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THE OVERTHRUST BELT:

AN OVERVIEW OF AN IMPORTANT NEW OIL AND GAS PROVINCE

by
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THE OVERTHRUST BELT:

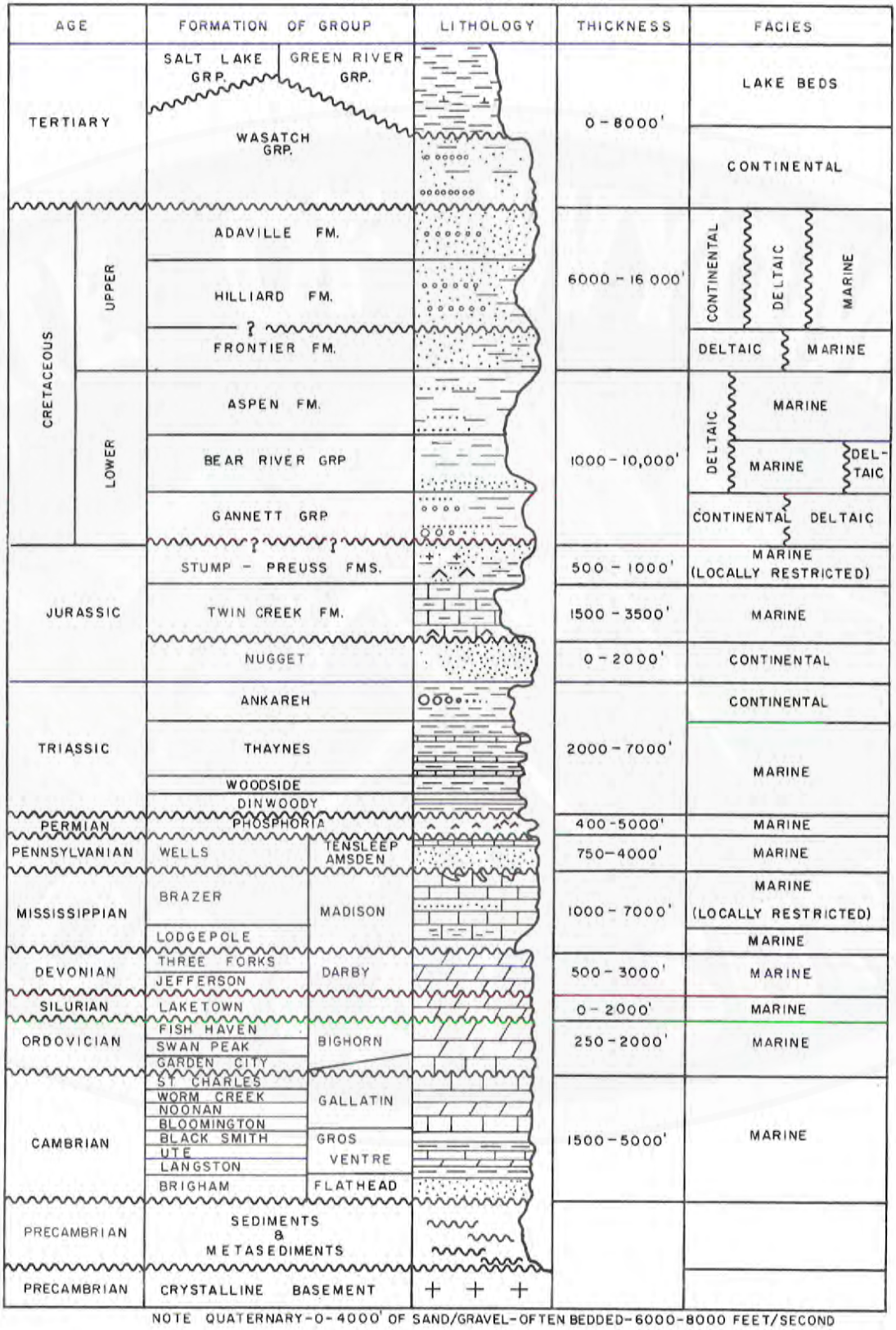
An Overview of an Important New Oil and Gas Province

Overleaf: Frontispiece. Stratigraphic Column, Overthrust Belt

TABLE OF FORMATIONS

WYOMING-IDAHO-UTAH FOLD AND THRUST BELT

(BEAR RIVER RANGE - MOXA ARCH)



NOTE QUATERNARY-0-4000' OF SAND/GRAVEL-OFTEN BEDDED-6000-8000 FEET/SECOND

SOURCE: PETROLEUM INFORMATION, 1978
"THE OVERTHRUST BELT"

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STATE OF WYOMING
1933
GEOLOGICAL SURVEY

THE OVERTHRUST BELT:
AN OVERVIEW OF AN IMPORTANT NEW OIL AND GAS PROVINCE

Introduction and General Geology

That portion of the Overthrust Belt located near the Utah-Wyoming border is considered by industry to be the hottest new oil and gas province in North America. The Overthrust Belt is a strip of structurally disturbed strata running from northern Alaska, southward through Canada and the western U.S., into Mexico. However, the segment which is currently the target of extensive exploratory efforts is bordered on the north by Jackson Hole, Wyoming, on the south by the Uinta Uplift, and on the east by the Darby and Prospect Faults, encompassing an area over 100 miles wide and 200 miles long, as shown on the map in Figure 1.

