

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:

RECEIVED
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OIL CON. DIV
DIST. 3

CASE No. 3743
Order No. R-3401

APPLICATION OF BENSON-MONTIN-GREER
DRILLING CORPORATION FOR A PRESSURE
MAINTENANCE PROJECT, RIO ARRIBA
COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on April 3, 1968,
at Santa Fe, New Mexico, before Examiner Elvis A. Utz.

NOW, on this 11th day of April, 1968, 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, Benson-Montin-Greer Drilling Corp-
oration, seeks authority to institute a pressure maintenance
project in its Canada Ojitos Unit Area, West Puerto Chiquito-
Mancos Oil Pool, Rio Arriba County, New Mexico, by the injection
of gas into the Niobrara member of the Mancos shale through its
Canada Ojitos Unit Well No. 2 (K-13), located in Unit K of Sec-
tion 13, Township 25 North, Range 1 West, NMPM, Rio Arriba County,
New Mexico.

(3) That initially the project area should comprise only
the following-described area in Rio Arriba County, New Mexico:

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TOWNSHIP 25 NORTH, RANGE 1 WEST, NMPM

Sections 10 and 11: All

Section 13: W/2

Sections 14 and 15: All

Section 16: E/2

Section 23: N/2

Section 24: NW/4

(4) That a pressure maintenance project comprising the above-described area is in the interest of conservation and should result in greater ultimate recovery of oil, thereby preventing waste.

(5) That the applicant further seeks the promulgation of special rules and regulations governing said pressure maintenance project, and the establishment of an administrative procedure whereby said project area may be expanded for good cause shown and whereby additional wells in the project area may be converted to gas injection.

(6) That Special rules and regulations for the operation of the BMG West Puerto Chiquito-Mancos Pressure Maintenance Project should be promulgated and, for operational convenience, such rules should provide certain flexibility in authorizing the production of the project allowable from any well or wells in the project area in any proportion, provided that no well in the project area which directly or diagonally offsets a well outside the Canada Ojitos Unit Area producing from the same common source of supply should be allowed to produce in excess of top unit allowable for the West Puerto Chiquito-Mancos Oil Pool until such time as the well has experienced a substantial response to gas injection. When such a response has occurred, the well should be permitted to produce up to two times top unit allowable for the West Puerto Chiquito-Mancos Oil Pool. Production of such well at a higher rate should be authorized only after notice and hearing.

IT IS THEREFORE ORDERED:

(1) That the applicant, Benson-Montin-Greer Drilling Corporation, is hereby authorized to institute a pressure maintenance project in its Canada Ojitos Unit Area, West Puerto Chiquito-Mancos Oil Pool, Rio Arriba County, New Mexico, to be designated

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as the BMG West Puerto Chiquito-Mancos Pressure Maintenance Project, by the injection of gas into the Niobrara member of the Mancos shale through the following-described well in Rio Arriba County, New Mexico:

Canada Ojitos Unit Well No. 2 (K-13),
located in Unit K of Section 13, Township 25 North, Range 1 West, NMPM.

(2) That Special Rules and Regulations governing the operation of the BMG West Puerto Chiquito-Mancos Pressure Maintenance Project, Rio Arriba County, New Mexico, are hereby promulgated as follows:

SPECIAL RULES AND REGULATIONS
FOR THE
BMG WEST PUERTO CHIQUITO-MANCOS PRESSURE MAINTENANCE PROJECT

RULE 1. The project area of the BMG West Puerto Chiquito-Mancos Pressure Maintenance Project, hereinafter referred to as the Project, shall comprise the area in Rio Arriba County, New Mexico, described as follows:

TOWNSHIP 25 NORTH, RANGE 1 WEST, NMPM

Sections 10 and 11: All
Section 13: W/2
Sections 14 and 15: All
Section 16: E/2
Section 23: N/2
Section 24: NW/4

RULE 2. The allowable for the Project shall be the sum of the allowables of the several wells within the project area, including those wells which are shut-in, curtailed, or used as injection wells. Allowables for all wells shall be determined in a manner hereinafter prescribed.

RULE 3. Allowables for injection wells may be transferred to producing wells within the project area, as may the allowables for producing wells which, in the interest of more efficient operation of the Project, are shut-in or curtailed because of high gas-oil ratio or are shut-in for any of the following reasons: pressure regulation, control of pattern or sweep efficiencies, or to observe changes in pressures or changes in characteristics of reservoir liquids or progress of sweep.

RULE 4. The allowable assigned to any well which is shut-in or which is curtailed in accordance with the provisions of Rule 3, which allowable is to be transferred to any well or wells in the project area for production, shall in no event be greater than its ability to produce during the test prescribed by Rule 6, below, or greater than the current top unit allowable for the pool during the month of transfer, whichever is less.

