

# Defiant Energy Exploration & Production, Inc.



DEFIANT ENERGY  
EXPLORATION & PRODUCTION

*A Vertically-Integrated  
Energy Company*

April 2024



# Disclaimer

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FORWARD-LOOKING STATEMENTS MAY INCLUDE THE WORDS “MAY,” “COULD,” “ESTIMATE,” “INTEND,” “CONTINUE,” “BELIEVE,” “EXPECT” OR “ANTICIPATE” OR OTHER SIMILAR WORDS. THESE FORWARD-LOOKING STATEMENTS PRESENT OUR ESTIMATES AND ASSUMPTIONS ONLY AS OF THE DATE OF THIS REPORT. EXCEPT FOR OUR ONGOING SECURITIES LAWS, WE DO NOT INTEND, AND UNDERTAKE NO OBLIGATION, TO UPDATE ANY FORWARD-LOOKING STATEMENT.

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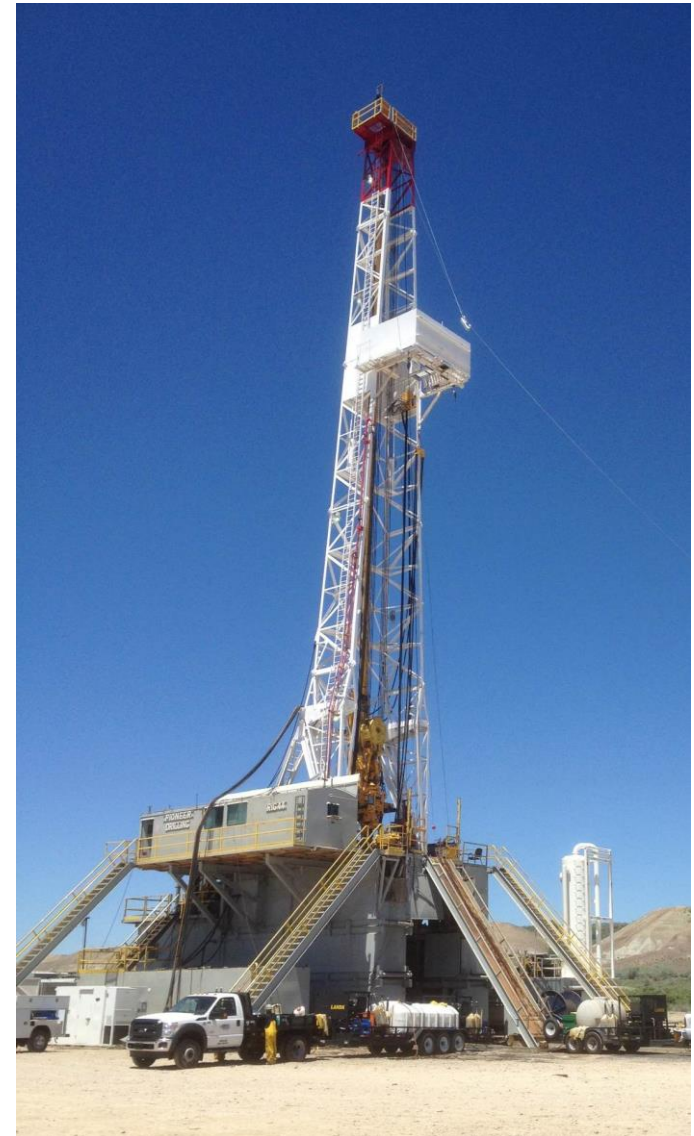
# About the Company

**Defiant Energy Exploration & Production, Inc.**, (the “Company”) based in Houston, Texas, will be a vertically-integrated growth stage energy company with two key divisions:

- E & P (Defiant Energy Fund, LLC); and
- Oil field services (Double H Services, LLC)

The Company is currently working to go public on the OTC Markets via a reverse merger with a currently trading company with up-to-date filings (i.e., not a shell).

The Company is primarily focused on developing existing properties in Oklahoma through low-cost reworks and recompletions and drilling new wells on high-return, proved undeveloped locations, with work completed by the Company’s oil field services division, Double H Services, LLC.

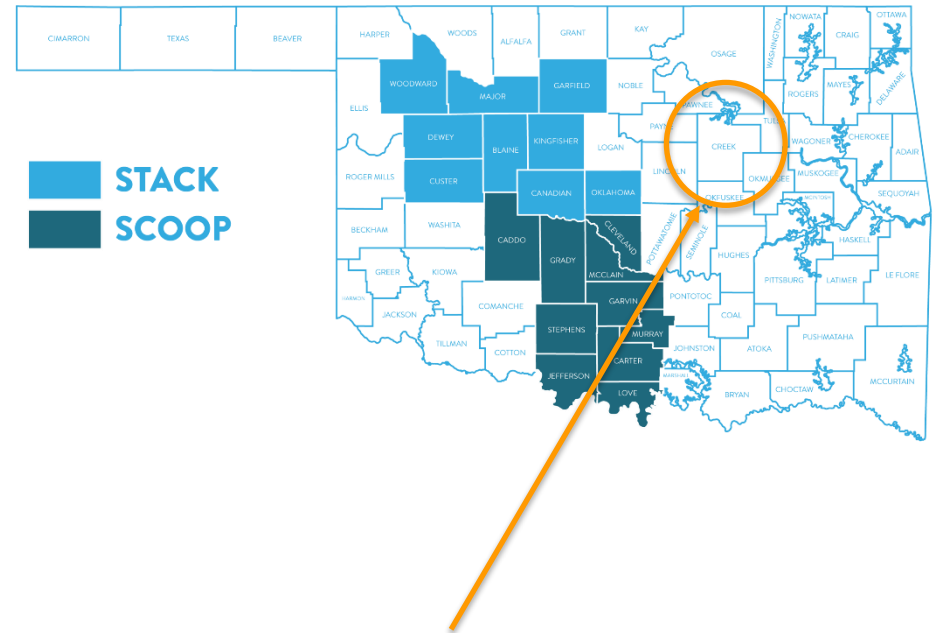




# Regional Focus and Oil Field Service Expertise



- **Well defined geographic focus –** Oklahoma’s SCOOP and STACK plays and adjacent counties.
- **Strong management and technical team** with a proven track record and deep operational knowledge of the area.
- **In-house oil field services**, Double H Services, LLC, based in Enid, OK.
- **Exploration and production properties** located in Creek County, Oklahoma with 81 wells and 1,800 acres in the Cottonwood Redfork Sand Unit.
  - **1,100 (undeveloped) acres adjacent to current leaseholds** to begin production in Q4 for new drilling opportunities and additional development.





# Creekwood Asset - History



- 1,810-acre lease developed in the Red Fork Sand, located in Creek County, Oklahoma, which has not been aggressively developed.
- Creek County, which produced approximately 1 million barrels in 2011, has historically been one of the largest oil producing counties in Oklahoma.
- Much of the Creekwood Asset was drilled in the 1930's and 1950's before the 30 individual leases that comprise the property were unitized into the current Cottonwood Red Fork Sand Unit ("CRFSU") water flood Unit in 1967.
- After 1967 several wells were converted into injectors and the field experienced a sustained increase in production through 1994, when water injection ceased.

# Creekwood Asset – Future Potential

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- CRFSU has not been aggressively developed and management believes that a **substantial amount of the recoverable oil remains** to be produced for several reasons:
    - Recent engineering analysis indicates that the CRFSU contains an additional **2.3 MM Bbls of recoverable oil**.
    - There is **no indication of any dry holes** among the 94 most recent wells drilled on the property.
    - Before production ceased, **only a few injection wells** had been put into operation and an **Arbuckle supply well** that can provide sufficient quantities of formation water to support a robust water flood program was **never drilled**.
    - According to lease and drilling records for the CRFSU, **many of the old wells were never fracked**.
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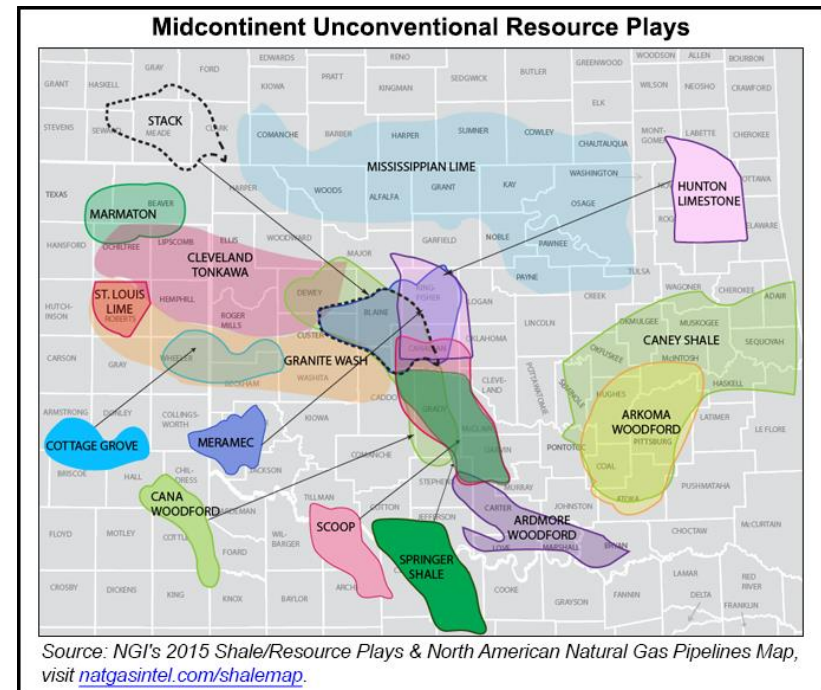
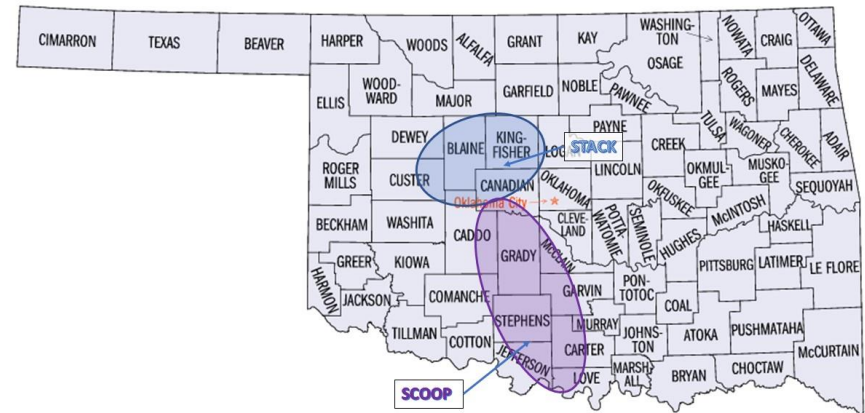




# Oklahoma Overview

## SCOOP and STACK Plays in Oklahoma

- The **SCOOP** (South Central Oklahoma Oil Province) and the **STACK** (Sooner Trend Anadarko, Canadian and Kingfisher) are two of the most explosive and well-known plays in the mid-continent currently.
- **Double H** is in the heart of the activity, which has propelled the business over recent years and will continue to do so.
- Companies like Newfield, Anadarko and Canvas Energy (formerly Chaparral) have made big “bets” on this area.





