

CASE 5496: MESA PET. CO. FOR A
DRILLING PERMIT AND AN UNORTHODOX
GAS WELL LOCATION IN THE POTASH-
OIL AREA, EDDY COUNTY, NEW MEXICO

CASE NO.

5496

APPLICATION,
TRANSCRIPTS,
SMALL EXHIBITS,

ETC.

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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) CASE
for an unorthodox gas well location,) 5496
Eddy County, New Mexico)

and)

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

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

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

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

6 MR. STAMETS: Call for appearances in this case.

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

11 I would like for you also to call the next case as
12 I would like to make a motion that these two cases be con-
13 solidated for the purpose of this Hearing.

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

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

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

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

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

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

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1 MR. HINKLE: We have two witnesses and several
 2 exhibits, but before proceeding I would like to point out
 3 that this application was originally filed for hearing before
 4 the full Commission due to the fact that the proposed location
 5 is in the potash area, coming under R-111, and the hearing
 6 was had and the Potash Company of America protested the
 7 application and then asked for a continuance of the case to
 8 give them permission to drill three core tests around the
 9 proposed well, which they did, and it turned out, apparently,
 10 that they didn't get any potash in appreciable quantities so
 11 they withdrew the protest, so consequently there is no
 12 protest as far as the Potash Company is concerned in Case
 13 5496 as to the location in the potash area.

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

18 We have two witnesses we would like to have sworn.

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

20 (THEREUPON, the witnesses were duly sworn.

21 JOSEPH W. JEFFERS
 22 called as a witness, having been first duly sworn, was
 23 examined and testified as follows:

24 DIRECT EXAMINATION

25 BY MR. HINKLE:

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

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

5 Q What is your position with the Company?

6 A Geologist.

7 Q Have you previously testified before the Commission?

8 A I have.

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

11 A It is.

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

15 A Yes, sir.

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

18 A That is correct.

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

21 A Yes, I have, sir.

22 Q Are you familiar with both applications?

23 A Yes, sir.

24 Q The one 5496 and 5497?

25 A I am.

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1 Q What is Mesa seeking to accomplish?

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

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

10 A That is correct.

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

13 A That is correct.

14 Q What else are you asking for 5497?

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

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

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

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

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

22 A No, sir.

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

25 A Exhibit Two is a geologic structure map contoured

1 on top of the Devonian formation. The scale of the map is
2 one inch equals two thousand feet. The map covers a portion
3 of southeastern New Mexico in Eddy County, primarily Township
4 23 South, Ranges 29 and 30 East. The Nash Unit Area is
5 outlined in red and the Mesa lease position is colored yellow.

6 The map was contoured utilizing regional sub-
7 surface information from well control over the Delaware Basin
8 and Transition Zone of southeastern New Mexico in conjunction
9 with the regional seismic information owned by Mesa Petroleum
10 Company and additional seismic control shot by Mesa in the
11 immediate area of the Nash Unit. The seismic control is
12 depicted on the map by numbered shot points with the interpreted
13 datum of the Devonian by each shot point. The well control
14 is indicated by well symbols with the correlative Devonian
15 datum by each well symbol. The contour interval is one
16 hundred feet regionally and fifty feet in the Nash Unit.
17 indicated by the dashed contours.

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

20 The Mesa Number 1 well is located in Section 13,
21 23 South, Range 29 East, and has two color rings indicating
22 a dual completion from the Strawn and Morrow formations.

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

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

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

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

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

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

13 The Mesa Number 1 Nash well was spudded June 25th,
14 1974 and completed from the Morrow formation for an IPCA of
15 of three point nine one nine million cubic feet of gas per
16 day on January 20th, 1975 from perforations thirteen one
17 seventy-five feet to thirteen six oh nine feet overall. The
18 total depth drilled was thirteen thousand eight hundred and
19 fifty feet.

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

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

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

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

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

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

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

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

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

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

12 A That is correct.

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

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

18 Q Has this been approved by the Commissioner and the
19 USGS?

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

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

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1 A Yes, sir.

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

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

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

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

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

3 A That is correct.

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

6 A That is correct.

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

9 A Yes, sir.

10 Q Have you had any objections from offset owners?

11 A No.

12 Q Have you obtained waivers from the offset operators?

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

15 Q In your opinion will the approval of this applica-
16 tion be in the interest of conservation, the prevention of
17 waste and the protection of correlative rights?

18 A Yes, I do.

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

21 A No.

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

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

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

2
3 CROSS EXAMINATION

4 BY MR. STAMETS:

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

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

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

13 A Three hundred and twenty acres.

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

16 A That is correct.

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

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

24 Q This would be typical of Morrow sands?

25 A That is correct.

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

6 A That's the way I feel.

7 Q Again this is a typical Morrow situation?

8 A Yes, sir.

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

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

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

19 A No.

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

25 A It is possible that we could develop the acreage

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

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

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

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

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

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

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1 twenty?

2 A Can you rephrase that?

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

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

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

13 A Right, and the development of the field.

14 MR. STAMETS: Any other questions of this witness?

15 MR. HINKLE: I have.

16
17 REDIRECT EXAMINATION

18 BY MR. HINKLE:

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

23 A That is correct.

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

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

3 A. That is correct.

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

8 A. That is correct.

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

12 A. Yes.

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

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

16 L. M. CARNES

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

19 DIRECT EXAMINATION

20 BY MR. HINKLE:

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

23 A. L. M. Carnes, I'm employed by Mesa Petroleum in
24 Amarillo, Texas.
25

1 Q What is your position with Mesa?

2 A Manager of Reservoir Engineering.

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

5 A Yes, I have.

6 Q Have you previously testified before the Commission?

7 A Yes, sir.

8 Q And qualified as a petroleum engineer?

9 A Yes, sir.

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

12 A Yes, sir.

13 MR. HINKLE: Are his qualifications acceptable?

14 MR. STAMETS: They are.

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

18 A Yes, sir.

19 Q Refer to Exhibit Five and explain what this
20 shows?

21 A Exhibit Five is a tabulation of completion, current
22 production and pressure history data on Nash Unit Number One,
23 located in the northeast quarter of Section 13, 23 South,
24 29 East, Eddy County, New Mexico.

25 Some of the information shown here under the

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

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

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

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

20 The original bottom-hole pressure in the Strawn
21 was seventy-five eighteen psia. This was taken on October 11th,
22 1974 and was based on extrapolated drill stem tests.

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

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

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

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

16 A No, I do not.

17 Q Refer to Exhibit Six and explain that?

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

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

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

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

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

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

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

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

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

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

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

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Phone (505) 982-9212

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

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

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

8 MR. HINKLE: That's all we have on direct.
9

10 CROSS EXAMINATION

11 BY MR. STAMETS:

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

16 A Yes, they are.

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

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

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1 is where they are located.

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

4 A That is true.

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

7 A Exactly.

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

11 A Right.

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

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

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

22 MR. HINKLE: I guess so.

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

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

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1 MR. STAMETS: The witness may be excused.

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

12 MR. STAMETS: Anything further in this case?

13 MR. HINKLE: That's all.

14 MR. STAMETS: We will take the case under advise-
15 ment.

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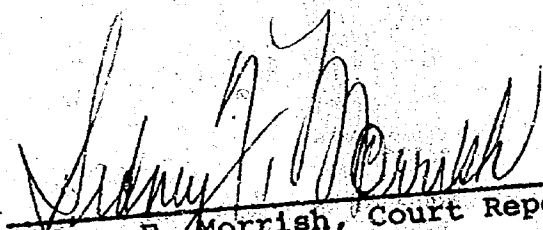
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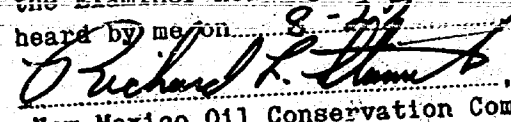
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State of New Mexico)
County of Santa Fe) ss.

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. 5476/5492 heard by me on 8-27 1925.
, Examiner
New Mexico Oil Conservation Commission

sid morrish reporting service
General Court Reporting Service
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

OIL CONSERVATION COMMISSION

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

LAND COMMISSIONER
PHIL R. LUCERO



STATE GEOLOGIST
EMERY C. ARNOLD

DIRECTOR
JOE D. RAMEY

Re: CASE NO. 5496
ORDER NO. R-5094

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

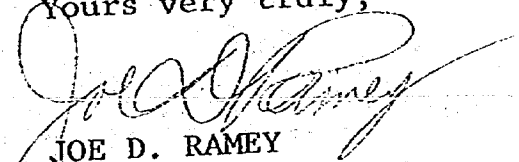
Applicant:

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

No. 481765

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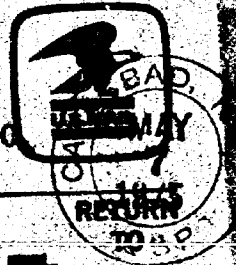
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Mr. Clarence Hinkle
Hinkle, Bondurant, & Co. Inc.
P. O. Box 10 Roswell, N. M. 88201
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1 Clarence E. Hinkle
2 Billie Tralacy

DRAFT
JR/

JR

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:

JR

CASE NO. 5496

Order No. R- 5094

APPLICATION OF MESA PETROLEUM CO.
FOR AN UNORTHODOX GAS WELL LOCATION,
EDDY COUNTY, NEW MEXICO.

JR

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 approval of an unorthodox gas well location 1350 feet from the North line and 1300 ¹³⁰⁰ ~~1500~~ feet from the West line of Section 18, Township 23 South, Range 30 East, NMPM, to test the

Pennsylvanian formation, Pool,

Eddy County, New Mexico, ^{at a point} or in the alternative, an unorthodox gas well location to drill said well 1350 feet from the North line and 1300 feet from

(3) That the of said Section 18 is to be dedicated to the well.

(4) That a well at said unorthodox location will better enable applicant to produce the gas underlying the proration unit.

(5) That no offset operator objected to the proposed unorthodox location.

(3) That ^{at either of the aforesaid locations,} the well ^{would} be drilled within the Potash-Oil Area as defined by Commission Order R-111-A, as amended.

(4) That the unorthodox location of the proposed well will ^{permit} the applicant to drill and produce the gas thereunder, without objection by ^{the} potash operator.

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(4) That core drilling has indicated that a well drilled at ^{either of} the proposed unorthodox locations should not encounter commercial deposits of potash.

(5) That no offset operator or potash operator appeared and objected to ^{either of} the proposed locations ^{aforsaid}.

(6) That a well drilled at the alternative location, i.e., 1350 from the North line and 1980 feet from the west line of Section 18, Township 23 South, Range 30 East, would be more ideally located insofar as an efficient drainage pattern for the Pennsylvanian formation is concerned.

-2-

Case No. _____

Order No. R- _____

to drill at the aforesaid alternative location

(7) That approval of the subject application will afford the applicant the opportunity to produce its just and equitable share of the gas in the subject pool, will prevent the economic loss caused by the drilling of unnecessary wells, avoid the augmentation of risk arising from the drilling ~~with not result in undue waste of gas and constitute a hazard to or~~ of an excessive number of wells, ~~and will not result in undue~~ will otherwise prevent waste and protect correlative rights.

IT IS THEREFORE ORDERED:

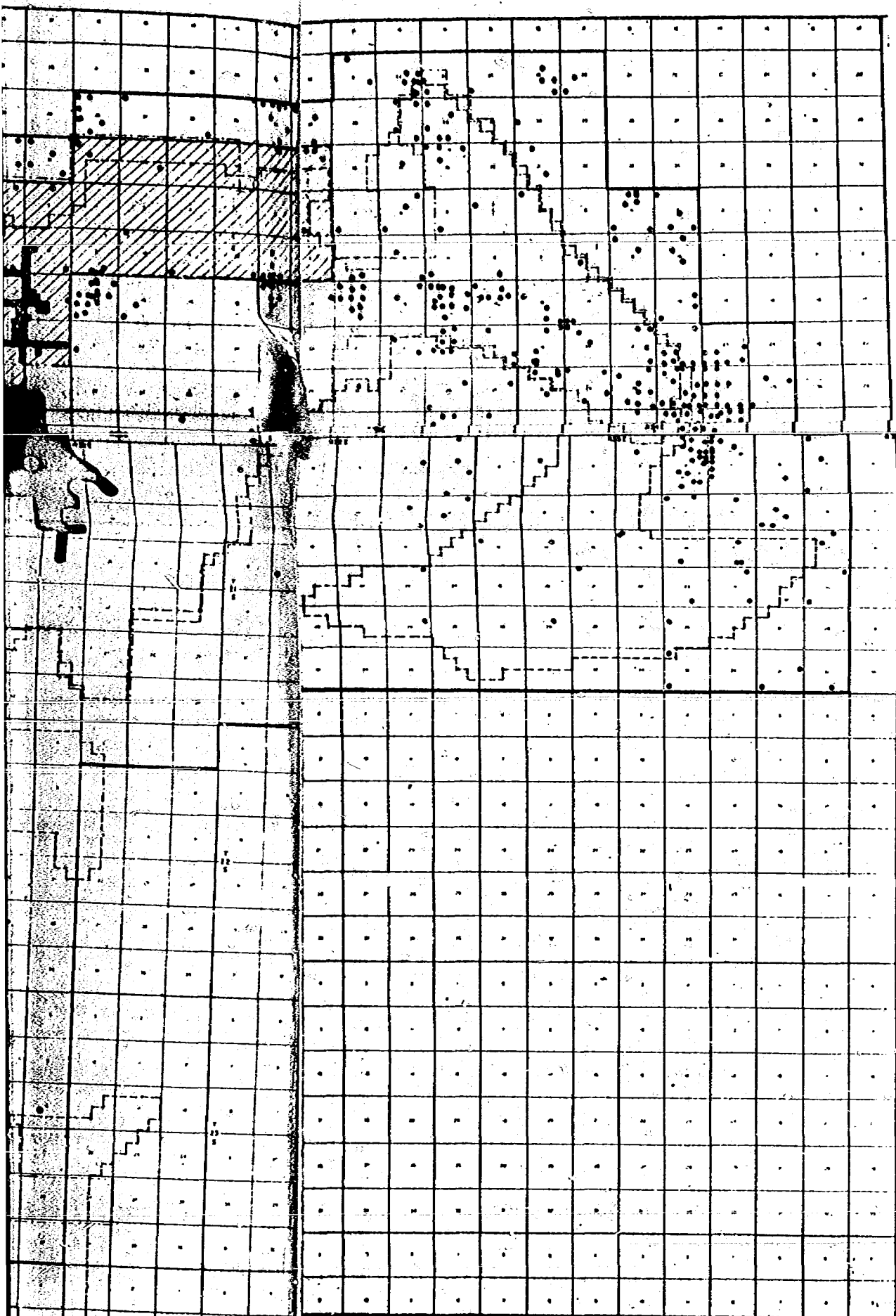
(1) That an unorthodox gas well location for the Pennsylvanian formation is hereby approved for a well to be located at a point 1350 feet from the North line and 1980 feet from the West line of Section 18, Township 23 South, Range 30 East NMPM, _____, ~~_____~~ Eddy County, New Mexico.

(2) That the _____ of said Section 18 shall be dedicated to the above-described well.

(3) That jurisdiction of this cause is 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.

POTASH DISTRICT - SOUTHEASTERN NEW MEXICO



LEGEND

• - OIL OR GAS WELL LOCATION

 - OPEN MINE WORKINGS:

1. DUVAL


2. AMAX

3. PCA

5. KERMAG


6. TELEDYNE

7. IMC

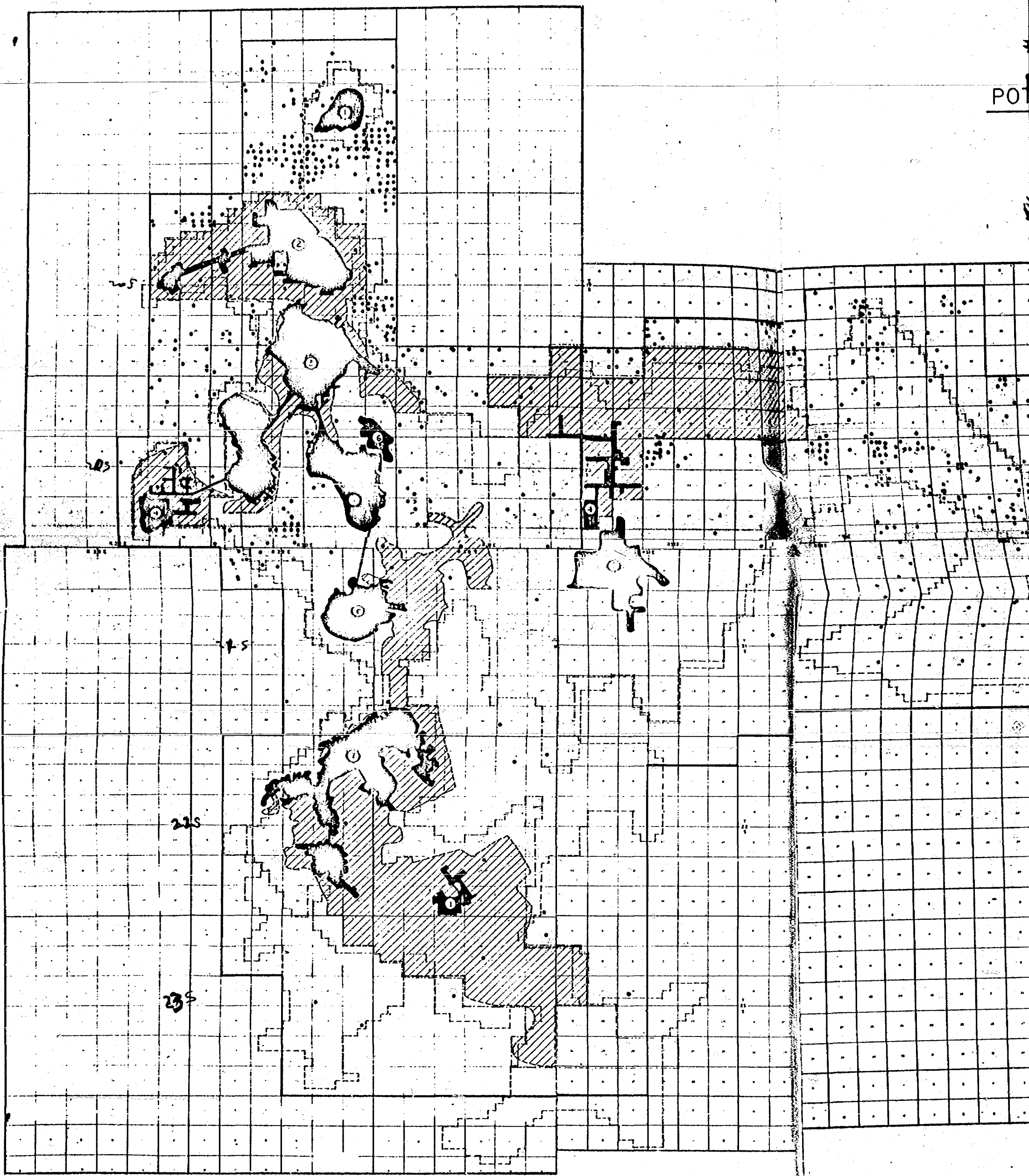
 APPROXIMATE ORE RESERVES, WITHIN
LEASED AREAS *

 SECRETARY OF INTERIOR - POTASH AREA

 U.S.G.S. KNOWN POTASH AREA

 - N.M.O.C.C. R-III-A AREA

* DATA SUPPLIED BY 5 OPERATING
COMPANIES. ESTIMATED OUTLINE FOR
TELEDYNE. RESERVES FOR
KERMAG & NON-OPERATING
COMPANIES ARE NOT SHOWN.



from PCA's projected ore line. The decision by the OCC followed Mr. Anderson's suggestion. In the 1964 hearing between Pan American and PCA, Mr. Fulton of the USGS made a statement at the conclusion of the hearing that the well, in his opinion, should not be allowed. Mr. John Anderson stated that although the proposed location was on State land, proper development would require locations on Federal lands. He urged the Commission to disallow the location. The decision of the Commission followed the request of Mr. Fulton and Mr. Anderson.

In the years of successful potash mining in the Carlsbad basin, many records have been kept and many facts have been established. The complete mining of a potash deposit requires secondary mining. The proper conservation of such deposits requires secondary mining. It is a policy of the USGS in carrying out their responsibilities of conservation of this valuable ore to require efficient and complete mining as safely as possible. The subsidence that is a result of secondary mining cannot be questioned. The records and measurements that have been kept and studied by competent mining engineers at the potash properties have shown the subsidence angle to be 45°. The effects of the subsidence not only underground but also on the surface are a documented matter of record. Independent, nationally-known consulting mining engineering firms have made studies and have found and have so testified in hearings before the OCC that subsidence does take place and does result in a subsidence angle of 45°.

There has been much said about the possibilities of gas escaping from an oil or gas well. There is ample proof that this can and has happened. In Case #862 before the New Mexico Oil Conservation Commission, Mr. S. J. Stanley, an engineer for the Commission, stated:

"It has been definitely proven in the oil business that the salt section is charged in the Monument and Hobbs pool and charged with gas. The charging of oil and gas in these pools was probably man-made by casing leaks. The point I am trying to make is that I feel porosity and permeability

exist in the salt section throughout Lea County, that the extent of charging the zone, and that is the salt zone, from one well would depend on the amount of gas present and, of course, the pressure of that particular gas."

To assume gas leaking from a casing would follow the hole to the surface and escape by that route as opposed to permeating a potash deposit is pure speculation. It is well known that although casing schedules may be improved, procedures for cementing and plugging may be improved, and elaborate testing valves may be installed, things often happen that are not planned. The business of Mr. Red Adair is based on accidents. Blow-outs can and do occur. Contention that pressure monitors on production wells will detect casing leaks and thereby offer protection to the potash deposits is valid only for major breaks that could well saturate the deposit before preventive measures could be taken. Equally or possibly even more hazardous conditions could be created by small casing leaks, undetectable by pressure monitors, which could saturate an unmined reserve over a period of time. If a gas or oil well exists, there is the possibility that gas could escape from such well, resulting in the extreme hazard of methane in a mine atmosphere. The industry and its employees are unwilling to take this risk.

It seems ironic that in the face of the multitude of new and restrictive Federal Mine Safety Laws initiated by catastrophes resulting from methane explosions, the potash industry is now called upon to defend its contention that gas and oil exploration through methane-free reserves constitutes an unwarranted hazard to both the life and economic well-being of the potash industry and its employees.

CURRENT CONTROVERSY BETWEEN POTASH AND OIL & GAS INDUSTRIES:

In September 1972, El Paso Natural Gas Company requested a location in Section 29, T23S, R31E. The location was protested by Teledyne Potash. An arbitration meeting was conducted in the offices of the USGS in Roswell, New Mexico, by Mr. Pete Porter, Chairman of the New Mexico Oil Conservation Commission. Although agreement was not reached, and a hearing should then have been held before the Oil Conservation Commission, the location was approved by the USGS. This was in variance with past accepted procedures and was a matter of great concern to the potash producers.

Following the decision on the El Paso Natural Gas Company well, Phillips Petroleum Company immediately requested a location in Section 13, T23S, R30E. The location was protested by International Minerals & Chemical Corporation since it would have penetrated the heart of a high grade langbeinite reserve. An arbitration meeting was conducted and as with the El Paso well, no agreement was reached. This time, however, the past accepted practice of following the procedure set forth in R-111-A was followed and a hearing was held before the OCC on February 21, 1973. The evidence presented at that hearing resulted in a decision by the OCC to disallow the location. This decision was in keeping with past decisions of the OCC in cases held in the 1950's and early 1960's. Phillips has now filed suit in District Court to overrule this decision.

Immediately following the OCC decision on the Phillips well, the Oil & Gas Association of New Mexico initiated a hearing before the Department of the Interior protesting recent OCC rulings. Apparently the Oil & Gas Association felt as though the past policies of the OCC, that have successfully governed the operation of both potash and oil for many years, have been modified to favor the potash industry. In their resolution submitted to the Department of the

Interior they state:

"Whereas notwithstanding such intent it now appears that a policy or practice has been formulated and put into effect whereby the development of potash deposits are being given preferential treatment over oil and gas deposits and the owners of oil and gas leases within the potash area are being denied approval of many well locations projected to test and develop oil and gas deposits lying at depths greatly in excess of the formation in which potash deposits occur..."

The potash industry does not object to oil and gas exploration in the potash area. We object only to those wells that would penetrate an established ore reserve or wells that are drilled in such close proximity to a reserve so as to constitute a hazard to the recovery of an established potash reserve. As stated previously, 122 oil and gas wells have been drilled since 1955 in the R-111-A areas without protest from the potash industry.

Concurrent operations in the Secretary's Area to the potash producers means that within the Secretary's Area there will be potash mining and oil and gas wells. The potash producers and the decisions handed down in the few cases where agreement could not be reached have shown that concurrent operations has never meant oil and gas wells and mining for potash could be conducted at the same time in the very same area.

The Oil & Gas Association, when being denied a location for a wildcat well on a non-competitive lease that is not within a known geologic structure, but is within a proven potash deposit, would point to the Secretary's order and claim that they were being unreasonably prevented from orderly development and production of their lease. A wildcat well cannot be considered orderly development and production.

The Oil & Gas Association has pointed to the closing of four potash mines as an indication that economic conditions are very poor and the potash producers are going out of business. The Wills-Weaver and the Saunders mine of the Duval Corporation were closed because the ore deposit was mined out. This is the same as shutting down a well after all the oil or gas has been recovered. Because Phillips Petroleum has completed the recovery of a particular reservoir does not mean that Phillips Petroleum is going out of business. In fact, the Duval Corporation has sunk two new shafts and is recovering ore from their Nash Draw mine. The Lea mine of National Potash was temporarily shut down to concentrate on recovering the ore from the Eddy mine. Teledyne #3 mine was shut down for the same reason as the Duval mines: the deposit of ore for which the #3 shaft was sunk to recover has been recovered. National Potash plans to reopen the Lea mine in the near future and IMC will be required to sink a new shaft for future recovery of high grade langbeinite ore.

The Oil & Gas Association has stated that the rules of the Commission are strict with respect to running and cementing of casing and testing when wells are drilled in the potash area through the salt or potash formation. They have stated this method of completion of wells has so far proven very satisfactory and has never been questioned by the potash companies. The fact is, in each of the cases heard before the Oil Conservation Commission, one of the prime concerns of the potash company has been the ability of the oil and gas operators to guarantee that the cementing and casing of wells would not result in oil or methane migrating to the potash beds.

The Oil & Gas Association has stated that it would appear that the only limitation on drilling wells for oil and gas under the regulations is where such drilling would interfere with mining operations being conducted. It would appear to them that there is no limitation on drilling when it will not interfere with actual mining operations being carried on. When in fact, the

regulations state no wells will be drilled for oil and gas except upon approval of the Regional Oil & Gas Supervisor of the Geological Survey, it being understood that drilling will be permitted only in the event that it is satisfactorily established that such drilling will not interfere with the mining and recovery of potash deposits. A gas well which produces for ten years can result in interference with mining and recovery of potash deposits that do not start in that area for a period of five to eight years from the time the well was first drilled. The regulations further state no wells will be drilled for oil or gas that would result in undue waste of potash deposits or constitute a hazard to mining operations. It does include interference with mining operations being conducted. If, however, the restrictions for oil or gas wells were held to areas presently being mined, potash deposits that are to be mined in the near future would have no protection whatsoever. Certainly mining through an area where an oil or gas well is located will result in undue waste and interfere with the mining and recovery of said potash deposits and could result in a hazard to the operation of the mine and to the miners who work the mine.

Federal regulations allow for suspension of oil and gas leases when drilling is denied. This is an important consideration to the oil and gas lease holders. Non-competitive gas leases may be held for a period of ten years with no exploration and no expense whatsoever to the oil and gas leasee. If after ten years oil or gas is not being produced from the lease, the lease must be given up by the lease holder. If this lease is suspended, the lease holder does not lose his lease after ten years and he is allowed to retain the lease at no rental costs whatsoever. The Oil & Gas Association has stated the potash companies can obtain suspension of their leases when the drilling of wells for oil and gas would interfere with projected development of the potash area. This is not quite the same, however, as potash leases are not for ten years and are not even issued unless it has already been proven that the area contains a potash deposit. The potash lease holder is limited to 25,000 acres and cannot afford to have much of this area held in suspension. Whereas

the oil and gas lease holders are allowed by the government to hold almost ten times this amount and, therefore, a suspension would not materially affect the area in which they have to explore.

Potash mines and refineries cannot be moved around like an oil well rig. The initial investment required by a potash operation is in the neighborhood of 50-70 million dollars before production can begin. He must have sufficient, protected reserves to earn a return on his capital. Once ore is bypassed the extreme cost of returning (if physically possible) to a bypassed area could very well prevent the recovery of that ore.

The Oil & Gas Association has suggested that American potash is not important because of high grade deposits in Canada. Although a similar rationalization could be drawn with the vast oil and gas reserves in the Near East, it is sufficient to say that past experience emphasizes the danger in this concept.

Presented separately by Phil Bennett
to Russell Wayland on August 7 in
Washington, D. C.



KERR-MCGEE CORPORATION
KERR-MCGEE BUILDING • OKLAHOMA CITY, OKLAHOMA 73102

August 7, 1973

JAMES J. KELLY
PRESIDENT

Hon. Stephen A. Wakefield
Assistant Secretary of the Interior
for Energy and Minerals
Washington, 26, D. C.

Re: Potash Area - Eddy & Lea Counties, New Mexico

Dear Mr. Wakefield:

This letter has been prepared for presentation to you in conjunction with the August 7th meeting at which you have invited the potash companies to submit their recommendations pertaining to oil and gas drilling in the potash area of Southeastern New Mexico recognized in the Secretary's 1951 and 1965 Orders. We have been informed that certain potash companies have jointly prepared for you a similar letter and supporting data. We prefer however to present our own statement of position that potash mining be accorded priority in this area.

Kerr-McGee Corporation urges you to take two steps:

1. To accord potash mining priority over oil and gas drilling in this area; and
2. To provide the potash companies with an opportunity to select sites where oil and gas drilling will not damage or prevent extraction of these valuable potash deposits and will result in the least interference with the orderly exploration, development and extraction of potash.

Within the relatively small area previously designated in the Secretary's Orders, potash mining should be accorded a priority because:

1. There is risk both of losing large quantities of valuable potash and of recurring hazards to the men and the mining operation if oil and gas drilling should precede mining operations, whereas there is no such danger to the oil and gas deposits if potash mining should precede oil and gas drilling operations.
2. The relatively small area involved contains the major source of potash in the United States and is thus of enormous importance to the nation as well as to the potash industry.

Hon. Stephen A. Wakefield
August 7, 1973
Page 2

3. Within this area the economic values of the potash, and of large stable mining and milling payrolls, coupled with the huge investment in mining and milling plants, outweigh the potential for oil and gas in this area.

Attached hereto is a brief memorandum supporting and amplifying the reasons listed above.

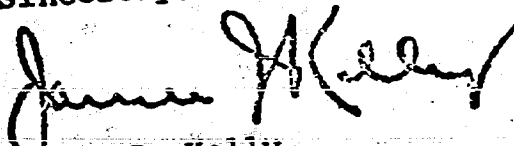
We recommend and urge that if action by the Secretary is contemplated at the present time, any guidelines or order recognize the integrity of the potash deposits and include the following:

1. That persons holding Federal and State potassium leases on lands within the potash area recognized in the Secretary's Orders be required to designate to the Secretary in writing within 180 days after a date set by the Secretary all land within the area where drilling for oil and gas could be conducted without significantly interfering with present or future potash exploration, development and mining. Oil and gas drilling could be freely conducted thereafter in the designated areas but no oil and gas drilling could be conducted outside of said areas except through a showing by clear and convincing evidence that such activities would not damage potash ore deposits or interfere with the development and mining of such deposits or pose a risk of injury to persons employed in potash operations.

2. In the event a showing is made to justify oil and gas drilling in undesignated areas, that the widest possible spacing be required and that the sites be selected to permit directional drilling from the approved sites.

3. To the extent feasible, unitization of oil and gas leases be required.

Sincerely,



James J. Kelly
President

MEMORANDUM OF KERR-McGEE CORPORATION IN
SUPPORT OF RECOMMENDATIONS FOR LIMITING
OIL AND GAS DRILLING IN POTASH AREA

This memorandum is submitted in support of a letter dated August 7, 1973 from Kerr-McGee Corporation to Stephen A. Wakefield, Assistant Secretary of the Interior for Energy and Minerals.

Potash Should Be Accorded Priority

The risk of losing large quantities of valuable potash and the potential hazards to mine employees and mining operations from prior oil and gas drilling result primarily from subsidence of overlying beds above areas where potash has been extracted. Subsidence is a well known occurrence in the Carlsbad mining area. Stresses result from subsidence, posing a serious threat of damaging or collapsing well casings and releasing hydrocarbons into adjacent potash beds and into active mine workings. The consequent hazards to miners working in such areas would be great. Apart from possible death or injuries to miners, it would not be economically feasible to convert potash mining equipment to operate under gaseous conditions. In order to avoid the risk of subsidence, it would be necessary to leave large pillars of unmined ore around oil and gas wells to provide support. The diameter of such a pillar in the eastern portion of Kerr-McGee's reserves is estimated at approximately 4,000 feet or a large portion of an entire section of land. The amount of ore left in such a pillar would vary between 3 and 6 million tons, depending upon whether or not first mining could be economically conducted. This is equal to approximately one to two years of Kerr-McGee's present annual production. The economics might well prevent keeping access available to these pillars after other mining operations in the area had ceased thus making it likely that a large portion of the ore in these pillars would be lost forever.

There is no corresponding risk involved to the oil and gas deposits, if any, should potash exploration, development and mining operations precede oil and gas operations. Oil and gas operations would simply be deferred until potash operations have been completed in the particular area. Experience has shown that all but insignificant amounts of subsidence occur within five years after the termination of mining operations.

The economics of potash versus oil and gas in this limited area finds the balance weighted heavily in favor of potash. The potash industry is a stable and important one. Large scale potash operations have been conducted in the Carlsbad Basin since the early

1930's. The annual payroll for Kerr-McGee employees has increased from 2.2 million dollars in 1966 to 3.8 million dollars in 1972, with utilities and local purchases by Kerr-McGee exceeding these figures for each year.

The Bureau of Business Research of the University of New Mexico has compiled data on the economics of the potash industry, attached to this memorandum as Appendix A. This shows that for 1970 (the last year for which official statistics are available) the potash industry accounted for approximately 2,600 jobs and generated an annual payroll of about \$21,000,000. The Bureau applied its own income and employment multipliers to produce a real value of approximately \$32,000,000 annually, or approximately 28.6% of the total earnings and 34.6% of the entire employment in Eddy County, New Mexico for that year.

Further, the employment provided by the mining of such an ore pillar, if not required to support an oil or gas well casing, would amount to approximately 95,000 man days as compared to the employment provided by the drilling of a deep oil or gas well of approximately 6,000 man days*, a ratio of approximately sixteen to one in favor of potash payrolls. Employment afforded by oil and gas operations tends to be confined to the exploration and development stages over a relatively short time. Producing wells in a field can be serviced by relatively few employees.

Likewise the retail value of the potash product in the pillar of ore necessary to support an oil or gas well casing amounts to approximately \$15,000,000, (assuming first mining can be conducted).

The investment in plant and equipment by the major potash companies in the Carlsbad mining area is conservatively estimated to exceed \$200,000,000, of which \$35,000,000 is represented by the capital investment of Kerr-McGee alone. The major portion of the capital investment by the oil and gas operators in or directly relating to the Secretarial Order area is the aggregate amount paid to acquire their leases. Moreover these oil and gas leases were acquired with knowledge by the lessees of existing potash deposits and of the conditions in the leases limiting the rights to drill for oil and gas in the event of conflict with potash deposits.

The foregoing payrolls, valuable potash deposits and capital investment all could be seriously jeopardized were oil and gas drilling permitted in this area without restrictions suggested below.

Selection of Drill Sites by Potash Companies

The New Mexico Oil and Gas Association has suggested that the potash area be redefined to eliminate portions which may

* based upon calculations and letter dated July 26, 1973 from Sipes, Williamson, Runyan & Aycock, Inc. Consulting Engineers, attached as Appendix B.

contain only marginal mineralization of potash. This proposal would create problems. In the first place substantial portions of the potash area have never been drilled adequately to rule out the presence of commercial ore. Secondly, an adequate drilling program must be conducted in an economic and orderly fashion over a period of time. At present, the New Mexico Oil Conservation Commission and the Department of Interior occasionally permit oil and gas operations unless mining operations are planned to be conducted within a period of five to ten years. This time standard fails to meet the needs of adequate planning and conservation. The large capital investment in the mining equipment and milling plant cause many companies to base their initial plans on an ore supply of twenty-five to thirty years in order to produce an economic operation. Kerr-McGee, for example, erected its plant commencing in 1965 based upon projections of a thirty-year supply of ore. That supply should be protected for the planned life of the facilities and not be limited or disrupted by an arbitrary five or ten year rule. Furthermore, mining plans tend to change from time to time based upon economics, occasional erratic occurrences of the ore and other factors.

An alternative to this arbitrary five to ten year time standard is available. To preserve the integrity of the valuable ore deposits and to prevent unnecessary interference with mining plans each mining company could be required to designate areas in which drilling would not involve a hazard to either. This would diminish potential conflicts between the potash and the oil and gas operators. It would lighten the burden on the New Mexico Oil Conservation Commission and upon the Secretary to resolve them. If necessary, additional designations could be requested by the Secretary, perhaps at five to ten year intervals as the mining operations progressed and the potash companies acquired additional information which would make possible additional designations.

Where feasible, oil and gas operators would be required to unitize their lease holdings to embrace both designated and undesignated areas. Drilling in undesignated places would be permitted only after a clear showing by the oil or gas applicant of no substantial likelihood of damage to the ore deposit, interference with development or mining operations or hazard to potash employees. Where such exceptions are made, the widest possible spacing should be observed and directional drilling employed.

NEW MEXICO OIL AND GAS PRESENTATION

It would serve no useful purpose to make a point-by-point refutation of the arguments of the New Mexico Oil and Gas Association or in the report of Mr. Warnock submitted in connection therewith. For example, the economics of potash mining, which occupied a large portion of the Association's presentation, is not here involved. Irrespective of future industry profits, the potash companies have invested a large amount of capital in plant and equipment and are actively pursuing exploration, development and mining operations on a major scale.

A proposal to permit wide-spread oil and gas drilling in the potash area without regard to the potash reserves is unreasonable, unwise and potentially devastating in the development and mining of the potash. The claim that the effect of subsidence upon well casings poses no threat to the potash reserves, mines and operations has not been substantiated. The claim that directional drilling is not feasible has not been supported and is directly refuted by the opinion of Sipes, Williamson, Runyan & Aycock, Inc. attached hereto as Appendix C. Its only disadvantage is increased cost. The interpretation of the prior orders of the Secretary and the Oil Conservation Commission by the U.S.G.S. and by the OCC, although failing to give sufficient protection to the potash reserves, clearly demonstrate that both have recognized the need to protect the integrity of the potash reserves.

The elaborate and unsubstantiated presentation by the New Mexico Oil and Gas Association on the question of the economics of potash mining is wholly irrelevant to the issues here presented. What is clear, however, is that adoption of the oil and gas position would lead inevitably to economic distress not only for the potash industry but likewise to communities whose welfare depends upon that industry.

TABLE 1
EDDY COUNTY

Income
(thousands of dollars)

	<u>1966</u>	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>
Total Earnings	\$102,789	\$102,303	\$98,770	\$105,474	\$112,384
*Farm	10,805	9,866	11,044	11,925	12,352
*Government	14,216	13,749	16,059	17,242	19,213
*Manufacturing	4,399	4,304	4,496	5,122	5,384
*Mining	34,952	34,994	27,049	28,378	31,237
*Contract Construction	4,132	4,135	5,106	5,495	5,547
Trade, Wholesale & Retail	13,429	13,488	13,382	13,624	13,690
Finance, Insurance & Real Estate	3,185	3,399	3,434	3,248	3,242
Services	12,529	13,186	14,085	16,258	17,417
Other	589	399	397	443	442

Employment

Total Employment	NA**	16,342	15,140	15,279	15,144
Number of Proprietors		1,798	1,802	1,821	1,807
Farm		520	509	502	495
Nonfarm		1,278	1,293	1,319	1,312
Wage & Salary Employment		14,544	13,338	13,458	13,337
*Farm		727	664	666	589
*Government		2,256	2,218	2,143	2,086
*Manufacturing		615	603	656	644
*Mining		3,934	3,032	3,189	3,237
*Construction		562	484	412	417
Transportation, Communication, & Public Utilities		756	752	749	695
Trade		2,623	2,497	2,396	2,349
Finance, Insurance & Real Estate		462	436	416	397
Services		2,540	2,589	2,763	2,853
Other		69	63	68	70

*Basic or export sectors

**Not Available

Source: Unpublished data, Bureau of Economic Analysis, U. S. Department of Commerce, March 8, 1973.

TABLE 2

INCOME AND EMPLOYMENT MULTIPLIERS

	<u>1966</u>	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>Income and Employment Multipliers</u>
<u>Total Earnings</u> <u>Basic Earnings</u>	1.500	1.526	1.549	1.547	1.524	1.529 ^a
<u>Total Employment</u> <u>Basic Employment</u>		1.905	2.016	2.019	2.028	1.992 ^b

Potash Payroll, 1970

$\$21,000,000^c \times 1.529 = \$32,109,000$ or
28.6% of 1970 Total Earnings

Potash Employment, 1970

$2630^d \times 1.992 = 5239$ or
34.6% of 1970 Total Employment

^a 5-year average

^b 4-year average

^c Carlsbad Chamber of Commerce statistical data

^d Annual average of covered employment in nonmetallic mining, Employment Security Commission of New Mexico.

TABLE 3

ECONOMIC IMPACT OF OIL WELL DRILLING IN POTASH AREA

Deep Well:

6 months drilling time, 5,965.5 man days required to drill & complete¹

Shallow Well:

30 days drilling time, 1,009 man days required to drill & complete¹

Mine 1400-foot Circle (area around well in which mining would be restricted):

380 workers, 1 year to complete²/approximately 95,000 man days³

Net "Base" Loss (assuming a deep well):

$95,000 - 5,965.5 = 89,034.5$ man days

Gross Loss (assuming a deep well):

$89,034.5 \times 1.992^4 = 177,356.7$ man days or approximately 709 man years³ of employment

¹Roy C. Williamson, correspondence April 19, 1973

²Kerr McGee

³Assumes 250 man days per year per worker

⁴Employment multiplier from Table 2

TABLE 4

ECONOMIC IMPACT OF OIL WELL DRILLING IN POTASH AREA

Net "Base" Loss (assuming a deep well):

$$95,000 - 5,965.5 = 89,034.5 \text{ man days or } 356 \text{ man years}^1$$

Using 1972 Average Wage Figures:

$$\frac{\$21,500,000}{2579} = 8337, \text{ the net dollar loss is } \$2,967,972$$

The Gross Dollar Loss (assuming a deep well):

$$\$2,967,972 \times 1.529^2 = \$4,538,029$$

¹Assumes 250 man days per year per worker

²Income multiplier from Table 2

APPENDIX "B"

SIPES, WILLIAMSON, RUNYAN & AYCOCK, INC.

CONSULTING ENGINEERS
Midland, Texas

July 26, 1973

1100 GIRLS TOWER WEST
MIDLAND, TEXAS 79701
915 683-1841

800 MAIN BUILDING
HOUSTON, TEXAS 77002
713 228-8148

Rodey, Dickason, Sloan, Akin & Robb, P. A.
First National Bank Building - West
West Central Avenue at Third
P. O. Box 1888
Albuquerque, New Mexico 87103

Attention: Mr. John D. Robb

Dear Mr. Robb:

Subject: Kerr-McGee Versus Belco
Economic Impact of Oil and Gas
Industry on the State of New Mexico
Kerr-McGee Potash Area
Lea and Eddy Counties, New Mexico

I have prepared the attached Table No. 1 for the purpose of examining the service and people requirements for drilling both a deep and a shallow well in the subject area. These data provide a qualitative look at the economic impact that drilling a well of either type described would have on the State of New Mexico. In addition to estimating the various costs involved in drilling both a deep and shallow well, an attempt was made to define the number of people and the number of days that they would be employed as a result of this drilling activity. As can be seen on the table, a deep well will cost over \$750,000 and a shallow well will cost over \$100,000. The costs are broken down between intangible and tangible items. The intangible items are service-oriented whereas the tangible items are equipment or pipe. Most of the intangible items will be provided by local service companies and it is hard to determine exactly how many wells would be required to maintain any one particular service office. These offices are often rather transient and when a local area becomes dormant as to drilling activities, some service locations will be shut down and services provided from a more centrally located office.

The majority of the drilling contractors having rigs capable of drilling deep holes are in Texas. There are some in New Mexico and, of course, their utilization would provide additional economic support to New Mexico.

Rodey, Dickason, Sloan, Akin & Robb, P. A.
Mr. John D. Robb
July 26, 1973
Page 2

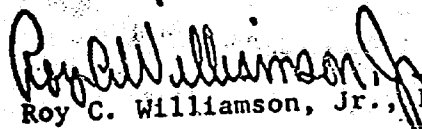
Considerable expense is involved in the casing and tank battery equipment, but the majority of this equipment, even though ordered locally, is manufactured outside the state. Here, again, ordering this equipment helps to maintain various supply outlets, but at the same time, this service could be provided from a remote office by means of a traveling salesman, etc.

A deep hole is estimated to require approximately six months to drill and, as shown on Table No. 1, would require approximately 5,965.5 man days for drilling and completing. A shallow well is estimated to take approximately thirty days to drill and would require 1,009 man days for drilling and completing.

It is obvious that the potential oil and gas industry effort in this area will create a very minor economic impact as far as goods and personnel are concerned. Please let me know if you need any expansion of the above comments.

Yours very truly,

SIPES, WILLIAMSON, RUNYAN & AYCOCK, INC.


Roy C. Williamson, Jr., P. E.

