



RAILROAD COMMISSION OF TEXAS

HEARINGS DIVISION

OIL AND GAS DOCKET NO. 08-0282332

THE APPLICATION OF TREY RESOURCES, INC., PURSUANT TO STATEWIDE RULE 46 FOR A PERMIT TO INJECT FLUID INTO A RESERVOIR PRODUCTIVE OF OIL OR GAS, SAVAGE LEASE, WELL NOS. 1 AND 9, SHAFTER LAKE (SAN ANDRES) FIELD, ANDREWS COUNTY, TEXAS.

HEARD BY: Paul Dubois – Technical Examiner
Michael Crnich – Hearings Examiner

APPEARANCES:

APPLICANT:

George Neale
Rick Johnston
Tim Hunt

REPRESENTING:

Trey Resources, Inc.

PROTESTANTS:

Michael McElroy
John McBeath
William Craig Gaines

Ring Energy

PROCEDURAL HISTORY

Application Filed:	December 5, 2012
Request for Hearing:	April 19, 2013
Notice of Hearing:	July 31, 2013
Date of Hearing:	October 23, 2013
Proposal For Decision Issued:	January 14, 2014

EXAMINERS' REPORT AND PROPOSAL FOR DECISION**STATEMENT OF THE CASE**

This is the application of Trey Resources, Inc. (Trey) for a permit to dispose of oil and gas waste by injection into a porous formation productive of oil or gas in its Savage Lease, Well Nos. 1 and 9, Shafter Lake (San Andres) Field, Andrews County, Texas. Trey's original application in this matter was to convert seven existing wells (Savage Lease Well Nos. 1, 2, 3-R, 6, 7, 8 and 9) on the lease to injection wells as a part of a waterflood project.

The application was protested by Ring Energy (Ring), an operator of wells adjacent to the north and west of Trey's Savage Lease. At the hearing, Trey withdrew five wells from consideration under this application, leaving just the Nos. 1 and 9 wells as the subject of the hearing. These two wells are more than one-half mile from Ring's active producing wells.

At the start of the hearing Trey requested to amend the injection intervals for the two wells. The amended injection intervals extended beyond the intervals specified in original application and the hearing notice. As a result, on November 13, 2013, the examiners sent a letter to all persons entitled to notice informing them of the changed application intervals, and affording these persons an opportunity to protest. No additional protests were received before the specified deadline of 5 p.m. on November 26, 2013.

The examiners recommend that Trey's application for injection authority under Statewide Rule 46 be approved for its Savage Lease Well Nos. 1 and 9, as Trey has met its burden of proof and satisfied the requirements of Chapter 27 of the Texas Water Code and the Railroad Commission's Statewide Rule 46.

DISCUSSION OF THE EVIDENCE**Applicant's Evidence**

Trey operates its Savage Lease on 642 acres 9 miles northwest of the town of Andrews, Andrews County, Texas. The lease produces from the Shafter Lake (San Andres) Field. Trey's original application in this matter was to convert seven existing wells (Savage Lease Well Nos. 1, 2, 3-R, 6, 7, 8 and 9) on the lease to injection wells as a part of a waterflood project. At the hearing, Trey withdrew five wells from consideration under this application, leaving just the Nos. 1 and 9 wells as the subject of the hearing. The one-quarter and one-half mile areas of review surrounding these two wells did not encompass the locations of any wells operated by the protestant, Ring Energy (Ring). The one-half mile area of review does still include the terminus locations of two proposed horizontal

wells. The operator who holds these drilling permits, Forge Energy, LLC, did not protest.

Also, at the hearing Trey requested amending the injection intervals for the two wells. The proposed injection interval for Well No. 1 was originally noticed from 4,728 feet to 4,768 feet, and Trey requested it be changed to 4,728 feet to 4,920 feet. Similarly, the proposed injection interval for Well No. 9 was originally noticed from 4,523 feet to 4,691 feet, and Trey requested it be changed to 4,523 feet to 4,920 feet. Trey's purpose for deepening the injection intervals is to include a second, lower porosity development in the San Andres Formation that is also productive on the lease. The Form H-1 indicated average horizontal permeability of 2 millidarcies (item no. 18) and average porosity of 7% (item no. 19). Trey's expert engineering witness stated those values were taken from an earlier application that he did not prepare, and so did not know the origin of those values.