RULE 5. The allowable assigned to any injection well on a 320-acre proration unit shall be top unit allowable for the West Puerto Chiquito-Mancos Oil Pool.

RULE 6. The allowable assigned to any well which is shut-in or curtailed in accordance with Rule 3, shall be determined by a 24-hour test at a stabilized rate of production, which shall be the final 24-hour period of a 72-hour test throughout which the well should be produced in the same manner and at a constant rate. The daily tolerance limitation set forth in Commission Rule 502 I (a) and the limiting gas-oil ratio (2,000 to 1) for the West Puerto Chiquito-Mancos Oil Pool shall be waived during such tests. The project operator shall notify all operators offsetting the well, as well as the Commission, of the exact time such tests are to be conducted. Tests may be witnessed by representatives of the offsetting operators and the Commission, if they so desire.

RULE 7. The allowable assigned to each producing well in the Project shall be equal to the well's ability to produce or to top unit allowable for the West Puerto Chiquito-Mancos Oil Pool, whichever is less, provided that any producing well in the project area which directly or diagonally offsets a well outside the Canada Ojitos Unit Area producing from the same common source of supply shall not produce in excess of top unit allowable for the pool until such time as the well receives a substantial response to gas injection. When such a response has occurred, the well shall be permitted to produce up to two times top unit allowable for the pool. Production of such well at a higher rate shall be authorized only after notice and hearing. Each producing well shall be subject to the limiting gas-oil ratio (2,000 to 1) for the West Puerto Chiquito-Mancos Oil Pool except that any well or wells within the project area producing with a gas-oil ratio in excess of 2,000 cubic feet of gas per barrel of oil may be produced on a "net" gas-oil ratio basis, which net gas-oil ratio shall be determined by applying credit for daily average gas injected if any, into the West Puerto Chiquito-Mancos Oil Pool

within the project area to such high gas-oil ratio well. The daily adjusted oil allowable for any well receiving gas injection credit shall be determined in accordance with the following formula:

$$A_{adj} = \frac{TUA \times F_a \times 2,000}{\frac{P_g - I_g}{P_o}}$$

where:

A_{adj} = the well's daily adjusted allowable

TUA = top unit allowable for the pool

F_a = the well's acreage factor

P_g = average daily volume of gas produced by the well during the preceding month, cubic feet

I_g = the well's allocated share of the daily average gas injected during the preceding month, cubic feet

P_o = average daily volume of oil produced by the well during the preceding month, barrels

In no event shall the amount of injected gas being credited to a well be such as to cause the net gas-oil ratio, $\frac{P_g - I_g}{P_o}$, to

be less than 2,000 cubic feet of gas per barrel of oil produced.

RULE 8. Each month the project operator shall, within three days after the normal unit allowable for Northwest New Mexico has been established, submit to the Commission a Pressure Maintenance Project Operator's Report, on a form prescribed by the Commission, outlining thereon the data required, and requesting allowables for each of the several wells in the Project as well as the total Project allowable. The aforesaid Pressure Maintenance Project Operator's Report shall be filed in lieu of Form C-120 for the Project.

RULE 9. The Commission shall, upon review of the report and after any adjustments deemed necessary, calculate the allowable for each well in the Project for the next succeeding month in accordance with these rules. The sum of the allowables so calculated shall be assigned to the Project and may be produced from the wells in the Project in any proportion except that no well in the Project which directly or diagonally offsets a well outside the Project producing from the same common source of supply shall produce in excess of two times top unit allowable for the pool.

RULE 10. The conversion of producing wells to injection, the drilling of additional wells for injection, and expansion of the project area shall be accomplished only after approval of the same by the Secretary-Director of the Commission. To obtain such approval, the project operator shall file proper application with the Commission, which application, if it seeks authorization to convert additional wells to injection or to drill additional injection wells shall include the following:

(1) A plat showing the location of proposed injection well, all wells within the project area, and offset operators, locating wells which offset the project area.

(2) A schematic drawing of the proposed injection well which fully describes the casing, tubing, perforated interval, and depth showing that the injection of gas will be confined to the Niobrara member of the Mancos shale.

(3) A letter stating that all offset operators to the proposed injection well have been furnished a complete copy of the application and the date of notification.

The Secretary-Director may approve the proposed injection well if, within 20 days after receiving the application, no objection to the proposal is received. The Secretary-Director may grant immediate approval, provided waivers of objection are received from all offset operators.

Expansion of the project area may be approved by the Secretary-Director of the Commission administratively when good cause is shown therefor.

RULE 11. That the subject pressure maintenance project shall be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations insofar as said rules are not inconsistent with the rules prescribed by this order.

