



RAILROAD COMMISSION OF TEXAS

HEARINGS DIVISION

OIL AND GAS DOCKET NO. 01-0280364

COMMISSION CALLED HEARING ON THE COMPLAINT OF WAPITI ENERGY, LLC TO GIVE REGENCY FIELD SERVICES LLC AN OPPORTUNITY TO SHOW CAUSE WHY ITS EXISTING INJECTION PERMIT, F-17347 AMENDED, SHOULD NOT BE MODIFIED, SUSPENDED OR TERMINATED FOR THE TILDEN GPI LEASE, WELL NO. 1, TILDEN, S. (WILCOX H2S DISPOSAL) FIELD, MCMULLEN COUNTY, TEXAS

HEARD BY: Richard D. Atkins, P.E. - Technical Examiner
Terry J. Johnson - Legal Examiner

APPEARANCES:

REPRESENTING:

COMPLAINANT:

David Nelson
Kerry A. Pollard
Robert W. Kirkclanz

Wapiti Energy, LLC

RESPONDENT:

James Mann
Bill Johnson
Liaqat Ali
Terry Payne
John Miller
Keith R. Crawford
Deena Jordan
Russell E. Bentley

Regency Field Services LLC

INTERVENORS:

David Cooney
Doug Johnson

RRC Oil & Gas Division Staff

Patrick Oegerle
Ross Dickinson

Dickinson Family

Glenn E. Johnson
Joe Craig

Chesapeake Operating, Inc.

INTERVENORS:

James N. Bostic
Loren Long

Momentum Oil & Gas, LLC

John Arnold
Dedrick Lance Terveen

EOG Resources, Inc.

Ana Maria Marsland-Griffith

Cheyenne Petroleum Co.

NON-PARTY OBSERVERS:

James M. Clark
John E. Kiss

Talisman Energy USA, Inc.

Steven H. Weller

McMullen County Commissioner's Court

PROCEDURAL HISTORY

Complaint Filed:	December 10, 2012
Notice of Hearing:	February 25, 2013
Hearing Held:	October 2 & 3, 2013
Transcript Received:	October 15, 2013
Proposal for Decision Issued:	February 3, 2014

EXAMINERS' REPORT AND PROPOSAL FOR DECISION

STATEMENT OF THE CASE

This is a Commission called hearing on the complaint of Wapiti Energy, LLC ("Wapiti") to give Regency Field Services LLC ("Regency") an Opportunity to Show Cause Why its Existing Injection Permit, F-17347 Amended, Should Not Be Modified, Suspended or Terminated for the Tilden GPI Lease, Well No. 1, Tilden, S. (Wilcox H2s Disposal) Field, McMullen County, Texas.

In Final Order No. 01-0249550, effective January 23, 2007, Regency received authority to dispose of a maximum of 1,924 BPD (5.0 MMCFGPD) of compressed acid gas at a maximum surface injection pressure of 2,925 psig. The disposal interval is the Wilcox formation between 5,870 feet and 6,800 feet and the waste being disposed of consists of approximately 34% hydrogen sulfide, 64% carbon dioxide and 2% natural gas. At the time of Regency's original application, acid gas concentrations were calculated and mapped based on modeling. The outer edge of the injection plume in the original modeling was represented by a 1% contour line, where the fluid was 99% formation fluid and 1% acid gas. The plume model projected a maximum extent of the 1% line to be 2,200 feet from the disposal well after 40 years of injection.

On February 29, 2012, Regency received Commission administrative approval to increase the disposal rate to a maximum of 2,660 BPD (7.3 MMCFGPD) of compressed acid gas at a maximum surface injection pressure of 2,925 psig. The revised plume model at that time projected a maximum extent of the 1% line to be 2,900 feet from the disposal well after 30 years of injection. As a special condition for the increased disposal rate, Commission staff required Regency to re-enter and properly plug three wells, the J. H. Dickinson Lease, Well No. 1 (API No. 42-311-01310), J. D. Campbell Lease, Well No. 1 (API No. 42-311-01308) and F. B. Horton Lease, Well No. 1 (API No. 42-311-01277), within eighteen months of the date of the new permit. The three wells were located within a 3,300 foot radius area of review and had been plugged with no cement plugs between the disposal interval and the base of the usable-quality groundwater, which occurs at a depth of 5,100 feet.

However, seven months later, hydrogen sulfide gas was detected at the Wapiti (successor to Layline Petroleum I, LLC) - JCB Horton Lease, Well No. 1 (API No. 42-311-01281), which is 3,300 feet from the disposal well. The plume had not been projected to reach this distance for at least 40 years. Wapiti, Regency and Commission staff began to meet and develop a plan to contain the hydrogen sulfide gas release. During the discussions, it was discovered that the JCB Horton Lease, Well No. 1, had been perforated, fracture stimulated and later squeezed off several times in the Wilcox disposal interval. The workover and squeezes had not been reported to the Commission and, consequently, this activity was not reflected in any Commission records.