# Large Operators in the SCOOP & STACK



The Company is surrounded by world-class operators in the area.



Newfield Exploration, Inc.  
(Acquired by Encana, which is  
now Ovitint, Inc.)  
NYSE: OVV  
Mkt Cap: 12.49B



(formerly Chaparal Energy, Inc.)  
Privately-held



Acquired by Occidental  
Petroleum Corp.  
NYSE: OXY  
Mkt Cap: \$52.8B



# Investment Sought

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- Seeking up to **\$17 million total** investment
    - Offering up to 50% Net Profits Interest in the properties into perpetuity:
      - **1031-Exchange** qualified replacement property
      - 20% projected annual ROI at \$70 oil
  
  - Issuing up to **\$500K** in convertible notes to *accredited investors only*:
    - 12% APR
    - 12-month term (“Maturity”)
    - If not repaid prior to Maturity, any Principal and Interest due on the Note shall automatically convert into a 5% Net Profits Interest Agreement (pro-rata) until 125% of Principal and Interest due upon conversion is recouped by Noteholder.
-

# Unlocking Value from Current Assets



**\$2.1 million CapEx invested into Cottonwood asset is projected to deliver annual field level gross revenues of ~\$2.4 million in 2024 and ~\$6.1 million in 2025.**

## Year 1 Reworks

### Phase I: \$0.150 MM CapEx

+ oil production from 10 BOPD up to ~103 BOPD

\$3.5 MM gross (\$2.4MM net) field level revenues in 2024 based on \$70 oil

Timing: immediate

## Year 2 Reworks

### Phase II: \$1.995 MM CapEx

+ oil production to ~262 BOPD

+ \$8.8MM gross (\$6.1MM net) field level revenues in 2025 based on \$70 oil

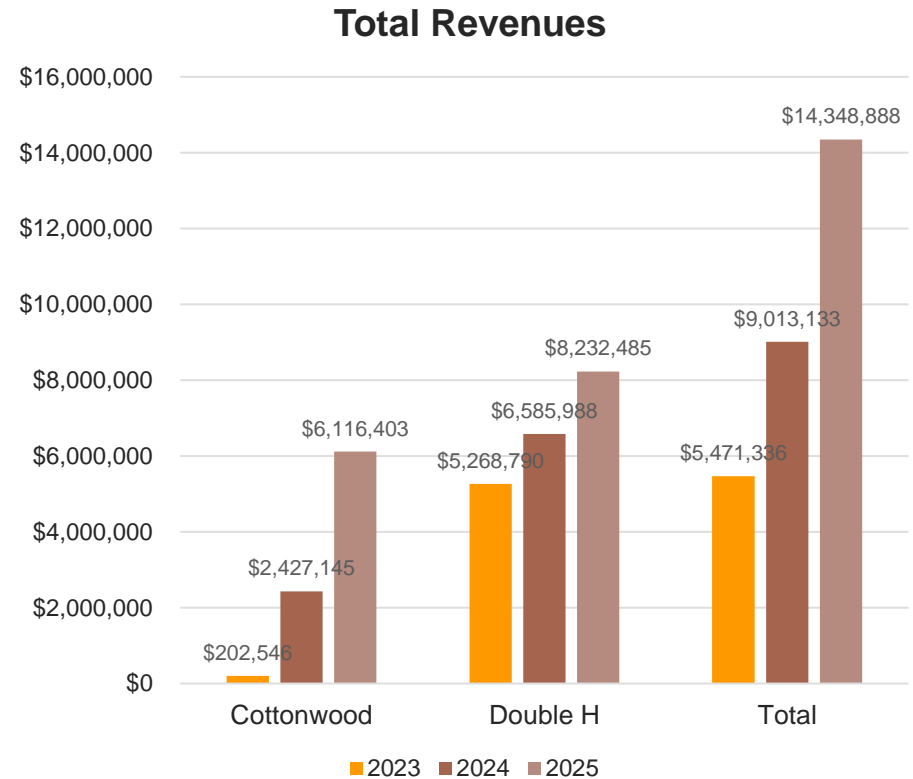
Timing: immediate





# Growing Revenues Significantly

- Financing the Company's workover program on its existing Cottonwood lease in Oklahoma for **\$2.145 million** is expected to deliver field level net operating income of approximately **\$2.4 million in 2024** growing to **\$6.1 million in 2025** based on \$70 oil.
- Consummating the acquisition of Double H Services, LLC for \$4.25 million and investing \$1 million working capital to expand operations to the SCOOP while also retiring \$3.25 million in debt is expected to deliver total revenues of **\$6.59 million in 2024** and **\$8.23 million in 2025**.



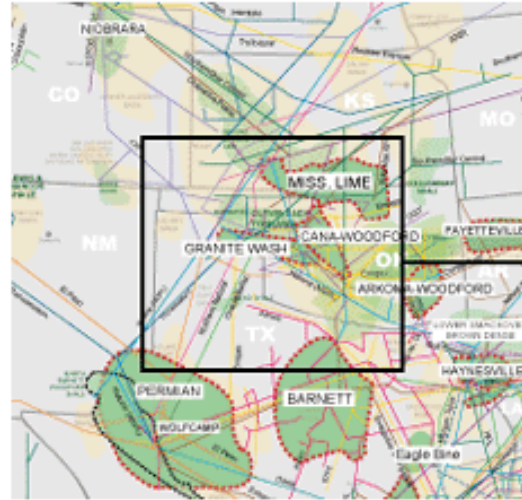


# Areas for Growth – Double H Services

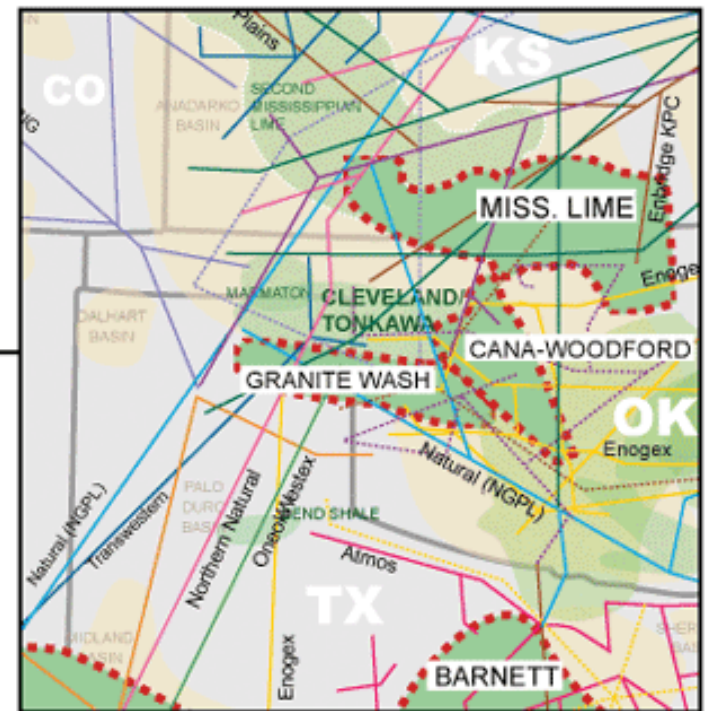
## Beyond the SCOOP and STACK Plays in Oklahoma

- Beyond the STACK and SCOOP plays, the Mississippian Lime, Granite Wash and Woodford (Cana, Arkoma and Ardmore) shales plays in south Kansas to Southern Oklahoma are a continued growth area for Double H, the Company's oil field services division.

*States Included: Oklahoma, Texas*



*Excerpted from NGI's Map of Nat Gas Pipelines and Shale Plays*





# Short-Term Outlook

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- Cumulative production of the Cottonwood Red Fork Sand Unit (CRFSU) through December 2023 is approximately **1.958 MM Bbls**.
- Current production is approximately **18-30 BOPD** from **15 wells** producing.
- Current project has 3-5 new wells coming online between April and May 2024 with an estimated increase in production up to **50-65 BOPD**.
- **3<sup>rd</sup> Party Engineering Report** (Ancell Engineering) estimates that
  - production can be increased to **262 BOPD by reworking 81 wells**;
  - well-planned water flood project can recover additional **2.3 MM Bbls from the Red Fork Zone** alone to provide additional income from the property;
  - additional **6.356 MM Bbls** can be produced from **Skinner** and **Bartlesville** formations using conventional recovery techniques; and
  - combined **PV-10 value** of the Skinner and Bartlesville reserves is **\$68.27 million**.
- In June 2023, the Company laid **2,500 feet of new flow lines** on the properties to increase efficiencies and total output.
- Upgrades are projected to include new/wider roads and additional flow lines, tank batteries and new pump jacks to maximize this underdeveloped asset.







# Reserves = 6.2 MMBO



Ancell Engineering evaluated the Skinner and Bartlesville formations within the Cottonwood Creek area, estimating 4.019 MM Bbls of recoverable reserves in the Skinner and 2,165 MM Bbls of recoverable reserves in the Bartlesville for a **total of 6.2 MM Bbls recoverable**.

## Skinner In Place and Recoverable Volumes

Section	TWN	Acres	Net Pay	Acre-ft	STOIIP (STBO)	Cum. Oil	Recoverable Oil	
							Base Case, (STBO)	Min. Case (STBO)
34	19N-8E	258	18.4	4,746	3,250,900		499,826	333,217
35	19N-8E	326	22.2	7,252	4,967,729		763,788	509,192
3	18N-8E	484	17.9	8,681	5,946,748		914,312	609,542
12	18N-8E	615	23.9	14,699		328,576	1,548,049	1,032,032
7	18N-9E	192	23.0	4,413	3,022,716		464,743	309,828
<b>Total</b>				39,791	27,256,702	328,576	4,190,718	2,793,812

## Bartlesville In Place and Recoverable Volumes

Section	TWN	Acres	Net Pay	Acre-ft	STOIIP (STBO)	Cum. Oil	Recoverable Oil	
							Base Case, (STBO)	Min. Case (STBO)
7	18N-9E	320	40	12,800	7,040,000	62,346	1,082,400	721,600
8	18N-9E	320	40	12,800	7,040,000	435,685	1,082,400	721,600
<b>Total</b>				25,600	14,080,000	498,031	2,164,800	1,443,200

# PV-10 Value = \$68.27 Million



- Ancell Engineering report provides an economic analysis of the Skinner and Bartlesville formations on a risked and derisked basis.
- As indicated in the base case below, the combined PV-10 value of the reserves in the two formations is estimated at **\$68.27 million**.