The geology of the area is extremely complex, with strata being highly folded and faulted. This complexity has contributed, and continues to contribute greatly, to the difficulty of exploring for oil and gas. Geologists familiar with the area attribute this geologic complexity to a process termed "plate tectonics," or, put simply, the collision of the oceanic Pacific crustal plate with the edge of the westward moving continental North American plate. Geologic interpretation of rock assemblages present in western North America seems to indicate that sedimentary and volcanic deposits overlying the ocean crust were literally scraped off and piled in front of the North American plate. Tremendous stresses compressed the sedimentary deposits, shearing them into massive sheets exceeding 20 miles in width and several miles in thickness. These sheets were moved or "thrust" eastward, in some cases as far as 50 to 70 miles over adjacent sections, resulting in an effect similar to shingles on a roof (Petroleum Information Corporation, 1978).

Thrusting in Wyoming, northern Utah, and eastern Idaho was episodic during a 90-million-year period which began in latest Jurassic times and ended in the early Eocene (Royce, 1979). Put simply, in instances where good reservoir rock in the thrust sheet came to rest on an extensive area of petroleum source rock and the reservoir rock was contorted sufficiently to provide trapping mechanisms, the petroleum migrated up into the trap to form the deposits being discovered today. Information provided by recent discoveries in the Utah-Wyoming area indicates that the above described productive accumulations or traps of oil and gas appear to be controlled by, or to coincide with, the intricately folded leading edges of major thrust faults (Powers, 1977). The pattern of oil and gas discoveries to date, as shown on the map in Figure 1, and their proximity to the leading edges of the major thrust faults, supports the above theory. Obviously, much work remains to be done before the details and mechanics of thrusting in the area can be worked out. The success of exploration for petroleum in the Overthrust Belt will go hand in hand with the unravelling of the complex geology of the area.

Exploration Activity in the Overthrust Belt

The existence of petroleum in southwestern Wyoming has been known since the early 1800's. Numerous oil springs and seeps have been known