Well No. 1 Completion and Proposed Injection Details

Trey's Savage Lease Well No. 1 was originally drilled by Mana Resources in 1970 to a depth of 13,394 feet. The dry hole was plugged soon after completion. The original 1970 completion reports were not entered into evidence, but Form W-3 plugging reports were entered with Exhibit No. 4. The plugging report indicated that at the time of plugging 550 feet of 8 5/8-inch casing was retrieved from the well. The casing size might be a typographical error, according to Trey, as other documents reference a 9 5/8-inch casing size. The well was re-entered by Pacesetter Energy, Inc., in 2006. The plugs were drilled out to 10,895 feet and a 9 5/8-inch casing was re-attached to the casing stub at 550 feet. The well was plugged back with cast iron bridge plugs each topped with 30-feet of cement at depths of 10,370 feet, 6,450 feet and 6,170 feet. The uppermost plug isolated a perforated and tested interval from 6,224 feet to 6,236 feet. The well is currently perforated in and producing from the Shafter Lake (San Andres) Field from 4,728 feet to 4,768 feet.

Completion details as the well is currently constructed are summarized below:

- 13 3/8-inch surface casing set in 1970 to 372 feet and cement circulated to surface.
- 9 5/8-inch casing set in 1970 to 4,650 feet and cemented to 3,962 feet (calculated, per Form H-1A). The top 550 feet of this casing string was pulled in 1970 and reattached during re-entry in 2006.
- 5 1/2-inch casing set in 2006 to 10,868 feet and cemented using a DV tool with top of cement at 2,259 based on cement bond log.
- Cast iron bridge plugs set in 2006 and topped with 30-feet of cement at depths of 10,370 feet, 6,450 feet and 6,170 feet.

The original completion report for the well was not provided. Trey's expert engineering witness stated his belief that the top of cement on the 9 5/8-inch casing was likely to be around 600 to 700 feet. His reasoning was based on the 1970 well plugging report that indicated 550 feet of the casing was removed from the well, and it was likely that the casing was cut just above the top of cement to maximize casing recovery. The form H-1A application submitted (Exhibit No. 1) indicated a calculated top of cement for this casing of 3,962 feet.

A valid Groundwater Protection Determination was not submitted for the No. 1 well. The letter entered into evidence (Exhibit No. 7) was for the Savage No. 7 well and for all wells drilled in the Southeast 1/4 of Section 2; the No. 1 well is in the Southwest 1/4 of Section 2. Exhibit No. 7 did indicate, however, that groundwater should be protected from the ground surface to a depth of 250 feet and in the zone from 1,300 to 1,750 feet. Trey's witness identified annotations made by District staff on several well completion reports indicating a groundwater protection depth of 1,700 to 1,800 feet would be appropriate for the area.

To recomplete the Savage No. 1 for injection, Trey proposes the following (wellbore diagram attached, Trey Exhibit No. 3):

- An injection interval from 4,728 feet to 4,920 feet
- 2 7/8-inch tubing with packer set at 4,700 feet
- A maximum daily injection rate of 2,500 barrels of produced salt water
- A maximum surface injection pressure of 2,000 psig

Well No. 9 Completion and Proposed Injection Details

Trey's Savage Lease Well No. 9 was drilled in June 2008, to a depth of 5,034 feet. The well is perforated from 4,523 to 4,681 feet and produces from the Shafter Lake (San Andres) Field. Completion details as the well is currently constructed are summarized below:

- 8 5/8-inch surface casing set to 1,718 feet and cement circulated to surface (note the W-15 for this casing string indicates 1,760 feet of casing was set [Exhibit No. 6.])
- 5 1/2-inch casing set to 5,034 feet and cement circulated to surface.

