

Jim Thorpe Building, Oklahoma City, Oklahoma, pursuant to notice given as required by law and the rules of the Commission for the purpose of taking testimony and reporting to the Commission.

APPEARANCES: **Robert A. Miller**, attorney, appeared on behalf of applicant, Johnson County Disposal Well Services, Inc. ("Johnson"); **Gregory L. Mahaffey**, attorney, appeared on behalf of Bay Oaks Resources, LLC ("Bay Oaks") and Stephens Production Company ("Stephens")(collectively "Stephens" or the "Protestants"); **Keith Thomas**, Assistant General Counsel, appeared on behalf of Underground Injection Control Department ("UIC"), Oklahoma Corporation Commission; and **Jim Hamilton**, Assistant General Counsel for the Conservation Division, filed notice of appearance.

The Administrative Law Judge ("ALJ") filed his Report of the Administrative Law Judge on the 25th day of March, 2013, to which Exceptions were timely filed and proper notice given of the setting of the Exceptions.

The Appellate argument concerning the Oral Exceptions was referred to **Patricia D. MacGuigan**, Oil and Gas Appellate Referee ("Referee"), on the 24th day of May, 2013. After considering the arguments of counsel and the record contained within these Causes, the Referee finds as follows:

STATEMENT OF THE CASE

STEPHENS APPEALS the ALJ's recommendation to grant the applications of PD 201200166 and PD 201200192.

Johnson made a request for administrative approval to use the Race Track #1-5 well as a disposal well and requested exceptions to certain well construction requirements. Bay Oaks and Stephens protested the applications. The Protestants are concerned that the use of the Race Track #1-5 well may affect their wells located beyond a half-mile radius from the Race Track #1-5 well. Protestants question the need to inject water into a zone with producing wells. Johnson maintains they have followed the rules of the Commission and should be granted an order to convert the Race Track #1-5 wellbore to a commercial disposal well.

PROTESTANTS TAKE THE POSITION:

1) The ALJ erred in granting commercial disposal well authority for the Race Track #1-5 well authorizing Johnson to bring in injected water, primarily from out of state wells in Arkansas because such well will result in waste of remaining Spiro hydrocarbons. It was undisputed that Stephens operates six actively producing Spiro wells and Bay Oaks operates one active Spiro well in sections immediately adjacent to the NE/4 of Section 5 where Johnson is

proposing to recomplete the Race Track #1-5 well as a commercial disposal well. It was Stephens' evidence that, although such wells have already produced approximately 22 BCF, there remains to be recovered about 1.7 BCFG. Johnson is seeking to inject up to 4,000 barrels of saltwater a day into this producing Spiro reservoir at a maximum injection pressure of 1850 psi. The ALJ opines that there is a sealing fault between the proposed disposal well and Stephens' producing reservoir. The ALJ does not discuss the adverse effect that the injection into the Race Track #1-5 well will have on the Bay Oaks Hickman #1-32 well to the North in Section 32, which well even Johnson admits is in the same fault block. However, the ALJ bases his opinion that the proposed disposal well will not have any adverse effect on the Stephens McWaters #1-4 well in Section 4 and other producing wells upon hotly disputed geological interpretations of the existence or nonexistence of the sealing fault. Johnson did not have any seismic data to confirm the existence of this alleged fault between the Race Track #1-5 well and the Stephens producing wells. None of the engineers who testified for Johnson had done an independent study of the fault or any pressure data. All of Johnson's engineers were relying on the testimony of Charles Samson, geologist, who based his interpretation of the fault upon well control. He admitted his opined fault had a throw of only 100 feet and that the Spiro formation, when coupled with the shale portion, was thicker than 100 feet. Thus, even if such a fault existed, it would not necessarily be a sealing fault.