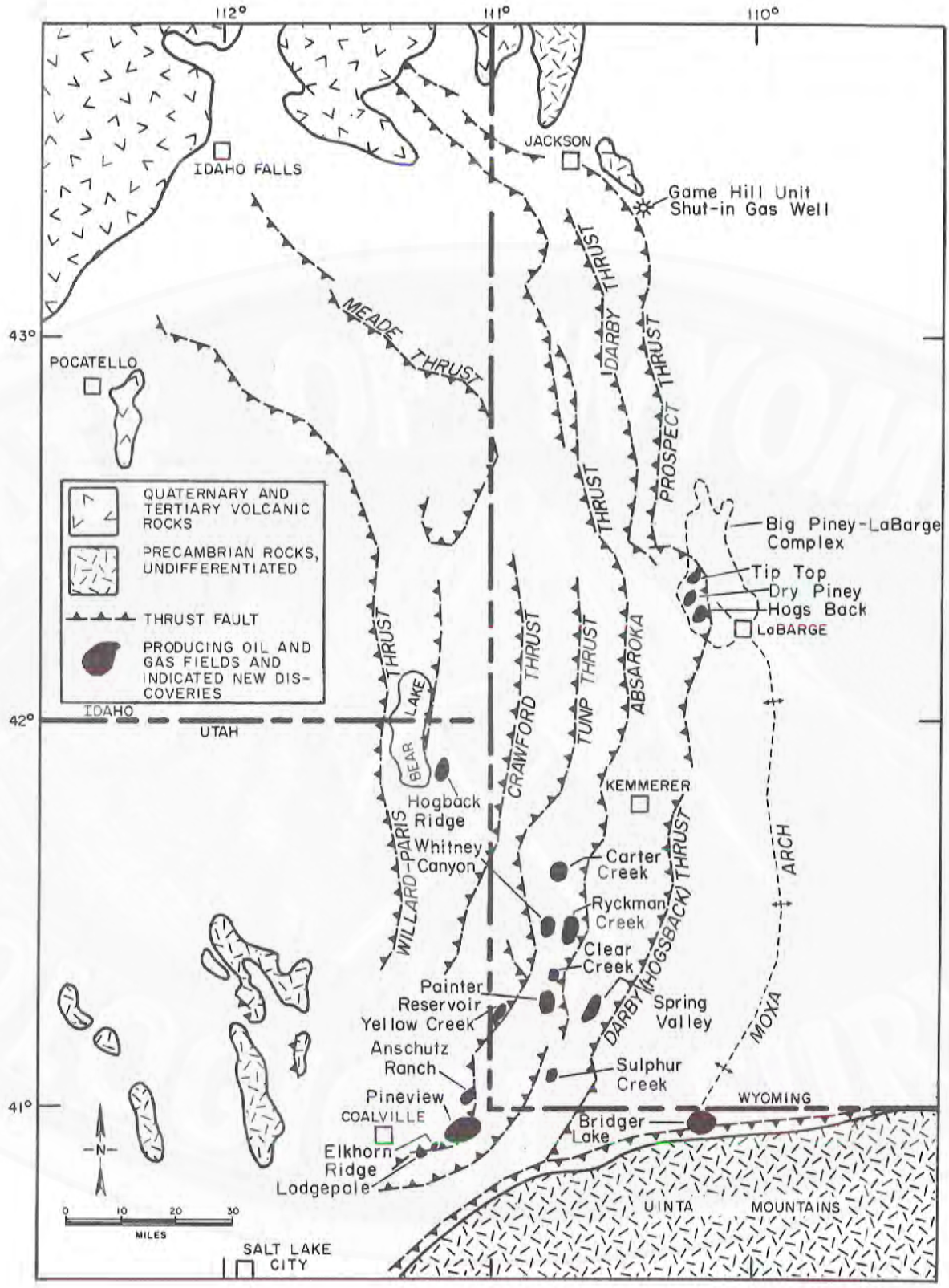

Figure 1. Oil and gas fields in the Overthrust Belt.

along the leading edge of the Absaroka thrust plate (Petroleum Information Corporation, 1978). Aspen (abandoned), Spring Valley and Sulphur Creek fields in Uinta County (see map in Figure 1) were early discoveries resulting from drilling during the late 1800's and early 1900's. Unfortunately, these shallow, small fields never produced significant amounts of oil and provided very little impetus for further exploration.

The second wave of successful exploration occurred in what is termed the Big Piney-La Barge complex, which lies in a transition zone between the Green River Basin and the Overthrust Belt (see Figure 1). This large producing area is located on a large anticlinal structure known as the La Barge Platform. La Barge field was first discovered in 1924. In 1952, an intensive gas development was initiated by A. B. Belfer, founder of Belco Petroleum. Tip Top field was discovered in 1951, Hogsback field in 1959, and Dry Piney field in 1970. These three fields are located on the edge of the Overthrust Belt as shown in Figure 1, and are significant in that, to date, they have accounted for production totalling nearly 22 million barrels of oil and 537 million Mcf (thousand cubic feet) of gas (Oil and Gas Conservation Commission, 1978). Discoveries of this size on the edge of the area logically stimulated interest in the Overthrust Belt proper.

Intensive exploratory efforts, however, did not commence until the discovery of Pineview field in early 1975. Pineview field is located on the southern end of the Overthrust Belt adjacent to the Uinta Uplift (see map in Figure 1). Production was subsequently established from the Jurassic Nugget and Twin Creek Formations and most recently the Cretaceous Wanship and Jurassic Stump Formations, in a deeply buried anticlinal structure. Cumulative production from Pineview through June 30, 1978 totalled 8,034,033 barrels of oil and 8,128,038 Mcf of gas, from 20 wells (Petroleum Information Corporation, 1978). Field reserves (the term reserves, as used throughout this report, refers to recoverable reserves) have been estimated at about 135 million barrels of oil and 135 million Mcf of gas, according to Petroleum Information Corporation in their 1978 publication. Figures from an unpublished report by Kenneth Cummings of Empire Resources, Inc. in 1978 are more optimistic, showing indicated reserves of 230 million barrels of oil and 100 million Mcf of gas. (For additional information on Pineview field as well as the fields yet to be discussed, refer to Table 1).

The second important discovery, in mid-1976, was Ryckman Creek field, located nearly 15 miles northeast of the town of Evanston. This discovery represented the first major exploration success in the Wyoming portion of the Overthrust Belt. Production, to date, is restricted to the Nugget Formation in a buried, overturned, and faulted anticlinal structural trap. Cumulative production for Ryckman Creek field through June 30, 1978 was 925,349 barrels of oil and 248,006 Mcf of gas with 8 wells on production (Petroleum Information Corporation, 1978). By late March, 1979, twelve wells were on production. Barlow and Haun, Inc., in their 1978 report, estimated reserves at 40 million barrels of oil and 9 million Mcf of gas. Cummings estimates 100 million barrels of oil and 200 million Mcf of gas. Estimates made by the operator for a recent gas sale put gas reserves at 100 million Mcf of gas.

