STATE CORPORATION COMMISSION
OF THE STATE OF KANSAS

In the Matter of the Application of TDR Construction, Inc. for a permit to authorize the enhanced recovery of saltwater into the Moldenhauer #W-42 well, located in Franklin County, Kansas.	)	Docket No.: 20-CONS-3043-CUIC CONSERVATION DIVISION License No.: 32218
In the Matter of the Application of TDR Construction, Inc. for a permit to authorize the enhanced recovery of saltwater into the Moldenhauer #30 and Moldenhauer #45 wells, located in Franklin County, Kansas.	)	Docket No.: 20-CONS-3079-CUIC CONSERVATION DIVISION License No.: 32218

PRE-FILED TESTIMONY

OF

JAKE EASTES

DECEMBER 9, 2019

Q. What is your name and business address?

A. Jake Eastes, 266 N. Main St. Wichita, KS 67202.

Q. By whom are you employed and in what capacity?

A. I am employed by the Conservation Division of the Kansas Corporation Commission as a Geology Specialist and Research Analyst within the Conservation Division's Production and Underground Injection Control (UIC) Departments.

Q. Would you please briefly describe your educational background and work experience?

A. Yes. I graduated with a Bachelor of Science degree in Geology from Kansas State University (KSU) in 2015. While completing my studies at KSU, I worked as a Well Site Geologist for Musgrove Petroleum during the summer of 2014. After receiving my Bachelor's degree, I continued my studies at Fort Hays State University (FHSU) where I graduated with a Master of Science degree in Petroleum Geology in 2017. While at FHSU, I was employed by the United States Geological Survey for a year and six months as a Hydrologic Technician Student Trainee. After graduating from FHSU, I worked briefly for Impac Exploration Services as a Well Site/Mudlogging Geologist in the Texas Panhandle, and later transitioned into my current role with the Kansas Corporation Commission in September of 2017.

Q. Have you previously testified before this Commission?

A. Yes.

Q. What duties does your position with the Conservation Division involve?

A. My primary duties include providing technical support on various applications involving UIC wells, unitizations, horizontal wells, well location exceptions, alternate tract units, flaring, and vacuum or high volume pumps. As part of these duties, I enforce the

Commission's gas gathering and UIC regulations, review gas well test reports, and monitor monthly production from Hugoton/Panoma gas wells.

Q. What is the purpose of your testimony in this matter?

A. The purpose of my testimony is to inform the Commission about my review of the Applications for injection filed by TDR Construction, Inc. (TDR or Operator), and to support my recommendation that the Commission approve the applications to amend existing permit E-18,352.

Q. What is the Operator requesting in these dockets?

A. Operator has applied for authorization to inject produced saltwater from oil wells on the Moldenhauer Lease into the Squirrel formation beneath the Moldenhauer Lease at a maximum rate of 40 barrels of water per day and a maximum surface pressure of 650 pounds per square inch using their Moldenhauer #30, #45, and #W-42 wells. In addition, Operator is asking to designate their permitted Moldenhauer #W-4 as the new pilot well on permit E-18,352 due to the previous pilot well being plugged and abandoned.[1]

Q. Do the Operator's Applications comply with all KCC regulations?

A. Yes.

Q. How did you determine that the Applications comply with KCC regulations?

A. I first began looking at whether the Moldenhauer #30, #45, and #W-42 wells met all KCC well construction requirements.[2] Once I determined the Moldenhauer #30, #45, and #W-42 met all of the KCC well construction requirements in TDR's application, I reviewed the wells to make sure amending them to existing permit E-18,352 would be appropriate.

[1] The Moldenhauer #W-4 has already been approved for injection, therefore, its status to be designated as the new pilot well is not germane to the remainder of this testimony.
[2] K.A.R. 82-3-405; K.A.R. 82-3-406; K.A.R. 82-3-407.

Q. Please explain the steps you took to determine whether Operator's Applications should be approved.

A. First, I reviewed the proposed surface and production casing depths in the subject wells to ensure that the proposed casing depths are in compliance with KCC regulations for this area. Second, I reviewed the valid completion documentation for the subject wells to prove that they are completed in accordance with KCC regulations. Third, I reviewed the proposed zone of injection for the subject wells to ensure that it is compatible with the proposed injection operations. Fourth, I considered the requested rate and pressure for injection to ensure that the injection formation could safely receive the injected fluids at the proposed rates by conducting a search of all injection wells actively injecting approved fluids into the Squirrel formation of Franklin County. Fifth, I conducted an Area of Review (AOR) to check for possible environmental concerns due to nearby wells. An AOR is a review of every known well within a quarter mile of a proposed injection well to see if any threat to fresh and usable water is present once an operator's proposed injection of fluids is introduced. Sixth, I reviewed the Applications to determine whether proper notice of the Applications was given.

Q. Please describe your review of the surface and production casing depths in the subject wells.

A. The Moldenhauer #30, #45, and #W-42 are located in what is known as Area 2 of Eastern Kansas and are therefore subject to the Eastern Kansas Rule established in Docket 133,891-C (C-20,079). This means the subject wells must be completed using Alternate II rules only. Please see **JDE-Exhibit A**, which is commonly known as the Eastern Kansas

Surface Casing Order (Order #133,891-C), and will be hereafter referred to as the Eastern Kansas Surface Casing Order.

Q. What does it mean for a well to be completed using Alternate II rules?

A. Alternate II well completion rules mean that the surface casing is set at a depth determined by the well's location in the state and is cemented from the designated depth it is set at to the surface. Then the smaller diameter production casing string is set at the well's total depth (TD) and is cemented from TD to the surface. Therefore, all of the fresh and usable subsurface aquifers are covered by cement and protected.

Q. Do the well casing completion documents for the Moldenhauer #30, #45, and #W-42 comply with Area 2 Alternate II rules?

A. Yes, submitted with the applications were third party signed cement tickets from the setting and cementing of the production casing in each of the subject wells. The well completion for the Moldenhauer #30 has 21 feet of 6-1/4" surface casing cemented to surface with four sacks of cement and 2-1/2" production casing cemented from 805 feet to surface with 140 sacks of cement. The well completion for the Moldenhauer #45 has 21 feet of 7" surface casing cemented to surface with three sacks of cement and 2-7/8" production casing cemented from 814 feet to surface with 121 sacks of cement. The well completion for the Moldenhauer #W-42 has 21 feet of 6-1/4" surface casing cemented to surface with three sacks of cement and 2-7/8" production casing cemented from 782 feet to surface with 122 sacks of cement. These wells are properly constructed and fresh water zones will be protected.

Q. What type of completion is TDR proposing for the subject wells?

A. A perforated interval through the production casing will be utilized in all of the subject wells. The Moldenhauer #30 is perforated and will be injecting produced saltwater at a depth of 764 feet to 783 feet from surface. The Moldenhauer #45 is perforated and will be injecting produced saltwater at a depth of 757 feet to 774 feet from surface. The Moldenhauer #W-42 is perforated and will be injecting produced saltwater at a depth of 738 feet to 752 feet from surface.

Q. Please describe the proposed zone of injection for the subject well.

A. The proposed injection zone for the subject wells is within the Squirrel formation. The Squirrel formation is a variable sandstone with porosity variations resulting from the amount of clay and other impervious materials deposited with the sand. Oil accumulation and production within the Squirrel formation is dependent upon the development of porosity in one or more of the impure sandstone beds within the formation. Therefore, the oil pay zone may be found at differing depths within the more sandy zones of the Squirrel formation found under the same anticlinal[3] setting.

For the subject wells, the top of the Squirrel formation is found at the following depths in the subsurface. In the Moldenhauer #30, the top of the Squirrel formation is found to be at a depth of 764 feet below the surface and 286 feet above sea level. Additionally, the top of the Squirrel formation in the Moldenhauer #45 is found to be at a depth of 757 feet below the surface and 294 feet above sea level. Finally, the top of the Squirrel formation in the Moldenhauer #W-42 is found to be at a depth of 738 feet below the surface and 285 feet above sea level.

[3] In structural geology, an anticline is a type of fold that is an arch-like shape and has its oldest beds at its core.

Q. What additional information did you review in your review of TDR's Applications?

A. I also reviewed available geophysical logs with recorded gamma ray and neutron tracks detailing the boreholes of the Moldenhauer #45 and #W-42. The Moldenhauer #30 did not have a readily available geophysical log freely available on the Kansas Geological Survey's website. Attached, as **JDE-Exhibit B** are the geophysical logs for the Moldenhauer #45 and #W-42 with formation tops and confining shale layers identified. From these geophysical logs, we can easily find the top of the Squirrel formation and the perforated intervals in each well. Directly on top of the Squirrel formation on each geophysical log we can see a confining shaly-sand to sandy-shale interval highlighted in purple. Further up hole we see the confining Excello and Little Osage shales highlighted in light blue and orange. Highlighted further up hole from the Excello and Little Osage shales are similar confining shale layers highlighted in pink. All of these confining shale layers have the ability to confine or prevent the upward movement of fluids in the subsurface.

