OIL & GAS DOCKET NO. 8A-0270493

THE APPLICATION OF CONOCOPHILLIPS PIPE LINE COMPANY PURSUANT TO STATEWIDE RULE 97 FOR A PERMIT TO CREATE, OPERATE AND MAINTAIN AN UNDERGROUND COMPRESSED AIR ENERGY STORAGE (CAES) FACILITY, GAINES PUMP STATION NGL STORAGE LEASE, HOBBS, SE (SAN ANDRES) FIELD, GAINES COUNTY, TEXAS

HEARD BY: Richard D. Atkins, P.E. - Technical Examiner

HEARING DATE: May 26, 2011

APPEARANCES:	**REPRESENTING:**
APPLICANT:	
Jamie Nielson	ConocoPhillips Pipe Line Company
Richard Germain	
Donald Vereide	
Jeff Langlinais	
Sergei Filatyev	
Ian Lawson	
Richard R. Longquist	
James M. Clark	
James Edwards	

EXAMINER'S REPORT AND RECOMMENDATION

STATEMENT OF THE CASE

ConocoPhillips Pipe Line Company ("ConocoPhillips") seeks a permit to create, operate and maintain an underground compressed air energy storage (CAES) facility in the Hobbs, SE (San Andres) Field on its Gaines Pump Station NGL Storage Lease (ID No. 64041), Gaines County, Texas. The application is filed pursuant to Statewide Rule 97.

The application was unprotested and the examiner recommends approval.

DISCUSSION OF THE EVIDENCE

The proposed Gaines CAES facility is a pilot project that will be the first of its kind in Texas. When complete, this facility will supply alternative energy sources to the region for commercial power consumption. During CAES operations, electrical energy from area

wind farms will be stored by compressing air into the cavern. Compressed air will be produced from the cavern to drive one or more expander/compressor units to generate electricity. While test conditions may indicate otherwise, it is anticipated that the cavern will be operated on a daily cycle with a maximum flow rate of 107 MMCFPD. The efficiency of this process is estimated at greater than 70%.

The CAES facility is located at the site of an existing inactive natural gas liquid (NGL) storage facility that is the Gaines Pump Station NGL Storage Lease (ID No. 64041). The Gaines lease consists of approximately 50 acres in western Gaines County about twenty-three miles southwest of the City of Seminole. The site is within the Midland Basin which contains Permian-age evaporite beds that have historically been used for the creation and operation of hydrocarbon storage caverns. The Midland Basin is comprised of the Salado Formation which is the dominant salt-bearing unit in the basin. The majority of all underground storage within the Midland basin is found in the Salado Formation. The Gaines CAES cavern is located within the Salado Formation. At the site of the cavern, the Salado Formation is 800' to 900' thick and is bounded above by the anhydrites of the Alibates Formation at a depth of abut 1,800 feet.

Construction of the Gaines CAES facility will be accomplished through the use of the existing dormant natural gas liquids storage cavern and injection wells. The Gaines CAES Cavern was designed and constructed as a dual-entry utilizing Wells No. 1I and 2S. The cavern was placed in service in January 1986 to store NGLs that primarily consisted of liquid ethane, propane and butane. The cavern has been in alternative monitoring status since December 2008. The cavern has an estimated total usable volume of 265,000 barrels. The top of the cavern is at 2,445 feet which is 645 feet below the top of the salt which was encountered at about 1,800' during the drilling of the cavern.

The CAES facility will be operated using two existing wells. Well No. 1I is the main entry for the cavern and will be the primary injection and withdrawal well for compressed air. Well No. 1I will be operated with the following casing string configuration: 20" surface casing set at 343 feet and cemented to surface; 13 3/8" intermediate casing set at 2,406 feet and cemented to surface; 9 5/8" intermediate casing set at 2,445 feet and cemented to surface. A 7" casing liner set on packer at 2,335 feet will serve as the “tubing” through which compressed air will enter and exit the cavern.

Well No. 2S is an offset well that was connected by directional drilling to the bottom of the cavern. This well is connected to the brine system and will be used to inject and discharge brine to and from the cavern. Well No. 2S will be operated with the following casing string configuration: 18 5/8" surface casing set at 355 feet and cemented to surface and 11 3/4 “ casing set at 2,891 feet and cemented to surface with a milled window from 2,764 - 2,776 feet through which brine will move to and from the cavern.

The Texas Commission on Environmental Quality recommends that usable quality water be protected from the ground surface to a depth of 300 feet and from the interval from 1,450 - 1,800 feet. Well Nos. 1I and 2S are cased and cemented to ensure protection of these usable quality water zones. Well Nos. 1I and 2S will undergo nitrogen/brine

mechanical integrity testing before they are placed into service.

Through a search of public records, ConocoPhillips identified (excluding the storage wells themselves) a total of two oil and gas-related wells which have penetrated the caprock within ¼ mile of each of the storage wells. These wells (an active disposal well and a plugged dry hole) are not conduits for fluid migration as a result of the proposed CAES operations.

