



RAILROAD COMMISSION OF TEXAS HEARINGS DIVISION

RULE 37 CASE NO. 0222873
STATUS NO. 756721
DISTRICT 09

**TO CONSIDER THE APPLICATION OF KADANE CORPORATION FOR A RULE 37
EXCEPTION, FORBES LEASE, WELL NO. 4RE, WILDCAT, BERRY (PALO PINTO),
BERRY, WEST (CONGL 7400), BERRY, NORTH (MISS.), BERRY (MISS.) AND
BERRY, WEST (MISS.) FIELDS, HARDEMAN COUNTY, TEXAS**

HEARD BY: Laura E. Miles-Valdez - Legal Examiner
Richard Atkins, P.E. - Technical Examiner
Paul DuBois - Technical Examiner (reviewed PFD)

APPEARANCES:

FOR APPLICANT:

David Jackson, Attorney
James Harwell, Geophysicist
Michael Gustafson, Vice President

APPLICANT:

Kadane Corporation

FOR PROTESTANTS:

George C. Neale, Attorney
Jay Milleson, Geologist
Jim Marcum, Vice President, MIS Properties
Cary McGregor, Petroleum Engineer

REPRESENTING:

Rio Petroleum, Inc. & MIS Properties, Inc.

PROPOSAL FOR DECISION

PROCEDURAL HISTORY

APPLICATION FILED:
NOTICE OF HEARING:

February 22, 2013
May 6, 2013

HEARING DATE :
PFD CIRCULATION DATE:

June 20, 2013
March 31, 2014

STATEMENT OF THE CASE

Kadane Corporation ("Kadane" or "Applicant"), seeks an exception to the lease line spacing requirements of the field rules for the Wildcat, Berry (Palo Pinto), Berry, West (Congl 7400), Berry, North (Miss.), Berry (Miss.) and Berry, West (Miss.) Fields, in Hardeman County, because the proposed well is closer than allowed by the field rules to the external boundary, being 176 feet to the nearest lease line. Kadane made an application for a Re-entry (directional) permit for Well No. 4RE, Forbes Lease, H&TC RR CO/Johnson, Mr. GA Survey, A-1443, Wildcat; Berry (Palo Pinto); Berry, West (Congl 7400); Berry, North (Miss.); Berry (Miss.) and Berry, West (Miss.) Fields. The proposed well is a re-entry and the bottom hole would be 176 feet from the lease line. Kadane claims that the proposed location is necessary to prevent waste and to protect correlative rights.

The surface location of the proposed well is 185.48 feet from the northeasterly lease line and 467 feet from the southeasterly lease line. The surface location is 482 feet from the southeasterly line and 467 feet from the southwesterly line of the Survey. The bottomhole location is 176 feet from the northeasterly lease line and 268 feet from the southeasterly lease line. The terminus is 283 feet from the southeasterly line and 1723 feet from the southwesterly line of the Survey. The lateral runs on an NW-SE trend. The proposed well is to be drilled to an approximate depth of 8600 feet.

Field rules for the Wildcat Field are Statewide rules, which provide for 467 feet from the nearest lease line and 1200 feet between wells on the same lease in the same field and reservoir on 40.0 acre proration units. Field rules for the Berry (Palo Pinto); Berry, West (Congl 7400); Berry, North (Miss.) Fields provide for 467 feet from the nearest lease line and 1200 feet between wells on the same lease in the same field and reservoir on 40.0 acre proration units, at depths of 5001' and below. Field rules for the Berry (Miss.) and Berry, West (Miss.): Oil Special rules provide for 467 feet from the nearest lease line and 1200 feet between wells on the same lease in the same field and reservoir on 40.0 acre proration units, at depths of 5001' and below.

A Rule 37 exception is needed for the proposed Forbes Lease, Well No. 4RE, because the section of the well proposed to be perforated is closer than 176 feet to the lease line. George C. Neale, representing Rio Petroleum, Inc. & MIS Properties, Inc., Jay Milleson, Geologist for Rio Petroleum, Jim Marcum, Vice President, MIS Properties, and Cary McGregor, Petroleum Engineer appeared at the hearing in protest.

DISCUSSION OF THE EVIDENCE

KADANE CORPORATION.