Q. How can you be confident that upward movement will not occur at these wells if TDR's Applications are approved?

A. Because of the existence of the various confining shale layers present. By way of explanation, we do not need to know the exact calculated permeability of these various confining layers, we only need to know that they are recognizable shales easily identified on the geophysical logs. This is due to the unique properties that all shales share. Shale is a fine-grained sedimentary rock that forms when silt to clay-sized particles are deposited and compacted. The compaction of the microscopic-sized silt to clay-sized particles distinctive to all shales, create microscopic interstitial spaces between the individual particles. While it is true that these microscopic interstitial spaces or voids can comprise a large volume of the

shale itself, it is also true that more spaces in the shale does not coincide with increased permeability because the distinctive sizes of the shale pore spaces lead to microscopic connectivity of voids. These microscopic interstitial spaces between voids will further inhibit the transmission of fluids due to the molecular attraction of the fluids to the clay and silt-sized particles being strong enough to prevent the movement of fluids through them. Thus, a characteristic distinctive to all shales is that they have low permeability. Therefore, oil, natural gas, and water will all have difficulty traveling through all shales, and in the case of the Squirrel formation, the numerous confining layers present on top of the formation make upward movement even more difficult and unlikely.

Q. Based on the impermeability of the Squirrel Sand formation's cap rock and the shale layers further up hole, what is your opinion on the formation's ability to contain water injected at the proposed rate and pressure?

A. It is my professional opinion that these confining layers directly on top of the Squirrel formation and further up hole will adequately contain the saltwater that is intended to be injected at a maximum rate of 40 barrels of water per day and a maximum surface pressure of 650 pounds per square inch in the Squirrel formation beneath the Moldenhauer Lease.

Q. Did you reach any conclusions after reviewing the completion documentation and geophysical logs for the subject wells?

A. Yes. The Moldenhauer #30, #45, and the #W-42 are correctly drilled and completed in accordance with the rules and regulations. These subject wells have already passed a Commission approved mechanical integrity test (MIT) with satisfactory results; it is my opinion that fresh and usable waters will be protected.

Q. Please describe your review of the requested rate and pressure for the subject wells.

A. As discussed previously, the Squirrel formation is a variable sandstone whose porosity variations are due to the amount of clay and other impervious materials deposited with the sand. Oil accumulation and production within the Squirrel formation is dependent upon the development of porosity in one or more of the impure sandstone beds within the formations. The oil produced from the Squirrel formation and in general, Eastern Kansas, is higher in viscosity and lower in gravity. This means the oil beneath the Moldenhauer lease where the subject wells are located is more resistant to flow, and is considerably closer to the same density as the associated water found with it, as compared to other crude oils of Kansas. Therefore, waterflooding and high injection pressures are needed to effectively sweep the remaining oil from the reservoir's pore spaces to the oil producing wells.

TDR is applying to inject produced saltwater from oil wells on the Moldenhauer Lease into the Squirrel formation beneath the Moldenhauer Lease at a maximum rate of 40 barrels of water per day and a maximum surface pressure of 650 pounds per square inch. Our records for Franklin County show that currently there are 90 injection wells permitted to inject produced fluids at pressures ranging from 650 pounds per square inch to 800 pounds per square inch into the Squirrel formation. Four hundred eight-six (486) wells in Franklin County are currently permitted to inject produced fluids into the Squirrel formation at rates between 45 and 1000 barrels of water per day. On the Moldenhauer lease itself, there are 18 enhanced oil recovery (EOR) wells actively injecting produced fluids into the Squirrel formation at an injection rate of 40 barrels of produced water a day at 650 pounds per square inch of pressure. These 18 EOR wells to our knowledge have not contaminated usable water resources and have kept waste from occurring. Attached, as **JDE-Exhibit C** is a map that

shows the subject injection well locations in relation to all Squirrel formation injection wells actively injecting approved fluids within one mile and their permitted injection rates and pressures. We know from experience and knowledge of waterflood operations that the Squirrel formation was able to safely accept the injection of produced fluids at the permitted injection rates and pressures of the 79 injection wells found within one mile of the Moldenhauer #30, #45, and #W-42.

These waterflood operations are essentially recycling the formation water produced with the oil out of the Squirrel formation. Oil and saltwater are both produced together out of the Squirrel formation, oil is separated out of the saltwater and is sold, and the saltwater is then re-injected back into the Squirrel formation from where it came in order to sweep the remaining oil. Over the producing life of an oil reservoir, oil production and reservoir pressure decline considerably. The injection of water under pressure needs to be introduced in order to mobilize and sweep the remaining oil towards producing wells. The injection of produced saltwater at the Operator's proposed rates and pressures will not allow the Squirrel formation in this reservoir to ever exceed or reach its virgin formation pressure and fluid volumes. This is because oil is constantly being removed from the Squirrel formation reservoir and saltwater is constantly being removed with the oil then re-injected back into the Squirrel formation. Therefore, the Squirrel formation can safely handle the requested rates and pressures from the three additional injection wells.

Q. Please walk us through the Area of Review you conducted.

A. I conducted a one-quarter mile radius AOR around each well to check for possible environmental concerns due to nearby wells. Attached as **JDE-Exhibit D** are the subject wells, plotted on a map along with all oil producers, plugged wells, other injection wells,

and water wells. Within the one-quarter mile AOR radius are 26 producing oil wells, 20 plugged and abandoned wells, 22 enhanced oil recovery wells actively injecting produced saltwater into the Squirrel formation, and five idle wells that we are waiting on correspondence from the operator on whether they are going to either plug them or return them to production. The 26 producing oil wells are currently producing oil from the Squirrel formation. All 26 of the producing oil wells were completed using Alternate II rules in accordance with Eastern Kansas Surface Casing Order. Therefore, all 26 producing wells are cemented from bottom to top and are effectively protecting fresh and usable water from their oil production activities. All 22 of the enhanced oil recovery wells were completed using Alternate II rules in accordance with Eastern Kansas Surface Casing Order. Therefore, all 22 enhanced oil recovery wells are cemented from bottom to top and are effectively protecting fresh and usable water from their enhanced oil recovery activities. The 20 plugged and abandoned wells were plugged by the operator of record at the time and all were plugged in a manner that protects fresh and usable water.

Q. Did the Operator provide proper notice of the Application?

A. Yes. For the Moldenhauer #30 and #45, the Operator published notice on August 8, 2019, in the official county newspaper and listed the 30-day protest period. The Operator also attested that a copy of the Application for the Moldenhauer #30 and #45 was delivered or mailed to the surrounding parties within a one-half mile radius of the subject well on August 28, 2019. For the Moldenhauer #W-42, the Operator published notice on July 6, 2019, in the official county newspaper and listed the 30-day protest period. The Operator also attested that a copy of the Application for the Moldenhauer #W-42 was delivered or mailed to the surrounding parties within a one-half mile radius of the subject well on July 8, 2019. The

published public notice heading for both applications read "TDR Construction, Inc. Application for a permit to authorize the enhanced recovery of saltwater into the Moldenhauer Lease/Well No. (30, 45, W-42) located in Franklin County, Kansas." Although this heading is incorrect, Legal Staff confirmed the body of the notice contains all of the required information in order to be considered valid. There appear to be no other issues with notice of the Applications.

Q. Based on your professional review of these Applications, what is your recommendation?

A. In my professional opinion, there is no present threat to usable water resources and waste will be kept from occurring at this rate and pressure. The Squirrel formation can safely handle the injection of fluids at the requested rate and pressure. Once we receive correspondence from Operator on whether they plan to plug, return to production, or temporary abandon, if eligible, the five idle wells within the AOR, I recommend the Commission approve Operator's Applications.

Q. Based on your review of these Applications, do you believe granting the Applications will cause waste?

A. No. Granting these Applications will prevent waste from occurring.

Q. Based on your review of these Applications, do you believe granting the Applications will violate correlative rights?

A. No. It is important to note that none of the Protesters in this docket made claims that these Applications violated their correlative rights.

Q. Based on your review of these Applications, do you believe granting the Applications will pollute the usable water resources of the State of Kansas?

A. No. The Squirrel formation can handle the requested rate and pressure proposed in TDR's completion method as demonstrated earlier in my testimony regarding other wells in the vicinity.

Q. Do you have a recommendation regarding whether the Commission should approve the Operator's Applications?

A. Yes. I recommend the Commission approve the Operator's Applications once we receive correspondence from the Operator on whether they plan to plug, return to production, or temporary abandon, if eligible, the five idle wells within the AOR.

Q. Does this conclude your testimony as of this date, December 9, 2019?

A. Yes.

THE STATE CORPORATION COMMISSION
OF THE STATE OF KANSAS

Before Commissioners: Susan M. Seltsam, Chair
F.S. Jack Alexander
Rachel C. Lipman

In the Matter of the Application of **EASTERN KANSAS OIL AND GAS ASSOCIATION, INC.**, to exempt or waive the minimum surface casing requirements of 50 feet from producers in Chautauqua County, Kansas.	)	DOCKET NO. 133,891-C (C-20,079)
	)	LICENSE NO. N/A
	)	CONSERVATION DIVISION

ORDER

The above-entitled matter comes on before the State Corporation Commission of the State of Kansas, upon its own motion. Being fully advised in the premises and having examined the files and records, the Commission makes the following findings and conclusions, pursuant to K.A.R. 82-1-232.

1. This Commission has authority to issue regulations and orders pertaining to the conservation of crude oil and natural gas and the protection of the fresh and usable waters of this State pursuant to K.S.A. 55-152.

2. On January 27, 1983, the Commission entered its order in this docket adopting surface casing requirements as recommended by a sub-committee of the ten (10) member Advisory Committee, established by K.S.A. 55-153.

