

BEFORE THE CORPORATION COMMISSION OF THE STATE OF OKLAHOMA

APPLICANT: SWAN ENERGY, INC. )  
)  
RELIEF SOUGHT: WELL LOCATION EXCEPTION - )  
ANNIE #2-6 )  
LEGAL DESCRIPTION: SE/4 OF SECTION 6, )  
TOWNSHIP 6 NORTH, RANGE 3 )  
WEST, MCCLAIN COUNTY, )  
OKLAHOMA )

CAUSE CD NO.  
201104002

**FILED**  
DEC 07 2011

OUR OFFICE - OKC  
CORPORATION COMMISSION  
OF OKLAHOMA

REPORT OF THE ADMINISTRATIVE LAW JUDGE

This Cause came on for hearing before Susan R. Osburn, Administrative Law Judge for the Corporation Commission of the State of Oklahoma, on the 20<sup>th</sup> day of October, 2011, at 8:30 a.m. in the Commission's Courtroom, 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.

CASE SUMMARY:

Cause 201104002 is the application of Swan Energy Inc. seeking authority for a location exception for the First Deese, Second Deese, Third Deese, Hart, Osborne, Basal Pennsylvanian Unconformity, Hunton, Viola, First Bromide and Second Bromide as an exception to Order Nos. 99319, 191955, 201830 and 586782 for the well to be located no closer than 330' FNL and no closer than 330' FEL of the SE/4 of Section 6, T6N, R3W, McClain County, Oklahoma. Swan bases their request on a need to improve their structural position for various common sources of supply and for some formations to obtain a well in a separate fault block from the Annie #1-6 well in this unit. Applicant further relies upon an acoustic-electromagnetic test to show the presence of hydrocarbons at their requested location and an absence of hydrocarbons at a legal location in the Bromide. Protestants state that they are not familiar with the test, nor have they ever heard of this type testing. Protestant Chaparral also has objected to this location, noting that the difference in structure is minimal. They also point out that based on the rules applicant should drill their well at a legal location, absent sufficient evidence to show the need for the location exception. Chaparral believes there is no evidence to show that the faulting reflected on applicant's exhibits would be sealing and they believe they have reserves to the north of the proposed location in their offset unit which they wish to protect from an off pattern well.

Swan prepared structure maps on the Hart, Hunton, Viola and Second Bromide and only one gross isopach on the Hunton; no net pay maps were furnished.

**RECOMMENDATIONS:**

It is the recommendation of the ALJ that the application of Swan Energy Inc. seeking location exception authority in the SE/4 of Section 6, T6N, R3W, McClain County, Oklahoma for the First Deese, Second Deese, Third Deese, Hart, Osborne, Basal Pennsylvanian Unconformity, Hunton, Viola, First Bromide and Second Bromide be denied based on lack of substantial evidence.

**HEARING DATE(S):** October 20, 2011

**APPEARANCES:**

Richard J. Gore, attorney, appeared on behalf of applicant, Swan Energy, Inc. ("Swan")

David E. Pepper, attorney, appeared on behalf of Chaparral Energy, L.L.C. ("Chaparral")

Emily P. Smith, attorney, appeared on behalf of Chesapeake Operating, Inc. and Chesapeake Exploration, L.L.C. ("Chesapeake")

**FINDINGS AND SUMMARY OF EVIDENCE**

1. CD 201104002 is the application of Swan requesting the Commission enter an order amending Order No. 99319 for the Hunton, First Bromide and Second Bromide common sources of supply, Order No. 191955 for the Viola common source of supply, Order No. 201830 for the First Deese, Second Deese, Third Deese, Hart and Osborne common sources of supply and Order No. 586782 for the Basal Pennsylvanian Unconformity common source of supply to permit a well at a location no closer than 330' FNL and no closer than 330' FEL of the SE/4 of Section 6, T6N, R3W, McClain County, Oklahoma

as an exception to the aforementioned orders which require wells be located in the SE/4 for these formations no closer than 660 feet from the boundary of said quarter section.

2. The Commission has jurisdiction over the subject matter and notice has been given in all respects as required by law and the rules of the Commission.

3. The following numbered exhibits were accepted into evidence:

1. Swan's Hart structure map
2. Swan's Hunton structure map
3. Swan's Hunton-Viola isopach map
4. Swan's Viola structure map
5. Swan's Second Bromide structure map
6. Chaparral's Hunton structure map
7. Chaparral's Viola structure map
8. Chaparral's Second Bromide structure map

4. A. That Douglas D. Daugherty, a landman with Continental Land Resources, appeared on behalf of applicant and presented his qualifications to testify in matters of this kind. He said he was familiar with this area and that the applicant has 128 acres with the right to drill. That Chaparral does not own in the SE/4 but they operate an offset well to the north. That offset operators were listed on Exhibit A and all of those parties had good and timely notice. At this time the ALJ had to inquire who those parties were and where they operated since no exhibit was presented by applicant reflecting names of operators nor productive zones for offset wells. The witness finally stated that courtesy notice had been given to John Taylor,

Sandridge Energy, and Hodgsden Operating Company. At this time the witness requested that Charter Oak Production be designated operator; he explained that Charter Oak owns 5% of Swan's 128 acres. He requested that the order authorize them one year within which to commence the well. When asked if he knew when Chaparral acquired the well to the north he said he didn't know.

B. On cross the witness said he had not been part of the hearing process for the density order for this unit; he stated that the initial well for this unit, the Annie #1 well, had not been commenced yet.

At this time upon questioning by the ALJ about whether they had obtained a density order before they had drilled their first well, Mr. Gore stated for the record that the Annie #1 well has been drilled but not completed; that it is to be completed within the next 30 days.

