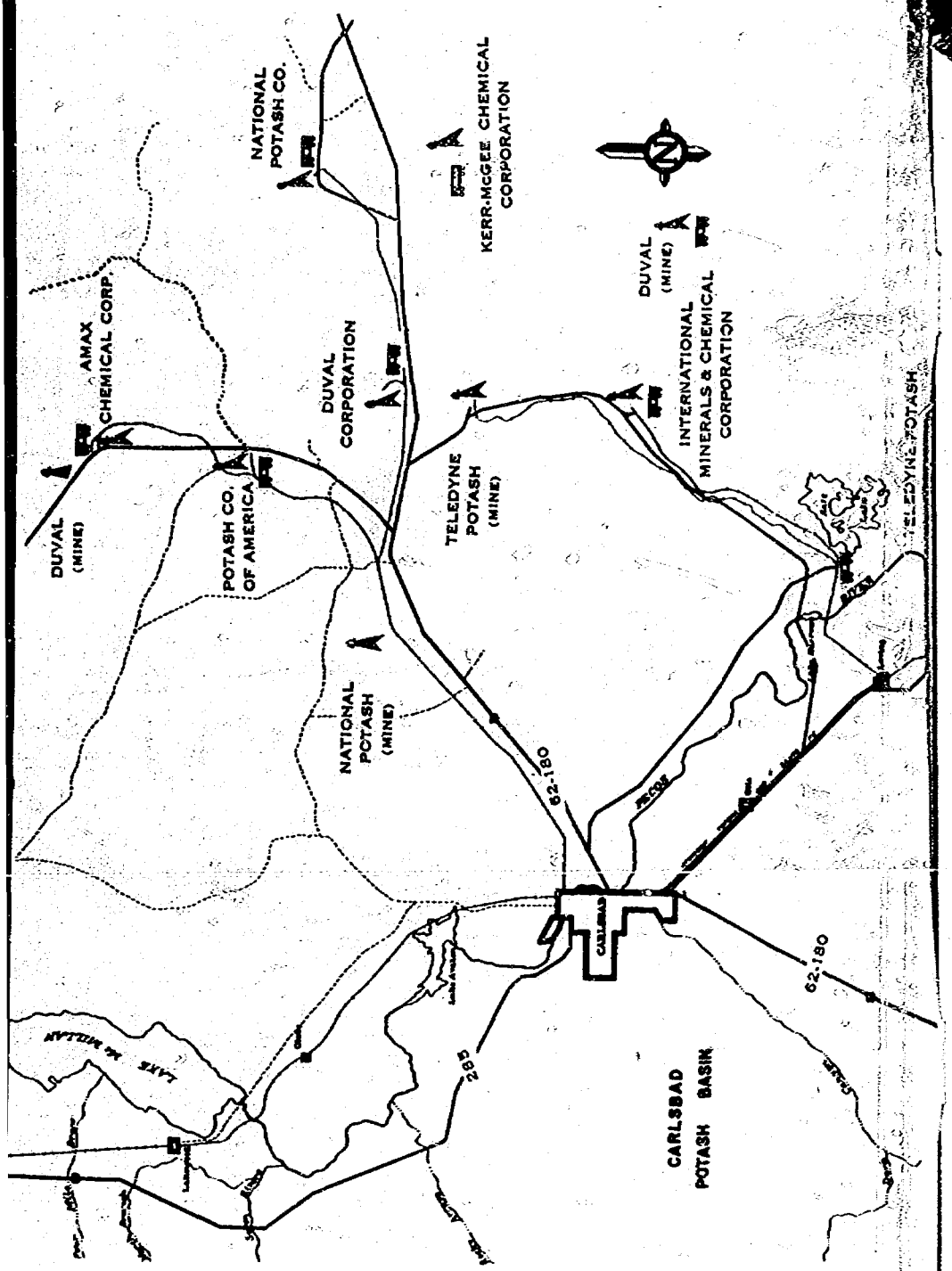
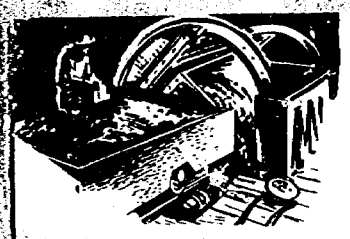
CASE 5497: MESA PET. CO. FOR CREATION OF TWO GAS POOLS AND SPECIAL RULES, EDDY COUNTY





NEW MEXICO *Potash*

NEW MEXICO FIRST IN POTASH PRODUCTION

Potash is of great importance to New Mexico. It is the basis of a $100,000,000-a-year industry. It provides employment to almost 3,000 New Mexico residents and is one of the state's biggest taxpayers.

New Mexico is the nation's leading producer of potash, one of our most vital minerals. Without potash, our modern-day intensive agriculture would be impossible. A strong and vigorous potash industry is vital to the economy of the United States.

But in spite of its great importance to our state and nation, most persons know little about potash.

WHAT IS POTASH?

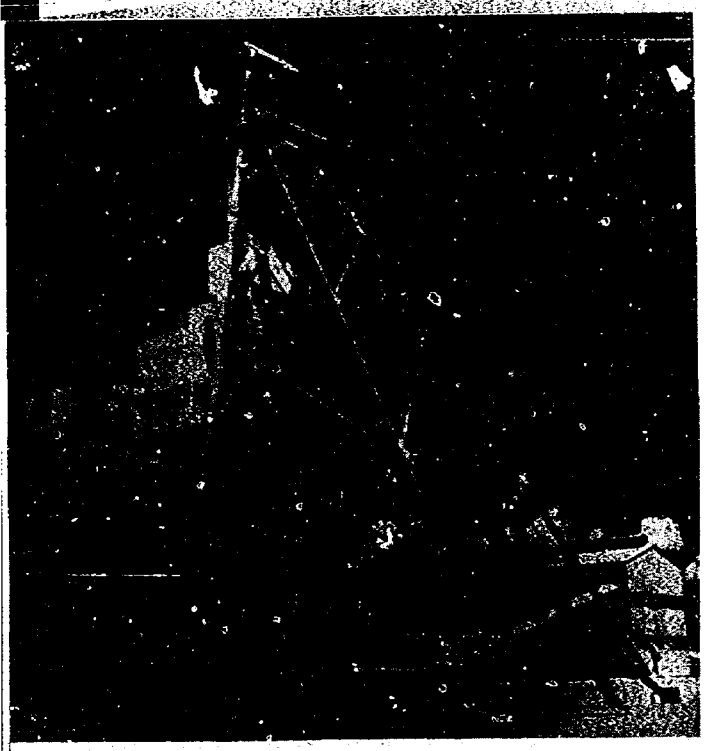
"Potash" is a word used to denote a chemical combination of the element potassium with one or more elements. Without potassium compounds you could no more live than you could without air or water.

The term "potash" when used in connection with fertilizers refers to potassium oxide, written chemically as K_2O. The element potassium (K) is what the plant uses. In nature and commerce it is found combined with other elements. When combined with chlorine, for example, it forms potassium chloride, called muriate of potash. Due to custom of many years and state and federal laws, the potash content of fertilizers is given in terms of K_2O, even though there is no K_2O as such in the material. When the chemist analyzes the fertilizer he finds out how much K is present and calculates this amount to the equivalent amount of K_2O.

In the early colonial days in this country, potash produced from wood ashes was of major economic importance. The term "potash" is said to have derived from the manufacture of this product by the leaching of hardwood ashes in large iron pots.

POTASH IN AGRICULTURE

Almost 95 per cent of the potash mined and refined in southeastern New Mexico goes to fertilizer factories and farms, for potash is one of the most important plant foods. Soils in which many of our basic crops grow must be fed potash. Otherwise they produce



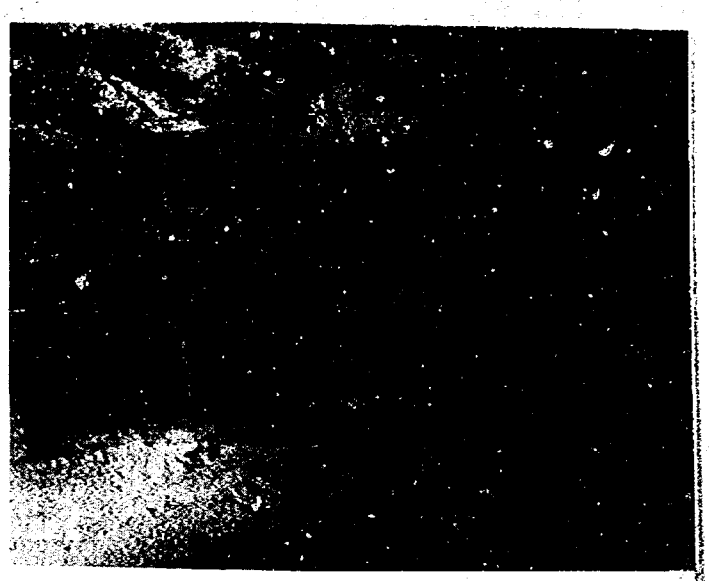
Typical headframe over hoisting shaft at New Mexico potash mine.

poor crops. Potash thus is a vital element in producing food and fibre for the American people.

Many areas, particularly in the eastern and southern states, can produce only very small yields unless the mineral content of the soil is increased through the use of potash and other plant foods. The middle western states have experienced potash deficiency in recent years as a result of intensive farming, and now that section has become the largest potash-consuming area in the United States. Illinois uses more New Mexico potash than any other state in the union, followed in order by Indiana, Ohio, Georgia, Florida, and Virginia.

Muriate of potash is by far the most popular material, comprising over 94 per cent of the total K_2O delivered for agricultural purposes, and sulphate of potash and sulphate of potash magnesia 6 per cent.

The importance of returning minerals to the soil can readily be seen when it is realized that the growth of one acre of the usual field crops will remove from 30 to 420 pounds of potash from the



Loading machine (right) loads ore into shuttlecar

soil. Ten of the largest acreage crops (tobacco, cotton, etc.) average 213 pounds of potash removed per acre per year.

Although the use of potash for fertilizer dates back several hundred years, no one knows just when or where the farmer first learned that plants grew better when the soil was fertilized with materials containing potash. At an early date the American Indians were able to produce more and better crops on land where fires had burned and also by using fish for fertilizer. For many centuries, wood ashes have been used to improve garden soils in Europe and Asia, and this is still a common practice in many of the rural areas. The recognized value of wood ashes for fertilizer created a heavy traffic in this item in this country as early as 1750.

POTASH IN CHEMISTRY, OTHER USES

Some New Mexico potash goes to the manufacturers of potash caustic, and this in turn goes into many important industries. Most of the finer glasses and chinaware require potash. Bohemian, crystal and optical glasses owe their exceptional clarity and brilliance to potash.

Specialty soaps, particularly liquid soaps, are potash products. Potash replaces soda in many applications where its properties yield an improved product.

It is used in the manufacture of matches, vat dyes, television tubes, pharmaceuticals, synthetic rubber, detergents, photographic film, insecticides and other products. For many years it was a chief constituent of explosives, and black gunpowder was roughly one-

third nitrate of potash. Closely allied to production of munitions, the developement of rockets and jet propulsion depend largely on solid fuels, some of which have included potash salts.

Potash salts also have been used in the production of special aviation gasolines, and certain petroleum catalysts have contained potash salts. Fluorides have been used in petroleum refining for special quality gasolines, and these processes have used potassium compounds.

The fluorescent lamp required a special quality glass, and potash is required in its manufacture. Many experimental incendiary bombs during World War II were based on potassium perchlorate and potassium chlorate. These potassium types gave extremely high temperatures, and the igniter of many incendiary bombs contained potash salts.

The production of magnesium metal, which was tremendously increased for the war period, requires potash salts as a part of the flux to protect the molten metal.

A large number of potash salts are produced, ranging alphabetically from potassium acetate to potassium xanthate. A wide range of uses are also covered.

Potassium nitrate, commonly known as niter, is used as a curing agent for meats, particularly for hams, bacon, beef tongue, and corned beef. It is also used as a steel tempering compound. Addition to tobacco leads to uniform burning, and cigarette papers are also treated. It also contributes to the flavor of cured tobaccos.

Potassium cyanide is another product used in considerable tonnage. In addition to uses as a fumigant and insecticide, it is used as a reagent in the preparation of metals such as gold, silver, and copper. Case hardening of steel uses both this cyanide and the iron cyanide complexes. The potassium ferrocyanide is the active agent in blueprint paper.

Potassium permanganate is used as a bleaching agent although it itself is a deep purple in color. It is used in uranium processing in relatively large quantities. It is used in chemical processes for producing other materials.

Potassium chlorate is also used in match heads and in various explosives. It is the material generally used to make oxygen in the high school laboratories.

Potassium bitartrate is a salt that is imported quite largely. It is the crystal that settles out of grape juice and is known as cream of tartar. As such it is used in the kitchen directly and also in the manufacture of the tartrate baking powders. Some is also used in beverages and effervescent salts.

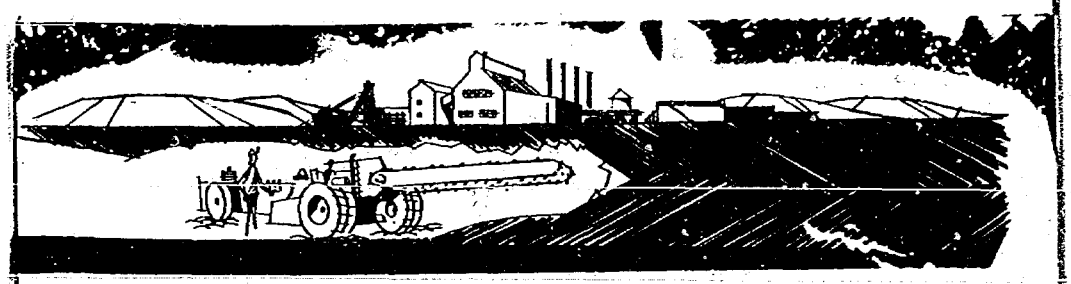
Potassium carbonate is used in glass compositions and also as an intermediate in making other salts.

Potassium chloride, which is the main material mined at Carlsbad, is the main constituent of salt substitutes. Use of such salt substitutes are prescribed for certain types of heart trouble. The body maintains a ratio of potassium to sodium and other salts in the blood and tissues. In fact, this ratio is quite critical. Dr. Vellaire, as a result of a recent study concludes that the modern diet is short of this essential nutrient. "We are operating on a border-line potassium deficiency", he declares. Orange juice has a comparatively high content of potassium and is one of the richest of the food sources.

Actually, the uses of potassium are many and varied, but many are of a technical nature only a chemist can appreciate. It is of interest to note that plants tend to carry high potassium content whereas the animals have more sodium than potassium. The plants concentrate potassium to such an extent that animals that eat only grass and plant products, must get salt from salt blocks or natural salt "licks". As the diet includes more animal products, extra salt may not be required and extra potassium salt may be needed for optimum health.

Pharmaceutical supply houses have listed some 35 different potash products. Of these, nine are quoted in carload lots, 21 in drum, keg or carton lots, and three in pound lots only. Those listed in carload lots include bichromate, carbonate, caustic, chlorate, chloride, nitrate, persulphate, silicate and sulphate. Our crystallization plants supply chloride raw material of high purity for industries manufacturing these various potash products.

In time of war failure of one material can have far-reaching effects, and in the first World War failure of potash supply led to great difficulties. In World War II, we were able to supply the chemical industries with all the potash needed and maintained an output of fertilizer potash adequate to continue high crop yields. Demand was greater than the supply, but government allocations distributed the available supplies, and no serious shortage developed anywhere in the U. S.



NEW MEXICO POTASH PRODUCTION

From an cutput of 535,000 tons of potash salts, equivalent to 317,000 tons K_2O in 1938, the last normal year prior to World War II, deliveries had increased by 1973 to 3,960,000 tons of salts, equivalent to 2,250,000 tons of K_2O.

The chemical industries, in 1938 consuming some 14,903 tons K_2O in their numerous manufacturers, under the impetus of war-time demands had increased their estimated requirements to 100,000 tons K_2O by the war's end, dropping back to a peace-time requirement of 88,026 K_2O tons in 1948. But deliveries of potash for non-agricultural purposes again had risen to 92,000 K_2O tons in 1973.