Table 1. Overthrust Belt Fields and Apparent Discoveries.

Field or Area Name	Discovery Completion Date	Ownership Interests	Producing Formations	Approximate Producing Depths	Number of Producing Wells	Cumulative Production (Petroleum Information, 1978)	Recoverable Reserves (Cummings 1978)
Pineview	Jan. 1975	American Quasar Amoco Production Energetics Sun Oil Occidental Pet. North Central Oil	Nugget Twin Creek Wanship Stump	10,000 9,000 3,000 6,000	21 (Mar. 79)	8,034,033 bbls. oil 8,128,038 mcf gas	230 million bbls. oil 100 million mcf gas
Ryckman Creek	Dec. 1975	Chevron U.S.A. Amoco Production Champlin Pet.	Nugget	7,800	12 (Mar. 79)	925,349 bbls. oil 248,006 mcf gas	100 million bbls. oil 200 million mcf gas
Yellow Creek	July 1976	Amoco Production Gulf Oil Chevron U.S.A. Champlin Pet.	Twin Creek	6,500	9 (Mar. 79)	--- ---	*40 million bbls. oil *300 million mcf gas
Lodgepole	Mar. 1977	American Quasar Can-Am Amoco Production Industrial Energy North Central Oil	Nugget Twin Creek	11,600 11,200	3 (Oct. 78)	--- ---	50 million bbls. oil ?
Whitney Canyon	Aug. 1977	Amoco Production Chevron U.S.A. Champlin Pet. Gulf Oil	Thaynes Big Horn Madison	9,200 15,400 13,200	2 (Jan. 79)	--- ---	10 million bbls. oil 300 million mcf gas
Elkhorn Ridge	Sept. 1977	Amoco Production Champlin Pet. Sun Oil Industrial Energy Occidental Pet. North Central Oil	Twin Creek	11,000	1 (Jan. 79)	--- ---	20 million bbls. oil ?
Hogback Ridge	Oct. 1977	American Quasar Can-Am L.L. & E. Cities Service Ram Petroleums Energy Res. Grp. W.R. Grace Patrick Petroleum Gulf Oil	Dinwoody Phosphoria	9,500 10,100	1 (Jan. 79)	--- ---	? 500 million mcf gas
Painter Reservoir	Oct. 1977	Chevron U.S.A. Amoco Production Champlin Pet. Reserve Oil Gulf Oil Cities Service	Nuggett	10,300	8 (Dec. 78)	148,999 bbls oil 246,219 mcf gas	150 million bbls. oil 250 million mcf gas
Evanston**	Dec. 1978 (completed)	(See Yellow Creek Field)	Twin Creek	6,500	1	--- ---	--- ---
Clear Creek Area	Testing (Jan. 1979)	Chevron U.S.A. Amoco Production Champlin Pet.	Nugget	8,800	Testing (Jan. 79)	--- ---	--- ---
Carter Creek Area	Testing (Jan. 1979)	Chevron U.S.A.	?Madison Weber	14,500 13,000	Testing (Jan. 79)	--- ---	--- ---
Anschutz Ranch	Oct. 1978	Anschutz Corp. etc.	Twin Creek	7,000	1 (Oct. 78)	--- ---	--- ---
South Lodgepole Area	Oct. 1978	Colorado Energetics, etc.	Kelvin	6,000	1	--- ---	--- ---

*Totals reflect inclusion of Evanston field with Yellow Creek field.
**Now included with Yellow Creek field.

At the same time that the Ryckman Creek discovery well was being completed, an important discovery was made southwest of Evanston near the Utah-Wyoming border. In July 1976, the first gas well in Yellow Creek field was completed in the Jurassic Twin Creek Formation within a buried anticlinal structure. As of October 1978, two wells were on production and a third about to go on stream. No production figures are available at this time; however, Barlow and Haun (1978) estimate reserves at 12 million barrels of oil and 9 million Mcf of gas, while Cummings (1978) puts reserves at 40 million barrels of oil and 300 million Mcf gas, a total reflecting both Yellow Creek field and Evanston field, five miles to the northeast. Recently, Evanston field was combined with Yellow Creek, as it appears from new discoveries that the Yellow Creek trend extends to the northeast to include Evanston field. As a result of this extension, through March 1979, there are nine producing wells attributed to Yellow Creek field. With the addition of this new information, the reserve figures will undoubtedly be revised upward significantly.

