

BEFORE THE CORPORATION COMMISSION  
OF THE STATE OF OKLAHOMA

**FILED**  
AUG 05 2015

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CORPORATION COMMISSION  
OF OKLAHOMA

APPLICANT: SANDRIDGE EXPLORATION )  
AND PRODUCTION, LLC )  
)  
RELIEF SOUGHT: AUTHORIZATION OF THE ) CAUSE PD NO.  
FRANCIS SWD 2507 1-26 WELL ) 201500033  
AS A NON-COMMERCIAL )  
DISPOSAL WELL )  
)  
LEGAL DESCRIPTION: SW/4 OF SECTION 26, )  
TOWNSHIP 25 NORTH, RANGE )  
8 WEST OF THE IM, GRANT )  
COUNTY, OKLAHOMA )

**REPORT OF THE OIL AND GAS APPELLATE REFEREE**

This Cause came on for hearing before **David D. Leavitt**, Administrative Law Judge ("ALJ") for the Corporation Commission of the State of Oklahoma, on the 1<sup>st</sup> day of April, 2015, 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.

**APPEARANCES:** **John R. Reeves**, attorney, appeared on behalf of applicant, Sandridge Exploration and Production, LLC ("Sandridge"); **Susan Conrad**, Deputy General Counsel, appeared on behalf of the Underground Injection Control ("UIC") department of the Oklahoma Corporation Commission; and **James L. Myles**, Deputy General Counsel for Deliberations, filed notice of appearance.

The Administrative Law Judge ("ALJ") filed his Report of the Administrative Law Judge on the 28<sup>th</sup> day of April, 2015, 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 26<sup>th</sup> day of June, 2015. After considering the arguments of counsel and the record contained within this Cause, the Referee finds as follows:

## **STATEMENT OF THE CASE**

**SANDRIDGE TAKES EXCEPTION** to the ALJ's recommendation that Sandridge's application for a non-commercial saltwater disposal ("SWD") well be continued until such time that Sandridge can provide the Commission with significant evidence to show that the components, found necessary for significant injection-induced seismicity by a recent report from the Environmental Protection Agency ("EPA") Underground Injection Control (UIC) National Technical Workgroup ("NTW"), are not present in the Arbuckle and Reagan formations and the Granite basement rock in the vicinity of the Francis SWD 2507 #1-26 well (the "Francis SWD well"). The evidence and data must be sufficient in scope and quality, however, that the UIC department can either recommend that the Francis SWD well be permitted to operate or not, or acknowledge that the evidence is presently not available or capable of being determined.

On or around December 2014, Sandridge began to drill the Francis SWD well located in the SW/4 of Section 26, T25N, R7W, Grant County, Oklahoma. The well was spud on December 3, 2014, drilling was finished on January 14, 2015 and the well was completed on February 4, 2015. Sandridge filed its Form 1002A for the well with the Commission around February 10, 2015. Sandridge spent around \$3.5 million to drill and complete the well.

On January 23, 2015, Sandridge filed a Form 1015 Application for Administrative Approval requesting that the Commission issue a permit to operate the Francis SWD well. The Application noted that Sandridge was the surface owner of the land upon which the well was drilled and that there were no offset operators in the adjacent sections.

The application also noted that the well was to be a SWD well taking fluids from horizontal Mississippi formation wells operated by Sandridge in the surrounding area and disposing of the fluids in the Arbuckle formation. The application listed the following parameters of the well: Wellbore: single vertical wellbore with two horizontal laterals; Geologic name of the source of the fluids: Mississippi formation - 5,628 foot depth; Geologic name of the disposal formation: Arbuckle formation; Perforation of injection interval: 6,462 to 7,662 TVD and 8,621 TD; Base of treatable water: 150 feet; Requested injection rate: 60,000 BPD/MCF; Requested injection pressure at surface: 1,000 psi; Surface casing setting depth: 1,200 feet; Production tubing setting depth: 6,462 feet; First lateral tubing setting depth: 6,420 feet; Second lateral tubing setting depth: 6,420 feet; Production tubing size: 9 5/8 inches; lateral tubing size: 7 inches.

Attached to the application or to be submitted later to the Commission were the following documents or submittals: \$100.00 filing fee; Proof of the publication of the Application in Grant and Oklahoma counties; Affidavit of mailing or delivery to those respondents entitled to notice; Signed analysis of fresh water from two or more producing wells within a one mile radius of the proposed injection well; Proof of surety bond; Signed analysis of a representative sample of the water to be injected; Plat showing the location of the proposed Francis SWD Well, all producing, abandoned and dry hole oil and gas wells and their depths within one-fourth mile of the proposed well; Form 1002A; Electric or radioactivity log of the proposed well; and Schematic drawing of the wellbore.

Sometime after the application was submitted to the UIC for approval, the application was tentatively approved pending an evaluation of whether the well was located in a seismically active area. The UIC staff determined that the well was in a seismically active "yellow" zone, requiring the application to be submitted to an ALJ and reviewed in a formal evidentiary hearing with respect to its potential to induce seismicity and harm human health and the environment. This "traffic light" system was first put in place by the Commission in 2013 in response to the concerns over the possibility of earthquake activity being caused by oil and gas wastewater disposal wells in Oklahoma. The "yellow light" permitting program requires seismicity review for any proposed disposal well and requires special permitting based on seismicity concerns to any well proposed within three miles of a stressed fault, even in the absence of seismicity and any proposed disposal well within six miles (ten kilometers) of an earthquake "swarm" or magnitude 4.0 event. Very recently, the Commission expanded the traffic light review system to encompass areas of interest defined as: (1) areas experiencing seismic swarms consisting of at least two events with epicenters within one-fourth mile of one another, with at least one event with a magnitude 3.0 or higher; and (2) a ten kilometers area (approximately six miles) with the central mass of the swarm serving as the area center. The change is expected to more than double the number of disposal wells within an area of interest. The ALJ notes that the Francis SWD well is within one of the areas of interest. The hearing was held on April 4, 2015 and the ALJ issued a report following the hearing.

**SANDRIDGE TAKES THE POSITION:**

1) The ALJ's recommendations are contrary to law and to the evidence presented. Such recommendations are arbitrary and unreasonable, and if adopted, would exceed the jurisdiction of the Commission in regard to disposal wells. Furthermore, the recommendations of the ALJ are based upon documents and other items that were not presented to the ALJ in this proceeding, not being a part of the record in this cause, and the adoption of such recommendations would constitute a violation of Sandridge's constitutional rights, specifically its due process rights.

2) The ALJ properly determines that the rules of the Commission and the applicable statutes related to disposal wells focus primarily on protecting groundwater and surface waters from pollution related to disposal wells and that such rules and statutes do not consider the issue of induced seismicity related to disposal wells. Furthermore, the ALJ correctly determines that the science linking oil and gas activity, specifically disposal wells, to induced seismicity has not been settled conclusively. However, even with these findings, the ALJ assumes that there is a direct causal relationship between disposal wells and seismicity. With this assumption, the ALJ then attempts to analyze federal and state statutes that are not applicable to disposal wells and to extend improperly the Commission's jurisdiction under such statutes to cover disposal wells. Furthermore, the ALJ improperly attempts to apply the law of public nuisance to the injection of fluids in a disposal well when there is no evidence in the record which would support any finding that the disposal of fluids in the Francis SWD well would constitute a public nuisance of any kind.