The American potash industry, having expanded tremendously since the war, is taking care of the greatly increased demand in this country for potash at a price which represents the lowest cost to the farmer of any point in the world.

The price of potash in the United States shot up about 1,000 per cent in World War I. But the total increase in World War II—thanks to increased New Mexico production—was only 0.2 per cent

Unlike so many others, which received government aid, the potash industry's wartime expansion was financed privately. The potash industry, in fact, has been developed with private capital from its beginning.

Development of the New Mexico potash industry drove the price of world potash down, and made this important fertilizer material available to the farmers at lower prices!

Interior view of modern potash refinery in Eddy County, N. M.

CREATING WEALTH FROM USELESS ROCK

Like copper, uranium and oil, potash is worthless while locked deep in the earth. For millions of years potash lay buried hundreds of feet beneath the New Mexico prairie, undetected and of no value to anyone. Like the grass on a western mesa or the trees in a mountain forest, potash is of no real value until it is converted into a product for man's use. The prairie grass in itself is of no value to the cattleman, but when that grass goes into a steer to produce beef for human consumption, it takes on a real commercial value. It is the same with other natural resources. Potash takes on its real value when it is mined and converted into fertilizer for American agriculture or refined for one of its many chemical and industrial uses.

In the process of mining, refining and marketing, wealth is created — wealth measured not alone in the dollar value of the finished product, but wealth measured in terms of payrolls, thousands of persons employed, taxes and royalties paid into local, state and federal treasuries which in turn, build schools and roads and employ thousands of men and women. The whole process of mining, refining and marketing potash creates wealth that touches every segment of local, state and national life.

The story of the potash industry is a tribute to the American way of life. It is, essentially, the story of the free enterprise system; of venture capital and the breed of men it produces—men who are willing to take a calculated risk with their money and who know how to build a business that will return a fair profit on millions of dollars of investment.

HOW POTASH FORMED

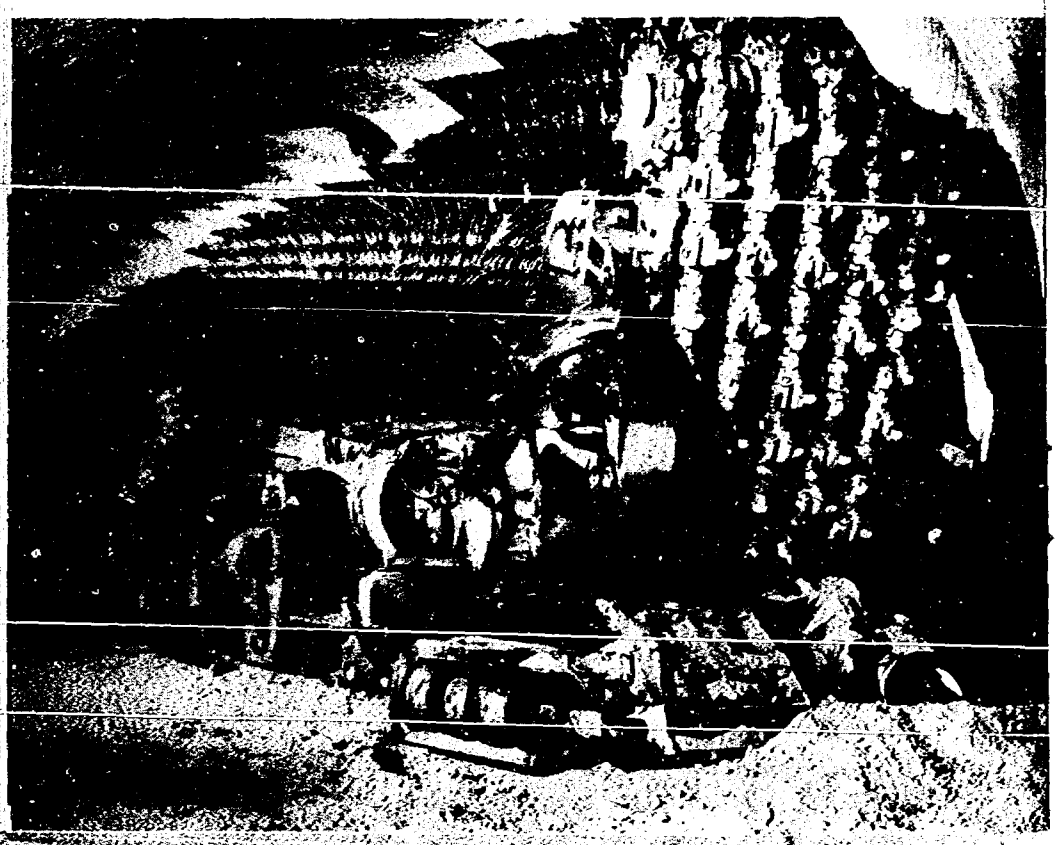
Some 220,000,000 years ago, more or less, in what geologists call the Permian Age, a vast arm of the sea covered a large portion of the Southwest. This was an irregular shaped area covering thousands of square miles in what today is eastern New Mexico and western Texas, Oklahoma and Kansas. Various types of salts crystallized on the bottom of the sea as its waters evaporated, building up vast layers during millions of years. Eventually the waters reced-

ed and during succeeding years, the layers of salts were buried to depths of hundreds and thousands of feet by silt, sand and rock.

More than 90 per cent of the potash refined today in the United States is mined from this rich Permian Basin, until recently the only such potash mines in the Western Hemisphere. These producing beds of ore are concentrated in a comparatively small area in Eddy and Lea counties in New Mexico, as potash has been found in only a small part of the Permian salt beds.

How these deposits came to be discovered and developed is a story that goes back to Colonial days. When what is now the eastern United States was a colony of Britain, a sizable industry developed from the production of potash from wood ashes; and much of it was exported to England. As the eastern forests were cut down, this source of potash supply was reduced. The discovery and development of the potash industry in Germany in 1865 (producing from Permian Age mineral deposits similar to those later discovered in the Carlsbad area) put an end to the wood ash industry as a major enterprise in the United States.

Continuous mining machine chews into potash ore and loads it into shuttle car (left).



WARTIME SHORTAGE

The German potash industry was the sole source of potash for American agriculture and industry up to the outbreak of World War I. Our complete dependence upon Germany as a source of potash was brought home in 1910 when, as a result of the organization of the German potash industry, favorable contracts held by American companies were suddenly cancelled. The raising of prices by the German cartel caused Congress, in 1911, to appropriate funds for the Agriculture and Interior Departments to explore for possible potash sources in the United States. We continued to import most of our potash from Germany during these years of exploration until 1914, when the outbreak of war completely cut off supplies.

The United States was forced during the war years to get what potash it could from a multitude of expensive sources, such as brine lakes, distillery wastes, flue dust and seaweeds. The price shot up from $35 a ton to almost $500 a ton.

When potash imports were resumed after the war only one of the 128 producing units that had developed during the war period — that of the American Potash & Chemical Corp. — continued to operate. Today this plant is owned by Kerr-McGee Corporation and is one of the largest U. S. producers outside New Mexico. Its method of operation involves the recovery of potash from the brines of Searles Lake, California.

But that war-time potash shortage had been almost tragic. Some persons refused to forget the lesson from the war, and they insisted that safety for this country could lie only in discovering low-cost American supplies.

POTASH DISCOVERED IN NEW MEXICO

Exploratory core drilling was carried on by the U. S. Geological Survey, but the first commercial deposit was located by private interests. In 1925 the Snowden and McSweeny Company, exploring for oil east of Carlsbad, discovered potash salts. This proved to be a find of world-wide importance. The area was core-drilled, and it was established that there was, at a depth of about 1,000 feet, a deposit of sufficient promise to warrant the sinking of a mine shaft. The principal potash-bearing material found was sylvinite ore (a mixture of potassium chloride and sodium chloride, containing about 21 to 25 per cent K_2O), the raw ore from which finished potash is produced. (K_2O is a unit or measure used in pricing and assaying potassium salts.)

Conveyor belt haulage system in use underground in one of the New Mexico potash mines.

COMPANIES FORMED

As a result of this discovery, the United States Potash Company was formed to develop the deposit. Further core drillings were made, a 1,000-foot mining shaft was begun in the fall of 1930, manure salts (unrefined ore) were shipped throughout 1931, and the company turned out its first refined commercial potash in September, 1932. America was at last on its way to becoming self-sufficient for its potash needs!

In the fall of 1931 Potash Company of America entered the Carlsbad area and began exploratory drilling. Its first shaft was completed in the spring of 1933, and mine-run ore was produced for shipment to fertilizer-consuming areas. In order to meet European competition, it was necessary to refine the crude ore to produce an almost pure potassium chloride and to eliminate the

common salt. The first unit of the PCA refinery was completed in the fall of 1935.

The third firm to enter the Carlsbad potash field was International Minerals & Chemical Corp., which commenced sinking its first shaft in the fall of 1936, and produced refined potash from its refinery in October of 1940.

Duval Corporation drilled its No. 1 test hole in November of 1947. Test Hole No. 37, in April of 1949, marked the discovery of the sylvinite deposit, the site of current operations. Sinking of shafts began in May 1950, and construction of plant and surface facilities proceeded concurrently, with the overall installation completed in March of 1952. Duval Corporation is wholly owned by the Pennzoil Corporation.

Amax Chemical Corp. brought its mine and plant into production during August 1952. Ground was broken for construction in 1950 after an intensive exploration program which started late in 1948 and included drilling more than 60 core test holes. This drilling proved a sizeable deposit of sylvinite and plans were made to bring the property into operation. Amax Chemical Corp. is wholly owned by Amax Incorporated.

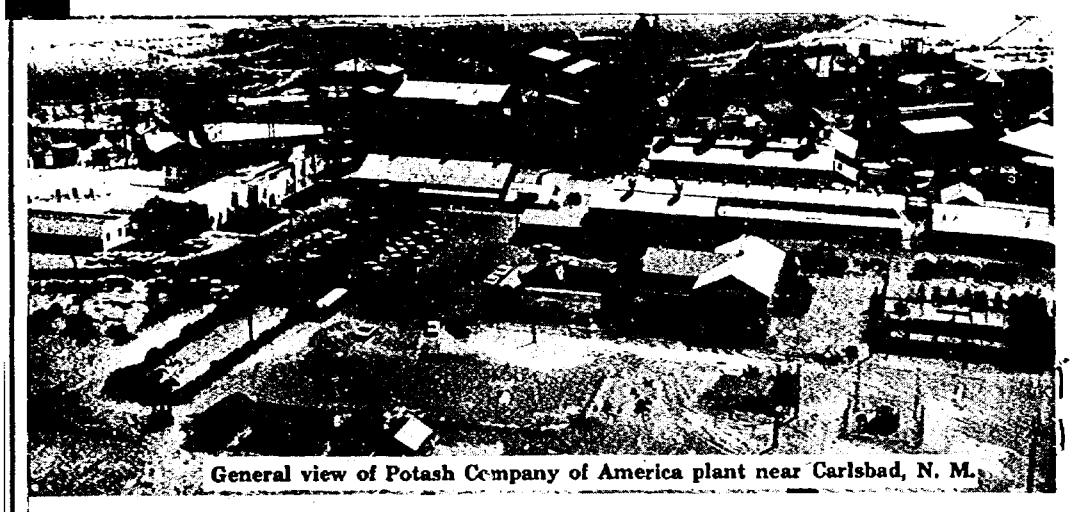
At National Potash Company, start of work on the shafts climaxed some six years of exploration and preparation by Freeport Minerals Company. Exploration in the area straddling the Eddy-Lea county line started in 1948. National Potash is wholly owned by Freeport Minerals Company. National Potash entered production and started shipping in February 1957.

Kerr-McGee Chemical Corporation, owned by Kerr-McGee Corporation, sank its second shaft in 1963 and began production in 1965.

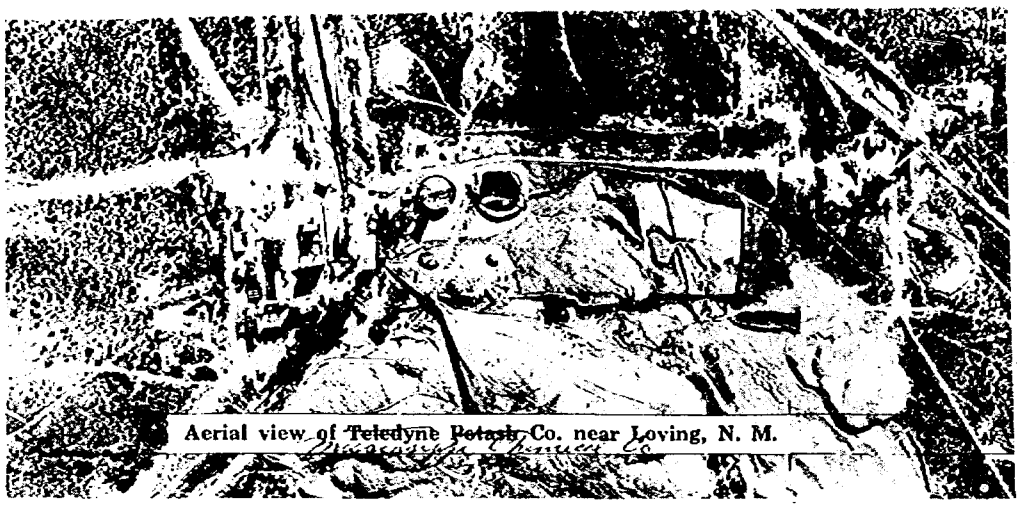
At present, six New Mexico producers, along with the Kerr-McGee operations at Searles Lake, Calif., account for about 92 per cent of the domestic production. The remaining 8 per cent comes from Salduro Marsh in Utah, (Bonneville Ltd.), the wells of Dow Chemical Company at Midland, Mich. and from the Texas-Gulf mine near Moab, Utah.

$200,000,000 INVESTMENT

The six potash companies located in southeastern New Mexico have properties originally valued at some $200,000,000. Amax Chemical Corp. announced its original plant investment at more

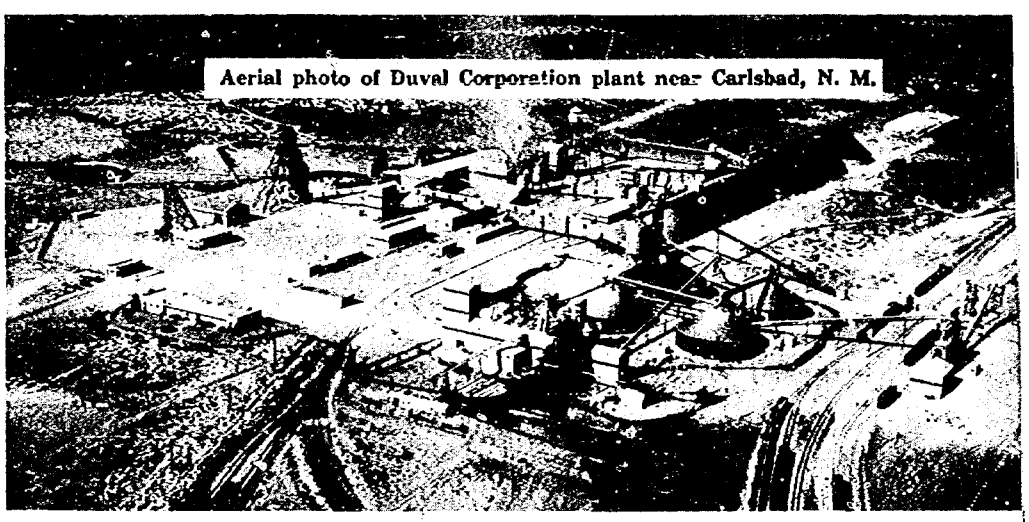


General view of Potash Company of America plant near Carlsbad, N. M.