/lm

attachment

ESTIMATE OF COSTS FOR DRILLING AND NUMBER OF PEOPLE INVOLVED
LEA AND EDDY COUNTIES, NEW MEXICO

TABLE NO. 11

INTANGIBLES	Deep Well 10,000 feet Equipment - \$	People Involved	Number People	Days Employed	Man Days	Shallow Well Costs - \$	Number People	Days Employed	Man Days
Location and Roads	10,000	Local Contractor	2	3	6	5,000	2	3	6
Damages	1,000	Land Owner	1	-	-	1,000	1	-	-
Drilling - Footage Basis	163,350	Drilling Contractor - Outside N. M.*	-	-	-	** 22,500	-	-	-
Drilling - Day Work	100,800	Drilling Contractor - Outside N. M.*	-	-	-	**	-	-	-
Cementing Operations	23,000	Local Service Company	7	1	7	7,000	4	1	4
Mud and Chemicals	50,000	Local Service Company	1	180	180	5,000	1	30	30
Logging	11,200	Local Service Company	4	2	8	2,500	3	1	3
Drill Stem Tests	4,500	Local Service Company	2	4	8	-	-	-	-
Water	5,000	Local Supplier	3	3	9	1,000	3	2	9
Trucking	2,500	Local Company	5	5	25	1,000	2	2	4
Mud Logger	5,600	Local Company	1	90	90	-	-	-	-
Bite and Reamers on Day Work	25,000	Local Supply Company	-	-	-	-	-	-	-
Perforating	2,200	Local Service Company	3	1	3	1,000	3	0.5	1.5
Roustabouts	1,000	Local Service Company	5	10	50	500	5	4	20
Rental Equipment	10,000	Local Company	-	-	-	1,000	-	-	-
Treatment (acid)	3,500	Local Service Company	3	0.5	1.5	1,000	3	0.5	1.5
Supervision	10,000	Drilling Contractor Employees - Outside N. M.*	3	180	180	1,500	1	30	30
SUBTOTAL INTANGIBLES	428,650					50,000			
20% Contingencies	87,500					10,000			
TOTAL INTANGIBLES	516,150					60,000			
TANGIBLES									
Casing	173,000					32,250			
Tubing	32,000					6,000			
Wellhead & Tree	25,000					1,000			
Liner Hanger	3,000					7,500			
Tank Battery & Installation	10,000					27,150			
TOTAL TANGIBLES	243,000					77,750			
Drilling Crews			30	180	5,400	104,750	30	30	900
GRAND TOTAL	759,150				5,185.5	104,750			1,009

* Most deep rigs come from Texas
** More shallow rigs available in New Mexico

TABLE NO.

STUBS, WILLIAMSON, BOWMAN & AVOCET, INC.
1100 CIVILS TOWER WEST MIDLAND, TEXAS 79701
BOX 0 - WILLIAMSON, TEXAS 76798

Appendix C

SIPES, WILLIAMSON, RUNYAN & AYCOCK, INC.

CONSULTING ENGINEERS

Midland, Texas

July 31, 1973

1000 GIRLS TOWER WEST
MIDLAND, TEXAS 79701
915 683-1841

800 MAIN BUILDING
HOUSTON, TEXAS 77002
713 228-8146

Rodey, Dickason, Sloan, Akin & Robb, P. A.
First National Bank Building - West
West Central Avenue at Third
P. O. Box 1888
Albuquerque, New Mexico

Attention: Mr. John D. Robb

Dear Mr. Robb:

Subject: Feasibility and Additional Cost of Drilling
a Whipstock Hole to a Vertical Depth of 13,500'
Lea and Eddy Counties, New Mexico

In accordance with your request, we have investigated the feasibility and cost for drilling a deviated hole to a vertical depth of 13,500' with a directionally controlled horizontal displacement of one mile between the top and bottom of the drilled hole.

Mr. Foy W. Boyd, a drilling consultant here in Midland with considerable experience in drilling deep holes in Southeast New Mexico, and Mr. H. G. Pruett, District Manager of Eastman Whipstock, Inc., have assured me that a deviated hole such as described above presents no serious technical problems. Below is an estimate of the increased cost required to achieve the required deviation.

Tangible and Intangible Costs to Vertically Drill and Complete a Well at a T. D. of 13,500', \$	710,000
---	---------

Incremental Tangible and Intangible Costs for Achieving a One Mile Directionally Controlled Horizontal Displacement of the Bottom of the Hole, \$	87,000
---	--------

Cost of Special Equipment and Services From Eastman Whipstock for 4 Hole Direction Corrections, \$	<u>64,871</u>
Cost of Increase, \$	151,871

Percentage Cost Increase = $\$151,871 / \$710,000 = 21.39\%$

Rodey, Dickason, Sloan, Akin & Robb, P. A.
Mr. John D. Robb
July 31, 1973
Page 2

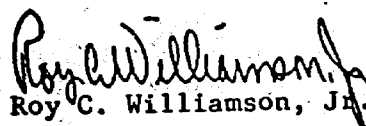
Mr. Pruett assures me that this proposed deviation would be considerably less than the maximum angle of deviation that Eastman has achieved. Attached is an estimate of costs from Eastman. There is a "no hole correction" estimate and a "4 correction" estimate. The "4 correction" estimate was chosen as a reasonable estimate of additional cost in this situation. Also shown is a cost breakdown for each additional hole correction that might be required. Such corrections may be necessary to keep the bottom hole location within the preset limits as the hole deviation angle is built. As can be seen from the Eastman proposal, the maximum deviation angle required is $41^{\circ}14'$. Eastman's maximum deviation achieved in hard rock was 68° in Holland where a horizontal displacement of 9,251' was achieved in a vertical depth of 7,000'.

A deviated hole such as described in this letter should present no serious technical problems and the increased cost is modest when compared with the potential hazard that a vertical hole drilled through the potash deposit would create.

Please let me know if you need elaboration on any part of this discussion.

Yours very truly,

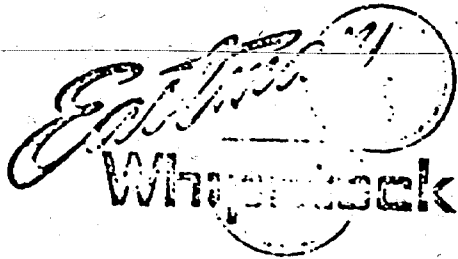
SIPES, WILLIAMSON, RUNYAN & AYCOCK, INC.


Roy C. Williamson, Jr., P. E.

/cr

attachments

563-0311



EASTMAN WHIPSTOCK, INC. PO BOX 14609 HOUSTON, TEXAS 77021 / CABLE ADDRESS: EASTCO
July 27, 1973

Mr. Roy C. Williamson
Sipes, Williamson, Runyan, & Aycock
1100 Gihls Tower West
Midland, Texas

Dear Mr. Williamson:

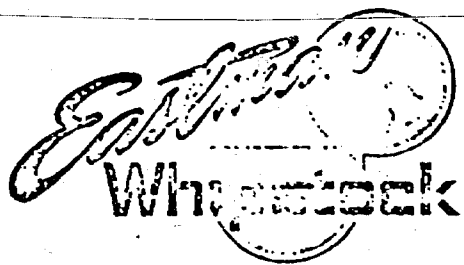
Please find enclosed, angle build-up schedule, and cost estimates to directionally drill your Lea County, New Mexico well, discussed yesterday afternoon, in the office of Mr. Foy Boyd.

I have tried to make the cost estimates high enough to take care of any unforeseen difficulties, and would like to discuss the job in more detail, at a later date.

We are happy to present this proposal for your approval.

Very truly yours,

H. G. Pruett
H. G. Pruett,
District Manager



EASTMAN WHIPSTOCK, INC. PO BOX 14609 HOUSTON, TEXAS 77021 / CABLE ADDRESS: EASTCO

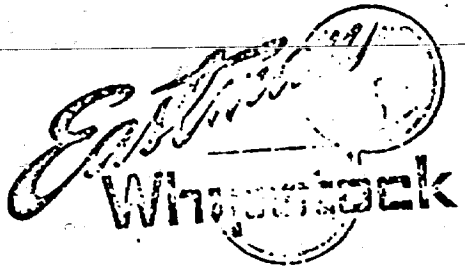
July 27, 1973

Sipes, Williamson, Runyan, & Aycock
Mr. Roy C. Williamson
Mr. Foy Boyd

Lea Co., New Mexico

Build-Up Schedule
2° /100' of Hole Drilled

<u>Measured Depth</u>	<u>Angle</u>	<u>True Vertical Depth</u>	<u>Displacement</u>
6500	0° 00'	6500.00	0.00
6600	2°	6599.94	3.49
6700	4°	6699.80	8.72
6800	6°	6799.42	17.14
6900	8°	6898.67	29.63
7000	10°	6997.44	45.27
7100	12°	7095.60	64.35
7200	14°	7193.04	86.85
7300	16°	7289.63	112.73
7400	18°	7385.26	141.97
7500	20°	7479.81	174.53
7600	22°	7573.17	210.37
7700	24°	7665.22	249.44
7800	26°	7755.85	291.70
7900	28°	7844.95	337.10
8000	30°	7932.41	385.58
8100	32°	8018.13	437.08
8200	34°	8102.00	491.54
8300	36°	8183.92	548.90
8400	38°	8263.78	609.08
8500	40°	8341.49	672.01
15,492	41° 14'	13600.00	5280.00



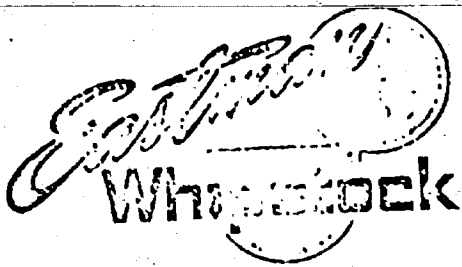
EASTMAN WHIPSTOCK, INC. PO BOX 14609 HOUSTON, TEXAS 77021 / CABLE ADDRESS: EASTCO
July 27, 1973

Sipes, Williamson, Runyan, & Aycock
Mr. Roy C. Williamson
Mr. Foy Boyd

Lea Co., New Mexico

Cost Estimate
(with no hole correction)
(based on 77 St. hole days)

1- First Service Day	\$ 510.00
102-Add'l Days @ \$210.00/day	21420.00
Eastco "R" Instrument - 103 days @ \$28.00/day	2884.00
15° - 90° Angle Unit - 95 days @ \$8.00/day	760.00
30' Non-Mag. D.C. - 103 days @ \$54.00/day	5562.00
Loss in hole coverage @ \$5.00/day	515.00
NOTE: If hole direction is more than 30° from Magnetic North or South, an additional 18' collar is necessary- 95 days @ \$38.00/day	3610.00
Loss in hole coverage @ \$5.00/day	475.00
6-1/2" Downhole Motor: For kick-off & buildup	980.00
8 Hr. Minimum	690.00
6 Add'l Hr. @ \$115.00/hr.	90.00
Loss in hole coverage for motor @ \$5.00/hr.	75.00
Bent sub adapted to Mule Shoe Orientation - 15 day Min	500.00
Misc: Trucking, subs, mileage, etc.	6864.00
24-Sets R.R.cutters @ \$286.00/set	2080.00
10-Sets R.R.cutters @ \$208.00/set	<u>\$ 47,015.00</u>



EASTMAN WHIPSTOCK, INC. PO BOX 14609 HOUSTON, TEXAS 77021 / CABLE ADDRESS: EASTCO

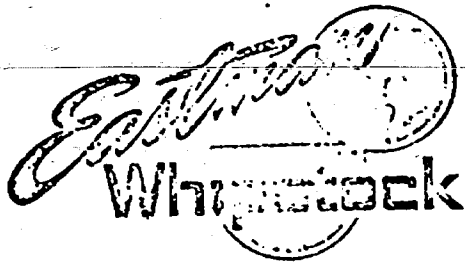
July 27, 1973

Sipes, Williamson, Runyan, & Aycock
Mr. Roy C. Williamson
Mr. Foy Boyd

Lea Co., New Mexico

Sample Cost Estimate
(with 4 corrections)

1-First Service Day	510.00
114-Add'l Service Days @ \$210.00/day	23940.00
Eastco Instrument - 115 Days @ \$28.00/day	3220.00
15°-90° Angle Unit - 107 Days @ \$8.00/day	856.00
30' Non-Mag. D.C. - 115 Days @ \$54.00/day	6210.00
Loss in hole coverage - 115 Days @ \$5.00/day	575.00
18' Non-Mag. D.C. - 107 Days @ \$38.00/day	4066.00
Loss in hole coverage - 107 Days @ \$5.00/day	535.00
First Downhole Motor run for kick-off & buildup:	
14 Hrs. Total	1670.00
Loss in hole coverage	90.00
Second Downhole Motor run for hole correction:	
14 Hrs. Total	1670.00
Loss in hole coverage	90.00
Third Downhole Motor run for hole correction:	
14 Hrs. Total	1670.00
Loss in hole coverage	100.00
Fourth Downhole Motor run for hole correction:	
14 Hrs. Total	1670.00
Loss in hole coverage	110.00
Surface Readout Tool	1540.00
Fifth Downhole Motor run for hole correction:	
14 Hrs. Total	1670.00
Loss in hole coverage	120.00
Surface Readout Tool	1540.00
Diamond Bit - 2 Runs - (estimated)	3500.00
Bent Sub - Minimum	75.00
R.R. Cutters - 34 Sets	8944.00
Misc: Trucking, subs, Mileage, etc.	500.00
	<u>\$ 64,871.00</u>



EASTMAN WHIPSTOCK, INC. P.O. BOX 14609 HOUSTON, TEXAS 77021 / CABLE ADDRESS: EASTCO

July 27, 1973

Sipes, Williamson, Runyan & Aycock
Mr. Roy C. Williamson
Mr. Foy Boyd

Lea Co., New Mexico

Cost Estimate
(For Each Hole Correction)

Without Use of Surface Readout Orientation:

Three Days Rig Time-

3-Service Days @ \$210.00/day	\$ 630.00
Eastco "R" Instrument - 3 Days @ \$28.00/day	84.00
15°-90° Angle Unit - 3 Days @ \$8.00/day	24.00
30' Non-Magnetic D.C. - 3 Days @ \$54.00/day	162.00
18' Non-Magnetic D.C. - 3Days @ \$38.00/day	114.00

Downhole Motor:

8 Hr. Minimum run	980.00
6 Add'l Hrs. @ \$115.00/hr.	690.00
Loss in hole coverage - 24 Hr. @ \$5.00/hr.	120.00

Bent Sub - 15 Day Minimum

75.00
\$ 2,879.00

For Use of Surface Readout Tool:

14 Hrs. @ \$110.00/hr. \$ 1,540.00

If Diamond bit is necessary in hard formations,
add for 2 runs - Est. Cost

\$ 3,500.00

In April 1957, OCC Cases #1233 and #1234 concerned locations requested by Yates and Carver on land owned by Southwest Potash. Southwest Potash engineers testified to the effect of subsidence at the Southwest Potash mine. Pictures taken in a timed sequence of pillars underground gave pictorial proof of the massive forces at work when pillars left were squeezed down showing the effect of subsidence in an area where second mining had taken place. Pictures of large surface cracks as a result of secondary mining were shown indicating the subsidence line as it appeared and the results of this subsidence on the surface.

In 1964 Case #3029, when Pan American Petroleum Corporation had requested a location in a deposit owned by PCA, expert testimony substantiated the danger of gas wells in potash deposits and the 45° subsidence line. Lewis C. Raymond, a consultant with the firm of Ford, Bacon & Davis, testifying for Pan American, also stated that pillar pulling would not be allowed around an operating well. Lowell Page, Senior Geologist for United States Potash, testified that the Washington office of the USGS would not allow pillar pulling within 1,250 feet of the US Potash #1 & #2 shafts, where the deposit was 1,000 feet deep.

In February of this year, John Boyd, an independent consulting mine engineer of the John Boyd firm, testified in the IMC-Phillips case as to the danger of a gas well located in a potash deposit and testified from his firm's own studies that subsidence would result in failure of casing and that the subsidence would be in effect for an angle of 45° and that prudent mining procedures would call for protective pillars around any oil or gas well.

Although conducted by the New Mexico Oil Conservation Commission, cooperation between State officials and the USGS officials has been noted in each of the cases. John Anderson, former Regional Supervisor for Oil & Gas for the USGS, in 1961 suggested at the end of the hearing on Case #2432 an unorthodox location which would move the proposed location further

OUTLINE

1. Subject
Waste of potash resulting from drilling through known potash deposits.
2. Issues
Will drilling through known potash deposits cause damage and waste of potash?

Can any waste of potash be justified to accelerate the production of gas or oil in the Carlsbad basin?
3. Extent of the Problem
If absolutely no drilling were permitted through known potash deposits which the New Mexico Oil and Gas Association desires to open to drilling, the area denied to drilling would not exceed four or five townships.

The value of an average grade and thickness sylvinite ore body one township in area is about \$1.5 billion.
4. (a) Drilling through a potash deposit will cause waste since protective pillars of potash ore will be left in place to insure that an oil or gas well which passes through the deposit will not be ruptured which would create an enormous safety hazard.
 - (1) If second mining operations were conducted, subsidence would occur causing both lateral and vertical movements of enormous power in the strata above the ore removal zone.
 - (2) The vertical and lateral movements would probably rupture or severely damage the casing and production string of a well.
 - (3) The damage could result in the escape of gas into the potash mine since the salt section has sufficient permeability and porosity to transmit oil and gas. Oil seeps, probably from leaking wells, have been exposed in the potash zone in two mines in the Carlsbad area. However, no dangerous gas leaks have occurred in any New Mexico potash mine.
 - (4) Gas escaping into a mine would expose employees to unreasonably dangerous conditions since the vast open areas of each mine are interconnected.
 - (5) Because of this danger no prudent potash mining executive will perform second mining (total mining) operations in the protective pillar surrounding an active producing well.

- (6) Protective pillars will therefore be left to protect the well and thus insure that no gas escapes into the mine. If second mining is not possible the value of protective pillars lost under average conditions is about \$2.1 million. It can be much higher in deeper than average ore bodies and in ore bodies having adverse strength-weakness characteristics.
 - (7) A well having any residual pressure is potentially as dangerous as a producing well.
- (b) The protective pillars will not be recovered unless the physical condition of the mine has not changed adversely and mining operations are still economically feasible when the well is depleted and assuredly adequately plugged.
 - (c) Certainly a large percentage will not be recoverable and will, in fact, be lost forever.
5. (a) Such waste is preventable since if the potash is fully produced before oil and gas operations penetrate the ore body, no waste will occur. The oil and gas operations will be postponed temporarily.
 - (1) Oil and gas exploration can be conducted elsewhere, whereas the potash industry cannot be moved. There will be no appreciable reduction in exploration drilling operations, since there is certainly no dearth of good gas prospects at present prices.
 - (b) Future generations will still require gas and oil.
 6. (a) The best interests of the United States would certainly not be served by waste of potash because:
 - (1) Increased cost can result in export of more of the potash industry to Canada.
 - (2) We should not be dependent on a foreign source (even Canada) for any necessary resource.
 - (3) Mining to remove protective pillars after a period of time has passed is more hazardous than removal contemporaneous with first mining.
 - (4) No natural resource should be wasted.
 7. (a) Value of the potash industry.
 - (1) The value of the industry is estimated at about one-third of the Eddy County, New Mexico business output.
 - (2) Royalties, taxes, salaries and wages.
 - (3) Comparison with gas production industry.

(ii)

8. History and Applicable Regulations
9. Miscellaneous Items
10. Conclusion

August 7, 1973

Hon. Stephen A. Wakefield
Assistant Secretary, Energy and Minerals
United States Department of the Interior
Washington, D. C. 20240

Re: Multiple Use - Waste of Potash
Resulting from Drilling through
Known Potash Deposits

The following report is presented on behalf of the potash producing companies in the Carlsbad basin in Eddy and Lea Counties, New Mexico, by the Potash Committee of the New Mexico Mining Association.

1. Subject

This report presents the position of the New Mexico potash industry concerning the problems associated with oil and gas drilling in the Secretary's potash area. It urges that rules be promulgated prohibiting either exploratory or development drilling through any known potash deposit.

2. Issues

Will drilling through known potash deposits cause damage and waste of potash?

The answer is an absolute unqualified yes. It is only a matter of degree.

Can any waste of potash be justified to accelerate the production of gas or oil in the Secretary's potash area?

We think not.

3. Extent of the Problem

The presentation by the New Mexico Oil and Gas Association recognizes that drilling into and through open mine workings would not be feasible at least until all operations have ceased and the mine has been abandoned.

If the recognized potash deposits of currently mineable grade, thickness and depth were gathered together into one solid body, the area would not exceed about four or five townships. This includes known potash deposits held under federal lease by operating companies and others.

The value of an average grade and thickness sylvinite potash ore body one township in area is about \$1.5 billion. Areas having dual deposits have much higher values.

4. (a) Drilling through a known potash deposit will cause waste since protective pillars of potash ore will be left in place to insure that an active oil or gas well or any well not assuredly adequately plugged which passes through the deposit will not be ruptured which would create an enormous safety hazard.

It is the considered unanimous position of the New Mexico potash industry members that first mining will not be conducted in the primary protective pillar and second mining will not be conducted in the secondary protective pillar surrounding an active oil or gas well.

The Primary Protective Pillar is a pillar of solid potash ore having a radius of at least 100 feet left in place surrounding the

well. This allows for surveying and operational errors in the mine and well.

The Secondary Protective Pillar is an area surrounding the well having a radius equal to the depth of the potash deposit from the surface. First mining only will be conducted in the Secondary Protective Pillar by mining out rooms leaving pillars for support to prevent subsidence. (Second mining would remove the pillars permitting subsidence.)

The amount of potash left in these two pillars will range from about 25% to about 40% of the total depending on mining methods used and underground conditions encountered. The value of lost potash is about \$2.1 million for each drill hole under average conditions for sylvinitic ore. It can be much higher in ore bodies of greater than average depth and with weaker strength characteristics, such as carnallite which requires much larger pillars to support the overlying strata, and in areas having more than one ore zone.

Exhibit A attached presents value calculations in several assumed conditions.

(1) If second mining operations were conducted, subsidence would occur causing both lateral and vertical movements of enormous power in the strata above the ore removal zone.

Exhibit B attached by Earl S. Miller and Frank Pierson reports on the horizontal and vertical subsidence movements at the U. S. Potash mine. Limiting angles up to 51° from the vertical were noted. In some instances surface variations were observed to rise and fall during overall descent in a pattern resembling a corkscrew. The horizontal and vertical forces inferred from the movements observed are obviously enormous.

Exhibit C attached is a map showing the area of total mining at the U. S. Potash mine on which is superimposed the area of surface deformation.

Exhibit D attached is a graph of the movement of a survey station at the old U. S. Potash mine which illustrates the corkscrew movement of the survey point actually observed on the surface.

(2) The vertical and lateral movements would probably rupture or severely damage the casing and production string of a well.

Exhibit E attached is a report of subsidence action at the Duval sulphur property in Culbertson County, Texas.

(3) The damage could result in the escape of gas into the potash mine since the salt section has sufficient permeability and porosity to transmit oil and gas. Oil seeps, probably from leaking wells, have been exposed in the potash zone in two mines in the Carlsbad area; however, no dangerous gas leaks have occurred in any New Mexico potash mine.

It seems obvious that if there were any oil or gas in the well it would be released into the strata by any rupture of the well casing. The section overlying the potash zone is laminated. It consists of several different materials, principally salt, clay, polyhalite and anhydrite, some of which are permeable to oil and gas. This stratification and its attendant permeability also exists in the Salado formation which includes the potash zone.

In the Potash Company of America mine, oil seeps or showings have been encountered four times in the potash zone itself, one of

which is in a vertical crack. A similar oil seep was encountered in the Eddy mine of National Potash Company.

Exhibit F is a report which details the several instances including color reproductions from photographs taken in the south tunnel area of the Potash Company of America mine which show the oil stains in the anhydrite layer just above the potash zone.

Exhibit G is a report which details an instance where oil seepage was encountered in the National Potash Company mine in Eddy County, New Mexico.

Small pockets of dead air under pressure have been encountered in all of the mines. Extensive sampling of the escaping gas reveal it to be mostly nitrogen and carbon dioxide. No significant amounts of methane or other explosive or flammable gases have ever been detected.

Case No. 862 before the New Mexico Oil Conservation Commission contains the testimony of Mr. S. J. Stanley, staff engineer for the Commission, at a hearing April 20, 1955, that:

"It has been definitely proven in the oil business that the salt section is charged in the Monument and Hobbs Pool and charged with gas. The charging of oil and gas in these pools was probably man made by casing leaks. The point I am trying to make is that I feel that porosity and permeability exists in the salt section throughout Lea County, that the extent of charging the zone, and that is the salt zone, from one well would depend on the amount of gas present, and, of course, the pressure of that particular gas."

(4) Gas escaping into a mine would expose employees to new and unreasonably dangerous conditions since the vast open areas of each mine are interconnected.

As an example, the Potash Company of America mine contains over 1,200 miles of interconnected tunnels about 28 feet wide and 6 feet high on the average. Other mines are both larger and smaller. All are similarly structured.

Most of the gas produced near the potash area is odorless. Gas leaking into a potash mine would produce a huge bomb. Employees could be smothered or poisoned if a major leak occurred although the principal hazard is the possibility of explosive mixtures accumulating undetected.

(5) Because of this danger no prudent potash mining executive will perform second mining (total mining) operations in the protective pillar surrounding an active producing well.

(6) Protective pillars will therefore be left to protect the well and thus insure that no gas escapes into the mine.

Exhibit H is a report by the John T. Boyd Company, a mining engineering firm of international repute, of Pittsburgh, Pennsylvania, which approves and elaborates on the statements and conclusions set forth herein.

(b) The protective pillars can only be removed by mining after the well has been abandoned and plugged in such manner that it can be absolutely assured that no gas can ever escape into the mine.

This may not occur until it is too late for economically profitable mining. It is obviously more expensive to remove mining and transportation machinery out of an area after first mining and then move it back in again for second mining.

After passage of a period of time the mining conditions may have changed to such a degree that a lesser overall percentage of ore can be removed than would have been possible had second mining been conducted coincidentally with first mining. Under such conditions hazards to employees will be increased.

The amount of ore so wasted is difficult to estimate, but it is surely substantial.

Exhibit I attached is an internal memorandum from Amax Corporation which furnishes some information on the character and extent of such losses. The memorandum is supported by photocopies of monthly reports in 1968 and 1969 in which the Amax mine superintendent points out the difficulties encountered and comments on the increased costs incurred and the pillars left in place to minimize hazards to employees and therefore, unavoidably at that time, wasted.

If the changed conditions are sufficiently hazardous, the second mining operation may not be conducted at all. This waste would be substantial.

At some point in time when either changed mining conditions interdict second mining, second mining will not yield a profit, or mining operations in the mine have ceased, all protective pillar ore will be lost.

The elements of delay and uncertainty introduced by the well will cause some losses. Depending on the length of the delay and the degree of uncertainty, the waste can range up to all ore in the protective pillar system.

Even if a well is located outside the subsidence area it cannot be

guaranteed that no damage will occur since if a blow-out occurs or if the well is improperly plugged when it reaches the uneconomic state, the gas could penetrate the mine through permeable strata. Wells which contain so little gas that they will not produce against gathering line pressure still contain sufficient pressure and volume to contaminate a mine.

Wells in the Getty field which is in the Potash Company of America west ore body have been plugged and abandoned under U. S. G. S. supervision, but because of the condition of the wells after many years of production, it cannot be assured that the plugging was successful. The potash ore in the protective pillars around those wells has probably been permanently lost.

Even if wells could be properly plugged, primary protective pillars would be left. Attempting to mine around these pillars would seriously affect efficiency and the normal mining cycle and make mining of the ore in that area uneconomical.

The possibility of ultimate recovery of some of the potash by solution mining is too remote for consideration. Solution mining in the thin potash beds in the United States has thus far been unsuccessful. However, one company in Canada appears to have a sustainable operation. They are producing from ore beds from 80 to 100 feet thick with average grade over 20% K_2O , reserves totally unlike those in the Carlsbad area which would average less than 8 feet in thickness and less than 20% K_2O .

In a study comparing solution with conventional potash mining prepared by W. H. W. Husband, head of the Engineering Division, and Selim Ozsahin, Associate Research Officer, both of the Saskatchewan Research Council, for presentation at the March 1967 annual general meeting of the Canadian Institute of Mining in Ottawa, the authors reached the following conclusions:

"The results indicate that solution mining and refining of potash is economically feasible in Saskatchewan at current market prices if reasonable production rates are maintained and a suitable deposit is used. Ore grade has to average at least 20% K_2O over a thickness of 50 feet.

The cost of the potash produced by the solution mining and refining method is greater than the cost of potash produced from the conventional method. This is due mainly to costlier surface recovery installations and operations. Great quantities of water have to be evaporated in the refining stage and this requires complex equipment and large amounts of fuel."

(c) Certainly, a large proportion of the ore in protective pillars will not be recoverable and will, in fact, be wasted.

(d) As illustrated by the Boyd report, Exhibit H, whether second mining can or cannot be performed can mean the difference between profit and loss operations.

5. (a) The waste described is preventable since if the potash is fully produced before oil and gas operations penetrate the ore body, no waste will occur. The oil and gas operations will be postponed temporarily.

(1) Oil and gas exploration can be conducted elsewhere, whereas the potash industry cannot be moved. There will be no appreciable

reduction in exploratory drilling operations, since there is certainly no dearth of good gas prospects at present prices.

(b) Future generations will still require gas and oil.

6. (a) The best interests of the United States would certainly not be served by waste of potash because:

(1) Increased cost can result in export of more of the potash industry to Canada.

(2) We should not be dependent on a foreign source (even Canada) for any necessary resource.

(3) Mining to remove protective pillars after a period of time has passed is more hazardous than removal contemporaneous with first mining.

(4) No natural resource should be wasted.

7. (a) Value of the potash industry.

(1) The value of industrial output and related and supported industries of the potash industry is estimated at about one-third of the Eddy County, New Mexico business output.

(2) Royalties, taxes, salaries and wages - During the 15 year period from 1958 through 1972, the potash industry has paid out over \$440 million in salaries and wages to their employees; over \$50 million in ad valorem, severance and other taxes to the State of New Mexico; and approximately \$55 million in State and Federal royalties. The turnover of these dollars

in wages and salaries as well as the support businesses that supply the potash industry has made and will continue to make a very significant contribution to the economy of southeastern New Mexico.

(3) Wages and salaries generated from potash production exceed wages and salaries from gas production by a ratio of about 17.5 to 1. Production of potash values of \$10 million would generate about \$3.5 million in salaries and wages. As per the following calculation, production of \$10 million of gas would generate about \$200,000.

Reserve:

20 billion cubic feet at \$0.50 - \$10 million

Production:

10 million cubic feet per day average for
2,000 days, 5-1/2 years

\$0.01 per MCF for labor cost - \$100 per day
for 2,000 days - \$200,000

One of the best wells in the potash area is about one mile from Potash Company of America's ore body. This well originally estimated at a production of 6 billion cubic feet has already produced about that amount and probably will produce an additional 6 billion cubic feet over a period of 12-18 years. Using today's prices, at \$0.50 per MCF, it would have a gross value of \$6 million. Were that well drilled through an average potash deposit, the value of the protective pillars, almost certainly lost because of its lengthy production period, would be \$2.1 million.

If we take into consideration the average productive well in the

area (we estimate 2-5 billion cubic feet for the average good producer), the lost potash would probably exceed in value the gas produced.

How can this be said to best serve the interests of the United States?

A schedule prepared by the New Mexico Bureau of Business Research of the University of New Mexico for Kerr-McGee Corp., tables 1-4, is attached as Exhibit J.

8. History and Applicable Regulations

From time to time beginning in the 1920's, substantial federal acreage in New Mexico was withdrawn from oil and gas leasing. Secretary's order dated October 16, 1951, 16 F.R. 10669 revoked previous withdrawals and established regulations concerning drilling in the newly released area. That order was superseded by the Secretary's order of May 11, 1965, 30 F.R. 6692 which contains the currently applicable drilling regulations.

1951 ushered in a period of intense controversy between the two industries over the serious questions of safety and conservation created by reopening the area to oil and gas activity.

Representatives of the potash and oil and gas industries held many meetings and many problems were aired. However, the only significant accord reached is embodied in New Mexico Oil Conservation Commission Order R-111-A, October 13, 1955, providing for notification to the potash lessee of notice of intention to drill by the oil and gas lessee and if objection is made, for a full record hearing before the New Mexico Oil Conservation Commission. Other provisions of Order R-111-A

were more or less imposed on both industries by the Commission.

A more complete paper prepared by International Minerals & Chemical Corporation for the potash group is attached as Exhibit K.

9. Miscellaneous Items

Sylvinite ore is a mechanical mixture of KCl and NaCl. Langbeinite ore is a similar structure but it is a double salt of potassium and magnesium.

These ores lie in bedded deposits. It is mined like coal with coal machinery but there the similarity ends.

Potash ore is non-toxic, non-explosive, non-flammable, has no inherent vices; the dust is harmless - potash miners have breathed it for over thirty years with no ill effects. The mines are clean and dry. About 95% of the finished product is used as fertilizer.

Before World War I, we were dependent on Germany for our potash and during that war, prices of potash rose to \$500 per ton.

The present prices are about \$21 per ton for both KCl and Sulphate of Potash Magnesia, less than before World War II. We know of no other commodity that can match that price record.

Almost complete automation of mining and processing is the reason. At its peak, the New Mexico industry produced about 5 million tons of finished product annually having a value in excess of \$105 million. Current production is about 4 million tons having a value of about \$78 million.

The potash industry has a substantial effect on the economy of Lea County, New Mexico and also supports a salt industry of about \$1.4 million annually.

About 800 wells have been drilled in the Secretary's area - about 200 of them since 1950 without objection from the potash industry. There have been six contested cases which went to hearing before the New Mexico Oil Conservation Commission. In four, the potash industry position prevailed and drilling was denied. In one there was failure of proof of the existence of potash ore, and in the other drilling was permitted in the old Getty field which was discovered and drilled out before the potash industry was established in New Mexico, on the theory that the potash there was already lost due to the presence of the old oil wells. Later plugging operations on those wells were not successful.

10. Conclusion

The potash industry has not objected to drilling in the Secretary's area arbitrarily or capriciously, and respectfully urges that the current system of proceeding through objection to hearing and decision under New Mexico Oil Conservation Commission Order R-111-A be continued and recognized. Drilling through known potash deposits with its resultant waste of potash must continue to be prevented.

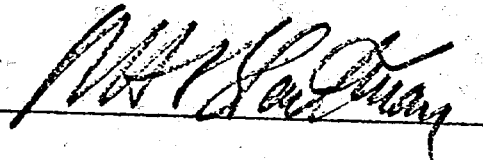
To the extent that the statements of fact made in this report are in conflict with statements made in the New Mexico Oil and Gas Association presentation, we respectfully urge that the evidence produced herein substantiates the validity of our position.

We shall be pleased to submit additional evidence or conduct studies and surveys on any matter herein treated concerning which you may desire additional information.

Respectfully submitted

On Behalf of the Potash Committee
of the New Mexico Mining Association
and
the New Mexico Potash Industry

By



5.5 ft. of 16% K₂O Sylvinite Potash Ore

43,560
5.5
<hr/>
15/239,580 cu. ft.
15,972 tons
.9 extraction
<hr/>
14,374.8
.82 recovery
<hr/>
11,787.34
11,787
16%
<hr/>
188,592 units
.35 per unit
\$ 66,000 per acre
<hr/>
640
\$42,240,000 per section
<hr/>
36
<hr/>
\$1,520,640,000

At 1,250 ft. depth the value of the protective pillar would be about \$2,100,000.

Value of Protective Pillars - Sylvinite

Value of 16% potash ore at 82% refinery recovery and \$0.35 per unit assuming that thickness is 5.5 feet:

$$\begin{aligned} \text{Value per ton} &= \text{Grade} \times \text{Recovery} \times \text{Unit Price} \times 100 \\ &= .16 \times .82 \times 0.35 \times 100 \\ &= \$4.592 \end{aligned}$$

- I. If well were not drilled, 90% of the ore within a 1,250 ft. radius circle would be mined, or:

$$\begin{aligned} \text{Tons} &= \frac{3.1416 \times 1250 \times 1250 \times 5.5}{15} \\ &= \frac{4,908,750 \times 5.5}{15} \\ &= 1,799,875^{(1)} \times .90 = 1,619,887 \end{aligned}$$

Value of ore that could be mined, no well:

$$1,619,887 \times \$4.592 = \underline{\$7,438,521}$$

- II. If well were drilled, the ore in a solid 100 ft. radius barrier would be lost, and the remainder of the ore outside the 100 ft. radius circle and a circle 1,250 ft. in radius would be only 65% extracted.

Tons in 100 ft. radius barrier:

$$\begin{aligned} T &= \frac{3.1416 \times 100 \times 100 \times 5.5}{15} \\ &= 11,519 \text{ tons} \end{aligned}$$

$$\begin{aligned} \text{Total tons in 1,250 ft. radius circle} &= 1,799,875 \\ &- \quad \quad \quad 11,519 \\ &= 1,788,356 \text{ tons, of} \end{aligned}$$

which only 65% could be mined or:

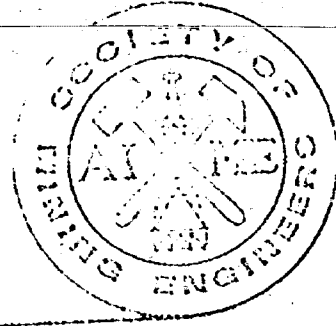
$$1,788,356 \times .65 = 1,162,431 \text{ tons, the value of which is:}$$

$$1,162,431 \times \$4.592 = \underline{\underline{\$5,337,883}}$$

Value if no well	\$7,438,521
Value, if well	<u>5,337,883</u>
Lost, due to well	<u>\$2,100,638</u>

7/31/73

AMERICAN INSTITUTE OF MINING, METALLURGICAL, AND PETROLEUM ENGINEERS
300 NASSAU ST. NEW YORK 10001



UNDERGROUND MOVEMENT AND SUBSIDENCE OVER
UNITED STATES POTASH COMPANY MINE

E. H. Miller
Resident Manager

F. L. Pierson
Senior Geologist

U.S. Potash Company
Carlsbad, New Mexico

This paper is to be presented at the Annual Meeting of the American Institute of Mining, Metallurgical, and Petroleum Engineers, New York, February 16-20, 1958. Permission is hereby given to publish with appropriate acknowledgments, excerpts or summaries not to exceed one-fourth of the entire text of the paper. Permission to print in more extended form subsequent to publication by the Institute must be obtained from the Secretary of the Society of Mining Engineers of A.I.M.E.

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- 1 -

UNDERGROUND MOVEMENT AND SUBSIDENCE OVER UNITED STATES POTASH
COMPANY MINE
By

Earl H. Miller, Resident Manager
And
Francis L. Plorson, Senior Geologist

5819P9

The United States Potash Company was the original discoverer and first producer of underground mined potash ore in North America and commenced active production of potash in 1931. In July 1956, the company merged with United States Borax & Chemical Corporation and is now a Division of that corporation.

The mine is located twenty-two miles east of the city of Carlsbad and the refinery is located sixteen miles south of the mine. The mine was placed where the ore was found and the refinery placed where there was sufficient water for a dissolving and re-crystallization plant.

For twenty-three of the last twenty-six years, the potash ore was mined with the room and pillar method, taking approximately sixty percent extraction and leaving forty percent in pillars. These pillars are generally fifty-eight feet by fifty-eight feet square. Three years ago, it was decided that removal of as large an extraction as possible from these pillars should be commenced.

The first visible evidence of subsidence on the surface is by small hairline cracks which rapidly develop into openings measuring up to approximately one inch wide and one hundred feet long. As the face retreats underground, these tension cracks disappear. About the boundaries of the final mined area which have been unworked for any length of time, these cracks appear and become larger. With continual strain and erosional effects, some of the cracks develop into sizeable openings measuring six inches to two feet wide and with an unknown depth. With continued erosion, the walls of the cracks fall into the bottom, thus widening and filling the openings.

In the present stage after two years, some of the openings appear as slump holes measuring some six to eight feet across, ten to thirty feet long, and five to fifteen feet deep. The geologic structure through which these forces are transmitted is rather typical of bedded salt deposits in the area. The buff dolomite section at approximately four hundred feet below the surface is a water zone of considerable magnitude over quite an extensive area. The fact that both the salt and potash are highly soluble makes it imperative that the section between this buff dolomite and the underground salt and potash beds below must not be ruptured. The potash bed, which varies from five to fifteen feet in height and lies more or less horizontal, is approximately one thousand feet below the surface and is normally overlain by a salt section some five hundred feet thick. The shale and clay strata below the water zone and above the salt section form the impervious layer which protects the salt section from the water above.

The effects of subsidence over the surface area are much larger than the actual final mined area underground. In those places where final mining has been carried to the limits of the ore-body, subsidence effects have been observed some seven hundred feet beyond the limits on the surface. In those places where final mining stopped in a first mined area, subsidence has been noted for distances as great as one thousand two hundred feet beyond the limits of final mining. Principally for this reason, a large zone about the hoisting shafts has been prohibited to final mining activities until all other mining is completed.

In present operations, there are two types of mining in use. The first is known as conventional mining which utilizes undercutters, drills and blasting, after which the ore is moved from the face with loaders and shuttle cars. The other method is with continuous mining machines, using extensible and mainline haulage belts. In both of these operations, final mining is being carried on. The conventional final mining system is used generally in high ore in which it would be uneconomical to use a continuous mining machine.

In cases where a mud seam or zone of weakness occurs in a pillar, it will, of course, crush and fail at this point. Frequently when the mud seam is just above the back or just under the floor, the pillar will punch through into the weak zone. Additional effects caused by the mud seam just above or just below an entry are frequent sags and falls of roof slabs and heaving of the floor.

Even in the event that roof slabs begin to fall over haulage ways, an attempt is made to control their subsidence until the haulage way is abandoned. In controlling roof slabs, cribbing, stulls and roof bolts are often used. These measures usually suffice to keep the haulage ways

open but occasionally it is necessary to blast down a slab and remove it.

It is thought that roof slabbing and floor heaving are caused by the vertical pressure and certain resulting forces. The vertical pressure through a punching action causes the tendency for the floor to rise in the entry and the back to sag. The other resulting forces are thought to be the movement of clay in the clay seams from above and below the pillars out into the floor and back in the entries. It is also thought that "end pressure" exerted on the floor and roof slabs from the expanding pillars helps to cause the initial separation of the slabs.

The second type of mining in our operations is in the continuous miner sections. About five years ago we commenced the use of continuous miners, and in this operation a different type pillar was necessary due to the limitations of the machine. The general mining pattern with this method leaves pillars one hundred feet long and thirty-five feet wide after first mining. In final mining, these pillars are reduced to such size that from ninety-five to ninety-eight percent extraction is being obtained. The back stands well immediately after mining out with such a large percentage of extraction, subsidence is relatively rapid.

In graphically plotting subsidence, the major amount of movement underground is estimated to be approximately twelve feet, while the major subsidence on the surface is approximately eight and one-half feet. This would appear to indicate that very little breaking is taking place in the strata above the mined-out area and that the overlying beds are more or less settling uniformly.

In plotting the movement of one particular station on the surface and underground in the final mined area, it was found that for approximately thirty days subsidence was extremely rapid. The total height of the mined-out area was originally 12.75 feet. For the first thirty days after final mining, there was apparently little movement; but between thirty and sixty days, the underground workings at this point had subsided 3.25 feet, while the point above on the surface had dropped 0.75 feet. At the end of one hundred days, the back had come down a total of six feet, while subsidence on the surface measured 2.20 feet. After one hundred and forty days, the station underground had dropped a total of seven and one-half feet, while the point on the surface had moved down three and one-half feet. Due to the bad conditions of the back underground at this time, observations were discontinued. On the surface, however, the point continued downward, measuring six feet total drop after two hundred days. It was at approximately this point that the sharp rate of subsidence changed abruptly. At the end of one thousand days, the surface station had subsided a total of 7.50 feet, an increase of 1.50 feet in the last eight hundred days.

In graphing the movement of this station, it was found that the line was not continuously downward but indicated that subsidence, both underground and on the surface, came in waves or intervals, and in some cases the ground actually rose from the previous month's reading. From our closest observation in a single instance, it appeared that surface subsidence became measurable approximately thirty-five days after subsidence was noted underground.

In the first study of subsidence movement, a grid was set over the area to be mined with stations on five-hundred foot spacing, both east-west and north-south. These stations were triangulated in each month and a record of their movement was noted. From this date an approximate limiting angle of 51 degrees - 30 degrees has been calculated, the limiting angle, of course, being measured from a line drawn vertically up from the edge of advance and a second line drawn upward from the edge of advance to the outermost point where subsidence was observed on the surface. This limiting angle is important in determining where surface structures will be affected by subsidence. There are many factors which contribute to the degree of the angle. Those principally responsible are:

(1) The overlying strata through which subsidence takes place, this angle being relatively small for strong rocks and relatively large for weaker members, the total limiting angle, of course, being the sum of the various limiting angles up through the different strata.

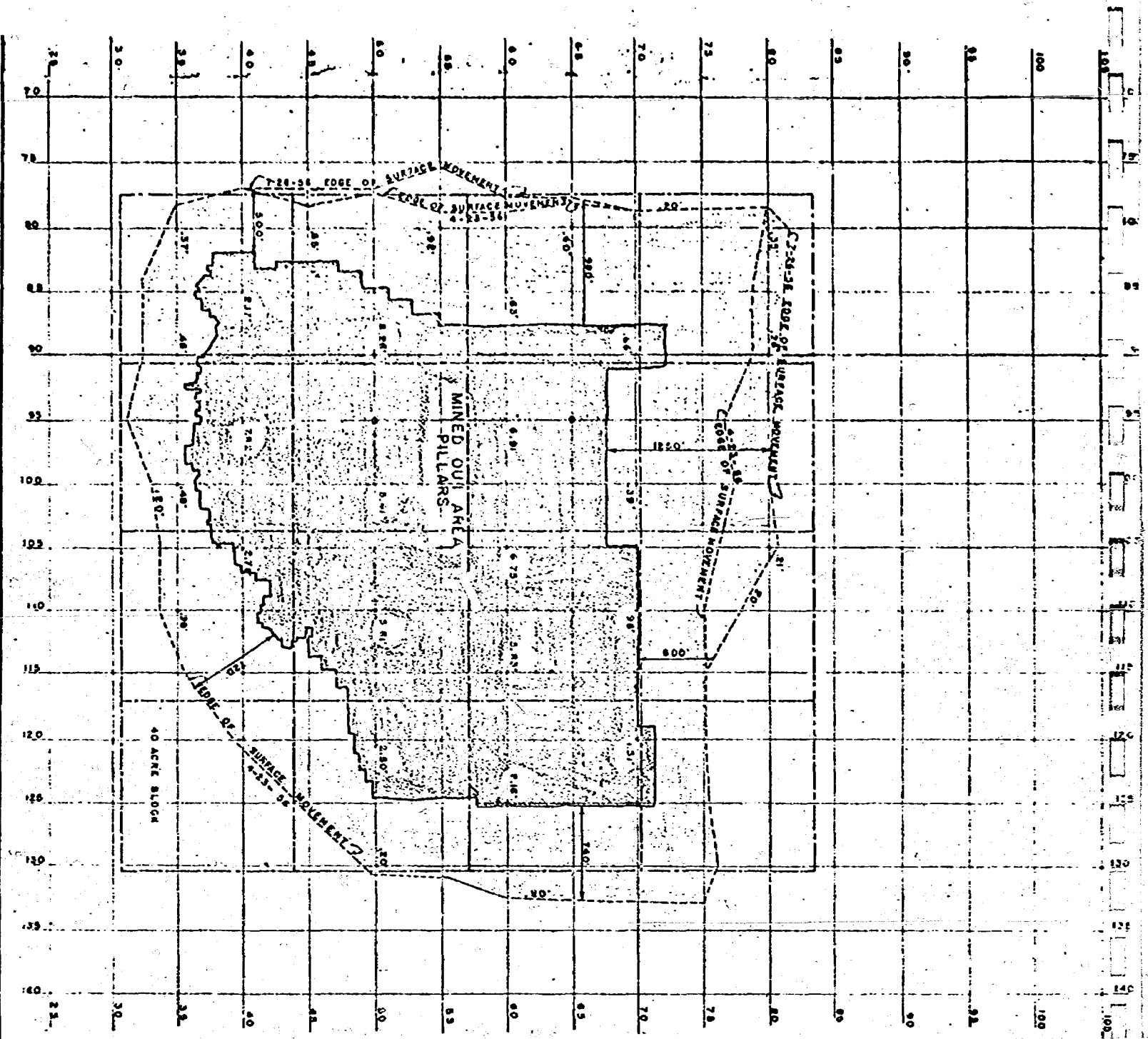
(2) It has been observed that the limiting angle is greater in areas where final mining operations are bordered by first mining operations. Strictly speaking, this is not a true limiting angle because extraction outside the area effects an increase of the angle. However, from the practical point of view, it is quite necessary to take this influence under consideration. We have observed in some cases a limiting angle as large as 51 to 30 degrees. It may be when the

ground completely stabilizes that this angle will become somewhat greater.