Kadane seeks an exception to the lease line spacing requirements of the field rules for the Wildcat; Berry (Palo Pinto); Berry, West (Congl 7400); Berry, North (Miss.); Berry (Miss.) and Berry, West (Miss.) Fields, in Hardeman County. Kadane's proposed well is closer to the external lease line boundary than allowed by the 467 feet allowed by the field rules, being 176 feet to the nearest lease line to the east. Kadane believes the requested exception is necessary to prevent waste

and confiscation of the hydrocarbons located under the Forbes Lease. Further, because of the shape of the Kadane Forbes Lease, there is no regular location that would access the target Chapel formation. *See Exhibit I - Copy of Plat Map. (Attached).* The Forbes Lease is approximately 246 acres and is located within 2.5 miles south of Chillicothe, Texas.

Testifying on behalf of Kadane was Mr. James Harwell, a consulting geophysicist. In 1999, Kadane drilled a vertical well (Forbes Well No. 4), which was 268 feet north of the southern boundary of the lease line. Kadane proposes to re-enter the Forbes Well No. 4 and kick-out 199 feet to the new bottomhole location. The proposed directionally drilled kick-out would be 199 feet south of the surface location of the 1999-drilled Forbes Well No. 4. Kadane intends to target the Berry, North (Miss.) Field and Berry, West (Miss.) Field, with secondary geologic targets to include the Berry, West (Congl. 7400) Field and the Berry (Palo Pinto) Field. The targeted vertical depth is 8,200 feet. Kadane testified they would not be drilling for the Berry, West (Congl. 7400) Field and the Berry (Palo Pinto) Fields as a primary target because there are currently no logs in the area on these formations; however, once Kadane is able to complete the proposed well, they intend to run logs for the secondary formations. Kadane did not present any evidence regarding the "Wildcat Field."¹

The original 1999 Forbes Well No. 4 was a dry hole. Kadane targeted the top of the Chapel formation and anticipated that in drilling the well the drill would walk to the south since two other wells in the area had walked to the south of the original intended bottomhole location. However, the Forbes Well No. 4 drilled directly vertical and hit the northern flank of the Chapel Member in the Mississippian, which had very tight porosity. Because the well lacked sufficient porosity they determined it to be a dryhole. Mr. Harwell anticipates better porosity at the proposed well, with porosity development between 6 and 8 percent. The proposed well would be in the Chapel Member of the Mississippian, which is known to be limestone with cavernous reservoirs.

Kadane offered three exhibits demonstrating the geophysical characteristics of the proposed well site for the Mississippian Fields. The first exhibit was a time structure map (a seismic-derived map) on the Chester formation which showed the geometry of subsurface structure in terms of depth coordinates. (The Chester formation is the deepest formation which can be mapped. The targeted Chapel formation is located below the Chester.) The time structure map indicated that the proposed drill site is within the sweet-spot of the formation. The other two exhibits were a north/south seismic section through the surface location of the original Forbes Well No. 4, and an east/west seismic section through the proposed bottomhole location. Kadane asserted that the seismic sections indicate that the proposed bottom hole location targets the highest point on the mound in the Chapel reservoir. The distance from the top of the structure to the top of the oil-water contact is approximately 286 feet. The higher a well encounters the structure, the more reserves the well will recover. Kadane believes it needs to drill at the highest structural position on the lease in order to recover the reserves beneath the lease. Here, the highest point on the mound is only accessible from the Forbes Lease. Kadane contends the proposed drill site should encounter the best porosity at the highest point on the structure, thereby allowing for the maximum amount of oil in the formation to

¹ A "Wildcat Field" is a formation in which the reservoir is not currently recognized as a "field" and therefore, does not have Commission field rules.

be drained. According to Mr. Harwell, moving the drill location to the west (to a more regular spacing location) would end up in a dry hole, just like the original Forbes Well No. 4 vertical well. Moving the proposed location north would be downdip and therefore lose access to the target reservoir. *See Exhibit II - Copy of Time Structure Seismic Map. (Attached).* Mr. Harwell asserted that the proposed well location is the only way Kadane would be able to get their fair share of the oil from this formation, while preventing waste and preventing confiscation.