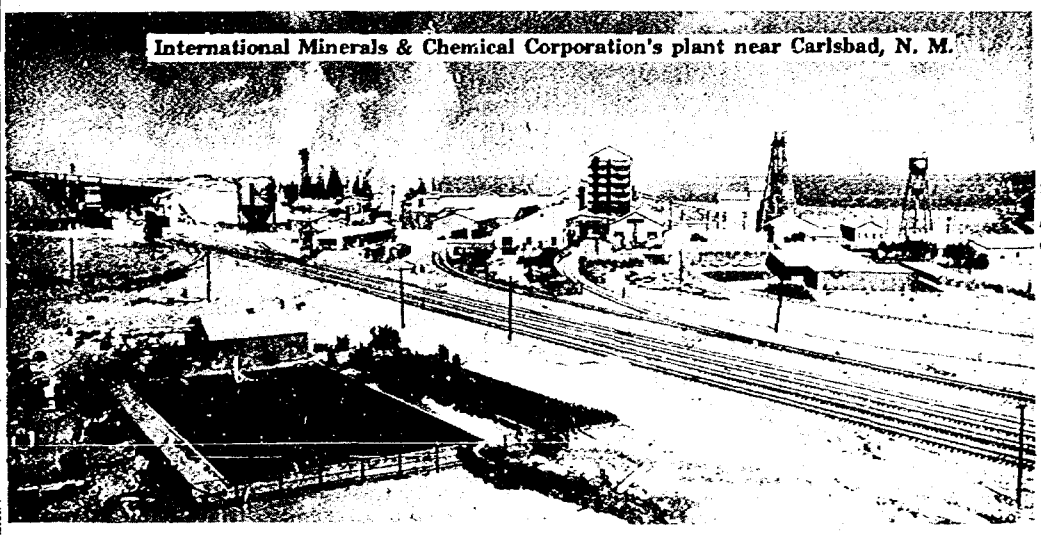


Aerial view of Teledyne Potash Co. near Loving, N. M.

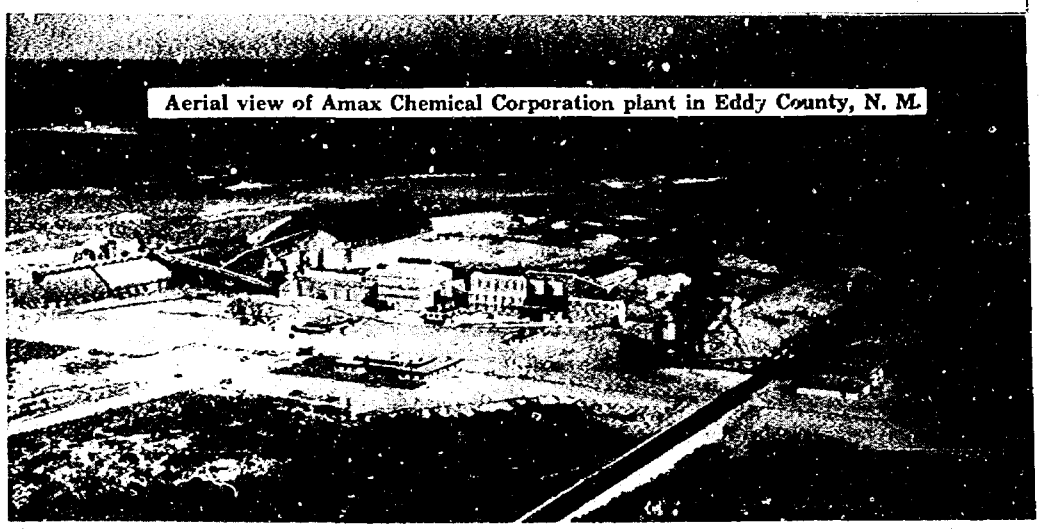
National Potash Company, located in Lea County.



Aerial photo of Duval Corporation plant near Carlsbad, N. M.



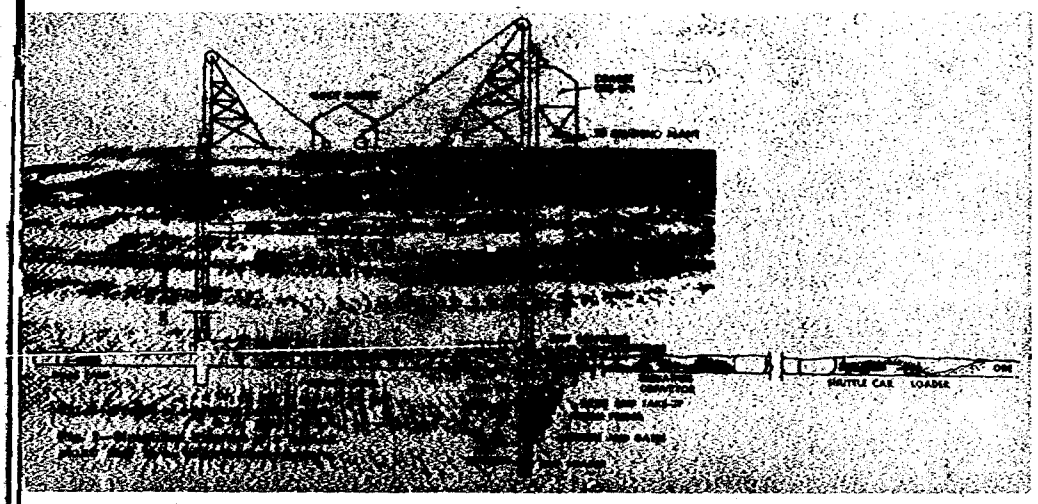
International Minerals & Chemical Corporation's plant near Carlsbad, N. M.



Aerial view of Amax Chemical Corporation plant in Eddy County, N. M.

than $10,000,000. Just a few years later it took an investment of almost $20,000,000 for National Potash Company to bring its plant to production. Such large expenditures are necessary because of the almost complete mechanization of the industry, and represent an investment of from $50,000 to $150,000 for each job produced in the new mines.

Mining and refining techniques and processes are constantly being improved and are today a miracle of efficiency. The potash plant runs full-tilt 24 hours a day, with three shifts of men carrying on the uninterrupted cycle of mining, concentrating, and refining. Deep in the mines under-cutting machines bite nine feet into ore. Electric drills bore blasting holes. Loading machines gulp up quarter-ton fragments of blasted ore at a bite. Shuttle cars carry ore to mine trains, which dump the ore in gravity chutes that carry it to crushing and storage bins at the bottom of the mine shaft. Here, skips, or hoisting buckets, with up to 14-tons capacity pick up the ore and convey it to the surface where all kinds of conveyors carry it from crushers to hot process tanks or flotation cells, to drying equipment, to storage warehouses and finally to the railroad for shipment.



When ore reaches the surface it is conveyed either to storage bins or directly into the processing operation. Throughout milling and refining processes, the ore is handled numerous times on conveyors of various lengths. One of the first refining processes is primary grinding followed by further grinding of ore in a ball or rod mill. Many of the treating processes use flotation cells, in which a

finely crushed mixture of ore and brine combined with certain chemical reagents is placed in tanks, agitated and caused to froth by the insertion of air-bubbles at the bottom of the tank.

After refining, the final product is filtered in a centrifuge, and then dried in large kilns before being placed in storage or directly prepared for shipment. A large portion is shipped in bulk, by rail and truck. The rest is bagged.

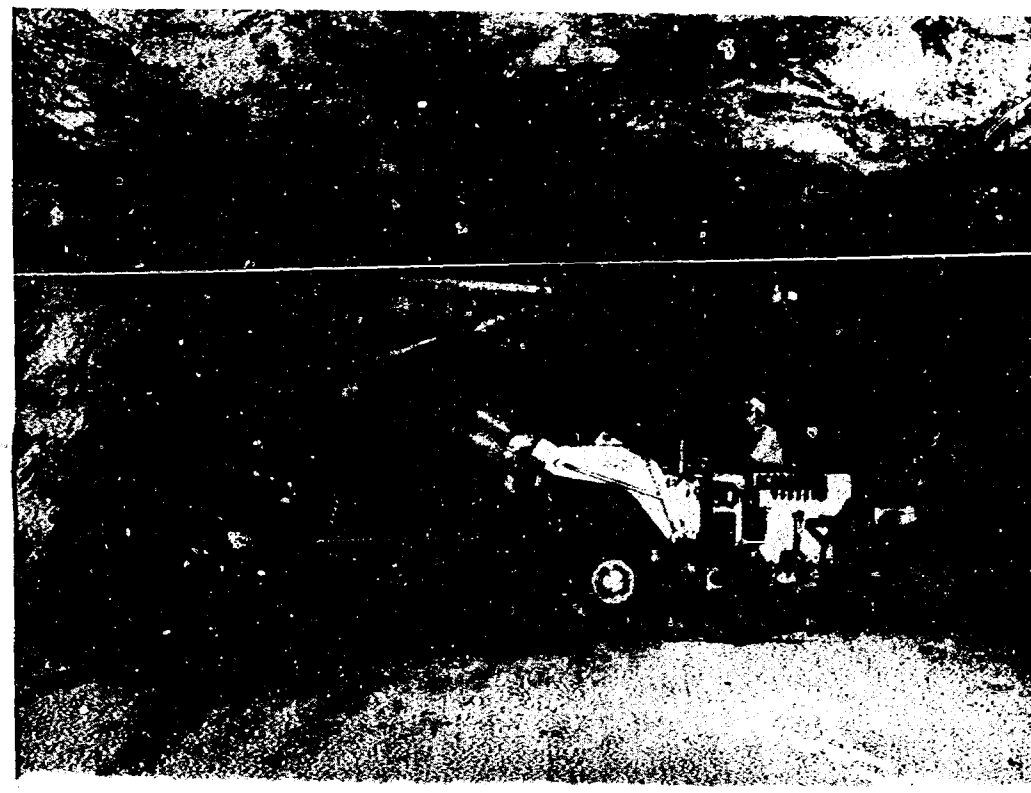
MINING RESEARCH

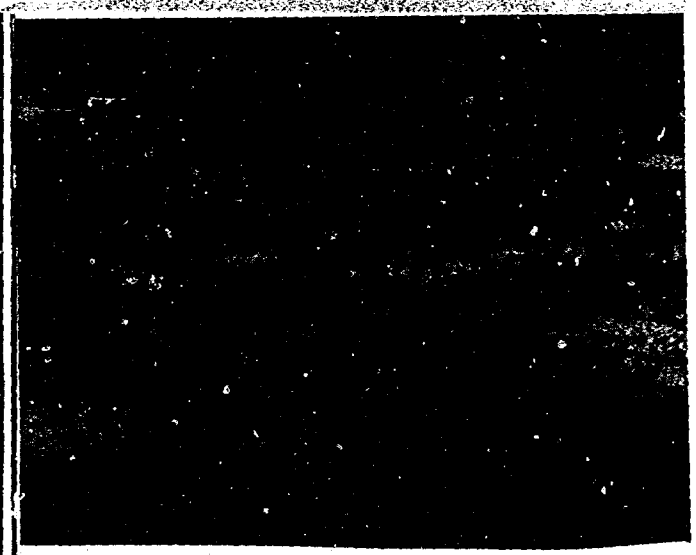
Developments at some of the vast New Mexico potash mines have been the introduction of continuous mining machines. These giant machines rip the ore from the mine walls and roof and eliminate several steps in conventional mining methods. One of the companies, Potash Company of America, has developed its own continuous miner.

Mining research in the New Mexico potash basin has resulted in outstanding new methods. An example, in addition to the continuous mining machine, is the "freezing" of quicksand and water in shaft-sinking operations.

Underground drifts and tunnels are wide, high, well-lighted

Mounted electric drills in use in New Mexico potash mine.





If all the tunnels, of the seven companies were in one line, they would stretch almost 8,000 miles, or 3 times the distance from New York to San Francisco.

A continuous mining machine in operation

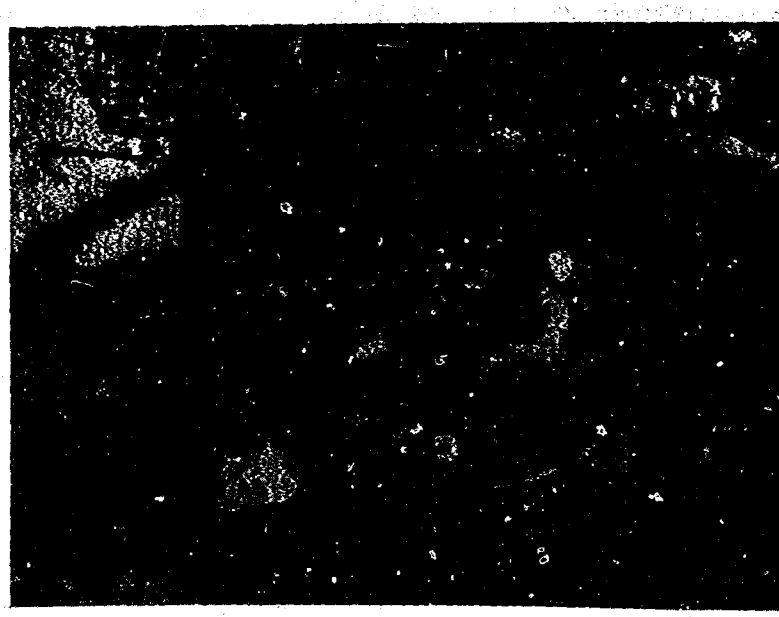
passageways leading off through a pastel-tinted world with no timbers or dripping water. Since the potash ores are laid down in solid beds, with no structural faults or intruded boulders to cause slips or falls, underground rooms are as much as 14 feet high and up to 40 feet wide without supporting timbers. The room and pillar method of mining is used. Under this plan, the mining area becomes a checker-board with rectangular rooms mined out and pillars of ore left to support the overburden. Above the pillars lies a solid bed of rock salt 200 to 700 feet thick. This, too, was laid down by the evaporating seas of the Permian Age in a solid unbroken mass. This great bed of salt acts as a giant beam to support the ceiling of the potash mines, 900 to 1,800 feet deep in the New Mexico earth.

Tremendous blower systems carry fresh air from the surface to every nook and cranny of the working area of the mines. Potash mining is free from many hazards customarily encountered in mines, and there are no noxious gases, no explosive dusts, no danger of silicosis. The Potash mines have an outstanding safety record.

HIGH WAGES

There are almost 3,000 persons directly employed by the six operating potash companies who receive well over $2,000,000 a month in wages. These wages are mostly retained in Eddy and Lea Counties, and are reflected in the prosperous businesses of Carlsbad and the other towns in the area.

Recent studies by the U. S. Department of Labor, Bureau of Labor Statistics have shown that the level of employee earnings in



A loaded Shuttle Car with trolley pole application in operation

the Carlsbad potash industry is among the highest of any comparable industry in the United States. The average earnings of hourly-paid workers is more than $35 a day. In addition, health and welfare benefits, only recently established in many industries, have been in effect here for years. Group life, accident and disability insurance policies have been standard in the potash industry, and a pension plan, paid holidays and other benefits are enjoyed by employees.

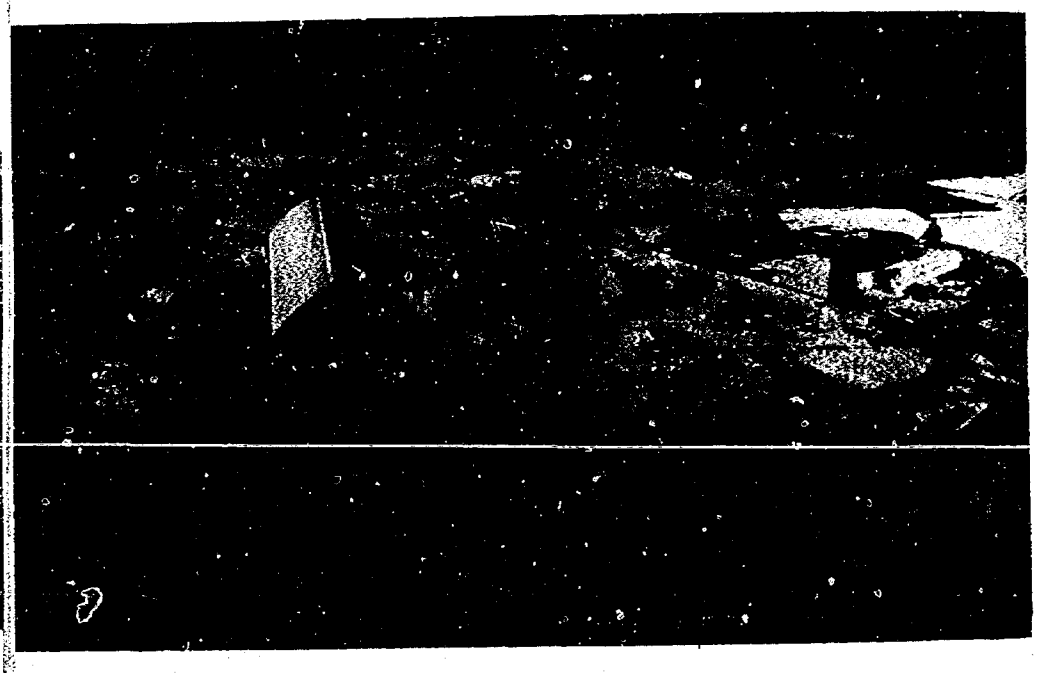
New Mexico potash today is in keen competition on the world markets with potash produced in Canadian and European potash mines (including some where the workers are paid in cents-per-hour rather than dollars). This competition is being met only because of highly efficient production, a tribute to American labor and industry.