5. A. That Larry Seng, a geologist qualified to testify in matters of this kind appeared and stated he was familiar with the cause and said he was qualified as both a geophysicist and a geologist having practiced as both for the last 20 years; that he was primarily a geologist. The SE/4 of Section 6 is his prospect and he has worked this area for about five years and has drilled about seven wells in McClain County. That applicant is seeking a vertical well location 330' from the north and the east boundary of the SE/4 rather than the required 660' setback. He identified his Hart structure map and stated it was based on well control; he said all his maps incorporated isopach and structure information. Exhibit 1 outlines the 160-acre unit and shows the two well locations in their unit and Chaparral's well to the north. Exhibit 2 is his Hunton structure map and shows Chaparral's Hunton well to the north. He said there were more faults at this level than at the Hart level. He identified Exhibit 3 as his Hunton isopach from the top of the Hunton down to the top of the Viola, so it included the Sylvan interval. His Exhibit 3 shows a fault separating the Annie #1 well and Annie #2 location and he said this was confirmed by the drilling of the Annie #1 well. He believed the Hunton and deeper formations in those wells would not be in communication. To clarify earlier testimony he said the faulting shown between the Annie wells was verified by comparing the Annie #1-6 to the Carter Mottinger #1 in the NW/4 SW/4 of Section 5 which is to the east.

He identified his Exhibit 4 as a Viola structure map based on log review. That this is a different type structure than the Hunton structure and here the Annie #2 location is on a different structure than the Chaparral well to the north. Over objection he said he believed this different structure for the Annie #2 location was confirmed by the fact that Carter, after drilling their dry hole, wouldn't have drilled their second well if they didn't think there was a separate structure too. Exhibit 4 shows more faulting than found at the Hunton level and that was based on isopaching and well control. He identified Exhibit 5 as his Second Bromide structure map prepared in the same manner as his previous exhibits; he agreed there were additional faults at this level and in fact there was one separating the Annie #2 location from the Chaparral well, but he couldn't say if it was a sealing fault. That faults can set up the structure and can separate producing wells, but he couldn't say if this fault was separating the wells here. He agreed that the deeper one goes here the more faulting occurs. He reiterated that one couldn't tell if these faults were sealing or not until wells are drilled near each other and across the faults. When asked if these faults were well known, he said he mapped these faults through this area for this prospect and based on isopach differences in wells across mapped faults, there are area faults. He didn't believe there could be that much difference in thicknesses without a fault and there was no doubt in his mind that the faulting existed as he mapped it.

He identified Exhibit 6 as Chaparral's Hunton structure map and he offered it to compare to his Exhibit 2; Exhibit 6 had no faulting in the Hunton. Chaparral apparently picked Hunton tops at well locations and contoured that and he didn't believe one could accurately contour formations without taking faults into consideration. Since he wanted to include all faulting when he mapped, he felt his Hunton structure map was more accurate. He identified Exhibit 7 as Chaparral's Viola structure map which would be on the same interval as his Exhibit 4; Exhibit 7 had no faulting and while one could configure structure as done here, he felt faulting was important in structure and one should have it available for mapping. That this area has a tremendous amount of faulting. He identified Exhibit 8 as Chaparral's structure on the Second Bromide which would be similar to his Exhibit 5; that Exhibit 8 had no faults but he believed they existed at this level and therefore Chaparral's Exhibit 8 was less accurate than his Exhibit 5.

Swan is seeking a location exception 330' from the north and east boundary of their unit and Chaparral is protesting and wants them to move back to a location 660' from the north. He said their location would be fault separated from Chaparral's well in the Bromide and he believed there was production at their requested location in the Bromide based on other information that they have available; the Bromide is their primary objective. That according to Chaparral's Exhibit 8 Swan's location exception would be 58' downdip from Chaparral's well.

According to seismic information which Swan had, and had furnished to Chaparral, the Annie #1 well is on the downthrown side of the fault and their proposed location is on the upthrown side of the fault; there is a fault throw of about 50' between the two Annie wells. When asked if a well would be productive at the 660'-660' location and also at the 330'-330' location, he said it would. He said they had used an acoustic test here; that they are experimenting with it right now and from the results at other locations this instrument works. Over the objection of protestant's attorney the witness explained that this was a combination of acoustic and electromagnetic testing and basically it supports whether one would have hydrocarbon or water as a fluid source at different locations. At 660' from the north boundary the test showed no hydrocarbons, but at a location 330' from the north and east boundary it showed hydrocarbons would be available.

Mr. Gore asked the witness why he had told him prior to the hearing that a location 660' from the north boundary of the unit would be a dry hole, but testified a short time ago that location would be productive, and the witness said he had been confused; that in fact a well drilled at a legal location in the unit would be a dry hole, but a well drilled at their proposed location would be productive based on the acoustic-electromagnetic test. Swan had used this test in other areas and was successful in drilling wells. That it would cost about \$1.25 to \$1.5 million to drill this well and they would not drill at a legal location. He noted the Chaparral well has produced from the Hunton since 1981 and Chaparral became operator of that well in 1997. He had not seen any other Chaparral operated wells in this area and public information indicated no work had been done on the Chaparral well to the north. That it is currently producing about 3 BOPD from the Hunton.