3. As part of its January 27, 1983 Order the Commission made these surface casing requirements part of its regulations and they are commonly referred to as Appendix "B" - Eastern Surface Casing.

4. During the first part of 1993, Commission staff made an investigation to determine if changes should be made to Appendix

"B" as adopted by the Commission's January 27, 1983, Order. Such investigation is made pursuant to K.S.A. 55-152, which mandates that the Commission annually review current drilling methods, geologic formations, plugging techniques and casing and cementing standards and intervals to ensure protection of fresh and usable water from pollution.

5. Such investigation included consulting the ten (10) member Advisory Committee, as established by K.S.A. 55-153.

6. As part of its review of the adequacy of surface pipe requirements, Commission staff recommended to the ten (10) member Advisory Committee that Appendix "B" - Eastern Surface Casing be amended. The ten (10) member Advisory Committee approved staff's recommendation at its September 29, 1993, meeting.

7. The Commission finds that the recommendation of the Advisory Committee is in keeping with ensuring protection of the fresh and usable water of the State and that such recommendation should be adopted by the Commission. Appendix "B" - Eastern Surface Casing should be amended as attached to this order.

8. Any person or corporation affected by this Order and that deems it to be improper, unreasonable or contrary to law, may apply, by written petition, for a hearing before the Commission pursuant to K.A.R. 82-1-232. Such petition must be received by the Executive Director of this Commission, 1500 S.W. Arrowhead Rd., Topeka, Kansas, 66604-4027, no later than fifteen (15) days from the date of this order.

IT IS, THEREFORE, BY THE COMMISSION ORDERED that the recommendation of the ten (10) member Advisory Committee to modify Appendix "B" - Eastern Surface Casing, is hereby adopted.

IT IS FURTHER ORDERED that revised Appendix "B" - Eastern Surface Casing, as attached hereto and made a part hereof, is in full force and effect fifteen (15) days following the date of this Order, until amended or modified by the Commission.

The Commission retains jurisdiction of the subject matter and the parties for the purpose of entering such further order or orders as from time to time it may deem proper.

BY THE COMMISSION IT IS SO ORDERED.

Seltsam, Chr.; Alexander, Com.; Lipman, Com.

Dated: JUN. 29 1994

Judith McConnell
Executive Director

Date Mailed: JUL 06 1994

CERTIFY THE ORIGINAL
COPY IS ON FILE WITH
State Corporation Commission

JUN 30 1994

Judith McConnell
EXECUTIVE DIRECTOR

APPENDIX "B" - EASTERN SURFACE CASING
Order #133,891-C

Area 1: (See exhibit.)

Oil, gas or injection wells drilled in Area 1 shall be completed under Alternate II rules only. A bond log may be required on the long string from the operator by the Kansas Corporation Commission.

The following rules shall apply:

1. Set a minimum of 20 feet of steel surface pipe or to the depth of the first solid formation capable of supporting the surface pipe, whichever is greater. Also, set through all unconsolidated alluvial sediments and a minimum of 5 feet into the top of the underlying formation capable of supporting the surface pipe.

2. No well shall be drilled closer than 660 feet of an existing domestic or municipal water well without written owner notification, a copy of which must be attached to the drilling intent form during filing. Special casing and cementing requirements may be imposed in those areas producing fresh and usable water.

3. If a well is completed, the production or long string casing nearest the formation wall shall be cemented from bottom to top.

4. The surface casing borehole shall be at least (2 1/4) inches greater than the surface casing outside diameter. The well bore below the surface casing shall be at least (2 1/4) inches greater than the outside diameter of production or long string casing. The inside diameter of surface casing shall be at least (2 1/4) inches greater than the outside diameter of the production or long string casing.

5. All wells shall be completed Alternate II or plugged within 30 days of the spud date. An extension may be granted by the District Supervisor of the Conservation Division upon written request by the operator. The responsibility for plugging or completing the well is referenced in K.S.A. 55-172.

6. If the well is dry and no long string or production pipe has been cemented in place, the well shall be plugged in the following manner:

Arbuckle: Plug all oil and gas producing zones or formations containing fresh or usable water and plug for 50 feet above the Arbuckle.

Mississippi: Plug all oil and gas producing zones and formations containing fresh or usable water and plug for 50 feet above the Mississippian.

Pennsylvanian: Plug for 50 feet above all oil, gas, and uppermost saltwater zones and plug from 50 feet below Table I to surface. Intervals between plugs shall be filled with drilling mud.

Area 2:

Oil, gas or injection Wells drilled in Area 2 shall be completed under Alternate II rules only. A bond log may be required on the long string from the operator by the Kansas Corporation Commission.

The following rules shall apply:

1. Set a minimum of 20 feet of steel surface pipe or to the depth of the first solid formation capable of supporting the surface pipe, whichever is greater. Also, set through all unconsolidated alluvial and glacial drift sediments and a minimum of 5 feet into the top of the underlying formation capable of supporting the surface pipe.

2. No well shall be drilled closer than 660 feet of an existing domestic or municipal water well without written owner notification, a copy of which must be attached to the drilling intent form during filing.

Special casing and cementing requirements may be imposed in those areas producing fresh and usable water.

3. If a well is completed, the production or long string casing nearest the formation wall shall be cemented from bottom to top.

4. The surface casing borehole shall be at least (2 1/4) inches greater than the surface casing outside diameter. The well bore below the surface casing shall be at least (2 1/4) inches greater than the outside diameter of production or long string casing. The inside diameter of surface casing shall be at least (2 1/4) inches greater than the outside diameter of the production or long string casing.

5. All wells shall be completed Alternate II or plugged within 30 days of the spud date. An extension may be granted by the District Supervisor of the Conservation Division upon written request by the operator. The responsibility for plugging or completing the well is referenced in K.S.A. 55-172.

6. If the well is dry and no long string or production pipe has been cemented in place, the well shall be plugged in the following manner:

Arbuckle: Plug all oil and gas producing zones or formations containing fresh or usable water and plug for 50 feet above the Arbuckle.

Mississippi: Plug all oil and gas producing zones and formations containing fresh or usable water and plug for 50 feet above the Mississippian.

Pennsylvanian: Plug for 50 feet above all oil, gas, and uppermost saltwater zones and plug from 50 feet below Table I to surface. Intervals between plugs shall be filled with drilling mud.

Area 3:

Wells drilled in Area 3 can be completed under Alternate I or Alternate II rules, the operator using Alternate I rules will set surface pipe for the protection of fresh and usable water as specified in Table I and will cement production or long string casing not less than 150 feet above the upper oil and gas zone to be tested or produced.

Alternate II rules for Area 3 are as follows:

1. Set minimum of 40 feet of steel surface pipe or to the depth of the first solid formation capable of supporting the surface pipe, whichever is greater. In designated areas, operators shall set through all surface or near surface sandstone aquifers and a minimum of 5 feet into the underlying formation. Also, set through all alluvial and glacial drift sediments and a minimum of 5 feet into the top of the underlying formation capable of supporting the surface pipe.

2. No well shall be drilled closer than 660 feet of an existing domestic or municipal water well without written owner notification, a copy of which must be attached to the drilling intent form during filing. Special casing and cementing requirements may be imposed in those areas.

3. If a well is completed, the production or long string casing nearest the formation wall shall be cemented from bottom to top.

4. The surface casing borehole shall be at least (2 1/4) inches greater than the surface casing outside diameter. The well bore below the surface casing shall be at least (2 1/4) inches greater than the outside diameter of production or long string casing. The inside diameter of surface casing shall be at least (2 1/4) inches greater than the outside diameter of the production or long string casing.

5. All wells shall be completed or plugged within thirty (30) days of the spud date. An extension may be granted by the District Supervisor of the Conservation Division upon written request by the operator. The responsibility for plugging or completing the well is referenced in K.S.A. 55-172.