A wide variety of products currently is being produced from the potash-bearing beds. These include 60% K_2O Standard Muriate of Potash, 62% K_2O Standard Muriate of Potash, 60% Coarse Muriate of Potash, 60% Granular Muriate of Potash, 62% Liquid Grade Muriate of Potash, 50% K_2O Sulphate of Potash in the standard, coarse and granular sizes; Refined Potassium Chloride, 99.9%, CP grade, industrial; 22% K_2O—18% MgO Sulphate of Potash Magnesia; Manure Salts, 20—22%; and Stock Salt.

The only commercial deposits in the United States of the min-

eral langbeinite are being successfully mined and beneficiated here in New Mexico. Langbeinite is the double salt of potassium magnesium sulfate having the chemical formula, $2MgSO_4 \cdot K_2SO_4$.

The steady work and high earnings of the potash workers have given Carlsbad a stable class of residents. Most of these workers own their own homes, and others have additional investments in real estate and business property. The sound growth of Carlsbad, which showed an increase in population of more than 300 per cent from 1940 to 1960, is evidence of the importance of potash to the city. The Carlsbad, Artesia and Loving school districts get a large percentage of their local revenue from the production taxes on potash.



Kerr-McGee acquired an interest in potash reserves near Hobbs, New Mexico, in 1955. An advanced recrystallization process was perfected, shaft sinking was completed in 1963 and the mine and mill was brought "on stream" in December, 1965. The complex was operated under the name Kermac Potash Company (a partnership with the National Farmers Union) until 1968, when Kerr-McGee purchased the outstanding ownership interest.

A MAJOR TAXPAYER

The New Mexico potash industry is a major supporter of the state government by paying a large share of state, federal and local taxes. In addition to paying royalties on potash production, the industry pays three substantial taxes which are not paid by other manufacturers outside the extractive industry. The taxes are: Severance tax, the Resources Excise tax and the Ad Valorem tax on production.

In addition, the potash industry pays all other taxes paid by the state's manufacturing industries, such as: Income tax, Ad Valorem tax on tangible property, Sales and Compensating Use taxes.

Most potash is mined from lands owned by the state or fereral government. For this privilege a royalty on the production is paid. Of royalties paid to the federal government, 37½ per cent is returned directly to the state, and 52½ per cent is allocated to the Reclamation Bureau, which follows the policy of spending this money in the state from which it came. Thus, the state receives 90 per cent of the federal royalties in addition to all of the states royalties. Obviously, the potash industry makes a direct, and major contribution to state, federal and local governments.

First potash mine in New Mexico (1931) is this one now owned by ~~Teledyne Potash Co~~. The plant closed in June, 1978.
Mississippi Chemical Co.

POTASH PRODUCES JOBS

These products from Carlsbad -- mostly potassium chloride — are good examples of producing, refining and processing to an end product from the source of supply. Agricultural grades of potash are fully refined end products needing no further processing after leaving the Carlsbad area. (They are, however, mixed with other ingredients for commercial agricultural fertilizer.) Chemical grade potash of almost 100 per cent purity is also produced. Thus, New Mexico labor is utilized in full and the state and its people reap the benefits.

The consumers' markets produced by the potash industry are of great importance to the southeastern part of New Mexico. The wages paid constitute a steady source of income to service industries of all kinds. Purchases of supplies and equipment contribute substantially to the Carlsbad community's favorable economy. Freight charges paid on shipments originated from the industry have been estimated to exceed $178,000 a day — more than $65,000,000 a year!

EXCESS PRODUCTION

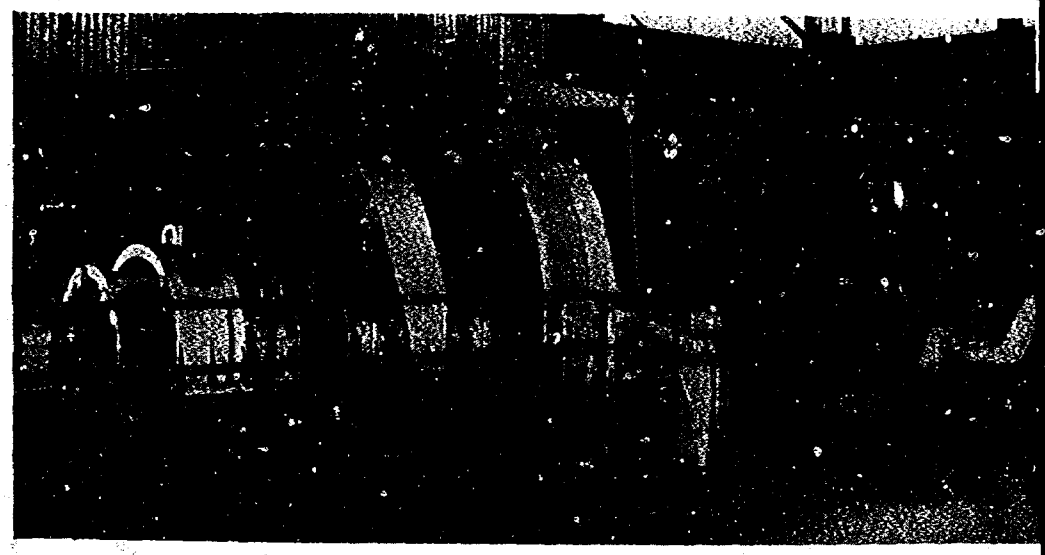
Although American agriculture and industry are using more than 21 times the amount of potash that was used before World War I, the American potash industry has more than kept pace with that growth. Current supplies of potash are more than enough to meet current demand. This is true in the United States but not in the world, due to the population explosion.

For many years the United States was the world's leading producer of potash but Canada has overtaken us and is expected to lead for many years to come.

In addition to this avalance of new Canadian production, new potash mines and refineries are coming into production or are in the planning stages in England, Russia, Australia, The Congo and Ethiopia.

The long-range outlook for the potash industry continues to be favorable, mainly because a strong demand factor exists. This optimism is not only attested to by the new production in Canada, but also by planned production in other parts of the world.

Many potash producers are basing their plans on the simple fact that fully half of the world's three billion people do not have



This Nordberg Hoist with 11-foot diameter drums can be operated either manually or automatically. This modern, 22,000-pound hoist lifts the potash ore under automatic control to the surface where it is crushed and processed into finished products.

enough to eat and that there will be six billion people in approximately 35 years!

With arable land comprising only three per cent of the earth's surface, it is obvious that food production must be doubled and redoubled for generations to come.

Although the United States has excess potash production capacity, imports to this country have increased in recent years. These imports are facilitated by the high freight rates from New Mexico to the Eastern Seaboard which at present enable the importers to deliver at a lower price than the delivered price from Carlsbad.

POTASH FOUNDATION

In 1960 a new foundation for international potash research was established and an intensive campaign was launched for export sales. Potash exports have increased, but they are hampered because American potash deposits are so far from deep water ports. New Mexico producers have the problem of high rail freight rates to port before domestic potash can be loaded into vessels for the world market. European producers can deliver their potash to the East coast of the U. S. cheaper than American producers can. Current freight rates from Europe to an East coast port such as Norfolk, Virginia of around $17 per ton compared with rail rates from Carlsbad of $25.04 a ton!

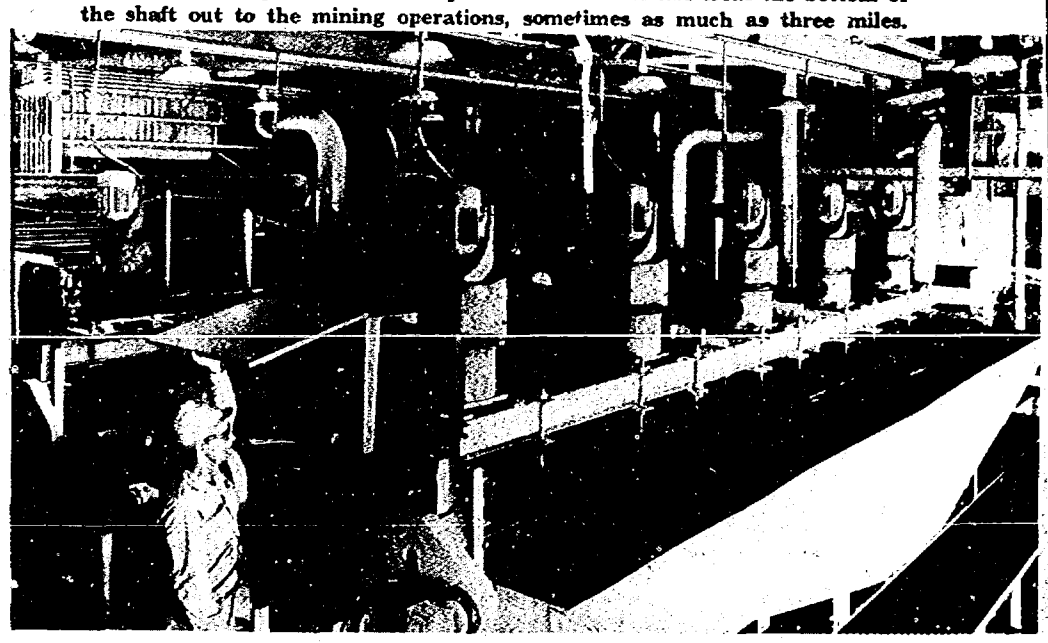
Twin electric locomotives pulling a loaded potash ore train of 32 cars, each holding about 5½ tons. These haulage units are equipped with trolley-radio phones for two-way communication with other haulage equipment and with the central office at the dumping station. Further safety is provided by a complete block-signal system on the main underground railroad. There are thousands of miles of underground tunnels in the New Mexico potash mines.

New Mexico producers can meet this condition only by a high level of operating efficiency and productivity, as a large percentage of the potash tonnage used in the United States is in the coastal area which can be reached advantageously by European shippers. And this area is now being expanded greatly by opening of the St. Lawrence Seaway to low-cost ocean freight.

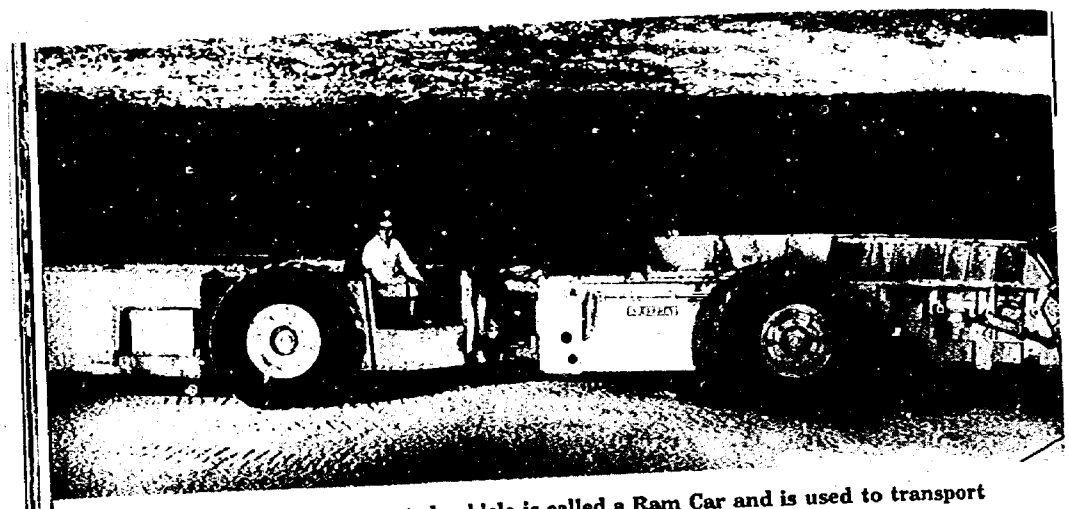
CANADIAN POTASH

Vast new deposits of potash in Canada have been brought into production. The Canadian potash beds, in the Province of Saskatchewan, are regarded as the largest future source of potash in the world. The vast Canadian deposit is more than 300 miles in length, and the ore beds are both thick and rich. They are at depths ranging from 3,300 to more than 7,000 feet. The world's largest potash mine has been brought into production recently in Canada — and is being expanded. The world's first potash solution mine, at a depth of more than 5,000 feet, is in Canada. And dozens of other firms, from several countries, have potash interests in Canada.

This man-trip jeep is used to transport men and materials from the bottom of the shaft out to the mining operations, sometimes as much as three miles.



The world's first langbeinite flotation system at International Minerals & Chemical Corporation's surface plant.



This huge battery-operated vehicle is called a Ram Car and is used to transport ore from the mining faces to belts where it unloads itself automatically.

The loading machine in foreground loads itself by means of the lobster-like claws, then transports the ore backwards to the waiting shuttle car in the rear.

YOUR F

Have you wondered w
commercial fertilizer?
For example, your
8-10-12. The first
weight, of water-soluble
percent. The second
(phosphoric oxide) —
is available potash (pot

These three minerals —
— are always
make up the bulk of

For further
vital New Mex
any of the following
Amax
Duval
International
Kerr-McGee
National
Potash Company
Teledyne

First United States Patent Grant
July 31, 1790

The United States.

To all to whom these Presents shall come. Greeting.

Whereas Samuel Hopkins of the City of Philadelphia and State of Pennsylvania hath discovered an Improvement, not known or used before such Discovery, in the making of Pot ash and Pearl ash by a new Apparatus and Process, that is to say, in the making of Pearl ash 1st by burning the raw Ashes in a Furnace, 2d by dissolving and boiling them when so burnt in Water, 3rd by drawing off and settling the ley, and 4th by boiling the ley into Salts which then are the true Pearl ash; and also in the making of Pot ash by fluxing the Pearl ash so made as aforesaid; which Operation of burning the raw Ashes in a Furnace, preparatory to their Dissolution and boiling in Water, is new, leaves little Residuum, and produces a much greater Quantity of Salt: These are therefore in pursuance of the Act, entituled "An Act to promote the Progress of useful Arts" to grant to the said Samuel Hopkins, his Heirs, Administrators and Assigns, for the Term of fourteen Years, the sole and exclusive Right and Liberty of using, and vending to others the said Discovery, of burning the raw Ashes previous to their being dissolved and boiled in Water, according to the true Intent and Meaning of the Act aforesaid. In Testimony whereof I have caused these Letters to be made patent, and the Seal of the United States to be hereunto affixed. Given under my Hand at the City of New York this thirty first Day of July in the Year of our Lord one thousand seven hundred & Ninety.

G. Washington

City of New York July 31st 1790. –

I do hereby certify that the foregoing Letters patent were delivered to me in pursuance of the Act, entitled "An Act to promote the Progress of useful Arts" that I have examined the same, and find them conformable to the said Act.