3) The ALJ erroneously concludes that the injection of fluids into the Arbuckle in the Francis SWD well would constitute waste in that it would compromise the productive capacity for oil and gas from the Arbuckle formation. The uncontroverted evidence presented in this proceeding is that the Arbuckle formation in this area does not contain any oil, gas or fresh water and that a significant number of disposal wells are injecting fluids into the Arbuckle formation. The uncontroverted evidence shows that the Arbuckle formation is a good candidate for disposal operations in that it is very thick, being from 1,300 feet to 1,600 feet thick, and is a dolomite with high porosity and extremely high permeability and with normal pressures. The uncontroverted evidence shows that the capacity of the Arbuckle formation in each section in this area is in the range of 750 million barrels up to a billion barrels, depending on the thickness and the porosity. The uncontroverted evidence further shows that the Arbuckle formation has a very large capacity to hold water and that at normal rates of injection, the Arbuckle formation takes the water on a vacuum. Such uncontroverted evidence further shows that it is only when the injection rates are increased in an Arbuckle disposal well that the pressure at the surface increases because of the friction pressure resulting from moving the fluids through the applicable tubing. Such uncontroverted evidence shows that at injection rates of 25,000 barrels per day, the surface pressure may be as high as 500 psi, which is all friction pressure down the tubing. Such uncontroverted evidence shows that the pressure in the Arbuckle formation is approximately 2,995 psi, which is the virgin pressure of the Arbuckle formation and that the weight of a column of fluid in the well is approximately 3,389 psi, which results in the Arbuckle formation taking such fluids on a vacuum. The uncontroverted evidence shows that given the capacity of the Arbuckle formation, injecting ten million barrels of fluid over the life of a disposal well is less than 0.5% of the volume in such formation. Even though the Arbuckle formation is saturated with water, the pressure

measurements reviewed by the engineering witness for Sandridge show that the pressure in the Arbuckle formation after the disposal of millions of barrels of fluid has not increased, which indicates that the Arbuckle formation is an enormous reservoir.

4) The ALJ stated in the Report that "Some areas of the Arbuckle formation are now designated "red" zones and cannot be used for disposal of fluids. Much larger areas of the Arbuckle are now "areas of interest" that soon may suffer the same fate. The Arbuckle formation is a valuable public natural resource used to dispose of hazardous wastes, mining wastes, radioactive wastes and other hazardous substances as well as the deleterious substances produced from oil and gas operations, and the loss of the productive disposal capacity of this formation will adversely affect the state's economy.\*\*\*Because the Arbuckle formation is a valuable public natural resource and not an unregulated dump, the current diminished disposal capacity of the formation mandates the implementation of conservation practices by both the Commission and the oil and gas industry so that the remaining disposal capacity of the formation can be preserved and maintained."

The above-quoted portion of the ALJ Report was never mentioned or addressed in any way at the hearing in this cause and is based upon evidence or documents that were never included in the record in this matter. In fact, the evidence presented in this cause is exactly contrary to the above-quoted conclusions reached by the ALJ which were apparently based upon documents and items not in the record. Adoption of such a finding by the Commission would constitute a violation of Sandridge's constitutional rights, specifically its due process rights.

5) At the hearing in this matter, the ALJ asked the witness for the UIC whether he was familiar with the EPA's working group for underground injection and some criteria made by such group for approving underground injection wells. Such witness indicated that he was familiar with the criteria and that such criteria did not conflict with, but complemented what the Commission was doing. Such was the extent of the reference to any EPA report. However, the ALJ quotes extensively from and relies heavily on a report from the EPA's UIC NTW, which was never a part of the record in this matter and was not relied upon by any witness in the proceeding, including the witness for UIC. Such EPA report is not a part of the record in this matter and it is improper for the ALJ to rely upon such report which was not introduced into such record. Such EPA report was not presented to Sandridge at the hearing in this matter. Sandridge did not have the opportunity to address any portion of such EPA report. Adoption of the recommendations of the ALJ based upon the above described EPA report would constitute a violation of Sandridge's constitutional rights, specifically its due process rights. In any event, based upon the testimony of the witness for UIC, any criteria in the EPA

report is not in conflict with, but merely complements what the UIC is already doing.

6) The ALJ states that "the Commission's UIC expert who reviewed the Application and Sandridge's Plan of Development could not recommend that the well be permitted." This quote by the ALJ is somewhat misleading in that the witness for UIC actually stated that UIC believes that the Francis SWD well has adequate protections to prevent contamination of treatable water, but that UIC is taking no position pertaining to seismicity. The witness for UIC stated that in order to continue monitoring and reviewing oil and gas activity and recent seismic activity, the Commission had implemented a traffic light approach, with the proposed Francis SWD well to fall under the yellow light of the traffic light system. Because the proposed disposal well is located within six miles of a seismic cluster, various cautionary measures would be taken in connection with the disposal of fluids in the Francis SWD well under an interim order, with such measures including the taking of bottom-hole pressures with a tool run in the well every 60 days and the reporting on a weekly basis of daily pressures and injected volumes. The witness for UIC stated that it was in the process of attempting to gain information to be able to analyze the situation concerning the disposal of fluids into the Arbuckle formation and any relationship to seismicity. While the witness for UIC stated that the staff was not taking any position on the relationship between disposal of fluids into the Arbuckle formation and seismicity, the staff was in the process of studying such situation and attempting to obtain necessary information to analyze it. The ALJ ignored all of the testimony of the witness for UIC in this cause and improperly reached the conclusion that there was and is a direct causal relationship between seismicity and the disposal of fluids into the Arbuckle formation .

7) The ALJ concludes that the hearing in this matter should be continued until such time that Sandridge could provide significant and substantial evidence that the Arbuckle formation in the area of the proposed disposal well involved here is not experiencing pressure buildup from disposal activities that is likely to induce seismicity or that the operation of the well would not cause such a build up of reservoir pressure. The ALJ ignored the uncontroverted evidence concerning the nature of the Arbuckle formation in this area, the capacity of the formation to receive disposal fluids and the lack of any increase in pressure through disposal activities in the formation. The evidence requested by the ALJ has been presented to him. Furthermore, the above recommendation of the ALJ imposes an unreasonable burden of proof on Sandridge to prove a negative, which places Sandridge in an impossible situation to ever meet such unreasonable burden.

8) The ALJ further recommends that at the continued hearing date in this matter, Sandridge provide significant and substantial evidence that there are no faults of concern (denoting faults or zones of multiple faults optimally

oriented for movement and located in a critically stressed region and of sufficient size and possessing sufficient accumulated stress/strain, such that faults slip and movement has potential to cause a significant earthquake). The uncontroverted evidence presented in this cause is that there are no faults in the area around the proposed disposal well involved herein. The ALJ ignored the uncontroverted evidence presented in the record in this matter. Furthermore, the above recommendation of the ALJ imposes an unreasonable burden of proof on Sandridge to prove a negative, which places Sandridge in an impossible situation to ever meet such unreasonable burden.

9) The ALJ further recommends that at the continued hearing herein, Sandridge present significant and substantial evidence "that there are no pathways allowing any increased pressure to communicate with the faults of concern." This requirement assumes that faults exist in this area and is contrary to the uncontroverted evidence presented. Furthermore, the above recommendation of the ALJ imposes an unreasonable burden of proof on Sandridge to prove a negative, which places Applicant in an impossible situation to ever meet such unreasonable burden.

10) The ALJ further recommends that Sandridge provide a table showing all of the non-commercial SWD wells operated by Sandridge in the area depicted on the map shown in Exhibit 9, with certain specific information for each such well. All of this information, as requested by the ALJ, is information that UIC has and if the ALJ desires such information, the ALJ should have requested such information be presented at the hearing in this cause.