B. On cross the witness said the Hart was a primary objective; its structural position at the proposed location would be about -7,515'; if they backed up to a 660' location from the north the Hart would be at about -7,520'; however he thought they would lose probably closer to 10' of structure. He didn't know if this was a water drive reservoir or not, that he didn't have information about that. Since none of the wells on his map were color coded for production he was asked if there were any Hart producers on his map and he said there were, but they were not coded on his map. He agreed that there were no faults in the Hart formation. The Annie #1-6 well had shows in the Hart, it had about 10' of density-porosity crossover. He was asked about the increased density order Swan obtained for this unit when there was no unit Hart production, which indicated that the Annie #1 and the Annie #2 locations would be separated by a sealing fault and the witness said he felt there was separation below the Hunton. He was asked if that meant they had increased density for the Hart, First Deese, Second Deese, Third Deese, Osborne and the Basal Pennsylvanian when there was no faulting there, and he agreed that was true. He agreed that nothing else had been presented in the order for the density authority to support increased density above the Hunton he agreed that was correct. It was noted to the witness that since he had no isopach on the Hart, that one could not tell if a move to the proposed location exception would be better than a location at legal and the witness agreed that was true, that all they had to support the location exception was the "acoustic" test which indicated that a location 660' from their north boundary would not be productive and would be a dry hole, whereas a location 330' from the north boundary would be productive. That he had no log or study results other than that acoustic test to support their request.

Regarding the Exhibit 2 Hunton structure map he agreed there was no fault separation between the Annie #1 and the Annie #2 location; that at the increased density hearing he knew there was no sealing fault separation between those wells from the Hunton on up through the shallower formations. When asked if he knew that before, why he had indicated they needed a density due to the faulting for all zones and he said that they did know that for zones below the Hunton. He had picked the 8,683' top of the Hunton in the Chaparral wellbore which was consistent with Chaparral's pick; that he had reviewed the maps to see if their picks were consistent. He believed the contouring should be different on Chaparral's Hunton map even though he agreed there was no separation between Chaparral's unit and Swan's unit at

the Hunton level and no structural difference between a location 660' from the north boundary and their proposed location. His Hunton/Viola isopach was a gross isopach showing 480' of gross Hunton at their proposed location; this isopach included the Sylvan which doesn't produce; he did not provide a map to show net Hunton. Based on his gross map, 660' from the north boundary would still obtain 480' of gross Hunton so the location exception would not gain thickness. On his Exhibit 4 Viola structure map he had picked tops similar to Chaparral's structural picks at the wellbores; he did not think Chaparral's well to the north produced from the Viola. He agreed a location 660' from the north boundary would obtain the same structural position in the Viola as their location exception; he had no isopach to show if thickness would be better at the location exception.

His Exhibit 5 Second Bromide structure map showed fault separation between the Chaparral well and Swan's proposed location, although the fault does not separate their location exception from Chaparral's unit; further he didn't know if the fault between the Annie #1 and Annie #2 wells was sealing, they wouldn't know that until they began to produce the Annie #2 well. The fault throw at the Viola level between the Annie #1 and #2 wells is about 40', while the Viola thickness was about 200' so it probably wasn't a sealing fault. At the Second Bromide the displacement between the Annie #1 and Annie #2 wells was also about 40' and the Second Bromide thickness was about 200' or more. In the Annie #1 they only drilled about 55 or 60' into the Second Bromide and probably wouldn't produce it in the Annie #1 well, that the samples were poor. The Second Bromide was the primary objective in the Annie #2 well. He was asked what encouraged Swan in the Annie #1 well to determine the Second Bromide would be a primary objective in the Annie #2 well; in a unresponsive manner he said it was because of the Hunton, that it looked good in the Annie #1 with 20' of net Hunton with good porosity. He again agreed that there was no fault in the Hunton between the Annie #1 and Annie #2 wells. He was asked if it was true that the Hunton could be productive at a legal distance from the north boundary as well as it would at the requested location exception and he agreed it could, He understood that the Hunton was the primary zone Chaparral was seeking to protect. Second Bromide samples in the Annie #1 well had not been good and their proposed location would be on the upthrown side of the fault. He agreed the acoustic-electromagnetic test indicated that the location exception would be productive of hydrocarbons, but a location 660' from the northern unit boundary would

not. This test was limited to the Bromide, their primary objective. He agreed it would be sensible that the fault at the Viola and Bromide would be post-depositional to the Hunton and therefore there should be the same thickness in the Hunton at 660' from the north as at their proposed location. When it was noted to the witness that Chaparral's well had 15 feet of Hunton and therefore Swan would have more net feet of pay in the Hunton at their location exception than Chaparral did at legal, the witness said Swan may have only 15', that he wouldn't know until they had a log on that well. He admitted Swan intends to complete their Annie #1 well in the Hunton.

C. On redirect for clarification the witness agreed that their proposed location is for the Bromide, that for the other zones a location 660' from the north boundary might be about the same quality as at a location 330' from the north boundary. The Second Bromide is their primary objective and is significantly more productive than the other zones. Regarding Chaparral's Exhibit 8 Second Bromide structure, Swan's proposed location exception is 20' higher than the 660' legal location, so there is significant structural difference between the proposed location and a location 330' farther south, even on Chaparral's map.

6. A. That John Herring, a petroleum engineer, qualified to testify in matters of this kind, appeared on behalf of applicant and said he was familiar with this area. That their proposed location exception depth of 10,400' would be into the Second Bromide, which is the deepest named formation in the application. He would not recommend a penalty for this location exception since there would be no adverse impact on offsets. That the reason for the location was to gain a structural advantage in the Second Bromide; that gaining 20' in structure in the Second Bromide can mean the difference between a dry hole and a producer and Swan would not drill this well at a legal location. He had been asked to quantify the reserves one might get in Swan's Second Bromide well, he said he had done a study of over 4500 wells over five townships and the average production is a 115,000 barrels of oil, but the average Bromide production in his study was 294,000 barrels of oil; they hope for that here. He noted Swan would not object to Chaparral drilling a mirror location to their location exception here. Over the objection of Mr. Pepper the witness said that Swan had offered Chaparral the ability to participate in this well with up to 40% of Swan's interest and had also offered them well information free of cost. At this time in order to correct previous testimony of

the landman that Swan owns 128 acres, he said that Swan had a farmout for that amount, but they had a pooling order and now control 160 acres.