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CASE No. 3743

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(3) That allowables to all wells in the Canada Ojitos Unit Area but outside the limits of the BMG West Puerto Chiquito-Mancos Pressure Maintenance Project Area as defined herein shall be assigned and produced in accordance with the applicable Commission Rules and Regulations.

(4) 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

DAVID F. CARGO, Chairman

GUYTON B. HAYS, Member

A. L. PORTER, Jr., Member & Secretary

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STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

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

CASE NO. 8950
Order No. R-2565-E
and
Order No. R-3401-A

APPLICATION OF BENSON-MONTIN-GREER
DRILLING CORPORATION FOR THE AMENDMENT
OF THE SPECIAL RULES AND REGULATIONS OF THE
WEST PUERTO CHIQUITO-MANCOS OIL POOL TO ESTABLISH
TEMPORARY SPECIAL PRODUCTION ALLOWABLE
LIMITATIONS AND GAS-OIL RATIO LIMITATIONS,
RIO ARriba COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing on August 7, 8, 21, 22, and 27, 1986, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission."

NOW, on this 11th day of September, 1986, the Commission, a quorum being present, having considered the testimony presented and the exhibits received at said hearing and being fully advised in the premises,

FINDS THAT:

(1) Notice of this application was provided to all operators of wells and each unleased mineral owner within the existing pool boundaries of the West Puerto Chiquito-Mancos Oil Pool as required by Division Rule 1207.

(2) Due public notice has been given as required by law and the Commission has jurisdiction of this case, the parties, and the subject matter thereof.

(3) The applicant, Benson-Montin-Greer Drilling Corporation (Greer) seeks an order amending the Special Rules and Regulations of the West Puerto Chiquito-Mancos Oil Pool to establish for a period of not less than 90 days a temporary special production allowable limitation of 400 barrels of oil per day for a standard 640-acre spacing and proration unit and a special temporary gas-oil ratio limitation factor of 1,000 cubic feet of gas per barrel of oil produced.

(4) In companion Case 8946, Jerome P. McHugh and Associates, Inc. (McHugh) seeks an order amending the temporary Special Rules and Regulations of the Gavilan-Mancos Oil Pool as promulgated by Division Order No. R-7407 to establish for a period of not less than 90 days a temporary special production allowable limitation of 200 barrels of oil per day for a standard 320-acre spacing and proration unit and a special temporary gas-oil ratio limitation factor of 1,000 cubic feet of gas per barrel of oil produced.

(5) Case 8946 and Case 8950 were consolidated by the Commission for the purposes of hearing.

(6) The Gavilan-Mancos Oil Pool and the West Puerto Chiquito-Mancos Oil Pool share a common boundary and are in pressure communication at least in proximity to such boundary.

(7) Greer operates and has operated the Canada Ojitos Unit in the West Puerto Chiquito-Mancos Oil Pool since 1963 to produce oil from the Mancos formation, and has developed the Mancos formation in the Canada Ojitos Unit with low well density, controlled withdrawal rates and pressure maintenance resulting in a low rate of pressure decline and significant additional oil recovery by gravity drainage.

(8) McHugh, Greer and Meridian Oil Company presented testimony and evidence in these cases as set out in Finding No. (7) in Order No. R-7407-D herein incorporated by reference.

(9) The Commission found that the evidence presented in these cases established those matters and issues contained in Findings Nos. (12) through (16) in Order No. R-7407-D also herein incorporated by reference.

(10) In Case No. 8950, Greer effectively seeks to have a common gas oil ratio limitation and a maximum daily oil allowable established to permit withdrawal rates on each side of the Gavilan/West Puerto Chiquito Oil Pool boundary to be equivalent, thereby protecting correlative rights.

(11) No party to the consolidated hearing objected to the establishment of such common limiting gas-oil ratio or equivalent daily oil allowable.

(12) Order No. R-7407-D, entered in Case No. 8946 effective September 1, 1986, established a limiting gas-oil ratio of 600 cubic feet of gas per barrel and a depth bracket allowable of 400 barrels of oil per day for wells in the Gavilan-Mancos Oil Pool for a temporary period until further order of the Commission and provided for reopening of such case at a hearing in March, 1987, unless otherwise called earlier by the Commission.

(13) Such temporary rules should be adopted for the West Puerto Chiquito-Mancos Oil Pool except that the maximum assignable oil allowable should be 800 barrels per day to account for the variation in spacing unit size between the two pools.

(14) For consistency, both the Special Rules for the West Puerto Chiquito-Mancos Oil Pool contained in Order No. R-2565-B, as amended, and the Special Rules for the West Puerto Chiquito-Mancos Pressure Maintenance Project contained in Order No. R-3401 should be amended to reflect such limiting gas-oil ratio and maximum oil allowable.