Base Case Economics - As of 7/1/2017						
Formation	Section	Wells	Net Oil, Mbbl	Invest	CF, M\$	PV10%, M\$
BV	7/8	30	1,622.7	11,584.6	53,830.4	26,867.7
SK	12	29	1,160.4	11,198.4	35,682.9	18,052.2
SK	7	8	348.4	3,089.2	10,580.2	4,987.1
SK	34	11	365.3	4,247.7	9,065.3	3,827.2
SK	35	15	572.5	5,792.3	17,538.3	8,173.3
SK	3	23	668.1	8,881.5	15,731.2	6,361.4
<b>Totals</b>			<b>4,737.3</b>	<b>44,793.6</b>	<b>142,428.3</b>	<b>68,268.9</b>

Minimum Case Economics - As of 7/1/2017						
Formation	Section	Wells	Net Oil, Mbbl	Invest	CF, M\$	PV10%, M\$
BV	7/8	30	1,081.8	11,584.6	33,134.0	18,713.8
SK	12	29	773.6	11,198.4	20,971.9	11,478.2
SK	7	8	232.2	3,089.2	6,557.0	3,416.7
SK	34	11	249.8	4,247.7	5,671.2	2,529.5
SK	35	15	381.7	5,792.3	10,085.3	5,015.2
SK	3	23	456.9	8,881.5	9,397.9	3,852.6
<b>Totals</b>			<b>3,176.0</b>	<b>44,793.6</b>	<b>85,817.1</b>	<b>45,006.0</b>



# Historical Creekwood Asset Production



Despite its relative lack of development and upkeep prior to the Company's acquisition of the asset, prior production history of the CRFSU is impressive, as summarized below:

## 1,810 Acre Cottonwood Red Fork Sand Unit ("CRFSU") Seven Year Annual Production and Revenue Summary

Year	BBLs	Price	Gross	Taxes	Net	75% NRI	AVG. BOPD
2009	7,051.90	\$48.10	\$339,213.89	\$24,488.06	\$314,725.83	\$236,044.32	19.32
2010	6,686.65	\$68.04	\$454,962.76	\$32,709.16	\$422,253.60	\$316,690.15	18.31
2011	9,273.25	\$85.61	\$793,900.06	\$57,148.18	\$736,751.86	\$552,577.83	25.40
2012	8,983.25	\$84.22	\$756,617.22	\$54,463.48	\$702,153.74	\$526,615.25	24.61
2013	5,592.01	\$93.00	\$520,081.37	\$37,389.66	\$476,691.71	\$349,105.49	15.32
2014	8,476.77	\$87.40	\$740,909.77	\$53,529.79	690,063.86	\$510,547.86	23.22
2015	1,947.09	\$44.34	\$86,136.91	\$6,222.91	\$80,183.17	\$60,137.44	9.18*
<b>Total</b>	<b>48,010.92</b>	<b>\$76.89</b>	<b>\$3,691,821.98</b>	<b>\$265,951.24</b>	<b>\$2,732,759.91</b>	<b>\$2,551,718.34</b>	<b>19.98</b>



**DOUBLE H**  
— SERVICES, LLC —

# About Double H Services, LLC

- Logistics and transportation company focused on the oilfield, providing pipe hauling, project management and rental of laydown machines and forklifting.
- Provides agricultural transportation services, hauling grain for AMD based in Enid, OK.
- Owns 12 trucks, which 10 of them are hauling grain weekly.
- Founded in 2007, Double H is located in Enid, Oklahoma. The Company's operations are focused on oilfield logistics, pipe hauling and renting laydown equipment to mid-to-large independent E&P companies and several Fortune-500 companies.
- Currently has 35 employees, 12 laydown machines, 45 sets of pipe racks, 20 pickup trucks, 12 semi-tractors, 3 forklifts, 5 flatbed trailers and 10 hopper bottom trailers.





# Regional Expansion Potential



- Double H has opportunities to grow its business into other regions/basins outside of Oklahoma by expanding with its current customer base.
- Double H has been a long-time one location operation but Defiant Energy plans to expand Double H's operations into other regions and basins where the Company acquires future oil and gas properties.
- Potential regions for future growth include the Haynesville, Eagleford, Barnett and Permian.
- Within Oklahoma, Double H's customer base is extensive with strong relationships and as such, Double H may open a facility in southern Oklahoma (Chickasha, Seminole or Duncan) to continue servicing the needs of its current customer base.

# Double H Operations Update

- Demand for oilfield services has increased sharply as the supply glut pre-COVID has turned into a major need for more oil. The customer list at Double H has doubled and the business is **consistently averaging \$500K to \$580K per month** in gross revenues.
- Double H also **recently implemented an ERP** (Microsoft Dynamics) which is built specifically for the trucking and oilfield services. This transparency and **end-to-end accounting solution** will reduce office administration needs in the long-term.
- Double H's is **focused on reducing costs while steadily increasing revenue** as its day rates continue to get back to pre-Covid levels with 30% margins. The continued focus on quality and service will allow Double H to remain a strong player in the STACK and **allow for the Company to expand** to the SCOOP.
- Double H's trucking division is ready to grow and expand and potential freight brokerage acquisition targets have been identified.



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**General Counsel:**

Matthew Bannister  
Banister & Miller, PLLC  
(832) 443-5571  
[matt@banistermiller.com](mailto:matt@banistermiller.com)





# **APPENDIX**

## **Geology and Maps for Cottonwood Creek Asset**

### **Waterflood Program Details**

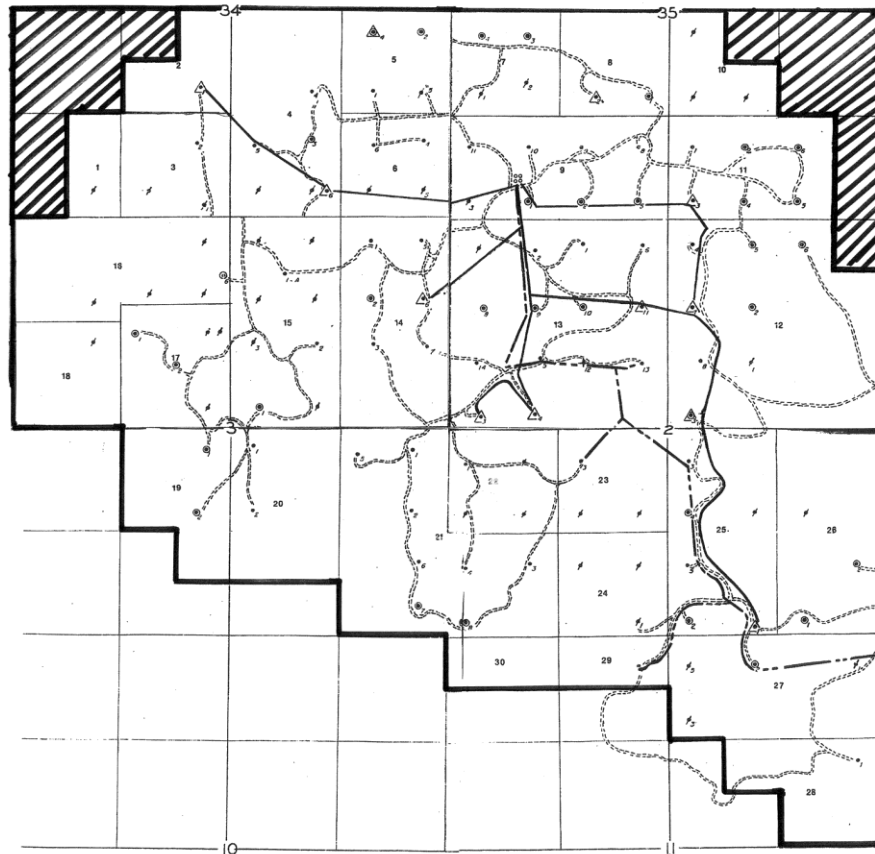


# Original Red Fork Sand Unit Lease (1,810 Acres)



## COTTONWOOD REDFORK SAND UNIT

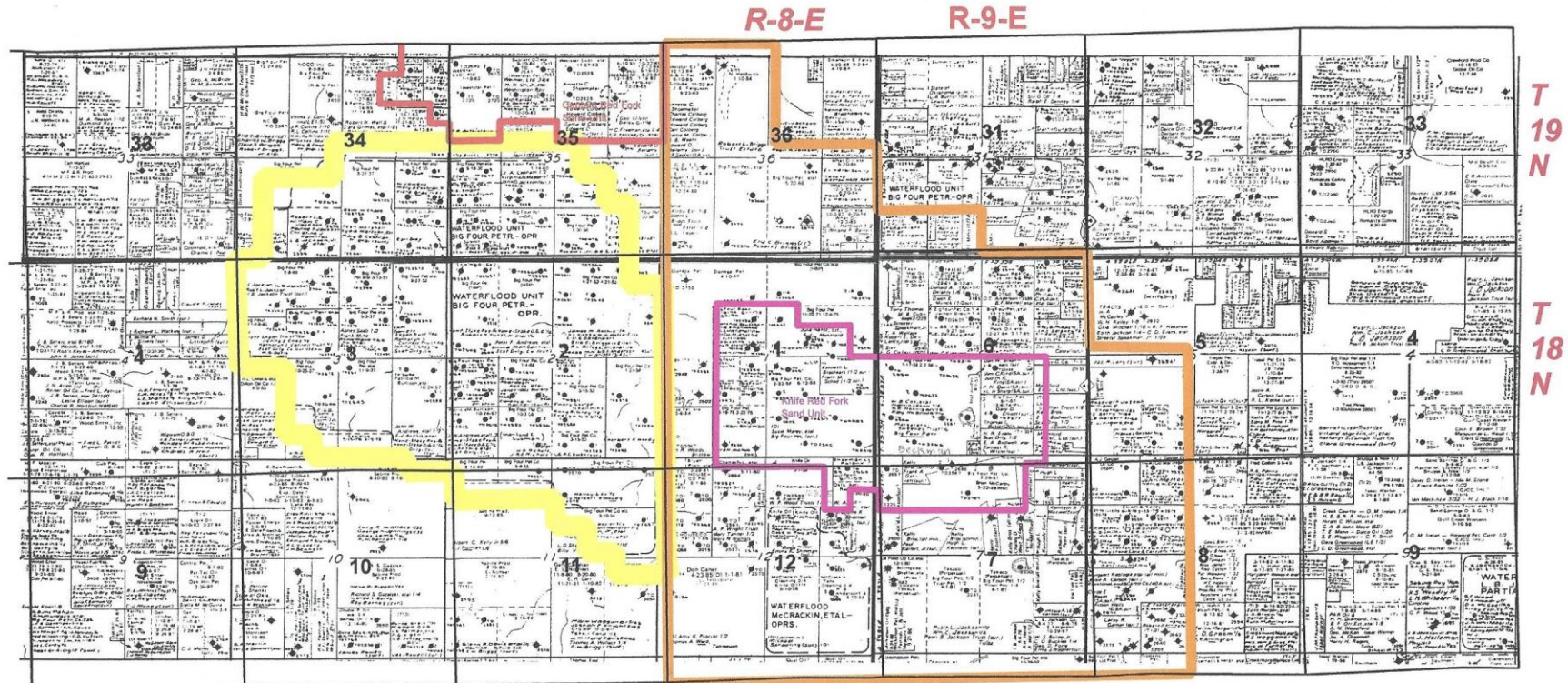
### WATER INJECTION SYSTEM GAS SUPPLY SYSTEM