Salt cores taken from the Gaines site were tested to determine salt strength. In addition, geomechanical modeling of cavern stress was conducted to evaluate cavern stability. The results of the analysis predict cavern stability during extended CAES operation.

Notice of the application was published November 7, 14 and 21, 2010 editions of the *Seminole Sentinel*, a newspaper of general circulation in Gaines County. Notice of hearing on the application was mailed to each person and entity entitled to notice. In addition, notice of hearing was published in the *Seminole Sentinel* on May 8, 15 and 22, 2011. No protests or notices of intent to appear at hearing were filed regarding the application.

FINDINGS OF FACT

1. Notice of application and hearing were provided to each person and entity entitled to notice. Notice of the application was published November 7, 14 and 21, 2010 editions of the *Seminole Sentinel*, a newspaper of general circulation in Gaines County. Notice of hearing on the application was mailed to each person and entity entitled to notice. In addition, notice of hearing was published in the *Seminole Sentinel* on May 8, 15 and 22, 2011.

2. ConocoPhillips Pipe Line Company seeks a permit to create, operate and maintain an underground compressed air energy storage (CAES) facility in the Hobbs, SE (San Andres) Field on its Gaines Pump Station NGL Storage Lease (ID No. 64041) in Gaines County.

3. The Gaines CAES facility will use an existing dormant natural gas liquids storage cavern. The cavern has an estimated total usable volume of 265,000 barrels.

4. The Gaines CAES cavern is located within the impermeable Salado Formation. At the site of the cavern, the Salado Formation is 800' to 900' thick and is bounded above by the anhydrites of the Alibates Formation at a depth of about 1,800 feet.

5. The Gaines CAES cavern was designed and constructed as a dual-entry cavern. The CAES facility will be operated using the existing Well Nos. 1I

and 2S.

6. Usable quality water must be protected from the ground surface to a depth of 300 feet and from the interval from 1,450 - 1,800 feet. Well Nos. 1I and 2S are cased and cemented to ensure protection of these usable quality water zones are protected.

   a. Well No. 1I is the main entry for the cavern and will be the primary injection and withdrawal well for compressed air. Well No. 1I will be operated with the following casing string configuration: 20" surface casing set at 343 feet and cemented to surface; 13 3/8" intermediate casing set at 2,406 feet and cemented to surface; 9 5/8" intermediate casing set at 2,445 feet and cemented to surface. A 7" casing liner set on packer at 2,335 feet will serve as the “tubing” through which compressed air will enter and exit the cavern.

   b. Well No. 2S is an offset well that was connected by directional drilling to the bottom of the cavern. This well is connected to the brine system and will be used to inject and discharge brine to and from the cavern. Well No. 2S will be operated with the following casing string configuration: 18 5/8" surface casing set at 355 feet and cemented to surface and 11 3/4 “ casing set at 2,891 feet and cemented to surface with a milled window from 2,764 - 2,776 feet through which brine will move to and from the cavern.

7. The facility will be used for the injection, storage and withdrawal of air. No hydrocarbons will be stored in the cavern. No natural gas will be supplied to a public utility.

8. During CAES operations, electrical energy from area wind farms will be stored by compressing air into the cavern. Compressed air will be produced from the cavern to drive one or more expander/compressor units to generate electricity. The efficiency of this process is estimated at greater than 70%.

9. While test conditions may indicate otherwise, ConocoPhillips anticipates that the cavern will be operated on a daily cycle with a maximum flow rate of 107 MMCFPD.

10. The Gaines CAES facility is in the public interest as it will supply alternative energy sources to the region for commercial power consumption.

11. ConocoPhillips has complied with the requirements set forth in Statewide Rule 97 for approval of the requested permit.

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CONCLUSIONS OF LAW

1. Proper notice was timely given to all parties entitled to notice pursuant to applicable statutes and rules.

2. All things have occurred and have been accomplished to give the Commission jurisdiction in this case.

3. The use of the proposed CAES storage facility cavern will not endanger oil, gas, or geothermal resources or cause the pollution of surface water or fresh water strata unproductive of oil, gas, or geothermal resources.

4. The facility is in the public interest as it will supply alternative energy sources to the region for commercial power consumption.

5. The monthly report of gas volumes supplied to a public utility set out in Statewide Rule 97(m)(1) is not applicable to the proposed CAES facility.

6. The applicant has complied with the requirements for approval set forth in Statewide Rule 97.

EXAMINER'S RECOMMENDATION

Based on the above findings of fact and conclusions of law, the examiner recommends that the application of ConocoPhillips Pipe Line Company to create, operate and maintain a CAES facility be approved pursuant to Statewide Rule 97. Technical Permitting is directed to issue the appropriate permit with the usual conditions, restrictions and limitations, as required by the Commission, with the specific exception that the monthly report of gas volumes supplied to a public utility set out in Statewide Rule 97(m)(1) shall not be required. ConocoPhillips Pipe Line Company shall comply with all applicable rules and safety standards adopted by the Commission pursuant to Statewide Rule 97.

Respectfully submitted,

Richard D. Atkins, P.E.
Technical Hearings Examiner