To re-complete the Savage No. 9 for injection, Trey proposes the following (wellbore diagram attached, Trey Exhibit No. 5):

- An injection interval from 4,523 feet to 4,920 feet
- 2 7/8-inch tubing with packer set at 4,500 feet
- A maximum daily injection rate of 2,500 barrels of produced salt water
- A maximum surface injection pressure of 2,000 psig

A valid Groundwater Protection Determination letter was submitted for the No. 9 well. The letter entered into evidence (Exhibit No. 7) was for the Savage No. 7 well and for all wells drilled in the Southeast 1/4 of Section 2, which includes Savage No. 9. According to the letter, groundwater should be protected through the base of usable quality groundwater (BUQW) from the ground surface to a depth of 250 feet and in the zone from 1,300 to 1,750 feet. The base of underground sources of drinking water (USDW) is estimated to be at 1,800 feet.

Area of Review

There is one well located within the one-quarter mile area of review surrounding the proposed injection wells. This well is Trey's Savage Lease, Well No. 8 (API No. 003-40406), which was drilled in 2008 and also produces from the Shafter Lake (San Andres) Field. It is located about one-quarter mile south of Well No. 1. The well completion report indicates Well No. 8 was built with 1,760 feet of surface casing with cement circulated to the surface. An annotation on the completion form (a form stamp placed by Commission staff and annotated with certain completion details) suggests that a surface casing letter dated February 22, 2008 from the Texas Natural Resource Conservation Commission indicated groundwater protection zones from the surface to 250 feet and from 1,300 feet to 1,700 feet.

Applicant's Exhibit No. 2 and Commission records indicate a cancelled drilling permit location about 200 feet northwest of Well No. 1. Two other permitted locations (23W and 24W) are also within the one-quarter mile radius. These locations received drilling permits on September 4, 2008, but the permits have since expired.

There are three producing wells and two plugged dry holes located between the one-quarter and one-half mile area of review. The three producing wells are operated by Trey (Well Nos. 3R, 6 and 7) and are completed in the Shafter Lake (San Andres) Field. Several permitted and cancelled locations are also located within this area, including surface and terminal locations of proposed horizontal wellbores. The two plugged dry holes (Well Nos. 1 [not the subject well] and the Savage Fisher 1A [API No. 003-10538]) are located about 2,000 feet northeast of Well No. 9.

Trey's engineering witness stated that there were no wells within a quarter mile that are improperly plugged such that they could act as a conduit to allow injected fluids to migrate outside the injection interval. Similarly, he also stated that he did not believe there were any wells within the one-half mile area of review that could form or cause a conduit to occur to allow the injected fluids to escape the injection interval.

Other

Trey provided copies of the proration schedules for the Shafter Lake (San Andres) Field and the nearby Block A-34 (San Andres) Field, demonstrating that injection activities are ongoing in both of these San Andres fields, especially Shafter Lake.

Trey has been issued injection permits for several wells in Section 2, but these wells have not yet been converted to injection or drilled. Savage Lease Well Nos. 2, 7 and 8 are existing producing wells for which injection authority has been granted by the Commission. Proposed locations 16W, 17W, 23W, and 24W also have been granted injection authority, but the drilling permits for these locations have expired. The injection permit for wells 7, 8, 16W, 17W, 23W and 24W was issued in 2009 and includes injection of salt water and carbon dioxide. The permit for well no. 2 was issued in 2002 for salt water only.

Trey has recently received Commission approval for an initial secondary recovery project (waterflood), which included the seven wells originally included in this injection well application. The application (exhibits 20 and 21) shows a proposed network of 16 injection wells evenly spaced across the one-section lease. Seven of the injection wells will be converted producers and nine will be newly drilled. There will be four east-west oriented horizontal producing wells also. The whole project will yield an estimated ultimate additional production of 1 million barrels of oil. Trey stated the two injection wells in this application will provide pressure maintenance for the one currently permitted horizontal well, which Trey asserts will not be drilled without Commission approval of the two injection wells.

Trey has an active P-5 on file with the Commission, with a \$250,000 financial assurance letter of credit. There are no active enforcement actions.

A notice of the application was published on November 22, 2012 in *Andrews County News*, a newspaper of general circulation in Andrews County. A copy of the application was mailed on December 3, 2012, to the Andrews County Clerk's Office, the surface owner, offsetting surface owners and operators within ½ mile of the proposed wells.