LEGEND	
•	Producing
⊙	Temp. Abandoned
⌘	Plugged
△	Injection
3	Tract No.
—	Inj. Line
- - -	Gas Line

KOL 4-95

# Includes 1,100 Adjacent Acres Added in 2017



10-5-16 Mid-Continent Red Fork Water Flood & Buy Area

**TAHOE**  
Oil & Gas, LLC

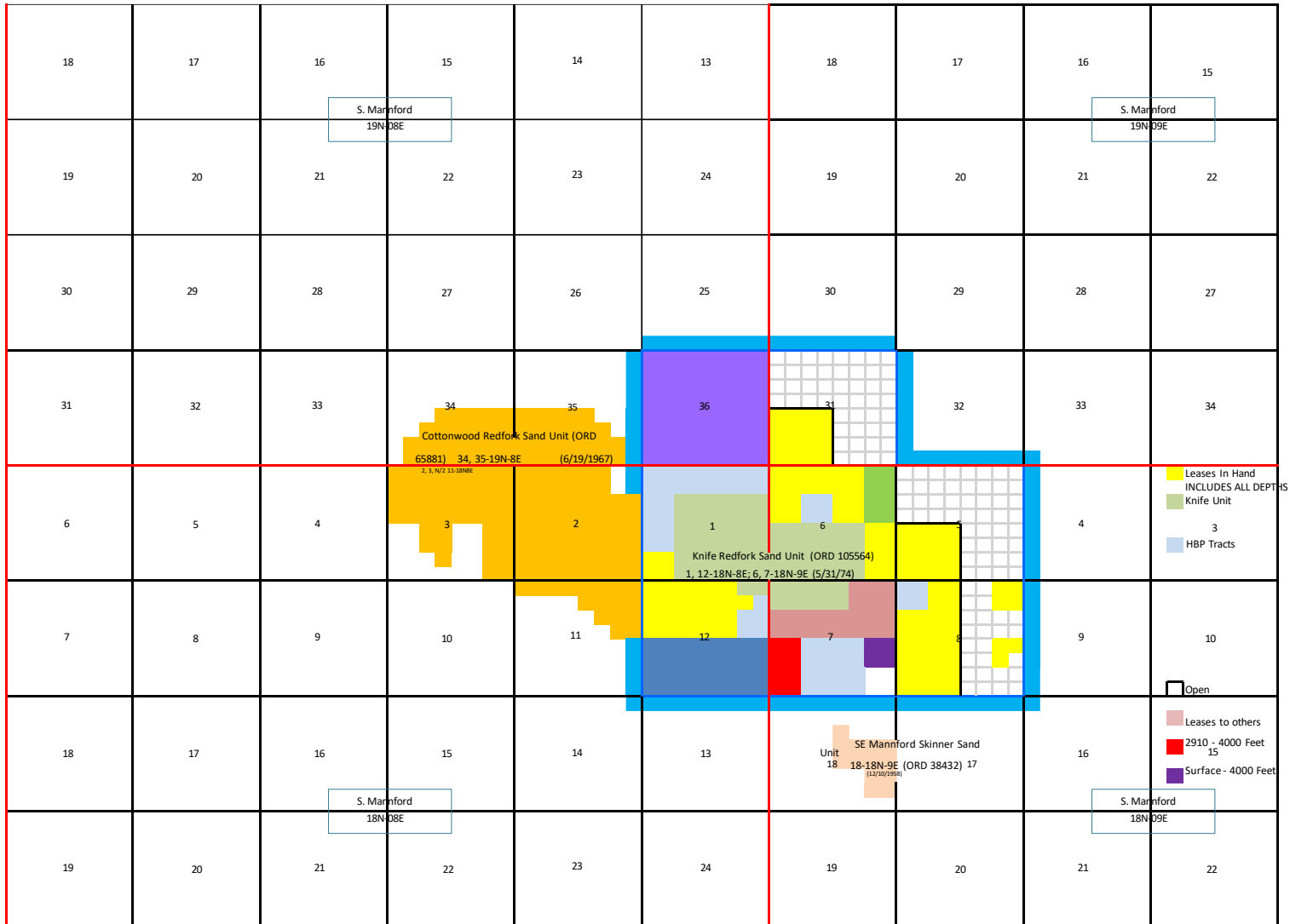
Cottonwood Creek Red Fork Water Flood  
Waterflood Unit  
Waterflood Unit  
Red Fork Water Flood and Buy Area  
Sixth Waterflood - Main

WellStart Services Inc  
Managing Member Paul J. Cochran

- East Extension Buy Area Outline  
 Polygon
- Cottonwood Creek Unit  
 Polygon
- Captain Red Fork Sand Unit
- Knife Red Fork Sand Unit

Note: Captain Red Fork Sand Unit and Knife Red Fork Sand Unit are NOT utilized as per OCC.

# Plat of Acreage



# Section 1 Township 18N Range 8E



Prospect Name:		Cottonwood Creek			
Section	1	Township	18N	Range	8E
County	Creek	State	OKLAHOMA		
		640.04	Acres, more or less		

TRACT 1 HBP	HBP NANTZ #1 AND #2 WELLS	
	HBP - PART OF THE KNIFE UNIT	
Knife Redfork Sand Unit		
TRACT 2		
LIH - 40.00		

Remarks: Total Leasehold = 40.0 NMA

# Section 6 Township 18N Range 9E



Prospect Name: <b>Cottonwood Creek</b>			
Section	<b>6</b>	Township	<b>18N</b>
		Range	<b>9E</b>
County	<b>Creek</b>	State	<b>OKLAHOMA</b>
<b>632.65</b> Acres, more or less			
Lot 4 - 37.98 ac	Lot 3 - 39.63 ac	Lot 2 - 39.39 ac	Lot 1 - 39.14 ac
Tract 4	Tract 3	Tract 2	Tract 1
LIH - 47.571624	LIH - 26.027208	LIH - 74.39	
Lot 5 - 38.49 ac			
			Tract 9
			LIH - 1.250000
			Tract 5
			LIH - 63.776044
Lot 6 - 38.83 ac	<b>Knife Redfork Sand Unit</b>		
Lot 7 - 39.19 ac		Tr 8	
Remarks:	<b>Totl Leasehold = 213.014876 NMA</b>		



# Section 31 Township 19N Range 9E



Prospect Name:		Cottonwood Creek			
Section	# 31	Township	19N	Range	9E
County	Creek	State	OKLAHOMA		
		632.24	Acres, more or less		
Lot 1 - 38.14 acres					
NW/4 NW/4					
		E/2 NW/4		NE/4	
Lot 2 - 38.08 acres		80 acres		160 acres	
SW/4 NW/4					
Lot 3 - 38.04 acres					
NW/4 SW/4				N/2 SE/4	
		E/2 SW/4		80 acres	
Lot 4 - 37.98 acres					
SW/4 SW/4		LIH - 80.00		LIH - 20.00	
				S/2 SE/4	
				80 acres	
Remarks:	Total Leasehold = 100 NMA				

# Section 5 Township 18N Range 9E



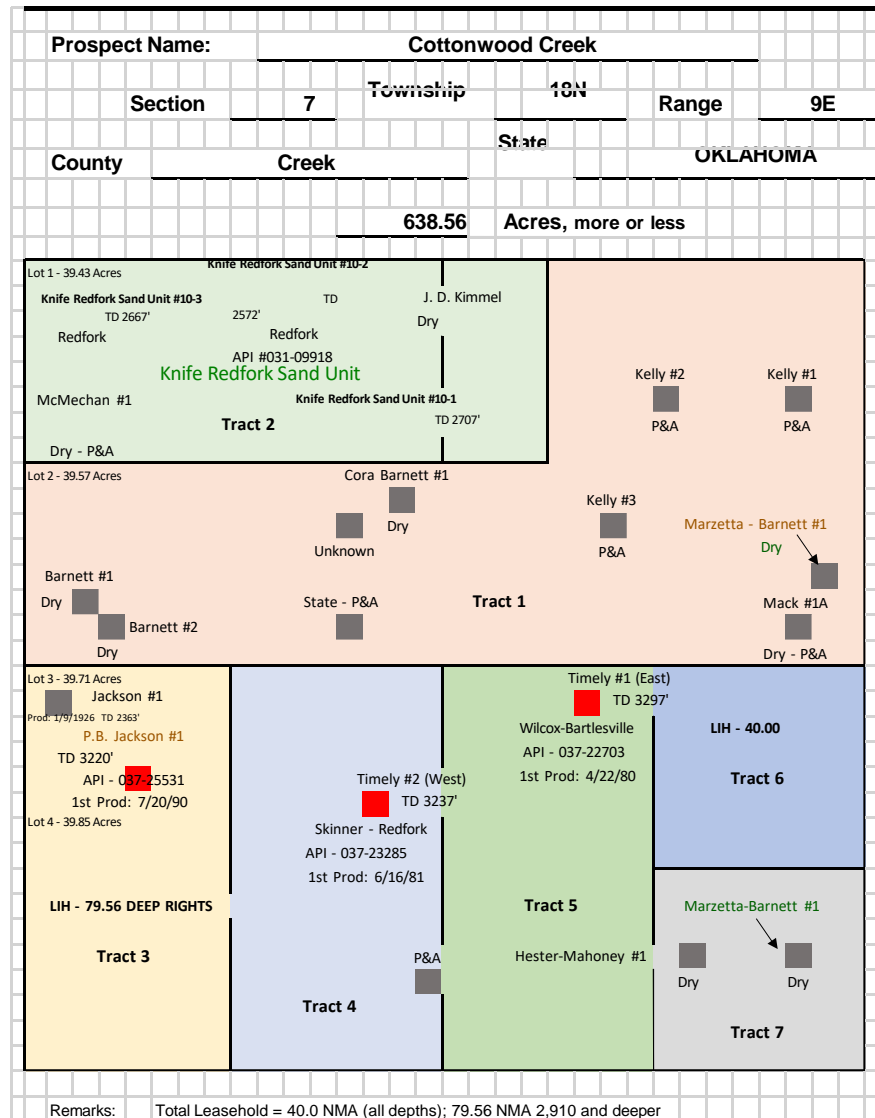
Prospect Name:		Cottonwood Creek	
Section	5	Township	18N
		Range	9E
County	Creek	State	OKLAHOMA
		636.16	Acres, more or less
Lot 4 - 39.02 ac	Lot 3 - 39.04 ac	Lot 2 - 39.04 ac	Lot 1 - 39.06 ac
Tract 1 - SW/4 LIH - 130.254630			
Remarks:	Total Leasehold = 130.254630		