11) The ALJ further recommends that Sandridge provide an "analysis of the actual costs to dispose of a barrel of saltwater using the existing Sandridge disposal wells and the Francis SWD Well." Such a requirement is irrelevant and unnecessary in determining whether or not the Francis SWD well should be authorized as a disposal well by the Commission. Such an analysis is beyond the jurisdiction of the Commission to inquire into and invades the business decision making capacity of Sandridge concerning such well and its other disposal wells. Such recommendation is unreasonable.

12) The ALJ further recommends that Sandridge provide "[d]etailed engineering and economic studies of the feasibility of alternate means of handling produced water other than disposal into the Arbuckle by injection wells." Such a requirement exceeds the Commission's jurisdiction in regard to determining whether or not the Francis SWD well should be authorized as a disposal well. Sandridge is not requesting in this proceeding for the Commission to evaluate whether, in the Commission's opinion, it is better economically to use some other method of handling produced water other than disposing of such water into the Arbuckle formation in the Francis SWD well. Any such analysis is beyond the Commission's jurisdiction and is unreasonable.

13) While the recommendations of the ALJ are beyond the jurisdiction of the Commission in evaluating whether the Francis SWD well should be authorized as a disposal well and are based upon documents and other items that are not a part of the record in this matter, resulting in recommendations that are arbitrary, unreasonable and improper, Sandridge supports UIC in its effort to obtain information concerning any potential relationship between the disposal of fluids into the Arbuckle formation and seismicity in the area. In regard to this proceeding, Sandridge has met with representatives of UIC concerning the proposed disposal well involved here and has been very transparent concerning such well, providing to UIC all information in connection with such well. Sandridge has no objection to providing voluntarily the information that has been requested by UIC in connection with the disposal of fluids in the Francis SWD well under an interim order. Based on the evidence and testimony presented to the ALJ, the Commission should adopt the recommendations of the witness for UIC and the witnesses for Sandridge concerning the manner in which the Francis SWD well should be authorized to commence disposal operations under an interim order.

14) Sandridge respectfully requests that the Commission not adopt the Report of the ALJ filed in this cause on April 28, 2015 and that the Commission enter an interim order in this cause authorizing the Francis SWD well to be used as a disposal well in the Arbuckle formation under the recommendations as made by Sandridge and the UIC Department.

**THE ALJ FOUND:**

1) It is a seminal public policy of the Commission to protect human health and the environment. This responsibility must take priority over all the other regulatory responsibilities to prevent waste and protect correlative rights with respect to oil and gas production. For this purpose the Commission has jurisdiction under 17 O.S. Section 52(A)(1)(i) over the handling and disposition of produced water and other deleterious substances associated with oil and gas extraction and transportation activities. The Commission is also obligated to prevent pollution and protect human health and the environment under various statutes and rules including 52 O.S. Section 139 and OCC-OAC 165:10-7-2. The Commission has promulgated rules for the location, installation and operation of SWD wells that are intended to protect human health and the environment. See 17 O.S. Section 52(A)(1)(i) which states that the Commission shall have jurisdiction over: "the handling, transportation, storage and disposition of saltwater, mineral brines, waste oil and other deleterious substances produced from or obtained or used in connection with the drilling, development, producing and operating of oil and gas wells." See 52 O.S. Section 139(A) which states that "The Corporation Commission is vested with exclusive jurisdiction, power and authority, and it shall be its duty, to make and enforce such rules and orders governing and regulating the

handling, storage and disposition of saltwater, mineral brines, waste oil and other deleterious substances produced from or obtained or used in connection with the drilling, development, producing, and operating of oil and gas wells and brine wells within this state as are reasonable and necessary for the purpose of preventing the pollution of the surface and subsurface waters in the state, and to otherwise carry out the purpose of this act." See OCC-OAC 165:10-7-2(c)(8)(9) and (10) which state that the Commission has jurisdiction over "(8) The handling, transportation, storage and disposition of saltwater, drilling fluids, mineral brines, waste oil and other deleterious substances produced from or obtained or used in connection with the drilling, development, production, and operation of oil and gas wells at any facility or activity specifically subject to Commission jurisdiction or other oil and gas extraction facilities and activities. (9) Spills of deleterious substances associated with facilities and activities specified in O.A.C. 165:10-7-4(c)(8) or otherwise associated with oil and gas extraction and transportation activities. (10) Groundwater protection for activities subject to the jurisdictional areas of environmental responsibility of the Commission."

2) These rules and statutes related to Class II UIC wells have primarily focused on protecting the groundwater and surface waters from pollution related to SWD wells. They have not specifically considered the issue of induced seismicity related to such wells because the threats posed by induced seismicity are a relatively recent phenomena and the science linking oil and gas activity to induced seismicity hasn't been settled conclusively. The authority of the Commission to investigate and address the risks of harm to human health and the environment arising from induced seismicity, however, is implicitly found in other rules and statutes related to analogous activities and explicitly found in the federal rules and statutes under which the Federal UIC program requirements were delegated to the states.

3) Under 17 O.S. Section 302 entitled Legislative intent – Public Policy, the Legislature directed the Commission to protect the public health, safety, welfare, the state's economy and the environment from the harmful effects of activities related to deleterious substances: "The Legislature finds that the release of hazardous substances and petroleum from storage tanks into the surface water, groundwater, air and subsurface soils of this state poses a potential threat to the natural resources, health, safety and welfare of the residents of this state and to the economy of this state....Therefore the Legislature declares it is the public policy of this state to protect the public health, safety, welfare, the state economy and the environment from the potential harmful effects of storage tanks used to store hazardous substances and petroleum. In order to implement this policy, it is the intent of the Legislature to establish a program for the regulation of storage tank systems.

4) The above statute applies to storage tank systems and such tanks and systems are often used as a part of a Class II underground injection operation.

The petroleum and hazardous substances referred to in the statute are regulated substances that encompass the kinds of deleterious fluids that could be disposed of in a Class II UIC well. See 17 O.S. Section 303.35 which states that a "'Storage tank system' means a closed-plumbed system including, but not limited to, the storage tank(s), the lines, the dispenser for a given product, and a delivery truck that is connected to the storage tank system." See 17 O.S. Section 303.37 which states that a "'Storage tank' means a stationary vessel designed to contain an accumulation of regulated substances which is constructed of primarily non-earthen materials that provide structural support." See OCC-OAC 165:10-1-2. Definitions in which "'Deleterious substances' means any chemical, saltwater, oil field brine, waste oil, waste emulsified oil, basic sediment, mud, or injurious substance produced or used in the drilling, development, production, transportation, refining, and processing of oil, gas and/or brine mining." The statute expressly states that it is the public policy of the Commission to address potential threats to the natural resources, health, safety and welfare of the residents of the state and to the economy of this state and such potential threats would clearly include threats and risks posed by induced seismicity.

5) In a similar vein, the Commission is authorized to issue orders necessary to protect property, human health and safety, and the environment with respect to the risks and hazards associated with above ground storage tanks. See OCC-OAC 165:26-1-26(a) which states that "The Commission will issue orders as necessary to enforce the provisions of this Chapter to protect property, human health and safety, and the environment." Under the accepted legal principle of *in pari materia*, the public policy of the Commission set forth for the regulation of storage tanks should extend to the regulation of Class II UIC wells and systems, since both sets of statutes and rules have a common purpose and comparable subject matter.