Protestant's Evidence

The Protestant, Ring Energy, declined to put forward any additional evidence beyond what was offered by the Applicant, asserting its case was made by evidence

already placed in the record. Ring's attorney did cross examine Trey's expert engineering witness and ask questions on voir dire for a number of exhibits.

Ring indicated that there was a problem with Trey's notice for the hearing, as the injection interval had changed since the application was submitted and protested.

As seen on Applicant's Exhibit No. 2, the area has experienced mixed vertical and horizontal development. The area south of the subject lease is being developed with horizontal wells oriented in a north-south direction. Generally speaking, most of the horizontal development in this part of the State includes laterals that are oriented in a general north-south direction. However, on the subject lease Trey has secured a drilling permit for a horizontal well oriented east-west. Trey has recently drilled an east west horizontal and permitted another on its lease adjacent to the east of the subject tract. Ring raised a question about the direction of preferential drainage in the area. Specifically, Ring speculated whether the fact that most horizontal laterals being drilled in a north-south orientation suggested a preferential natural drainage direction on an east-west orientation. Ring did not, however, provide any evidence to support a direction of preferential drainage. Ring pointed out that there were no intervening wells between the two proposed injection wells and Ring's lease to the west, and that if there was preferential drainage in an east-west orientation, then Ring's hydrocarbon resources could be harmed.

Ring noted that Trey did not address all historical wellbore penetrations within the one-half mile area of review. Specifically, Ring noted that the two dry holes (Nos. 1 and 1A) to the northeast, No. 4 to the west, and No. 5 to the southwest were not specifically addressed by Trey.

Finally, Ring expressed concern about injected fluids being confined to the proposed injection interval. Ring pointed to the Applicant's Exhibit No. 17, a cross-section including Trey's Savage 1 and 9 wells. The cross section (1) indicated Well No. 9 was perforated above the top of the San Andres Formation and above the top of the upper porosity development, and (2) did not exhibit evidence of confining strata above or below the proposed injection interval. Ring believes that the Applicant did not meet its burden of proof to demonstrate that the injected fluids would be confined to the proposed injection interval.

EXAMINERS' OPINION

The examiners recommend that Trey's application for the Savage Lease Well Nos. 1 and 9 be approved. The Railroad Commission may grant an application for an injection well permit under Subchapter C of the Texas Water Code if it finds the following:

1. That the use or installation of the injection well is in the public interest;

2. That the use or installation of the injection well will not endanger or injure any oil, gas, or other mineral formation;
3. That, with proper safeguards, both ground and surface fresh water can be adequately protected from pollution; and
4. That the applicant has made a satisfactory showing of financial responsibility as required by Section 27.073 of the Texas Water Code.

The examiners will explore each of these requirements in turn.

Public Interest

The Applicant requests authority to inject salt water into the productive Shafter Lake (San Andres) Field as part of a waterflood project on its 640 acre lease. The applicant has been granted approval for an enhanced oil recovery project and area designation (Project No. F-16204), and the project is expected to yield an ultimate additional production of 1 million barrels of oil. These reserves would not be recovered without the waterflood project. The examiners conclude that approval of the two injection wells is in the public interest.

Not Endanger or Injure Mineral Resources

The Applicant is requesting approval to inject salt water into the Shafter Lake (San Andres) Field for secondary recovery. That is, the Applicant's intention is to recover—not endanger or injure—its (Trey's) mineral resources. The Protestant is concerned that such injection may endanger or injure its (Ring's) adjacent mineral resources.

In this particular matter, the primary criterion used by the examiners to evaluate whether mineral resources will be endangered or injured is distance. The Savage No. 1 well is approximately 1,950 feet east of the Protestant's lease line and 3,100 northeast feet of the nearest producing well (the Savage Well No. 9 is about 2,000 feet east of Well No. 1, and thus further from the Protestant's property). The examiners note that the one-half mile area of review around the Savage No. 1 well does not include any producing wells or permitted locations on the Protestant's lease. The examiners do not believe that this distance necessarily excludes the Protestants from having standing in this case. However, the examiners believe that the one-half mile area of review required by the Rule—and within which there are no protestants—does provide the Applicant space to operate secondary recovery activities with a reasonable buffer mitigating the risk of harm to other interests in the absence of evidence to the contrary.