# Section 12 Township 18N Range 08E



Prospect Name:		Cottonwood Creek			
Section	# 12	Township	18N	Range	08E
County	Creek	State	OKLAHOMA		
		640.00	Acres, more or less		
TRACT 3 LIH - 45.000000	TRACT 6 LIH - 20.000000	TRACT 4 LIH - 29.166667	Tract 1 HBP KNIFE UNIT Sidwell 1-B (N2NENE)		
	TRACT 7 LIH - 15.555556	TRACT 5 LIH - 23.333333	HBP SIDWELL UNIT TRACT 2 Sidwell #1 (NWSENE) TRACT 3		
TRACT 8 LIH - 160.000000		TRACT 9 LIH - 118.000002			
Remarks:	Total Leasehold = 411.055558 NMA				

# Section 7 Township 18N Range 9E



# Section 8 Township 18N Range 9E



Prospect Name:		Cottonwood Creek			
Section	8	Township	18N	Range	9E
County	Creek	State	OKLAHOMA		
		640.00	Acres, more or less		
TRACT 5	TRACT 4 LIH - 20.615826			TRACT 1 LIH - 6.935148	
TRACT 6					
TRACT 3 LIH - 21.324037			TRACT 2		
LIH - 41.666667			TRACT 2	TRACT 7	
TRACT 7					
	TRACT 11		TRACT 10	TRACT 8	
				TRACT 9	
Remarks:	Total Leasehold = 90.541678 NMA				



# CRFSU Structure Map

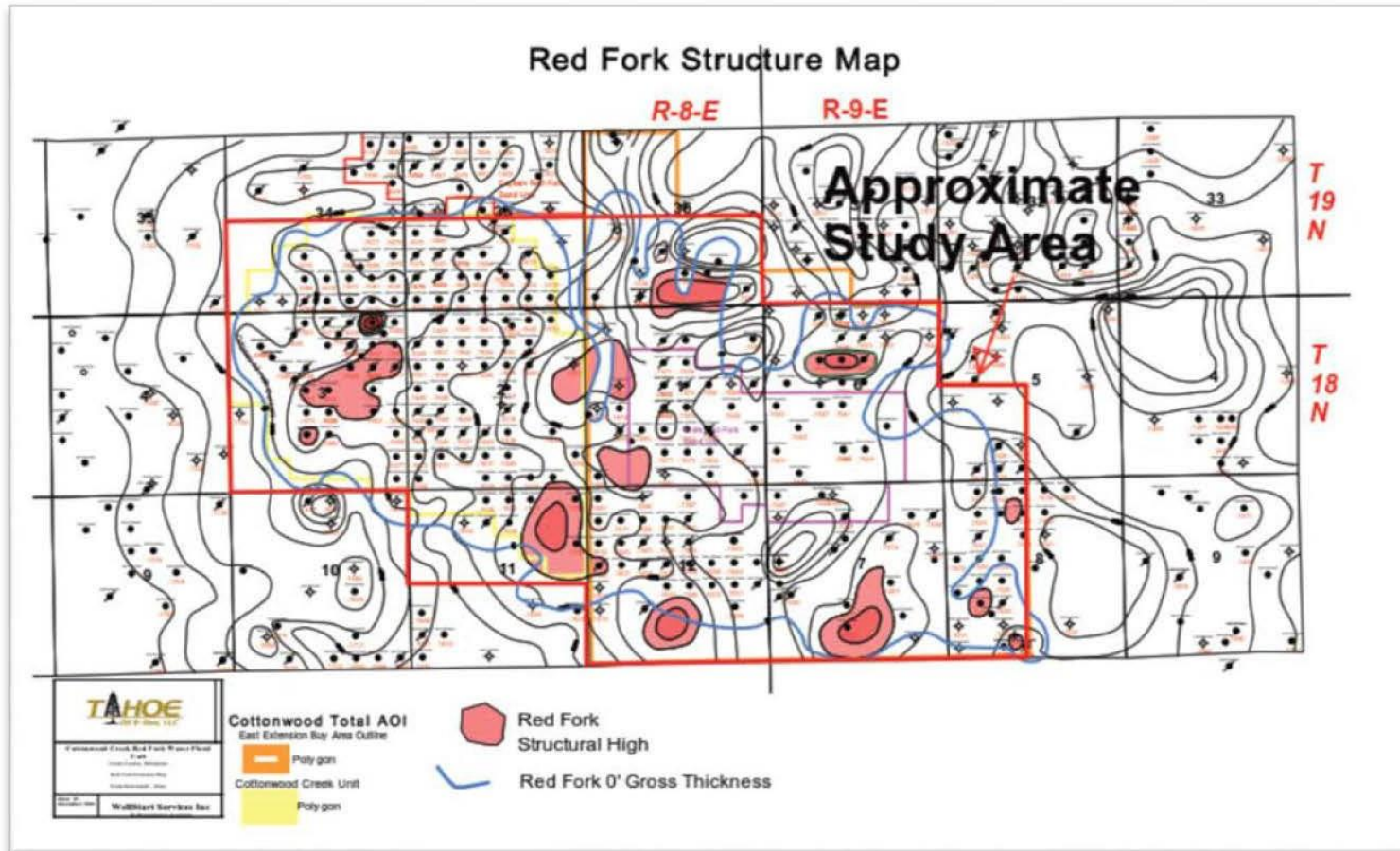
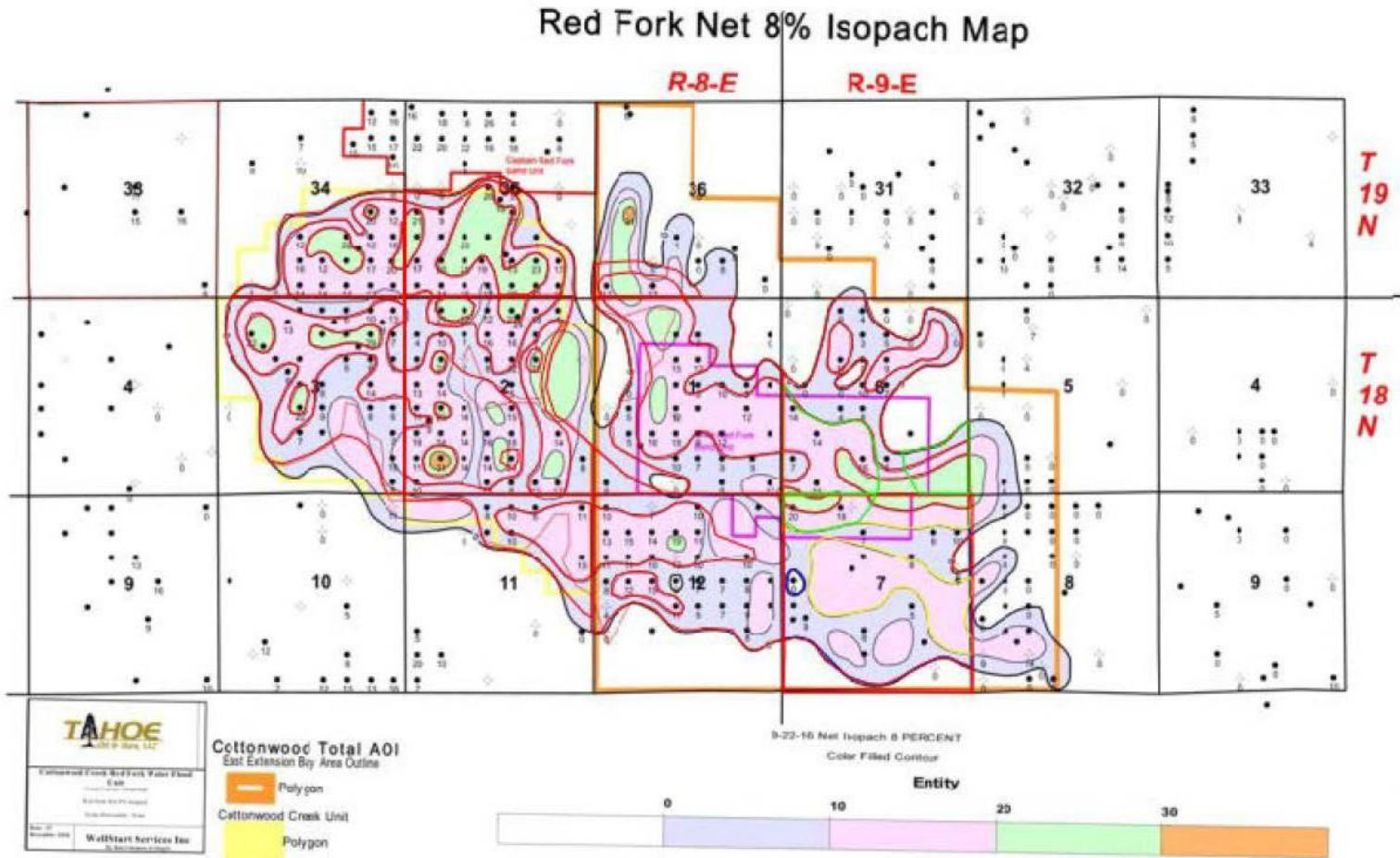