IT IS THEREFORE ORDERED THAT:

(1) The limiting gas-oil ratio for the West Puerto Chiquito-Mancos Oil Pool, as heretofore defined and described, Rio Arriba County, New Mexico, shall be 600 cubic feet of gas per barrel of liquid hydrocarbons produced.

(2) Rule 7(a) of the Special Rules for The West Puerto Chiquito-Mancos Oil Pool as established by Order No. R-2565-B, as amended, is hereby amended to read in its entirety as follows:

"Rule 7. (a) Except as otherwise provided for in subparts (b) and (c), below, a standard spacing or proration unit in the West Puerto Chiquito-Mancos Oil Pool (632 through 648 acres) shall be assigned a top allowable of 800 barrels of oil per day. Any non-standard spacing or proration unit containing less than 632 acres or more than 648 acres shall be assigned an allowable in the same ratio to 800 as the acreage in the proration unit bears to 640."

(3) Rule 6 and Rule 7 of the Special Rules for the West Puerto Chiquito-Mancos Pressure Maintenance Project established

by Order No. R-3401 are hereby amended to read in their entirety as follows:

"Rule 6. The allowable assigned to any well which is shut-in or curtailed in accordance with Rule 3, shall be determined by a 24-hour test at a stabilized rate of production, which shall be the final 24-hour period of a 72-hour test throughout which the well should be produced in the same manner and at a constant rate. The daily tolerance limitation set forth in Commission Rule 502 I (a) and the limiting gas-oil ratio (600 to 1) for the West Puerto Chiquito-Mancos Oil Pool shall be waived during such tests. The project operator shall notify all operators offsetting the well, as well as the Commission, of the exact time such tests are to be conducted. Tests may be witnessed by representatives of the offsetting operators and the Commission, if they so desire."

"Rule 7. The allowable assigned to each producing well in the Project shall be equal to the well's ability to produce or to top unit allowable for the West Puerto Chiquito-Mancos Oil Pool, whichever is less, provided that any producing well in the project area which directly or diagonally offsets a well outside the Canada Ojitos Unit Area producing from the same common source of supply shall not produce in excess of top unit allowable for the pool. Production of such well at a higher rate shall be authorized only after notice and hearing. Each producing well shall be subject to the limiting gas-oil ratio (600 to 1) for the West Puerto Chiquito-Mancos Oil Pool except that any well or wells within the project area producing with a gas-oil ratio in excess of 600 cubic feet of gas per barrel of oil may be produced on a "net" gas-oil ratio basis, which net gas-oil ratio shall be determined by applying credit for daily average gas injected, if any, into the West Puerto Chiquito-Mancos Oil Pool within the project area to such high gas-oil ratio well. The daily adjusted oil allowable for any well receiving gas injection credit shall be determined in accordance with the following formula:

$$A_{adj} = \frac{TUA \times F_a \times 1,000}{P_g - I_g}$$
$$P_o$$

where A_{adj} = the well's daily adjusted allowable.

TUA = top unit allowable for the pool.

F_a = the well's acreage factor (1.0 if one well on a 640 acre proration unit or 1/2 each if two wells on a 640 acre unit, and 1/2 for a well in a section along the Gavilan boundary which lies closer than 2310' from the Gavilan boundary).

P_g = average daily volume of gas produced by the well during the preceding month, cubic feet.

I_g = the well's allocated share of the daily average gas injected during the preceding month, cubic feet.

P_o = average daily volume of oil produced by the well during the preceding month, barrels.

In no event shall the amount of injected gas being credited to a well be such as to cause the net gas-oil ratio, $\frac{P_g - I_g}{P_o}$ to be less than 600 cubic feet of gas per barrel of oil produced.

(4) The effective date of this order shall be September 1, 1986.

(5) Unless otherwise reopened by the Commission, this case shall be reopened at a Commission hearing in March, 1987, to be consolidated with the reconsideration of the Temporary Special Rules established by Order No. R-7407 for the Gavilan-Mancos Oil Pool.

(6) Jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

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Case No. 8950

Order No. R-2565-E and Order No. R-3401-A

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

JIM BACA, Member



ED KELLY, Member



R. L. STAMETS, Chairman and
Secretary

S E A L

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

CASE NO. 8950
Order No. R-6469-C
and
Order No. [REDACTED]

APPLICATION OF BENSON-MONTIN-GREER
DRILLING CORPORATION FOR THE
AMENDMENT OF THE SPECIAL RULES AND
REGULATIONS OF THE WEST PUERTO
CHIKUITO-MANCOS OIL POOL TO ESTABLISH
TEMPORARY SPECIAL PRODUCTION ALLOWABLE
LIMITATIONS AND GAS-OIL RATIO LIMITA-
TIONS, RIO ARRIBA COUNTY, NEW MEXICO.