Edm: Randolph Attorney General for the United States. –

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
June 12, 1975

COMMISSION HEARING

IN THE MATTER OF:

Application of Mesa Petroleum Company for creation of two gas pools and special rules, Eddy County, New Mexico

CASE NO. 5497

BEFORE MEMBERS OF THE COMMISSION:

Commissioner Joseph Ramey, Secretary
Commissioner Phil Lucero, Member
Mr. Ralph Trujillo, Member

TRANSCRIPT OF THE HEARING

A P P E A R A N C E S

For the New Mexico Oil Conservation Commission: William F. Carr, Esq.
Legal Counsel for the Commission
State Land Office Building
Santa Fe, New Mexico

For the Applicant: Clarence Hinkle, Esq.
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Roswell, New Mexico

THE NYE REPORTING SERVICE
STATE-WIDE DEPOSITION NOTARIES
225 JOHNSON STREET
SANTA FE, NEW MEXICO 87501
TEL. (505) 982-0386

COMMISSIONER RAMEY: Case 5497.

MR. CARR: Case 5497. Application of Mesa Petroleum Company for creation of two gas pools and special rules, Eddy County, New Mexico.

MR. HINKLE: Clarence Hinkle, Hinkle, Bondurant, Cox and Eaton, appearing on behalf of Mesa. If the Commission please, in view of your ruling on the other case, we believe that this case ought to be continued until the same time. The Application originally included both of these cases. The Commission split it into two cases due to the fact that the protest only related to the drilling or the location of the well, but I see no reason why we can't take it all up at the same time. If we can't drill a well between now and then, the rules are immaterial anyway, so we might as well continue the whole thing.

COMMISSIONER RAMEY: Are you going to make an appearance, Mr. Blackman, in this case?

MR. BLACKMAN: Under the circumstances, no. I didn't have any objection anyway, but I will just leave my appearance out of it.

COMMISSIONER LUCERO: In other words, Mr. Blackman, you will join in the request for continuance of this other case?

MR. BLACKMAN: Yes. The only objection that I would possibly have is if we heard that other case, the implication might be that we were allowing them to drill, but that isn't in there and there is no reason why it can't come out at another time.

If it please the Commission, I would like to make a request which I neglected to do. I would like to ask the Commission to accept Mr. Cummings as an expert witness in this case. He has already been qualified in other cases before the Commission as an expert, but I neglected to ask the Commission at the start of his testimony.

COMMISSIONER RAMEY: I think the witness is qualified.

Case 5497 will be continued to September 3rd.

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SANTA FE, NEW MEXICO 87501
TEL. (505) 982-0386

STATE OF NEW MEXICO)
) SS.
COUNTY OF SANTA FE)

I, RICHARD L. NYE, Court Reporter, do hereby certify that the foregoing and attached Transcript of Hearing before the New Mexico Oil Conservation Commission was reported by me, and the same is a true and correct record of the said proceedings, to the best of my knowledge, skill and ability.

COURT REPORTER

THE NYE REPORTING SERVICE
STATE-WIDE DEPOSITION NOTARIES
225 JOHNSON STREET
SANTA FE, NEW MEXICO 87501
TEL. (505) 982-0386

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
August 27, 1975

EXAMINER HEARING

IN THE MATTER OF:

Application of Mesa Petroleum Company for an unorthodox gas well location, Eddy County, New Mexico — CASE 5496

and

Application of Mesa Petroleum Company for creation of two gas pools and special rules, Eddy County, New Mexico — CASE 5497

BEFORE: Richard L. Stamets, Examiner.

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the New Mexico Oil Conservation Commission: William F. Carr, Esq.
Legal Counsel for the Commission
State Land Office Building
Santa Fe, New Mexico

For the Applicant: Clarence Hinkle, Esq.
HINKLE, BONDURANT, COX & EATON
Hinkle Building
Roswell, New Mexico
and
Don D. Dent, Esq.
MESA PETROLEUM COMPANY
Amarillo, Texas

I N D E X

EXHIBIT INDEX

MR. STAMETS: The Hearing will come to order, please. We will call the next case, 5496.

MR. CARR: Case 5496, application of Mesa Petroleum Company for an unorthodox gas well location, Eddy County, New Mexico.

MR. STAMETS: Call for appearances in this case.

MR. HINKLE: Clarence Hinkle of Hinkle, Bondurant, Cox and Eaton appearing on behalf of Mesa Petroleum Company, and we also have associated with us Don Dent, general attorney from Amarillo with Mesa.

I would like for you also to call the next case as I would like to make a motion that these two cases be consolidated for the purpose of this Hearing.

MR. STAMETS: I presume you have all of your testimony.

MR. HINKLE: Well, our exhibits cover both and it will save time and save the record to have them as one.

MR. STAMETS: Let's call then, Case 5497.

MR. CARR: Case 5497, application of Mesa Petroleum Company for creation of two gas pools and special rules, Eddy County, New Mexico.

MR. HINKLE: I would like to move that these two cases be consolidated for the purpose of taking testimony.

MR. STAMETS: Case 5496 and 5497 will be consolidated for that purpose.

MR. HINKLE: We have two witnesses and several exhibits, but before proceeding I would like to point out that this application was originally filed for hearing before the full Commission due to the fact that the proposed location is in the potash area, coming under R-111, and the hearing was had and the Potash Company of America protested the application and then asked for a continuance of the case to give them permission to drill three core tests around the proposed well, which they did, and it turned out, apparently, that they didn't get any potash in appreciable quantities so they withdrew the protest, so consequently there is no protest as far as the Potash Company is concerned in Case 5496 as to the location in the potash area.

I have talked with Carl Traywick with the USGS and he has authorized me to state that as far as the USGS is concerned they are willing to approve the location if approved by the OCC.

We have two witnesses we would like to have sworn.

MR. STAMETS: Will you stand and be sworn, please?

(THEREUPON, the witnesses were duly sworn.

JOSEPH W. JEFFERS

called as a witness, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. HINKLE:

Q. State your name, residence and by whom you are employed?

A. Joseph W. Jeffers, Midland, Texas and I'm employed by Mesa Petroleum Company.

Q. What is your position with the Company?

A. Geologist.

Q. Have you previously testified before the Commission?

A. I have.

Q. And your qualifications as a geologist is a matter of record with the Commission?

A. It is.

Q. Have you prepared or has there been prepared under your direction certain exhibits for introduction in this case?

A. Yes, sir.

Q. And they are the exhibits which have been marked one through four, I believe?

A. That is correct.

Q. Have you made a study of the area that is involved in this case?

A. Yes, I have, sir.

Q. Are you familiar with both applications?

A. Yes, sir.

Q. The one 5496 and 5497?

A. I am.

Q. What is Mesa seeking to accomplish?

A. Mesa is trying to get a location to drill a Morrow test approximately fourteen thousand feet at a location nineteen eighty from the west line and thirteen fifty from the north line of Section 18, Township 23 South, Range 30 East.

MR. STAMETS: If I may ask a question at this point? I take it from your testimony then what has been advertised as the alternative location is the preferred location?

A. That is correct.

Q. (Mr. Hinkle continuing.) You desire to abandon the original location and go to the alternative location?

A. That is correct.

Q. What else are you asking for 5497?

A. We are asking for six hundred and forty acre spacing for the Morrow and the Strawn formations.

Q. Now, refer to Exhibit One and explain what this is and what it shows?

A. Exhibit One is a general plat in the Nash Unit Area. It is on a scale of one inch equals two thousand feet, covering primarily a portion of Township 23 South, Ranges 29 and 30 East, Eddy County, New Mexico. It shows the Nash Unit outlined in red. Is it outlined in red on yours? It is outlined in a hatchered line and is designated as the Nash Unit Area.

In addition, it shows the ownership of the oil and gas leases within the Unit Area and the surrounding area, the location of the initial Nash Unit Number 1 well completed in the Strawn and Morrow formations; also, the location of other wells in the surrounding area which have been completed in the Wolfcamp and Morrow formations. The plat also shows the proposed development location of the Number 2 well on a State lease thirteen fifty from the north and thirteen hundred from the west line of Section 18, 23, 30 and the more desirable alternate location for the Number 2 well located thirteen fifty from the north and nineteen eighty from the west line of the same section. The exhibit also shows the potash leases owned by Duval, Incorporated, Hodges-PCA and the area which is unleased for potash, these are indicated in the legend by various codes. In addition, the location of the three potash core tests are indicated in Section 18. These are the three core tests that were drilled by PCA to determine if there was any potash ore under the northwest quarter of Section 18.

Q. Do you have any further comments with respect to Exhibit One?

A. No, sir.

Q. Refer to Exhibit Two and explain what this is and what it shows?

A. Exhibit Two is a geologic structure map contoured

on top of the Devonian formation. The scale of the map is one inch equals two thousand feet. The map covers a portion of southeastern New Mexico in Eddy County, primarily Township 23 South, Ranges 29 and 30 East. The Nash Unit Area is outlined in red and the Mesa lease position is colored yellow.

The map was contoured utilizing regional subsurface information from well control over the Delaware Basin and Transition Zone of southeastern New Mexico in conjunction with the regional seismic information owned by Mesa Petroleum Company and additional seismic control shot by Mesa in the immediate area of the Nash Unit. The seismic control is depicted on the map by numbered shot points with the interpreted datum of the Devonian by each shot point. The well control is indicated by well symbols with the correlative Devonian datum by each well symbol. The contour interval is one hundred feet regionally and fifty feet in the Nash Unit indicated by the dashed contours.

The producing formations are color coded to correspond with the production legend on the map.

The Mesa Number 1 well is located in Section 13, 23 South, Range 29 East, and has two color rings indicating a dual completion from the Strawn and Morrow formations.

The proposed location and alternate location in Section 18, Township 23 South, Range 30 East are indicated by the arrows on the map.

The potash core tests in Section 18 are also indicated on this map.

Q. Does this indicate that the alternate location is at a more strategic point as far as the geology is concerned?

A. We feel that it is probably structurally as good as the originally proposed location and probably better stratigraphically.

Q. Refer to Exhibit Three and explain that, please?

A. Exhibit Three is a portion of the Number 1 Nash well on a vertical scale of two and a half inches equals one hundred feet. It shows the productive zones and those potential zones not completed at this time.

The Mesa Number 1 Nash well was spudded June 25th, 1974 and completed from the Morrow formation for an IPCAOf of three point nine one nine million cubic feet of gas per day on January 20th, 1975 from perforations thirteen one seventy-five feet to thirteen six oh nine feet overall. The total depth drilled was thirteen thousand eight hundred and fifty feet.

The initial flow from the Strawn was one point seven million cubic feet of gas per day from perforations twelve thousand one hundred and thirty eight to twelve thousand one fifty feet, June 3rd, 1975.

The perforations for these formations are indicated on Exhibit Number Three.

Additional potential pay zones are indicated on Exhibit Number Three in the Wolfcamp formation shown by DST Number 3, eleven thousand three forty three to eleven thousand five thirty-five, and the Delaware Cherry Canyon formation indicated by DST Number 1, four thousand and seventy-two feet to four thousand eight hundred and sixty feet. Additional pay in the Cherry Canyon is indicated by log analysis at an interval below the zone tested in this well.

Both of these zones are indicative of commercial production, the Cherry Canyon by oil and the Wolfcamp by gas production.

Q. Refer to Exhibit Number Four and explain what this shows?

A. Exhibit Number Four is a stratigraphic cross section from the Skelly Number 1 Forty Niner well located in Section 16, Township 23 South, Range 30 East, through the Number 1 Nash well to the Texaco Number 1 Remuda Basin located in Section 24, Township 23 South, Range 29 East. The cross section is on a vertical scale of two and one half inches equals one hundred feet, the horizontal scale represents the relative distances between the wells, the distance between the wells is noted on the cross section. The portions of the logs of the wells shown are those stratigraphic sections producing or completed in the Number 1 Nash well. The

perforated units are indicated in red on the depth scale. The purpose of the cross section is to show the relationship of the producing zones in the Number 1 Nash well with the correlative zones in nearby wells.

Q. Do you have a pipeline connection at the present time on the Nash Number 1?

A. Yes, the first gas was sold June 5th, 1975 to Transwestern Pipeline Company at a price of fifty one cents per MCF plus a BTU adjustment. The combined rate of gas sold was four point three million cubic feet of gas per day.

Q. Mesa is the unit operator of the Nash Unit?

A. That is correct.

Q. Has Mesa as the unit operator filed a plan with the Commissioner and the USGS of development?

A. This plan was dated April 21st, 1975 and was filed on or about that date with the Supervisor and Commissioner of Public Lands.

Q. Has this been approved by the Commissioner and the USGS?

A. The plan of development was approved by Ray D. Graham, Director of the Oil and Gas Division for the Commissioner of Public Lands on April 30th, 1975. It has also been approved by the USGS.

Q. Is the Nash Number 2 well projected to be completed, dually completed, in both the Morrow and the Strawn formations?

A. Yes, sir.

Q. Now, Order R-111-A of the Commission provides that upon the discovery of oil or gas in the potash area, the Oil Conservation Commission shall promulgate pool rules for the affected area after due notice and hearing.

Do you have any recommendations to make to the Commission as to the adoption of these rules?

A. We believe that under the circumstances, six hundred and forty acre spacing should be adopted to prevent the drilling of unnecessary wells to the Strawn and Morrow formations.

It is my understanding that ordinarily when special rules are adopted, including six hundred and forty acre spacing, provision is made that each well shall be located no nearer than sixteen hundred and fifty feet to the outer boundary of the section and no nearer than three hundred and thirty feet to any governmental quarter-quarter section line. In the case of the Number 2 Nash well, we are requesting that this well be located at an unorthodox location thirteen hundred and fifty feet from the north line and nineteen hundred and eighty feet from the west line of Section 18. This will locate the well at the optimum structural and stratigraphic location in Section 18 for production and reservoir drainage from the Strawn and Morrow formations.

Q. Are you seeking an exception as to unorthodox location for both the Number 1 and the Number 2 well?

A. That is correct.

Q. Do you propose to dedicate all of Section 13 to the Number 1 well and all of Section 18 to the Number 2 well?

A. That is correct.

Q. Were copies of the application filed in this case mailed to all of the owners of offset oil and gas leases?

A. Yes, sir.

Q. Have you had any objections from offset owners?

A. No.

Q. Have you obtained waivers from the offset operators?

A. Yes. Roy G. Barton, Hannagan and Hannagan, Phillips Skelly, Texaco, Perry R. Bass and Pauley Petroleum.

Q. In your opinion will the approval of this application be in the interest of conservation, the prevention of waste and the protection of correlative rights?

A. Yes, I do.

Q. Do you have anything else you would like to submit to the Commission?

A. No.

MR. HINKLE: I would like to offer into evidence Exhibits One through Four.

MR. STAMETS: Exhibits One through Four will be admitted.

MR. HINKLE: That's all we have, Mr. Examiner.

CROSS EXAMINATION

BY MR. STAMETS:

Q. Mr. Jeffers, in Sections 16 and 21 and 23 South, Range 30 East, find the two Skelly Forty Niner Ridge Unit wells; do you know what the spacing is for those Morrow wells?

A. Six hundred and forty acres, I believe, I don't know whether they have gone before a Commission hearing to get it, I don't know.

Q. You don't know? In the absence of special pool rules what would the spacing be?

A. Three hundred and twenty acres.

Q. And the Commission's records would reflect whether or not there were special pool rules?

A. That is correct.

Q. Do you have any knowledge as to whether or not the completions of these two wells indicates inter-connection of the Morrow producing sands between the two wells?

A. The correlation indicates that the two wells could be draining the same reservoir, however, the engineers that I have talked to at Skelly don't feel that they have got good communication between the two wells.

Q. This would be typical of Morrow sands?

A. That is correct.

Q. Referring to your cross section which is Exhibit Number Four, looking at the Morrow sands across there it would appear as though the general zones are correlative, but the production is not continuous across there, is that correct?

A. That's the way I feel.

Q. Again this is a typical Morrow situation?

A. Yes, sir.

Q. Now, what about the Strawn, I notice on the cross section you have three wells and only one of them is producing?

A. The Strawn in the Skelly Forty Niner was not tested, nor was it tested in the Texaco Remuda Basin. The Forty Niner well which is on the right side of the cross section doesn't indicate any reservoir potential in the Strawn. The Texaco Remuda Basin indicates a possibility of Strawn production.

Q. Do you have any evidence whatsoever in this area that indicates that this well is capable of or is draining a six hundred and forty acre tract?