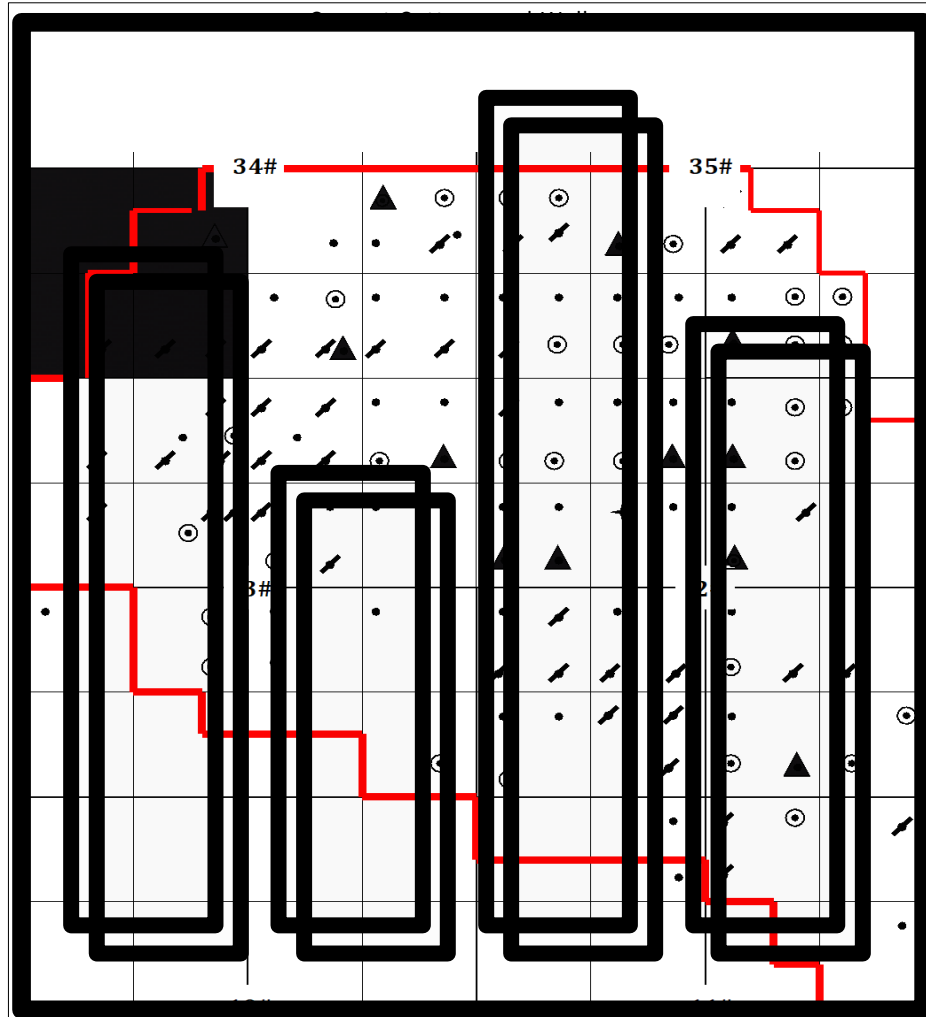
FIGURE 1 - RED FORK STRUCTURE MAP PROVIDED BY TAHOE OIL AND GAS, SHOWING STUDY AREA OUTLINED IN RED, THE RED FORK 0' GROSS THICKNESS LINE IN BLUE AND STRUCTURAL HIGHS ALSO IN RED. NOTE LACK OF RED FORK PRODUCERS ALONG WITH DRY HOLES IN AND AROUND RED FORK STRUCTURAL HIGHS.

# CRFSU Net 8% Isopach Map

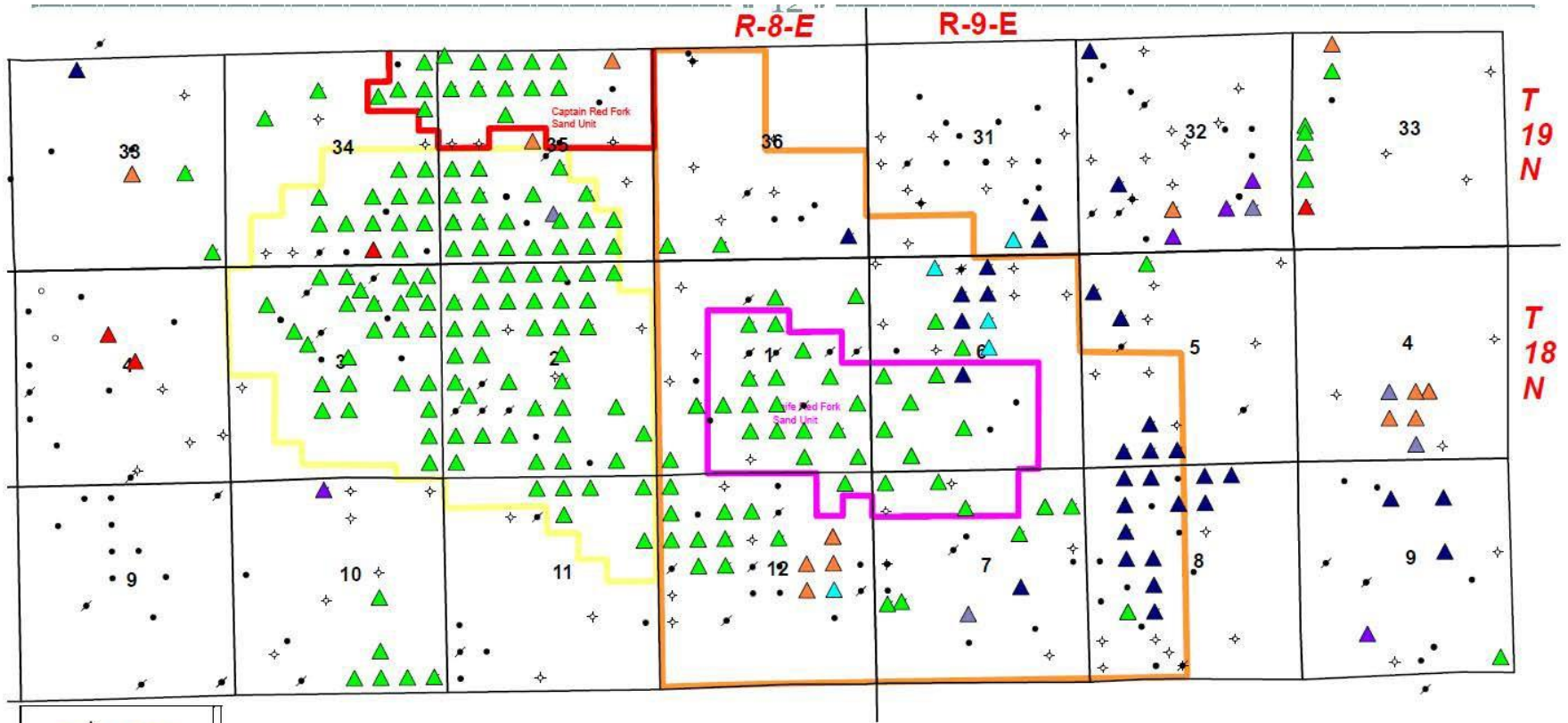


**FIGURE 7 - NET FEET OF PAY GREATER THAN 8% POROSITY, AFTER RON COLEMAN, WELLSTART SERVICES, INC.**

# Current CRFSU Wells



# Existing Completion and Production



**TAHOE**  
Oil & Gas, LLC

Cottonwood Creek Red Fork Water Flood  
Eggs  
Creek Creek, Oklahoma  
Wells with Completion/Production  
Scale Horizontal - None

Date: 12 December 2016  
WellStart Services Inc  
By: A. M. [Name]

Cottonwood Total AOI  
East Extension Buy Area Outline

Orange Polygon  
Cottonwood Creek Unit  
Yellow Polygon

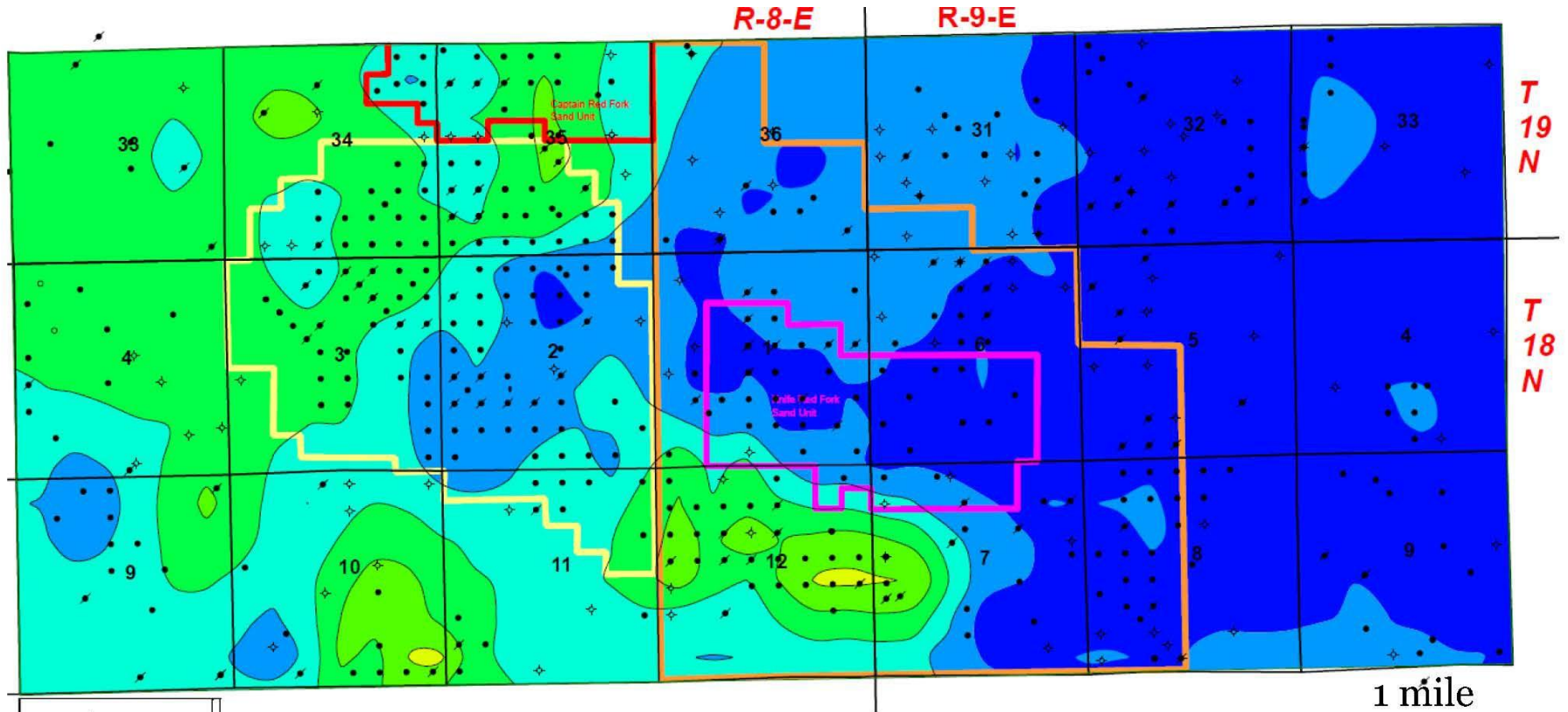
- ▲ Cleveland Production
- ▲ Red Fork Production
- ▲ Bartlesville Production
- ▲ Wilcox Production
- ▲ Skinner Production
- ▲ Squirrel Production
- ▲ Miss Lime Production

