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BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico

Cas. No. 9225 Exhibit No. 1
Submitted by Mesa Grande, Lb.
Hearing Date 1-21-88

MESA GRANDE, LTD.

Application for Compulsory Pooling

Section 20 - T25N - R2W

Rio Arriba County, New Mexico

CASE Number 9225

January 21, 1988

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MESA GRANDE RESOURCES, INC.
1200 PHILTOWER BUILDING
TULSA, OKLAHOMA 74103
(918) 581-8494

January 19, 1988

Mr. Larry Sweet
Mesa Grande, Ltd.
1307 Philtower Building
Tulsa, Oklahoma 74103

RE: Geological Analysis of E/2 Sec. 20, T25N-R2W
Gavilan Mancos Oil Pool Rio Arriba Co., N.M.

Dear Mr. Sweet:

Per your request, this letter and accompanying maps will serve to detail the geology of the area surrounding the Loddy #1 well for your use in case #9225.

An evaluation of acreage within the greater Gavilan area can best be accomplished by first understanding the general geology of the Gavilan Mancos Oil Pool and its relationship to the productive capacity and ultimate recovery capabilities of individual wells.

The Gavilan Mancos Oil Pool produces from a fractured sequence of interbedded sandstones, siltstones, and shales commonly known as the Niobrara or Gallup interval. The reservoir's dual porosity system is composed of a high flow capacity fracture system and a low flow capacity matrix system. The matrix porosity system involves a combination of low capacity fractures, microfractures, and true sandstone porosity. Sample and core data serve to substantiate the presence of the matrix. Rock compressibility studies have shown that the storage capacity of the reservoir's dual porosity system is decidedly onesided in that greater than 90% of the reservoir resides in the matrix system and less than 10% lies within the high capacity fracture system. However it is this high capacity fracture network that accounts for most of the permeability and high flow rates of the wells.

Natural fracturing can occur anywhere within the 600 plus foot section of the Niobrara-Gallup interval present in the eastern side of the San Juan Basin. In the Gavilan Mancos Oil Pool production logs, wireline logs, and drill cutting analysis have each shown that the majority of the field wide production comes from the Niobrara A and B intervals and to a much lesser extent from the Niobrara C zone. This can be explained by the positive curvature of the Niobrara interval over the Gavilan Dome. Documentation of the productive interval of the pool can be found in Mallon-Mesa Grande's geological testimony and exhibits at the March 30, 1987 Gavilan Mancos Pool hearing.

Mesa Grande, Ltd.

January 19, 1988

Stratigraphic continuity of the Niobrara A,B,C zones within the Gavilan Mancos Oil Pool has never been at issue. The large amount of cross-sections submitted to the OCD have all documented this fact.

Based on my knowledge of the Gavilan area, ongoing studies, and analysis of the Gavilan Mancos Oil Pool, it is my judgement that all acreage under the E/2 of Section 20, T25N-R2W lies within the geological boundaries of and surrounded by production from the Gavilan Mancos Oil Pool. I anticipate that this fact will not be refuted by Sun. Mr. Dick Ellis in Case #8839, while working for McHugh, stated that the narrow section 19 lying to the west of the Loddy #1 was "at least in the pool as he structurally envisioned it".

I hope that the maps and cross-sections that I have included with this letter will assist you in Mesa Grande, Ltd.'s presentation of the geology of the subject acreage within the Gavilan Mancos Pool.

Yours truly,

A handwritten signature in dark ink, appearing to read "Alan P. Emmendorfer". The signature is fluid and cursive, with the first name "Alan" and last name "Emmendorfer" clearly distinguishable.

Alan P. Emmendorfer
Geologist

APE:cs

Enclosures.