Since mid-1976, several additional significant discoveries have been made in the Wyoming portion of the Overthrust Belt. These include Whitney Canyon field, Painter Reservoir field, Evanston field (now combined with Yellow Creek field), and apparent discoveries in the Carter Creek and Clear Creek areas which are still being tested (see map in Figure 1).

Probably the most significant of these recent discoveries is Painter Reservoir field. Total cumulative production through June 30, 1978 was 148,999 barrels of oil and 249,219 Mcf of gas from three wells (Petroleum Information Corporation, 1978). As of November 1978, there are 6 wells producing from the Jurassic Nugget Formation within the buried, overturned anticline that forms Painter Reservoir's trap. Barlow and Haun, Inc., in their 1978 report, conservatively estimated reserves at 15 million barrels of oil and 10.4 million Mcf of gas. More recent estimates by Cummings (1978) put reserves at 150 million barrels of oil and 250 million Mcf of gas. The operators estimated 304 million Mcf of gas recently when negotiating the sale of their portion of the field's gas to Northern Natural Gas. The reserve total for oil puts Painter Reservoir in the giant oil field category (reserves greater than 100 million barrels) along with Ryckman Creek and Pineview fields.

Whitney Canyon field represents another important gas discovery with production indicated from Triassic Thaynes, Mississippian Madison, and Ordovician Big Horn Formations. Little is known about the ultimate extent of the field, and, as of January 1979, two wells had been completed. Cummings in his 1978 report put reserves at 10 million barrels of oil and 300 million Mcf of gas. However, reserve figures for the field will undoubtedly be revised significantly as the structural trap forming the field is further evaluated.

A well in the Clear Creek area has indicated production from the Jurrassic Nugget Formation. Little is known about the size of this new discovery; however, it is on trend between Painter Reservoir and Ryckman Creek fields, indicating that the two may eventually connect to form one long producing trend. The other indicated discovery, in the Carter Creek area, is apparently a multipay gas discovery several miles north and on trend with Ryckman Creek field. Very little is known

about the size and extent of this new discovery, as the discovery well is still being tested, with possible production from the Mississippian Madison and Pennsylvanian Weber Formations.

The northern portion of the Overthrust Belt in Wyoming has yet to yield a discovery, although Rainbow Resources recently completed an apparent Cretaceous Frontier gas discovery after encountering engineering problems. This well is currently shut in, awaiting hook up to a pipeline. Several abandoned wells in this area had shows of gas, indicating that the area could contain an important new gas field, thereby giving Teton County its first commercial production.

Following the discovery of Pineview field, several significant finds were made in the Utah portion of the Overthrust Belt. The most remote of these, Hogback Ridge field, was discovered in October 1977 in northern Utah near Bear Lake, as shown in Figure 1. Production tests on the discovery well indicate a tremendous potential gas flow from the Triassic Dinwoody and Woodside and Permian Phosphoria formations. To date, the boundaries of the field have not been determined and little is known about reserves, although Cummings (1978) estimates gas reserves at 500 million Mcf.

Six miles southeast of Pineview field, the Lodgepole field discovery well was completed in March 1977. To date, oil and gas production has been established from the Jurassic Twin Creek and Nugget formations in three producing wells. The extent and overall reserves of the field are yet to be defined; however, Cummings (1978) estimates reserves of 50 million barrels of oil.

In September 1977, the Twin Creek (Jurassic) oil and gas discovery well for Elkhorn Ridge field was completed. An offset well also has indicated production from the Twin Creek. Once again, little is known about extent and reserves of the field. However, Cummings (1978) estimates oil reserves of at least 20 million barrels.

Recent production tests of a well in the Anschutz Ranch area established the twelfth field in the Overthrust Belt, nearly eight miles north of Pineview field. The Twin Creek is the producing formation for this apparently large gas discovery. The extent and reserves of this field are yet to be determined.

The most recent discovery became apparent with the announcement of the completion of a shallow Cretaceous Kelvin gas well two miles south of Lodgepole Field. Very little is known about the discovery at this time.

As yet, the Idaho portion of the Overthrust Belt has not yielded an oil or gas discovery, although considerable exploratory drilling has taken place. Several of the previously abandoned wells contained oil or gas shows, i.e., hydrocarbons in amounts not sufficient to produce. A Conoco well in Bonneville County appears to be the newest candidate for the first discovery in Idaho, and will be evaluated later this spring, as operations have been shut down for the winter due to weather. It appears only a matter of time until Idaho joins Wyoming and Utah in oil and gas production

The importance of the above mentioned large new fields to the incomes of their respective states cannot be overemphasized. Don Basko, Wyoming State Oil and Gas Supervisor, illustrates this point, taking Painter Reservoir field as an example. The State of Wyoming receives

15 3/4% in taxes and mineral royalty return from oil and gas that is discovered and produced. This total is based on 4% severance tax, 5 1/2% ad valorem tax and 6 1/4% mineral royalty return. In the case of Painter Reservoir, he assumes an ultimate recoverable reserve of 256 million barrels of oil. Utilizing this reserve figure, he develops the following number as income to the state over the life of the field:

> 256 million barrels x $13.05/ barrel x 15 3/4% = 526 million dollars

When one considers this number, plus similar totals for the other existing fields and fields yet to be discovered, the importance of this new oil and gas province to the states involved is quite evident.