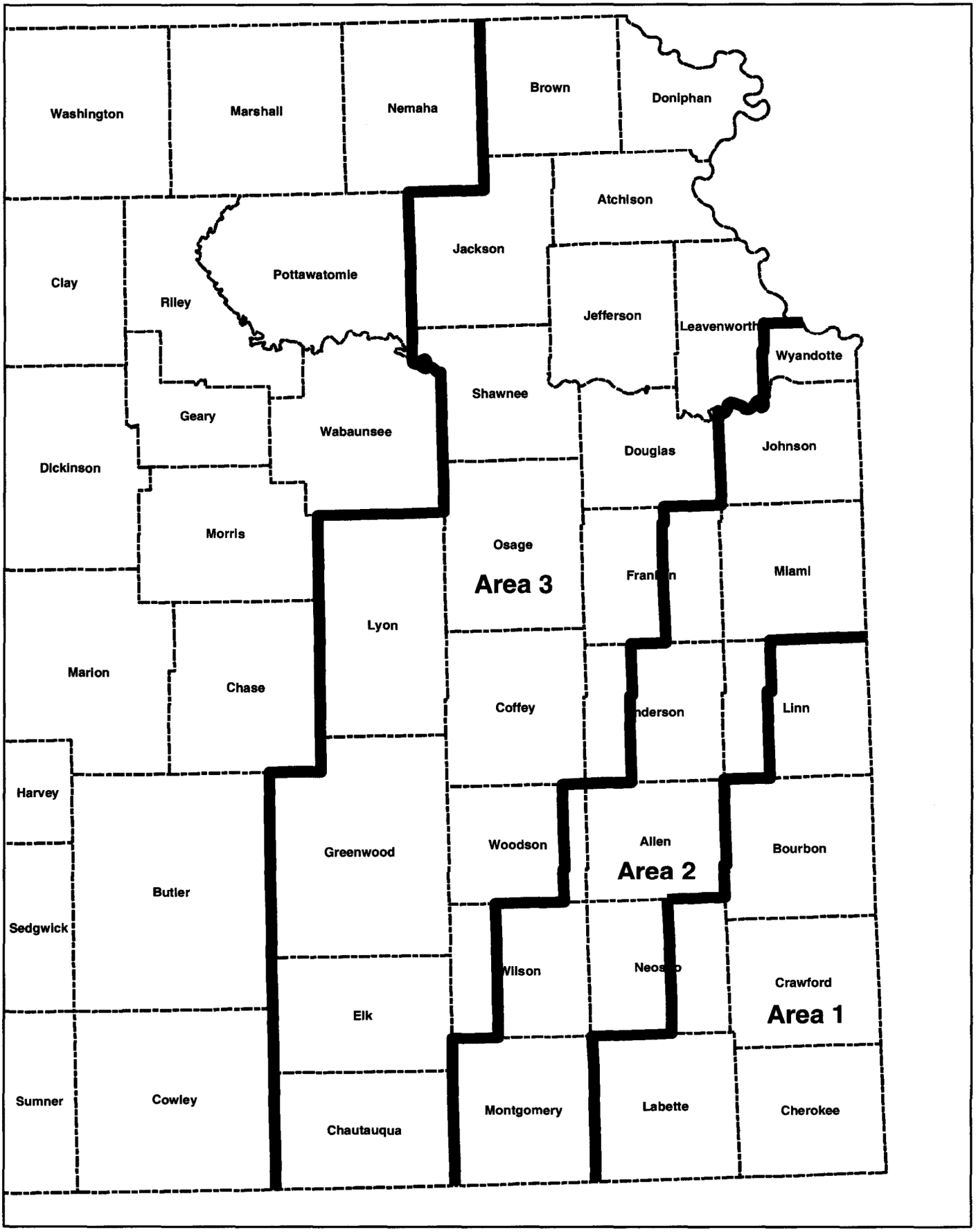
6. If the well is dry and no long string or production casing has been cemented into place, the well shall be plugged in the following manner:

Arbuckle: Plug all oil and gas producing zones with cement and plug for 50 feet above the Arbuckle.

Simpson-Viola and Hunton: Plug any oil and gas producing zones with cement and at top of upper formation for 50 feet.

Mississippi: Plug with cement all oil and gas producing zones and for 50 feet above the top of the Mississippian.

Pennsylvanian: Plug for 50 feet above all oil, gas, and uppermost saltwater zones and plug from 50 feet below Table I to surface. Intervals between plugs shall be filled with drilling mud.


Washington
Marshall
Nemaha
Brown
Doniphan
Atchison
Clay
Riley
Pottawatomie
Jackson
Jefferson
Leavenworth
Wyandotte
Shawnee
Geary
Wabaunsee
Douglas
Johnson
Dickinson
Morris
Osage
Area 3
Miami
Lyon
Marion
Chase
Coffey
Linn
Harvey
Greenwood
Woodson
Allen
Area 2
Bourbon
Butler
Sedgwick
Wilson
Crawford
Area 1
Elk
Sumner
Cowley
Montgomery
Labette
Cherokee
Chautauqua

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913 / 755 - 2128

GAMMA RAY / NEUTRON / CCL

File No.

API # 15-059-25,242

Company J.T.C. Oil Company

Well Moldenhauer No.- 45

Field Wellsville

County Franklin State Kansas

Location
955' FSL & 3760' FEL
NW-SE-SW

Sec. 29 Twp. 15s Rge. 21e

Permanent Datum GL Elevation NA
Log Measured From GL
Drilling Measured From GL

Other Services
Perforate

Elevation
K.B. NA
D.F. NA
G.L. NA

Date	4-21-2008		
Run Number	One		
Depth Driller	820.0		
Depth Logger	808.8		
Bottom Logged Interval	806.8		
Top Log Interval	20.0		
Fluid Level	Full		
Type Fluid	Water		
Density / Viscosity	NA		
Salinity - PPM Cl	NA		
Max Recorded Temp	NA		
Estimated Cement Top	0.0		
Equipment No. / Location	107 / Osawatomie		
Recorded By	Steve Windisch		
Witnessed By	Tom Cain		

RUN	BORE-HOLE RECORD			CASING RECORD			
No.	BIT	FROM	TO	SIZE	WGT.	FROM	TO
One	9.875"	0.0	21.0	7.00"		0.0	21.0
Two	5.625"	21.0	820.0	2.875"		0.0	814.0

RECEIVED
KANSAS CORPORATION COMMISSION
JUN 05 2008
CONSERVATION DIVISION
WICHITA, KS

Fold Here >>>

All interpretations are opinions based on inferences from electrical or other measurements and we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to our general terms and conditions set out in our current Price Schedule.

