January 2, 1996

IPI-374

Conoco, Inc.
10 Desta Drive, Suite 100W
Midland, Texas 79705-4500

Attn: Mr. Jerry Hoover

RE: Injection Pressure Increase MCA Unit Pressure Maintenance Project, Lea County, New Mexico

Dear Mr. Hoover:

Reference is made to your request dated November 7, 1995 to increase the surface injection pressure on three wells in the above referenced pressure maintenance project. This request is based on a step rate tests conducted on October 19 and 20, 1995. The results of the test have been reviewed by my staff and we feel an increase in injection pressure on these wells is justified at this time.

You are therefore authorized to increase the surface injection pressure on the following wells:

Well and Location	Maximum Injection Surface Pressure	API (30-025)
MCA Unit Well No.280, Unit Letter H, Section 28	1898 PSIG	23740
MCA Unit Well No.282, Unit Letter B, Section 27	1770 PSIG	23846
MCA Unit Well No.311, Unit Letter C, Section 2	2560 PSIG	24101
All located in Township 17 South, Range 33 East, Lea County, New Mexico.		

The Division Director may rescind this injection pressure increase if it becomes apparent that the injected water is not being confined to the injection zone or is endangering any fresh water aquifers.

Sincerely,

William J. LeMay
Director

WJL/BES

cc: Oil Conservation Division - Hobbs
File: PMX-135, 180; PSI-X 3rd QTR 96

ATTACHMENT 5

ANALOGOUS DATA

APPLICATION FOR AUTHORIZATION TO INJECT - PART VII

Stage I of the MCA CO_2 Project is designed to inject an average of 23 MMSCF per day of CO_2 into 16 injection wells. This translates into an average of 1.5 MMSCFPD per well. The maximum injection rate for stage I should not exceed 30 MMSCFPD in total and should not exceed 3 MMSCFPD in any one well.

The injection system will be a closed system. The CO_2 will be transported via pipeline, boosted to injection pressure and injected into the wells through two headers. The produced gas stream will in time contain too much CO_2 to be sold. At that time, the total produced gas stream will be compressed, dehydrated and reinjected along with the purchased CO_2.

The CO_2 injection system working pressure is designed as 2500 psi which will provide an average injection well pressure of about 2100 psi after distribution losses. The fracture gradient of the injection zones ranges from 0.97 psi/ft. to 1.13 psi/ft. based on fracture stimulation of recently drilled wells in the Unit. (See attached tables.) Assuming a 2100 psi wellhead injection pressure and an average CO_2 temperature of 80°F, it can be shown that the bottom hole injection pressures will in no case be within 100 psi of the minimum parting pressure. Under these expected operating conditions the average CO_2 gradient is 0.398 psi/ft.

The source of the purchased CO_2 will be the McElmo Dome CO_2 field in southwest Colorado. The CO_2 will be transported via the Cortez pipeline to Tatum, New Mexico, via the Llano pipeline (now owned and operated by Big 3) to Buckeye, New Mexico, and finally via the new pipeline now being installed by Big 3 to the MCA Unit.

As stated above, recycled CO_2 and hydrocarbon gas will supplement the purchased CO_2 stream.

After CO_2 injection has been completed, the project design calls for a post-flush waterflood. The injection water will be produced water supplemented with the fresh water supply which has served the MCA Unit in the past.

ATTACHMENT 5.1

TABLE 1. SIXTH ZONE ESTIMATED FRACTURE GRADIENTS FROM RECENT D&E WELLS

WELL	DATE	MID-PERF DEPTH ft. (gl)	ISIP SURFACE psi	ISIP MID-PERF psi	FRACTURE GRADIENT psi/ft
367	6-4-87	4003	2750	4490	1.12
368	5-15-87	3792	2230	3880	1.02
369	3-27-87	3755	2410	4050	1.08
370	5-1-87	3960	2200	3930	0.99
371	9-18-87	3939	2200	3920	1.00
373	10-16-87	3742	2450	4080	1.09
376	12-29-87	3983	3000	4740	1.19
			Average fracture gradient		1.07

TABLE 2. SEVENTH ZONE ESTIMATED FRACTURE GRADIENTS FROM RECENT D&E WELLS

WELL	DATE	MID-PERF DEPTH ft. (gl)	ISIP SURFACE psi	ISIP MID-PERF psi	FRACTURE GRADIENT psi/ft
7th fractured separately					
367	5-29-87	4131	2870	4670	1.13
368	5-12-87	3920	2725	4430	1.13
370	4-15-87	4119	1950	3980	0.97
373	10-12-87	3953	3100	4820	1.22
				Average fracture gradient	1.11
6th & 7th fractured together					
374	11-11-87	3740	2500	4130	1.10
375	12-1-87	4027	2750	4500	1.12
377	1-6-88	3940	2700	4420	1.12
				Average fracture gradient	1.11

TABLE 3. SURFACE CO2 INJECTION PRESSURES CORRESPONDING TO MINIMUM PARTING PRESSURES

ZONE	MID-PERF DEPTH FT	FRACTURE GRADIENT PSI/FT	BOTTOM HOLE PARTING PRESSURE PSIG	CO2 INJECTION SURFACE PARTING PRESSURE PSIG
6	3810	1.07	4080	2560
7	3960	1.11	4400	2800