High Exploration and Development Costs in the Overthrust Belt

The important geological structures that have proven to be petroleum traps were not located as a result of surface expression as was the case with many of the older fields in Utah and Wyoming. They all represent deeply buried anticlinal structures which had no surface expression and could only be located using a technique known as seismic reflection. Basically, seismic reflection is a process by which travel times of elastic waves, generated at or near the surface and reflected back from rock interfaces, are measured to determine the depth and configuration of specific rock units. The complex geology, including multiple thrust sheets and highly deformed rock strata, makes interpretation of Overthrust Belt seismic information extremely difficult.

As a result of the rugged terrain, elaborate equipment used, and problems with accessibility, the costs associated with seismic exploration in the area are very high. Average costs can run as high as $300,000 per month for a seismic crew, with the number of miles surveyed per month averaging 40-45 in rough terrain and about 70 in road areas. By comparison, less complex and rugged areas outside the Overthrust Belt can be surveyed with crew costs closer to $200,000 per month with a typical crew covering closer to 90-100 miles per month (Petroleum Information Corporation, 1978). In addition, some areas in the Overthrust Belt are so isolated and rugged as to necessitate use of special equipment and transportation by helicopter, which can easily double the already high average cost for seismic exploration. As a result of these high costs it has become popular for companies to become involved with group surveys; i.e., 10-12 companies share the cost for the survey and all receive the same raw data. It is then up to an individual company's geophysical team to make their own geological interpretation.

Complex geology, rugged terrain with poor access, and seasonal working restriction because of bad weather also have their effect on exploration drilling costs. These costs, first of all, include a flat fee for constructing the access road and drill site, which varies considerably depending on terrain. To this is added the cost of moving in and setting up the drill rig, $50,000-$60,000 for distances less than 100 miles. In addition, daily rig cost, which increases with the depth capacity of the rig, runs quite high. For example, in the case of a 10,000-foot Nugget test, the day rate rig cost approaches $50-$60 per drilled foot (Petroleum Information Corporation, 1978).

Table 2: Overthrust Belt Reserve Estimates.

Information Source	Undiscovered Recoverable Resources
Monley (1971)	3.3 billion barrels of oil
U.S. Geological Survey Circular 725 (1975)	0-0.2 billion barrels of oil 0-1.1 trillion cubic feet of gas
U.S. Geological Survey Powers (1977)	.6-3.0 billion barrels of oil 4.0-12.0 trillion cubic feet of gas
Rocky Mtn. Oil & Gas Assoc. est. for RAREII tracts (1978)	1.5-8.8 billion barrels of oil* 6.0-51.5 trillion cubic feet of gas*
Cummings unpublished report (1978)	15 billion barrels of oil 75 trillion cubic feet of gas

*These figures represent totals for RAREII tracts only; R.M.O.G.A. estimates that reserves for the entire Overthrust Belt may be 10 times this amount.

better exploration models developed, thereby leading to more accurate reserve estimates. Table 2 illustrates this, in that, as the number of discoveries increased, the estimates of reserves increased in size and reliability. However, many more discoveries in various parts of the Overthrust Belt will be needed before very reliable reserve estimates can be made, especially in the case of the northern portion. The present numbers, although far more accurate and meaningful than the early estimates, are still only broad "ball park" numbers based on minimal data.

Problems faced by Industry within the Overthrust Belt

The petroleum industry operating in the Overthrust Belt faces numerous obstacles and problems which are, for the most part, uncommon in most other major oil and gas producing provinces within the continental U.S. These problems range from the high exploration and drilling costs mentioned earlier to the obstacles and delays brought on by environmental and wilderness legislation.

One fairly unique problem found in the Overthrust Belt is the complex land and mineral ownership pattern characteristic of the area (see map in Figure 3). The area includes National Forest lands, BLM-controlled Federal lands, Union Pacific Railroad lands, State lands, and private lands. In each case, the policy under which leasing, drilling, etc., occurs varies considerably creating a confusing situation for operators. As demonstrated by the map in Figure 3, a very large portion of the lands within the Overthrust Belt are federally controlled by either the Forest Service or BLM and, of this federally controlled land, approximately 47% is either closed or effectively closed to mineral development (Kleppe, 1977).