1 mile





# Skinner Gross Sand



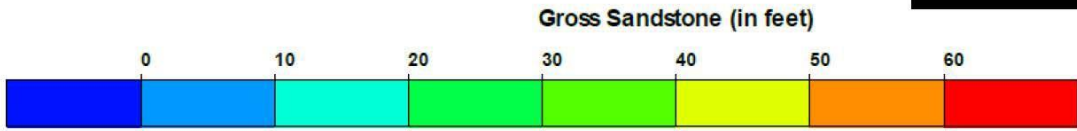
1 mile

**TAHOE**  
Oil & Gas, LLC

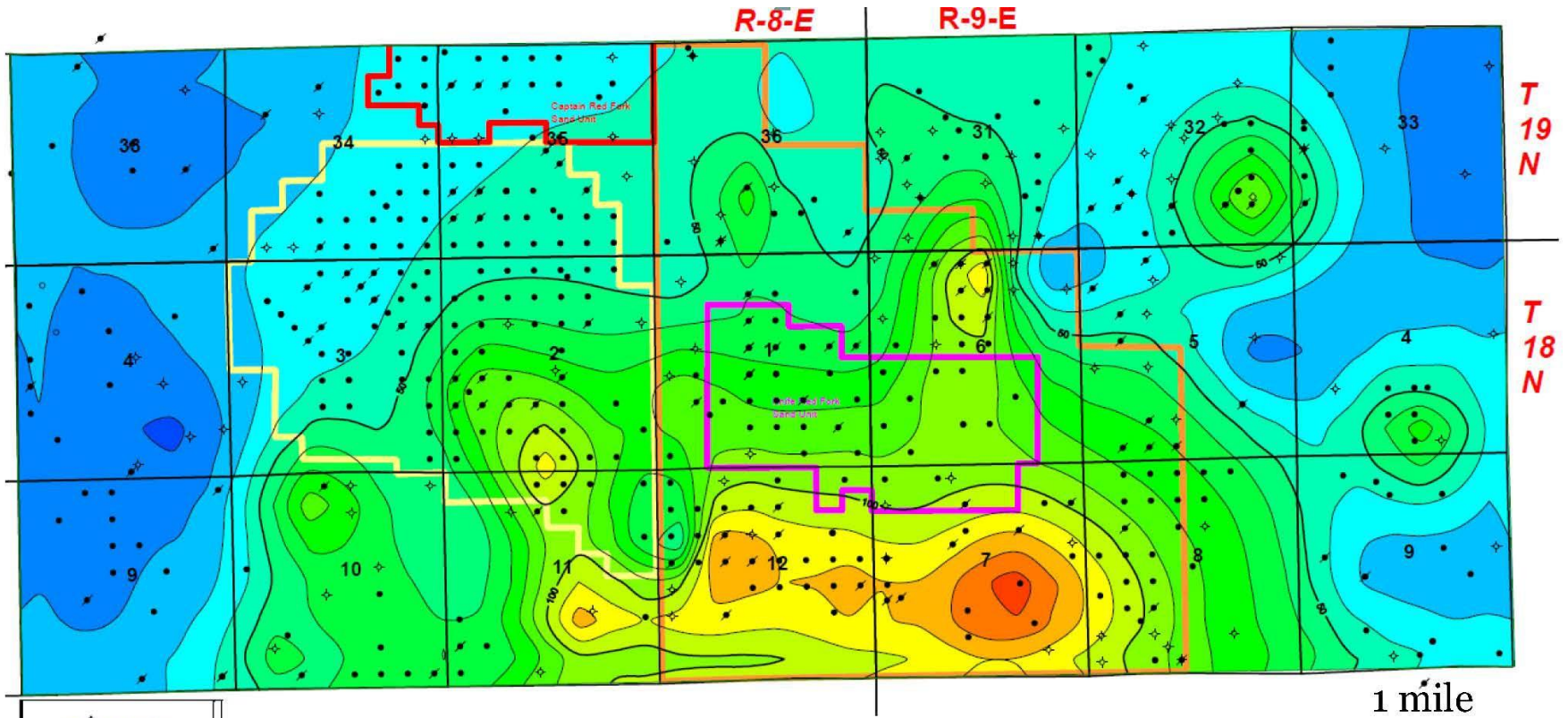
Cottonwood Creek Red Fork Water Flood  
Unit  
Crest County, Oklahoma  
Skinner Cottonwood  
Side Historical - None

Date: 12 December 2015  
**WellStart Services Inc**  
By: A. H. Smith, Geologist

- Cottonwood Total AOI  
East Extension Buy Area Outline
- Polygon
  - Cottonwood Creek Unit
  - Polygon



# Bartlesville Gross Sand

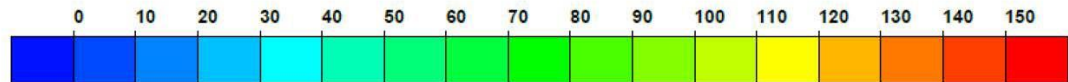


 Oil & Gas, LLC	
Cottonwood Creek Red Fork Water Flood Unit Creek County, Oklahoma Bartlesville Gross Sand Scale Modified - New	
Date: 11 November 2014	WellStart Services Inc. by John Hovorka, Geologist

Cottonwood Total AOI  
East Extension Buy Area Outline

- Polygon
- Cottonwood Creek Unit
- Polygon

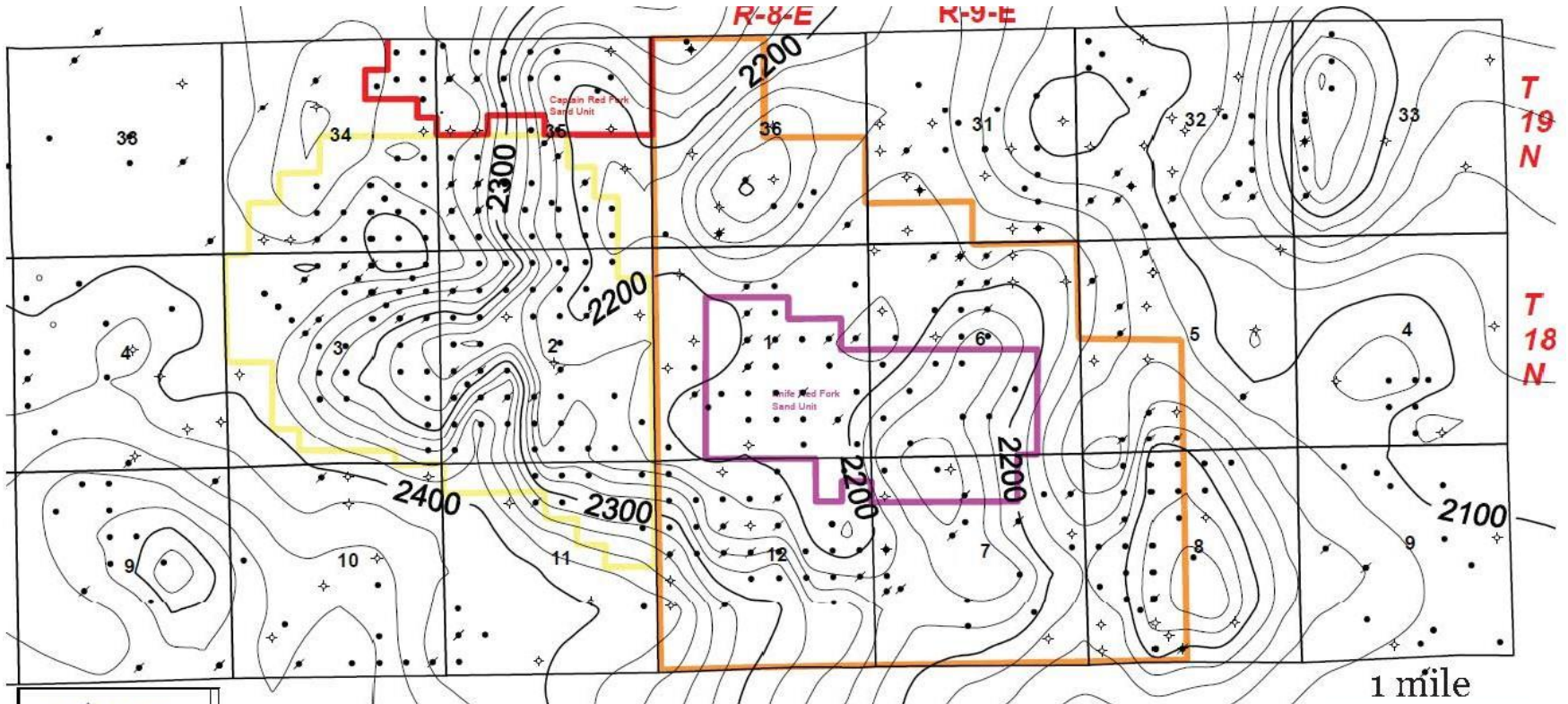
Gross Sandstone (in feet)



1 mile



# Skinner A Structure



**TAHOE**  
Oil & Gas, LLC


Cottonwood Creek Red Fork Water Flood Unit  
Cotton County, California  
Water A Phase (TVD)  
Scale Horizontal - None