Kadane believes the location recommended by the Protestants, which is 65 feet west of the proposed well site and not at the highest structural position, would leave reserves in the reservoir. Kadane's geophysicist contends the best location for re-entry is the one proposed by Kadane and estimates that it should recover 60,000 BO. Because there is no way to seismically map the reservoir to be sure of what the targeted reservoir holds, Kadane also wants authority to produce from the Conglomerate and the Palo Pinto Fields. Mr. Harwell testified in the event they do encounter hydrocarbons in either the Palo Pinto or the Conglomerate, he believes they would recover minimal oil from those formations at the proposed location. Mr. Harwell noted that a nearby well in the Palo Pinto has produced 36,000 barrels and a nearby Conglomerate well has produced 13,000-15,000 barrels.

PROTESTANTS RIO PETROLEUM, INC. AND MIS PROPERTIES, L.P.

Protestant MIS Properties, L.P. ("MIS") is a nonoperating lease owner who holds a working interest in the Forbes-Spears unit that is directly adjacent to the proposed re-entry bottomhole location. As a nonoperating lease owner they are not able to drill a well on their lease without the approval of the lease operator, Kadane. Protestant Rio Petroleum, Inc. ("Rio") is an affiliate operating company of MIS and owns no leasehold interest. Testifying on behalf of the Protestants was Mr. Jay Milleson, a petroleum geologist employed by Rio Petroleum and MIS Properties. Mr. Milleson presented his study of six (6) nearby wells that have been completed in the Mississippian. Of the six wells, the well with the highest cumulative production (333,000 BO) was off the apex of the structure. This well, the Spears-Jackson-Forbes Well #1, is located due west of the proposed drill site. Mr. Milleson explained the successful production of the Spears-Jackson-Forbes Well #1 was due to the porosity, irrespective of the well's relation to the apex of the structure. He speculated that alternative locations could be drilled at more regular locations with potentially better porosity. In support, Protestants asserted that based on seismic logs, better porosity may be found approximately 65 feet to the northwest of the proposed location.

Mr. James Marcum, the vice president of Rio testified Kadane's proposed location would unduly drain the oil and gas located on the Forbes-Spears unit. Protestants contend there are numerous other locations located further west of the proposed location which would be less damaging to MIS and not drain as much of the oil and gas located under the Forbes-Spears Lease, yet Protestants only proposed the one site 65 feet west of Kadane's proposed well.

EXAMINERS' OPINION

The parties disagree as to whether this a Rule 37 exception case that is based on prevention of waste or confiscation. An owner of oil and gas is entitled to obtain an exception to Rule 37 based on the prevention of waste, where an applicant is able to demonstrate that due to unusual conditions concerning the tract, the ultimate loss of substantial hydrocarbons will occur unless the exception is granted. *Hawkins v. Texas Company*, 209 S.W.2d 338 (Tex. 1948); *Gulf Land Co. v. Atlantic Refining Co.*, 131 S.W.2d 73 (Tex. 1939). An applicant seeking an exception to Rule 37 based on prevention of waste must prove that: (1) unusual conditions, different from conditions in adjacent parts of the field, exist under the tract for which the exception is sought; (2) as a result of these conditions, hydrocarbons will be recovered by the well for which the exception permit is sought that would not be recovered by any existing well or by additional wells drilled at regular locations; and (3) the volume of otherwise unrecoverable hydrocarbons is substantial.

An owner of oil and gas is entitled to an opportunity to recover the reserves underlying his tract, and any denial of that opportunity amounts to confiscation. *Atlantic Refining Co. v. Railroad Commission*, 346 S.W.2d 801 (Tex. 1961); *Imperial American Resources Fund, Inc. v. Railroad Commission*, 557 S.W.2d 280 (Tex. 1977). An applicant seeking an exception to Rule 37 based on prevention of confiscation must prove that granting of the requested exception permit is necessary to afford the mineral owners a reasonable opportunity to recover their fair share of hydrocarbons currently in place under the subject lease, or the equivalent in kind. The applicant must show that: (1) it is not possible to recover its fair share from wells drilled at regular locations; and (2) the proposed irregular location is reasonable.