NUNC PRO TUNC ORDER

BY THE COMMISSION:

It appearing to the Oil Conservation Commission of New Mexico (Commission) that the combined order (Order Nos. R-2565-E and R-3401-A) issued in Case No. 8950 and dated September 11, 1986 does not correctly state the intended order of the Commission,

IT IS THEREFORE ORDERED THAT:

(1) Division Order No. R-6469-B issued in Case No. 8715 and dated March 7, 1986, superseded the Special Rules promulgated for the West Puerto Chiquito-Mancos Oil Pool, as previously established by Division Orders Nos. R-2565-B, R-2565-C, and R-6469-A; and the designation of Division Order No. R-2565-E in the immediate case was in error; therefore, all references to said "Order No. R-2565-E" throughout this Order are hereby amended to read "Order No. R-6469-C."

(2) Division Order No. R-2565-E, herein redesignated Order No. R-6469-C, as described above, is hereby affirmed by this Order; similarly, all provisions pertaining to Division Order No. R-3401-A simultaneously issued in the immediate case shall remain in full force and effect except as provided in paragraph (3) herein below.

(3) The daily adjusted oil allowable formula contained in "Rule 7" of Decretory Paragraph No. (3) on page 4 of said order is hereby amended to read as follows:

$$A_{adj} = \frac{TUA \times F_a \times 600}{\frac{P_g - I_g}{P_o}}$$


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Case No. 8950

Order No. R-6469-C and

Order No. R-3401-A-1

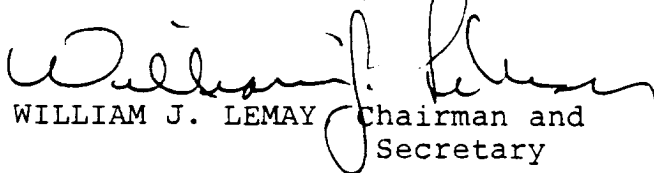
(4) The corrections set forth in this order be entered
nunc pro tunc as of September 11, 1986.

 DONE at Santa Fe, New Mexico, on this 2nd day of
March, 1987.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

WILLIAM R. HUMPHRIES, Member


ERLING A. BROSTUEN, Member


WILLIAM J. LEMAY, Chairman and
Secretary

S E A L

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION COMMISSION

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

CASE NO. 9111
Order No. R-3401-B

APPLICATION OF BENSON-MONTIN-GREER
DRILLING CORPORATION FOR EXPANSION OF
THE PROJECT AREA FOR ITS WEST PUERTO
CHIKUITO-MANCOS PRESSURE MAINTENANCE
PROJECT, RIO ARriba COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9:00 a.m. on March 18, 1988, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission." Decision on the case was deferred until possibly related testimony in Cases 7980, 8946, 8950 and 9412 was received at the hearing held June 13, 1988.

NOW, on this 5th day of August, 1988, the Commission, a quorum being present, having considered the testimony presented and the exhibits received at said hearing, and being fully advised in the premises,

FINDS THAT:

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

(2) Applicant requests expansion of the West Puerto Chiquito-Mancos Pressure Maintenance Project area to include the below-described area which would make the project area coterminous with the Canada Ojito Unit area and the Mancos Participating Area of the unit:

TOWNSHIP 24 NORTH, RANGE 1 WEST, NMPM
Sections 5 through 8

TOWNSHIP 25 NORTH, RANGE 1 WEST, NMPM
Sections 5 through 8
Sections 17 through 20
Sections 29 through 32

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Case No. 9111
Order No. R-3401-B

TOWNSHIP 26 NORTH, RANGE 1 WEST, NMPM
w/2 Sections 5, 8, 17, and 20
Sections 6, 7, 18, 19, 29, 30, 31 and 32

All in Rio Arriba County, New Mexico

(3) The expanded project area would abut the Gavilan-Mancos Pool boundary at the West line of Range 1 West.

(4) Applicant was supported in its application by Sun Exploration and Production Company and was opposed by Mallon Oil Company, Mesa Grande Resources, Inc., Mobil Texas-New Mexico Producing, Koch Exploration and others.

(5) Critical to the case is the degree, if any, of pressure communication across a low permeability zone at or near the present western boundary of the project area which is approximately two miles east of the western boundary of the unit.

(6) The two westernmost rows of sections inside the unit area are in effective pressure communication with the Gavilan-Mancos pool as demonstrated by shut in pressure measurements.

(7) The unit area east of the proposed expansion of the area described above exhibits a significantly greater pressure than the proposed expansion area and the adjacent Gavilan area, as a result of gas injection at the structurally higher and more easterly portion of the unit.