The limiting angle, of course, can only be measured well after final mining has been completed and the ground has more or less become stabilized. Up until that point there is a definite lag of subsidence behind final mining operations.

Recently a line of stations on one-hundred foot centers was placed over the center of an area which was to be final mined. In addition to giving much closer control on subsidence data, we can determine the amount of strain (elongation and compression) between these points. This method of computing will give a more accurate limiting angle and an angle of repose which is the complement of the limiting angle, and the angle of break. The angle of break is of considerable interest as it is the line through which the greatest force of shear is exerted. This angle is measured from the horizontal to a line which is drawn from the edge of advance of the retreating face underground up to a point of maximum tension strain, as plotted from the field data.

It is expected that with continued study, more detailed information on the characteristics of ground movement, as applied to salt-bedded deposits in the Carlsbad district, will become available.



ISSUED	By <i>W. Schell</i>	Date <i>12-21</i>
APPROVED	By	Date
REMARKS		



KEY
 MINED OUT AREA - PILLARS
 DOTTED LINE EDGE OF SURFACE MOVEMENT
 DASHED LINE SHOWING 40 ACRE BLOCKS

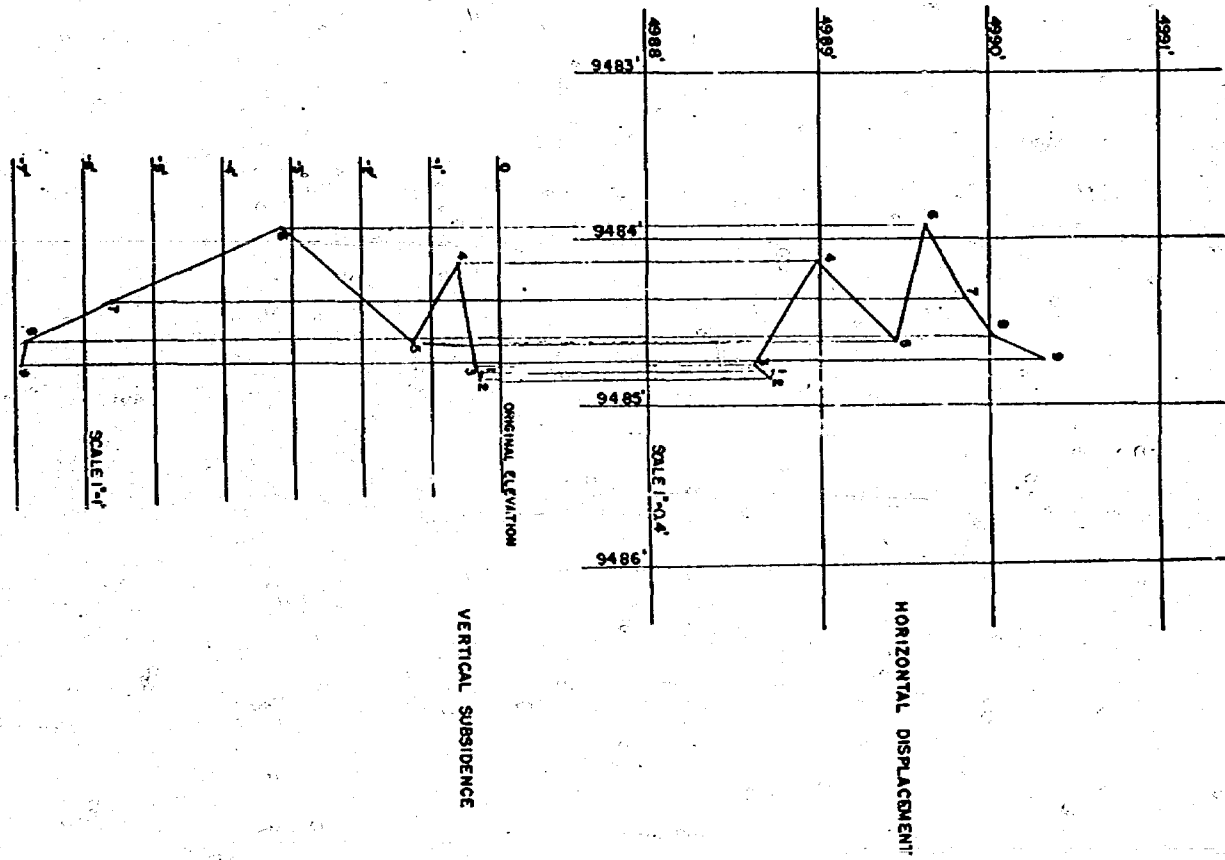
UNITED STATES POTASH COMPANY
 MINE
 CARLSBAD NEW MEXICO
 MAP SHOWING VERTICAL
 SUBSIDENCE

DATE	7-1-1933	SCALE	1" = 500'
DRAWN BY	J. M. W. S. CHRISTO		
CHECKED BY	G. A. WILSON		
APPROVED BY	O. E. LIBBY		
MINED AREA	27-1-1933		

Exhibit C

STATION 504'-902'

DATE
1. 9-10-55
2. 11-03-55
3. 02-21-55
4. 1-23-56
5. 2-24-56
6. 3-24-56
7. 4-23-56
8. 5-23-56
9. 6-28-56



UNITED STATES POTASH COMPANY
 CARLSBAD, NEW MEXICO
 MAP SHOWING HORIZONTAL DISPLACEMENT &
 VERTICAL SUBSIDENCE OF STATION 504'-902'

DATE: 6-2-54
 DRAWN BY: SAUL CHRISTO
 CHECKED BY: G. A. BACON
 APPROVED BY: G. E. LIBBY
 PREPARED BY: T. R. BAKER

50-69

Exhibit D



CORPORATION

POST OFFICE BOX 511 CARLSBAD NEW MEXICO 88220

Exhibit E

Duval Corporation is currently producing sulphur by the Frasch Process in Culberson County, Texas. The plant was originally designed to produce 2.5 million tons annually. However, sulphur supply conditions at the time of startup limited production to 1.5 million tons annually. Initial production plans called for producing sulphur from three contiguous areas, but such good results were achieved that only one area was steamed for about the first year. As a result of the subsidence due to sulphur production, previously drilled and equipped adjacent wells were damaged beyond use and/or casing recovery. This damage was discovered when attempts to inject superheated water into fully equipped wells failed and when three inch tubing would not pass through seven inch casing in the installation of the final production equipment. Failure to recover 7 inch uncemented casing and uncemented 3 inch tubing accrued in over 45 wells.

The sulphur bearing limestone host rock, up to 400 feet thick, occurs at a depth of approximately 300 feet and is of Permian age: The Castile and Rustler formations of the Ochoa Series.

J. W. Magraw
J. W. Magraw
Mine Superintendent

POTASH COMPANY OF AMERICA

CARLSBAD, NEW MEXICO

To Mr. R. H. Blackman
Resident Counsel

Date June 12, 1973

Subject Oil Seeps in Salt Section
P.C.A. Mine Area

From L. P. Corbin

File

Two areas in the P.C.A. Mine have oil seeps in the salt section.

The first area is in Sections 5, 8, and 9, T. 20 S., R. 30 E. as shown on Figure 1. The top of the salt in this area is approximately 490' and the bottom of the salt is about 1390'. The Main South Haulage Tunnel encountered an oil seep in the tunnel heading which is at a depth of about 827'. Oil flowed slowly out of a drill hole in the tunnel face. The flow was killed by tamping a wooden plug into the drill hole. As shown on Figure 1, the tunnel was rerouted at considerable expense only to encounter another seep of smaller volume. Both locations are still seeping oil at a very slow rate. A core test, PCA 107, shown in Section 5 on Figure 1, had seven zones of oil stained core over an interval of 304' in the salt section. These seeps are thought to be coming from an abandoned oil test "Continental Chase" which was drilled in the late 1920's in the NE-1/4 Sec. 8, T. 20 S., R. 30 E.

The second area of oil seeps is in the east end of our West Orebody (Figure 2). The top of the salt in this area is approximately 360' and the bottom of the salt is about 1041'. Here in Room 5, Breakthrough 13, as described by E. C. Jourdan, chief mine engineer "The seep was interesting in that it occurred in a fine vertical fracture within the ore horizon and extends for an unknown distance into the salt above and below the ore zone." This seep is approximately 600' below the surface and 1000' from the nearest abandoned oil well in the Getty Pool. In the National Potash Mine, about 900' south of our oil seep in Room 5, Breakthrough 13, another oil seep was encountered. This seep is about 700' from an abandoned oil well in the Getty Pool. PCA Core Test 74, in this same area, showed two zones of oil stains in the salt section at 549' and 565'4". Core Test 74 is located between two abandoned oil wells, one about 1000' due north, the other 1000' due south.

LPC:dt
attachments

LPC

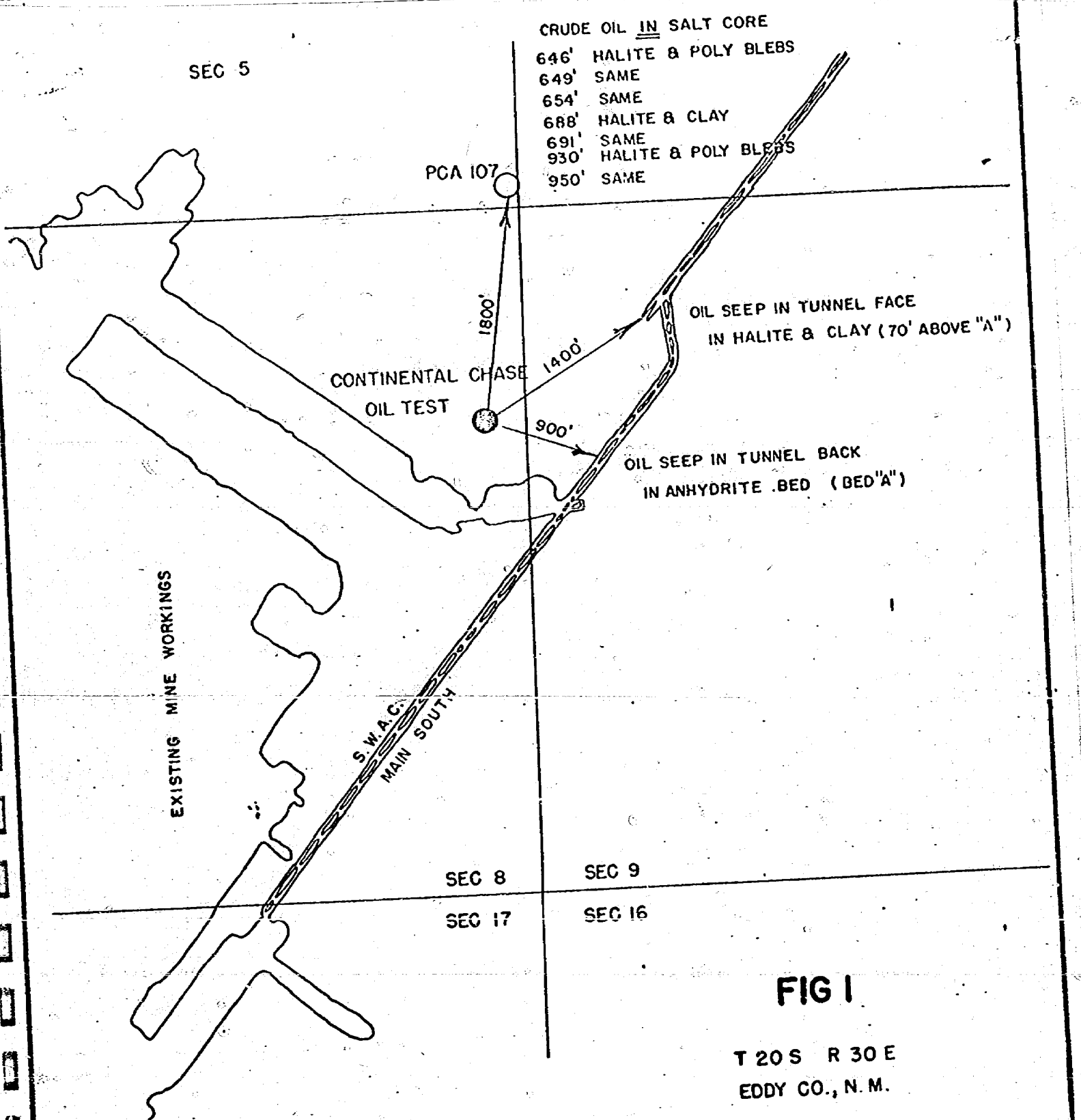
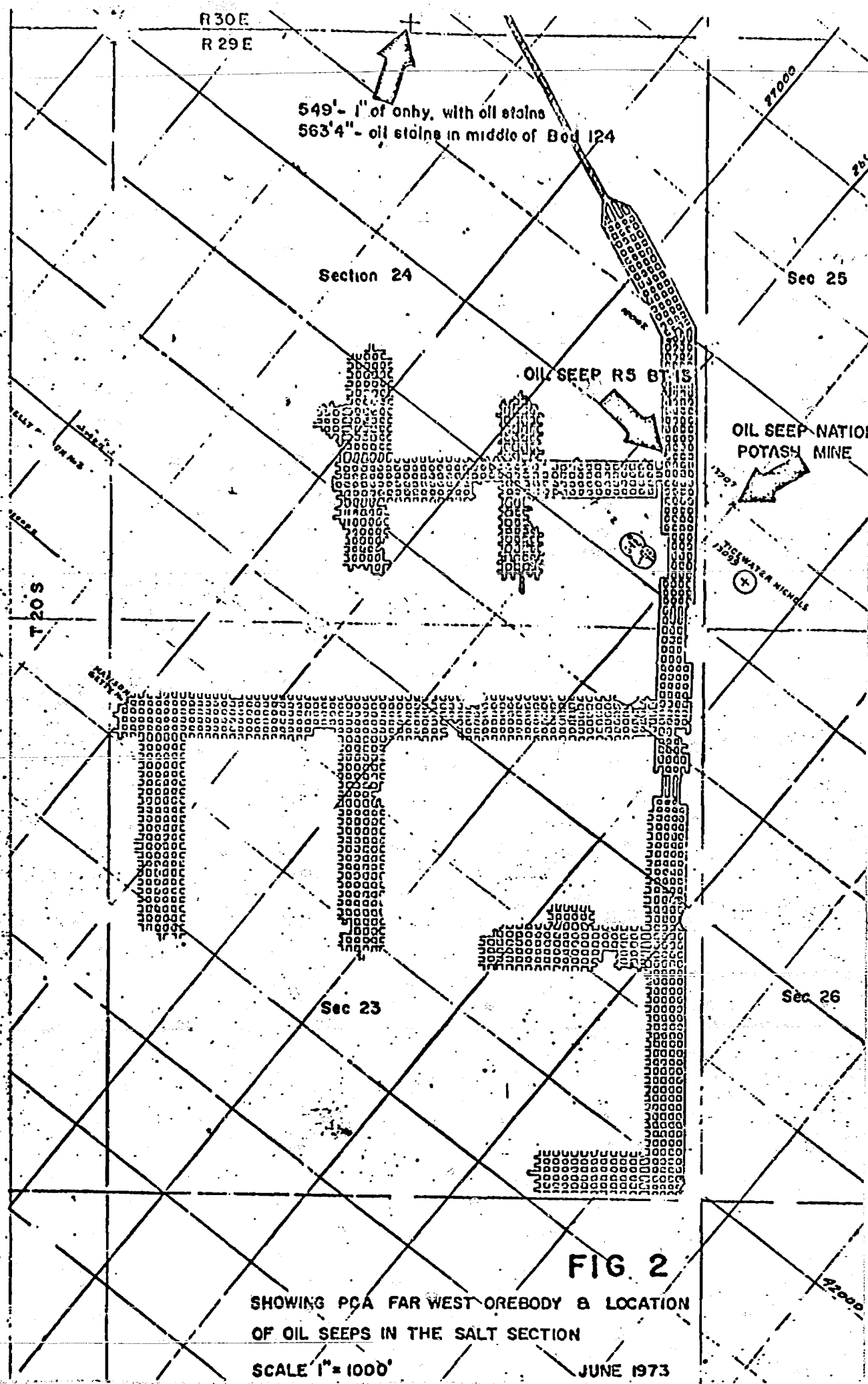


FIG 1

T 20 S R 30 E
EDDY CO., N. M.

APPROVED BY	SHOWING CONTINENTAL CHASE OIL TEST AND THE AREAS WHERE CRUDE OIL HAS BEEN ENCOUNTERED IN SALT.	POTASH COMPANY OF AMERICA CARLSBAD, NEW MEXICO	
		DRAWN BY LFC	DRAWING NO.
		CHECKED BY	
		DIRECTED BY JBC	
	SCALE- 1" = 1000'	DATE- MARCH 64	



R 30E
R 29E

549' - 1' of onhy, with oil stains
563' 4" - oil stains in middle of Bed 124

Section 24

Sec 25

OIL SEEP R 5 BT 13

OIL SEEP-NATION
POTASH MINE

T 20S

Sec 23

Sec 26

FIG 2

SHOWING PCA FAR WEST OREBODY & LOCATION
OF OIL SEEPS IN THE SALT SECTION

SCALE 1" = 1000'

JUNE 1973

POTASH COMPANY OF AMERICA

Photographs of Main South Entries Showing Oil Seep Near Abandoned Oil Well

January 18, 1962



Tension crack in anhydrite filled with salt showing oil seep in Main South.



Anhydrite bed - Main South showing oil seep.



Oil seep in rib of Main South Entry.



Face of Main South. Red is polyhalite and salt. Oil covers most of face.

NATIONAL POTASH COMPANY

P. O. BOX 731
CARLSBAD, NEW MEXICO

August 1, 1973

Mr. Roy H. Blackman
Resident Counsel
Potash Company of America
P. O. Box 31
Carlsbad, New Mexico 88220

Dear Mr. Blackman:

This pertains to an incident in the spring of 1965 in which we encountered evidence of oil seepage in operations at our Eddy Mine. The location where this occurred was approximately 1,000 feet from the west line and 100 feet from the north line of the NW-1/4, Sec. 25, T. 20 S., R. 29 E. Altogether there were some three or four oil stains present, and two separate entries in the panel were affected.


The material involved at the site was horizontally bedded and consisted of 5 feet of sylvinitic overlaid by 1 to 1-1/2 feet of clay. No particularly unusual physical conditions were present other than the fact that it was a salt dome area in which the seeps were encountered.

Mining operations in the area were discontinued immediately in order that the seep conditions could be investigated. This, of course, necessitated transfer of operations, including removal of all equipment by the production crews involved, to another area of the mine.

Since the nearest well was the Getty No. 1, which was approximately 700 feet from the location of the seeps, it was suspected as their source. The U. S. G. S. investigated and determined that this well had not been properly and adequately sealed. So the owner was required to reseal it in an approved manner. It is my understanding that this led further to a check of several other wells in the Getty pool in which the findings of such inadequacy were essentially the same and in which similar corrective action was also taken.

If, for any reason, additional information in regard to this matter is needed, I am sure it can readily be obtained from the U. S. G. S. office in Roswell, New Mexico, as personnel from there were involved in the incident.

Very truly yours,



Orland Foster
Industrial Relations Manager

OF:ca

JOHN T. BOYD COMPANY

H

MINING ENGINEERS AND GEOLOGISTS

John T. Boyd
Chairman and
Chief Executive Officer
Robert L. Frantz
President
Lawrence D. Gent
Executive Vice President
James W. Boyd
Assistant to the President
Marjorie C. Rist
Administrative Assistant

PITTSBURGH, PENNSYLVANIA
DENVER, COLORADO

Alfred G. Gilbert
Vice President
Lawrence M. Thomas
Vice President
Richard W. Brummett
Vice President

July 27, 1973

Potash Committee
New Mexico Mining Association
Post Office Box 31
Carlsbad, New Mexico 88220

Attention: R. H. Blackman, Esquire
Resident Counsel, Potash Company of America

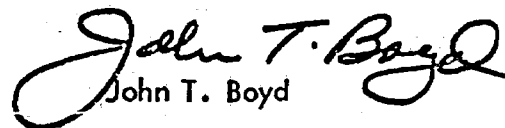
Dear Sirs:

Herewith are our findings on the effects oil or gas wells drilled in potash reserve areas would have on the actual mining operation.

The safety of the underground physical property and personnel operating the mine have been taken into consideration.

I have a working knowledge of the Carlsbad Potash Basin dating back to 1952. Included in this report is Exhibit 1 showing my professional background and specific consulting work in potash mining.

Very truly yours,


John T. Boyd

PLEASE REPLY TO:

430 Oliver Building
Pittsburgh, Pennsylvania 15222
Phone: (412) 281-1219

1028 Lincoln Tower
Denver, Colorado 80203
Phone: (303) 573-9624

GENERAL

The Potash Basin of Lee and Eddy Counties, New Mexico, covers approximately 270,000 acres of land; a high percentage has been mined over. There are seven active operations in the basin, namely,

Amax Corporation
Duval Corporation
International Minerals and Chemical Corporation
Kerr McGee Corporation
National Potash Company
Potash Company of America
Teledyne Potash Company

Refer to Exhibit 2 for general location of the operations.

The general geology of the Carlsbad Potash District is similar over the general area. The surface is covered with sand, caliche and gypsum for several feet then the Rustler Formation of the late Permian Age lies unconformably on the Salada (salt) Formation. The Rustler Formation consists of limestones, anhydrites, water-bearing dolomites, clays and shales.

The Salada Formation is approximately 1600 ft. thick with beds of potash ore (sylvite) within a 150 ft. to 250 ft. zone approximately in the center of the formation. In the western half of the Potash Basin, No. 4 (or 28) Bed is mined and is approximately 1000 ft. below the surface.

In the eastern portion of the Potash Basin the mineable potash ore is known as the 10th Ore Zone and ranges from 1600 to 2100 ft. below the surface, or 650 to 750 ft. into the Salada Formation. The Salada Formation consists principally of beds of halite with bands of anhydrite, polyhalite, thin layers of clay and beds of potash ore (sylvite).

With the underground mining of potash ore or halite (salt), stresses originally distributed throughout a large area are concentrated in the pillars. These stresses are relieved as the pillars undergo continuous permanent deformation without fracture; a process commonly called "plastic flow". As mining continues, pressure on the pillars increases and plastic flow continues indefinitely or until the pillar crushes. A salt grain in an aggregate surrounded on all sides by other salt grains cannot change its shape in an arbitrary manner as the single salt crystal tends to act like the aggregate as a whole with plastic flowage the result.

Potash ore is a combination of halite and sylvite with the same characteristics. The higher the percentage of sylvite, the weaker the potash ore becomes. A second factor which tends to weaken the potash ore is the amount of clay within the ore zone.

The bedded potash ore in the Carlsbad Basin with a 15 to 20 percent K_2O content and the roof salt have the following characteristics when a force is applied perpendicular to the planes of stratification:

	<u>Potash Ore</u> <u>15 to 20% K_2O</u>	<u>Salt</u>
Compressive Tests (PSI)	3,300	4,400
Yield Strength (PSI)	2,000	2,500

The mineable ore zones in the Carlsbad Potash Basin range from 1000 to 2100 ft. below the surface.

Following is a tabulated comparison of pillar loads for different percentages of recovery.

Mining Recovery %	Overburden Thickness		
	1,000 ft. PSI	1,600 ft. PSI	2,100 ft. PSI
30	1,430	2,285	3,000
40	1,667	2,670	3,500
50	2,000	3,200	4,200
60	2,500	4,000	5,250
70	3,333	5,330	7,000
80	5,000	8,000	10,500
85	6,600	10,670	14,000
92	12,500	20,000	26,250

Experience at the Amax operation shows that it requires 92% recovery for the remaining ore pillars to crush out and the salt back to bend down and meet the buckled floor. Exhibit 3 shows a generalized section of the manner in which the Salada Formation flows and bends while the shales, clays, limestone and dolomite strata above in the Rustler Formation shear. This is substantiated by the visible surface cracks above an underground pillared area.

The salt back starts to flow and bend when 60% mining recovery is reached with 1000 ft. of cover and 20% mining recovery at 2100 ft. of cover. The potash ore pillars start compressing with 50% mining recovery at 1000 ft. of cover and when first mining starts at 2100 ft. of cover.

Experience has shown that the first layer of salt roof does not always break as represented on Exhibit 3; the breaking depends on the location of the clay seams. In many cases the immediate salt roof will bend or break off in large slabs.

With pillar mining in potash, the surface will subside 65% of the mining height underground directly above the mined out areas and taper off to 0 at the edge of the 45 to 50 degree angle of draw (see Exhibit 3).

With a normal pillar recovery system in mining a 10 ft. seam, the salt back will move as much as 12 to 14 ft. The salt becomes plastic and flows as a mass. The forces that would build up against any oil or gas well casing in a subsidence area would be uncontrollable.

EFFECTS OF OIL AND GAS WELLS IN POTASH MINING AREAS

1. The mine operators in the Carlsbad Potash Basin have definite proof that the angle of draw or area affected by pillar mining ranges from 45 to 51 degrees from the edge of the caved area at the ore level (see Exhibit 3).
2. With pillars removed, the 400 to 600 ft. of salt back above the potash ore zone becomes plastic and flows. This is substantiated as the dolomites in the Rustler Formation above the salt are water-bearing and would enter the mine in large quantities if the salt would fracture.
3. The limestone, clays, dolomites and shales above the Salada (salt) Formation fracture and subside when pillars are removed. This has been proven by visual evidence and surveys by the potash mine operators.
4. Any oil or gas well drilled in the Carlsbad Potash Basin would require the mine operator to first mine only in an area around the well with the diameter of the area equal to twice the depth of the surface to the ore zone. The amount of first mining permitted would depend on the

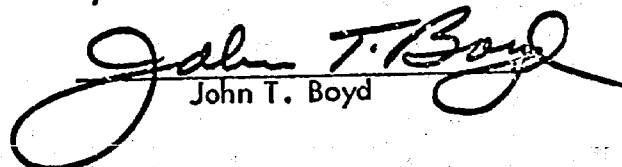
4. (continued)
depth of the ore zone from the surface and could range from 35 to 50 percent mining recovery. The ore lost due to first mining only could range from 460,000 to 3,400,000 tons per well.
5. In the Carlsbad Potash Basin two mine operators, namely, PCA and National, have witnessed oil seeps. Gas has been known to migrate through salt strata and could readily migrate along the mud seams in the Salada Formation.
6. Pillar mining within a minimum of a 45 degree angle of draw area of any oil or gas well (see Exhibit 3) could result in the shearing of the casing. Methane gas entering the mine could cause a violent explosion which would damage equipment and take the lives of the miners. The explosive range of methane gas is 5 to 15 percent mixture with air.
7. If methane gas is detected in any operating mine, the United States Bureau of Mines would classify the mine as "gaseous". This would require the mine to operate under different mining conditions. The main changes would be,
 - (a) Mining equipment would become obsolete and would be replaced with permissible electrics.
 - (b) Each operating section would operate on a separate ventilating split of air.

7. (continued)
- (c) Ammonia nitrate explosives would be replaced with permissible explosives.
 - (d) Total capital cost would depend on the size of the mine, but operating costs could increase 25 percent.
8. The oil and gas reserves would not be wasted as it is my opinion that 5 years after pillar mining is completed complete subsidence would occur and the areas could be penetrated with wells.
9. Comparing a pillar mining versus first mining only operation in the Carlsbad Potash Basin, the net profit per ton of product drops from \$3.20 before taxes to a net loss of \$0.12. Thus, a mining system limited to first mining only would result in an uneconomical operation. See Schedule 1 following this text for detail.

Respectfully submitted,

JOHN T. BOYD COMPANY

By:


John T. Boyd

JOHN T. BOYD COMPANY

SCHEDULE 1

CARLSBAD POTASH INDUSTRY

Example of Effect of Restricted Mining Recovery
on Production Costs

By
John T. Boyd Company
Mining Engineers
July 1973

Basic Assumptions:

Total Reserves, Ore in Place, net tons (000's)	135,000
Average Mining Depth	2,000 ft.
Mine Production per Year, net tons (000's)	3,600
K ₂ O Grade	15%
Product Grade, Percent K ₂ O	62%
Mill Recovery	82%
Total Recovery - Millfeed to Product, $\frac{0.15 \times 0.82}{0.62} \times 3,600,000$	714,000 tons
Sales Value per Ton Product	\$21.70

	<u>Case 1</u>	<u>Case 2</u>
Mining Plan	Pillar Mining	Partial Mining
Mining Recovery	80%	35%
Recoverable Ore to Mill, net tons (000's)	108,000	47,250
Total Recoverable Product, net tons (000's)	21,400	9,400
Annual Product, net tons (000's)	714	714
Life of Mine, years	30.6	13.2
Investment per Annual Ton Product	\$72.00	\$72.00
Depreciation per Ton Product		
Mining	\$ 2.50	\$ 2.75
Milling and Processing	2.35	3.55
Total	\$ 4.85	\$ 6.30
Depreciation per Year \$(000's)	\$3,463	\$4,498
Increase in Depreciation Charges	-	\$1,035
Depreciation per Unit K ₂ O Equivalent	\$.078	\$.102
Cash Cost per Unit K ₂ O Equivalent	.220	.250
Total Cost per Unit K ₂ O Equivalent	\$.298	\$.352
Total Cost per Ton Product, Before Taxes and Return on Investment	\$18.50	\$21.82
Estimated Sales Price	21.70	21.70
Profit Before Taxes per Ton of Product	\$ 3.20	\$ (0.12)
Estimated Mine and Mill Investment per Annual Ton of Product	\$72.00	\$72.00

PROFESSIONAL BACKGROUND AND EXPERIENCE

John Thomas Boyd
Mining Engineer

Born: Elyria, Ohio, January 14, 1913.

Education: The Ohio State University, B.E.M. - 1935

Memberships: American Institute of Mining, Metallurgical and Petroleum Engineers; American Mining Congress; Coal Mining Institute of America; Ohio Society of Professional Engineers; National Society of Professional Engineers; etc.

Registration: Registered Professional Engineer in Kentucky, Ohio, Pennsylvania and West Virginia.

Experience: (1) John T. Boyd Company, Consulting Mining Engineers, Oliver Building, Pittsburgh, Pennsylvania. Chairman and Chief Executive Officer. (1968 to date)

(2) John T. Boyd & Associates, Consulting Mining Engineers, Oliver Building, Pittsburgh, Pennsylvania. Owner. (1964 - 1968)

(3) J. W. Woerner & Associates, Consulting Mining Engineers, Oliver Building, Pittsburgh, Pennsylvania. Partner. (1944 - 1963)

(4) From engineer trainee to production engineer. (1935 - 1943)

Nature of Consulting Work: Geological work on coal (deep and strip), potash, limestone, clays, sand and gravel, copper and iron ore. Proved mining properties, both metallic and non-metallic. Designed modern plants and modern mining systems. Installed modern machinery in underground and opencast operations. Presented forecasts of costs, production and financial returns. Designed rock tunnels and supervised their installation. Made many specific project studies on drainage, hoisting, maintenance, etc. Made valuations and appraisals for banks, railroads, utilities, and various companies. Represented utility companies on coal combustion matters. Appeared as expert witness in legal controversies.

Foreign Mining Experience:

Australia	Ethiopia	Israel
Canada	France	Mexico
Chile	Greece	Philippines
Dominican Republic	Japan	United Kingdom

Consulting Work in Potash:

Southwest Potash Corporation
Carlsbad, New Mexico
Bredenburg Potash Reserve, Saskatchewan, Canada
Musley Sylvite Study, Danakil, Ethiopia

Superior Oil Limited
Canberra Potash Study, Saskatchewan, Canada

Consolidated Mining & Smelting Company of Canada Limited
Vanscoy Potash Study, Saskatchewan

Noranda Mines Limited
Noranda Potash Study, Saskatchewan

Scurry-Rainbow Oil Limited
Potash Mining Study, Saskatchewan

United States Steel Corporation
Hollo Potash Study, African Congo

National Potash Company
Potash Studies in Lee and Eddy Counties

Continental Minerals Inc.
IMC Reserve Study, Saskatchewan

Potash Company of America
Carlsbad, New Mexico

IMC
Carlsbad, New Mexico

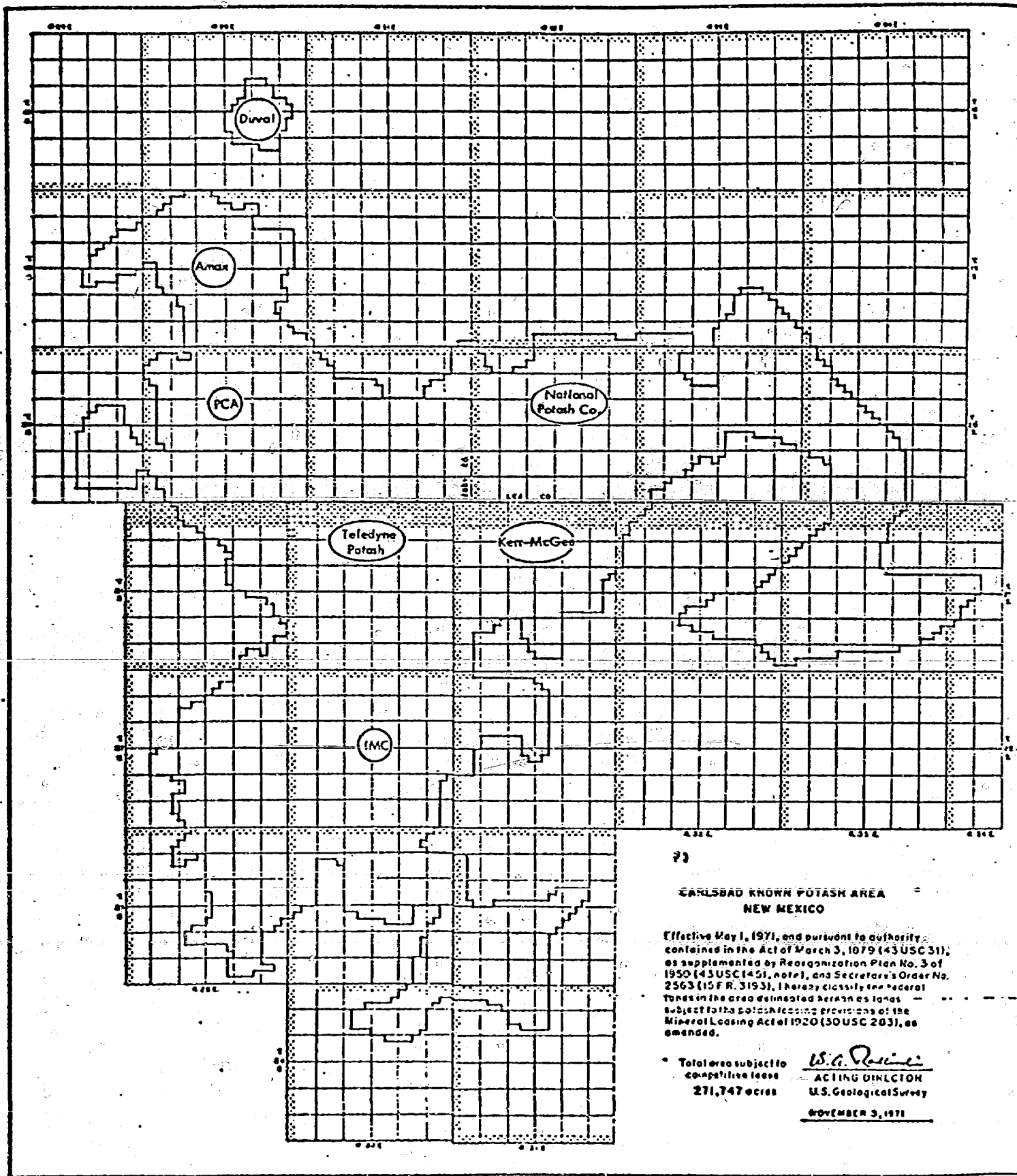


Exhibit 2

MEMORANDUM

AMAX Chemical Corporation
A SUBSIDIARY OF AMERICAN METAL CLIMAX, INC.
P.O. BOX 279, CARLSBAD, NEW MEXICO 88220 (505) 885-3157

July 6, 1973

To: Mr. R. D. Brown
From: C. C. Curry
Subject: Increased Cost of Second Mining After Passage of Time

During the period February 1968 through May 1970, we reentered several sections of our mine in which first mining had been completed for periods of from four to sixteen years.

Attached are excerpts from reports of the Mine Superintendent to the General Manager during that period in which pertinent comments have been underlined in red. In each instance where an item is so identified, the area identified was a reentered area as explained above.

From the attached report and our accounting records, the following conclusions are presented:

1. Productivity in reentered sections was approximately 22% lower than if the second mining had been performed contemporaneously with first mining.
2. The additional cost per ton of product produced from a reentered area is estimated at \$0.35.
3. Ore which could not be removed on delayed second mining which probably could have been produced contemporaneously with first mining was substantial. In 59-West that extraction was only 76.5% compared with our current extraction rate of 91%.


C. C. Curry

MEMORANDUM

AMAX Chemical Corporation
 A SUBSIDIARY OF AMERICAN METAL CLIMAX, INC.
 P. O. BOX 279, CARLSBAD, NEW MEXICO 88220 (505) 885-3157

June 26, 1973

To: Mr. R. D. Brown
 FROM: C. C. Curry
 SUBJECT: Oil and Gas Well Drilling Proposal

Recent proposals by the oil and gas industry to drill test wells in the Potash Area have caused us to examine our own past experience in terms of safety and economics in re-entering a mining area after years of dormancy. Proposed drilling programs would require that we leave protective pillars and entirely bypass large amounts of minable ore. Second mining operations would only be possible after cessation of oil and gas production.

Attached are portions of plant monthly operating reports covering the period February, 1968 through May, 1970 during which time we re-entered the east region of our mine. Included were areas which had been inactive from four to sixteen years. These reports detail the safety hazards and operational difficulties encountered in returning to a mining area after years of inactivity such as:

1. Increased danger to miners due to convergence and shifting ground.
2. Forced abandonment of minable ore in pillars for safety considerations. Second mining areas would be greatly reduced as compared with present mining operations. During 1972 our Company mined 673,983 tons of ore from second mining operations, 32% of total production, with an approximate sales value of \$4,000,000.
3. Unstable mining conditions which hampered operations resulted in a marked drop in efficiency. Productivity in the re-entered sections was approximately 22% lower than normal mining areas. Translated into current costs, an overall efficiency decrease of this magnitude would result in additional labor and fringe expense of approximately \$185,000 annually or \$0.35 per ton of product. This excessive labor cost would certainly be a determining factor in any decision to mine marginal ore or leave it in place, probably never to be utilized as a natural resource of our nation.

C. C. Curry
 C. C. Curry

CCC:bl

February, 1968

West Mains - The ore bed remains regular and good grade. Some localized rolling of the bed was encountered on the northern portion of the section.

2 South-West - The ore bed is slightly improved as to thickness and grade.

East Region

59 West - Second mining was completed with a total extraction of 76.5%. The lower extraction was due to necessity of leaving three rows of partially crushed pillars along the old 59 West second mined area.

10 South - Men and equipment were moved from 59 West and second mining operations started in fringe ore.

2 South-East - Second mining is progressing satisfactorily in thick, good grade ore.

6 East - Production from the continuous miner was 3,238 tons, with the remaining 516 tons from ore left in section from previous mining. The ore bed is thick, good grade, with some sharp rolling.

Continuous Miner

The machine operated 16 shifts and produced 3,238 tons with the following evaluation:

Effective machine utilization = 18.5%
Effective cutting rate = 128 tons/hr.

The remaining lost time of 81.5% is distributed as follows:

<u>Miner</u>	
Mechanical, electrical, etc.	18.5%
Service & change bits	8.6%
Moving, position, trimming	14.1%
Total	<u>41.2%</u>
<u>Other</u>	
Ventilation	2.2%
Back-up equipment	32.6%
Travel and lunch	24.0%
Total	<u>58.8%</u>

The higher mechanical down time was mainly due to considerable trouble with hydraulic jacks.

Safety

There were a total of 3 lost time accidents consisting of electrical burns, sprained shoulder and bruises to arm and leg.

JULY, 1968

Production from State and Federal Leases

	July		Year-to-Date	
	Tons	% K ₂ O	Tons	% K ₂ O
Federal	77,309	17.4	1,063,056	18.1
State	63,197	18.0	648,709	19.4

Efficiency Rate (Based on Tons Hoisted)

	Man-Shifts		Tons per Man-Shift		
	July	June	July	June	Year-to-Date
Production Crews - Hourly	1577.81	2058.19	89.05	95.31	89.56
Total Hourly	3662.09	4209.81	38.37	46.60	45.72
Salary	769.00	807.00	182.72	243.09	248.44
Total	4431.09	5061.81	31.71	39.10	38.62

Ineffective manpower for July was 5.56% as compared with 5.13% for June.

General Comments

The mine grade of 17.7% K₂O fell below the plan grade of 18.2% K₂O. This low grade can be attributed to the following:

1. Excessive heights in the two 1st mining sections caused unnecessary dilution of the potential ore grade.
2. Degradation of the ore bed in a localized area of 2 Southwest.
3. Extremely heavy ground conditions in the 2 Southeast and 45 West 2nd mining sections which, among other things, contributed additional dilution.

The degradation in 2 Southwest is showing a natural improvement and steps are being taken to improve grade control in the other areas.

Production efficiency dropped from 95.31 tons per man-shift in June to 89.05 in July. This in part explains the 12.2¢ per ton increase of mining costs over the projected standard costs. There are existing conditions in 45 West which are not conducive to high production efficiency. Back conditions are causing excessive rehandling of material and the original low mining height plus the fact that this section has been dormant for 6-1/2 years causes numerous additional problems. As a result, this section produced 8.9% of the total ore and required 13.4% of the total production manpower for an efficiency rate of 58.9 tons per man-shift compared with the overall average of 89.05.

JULY, 1968

West Region

3 North - 2nd mining operations continue under satisfactorily controlled conditions in very low grade ore.

2 Southwest - 1st mining intersected a localized area of salt inclusions which affected the overall grade. This condition appears to have improved and the section is back to normal.

5 South - Some of the gauges installed at the 14 and 17 Breaks to record convergence are no longer visible. It is assumed that, at these points, convergence has exceeded the 2-1/2 ft. range of the gauge.

West Mains - Ore grade and thickness continue to be satisfactory.

East Region

45 West - This section is operating under adverse conditions in respect to low height, back conditions and maneuverability with the section which have resulted in low grade and low tonnage. Steps have been taken to improve this condition by selectively mining the more accessible pillars, thereby sacrificing overall percent extraction in favor of higher grade and efficiency.

2 Southeast - Conditions are similar to 45 West and warrant the same approach.

Cost Analysis

1. Unfavorable variance of \$7,846 in salaries and fringes reflects the difference in manpower for the planned production level and the actual production level achieved, also increased cost of fringe benefits granted after the plan was formulated.

2. Unfavorable variance of \$7,645 in hourly labor is due to the low production efficiency and increased maintenance employees.

3. Favorable variance of \$3,627 in production bonus reflects the low tonnage levels.

4. Unfavorable variance of \$11,651 in hourly fringe benefits results from unfavorable labor variance.

5. Favorable variance of \$7,949 in ordinary and lubricating supplies was offset by overexpenditures of \$7,413 in repair supplies. This overexpenditure is due chiefly to overhauling major mine equipment as a preventive measure.

George Carrico

George Carrico
Mine Superintendent

AUGUST, 1968

Production from State and Federal Leases

	<u>August</u>		<u>Year-to-Date</u>	
	<u>Tons</u>	<u>% K₂O</u>	<u>Tons</u>	<u>% K₂O</u>
Federal	128,255	18.6	1,191,311	18.2
State	124,183	18.6	772,892	19.3

Efficiency Rate (Based on Tons Hoisted)

	<u>Man-Shifts</u>		<u>Tons per Man-Shift</u>		
	<u>August</u>	<u>July</u>	<u>August</u>	<u>July</u>	<u>Year-to-Date</u>
Production Crews - Hourly	2940.00	1577.81	85.86	89.05	89.06
Total Hourly	5746.59	3662.09	43.93	38.37	45.48
Salary	1046.00	769.00	241.34	182.72	247.51
Total	6792.59	4431.09	37.16	31.71	38.42

Ineffective manpower for August was 4.73% compared with 5.56% during July.

General Comments

The average grade of 18.6% K₂O for August exceeded the plan grade at 18.4% K₂O. The year-to-date average is 0.5% K₂O below the planned average. It is doubtful that the four remaining months will average the required 19.5% K₂O needed to meet the year end planned average of 18.9%.

Production efficiency dropped from the previous month to 85.86 tons per man-shift. Overall efficiency also dropped when compared to the last full month (May) of operation. This loss in production is primarily attributed to the following:

1. Completion of 5 South and 3 North second mining during the month and the resulting preparation of two new working sections.
2. Adverse ground conditions and restricting mining conditions in 2 Southeast and 45 West.
3. Extraordinary loss on mainline haulage due to derailments.
4. Equipment breakdowns.

The mining cost of \$1.485 per ton was \$0.165 over the standard of \$1.320.

West Region

3 North - Second mining operations were completed for the present. Extraction was 92.6% under satisfactory ground conditions. Crews were moved to 80 West.

AUGUST, 1968

80 West - A new first mining belt section was set up off the 3 North Main immediately south of 89 West. Experimental innovations with respect to work cycle, equipment combinations, shooting patterns, and height-grade control are being set up and evaluated on this section.

5 South - Second mining operations were completed during the month and the crews are being moved to 14 South, a new first mining section on the east side immediately north of 23 West. Extraction in 5 South, from 19 to 4 break, averaged 92.0% with good second mining conditions. It has been recommended that the second mining pattern adopted in this section after the last major fall should be continued on future second mining operations.

West Mains - Ore grade and thickness continue satisfactory in this first mining section.

2 Southwest - The salt horse reported last month was a localized condition as predicted and all entries returned to good ore. However, this condition was only temporary and during the latter part of the month, the entries again intercepted what appears to be a major salt horse. As of the end of the month, 5 of the 11 entries were in salt. All entries have been narrowed down and it may become necessary to probe through with a minimum number of entries to sustain haulage and ventilation.

