

OIL INDUSTRY'S CONTRIBUTION
TO NEW MEXICO'S WATER RESOURCES

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Upon reviewing in 1965 my paper presented at the Third Annual New Mexico Water Conference in 1958 entitled, The Industrial Use of Water, I find that the information is still basically valid; however, New Mexico's growth has accelerated and attention to factors effecting conservation have been accentuated. Suffice to say that the conclusions in 1958 were not optimistic enough. New Mexico is growing at such a rapid rate that pressure for the most beneficial use of water will continue to increase. An open mind on the part of those charged with regulation to new concepts and uses will enhance and increase New Mexico's economic position.

New Mexico's mineral wealth is fantastic, and its favorable population and geographic position in respect to the nation places New Mexico in an excellent position to convert its raw materials into higher value consumer items; provided, regulation in the field of water and energy does not make these two basic items so expensive that states with more favorable regulations continue to process New Mexico's raw mineral wealth. As an example, Southeastern New Mexico is rich in three depletable minerals - oil, potash and water. Not only is the mineral wealth significant to Southeastern New Mexico, but to the state and to the nation. With ninety-eight percent of our domestic potash, twenty-five percent of the nation's oil located in the Permian Basin, fourteen cubic miles of water in Lea County -- and, consider the fact that Lea County, New Mexico produces more dollar value in oil and gas than any county in the nation -- it at once becomes apparent why this area is of vast importance to the nation. The area can become of even greater importance to New Mexico if we can encourage local processing.

New Mexico has obtained considerable wealth from these depletable minerals, and I hasten to add that these minerals were discovered and developed by speculation. However, in order to recover these minerals, water is needed; and in order to continue these operations and to maximize the economic impact on New Mexico, water will have to be readily available now and in the future! Patterns of exploration, discovery, processing, manufacturing, transportation and marketing are established on many factors. Water, readily available at a reasonable price, is one of the major factors that sets these economic patterns. If water is not locally available, the raw materials will continue to be exported.

As an individual that has been closely associated with the extractive industries and industrial development, the first question in-

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variably asked by a prospective investor -- "Does New Mexico have the water?" Vast quantities of water in fact are present; however, not always readily available. The hurdles that a potential investor who needs water must jump are often so complicated, at least to the uninitiated, that the frustrating experience frequently lends support to the question, "Does New Mexico have the water?" Emphatically, yes! New Mexico does have vast volumes of water.

The oil industry has taken many positive steps that have increased the water resources of this state. To summarize a few of these positive steps, I submit the following for your information:

1. The very nature of the oil industry's exploration program has caused the discovery and development of water for farmers, ranchers, and municipalities.
2. The thousands upon thousands of shot-hole formation records are on file for the water explorer's and researcher's use.
3. In many areas these thousands of shot-holes have had a side effect of allowing rainfall to immediately enter the water aquifer, thereby reducing evaporation losses and recharging the basins such as the Lea County Water Basin.
4. The oil industry has proved, with large outlays of capital, the vast Capitan-Guadalupean artesian water aquifer. This aquifer is of major proportion many times greater than the fourteen cubic miles of Ogallala water, and it lies in a semi-arid, sparsely populated grazing land that has a long growing season. Although the quality is considered marginal by many accepted standards, the Capitan water can be and is used for all purposes, including irrigation. Perhaps these accepted standards are based on exceptionally high quality, large quantity, and low lifting cost of the Ogallala. Positive action in encouraging the development of this aquifer will greatly enhance New Mexico's economic growth. I suggest a program of detailed research not only with this aquifer, but with the overlying soils.
5. A fifth area that the oil industry has been active in is the conservation of water. By virtue of discovery and development, oil has brought wealth and population to an area that formerly was poor and sparsely settled. This cause and now effect has brought pressures to bear, many of which were sound. The oil industry has met these problems head-on, particularly in the protection of water quality and water conservation.

(a) PROTECTION OF WATER QUALITY

The oil industry found, when it was pointed out by the State Engineer, that its water disposal methods could possibly affect the excellent water quality of the Ogallala, and invested in twenty-nine separate oil field disposal systems. These systems dispose of water at depths from 4,000 to 15,000 feet. A portion of this disposed water is of higher quality than many municipalities in the Southwest are presently using. It is estimated that these systems have cost in excess of \$7,500,000 in capital outlay and that the operating cost to date approaches another \$2,000,000. The volume of disposed water to date (which will never be recovered again) is 315,000,000 barrels-- or over 40,000 acre feet -- at a cost of \$232/acre foot. I am advised that water used for growing cotton has a gross value of \$60/acre foot.