(8) The pressure differential across the low-permeability area which resides in the third row of sections east of the western boundary of the unit is in the range of 350-400 psi, and thus indicates limited pressure communication between the injection wells and the proposed expansion area.

(9) Limited transmissibility across the low-permeability zone has been shown by (1) transmission of a pressure pulse from a hydraulically fractured well to wells across the low permeability zone, (2) failure to increase the average pressure east of the zone by overinjection of gas, and (3) the lower gas-oil ratio of wells in the proposed expansion area as compared to adjacent Gavilan-Mancos wells.

(10) The gas credit provided by Rule 7 of Order R-3401, as amended, in the project area provides a reduced GOR penalty for wells in the project area because the pressure maintenance process results in a smaller reservoir voidage per barrel of oil produced than would occur if the gas were not reinjected.

(11) The permeability restriction described in Finding No. (5) limits the benefit which the proposed expansion area can receive from the pressure maintenance gas injection.

(12) There is evidence that wells within both the WPC and the Gavilan Pools are in communication with areas outside of those pools, particularly in a north-south direction. As a result there may be gas flow and repressurization from the pressure maintenance project in a northerly and southerly direction and that it may extend beyond the northern and southern boundaries of the pressure maintenance project.

(13) Because of Findings (11) and (12), giving full injection credit to those wells in the proposed expansion area would give those wells an advantage over the adjacent wells in the Gavilan-Mancos Pool and would impair the correlative rights of the owners in the Gavilan-Mancos Pool.

(14) Limited expansion of the project area, and reduced credit to wells in the expansion area for reinjected gas in the project area will encourage continued gas injection, will increase the ultimate recovery of oil in the West Puerto Chiquito-Mancos Oil Pool and will also protect correlative rights in the Gavilan-Mancos Pool wells offsetting the unit.

(15) The project area should be expanded only one tier of sections to the west leaving one tier of sections between the expansion area and Gavilan.

(16) The evidence is not conclusive as to the amount of injection credit which the wells in the expansion area of the project should receive, and pending further data evaluation, a 50% injected gas credit is reasonable.

(17) The gas credit amount in the expansion area granted by this order should be modified upon presentation of evidence that an advantage is gained by either pool over the other.

(18) The Aztec district office of the Division, in consultation with the operators in the two pools should determine the wells and procedures to be employed to obtain accurate, representative BHP's on either side of the common pool boundary on a semi-annual basis for detection and evaluation of any drainage across the said boundary and a basis for adjusting the gas injection credit assigned the wells in the expansion area.

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Case No. 9111

Order No. R-3401-B

IT IS THEREFORE ORDERED THAT:

(1) The Project Area of the West Puerto Chiquito-Mancos Pressure Maintenance Project is hereby expanded to include the following described area:

TOWNSHIP 24 NORTH, RANGE 1 WEST, NMPM
Sections 5 and 8

TOWNSHIP 25 NORTH, RANGE 1 WEST, NMPM
Sections 5, 8, 17, 20, 29 and 32

TOWNSHIP 26 NORTH, RANGE 1 WEST, NMPM
W/2 Sections 5, 8, 17 and 20 and all of
Sections 29 and 32

All in Rio Arriba County, New Mexico.

(2) Rule 6 and Rule 7 of the Special Rules for the West Puerto Chiquito-Mancos Pressure Maintenance Project established by Order No. R-3401, as amended, are hereby amended to read in their entirety as follows:

"Rule 6. The allowable assigned to any well which is shut-in or curtailed in accordance with Rule 3, shall be determined by a 24-hour test at a stabilized rate of production, which shall be the final 24-hour period of a 72-hour test throughout which the well should be produced in the same manner and at a constant rate. The daily tolerance limitation set forth in Commission rule 502 I (a) and the limiting gas-oil ratio for the West Puerto Chiquito-Mancos Oil Pool shall be waived during such tests. The project operator shall notify all operators offsetting the well, as well as the Commission, of the exact time such tests are to be conducted. Tests may be witnessed by representatives of the offsetting operators and the Commission, if they so desire."

"Rule 7. The allowable assigned to each producing well in the Project shall be equal to the well's ability to produce or top unit allowable for the West Puerto Chiquito-Mancos Oil Pool, whichever is less, provided that any producing well in the project area which directly or diagonally offsets a well outside the Canada Ojitos Unit Area producing from the same common source of supply shall not produce in excess of top unit allowable for the pool. Production of such well at a higher rate shall be authorized only after notice and hearing. Each producing well shall be subject to the limiting gas-oil

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ratio for the West Puerto Chiquito-Mancos Oil Pool except that any well or wells within the project area producing with a gas-oil ratio in excess of the limiting gas oil ratio may be produced on a "net gas-oil ratio" basis, which shall be determined by applying credit for daily average gas injected, if any, into the West Puerto Chiquito-Mancos Oil Pool within the project area to such high gas-oil ratio well. The daily adjusted oil allowable for any well receiving gas injection credit shall be determined in accordance with the following formula:

$$A_{adj} = TUA \times F_a \times \frac{GOR}{\frac{P_g - I_g}{P_o}}$$

where A_{adj} = the well's daily adjusted allowable.