The ALJ failed to properly account for the testimony of Mr. Sam Hall, reservoir and production engineer for Stephens, who demonstrated that the Bay Oaks Hickman #1-32 well, admittedly in the same fault block as the Race Track #1-5 well, was completed at a pressure approximately 108 psi or 12% less than the virgin pressure in the Stephens McWaters #1-4 well. Mr. Hall further testified that the Stephens McWaters #1-4 well, approximately a mile and a half away, was the only well which could have reduced the pressure in the Spiro reservoir in the Bay Oaks Hickman #1-32 unit well in Section 32. Such evidence overwhelmingly flies in the face of Johnson's opined sealing fault south of the Race Track #1-5 well. Mr. Hall went on to testify that even at the reduced injection rate of 4,000 barrels a day, the injected water would cause watering out of the southern part of the reservoir where there is a substantial amount of remaining Spiro reserves. He calculated that even at the reduced rate of 4,000 barrels a day, Johnson would affect the Stephens McWaters #1-4 well in 1.7 years and that approximately 150 MCFG would be permanently lost from the Stephens McWaters #1-4 well.

The Commission's primary function is to prevent waste of its valuable, natural resources. See *Application of Peppers Refining Co.*, 272 P.2d 416 (Okla. 1954). Here where there is substantial evidence that gas will be permanently lost from the Spiro formation, this Commission should prohibit commercial injection of over 4,000 barrels of saltwater a day into such actively producing reservoir.

2) The ALJ erred in admitting, over Stephens objection, Exhibits 6, 7, 8, and 9, Structure Maps prepared by witnesses who are not available for cross-examination. Exhibits 6, 7, 8, and 9 were Spiro Structure Maps prepared by geologists (some who were not even identified) that had been admitted by the Corporation Commission in some prior proceedings in the area of the Race Track #1-5 well. Exhibit 8 was prepared by Hoover Wilson, a company no longer in business, and Exhibit 9 was prepared by a geologist for Providence Exploration. The geologists sponsoring those maps were not identified and were not available for cross-examination by the Protestants. Thus, these maps are hearsay. The Applicant introduced the hearsay maps for the obvious purpose of trying to show the location of a fault which was the "truth of the matter asserted." It was error for the Commission to introduce such rank hearsay maps over the Protestants' objection.

3) The ALJ erred in not admitting Exhibits 16 and 17, the Stephens map on the Alma Structure and the Stephens Alma Sands Structural cross section. Since one of the central issues in the case framed by Johnson was the existence or non-existence of a sealing fault between the proposed Race Track #1-5 commercial disposal well and Stephens' producing Spiro reservoir, the ALJ should have allowed introduction of Exhibits 16 and 17. Granted, such maps were not exchanged at the pretrial exhibit exchange. However, Mr. Robert Liner, a very experienced Arkoma Basin geologist with Stephens prepared such additional maps to show the fallacy of Applicant's interpretation of the sealing fault between the Race Track #1-5 well and the Stephens' producing Spiro wells to the southeast. Mr. Liner was allowed to testify about why the Alma structure and his cross section demonstrated the fallacy of Johnson's opinion, down to the south, thrust fault across Section 5. However, the ALJ refused admittance of Exhibits 16 and 17 which would have demonstratively shown the fallacy of such fault interpretation by Johnson.

4) While a private company has a right to try to make a profit and commercially dispose of our state saltwater in this State, the Commission's paramount mandate from the Oklahoma Supreme Court is to prevent waste of hydrocarbons. Applicant can find a different well to dispose into, drill its own well where there is no active production, or simply complete the existing Race Track #1-5 well in a formation other than the Spiro. Where there is any risk of watering out and premature abandonment of a producing reservoir, this Commission should deny commercial disposal into such formation.

5) Wherefore Stephens and Bay Oaks, operators of nearby producing Spiro wells, respectfully request the Commission reverse the ALJ and deny these applications.

THE ALJ FOUND:

1) After taking into consideration all the facts, circumstances, testimony, and evidence presented in this cause the ALJ recommends the applications in PD 201200166 and PD 201200192 be granted with a 4,000 barrel a day limit and a maximum lifetime injection of 10,000,000 barrels into the Spiro common source of supply.

PD 201200192

2) The evidence is undisputed the Spiro common source of supply drained by the Bay Oaks Hickman #1-32 well and Race Track #1-5 well are the same common source of supply as the Stephens McWaters #1-4 well. However, The ALJ believes the common source of supply is faulted.