Comments

Drilling Contractors :
J.T.C. Oil Company

JDE-Exhibit B
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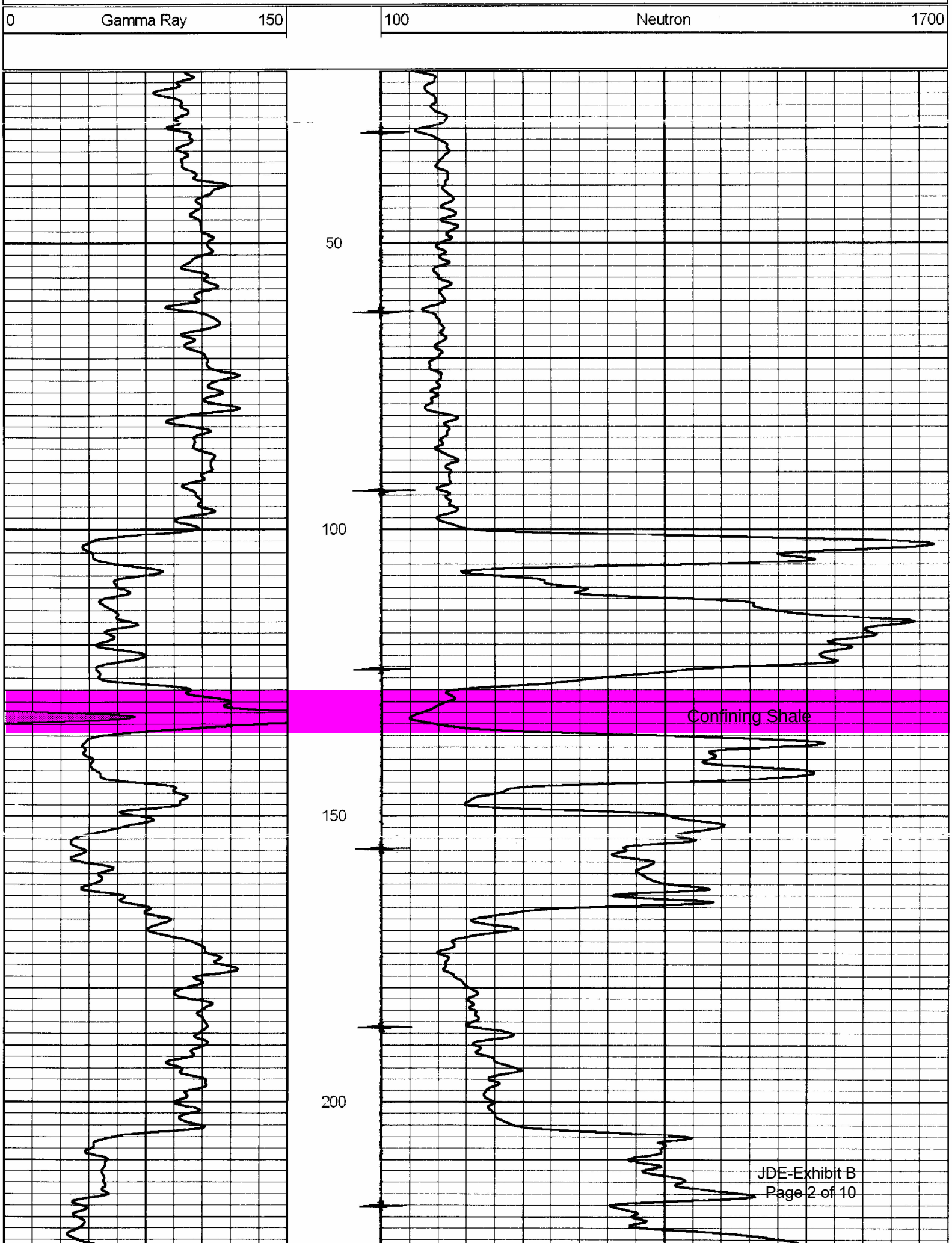
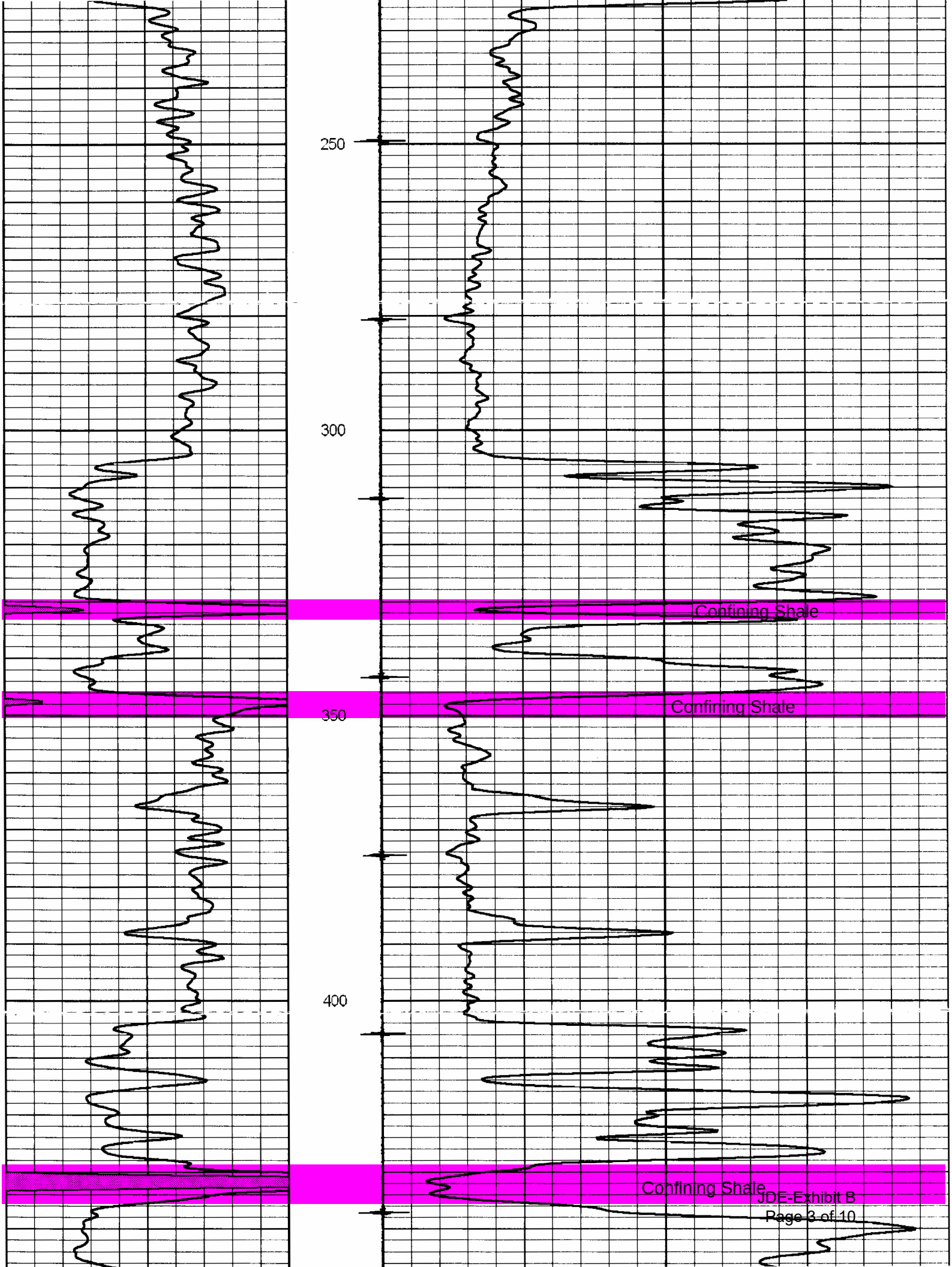
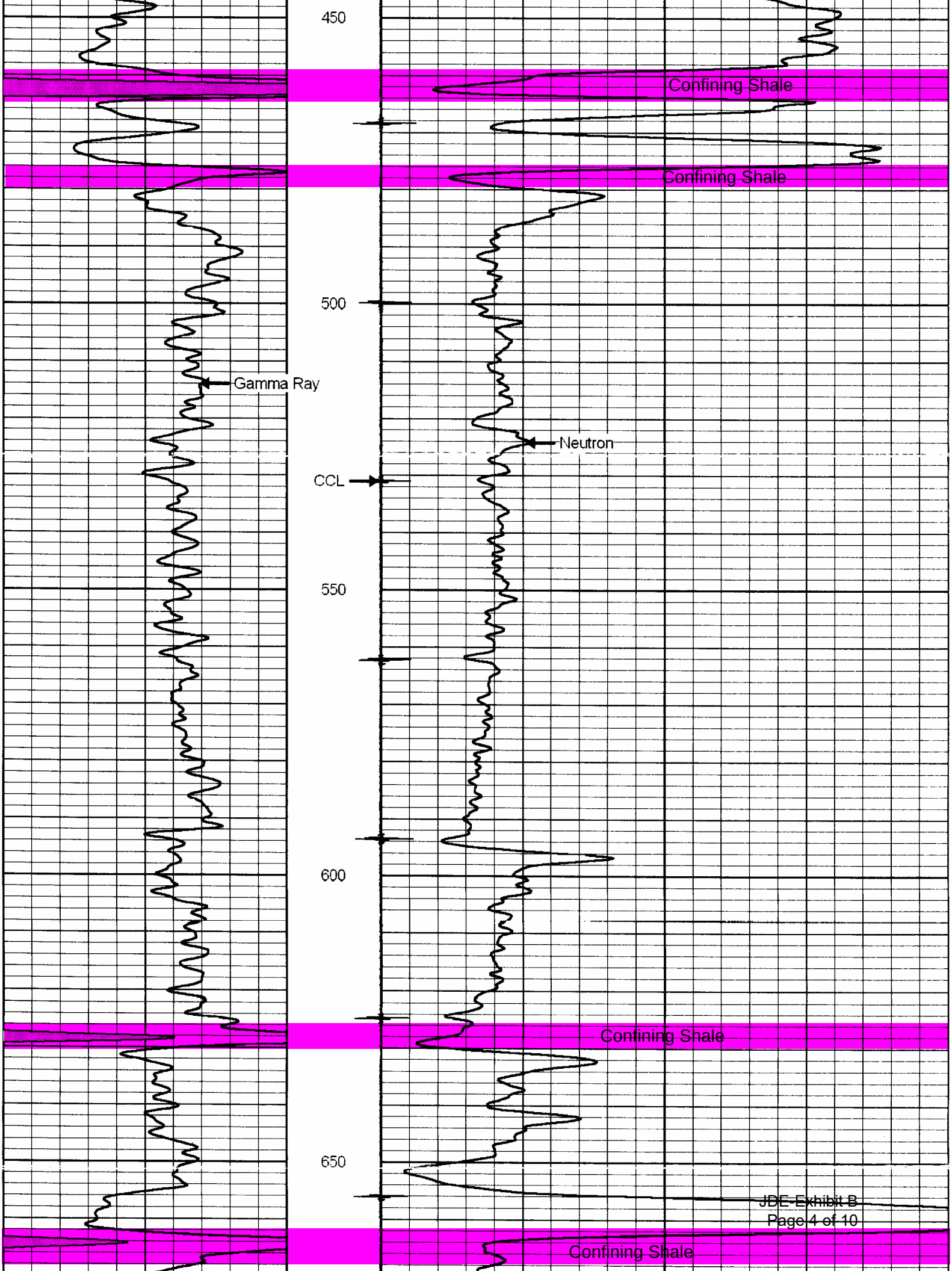
Database File: modhr45.db
Dataset Pathname: pass1
Presentation Format: gr-n-ccl
Dataset Creation: Mon Apr 21 13:52:08 2008 by Log Std Casedhole 07122