A. No.

Q. Referring back to Exhibit Number One, it would appear there is quite a bit of the acreage inside the unit boundary, is there any reason why Mesa couldn't go ahead and develop this acreage on a six hundred and forty acre spacing pattern regardless of what the Commission's regulations are?

A. It is possible that we could develop the acreage

on six hundred and forty acres without a special six hundred and forty acre spacing, however, we are in a potash area which in all likelihood we would be able to get a six hundred and forty acre spacing and drain the best we could the sections and if we had to fight every location with the potash people in three twenty's, that would be twice as many wells to drill and this is in R-111-A and we have had objections to the drilling in the area, so we think that the development on six hundred and forty acres is the most feasible way to go.

Q. Is there any reason under unit operations that Mesa couldn't go ahead and develop this on six hundred and forty spacing regardless of what the standard spacing in the area is?

A. I don't believe there are, but I'm not sure of that answer.

Q. Now, I believe you also made a statement that with six hundred and forty acre spacing unnecessary wells would be eliminated. If these wells aren't capable of draining a full six hundred and forty acre spacing unit, could we then refer to the second well on the six forty as an unnecessary well?

A. Well, it is highly unlikely that we would get to drill the second well on the six hundred and forty acres based on the potash problem.

Q. Nonetheless, though, would that affect whether or not the well would be necessary in order to drain the three

twenty?

A. Can you rephrase that?

Q. You refer to in essence the second well on the six forty as being unnecessary, but if a second well is required to drain the six hundred and forty acres, could you then refer to that as an unnecessary well?

A. I would not at that time refer to it as an unnecessary well, however, the economics of the drilling in the area would in likelihood preclude a second well in each section to the Morrow formation.

Q. That is a fact which could change dramatically with the price?

A. Right, and the development of the field.

MR. STAMETS: Any other questions of this witness?

MR. HINKLE: I have.

REDIRECT EXAMINATION

BY MR. HINKLE:

Q. Mr. Jeffers, referring to Exhibit Number One, this plat indicates that the west half of the northwest quarter of 18 and the east half of the northeast quarter of 13 are State land?

A. That is correct.

Q. It would make a difference, would it not, in the allocation of that production as to whether you went on a

three hundred and twenty acres or six hundred and forty acre spacing unit?

A. That is correct.

Q. As far as the State interest is concerned? But outside of that there is no reason why you can't develop it, either on three twenty or six forty as far as the Unit is concerned, is that correct?

A. That is correct.

MR. STAMETS: In that regard then could participating areas be established which would have the same effect as spacing units?

A. Yes.

MR. STAMETS: Any further questions? The witness may be excused.

MR. HINKLE: I have one other witness, Mr. Carnes.

L. M. CARNES

called as a witness, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. HINKLE:

Q. State your name, your residence and by whom you are employed?

A. L. M. Carnes, I'm employed by Mesa Petroleum in Amarillo, Texas.

Q. What is your position with Mesa?

A. Manager of Resevoir Engineering.

Q. Have you made a study of the Nash Unit area, as far as reservoir is concerned, based upon the discovery wells?

A. Yes, I have.

Q. Have you previously testified before the Commission?

A. Yes, sir.

Q. And qualified as a petroleum engineer?

A. Yes, sir.

Q. Are your qualifications a matter of record with the Commission?

A. Yes, sir.

MR. HINKLE: Are his qualifications acceptable?

MR. STAMETS: They are.

Q. (Mr. Hinkle continuing.) Have you prepared or has there been prepared under your direction instruments which have been marked Exhibits Five and Six?

A. Yes, sir.

Q. Refer to Exhibit Five and explain what this shows?

A. Exhibit Five is a tabulation of completion, current production and pressure history data on Nash Unit Number One, located in the northeast quarter of Section 13, 23 South, 29 East, Eddy County, New Mexico.

Some of the information shown here under the

general category has already been covered by Mr. Jeffers as to the spud date, the total depth reached, the perforations of both the Morrow and the Strawn, the AOF of the Morrow, and the date of first production, and the purchaser, Transwestern Pipeline.

However, the information under the topic of current production and pressure data on the lower half of the page has not been covered, so I will get into that in a little bit more detail.

The current production from the Morrow zone is twenty-eight hundred MCF per day at a flowing tubing pressure of twenty-five seventy-five psig. This was based on a test on August the eighth, 1975.

At the same date the Strawn was not flowing, due to problems of liquid accumulation in the well bore and low flowing pressures. The sixteen fifty psig pressure shown for the Strawn really represents a shut-in casing pressure, rather than a flowing tubing pressure and that is noted on this exhibit.

The original bottom-hole pressure in the Strawn was seventy-five.eighteen psia. This was taken on October 11th, 1974 and was based on extrapolated drill stem tests.

A recent pressure on May 23rd, 1975 was only fifty-four twenty-nine psia. This was taken after several months of problems in segregating the production from the

Morrow and Strawn zones through a cross-over assembly which malfunctioned. We were attempting to take the lower Morrow dry gas and bring it up through the cross-over assembly and into the tubing casing annulus. When this was not achieved, due to the malfunction of the cross-over assembly, we then shut-in the upper zone, the Strawn, and flowed the Morrow directly up through the tubing, from the bottom right through the tubing and to the purchaser's line.

So this is the reason then that the Strawn is shut-in, because it did not flow at a desirable rate up the tubing casing annulus. It is also the reason, because of the liquids in the Strawn, that we wanted to put it into the tubing and bring the Morrow into the tubing casing annulus.

Q. Do you have anything further with respect to Exhibit Number Five?

A. No, I do not.

Q. Refer to Exhibit Six and explain that?

A. Exhibit Six is a tabulation of the volumetric reserve data, the reserve determined from these data and the economics for both a three hundred and twenty acre and a six hundred and forty acre Morrow gas well.

It indicates that the Morrow gas recovery based on seventy-five percent of the gas in place would be four hundred and eighty-three MCF per acre foot. The gross gas reserves, then, based on this recovery of four eighty-three

MCF per acre foot, the twenty-six feet of net pay in the well bore of Nash Unit Number 1 in the three hundred and twenty acres would result in a little over four billion cubic feet of gas. Likewise on six hundred and forty acres you would double the gas reserves if you had a continuous Morrow sand section of this thickness and a little over eight billion cubic feet.

Getting down to the economics on the lower portion of the page, we have shown the economics for a Morrow gas well and its reserves only because we do not know the extent of the Strawn at this time because of those test problems I cited before. The cost of a Morrow well is estimated to be a million one hundred thousand dollars. The operating expense, including production severance taxes, for a three hundred and twenty acre reserve is estimated to be one hundred and eighty-two thousand dollars, resulting in a total operating and well cost for a three hundred and twenty acre spaced Morrow well of a million two eight two dollars. This is equivalent to thirty-nine cents per net MCF of reserve developed. The undiscounted net revenue for a three hundred and twenty acre Morrow well would be about a million seven hundred thousand dollars. The ten percent discounted net revenue is a million three, resulting in an annual rate of return of only eighteen percent for three hundred and twenty acres. Your net profit is about six hundred thousand dollars.

Compare this to your original cost to drill and equip a well of about a million one. The productive life is seven and a half years.

Compare this then to the six hundred and forty spaced Morrow well, the cost to drill and equip the well will be the same. The operating cost because of a longer life is somewhat over double the three hundred and ninety-one thousand, resulting in a total operating and well cost of a million five or twenty-three cents per MCF reserve developed.

The undiscounted net revenue is three and a half million dollars. That is somewhat over, or just about double that for the three hundred and twenty acre well.

So, therefore, your economics are much better. You have a thirty percent average rate of return and your net profit is two point four million versus the six hundred thousand dollars for the three hundred and twenty acre well.

The actual cost of Nash Unit Number One was a million three hundred and fifty-two thousand dollars, and the reason for this higher expenditure is, we were trying to complete in the Morrow and Strawn and make a dual well.

Q. Do you have anything further with respect to Exhibit Six?

A. No, I do not. I might say, therefore, based on economics, we prefer the six hundred and forty acre spacing

in lieu of three hundred and twenty standard spacing for a gas well in this area, and also it would minimize the number of penetrations in the potash area.

MR. HINKLE: We would like to offer Exhibits Five and Six.

MR. STAMETS: Exhibits Five and Six will be admitted.

MR. HINKLE: That's all we have on direct.

CROSS EXAMINATION

BY MR. STAMETS:

Q. Mr. Carnes, are all of your calculations on reserves on Exhibit Six based on a blanket sand with the characteristics set out, oh, net pay, porosity, water saturation and so on on the top of the sheet?

A. Yes, they are.

Q. Is this situation very often found in the Morrow formations?

A. No, it isn't. This is the only thing you have to go in the early production life of the well is just to assume this. This is frequently done on spacing cases where we ask for something other than the standard spacing early in the life of the well and without additional control in the area except those Forty Niner Unit wells which I'm not that familiar with. Two to two and a half miles away, I believe,

is where they are located.

Q. So the reserves you have calculated here may or may not be the reserves of that particular well?

A. That is true.

Q. And they may or may not extend over three hundred and twenty or six hundred and forty acres?

A. Exactly.

Q. And I believe you heard the testimony of Mr. Jeffers that inside the unit area that spacing could be controlled by the operator regardless of the pool rules?

A. Right.

Q. You have asked for two pool creations and I don't see that there is a recommended name. What would you propose, the Nash Morrow.

MR. HINKLE: In connection with the Strawn, of course, I don't think that should be designated now because that has been shut in and we have no information on it, but any reasonable area, six hundred and forty acres or so, would be satisfactory as far as the Morrow formation.

MR. STAMETS: Is the name Nash Morrow or Nash Strawn acceptable?

MR. HINKLE: I guess so.

MR. STAMETS: Are there any other questions of this witness?

MR. HINKLE: I would like to make one comment.

MR. STAMETS: The witness may be excused.

MR. HINKLE: Due to the fact that the Examiner has brought up the fact that we may go ahead and develop this on six hundred and forty acres because of the unit, I would like to call the attention of the Commission to this: Order R-111-A provides upon the discovery of oil or gas in the potash area, the Oil Conservation Commission shall promulgate pool rules for the affected area after due notice and hearing. Now, it was because of this provision that we requested the six hundred and forty acres. And it says: They shall promulgate the rules, so that is up to the Commission.

MR. STAMETS: Anything further in this case?

MR. HINKLE: That's all.

MR. STAMETS: We will take the case under advisement.

State of New Mexico)
) ss.
County of Santa Fe)

I, SIDNEY F. MORRISH, a court reporter, do hereby certify that the foregoing and attached Transcript of Hearing before the New Mexico Oil Conservation Commission was reported by me, and the same is a true and correct record of the said proceedings to the best of my knowledge, skill and ability.

Sidney F. Morrish, Court Reporter

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 5496/5497 heard by me on 8-27, 1975.

Richard L. Stamets, Examiner
New Mexico Oil Conservation Commission

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE APPLICATION OF MESA PETROLEUM COMPANY FOR PERMISSION TO DRILL AN OIL AND GAS TEST WELL 1,350' FROM NORTH AND 1,300' FROM WEST BOUNDARIES OF SECTION 18, T. 23S., R. 30E.

CASE NO. 5496

MOTION TO QUASH SUBPOENA DUCES TECUM

Come now Ideal Basic Industries, Inc. and J. B. Cummings and move that the Subpoena Duces Tecum heretofore entered in the above captioned matter be quashed for the following reasons:

1. The material requested in said Subpoena Duces Tecum is not pertinent at this time to the issue before the Commission.

2. Until more core test wells have been drilled, analyzed and evaluated geologically, it cannot be ascertained whether any of such material will ever become pertinent to an issue before the Commission.

3. In the event that 3 core test wells to be drilled at locations northeast, northwest and south of the proposed location, should be barren of potash, none of the material subpoenaed will ever be pertinent to the question before the Commission.

4. Production of the core test information sought would cause irreparable injury to Ideal Basic Industries, Inc. since such information is secret proprietary information obtained at substantial expense and the publication of such information would place Ideal Basic Industries, Inc. in a disadvantageous position with its competitors in the potash industry, both in operations and in competitive bidding for federal leases of the nearby Known Potash Area.

In the alternative, that the return day of the Subpoena Duces Tecum be advanced to the day set by the Commission for continuation of the hearing commenced June 12, 1975.

Respectfully submitted,

IDEAL BASIC INDUSTRIES, INC.

By _____

R. H. Blackman, Attorney
P. O. Box 31
Carlsbad, New Mexico 88220

Dated: June 12, 1975

Dockets Nos. 21-75 and 22-75 are tentatively set for hearing on September 10 and September 24, 1975. Applications for hearing must be filed at least 22 days in advance of hearing date.

DOCKET: EXAMINER HEARING - WEDNESDAY - AUGUST 27, 1975

9 A.M. - OIL CONSERVATION COMMISSION CONFERENCE ROOM, STATE LAND OFFICE BUILDING, SANTA FE, NEW MEXICO

The following cases will be heard before Richard L. Stamets, Examiner, or Daniel S. Nutter, Alternate Examiner:

CASE 5536: (Continued from the August 13, 1975 Examiner Hearing)

Application of Petroleum Development Corporation for a dual completion, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of the dual completion (conventional) of its McKay-West Federal Well No. 1, located in Unit F of Section 34, Township 18 South, Range 32 East, Lea County, New Mexico, to produce oil from the Bone Spring formation and gas from the Morrow formation through parallel strings of tubing.

CASE 5540: Application of CleveRock Energy Corporation for a non-standard gas spacing unit, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for a 320-acre non-standard gas spacing unit comprising the S/2 of Section 16, Township 19 South, Range 32 East, Lusk-Morrow Gas Pool, Lea County, New Mexico, to be dedicated to its Superior State "C" Well No. 1, located in Unit K of said Section 16.

CASE 5541: Application of Amoco Production Company for a unit agreement, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval for the Horseshoe Lake Unit Area comprising 2569 acres, more or less, of State, Federal and fee lands in Townships 24 and 25 South, Range 28 East, Eddy County, New Mexico.

CASE 5534: (Continued & Readvertised)

Application of Texaco Inc. for three unorthodox oil well locations, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the unorthodox locations for its West Vacuum Unit Wells Nos. 51, 52, and 53 to be located, respectively, 1360 feet from the South line and 150 feet from the East line of Section 33; 1466 feet from the South line and 1375 feet from the West line of Section 34; and 1410 feet from the South line and 2600 feet from the East line of Section 34, all in Township 17 South, Range 34 East, Vacuum Grayburg-San Andres Field, Lea County, New Mexico.

CASE 5542: Application of Mesa Petroleum Co. for a unit agreement, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the Merritt Unit Area comprising 2546 acres, more or less, of State lands in Township 18 South, Ranges 34 and 35 East, Lea County, New Mexico.

CASE 5496: (Continued & Readvertised)

Application of Mesa Petroleum Co. for an unorthodox gas well location, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval for an unorthodox location to test the Pennsylvanian formation for its Nash Unit Well No. 2, to be located 1350 feet from the North line and 1300 feet from the West line, or in the alternative, 1350 feet from the North line and 1980 feet from the West line of Section 18, Township 23 South, Range 30 East, Eddy County, New Mexico.

CASE 5497: (Continued & Readvertised)

Application of Mesa Petroleum Co. for creation of two gas pools and special rules, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks the creation of a new Strawn gas pool and a new Morrow gas pool for its Nash Unit Well No. 1, located in Unit H of Section 13, Township 23 South, Range 29 East, Eddy County, New Mexico, and the promulgation of special pool rules therefor, including a provision for 640-acre spacing units.

CASE 5544: Application of Continental Oil Company for an unorthodox oil well location, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the unorthodox location of its Southeast Monument Unit Well No. 96 to be located 1650 feet from the South line and 990 feet from the East line of Section 23, Township 20 South, Range 37 East, Cass-Pennsylvanian Pool, Lea County, New Mexico.

CASE 5545: Application of Continental Oil Company for downhole commingling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to commingle Drinkard and Penrose Skelly production in the wellbore of its Lockhart A-17 Well No. 3, located in Unit H of Section 17, Township 21 South, Range 37 East, Lea County, New Mexico.