6) OCC-OAC 165:10-5-9 also authorizes the Commission to revoke the permits of disposal wells for just cause or lapses. The Commission may modify, vacate, amend or terminate any order granting underground injection upon its own initiative if information related to the operation of a SWD well indicates that the cumulative effects on the environment are unacceptable. Since the Commission has the authority to shut down an injection well because of information that the well may have an unacceptable environmental impact, it also has the authority to deny a permit to an applicant for the same reasons. See OCC-OAC 165:10-5-9 which states that "(a) Subject to 165:10-5-10, authorization of injection into enhanced recovery injection wells and disposal wells shall remain valid for the life of the well, unless revoked by the Commission for just cause or lapses and becomes null and void under the provisions of 165:10-5-5(g). (b) An order granting underground injection may be modified, vacated, amended, or terminated during its term for cause. This may be at the Commission's initiative or at the request of any interested person through the prescribed complaint procedure of the Conservation Division. All

requests shall be in writing and shall contain facts or reasons supporting the request. (c) An order may be modified, vacated, amended, or terminated after notice and hearing if: (1) There is a substantial change of conditions in the enhanced recovery injection well or the disposal well operation, or there are substantial changes in the information originally furnished. (2) Information as to the permitted operation indicates that the cumulative effects on the environment are unacceptable. (d) If an operator fails to complete or convert a well as approved by the Conservation Division within eighteen (18) months after the effective date of the order or permit authorizing injection into the well, then the order or permit authorizing injection into the well shall expire."

7) The EPA has delegated primary enforcement authority for the Federal UIC program through Part C of the Safe Drinking Water Act ("SWDA") to the State of Oklahoma. The State of Oklahoma has empowered the Commission to enforce the Federal UIC program related to Class II wells. See 40 C.F.R. Section 144.1(b)(1) which states that "The regulations in this part establish minimum requirements for UIC programs. To the extent set forth in part 145, each State must meet these requirements in order to obtain primary enforcement authority for the UIC program in that State." Commission actions under this delegation of authority shall be conducted in accordance with the federal requirements although nothing in the federal regulations precludes the state from adopting or enforcing requirements that are more stringent than the federal regulations. See 40 C.F.R. Section 145.1(f) which states that "Any State program approved by the Administrator shall at all times be conducted in accordance with the requirements of this part." See 40 C.F.R. Section 145.1(g)(1) which states that "Nothing in this part precludes a State from adopting or enforcing requirements which are more stringent or more extensive than those required under this part."

8) Under 40 C.F.R. Section 145.13, the EPA has delegated authority to the Commission to restrain any person from engaging in any activity which endangers or causes damage to public health or the environment. See 40 C.F.R. Section 145.13(a) which states that "Any State agency administering a program shall have available the following remedies for violations of State program requirements: (1) To restrain immediately and effectively any person by order or by suit in State court from engaging in any unauthorized activity which is endangering or causing damage to public health or environment." Because induced seismicity poses a real threat to public safety, the Commission thereby has the authority under the SWDA to refuse to issue a permit to an applicant that fails to provide substantial evidence to the Commission that its SWD well will not endanger human health and the environment. The burden of proof falls upon the applicant to provide such substantial evidence to the Commission.

9) The Commission is also charged by law to regulate and abate public nuisance that arises from oil and gas activities. The Oklahoma Court of Civil

Appeals held in *Union Texas Petroleum Corp. v. Jackson*, 909 P.2d 131 (Okla.Civ.App. 1995), that "although the proper forum for a landowner to recover damages for nuisance caused by encroaching saltwater is in district court, the Commission may proceed to abate such 'nuisance', including assessment of liability therefore, in accordance with State statutes and court decisions, including the law of nuisance in order to enforce compliance with its rules and regulations." See *Union Texas Petroleum Corp.*, supra, where the Court said that "A nuisance consists in unlawfully doing an act or omitting to perform a duty, which act or omission either annoys, injures or endangers the comfort, repose, health or safety of others or in any way renders other persons insecure in life or in the use of property. 50 O.S. 1991 §1; *Cities Service Oil Company v. Merritt*, 332 P.2d 677, 684 (Okla. 1958). In *Cities Service*, the Supreme Court determined the basis of liability for injury or damage to property by pollution of subterraneous waters, from oil, gas or saltwater from oil wells, must be either negligence or nuisance. *Cities Service*, at 684. Cities or towns may seek abatement of a public nuisance, including protection of public water supplies, within their respective corporate limits in district court. 50 O.S. 1991 §§ 16, 17. A public nuisance is one which affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon the individuals may be unequal. 50 O.S. 1991 § 2; *Miller v. State*, 74 Okla. Crim. 104, 123 P.2d 699 (Okla. Crim. App. 1942). The remedies for public nuisance are through indictment or information, civil action, or abatement. 50 O.S. 1991 § 8. A public nuisance may be abated by any public body or officer authorized thereto by law. 50 O.S. 1991 § 11."

10) Because public nuisance may encompass the harm and injury to human health and the environment that would result from a serious induced seismicity event, the Commission has the authority to abate and assess the liability of any public nuisance related or potentially related to induced seismicity, and an applicant seeking a permit for a SWD well has a duty to provide all required information that would enable the Commission to assess the risk of public nuisance that could be caused by the well.

11) The Commission is also empowered by law to prevent waste, a duty that ordinarily applies to the proper management and productive use of the state's hydrocarbon-bearing rock formations and reservoirs so that the maximum amount of oil and gas can be produced. Before the advent of oil and gas regulations such as the spacing statutes, reservoirs were often damaged by over-drilling and hydrocarbons were stranded in the earth. The spacing laws established drilling and spacing units that promoted the orderly development of the petroleum reservoirs and prevented waste of the natural resource.

12) The substantial increase in the production of hydrocarbons over the past seven years brought about by horizontal drilling in unconventional reservoirs

has produced a corresponding increase in the production of saltwater. The disposal of the saltwater by underground injection has now compromised the productive capacity of some of the state's disposal rock formations, such as the Arbuckle formation, in a manner analogous to what happened to the petroleum reservoirs before the advent of the spacing laws. Some areas of the Arbuckle formation are now designated "red" zones and cannot be used for disposal of fluids. Much larger areas of the Arbuckle are now "areas of interest" that soon may suffer the same fate. The Arbuckle formation is a valuable public natural resource used to dispose of hazardous wastes, mining wastes, radioactive wastes and other hazardous substances as well as the deleterious substances produced from oil and gas operations, and the loss of the productive disposal capacity of this formation will adversely affect the state's economy.

13) The Commission has the authority to prevent the continuing waste of the disposal capacity of the Arbuckle formation through management of the resource and restriction of the amount, location and injection rates of fluid injected into the formation. Because the Arbuckle formation is a valuable public natural resource and not an unregulated dump, the current diminished disposal capacity of the formation mandates the implementation of conservation practices by both the Commission and the oil and gas industry so that the remaining disposal capacity of the formation can be preserved and maintained.

14) Conservation practices focus upon the orderly and sustainable development of a resource, and sustainable practices often entail an evaluation of all the alternatives to the intensive use of a resource. Here the oil and gas industry has already studied, evaluated and implemented many conservation practices for recycling and treating produced water, minimizing produced water production and optimizing the management of produced water through the use of pipelines, flowback water pits, water treatment operations and other related facilities throughout the state and in surrounding states. The Commission can thus prevent waste by requiring all applicants that seek permits for new SWD wells or seek permission to increase the injection rates of existing SWD wells in the Arbuckle complete detailed engineering and economic studies of the feasibility of alternate means of handling produced water other than disposal into the Arbuckle by injection wells. Sandridge should submit such studies to the Commission to assist the Commission in the management and maintenance of the resource.