The examiners are of the opinion that approval of the Rule 37 exception requested by Kadane is necessary to prevent waste. Both parties agree that there are reserves in a mounded structure located in the Mississippian beneath both the Forbes Lease and adjacent Forbes-Spears Lease, and that the drilling of a well is necessary to recover these reserves. The parties agree there is no regular location on the Forbes Lease where such a well might be drilled and they also agree that only by drilling at an irregular location will the targeted reserves be recovered. (However, they disagree as to which proposed irregular well location would best recover the reserves.)

Further, according to reserve estimates of Kadane's geophysicist, the recoverable oil in the Mississippian is 60,000 BO; and a nearby well in the Palo Pinto has produced 36,000 barrels and a nearby Conglomerate well has produced 13,000-15,000 barrels. No evidence was presented regarding the Wildcat Field. Protestants did not directly dispute Kadane's estimate of recoverable oil beneath the Forbes Lease by presenting its own estimate. Kadane is entitled to a reasonable opportunity to recover the current recoverable hydrocarbons beneath the Forbes Lease, and any denial of this reasonable opportunity to Forbes would amount to waste.

The main point of controversy between the parties concerns the reasonableness of Kadane's proposed location for the Forbes Well No. 4 reentry. MIS and Rio contend that there is an alternative location on the Forbes Lease that is more reasonable than the proposed location in that it is less irregular to MIS/Rio's lease line and still structurally equivalent to the proposed location. Further, MIS/Rio believes that having better porosity in the structure is more important than being at the apex of the mound and that their proposed location 65 feet to the west should have better porosity.

The examiners conclude Kadane has proven that its proposed location for the reentry Well No. 4RE is reasonable because there is sufficient porosity and the proposed location is high on the structure, which would allow for greater recovery of hydrocarbons in this reservoir. Wells must be drilled high on structure in this reservoir to maximize recovery of reserves due to the 286 feet from the top of the structure to the top of the oil-water contact. The higher a well encounters the structure, the more reserves the well will recover. Drilling the well at the alternative location suggested by MIS/Rio runs a significant risk of encountering the reservoir at a down dip location or possibly, drilling another dry hole. MIS/Rio did not establish its proposed location would have better porosity, which traditionally ensures recovery of more reserves. Nor did its interpretation of seismic data support that their proposed site will assure that oil would not be left in place due to encountering the structure at a downdip location. Kadane's proposed location is reasonable even though it is only 176 feet from MIS/Rio's lease line and positioning the well at this location is necessary to place the well high on structure and recover the current reserves beneath the Forbes Lease.

The examiners recommend that Kadane's Rule 37 exception for the Forbes Lease, Well No. 4RE, Wildcat Field, Hardeman County, Texas, be denied. No evidence was presented regarding the Wildcat Field.

The examiners recommend that Kadane be granted a Rule 37 exception for the Forbes Lease, Well No. 4 RE, Berry (Palo Pinto), Berry, West (Congl. 7400), Berry, North (Miss.), Berry (Miss.) and Berry, West (Miss.) Fields, Hardeman County, Texas.

Based on the record in this case, the examiners recommend adoption of the following Findings of Fact and Conclusions of Law.

FINDINGS OF FACT

1. At least ten (10) days notice of this hearing was provided to all affected persons as defined by Statewide Rule 37(a)(2) and 37(a)(3).
2. Kadane Corporation ("Kadane"), requests an exception to the lease line spacing requirements of the field rules for the Wildcat, Berry (Palo Pinto), Berry, West (Congl. 7400), Berry, North (Miss.), Berry (Miss.) and Berry, West (Miss.) Fields, in Hardeman County, because the proposed well is closer than allowed by the field rules to the external boundary, being 176 feet to the nearest lease line. Kadane's proposed well is a Re-entry (directional) permit for Well No. 4RE, Forbes Lease, H&TC RR CO/Johnson, Mr. GA Survey, A-1443, Wildcat; Berry (Palo Pinto); Berry, West (Congl. 7400); Berry, North (Miss.); Berry (Miss.) and Berry, West (Miss.) Fields. The targeted vertical depth is 8,200 feet.
3. The surface location of the proposed well is 185.48 feet from the northeasterly lease line and 467 feet from the southeasterly lease line. The surface location is 482 feet from the southeasterly line and 467 feet from the southwesterly line of the Survey. The bottomhole location is 176 feet from the northeasterly lease line and 268 feet from the southeasterly lease line. The terminus is 283 feet from the southeasterly line and 1723 feet from the

southwesterly line of the Survey. The lateral runs on an NW-SE trend. The proposed well is to be drilled to an approximate depth of 8600 feet.