East Region

45 West - This section continues to operate in very low constricting height and heavy ground conditions. The southern end of the adjacent 1 South Main is being prepared for operation and will hopefully alleviate these conditions to some extent.

2 Southeast - Ground conditions and maneuverability continue to plague this section. The low production from this section is somewhat counteracted by the high grade.

Cost Analysis

Ore Grade Variance - Unfavorable variance of \$8,055 due to the year-to-date averaging 0.48% below the plan.

Production Volume - Unfavorable variance of \$2,861 due to low level of ore mined.

Mining Cost - Unfavorable variance of \$41,480 due to the following:

1. Unfavorable variance of \$8,383 in salaries and fringes continue to reflect increased personnel over planned estimate as well as increased cost of fringe benefits granted after standard costs were formulated.

2. Unfavorable variance of \$30,002 in hourly labor due to low average daily tonnage with the manpower projected to achieve a higher level. Also, increased maintenance employees over planned estimate.

3. Favorable variance of \$5,676 in production bonus reflects the 85.86 versus 97.0 tons per man-shift projection.

SOUTHWEST POTASH CORPORATION
REPORT OF OPERATIONS
Month of October, 1968

To: Mr. C. A. Arend, Jr., Vice President

By: J. S. Mitchell, General Manager

General Summary

The mine hoisted 258,708 tons of ore as compared with the forecast of 283,650 tons. A fatal accident in the mine on October 24th resulted in a twenty-four hour production delay, thus accounting for 9,000 tons of the 25,000-ton shortage.

Muriate production amounted to 65,558 tons as compared with the anticipated 77,000 tons. The shortage of 11,500 tons is attributable to general failure to produce mine tonnage and the average ore grade of 18.1% K_2O as compared with 19.5% in the forecast. The grade problem resulted primarily from encountering a "salt horse" of unknown size in the 2 South-West section. Efforts to probe this area also adversely affected production. Productivity index for mine production crews averaged 89.7 tons per man-shift which is the same as the previous month. Productivity in the three West sections of the mine averaged 98.5 tons per man-shift versus 80.8 TPMS for the three sections in the East.

Mill recovery averaged 85.8 percent which reflects an improvement of 0.5% over September's performance. Carnallite content of the feed ore averaged 3.90% for the second straight month. This material is coming from the West Mains in the mine. Tailings losses averaged 4.4% of the mill feed K_2O values. The CCD complex losses averaged 6.1% reflecting the high carnallite content of the feed ore.

Muriate production was 65,558 tons with a product mix of 29% Standard, 42% Coarse, 26% Granular, and 3% Unscreen. Total product inventory decreased approximately 11,400 tons to a month-end value of 87,000 tons.

Muriate shipments totalled 77,003 tons. Export shipments amounted to 10,900 tons or 14.2% of the total. Sales estimates indicated 56,000 tons for domestic and 13,000 tons of export for a total of 69,000 tons.

Cost Analysis

Total expenditures for the month were \$828,237 for an average of \$12.63 per ton of product. Overall variance exceeded plan by approximately \$7,500. This is the result of an unfavorable variance of \$31,630 for production costs that were nearly offset by favorable variances of \$2,564 for storage and shipping and \$21,584 for plant administrative costs.

Mining costs averaged \$1,485 per ton of ore, thus exceeding standard costs by \$.167 per ton. Salary, hourly labor and fringes exceeded standard costs by \$40,943. Mine repair supply costs exceeded standard costs by \$12,612. This supply account for the year to date exceeds standard by \$109,443. Of this amount, some \$46,224 or 1.9¢ per ton represents non-recurring items such as Nordberg holst gear, rotary car dump repair, Goodman loader conversions, etc.

NOVEMBER, 1968

West Region

38 East - First mining in this new section continues in high grade ore without intersecting any additional salt horses. Productivity levels were low due to equipment failures.

West Main - Productivity from this section remains high despite the unnatural rolling of the ore body. Grade dropped drastically during the month as a result of excessive heights and displacement of sylvite with carnallite in the ore body. The higher carnallite concentrations are becoming a problem to recovery in the mill.

80 West - The ore in the section continued to thin and finally dropped below the economic cut-off. Development was stopped and second mining operation initiated on November 27, 1968. This section was stopped even with the adjacent section, 89 West.

East Region

1 South - Second mining in this section is experiencing adverse roof conditions. The nature of the roof coupled with the time lapse between first and second mining have created conditions that restrict production and lower efficiency.

2 South-East - Mining conditions and productivity showed some improvement during the month in this second mining section. The grade of the ore continues to be exceptionally good.

14 South - First mining continued to be hampered by dipping of the ore body. Grade improved during the month.

Cost Analysis

Mining Costs - Unfavorable Variance of \$40,652

1. Unfavorable variance of \$2,517 in salaries and fringes continues to reflect increased personnel and increased fringe costs not anticipated when the plan was formulated.
2. Unfavorable variance of \$30,316 in hourly labor, bonus and fringes is due to lower efficiency of the production crews and total manpower levels keyed to 9,400 tons per day and a resulting 8,675 tons per day.
3. Unfavorable variance of \$13,520 in repair supplies continues to reflect condition of the mining equipment.
4. Favorable variance of \$5,386 in blasting supplies results from an increased efficiency of materials used and a reduction in cost of materials.

George Carrico
George Carrico
Mine Superintendent

East Region

1 South - Second mining in this section continues at a very slow rate. Deteriorating roof conditions have not improved.

2 South-East - Ground conditions have improved now that one side of the section is adjacent to solid ground, second mining production is still a problem in this area. The present mining and haulage systems being used are not compatible with the methods that were used to develop this area years ago.

14 South - The ore grade has continued good with less rolling of the ore bed.

Cost Analysis

Mining Costs - Unfavorable Variance of \$16,023

1. Unfavorable variance of \$2,653 in salaries and fringes continues to reflect increased personnel and fringe benefit costs not anticipated when the plan was formulated.
2. Unfavorable variance of \$25,522 in hourly labor, bonus and fringes is partially due to low production efficiency and manpower levels set up for 9,450 TPD with a resulting production of 9,139 TPD. Two Saturday midnight shifts on overtime rates also contributed to this variance.
3. Favorable variance of \$8,507 in ordinary and lubricating supplies reflects a \$2,224 credit refund on lubricating taxes.
4. Unfavorable variance of \$7,248 in repair supplies continues to reflect condition of the mining equipment.
5. Favorable variance of \$10,553 in blasting supplies is due to reduction in price of ammonium nitrate and more efficient use of materials.


George Carrico
Mine Superintendent

February, 1969

3 North - Four rows of blocks were skipped in the 3 North Mains due to low grade. Four rows were second mined and completed February 25th. Production in this area will resume after the new mainline belt set-up is completed.

East Region

1 South - Second mining operations are experiencing very heavy ground conditions. The ore grade continues good and uniform. Production efficiency failed to improve.

2 South-East - Second mining in very good grade was increased during the month, however, the production efficiency dropped.

14 South - This first mining section is now heading east, attempting to complete development of the very irregular shaped area. Limited working places dictates the use of half crews. Ore of very good grade was diluted due to difficulties in following the rolling ore body.

Cost Analysis

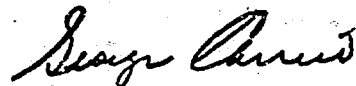
The unfavorable mining cost of \$1,501 was due to the overall low efficiency causing a variance of \$36,323 in salaries and labor. Favorable variances mainly in supplies, fringes and bonuses defrayed \$16,019 of these costs.

The low production efficiency combined with increased back-up labor continue to escalate mining costs.

Blasting supplies showed a small increase during the month due to the following:

1. The last two sections, 14 South and 2 South-East, were converted to the new blasting pattern.
2. This required the removal of approximately 15,000 8-ft. leg wires already charged to the mine, and their replacement with higher priced 12-ft. leg wires.

A credit for these caps will be reflected in the March cost. An overall 3.5% price increase of caps from the supplier went into effect March 1st. Due to the changes taking place with respect to blasting, it will be April before a stabilized cost is available and the savings effects of this change can be evaluated.


George Carrico
Mine Superintendent

March, 1969

West Region

38 East - Production from this first mining section was increased during the month due to absence of 3 North production. The ore bed continues regular and uniform but at a lower grade.

West Mains - Carnallite content dropped some from 12.4% to 11.4% with a slight overall grade improvement. Hole #37 was intersected during the month. This hole penetrated an irregular ore body with respect to grade and carnallite content at a location which produced erroneous results. A regular mine sample, 13 feet away was cut in ore of completely different ore averaging 19% K₂O and 25% carnallite. In addition to ore grade, the dip of the ore body continues to be a problem for rail haulage.

3 North - Conversion of the haulage system was completed and ready for operation March 31st. The first production panel will drive east to old 2 North and be designated 70 East.

East Region

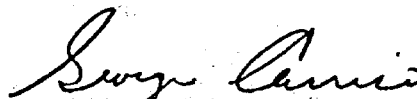
2 Southeast - Second mining operations were completed in this section on March 30th. Production crews from this section will move into 6 East first mining operations.

1 South - Heavy ground conditions and restricted haulage facilities which contribute to low production in only average grade ore present some question as to the economics of continuing this section.

14 South - First mining operations were completed and second mining initiated on the 24th of March.

Cost Analysis

The unfavorable mining cost of \$1,508 was composed of a variance in salaries, labor and fringes of \$56,759. Low production from the total mine force sized for a much higher production level produced this discrepancy. All other expense accounts showed a favorable variance of \$21,947 which defrayed the labor cost and resulted in a total unfavorable variance of \$34,812.


George Carrico
Mine Superintendent

April, 1969

Production from State and Federal Leases

	April		Year-to-Date	
	Tons	% K ₂ O	Tons	% K ₂ O
Federal	131,360	21.0	498,195	20.5
State	136,396	15.8	577,895	16.5
			577,495	

Efficiency Rate (Based on Tons Hoisted)

	Manshifts		Tons per Manshift		
	April	March	April	March	Year-to-Date
Production Crews - Hourly	3239.63	3072.94	82.65	84.92	83.80
Total Hourly	6369.53	6434.80	42.04	40.55	42.37
Salary	1000.00	1065.00	267.76	245.03	265.21
Total	7369.53	7499.80	36.33	34.79	36.53

Ineffective manpower for April was 5.3% compared with 4.2% during March.

General Comments

The mine operated a total of 90 production shifts during the month which included four (4) Saturday night shifts. Production efficiency dropped to 82.65 tons. However there was an improvement shown in overall efficiency for the month. Mainline haulage problems, particularly in the 6 East section, drastically affected production.

The average mine grade dropped from 18.6% to 18.3% K₂O. This drop in grade reflects the degradation in the West Mains and resumption of mining in the 3 North area.

West Region

38 East & 9 South - This first mining section had advanced eastward to the 1 South workings. The production crews are now in the process of turning south from this point and working the 9 South section. The ore continues to be regular and good grade.

70 East - This belt section was turned east off the 3 North Mains at 70 break. The ore is relatively flat lying and reasonably uniform. Mine samples indicate that the overbreak is excessive in this belt section. Height control to 64" could yield a +19% grade.

West Mains - This section continues to produce high tonnage at very low grade. The carnallite content continues to be relatively stable, averaging 11.8% for the month, however the sylvite content appears to be weakening.

East Region

1 South - Second mining conditions have improved some during the month. This section is now operating with first mined ground to the west and a sizable barrier pillar to the east. The average ore grade has also improved considerably.

April, 1969

14 South - Second mining operations are being affected by severe rolling of the ore. This is in an area that created difficulty during first mining. These severe rolls cause numerous problems including excessive overbreak which reflects this month's drop in grade.

6 East - First mining operations were resumed in 6 East. Except for minimum production from the continuous miner, this section has been dormant since April, 1965. The ore is thick and good grade but extremely irregular. Adverse haulage grades from the loading points are seriously affecting production.

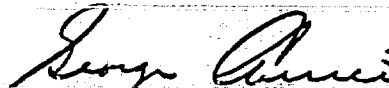
Cost Analysis

Mining Costs - Unfavorable Variance of \$30,368.

Major unfavorable variances were as follows:

1. Unfavorable variance of \$4,092 in salaries was due to \$1,303 payments to mine foremen working their vacation, \$1,350 to foremen working extra Saturday shifts, \$396 to temporary foreman upgraded, and \$1,878 severance pay to a foreman who was terminated.
2. Unfavorable variance of \$1,160 in salary fringes was due to increase in salaries over standard estimates.
3. Unfavorable variance of \$31,107 in hourly labor, bonus and fringes is due to low production efficiency. The production efficiency averaged 82.65 tons per manshift and total hourly averaged 42.04 tons per manshift versus 97.00 and 47.26 respectively estimated in the plan for standard costs.
4. Unfavorable variance of \$4,700 in supplies reflects overexpenditures in these categories as compared to the production level.

The only significant favorable variance this month was \$11,680 in blasting supplies and this reflects a variance in deliveries to the mine.


George Carrico
Mine Superintendent

May, 1969

West Mains - The challenge of pitching ore versus rail haulage continues. A slight improvement in grade and reduction in carnallite from 11.8 to 10.5% occurred during the month. This put the year-to-date average at 417,042 tons - 15.1% K₂O - 11.7% carnallite.

East Region

1 South - At month's end this section was working in No. 13, the last row to be mined from this section. Equipment and crews will move to 6 South off the West Mains.

14 South - Extremely heavy ground is seriously affecting extraction, production, and grade. The angular attack of weight from the completed 2 South-East section is exerting extraordinary force on the remaining pillar in this section.

6 East - During the month it was necessary to change the rail haulage layout from the conventional mainline and stub-track to an independent track to each loading point in order to maintain grades that could be negotiated by the haulage motors. These severe grades are also drastically affecting production and ore quality.

Cost Analysis

Mining Cost - Unfavorable Variance of \$20,301.

Major variances were as follows:

1. Unfavorable variance of \$25,112 in hourly labor, bonus and fringes continues to reflect lower than planned average tonnage and decreased efficiency of the total work force when compared to the standard estimates.

2. Unfavorable variance of \$4,491 in ordinary and lubricating supplies was due mainly to advanced purchases of lumber in the amount of \$4,186 for use in ventilation.

3. A favorable variance of \$10,364 in blasting supplies continues to reflect implementation of new blasting techniques.

The overall improvement from an unfavorable variance of \$30,368 last month to the current variance of \$20,301 can be fully attributed to the increased production efficiency during the month.


George Carrico

October, 1969

9 South - The anticipated return of good ore reported at the end of last month was short-lived. Conditions reverted and worsened during October. The ore bed is very erratic with sudden facies changes from ore to salt with no apparent relief in sight.

East Region - Second mining operations are progressing satisfactorily with the exception of a severe haulage problem. Revision of the haulage has been considered and dismissed on a basis of the work entailed for little or no improvement and the short life of the section remaining.

Cost Analysis

The unfavorable mining cost of \$1.487 per ton of ore was \$0.100 over the standard cost. Gross unfavorable variances of \$42,454, comprised principally of labor, fringes and supplies, was partially offset by favorable variances of \$15,193 in salaries, blasting materials and bonuses.

The net unfavorable variance of \$27,261 represents the difference in planned production efficiency of 97 TPMS and the actual production efficiency of 89 TPMS.

George Carrico
George Carrico
Mine Superintendent

November, 1969

6 South - First mining operations continue satisfactorily in good ore. The ore grade, although showing some gradual decline, is agreeable with estimates derived from the adjacent 5 South section.

9 South - During the month, the ore in this section has displayed more stability than it has during the two previous months. As a result, the grade improved to 16.1% K₂O. Development is approximately 400 feet from the southern lease boundary of State Section 16.

East Region - Second mining operations are being conducted under heavy ground conditions. Converging weight from three directions dictates extreme caution and in some cases sacrificing a small percent of extraction in the interest of safety.

Cost Analysis

Mining Cost - Favorable Variance of \$3,153

This is the first monthly mining cost in 34 consecutive months that has come within the estimated standard costs. Reasons for this favorable mining cost are as follows:

1. Unfavorable variance of \$20,319 in hourly labor was substantially decreased from the previous months and reflects the increased production efficiency.
2. Favorable variance of \$2,273 in production bonus was due to an efficiency rate lower than the 1969 projected standards.
3. Favorable variance of \$15,809 in hourly fringe benefits was due to not expensing the hourly pension plan for the month of November and crediting this expense from overaccruals in earlier months. The net effect on mine costs amounted to \$13,991.
4. Unfavorable variance of \$4,465 in ordinary and lubricating supplies was due primarily to expensing \$7,200 of belt hardware for the West Mains.
5. Favorable variance of \$11,375 in blasting supplies reflects modifications to the blasting operations.
6. Unfavorable variance of \$1,765 in power purchased coincides with a production level lower than 1969 estimates.

George Carrico
George Carrico
Mine Superintendent

December, 1969

3. 30.7% more places cut per grinding with Carboloy bits.
4. 33.4% more footage cut per grinding with Carboloy bits.
5. 36.2% less broken bits per 1,000' cut with Carboloy bits.
6. 18.8% reduction in bit cost per foot cut with Carboloy bits.

The cutting operation, which is a bottleneck in the production cycle, is affected by more than the type of bits being used. Results of this test are limited to data taken from one production crew and limited to the cutability on one section and therefore does not present conclusive evidence to support a sudden or radical change in cutter bits. The test does however suggest that improvements are possible and continuation of this project will be continued if and when time allows.

A capital expenditure progress chart is attached depicting the anticipated arrival and installation of major mining equipment included in the 1970 Capital Program. This chart will be updated and included in ensuing reports.

West Region

West Mains - Ore grade dropped during the month to 19.0% K_2O . This was caused by a rapid degradation which occurred during the last week. The ore bed which is satisfactory grade and relatively clean, averaging 6.2% carnallite, has suddenly thinned out. Current advance is approximately 1,000' from the projected ore limits.

71 West - Average ore grade improved as second mining retreats. Ground conditions remain satisfactory.

70 East - Second mining operations are progressing satisfactorily. Convergence of approximately 20" has been recorded 4 rows behind the working row.

6 South - First mining continues in good grade ore. Production efficiency dropped during the month by a factor of 4.2 TPMS.

9 South - During the month the ore has again become very spotty and inconsistent. The average grade dropped to 14.4% K_2O . Back conditions resembling the adjacent 1 South area are presenting problems. Production efficiency dropped 7.5 TPMS during the month.

East Region

Row 7 was completed on the 23rd, crew and equipment were moved to an area immediately north to recover a small block of pillars originally mined in 1953. Production was resumed December 29th. Production from this area will be limited to one loading point set ups.

Cost Analysis

An unfavorable mining cost of \$1.489 per ton of ore before adjustment was \$0.094 over the standard cost. A gross unfavorable variance of \$46,390, comprised principally of labor,

May, 1970

Production from State and Federal Leases

	May		Year-to-Date	
	Tons	% K ₂ O	Tons	% K ₂ O
Federal	236,340	18.86	1,021,498	19.77
State	85,645	18.43	408,918	16.88

General Comments

The mine operated a total of 89 shifts during May. Production averaged 10,387 tons per day or 3,618 tons per shift, an increase of 101 tons per shift over April.

The efficiency of the mine production crews averaged 100.82 tons per manshift with the total mine efficiency including salaried personnel averaging 45.19 tons per manshift.

The average mine grade dropped from 19.66% K₂O in April to 18.75% K₂O in May. This was as expected and was caused primarily by the completion of 6 East section and starting 62 South at a lower grade. There was also a general decline in grade in all sections, the greatest change being in 17 West which dropped 1.4% K₂O.

The East hoist rope on the #1 shaft was replaced on May 21, with the West rope scheduled for replacement the second week in June. This is a planned replacement when each rope has hoisted 4 million tons of ore.

Surface hole No. 85 was completed on May 22. Core analysis showed 9.9% K₂O at a 5.6' mining height. Hole #86 is now being drilled and core analysis should be completed by June 8th.

Installation of the new 6,000-ft. belt conveyor in the West Mains is for all practical purposes completed. The second panel belt in the West area is being installed in 272 break for the 272 North section. This section will be worked with equipment and crews from the 62 South section following the four-day shutdown in July.

Mining Regions

6 East - Second mining was completed on May 10, 1970, and equipment and crews were moved to the new 62 South section.

17 West - First mining continued in poor to fair grade ore. The ore bed is of good thickness but varies in grade from poor to only fair. The average ore grade dropped from 16.0% K₂O in April to 14.7% in May.

6 South - First mining continued in good ore. The average grade dropped from 18.0% in April to 17.9% K₂O in May. However, some weakening of the ore grade was apparent on the Nos. 1 and 2 entries adjacent to 5 South section at month's end. Continued deterioration of the ore bed is expected as we are 150 feet beyond the 5 South extremity. Better control of mining heights is still needed in this section.

TABLE 1

EDDY COUNTY

Income
(thousands of dollars)

	<u>1966</u>	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>
Total Earnings	\$102,789	\$102,303	\$98,770	\$105,474	\$112,384
*Farm	10,805	9,866	11,044	11,925	12,352
*Government	14,216	13,749	16,059	17,242	19,213
*Manufacturing	4,399	4,304	4,496	5,122	5,384
*Mining	34,952	34,994	27,049	28,378	31,237
*Contract Construction	4,132	4,135	5,106	5,495	5,547
Trade, Wholesale & Retail	13,429	13,488	13,382	13,624	13,690
Finance, Insurance & Real Estate	3,185	3,399	3,434	3,248	3,242
Services	12,529	13,186	14,085	16,258	17,417
Other	589	399	397	443	442

Employment

Total Employment	NA**	16,342	15,140	15,279	15,144
Number of Proprietors		1,798	1,802	1,821	1,807
Farm		520	509	502	495
Nonfarm		1,278	1,293	1,319	1,312
Wage & Salary Employment		14,544	13,338	13,458	13,337
*Farm		727	664	666	589
*Government		2,256	2,218	2,143	2,086
*Manufacturing		615	603	656	644
*Mining		3,934	3,032	3,189	3,237
*Construction		562	484	412	417
Transportation, Communication, & Public Utilities		756	752	749	695
Trade		2,623	2,497	2,396	2,349
Finance, Insurance & Real Estate		462	436	416	397
Services		2,540	2,589	2,763	2,853
Other		69	63	68	70

*Basic or export sectors

**Not Available

Source: Unpublished data, Bureau of Economic Analysis, U. S. Department of Commerce, March 8, 1973.

TABLE 2
INCOME AND EMPLOYMENT MULTIPLIERS

	<u>1966</u>	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>Income and Employment Multipliers</u>
<u>Total Earnings</u> <u>Basic Earnings</u>	1.500	1.526	1.549	1.547	1.524	1.529 ^a
<u>Total Employment</u> <u>Basic Employment</u>		1.905	2.016	2.019	2.028	1.992 ^b
Potash Payroll, 1970	$\$21,000,000^c \times 1.529 = \$32,109,000$ or 28.6% of 1970 Total Earnings					
Potash Employment, 1970	$2630^d \times 1.992 = 5239$ or 34.6% of 1970 Total Employment					

^a 5-year average

^b 4-year average

^c Carlsbad Chamber of Commerce statistical data

^d Annual average of covered employment in nonmetallic mining, Employment Security Commission of New Mexico.

TABLE 3

ECONOMIC IMPACT OF OIL WELL DRILLING IN POTASH AREA

Deep Well:

6 months drilling time, 5,965.5 man days required to drill & complete¹

Shallow Well:

30 days drilling time, 1,009 man days required to drill & complete¹

Mine 1400-foot Circle (area around well in which mining would be restricted):

380 workers, 1 year to complete²/approximately 95,000 man days³

Net "Base" Loss (assuming a deep well):

$95,000 - 5,965.5 = 89,034.5$ man days

Gross Loss (assuming a deep well):

$89,034.5 \times 1.992^4 = 177,356.7$ man days or approximately 709 man years³ of employment

¹Roy C. Williamson, correspondence April 19, 1973

²Kerr McGee

³Assumes 250 man days per year per worker

⁴Employment multiplier from Table 2

TABLE 4

ECONOMIC IMPACT OF OIL WELL DRILLING IN POTASH AREA

Net "Base" Loss (assuming a deep well):

$$95,000 - 5,965.5 = 89,034.5 \text{ man days or } 356 \text{ man years}^1$$

Using 1972 Average Wage Figures:

$$\frac{\$21,500,000}{2579} = 8337, \text{ the net dollar loss is } \$2,967,972$$

The Gross Dollar Loss (assuming a deep well):

$$\$2,967,972 \times 1.529^2 = \$4,538,029$$

¹Assumes 250 man days per year per worker

²Income multiplier from Table 2

EXHIBIT K

REPORT TO POTASH COMMITTEE

CONCERNING

PROSPECTING FOR OIL & GAS

IN THE POTASH AREA

JULY 1973

EXHIBIT K

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ISSUE:

Should prospecting for oil and gas be conducted in or through potash-bearing land without satisfactorily establishing that such drilling would not interfere with the mining and recovery of potash deposits or cause undue waste of potash or constitute a hazard.

SUMMARY:

The Potash Area, as designated by the Secretary of the Interior, is an area of land in the southeastern part of the State of New Mexico covering 420,212 acres. Within this approximate same area, the United States Geological Survey has described an area covering 271,747 acres that is known as the Known Potash Area. The Potash Area is a multiple-use land. A study of the area shows that within the Secretary's area as it is now designated, there are over 800 oil and/or gas wells, and approximately 30,000 acres of open mine workings. See attached map.

Potash, as well as oil and gas activity, in this area is governed by the Secretary's Order dated May 11, 1965. Parts of this area are also governed by New Mexico Oil Conservation Commission Order R-111-A. It is the feeling of International Minerals & Chemical Corporation that the present regulations have proven to be adequate.

Carlsbad area potash reserves are the only significant potash reserves in the United States that have been economically mined. In the southern portion of the Potash Area, the only langbeinite potash reserves known in the Western Hemisphere exist. The United States government in 1911 appropriated funds to explore for possible potash sources in the United States. The New Mexico deposits were located in 1925. Mining of this ore began in the early 1930's. These valuable

deposits have been protected by the laws and regulations of the United States government. The capital investment and future planning of any mining operation is contingent upon ore reserves. After an investment in a plant and mine and the capital expenditures in locating and delineating an ore body, a mining company must have adequate protection of those reserves in order to properly protect their investment.

There is no way oil and gas wells can be drilled through valuable potash deposits without resulting in a possible hazard or causing undue waste of these deposits. It seems unreasonable to approve a wildcat location for oil and gas exploration through a delineated, proven potash deposit. A wildcat location cannot be considered development or production when it is not even known if oil and/or gas is present at that location. There are many millions of acres of land where oil and gas exploration can be conducted while potash is being mined. Some of those acres are within the Secretary's Area where valuable deposits of potash are not known to exist. On the other hand there are no other places to mine potash in these United States.

Proper conservation procedures call for the mining of potash and then the recovery of oil and gas.

RECOMMENDATIONS:

1. Present regulations should remain in effect.
2. Allow wildcat locations in the Secretary's Area when the well will not penetrate a valuable potash deposit.
3. Disallow any wildcat location that would penetrate a delineated, proven potash ore reserve.
4. Solve any disputes between oil and gas operators and potash producers by following the procedures set forth in the New Mexico Oil Conservation Commission Order R-111-A.

APPLICABLE REGULATIONS & HISTORY OF REGULATIONS:

The current applicable regulations are the Order signed by the Secretary of the Interior, Stewart L. Udall, dated May 11, 1965, and the New Mexico Oil Conservation Commission Order R-111-A. The Secretary's Order of 1965 superseded an Order of 1951 which superseded an Order of 1939. In 1939, 42,245 acres were reserved from oil and gas leasing to protect the then-known potash deposits. In 1951 the area was increased to 298,345 acres with new rules which did not reserve any areas but put stipulations on the leases so that there would be no waste and no hazards would result from oil and gas activity. In 1965 the Secretary's Area was again enlarged; this time to 420,212 acres and the rules were modified somewhat, but the concept of no waste, no hazard, remained.

In 1951 the New Mexico Oil Conservation Commission issued Order R-111, which dealt with the rules concerning the area referred to by the Order as the Potash-Oil Area. This Order was revised as R-111-A in 1955. Extensions of the Area described in R-111-A have been made in Orders R-111-B through R-111-H. The main difference between the Federal Order and the State Order is the State established a procedure which requires the oil and gas operators to notify all potash lease holders within one mile of the proposed location of the intent to drill. If a potash lease holder within one mile of the proposed location has an objection to the location, an arbitration meeting is held to discuss the location. If agreement is not reached in the arbitration meeting, a full hearing is conducted before the Commission.

The Secretary of the Interior Order places the responsibility for the decision as to whether an oil or gas well will be approved upon the Regional Oil & Gas Supervisor of the Geological Survey. The Order calls for the Regional Oil & Gas Supervisor to take into consideration recommendations of the Regional Mining Supervisor of the Geological Survey and the applicable

conservation rules and regulations of the Oil Conservation Commission of the State of New Mexico. The Order states "no wells will be drilled for oil or gas except on the approval of the Regional Oil & Gas Supervisor of the Geological Survey, it being understood that drilling will be permitted only in the event that it is satisfactorily established that such drilling will not interfere with the mining and recovery of potash deposits or the best interests of the United States would best be subserved thereby." It further states "no wells will be drilled for oil or gas at a location which in the opinion of the Regional Oil & Gas Supervisor of the Geological Survey would result in undue waste of potash deposits or constitute a hazard to or unduly interfere with mining operations being conducted for the extraction of potash deposits." The Order places the responsibility for mining activities upon the Regional Mining Supervisor of the Geological Survey. The requirements are that no mining or exploratory operations will be conducted that in the opinion of the Regional Mining Supervisor of the Geological Survey would constitute a hazard to oil or gas production or that would unreasonably interfere with the orderly development and production under any oil or gas lease issued for the same land.

RULES REGARDING LEASING OF FEDERAL LANDS:

Potash leases may be obtained by one of two methods. If the land is in the Known Potash Area as described by the USGS, the land is available for competitive leases. Land outside the USGS Known Potash Area may be taken as a prospecting permit. These permits are issued for two years and if at least one test hole is drilled on the permit land, the prospecting permit may be extended for a period of two years. A permittee who discovers potash on a prospecting permit is entitled to a preference right lease. Leases are issued for an indeterminate period subject to readjustment at the end of the first 20 years.

There are two types of oil and gas leases. The first is known as a competitive lease. This is a lease covering land that is included within the known geologic structure and these leases can be obtained by competitive bidding in units of not more than 640 acres. Non-competitive leases are for areas that are not within a known geologic structure and are issued to the first qualified offerer, and may not exceed 2,560 acres. A maximum of 246,080 acres may be held by one company. A non-competitive oil and gas lease compares to a prospecting permit for potash. One of the main differences between an oil and gas lease and a potash lease is that potash must be proven or known to exist before a potash lease will be issued, whereas non-competitive oil and gas leases are issued whether oil and/or gas is known to exist or not. Another important difference is that potash lease holders are restricted to a maximum of 25,600 acres, while oil and gas leasees may hold a maximum of 246,080 acres.

HISTORY OF POTASH IN NEW MEXICO:

The German potash industry was the major source of potash for American agriculture and industry until the outbreak of World War I. Loss of this essential commodity during the war and escalating potash prices by the German cartel emphasized the absolute necessity of discovering low-cost American reserves of this ore. After several years of exploration by both the USGS and by private industry, potash was identified in drill cutting from a well being drilled by Snowden & McSweeney Company near Carlsbad, New Mexico. Following the initial discovery in 1925, subsequent core drilling operation over a great many years has established the only significant potash reserve in the United States.

Seven companies are now in operation in the Carlsbad potash basin:

	<u>Initial Production</u>
Teledyne Potash Company (formerly United States Potash)	1932
Potash Company of America	1935
International Minerals & Chemical Corporation	1940
Duval Corporation	1952
Amax Chemical Corporation (formerly Southwest Potash)	1952
National Potash Company	1957
Kermac Potash Company	1965

Two types of potash ore are mined in the Carlsbad basin. The primary potash ore contains the potassium chloride mineral called sylvite. This mineral is mined by all producers in the basin and is also being mined from the vast Canadian ore deposits. In addition to sylvite, a double salt of potassium magnesium sulphate, called langbeinite, is being mined by two companies,

Duval and IMC, in the southern portion of the Secretary's area, to supply the rapidly increasing market demands for animal feed ingredients and for chloride-free fertilizers containing the essential ions of both magnesium and sulphur. The langbeinite deposits, covering a small section of the Secretary's Area, are the only known commercial reserves in the Western Hemisphere, and possibly the only commercial reserves in the world.

The Secretary of the Interior issued an Order in 1939 which reserved the known potash deposits from oil and gas leases. The successful exploration for potash in the late 1940's made it quite clear that the area reserved by the Secretary's Order of 1939 was not large enough to protect the potash deposits. As a consequence and after some controversy between the two industries, the Secretary issued an Order in 1951 which increased the area of the 1939 Order seven-fold. However, a new approach was taken that would allow oil and gas leasing in the area with stipulations that drilling would not be permitted if it would result in undue waste or result in a hazard to any of the potash deposits. This same year, the New Mexico Oil Conservation Commission issued its Order R-111, which was designed to allow for both potash and oil and gas production from the area described in that Order, yet giving the Commission the power to determine which wells would be drilled as to best conserve both minerals. It seems quite clear, in both the Federal Order and the State Order, that deposits of oil and gas, as well as deposits of potash, should be protected and not interfered with by exploration for the other. Both Orders refer to the orderly development and production of oil and gas and not the exploration for oil and gas. It seems clear that potash deposits as well as mines should be protected from exploratory wells for gas and oil. The potash deposits which the US government was attempting to protect from undue waste remain to be the only potash deposits in the United States to be successfully and economically mined.

In 1955 the Oil Conservation Commission of the State of New Mexico issued Order R-111-A as an Order revising Order R-111. Since that time various Orders, R-111-B through R-111-H, have amended the area described in R-111-A. The objectives of those rules and regulations were to prevent waste, assure maximum conservation of the oil, gas, and potash resources and permit the economic recovery of said minerals within the defined area.

Cooperation between the potash and petroleum industries has been extremely good until recent months. Since 1955, 122 oil and/or gas wells have been drilled within the R-111-A area without protest from the potash operators. Similarly, the petroleum industry has accepted suspension of some 64 Federal oil and gas leases totaling 19,380 acres where well locations would have constituted a hazard to mining operations or potash deposits.

Only in six cases have the potash lease holders and the oil and gas lease holders been unable to reach an agreement, thereby resulting in hearings before the New Mexico Oil Conservation Commission. On five of these occasions the disputed location was on Federal lands. There has been an unwritten agreement between Federal and State officials that the procedures set forth in Order R-111-A would be followed since it called for a hearing where both sides could present their testimony. Although conducted by the chairman of the OCC, the USGS officials have always played a large part in making the decisions by offering advice and, in earlier cases, testimony.

Although profits have been reduced and increased efficiencies have been necessary to remain in operation, the New Mexico potash industry is a viable part of the economy and will remain so for many years if offered adequate protection for its reserves.

REVIEW OF CASES HEARD BY THE OIL CONSERVATION COMMISSION:

In the New Mexico Oil & Gas Association report presented to the Secretary, many assumptions were made to support the contention that oil and gas wells would pose no interference or hazard to the potash industry. Expert testimony by both potash industry engineers with many years of actual experience and by eminent consulting engineers and USGS officials, such as Don Libbey and Bob Fulton from the USGS, Daniel M. Bass, Jr., Petroleum Department Head at the Colorado School of Mines, Mr. J. W. Woerner, recipient of the AIME Man of the Year Award, Lewis C. Raymond with Ford, Bacon & Davis, and John Boyd, an independent consultant, tend to discount many of these assumptions. In the six cases heard before the OCC, these witnesses have established the following facts that must be given careful consideration:

1. An oil and/or gas well presents a hazard, in that no guarantee can be given that gas or oil will not escape and leak into the potash deposits. Even an abandoned or non-commercial gas well could have enough pressure to result in a leak. There can be no question of the danger that results from methane gas in a mining atmosphere. Any student of mine disasters is well aware of the many catastrophes caused by methane explosions. Although most of these disasters have occurred in coal mines, a methane explosion in the Texas Gulf & Sulphur Cane Creek potash mine resulted in several deaths and the subsequent gassy-mine classification. High production costs materially increased by gassy-mine classification eventually resulted in termination of underground operations. No gas or oil operator will agree to guaranteeing that gas will not escape from one of their wells, thereby resulting in extreme hazards to anyone mining through those deposits. Potassium deposits in Carlsbad are methane free and the potash producers and their employees are emphatic in maintaining that condition. In addition to the unwarranted hazards, the high capital requirement for conversion to gassy mine conditions and high operating costs would result in the closure of some of the potash mines.

WASTE OF POTASH
RESULTING FROM
DRILLING THROUGH KNOWN
POTASH DEPOSITS

NEW MEXICO POTASH INDUSTRY
August, 1973

2. When such a well exists and mining is carried on around it, the mine operator must leave protective pillars around the well. This consists of a solid pillar around the well of a minimum radius of 100 feet. In some cases, operators have indicated a larger radius would be required. Secondary mining cannot be completed for a distance from the well equal to the depth of the potash deposit. This results in a waste of potash ore. The resultant waste will vary with the depth of the deposit and the strength of the ore; that is to say, whether the ore is primarily a sylvinite or langbeinite ore. In the recent IMC-Phillips Petroleum case, testimony showed that the potash which would have to be left because of a gas well would have the value of approximately \$9,000,000.
3. State and Federal lands must be treated in a like manner as they adjoin each other and the efficient recovery of any ore deposit or oil and gas reservoir will, at times, require development of both State and Federal lands.
4. The salt section containing the potash reserves contains permeable members that can be charged with gas leaking from ruptured or perforated casings.

The information leading to the establishment of the above facts has been attested to by many prominent mining people throughout the history of the OCC hearings. In 1956, in the OCC hearing concerning Case #1130, testimony was given relating to the pillar-pulling experience at the US Potash mine and of the extensive records that had been kept of the measurements, both underground and on the surface, to delineate subsidence. Information from US Potash, who at that time had more pillar-pulling experience than any of the other potash operators, proved the subsidence angle to be 45°. In addition, the USGS testified as to the government requirements of 100-foot solid pillar with no pillar pulling or secondary mining within a radius of 750 feet. At the requested location, the potash depth was 750 feet.



POTASH COMPANY OF AMERICA

A DIVISION OF IDEAL BASIC INDUSTRIES, INC.

MINE AND REFINERY: P. O. BOX 31 • CARLSBAD, NEW MEXICO 88220 • AREA CODE 505 • 887-2844

August 7, 1973

R. H. BLACKMAN
RESIDENT COUNSEL

Hon. Stephen A. Wakefield
Assistant Secretary, Energy and Minerals
United States Department of the Interior
Washington, D. C. 20240

Your Reference: ECS

Dear Mr. Secretary:

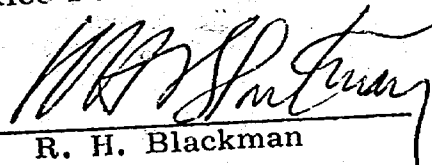
We are grateful for the opportunity to present to you the position paper of the New Mexico potash industry relating to whether oil and gas drilling should be permitted through known potash ore bodies in the Secretary's potash area.

The paper is divided into three sections: (1) the Outline which briefly states each principal proposition treated, (2) the Report which enlarges upon each proposition with our reasoning and proof and (3) supporting Exhibits. Should you wish any further information will you please so advise us.

For your convenience we enclose two additional copies.

Respectfully submitted

On Behalf of the Potash Committee
of the New Mexico Mining Association
and
the New Mexico Potash Industry

By 
R. H. Blackman

RHB/jm



MEMBER: AMERICAN POTASH INSTITUTE



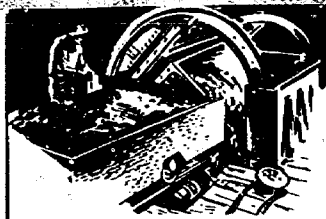
NEW MEXICO

Potash

S. 20112

BEFORE THE
CONSERVATION COMMISSION
Santa Fe, New Mexico

Case No. 5796 Exhibit No. 3
Submitted by Potash
Herrera, 6/12/75



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?

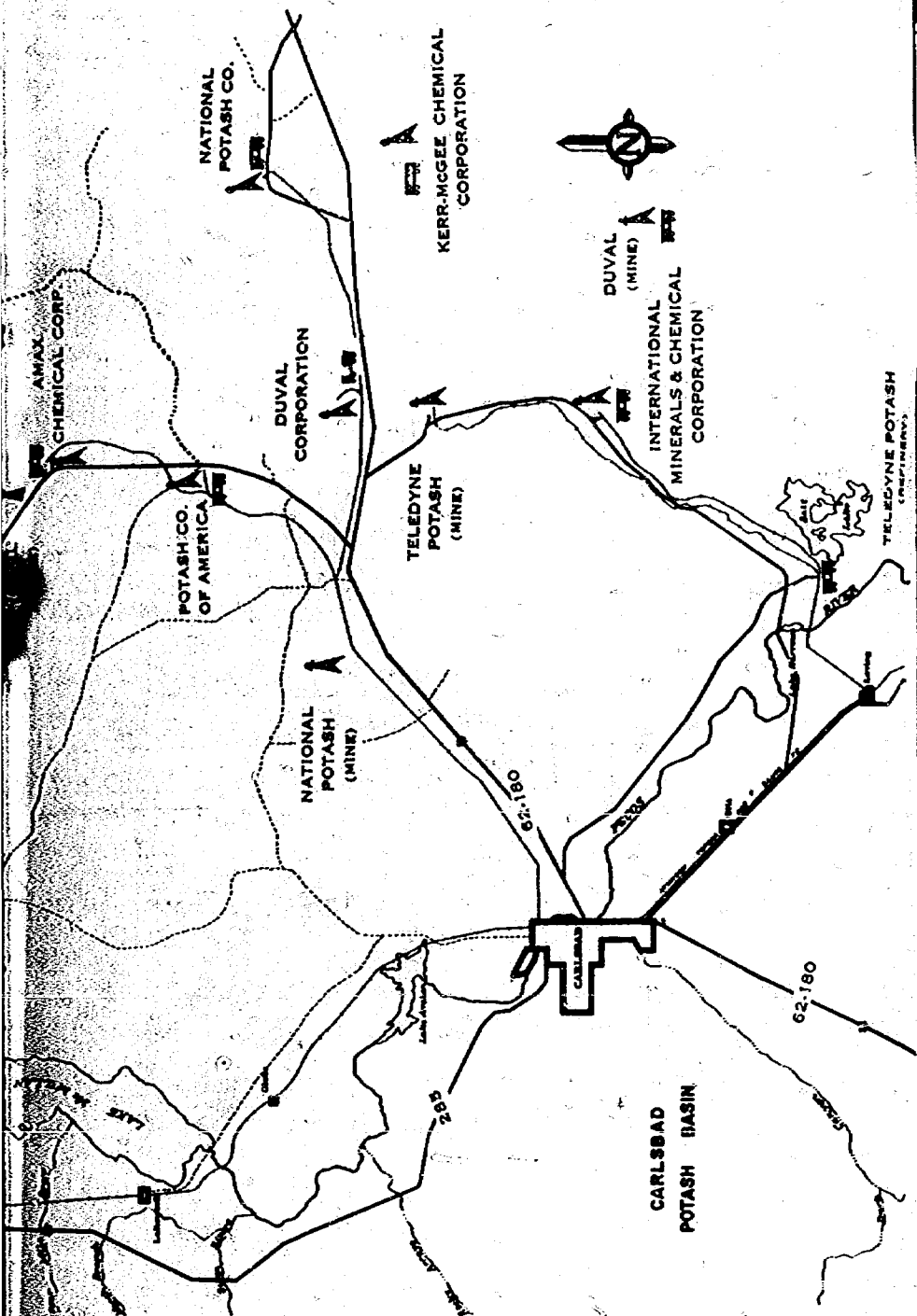
"Potash" is a word used to denote a chemical combination of the element potassium with one or more elements. Without potassium compounds you could no more live than you could without air or water.

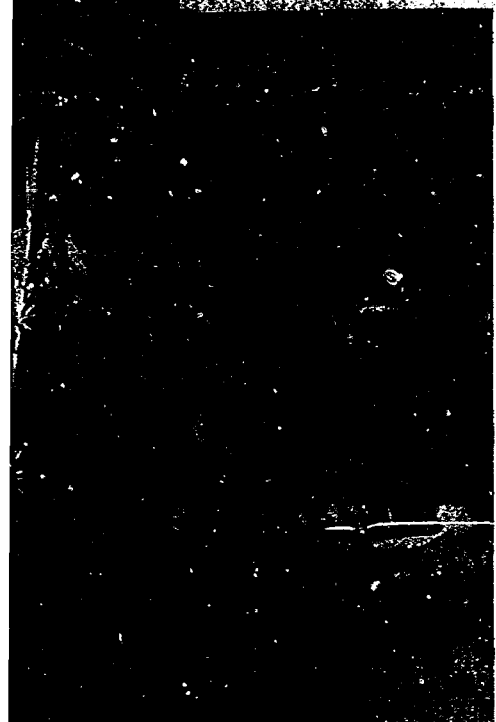
The term "potash" when used in connection with fertilizers refers to potassium oxide, written chemically as K_2O . The element potassium (K) is what the plant uses. In nature and commerce it is found combined with other elements. When combined with chlorine, for example, it forms potassium chloride, 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

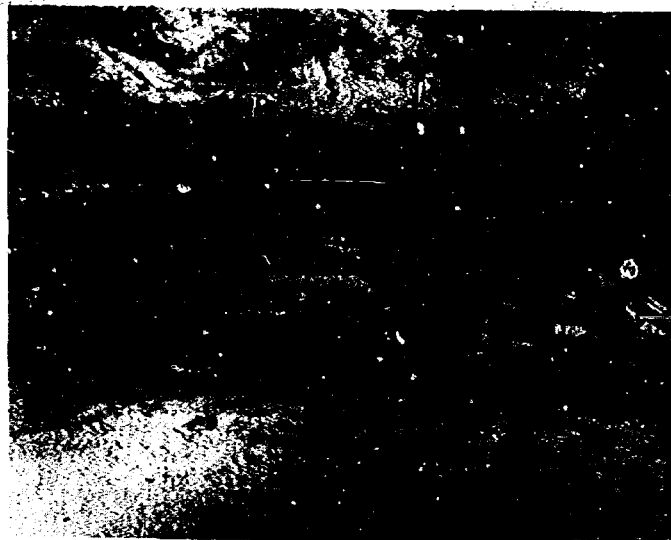
Almost 95 per cent of the potash mined and refined in southeastern New Mexico goes to fertilizer factories and farms, for potash is one of the most important plant foods. Soils in which many of our basic crops grow must be fed potash. Otherwise they produce





Time over hoisting shaft
Mexico potash mine.

ops. Potash thus is a vital element in producing food and
r the American people.
ny areas, particularly in the eastern and southern states,
duce only very small yields unless the mineral content of the
increased through the use of potash and other plant foods.
ddle western states have experienced potash deficiency in
years as a result of intensive farming, and now that section
ome the largest potash-consuming area in the United States.
uses more New Mexico potash than any other state in the
followed in order by Indiana, Ohio, Georgia, Florida, and
a.
riate of potash is by far the most popular material, com-
over 94 per cent of the total K_2O delivered for agricultural
es, and sulphate of potash and sulphate of potash magnesia
en.
e importance of returning minerals to the soil can readily
when it is realized that the growth of one acre of the usual
ops 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 development 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.