15) Applications for a permit to operate a SWD well are not enforcement actions. In an enforcement action taken in response to a complaint or an alleged violation of a statute or rule, the Commission has the burden of proof to establish by clear and convincing evidence that a respondent has committed the violation. The Commission's inspectors and technical experts often testify about the facts related to a violation and recommend actions to be taken.

16) In an application for a permit, the applicant has the burden of proof to show that the SWD well will not harm human health and the environment. Here the Commission also has a responsibility to the regulated community to clearly define what rules must be followed and what evidence must be presented by an applicant that would enable the Commission's engineers and scientists to address the risks of induced seismicity presented by a SWD well. The rules related to the protection of the state's surface water and groundwater are clear and well-established but the evidentiary standards related to the risks of induced seismicity are evolving and are changing in response to new scientific studies on the topic and ongoing seismic activity.

17) In this present case, Sandridge presented substantial evidence that the Francis SWD well complies with the Commission's rules to protect the waters of the state. Sandridge also implicitly acknowledged the risks and liabilities posed by the operation of the well in a seismically-active area by amending its application during the hearing to initially operate the well at a reduced rate. After approval of its application and during the first two months of its operation at a reduced rate of injection, Sandridge also pledged to complete a 3-D seismic study of the area around the wellbore and evaluate the data to identify any faults in the Arbuckle and basement rock and share the data with the Commission for its review.

18) During the hearing, however, the Commission's UIC expert who reviewed the application and Sandridge's plan of development could not recommend that the well be permitted, indicating to the ALJ that submission of a 3-D seismic study of the Arbuckle formation as proposed by Sandridge would not comprise sufficient information to allow UIC to make a recommendation about the SWD well. Upon inquiry by the ALJ, the Commission's UIC expert did agree with the decision model and recommendations for evaluating the potential for injection-induced seismicity developed by the NTW. The NTW report thus serves as a set of acceptable and clearly presented considerations that can be used to identify the information that should be presented to the Commission by an applicant.

19) The NTW report confirmed that the following components are necessary for significant injection-induced seismicity: (1) sufficient pressure buildup from disposal activities characterized by an increase in formation pore pressure; (2) faults of concern (denoting faults or zones of multiple faults optimally oriented for movement and located in a critically stressed region and of sufficient size and possessing sufficient accumulated stress/strain, such that fault slip and movement has the potential to cause a significant earthquake); and (3) a pathway allowing the increased pressure to communicate with the fault. The report found that understanding the geologic characteristics of a site is an essential step in evaluating the potential for injection-induced seismicity and that the "application of basic petroleum engineering practices coupled with geology and geophysical information can provide a better understanding of reservoir and fault characteristics."

20) According to the NTW report, "Petroleum engineering methodologies provide practical tools for evaluating the three key components that must all be present for induced seismicity to occur: (1) sufficient pressure buildup from disposal activities, (2) a Fault of Concern, and (3) a pathway allowing the increased pressure to communicate from the disposal well to the fault. Specifically, petroleum engineering methods typically focus on the potential for reservoir pressure buildup and the reservoir flow pathways present around a well and at a distance, and characterize reservoir behavior during the well's operation. Petroleum engineering approaches enhance geological and seismological interpretations related to the characterization of faults and flow behavior. The petroleum engineering approach incorporates information typically collected from the permit application (well construction and completion data) and data on injection volumes and pressures reported for compliance purposes during operation of the well. This information is presented in a graphical format to illustrate behavior of the well over time. These graphs are compared to graphs of expected well behavior from various reservoir behavior models to identify anomalous patterns. Operational analysis consists of plotting readily available data reported as part of the Class II disposal well permit compliance. These plots include: 1) Injection volumes and wellhead pressures; 2) Bottomhole injection pressure gradient; and 3) Hall integral and derivative. Plotting injection volumes and pressures in an appropriate format along with operating pressure gradients may highlight significant changes in disposal well behavior. The operating gradient plot can indicate whether a disposal well is operating above fracture gradient. The Hall integral and derivative plot utilizes operating data to characterize a well's long term hydraulic behavior by providing a long-term, long distance look into the disposal zone....Changes in Hall integral and derivative trends can represent reservoir heterogeneities (i.e., faults, stratigraphic changes, etc.), changes in completion conditions, reservoir boundaries, and effects of offset wells. Supplemental evaluations may be performed but require data or logs that may or may not be routine for Class II disposal permit activities. These evaluations quantitatively assess potential pathways and potential reservoir pressure buildup and may include the following: 1) Step rate tests; 2) Pressure falloff tests; 3) Production logs; and 4) Static reservoir pressure measurements. Step rate tests are used to determine the formation parting pressure (fracture extension pressure). The quality of the data analysis is dependent on the amount of pressure data recorded during the test. Pressure falloff tests can provide the completion condition of the well (wellbore skin) and reservoir flow characteristics. Production logs typically include temperature logs, noise logs, radioactive tracer surveys, oxygen activation logs or spinner surveys. These types of logs are used to evaluate the fluid emplacement at the well. Periodic static pressure measurements provide an assessment of reservoir pressure buildup."

21) Based upon the NTW report, Sandridge has to provide significant evidence to the Commission that the components found necessary for significant injection-induced seismicity by the NTW are not present in the Arbuckle and Reagan formations and the Granite basement rock in the vicinity of the Francis SWD well. The kind and type of evidence (i.e., 3-D seismic studies, reservoir pressure and volume calculations, bottomhole pressure measurements, Hall integral and derivative data and other operating data from nearby SWD wells such as the Charley SWD 2407 #1-9 or the Charley SWD 2407 #2-9 well, etc.) are to be determined by the technical experts working for Sandridge and the Commission.

22) The evidence and data must be sufficient in scope and quality, however, that UIC can either recommend that the Francis SWD well be permitted to operate or not, or acknowledge that the evidence is presently not available or capable of being determined. The ALJ notes that if sufficient evidence cannot be found or determined to meet this minimum standard of review, then Sandridge will not be able to meet the burden of proof that the operation of the Francis SWD well will not harm human health and the environment.

23) After taking into consideration all of the facts, circumstances, evidence and testimony presented in the cause, it is the recommendation of the ALJ that the hearing concerning Sandridge's application be continued until such time that Sandridge can provide the Commission with the following information:

a. Significant and substantial evidence that the Arbuckle formation in the area of the Francis SWD well is not experiencing pressure buildup from disposal activities characterized by an increase in formation pore pressure that is likely to induce seismicity or that the operation of the well would not cause such a build up of reservoir pressure;

b. Significant and substantial evidence that there are no faults of concern (denoting faults or zones of multiple faults optimally oriented for movement and located in a critically stressed region and of sufficient size and possessing sufficient accumulated stress/strain, such that fault slip and movement has the potential to cause a significant earthquake). The area of review should comprise the area shown on Exhibit 9 or in the alternative, an area recommended by the UIC staff;

c. Significant and substantial evidence that there are no pathways allowing any increased pressure to communicate with the faults of concern;

d. A table showing all of the non-commercial SWD wells operated by Sandridge in the area depicted on the map shown in Exhibit 9, including the following information for each well: name; location; the distance of the wells from the Francis SWD well; permitted maximum injection rate; actual injection rate; total amount of fluid injected into the disposal formation from the date

that a well commenced injection operations; permitted injection pressure; actual injection pressure; tubing size; geologic name of the disposal formation; total depth of the wellbore; distance from the bottom of the wellbore to the top of the basement rock.

e. An analysis of the actual costs to dispose of a barrel of saltwater using the existing Sandridge disposal wells and the Francis SWD well;

f. Detailed engineering and economic studies of the feasibility of alternate means of handling produced water other than disposal into the Arbuckle by injection wells, including: trucking water to other disposal wells located outside of the zone of interest encompassing a "yellow" zone; piping water to other disposal wells located outside of the zone of interest encompassing a "yellow" zone; recycling the water for reuse in the area; and treating the water to reduce its volume or improve its quality for a beneficial use other than disposal. The engineering and economic studies should enable the Commission to compare the costs for each option.

