NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

BILL RICHARDSON
Governor
Joanna Prukop
Cabinet Secretary

March 9, 2005

Mark E. Fesmire, P.E.
Director
Oil Conservation Division

Sage Energy Company
P.O. Box 3068
Midland, Texas 79702

Attention: Mr. George M. Harris, Jr.

Re: Injection Pressure Increase
NVANU "12A" Well No. 1
(API No. 30-025-25146)
Unit P, Section 36, T-16S, R-34E, NMPM,
Lea County, New Mexico

Dear Mr. Harris:

I have received your request dated January 27, 2005 to increase the surface injection pressure within the NVANU "12A" Well No. 1. Please be advised that I cannot approve in increase in injection pressure for this well without having support data. We generally do not approve increases in injection pressure without a step rate test, however, we have, in certain instances, considered fracture data from the well's initial completion. Please submit this initial fracture data, or any other data you feel may justify increasing the well's injection pressure, at which time your request will be processed.

If you have any questions, please contact me at (505) 476-3466.

Sincerely,

David Catanach
Engineer

1/31/05 DATE IN	3/15/05 SUSPENSE	DLC ENGINEER	3/14/05 LOGGED IN	IPF TYPE	PDLC0507346682 APP NO.

ABOVE THIS LINE FOR DIVISION USE ONLY

NEW MEXICO OIL CONSERVATION DIVISION
- Engineering Bureau -
1220 South St. Francis Drive, Santa Fe, NM 87505

ADMINISTRATIVE APPLICATION CHECKLIST

THIS CHECKLIST IS MANDATORY FOR ALL ADMINISTRATIVE APPLICATIONS FOR EXCEPTIONS TO DIVISION RULES AND REGULATIONS WHICH REQUIRE PROCESSING AT THE DIVISION LEVEL IN SANTA FE

Application Acronyms:

[NSL-Non-Standard Location] [NSP-Non-Standard Proration Unit] [SD-Simultaneous Dedication]
[DHC-Downhole Commingling] [CTB-Lease Commingling] [PLC-Pool/Lease Commingling]
[PC-Pool Commingling] [OLS - Off-Lease Storage] [OLM-Off-Lease Measurement]
[WFX-Waterflood Expansion] [PMX-Pressure Maintenance Expansion]
[SWD-Salt Water Disposal] [IPI-Injection Pressure Increase]
[EOR-Qualified Enhanced Oil Recovery Certification] [PPR-Positive Production Response]

[1] **TYPE OF APPLICATION** - Check Those Which Apply for [A]

[A] Location - Spacing Unit - Simultaneous Dedication
☐ NSL ☐ NSP ☐ SD

Check One Only for [B] or [C]

[B] Commingling - Storage - Measurement
☐ DHC ☐ CTB ☐ PLC ☐ PC ☐ OLS ☐ OLM

[C] Injection - Disposal - Pressure Increase - Enhanced Oil Recovery
☐ WFX ☐ PMX ☐ SWD ☐ IPI ☐ EOR ☐ PPR

[D] Other: Specify _____

[2] **NOTIFICATION REQUIRED TO:** - Check Those Which Apply, or ☐ Does Not Apply

[A] ☐ Working, Royalty or Overriding Royalty Interest Owners

[B] ☐ Offset Operators, Leaseholders or Surface Owner

[C] ☐ Application is One Which Requires Published Legal Notice

[D] ☐ Notification and/or Concurrent Approval by BLM or SLO
U.S. Bureau of Land Management - Commissioner of Public Lands, State Land Office

[E] ☐ For all of the above, Proof of Notification or Publication is Attached, and/or,

[F] ☐ Waivers are Attached

[3] **SUBMIT ACCURATE AND COMPLETE INFORMATION REQUIRED TO PROCESS THE TYPE OF APPLICATION INDICATED ABOVE.**

[4] **CERTIFICATION:** I hereby certify that the information submitted with this application for administrative approval is **accurate** and **complete** to the best of my knowledge. I also understand that **no action** will be taken on this application until the required information and notifications are submitted to the Division.

Note: Statement must be completed by an individual with managerial and/or supervisory capacity.