The Protestant expressed a concern regarding the preferential drainage patterns in the area, and suggested the presence of north-south oriented horizontal wells south of the subject tract indicate a natural east-west orientation of reservoir drainage. If true, the

Protestants are concerned that the proposed injection wells could harm their adjacent production to the west, as there are no intervening producing wells to recover the injected fluids. The Applicant's expert declined to give an opinion on whether a preferential drainage direction exists in the area, but neutrally accepted an east-west drainage orientation as a non-exclusive possibility. Neither party offered evidence to identify whether or not a preferential drainage direction exists or its direction. The examiners recognize that most horizontal wells in the greater area (beyond the study area presented in Applicant's Exhibit No. 2) are oriented in a more-or-less north-south orientation. The examiners agree with the Applicant's expert that this orientation is typically attributed to aligning the laterals perpendicular to the direction of principle stress of the reservoir rock, or perpendicular to the natural fractures, to enhance the effectiveness of fracture stimulation and recovery.

The Commission's rules require a one-quarter mile area of review for penetrations into the injection interval, and one-half mile area of review for serving notice to well operators. These radial areas of review are derived from an infinite-unbounded radial flow model for injection. That is, the basic assumption of the rule is that fluids will migrate radially (horizontally) from the injection well in all directions, infinitely (while staying within the vertically-confined injection interval). The Rule allows an applicant to apply for a reduced area of review when certain criteria are met and evidence establishes a boundary to flow within the area of review. The examiners note that the Applicant has met the requirements regarding the one-quarter and one-half mile area of review. The Protestant's wells are outside of this area, thus the burden to establish a hypothetical or actual preferential drainage orientation belongs to the Protestant. Simply noting the nearby presence of north-south oriented horizontal wells is not sufficient to establish a local or regional direction of flow.

The examiners conclude that the use or installation of these two injection wells will not endanger or injure any oil, gas, or other mineral formation.

Protect Water Resources

The Applicant reviewed all wellbore penetrations into or through the proposed injection interval within a one-quarter mile area of review required by Rule 46, as well as those additional wellbores between a one-quarter and one-half mile radius around the two proposed injection wells, to determine whether sub-standard well construction and/or plugging details might cause or result in contamination of the fresh groundwater. The Applicant did not identify any wellbores of concern.

The Applicant did not provide a valid letter from the Commission's Groundwater Advisory Unit for Well No. 1. The examiners note that this was probably an oversight when the original application was reviewed by Commission staff, as the application would not have been determined to be 'administratively complete' without a valid letter. The letter

submitted for Well No. 9 stated that the protection depths were from the surface to 250 feet, from 1,300 feet to 1,750 feet, and that the USDW is at about 1,800 feet. However, the examiners find that obtaining such a letter for Well No. 1 at this point this will not substantively impact material aspects of the well's design or its potential impact on groundwater resources. The examiners base this conclusion on two reasons. First, the Applicant reasonably established that based on other well and Commission records within the lease, the BUQW and USDW are very likely to be consistent with, if not identical to, the protection depths determined for Well No. 9.

Second, the Applicant proposes to convert existing producing wells to injection. Well No. 1, originally drilled in 1970 and recompleted in 2006, has 'short' surface casing. That is, the surface casing and cement does not fully cover the required protection interval. Well No. 9 may also have short casing. The Commission requires groundwater to be protected by surface casing and cement from 1,750 feet to the surface for Well No. 9. Most of the documentation indicates that the surface casing was set to 1,718 feet and cemented to surface; the W-15 indicates 1,760 feet of surface casing. Current Commission policy regarding the conversion of producing wells to injection wells in non-commercial settings allows for short surface casing. In these cases, the Commission places an additional condition on the injection permits that requires the Applicant to (1) perform annual pressure testing, and (2) conduct monthly casing-tubing annulus monitoring. As the Applicant intends to convert existing wells to injection and does not seek commercial disposal authority, the examiners find the surface casing and cement conform to current Commission policy and are sufficient to protect groundwater resources, with the additional monitoring requirements.