Charted by: Depth in Feet scaled 1:240




250
300
Confining Shale
350
Confining Shale
400
Confining Shale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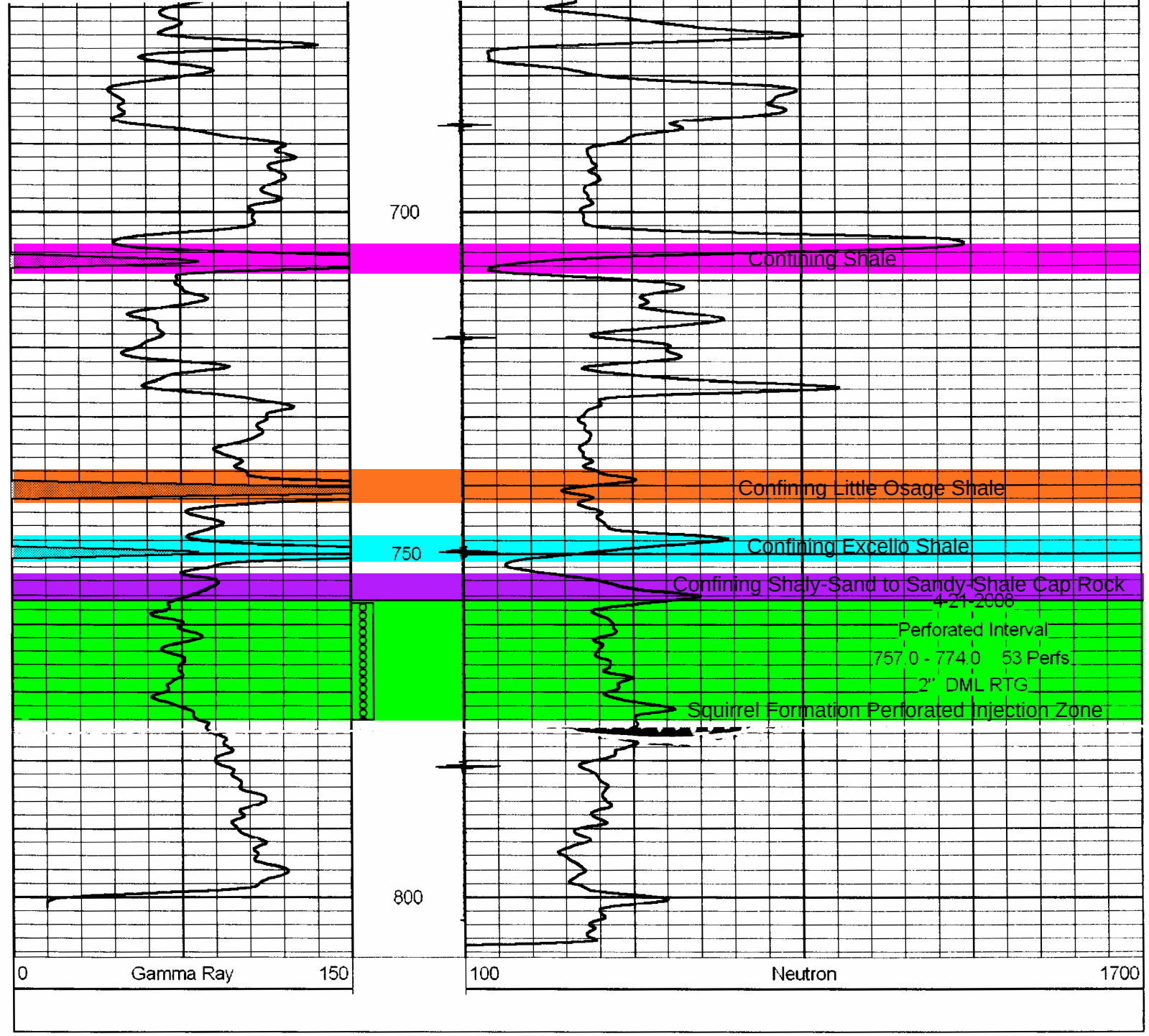
Confining Shale
Confining Shale
500
Gamma Ray
Neutron
CCL
550
600
Confining Shale
650
Confining Shale



Schlumberger BlueView :

29-15-21E

MIDWEST SURVEYS

LOGGING - PERFORATING - CONSULTING SERVICES
P.O. Box 68, Osawatomie, KS 66064
913 / 755 - 2128

GAMMA RAY / NEUTRON / CCL

File No.

API # 15-059-25,313

Company J.T.C. Oil, Inc
Well Moldenhauer No. W-42
Field Paola - Rantoul
County Franklin State Kansas

Location
480' FSL & 3990' FEL
SE-SW-SW
Sec. 29 Twp. 15s Rge. 21e

Other Services
Perforate

Elevation
K.B. NA
D.F. NA
G.L. NA

Permanent Datum	GL	Elevation	NA
Log Measured From	GL		
Drilling Measured From	GL		

Date		7-18-2008					
Run Number		One					
Depth Driller		820.0					
Depth Logger		776.2					
Bottom Logged Interval		774.2					
Top Log Interval		20.0					
Fluid Level		Full					
Type Fluid		Water					
Density / Viscosity		NA					
Salinity - PPM Cl		NA					
Max Recorded Temp		NA					
Estimated Cement Top		0.0					
Equipment No.	Location	107	Osawatomie				
Recorded By		Steve Windisch					
Witnessed By		Tom Cain					

RUN	BORE-HOLE RECORD			CASING RECORD			
No.	BIT	FROM	TO	SIZE	WGT.	FROM	TO
One	9.875"	0.0	21.0	6.625"		0.0	21.0
Two	5.625"	21.0	820.0	2.875"		0.0	816.0