Print or Type Name	Signature	Title	Date

e-mail Address

Sage Energy Company

Independence Plaza 400 W. Illinois, Suite 1080
P.O. Box 3068 Midland, Texas 79702

Office: (915) 683-5271 Fax: (915) 683-5248

January 27, 2005

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Attention: Mr. David Catanach

Re: Maximum Wellhead Injection Pressure Increase for:

NVANU '12A' Well No. 1
Unit P, Section 36, T-16 South, R-34 East, NMMP,
Lea County, New Mexico

2005 JAN 31 PM

Dear Mr. Catanach:

Sage Energy Company operates 17 water injection wells in the North Vacuum Abo North Unit and will soon convert the 12A#1 to water injection service as our 18th water injection well. This unit was formed in 1991 and Sage has made and had approved a minimum of five applications for increased surface injection pressure. The seventeen wells have maximum surface injection pressures (set by the NMOCD) ranging from 3698# to 4850#.

Currently we are limited in the 12A#1 to a maximum surface injection pressure of 1769#. Upon initial completion of this well as a producer in 1975, an ISIP of 3700# was recorded. This would suggest a frac gradient of .85 psi/ft. The current yardstick of .2 psi/ft to set the maximum surface injection pressure seems conservative.

Utilizing the 7C#2 as our most conservative guideline, this wells 3800# maximum injection pressure reflects a frac gradient guideline of .43 psi/ft. The 9#3, which you administratively approved for a wellhead pressure increase in April, 2004, utilized a wellhead limit of .43 psi/ft. All other injection wells in our unit have frac gradient guidelines in excess of .47 psi/ft and range from .47 to .56 with an average of .505 psi/ft.

Structurally, the NVANU is a plunging nose located on the northern edge of the productive Abo formation. The pay is thinning and very tight (.1-.3 md). Other Abo waterflood units are located to the south and are contiguous with our unit. The North Vacuun Abo Unit and the North Vacuum Abo East Unit are operated by ExxonMobil while the North Vacuum Abo West Unit is operated by Chevron-Texaco.

I hope this information will be useful to you in order to re-evaluate the maximum injection pressure previously assigned to the NVANU 12A#1. If you require any further information, please contact me at 432-683-5271.

Sincerely,

George M. Harris Jr.

George M. Harris, Jr.

North Vacuum Abo North Unit 12-A Well No. 1
API No. 30-025-25146
460' FSL & 660' FEL, Unit P,
Section 36, Township 16 South, Range 34 East
Perforated Injection Interval: 8,847'-8,898'
Maximum Surface Injection Pressure: 1769 PSIG

IT IS FURTHER ORDERED THAT:

The operator shall take all steps necessary to ensure that the injected water enters only the proposed injection interval and is not permitted to escape to other formations or onto the surface.

Prior to commencing injection operations into the well, the casing shall be pressure tested from the surface to the packer setting depth to assure the integrity of said casing.

The casing-tubing annulus shall be loaded with an inert fluid and equipped with a pressure gauge at the surface or left open to the atmosphere to facilitate detection of leakage in the casing, tubing or packer.

The injection well or system shall be equipped with a pressure limiting device which will limit the wellhead pressure to 0.2 psi/ft. to the uppermost injection perforations, as shown above.

The Director of the Division may authorize an increase in injection pressure upon a proper showing by the operator of said well that such higher pressure will not result in migration of the injected fluid from the Abo formation. Such proper showing shall consist of a valid step-rate test run in accordance with and acceptable to this office.

The operator shall notify the supervisor of the Hobbs district office of the Division of the date and time of the installation of injection equipment and of the mechanical integrity test so that the same may be inspected and witnessed.

The operator shall immediately notify the supervisor of the Hobbs district office of the Division of the failure of the tubing, casing or packer in said well and shall take such steps as may be timely and necessary to correct such failure or leakage.

The subject well shall be governed by all provisions of Division Order No. R-9359, and Rules 702-706 of the Division Rules and Regulations not inconsistent herewith.

PROVIDED FURTHER THAT, jurisdiction is retained by the Division for the entry of such