Based on the new information, all parties agreed that Regency would shut-in their acid gas disposal well and that Wapiti would properly plug the JCB Horton Lease, Well No. 1. After the Horton well was plugged, Regency requested Commission permission to re-start disposal operations. Commission staff agreed, but at a reduced injection rate of 4,000 MCFGPD and only under the following special conditions: 1) Develop a new plume model; 2) Properly plug additional wells in the area of the JCB Horton Lease, Well No. 1; 3) Explore the possibility of injecting the acid gas into deeper formations below the Wilcox; and 4) Examine the feasibility of a sulfur recovery facility. Once Regency re-started its disposal operations, Wapiti filed its complaint and request for hearing on December 10, 2012.

DISCUSSION OF THE EVIDENCE

Complainant's Evidence

Wapiti's expert engineering witness performed a study of all of the wells that were located in an area of review between one-half and one mile of Regency's acid gas disposal well. The expert testified that there were four wells that were not properly plugged or cemented to completely isolate the disposal interval from the base of the usable-quality groundwater. The four wells were the J. H. Dickinson Lease, Well No. 1 (API No. 42-311-01307), J. H. Dickinson Lease, Well No. 1 (API No. 42-311-01265), F. B. Horton Lease, Well No. 1 (API No. 42-311-01278) and Franklin A Lease, Well No. 1H (API No. 42-311-34606).

Wapiti stated that it was not proposing to shut the Regency Gas Plant down or to shut-in any producing wells. Wapiti believes that there are other alternatives to injecting the acid gas into the Wilcox formation. Wapiti recommends that the Commission follow up on its letter issued October 2012 and modify Regency's disposal permit by requiring disposal into a deeper zone below the Wilcox formation, such as the Edwards, Glen Rose or Sligo formations.

Respondent's Evidence

Prior to the hearing, Regency had already re-entered and properly plugged the three special condition wells and a shut-in Escondido commercial disposal well, the Dickinson Lease, Well No. 1 (API No. 42-311-31897), that had been completed and fracture stimulated in the upper portion of the Wilcox disposal interval. Regency submitted a wellbore diagram and injection history rate and pressure graph on its Tilden GPI Lease, Well No. 1 (API No. 42-311-33905), that showed the well was perforated within the permitted disposal interval and had been operated within the permitted injection rate and pressure. Regency also submitted a Schlumberger injectivity survey showing that all of the injected fluid was going into the perforated interval from 5,910 feet to 6,678 feet which was within the permitted disposal interval of 5,870 feet to 6,800 feet. In addition, the acid gas disposal well passed its latest mechanical integrity test that was run on September 4, 2012, and submitted on Commission Form H-5, which was received on September 12, 2012. A Regency gas plant area map around the disposal facility depicts 19 operators and several hundred wells are connected to the plant, which processes approximately 28.9 MMCFGPD.

After the H₂S breakout in the JCB Horton Lease, Well No. 1, Regency contracted Terracon Consultants, Inc. ("Terracon") to sample water wells in the area for any H₂S or CO₂ contamination that might be related to the Regency disposal operations. Beginning on August 2012 and ending on September 2013, Terracon sampled seven water wells within a two mile radius of the Regency disposal well and a water well located in the town of Tilden, Texas, which is approximately four miles north of the Regency gas plant.

The average concentration of sulfides in the Regency gas plant water well was 0.10 mg/L with the highest concentration of sulfides of 2.83 mg/L occurring in the Tilden water well. Based on the distribution of sulfides in the groundwater samples collected, it was Terracon's opinion that there was no evidence to indicate that Regency's acid gas disposal operations had adversely impacted groundwater in the area with sulfides.

The average concentration of CO₂ in the Regency gas plant water well was 3.55 mg/L and the overall average concentration of CO₂ for the water wells tested was 3.30 mg/L. Based on the fairly even distribution of CO₂ in the groundwater samples collected, it was Terracon's opinion that there was no evidence to indicate that Regency's acid gas disposal operations had adversely impacted groundwater in the area with CO₂.

Regency's expert engineering witness performed a three dimensional reservoir simulation model based on the WENPROP and GEM software. The model incorporated 3D seismic to map the existing faults and 59 wells, of which, 49 wells had core and log data for a petro-physical evaluation of the porosity and permeability values. Since there was extensive data from different sources, Regency assembled a team of experts which included geologists, geophysicists and petroleum, reservoir and drilling engineers. The model had 39 layers with 438,204 grid blocks (cells) and incorporated 26 wells. Regency selected four sands which were shown in the injection survey to take 67% of the injectate, the D, H, M and N sands. The resulting plume model generated was a composite of all four sands for a worst case plume expansion.

