BEFORE THE STATE CORPORATION COMMISSION
OF THE STATE OF KANSAS

In the Matter of the Application of Merit Energy Company, LLC (Operator) for a permit to authorize the injection of saltwater into the Morrow formation At the WMSU #1602 well in Section 32, Township 34 South, Range 41 West, Morton County, Kansas.	)))))	Docket No. 23-CONS-3080-CUIC CONSERVATION DIVISION License No. 32446

PRE-FILED DIRECT TESTIMONY OF

NICHOLAS LAHUTSKY

MERIT ENERGY COMPANY, LLC

Q. Please state your name and business address for the record.

A. My name is Nicholas Lahutsky and my business address is 13727 Noel Rd. Suite 1200, Dallas, Texas 75240.

Q. What is your profession and who is your employer?

A. I am a senior reservoir engineer employed by Merit Energy Company. I have been in that position since 2017.

Q. Please summarize your educational background and work experience.

A. I hold a Bachelor of Science degree in Petroleum Engineering with Magna Cum Laude honors from Texas A&M University. I earned this degree in 2013. After graduation, I began work as a field engineer for EOG Resources in North Dakota developing unconventional assets in the Bakken field in a number of petroleum engineering related disciplines, including facilities, production, drilling and completion engineering, as well as onsite job supervision for workover rig and wireline operations. In 2017, I moved to Dallas to work at Merit Energy Company where I have managed and developed a range of conventional waterflood assets as a reservoir, drilling and production and facilities engineer.

Q. Are you familiar with the Application for Injection Well for the WMSU 1602 well filed in this docket on behalf of Merit Energy Company, LLC ("Application")?

A. Yes, it was filed at my direction. The Application seeks to amend enhanced oil recovery UIC permit number E-12,571 to add the WMSU 1602 well as an injection well. Merit would like to dually complete the WMSU 1602 for injection into the Morrow while continuing to produce gas from the Topeka and Wabaunsee formations.

Q. Is the subject matter of the Application within the scope of your responsibilities as Senior Reservoir Engineer at Merit Energy Company, LLC ("Merit")?

A. Yes. It is my primary responsibility to manage and grow reserves and production from waterfloods for Merit Energy. In my approximately 10 years of experience working as a Petroleum Engineer I have encountered many dual completions within a single wellbore. The purpose of a dual completion is to prevent the mixing of fluids from two different zones or reservoirs, while keeping both zones active within the same wellbore. This is something the industry has been able to successfully accomplish since the 1950's and is

used regularly in many basins. I have seen dual completions with both completions as injectors, both completions as producers, and cases where one completion is for injection while the other is for production. The latter scenario is what the Application in question seeks to accomplish. In all cases a packer and separate tubing string create isolation between the two completions in the well.

By utilizing the same wellbore for several purposes across multiple horizons the economic waste of drilling multiple wells to do each purpose is avoided.

Q. Can you elaborate on the purpose of the Application?

A. As a background, the subject well is currently known as the Pearson C-2, and produces 47 MCFD and 3 BWPD from the Topeka and Wabaunsee formations. The well is located within the boundaries of the Wilburton Morrow Sand Unit (WMSU) and remains completed in the Morrow formation below a cast iron bridge plug set in the well.

The Application seeks permission to dually complete the WMSU 1602 as producer of gas from the Topeka and Wabaunsee formations, and as an injector of water into the deeper Morrow formation. The objective is to increase the oil recovery from the WMSU, a waterflood dating back to the early 1960's operated by Merit, while continuing to produce the approximately 47 MCFD of natural gas production from the Topeka and Wabaunsee formations. If the application for dual completion is denied, then natural resource waste will occur if Merit plugs off the Topeka and Waubonsee gas production or forgoes the enhanced oil recovery related injection into the Morrow sand.