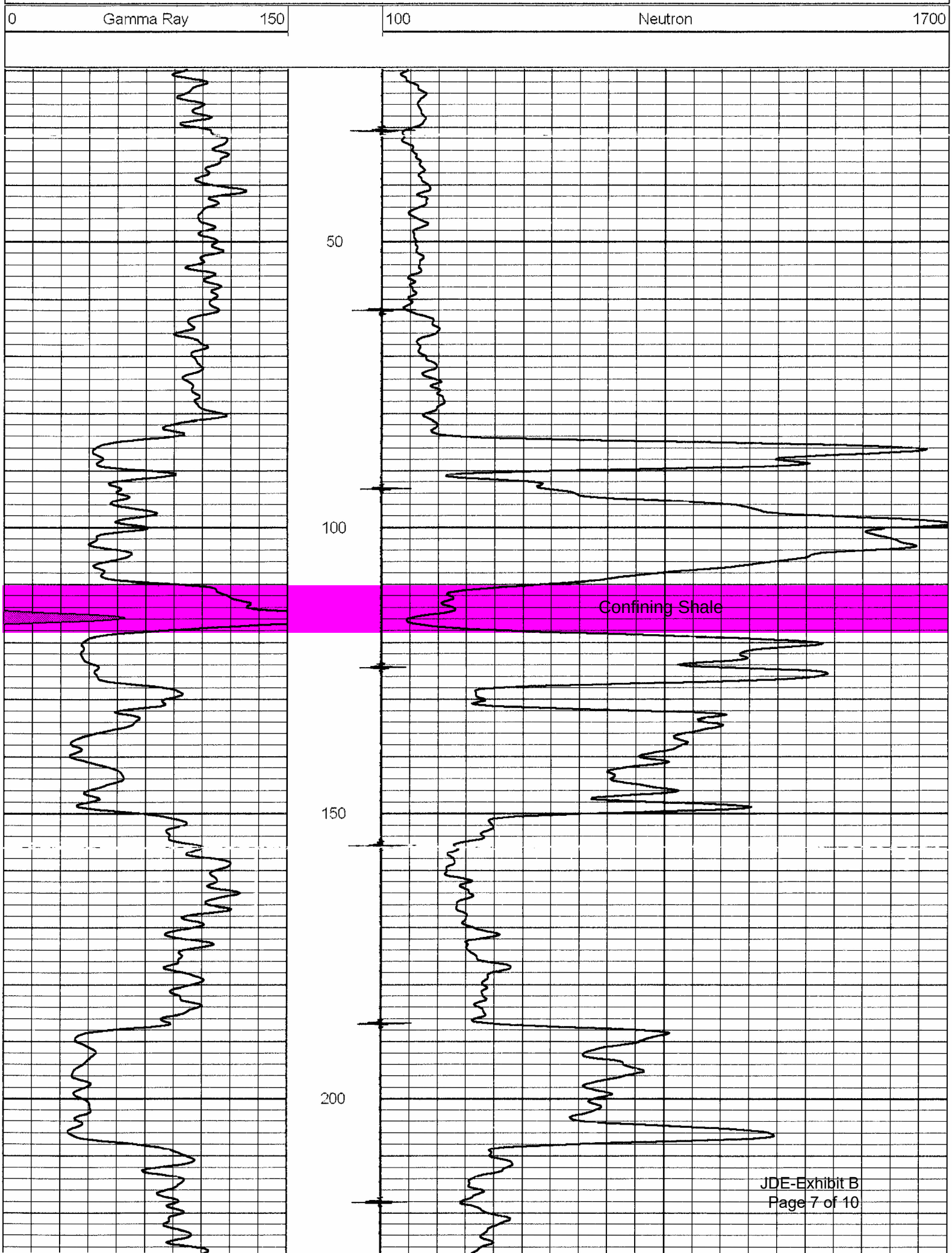
<<< Fold Here >>>

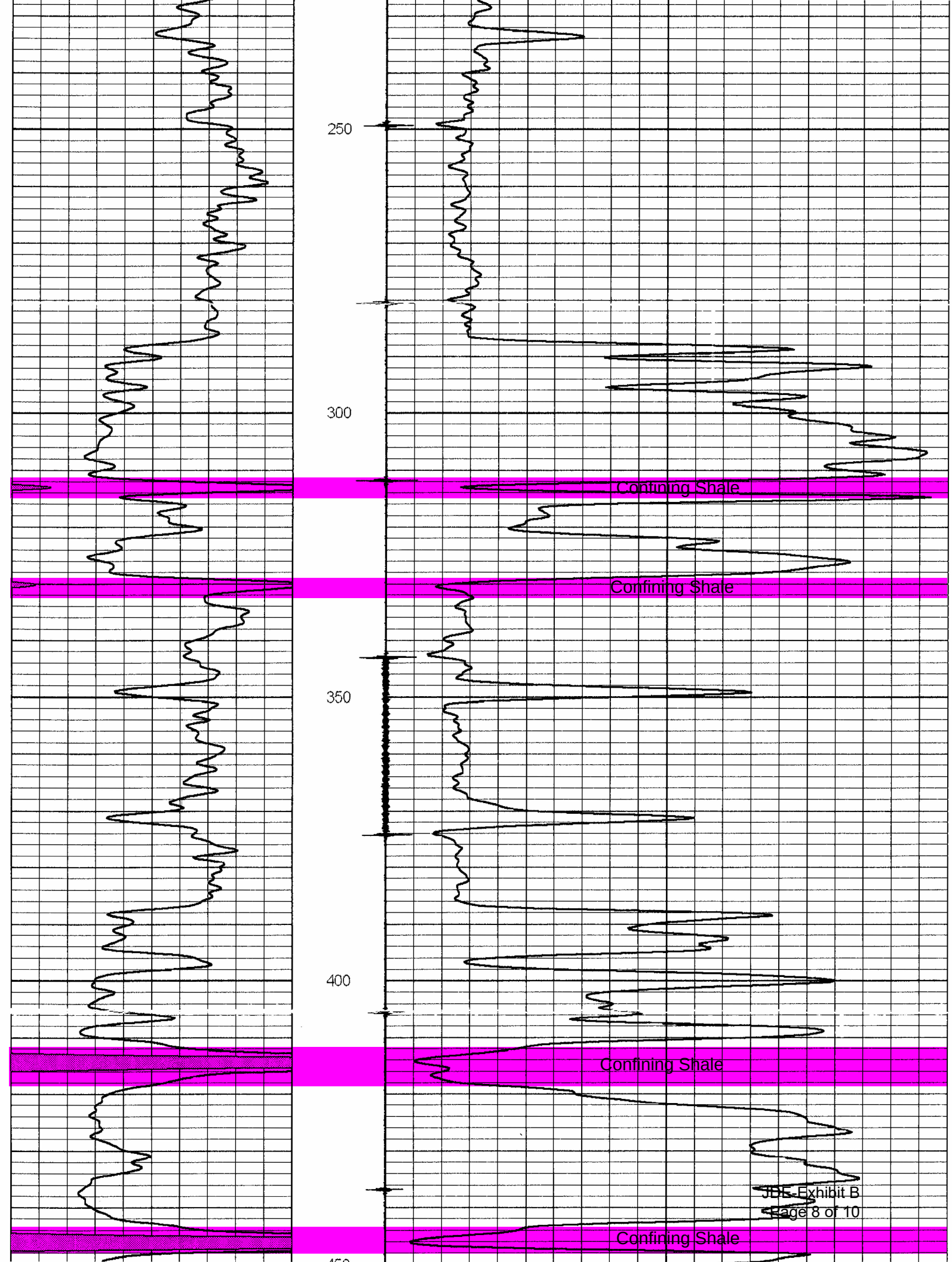
Comments

Drilling Contractors :
J.T.C. Oil, Inc.

Database File: modhr42w.db
Dataset Pathname: pass1
Presentation Format: gr-n-ccl
Dataset Creation: Fri Jul 18 11:51:11 2008 by Log Std Casedhole 07122

Charted by: Depth in Feet scaled 1:240

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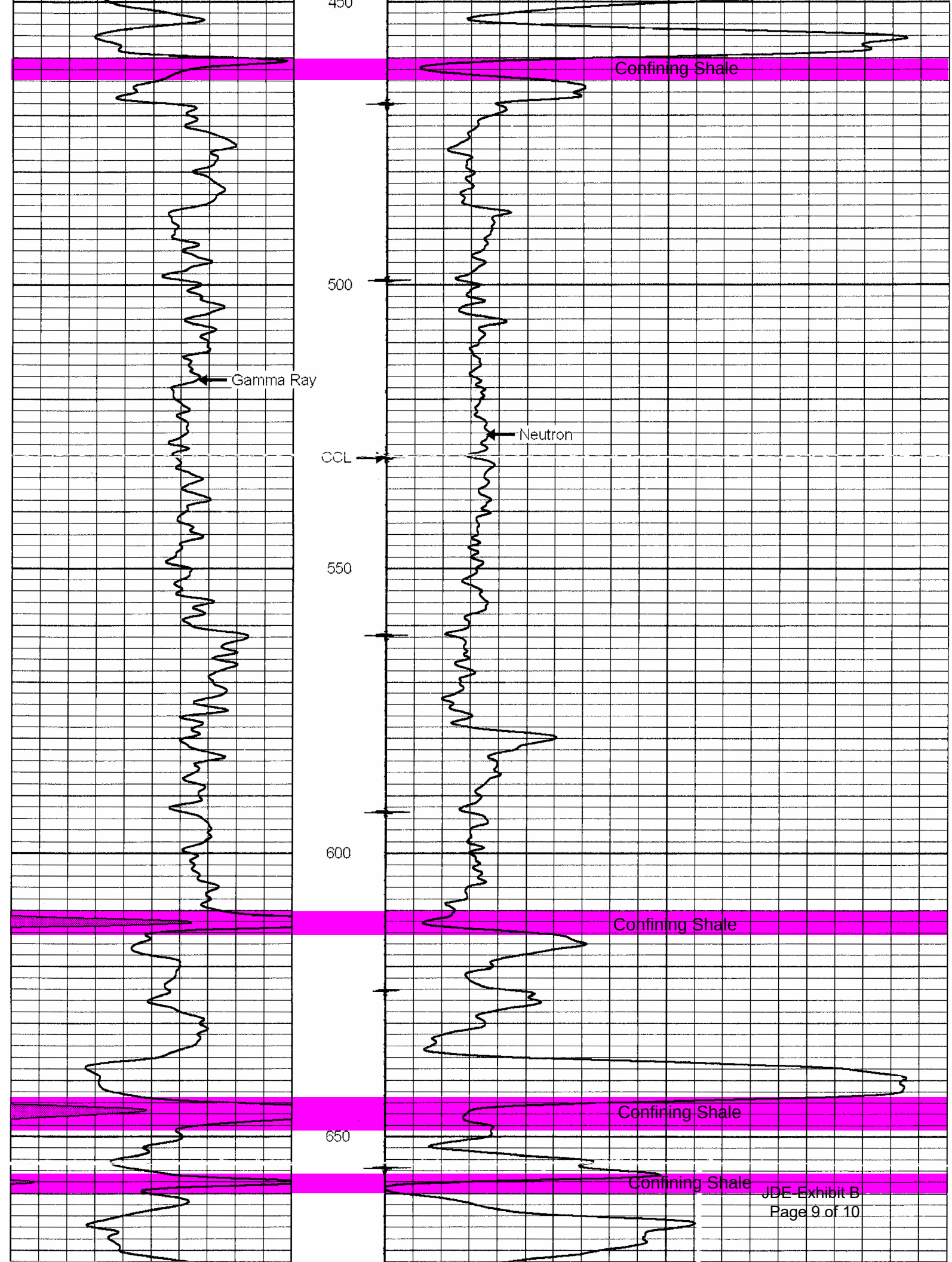
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Gamma Ray
Neutron
CCL
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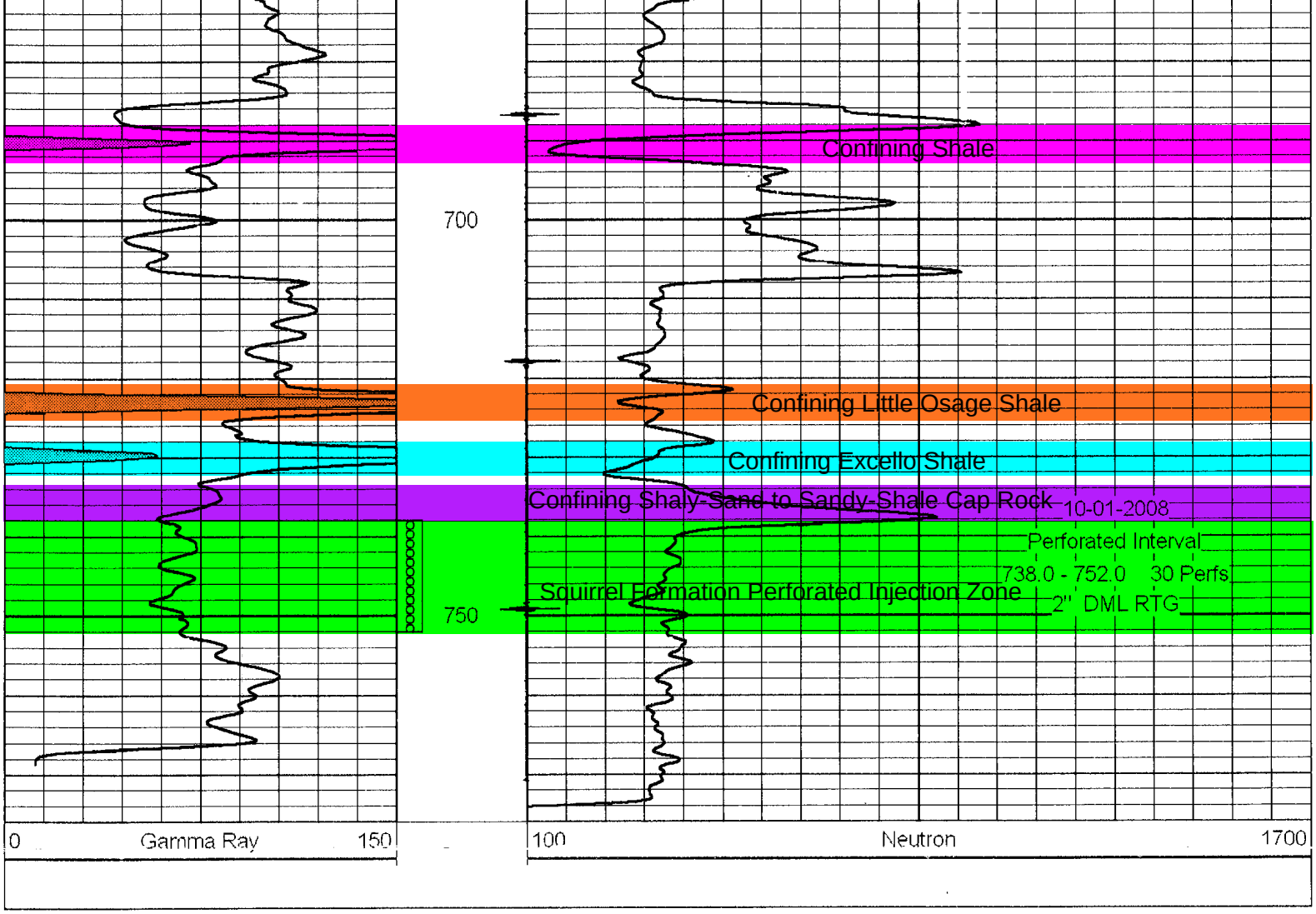
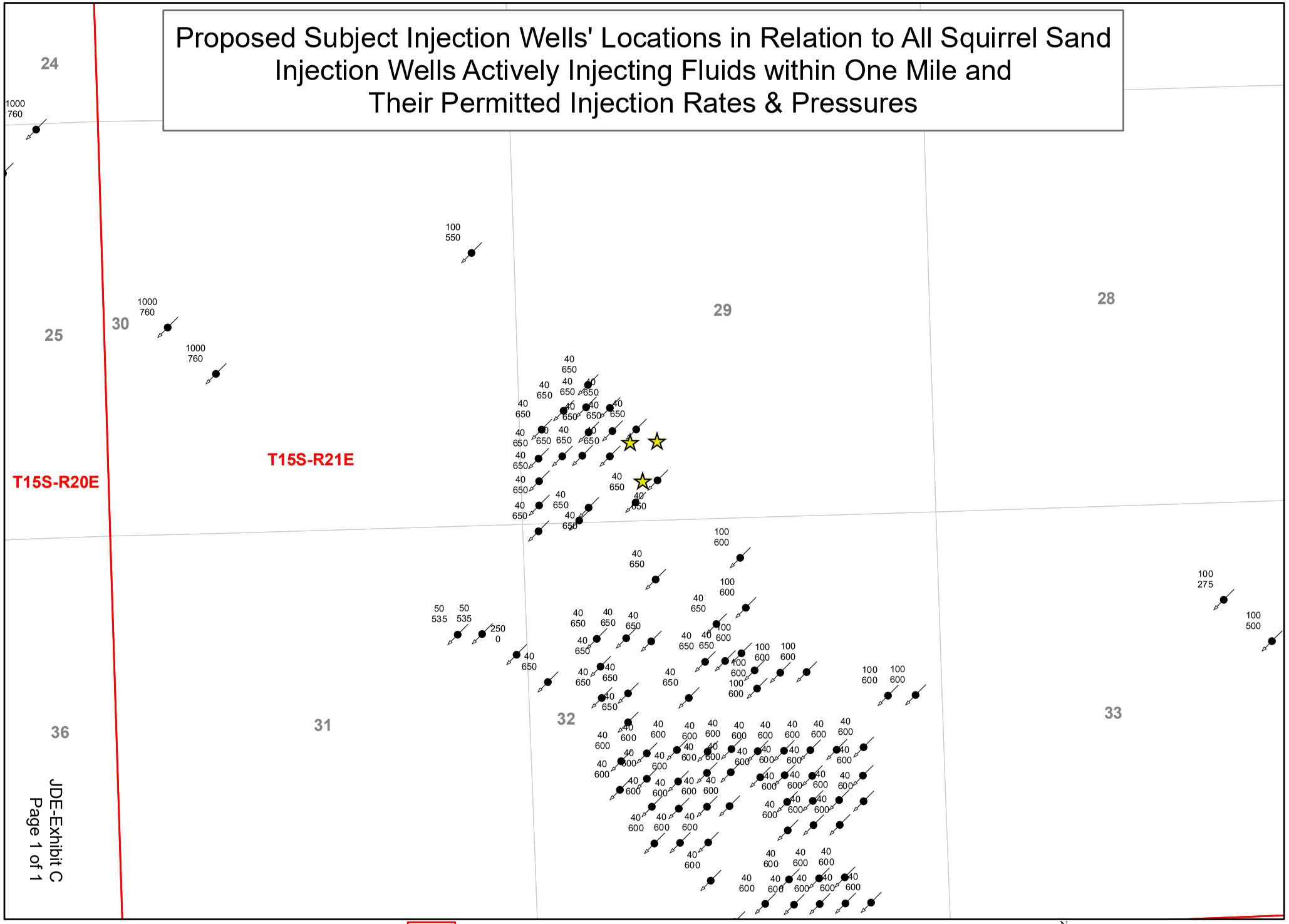
Confining Shale
650
Confining Shale