TUA = top unit allowable for the pool.

F_a = the well's acreage factor (1.0 if one well on a 640 acre proration unit or 1/2 each if two wells on a 640 acre unit, and 1/2 for a well in a section along the Gavilan boundary which lies closer than 2310' from the Gavilan boundary).

P_g = average daily volume of gas produced by the well during the preceding month, cubic feet.

I_g = the well's allocated share of the daily average gas injected during the preceding month, cubic feet.

P_o = average daily volume of oil produced by the well during the preceding month, barrels.

GOR = limiting gas-oil ratio for the West Puerto Chiquito-Mancos Oil Pool.

In no event shall the amount of injected gas being credited to a well be such as to cause the net gas-oil ratio, $\frac{P_g - I_g}{P_o}$ to be less than the limiting gas-oil ratio for the West Puerto Chiquito Mancos Oil Pool.

Provided however, that wells located in the area described as: Sections 5 and 8, Township 24 North, Range 1

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West; Sections 5, 8, 17, 20, 29 and 32,
Township 25 North, Range 1 West; Sections 29
and 32 and W/2 of Sections 5, 8, 17 and 20,
Township 26 North, Range 1 West

shall be limited to 50% of the allocated share of injection
gas in the I_g term of the formula above.

(3) The Aztec district office of the Division, with due
counselling and advice from pool operators, shall, by October
1, 1988, develop a program for semi-annual bottomhole pressure
surveys of wells in both pools located not less than 3/8 mile
and not more than 1 1/2 miles from the common pool boundary,
designed to measure accurately the pressure differential
across the pool boundary and to be used as a basis for
adjusting the gas injection credit to wells in the expansion
area. The program shall be presented for approval to the
Commission Conference on October 6, 1988.

(5) This order may be modified, after notice and hear-
ing, to offset any advantage gained by wells on either side of
the common boundary of the Gavilan and West Puerto Chiquito
Oil Pools, as a result of this order.

(6) 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



WILLIAM R. HUMPHRIES, Member

ERLING A. BROSTUEN, Member



WILLIAM J. LEMAY, Chairman and
Secretary

S E A L

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
DIVISION FOR THE PURPOSE OF
CONSIDERING:

CASE NO. 9837
ORDER NO. R-3401-C

APPLICATION OF BENSON-MONTIN-GREER
DRILLING CORPORATION FOR AMENDMENT
OF DIVISION ORDER NO. R-3401, AS
AMENDED, RIO ARriba COUNTY, NEW MEXICO

ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 8:15 a.m. on November 29, 1989, at Santa Fe, New Mexico, before Examiner Michael E. Stogner.

NOW, on this 8th day of February, 1990, the Division Director, having considered the testimony, the record and the recommendations of the Examiner, and being fully advised in the premises,

FINDS THAT:

- (1) Due public notice having been given as required by law, the Division has jurisdiction of this cause and the subject matter thereof.
- (2) The applicant, Benson-Montin-Greer Drilling Corporation, seeks amendment of the Special Pool Rules and Regulations for the BMG West Puerto Chiquito-Mancos Pressure Maintenance Project as promulgated by Order No. R-3401, as amended, to provide for accumulation of credit for extraneous gas injected into the project area.
- (3) The applicant is the operator of the BMG West Puerto Chiquito Mancos Pressure Maintenance Project and is injecting gas into this unit which is produced from a source outside of the project area.
- (4) At the hearing, the applicant requested dismissal of that portion of the application which requested cumulation of credits on an annual basis.
- (5) Granting this application will result in the operator moving more gas through the project area which will increase the ultimate recovery of oil from the project area thereby preventing waste.

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(6) Since the injection credit will be equal to the gas injected by the operator into this formation as part of pressure maintenance operations, less that volume of gas produced from the project area, the correlative rights of no interest owners in the pool will be impaired by permitting the operator to cumulate the credit for injection of this gas.

(7) The Special Pool Rules and Regulations for the BMG West Puerto Chiquito-Mancos Pressure Maintenance Project should be amended to provide for accumulation of credit for withdrawal at a future date for gas which is produced from a source outside the project area and injected into the Unit by the operator as part of pressure maintenance operations.