The Chaparral well had produced for 30 years and from his study of area wells he had not seen any other Chaparral operated wells in this area; from a review of the records this well had not been worked on at all since Chaparral obtained it in 1997. That well has cumed 87,000 barrels of oil.

He said the proposed location exception 330' from their north and east unit boundary would not impact Chaparral's Hunton well based on three wells he had completed in the Hunton in this area which are spaced about 1200' apart from each other; that he frac'd one last December 2010 and another 1200' distance from it about 30 days ago and there was no impact between those two wells in the Hunton. That Chaparral's well is 1600' from Swan's proposed location and therefore he doesn't believe there would be any communication between them. Asked why the location exception was important from an engineering standpoint he responded only that the geologist had advised him it was the best location. He did believe the drilling of the well at a location 330' from the unit boundaries would be necessary to effectively and efficiently drain recoverable hydrocarbons from the Second Bromide that could not be obtained by drilling at a legal location, therefore he felt it was necessary to have the location exception to prevent waste.

B. Regarding his testimony about an offer of settlement he was reminded his e-mail had offered 5% for Chaparral to obtain and participate within Swan's well, not 40%; he said 5% was his initial offer, that he had been authorized up to 40% so he just started at 5%; there had been no other e-mails, that Chaparral did not respond to his initial offer. He agreed the geologist had testified that the Hunton would be productive at a location 660' from the northern unit boundary; the witness didn't think that a Bromide well 660' from the northern unit boundary would be productive. He said the Annie #1 well was drilled about 50' into the Second Bromide and they logged across the top 10' and chose not to complete in that zone, although they may complete in the Hunton, Viola and some of the Deese sands; he agreed earlier testimony indicated there was no faulting in the uphole zones. He agreed they didn't know now if they really needed density for the up hole zones which were not fault separated, and that would include the Hunton. When asked about his testimony regarding the average production from the Bromide of 294,000

barrels of oil he explained that it would include any of the five Bromides, that specifically this would be all of the Simpson production. For the 294,000 BO average Simpson production he had done a drainage calculation; for the net pay at the location he would expect between 20 to 100 feet in the Bromide and he used 100' of net pay in his analysis and determined that the well would probably drain about 10 acres, that there would be 294,000 barrels of fluid in 10 acres. His calculation used 10 acres times 100' of thickness and 400 barrels per acre/foot. That he got that 400 barrels per acre/foot based on documented public knowledge of recovery for about 250 to 400 barrels per acre foot in the Golden Trend from the Second Bromide, that he used the 100' of net based on the top 100' of the Second Bromide from a look-a-like well in Section 32-6N-3W. Asked if he had drilled any wells like that in the nine section area, he said he had not drilled any Bromide wells in the nine section area, that he had drilled a Hunton well in Section 9, but it is now plugged. In his calculation he used average porosity of 20% and as far as the water saturation he said it was almost impossible to use for the Simpson and he didn't use it in his calculation. When asked about the documented recovery of 250 to 400 barrels per acre/foot he said he didn't have it with him but he could find it, that this 10 acres x 400 barrels x 100' of pay would yield 400,000 barrels of fluid, which would be oil and water, as they are usually produced together. There is about an 80% oil cut so about 320,000 BO would be recovered. That this would represent about a 400' radius drainage. When questioned about his method of calculation he said it would be the preferred and only method since the other method of calculation for oil-in-place would require a water saturation and it was almost impossible to determine that in the Bromide in McClain County. As to his 400 foot radius of drainage he agreed that would impact somewhat into Chaparral's unit which is 330' from the proposed location. From an engineering standpoint he could not say why this location would be preferred to a legal location. That the Annie #1 is about 1000' from the Annie #2 proposed location; that the Annie #1 had poor Bromide samples and he believed that they could move 1000' away and get a well that would produce around 400,000 BO from the Bromide. When asked if there was any well like that he noted the C.W. Mottinger well in the NW/4 of Section 5 came in at 1000 barrels a day, that it has made about 450,0000 BO; it was perforated in the Simpson, Second Bromide and Hunton and he surmised the majority of oil production would be from the Simpson. As to other such wells in the 12 section area on Swan's exhibit he noted in Section 7, the Pugh #1-7 produced 220,000 BO from the Hunton and Second Bromide. The Mottinger #1 was the

closest Bromide well to their location exception but it was not a good well having produced about 38,000 BO. The C.W. Mottinger, which produced about 400,000 BO, was just a short distance from the Mottinger #1 and moving a short distance in this reservoir can make a huge difference.

The fracing he had talked about in the Hunton in December of 2010 had occurred about six miles to the west in Section 18-6N-2W where he frac'd a Hunton well about 1200' away from his original Hunton well. The fracing of the second well did not occur 330' distance from the first well but their location exception was 330' from Chaparral's unit; he agreed that the fact that there was no impact between the two wells 1200' apart after a Hunton frac job didn't say anything about an impact 330' away from a frac treatment. He had no pressure information regarding the effect of that frac but the production did not change; that production is a reflection of the pressure, and production was the same before and after the fracture treatment 1200' away. He admitted he had no pressure information to substantiate that.