After accounting for the natural fractures associated with the faulting and the hydraulic fracturing of the JCB Horton Lease, Well No. 1, and the Escondido saltwater disposal well, the simulation correctly predicted that the injectate would reach the JCB Horton Lease, Well No. 1, by August 2012 in the M sand. This result could not have been achieved without including a geo-mechanical mechanism, such as a high permeability channel due to the hydraulic fracturing along the fault line. The sand shown in the predicted plume in the Horton well to the northeast was the M sand and the sand to the south was the D sand, as they were the sands where the injectate traveled the furthest.

Regency's expert engineering witness also analyzed the four wells of concern that were identified by Wapiti. The expert believed that the J. H. Dickinson Lease, Well No. 1 (API No. 42-311-01265), F. B. Horton Lease, Well No. 1 (API No. 42-311-01278) and Franklin A Lease, Well No. 1H (API No. 42-311-34606) were not of concern, as all three wells were outside of the 35-year predicted plume. In addition, the Franklin A Lease, Well No. 1H, was a horizontal well that had a surface location almost two miles from the disposal well and had surface casing cemented below the base of useable-quality groundwater. Likewise, both the J. H. Dickinson Lease, Well No. 1 (API No. 42-311-01265) and F. B. Horton Lease, Well No. 1, were discovered to have DV tools run and were cemented across the base of the usable-quality groundwater. However, the J. H. Dickinson Lease, Well No. 1 (API No. 42-311-01307) is located inside the predicted 5-year plume and has been plugged with no cement plugs between the disposal interval and the base of the usable-quality groundwater. The expert felt that this well needed to be re-entered and properly plugged and should be a special condition to a renewed 5-year disposal permit.

Based on the well data and modeling results, Regency opined that it knew more about the Wilcox in the area of the disposal well, than any other project in Texas. Regency proposes to continue with the existing amended permit (a maximum disposal rate of 7.3 MMCFGPD with a maximum surface pressure of 2,925 psig) for five years, then update the plume model and return to hearing at the Commission to review the results. In addition, Regency will continue to investigate the deeper formations for possible disposal zones and re-enter and properly plug the J. H. Dickinson Lease, Well No. 1 (API No. 42-311-01307).

Intervenors' Statements

Mr. Ross Dickinson is a landowner in the area of the Regency gas plant and lives approximately one mile from the plant. He testified that he is mainly concerned with the contamination of the groundwater, which he depends on both for drinking water and for ranch operations. He is also concerned for the safety of his family should there be any more releases of H₂S gas in the area.

Chesapeake Operating, Inc. ("Chesapeake") operates 141 producing wells in McMullen and Atascosa Counties. The wells produce on average 19,100 BOPD and 17.1 MMCFGPD, of which approximately 10 MMCFGPD is sent to the Regency gas plant. Chesapeake is running three drilling rigs in the area that are drilling 70 infill wells per year. At full development, Chesapeake expects to have about 900 producing wells in the area with an average estimated ultimate recovery of 300,000 BO and 300 MMCFG per well. Chesapeake opined that the Regency gas plant was critical to its operations and, without the plant, Chesapeake would have to significantly reduce its activity in the area and shut-in much of its current production.

Momentum Oil & Gas, LLC ("Momentum") operates 10 producing wells in the Fashing Field in McMullen County. The wells produce on average 50 BOPD and 2.0 MMCFGPD and all of the produced gas is sent to the Regency gas plant. Momentum expects its wells to have an estimated ultimate recovery of 231,200 BO and 9.5 BCFG. Momentum testified that its 10 wells were the only company assets and that the Regency gas plant was critical to its operations in the area. Without the Regency gas plant, Momentum would have to shut-in its current production, which would be catastrophic for the company.

EOG Resources, Inc. ("EOG") operates 63 producing wells in McMullen and Atascosa Counties. The wells produce on average 12,000 BOPD and 9.5 MMCFGPD, with all of the produced gas sent to the Regency gas plant. EOG stated that it was very dependent on the Regency gas plant for its production in the area and would like to see it remain in operation. Without the Regency gas plant, EOG would have to significantly reduce its activity in the area and shut-in wells or flare much of its current gas production, resulting in the loss of approximately 1,200 barrels per day of condensate production.

Extra-record Submission

On November 14, 2013, after the hearing was concluded and the record in the case had closed, the examiners received a resolution stating the position of the McMullen County Commissioner's Court. That body did not participate in the case and was present, through counsel, solely as a non-party observer. In the examiners' opinion, the resolution is outside the record and not properly considered as part of the evidence.

EXAMINERS' OPINION

The examiners' recommend that the Regency disposal permit, as amended, be renewed for a five year term that will expire unless updated modeling and other information requested in the special conditions is filed for staff consideration. It is also recommended that the permit contain the following special conditions: 1) Regency continue to investigate the deeper formations for possible disposal zones; and 2) Regency re-enter and properly plug the J. H. Dickinson Lease, Well No. 1 (API No. 42-311-01307).