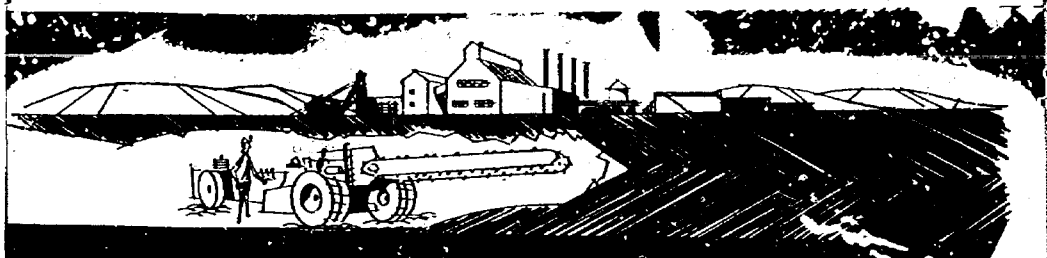
Potassium carbonate is used in glass compositions and also as an intermediate in making other salts.

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 output 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 wartime 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

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



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!

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

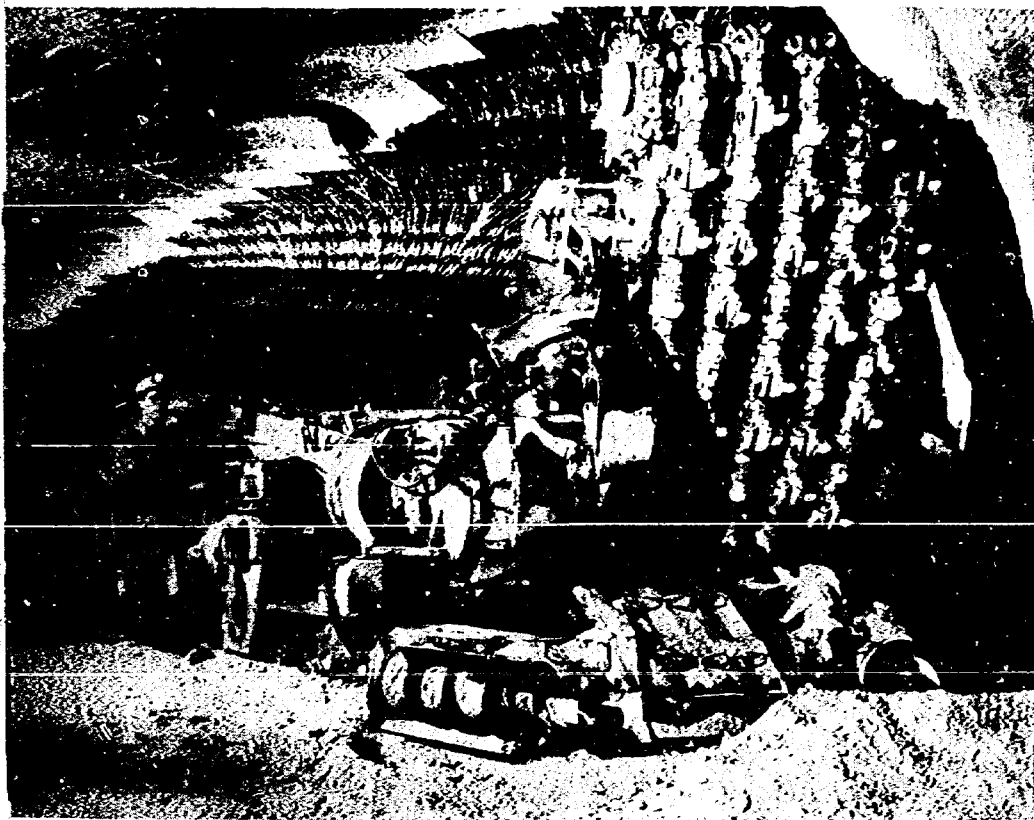
Some 220,000,000 years ago, more or less, in what geologists call the Permian Age, a vast arm of the sea covered a large portion of the Southwest. This was an irregular shaped area covering thousands of square miles in what today is eastern New Mexico and western Texas, Oklahoma and Kansas. Various types 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.

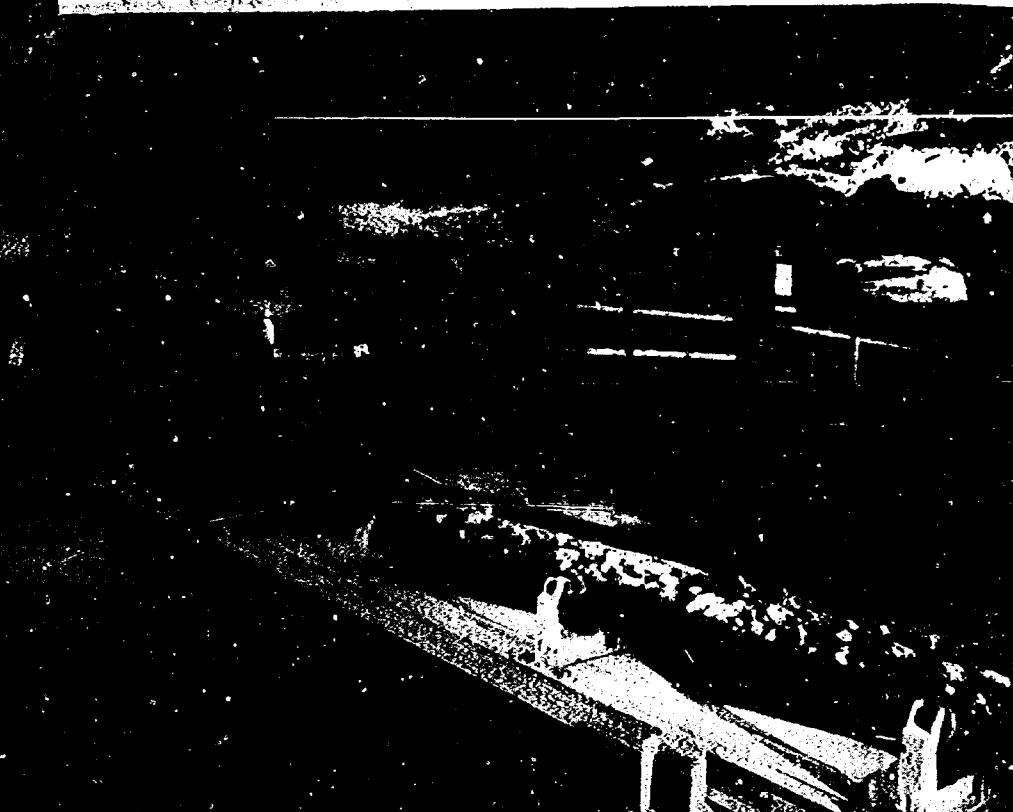
The United States was forced during the war years to get what potash it could from a multitude of expensive sources, such as brine lakes, distillery wastes, flue dust and seaweeds. The price shot up from \$35 a ton to almost \$500 a ton.

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 McSweeney 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.

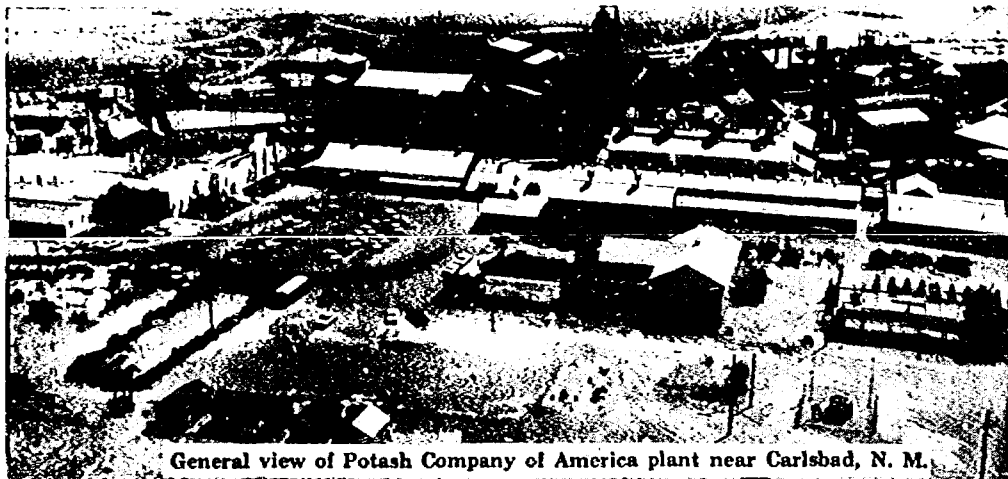
At National Potash Company, start of work on the shafts climaxed some six years of exploration and preparation by Freeport Minerals Company. Exploration in the area straddling the Eddy-Lea county line started in 1948. National Potash is wholly owned by Freeport Minerals Company. National Potash entered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

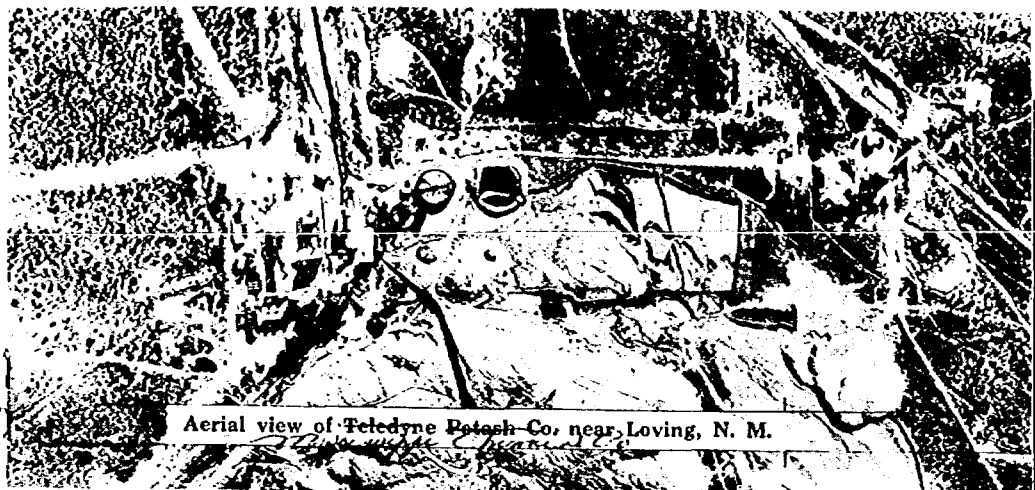
At present, six New Mexico producers, along with the Kerr-McGee operations at Searles Lake, Calif., account for about 92 per cent of the domestic production. The remaining 8 per cent comes from Salduro Marsh in Utah, (Bonneville Ltd.), the wells of Dow Chemical Company at Midland, Mich. and from the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



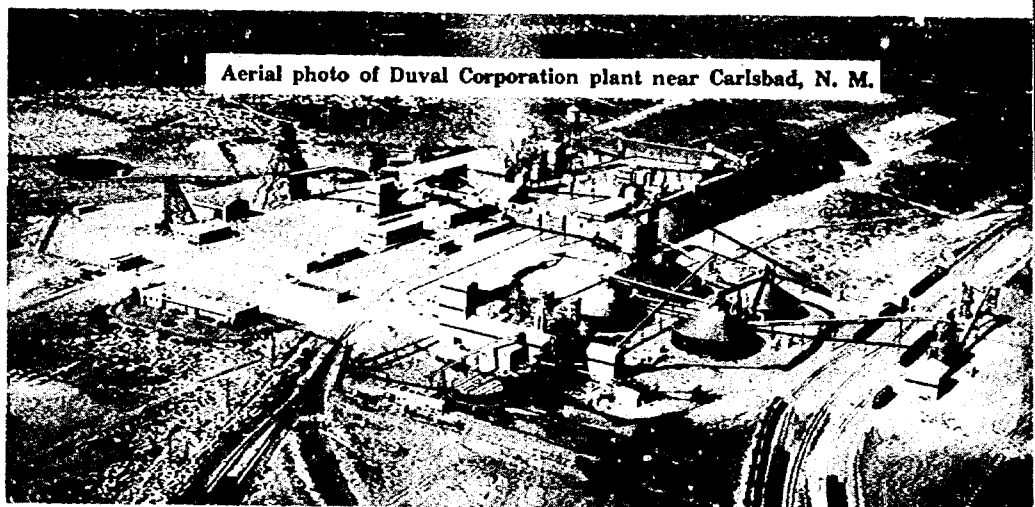
General view of Potash Company of America plant near Carlsbad, N. M.



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



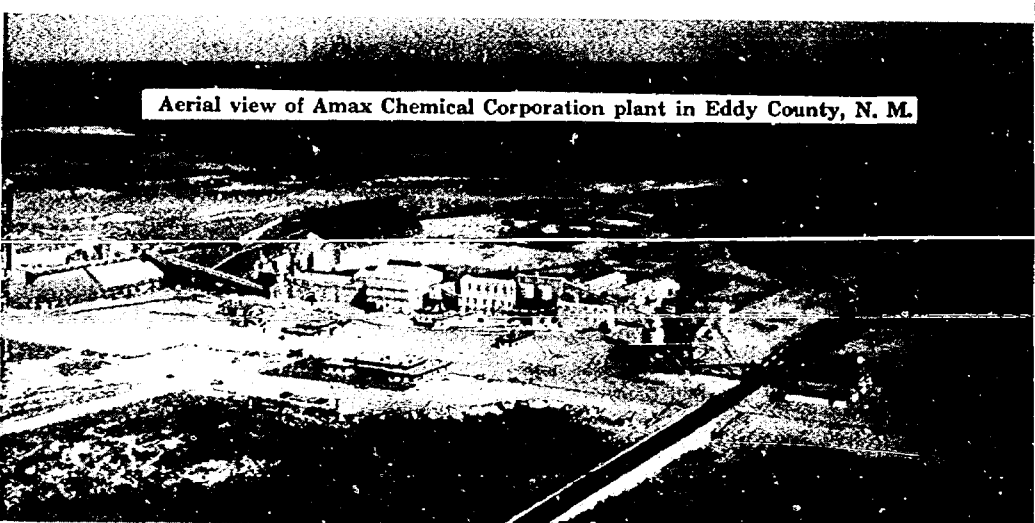
National Potash Company, located in Lea County.



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



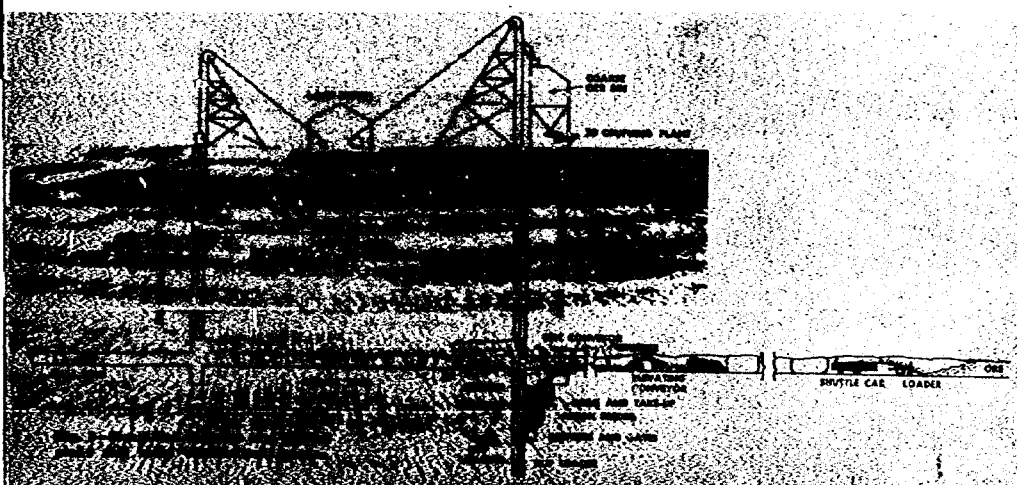
International Minerals & Chemical Corporation's plant near Carlsbad, N. M.



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.

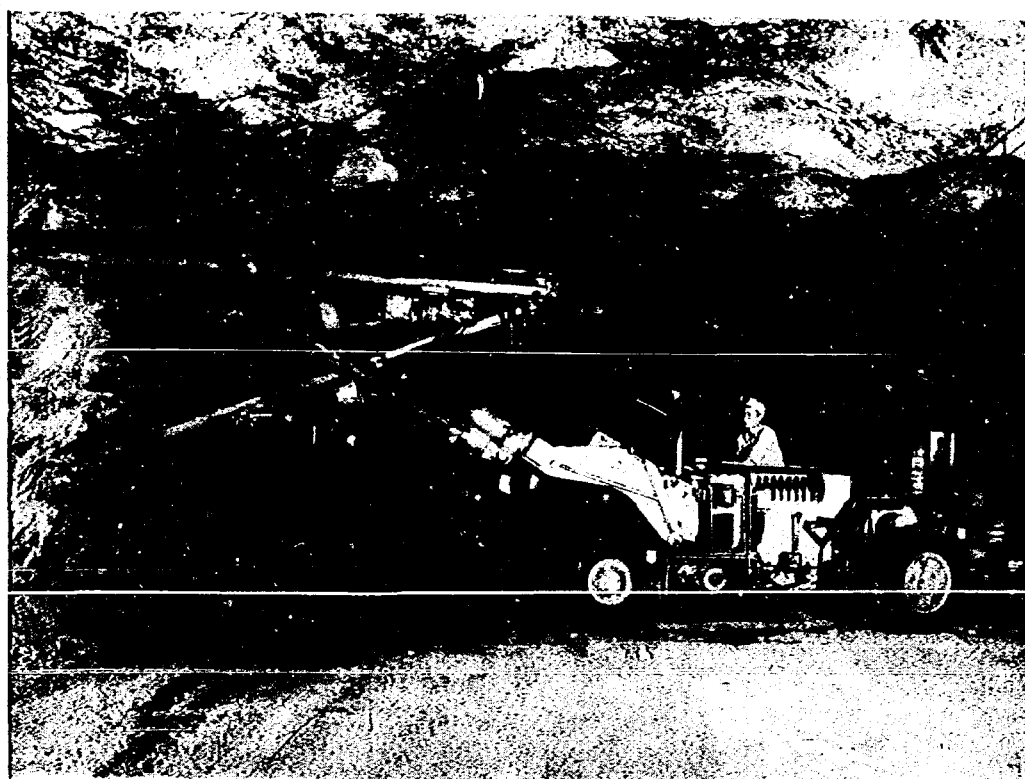
MINING RESEARCH

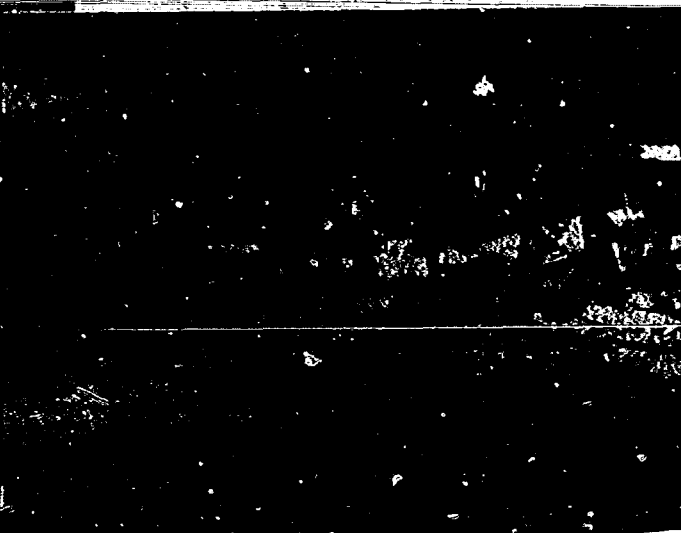
Developments at some of the vast New Mexico potash mines have been the introduction of continuous mining machines. These giant machines rip the ore from the mine walls and roof and eliminate several steps in conventional mining methods. One of the companies, Potash Company of America, has developed its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

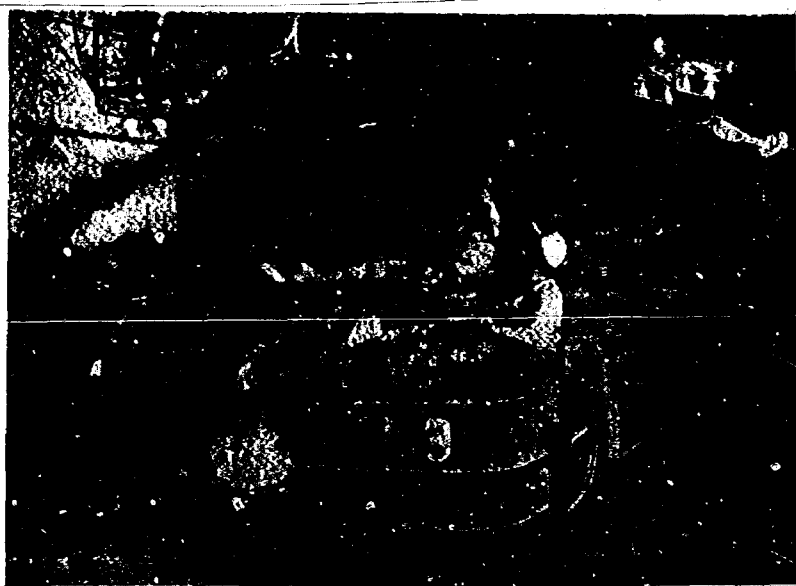
passageways leading off through a pastel-tinted world with no timbers or dripping water. Since the potash ores are laid down in solid beds, with no structural faults or intruded boulders to cause slips or falls, underground rooms are as much as 14 feet high and up to 40 feet wide without supporting timbers. 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.

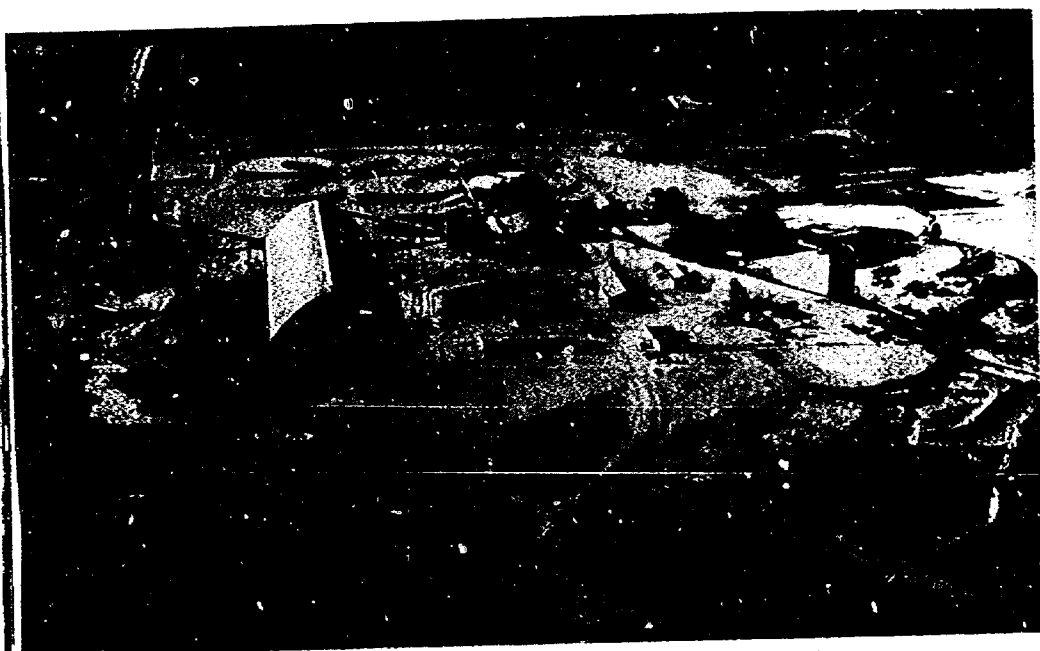
New Mexico potash today is in keen competition on the world markets with potash produced in Canadian and European potash mines (including some where the workers are paid in cents-per-hour rather than dollars). This competition is being met only because of highly efficient production, a tribute to American 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, $2\text{MgSO}_4 \cdot \text{K}_2\text{SO}_4$.

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.

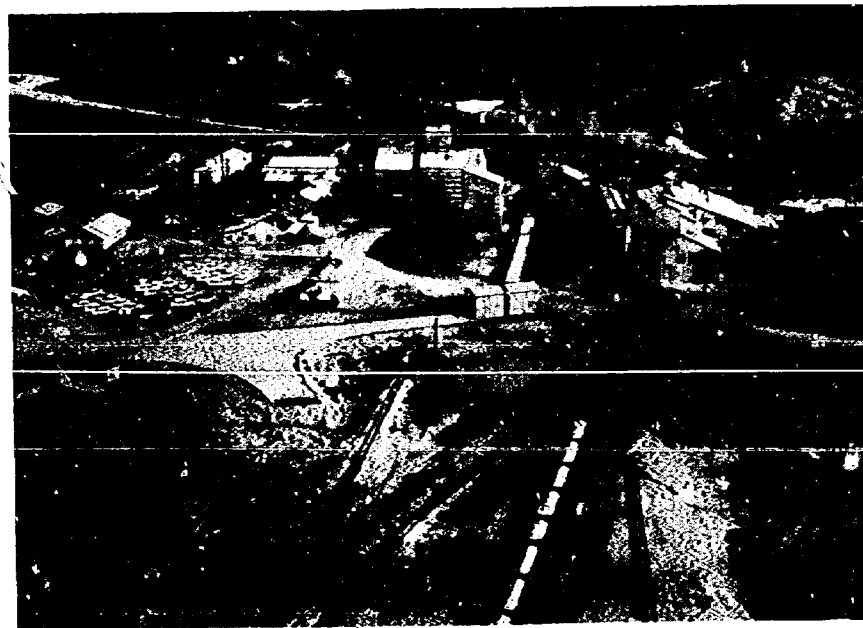
A MAJOR TAXPAYER

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 federal government. For this privilege a royalty on the production is paid. Of royalties paid to the federal government, $37\frac{1}{2}$ per cent is returned directly to the state, and $52\frac{1}{2}$ 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 ~~Tetradyne Potash Co.~~ The plant closed in June, 1973.
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

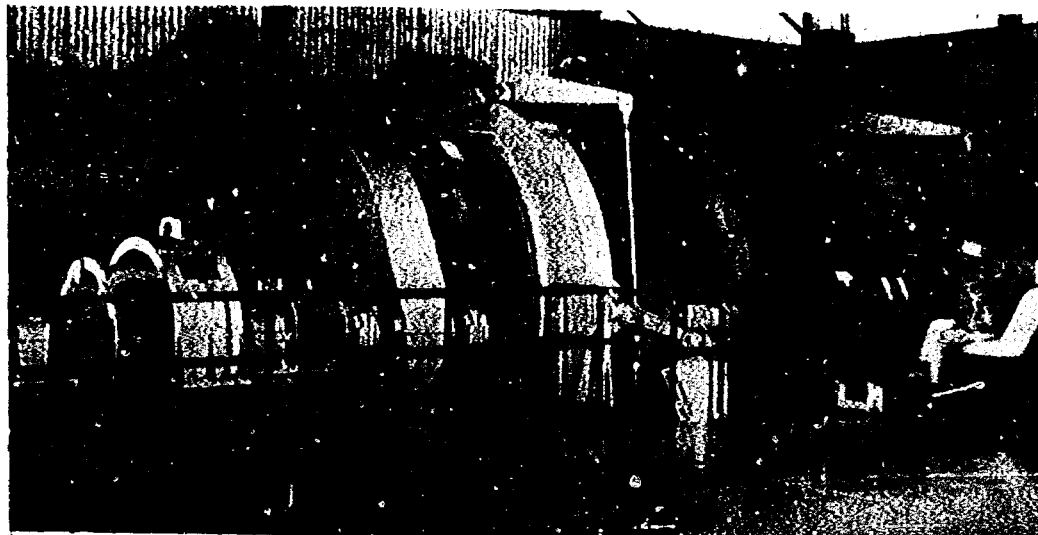
Although American agriculture and industry are using more than 21 times the amount of potash that was used before World War I, the American potash industry has more than kept pace with that growth. Current supplies of potash are more than enough to meet current demand. This is true in the United States 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 avalanche 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!

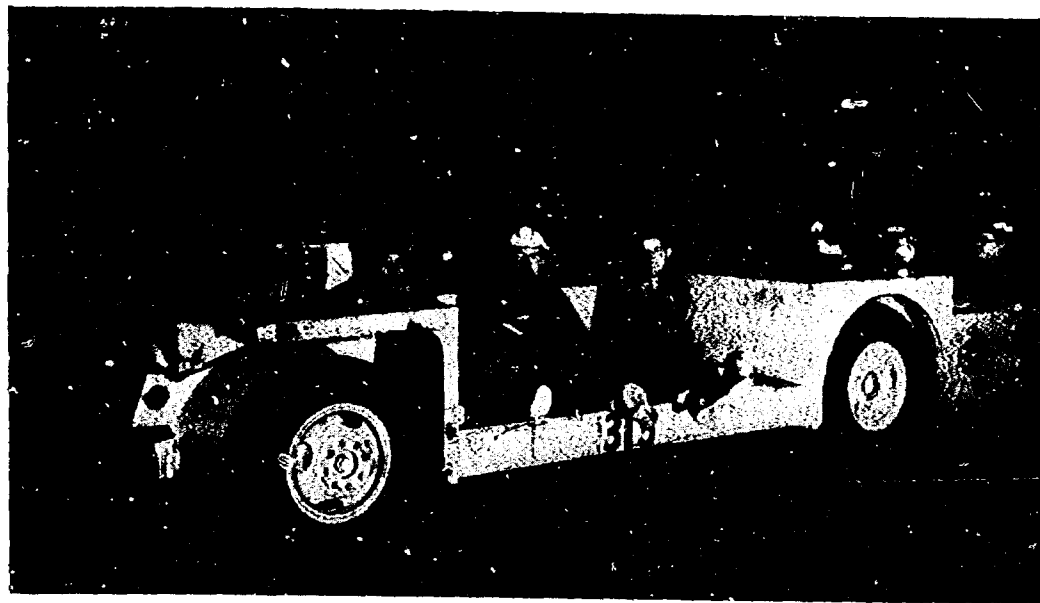


Twin electric locomotives pulling a loaded potash ore train of 32 cars, each holding about 5½ tons. These haulage units are equipped with trolley-radio phones for two-way communication with other haulage equipment and with the central office at the dumping station. Further safety is provided by a complete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

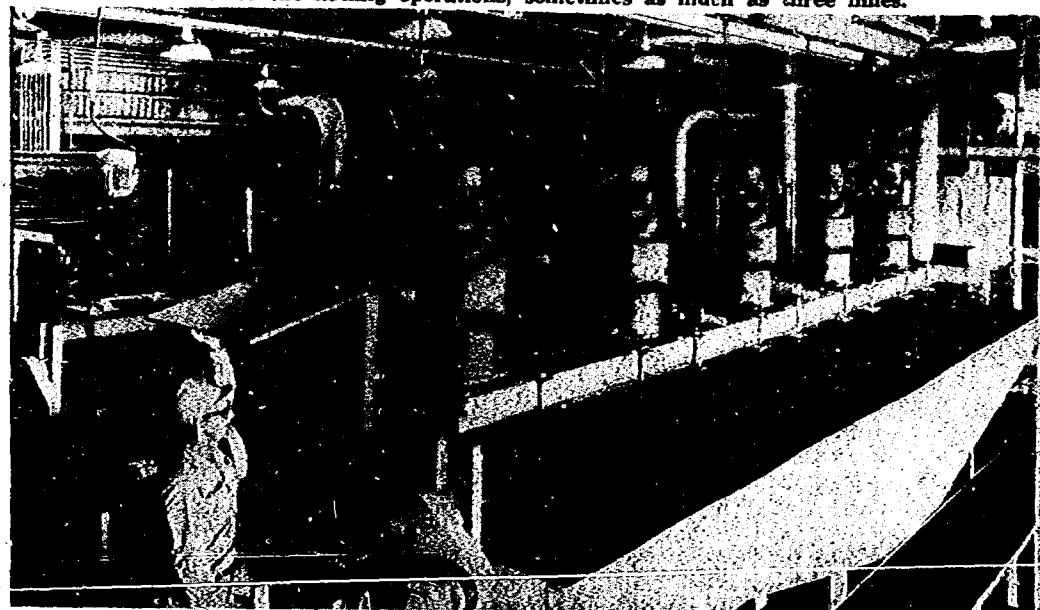
New Mexico producers can meet this condition only by a high level of operating efficiency and productivity, as a large percentage of the potash tonnage used in the United States is in the coastal area which can be reached advantageously by European shippers. And this area is now being expanded greatly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



The United States

First United States Patent Grant
July 31, 1790

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
said Discovery; in the making of Red ash and Red ash by some Apparatus and Druggs; that is to say; in the making of Red ash 1st by burning the
new Ashes in a Furnace; 2^d by dipping and holding them when so burnt in Water; 3^d by drawing off and setting the ley; and 4th by boiling the ley
into shells which burn as the true Red ash; and also in the making of Red ash by passing the Red ash so made as aforesaid; which Operation
having the new Ashes in a Furnace; purifying between Operations and boiling in Water; is new; he has this Declaration; and produces a much greater
in Quantity of shells: These are therefore in pursuance of the Act entitled "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 Privilege of using and vending
to others the said Discovery of burning the new Ashes; purifying between being dippled and boiled in Water; according to the true spirit and meaning
of the Act aforesaid. In Testimony whereof these Letters under the Great Seal of the United States are hereunto signed
Given under my hand at the City of New York the thirty first Day of July in the third Year of our said most Excellent and most Happy Majesty.

Samuel Hopkins

City of New York July 31st 1790.

So hereby testify 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.

Sam. Wentworth Attorney General for the United States.

BEFORE EXAMINER STAMETS
OIL CONSERVATION COMMISSION

OR EXHIBIT NO. 6
CASE NO. 5496 & 5497
Submitted by MESA PETR. CO.
Hearing Date 8-27-75

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

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

$$\text{Gross 320-Acre Reserves} = (.483 \times 26) 320 = 4,019 \text{ MMCF}$$

$$\text{NRI Reserves} = (4,019) (.82) = 3,296 \text{ MMCF}$$

$$\text{Gross 640-Acre Reserves} = (.483 \times 26) 640 = 8,038 \text{ MMCF}$$

$$\text{NRI Reserves} = (8,038) (.82) = 6,591 \text{ MMCF}$$

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

NW¹/₄ SEC. 18, TWP. 23 S., RGE 30 E., NMPM

PCA 37

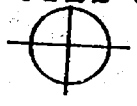
○ "C"

1000'

○ "A"

1000'

MESA PETROLEUM CO
PROPOSED O. & G. TEST



1000'

○ "B"

SEC 18

CASE NO. 5496
EXHIBIT

[Handwritten signature]
5
6/12/75

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

BEFORE EXAMINER STAMETS
OIL CONSERVATION COMMISSION

off EXHIBIT NO. 5
CASE NO. 5496 & 5497
Submitted by MESA PETR. CO.
Hearing Date 8-27-75

EXHIBIT NO. 5

MESA PETROLEUM CO.

INITIAL COMPLETION DATA - NASH UNIT NO. 1
POTASH AREA - NE SECTION 13-23S-29E
EDDY COUNTY, NEW MEXICO

General

Date Spudded	7-25-74
Total Depth - Feet	13,850
Date of Potential Test	
Morrow	1-22-75
Strawn	Not Taken
Perforations - feet.	
Morrow	13,175-609
Strawn	12,138-150
Calculated Open Flow - MCF/D	
Morrow	3,919
Strawn	N.A.
Date of First Production	6-4-75
Purchaser	Transwestern P.L.

Current Production and
Initial Pressure Data

	<u>Morrow</u>	<u>Strawn</u>
Date	8-8-75	8-8-75
Gas Production - MCF/D	2,800	0 (1)
Condensate Production - BPD	4	0 (1)
FTP - psig	2,575	1,650 (2)
Choke Size - in.	17/64	None
Original BHP - psia	5,910	7,518
Date BHP Taken	11-19-74	10-11-74
Source of BHP	Extrap. DST	Extrap. DST
KB Datum Depth - Ft.	13,482	12,144
Recent BHP - psia	---	5,429
Date BHP Taken	None taken	5-23-75
Source of BHP	---	BHP Bomb

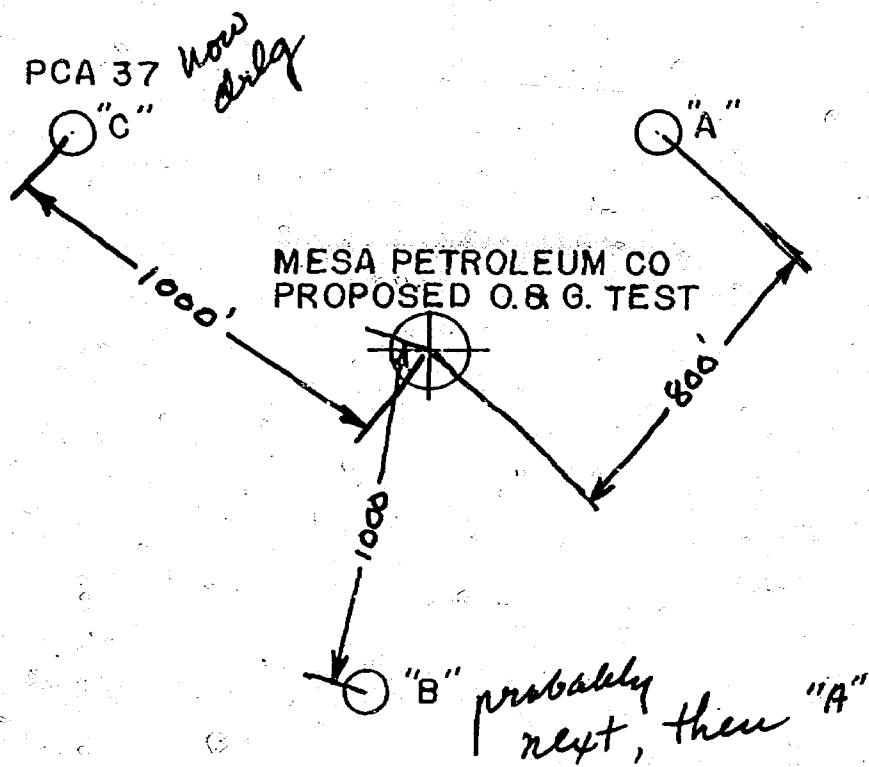
(1) Well currently shutin due to liquids in the wellbore and low flowing pressures.

(2) Represents SICP rather than FTP

LMC:dm
8-25-75

*Strawn SI
because of problems
with crossover assembly
Morrow up tubing*

NW 1/4 SEC. 18, TWP. 23 S., RGE 30 E., NMPM



- EX 1 US Dept Interior Memos (Admitted)
- EX 2 USGS Potash Enclave Map (not Entered)
- EX 3 "N.M. Potash" Booklet (Admitted)
- EX 4 Core Hole Map (Admitted)
- EX 5 This Plat (Admitted)

SEC 18

CASE NO. 5496
EXHIBIT

Protestants
S
6/11/75

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	



United States Department of the Interior

GEOLOGICAL SURVEY
Denver Federal Center
Denver, Colorado 80225

IN REPLY REFER TO:

April 2, 1974

APR 11 1974

Memorandum

To: -> Area Geologist, Roswell, New Mexico U.S. GEOLOGICAL SURVEY
Area Mining Supervisor, Carlsbad, New Mexico 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 H. Horn
George H. Horn

Attachments:
Memos of Feb. 14 & 15, 1974

cc: Chief, Conservation Division

NOTED
APR 11 1974
PATERSON

NOTED
APR 11 1974
PETE C. AGUILAR

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
Case No. 5496 Exhibit No. 1
Submitted by *[Signature]*
Hearing Date *6/11/74*



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
Acting Deputy
From: 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. Rollins

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
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 S. 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-0) (AVB) (ERW) (WCS) (TOF)

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

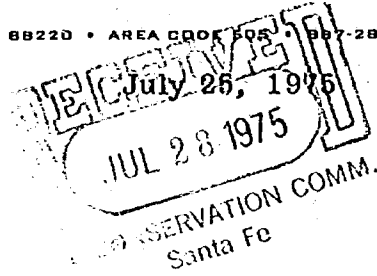
**P
C
A**

POTASH COMPANY OF AMERICA

A DIVISION OF IDEAL BASIC INDUSTRIES, INC.

MINE AND REFINERY: P. O. BOX 31 • CARLSBAD, NEW MEXICO 88220 • AREA CODE 505 • 887-2844

R. H. BLACKMAN
RESIDENT COUNSEL



Mr. Joseph Ramey, Secretary-Director
New Mexico Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico 87501

Re: Mesa Petroleum Co. - Notice of Intent
to Drill a Well 1350' from N line and
1300' from W line, Section 18, T. 23 S.,
R. 30 E., Eddy County, New Mexico

Dear Sir:

Potash Company of America, A Division of Ideal
Basic Industries, Inc. and Leland A. Hodges, Trustee
hereby withdraw objections heretofore filed in the above
matter with the New Mexico Oil Conservation Commission.

Very truly yours,

Potash Company of America
A Division of Ideal Basic Industries, Inc.

Leland A. Hodges, Trustee

By 
R. H. Blackman

cc: U.S.G.S., P. O. Box 1716, Carlsbad
U.S.G.S., P. O. Box 1857, Roswell
Mr. Clarence E. Hinkle, Hinkle, Bondurant,
Cox & Eaton, P. O. Box 10, Roswell
Mr. Phil Lucero, State Land Commissioner,
Santa Fe, New Mexico 87501



MEMBER: AMERICAN POTASH INSTITUTE

BILL GRESSETT

Mr. Ramey
The attached for your
information.

Bill,



OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO
P. O. DRAWER DD - ARTESIA
88210

August 7, 1975

I. R. TRUJILLO
CHAIRMAN

LAND COMMISSIONER
PHIL R. LUCERO
MEMBER

STATE GEOLOGIST
A. L. PORTER, JR.
SECRETARY - DIRECTOR

Mesa Petroleum Company
904 Gihls Tower West
Midland, Texas 79701

ATTENTION: MR. ROBERT H. NORTINGTON

Re: Nash Unit #2
1350'FNL & 1980'FWL
Sec. 18-23-30, Eddy
County, New Mexico

Gentlemen:

We hereby acknowledge receipt of Forms C-101 Notice of Intention to Drill and Form C-102 Well Location and Acreage Dedication Plat on the subject well.

Said well is located on a Federal Lease, therefore we are forwarding the above forms to the U.S.G.S. Office, Drawer U, Artesia. Said Intention to Drill should be re-submitted on the proper Federal Forms.

Further, to date this office has no record of approval of the non-standard location.

If you have any questions concerning this matter please feel free to call upon me.

Sincerely yours,

OIL CONSERVATION COMMISSION

W. A. Gressett
W. A. Gressett
Supervisor, District II

WAG:jw

Xc: Mr. Joe D. Ramey

Registered Mail
Return Receipt



August 6, 1975

RECEIVED

AUG 7 1975

O. C. C.
ARTESIA, OFFICE

New Mexico Oil Conservation Commission
Drawer DD
Artesia, New Mexico 38210

Attention: W. A. Gressett, Supervisor

Re: #2 Nash Unit, 14,000' Morrow Test
1350' FNL & 1980' FWL
Section 18-23S-30E
Eddy County, New Mexico
Mesa OP 10-0553-2

Gentlemen:

Mesa Petroleum Co., as operator of the Nash Unit, hereby applies for a permit to drill the captioned well. Ten copies each of N.M.O.C.C. Form C-101 and Form C-102 are enclosed for your consideration and distribution. In compliance with N.M.O.C.C. order #R-111 we have this date mailed (registered mail, return receipt) copies of these forms to each of the operators who hold potash leases within a radius of one mile of the captioned well. According to information reflected by plats furnished under Article IX, Paragraph (3) of order #R-111 and information obtained from State and Federal records in Santa Fe, the only potash operators within one mile of the captioned location are Leland A. Hodges, Trustee and International Minerals and Chemical Corporation.

The #2 Nash Unit will be the second test well drilled on the State and Federal Approved Nash Unit Area (14-08-0001-14168). We respectfully request your prompt and favorable consideration of the enclosed application, and if additional information in this regard is required please advise.

Very truly yours,

Robert H. Northington
Robert H. Northington

Robert H. Northington

RHN:hh

Enclosures

Copies: Leland A. Hodges, Trustee
International Minerals and
Chemical Corporation
Supervisor, USGS, Roswell
Commissioner of Public Lands
Nash Unit Partners

NO. OF COPIES RECEIVED	
DISTRIBUTION	
SANTA FE	
FILE	
U.S.G.S.	
LAND OFFICE	
OPERATOR	

NEW MEXICO OIL CONSERVATION COMMISSION

RECEIVED

Form C-101
Revised 1-1-65

AUG 7 1975

O. C. C.
ARTESIA, OFFICE

5A. Indicate Type of Lease
STATE FEE

5. State Oil & Gas Lease No.
NM 0556857

APPLICATION FOR PERMIT TO DRILL, DEEPEN, OR PLUG BACK

1a. Type of Work
b. Type of Well
DRILL DEEPEN PLUG BACK
OIL WELL GAS WELL OTHER
SINGLE ZONE MULTIPLE ZONE

2. Name of Operator
Mesa Petroleum Co.

3. Address of Operator
904 Gihls Tower West, Midland, Texas 79701

4. Location of Well
UNIT LETTER F LOCATED 1350 FEET FROM THE North LINE
AND 1980 FEET FROM THE West LINE OF SEC. 18 TWP. 23S RGE. 30E NMPM

7. Unit Agreement Name
Nash Unit

8. Farm or Lease Name
Nash Unit

9. Well No.
2

10. Field and Pool, or Wildcat
Undesignated Morrow

12. County
Eddy

19. Proposed Depth
14,000'

19A. Formation
Morrow

20. Rotary or C.T.
Rotary

21. Elevations (Show whether D.F., R.I., etc.)
3039 GR

21A. Kind & Status Plug. Bond
Blanket

21B. Drilling Contractor
McVay

22. Approx. Date Work will start
October 1, 1975

23. PROPOSED CASING AND CEMENT PROGRAM

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	SACKS OF CEMENT	EST. TOP
17 1/2	13 3/8	48	300	350	Circ. to surf.
12 1/4	9 5/8	36	3400	1000	Circ. to surf.
8 3/4	7	23-26	11,100	1800	Circ. to surf.
6	4 1/2	13.5	14,000	325	Top of liner.