The 400 barrels per acre/foot he used in his calculation was based on a compilation of various Simpson sands; that he had no published data or study regarding just the First and Second Bromide; that the two highest producers in the Simpson Series would be the Second and Fifth Bromide, so the highest recoveries of 250 to 400 barrels per acre foot would come from the Second Bromide or Oil Creek; when asked what study he had to rely on for that statement he said he didn't have one with him. Good First Bromide production would average about 50,000 to 125,000 BO; that he used post 1970 production but he didn't have a list of those wells with him. Average production from a Second Bromide well would vary from 50,000 to 2 million barrels, that in the East Bromide Sand Unit there are 20 wells and that unit has produced 20 MMBO which would average about a million barrels per well from the Second Bromide; that unit is in south McClain County about five miles south of here. He said one can have that anytime one drills a Second Bromide well. When it was noted there were several Second Bromide penetrations in the area and none would suggest that, the witness responded that they had a well that produced 400,000 BO and one that produced as little as 38,000 barrels. He agreed in the twelve section area there are no Second Bromide wells that produce a million barrels of oil. Since there are 21 wells that produce from Simpson members in this general area and none produce a million barrels of oil, he was again asked the average production of a well producing from the

Second Bromide and he said it would be about 250,000 BO based on his study of 4500 wells that produced from any or all of the Simpsons members together. He reiterated that the largest Simpson production was from the Second Bromide. In T6N-3W there are only about ten Oil Creek penetrations, that most wells are drilled only to the Second Bromide to a depth of about 10,200'. He had not brought any of his calculations reduced to writing today, nor had he provided any such calculations to Chaparral.

C. On redirect the witness said if Chaparral wants to participate in Swan's well they can participate with up to 40% of Swan's interest. His 4500 well study was from January to March of 2011 and from it he determined that a good Second Bromide well drilled at their proposed location would drain about ten acres. He had seen situations where there was a dry hole in the Second Bromide and then a producer would be drilled closer than 330' to that dry hole. Based on Swan's maps he believed the location exception will not impact Chaparral's well due to the faulting shown on their maps. If they drill their well and do not get Second Bromide production and just have Hunton he did not believe there would be any impact; based on his experience in completing in limestones when they stimulate those wells the fractures run east-west so they would not impact to the north since the drainage would run east-west. The fact that Chaparral's well has produced for 30 years would also be an indicator that Swan's location exception would not impact Chaparral's well nor unit. By drilling their location exception Swan hopes to prove up a theory and if the well is successful it could prove up Chaparral's interest to the north. Regarding an earlier question on cross about whether he had given Chaparral his Simpson data he noted that in fact they did not ask for it and if they had he would have given it to them.

D. On further cross when asked why he had not brought his information on his 4500 wells study to support their case, he said he didn't know average production data would be useful in proving up their case, that he didn't even know it would be discussed. He was asked if that meant he didn't think they would be talking about penalty and he said hadn't thought so. Asked if he was aware that proving up Chaparral's acreage was not a basis for Swan's location exception he said he wasn't aware of that. When asked if he had heard the geologist say they could have a productive Hunton well at a legal location he said he had heard that testimony and agreed that they might not

need the location exception at the Hunton level. That he had not made any calculation as to the Hunton reserves.

7. A. That Kurt Malinowsky, a geologist qualified to testify in matters of this kind, appeared on behalf of Chaparral and said he had prepared Exhibits 6, 7 and 8 based on log data. As to criticism about no faulting on his exhibits, he said when he reviews an area he looks for direct evidence from seismic or wellbores cuts to show faulting. He has not seen any direct evidence of fault cuts here. That a location set back 660' from Swan's northern boundary would be almost structurally flat to the location exception.

That the Hunton is of concern to Chaparral, they have an older Hunton well to the north but they have reserves to the south of that well and they plan to drill a well at a legal location in the SW/4 NE/4, somewhat mirroring the recent Annie #1 well, so they are concerned about protecting their acreage from Swan's proposed location exception. That applicant's geologist had agreed that a legal location in the Hunton would be productive and he noted Swan obtained about 20' of Hunton pay in the Annie #1 well which was similar to Chaparral's well to the north. That Chaparral is seeking denial of Swan's location exception for the Hunton and above. He explained that the sole evidence for the Bromide was applicant's testimony that they would expect production at their location exception but none at a legal location based on their acoustic-electromagnetic test. He said that in his 30 years experience he had never heard of this test. That from his evaluation of information on the Bromide, including the fact that Swan drilled 10' into the Bromide in the Annie well, sampled it and determined not to complete in that formation, and based on log analysis of Chaparral's well and the Mottinger #1 well he would expect no more than 10' of pay in the Second Bromide at Swan's location, rather than 100' Swan indicated they might find. Considering the Annie #1 well had 10' of pay, the Mottinger #1 in the S/2 NW/4 of Section 5 with limited Second Bromide production and Chaparral's Wells A 1-6 well which tested 6' of Bromide there would be three wells in the general area with limited Bromide development so he would not expect 100' of net pay at Swan's proposed location. There was one good Bromide well in Section 5, the C.W. Mottinger well, but all they had on it was an old electric log from which he could not determine net pay, that there was no porosity tool. He reiterated that Chaparral would seek denial of the application completely, but as a secondary

request they would ask that the Commission deny the application especially as to the Hunton and all formations above the Hunton. He said he assisted the engineer in determining net pay in Chaparral's Wells A 1-6 well for use in engineering calculations.