As mentioned, the infinite-unbounded radial flow model for injection assumes the injected fluids will stay within the vertically-confined injection interval. Commission rules require the Applicant to demonstrate that the fluids will be confined to the injection interval—the interval defined in the application, which may or may not correspond to an interval described by a common field or formation name. The Protestant believes that the Applicant has not met its burden of proof in this regard. The examiners are sympathetic, but the Applicant's case in this regard is sufficient. The cross-section offered into evidence (Exhibit No. 17) identified the top of the porosity development, the top of the San Andres Formation, and the top of the lower San Andres. The top of the lower San Andres roughly corresponds to the lower limit of the proposed injection intervals. According to the cross section, the upper limits of the proposed injection intervals in the two wells do not correlate geologically with each other.

Yet, the presence of accumulated hydrocarbons does, in fact, demonstrate some degree of confinement, although by itself not necessarily enough to satisfy Commission guidelines for underground injection—or, by inference, enough to protect usable groundwater. The examiners note that the Shafter Lake (San Andres) Field is not strictly coincident with the locally-defined San Andres Formation. That is, the upper part of the

field appears to include the lower portions of the commonly named Grayburg Formation. Applicant's Exhibit No. 17 illustrated five wells in the field, four of which produced from both the Grayburg and San Andres Formations. The Commission, absent a request from an operator in the field, has not established a correlative interval for the Shafter Lake (San Andres) Field.

Further, the examiners take note of Commission proration schedules (exhibit nos. 11 and 12) as well as online Commission data queries regarding permitted injection wells. The Commission's records indicate that the Shafter Lake (San Andres) Field currently has about 260 producing wells and 62 injection wells. Nearly one-in-five wells in the field are injection wells.

Finally, the examiners note that the USDW is at 1,800 feet and the uppermost proposed injection interval is at 4,523 feet: 2,723 feet separate the two intervals. The well logs presented in cross-section at hearing (Exhibit No. 17) suggest some shale confinement, and the well log submitted with the original administrative application indicates more. The Applicant did not expressly comment on this aspect of its application for injection authority, and it should have. The presence of multiple and extensive evaporite/anhydrite deposits (not to mention shale intervals) separating the Grayburg/San Andres Formations from the shallower water-bearing intervals in this area is well documented in literature. The examiners believe that adequate confining strata are present, based on (1) the presence of hydrocarbon accumulations, (2) a 2,723-foot intervening interval, and (3) the regionally documented presence of impermeable evaporite/anhydrite deposits.

The examiners conclude that, with proper safeguards, both ground and surface fresh water will be adequately protected from pollution.

Financial Responsibility

Trey has an active P-5 on file with the Commission, with a \$250,000 financial assurance letter of credit. There are no active enforcement actions against Trey. The examiners conclude the Applicant has made a satisfactory showing of financial responsibility as required by Section 27.073 of the Texas Water Code.

Other

The Applicant withdrew five wells from this matter at the start of the hearing, leaving only the Savage Lease Well Nos. 1 and 9 for consideration. Additionally, the Applicant amended the injection intervals from what was on the original notice and application. Because the amended injection intervals extended outside of the noticed intervals, the examiners sent a letter to those entitled to notice, informing them of the changed intervals and providing them the opportunity to protest within ten days. No further protests were

received. The examiners consider the matter to be properly noticed.

Finally, the examiners emphasize that their opinion in this matter pertains only to the Savage Well Nos. 1 and 9, in very large part because of the distances between these two wells and the Protestant's (or others') lease lines and producing wells. Nothing in this recommendation should be taken as support for or opposition to other injection wells which the Applicant may seek a permit on the Savage Lease.