Date: 8 November, 2014  
**WellStart Services Inc**  
An Arco Services Company

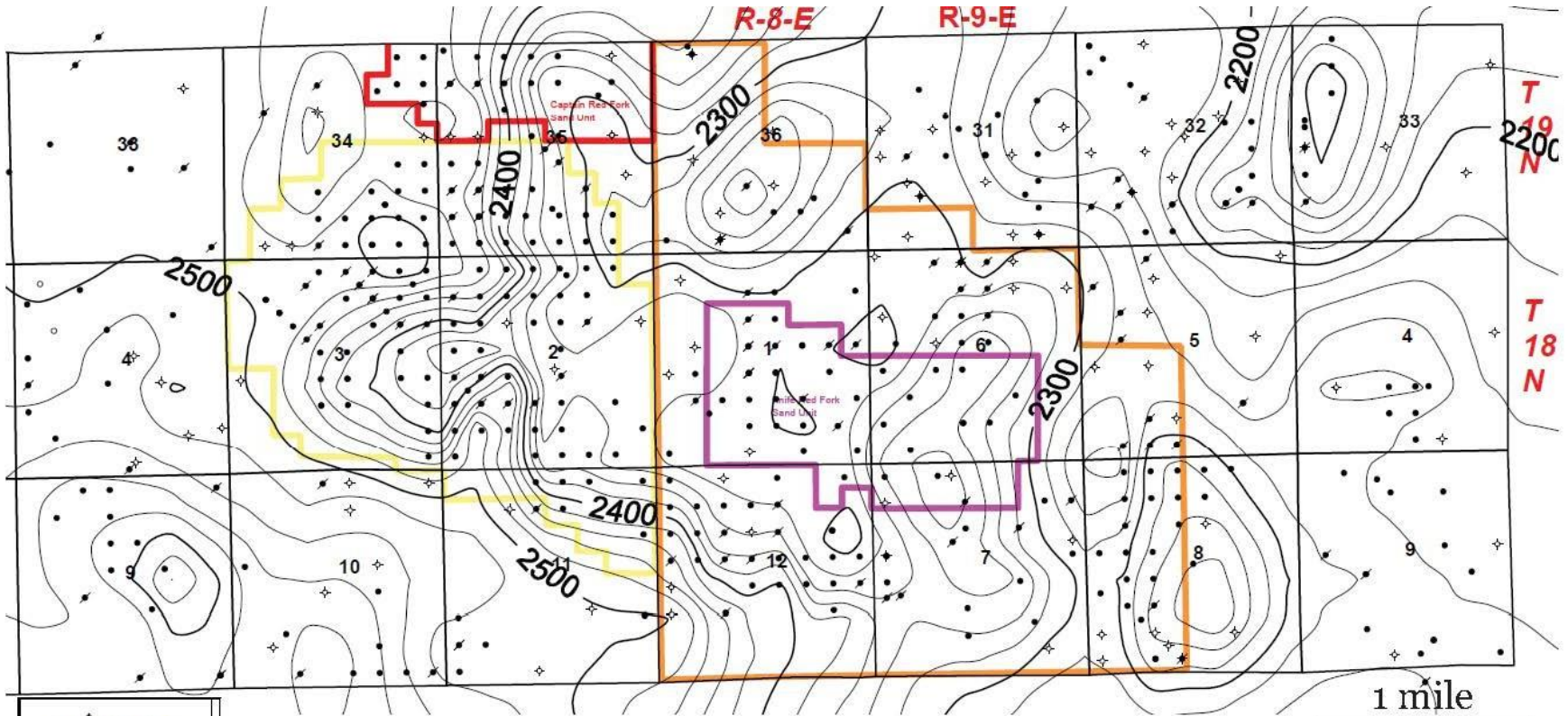
Cottonwood Total AOI  
East Extension Buy Area Outline

 Polygon

Cottonwood Creek Unit

 Polygon

# Skinner C Structure



Cottonwood Creek Red Fork Water Flood Unit Grant County, Oklahoma Skinner C Structure (TVD) Scale Horizontal / None	
Date: 11/20/18 Drawn by:	<b>WellStart Services Inc</b> By: A. M. Swartz, Geologist

**Cottonwood Total AOI**  
 East Extension Buy Area Outline  
 Polygon  
**Cottonwood Creek Unit**  
 Polygon

1 mile



# Bartlesville Structure



**TAHOE**  
Oil & Gas, LLC

Cottonwood Creek Red Fork Water Flood Unit  
Creek Creek, Oklahoma  
Barbours (Structure #175)  
State Horizontal - None

Drawn by: [Name]  
Reviewed by: [Name]  
Date: [Date]

**WellStart Services Inc**  
By: [Name]

Cottonwood Total AOI  
East Extension Buy Area Outline

 Poly gon

Cottonwood Creek Unit

 Poly gon



# **WATERFLOOD PROGRAM**



# Water Flood Programs Successful in Area



- To assess the recovery that might be anticipated from implementing a modern water flood program for the CRFSU lease an analysis of five neighboring water flood projects was performed:
  - **Cottonwood Red Fork Sand Unit (CSFRU)**
  - Captain Red Fork Sand Unit
  - Southwest Mannford Red Fork Sand Unit
  - Olive Red Fork Unit
  - Travis-Olive Red Fork Sand Unit
- All five reservoirs share similar porosity, permeability, oil and water saturation and gravity. The largest water flood project to date was conducted on the Travis Skinner Unit by Gulf Oil and Chevron USA. The following compares the five water flood programs including the CRFSU lease.

Lease	Reservoir size (acre/feet)	Barrels of water Injected (millions)	Barrels of water per acre / foot	Cumulative oil produced (MM Bbls)	Barrels of oil per acre/foot
<b>Cottonwood Red Fork (CRFSU)</b>	<b>20,580</b>	<b>8.49</b>	<b>412</b>	<b>1.96</b>	<b>95</b>
Captain Red Fork	6,450	2.79	432	0.90	140
Southwest Mannford Red Fork	4,185	2.35	560	0.29	68
Olive Red Fork	3,676	5.09	1,385	0.80	217
Travis Skinner	10,049	33.41	3,324	2.77	276

# Water Flood Programs Successful in Area

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- In December 2015 then operator of this lease engaged Wellstart Services, Inc. (“Wellstart”) to develop a water flood plan as well as an estimate of the oil that might be recovered from the CRFSU lease.
    - However, as summarized below, the table on the preceding page suggests that the ultimate recovery for each field may be positively related to the number of injection wells properly spaced over the lease and the amount of water injected per acre/foot of the reservoir.
    - Although the oil reserve of the Travis Skinner Unit does not contain the largest number of acre/feet, it does have the greatest water injection rate with roughly 3,324 barrels injected per water per reservoir acre/foot. Importantly, the Travis Unit also has the greatest oil recovery rate of 276 barrels oil production per acre / foot.
    - As compared to the Travis Skinner Unit, the Olive Red Fork Unit reservoir is only 3,676 acre/feet. However, it also has the second greatest water injection rate of 1,385 barrels of water per acre/foot and consequently also has produced the second highest recovery rate at 217 barrels per acre/foot.
  
  - Of the five leases compared, the Cottonwood Red Fork Sand Unit has the largest oil reservoir, 20,580 acre/feet, which is approximately 205% larger than the 1,415 acre Travis Skinner Unit. Moreover, the Cottonwood has had only about 412 barrels of water injected per acre/ foot, which is only about 13% of the injection rate for the Travis Skinner Unit.
  
  - **Of the five leases, the CRFSU lease has the lowest number of barrels of water injected per acre/foot. Therefore, management believes that implementing a water flood program that combines best practices technology with a much higher injection rate may result in substantial oil recovery from the CRFSU lease.**
-

# State-of-the-Art Water Flood Plan



In December 2015, Leg Up (DEEP's Operator) engaged Wellstart to complete a comprehensive subsurface geology structure and isopach map and to develop a water flood plan for the Lease. To assist in its work, Wellstart utilized the services of geologist Ronald Coleman and Ann Hewlett. Copies of the Wellstart reports are available. The following is a summary of the work completed by Wellstart:

## 1. Rely on numerous data sources.

To develop its understanding of the subsurface rocks and physical characteristics of the CRFSU reservoir, Wellstart incorporated extensive data from numerous sources. This included data from electric logs for newer wells, manually created logs from older wells, and data from modern electric logs and cores from the first 10 – 20 wells that are drilled after development of the lease begins. Data sources:

- |   |   |  |   |
|---|---|--|---|
| <ul style="list-style-type: none"><li>• Open hole logs</li><li>• Core data</li><li>• Cased hole logs</li><li>• Original reservoir pressure</li><li>• Reservoir pressure history</li></ul> | <ul style="list-style-type: none"><li>• Water levels in producers</li><li>• DST-original well test results</li><li>• Well construction</li><li>• Well histories</li><li>• Field development history</li></ul> | <ul style="list-style-type: none"><li>• Oil production rates by well</li><li>• Cumulative production by well</li><li>• Water production rates by field and by well</li><li>• Cumulative production by well</li></ul> | <ul style="list-style-type: none"><li>• Water injection rates and pressures by well</li><li>• Gas content in the oil reservoir</li><li>• API oil gravity-viscosity</li><li>• Ongoing water analyses</li></ul> |
|---|---|--|---|

## 2. Develop a through understanding of reservoir rocks.

Development of a comprehensive understanding of the reservoir rocks as well as the water/oil/rock characteristics of the reservoir that control wettability, residual oil saturation to water flooding, and the oil relative permeability at higher water saturations. Other critical elements of this process:

- Develop the diagenetic history of the subsurface rocks to permit an understanding of their geologic history
- Assess the depositional environment at the porosity, pore throat (permeability) and reservoir levels as well as the nature and type of fluids that have circulated through them



# State-of-the-Art Water Flood Plan

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### **3. Conduct a through assessment of the physical characteristics of the reservoir.**

An additional activity in designing the water flood program is to evaluate the structure and faulting of the reservoir as well as its porosity-permeability in order to understand the interconnectivities among the various parts of the reservoir, particularly the injector producer connectivity.

- Structure of the reservoir
- Isopacs of the gross and net pay of the reservoir
- Oil / water contacts in the reservoir
- Reservoir spill points
- Dips of the reservoir

### **4. Design of the water flood project to include the following steps:**

- Perform reservoir calculations to determine the well spacing and pattern style that will be used in the CRFSU water flood. These choices will be based on Wellstart's understanding of the reservoir geology, especially after it has received core data from the initial 10 – 15 wells and the well cores have gone through analysis in the petrology lab.
  - Design surface facilities with emphasis on anticipated water-injection volumes and potential limits on the number of injectors and producers, injection rates and pressures of the various injectors and producers, and oil / water production rates.
  - Design initial facility capacities for flexibility. As the waterflood program progresses, there will be ongoing modifications to the original design and operating plans. This will be recognized during the original planning and ongoing design stages.
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# State-of-the-Art Water Flood Plan

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## 5. Design a water flood program with the following elements:

- By utilizing the latest technology and management techniques, Defiant expects that the Wellstart- designed water flood program will bring the desired result for the CRFSU lease:
  - Design and implement system to gather data and monitor all production wells, injector wells, water production wells, and all surface facilities
  - Specify pattern layouts for injection and production wells
  - Placement and requirements for new wells
  - Requirements for logging and coring techniques
  - Placement and requirements for water supply wells and injection
  - Injection-water sensitivity studies
  - Design for Injection wells, including infectivity (bacteria etc), allocation approaches, and well fracturing.
  - Design for injector and production field piping layout design
  - Surface facilities for produced oil
  - Surface facilities for injection water
  - Surface facilities for produced
-