IT IS THEREFORE ORDERED THAT:

(1) Rules 7, 8 and 9 of the Special Pool Rules and Regulations for the BMG West Puerto Chiquito-Mancos Pressure Maintenance Project, as promulgated by Division Order No. R-3401, as amended, are hereby amended to read as follows:

"Rule 7(a): The allowable assigned to each producing well in the Project shall be equal to the well's ability to produce or top unit allowable for the West Puerto Chiquito-Mancos Oil Pool, whichever is less, provided that any producing well in the project area which directly or diagonally offsets a well outside the Canada Ojitos Unit Area producing from the same common source of supply shall not produce in excess of top unit allowable for the pool. Production of such well at a higher rate shall be authorized only after notice and hearing. Each producing well shall be subject to the limiting gas-oil ratio for the West Puerto Chiquito-Mancos Oil Pool except that any well or wells within the project area producing with a gas-oil ratio in excess of the limiting gas-oil ratio may be produced on a "net gas-oil ratio" basis, which shall be determined by applying credit for daily average gas injected, if any, into the West Puerto Chiquito-Mancos Oil Pool within the project area to such high gas-oil ratio well. The daily adjusted oil allowable for any well receiving gas injection credit shall be determined in accordance with the following formula:

$$A_{adj} = TUA \times F_p \times \frac{GOR}{P_o - I_g}$$

where A_{adj} = the well's daily adjusted allowable.

TUA = top unit allowable for the pool.

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- F_i = the well's acreage factor (1.0 if one well on a 640-acre proration unit or 1/2 each if two wells on a 640-acre unit, and 1/2 for a well in a section along the Gavilan boundary which lies closer than 2310 feet from the Gavilan boundary).
- P_i = average daily volume of gas produced by the well during the subject month, cubic feet.
- I_i = the well's allocated share of the daily average gas injected during the subject month, cubic feet.
- P_o = average daily volume of oil produced by the well during the subject month, barrels.
- GOR = limiting gas-oil ratio for the West Puerto Chiquito-Mancos Oil Pool.

In no event shall the amount of injected gas being credited to a well be such as to cause the net gas-oil ratio, $\frac{P_i - I_i}{P_o}$, to be less than the limiting gas-oil

for the West Puerto Chiquito-Mancos Oil Pool.

PROVIDED HOWEVER, that wells located in the area described as: Sections 5 and 8, Township 24 North, Range 1 West; Sections 5, 8, 17, 20, 29 and 32, Township 25 North, Range 1 West; Sections 29 and 32 and W/2 of Sections 5, 8, 17 and 20, Township 26 North, Range 1 West, shall be limited to 50% of the allocated share of injected gas in the I_i term of the formula above.

Rule 7(b): The operator may inject extraneous gas (gas produced from a source outside the West Puerto Chiquito-Mancos Pressure Maintenance Project) and accumulate credit for withdrawal at a future date. Withdrawal of such gas shall not be charged against the gas allowable of any well in the unit. Hydrocarbon liquids recovered from such gas at a separation facility shall be charged against the oil allowable for the well which produced the gas, but hydrocarbon liquids recovered from a processing or stripping facility shall be, and shall be treated as, condensate and shall not be charged against the unit's allowable or that of any well in the unit."

"Rule 8: Each month the project operator shall, within three weeks following the production month, submit to the Commission a Pressure Maintenance Project Operator's Report, on a form prescribed by the Commission outlining thereon the data required, and setting out the allowables for that production month and showing thereon overproduction, if any, for each of the several wells in the project

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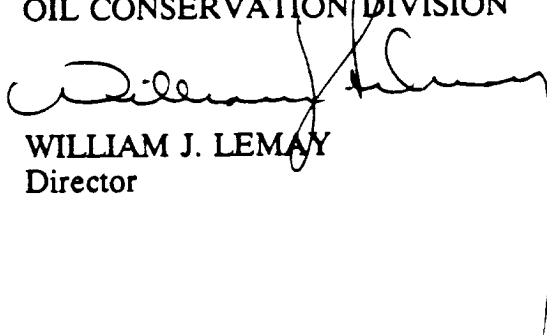
volume of extraneous gas injected, the amount withdrawn and the cumulative net status of extraneous gas remaining in the project area at the end of the reporting month. The aforesaid Pressure Maintenance Project Operator's Report shall be filed in lieu of Form C-120 for the Project."

"Rule 9: The Commission shall, upon review of the report and after any adjustments deemed necessary, confirm the allowable and overproduction, if any, and, if the project operator is not so doing, issue instructions to bring production and allowables into balance. The sum of the allowables so calculated shall be assigned to the project and may be produced from the wells in the project in any proportion except that no well in the project which directly or diagonally offsets a well outside the project producing from the same common source of supply shall produce in excess of two times top unit allowable for the pool."

(2) Jurisdiction of this cause is retained for the entry of such further orders as the Division may deem necessary.

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

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION



WILLIAM J. LEMAY
Director

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