B. On cross he said his specific objections were from a review of Chaparral's and Swan's maps, that he did not see a difference structurally between a location exception 330' from the north and east boundaries and a location at a legal location 660' from those boundaries, and he would expect no more than about 10' of pay in this area. In reference to his own Exhibit 8 Second Bromide structure map he said that he didn't think there would be but about 4 to 5' of structural difference between the proposed location and a location 660' from the northern boundary and 330' from the eastern boundary; Chaparral was requesting Swan's location exception move back 660' from the northern boundary, that Chaparral didn't request any move from the 330' call from the eastern boundary. He believed there would be about 10' of pay in the Second Bromide at Swan's requested location based on log analysis of Chaparral's A 1-6 Wells' well with 6' of pay and the Mottinger #1 well with 10' of pay. When advised that there had been earlier testimony about Second Bromide wells with a 100' of Bromide he said he understood that there had been testimony like that but he was not familiar with those wells. When reminded that there had also been testimony that within a 200 to 300' distance that wells can go from 10' of Bromide to a 100' of Bromide thickness and he said he had not seen that occur. That in the last five years he had studied development in McClain County quite a bit, that there was the Dibble Hunton Field a couple of miles to the southwest and he had done a lot of work with the Hunton and had done some work in the Bromide in localized areas. That he had worked with the Hunton and the Bromide in western McClain County.

That Chaparral probably did acquire the A 1-6 Wells well in 1997; as to any work or plans to enhance production in that well he said they had done detailed log analysis on the Woodford in that well. He agreed Chaparral had done no work on the Well's A 1-6 well since they acquired it.

His study of this area was not due to Swan's application, that Swan's activity came up on their radar after he had already started doing his study on the Woodford here and he was concerned Swan might be interested in the Woodford too. After a review of what was going on he determined Swan

was going after the Bromide. The Hunton Dibble field is not a secondary recovery unit, it is a 160 acre spaced oil field with low GOR and Chaparral has determined in-field potential in the Hunton and has proceeded to develop on an 80 acre basis and is now considering 40 acre in-field development. Most of his work in this area has been focused on that field and on the Woodford. As to Chaparral's ownership they have scattered acreage in the area outside the NE/4 of Section 6, but their block of ownership is in the Dibble Field. When asked if Swan's well here could prove up Chaparral's acreage in the Bromide, he said that it could and then they might be interested in drilling in their unit to the Bromide; however he noted they would still object to Swan's drilling at the proposed location exception, that he did not see any benefit or difference in drilling 330' from the north boundary compared to a location 660' from the north boundary. That without some basis for the off pattern move he believed Swan should follow the rules regarding a legal location for their unit. It was noted to the witness that Swan believed they had presented evidence that there would be a dry hole at a legal location for the Bromide and the witness said based on his expertise and on what has been given him to review at this hearing he did not see a difference between the proposed location exception and legal. As to his study of the Bromide in this area he said he had looked at logs and determined pay and had reviewed the structural mapping, that he did not know what kind of science Swan was doing here but he had not seen anything in the way of a map or technical evidence to substantiate Swan's position about a dry hole at legal and a producer at the off pattern location; that if such were provided to him he would be glad to look at it and consider it. That Chaparral had not run any seismic across this area because he didn't see a lot of potential here and they were not interested in the Bromide at this point. When asked if that was the case why Chaparral was objecting to the location, he reiterated that he had not seen any basis to support the 330' location, that if they could show him a map or a fault cut, that might make a difference in Chaparral's position here. He explained that if Swan drills at the off pattern location and finds production, then Chaparral will have to twin that to protect their interest; then each of those two wells would be 330' from the unit boundary and competing for the same reserves and he thought that would constitute economic waste. When asked if that meant they should leave the reserves in the ground he said that wasn't what he meant, but from the information he had it appeared Swan could obtain those reserves by drilling at a legal location which would be no different than drilling at the off pattern location except for the distance to Chaparral's boundary.

He agreed his study across McClain County showed that it was a highly faulted area. When asked if it was unusual for a 12 section area map like his to show no faults, he said he saw no direct evidence of faulting through this area, either through seismic review or through fault cuts in wells. He wasn't saying there were no faults here, that he just had no direct evidence of them. Regarding his Exhibits 6, 7 and 8 structure maps he said he had prepared them from log data and furnished the structural tops for the computer to plot and he then reviews what the computer generated to determine if he agrees with it. Chaparral currently had a proposed location in their unit which would mirror the Annie #1-6 well; it was not a reaction to Swan's Annie #1 well, that they had a location booked before that; he acknowledged they were interested in the results of the Annie #1 well but had already determined to drill in this area. Based on the information he had, he saw no difference between the legal location and the off pattern location. When asked if there were only 10' of pay at the location exception and if structure there was down 5' from a legal location if that would mean that there would be a significant decrease in thickness he said that would not be the case unless they were near the oil-water contact, that if that location were near the oil-water contact there might be less pay thickness. He acknowledged that Swan had sent him seismic information and it showed fault interpretation, but he saw no evidence of faulting at the Hunton level; he struggled with Swan's interpretation as to faulting at the Bromide level and from his own interpretation of that seismic he chose not to map faulting. He agreed that one would try to drill a well where they would produce the most hydrocarbons. When asked if Swan drilled at their proposed location and got a good well if the witness was concerned that Chaparral would then have to drill a mirror to that and he said that would be a concern because they would be spending money to drill a well to compete with Swan for the same reserves.

C. On redirect the witness agreed if one looks at Swan's maps that there is no real difference between the proposed location and a legal location even with their faults, that there is no structural difference whether the faulting is there or not. Regarding the seismic data that Swan sent to Chaparral and testimony that the one sheet of paper was all the seismic Swan had, the witness said that he had been involved in seismic shoots and he didn't believe the one sheet of paper furnished would be enough to interpret the area.