4. Field rules for the Wildcat Field provide for 467 feet from the nearest lease line and 1200 feet between wells on the same lease in the same field and reservoir on 40.0 acre proration units. Field rules for the Berry (Palo Pinto); Berry, West (Congl. 7400); Berry, North (Miss.) Fields provide for 467 feet from the nearest lease line and 1200 feet between wells on the same lease in the same field and reservoir on 40.0 acre proration units, at depths of 5001' and below. Field rules for the Berry (Miss.) and Berry, West (Miss.) provide for 467 feet from the nearest lease line and 1200 feet between wells on the same lease in the same field and reservoir on 40.0 acre proration units, at depths of 5001' and below.
5. A Rule 37 exception is needed needed for the proposed Forbes Lease, Well No. 4RE to prevent waste. Kadane demonstrated that:
 - (1) unusual conditions exist under the Forbes Lease; specifically, the geometry of subsurface structure indicates a high structure mounded at the targeted location;
 - (2) the parties agree that as a result of these conditions, hydrocarbons will be recovered by the well for which the exception permit is sought that would not be recovered by any existing well or by additional wells drilled at regular locations; and
 - (3) the recoverable oil in this structure beneath this lease is estimated at 60,000 BO..
6. A Rule 37 exception is needed for the proposed Forbes Lease, Well No. 4RE, because the section of the well proposed to be perforated is closer than 176 feet to the lease line.
7. The application is opposed by MIS Properties, L.P. ("MIS"), a nonoperating lease owner who holds a working interest in the Forbes-Spears unit that is directly adjacent and east of the proposed re-entry bottomhole location, and Rio Petroleum, Inc. ("Rio"), an affiliate operating company of MIS and which owns no leasehold interest.
8. Wells must be drilled high on structure in this reservoir in order to maximize the recovery of reserves due to the 286 feet from the top of the structure to the top of the oil-water contact.
9. In 1999, Kadane drilled a dry hole vertical well (Forbes Well No. 4), which was 268 feet north of the southern boundary of the lease line.
10. A time structure map of the Chester formation showed the geometry of subsurface structure indicates the proposed bottom hole location targets the highest point on the mound in the Chapel reservoir. The Chester formation is the deepest formation which Kadane was able to map. The targeted Chapel formation is located below the Chester.
11. The recoverable oil in this structure beneath this lease is 60,000 BO. MIS/Rio did not provide any contrary estimates of the amount of oil or gas in place or currently recoverable oil or gas beneath the Forbes Lease.

12. There is no regular location on the Forbes Lease where the proposed Forbes Well No. 4RE would encounter the target reservoir. The lease is irregularly shaped and a regular location 467 feet from the east line and 467 feet from the south line of the lease, would not encounter the target fields.
13. MIS/Rio agrees with Kadane that there are recoverable reserves beneath the Forbes Lease, and there is no regular location on the Forbes Lease that will provide Kadane an opportunity to recover these reserves. MIS/Rio does not believe that drilling of a well high on structure is necessary to maximize recovery of reserves in this reservoir. MIS/Rio believes that a location 65 feet to the west of the proposed location would be a more reasonable drill site and would have better porosity.
14. Kadane's proposed location for the Forbes Well No. 4RE is reasonable.
 - a. Kadane's proposed location for the Forbes Lease Well No. 4RE targets the highest structural position on the southern mound located under the Forbes Lease.
 - b. Drilling the Forbes Well No. 4RE at the location proposed by Kadane will maximize recovery of reserves from beneath the Forbes Lease.
 - c. There is no regular location on the Forbes Lease where the proposed Forbes Well No. 4RE would encounter the target reservoir.
 - d. MIS's alternative location 65 feet northwest of Kadane's proposed well location is not structurally equivalent to Kadane's proposed drill site.
15. Kadane did not present geologic evidence regarding the Wildcat Field. All of Kadane's evidence related to the Berry (Palo Pinto); Berry, West (Congl. 7400); Berry, North (Miss.); Berry (Miss.) and Berry, West (Miss.) Fields.