Surface hole will be drilled to 300' without BOP's. Below the surface casing, 12" API 3000 psi BOP's will be used to casing shoe depth at 3400'. Salt brine will be used to drill this portion of the hole to prevent unnecessary hole enlargement. After the 9 5/8" casing is set, 10" API 5000 psi BOP's will be used to total depth. Controlled polymer brine mud will be used to drill to total depth. Maximum mud weight required to overbalance formation pressure is anticipated to be 12.2 PPG at approximately 12,100' based on experience gained while drilling the immediate offset well (Nash Unit # 1- located in Section 13, T23S, R29E). BOP's will be thoroughly tested before penetrating this abnormally pressured section, also 7" casing will have been set at approximately 11,100'. Cement will be circulated to the surface behind the 7" casing, using necessary DV tools.

IN ABOVE SPACE DESCRIBE PROPOSED PROGRAM; IF PROPOSAL IS TO DEEPEN OR PLUG BACK, GIVE DATA ON PRESENT PRODUCTIVE ZONE AND PROPOSED NEW PRODUCTIVE ZONE. GIVE BLOWOUT PREVENTER PROGRAM, IF ANY.

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

Signed Michael P. Winston Title Division Engineer Date August 6, 1975

(This space for State Use)

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:
10 NMOCC, 10 Partners, 1 USGS, 1 Comm. P.L., Harold Hensley, MRC, CG, GUE, MPH, LME

NEW MEXICO OIL CONSERVATION COMMISSION
WELL LOCATION AND ACREAGE DEDICATION PLAT

Form C-102
Supersedes C-128
Effective 1-1-65

All distances must be from the outer boundaries of the Section.

Operator Mesa Petroleum Company		Lease Nash Unit			Well No. 2
Unit Letter F	Section 18	Township 23 South	Range 30 East	County Eddy	
Actual Well Location of Well:					
1350	feet from the	North	line and	1980	feet from the
Ground Level Elev. 3039	Producing Formation Morrow	Pool Wildcat	Dedicated Acreage: 320 $\frac{1}{2}$ Acres		

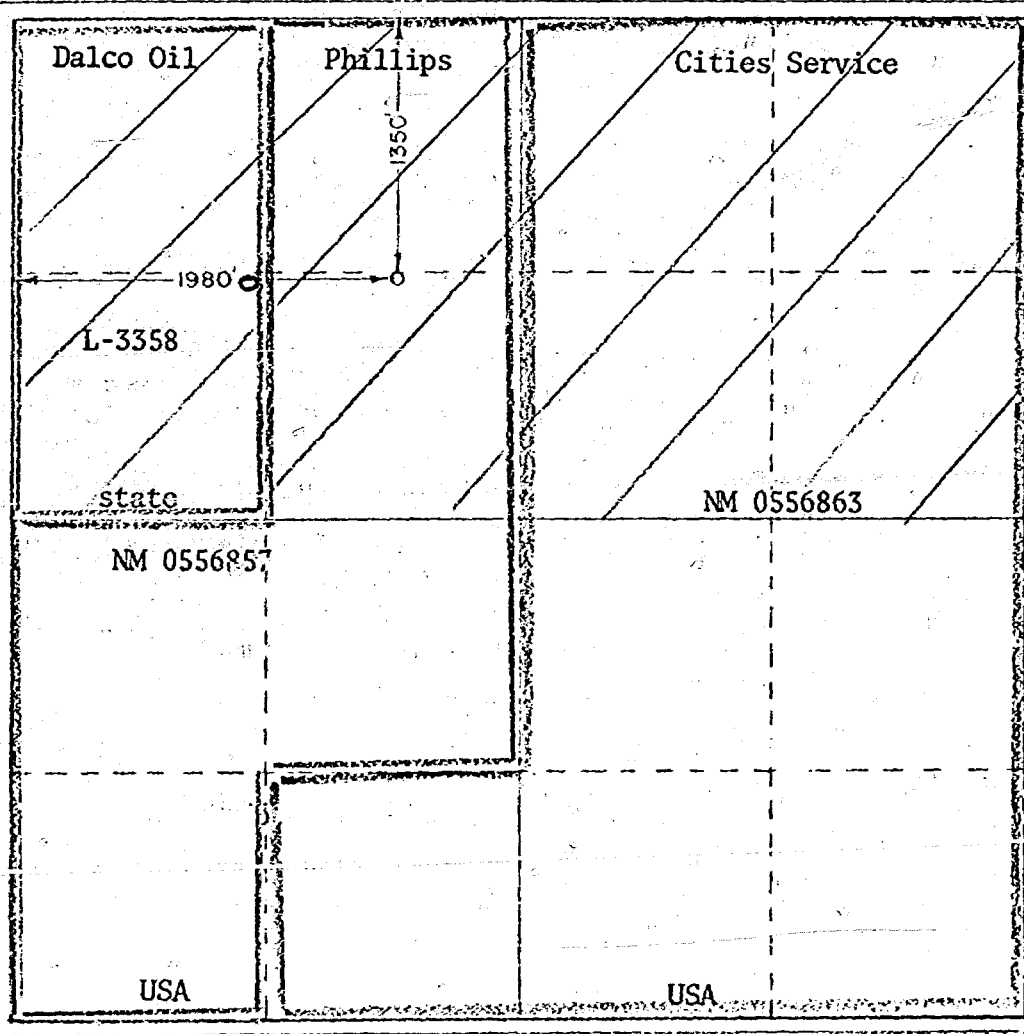
1. Outline the acreage dedicated to the subject well by colored pencil or hachure marks on the plat below.
2. If more than one lease is dedicated to the well, outline each and identify the ownership thereof (both as to working interest and royalty).
3. If more than one lease of different ownership is dedicated to the well, have the interests of all owners been consolidated by communitization, unitization, force-pooling, etc?

RECEIVED
AUG 7 1975
D. C. C.
ARTESIA, OFFICE

Yes No If answer is "yes," type of consolidation Unitization (Nash Unit)

If answer is "no," list the owners and tract descriptions which have actually been consolidated. (Use reverse side of this form if necessary.) _____

No allowable will be assigned to the well until all interests have been consolidated (by communitization, unitization, forced-pooling, or otherwise) or until a non-standard unit, eliminating such interests, has been approved by the Commission.



CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief.

Michael P. Houston

Name
Michael P. Houston

Position
Division Engineer

Company
Mesa Petroleum Co.

Date
August 6, 1975

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my knowledge and belief.

Date Surveyed
August 4, 1975

By
John W. West
Professional Engineer and Surveyor
676
MEXICO

10 NM 000 10 Partners, 1 USGS, 1 Comm. P.L., Harold Hensley, Mee, CG, JLF, MPH, LMC.

NOTICE OF PUBLICATION
STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

The State of New Mexico by its Oil Conservation Commission hereby gives notice pursuant to law and the Rules and Regulations of said Commission promulgated thereunder of the following public hearing to be held at 9 o'clock a.m. on AUGUST 27, 1975, at the Oil Conservation Commission Conference Room, State Land Office Building, Santa Fe, New Mexico, before Richard L. Stamets, Examiner, or Daniel S. Nutter, Alternate Examiner, both duly appointed for said hearing as provided by law.

STATE OF NEW MEXICO TO:

All named parties and persons
having any right, title, interest
or claim in the following cases
and notice to the public.

(NOTE: All land descriptions herein refer to the New Mexico Principal Meridian, whether or not so stated.)

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:

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.

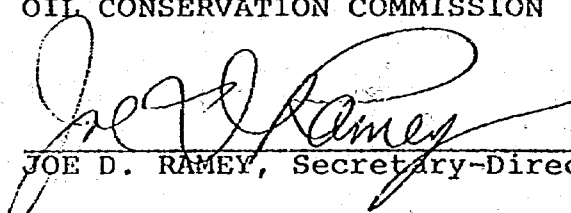
CASE 5543:

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.

GIVEN under the seal of the New Mexico Oil Conservation Commission at Santa Fe, New Mexico, on this 8th day of August, 1975.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION



JOE D. RAMEY, Secretary-Director

S E A L

Case 5496

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 WITHIN 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

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.

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

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.

CLARENCE E. HINKLE
W. E. BONDURANT, JR. (94-1973)
LEWIS C. COX, JR.
PAUL W. EATON, JR.
CONRAD E. COFFIELD
HAROLD L. HENSLEY, JR.
STUART D. SHANOR
C. O. MARTIN
PAUL J. KELLY, JR.

JAMES H. BOZARTH
RONALD O. HARRIS
JAMES H. ISBELL

LAW OFFICES
HINKLE, BONDURANT, COX & EATON

600 HINKLE BUILDING
Post Office Box 10
ROSWELL, NEW MEXICO 88201

August 14, 1975

TELEPHONE (505) 622-6510

MR. ISBELL LICENSED
IN TEXAS ONLY

MIDLAND, TEXAS OFFICE
521 MIDLAND TOWER
(915) 683-4691

Mr. Tom Derryberry
Oil Conservation Commission
Box 2388
Santa Fe, New Mexico 87501

Dear Mr. Derryberry:

Pursuant to our telephone conversation today, I am enclosing three copies of the application of Mesa Petroleum Co. in connection with the Nash Unit No. 2 well. According to our file, the original and two copies were forwarded to Mr. Ramey on August 1, with a copy being sent to Mr. Dan Nutter. It would be interesting to learn where both copies went astray.

Yours very truly,

HINKLE, BONDURANT, COX & EATON

By Charlotta Sandrey
Secretary to Mr. Hinkle

Enc.

BEFORE THE OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO

AMENDED 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 UNORTHDOX 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, OR IN THE ALTERNATIVE 1980 FEET FROM THE WEST LINE AND 1350 FEET FROM THE NORTH LINE OF SAID SECTION 18 ON FEDERAL LANDS, AND THE DEDICATION OF SECTION 18 TO SAID WELL, WHICH IS WITHIN 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 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, or in the alternative 1980 feet from the west line and 1350 feet from the north line of said Section 18 on federal lands, 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 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 1330 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.

8. Applicant has mailed to International Minerals & Chemical Corporation, Leland A. Hodges and Potash Company of American 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 amended 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 matter be included on the docket for an Examiner hearing on August 27, 1975.

Respectfully submitted,

MESA PETROLEUM CO.

BY *Harold L. Henderson J.*
HINKLE, BONDURANT, COX & EATON
P. O. Box 10
Roswell, New Mexico 88201
Attorneys for Applicant

DOCKET MAILED

Date 8/19/75

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

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Box 1351
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(Skelly is Unit Operator of the Forty-Niner Ridge Unit
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All other offset acreage committed to Nash Unit of which
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BEFORE THE OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO

AMENDED 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, OR IN THE ALTERNATIVE 1980 FEET FROM THE WEST LINE AND 1350 FEET FROM THE NORTH LINE OF SAID SECTION 18 ON FEDERAL LANDS, AND THE DEDICATION OF SECTION 18 TO SAID WELL, WHICH IS WITHIN THE POTASH AREA AS DEFINED BY ORDER R-111 AS AMENDED.

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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.

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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

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10. Applicant requests that this matter be included on the docket for an Examiner hearing on August 27, 1975.

Respectfully submitted,

MESA PETROLEUM CO.

BY *Harold L. Hendry, Jr.*
HINKLE, BONDURANT, COX & EYTON
P. O. Box 10
Roswell, New Mexico 88201
Attorneys for Applicant

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

BEFORE THE OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO

AMENDED 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, TOWN-
SHIP 23 SOUTH, RANGE 29 EAST, EDDY COUNTY,
AND FOR PROMULGATION OF SPECIAL POOL RULES
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TIVE 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, OR IN THE ALTERNATIVE 1980 FEET
FROM THE WEST LINE AND 1350 FEET FROM THE NORTH
LINE OF SAID SECTION 18 ON FEDERAL LANDS, AND
THE DEDICATION OF SECTION 18 TO SAID WELL,
WHICH IS WITHIN THE POTASH AREA AS DEFINED BY
ORDER R-111 AS AMENDED.

Oil Conservation Commission
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Santa Fe, New Mexico 87501

Comes now Mesa Petroleum Co., acting by and through the under-
signed attorneys, and hereby makes application for designation of a
new pool because of the discovery of gas in the Strawn and Morrow
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Township 23 South, Range 29 East, Eddy County and for promulgation of
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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

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.

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.

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.

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 1330 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.

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.

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 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.

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.

8. Applicant has mailed to International Minerals & Chemical Corporation, Leland A. Hodges and Potash Company of American 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 amended 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 matter be included on the docket for an Examiner hearing on August 27, 1975.

Respectfully submitted,

MESA PETROLEUM CO.

BY

Harold L. Hendley, Jr.
HINKLE, BONDURANT, COX & EATON

P. O. Box 10

Roswell, New Mexico 88201

Attorneys for Applicant

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.

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.

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 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.

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.

APR 1975
OIL CONSERVATION COMMISSION
Santa Fe

CASE NO. 5496

MOTION TO QUASH SUBPOENA DUCES TECUM

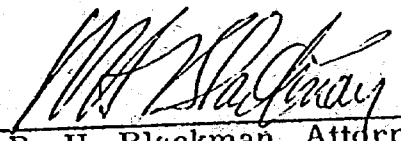
Come now Ideal Basic Industries, Inc. and J. B. Cummings and
move that the Subpoena Duces Tecum heretofore entered in the above
captioned matter be quashed for the following reasons:

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

OIL CONSERVATION COMMISSION
P. O. BOX 2088
SANTA FE NEW MEXICO 87501

April 30, 1975

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

Dear Mr. Hinkle:

With reference to your letter of April 28, we have received the Notice of Intention to Drill the well in question, but we have not yet received written objections to the location. When such objections are received we will set an arbitration meeting to be held in Santa Fe as soon as possible.

Very truly yours,

A. L. PORTER, Jr.
Secretary-Director

ALP/ir

cc: Mr. Roy Blackman

C
O
P
Y

LAW OFFICES

HINKLE, BONDURANT, COX & EATON

TELEPHONE (505) 622-6510

CLARENCE E. HINKLE

W. E. BONDURANT, JR. (914-1973)

LEWIS C. COX, JR.

PAUL W. EATON, JR.

CONRAD E. COFFIELD

HAROLD L. HENSLEY, JR.

STUART O. SHANOR

C. D. MARTIN

PAUL J. KELLY, JR.

JAMES H. BOZARTH

RONALD O. HARRIS

JAMES H. ISBELL

600 HINKLE BUILDING

POST OFFICE BOX 10

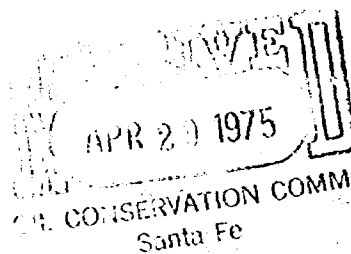
ROSWELL, NEW MEXICO 88201

MR. ISBELL LICENSED
IN TEXAS ONLY

MIDLAND, TEXAS OFFICE
521 MIDLAND TOWER
(915) 683-4691

April 28, 1975

Mr. A. L. Porter, Jr.
Oil Conservation Commission
Box 2088
Santa Fe, New Mexico 87501



Dear Mr. Porter:

You will recall our telephone conversations of last week in regard to the application of Mesa Petroleum Co. to drill the No. 2 Nash Unit well located in the potash area. After I talked with Roy Blackman of Potash Company of America, I talked with Marion Causey, Manager of Mesa's Midland office, and he has just advised that Mesa desires to go ahead with the application and feels that it should not be delayed.

We have not received any protests to the application but we anticipate it might be protested by Ieland Hodges and Potash Company of America. Copies of the Notice of Intention to Drill and plat have been sent to the potash lease owners and if protests are filed within the time permitted, we would suggest that the arbitration conference be held in Santa Fe as quickly as possible so that if the hearing is to be held proper notice can be published so that the hearing can be held on June 12 or as soon thereafter as possible.

Yours very truly,

HINKLE, BONDURANT, COX & EATON

BY 

CEH:cs

cc: Mr. Marion Causey



RECEIVED

April 24, 1975

APR 25 1975

D. C. C.
ARTESIA, OFFICE

New Mexico Oil Conservation Commission
Drawer "DD"
Artesia, New Mexico 88201

Re: Nash Unit # 2, 14,000' Morrow Test
1350' FNL & 1300' FWL
Section 18, T23S, R30E
Eddy County, New Mexico

Gentlemen:

Attached is an amended copy of Form C-101, Application for Permit to Drill. This form should replace the original Form C-101, dated April 18, 1975, on the subject well. The original C-101 did not reflect cement volumes sufficient to circulate to the surface, behind the intermediate string (7"), which is required by Order R-111.

If questions arise, do not hesitate to contact the undersigned.

Michael P. Houston

Michael P. Houston,
Division Engineer

MPH:tb

XC: Amarillo

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SANTA FE	
FILE	
U.S.G.S.	
LAND OFFICE	
OPERATOR	

NEW MEXICO OIL CONSERVATION COMMISSION

Form C-101
Revised 1-1-65

APR 25 1975

O. C. C.
ARTESIA, OFFICE

5A. Indicate Type of Lease
STATE FEE

5. State Oil & Gas Lease No.
L-3358

APPLICATION FOR PERMIT TO DRILL, DEEPEN, OR PLUG BACK

1a. Type of Work DRILL <input checked="" type="checkbox"/> DEEPEN <input type="checkbox"/> PLUG BACK <input type="checkbox"/>		7. Unit Agreement Name	
b. Type of Well OIL WELL <input type="checkbox"/> GAS WELL <input checked="" type="checkbox"/> OTHER <input type="checkbox"/>		8. Firm or Lease Name Nash Unit	
2. Name of Operator Mesa Petroleum Co.		9. Well No. 2	
3. Address of Operator 904 Gihls Tower West, Midland, Texas 79701		10. Field and Pool, or Wildcat Undesignated	
4. Location of Well UNIT LETTER <u>E</u> LOCATED <u>1350</u> FEET FROM THE <u>North</u> LINE AND <u>1300</u> FEET FROM THE <u>West</u> LINE OF SEC. <u>18</u> TWP. <u>23S</u> RGE. <u>30E</u> NMPM		12. County Eddy	
19. Proposed Depth 14,000'		19A. Formation Morrow	20. Rotary or C.T. Rotary
21. Elevations (Show whether DI, KI, etc.) 3022 GR	21A. Kind & Status Plug. Bond Blanket	21B. Drilling Contractor McVay	22. Approx. Date Work will start July 1, 1975

23. PROPOSED CASING AND CEMENT PROGRAM

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	SACKS OF CEMENT	EST. TOP
17 1/2	13 3/8	48	300	350	Circ. to surf.
12 1/4	9 5/8	36	3400	1000	Circ. to surf.
8 3/4	7	23-26	11,100	1800	Circ. to surf.
6	4 1/2	13.5	14,000	325	Top of liner

AMENDED COPY" REPLACES APPLICATION DATED APRIL 18, 1975

Surface hole will be drilled to 300' without BOP's. Below the surface casing, 12" API 3000 psi BOP's will be used to casing shoe depth at 3400'. Salt brine will be used to drill this portion of the hole to prevent unnecessary hole enlargement. After the 9 5/8" casing is set, 10" API 5000 psi BOP's will be used to total depth. Controlled polymer brine mud will be used to drill to total depth. Maximum mud weight required to overbalance formation pressure is anticipated to be 12.2 PPG at approximately 12,100', based on experience gained while drilling the immediate offset well (Nash Unit # 1 - located in Section 13, T23S, R29E). BOP's will be thoroughly tested before penetrating this abnormally pressured section, also 7" casing will have been set at approximately 11,100'. Cement will be circulated to the surface behind the 7" casing, using necessary DV tools.

IN ABOVE SPACE DESCRIBE PROPOSED PROGRAM; IF PROPOSAL IS TO DEEPEN OR PLUG BACK, GIVE DATA ON PRESENT PRODUCTIVE ZONE AND PROPOSED NEW PRODUCTIVE ZONE. GIVE BLOWOUT PREVENTER PROGRAM, IF ANY.

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

Signed Michael P. Houston Title Division Engineer Date April 24, 1975

(This space for State Use)

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

xc-1-alf. 10 Htnes. 10 Partners 2 Potash Leases 1 PPH 1-rc 1-mph. 1-dmc 1-OSTN 1-MJM



OIL CONSERVATION COMMISSION

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

I. R. TRUJILLO
CHAIRMAN

LAND COMMISSIONER
PHIL R. LUCERO
MEMBER

STATE GEOLOGIST
A. I. PORTER, JR.
SECRETARY - DIRECTOR

May 23, 1975

Return

CASE 5496

Sheriff
Eddy County Court House
Carlsbad, New Mexico 88220

Dear Sir:

Enclosed is a Subpoena which needs to be served
as soon as possible.

Any charges will be paid by the Commission.

Very truly yours,

William F. Carr

WILLIAM F. CARR
General Counsel

WFC/dr

enclosure

Served 5/26/75 1:40 P.M.

F. J. B. Cummings Sheriff LeRoy Payne

OIL CONSERVATION COMMISSION

P. O. BOX 2088

SANTA FE NEW MEXICO 87501

May 23, 1975

C
O
P
Y

Sheriff
Eddy County Court House
Carlsbad, New Mexico 88220

Dear Sir:

Enclosed is a Subpoena which needs to be served
as soon as possible.

Any charges will be paid by the Commission.

Very truly yours,

WILLIAM F. CARR
General Counsel

WFC/dr
enclosure

SUBPOENA DUCES TECUM

THE STATE OF NEW MEXICO

TO: Mr. J. B. Cummings,
 Administrative Assistant in Charge of Exploration,
 Potash Company of America, Carlsbad, New Mexico

GREETING:

We command you to be and appear at 9 o'clock a.m. June 12, 1975, before the Oil Conservation Commission of the State of New Mexico, in the Land Office Building, in the City of Santa Fe, in Oil Conservation Commission Case No. 5496, application of Mesa Petroleum Company for a drilling permit and an unorthodox location in the Potash-Oil Area, Eddy County, New Mexico, and that you bring with you and produce at the time and place aforesaid Potash Core Hole Logs with complete analysis on the following core holes:

<u>HOLE NO.</u>	<u>DESIGNATION</u>	<u>DESCRIPTION</u>	<u>SEC, TWP, RGE</u>
1	0349889	2640' from N. Line & 2640' from E. Line	12-23S-29E
2	0349889	77' from N. Line & 77' from W. Line	11-23S-29E
3	0349889	2690' from S. Line & 1120' from E. Line	11-23S-29E
4-S	State	100' from S. Line & 2640' from E. Line	2-23S-29E
PCA #1-H-S	State	400' from S. Line & 1400' from W. Line	2-23S-29E
PCA #2-H	0349889	1200' from N. Line & 1350' from W. Line	11-23S-29E
PCA #3-H	10544	1420' from S. Line & 387' from E. Line	3-23S-29E
PCA #4-H	10545	145' from N. Line & 136' from E. Line	10-23S-29E
PCA #5-H-S	State	1350' from S. Line & 2100' from E. Line	2-23S-29E
PCA #7-H-S	State	3551' from S. Line & 900' from W. Line	2-23S-29E
PCA #8-H-S	State	2400' from S. Line & 1200' from E. Line	2-23S-29E
PCA #9-H-S	State	600' from S. Line & 900' from E. Line	2-23S-29E

<u>HOLE NO.</u>	<u>DESIGNATION</u>	<u>DESCRIPTION</u>	<u>SEC, TWP, RGE</u>
PCA #10-H-S	State	600' from N. Line & 700' from E. Line	2-23S-29E
PCA #11-H-S	State	1600' from N. Line & 2850' from W. Line	2-23S-29E
PCA #12-H	0349889	100' from N. Line & 2630' from E. Line	14-23S-29E
PCA #13-H	0349889	100' from S. Line & 2630' from E. Line	14-23S-29E
PCA #14-H	0349889	2630' from N. Line & 100' from W. Line	14-23S-29E
PCA #15-H	0349891	1600' from S. Line & 1400' from W. Line	20-23S-30E
PCA #16	0349891	700' from S. Line & 1900' from E. Line	17-23S-30E
PCA #17	10545	1700' from N. Line & 1400' from E. Line	10-23S-29E
PCA #20	0349889	2100' from S. Line & 900' from W. Line	11-23S-29E
PCA #21	0349889	600' from S. Line & 1300' from W. Line	11-23S-29E
PCA #22	0349889	1750' from N. Line & 2300' from E. Line	11-23S-29E
PCA #23	0349889	2250' from S. Line & 2500' from E. Line	11-23S-29E
PCA #24	0349889	1000' from S. Line & 2500' from E. Line	11-23S-29E

and also the following core holes, the exact locations of which are not known:

<u>HOLE NO.</u>	<u>DESIGNATION</u>	<u>DESCRIPTION</u>	<u>SEC, TWP, RGE</u>
4	0349889		
5	0349889		
7	0384585		
6	10546		
PCA #6-H			
PCA #18			
PCA #19			

And this do you under penalty of the law.

WITNESS A. L. PORTER, Jr., Secretary-Director
of the Oil Conservation Commission
of the State of New Mexico, and the
seal of said Commission, this _____
day of _____, AD 1975

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. 5496
Order No. R-5094

APPLICATION OF MESA PETROLEUM CO.
FOR AN UNORTHODOX GAS WELL LOCATION,
EDDY COUNTY, NEW MEXICO.

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 16th 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 approval of an unorthodox gas well location 1350 feet from the North line and 1300 feet from the West line of Section 18, Township 23 South, Range 30 East, NMPM, to test the Pennsylvanian formation, Eddy County, New Mexico, or in the alternative, an unorthodox location to drill said well at a point 1350 feet from the North line and 1980 feet from the West line of said Section 18.

(3) That at either of the aforesaid locations, the well would be drilled within the Potash-Oil Area as defined by Commission Order R-111-A, as amended.

(4) That core drilling has indicated that a well drilled at either of the proposed unorthodox locations should not encounter commercial deposits of potash.

(5) That no offset operator or potash operator appeared and objected to either of the proposed locations.

-2-

Case No. 5496
Order No. R-5094

(6) That a well drilled at the aforesaid alternative location, i.e., 1350 feet from the North line and 1980 feet from the West line of Section 18, Township 23 South, Range 30 East, would be more ideally located insofar as an efficient drainage pattern for the Pennsylvanian formation is concerned.

(7) That approval of the subject application to drill at the aforesaid alternative location will afford the applicant the opportunity to produce its just and equitable share of the gas in the subject pool, will prevent the economic loss caused by the drilling of unnecessary wells, avoid the augmentation of risk arising from the drilling of an excessive number of wells, and will otherwise prevent waste and protect correlative rights.

IT IS THEREFORE ORDERED:

(1) That an unorthodox gas well location for the Pennsylvanian formation is hereby approved for a well to be located at a point 1350 feet from the North line and 1980 feet from the West line of Section 18, Township 23 South, Range 30 East, NMPM, Eddy County, New Mexico.

(2) That jurisdiction of this cause is 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. ARNCLD, Member


JOE D. RAMEY, Member & Secretary


S E A L

dr/



United States Department of the Interior

GEOLOGICAL SURVEY
Denver Federal Center
Denver, Colorado 80225

IN REPLY REFER TO:

April 2, 1974

APR 11 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 H. Horn
George H. Horn

Attachments:
Memos of Feb. 14 & 15, 1974
cc: Chief, Conservation Division

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
Case No. 5496 Exhibit No. 1
Submitted by *John J. Anderson*
Hearing Date 6/12/75

NOTED
D. M. VAN BUREN

NOTED
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PETE C. AGUILAR



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 Deputy 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. Rollins

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

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 S. Wayland

Chief, Conservation Division

Enclosures

CC: CD File
Reg. Cons. Mar., 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

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E X H I B I T S

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Protestant's Exhibit No. 4	24	35
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COMMISSIONER RAMEY: Case 5496.

MR. CARR: Case 5496. Application of Mesa Petroleum Company for a drilling permit and an unorthodox gas well location in the Potash-Oil Area, Eddy County, New Mexico.

MR. HINKLE: Clarence Hinkle, appearing on behalf of Mesa Petroleum Company. I would like for the record to also show that we have associated with us, Mr. Don Dent, general attorney for Mesa in Amarillo.

MR. BLACKMAN: Roy H. Blackman of Carlsbad, representing the Protestant Ideal Basic Industries, Inc., and Hodges, Trustee, the legal owner of the leases in the area involved. I will have two witnesses.

MR. HINKLE: If the Commission please, I understand that Mr. Blackman wants to put on a witness and then make a motion for a continuance of the case. We have no particular objection to that, but I would like to make a brief opening statement before we proceed.

COMMISSIONER RAMEY: Are there any other appearances? You may make your statement, Mr. Hinkle.

MR. HINKLE: One of the principal things involved in these cases before the Commission is approval of a development well for the Nash Unit. This is the Nash Unit

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No. 2 Well which is proposed to be located at an unorthodox location in Section 18, Township 23 South, Range 30 East, Eddy County. This well is located in the Potash-Oil Area as defined by Oil Conservation Order R-111-A as amended.

In case some of the members of the Commission are not familiar with the history of the creation of the Potash-Oil Area, I would like to mention briefly that Order R-111 was originally issued on November 9th, 1951. During the early 1930's, potash was first discovered in Lea and Eddy Counties. Shortly after mining operations were started, the Secretary of the Interior withdrew from oil and gas leases all Federal lands within an area which was defined as the Secretary of the Interior's Potash Area. Along about 1950, the Secretary determined to open up the Potash Area for oil and gas development which resulted in the whole potash area being leased for oil and gas. The Secretary's potash area, of course, included some State land. The order of the Secretary opening the potash area to oil and gas leasing provided in effect that since both potash and oil and gas were natural resources, that there should be simultaneous or multiple development of these resources in such a way that one would not or would interfere as little as possible with the other.

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The Commission issued Order R-111 for this same purpose, although the Commission's definition of the Potash Area did not exactly coincide with the Secretary's definition. In fact, Order R-111 did not include Section 18 on which the subject well is proposed to be drilled until after the Nash Unit was approved by the Commission. Order 111-A contemplates very clearly that simultaneous development of both potash and oil and gas are contemplated. Section 3 of the Order -- this is R-111 -- provides as follows: (Reading) No wells will be drilled for oil or gas at a location which in the opinion of the Commission or its duly authorized representatives would result in undue waste of potash deposits or constitute a hazard to or interfere unduly with potash deposits. (End of reading.)

The same article of Order R-111 also provides: (Reading) No mining operations in the potash area that would in the opinion of the Commission or its duly authorized representatives constitute a hazard to oil and gas production or that would unreasonably interfere with the orderly development and production from any oil and gas pool. (End of reading.)

Thus, the Order is a two-way street, so to speak. Mesa Petroleum Company, as operator of the Nash Unit, has

made a valuable discovery of gas in two separate zones which underlie the Nash Unit area. One is in the Strawn and the other is in the Morrow formation. Here we have a protest by one of the owners of potash leases under the proposed No. 2 unit development well. The Applicant in this case takes the position that this development well is at a location which Applicant believes is not underlain with potash deposits in commercial quantities, and therefore cannot result in undue waste of potash. Furthermore, that even if it could be shown that some potash beds were present, the development of the same for potash will certainly interfere with the orderly development and production of oil and gas from the newly discovered pool.

Mr. Dent says we have other appearances on behalf of Mesa. Are there any other witnesses? We have three witnesses and they could all be sworn at once.

MR. BLACKMAN: I have two witnesses. Mr. Hinkle and I, I think, have both been in on the development of this oil-potash controversy pretty much from the beginning. We disagree on one area in here in that we do not believe it is possible to have simultaneous development of both oil and potash at the same time. One of them is going to be wasted. If there is oil and gas development in an area

which contains commercial potash, there is going to be some potash wasted. There isn't any doubt about it. The oil and gas development should be postponed until after the potash is developed and mined out and the oil and gas can still be developed without waste.

So that the Commission will realize where we are at this particular point, I will tell you something about what our evidence is going to show this morning. We have an area down in Township 23 South, Ranges 29 and 30 East pretty much south of the generally known potash area in which we are presently conducting an exploration program in an area which produces langbenite ore. This is one of the -- I believe the only area -- producing langbenite ore in the world. I am certain it is the only one in the northern hemisphere. It is possible there may be some in Russia or someplace else, but this is the only one here. We do have other potash --

COMMISSIONER RAMEY: Would you clarify what langbenite is?

MR. BLACKMAN: All right. We do have other potash producing areas in the United States that produce sylvinite ore. Sylvinite ore is potassium chloride combined with salt and gang material. Langbenite ore is also a potash ore,

but it is a double-salt of potash magnesium sulfate. The ore itself is mixed with gang material and some salt. That is what we call langbenite and the material produced is different from the potassium chloride. There is potassium sulfate and magnesium sulfate and it can be further processed to eliminate the magnesium sulfate and just produce the potassium sulfate. Now, we will have testimony as to the exploration program that we have entered into that is continuing at the present time. We are currently developing or rather currently drilling the first of three wells which will triangulate the proposed location, and at the appropriate time, I am going to move that we continue this case until we can complete the drilling of the three wells and possibly some others if it is necessary to drill others, but Mr. Cummings will be our chief witness. He is in charge of that for Potash Company of America and he can tell you exactly what the commitments are.

I don't believe that it is possible to develop both products at the same time. This is a case that will be very very hard fought if the evidence turns out that to prove there is potash at this location. We don't know that, as we have explained to them.

I have two witnesses.

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AGUILAR-DIRECT

(Witnesses sworn.)

(Whereupon, Protestant's Exhibit No. 1 was marked for identification.)

PETE C. AGUILAR

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

DIRECT EXAMINATION

BY MR. BLACKMAN:

Q Mr. Aguilar, will you state your name, please, and your occupation?

A Pete C. Aguilar. I am a geologist with the Conservation Division, Geological Survey.

Q United States Geological Survey?

A Yes, sir, I am sorry. That's right.

Q Where are you located?

A In Roswell, New Mexico.

Q What is your professional background, Mr. Aguilar?

A I completed my degree, my Bachelor's degree from the University of New Mexico in 1958. I have a Master's degree from North Texas State, Denton, Texas.

Q What were those degrees in?

A In Geology and Engineering from the University of New Mexico, and Biological Sciences and Water Sciences,

AGUILAR-DIRECT

of course, from North Texas.

Q Since graduating from college, by whom have you been employed?

A I worked for the Carlsbad Municipal Schools where I taught Chemistry and Earth Science for approximately 7½ years and then for four years I have been with the United States Geological Survey.

Q In your work with the United States Geological Survey, have you been working with both oil and gas and potash?

A Yes, sir.

Q Mr. Aguilar, I hand you a document which has been marked Protestant's Exhibit No. 1, and ask you if you will kindly identify that document, please, starting with the first?

A The first document which would be the last one in the stapled group here is the memorandum from the Chief, Conservation Division, Dr. Waylund, which directed us to produce a potash enclave map, or more or less to delineate the potash deposits of southeastern New Mexico in the Carlsbad area.

MR. HINKLE: What is the date of that?

THE WITNESS: It is dated February 14, 1974.

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(Whereupon, a discussion was held off the record.)

THE WITNESS: The next letter, which is a memorandum, transmittal memorandum, going to the Director of the Geological Survey, and then, of course, it is dated as being approved or the recommendation having been approved, on March 1st of '74 and then this, of course, the top memorandum is a memorandum from the Manager of the Conservation Division, Central Region, George Horn to the Area Geologist in Roswell which, of course, more or less tells what the original memorandum said from Dr. Wayland.

BY MR. BLACKMAN:

Q Mr. Aguilar, this Exhibit No. 1 which you have just identified, this is, taken together with the rules and orders which currently are in effect and which govern the United States Geological Survey in matters involving oil and gas drilling in potash areas?

A They do.

Q Mr. Aguilar, if you know, is the west half of the northwest quarter of Section 18, Township 23 South, Range 30 East which is the proposed location, is that Federal potash land?

A Yes, sir.

AGUILAR-DIRECT

Q The United States Government owns the potash?

A Owns the potash.

Q Who owns the oil and gas?

A The State of New Mexico does.

Q Mr. Aguilar, does Exhibit 1 provide for the establishment of a so-called potash enclave?

A Yes, sir.

Q Did you participate in gathering data, doing geological evaluations in order to establish the boundaries of that potash enclave?

A Yes.

Q Did you establish such boundaries?

A Yes, sir, I did.

Q Is the west half of the northwest quarter of Section 18, Township 23 South, Range 30 East inside those boundaries?

A Yes, sir.

Q When were the boundaries established?

A The date of the map that we completed for the potash enclave was May of '74. That is the effective date.

Q Was the west half of the northwest quarter of 18, 23, 30 established as within the enclave as of that date?

A Yes, sir.

AGUILAR-DIRECT

Q Have any oil or gas wells been permitted to be drilled in the entire potash enclave since its establishment except with the prior permission of the potash lessee?

A To my knowledge, none.

MR. BLACKMAN: I will offer into evidence Exhibit No. 1.

COMMISSIONER RAMEY: Without objection, Protestant's Exhibit No. 1 will be admitted.

MR. HINKLE: No objection.

COMMISSIONER RAMEY: It will be admitted.

(Whereupon, Protestant's Exhibit No. 1 was offered and admitted into evidence.)

MR. BLACKMAN: That is all of the evidence.

COMMISSIONER RAMEY: Do you have any questions of this witness?

(Whereupon, a discussion was held off the record.)

CROSS EXAMINATION

BY MR. HINKLE:

Q Mr. Aguilar, under this directive of February 14, 1974 shown by Exhibit No. 1 of the Director of the U.S.G.S., that directed the U.S.G.S. to prepare a map as of the middle of 1974 sometime, does it not?

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AGUILAR-CROSS

A Yes, sir.

Q Did it request the potash companies to furnish information from which that map would be prepared?

A Yes, sir.

Q Did the potash companies do that?

A Yes, sir.

Q What kind of information did they submit to you? Was it well logs or was it plats giving their interpretation of what constituted the potash areas or not?

A The well logs, of course, we had already on file in the Carlsbad office in the Mining Office, and most of the information, of course, we already had compiled to begin with, so we had to just simply now delineate one complete map which, rather than looking at individual zones, we now looked at all of them together.

Q Did you use the maps or plats of the potash companies in making up your large map which is dated May, 1974?

A We used their mine workings that they submitted and whatever materials that we requested, yes, sir.

Q Did you accept their interpretation of what constituted areas that were underlain by potash in commercial quantities or did you make your own interpretations?

A We already had our own interpretation in most cases.

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Q Was that your interpretation or somebody else's?

A This was our interpretation.

Q It wasn't altogether your interpretation?

A No, sir. Some of this was done by -- previously by our District Geologist that was in Carlsbad, and of course, we also had the mining engineer that worked with me on the enclave map that had input into this.

Q Was it the U.S.G.S. that made the determination of the economic criteria to be used in delineating the potash areas?

A You are referring to our standards, our cutoff standards?

Q Yes.

A This, of course, has been around for quite some time and this was a joint decision, I am sure that involved the mining engineer, and of course, the District mining engineer and the aerial supervisor in Carlsbad along with the District geologist and the Area geologist.

Q Now, as a result of this directive the U.S.G.S. did publish the map dated May, 1974 which you referred to?

A Yes, sir.

Q What core holes did you take into consideration in connection with Section 18 which is the subject of this hearing?

AGUILAR-CROSS

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A I didn't bring any core hole data with me, but if I remember, I vaguely remember that the area that we are talking about, Section 18, was influenced by the 10th ore zone. This was at the time of the information that we had.

Q Did you take into consideration the core of S-6 which is located -- the Shell No. 6 -- which is located in the center of the extreme left side of Section 17?

A I am sure that I did.

Q Now, your plat shows that this does not show any ore at all?

A That is correct.

Q So, you did take into consideration the fact that there is a well directly across from where this subject well is to be drilled that does not show any potash, is that right?

A Right.

Q Now, there is no core test at all in the south half of Section 7 which lies to the north of Section 18, is there?

A I don't recall. There are some new holes now, but they weren't used in that particular map.

COMMISSIONER RAMEY: Do you happen to have an extra copy of that map?

THE WITNESS: I have three copies.

MR. BLACKMAN: I have no objection. I would be happy to put the map in.

(Whereupon, a discussion was held off the record and Protestant's Exhibit No. 2 was marked for identification.)

COMMISSIONER RAMEY: Mr. Blackman, is it your intention to offer this map?

MR. BLACKMAN: I was just going to say that I think I gave you the wrong information and to the Reporter. I suggested that he put Protestant's Exhibit No. 2, and really, Mr. Hinkle is the one putting it in. I have no objection to it. I think it is excellent evidence and should go in. I hope the record simply shows it. It really doesn't make much difference whose exhibit it is marked as.

MR. HINKLE: I would like for the Commission to withhold passing on this offer until such time as cross examination is completed. We will probably have a witness in rebuttal to the information shown on this plat at which time you will probably want to object to the admission in evidence of this exhibit.

COMMISSIONER LUCERO: Mr. Blackman, with respect to that exhibit, is it your intention to offer it as an

AGUILAR-CROSS

exhibit at this time and then Mr. Hinkle will cross examine as to its admissibility?

MR. BLACKMAN: No, I did not offer the exhibit. For your information, the last time I was up here, we had this map and it was identified and put into evidence, and Mr. Kellahin was representing the other side and he objected strenuously and it was ruled inadmissible at that time, so, I didn't intend to put it in today. I recall Mr. Hinkle asked me if I objected to it or something like that and I said that I don't object to it. I think it should be in.

COMMISSIONER LUCERO: Somewhere along the line it has to be marked at least for identification.

MR. HINKLE: It is already marked.

COMMISSIONER LUCERO: One of the two parties have to offer it and then if there is going to be cross examination as to its admissibility, that is something else.

MR. HINKLE: If the Commission please, in his original testimony, he referred to this map, under direct, that they were required to prepare it. Mr. Blackman didn't incorporate it, and in order to cross examine him, we necessarily have to refer to the exhibit that he is talking about, and we would like to show here that it is probably not evidence that should be admitted, as far as that goes.

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COMMISSIONER LUCERO: I think we have maps that that are in limbo over here as far as an offer into evidence. You will probably direct your examination as to its admissibility in the event it is offered?

MR. HINKLE: That is right.

MR. BLACKMAN: If any issue is being made as to whether it happens to be Protestant's or Proponent's exhibit, then it should be marked Proponent's exhibit because I didn't offer it. I just have no objection. I can clarify this. As I said, I am going to move for a continuance and I will explain that fully at the proper time when Mr. Hinkle finishes his cross examination.

MR. HINKLE: If the Commission please, Mr. Aguilar's testimony is largely based upon the work that they did under the directive of the Conservation Branch of the U.S.G.S. which resulted in the preparation of this plat, which in their opinion shows the potash area or the areas that are underlain with mineable potash and the areas which have indications of potash, and if this plat is not going to be offered, because his evidence is based entirely on this, that is all it amounts to, why, I move that his evidence be stricken at this time.

MR. BLACKMAN: You say that his evidence is based

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entirely on this map and I say that it is not. This is how the potash enclave was established. He said that the map was dated, I think, August 14th, 1974 and that established the date on which they made it a part of the potash enclave.

MR. HINKLE: This memorandum, which is Exhibit No. 1, refers to this map and this Exhibit 1 is a directive under which the U.S.G.S. was required to compile that map. It is all interwoven together and if the map is not going in, I don't think any of it should go in.

MR. BLACKMAN: I don't take the position that the fact that this property is within the Geological Survey potash enclave establishes that there is potash at that location. I do not take that position. I simply say that it is within the potash enclave that the United States Geological Survey was directed to do this and this is the evidence, it is in the enclave. That's all. If there is potash there, this doesn't establish it.

MR. CARR: We have properly identified it and if Mr. Blackman is not going to offer it, Mr. Hinkle, you will either have to mark it as your exhibit and proceed to use it for your cross examination, or if you are not willing to have it so marked, then you will have to proceed without the exhibit and carry on your cross examination

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without it.

MR. HINKLE: What about our motion to strike the testimony?

MR. BLACKMAN: With respect to the motion to strike the testimony, Mr. Aguilar has testified that he participated, pursuant to Exhibit 1 which is in evidence, to establish the potash enclave. This property on which the proposed location is situated is within the potash enclave, and that's it. He did not testify that there was potash there.

MR. HINKLE: I take it from Mr. Blackman's statement there that he is willing to stipulate that this plat does not indicate the existence of potash in commercial quantity.

MR. BLACKMAN: I am not willing to stipulate to that.

COMMISSIONER RAMEY: Is the witness willing to stipulate to that?

MR. BLACKMAN: I don't know whether he is or not, but I am not. You can ask him the question and see what he says.

MR. HINKLE: Your statement was that this does not indicate the existence of potash, only that Section 18

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is in the potash enclave.

MR. BLACKMAN: That's right.

MR. HINKLE: If his evidence would be limited to that, why, that's all right.

COMMISSIONER RAMEY: Mr. Aguilar, you referred to the 10th ore zone at one time. Where is that?

THE WITNESS: The 10th ore zone, of course, is the prominent ore zone that we are concerned with right in that particular area, and, of course, we also have the 4th ore zone which certainly surrounds the area and probably with additional drilling and so forth will -- probably we are going to find that the 4th ore zone is also present in this particular location. Now, we are talking about ore zones, and remember that we are moving down from the higher numbers to the lower numbers, so the 10th would be above the 4th.

MR. HINKLE: If the Commission please, if the gist of Mr. Aguilar's testimony is the statement that Mr. Blackman made is just to show that this is in the potash enclave, we have no objection to that at all. If that is all he seeks to prove with Mr. Aguilar, then we have no further questions.

COMMISSIONER LUCERO: Is that correct, Mr. Blackman?

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MR. BLACKMAN: Yes, sir, that is correct.

COMMISSIONER LUCERO: And you agree to the statement that Mr. Hinkle has made?

MR. BLACKMAN: Yes, I agree that that is all I asked Mr. Aguilar, was whether he participated in it pursuant to this Order, that it is in the potash enclave, having been placed there by the United States Geological Survey. Beyond that, what that means --

COMMISSIONER LUCERO: (Interrupting) Then, at this point, the map has just been marked for identification purposes and is not being offered by either side?

MR. BLACKMAN: Not by me.

MR. HINKLE: Does that conclude your examination?

MR. BLACKMAN: That concludes my examination of this witness. I have one more witness.

COMMISSIONER RAMEY: The witness may be excused.

(Witness dismissed.)

(Whereupon, Protestant's Exhibits Nos. 3, 4 and 5 were marked for identification.)

JOSEPH B. CUMMINGS

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

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BY MR. BLACKMAN:

Q Would you kindly state your name, please?

A Joseph B. Cummings.

Q By whom are you employed, Mr. Cummings?

A By Potash Company of America, Division of Ideal Basic Industry.

Q Mr. Cummings, would you kindly tell us what your academic qualifications are, where did you go to school and what degrees do you have?

A I have a Bachelor of Science Degree in Mining Engineering from South Dakota School of Mines, graduating in 1935.

Q Please outline your experience record for us?

A Well, for a period of 6 years following graduation, I was employed by small gold mining operations in the Black Hills in South Dakota. I spent approximately 5 years with the U. S. Bureau of Mines at the southwest experimental station in Tucson, Arizona in exploration and evaluation of mineral properties throughout the State. For the past 29 years, I have been employed by Potash Company of America in the exploration department. My positions include Exploration Engineer, Chief Geologist, Field Superintendent and Resident Manager of the Saskatchewan potash operation,

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and presently, I am Administrative Assistant in charge of all exploration for the Company. In the past 19 years, I have been in charge of all of their exploration and have been responsible for maintaining ore reserves in the Carlsbad operation, exploration for potash in other States in the United States and in Canada, and evaluation of deposits in South America, Africa and the Far East.