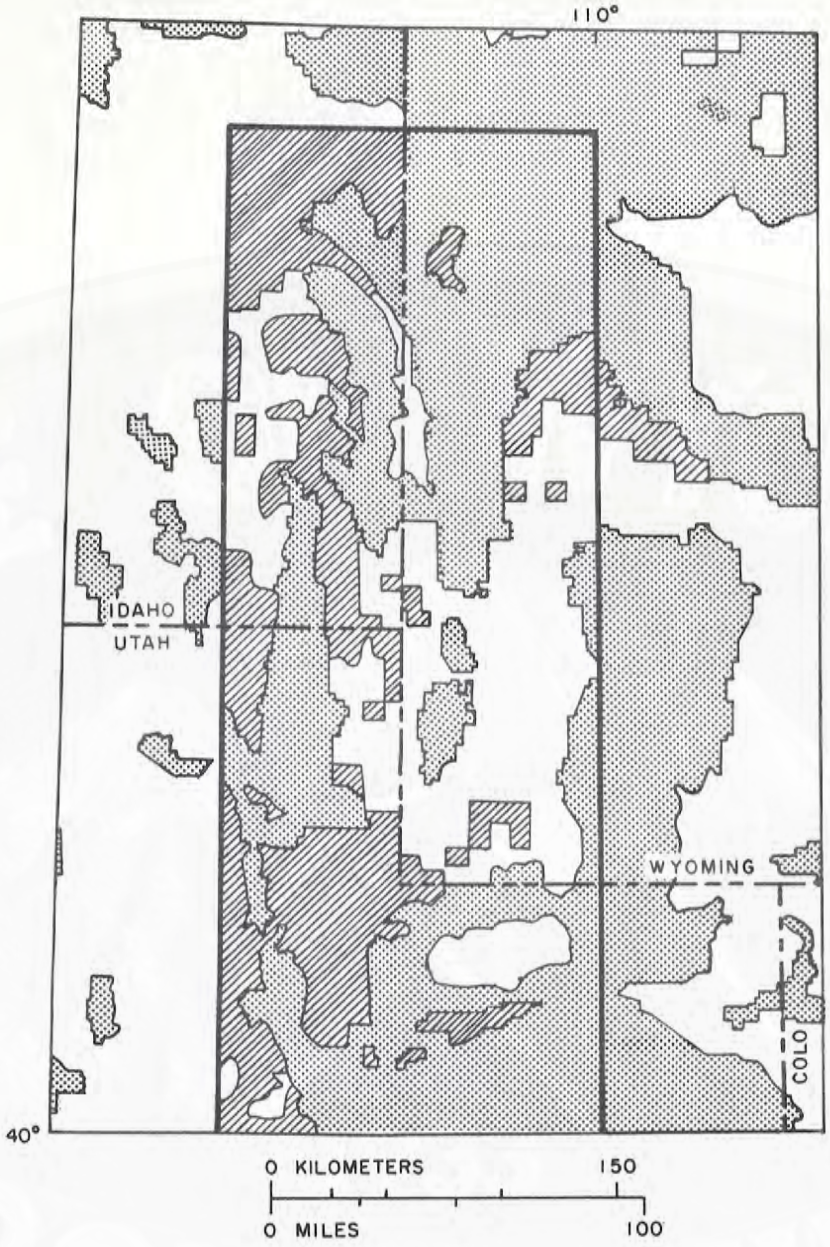

Figure 3. Map showing Federal lands which are subject to mineral restrictions in the Thrust Belt province. Stippled and clear areas represent Federal lands, 47 percent of which are effectively closed to oil and gas development. Diagonal patterned areas represent non-Federal lands. (U.S. Geological Survey, 1976, as reproduced by Powers, 1977.)

This brings us to the most devastating obstacle to operators, that being restrictions or limitations on development and exploration resulting from the long list of wilderness and environmental legislation affecting Federal lands. Some of the legislation that has had an obvious effect on exploration and development is summarized in Table 3.

Of the legislation listed in Table 3, the Wilderness Act appears as though it may have the greatest effect on exploration and development in the Overthrust Belt. As a result of this act, the Forest Service undertook their RAREI and RAREII roadless area reviews to identify areas to be added to the National Wilderness Preservation System. Several tracts were nominated within the Overthrust Belt (see map in Figure 2 for those tracts nominated in the Wyoming portion) which could contain up to 8.8 billion barrels of oil and 51.5 trillion cubic feet of gas. Management of these areas with respect to oil and gas exploration has been quite restrictive.