3) The cumulative production figures for wells to the north and west of the fault and to the south and east are significantly different. This implies the quality of the reservoir is different as one moves to the west and north. Evidence introduced indicates the Spiro has two lobes until it approaches or reaches the Stephens McWaters #1-4 well, where it becomes one sand. This can explain the difference in quality of the Spiro reservoir. Spiro wells to the north (of the theorized fault) have, across the board, produced less than Spiro wells to the south with one exception, the Sonat Carl A#1-5 well. North of the fault wells average 1.10 BCF. Wells to the south average 2.71 BCF. Further the evidence also shows a consistent pressure difference exists between the Bay Oaks Hickman #1-32 well and the Stephens McWaters #1-4 well. The curve of the declining pressures is a near perfect match. However, there has been a consistent pressure difference since the Bay Oaks Hickman #1-32 came on line seven years after the Stephens McWaters #1-4 well. If they were the same reservoir without a fault, then one could reasonably expect to find the pressures to be the same from the initial date of production until the date of the exhibit. Clearly, they are not. It is reasonable to conclude that having the same rate of decline in the pressures over time shows the reservoirs have similar characteristics. This lends credence that it is the same common source of supply, but in two different reservoirs. The ALJ is not persuaded that the Stephens McWaters #1-4 well in Section 4 reached out to drain in the area of the Bay Oaks Hickman #1-32 well in Section 32. The two wells are over a mile and a quarter apart. In between the two wells is a third well that did produce 0.19 BCFG before it became inactive. The ALJ does not believe the Stephens McWaters #1-4 well encroaches on the drainage area of the Bay Oaks Hickman #1-32 and the ALJ believes the Bay Oaks Hickman #1-32 well was responsible for the depletion of the Race Track #1-5 well. The ALJ also believes the Bay Oaks Hickman #1-32 well is at the end of its economic life.

4) In addition, it is uncontroverted that the structure map of the Spiro clearly shows an offset in the contours. The witness said the map was constructed using well control. He also used well data from other sections to extrapolate the fault in Section 5. Further, there was testimony the Stephens

McWaters #1-4 well is about 300' higher structurally than the Race Track #1-5 well. This would give the injected water a place to collect before it would reach a level to begin to affect the Stephens McWaters #1-4 well, assuming an absence of a sealing fault. The ALJ found the testimony more persuasive in support of a sealing fault.

5) The Applicants are in compliance with Commission rules and The ALJ recommends granting the requested relief for the reasons stated above.

PD 201200166

6) As to the request for an exception to OCC-OAC 165:10-5-5(h), the ALJ recommends PD 201200166 be granted. Johnson presented uncontroverted evidence regarding the protection of the Wapanucka formation and treatable water. No party raised any objection to the well schematic proposed by Johnson. Protestants did not raise a specific objection to the well schematic except to say they were against injecting water into the Spiro. There were no objections by the staff to the exception to the rules being granted during the hearing. The ALJ recommends the requested variance to the rules be granted.

POSITIONS OF THE PARTIES

STEPHENS

1) **Gregory L. Mahaffey**, attorney, appeared on behalf of Stephens, stated the primary function of this Commission is to prevent waste. Stephens strongly feel that granting this commercial disposal well for an out-of-state company wanting to bring in water from Arkansas will be detrimental to the protection of remaining Spiro reserves.

2) The operator has not shown any reason why they couldn't dispose of the water in a shallower zone or a deeper zone. The abandoned Race Track #1-5 well they purchased was completed to the Spiro. Most of the wells in the area are Spiro producers. It is undisputed that the Stephens McWaters #1-4 well still has 150 or 200 MCFG to produce as long as it is not watered out. Cumulatively in the other wells in the Spiro, it is undisputed that there is probably 1.7 BCFG left to recover in these wells.