CONCLUSIONS OF LAW

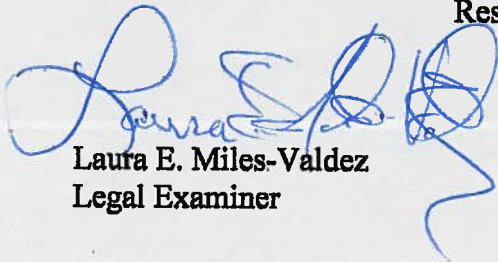
1. Proper notice of hearing was timely issued by the Railroad Commission to appropriate persons legally entitled to notice.
2. All things necessary to the Commission attaining jurisdiction over the subject matter and the parties in this hearing have been performed.
3. Approval of a Rule 37 exception for the Forbes Lease, Well No. 4 RE, Berry (Palo Pinto); Berry, West (Congl. 7400); Berry, North (Miss.); Berry (Miss.) and Berry, West (Miss.) Fields, Hardeman County, Texas is necessary to prevent waste and protect the correlative rights of mineral owners.

4. Kadane Corporation did not prove that approval of a Rule 37 exception for the Forbes Lease, Well No. 4 RE, Wildcat Field, Hardeman County, Texas is necessary to prevent waste and protect the correlative rights of mineral owners.


RECOMMENDATION

The examiners recommend that the application of Kadane Operating Company for a Rule 37 exception for the Forbes Lease, Well No. 4 RE, Berry (Palo Pinto); Berry, West (Congl. 7400); Berry, North (Miss.); Berry (Miss.) and Berry, West (Miss.) Fields, Hardeman County, Texas, be GRANTED to prevent waste. The examiners further recommend that Kadane's Rule 37 exception for the Forbes Lease, Well No. 4RE, Wildcat Field, Hardeman County, Texas, be DENIED.