FINDINGS OF FACT

1. A notice of the application was published on November 22, 2012 in *Andrews County News*, a newspaper of general circulation in Andrews County. A copy of the application was mailed on December 3, 2012, to the Andrews County Clerk's Office, the surface owner, offsetting surface owners and operators within ½ mile of the proposed wells.
2. On November 13, 2013, all persons entitled to notice were notified of a change in the injection interval from the original application and afforded the opportunity to protest; no protests were received. The examiners determined republication of the change was not required.
3. Trey proposes to convert two existing producing wells, its Savage Lease Well Nos. 1 and 9, to injection wells for waterflood purposes.
4. Trey withdrew Savage Lease Well Nos. 2, 3-R, 6, 7, and 8 from the application at the start of the hearing.
5. Trey has received Commission approval for a waterflood enhanced oil recovery project and area designation.
6. Trey estimates the enhanced oil recovery project will yield an ultimate additional production of 1 million barrels of oil.
7. Well Nos. 1 and 9 will inject produced salt water into the Shafter Lake (San Andres) Field, which includes the San Andres and portions of the Grayburg Formations.
8. Well No. 1 will be recompleted as an injection well as follows:
 - a. 13 3/8-inch surface casing set in 1970 to 372 feet and cement circulated to surface.

- b. 9 5/8-inch casing set in 1970 to 4,650 feet and cemented to 3,962 feet (calculated, per Form H-1A). The top 550 feet of this casing string was pulled in 1970 and reattached during re-entry in 2006.
 - c. 5 1/2-inch casing set in 2006 to 10,868 feet and cemented using a DV tool with top of cement at 2,259 based on cement bond log.
 - d. Cast iron bridge plugs set in 2006 and topped with 30-feet of cement at depths of 10,370 feet, 6,450 feet and 6,170 feet.
 - e. An injection interval from 4,728 feet to 4,920 feet.
 - f. 2 7/8-inch tubing with packer set at 4,700 feet.
9. Well No. 9 will be recompleted as an injection well as follows:
- a. 8 5/8-inch surface casing set to 1,718 feet and cement circulated to surface (note the W-15 for this casing string indicates 1,760 feet of casing was set).
 - b. 5 1/2-inch casing set to 5,034 feet and cemented circulated to surface.
 - c. An injection interval from 4,523 feet to 4,920 feet.
 - d. 2 7/8-inch tubing with packer set at 4,500 feet.
10. The injection wells will operate with a maximum daily injection volume of 2,500 barrels of salt water and a maximum surface injection pressure of 2,000 psig.
11. Applicant has demonstrated that groundwater in Section 2 should be protected above 1,750 feet.
12. Current Commission policy allows for existing wells with short surface casing to be converted to Rule 46 injection wells when the applicant is not seeking a commercial disposal permit.
13. Current Commission policy requires short surface casing wells to undergo annual pressure testing and monthly tubing-casing annulus monitoring.
14. There were no producing wells operated by anyone other than Trey within a one-half mile radius.
15. Injection of salt water into Savage Lease Well Nos. 1 and 9 for waterflood purposes will not harm adjacent mineral resources.

16. There was one penetrating wellbore within a one-quarter mile radius, the Trey Savage Lease Well No. 8, which is adequately cased and cemented.
17. There is adequate geologic confinement between the top of the injection zone and the USDW.
18. Trey has an active P-5 on file with the Commission, with a \$250,000 financial assurance letter of credit. There are no active enforcement actions against Trey.

CONCLUSIONS OF LAW

1. Proper notice was issued in accordance with the applicable statutory and regulatory requirements.
2. All things have occurred to give the Railroad Commission jurisdiction to consider this matter.
3. The use or installation of the proposed injection wells is in the public interest.
4. The use or installation of the proposed injection wells will not endanger or injure any oil, gas, or other mineral formation.
5. With proper safeguards, as provided by terms and conditions in the attached final order, which are incorporated herein by reference, both ground and surface fresh water can be adequately protected from pollution.
6. Trey has made a satisfactory showing of financial responsibility to the extent required by Section 27.073 of the Texas Water Code.
7. Trey has met its burden of proof and satisfied the requirements of Chapter 27 of the Texas Water Code and the Railroad Commission's Statewide Rule 46.

EXAMINERS' RECOMMENDATION

Based on the above findings and conclusions, the examiners recommend that the application be approved as set out in the attached Final Order.