3) If there is any doubt of the existence of the blue fault being a sealing fault, then the Commission needs to deny this application. There is substantial evidence to refute the existence of that fault, or even if there is a fault, to refute the existence of it being a sealing fault. The engineers that testified in this case on behalf of the applicant had not done a study of the pressures or the fault. He assumed the disposal well was down dip, assumed the liquid would push the gas to the front, assumed the thickness of the

formation was equal across the injection area, assumed radial drainage or radial distribution. Another assumption was that the reservoir space between the Race Track #1-5 well and McWaters #1-4 well was not separated by a sealing fault. But he agreed he was not a geologist and did not study whether or not there was a fault present. But, he made a lot of assumptions. And, after cross examination, he admitted this is probably not radial distribution because the geologist said this was more of a channel environment or deposition. Like any channel you're going to have poor, permeability out on the edge. You're going to have better porosity and permeability in the middle. And everyone agrees fluids follow the path of least resistance. You would expect they're going to go where the better porosity and permeability is. You're not going to have radial distribution. You're going to have a channeling of fluids.

4) Stephens submits evidence that the pressure data was overwhelming that the wells north of the fault were in communication with the wells south of the fault. This couldn't happen if there was a sealing fault.

5) Mr. Hall testified about the different pressures and came to his opinion that the Race Track #1-5 well, the Bay Oaks Hickman #1-32 well and the Stephens McWaters #1-4 well are in the same reservoir and are not separated by a sealing fault.

6) Stephens operates six active wells in this reservoir, and Bay Oaks operates one. If this disposal well is granted it would be watering out these wells within four years by Johnson's evidence. Stephens believe it will be under two years. Mr. Hall has testified that the McWaters #1-4 well has a remaining life of 20 years with 150 MMCFG. So either way this disposal well would prematurely water out these wells and cause a substantial loss of hydrocarbons.

7) Stephens believes that the ALJ did not focus enough on the pressure data and the testimony of Mr. Hall. When the Bay Oaks Hickman #1-32 well showed it was pressure depleted, there is no other well that could have done that except one or two of the wells that were south of the fault 1.5 miles away.

8) There is substantial evidence that gas will be permanently lost from the Spiro. The Commission should prohibit injection of 4,000 BWPD into what is an actively producing reservoir.

9) Johnson also made no showing why they couldn't look at a shallower zone for their disposal well.

10) Johnson also used some Commission records from another case. Those maps were prepared by unknown geologists who were not available for cross examination. That was hearsay offered for the truth of the matter asserted. Stephens objected and the ALJ allowed them over their objection.

This evidence probably highly influenced his decision to opine that there is a fault there.

11) Stephens submits that Johnson can find a different well to dispose into; they can drill their own well into a zone that has no active production; or they can complete this Race Track #1-5 well in a different zone other than the Spiro. There is a substantial risk of watering out and prematurely abandoning this reservoir, and thus the Commission should deny this commercial disposal application.

JOHNSON

1) **Robert A. Miller**, attorney, appeared on behalf of Johnson, stated that the Report of the ALJ should be upheld. All of the companies that are involved in this case are from Fort Smith, Arkansas. Both Stephens and Bay Oaks are from Fort Smith. So there are no Oklahoma companies here, they are all from Arkansas. Bay Oaks used to be Hoover/Wilson. So, when we look at the exhibits prepared that the ALJ let in from the prior cases, Exhibits 6, 7, 8 and 9, they were Stephens in 2007 and Hoover/Wilson done by the geologist for Hoover/Wilson who is the head of geology for Bay Oaks. And that is all in the transcript.

2) The ALJ heard the testimony and believes there is a fault. The ALJ decided to put a safety on his Report by limiting the disposal well to 10 MM barrels because that is what might possibly cause any damage. He limited the rate to 4,000 BWPD. Once the well reaches the 10 MM barrels it is done.

3) The undisputed testimony by Mr. Hall, Stephen's witness, is that when you get below 15 MCFPD you have a non-commercial well, and you plug it. Continuing to produce past that point is not economical. The Bay Oaks Hickman #1-32 well is producing 5 MCFPD. It is producing at an uneconomic limit according to the testimony of both engineers. Thus, there is no waste.

4) Johnson would ask the Report of the ALJ be affirmed.

RESPONSE OF STEPHENS

1) Stephens isn't arguing that this disposal well shouldn't be allowed, they just don't want it in the Spiro. Put the well in some other formation.