Q Mr. Cummings, I hand you a document marked as Protestant's Exhibit No. 3 and ask you if you would kindly identify that document?

A This is a booklet prepared by several potash companies which in general describes the potash industry in New Mexico.

Q Have you read that booklet, Mr. Cummings, and know what its contents are?

A Yes.

Q Your testimony is that you have been connected with the potash industry for many years. Would you kindly state whether in your opinion that book fairly represents the present status of the potash industry in a very general fashion?

A Yes, it does. I have changed the name of Teledyne Potash Company in the booklet to take note of the change

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in ownership. I have changed the name to Mississippi Chemical Company. It represents the industry in a general manner, using as it does, 1973 figures. It does not reflect the exploration program now being conducted in Lea County by Noranda which is a subsidiary of Noranda Mines of Canada and an exploration program being conducted by Day Mines, Incorporated which is a United States mining company, and the current exploration program being conducted by Potash Company of America, Division of Ideal Basic Industry.

Q Mr. Cummings, your testimony is that in this booklet at anyplace the name Teledyne Potash occurs, it should be changed to Mississippi Chemical Company?

A Yes, sir.

Q Are you familiar with the provisions of the contract entered into last year between Ideal Basic Industries and the Hall Trust of Fort Worth, Texas in which Ieland Hodges is Trustee?

A Yes.

Q Is that the entity that owns the Federal and State potash leases in the general area of the proposed location?

A Yes.

Q Would you please outline the provisions of that contract which are pertinent to this inquiry?

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A The contract with Ideal Basic Industries is an exploration contract which provides that Ideal will drill a minimum of 15 holes on the Hodges property, and thereafter, could maintain the exploration agreement in existence by continuous drilling. The drilling program is now going forward and we expect to continue it for some months after we have drilled to the extent which in our opinion is sufficient. The contract allows one year for evaluation and feasibility studies and at that time we either commit ourselves to an operation or back off. In the event that we commit to an operation, the Hodges people can come in on a partnership basis if they desire.

Q Mr. Cummings, how many wells have been drilled to date on this program and what wells are now drilling?

A We have completed 36 wells and are now drilling Nos. 37 and 38.

Q I hand you a document marked for identification as Protestant's Exhibit No. 4 and ask you if you will identify that document, please?

A This is a large map of the general area in which exploration is being conducted.

Q Now, Mr. Cummings, I hand you a document marked Protestant's Exhibit No. 5 and ask you if you will identify

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that document?

A This is a larger scale map of the area surrounding the proposed drilling location for the proposed oil and gas test.

Q Mr. Cummings, were these maps prepared by you or under your direction?

A Yes, they were.

Q How long does it usually take to drill a well and complete all analytical work and plot the results of all the work on one of your geological maps in order to determine with rather some specificity just what the condition is with respect to the presence or absence of potash?

A At the present time, we have two drilling contractors, each with one rig operating. The time is variable. It takes anywhere from one week to 10 days or two weeks to complete drilling the well, and then to assemble the -- do the analysis and assemble the information, it takes a similar period. The analytical work is quite involved in that these are mixed ores. It is not only involved, but it is a very crucial part of the work inasmuch as many millions of dollars will hinge on the results of this work.

Q To digress a moment, the contracts we have with the drilling contractors, Mr. Cummings, are those turnkey

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contracts in which they receive a certain amount of money per foot of drilling no matter how long it takes them to do it?

A Pretty much so. There is day-work stipulations which is minor.

Q But the drilling companies would have an incentive to proceed as fast as they can if they are paid on a footage basis?

A Right, for the most part.

Q Is most of the land in the vicinity of this drilling activity leased for potash from either the State or Federal government, is that true, Mr. Cummings?

A Yes.

Q Are there any tracts of land in this vicinity which are not so leased?

A Yes. There are some tracts in the area, all United States government potash which are part of the so-called known potash area. Those tracts may not be leased by the Federal government under the ordinary leasing procedure.

Q How will those tracts be leased by the Federal Government, Mr. Cummings?

A They are usually not leased until the owner on the adjoining potash lease requests the Department of the

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Interior to put the tracts up for lease. The rules and regulations governing the conditions upon which leases will be granted will be made at that time. In the case of the known potash area tracts which I mentioned, those tracts are on boundaries between leases owned by International Minerals and Chemical Corporation and leases owned by Hodges Trustee group. I would expect that should either of the parties request the area be put up for lease, the Government would only issue leases after competitive bidding between the parties that are interested.

Q Mr. Cummings, why do we object to the drilling of oil and gas wells through potash deposits?

A Potash mines in the Carlsbad area are free of gas. Were we to mine in such fashion that the adjacent support would be removed, subsidence would take place and forces of tremendous magnitude would be exerted upon the well casing. It could rupture, causing leakage of gas into the mine which would create enormous hazards for our employees and increase the cost of mining substantially, perhaps even to the point of unprofitability. To guard against this, there is a uniform practice in the potash industry to leave a solid pillar around the well casing, having a radius of about 200 feet in which no mining will ever be done, and

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to leave the pillar surrounding the casing of a radius equal to the depth to the potash measures into which only first mining is conducted. This potash is of quite considerable value and has to be left in the ground for the safety of mining operations.

Q Do you think it will probably ever be recovered?

A No, I don't think so.

Q Mr. Cummings, assuming the grade and thickness of potash ore which you expect to encounter in this general area, what would be the value of the potash loss if a well were drilled at the proposed location?

A It would be a minimum, perhaps --

MR. HINKLE: (Interrupting) We object to that question. This is all hypothetical. He hasn't proven that there is potash existing under the location.

COMMISSIONER RAMEY: The objection is sustained.

BY MR. BLACKMAN:

Q Mr. Cummings, we assume that at this location of the proposed Mesa Petroleum test that there is potash ore of a grade and thickness of four feet of 10 percent K20 equivalent. How much of that potash would be lost in the event a petroleum or oil and gas test is drilled on that location?

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MR. HINKLE: We impose the same objection.

MR. BLACKMAN: At this time he has qualified as an expert in this particular area, and I have asked him, assuming there is potash there of four feet 10 percent of grade and thickness what would be the value of the potash lost in the pillar. That is a perfectly proper question.

COMMISSIONER RAMEY: I think we have to sustain the objection.

MR. BLACKMAN: I will save an exception to that.

BY MR. BLACKMAN:

Q Mr. Cummings, do you know whether such a deposit of potash exists at the proposed location?

A No, I do not know. On the basis of presently available information, all I can do is speculate.

Q Mr. Cummings, will you kindly refer to Exhibit No. 3 and explain the progress of the drilling program to date?

A We have numbered the wells which have been drilled under this program.

COMMISSIONER RAMEY: Is this Exhibit 4, Mr. Blackman?

BY MR. BLACKMAN:

Q Excuse me. Exhibit 4.

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A To recap, we have numbered the wells which have been drilled under this program from 1 to 36. The numbering is consecutive with the order of drilling, and as I previously stated, we are now drilling Nos. 37 and 38. We have not determined the total number of wells which will be drilled.

Q Mr. Cummings, on Exhibit No. 4, it shows some round circles on there which have been shaded in pink. What do those represent?

COMMISSIONER LUCERO: Excuse me. May I interrupt? Mr. Blackman, are you referring to the specifics of that particular exhibit for the purpose of laying a foundation to introduce it into evidence or are you already having him testify from an exhibit that is not in evidence at this point?

MR. BLACKMAN: I intend to introduce this into evidence.

COMMISSIONER LUCERO: Perhaps that would be the first order of business and then you can have your witness testify from the exhibit itself.

MR. BLACKMAN: Very good. That has not been the practice here in the past, but I think that is right.

I have asked Mr. Cummings previously if this was prepared

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under his direction or by him and he testified that it was.

BY MR. BLACKMAN:

Q Does this exhibit represent the general area of the Hodges Trustee land?

A A portion of it, yes.

MR. BLACKMAN: I will offer Protestant's Exhibit No. 4 in evidence.

COMMISSIONER RAMEY: Without objection, the Exhibit No. 4 will be admitted.

COMMISSIONER LUCERO: Any objections, Mr. Hinkle?

MR. HINKLE: No objections.

COMMISSIONER RAMEY: It will be admitted.

(Whereupon, Protestant's Exhibit No. 4 was offered and admitted into evidence.)

BY MR. BLACKMAN:

Q Mr. Cummings, the Exhibit No. 4 contains several little circles which have been shaded in pink. What do those represent?

A Those represent, with the exception of 37 and 38 which we are now drilling, they represent drill hole locations which have been staked and approved for drilling.

Q When you say "staked and approved," who do you mean, by whom?

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A Approved by the U. S. Geological Survey.

Q Is this under the Environmental Protection Program of the Bureau of Land Management that it is necessary to have your locations staked and approved before you can even begin to drill them?

A Yes.

Q In the case of P.C.A. No. 37, which is situated in the northwest quarter of the northwest quarter of Section 18, Township 23 South, Range 30 East, are you now drilling on that location; is that true?

A Right.

Q How far is that well from the proposed Mesa location?

A Approximately 1000 feet.

Q The other well which you testified was now drilling which is also shaded in pink is P.C.A. No. 38 in Section 15, Township 23 South, Range 29 East?

A Right.

Q There are also in Section 13 some crosses. What do those crosses represent?

A The crosses represent holes that have been staked but have not been approved for drilling by the necessary governmental agencies.

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MR. BLACKMAN: If the Commission please, I will offer into evidence Protestant's Exhibit No. 5 which Mr. Cummings testified was prepared under his supervision and is simply a blow-up of part of the area shown on Exhibit 4.

COMMISSIONER RAMEY: Without objection, Exhibit 5 will be accepted into the record.

(Whereupon, Protestant's Exhibit No. 5 was offered and admitted into evidence.)

BY MR. BLACKMAN:

Q Mr. Cummings, referring to Exhibit No. 5, as I understand it, we are now drilling P.C.A. No. 37 which we designated for convenience "C" on the map. How far did you say that was from --

A (Interrupting) 1000 feet.

Q Mr. Cummings, are you in charge of the drilling program in this area for Ideal Basic Industries?

A Yes.

Q Do you definitely intend to complete P.C.A. Hole No. 37 which is also designated "C" on the map?

A Yes.

Q Do you definitely intend to drill and complete wells which are designated "A" and "B" on Exhibit No. 5?

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A Yes.

Q In what order will those wells be drilled?

A Well, it makes very little difference. Both sites are prepared and it makes very little difference, but probably we will drill "B" and then "A" but it doesn't make too much difference which you drill first. They are definitely going to be drilled.

Q How far is location "B" from the Mesa proposed test?

A It is approximately 1000 feet.

Q How far is location "A"?

A About 800 feet.

Q Mr. Cummings, when you have drilled those three holes and the cores have been analyzed, will you then be able to calculate whether mineable potash exists at the proposed drilling site?

A In the event that all of the holes -- that is, "A", "B", and "C" -- are barren of potash or of submarginal grade, it is my opinion that the likelihood of drilling of potash at the drilling site itself, that is, the proposed location, the existence of potash there would be very remote.

Q Mr. Cummings, should that situation occur, what would be your recommendation with respect to the drilling

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of the proposed Mesa well?

A I would recommend that we withdraw our protest.

Q To repeat that, if all three holes are barren or of such submarginal potash that it would be disregarded, you could safely assume the absence of potash at the proposed site?

A Yes.

Q You would need no further information at all?

A No.

Q Suppose that one or more of those three holes, "A", "B" or "C" indicates potash, would you then need more information?

A Yes.

Q How much more information?

A That would depend upon the results obtained to date, or to that date. We would follow the trend of the indicated potash deposit and determine its extent. It is not possible now to state what additional information would be required. We would have to wait to see until we have drilled the holes and then determine what further drilling information would be necessary. There are so many possible variations that it is not possible now to state just what further information would be required.

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Q Mr. Cummings, assuming the worst conditions of bad weather, drilling difficulties, loss of circulation, rig breakdowns, strikes, vacations of key analytical personnel and other horrible happenings, how much time might it take to acquire all pertinent information to enable you to make a professional evaluation of the existence or non-existence of mineable potash at the proposed drilling location?

A All things considered, we should be able to acquire this information by October 1st, 1975.

Q Do you think you might be able to get it by the 1st of August, maybe?

A No.

Q How about the 1st of September?

A It might be possible, but I wouldn't promise it. I feel that barring the most unusual unforeseen events, we should have the information by October 1st.

Q Mr. Cummings, can you now say what information may be pertinent to this question of whether the well should be drilled at that time?

A No. What is pertinent at that time will depend upon what is known at that time. It could be little or no additional information beyond the three wells, "A", "B" and

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"C" and it could be that substantial information would be pertinent. As of now, it is pure speculation.

MR. BLACKMAN: If the Commission please, as I stated earlier, it is my intention to move for a continuation. At this time, we move for a continuance in this case, and I now wish to present to the Commission a motion to quash the subpoena duces tecum which has been issued in this case.

There is one original and several copies. I will read this motion to quash the subpoena duces tecum into the record:

(Reading) Come now Ideal Basic Industries, Inc., and J. B. Cummings and move that 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 and analyzed and evaluated, geologically, it cannot be ascertained whether any of such material will ever become pertinent to the issue before the Commission.

(3) In the event that the three core test wells to be drilled in the locations northeast, northwest and

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south of the proposed location should be barren of potash, none of the materials subpoenaed will ever be pertinent to the question before the Commission. 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, 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 competitive bidding for the Federal leases in the nearby known potash area. In the alternative, we move that the return day of the subpoena duces tecum be advanced to the date set by the Commission for continuation of the hearing to commence June 12, 1975.

(End of reading.)

I would like to make a statement in that regard, if the Commission please. This is an unusual case to appear before the Commission. It is a matter of first impression as far as I am concerned where we have Federal potash and State oil and gas. I state that there could be in this case, if there is potash present at this particular location, there could be over a million dollars in valuable potash lost to the State of New Mexico. The loss to Ideal

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Basic Industries would be something less than that because we would lose the profit on it, but the loss to the State would be somewhere in the neighborhood of one million dollars because of the labor and utilities and other materials which are purchased by the potash industry and used. I think you can see that in the event that the drilling which we intend to do shows that there is potash there, in our opinion, it is going to be a very hard fought case, a very hard fought case. It is going to take a long time. We will have to present in detail the information concerning all of the elements of subsidence and elements of losses of potash and the whole thing. At that time we will have definite information as to how much and of what grade and thickness there is potash there if it is there.

Now, as I see the problem at this time, there is only one question before this Commission, one issue, and that is, should that well be drilled. Should that Mesa well be drilled at that location? We protested the location because we believe the likelihood is great that potash existed and the loss would be great if the well is drilled. The U. S. Geological Survey agrees to some extent and has placed this area in the potash enclave. In

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that enclave there haven't been any wells approved by the U.S.G.S. except with the consent of the potash lessee. It happens that it was in this very case that the discovery well was in this location where we consented. I will tell you why we think that there is potash there, and the Geological Survey apparently thinks there is potash there, or the possibility is good, but we could be wrong. We could certainly be wrong. There may not be any potash there. Our core tests at locations "A", "B" and "C" may establish the fact that there isn't any potash there, and if that is so, then none of the items requested in the subpoena duces tecum are pertinent to the issue.

The Statute provides -- and this is Section 35-3-7 -- for the subpoena power of the Commission. It provides that nothing herein contained shall be construed as requiring any person to produce any books, papers or records or to testify in response to any inquiry not pertinent to some question lawfully before such Commission or Court for determination.

It is our contention that until we know what the facts are here that we don't know what is pertinent. As long as the possibility exists that this could turn out to be completely blank, then nothing is pertinent, and the subpoena

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duces tecum should be quashed or, in the alternative, a new return day set to a time when we can determine what is pertinent. This question is going to be hard fought before the Commission, I can assure you, as to what is and what isn't pertinent. It is very difficult, impossible at this stage, to tell just how it can be worked out.

If those holes, "A", "B" and "C" are barren of potash and no further evidence is necessary, I state here for the record that if that happens, we will withdraw our protest and there will be no question before the Commission.

Now, if one or more of the core holes at "A", "B" or "C" indicate the presence of potash and further drilling may be necessary, it could be that further drilling would not prove potash. If that is so, our protest could not be sustained. In that case, the only pertinent information would be holes "A", "B" and "C" and the further core tests, the further tests that we have drilled in proving it negative. None of that information is now available. It is not included in the subpoena duces tecum. It only covers information which has been had in the past. It is only in the event that potash is sufficiently indicated by core holes at "A", "B", and "C" or by those core holes and further drilling that other information becomes pertinent,

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and what other information? Well, that is a dilemma because until holes "A", "B" and "C" are drilled and other work supporting those holes, if that turns out to be necessary, it can't be determined what other information is pertinent. To try to determine what is pertinent today is pure speculation. Since it simply cannot be done on the basis of present information, the subpoena duces tecum should be quashed.

On the other hand, we are committed to drill holes "A", "B" and "C" and Mr. Cummings has so testified. He has also testified that we will conduct such further drilling as is necessary to establish the boundaries of any potash deposits which may be discovered in this area.

We fully realize that to sustain our protest, we must produce evidence, and that in all probability potash exists at the proposed location. We will have to prove that in order to sustain our protest. To establish those facts, it will be necessary that we present the results of core drilling at locations "A", "B" and "C" and such other core information as is available and determined to be pertinent to the question before the Commission.

Our point is that at this time, right now, right now, we don't have, nor does anyone else have sufficient

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information upon which the Commission can base a decision. That information will be available at a later date, and we now move that this hearing be recessed or postponed until a later date to be reconvened at the call of the Commission with the understanding that the date will be sometime after the 1st of October, 1975, and we would there emphasize that our motion to quash the subpoena duces tecum is in the alternative and that that date could be extended down there so that all of the information would be present here that at that time could be determined just what is pertinent and what isn't. When the question of what is pertinent and what is not can be determined in connection with the evidence which will be gathered between now and then, we will present it and we will have it. To be perfectly frank with you, we do not wish to disclose the evidence called for by the subpoena duces tecum. We are sitting down here in a situation where we have -- well, we have another potash company, International Minerals which has property adjoining this property, and there is still a third potash company, Duval Corporation, who have property that doesn't directly join us, but they join International. Those two companies are already in the business of producing langbenite ore and sulfate products that come from langbenite ore, and it would be very

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very valuable to them to have the exact core information on the property that we hope to develop. It would be very similar, and it would be very valuable if we had the information on their's, but we don't have it. You can see that in a competitive situation where you began to get anywhere near the marginal area, one company having that information and the other not having it, the first company would be placed in a substantial disadvantageous position.

The other problem that we have is with this known potash area. Now, the known potash area, which is all Government, is the parts that we are interested in which is in a string of 40's, 40-acre tracts, probably a dozen or 15 of them or something like that which exists between the lease area held by International Minerals and Chemical and the lease area held by Hodges. They have been permitted at some other time to other people and core tests were drilled on them or drilled nearby to the extent that the Geological Survey determined that they contained potash, commercial potash, and therefore, they do not lease them under the ordinary system, the ordinary system being that if you should ask for a potash prospecting permit, they give it to you, you drill a hole and if you find potash you are entitled to a lease, We don't do that, We say that

we already know that there is potash here, and in the instances that this has happened before, they have stated an upset price, stated what the conditions of the lease are going to be and then put it up for bid among all the people who might be interested.

I think that you can see that we would be in a very disadvantageous position if International had the information if we responded to the subpoena duces tecum here and produced that core hole information. They would get it.

Now, again, we understand and we fully realize that at some time we are going to have to produce what parts of it are necessary to sustain our protest before the Commission. Mr. Hinkle stated in his initial presentation at the start of this that the Order R-111 which has subsequently been amended many times before which was issued by the Oil Conservation Commission to deal with the potash problem, the problem of oil and gas drilling in potash areas. Exhibit No. 1 which was introduced in evidence here is another document which has to do with the drilling of oil and gas tests on potash property. Now, this applies to Federal land, and the extent to which it applies or doesn't apply to this particular case is a very nice question

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because the State owns the oil and gas and surface, and the Federal Government owns the potash. In any event, there have been other representations and negotiations and hearings and things on this thing. In particular, in 1973, representations were made by the New Mexico Oil and Gas Association and the New Mexico Mining Association on behalf of the potash industry to the Department of the Interior in Washington. Hearings were held in Washington and in Albuquerque and those hearings resulted in the issuance of an Order by the Department of the Interior providing for the potash enclave. That was Exhibit No. 1 that we have placed in evidence here. That Order governs the operations in the potash enclave also. Copies of those representations were furnished informally to the New Mexico Oil Conservation Commission at about the same time it was presented to the Interior Department in Washington by the potash industry. They were presented informally to Mr. Porter, and I am sure that the representations are in his office, the brochure which the potash industry prepared. I have a couple of extra copies which I can furnish for the edification of the Commission. I believe that particularly since we have the problem here of both Federal potash and State oil and gas that the Commission should take official notice under

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Section 4-32-11-G of the New Mexico Statutes which governs administrative procedures and the brochure presented on behalf of the potash industry. I haven't any objection to similar notice being taken of the New Mexico Oil and Gas Association's brochure if counsel so proposes.

To recapitulate, I move that the hearing be postponed to a date after October 1st and that the subpoena duces tecum be either quashed or the return date extended to a new hearing date.

We feel very strongly that at this time no information requested in the subpoena duces tecum is pertinent to the question before the Commission at this time, but it may become so pertinent, we fully admit, and we think that in a case of the importance of this case it is important, a very important case, it is going to be very hard fought and it is going to take a long time to do it. I don't think the Commission should make a move without the evidence which we will produce in drilling these three wells. We will drill the three wells and drill whatever else is necessary to prove it out.

I would renew my motion now -- I believe it is in order -- that this be postponed to about October 1st because by that time, we will know what we have. I think

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that an indefinite postponement would be in order. It has been done before, subject to the call of the -- Mr. Porter used to do the calling by getting people on the telephone and agreeing on a date. That can be done. The Commission can certainly order the date at its convenience.

COMMISSIONER RAMEY: Is that all you have to say?

MR. BLACKMAN: That's all I have to say. I was hoping to avoid a large quarrel now on the preliminary problem because when we get to the main hearing, we are certainly going to have to go over it all again.

MR. HINKLE: If the Commission please, I would like to respond very briefly to Mr. Blackman's motion for continuance and also to quash the subpoena.

As I indicated in my opening statement, Order R-111-A is a two-way street. It contemplates simultaneous development of both potash and oil and gas and the Federal directive in that regard does exactly the same thing. Now, when Order R-111 was enacted, it provides that delineation of an area including and containing potential oil and gas reserves within which are commercial potash deposits, and that both promulgation of rules and regulations for the orderly development of oil and gas resources in such area known to be productive of potash is within the authority of

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the Commission for the protection of correlative rights, the promotion of conservation and the prevention of waste. Now, in this case, we've got definitely an established gas pool provided for in two different zones, the Strawn and the Morrow formations. The well which is before the Commission for approval is a development well, and this Order R-111-A states in effect that no mining operations will be conducted -- and the drilling of test holes and so forth is a part of mining operations -- which will unreasonably interfere with the orderly development and protection from any oil or gas pool. That is very clear. I don't think there is any question about it. Now, we are prepared to go ahead with this case, and I think it should be based upon conditions that exist today, not what they might be by drilling of additional holes.

Now, in June of 1974, again in January of 1975 and May of 1975, P.C.A. was approached on drilling wells in Section 18. We even talked about maybe sharing the cost. They said, well, if you want to drill them, you go ahead and drill them at your cost. So, they have had plenty of time to drill core tests in Section 18. Now, even if this case is delayed until October and one of these wells indicates some potash, it wouldn't be conclusive. Before

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you can establish mining conditions, you are going to have to drill maybe a dozen wells in Section 18. That's true, you can look at Exhibit 4, and in Section 11 I believe you will find they have drilled 12 wells there, and in Section 12 they have drilled to about the same density, but they don't own part of that, so it is going to take a long period of time to definitely establish whether there is commercial deposits of mineable potash ore in Section 18.

Now, the Order R-111 also provides that potash companies shall file with the Commission plans of development on a three to five year basis. Now, the evidence in this case I think would show that they haven't filed any plans of that kind. Are we supposed to wait until they file a plan and then when they file a plan, wait until there is exploration of that plan? I don't think so, because under the Order, as I have explained, we are entitled to the orderly development of the oil field and the gas field which has been found.

Now, we also have on the docket here when we proceed with the case, a proposition of adoption of special pool rules which includes 640-acre spacing. The reason for that is to cooperate with the potash industry in drilling just as few wells as possible which will effectively and

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efficiently drain that pool. Now, we have located the No. 2 Well, and I think this will be brought out in the evidence if we proceed with the case, at a position which is the best strategically structurally location we think in Section 18, and the No. 1 Well and the No. 2 Well taken together is not -- even if potash exists -- is not going to make a whole lot of difference because there is not too much involved. They will have all the rest of Section 18 if we only drill one well in a section. They will have all the rest of Section 13 where the No. 1 Well is. That will be dedicated to that well. So, we are trying to be cooperative and reasonable, but we are entitled to the development of this field in an orderly manner.

Now, as you know, because of the energy shortage, gas is in a critical condition. It needs to be produced. There is a market for this gas, and we think the evidence will show that they can run all the gas that they can produce and that all additional wells that they drill, they can run it and it is needed.

Now, I think that Mr. Blackman has indicated the real reason he does not want to present or give us the information on these logs, and that is that he doesn't want to disclose that information to the other potash companies.

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That is a matter between them, but I can sympathize with his position. I understand why he wants that, but he has indicated to us before that by the drilling of all these wells, they intended to establish a trend which would go across Section 18 in order to show that there might be, by extrapolation of this trend, potash in Section 18.

Under the present state of the drilling there, we think that all these well logs are material to show whether or not he has established this trend and whether there is any possibility that this can be projected over and across Section 18. We think that the production of these logs is very material if we go ahead with the case and we think that the Commission should go ahead. As I stated, we are prepared to go ahead and if the Commission denies this motion, I intend to request that this case be consolidated with the other case on the docket for the adoption of the special pool rules with 640-acre spacing and that we proceed with the case.

MR. BLACKMAN: If the Commission please, the original R-111 order and its amendment at the present time provides that oil and gas operations shall not unreasonably interfere with potash development and potash development shall not unreasonably interfere with oil and gas

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development. The orders of the Secretary of the Interior with respect to Federal land provides the same thing. In other words, it doesn't say anything. It is like the old supposedly statute in Nebraska which said that when two trains meet at a crossing, neither shall proceed until the other shall pass. That is the same thing that has happened in the Federal rules and the same thing that happened in the State rules. It is up to the Commission to decide what to do in this case. I would call to your attention and remind you of the statute which provides that the Commission has the responsibility for preventing waste of potash, and in this case there could be a substantial waste of potash if it happens to exist there.

Mr. Hinkle said that we had plenty of time to drill in Section 18, but that does not allow for the orderly drilling in an attempt to really establish an ore body. You do not establish an ore body, a potash ore body by poking holes out at random like you might call wildcatting because you don't prove very much when you get a well out there with a core that shows some potash. Actually, it shows you that you have a core of about 2½ or 3 inches in diameter and a few feet in length which shows you that you have some potash. You need to acquire a large amount

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of additional information from which you can make reasonable geological inferences to go along, and in this case when we are trying to establish an ore body here and decide whether we can establish a mining operation, we move out, as Exhibit No. 4 shows, about a quarter of a mile of set locations. It has been our experience that that will give us sufficient information so that we can go to the bank and borrow money on it if we establish a sufficiently large body of potash.

Now, we cannot tell, with respect to what Mr. Hinkle said about this trend, is this part of another ore body? Is there potash there? That's the first question. The second question is, if we find potash, do you have enough that you can mine it by itself, and if you don't have enough to mine it by itself, is it accessible from other ore bodies that can be mined? Is it connected to something else? This is matters which will be pertinent, certainly, when it comes. They are all in the future because most of this information is yet to be obtained. If an ore body extends out in this area and goes on, we will know it by the time October gets here. We certainly don't know it now.

The plan of development that Mr. Hinkle refers to

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is, in my opinion, not at all applicable to the situation. This is an exploration program that we are on now. The plan of development which is in the R-111 regulations is simply to provide the Commission with the situation on an annual basis as to what the situation is in each mine and what they think it will be in the next five years. I think there is a vast difference of opinion as to what the real effect of that is. I contend that it is very simple. It has no effect other than to advise the Commission of what the situation is and to make it available to the general public who can come in and look and point out what is going to happen to some degree.

Now, I feel that we can sit here and argue about this matter, argue back and forth about what is involved and what isn't involved, but it all boils down to the fact that there is a single issue before this Commission. Should this well be drilled and will it cause the waste of potash, and as of the present time, we simply do not know. We do not know, and under those circumstances, it seems to me that the Commission, if they decided that this well should be drilled on the basis of the information that we now have, it cannot be connected up. We cannot tell you whether there is potash there or not. We say that

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it certainly looks to us like there is, and it looks to the U.S.G.S. like there is and we are going to have to find it out. We have already spent a large amount, a tremendous amount of money and we intend to keep right on spending it to see if we can't develop a new industry for the State of New Mexico. With respect to the energy shortage, there is also a shortage of food, so fertilizer is just as important as energy, and perhaps even more important, if you look at it that way. We have to look at these things in a broad picture, it seems to me. If the Commission is to decide a case which is going to mean the possibility, a very real possibility of a million-dollar loss to the State, they certainly should have all of the information. We don't have it, but we are going to get it.

I see absolutely nothing unreasonable about this request for an extension of time. I would state to the Commission that at the time the Nash Unit was first established and the first agreement was made up by the Geological Survey in Roswell and sent to Denver, it contained a clause which is somewhat ambiguous, but in effect provided, in my opinion, that there wouldn't be any drilling in the Nash Unit for two years, at least so long as potash exploration within the unit was continuing, and it certainly is

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continuing. Now, that was thrown out of the agreement in Denver, but at that time, Mesa didn't think it was an unreasonable length of time, and to me, an additional four months doesn't amount to very much in the lives of any of us, and the Commission, at the end of that time certainly will have evidence on which to determine the matter that hopefully will stand up. It might be appealed, but we would hope that at that time it could stand up. On the basis of this information in this situation, I would think that any decision of the Commission would certainly be appealed. We would be fighting in court all summer anyway.

COMMISSIONER RAMEY: For my own information, Mr. Blackman, this million dollar figure, where is this coming from, the million dollar loss to the State?

MR. BLACKMAN: Well, the basis for that, Mr. Ramey, is this: Mr. Cummings has testified that a large amount of potash would be lost in the event that we have to leave pillars and things of that kind to support the well if one happened to be drilled. Now, this has been established before the Commission many times. The amount of money involved depends on the depth of the potash measure and the grade and thickness of the potash which is there. I simply stated for the record -- it was, I admit, the objection to

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that particular evidence was sustained, but I would ask that the Commission take judicial notice of the record in many other cases in which the value of the potash pillar has been established as being several million dollars, 10 or 15 in some cases, if it happens to be deeper, because the deeper it is, the wider the pillar has to be left. For the purpose of making my motion for continuance, I decided not to go further into that. I can go further into it with Mr. Cummings and get his exact method by which he calculated the value of the potash if the Commission would like me to. This is a very important case. If a potash operation is established out here, it will be a new mine and it will involve many many millions of dollars. That is why this is an extremely important case so far as Ideal Basic Industries is concerned. It is extremely important.

MR. HINKLE: If the Commission please, before Mr. Blackman made his motion, I was not permitted to go ahead with cross examination of Mr. Cummings, but I believe that Mr. Cummings will admit that this is the case: That the drilling of the P.C.A. No. 37 Well was just started yesterday or today and that these locations for the other wells in 18 have all been made since the Application was filed and the protest has been filed, so it is very apparent

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that the purpose of this stepping over here and drilling this thing is to try to avoid this hearing.

Furthermore, I wish to state again that this location that we have selected is the best location structurally that will be revealed by our structural maps to stay as close to the present No. 1 Well so as not to interfere with any other potash that might be in Section 18. That location would be requested regardless of the fact that there is definitely established potash to be present at that location. So, we are going to have this facing us in the future even if they go ahead with their drilling and find that this is all underlain with potash. We are going to still make the same location because it is the best location structurally in the orderly development of this gas field which we think we are entitled to have under R-111.

MR. BLACKMAN: I would say with respect to that that I have already shown why we are drilling the way we are. We come out from the center and move out step by step which is the proper way to establish and locate an ore body. We might find here, as I have said before, an island in this location, and I would remind the Commission that we provided the location on which the discovery well was

made. We withdrew our objection to a location. I didn't state that correctly. Mesa had filed an Application for a location in Section 12 which is about a mile from this location. We had objected to the location. The proposition was set for hearing before the Commissioner and we offered and worked out another location which was within Section 13 because Mesa did not have time, had that hearing been successful -- we thought we could lick them on Section 12 -- had they had the hearing and failed to get permission of the O.C.C. to drill that well, there was not time for them within the remainder of their lease to advertise an unorthodox location. We stated that we would allow them to drill in Section 13. At that particular time, I thought that I had an understanding that the provision of the original unit agreement, ambiguous as it is, would be in force if we gave them that location. It didn't work out that way. It turned out that I thought wrong, but it was thought at that time that two years from about a year ago would not be an unreasonable length of time. As I said, we may find an island at this location and we might find one some other place, and if this turned out to be the location to drill, it probably wouldn't have been the one they made the discovery on, but it turned out to be a pretty wonderful

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location. I would think that in this situation that it would certainly be subject to the allegation of arbitrary and capricious action, and if the Commission went ahead without these drilled wells, and we are going to drill. We had a hard time getting the extra rig, and we finally got two rigs, and those were the only two rigs.

COMMISSIONER RAMEY: Mr. Hinkle, do you plan to cross examine this witness?

MR. HINKLE: Well, I was only going to cross examine him on the proposition of when these locations were made. I think I have already stated, and I think Mr. Cummings will admit that --

THE WITNESS: (Interrupting) Yes, they have been made within the past month.

MR. HINKLE: And this No. 37 Well was just started today or yesterday?

THE WITNESS: Just started. But I would like to point out that this wasn't done for the timeliness of this meeting or this hearing. If you will refer to Exhibit No. 4--

MR. BLACKMAN: (Interrupting) Just a second. I believe you answered the question.

THE WITNESS: Okay.

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MR. BLACKMAN: We could go back and forth here and try to bring out a lot more information.

COMMISSIONER LUCERO: At this point, it appears that you have made a motion in the middle of the direct testimony of a witness.

MR. BLACKMAN: Yes, sir, I have.

COMMISSIONER LUCERO: I think, first of all, we should ask if you are through and then ask Mr. Hinkle if he wishes to cross examine.

MR. HINKLE: I hate to waste the time of the Commission, but I think you understand our side of it.

COMMISSIONER RAMEY: I would like to recess and rule on this motion at 1:15.

MR. BLACKMAN: May I ask the indulgence of the Commission in asking one more question of the witness before the noon recess.

COMMISSIONER RAMEY: Do you have any objections, Mr. Hinkle?

MR. HINKLE: No.

BY MR. BLACKMAN:

Q Mr. Cummings, would you explain why we developed this property the way we did in the orderly development program?

COMMISSIONER RAMEY: I really don't think that matters. I think we ought to give the Reporter a rest. We will recess until 1:15.

(Whereupon, the lunch recess was held.)

AFTERNOON SESSION

COMMISSIONER RAMEY: The Hearing will come to order. Mr. Blackman, may I ask you a question? Would you make the core information available on those wells surrounding the proposed Mesa site to Mesa as soon as you have the information?

MR. BLACKMAN: Just a minute:

(Whereupon, a discussion was held off the record.)

MR. BLACKMAN: Yes, sir, we will.

COMMISSIONER RAMEY: We request that you do this. We are going to continue this case until September 3rd. We feel this should be ample time to drill the wells around this location.

MR. BLACKMAN: We will try our best to do it by that time. If we don't do it, we will come in and have a hearing anyway. We will have all of this material that we are talking about. The only thing we might not have is if something goes wrong. This is an on-going program, and it keeps on going and there might be something out there that we might not have, but it looks to me like we should have it.

COMMISSIONER LUCERO: Mr. Blackman, I believe you stated in your unsworn statement that if you develop

information from these three tests that there was no potash there or that there was no potash except for traces, your client would dismiss this case, is that correct?

MR. BLACKMAN: Yes, sir.

COMMISSIONER LUCERO: Therefore, at least upon the information based upon these three wells, you would be in a position to evaluate whether or not you wish to continue the case or dismiss it, is that correct?

MR. BLACKMAN: Almost. We have this feeling about it: When we are in this position of trying to guess what is going to happen on three wells, I have to leave a crack in the door, because if the three wells are barren, the answer is "yes," but if one of them or two of them show reasonable areas of potash, then we will have to do some more drilling to find out what is at the other locations to see if it justifies going forward, and it could say no, and it could say yes.

COMMISSIONER LUCERO: What you are saying now is that it also could say "maybe."

MR. BLACKMAN: It could say "maybe," yes. It could say no. It could say "yes." It could say "maybe."

COMMISSIONER LUCERO: I wanted to clarify that because my understanding was when you were addressing

yourself to the Commission, that based on the tests here, it would either be yes or no, but now you are saying that it might be maybe?

MR. BLACKMAN: Well, I was following myself along pretty well on my notes on what I was trying to say, and what I was trying to say was: If "A", "B" and "C" are negative, barren of potash, the answer is easy. If one of those holes shows potash, then you may have, or probably we would have to do some more drilling and that other drilling might say no, there isn't anything there. So, you might come out with four, five or six holes and say there isn't anything to it. It isn't there. On the other hand, the three or four holes you drill might say yes, we think it is there. So that based on what we can do now, we would just be speculating. I think we have to leave that crack in the door. It could go either way. It could go "yes" or "no" or "maybe," and to the best of my recollection, I tried to say just that exactly in my statement to the Commission.

COMMISSIONER LUCERO: In making the information available to Mesa, would you be in a position to do so as soon as possible, between now and September 3rd so that perhaps they might have this information on September 1st so that they can evaluate it also so that we can proceed

with the case on September 3rd.

MR. BLACKMAN: We will make the information available to the Commission just as soon as we can with what we think is an evaluation. We will go ahead and inform Mesa of that information, but you must recognize that we may have an entirely different theory about what it says than what they have. In other words, it is our evaluation.

MR. HINKLE: If the Commission please, we think that as soon as they finish these core tests they ought to furnish us with the information and at least 10 or 15 days before September 3rd so that we would be able to evaluate it.

COMMISSIONER LUCERO: This was the thrust of my asking them about this, to get it to you as soon as possible. One party's evaluation of a core test and another's is something else.

MR. BLACKMAN: With respect to these three wells, we will get it to them as soon as we can and we will give it to the Commission at the same time. When you get it they will get it and they will know exactly what it is. My problem I was thinking about, we are talking about September 3rd and that would move ourselves back into August in getting the information and that might get hairy. It

shouldn't, but it might. If it does, we will let you know. We don't want to come up here and try to have a half hearing on September 3rd. That's why we moved it up to October 1st. That's all right. We will do our best to make it.

COMMISSIONER RAMEY: Case 5496 will be continued to September 3rd. We will postpone the ruling on the motion to suppress the subpoena until that time.

MR. BLACKMAN: The return date of the subpoena will also be extended to the 3rd of September?

COMMISSIONER RAMEY: Yes.

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.

Richard L. Nye

COURT REPORTER

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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:

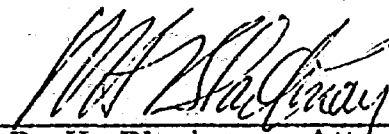
1. The material requested in said Subpoena Duces Tecum is not pertinent at this time to the issue before the Commission.
2. Until more core test wells have been drilled, analyzed and evaluated geologically, it cannot be ascertained whether any of such material will ever become pertinent to an issue before 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

Exhibits for Lone-Pine Dakota "D" Hearing
before NMOCC scheduled for June 12, 1975

1. Outline of Lone Pine Dakota "D" Pool
2. Completion Map, Hospah Area
3. Structure of Dakota "D" Sand
4. Type Log - Hanson No. 25
5. Cross Section A-A'
6. Cross Section B-B'

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

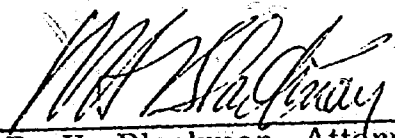
Come now Ideal Basic Industries, Inc. and J. B. Cummings and move that the Subpoena Duces Tecum heretofore entered in the above captioned matter be quashed for the following reasons:

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

CLARENCE E. HINKLE
W. E. BONDURANT, JR. (RM-1073)
LEWIS C. COX, JR.
PAUL W. EATON, JR.
CONRAD E. COFFIELD
HAROLD L. HENSLEY, JR.
STUART D. SHANOR
C. D. MARTIN
PAUL J. KELLY, JR.

JAMES H. BOZARTH
RONALD G. HARRIS
JAMES H. ISBELL

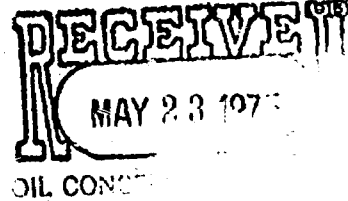
LAW OFFICES
HINKLE, BONDURANT, COX & EATON
600 HINKLE BUILDING
POST OFFICE BOX 10
ROSWELL, NEW MEXICO 88201

TELEPHONE (805) 622-6510

MR. ISBELL LICENSED
IN TEXAS ONLY

MIDLAND, TEXAS OFFICE
521 MIDLAND TOWER
513-683-4691

May 22, 1975



Oil Conservation Commission
Box 2088
Santa Fe, New Mexico 87501

Re: Application of Mesa Petroleum Co.
for unorthodox well location,
Nash Unit No. 2 well in potash area

Gentlemen:

It is our understanding that the captioned application will be set for hearing before the full Commission on June 12 due to the fact that the proposed location comes under Order R-111 as amended since it is in the potash area.

In our opinion, information with respect to all potash core tests which have been drilled in the surrounding area will be pertinent to the consideration of the case. We enclose two copies of a list of core tests which have been drilled by Potash Company of America in the area. The locations of these wells were obtained from the office of the Mining Supervisor of the U.S.G.S. at Carlsbad and which are a matter of public record.

We are having Mr. George Warnock, a Consulting Engineer of Albuquerque, make a study of the area and he will be a witness on behalf of Mesa Petroleum at the hearing. In Mr. Warnock's opinion the information to be obtained from the logs of the wells shown on the enclosed list will be pertinent to the hearing.

On May 12 we requested Mr. R. H. Blackman, attorney for Potash Company of America, to furnish us copies of the logs of these wells. After I failed to hear from Mr. Blackman, I called him today and he takes the position that furnishing the logs is not necessary and said that he would have such well logs as he thought pertinent at the hearing.

May 22, 1975

In order to prevent any delay in connection with the hearing, we would like for the Commission to issue a subpoena to Potash Company of America in accordance with the provisions of Section 65-3-7 N.M.S.A. 1953 Comp. requiring Potash Company of America to furnish to Mesa Petroleum, at least 10 days in advance of the hearing on June 12, copies of the logs of the wells shown on the enclosed list. It will be noted that the location and descriptions have been omitted in connection with several of the wells. We do not know the reason for this, but assume that it was due to the fact that the U.S.G.S. records were not complete with respect to the wells.

Your prompt issuance of the subpoena will be greatly appreciated.

Yours very truly,

HINKLEY, BONDURANT, COX & EATON

By 

CEH:cs

Enc.

cc: Mesa Petroleum Co.

cc: George Warnock

Hole No.	Designation	Location	Description
1	0349889	12-23-29 ^E	2640' from N. line & 2640' from E. line
2	0349889	11-23-29 ^E	77' from N. line & 77' from W. line
3	0349889	11-23-29 ^E	2690' from S. line & 1120' from E. line
4-S	State	2-23-29 ^E	100' from S. line & 2640' from E. line
4	0349889		
5	0349889		
7	0384585		
6	10546		
PCA #1-H-S	State	2-23-29 ^E	400' from S. line & 1400' from W. line
PCA #2-H	0349889	11-23-29 ^E	1200' from N. line & 1350' from W. line
PCA #3-H	10544	3-23-29 ^E	1420' from S. line & 387' from E. line
PCA #4-H	10545	10-23-29 ^E	145' from N. line & 1361' from E. line
PCA #5-H-S	State	2-23-29 ^E	1350' from S. line & 2100' from E. line
PCA #6-H			
PCA #7-H-S	State	2-23-29 ^E	3551' from S. line & 900' from W. line
PCA #8-H-S	State	2-23-29 ^E	2400' from S. line & 1200' from E. line
PCA #9-H-S	State	2-23-29	600' from S. line & 900' from E. line
PCA #10-H-S	State	2-23-29	600' from N. line & 700' from E. line
PCA #11-H-S	State	2-23-29	1600' from N. line & 2850' from W. line
PCA #12-H	0349889	14-23-29	100' from N. line & 2630' from E. line
PCA #13-H	0349889	14-23-29	100' from S. line & 2630' from E. line
PCA #14-H	0349889	14-23-29	2630' from N. line & 100' from W. line
PCA #15-H	0349891	20-23-30	1600' from S. line & 1400' from W. line
PCA #16	0349891	17-23-30	700' from S. line & 1900' from E. line
PCA #17	10545	10-23-29	1700' from N. line & 1400' from E. line
PCA #18			
PCA #19			
PCA #20	0349889	11-23-29	2100' from S. line & 900' from W. line
PCA #21	0349889	11-23-29	600' from S. line & 1300' from W. line
PCA #22	0349889	11-23-29	1750' from N. line & 2300' from E. line
PCA #23	0349889	11-23-29	2250' from S. line & 2500' from E. line
PCA #24	0349889	11-23-29	1000' from S. line & 2500' from E. line

OIL CONSERVATION COMMISSION

P. O. BOX 2088

SANTA FE NEW MEXICO 87501

May 23, 1975

C
O
P
Y

Sheriff
Eddy County Court House
Carlsbad, New Mexico 88220

Dear Sir:

Enclosed is a Subpoena which needs to be served
as soon as possible.

Any charges will be paid by the Commission.