## **POSITIONS OF THE PARTIES**

### **SANDRIDGE**

1) **John R. Reeves**, attorney, appearing on behalf of Sandridge, stated this well is to dispose of fluids into the Arbuckle formation. It has one vertical portion to it and two high angle laterals that come out of the vertical portion. This was to get into the Arbuckle but to stay away from the base of the Arbuckle. The well has been drilled, completed and is shut-in. It is to be used in connection with a large disposal system of Sandridge. The effect of this well will allow 375,000 BO equivalent to be produced, if authorized and if not it will be shut-in. This has some impact on actual production from the Mississippian in this area.

2) From the ALJ's report, the ALJ got mixed up on the casing in the well. It was a proposed casing string because it was before the well had been drilled. The amended application listed what the casing strings were. The surface casing is at 13 3/8 inch set to 1,200 feet. The cement circulating to the surface at 9 5/8 inch casing set to 6,462 feet and has cement all the way up to 4,650 feet. It has seven inch tubing set in the well down to 6,420 feet and set into a packer at 6,420 feet. The casing is only relevant for purpose of whether the treatable water is being protected. The first lateral is 1,184 feet and commences at 6,916 feet going out to a measured depth of 8,100 feet and has a true vertical depth of 7,656 feet. The second open-hole portion is 1,185 feet, it goes from 6,916 feet to 8,101 feet.

3) The base of the treatable water is at 150 feet as taken from the Commission maps and the top of the Arbuckle is at 6,795 feet. So there is an intervening strata of 6,645 feet at the end of the 9 5/8 inch casing that is cemented into the Arbuckle where the fluid is going into the Arbuckle. There is a significant interval between the Arbuckle and the treatable water. The treatable water is not going to be affected because of the SWD well into the Arbuckle. It will not frac out of the Arbuckle into the treatable water zones. That is impossible to do as the base of the treatable water is 150 feet.

4) The Arbuckle formation is used for SWD. It has high porosity and permeability. There is no oil or gas production or freshwater within the Arbuckle in at least a 1.5 miles from the well. The Arbuckle takes water in a vacuum because it is a normal pressured reservoir.

5) The well is within full compliance with the rules for SWD wells. It is not going to affect treatable water. The Commission Staff agreed with that. There was a hearing because the well is within six miles of a cluster of earthquakes. The Commission is concerned with the relationship between disposal into the Arbuckle and earthquakes.

6) Sandridge has been working with UIC department to examine the connection between disposal in the Arbuckle and earthquakes. Sandridge is willing to provide 3-D seismic within a fault area to the Commission or to the Oklahoma Geological Survey. Sandridge is concerned about this and has shut-in a disposal well in the past where there was a concern regarding earthquakes. Sandridge is trying to work closely with the UIC Staff to solve this mystery. The 3-D seismic of this tract in this general area is now done and Sandridge is willing to provide that.

7) This well falls within the yellow traffic light. The UIC traffic-light system allows SWD wells to happen in the Arbuckle but also allows for control of the disposal pressure and rates in case it needs to be stopped. It also gains information from disposal operations and their connection to earthquakes, if any. This system is a very reasoned and logical approach to this problem. The Commission requires certain information for disposal into the Arbuckle under OCC-OAC 165:10-5-7(b)(3). The traffic light system is an extension of that concept.

8) Sandridge is willing to work with the UIC Staff under this traffic light system and agreed to entry of an Interim Order where Sandridge would notify the UIC department when the disposal process begins. Sandridge would monitor and record on a daily basis the volumes and pressure in the well and provide that information to the UIC on a weekly basis. For the first six months, Sandridge will take three tools in the well to take a bottom-hole pressure of the well and also measure the bottom-hole pressure off the surface pressures and compare it to the result of the actual tool run in the hole. If the frequency and

magnitude of earthquakes causes concern with the Director of Conservation, the Director can tell the operator to temporarily and immediately limit or suspend operations. This is a reasonable procedure to the potential problem of induced seismicity. In the agreement, Sandridge reduced the rate from 80,000 barrels per day to 30,000 barrels per day and from 2,000 pounds surface pressure to 1,000 pounds surface pressure.

9) The ALJ says the science linking oil and gas activity to induced seismicity has not been settled conclusively. This is correct. But then later the ALJ makes the assumption that disposal into the Arbuckle will cause earthquakes and bases his recommendation on that assumption. That is contrary to evidence that is presented in the cause and contrary to his previous statements. Sandridge's witness, J. P. Dick, presented Exhibit 5 and Exhibit 7. Injection into the Arbuckle is around 6,450 feet which is 1.97 km deep. The shallowest epicenter on Exhibit 5 is 3.2 km which is 11,000 feet and everything else is deeper than that. Exhibit 7 shows earthquakes that have occurred in the area and disposal wells in the area. There are places where there are lots of earthquakes with no wells and few earthquakes with many wells. It is difficult to find a causal relationship between disposal wells and earthquakes just based on location. The witness Charles Lord from the UIC department said the well adequately protects the treatable water but did not take a position on the casual relationship between disposal wells and earthquakes.

10) The ALJ puts burdens upon Sandridge to put on substantial evidence to prove negatives which will be impossible to do and also provide information that the Commission already has. The ALJ's two other burdens are beyond the Commission's jurisdiction. The ALJ takes existing case law and statutes and stretches them too far. The ALJ recognized that the focus of the rules on Class 2 UIC wells is protecting the ground and surface water in paragraph 19 on page 9 of the ALJ Report and the rules have not considered the issue of induced seismicity related to SWD wells. The ALJ found this because it is a recent issue and because science linking oil and gas activity and induced seismicity is not settled conclusively. Clearly, the rules deal with protecting treatable water and not induced seismicity.

11) The ALJ cites 17 O.S. Section 302 and finds that if they are equal status and covering the same subject, the statutes needs to be read together and that this statute should be read like this. This statute deals with storage tank systems, not SWD wells. Storage tank systems and SWD wells are not of equal importance and cannot be read together. It is taking a statute and reading it out of context.

12) Next the ALJ cites OCC-OAC.165:26-1-26(a) which regulates the safe operation of above ground storage tank systems and avoiding leaks from the storage tank systems. The context of the chapter deals with leaking storage tanks, not SWD wells. OCC-OAC 165:10-5-9 is also cited and says the

Commission can revoke a permit for a SWD well for just cause or lapses. The ALJ construes "unacceptable environmental impact" in a very broad sense and outside the context of the rule. This statute is regulating unacceptable environmental impact that is affecting treatable water, not earthquakes.

13) The ALJ also cites Safe Drinking Water Act and 40 C.F.R. Section 145.13 where it says that the EPA has delegated authority to the Commission to restrain any party engaging in activity that endangers or damages the public health and the environment. He found that because induced seismicity poses a threat to the public safety, the Commission has authority under this Act to refuse the issuance of a SWD well permit to someone who does not provide sufficient evidence that the well will not harm human health and the environment. This is a very broad interpretation of the Act. The ALJ left out part of the analysis. The Act regulates the public drinking supply and does not deal with earthquakes. This broad interpretation would allow the Commission to have power over all sorts of things besides drinking water under this Act.