As to the only other piece of data Swan is relying on, he said he had never heard of an acoustic-electromagnetic test.

8. A. Don Barrett, a reservoir engineer qualified to testify in matters of this kind appeared on behalf of Chaparral and recommended denial of the application, especially as to the Hunton and all formations above the Hunton. He believed Swan could make a productive Hunton well at a legal location. Swan's request for Second Bromide location exception was based on a belief that there was a lack of productive Second Bromide at a legal location and that there was production at the proposed location exception. This belief was based on their acoustic-electromagnetic test, however he had no idea what kind of test that would be. Swan had brought nothing regarding that test to look at and Chaparral does not use any such a device in their exploration for reserves. He reiterated that they did not want the Commission to authorize the location exception for the Hunton, that Chaparral has Hunton acreage offsetting that location and they have a Hunton well in the north of their unit and plan to drill another legal location for a Hunton well in the SW/4 of NE/4 of Section 6. The existing Chaparral well makes 3 BOPD and has cumed about 90,000 BO and they project it will ultimately produce 137,000 BO; that he estimated a drainage area based on the current cume of that well would be 90.1 acres with about an 1100' drainage radius. He did not know what Swan projected for Hunton reserves at their requested location, but if they drill at the requested location and if the well drains similarly to the Chaparral well the 1100' drainage would be into Chaparral's unit. When asked if Chaparral could mirror the location exception if Swan is authorized to drill their off pattern location, he said he didn't think there needed to be two competitive wells 660' apart, considering the cost to drill these wells. That Chaparral plans to drill their next well in their unit at a legal location.

As to Swan's location exception need for the Bromide, based on the acoustic-electromagnetic test, he said he had made an analysis for that location by using available log data; that he calculated the reserves available in a 10-acre tract. In a 10' thickness of Bromide they would have in that 10 acres recoverable oil of about 5,000 barrels and if the off pattern well produced any more than that, it would be from Chaparral's unit. That Swan's engineer had indicated they would produce 400,000 BO in their 10-acre tract and that did not make any sense to the witness, that he had not seen anything that would suggest 100' of net pay in the Bromide in this area. He recommended the

Commission deny Swan's application in its entirety. Chaparral did not believe the application should be granted, that it seemed clear to him that the location exception request should be denied.

B. On cross when asked if Swan's data indicating there are hydrocarbons at the proposed location exception but none at the 660' legal location in the Bromide is correct, if that meant there would need to be a well drilled at the location exception, the witness said he would agree if that was true, but there was no evidence at this point to indicate that; he agreed he had heard Swan's testimony for their location exception. When asked if it would be better for everybody if Swan just left the reserves in the ground, he said if one can't get any more than what he is seeing volumetrically that it wouldn't be economic to drill. That he had heard earlier testimony by Swan about Bromide wells that have produced 200,000 - 300,000 BO from 100' of pay. He also heard Swan's testimony that there were wells short distances from these particular prolific wells with limited Bromide pay, but he said he had not seen evidence of those type wells. When asked if he had looked at those particular wells with the high volume of production he said he might not have looked at those specific wells, that they had concentrated on wells most materially affecting this application. He agreed if Swan was correct and there is a large oil deposit here as they project and the application is denied there would be reserves left in the ground, but only if Swan was correct. Since he was requesting denial of the application as to the Hunton and above he was asked if that meant it would be prudent to drill at an off pattern location for the Bromide and a second well at a legal location for the Hunton and shallower zones and he said if that's what their economics supported that they should do that. Asked if it wouldn't be better to recover reserves from a single wellbore from all the zones at the location exception the witness reiterated that the same scenario would exist in the Hunton as it does in the Bromide, that with only 15'-20' of net pay it would still drain into Chaparral's unit and further it would not be economically practical to drill just for the Hunton at that location.

He agreed that Chaparral's A-1-6 Wells well had cumed about 90,000 BO and would ultimately produce 137,000 BO and that it would have about 90 acres of drainage with an 1100' radius. He said the Wells A-1-6 was 1320' from the south and 660' from the east boundary of their unit and with that 1100' radial drainage there would be 220' drainage left to the south and 440' drainage to the east. Chaparral's well is also 1320' from their north

boundary which would leave them 220' of drainage to the north and 880' of drainage to the west. Since they plan to drill a well 660' out of the south corner of their unit he agreed it is possible their well would be draining 200' to the north and to the east. When asked if Chaparral's planned well is comparable to Swan's existing wells if that meant it would drain 440' from the east and 440' into Swan's unit and the witness said they had not allocated that amount of reserves for their second well location. He explained they had risked this well, since it is a location that might be drained by the A-1-6 well and even though it may be thicker at this location than the A-1-6 location it may have been impacted by drainage. It was noted to the witness that Swan is willing to take a risk to drill a Bromide location and to spend over \$1 million to do this, yet Chaparral objects to this although it appears that Chaparral's well may have drained from offsets and the witness responded that this is a law of capture state and there has been no objection yet to their proposed development. The witness didn't disagree that there had been some wells drilled in this Second Bromide in McClain County that have recovered 400,000 barrels of oil. When asked if what Swan was shooting for was then a possibility, the witness said there's always a possibility. When reminded there had been testimony regarding the C.W. Mottinger well having produced 400,000 BO from the Simpson Group which includes the Bromide and that it had drained 40 acres, he said he recalled testimony about that well production but did not recall that drainage figure being offered. When asked if he disagreed that well would drain about 40 acres he said he had no idea without studying it in detail. When asked if in fact the C.W. Mottinger well did drain 40 acres and then if Swan drilled their location exception and produced 100,000 BO if that meant it would drain 10 acres and he said he couldn't say that.