In January of this year, the U.S. Forest Service released its final recommendations on "wilderness" and "further planning" land withdrawals. Apparently, all proposed tracts in the Wyoming portion of the Overthrust Belt received non-wilderness recommendations, with the exception of the 290,000-acre Gros Ventre tract which received a wilderness recommendation with reduced boundaries, and the 135,000-acre Palisades tract which received a further planning recommendation (see map in Figure 2). These two tracts will continue to be managed very restrictively, until final disposition of the land is made by Congress. Although no discoveries have been made on either of these tracts, exploratory tests near them have encountered good gas shows, and it appears only a matter of time before the area has its first exploratory success, the Rainbow Resources well referred to earlier being a prime candidate. Indications are that significant reserves could be tied up in portions of these two tracts.

The Forest Service, through the Organic Administration Act and NEPA, has statutory authority to control exploration and development on all National Forest lands. The BLM, which determines what lease stipulations may be imposed on National Forest lands, has, for the most part, followed Forest Service recommendations. These recommendations have included no new leasing on RAREII inventoried lands and no surface occupancy or very restricted access on existing leases.

The BLM Organic Act (FLPMA) has authorized the inventory of roadless areas on BLM and administered lands similar to the above RAREII process. Although this process is only in the preliminary stages, the BLM indicates that several tracts in the Wyoming portion of the Overthrust Belt have been identified for further evaluation (see map in Figure 2), placing these areas under the BLM interim management policy until the disposition of the tracts is determined. This interim management policy is designed to protect the tracts from activities which might impair their suitability for inclusion in the wilderness system and obviously will be quite restrictive -- to the point of not allowing exploration or new development.

For the most part, the remaining legislation in the table above has only been responsible for delays in drilling and relocation of drill sites. There have been instances where, for example, by strict enforcement of the Clean Air Act, EPA has caused very large increases in

Table 3. Congressional legislation affecting Overthrust Belt oil and gas activity.

LEGISLATION	GROSS PROVISIONS AS RELATED TO OVERTHRUST BELT ACTIVITY
Organic Administration Act of 1897	Provides U.S. Forest Service with authority to control access and surface disturbances within National Forest lands.
Wilderness Act of 1964	Provides for continuing assessment of Federal lands for identification and creation of wilderness areas as defined with the act. Basis for RAREI and RAREII studies.
National Environmental Policy Act of 1969 (NEPA)	Establishes national policy insuring protection of the environment and its resources. Initiates policy of requiring environmental impact statements to be written in cases where it is determined that a given activity could have an effect on the environment.
BLM Organic Act of 1976 (Federal Land Policy and Management Act) (FLPMA)	Among other things, requires BLM to identify and inventory all roadless areas with wilderness characteristics and evaluate them with respect to suitability for inclusion in the National Wilderness Preservation System.
National Historic Preservation Act of 1966	Institutes continuing program for the protection of historical and cultural resources. Provides specific provisions for land-administering agencies.
Archeological and Historic Data Preservation Act of 1974	Authorizes the preservation and protection of cultural resources endangered by any project conducted under Federal license or permit. Initiates pre-drilling site inspection for cultural values.
Clean Air Act of 1970 (specifically, 1977 Amendments)	Authorizes control of air emissions (EPA). Amendments in 1977 affect production facility emissions, especially in processing sour gas.
Safe Drinking Water Act of 1974	Controls contamination of drinking water. Regulates underground injection and disposal programs related to oil field production.
Federal Water Pollution Control Act of 1972	Institutes continuing program to reduce and eventually eliminate discharge of all water pollutants by 1985. Authorizes EPA to issue permits and control industrial waste discharge, including oil and drilling mud.
Endangered Species Act of 1973	Continues protection of species of fish, wildlife, and plants threatened with extinction.
Fish and Wildlife Coordination Act of 1934	Institutes additional legislation for protection of wildlife and wildlife habitat.

(Some of the information above was condensed from the Petroleum Information Corporation publication on the Overthrust Belt, 1978.)

company costs for constructing production facilities. Drill sites and access routes have been relocated in order to protect archeological sites, etc., identified as a result of the Historic Preservation Act and Archeological and Historic Data Conservation Act. Numerous cases have cropped up where, due to overzealous management or overly restrictive stipulations, exploration activity has been delayed or even stopped.

In summary, the Overthrust Belt, characterized as a very complex geologic province, represents a very important new addition to the nation's petroleum reserves. Recent large discoveries resulting from extremely expensive exploration efforts indicate a very bright future for the area, if exploration and development are not impeded by restrictive legislation. It appears at this point, however, that wilderness studies in the form of RAREII and the BLM roadless inventory will tie up much of the area under very restrictive management, allowing very little, if any, exploration and development activity. In the case of those tracts which become wilderness, their potential will be lost permanently. The importance of this new oil and gas province to the economy and future of this country cannot be overemphasized.

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