14) The *Union Texas Petroleum Corp. v. Jackson*, 909 P.2d 131 (Okl.Civ.App. 1995) case states that the Commission is charged to regulate and abate public nuisances. The ALJ extends this concept to SWD wells. The ALJ left out the part of the case that says the Commission has jurisdiction if it is determined that remediation is feasible and the Commission finds that the party violated a rule or regulation of the Commission. In this case, this SWD well has followed all rules and regulations. The ALJ did not cite a rule that was violated or one that might be violated to give the Commission the authority to stop a public nuisance from occurring.

15) The ALJ states in his Report that the Commission has the power to prevent waste which applies to the proper management of production of hydrocarbons from formations. The ALJ states the increase in hydrocarbons over the last seven years due to horizontal drilling has increased the production of water. The ALJ states that disposal of salt water by underground injection has compromised the productive capacity of some of the disposal formations, like the Arbuckle. There is no evidence of this in the record at all. The ALJ also states that some portions of the Arbuckle are designated red zones and are not allowed to be used to dispose fluid and that some areas of the Arbuckle are areas of oil and gas production interest. There is no evidence of either of these in the record of this case. The ALJ recommended that Sandridge conduct a detailed study of disposing of salt water somewhere else to protect the productive capacity of the Arbuckle. It is beyond the jurisdiction of the Commission to regulate this business decision of Sandridge.

16) The ALJ referenced the NTW in Footnote 22 on page 14. This report was never presented to Sandridge nor placed in the record. It is a violation of Constitutional rights to rely on this NTW report and not allow Sandridge an opportunity to address it. The UIC witness said that the recommendations of

the NTW do not conflict with what the UIC department has ordered Sandridge to do. The ALJ imposes the standards from this NTW report which are much more stringent than what the UIC is requesting. Sandridge is not able to live under the standards of this NTW report but can live under the standards that the UIC has imposed.

17) There are six things that the ALJ imposed upon Sandridge that are difficult to comply with. One is that substantial evidence is needed to show that the Arbuckle is not experiencing pressure build-up from disposal operations or faults of concern. The Sandridge witness testified that he has not seen any increase in pressure in the Arbuckle due to disposal operations. Exhibit 7 and the testimony about the Woodford has the best information that we have about faults. The Woodford is 200 feet above the Arbuckle and is reflective of what is found in the Arbuckle and Sandridge's witness did not see any faults in the Woodford.

18) The ALJ also requires Sandridge to provide a table showing all Sandridge's non-commercial disposal wells, but the Commission has this information. The last requirement is the actual costs to dispose of a barrel of salt water in Sandridge's disposal system and alternate means to dispose of the water. This is almost impossible to do. What is the Commission going to do with that information? The Commission does not have the jurisdiction to say if Sandridge's cost is too high or too low because it is a business decision. It is not within the Commission's jurisdiction to tell Sandridge that they should use an alternate method of how to dispose of the salt water. Sandridge is not asking the Commission to evaluate the disposal system.

19) The ALJ has imposed a burden on Sandridge that they cannot meet and is requiring things that are not within the Commission's jurisdiction. The ALJ's Report should not be adopted and the agreement between Sandridge and the UIC department should be adopted.

20) Order 642055 has been entered involving a disposal well. The Commission provided for a graduated increased rate of disposal. The first 60 days of the six-month period under the Interim order at 15,000 barrels per day, next 60 days at 20,000 barrels per day, and the last 60 days at 25,000 barrels per day. Sandridge would accept this.

### UIC

1) **Susan Conrad**, Deputy General Counsel, appearing for the UIC, is neutral on this case. Sandridge assumed the risk to drill the well without the authorization of the Commission. On Page 1, paragraphs 1 and 2, the ALJ's

Report explains that Sandridge drilled the well before they sought administrative approval of the well. Also, the UIC witness Mr. Lord said that the UIC department is taking a neutral position on this cause.

2) Sandridge refers to preliminary discussions that Sandridge had with UIC staff about Sandridge's desire to permit the Francis SWD well. Apparently Sandridge decided to assume the risk of drilling the well without a permit or order issued by the Commission authorizing use of the well as a SWD well.

### **RESPONSE OF SANDRIDGE**

1) Sandridge stated that the only reason he brought up Sandridge's communication with UIC is to show that Sandridge notified UIC that the well was going to be drilled.

### **CONCLUSIONS**

**The Referee finds the Report of the Administrative Law Judge should be affirmed in part and reversed in part.**

1) The Referee affirms the ALJ's recommendation "that the hearing concerning Sandridge's application be continued until such time that Sandridge can provide the Commission with the following information;

a. Significant and substantial evidence that the Arbuckle formation in the area of the Francis SWD well is not experiencing pressure buildup from disposal activities characterized by an increase in formation pore pressure that is likely to induce seismicity or that the operation of the well would not cause such a build up of reservoir pressure;

b. Significant and substantial evidence that there are no faults of concern (denoting faults or zones of multiple faults optimally oriented for movement and located in a critically stressed region and of sufficient size and possessing sufficient accumulated stress/strain, such that fault slip and movement has the potential to cause a significant earthquake). The area of review should comprise the area shown on

Exhibit 9 or in the alternative, an area recommended by the UIC staff;

c. Significant and substantial evidence that there are no pathways allowing any increased pressure to communicate with the faults of concern;

2) The Referee reverses the ALJ's recommendation that Sandridge provide the Commission with the following information:

d. A table showing all of the non-commercial SWD wells operated by Sandridge in the area depicted on the map shown in Exhibit 9, including the following information for each well: name; location; the distance of the wells from the Francis SWD well; permitted maximum injection rate; actual injection rate; total amount of fluid injected into the disposal formation from the date that a well commenced injection operations; permitted injection pressure; actual injection pressure; tubing size; geologic name of the disposal formation; total depth of the wellbore; distance from the bottom of the wellbore to the top of the basement rock.

The UIC apparently has this information and can provide to the ALJ the requested information.

3) The Referee would reverse the recommendation of the ALJ to "provide the Commission with the following information:

e. An analysis of the actual costs to dispose of a barrel of saltwater using the existing Sandridge disposal wells and the Francis SWD well;

f. Detailed engineering and economic studies of the feasibility of alternate means of handling produced water other than disposal into the Arbuckle by injection wells, including: trucking water to other disposal wells located outside of the zone of interest encompassing a "yellow" zone; piping water to other disposal wells located outside of the zone of interest encompassing a "yellow" zone; recycling the water for reuse in the area; and treating the water to reduce its volume or improve its quality for a beneficial use other

than disposal. The engineering and economic studies should enable the Commission to compare the costs for each option.

The Referee agrees with Sandridge that said requests are unreasonable. Also, such a requirement is irrelevant and unnecessary in determining whether or not the Francis SWD well should be authorized as a disposal well by the Commission, which is the subject of the present application by Sandridge.

4) 17 O.S. Section 52(A)(1)(i) provides:

A. 1. Except as otherwise provided by this section, the Corporation Commission is hereby vested with exclusive jurisdiction, power and authority with reference to:

i. The handling, transportation, storage and disposition of saltwater, mineral brines, waste oil and other deleterious substances produced from or obtained or used in connection with the drilling, development, producing and operating of oil and gas wells,...