C. On redirect regarding the calculations that he had been asked to do on cross regarding the amount of drainage distance the Wells 1-6A well had drained he agreed that well was at a legal location and they were seeking to develop further reserves through increased density relief also at a legal location. As to trying to drill at a location where there are the most reserves the witness agreed one always wants to get a location to produce the most reserves, however it has to be within the boundary limits of the unit so as not to harm correlative rights of others.

D. On further cross regarding drilling a location where there are the most reserves, he was asked if Swan drilled a really good well if

then Chaparral could mirror it and if that wouldn't be fair and he said it would not be a good idea if they had to just share available reserves on a 50/50 basis, that it could in fact be uneconomic.

9. The ALJ took the cause under advisement and closed the record.

### **RECOMMENDATIONS AND CONCLUSIONS**

After taking into consideration all the facts, circumstances, evidence and testimony presented in this cause, it is the recommendation of the ALJ that the application of Swan Energy seeking location exception authority for the First Deese, Second Deese, Third Deese, Hart, Osborne, Basal Pennsylvanian Unconformity, Hunton, Viola, First Bromide and Second Bromide be denied. Applicant testified that their primary zone of interest was the Second Bromide and they relied on the results from an "electromagnetic acoustic" test to show there would be no hydrocarbons available at a legal location and there would be recoverable reserves only at the proposed location exception. Neither Chaparral's engineer nor geologist had ever heard of this test. Swan brought no results of this testing and when given the opportunity to explain the methodology of this test they did not explain how it worked nor how it was administered. Swan's witness did state that the test was experimental and that Swan had had good results when using this test in other areas, however, no examples to support these good results were provided for the record. The ALJ is also unfamiliar with this test and did not find substantial evidence presented in this record to rely on the test in order to recommend the location exception for the Second Bromide. Applicant's geologist presented structure maps on the Hart, Hunton and Viola and indicated that these maps incorporated both isopach and structural information, but the only isopach map was a gross isopach on the Hunton. Although his Exhibit 3 Hunton isopach showed a fault between the Annie #1 and Annie #2 the geologist testified that the faulting for all these zones occurred only below the Hunton, not in the Hunton and shallower zones. This is troublesome to the ALJ, in that later cross examination indicated that the basis for the increased density order, which Swan relies on for drilling this off pattern well, indicated the entire need for density for all zones was based on fault separation between the Annie well and their proposed development east of

the faulting. Swan's witness admitted that they probably knew there was no fault separation through the Hunton and shallower zones at the time of the increased density hearing. The geologist also acknowledged the location exception would not gain thickness in the Hunton over a location 660' from the north of their unit which protestants wanted them to move back for drilling. Even Swan's engineer acknowledged they did not know if they really needed increased density for the up hole zones. Chaparral stated they were most concerned about protecting Hunton reserves south of their Wells A 1 6 well in their unit from any encroachment of Swan's location exception and they sought denial of a location exception authority at the Hunton level and shallower zones. The ALJ finds it impossible to recommend a location exception for the Hunton and shallower zones given the testimony in this record, and questions whether the increased density authority should be revisited at least as to the Hunton and the shallower zones.

When asked about a possible penalty on their off pattern well Swan declined to recommend such, stating that their well would drain only about 10 acres in the Second Bromide and produce about 400,000 barrels of oil. Swan noted Second Bromide production can vary by extreme amounts over short distances and they felt it was possible to get a well here capable of producing 400,000 barrels of oil even though the Annie #1 had poor Bromide samples. Protestant disputed this and pointed out that even though the C.W. Mottinger well would produce around 400,000 BO that it produced from the Simpson (which the engineer said would include any of the five Bromides) and from the Second Bromide and from the Hunton. The engineer's study for the Second Bromide drainage assumed 10 acre drainage and assumed 20% porosity and 100' thickness and 400 barrels per acre foot recovery; he said that recovery was based on documented public knowledge of recoveries in the Golden Trend but he never presented evidence of his documented source. He presented his calculation through testimony and had never furnished this information as an exhibit to the protestants nor did he present it at the hearing on the merits. The basis for the applicant's need for the location exception is all geological, the engineer could not justify the need from an engineering standpoint when asked about that on cross examination.

There was criticism of protestant's structure maps, that they lacked faulting. Protestant's geologist explained that he was aware this was a faulted area but he would not include them on his maps without direct

evidence of their existence. He acknowledged seeing the single sheet of seismic that Swan said represented all their seismic data, but he said he saw no evidence of faulting at the Hunton level and though he struggled with Swan's interpretation of faulting at the Bromide level he did not interpret faulting at that level either.

Although a great deal of testimony was presented it is the opinion of the ALJ, based on the review of the entire record, that there was not substantial evidence to support granting the requested location exception for the Second Bromide. The primary evidence for the location exception was based on the electromagnetic acoustic test which Swan's witness said was done only on the Second Bromide. It is the opinion of the ALJ that a net isopach on the Bromide, as applicant would interpret that interval to lie through this area, would have been helpful. No net maps were presented for any zone. There just was not sufficient evidence to grant the location exception authority for the Second Bromide and a review of the record indicates that even the engineer and geologist for Swan appeared to acknowledge that their need for a location exception based on faulting in the Hunton and shallower zones could not be supported by any evidence.

RESPECTFULLY submitted this 7<sup>th</sup> day of December, 2011.



Susan R. Osburn  
Administrative Law Judge

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