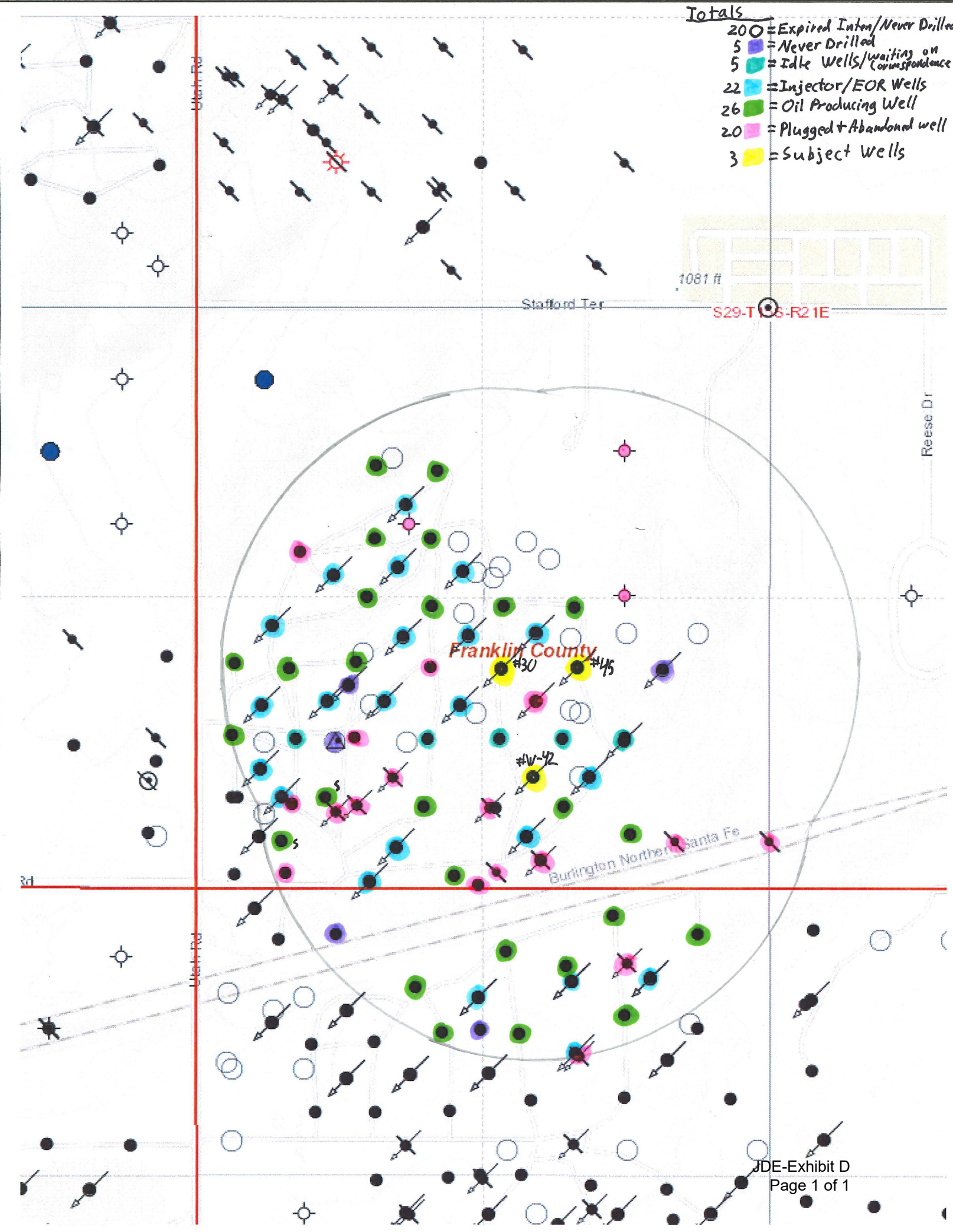


Schlumberger BlueView :

Proposed Subject Injection Wells' Locations in Relation to All Squirrel Sand Injection Wells Actively Injecting Fluids within One Mile and Their Permitted Injection Rates & Pressures



JDE-Exhibit C
Page 1 of 1


Totals
20 = Expired Inten/Never Drilled
5 = Never Drilled
5 = Idle Wells/waiting on Correspondence
22 = Injector/EOR Wells
26 = Oil Producing Well
20 = Plugged + Abandoned well
3 = Subject Wells
1081 ft
Stafford Ter
S29-T16S-R21E
Reese Dr
Franklin County
#30
#45
#W-42
Burlington Northern Santa Fe
Utah Rd

CERTIFICATE OF SERVICE

20-CONS-3043-CUIC, 20-CONS-3079-CUIC

I, the undersigned, certify that a true copy of the attached Prefiled Testimony of Jake Eastes has been served to the following by means of electronic service on December 9, 2019.

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Paula J. Murray