Respectfully submitted,



Paul Dubois
Technical Examiner



Michael Crnich
Hearings Examiner

Savage # 9
(API # 42-003-40558)
Trey Resources
Andrews County, Texas

Proposed Injection Configuration

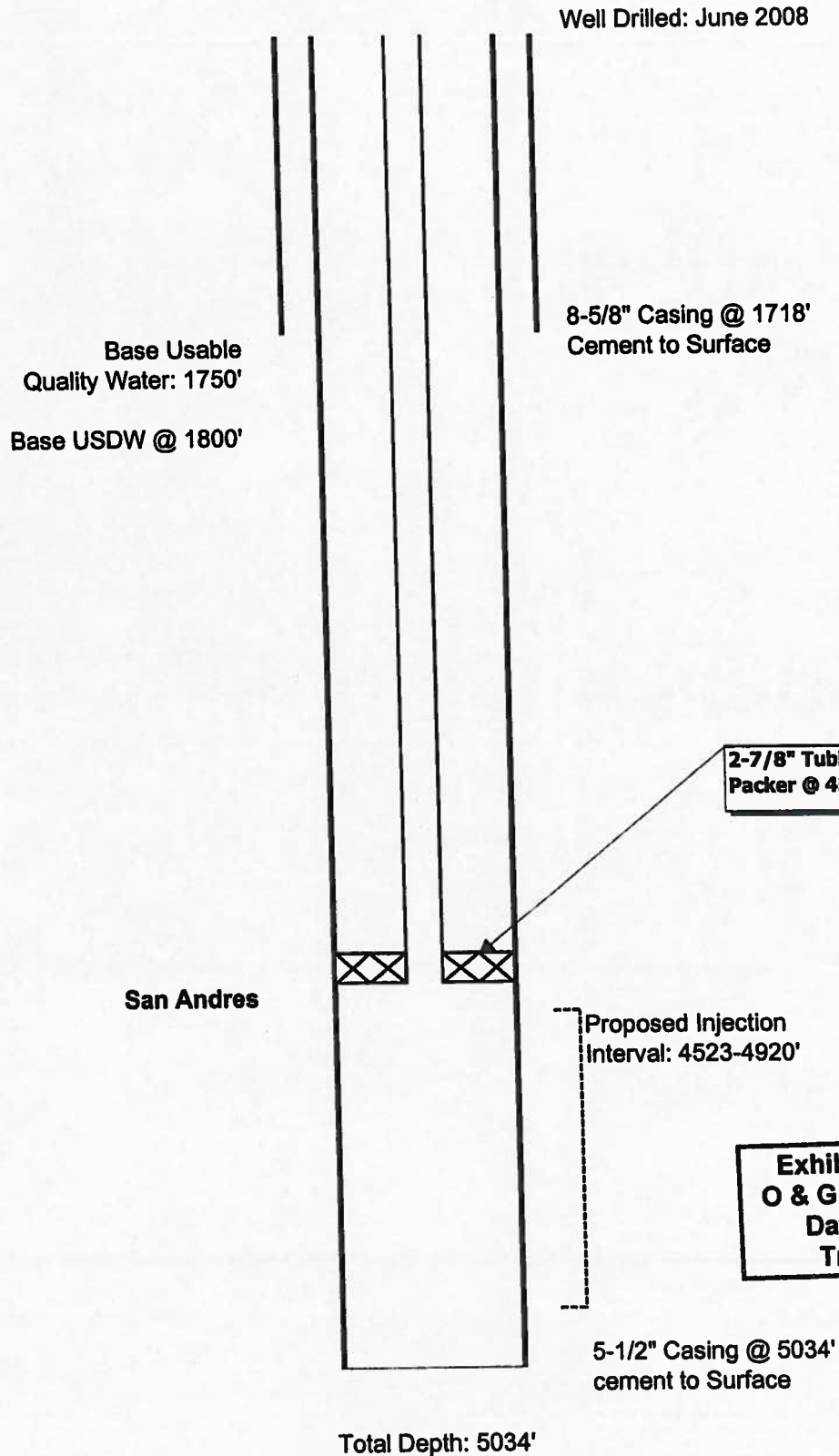


Exhibit No. 5
O & G Docket No. 08-0282332
Date: October 23, 2013
Trey Resources, Inc.

Savage # 1
(API # 42-003-30129)
Trey Resources
Andrews County, Texas

Proposed Injection Configuration