2) There was a similar case some years ago that the Commission denied the application because of the risk of exposing the formation. Because this is highly interpretive data, it's not worth the risk. Johnson, who bought this well for \$25,000, simply wants to start injecting into the formation where the well they bought, the Race Track #1-5 well, was already perforated. Stephens has more at stake. Stephens has 1.7 BCFG left in their wells. That is \$6 million worth of gas that you are taking a risk with.

3) Mr. Stovall, Johnson's engineering witness, agreed the best permeability usually is where there is thicker rock and agreed that along the axis the wells are very productive but on the edges the wells are not as productive. Mr. Stovall was not able to guaranty that the water would not reach the McWaters #1-4 well during his testimony. So that is the risk that some of this gas will be permanently lost. The Commission's job should be to avoid that risk.

4) If you water out a well, that gas is lost forever, and it can never be produced.

5) The opposing counsel argues that Bay Oaks is formerly Hoover/Wilson, but there still was no evidence that there was a Hoover/Wilson geologist that testified. Also, there was a Providence map, and Providence certainly wasn't a party to the proceeding so there were still maps that qualify as hearsay.

6) Even with the barrel limit of 10,000 barrels injected water, the Stephens engineer said that it would still water out the other wells.

7) Johnson thinks Stephens pressure of 810 psi on the Bay Oaks Hickman #1-32-32 well was too low, it was really higher. Even if it is 885, that is about 5% less than virgin pressure of 917 pounds. If it is in its own fault block, it should have been virgin. It should have been 917. It wasn't. It was depleted. So, whether it is 5% or 12%, it was still pressure depleted when it came in. Where there is an issue with pressure depletion in the wells and there is going to be communication and you're going to prematurely water out wells, the Commission ought to deny the request for a disposal well.

CONCLUSIONS

The Referee finds that the Report of the Administrative Law Judge should be reversed and the applications denied.

1) The Referee finds the recommendation of the ALJ to grant the Johnson applications for commercial disposal authority is contrary to law and the weight of the evidence and must be reversed.

2) The issue presented before the Commission is whether the commercial disposal of salt water underground through the Race Track #1-5 well in the manner contemplated by Johnson of injecting 4000 barrels of salt water a day to the producing Spiro reservoir, with a maximum injection pressure of 1850 psi and a limit of 10 MM barrels being injected, would cause, or is reasonably likely to cause, any damage to any oil or gas bearing stratum. *Appeal of Cummings and McIntyre*, 319 P.2d 602 (Okl. 1957).

3) The Referee finds the weight of the evidence established that the disposal of water into the Spiro formation by Johnson in the Race Track #1-5 well will cause damage to the productive Spiro formation in the area.

4) The Commission has the responsibility to prevent pollution and protect productive common sources of supply and takes this responsibility very seriously. The Commission implemented its rules concerning the commercial disposal of salt water by calling upon experts within the industry to help design stringent rules, such that, if a well meets the requirements of the Commission rules for a commercial SWD and there is no reasonable likelihood of pollution or damage to oil and gas bearing stratus in the use of such well, then the well will be granted. See OCC-OAC 165:10-5-1, et seq.

5) Johnson is proposing to recomplete the Race Track #1-5 well as a commercial disposal well in the NE/4 of Section 5. Stephens operates six actively producing Spiro wells and Bay Oaks operates one active Spiro well in sections immediately adjacent to the NE/4 of Section 5. Stephens' evidence reflected that although their wells have already produced approximately 22 BCF, there remains to be recovered about 1.7 BCFG. That is \$6 million worth of gas that they are taking a risk for if this commercial disposal well is granted.

6) Johnson presented evidence that there is a sealing fault between the proposed disposal well in Stephens' producing reservoir. Johnson's testimony was that the fault had a throw of only 100 feet and that the Spiro formation when coupled with the shale portion was thicker than 100 feet, i.e. 117 feet. Thus, even if such a fault existed it would not necessarily be a ceiling fault. There would also be a likelihood of an adverse effect on the Bay Oaks Hickman #1-32 well if there was the proposed injection of salt water in the Race Track #1-5 well as the two wells are in the same fault block, if such fault exists.