Respectfully submitted,

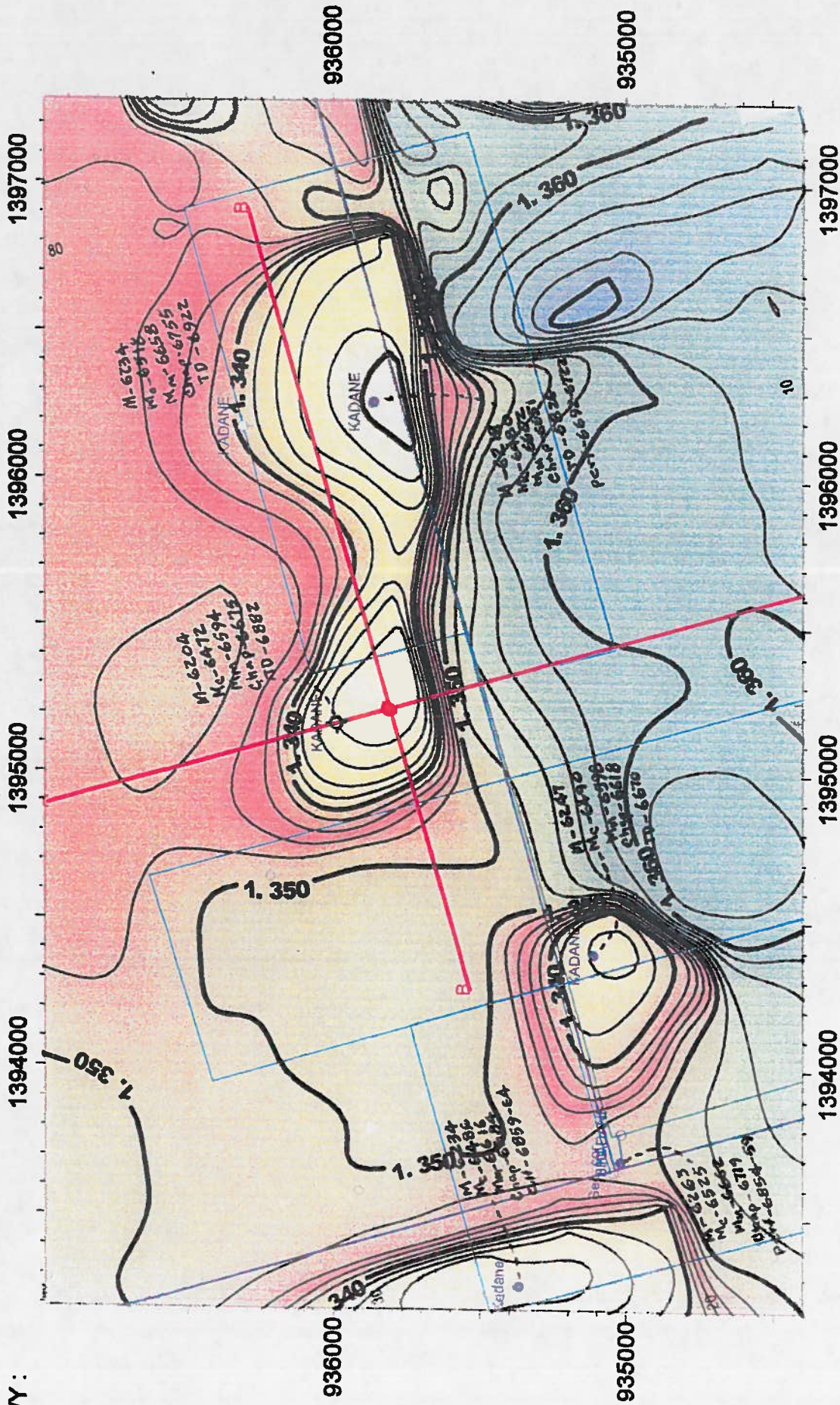


Laura E. Miles-Valdez
Legal Examiner



Paul Dubois
Technical Examiner

XY :



M T.Miss
Mc Chester
Mn Maramec Lm
● Proposed B.L.

Docket: R37 No. 0222873
Hearing Date: 06-20-2013
Kadane Ex. No.: 4

Kadane Corporation

Forbes #4

Scale = 1:6000



Chester Time, C.I.=2ms, May, 2004

H. & T. C. RY. CO. SURVEY
BLOCK 10, SECTION 55,

Elmer Jackson et ux
N-280 Ac. of E-1/2
V.230, P.223

A-40

SURVEY, Prop. & Le.

FM Highway 91

H. & T. C. RY. CO. SURVEY
BLOCK 10
HARDEMAN COUNTY, TEXAS

E. B. Walser
Called 105.45 Ac.
V. 330, P. 904

J. L. McMichael Est.
Called 170 3/4 Ac.

Property & Lease Line

SECTION 42

A

KADANE CORPORATION
Forbes No. 4-RE
Elev. = 1455.5

B E. Forbes et ux Rev. Trust
S-1/2 Section 42
V. 345, P. 917
Called 246.289 Acre Lease

A

A-1443

Hardeman County has
16 889 each side of
Section Line here

(680')
(20 Ac.)

42

KADANE CORP.
Spears-Jackson-Forbes
Unit No. 1

Edward C. Quinn
V.364, P.321

55

69

56

H. & T. C. RY. CO. SURVEY
BLOCK 16

CO. SURVEY
BLOCK 16

56

55

This Location equals X=1395167.1 and Y=935988.8
Texas State Plane, North Central Zone, NAD27
Coordinate Base.

The Proposed Bottom Hole Location
equals X=1395230. and Y=935800.

This Location is 2.5 miles south of Chillicothe.

KADANE CORPORATION

FORBES No. 4-RE Oil Well Location

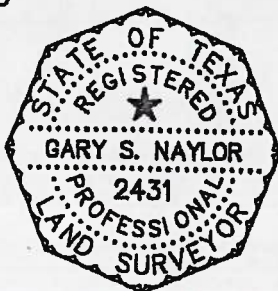
SCALE:

1 inch = 1000 feet

I, GARY S. NAYLOR, REGISTERED PROFESSIONAL
SURVEYOR NO. 2431 IN THE STATE OF TEXAS,
HEREBY CERTIFY THE ABOVE DESCRIBED
LOCATION TO BE CORRECT AND AS
SURVEYED ON THE GROUND

SEPTEMBER 6, 2012.

Gary S. Naylor



ENGINE

Box 426,

Docket: R37 No. 0222873

Hearing Date: 06-20-2013

Kadane Ex. No.: 2