Very truly yours,

WILLIAM F. CARR
General Counsel

WFC/dr

enclosure

SUBPOENA DUCES TECUM

THE STATE OF NEW MEXICO

TO: Mr. J. B. Cummings,
 Administrative Assistant in Charge of Exploration,
 Potash Company of America, Carlsbad, New Mexico

GREETING:

We command you to be and appear at 9 o'clock a.m. June 12, 1975, before the Oil Conservation Commission of the State of New Mexico, in the Land Office Building, in the City of Santa Fe, in Oil Conservation Commission Case No. 5496, application of Mesa Petroleum Company for a drilling permit and an unorthodox location in the Potash-Oil Area, Eddy County, New Mexico, and that you bring with you and produce at the time and place aforesaid Potash Core Hole Logs with complete analysis on the following core holes:

<u>HOLE NO.</u>	<u>DESIGNATION</u>	<u>DESCRIPTION</u>	<u>SEC, TWP, RGE</u>
1	0349889	2640' from N. Line & 2640' from E. Line	12-23S-29E
2	0349889	77' from N. Line & 77' from W. Line	11-23S-29E
3	0349889	2690' from S. Line & 1120' from E. Line	11-23S-29E
4-S	State	100' from S. Line & 2640' from E. Line	2-23S-29E
PCA #1-H-S	State	400' from S. Line & 1400' from W. Line	2-23S-29E
PCA #2-H	0349889	1200' from N. Line & 1350' from W. Line	11-23S-29E
PCA #3-H	10544	1420' from S. Line & 387' from E. Line	3-23S-29E
PCA #4-H	10545	145' from N. Line & 1361' from E. Line	10-23S-29E
PCA #5-H-S	State	1350' from S. Line & 2100' from E. Line	2-23S-29E
PCA #7-H-S	State	3551' from S. Line & 900' from W. Line	2-23S-29E
PCA #8-H-S	State	2400' from S. Line & 1200' from E. Line	2-23S-29E
PCA #9-H-S	State	600' from S. Line & 900' from E. Line	2-23S-29E

<u>HOLE NO.</u>	<u>DESIGNATION</u>	<u>DESCRIPTION</u>	<u>SEC, TWP, RGE</u>
PCA #10-H-S.	State	600' from N. Line & 700' from E. Line	2-23S-29E
PCA #11-H-S	State	1600' from N. Line & 2850' from W. Line	2-23S-29E
PCA #12-H	0349889	100' from N. Line & 2630' from E. Line	14-23S-29E
PCA #13-H	0349889	100' from S. Line & 2630' from E. Line	14-23S-29E
PCA #14-H	0349889	2630' from N. Line & 100' from W. Line	14-23S-29E
PCA #15-H	0349891	1600' from S. Line & 1400' from W. Line	20-23S-30E
PCA #16	0349891	700' from S. Line & 1900' from E. Line	17-23S-30E
PCA #17	10545	1700' from N. Line & 1400' from E. Line	10-23S-29E
PCA #20	0349889	2100' from S. Line & 900' from W. Line	11-23S-29E
PCA #21	0349889	600' from S. Line & 1300' from W. Line	11-23S-29E
PCA #22	0349889	1750' from N. Line & 2300' from E. Line	11-23S-29E
PCA #23	0349889	2250' from S. Line & 2500' from E. Line	11-23S-29E
PCA #24	0349889	1000' from S. Line & 2500' from E. Line	11-23S-29E

and also the following core holes, the exact locations of which are not known:

<u>HOLE NO.</u>	<u>DESIGNATION</u>	<u>DESCRIPTION</u>	<u>SEC, TWP, RGE</u>
4	0349889		
5	0349889		
7	0384585		
6	10546		
PCA #6-H			
PCA #18			
PCA #19			

And this do you under penalty of the law.

WITNESS A. L. PORTER, Jr., Secretary-Director
of the Oil Conservation Commission
of the State of New Mexico, and the
seal of said Commission, this _____
day of _____, AD 1975

Case 5496



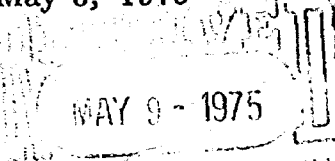
POTASH COMPANY OF AMERICA

A DIVISION OF IDEAL BASIC INDUSTRIES, INC.

MINE AND REFINERY: P. O. BOX 31 • CARLSBAD, NEW MEXICO 88220 • AREA CODE 505 • 887-2844

R. H. BLACKMAN
RESIDENT COUNSEL

May 8, 1975



U.S. DEPARTMENT OF THE INTERIOR
OIL CONSERVATION COMM.
Santa Fe

Mr. A. L. Porter, Jr., Secretary-Director
Oil Conservation Commission
State of New Mexico
P. O. Box 2088
Santa Fe, New Mexico 87501

Re: Proposed Well of Mesa Petroleum Company in
Section 18, T. 23 S., R. 30 E., Eddy County,
New Mexico

Dear Mr. Porter:

This will confirm our telephone conversation of
Wednesday, May 7, wherein I agreed to waive the arbi-
tration hearing which had been set for Friday, May 9,
since I am at that time engaged in labor negotiations and
it is impossible for me to attend the meeting.

With kindest personal regards.

Sincerely,

R. H. Blackman

RHB/jm

Transcribed in writer's absence.



MEMBER: AMERICAN POTASH INSTITUTE

DOCKET MAILED

Date _____

Case 5496

OIL CONSERVATION COMMISSION

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

I. R. TRUJILLO
CHAIRMAN

LAND COMMISSIONER
PHIL R. LUCERO
MEMBER

STATE GEOLOGIST
A. L. PORTER, JR.
SECRETARY - DIRECTOR

May 5, 1975

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

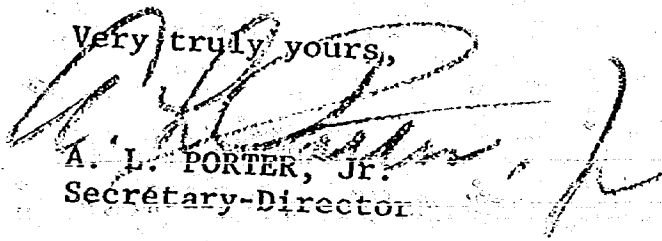
Dear Mr. Hinkle

Our Artesia Office has received objections from Mr. Roy Blackman for Leland A. Hodges, Trustee, and Mr. J. B. Cummings for the Potash Company of America to the proposed well of Mesa Petroleum Company to be drilled 1350 feet from the North line and 1300 feet from the West line of Section 18, Township 23 South, Range 30 East, Eddy County, New Mexico.

This matter has been discussed with you and Mr. Blackman individually. We are therefore setting the matter for arbitration in Room 205 of the State Land Office Building, Friday May 9 at 10 a.m., Santa Fe, New Mexico.

If the parties should agree to a waiver of the arbitration meeting, I should be notified not later than Thursday, May 8th. If the arbitration meeting should be waived the Commission will proceed to advertise the matter for hearing June 12th.

Very truly yours,


A. L. PORTER, JR.
Secretary-Director

ALP/ir

cc: Mr. Roy Blackman for Leland A. Hodges, Trustee
Mr. J. B. Cummings, Administrative Assistant for PCA
U. S. G. S. Roswell and Carlsbad
Mr. Phil R. Lucero, Commissioner of Public Lands
Mr. Bill Gressett, Supervisor, OCC - Artesia, N. Mex.

DOCKET MAILED

Date _____

To be put for
June 2 if
Mr. Heuble gets
Waiver for
talked to Heuble
He called Mess to
see if can be
be continued as
postponed 7-11-75.

BILL GRESSETT

4-22-75

Mr. Porter

The casing program on
this well does not conform
to order R-111-A.

However so far I have
not notified the operator
of this.

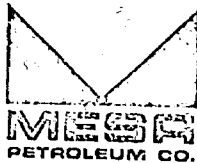
Bill

Mr. Porter

Information Copy

Permian Basin Division

April 21, 1975



New Mexico Oil Conservation Commission
Drawer DD
Artesia, New Mexico 88210

Attention: W. A. Gressett, Supervisor

Re: #2 Nash Unit, 14,000' Morrow Test
1350' FNL & 1300' FWL
Section 18-23S-30E
Eddy County, New Mexico

RECEIVED

APR 22 1975

O.C.C.
ARTESIA, OFFICE

Gentlemen:

Mesa Petroleum Co., as operator of the Nash Unit, hereby applies for a permit to drill the captioned well. Ten copies each of N.M.O.C.C. Form C-101 and Form C-102 are enclosed for your consideration and distribution. In compliance with N.M.O.C.C. order #R-111 we have this date mailed (registered mail, return receipt) copies of these forms to each of the operators who hold potash leases within a radius of one mile of the captioned well. According to information reflected by plats furnished under Article IX, Paragraph (3) of order #R-111 and information obtained from State and Federal records in Santa Fe, the only potash operators within one mile of the captioned location are Leland A Hodges, Trustee and International Minerals and Chemical Corporation.

The #2 Nash Unit will be the second test well drilled on the State and Federal Approved Nash Unit Area (14-08-0001-14168). The initial test well, #1 Nash Unit, is being completed this week as a dual gas well producing from the Morrow and Strawn formations.

We respectfully request your prompt and favorable consideration of the enclosed application, and if additional information in this regard is required please advise.

Very truly yours,

A handwritten signature in cursive script that reads 'Robert H. Northington'.

Robert H. Northington

RHN:hh

Enclosures

Copies: Leland A. Hodges, Trustee
International Minerals and
Chemical Corporation
Supervisor, USGS, Roswell
Commissioner of Public Lands
Nash Unit partners

REGISTERED NO. 1717

Value \$ NV Special Delivery \$

Reg. Fee \$ 95 Return Receipt \$ 15

Handling Charge \$ Restricted Delivery \$

Postage \$ 10 AIRMAIL

POSTMASTER (By) *Edmund*

FROM *Mesa Pet. Co.*

904 G.H.L. Tower W.

Middleburg TX

International Mineral Chem. Corp

PO Box 271

Carlsbad N.M. 88220



MAILING OFFICE

★ U.P.O. 1975-505-110

REGISTERED NO. 1711

Value \$ NV Special Delivery \$

Reg. Fee \$ 95 Return Receipt \$ 15

Handling Charge \$ Restricted Delivery \$

Postage \$ 10 AIRMAIL

POSTMASTER (By) *Edmund*

FROM *Mesa Pet. Co.*

904 G.H.L. Tower W.

Middleburg TX

Relax A. Hodge Trustee

200 Brockmeyer St

St. Worth TX 76107



MAILING OFFICE

★ U.P.O. 1975-505-110

Information Copy

NEW MEXICO OIL CONSERVATION COMMISSION

Form C-101
Revised 1-1-65

NO. OF COPIES RECEIVED	
DISTRIBUTION	
SANTA FE	
FILE	
U.S.G.S.	
LAND OFFICE	
OPERATOR	

5A. Indicate Type of Lease
STATE FEE

5. State Oil & Gas Lease No.
L-3358

APPLICATION FOR PERMIT TO DRILL, DEEPEN, OR PLUG BACK

1a. Type of Work
b. Type of Well DRILL DEEPEN PLUG BACK
OIL WELL GAS WELL OTHER SINGLE ZONE MULTIPLE ZONE

2. Name of Operator
Mesa Petroleum Co.

3. Address of Operator
904 Gihls Tower West, Midland, Texas 79701

4. Location of Well UNIT LETTER E LOCATED 1350 FEET FROM THE North LINE
AND 1300 FEET FROM THE West LINE OF SEC. 18 TWP. 23S RGE. 30E NMPM

7. Unit Agreement Name
8. Farm or Lease Name
Nash Unit
9. Well No.
2
10. Field and Pool, or Wildcat
Undesignated
17. County
Eddy

19. Proposed Depth 14,000'
19A. Formation
Morrow
20. Rotary or C.T.
Rotary

21. Elevations (Show whether DT, RI, etc.) 3022 GR
21A. Kind & Status Plug, Bond Blanket
21B. Drilling Contractor
McVay
22. Approx. Date Work will start
July 1, 1975

PROPOSED CASING AND CEMENT PROGRAM

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	SACKS OF CEMENT	EST. TOP
17 1/2	13 5/8	48	300	350	Circ. to surf.
12 1/4	9 5/8	36	3400	1000	Circ. to surf.
8 3/4	7	23-26	11,100	250	9500
6	4 1/2	13.5	14,000	325	Top of liner

Surface hole will be drilled to 300' without BOP's. Below the surface casing, 12" API 3000 psi BOP's will be used to casing shoe depth at 3400'. Salt brine will be used to drill this portion of the hole to prevent unnecessary hole enlargement. After the 9 5/8" casing is set, 10" API 5000 psi BOP's will be used to total depth. Controlled polymer brine mud will be used to drill to total depth. Maximum mud weight required to overbalance formation pressure is anticipated to be 12.2 PPG at approximately 12,100', based on experience gained while drilling the immediate offset well (Nash Unit # 1) - located in Section 13, T23S, R29E). BOP's will be thoroughly tested before penetrating this abnormally pressured section, also 7" casing will have been set at approximately 11,100'.

IN ABOVE SPACE DESCRIBE PROPOSED PROGRAM; IF PROPOSAL IS TO DEEPEN OR PLUG BACK, GIVE DATA ON PRESENT PRODUCTIVE ZONE AND PROPOSED NEW PRODUCTIVE ZONE. GIVE BLOWOUT PREVENTER PROGRAM, IF ANY.

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

Signed Michael P. Houston Title Division Engineer Date April 18, 1975

(This space for State Use) XC: 10 NMOCC, 1-MEC, 1-RHN, 1-LMC, 1-JLF, 1-M+M, 1-D+M
10 - Partners, 2 Potash Lessors, 1-MPH

APPROVED BY _____ TITLE _____ DATE _____
CONDITIONS OF APPROVAL, IF ANY:

NEW MEXICO OIL CONSERVATION COMMISSION
WELL LOCATION AND ACREAGE DEDICATION PLAT

Form O-1
Superseded O-128
Effective 1-1-75

All distances must be from the outer boundaries of the Section

Mesa Petroleum Company		Nash Unit		2
18	23 South	30 East	Eddy	
1350	North	1300	West	Sec. 18
3022.1	Morrow	Undesignated	640	

Outline the acreage dedicated to the subject well by colored pencil or hachure marks on the plat below.

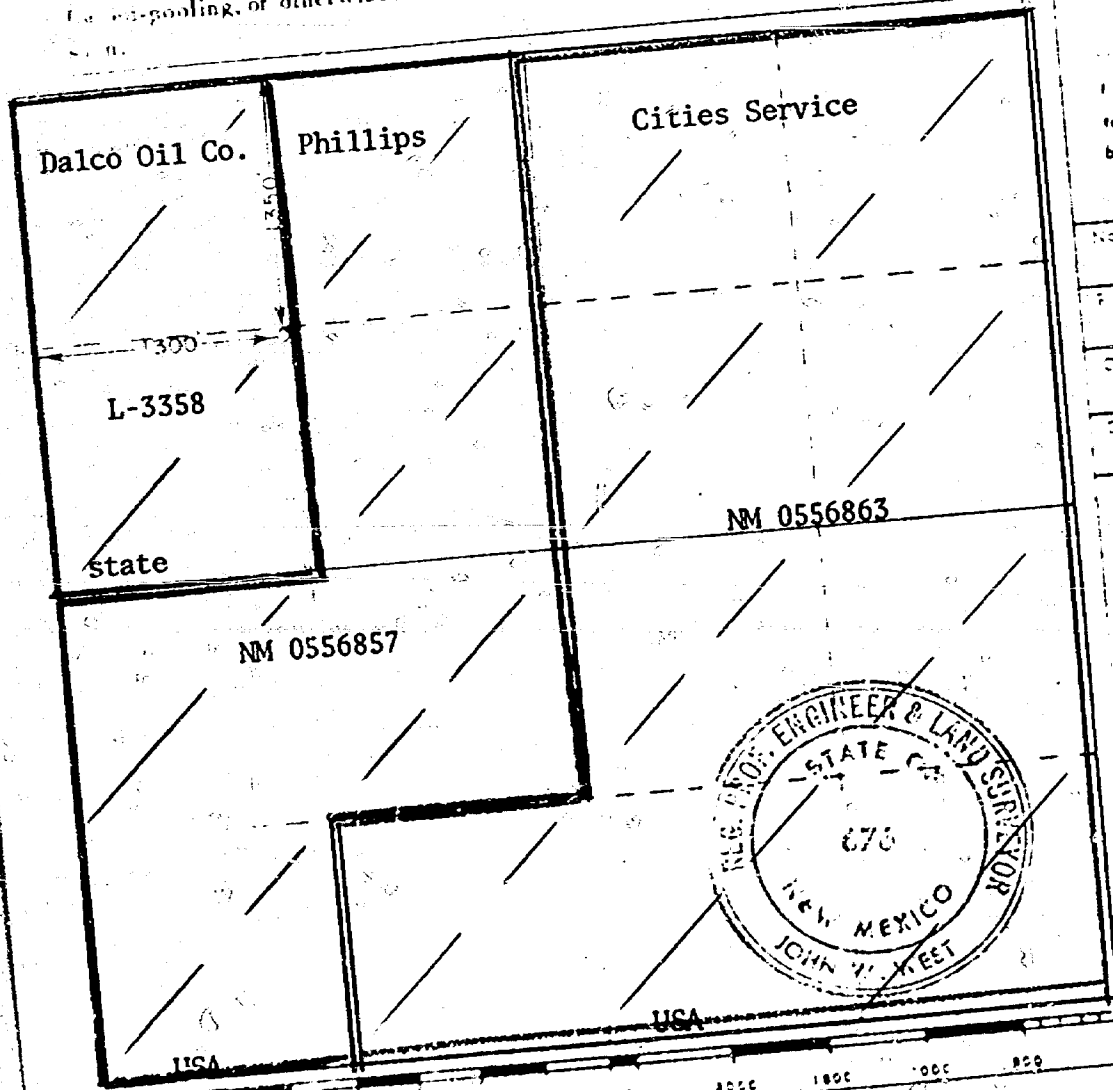
If more than one lease is dedicated to the well, outline each and identify the ownership thereof (both as to working interest and royalty)

If more than one lease of different ownership is dedicated to the well, have the interests of all owners been consolidated by communitization, unitization, force-pooling, etc?

Yes No If answer is "yes," type of consolidation Unitization (Nash Unit)

If answer is "no," list the owners and tract descriptions which have actually been consolidated (on reverse side of this form if necessary.)

Consolidation (force-pooling, or otherwise) or until a non-standard unit, eliminating such interests, has been approved by the Commission.



CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief.

Michael P. Houston

Name Michael P. Houston

Position Division Engineer

Company Mesa Petroleum Co.

Date April 18, 1975

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my knowledge and belief.

Date Surveyed April 15, 1975

Registered Professional Engineer and/or Land Surveyor

John W. West

Certificate No. 676

Case 5496

LAW OFFICES
HINKLE, BONDURANT, COX & EATON

TELEPHONE (505) 622-3510

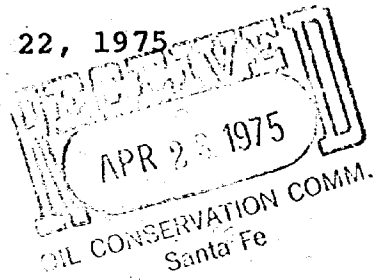
CLARENCE E. HINKLE
W. E. BONDURANT, JR. (914-1973)
LEWIS C. COX, JR.
PAUL W. EATON, JR.
CONRAD E. COFFIELD
HAROLD L. HENSLEY, JR.
STUART D. SHANOR
C. D. MARTIN
PAUL J. KELLY, JR.

600 HINKLE BUILDING
POST OFFICE BOX 10
ROSWELL, NEW MEXICO 88201

MR. ISBELL LICENSED
IN TEXAS ONLY

MIDLAND, TEXAS OFFICE
521 MIDLAND TOWER
(915) 683-4691

April 22, 1975



JAMES H. BOZARTH
RONALD G. HARRIS
JAMES H. ISBELL

Mr. A. L. Porter, Jr.
Oil Conservation Commission
Box 2088
Santa Fe, New Mexico 87501

Dear Mr. Porter:

This will refer to our telephone conversation last week in regard to Mesa Petroleum Co. filing an application to drill the No. 2 Nash Unit well which is located in the potash area. Mesa has filed a Notice of Intention to Drill the well and has mailed copies of the notice with plats showing the location to each of the potash companies, as required by applicable regulations.

We enclose in triplicate application for designation of a new pool because of the discovery in the No. 1 well which we understand has not yet been delineated; also for the adoption of special pool rules including 640 acre spacing, and approval of the unorthodox location for the No. 2 well.

As I explained to you over the telephone Mesa is extremely anxious to have a hearing on this matter as quickly as possible and we sincerely hope that you will be able to set a full Commission hearing for some time during the latter part of May.

As I advised you by telephone we have had conferences with International Minerals & Chemical Corporation and Potash Company of America. Potash Company of America indicated that due to the fact that they were in the process of drilling core holes to the northwest of Section 18 and felt that Section 18 was in a trend, they should protest the drilling of a well in said section. PCA has an option to acquire the potash leases held by Leland A. Hodges which are shown on Exhibit "A" to the application. You will note that the No. 2 well is located on state land.

Mr. A. L. Porter, Jr.

-2-

April 22, 1975

Due to the fact that Mesa has already had conferences with IMC and PCA, we doubt the advisability of any further conferences before the hearing.

Anything you can do to expedite this matter will be greatly appreciated.

Yours sincerely,

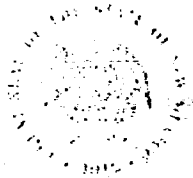
HINNE, BONDURANT, COX & EATON

BY 

CEH:cs

Enc.

cc: Marion Causey
cc: Bob Northington
cc: Don Dent



Case 5496

OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO
P. O. BOX 208R - SANTA FE
87501

I. R. TRUJILLO
CHAIRMAN
LAND COMMISSIONER
PHIL R. LUCERO
MEMBER

STATE GEOLOGIST
A. L. PORTER, JR.
SECRETARY - DIRECTOR

May 5, 1975

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

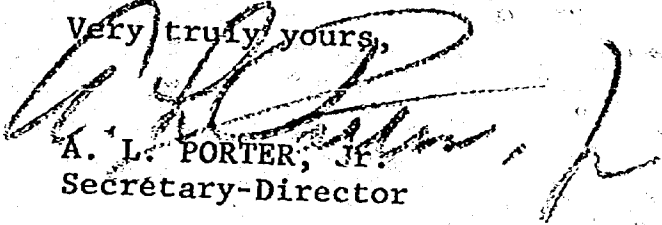
Dear Mr. Hinkle

Our Artesia Office has received objections from Mr. Roy Blackman for Leland A. Hodges, Trustee, and Mr. J. B. Cummings for the Potash Company of America to the proposed well of Mesa Petroleum Company to be drilled 1350 feet from the North line and 1300 feet from the West line of Section 18, Township 23 South, Range 30 East, Eddy County, New Mexico.

This matter has been discussed with you and Mr. Blackman individually. We are therefore setting the matter for arbitration in Room 205 of the State Land Office Building, Friday May 9 at 10 a.m., Santa Fe, New Mexico.

If the parties should agree to a waiver of the arbitration meeting, I should be notified not later than Thursday, May 8th. If the arbitration meeting should be waived the Commission will proceed to advertise the matter for hearing June 12th.

Very truly yours,


A. L. PORTER, JR.
Secretary-Director

ALP/ir

cc: Mr. Roy Blackman for Leland A. Hodges, Trustee
Mr. J. B. Cummings, Administrative Assistant for PCA
U. S. G. S. Roswell and Carlsbad
Mr. Phil R. Lucero, Commissioner of Public Lands
Mr. Bill Gressett, Supervisor, OCC - Artesia, N. Mex.

Case 5476

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

RECEIVED

MAY 1 1975

IN THE MATTER OF THE NOTICE
OF INTENTION TO DRILL A WELL
IN SECTION 18, T. 23S., R. 30E.,
EDDY COUNTY, NEW MEXICO FILED
BY MESA PETROLEUM COMPANY

O. C. C.
ARTEZIA, OFFICE

CASE NO.

OBJECTION OF LELAND A. HODGES, TRUSTEE


Leland A. Hodges, Trustee, P. O. Box 1718, Fort Worth, Texas,
hereby objects to the drilling of a well 1,350 feet from the North line and 1,300
feet from the West line of Section 18, T. 23S., R. 30E., Eddy County,
New Mexico and hereby states:

1. The land described above is within the oil-potash area as set forth in Order No. R-111-A, as amended, by the New Mexico Oil Conservation Commission.
2. Leland A. Hodges, Trustee is the owner and holder of a U. S. Government potash lease covering said land.
3. Drilling of a test well at the location specified or any other location to which the well can be moved without further notification will result in waste of potash deposits of substantial value.
4. The Notice of Intention to Drill is deficient in that the casing program does not comply with the requirements of Order R-111, as amended.

Date: April 30, 1975

Respectfully submitted

LELAND A. HODGES, TRUSTEE

By 
R. H. Blackman, Attorney
P. O. Box 31, Carlsbad, N. M.

cc: NMOCC - Santa Fe (3)
NMOCC - Artesia (3)
Mesa Petroleum Company
Gihls Tower West, Midland, Texas 79701
Mr. N. O. Frederick, U.S.G.S., Roswell (2)
Mr. R. S. Fulton, U.S.G.S., Carlsbad (2)



POTASH COMPANY OF AMERICA

A DIVISION OF IDEAL BASIC INDUSTRIES, INC.

MINE AND REFINERY: P. O. BOX 31 • CARLSBAD, NEW MEXICO 88220 • AREA CODE 505 • 887-2844

Case 5496

J. B. CUMMINGS
ADMINISTRATIVE ASSISTANT
IN CHARGE OF EXPLORATION

April 30, 1975

RECEIVED

Mr. A. L. Porter, Secretary-Director
New Mexico Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico 87501

MAY 1 1975

O. C. C.
ARTESIA, OFFICE

Dear Mr. Porter:

Enclosed are three copies of our objection in the matter of the notice of intent to drill a well in Section 18, T. 23S., R. 30E., Eddy County, New Mexico filed by Mesa Petroleum Company of Midland, Texas.

Very truly yours,

J. B. Cummings
J. B. Cummings

JBC/jm
enc.

cc: NMOCC District Field Office
Attn: Mr. W. A. Cressett, Supervisor
Drawer DD, Artesia, New Mexico 88210

Mesa Petroleum Co.
GIHLS Tower West, Suite 904
Midland, Texas 79701

Mr. N. O. Frederick, U.S.G.S.
P. O. Box 1857, Roswell, New Mexico 88201

Mr. R. S. Fulton, U.S.G.S.
P. O. Box 1716, Carlsbad, New Mexico 88220

CERTIFIED MAIL - RETURN RECEIPT REQUESTED



MEMBER: AMERICAN POTASH INSTITUTE



United States Department of the Interior

GEOLOGICAL SURVEY
Denver Federal Center
Denver, Colorado 80225

IN REPLY REFER TO:

April 2, 1974

APR 11 1974

Memorandum

To: -> Area Geologist, Roswell, New Mexico
Area Mining Supervisor, Carlsbad, New Mexico
Area Oil & Gas Supervisor, Roswell, New Mexico
U. S. GEOLOGICAL SURVEY
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 H. Horn
George H. Horn

Attachments:
Memos of Feb. 14 & 15, 1974

cc: Chief, Conservation Division

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
Case No. 5496 Exhibit No. 1
Submitted by *W. H. ...*
Hearing Date 6/12/75

NOTED
U. S. YAH ...

NOTED
APR 11 1974
PATTERSON

NOTED
APR 11 1974
PETE C. AGUILAR



United States Department of the Interior

GEOLOGICAL SURVEY
12201 SUNRISE VALLEY DRIVE
RESTON, VIRGINIA 22092

FEB 20 1974

Memorandum

To: Secretary of the Interior
Through Assistant Secretary - Energy & Minerals
Acting Deputy
From: Director, Geological Survey
(Signed) William A. Vosely
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. Rollins

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

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 J. 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

PCA

POTASH COMPANY OF AMERICA

A DIVISION OF IDEAL BASIC INDUSTRIES, INC.

MINE AND REFINERY: P. O. BOX 31 • CARLSBAD, NEW MEXICO 88220 • AREA CODE 505 • 887-2844

Case 5496

April 30, 1975

J. B. CUMMINGS
ADMINISTRATIVE ASSISTANT
IN CHARGE OF EXPLORATION

RECEIVED
MAY 5 - 1975
OIL CONSERVATION COMM.
Santa Fe

Mr. A. L. Porter, Secretary-Director
New Mexico Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico 87501

Dear Mr. Porter:

Enclosed are three copies of our objection in the matter of the notice of intent to drill a well in Section 18, T. 23S., R. 30E., Eddy County, New Mexico filed by Mesa Petroleum Company of Midland, Texas.

Very truly yours,

J. B. Cummings
J. B. Cummings

JBC/jm
enc.

cc: NMOCC District Field Office
Attn: Mr. W. A. Gressett, Supervisor
Drawer DD, Artesia, New Mexico 88210

Mesa Petroleum Co.
GIHLS Tower West, Suite 904
Midland, Texas 79701

Mr. N. O. Frederick, U.S.G.S.
P. O. Box 1857, Roswell, New Mexico 88201

Mr. R. S. Fulton, U.S.G.S.
P. O. Box 1716, Carlsbad, New Mexico 88220

CERTIFIED MAIL - RETURN RECEIPT REQUESTED



MEMBER: AMERICAN POTASH INSTITUTE

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE NOTICE
OF INTENTION TO DRILL A WELL
IN SECTION 18, T. 23S., R. 30E.,
EDDY COUNTY, NEW MEXICO FILED
BY MESA PETROLEUM COMPANY

CASE NO.

OBJECTION OF LELAND A. HODGES, TRUSTEE

Leland A. Hodges, Trustee, P. O. Box 1718, Fort Worth, Texas,
hereby objects to the drilling of a well 1,350 feet from the North line and 1,300
feet from the West line of Section 18, T. 23S., R. 30E., Eddy County,
New Mexico and hereby states:


1. The land described above is within the oil-potash area as set forth in Order No. R-111-A, as amended, by the New Mexico Oil Conservation Commission.
2. Leland A. Hodges, Trustee is the owner and holder of a U. S. Government potash lease covering said land.
3. Drilling of a test well at the location specified or any other location to which the well can be moved without further notification will result in waste of potash deposits of substantial value.
4. The Notice of Intention to Drill is deficient in that the casing program does not comply with the requirements of Order R-111, as amended.

Date: April 30, 1975

Respectfully submitted

LELAND A. HODGES, TRUSTEE

By


R. H. Blackman, Attorney
P. O. Box 31, Carlsbad, N. M.

cc: NMOCC - Santa Fe (3)
NMOCC - Artesia (3)
Mesa Petroleum Company
Gihls Tower West, Midland, Texas 79701
Mr. N. O. Frederick, U.S.G.S., Roswell (2)
Mr. R. S. Fulton, U.S.G.S., Carlsbad (2)

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE NOTICE
OF INTENTION TO DRILL A WELL
IN SECTION 18, T. 23S., R. 30E.,
EDDY COUNTY, NEW MEXICO FILED
BY MESA PETROLEUM COMPANY

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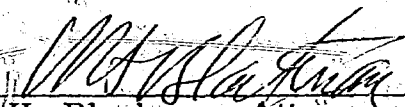
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Date: April 30, 1975

Respectfully submitted

LELAND A. HODGES, TRUSTEE

cc: NMOCC - Santa Fe (3)
NMOCC - Artesia (3)
Mesa Petroleum Company
Gihls Tower West, Midland, Texas 79701
Mr. N. O. Frederick, U.S.G.S., Roswell (2)
Mr. R. S. Fulton, U.S.G.S., Carlsbad (2)

By 
R. H. Blackman, Attorney
P. O. Box 31, Carlsbad, N. M.

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE NOTICE
OF INTENTION TO DRILL A WELL
IN SECTION 18, T. 23S., R. 30E.,
EDDY COUNTY, NEW MEXICO FILED
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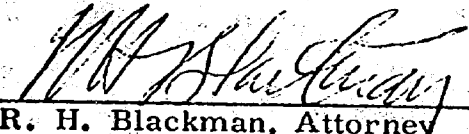
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Date: April 30, 1975

Respectfully submitted

LELAND A. HODGES, TRUSTEE

By


R. H. Blackman, Attorney
P. O. Box 31, Carlsbad, N. M.

cc: NMOCC - Santa Fe (3)
NMOCC - Artesia (3)
Mesa Petroleum Company
Gihls Tower West, Midland, Texas 79701
Mr. N. O. Frederick, U.S.G.S., Roswell (2)
Mr. R. S. Fulton, U.S.G.S., Carlsbad (2)



United States Department of the Interior

GEOLOGICAL SURVEY

P. O. Drawer U
Artesia, New Mexico 88210

AUG 14 1975

OIL CONSERVATION COMM.
Santa Fe

August 13, 1975

Mr. J. D. Ramey
New Mexico Oil Conservation Commission
Post Office Box 2088
Santa Fe, New Mexico 87501

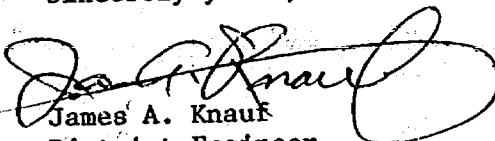
*File Case No
5496*

Re: Oil-Potash Area

Dear Mr. Ramey:

Attached is an "Information Copy" of an Application for Permit to Drill a well to a depth of 14,000 feet to test the Morrow formation in the SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 18, T. 23 S., R. 30 E., N.M.P.M., Eddy County, New Mexico, filed by Mesa Petroleum Company, 904 Gihls Tower West, Midland, Texas, 79701. The location is on Federal oil and gas lease New Mexico 0556857.

Sincerely yours,


James A. KnauF
District Engineer

Attachment

Copy w/Application to: N.M.O.C.C., Artesia
U.S.G.S., Roswell
U.S.G.S., Carlsbad

INFORMATION COPY

Form 9-231 C
(May 1963)

SUBMIT IN TRIPPLICATE*
(Other instructions on
reverse side)

Form approved.
Budget Bureau No. 42-R1425.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

APPLICATION FOR PERMIT TO DRILL, DEEPEN, OR PLUG BACK

1a. TYPE OF WORK
 DRILL DEEPEN PLUG BACK

b. TYPE OF WELL
 OIL WELL GAS WELL OTHER SINGLE CONN. MULTIPLE ZONE

2. NAME OF OPERATOR
 Mesa Petroleum Co.

3. ADDRESS OF OPERATOR
 904 Gibbs Tower West, Midland, Texas 79701

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.)*
 At surface: 1350' FNL & 1980' FWL of Sec. 18
 At proposed prod. zone: same as above

14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE*
 18 mi SE of Carlsbad

10. DISTANCE FROM PROPOSED LOCATION TO NEAREST PROPERTY OR LEASE LINE, FT. (Also to nearest drilg. unit line, if any) 1350

16. NO. OF ACRES IN LEASE 5122.86

17. NO. OF ACRES ASSIGNED TO THIS WELL 320.37

18. DISTANCE FROM PROPOSED LOCATION TO NEAREST WELL, DRILLING, COMPLETED, OR APPLIED FOR, ON THIS LEASE, FT. NA

19. PROPOSED DEPTH 14,000

20. ROTARY OR CABLE TOOLS Rotary

21. ELEVATIONS (Show whether DF, RT, GR, etc.) 3039 GR

22. APPROX. DATE WORK WILL START* Upon Approval

6. LEASE DESIGNATION AND SERIAL NO. NM 0556857

8. IF INDIAN, ALLOTTEE OR TRIBE NAME

7. UNIT AGREEMENT NAME Nash Unit

8. FARM OR LEASE NAME Nash Unit

9. WELL NO. 2

10. FIELD AND POOL, OR WILDCAT Undesignated

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA Sec. 18, T23S, R30E

12. COUNTY OR PARISH 13. STATE Eddy New Mexico

23. PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	QUANTITY OF CEMENT
17 1/2	13 3/8	48	300	350
12 1/4	9 5/8	36	3400	1000
8 3/4	7	23-26	11100	1800
6	4 1/2	13.5	14000	325

Propose to drill with rotary tools to depth of 14,000'. BOP's will not be used to drill 17 1/2" hole to 300'. Thereafter, either 12" API 3000 psi and 10" API 5000 psi WP BOP's will be used as appropriate. Electric logs will be run at 11,100' and 14,000'. Cement will be circulated on 13 3/8", 9 5/8" and 7" casing strings in order to comply with rule R-111-A. See attachment for details.

RECEIVED
AUG 14 1975
OIL CONSERVATION COMM.
Santa Fe

RECEIVED
AUG 12 1975
U.S. GEOLOGICAL SURVEY
ARTESIA, NEW MEXICO

IN ABOVE SPACE DESCRIBE PROPOSED PROGRAM: If proposal is to deepen or plug back, give data on present productive zone and proposed new productive zone. If proposal is to drill or deepen directionally, give pertinent data on subsurface locations and measured and true vertical depths. Give blowout preventer program, if any.

24. SIGNED Michael P. Houston TITLE Division Engineer DATE August 8, 1975

(This space for Federal or State office use)

PERMIT NO. _____ APPROVAL DATE _____

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

*See Instructions On Reverse Side

S-USGS, JLF, LMC, MEC, RMN, WI Partners, IMC, Hodges, MPH, Hensley, NMOC, JS

NEW MEXICO OIL CONSERVATION COMMISSION
WELL LOCATION AND ACREAGE DEDICATION PLAT

Form C-122
Supersedes C-128
Effective 1-1-65

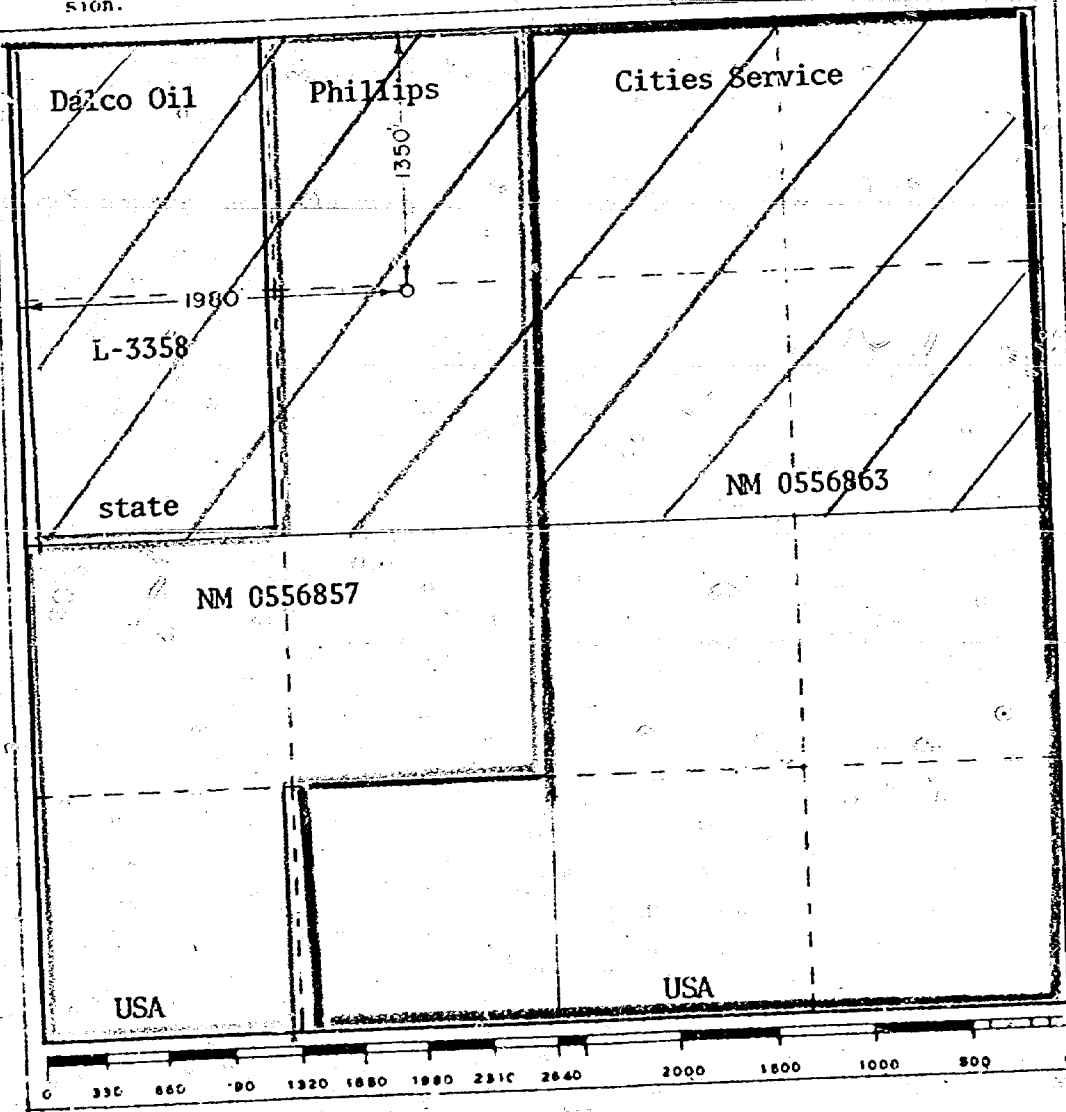
All distances must be from the outer boundaries of the Section

Mesa Petroleum Company		Nash Unit		Well No. 2
F	18	23 South	30 East	Eddy
1350	North	1980	West	line
3039	Morrow	Wildcat	320	$\frac{1}{2}$ Acres

- Outline the acreage dedicated to the subject well by colored pencil or marker on the plat below.
- If more than one lease is dedicated to the well, outline each and identify the ownership thereof as to working interest and royalty.
- If more than one lease of different ownership is dedicated to the well, have the interests of all owners been consolidated by communitization, unitization, force-pooling, etc?

Yes No If answer is "yes" type of consolidation Unitization (Nash Unit)

If answer is "no" list the owners and tract descriptions which have actually been consolidated (by force-pooling, communitization, unitization, or otherwise) or until a non-standard unit, eliminating such interests, has been approved by the Commission.



OIL CONSERVATION COMM.
CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief.

Michael P. Houston

Name: Michael P. Houston

Position: Division Engineer

Company: Mesa Petroleum Co.

Date: August 6, 1975

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my knowledge and belief.

Date: August 4, 1975
Required Professional Engineer and Surveyor No. 676
John W. West
JOHN W. WEST

RECEIVED
AUG 7 1975
ARTESIA, OFFICE
MESA-80
AUG 12 1975

CASE NO.

5467

APPLICATION,
TRANSCRIPTS,
SMALL EXHIBITS,

ETC.

EXHIBIT NO. 5

MESA PETROLEUM CO.

INITIAL COMPLETION DATA - NASH UNIT NO. 1
POTASH AREA - NE SECTION 13-23S-29E
EDDY COUNTY, NEW MEXICO

General

Date Spudded	7-25-74
Total Depth - Feet	13,850
Date of Potential Test	
Morrow	1-22-75
Strawn	Not Taken
Perforations - feet	
Morrow	13,175-609
Strawn	12,138-150
Calculated Open Flow - MCF/D	
Morrow	3,919
Strawn	N.A.
Date of First Production	6-4-75
Purchaser	Transwestern P.L.

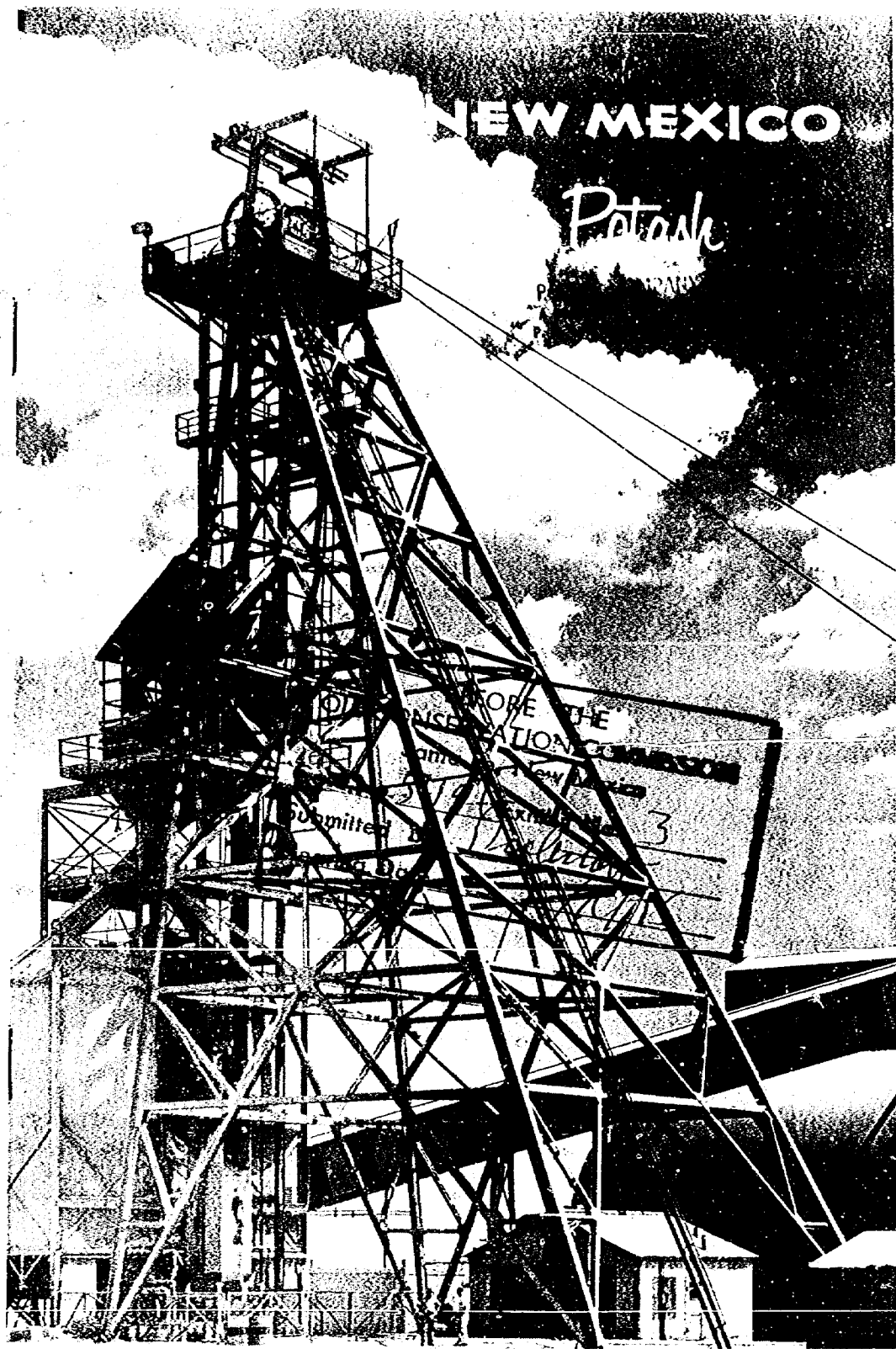
Current Production and
Initial Pressure Data

	<u>Morrow</u>	<u>Strawn</u>
Date	8-8-75	8-8-75
Gas Production - MCF/D	2,800	0 (1)
Condensate Production - BPD	4	0 (1)
FTP - psig	2,575	1,650 (2)
Choke Size - in.	17/64	None
Original BHP - psia	5,910	7,518
Date BHP Taken	11-19-74	10-11-74
Source of BHP	Extrap. DST	Extrap. DST
KB Datum Depth - Ft.	13,482	12,144
Recent BHP - psia	---	5,429
Date BHP Taken	None taken	5-23-75
Source of BHP	---	BHP Bomb

(1) Well currently shutin due to liquids in the wellbore and low flowing pressures.

(2) Represents SICP rather than FTP

LMC:dm
8-25-75



NEW MEXICO

Petash

FOR THE
COMMISSION

mitted

3