5) 52 O.S. Section 139(A) provides;

A. The Corporation Commission is vested with exclusive jurisdiction, power and authority, and it shall be its duty, to make and enforce such rules and orders governing and regulating the handling, storage and disposition of saltwater, mineral brines, waste oil and other deleterious substances produced from or obtained or used in connection with the drilling, development, producing, and operating of oil and gas wells and brine wells within the state as are reasonable and necessary for the purposes of preventing the pollution of the surface and subsurface waters in the state, and to otherwise carry out the purpose of this act.

6) OCC-OAC 165:10-7-2(c)(8)(9) and (10) provides:

**(c) Specific areas of Conservation Division jurisdiction to which Pollution Abatement rules apply:**

\* \* \*

(8) The handling, transportation, storage and disposition of saltwater, drilling fluids, mineral brines, waste oil and other deleterious substances produced from or obtained or used in connection with the drilling, development, production, and operation of oil and gas wells at any facility or activity specifically subject to Commission jurisdiction or other oil and gas extraction facilities and activities.

(9) Spills of deleterious substances associated with facilities and activities specified in OAC 165:10-7-4(c)(8) or otherwise associated with oil and gas extraction and transportation activities.

(10) Groundwater protection for activities subject to the jurisdictional areas of environmental responsibility of the Commission.

7) OCC-OAC 165:10-5-9(a)(b)(c)(d) provides as follows:

(a) Subject to 165:10-5-10, authorization of injection into enhanced recovery injection wells and disposal wells shall remain valid for the life of the well, unless revoked by the Commission for just cause or lapses and becomes null and void under the provisions of 165:10-5-5(g).

(b) An order granting underground injection may be modified, vacated, amended, or terminated during its term for cause. This may be at the Commission's initiative or at the request of any interested person through the prescribed complaint procedure of the Conservation Division. All requests shall be in writing and shall contain facts or reasons supporting the request.

(c) An order may be modified, vacated, amended, or terminated after notice and hearing if:

(1) There is a substantial change of conditions in the enhanced recovery injection well or

the disposal well operation, or there are substantial changes in the information originally furnished.

(2) Information as to the permitted operation indicates that the cumulative effects on the environment are unacceptable.

(d) If an operator fails to complete or convert a well as approved by the Conservation Division within eighteen (18) months after the effective date of the order or permit authorizing injection into the well, then the order or permit authorizing injection into the well shall expire.

8) The Oklahoma Court of Civil Appeals in *Union Texas Petroleum Corp. v. Jackson*, 909 P.2d 131 (Okla.Civ.App. 1995) provides:

A nuisance consists in unlawfully doing an act or omitting to perform a duty, which act or omission either annoys, injures or endangers the comfort, repose, health or safety of others or in any way renders other persons insecure in life or in the use of property. 50 O.S. § 1; *Cities Service Oil Company v. Merritt*, 332 P.2d 677, 684 (Okla. 1958). In *Cities Service*, the Supreme Court determined the basis of liability for injury or damage to property by pollution of subterraneous waters, from oil, gas or saltwater from oil wells, must be either negligence or nuisance. *Cities Service*, at 684. Cities or towns may seek abatement of a public nuisance, including protection of public water supplies, within their respective corporate limits in district court. 50 O.S. 1991 §§ 16, 17. A public nuisance is one which affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon the individuals may be unequal. 50 O.S. 1991 § 2; *Miller v. State*, 74 Okla. Crim. 104, 123 P.2d 699 (Okla. Crim. App. 1942). The remedies for public nuisance are through indictment or information, civil action, or abatement. 50 O.S. 1991 §8. A public nuisance may be abated by any public body or officer authorized thereto by law. 50 O.S. 1991 § 11.

9) The Referee agrees with the ALJ's findings and statements in paragraph #33 on page 13 of his ALJ Report which stated:

33. In an application for a permit, the applicant has the burden of proof to show that the SWD well will not harm human health and the environment. Here the Commission also has a responsibility to the regulated community to clearly define what rules must be followed and what evidence must be presented by an applicant that would enable the Commission's engineers and scientists to address the risks of induced seismicity presented by a SWD well. The rules related to the protection of the state's surface water and groundwater are clear and well-established but the evidentiary standards related to the risks of induced seismicity are evolving and are changing in response to new scientific studies on the topic and ongoing seismic activity.

10) The Referee agrees with the conclusion of the ALJ that Sandridge presented substantial evidence that the Francis SWD well complies with the Commission rules to protect the waters of the State. The UIC expert, Mr. Charles Lord, at the hearing testified and stated: "We feel that they have adequate protections to prevent contamination of treatable water." Mr. Lord stated, however, that "But we [UIC] take no position pertaining to seismicity." Mr. Lord testified that the stressed fault data compiled by OGS is data that UIC has and indicates where the stressed faults exist and knowledge as to whether it is highly stressed or moderately stressed or not stressed at all, but Mr. Lord also stated that "...they are continuing to work on this to-date." Mr. Lord did not believe that the OGS had a lot of 3-D seismic data in this area but were working off of sonic logs. Mr. Lord stated he was familiar with the EPA's NTW group and that they have provided a decisive model and recommendations for evaluating the potential for injection induced seismicity. Mr. Lord stated that they were gathering data for the OGS and the EPA. Mr. Lord agreed with the NTW decision model and recommendations for evaluating the SWD well.

11) The NTW report, as stated by the ALJ, provides practical tools for evaluating the "three key components that must all be present for induced seismicity to occur: (1) sufficient pressure buildup from disposal activities, (2) a Fault of Concern, and (3) a pathway allowing the increased pressure to communicate from the disposal well to the fault." The Referee would agree with the conclusion of the ALJ that the hearing should be continued so that Sandridge can provide significant evidence to the Commission based upon the components found by the NTW report for evaluating the potential for injection-induced seismicity.

12) The Referee agrees with the ALJ that Mr. Lord as the technical expert and representative of the UIC department took "no position pertaining to seismicity" concerning the risk posed by the Francis SWD well with respect to induced seismicity. If he has more/sufficient information provided by Sandridge based upon the NTW decision model and recommendations for evaluating the potential for injection induced seismicity then the UIC department would perhaps be able to review such information and make a decision as to the risk posed by the Francis SWD well with respect to induced seismicity.

13) The weight of the evidence established that the manner and method proposed by the ALJ pursuant to the NTW decision model and recommendations for evaluating the potential for injection induced seismicity would comply with and exceed the Commission rules to protect human health and the environment. The ALJ is the finder of fact and it is the ALJ's duty to observe the demeanor of the witnesses, assess their credibility and assign the appropriate weight to their opinions. *Application of Choctaw Express Company*, 253 P.2d 822 (Okl. 1953); *Palmer Oil Corporation v. Phillips Petroleum Company*, 231 P.2d 997 (Okl. 1951); *Haymaker v. Oklahoma Corporation Commission*, 731 P.2d 1008 (Okl.Civ.App. 1986).

14) Based upon the above stated reasoning, rules and law, the Report of the ALJ should be affirmed in part and reversed in part as stated above.

**RESPECTFULLY SUBMITTED THIS 5<sup>th</sup> day of August, 2015.**



Patricia D. MacGuigan  
OIL & GAS APPELLATE REFEREE

PM:ac

xc: Commissioner Anthony  
Commissioner Murphy  
Commissioner Hiett  
James L. Myles  
ALJ David D. Leavitt  
John R. Reeves  
Susan Conrad  
Michael L. Decker, OAP Director  
Oil Law Records  
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Commission Files