Secondary recovery by injection of water is relatively new in New Mexico for only a few projects have reached their final stages. I cite one for your evaluation:

Ambassador Oil Corporation
North Caprock Queen Unit 47 wells

20,005,778 barrels of water injected to 1/1/65
15,212,588 barrels of water recycled to 1/1/65
4,793,190 barrels of make up water to 1/1/65

4,793,190 barrels of water = 617.8 acre feet
7759 barrels per acre foot

This 618 acre feet of make up water has recovered 3,256,833 barrels of oil. Assuming an average value of \$2.90 per barrel, the gross value recovered to 1/1/65 is \$9,444,815, or a gross per acre foot value of \$15,282.87 for the water.

Directly, the governmental agencies of the State of New Mexico receives approximately \$1,064/acre foot of Ogallala water used. In addition to this, since the state owns the minerals, it received in royalty \$1,180,602 or a value of \$1,910/acre foot of Ogallala water. Jobs were created and materials purchased. Without secondary recovery utilizing Ogallala water, this natural resource was unrecoverable.

What is wise use? If the water used to recover this oil had a value, what is the value? Is it a dollar value? Some so-called conservationists say, no, that we cannot place a dollar value on water. Perhaps this group places a social value on water. If so, the monies derived from the taxes and royalties paid, contributed to untold projects in welfare and education.

Perhaps this group places an intellectual value on water. If so, the monies derived from the taxes and royalties paid contributed a substantial portion of the money available for all levels of education and research.

Many in this group predict we will run out of drinking water. Those familiar with the vast volume of our water resources know that these prophets are not responsible for their irresponsible statements. In our part of the state, it is a basic fact that without the oil industry there would not be enough people, or water, to worry one way or the other about the many facets of water problems that can and have been created.

6. The Interstate Oil Compact Commission is presently studying the basic concepts and problems involved in making a survey of the mineralized water that is produced from great depths to determine the economic value of recoverable minerals.
7. Increased local consumption of this energy resource is occurring each year, creating more jobs and reasonable prices for New Mexico consumers, particularly power for lifting water.
8. The proper plugging and abandonment of oil wells to protect our water sands has been a practice for so many years that it is often overlooked.
9. It is estimated \$30,000,000 has been spent through the years running surface pipe to protect surface waters is a practice that has been in effect for many years. It is often overlooked when assessing what the oil industry has done to contribute to the protection of the water resources of New Mexico.

Oil is a depletable natural resource just as is the Lea County Water Basin, and just as is the Hobbs-Carlsbad Potash. The ability to recover the last possible barrel of oil and the last possible ton of potash is determined by many factors, but water at a reasonable

price is axiomatic. The maximum use of these three mineral resources are necessary one to the other, and the time at which the water is available is important. Foreign potash and oil have become extremely competitive in recent years. Only through aggressive development can our domestic resources continue to compete.

New Mexico's economy is spiralling and consequently its governmental expenditures are increasing. In order to help pay the tax load, we must encourage maximum utilization of our three depletable minerals. Five years ago, the total volume of secondary oil was insignificant; today it represents eleven percent of New Mexico's production from ninety-four active floods with eighteen percent of the wells engaged in secondary operations. Without secondary recovery utilizing water, it is estimated that over \$1,500,000,000 will not enter into the economy of New Mexico.

The state's economic health is tied to a positive approach on the availability of water to industry and it must be available at the time required.

The oil industry has been a partner in the development and protection of our water resources and it is ready and willing not only to continue, but rather to accelerate our participation. In 1964 the New Mexico Oil and Gas Association had as its leading speakers our able State Engineer, Steve Reynolds, and the Honorable Tom Morris. After hearing these gentlemen, the Regulatory Practices Committee, Chairmanned by Mr. Jason Kellahan recommended to the association that the talks be reproduced and distributed. The committee then organized a steering committee to study, not just industry's water problem, but to offer the assistance of a vast technical pool to study the entire state. Mr. Kellahan's group then took a third step by recommending to the association that it contact other agencies interested in the water resources of New Mexico in order to initiate a joint study on a broad, comprehensive basis, and that these agencies jointly contact our water-oriented schools to determine their interest in furthering these studies. The fifth recommendation on water was that the association consider offering such financial assistance as may be feasible for such a program and to give it full cooperation, and actively solicit support in the form of grants from other organizations or foundations to further the study.

The oil and gas industry is proud to have played such an important part in the development of our great state. The New Mexico Oil and Gas Association stands ready at all times to meet its responsibility in all governmental and public affairs.