CASE 5546: Application of Navajo Refining Company for compulsory pooling and an unorthodox gas well location, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Pennsylvanian formation underlying the S/2 of Section 30, Township 17 South, Range 26 East, Eddy County, New Mexico, to be dedicated to a well to be drilled at an unorthodox gas well location either 660 feet from the South and West lines, or 1980 feet from the South line and 660 feet from the West line of said Section 30. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof, as well as actual operating costs and charges for supervision. Also to be considered will be the designation of the applicant as the operator of the well and a charge for the risk involved in drilling said well.

CASE 5547: Application of Exxon Corporation for compulsory pooling, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Pennsylvanian formation underlying the E/2 of Section 16, Township 21 South, Range 27 East, Burton Flats Field, Eddy County, New Mexico, to be dedicated to a well to be drilled at a standard location for said unit. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof, as well as actual operating costs and charges for supervision. Also to be considered will be the designation of the applicant as the operator of the well and a charge for the risk involved in drilling said well.

CASE 5543: Application of Cities Service Oil Company for compulsory pooling, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Pennsylvanian formation underlying the N/2 of Section 16, Township 21 South, Range 27 East, Burton Flats Field, Eddy County, New Mexico, to be dedicated to a well to be drilled at an orthodox location for said unit. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof, as well as actual operating costs and charges for supervision. Also to be considered will be the designation of the applicant as the operator of the well and a charge for the risk involved in drilling said well.

EXHIBIT NO. 6

MESA PETROLEUM CO.

NASH UNIT NO. 1 - RESERVES AND ECONOMICS
POTASH AREA - NE SECTION 13-23S-29E
EDDY COUNTY, NEW MEXICO

Volumetric Reserves

Net Pay - Feet	26
Ø - %	7.3
Sw - %	30
BHT - °F.	209
BHP - psia	5,910
Z Factor	1.08
Recovery Factor - %	75

$$\text{Morrow Gas Recovery} = \frac{1541\ (.073)\ (1 - .3)\ (5910)\ (.75)}{(460 + 209)\ (1.08)} = 483 \text{ MCF/AF}$$

Gross 320-Acre Reserves = (.483 x 26) 320 = 4,019 MMCF
NRI Reserves = (4,019) (.82) = 3,296 MMCF

Gross 640-Acre Reserves = (.483 x 26) 640 = 8,038 MMCF
NRI Reserves = (8,038) (.82) = 6,591 MMCF

Economics

	320-Acre Spacing	640-Acre Spacing
Completed Well Cost - M$ (1)	1,100	1,100
Operating Expense - M$ (2)	182	391
Total Operating & Well Cost - M$	1,282	1,491
Total Operating & Well Cost -$/MCF	0.39	0.23
Undiscounted Net Revenue - M$ (3)	1,697	3,513
10% Discounted Net Revenue - M$	1,320	2,262
Annual Rate of Return - %	18	30
Undiscounted Net Profit		
M$	597	2,413
$/MCF	0.18	0.37
Productive Life - Yrs.	7.5	14.5

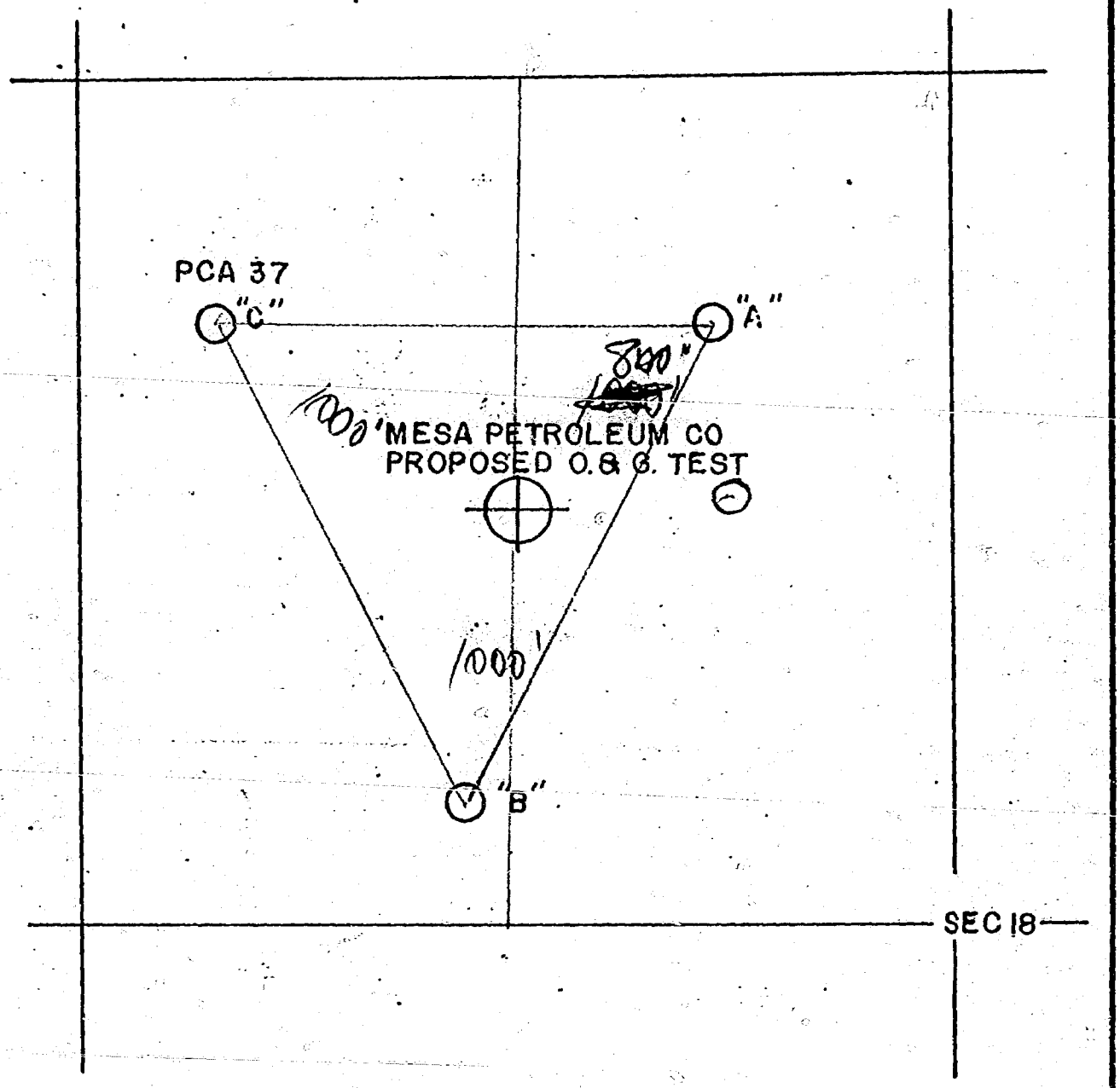
(1) Represents completed well cost for single Morrow producer. Actual Strawn-Morrow cost for Nash Unit No. 1 was $1,352,000 including dual equipment problems.

(2) Includes direct expenses plus production-severance taxes.

(3) After operating expenses and based on initial gas price of 52¢/MCF escalated 1¢/MCF per year.

LMC: dm
8/25/75

NW¼ SEC.18, TWP. 23 S., RGE 30 E., NMPM



CASE NO. 5496
EXHIBIT 5

APPROVED BY			POTASH COMPANY OF AMERICA CARLSBAD, NEW MEXICO
			DRAWN BY / DRAWING No.
			CHECKED BY
	SCALE- 1" = 500'	DATE- JUNE 5,1975	DIRECTED BY JBC

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

CASE NO. 5497
Order No. R-5095

APPLICATION OF MESA PETROLEUM
CO. FOR CREATION OF TWO GAS
POOLS AND SPECIAL RULES,
EDDY COUNTY, NEW MEXICO.

NOMENCLATURE

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on August 27, 1975, at Santa Fe, New Mexico, before Examiner Richard L. Stamets.

NOW, on this 23rd day of September, 1975, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That the applicant, Mesa Petroleum Co., seeks the creation of a new Strawn gas pool and a new Morrow gas pool for its Nash Unit Well No. 1 located in Unit H of Section 13, Township 23 South, Range 29 East, Eddy County, New Mexico.

(3) That the applicant further seeks the promulgation of special pool rules for said gas pools including provisions for 640-acre spacing units.

(4) That in said Nash Unit Well No. 1, applicant has discovered separate common sources of gas supply in the Strawn and Morrow formations.

(5) That at the present time said Nash Unit Well No. 1 is the only well completed in the Strawn and Morrow formations in said sources of gas supply.

(6) That said Nash Unit Well No. 1 is located within the Potash-Oil Area as defined by Commission Order R-111-A as amended.

(7) That the evidence presently available does not establish that one well can efficiently and economically drain 640 acres within said sources of gas supply.

(8) That the evidence presently available does not establish that the proposed special pool rules are necessary for the orderly development of said common sources of supply nor for the protection of potash resources from undue waste or hazard from such development.

(9) That new pools for the production of gas from the Strawn formation and the Morrow formation should be created and designated as the Nash Draw-Strawn Gas Pool and Nash Draw-Morrow Gas Pool, respectively, with both pools having as horizontal limits the E/2 of Section 13, Township 23 South, Range 29 East, NMPM, Eddy County, New Mexico.

(10) That in order to prevent the reduced recovery occasioned by the drilling of an insufficient number of wells and to otherwise prevent waste and protect correlative rights, the application for special pool rules for the pools set out in Finding (9) above should be denied.

(11) That the pools set out in Finding (9) above should be governed by Commission Rules and Regulations for gas pools of Pennsylvanian age or older in Southeastern New Mexico.

IT IS THEREFORE ORDERED:

(1) That effective October 1, 1975, a new pool for the production of gas from the Strawn formation is hereby created and designated as the Nash Draw-Strawn Gas Pool with horizontal limits comprising the following described area:

EDDY COUNTY, NEW MEXICO
TOWNSHIP 23 SOUTH, RANGE 29 EAST, NMPM
Section 13: E/2

(2) That effective October 1, 1975 a new pool for the production of gas from the Morrow formation is hereby created and designated as the Nash Draw-Morrow Gas Pool with horizontal limits comprising the following described area:

EDDY COUNTY, NEW MEXICO
TOWNSHIP 23 SOUTH, RANGE 29 EAST, NMPM
Section 13: E/2

(3) That the application of Mesa Petroleum Co. for special pool rules for said Nash Draw-Strawn and Nash Draw-Morrow Gas Pools is hereby denied.

(4) That jurisdiction of this cause is hereby retained for the entry of such further orders as the Commission may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

PHIL R. LUCERO, Chairman

EMERY C. ARNOLD, Member

JOE D. RAMEY, Member & Secretary

S E A L

jr/

OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO
P. O. BOX 2088 - SANTA FE
87501

DIRECTOR
JOE D. RAMEY

LAND COMMISSIONER
PHIL R. LUCERO

STATE GEOLOGIST
EMERY C. ARNOLD

September 23, 1975

Re: CASE NO. 5497
ORDER NO. R-5095

Clarence Hinkle
Hinkle, Bondurant, Cox
& Eaton
Attorneys at Law
Post Office Box 10
Roswell, New Mexico 88201

Applicant:

Mesa Petroleum Company

Dear Sir:

Enclosed herewith are two copies of the above-referenced Commission order recently entered in the subject case.

Yours very truly,

JOE D. RAMEY
Director

JDR/fd

Copy of order also sent to:

Hobbs OCC x
Artesia OCC x
Aztec OCC

Other Don Dent

United States Department of the Interior

GEOLOGICAL SURVEY
Denver Federal Center
Denver, Colorado 80225

IN REPLY REFER TO:

April 2, 1974

Memorandum

To: -> Area Geologist, Roswell, New Mexico
Area Mining Supervisor, Carlsbad, New Mexico
Area Oil & Gas Supervisor, Roswell, New Mexico

From: Conservation Manager, Central Region

Subject: Drilling oil and gas tests in the Secretary's Potash Area, New Mexico

By memorandum dated March 22, 1974, the Chief, Conservation Division advised that the recommendations in his February 14 memorandum concerning the subject operations should be implemented.

Copies of that memorandum and approved transmitting memorandum are attached. These revised operating instructions should be adopted immediately. Copies of these instructions are also being sent to the New Mexico Oil Conservation Commission, the New Mexico Mining Association, and the New Mexico Oil and Gas Association.

George W. Horn
George H. Horn

Attachments:
Memos of Feb. 14 & 15, 1974

cc: Chief, Conservation Division

United States Department of the Interior

GEOLOGICAL SURVEY
12201 SUNRISE VALLEY DRIVE
RESTON, VIRGINIA 22092

FEB 18 1974

Memorandum

To: Secretary of the Interior
Through: Assistant Secretary - Energy & Minerals

From: Acting Director, Geological Survey (Signed) William A. Vogely FEB 20 1974

Subject: Drilling of oil and gas tests in the Secretary's Potash Area, New Mexico

As you will recall, several recent controversies as to whether to permit the drilling of certain oil and gas tests in the Secretary's Potash Area precipitated a review of Departmental policy with respect to operations in this multiple use area.

The Conservation Division has now completed its study of the situation. Items such as (1) the stated position of the potash and oil and gas industries; (2) past approval actions; (3) the need to maintain a harmonious relationship with the State of New Mexico; (4) the Nation's requirements for additional energy sources; and, (5) the conservation of our most important domestic potash supply have been considered. Based on this study, the Chief, Conservation Division believes that action is required if we are to avoid similar conflicts in the future, and the Division has made certain recommendations as set forth in the enclosed memorandum.

If you concur in these recommendations, please indicate in the space provided, and the Conservation Division will prepare the necessary implementation papers.

W. A. Radlinski

Acting Director

Determination is hereby made that adoption of the recommendations contained in Chief, Conservation Division's memorandum of February 14, 1974, would be in the public interest and authority to proceed as recommended is hereby granted.

Date MAR 1 1974

John C. Whitaker

Acting Secretary of the Interior

Enclosure

United States Department of the Interior

GEOLOGICAL SURVEY
12201 SUNRISE VALLEY DRIVE
RESTON, VIRGINIA 22092

FEB 14 1974

Memorandum

To: Director, Geological Survey FEB 15 1974

From: Chief, Conservation Division

Subject: Drilling of oil and gas tests in the Secretary's Potash Area, southeastern New Mexico

By order of October 16, 1951, the Secretary of the Interior delineated an area embracing 298,345 acres in southeastern New Mexico as a designated potash area. This order revoked the Secretary's Order of February 6, 1939, thereby eliminating the ban on oil and gas leasing which had been in effect on 42,285 acres of these same lands. Since that time, there have been periodic differences of opinion between the potash mining companies and the oil industry as to whether a particular oil and gas well should be drilled in the Area. Secretarial Order of May 11, 1965, expanded the Secretary's Potash Area to include 420,212 acres and eased some of the restrictions previously imposed on oil and gas drilling in the Area. The discovery and development of extensive and very valuable langbeinite potash deposits, and the currently escalating price of oil and gas which has given impetus to exploratory activity in the Area by the oil and gas industry have resulted in a situation where conflicts of interest between the two industries are inevitable. In each of the several recent controversies, neither side has seemed willing to compromise, and each new confrontation appears to magnify the differences of opinion.

As to Federal lands in the Secretary's Potash Area, the Area Oil and Gas Supervisor, in consultation with the Area Mining Supervisor, is charged with the responsibility of deciding which proposed oil and gas tests may be drilled. These have never been easy decisions, but with today's energy shortage and the need to protect our most important source of domestic potash, these decisions have become more difficult.

Accordingly, a complete policy review was initiated in April of 1973. As a part of this study, Assistant Secretary Wakefield and other Departmental representatives met with delegations from the New Mexico Oil and Gas Association and the seven potash operating companies in

Washington, D.C., on May 8 and August 7, 1973, respectively. The Area Oil and Gas Supervisor and the Area Mining Supervisor reviewed the position documents presented by both industries and submitted a joint report dated August 24, a copy of which is enclosed. The Conservation Manager, Central Region, supplied his comments and recommendations in a memorandum of September 6, a copy of which is also enclosed.