Regency has done extensive work to characterize the Wilcox reservoir and performed a three dimensional reservoir simulation model that predicted the H₂S breakout in the JCB Horton Lease, Well No. 1, and generated a 5-year and 35-year predicted plume model based on the new Wilcox reservoir characterization. With properly plugged wellbores, the model shows that continued disposal operations will be contained and will not pose a safety or contamination risk to other producing formations or useable-quality groundwater. In addition, no party to this hearing wants the Regency gas plant and related disposal operations to be shut-in, which would create waste and economic uncertainty for the operators connected to the plant.

FINDINGS OF FACT

1. Notice of this application and hearing was provided to all persons entitled to notice at least ten (10) days prior to the date of the hearing.
2. The proposed injection into the Tilden GPI Lease, Well No. 1, will not endanger useable-quality groundwater.
 - a. Usable-quality groundwater occurs down to a depth of 5,100 feet below the land surface.
 - b. Wapiti Energy, LLC ("Wapiti") has properly plugged the JCB Horton Lease, Well No. 1, which previously had been a conduit for injected fluids.
 - c. Regency Field Services LLC ("Regency") has re-entered and properly plugged three special condition wells and a shut-in Escondido commercial disposal well, the Dickinson Lease, Well No. 1, that had been completed and fracture stimulated in the upper portion of the Wilcox disposal interval.
 - d. Terracon Consultants, Inc. sampled seven water wells within a two mile radius of the Regency disposal well and a water well located in the town of Tilden, Texas, which is approximately four miles north of the Regency gas plant.

- e. There is no evidence in the record that Regency's acid gas disposal operations have adversely impacted groundwater in the area with sulfides.
 - f. There is no evidence in the record that Regency's acid gas disposal operations have adversely impacted groundwater in the area with CO₂.
 - g. As a special condition to the disposal permit renewal, Regency will re-enter and properly plug the J. H. Dickinson Lease, Well No. 1, which is located within the predicted 5-year plume.
3. The proposed injection into the Tilden GPI Lease, Well No. 1, will be safely contained to the disposal interval and will not reach the surface or endanger production from other oil, gas or mineral bearing formations.
- a. The three-dimensional simulation model of the Wilcox reservoir contained in the record correctly predicted the H₂S breakout in the JCB Horton Lease, Well No. 1, and generated a 5-year and 35-year predicted plume model based on the new Wilcox reservoir characterization.
 - b. With properly plugged wellbores, the model shows that continued disposal operations will be contained and will not pose a contamination risk to other producing formations or useable-quality groundwater or a danger to the public.
4. Use of the Tilden GPI Lease, Well No. 1, as a acid gas disposal well is safe and in the public interest because it will provide needed H₂S and CO₂ disposal capacity for wells to be drilled, completed and produced in the area of the proposed facility and disposed fluids will be confined to the disposal interval.
- a. Nineteen operators with several hundred wells are connected to the Regency gas plant, which processes approximately 28.9 MMCFGPD.
 - b. Chesapeake Operating, Inc. ("Chesapeake") operates 141 producing wells in McMullen and Atascosa Counties and is drilling 70 infill wells per year. The Regency gas plant is critical to its operations and, without the plant, Chesapeake would have to significantly reduce its activity in the area and shut-in much of its current area production.
 - c. Momentum Oil & Gas, LLC ("Momentum") operates 10 producing wells in the Fashing Field in McMullen County. Without the Regency

gas plant, Momentum would have to shut-in its current production, which is a significant portion of its total statewide production.

- d. EOG Resources, Inc. ("EOG") operates 63 producing wells in McMullen and Atascosa Counties. Without the Regency gas plant, EOG would have to significantly reduce its activity in the area and shut-in wells or flare much of its current gas production, resulting in the loss of approximately 1,200 barrels per day of condensate production.

CONCLUSIONS OF LAW

1. Proper notice of this hearing was issued.
2. All things have been accomplished or have occurred to give the Commission jurisdiction in this matter.
3. Renewal of the Regency disposal permit, as amended, will not harm useable-quality water resources, will not endanger public safety or oil, gas, or geothermal resources, will promote further development in this area of McMullen County and is in the public interest pursuant to Sec. 27.051 of the Texas Water Code.

EXAMINERS' RECOMMENDATION

Based on the above findings of fact and conclusions of law, the examiners recommend that the Commission renew the Regency disposal permit, as amended, for a five year term that will expire unless Regency supplies the Commission with an updated plume model and analysis of other H2S disposal possibilities, as set out in the attached Final Order.

Respectfully submitted,



Richard D. Atkins, P.E.
Technical Examiner



Terry J. Johnson
Legal Examiner