7) Additionally, the testimony concerning the pressure data leads one to believe that the Bay Oaks Hickman #1-32, the Race Track #1-5 and the Stephens' McWaters #1-4 wells are more likely in the same reservoir. The testimony of Stephens' engineer stated at Transcript, November 15, 2012, page 63, line 8-25:

A. When the Hickman well was initially produced the shut-in pressure was, as has been discussed,

around 810 psi or somewhere in that range, which falls very closely to where the McWaters shut-in was at that point. They tracked..their shut-in pressures throughout the life of the wells have tracked each other closely. When the Race Track well was initially produced the shut-in pressure was in line with both of those wells and, so the pressures have matched throughout.

Q. All right. And when you see that kind of pressure match, does that lead you as an engineer to believe those wells are more likely in the same reservoir or in a different reservoir?

A. In the same reservoir.

Q. If the Hickman well had been in a separate reservoir, would you have expected the initial pressure to be virgin pressure;

A. I would.

The Race Track #1-5 well was completed at a pressure approximately 108 psi or 12% less than the virgin pressure in the McWaters #1-4 well. The testimony also reflected that the McWaters #1-4 well, was only approximately a mile and a half away and was the only well that could have reduced the pressure in the Spiro reservoir in the Bay Oaks Hickman #1-32 well. This evidence, thus reflects that there is no sealing fault south of the Race Track #1-5 well.

8) Stephens' evidence also reflected that at the injection rate of 4000 barrels a day, the injected water would cause watering out of the southern part of the reservoir where there is a substantial amount of remaining Spiro reserves. With 4000 barrels a day, the McWaters #1-4 well would be affected in 1.7 years and approximately 150 MCFG would be permanently lost from the McWaters #1-4 well.

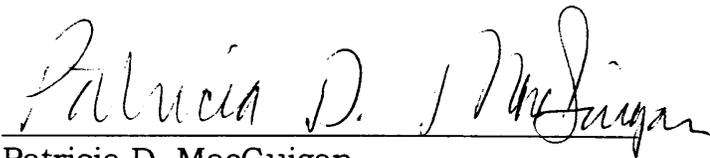
9) A primary function of the Commission is to prevent waste of its valuable, natural resources. *Denver Producing and Refining Company v. State*, 184 P.2d 961 (Okl. 1947); *Application of Peppers Refining Company*, 272 P.2d 416 (Okl. 1954). Where the evidence reflects that the Spiro does contain hydrocarbons that can be produced through existing wellbores, with little likelihood that any new wells will be drilled to the Spiro for production, if the Commission allows the disposal of water into the Spiro through the proposed

Race Track #1-5 well, it would occasion waste by watering out productive portions of the Spiro.

10) The Commission must base its rulings on evidence that would convince a reasonable man that the granting of these applications was proper. *El Paso Natural Gas Company v. Corporation Commission of Oklahoma*, 640 P.2d 1336 (Okl. 1981); *Kuykendall v. Corporation Commission*, 634 P.2d 711 (Okl. 1981); and *Landowners, Oil, Gas and Royalty Owners v. Corporation Commission*, 415 P.2d 942 (Okl. 1966). The Referee has read the transcripts and believes the evidence presented by Johnson and the opinions given by its expert witnesses are not substantial evidence to support such an order. *Application of Choctaw Express Company*, 253 P.2d 822 (Okl. 1953); *Downs v. Longfellow Corporation*, 351 P.2d 999 (Okl. 1960); and *Haymaker v. Oklahoma Corporation Commission*, 731 P.2d 1008 (Okl.Civ.App 1986).

11) Therefore considering the evidence and the law as noted above, the Commission should reverse the Report of the ALJ and deny the applications.

RESPECTFULLY SUBMITTED THIS 2nd day of July, 2013.



Patricia D. MacGuigan
OIL & GAS APPELLATE REFEREE

PM:ac

xc: Commissioner Douglas
Commissioner Anthony
Commissioner Murphy
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