The results of this study indicated that action should be taken to assure that the decisions of our Supervisors reflect Departmental policy, are made as fairly as possible, result in proper conservation of both of these important mineral resources, and do not unduly impede the development of either resource. It was concluded (1) that certain facets of Departmental policy affecting operations in the Secretary's Potash Area should be reaffirmed; (2) that more clear-cut procedures to assist the two Supervisors in their decision-making processes should be adopted; and (3) that guidelines to implement the new procedures should be developed. Based on these conclusions, certain proposed recommendations were submitted for your consideration by our memorandum of December 7, 1973, and, upon your concurrence, those recommendations were forwarded by memorandum of December 10 to the Office of the Assistant Secretary - Energy and Minerals for further consideration. Subsequently, copies of the December 7 memorandum were furnished to representatives of the New Mexico oil and gas and potash industries for their review. On January 31, Deputy Assistant Secretary Rigg and other Departmental personnel conducted a meeting in Albuquerque, New Mexico, to discuss the proposed new procedures. Approximately 50 people attended the meeting, of which 35 were representatives of the two industries. A copy of the attendance list is enclosed. The discussions at that meeting were very productive. They not only disclosed the need for revision of some segments of the proposed procedures but also seemed to promote a spirit of cooperation between the two industries. As a result of this further review, we now recommend that:

Part 1. The Department reaffirm its position that the Secretarial Order of May, 1965, adequately protects the rights of the oil and gas and potash industries. However, the Area Mining Supervisor is to initiate action to bring about the expansion of Secretary's Potash Area to include those known potash deposits in T. 22 S., R. 31 E., T. 23 S., Rs. 29 and 31 E., and T. 24 S., Rs. 30 and 31 E., N.M.P.M., presently outside the designated Area.

Part 2. Each potash lessee will be required by April 15, 1974, to file with the Mining Supervisor a map or maps on which has been delineated the following information with respect to the Federal potash leases which it then holds:

a. The areas where active mining operations are now in progress on one or more ore zones.

b. The areas where mining operations have been completed on one or more ore zones.

c. The presently unmined areas which are considered to contain a minable reserve in one or more ore zones, i.e., those areas (enclaves) where potash ore is known to exist in sufficient thickness and quality to be minable under present day technology and economics.

d. The areas within these enclaves which are believed to be barren of commercial ore.

These maps are to be updated effective January 1, 1975, and thereafter on an annual basis. The Area Geologist, in consultation with the Mining Supervisor, will prepare the data required in subparts c. and d. above for unleased Federal lands in the Secretary's Potash Area.

The potash lessee will be responsible for submitting sufficient data to justify any area which is proposed as a minable reserve. The Area Geologist, in consultation with the Mining Supervisor, will review the information furnished in this regard and make any revision in the boundary of a proposed minable reserve (potash enclave) which is considered to be consistent with the data available at the time of each such analysis. All maps which are developed pursuant to this Part will be updated between the required revision dates whenever new information becomes available.

The Area Geologist and the Area Mining Supervisor will complete the analysis of the initial data supplied by the potash lessees and commit their total findings to a map or maps of suitable scale by June 1, 1974. These maps will be revised as necessary to reflect the latest available information. Copies of such map(s) will be available to all interested parties through map reproduction companies located in Roswell, New Mexico.

Part 3. After April 15, 1974, it will be Departmental policy to deny approval of most applications for permits to drill oil and gas tests from surface locations within the potash enclaves established in accordance with Part 2 hereof. Two exceptions to this policy will be permitted under the following conditions:

a. Drilling of vertical or directional holes will be allowed to take place from barren areas within the potash enclaves when the Mining Supervisor determines that such operations will not adversely affect active or planned mining operations in the immediate vicinity of the proposed drillsite.

b. Drilling of vertical or directional holes will be permitted to take place from a drilling island located within a potash enclave when: (1) there are no barren areas within the enclave or drilling is not permitted on the established barren area(s) within the enclave because of interference with mining operations; and, (2) the objective oil and gas formation beneath the lease cannot be reached by a well which is vertically or directionally drilled from any permitted location within the barren area(s); or, (3) in the opinion of the Oil and Gas Supervisor, the target formation beneath a remote interior lease cannot be reached by a well directionally drilled from a surface location outside the potash enclave. Under these circumstances, the Mining Supervisor will, in consultation with the Oil and Gas Supervisor, establish an island within the potash enclave from which the drilling of that well and subsequent wells will be permitted. The Mining Supervisor in establishing any such island will, consistent with the data supplied by the Oil and Gas Supervisor regarding present directional drilling capabilities, select a site which will minimize the loss of potash ore. No island will be established within one mile of any area where approved mining operations will be conducted within three years. To assist the Mining Supervisor in this regard, he may require potash mining operators to furnish a three-year mining plan.

Part 4. In order to protect the equities between oil and gas lessees while at the same time reducing the number of oil and gas wells which operators propose to drill in the Potash Area, the Oil and Gas Supervisor will make greater use of his prerogative to require unitization. Unitization will be mandatory in those cases where completion of the proposed well as a producer would result in the drainage of oil and gas from beneath other Federal lands within a potash enclave. In other words, unitization will be a prerequisite to the approval of any well which is (1) located adjacent to an enclave (within a quarter of a mile if an oil test or one-half mile if a gas test) and which is to be drilled vertically to the prospective formation; (2) to be directionally drilled from an adjacent surface location to bottom in a formation beneath an enclave; or (3) to be vertically or directionally drilled from a barren area or island within an enclave.

Part 5. The Department reaffirm its intent to cooperate with the New Mexico Oil Conservation Commission (NMOCC) in the implementation of that agency's rules and regulations. In that regard, the potash lessees shall continue to have the right to protest to the NMOCC the drilling of a proposed oil and gas test on Federal lands provided that the location of said well is within the State of New Mexico's "Oil-Potash Area" as that Area is delineated by NMOCC Order No. 111, as amended.

Part 6. The Department reassert its prerogative to make the final decision of whether to approve the drilling of any proposed well on Federal oil and gas leases within the Secretary's Potash Area.

Part 7. Applications for permits to drill vertical tests for oil and gas at locations that are in the Secretary's Potash Area but outside the State of New Mexico's Oil-Potash Area and which do not directly offset an enclave (within a quarter mile if an oil test or within one-half mile if a gas test) will be routinely approved by the Oil and Gas Supervisor after review by the Mining Supervisor.

Part 8. Future controversies as to whether to permit the drilling of an oil and gas test in the Secretary's Potash Area which cannot be resolved in the field are to be referred to the Chief, Conservation Division, with a recommendation from the Regional Conservation Manager.

If these recommendations meet with your approval, we suggest that this memorandum be sent to the Assistant Secretary - Energy & Minerals for review and the subsequent authorization of the Secretary of the Interior to proceed as recommended.

Russell G. Wayland

Chief, Conservation Division

Enclosures

CC: CD File
Reg. Cons. Mgr., Denver
Area Mining Supv., Carlsbad
Area O&G Supv., Roswell
Area Geologist, Roswell
OS&D Section
Desk Files (CCD) (ADE-O) (AVB) (ERW) (WCS) (TOF)

RWayland:JDuletsky:ABailey:EWyatt:WSheldon:TFriz:dw:2/14/74

Case 5497

BEFORE THE OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO

APPLICATION OF MESA PETROLEUM CO. FOR DESIGNATION OF A NEW POOL BECAUSE OF THE DISCOVERY OF GAS IN THE STRAWN AND MORROW FORMATIONS IN THE NASH UNIT NO. 1 WELL LOCATED IN UNIT H, SECTION 13, TOWNSHIP 23 SOUTH, RANGE 29 EAST, EDDY COUNTY AND FOR PROMULGATION OF SPECIAL POOL RULES INCLUDING 640 ACRE SPACING AND PRORATION UNITS ON A PERMANENT BASIS OR IN THE ALTERNATIVE ON A TEMPORARY BASIS AND FOR DEDICATION OF ALL OF SECTION 13 TO THE WELL. APPLICANT ALSO SEEKS APPROVAL OF AN UNORTHODOX LOCATION FOR ITS NASH UNIT NO. 2 WELL TO BE LOCATED 1350 FEET FROM THE NORTH LINE AND 1300 FEET FROM THE WEST LINE OF SECTION 18, TOWNSHIP 23 SOUTH, RANGE 30 EAST ON LANDS OF THE STATE OF NEW MEXICO AND THE DEDICATION OF SECTION 18 TO SAID WELL, WHICH IS WHITHIN THE POTASH AREA AS DEFINED BY ORDER R-111 AS AMENDED.

Oil Conservation Commission
Box 2088
Santa Fe, New Mexico 87501

Comes now Mesa Petroleum Co., acting by and through the undersigned attorneys, and hereby makes application for designation of a new pool because of the discovery of gas in the Strawn and Morrow formations in the Nash Unit No. 1 well located in Unit H, Section 13, Township 23 South, Range 29 East, Eddy County and for promulgation of special pool rules including 640 acres spacing and proration units on a permanent basis or in the alternative on a temporary basis and for dedication of all of Section 13 to the well. Applicant also seeks approval of an unorthodox location for its Nash Unit No. 2 well to be located 1350 feet from the north line and 1300 feet from the west line of Section 18, Township 23 South, Range 30 East on lands of the State of New Mexico and the dedication of Section 18 to said well, which is within the potash area as defined by Order R-111 as amended, and in support thereof respectfully shows:

1. The Unit Agreement for the Development and Operation of the Nash Unit Area consisting of both federal and state lands was approved by the Oil Conservation Commission on May 28, 1974 under Order R-4794 and became effective shortly thereafter upon approval by the United

DOCKET MAILED

Date 8/19/75

Case 5497

States Geological Survey. There is attached hereto as Exhibit "A" a plat showing the outlines of the unit area and all of the wells which have been drilled within the unit and in the surrounding area, together with the character of the lands and the ownership of all oil and gas leases and potash leases within and surrounding the unit area.

2. Applicant is the operator designated in the Nash Unit Agreement and, as such, completed a well in Unit H., Section 13, Township 23 South, Range 29 East on lands of the State of New Mexico, which well resulted in the discovery of valuable deposits of gas in the Strawn and Morrow formations and under Order R-4982 issued by the Commission on March 11, 1975 said well has been dually completed for production from said formations.

3. Applicant has filed a Notice of Intention to Drill the Nash Unit No. 2 well to be located on lands of the State of New Mexico 1350 feet from the north line and 1300 feet from the west line of Section 18, Township 23 South, Range 30 East. It is anticipated that this well will be completed as a dual gas well producing from the Strawn and Morrow formations.

4. All of the lands within the Nash Unit Area are within the limits of the potash area as defined by the Secretary of Interior and by the Oil Conservation Commission under Order R-111 as amended. Said order provides that upon discovery of oil or gas in the potash area the Oil Conservation Commission shall promulgate pool rules for the affected area after due notice and hearing.

5. A new pool for the Strawn and Morrow formations due to the discovery of gas in the Nash Unit No. 1 well has not been designated and in connection with the designation thereof applicant believes that it would be in the interests of conservation, the prevention of waste and the protection of correlative rights to adopt special pool rules including 640 acre spacing and proration units.

6. Both the discovery well and the proposed No. 2 well are at unorthodox locations and it is necessary that the same be approved. It is proposed to dedicate all of Section 13, Township 23 South, Range 29 East to the No. 1 well and all of Section 18, Township 23 South, Range 30 East to the No. 2 well.

7. Applicant believes that the proposed unorthodox location for the No. 2 well will not result in undue waste of potash deposits and there are no potash mining operations within several miles of the proposed location and so far as is known to applicant, the owners of potash leases in the immediate area have not filed plans of projected development of the area in which the No. 2 well is to be located.

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8. Applicant has mailed to International Minerals & Chemical Corporation, Leland A. Hodges and Potash Company of America by registered mail copies of applicant's Notice of Intention to Drill the Nash Unit No. 2 well, together with a plat showing the location of the proposed well in accordance with the rules of Order R-111 as amended.

9. Applicant is sending copies of this application to the owners of all oil and gas leases offsetting Section 18, Township 23 South, Range 30 East, except those committed to the Nash Unit, and there is attached hereto a list of said owners, together with their addresses.

10. Applicant requests that this application be included on the docket for a full Commission hearing at the earliest possible time.

Respectfully submitted,

MESA PETROLEUM CO.

By _____

HINKLE, BONDURANT, COX & EATON
P.O. Box 10
Roswell, New Mexico 88201

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Owners of oil and gas leases offsetting Section 18, Township 23 South, Range 30 East:

R. G. Barton
300 West Taylor
Hobbs, New Mexico 88240

Hanagan & Hanagan
Box 1737
Roswell, New Mexico 88201

Perry R. Bass
Fort Worth National Bank Building
Fort Worth, Texas 76102

Phillips Petroleum Company
Permian Building
Midland, Texas

Skelly Oil Company
Box 1351
Midland, Texas 79701
(Skelly is Unit Operator of the Forty-Niner Ridge Unit covering Sections 8, 17 and 20, Township 23 South, Range 30 East)

Texaco Inc.
Box 3109
Midland, Texas 79701
(Texaco is Unit Operator of the Remuda Basin Unit covering Section 24, Township 23 South, Range 29 East)

All other offset acreage committed to Nash Unit of which Mesa Petroleum Co. is Unit Operator.

DRAFT

dr/

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

CASE No. 5497

Order No. R-5095

APPLICATION OF MESA PETROLEUM CO.
FOR CREATION OF TWO GAS POOLS AND
SPECIAL RULES, EDDY COUNTY,
NEW MEXICO.

NOMENCLATURE

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on August 27, 1975 at Santa Fe, New Mexico, before Examiner Richard L. Stamets.

NOW, on this _____ day of September, 1975, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That the applicant, Mesa Petroleum Co., seeks the creation of a new Strawn gas pool and a new Morrow gas pool for its Nash Unit Well No. 1 located in Unit H of Section 13, Township 23 South, Range 29 East, Eddy County, New Mexico.

(3) That the applicant further seeks the promulgation of special pool rules for said gas pools including provisions for 640-acre spacing units.

(6) That said Nash Unit Well No. 1 is located within the Potash-Oil Area as defined by Commission Order R-111-A as amended.

(4) That in said Nash Unit Well No. 1, applicant has discovered separate common sources of gas supply in the Strawn and Morrow formations.

(5) That at the present time said Nash Unit Well No. 1 is the only well completed in the Strawn and Morrow formations in said ~~newly discovered~~ sources of gas supply.

(7) That the evidence presently available does not establish that one well can efficiently and economically drain 640 acres within said sources of gas supply.

(8) That the evidence presently available does not establish that the proposed special pool rules are necessary for the orderly development of said common sources of supply nor for the protection of potash resources from undue waste or hazard from such development.

(9) That new pools for the production of gas from the Strawn formation and the Morrow formation should be created and designated as the Nash Draw-Strawn Gas Pool and Nash Draw-Morrow Gas Pool, respectively, with both pools having as horizontal limits the E/2 of Section 13, Township 23 South, Range 29 East, NMPM, Eddy County, New Mexico.

(10) ~~(7)~~ That in order to prevent the reduced recovery occasioned by the drilling of an insufficient number of wells and to otherwise prevent waste and protect correlative rights, ~~the subject application should be denied.~~ [redacted] Continued under governed by Commission Rules and Regulations for gas pools of Pennsylvanian age or older in Southeastern New Mexico.

IT IS THEREFORE ORDERED:

(1) That effective October 1, 1975, a new pool for the production of gas from the Strawn formation is hereby created and designated as the Nash Draw-Strawn Gas Pool with horizontal limits

comprising the following described area:

EDDY COUNTY, NEW MEXICO
TOWNSHIP 23 SOUTH, RANGE 29 EAST, NMPM
Section 13: E/2

(2) That effective October 1, 1975 a new pool for the production of gas from the Morrow formation is hereby created and designated as the Nash Draw-Morrow Gas Pool with horizontal limits comprising the following described area:

EDDY COUNTY, NEW MEXICO
TOWNSHIP 23 SOUTH, RANGE 29 EAST, NMPM
Section 13: E/2

(3) That the application of Mesa Petroleum Co. for special pool rules for said Nash Draw-Strawn and Nash Draw-Morrow Gas Pools is hereby denied.

(4) That jurisdiction of this cause is hereby retained for the entry of such further orders as the Commission may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.