More specifically, water produced from the WMSU would be injected into the Morrow to support WMSU waterflood operations. By dually completing the well, Merit will be preventing waste through increased recovery of oil reserves from the WMSU. Waste will also be prevented in the Morrow formation by utilizing the wellbore to the fullest extent and optimizing the WMSU waterflood. By maintaining the completion in the Topeka and Wabaunsee formations, proven gas reserves can be simultaneously produced. If the Topeka and Wabaunsee formations were abandoned, those gas reserves would be wasted. It is not economically viable at current production of only 47 thousand cubic feet of natural gas per day to drill a twin well to create separate wellbores for the Topeka and Wabaunsee gas production and the Morrow injection.

Q. Can you describe how the WMSU 1602 is currently completed and equipped?

A. A wellbore schematic depicting the current engineering of the WMSU 1602 is attached as Exhibit M-1. The well is located in the NE/4 SE/4 of Section 32-T34S-R41W, Morton County, Kansas. The well was originally drilled in 1985 to a depth 5,011' and completed in the Upper Morrow formation with perforations between 4,868' – 4,872'. Subsequently in 1989, the Morrow formation was plugged off with a cast iron bridge plug set at 4,850' and the well was recompleted for gas production in the Topeka formation with multiple sets of perforations from 3,121' – 3,258'. In 2004, an additional set of Wabaunsee perforations were added from 2,872' – 2,897' for gas production. There is a 2-3/8" Tubing string set to a depth of 3,288' with a rod pump in order to pump the 3 barrels of water per day produced for disposal. The natural gas from the Topeka and Wabaunsee is produced up annulus between the tubing and 5.5" production casing.

The surface casing is 8-5/8" 24# pipe set to a depth of 1457' and cemented to surface. The production casing is 5.5" 14# pipe set to a depth of 5,010' and cemented with 175 sax for an original top of cement of 3,754'. In 1989, during the recompletion to the Topeka formation, 450 sax of cement were pumped through cement retainer squeeze holes in the production casing at 3,400'. According to the well history records a cement bond log was run April 7, 1989 to confirm the new top of cement behind the production casing to be 700'. This remedial cement work was required to ensure good behind pipe isolation for the Topeka and Wabaunsee natural gas production. A top of cement of 700' is well above the surface casing shoe at 1,457' and will ensure full zonal isolation for all depths behind the production casing.

Q. Can you describe how Merit proposes to recomplete and equip the WMSU 1602 as a dually completed well?

A. A wellbore schematic depicting the proposed engineering of the dually completed WMSU 1602 is attached as Exhibit M-2. Merit proposes to drill out the cement retainer set at 3,400' and the cast iron bridge plug set at 4,850'. Merit would then run a 2-1/16" Internally Plastic Coated (IPC) injection string of tubing on a packer set at 4,818'. The packer will be 50' above the Morrow sand perforations. The packer will prevent injected water from migrating up hole. A second 2-1/16" tubing string will be run to a depth of 3,310' with a

seat nipple to set a rod pump in to produce the 3 barrels of water per day from the Topeka and Wabaunsee. Gas will continue to be produced from the Topeka and Wabaunsee through the annulus between the tubing and production casing.

Q. Do Commission regulations allow for dually completed wells?

A. Yes, K.A.R. 82-3-401(b) expressly allows for dually completed wells, so long as the producing interval is above the injection interval, and the well demonstrates mechanical integrity above the producing interval. Additionally, 82-3-404(c) contains additional notice requirements for dually completed wells, and K.A.R. 82-3-407(a)(4) contains additional periodic monitoring and reporting requirements for dually completed wells. Specifically, fluid levels in the annulus in the production casing and within the injection tubing are to be measured during static conditions, and the oil-to-water ratio or changes in gas volume are to be measured. The measurements are to be reported to Commission staff once every three months during the first year of each five-year test cycle of the well, and annually during the subsequent four years of the five-year test cycle. Beyond that, Commission regulations generally governing injection wells also apply to dually completed wells.

An example of a well that had a dual completion in the WMSU inside the same two zones for which Merit seeks dual completion is the Gore D2 (API: 15-129-01004). The Gore D2 was drilled to a depth of 5,258' in 1962. This well is located approximately 4,750' from the WMSU 1602 that is the subject of the Application. The Gore D2 was dually completed as a Morrow sand producer and a Topeka natural gas producer. As dually completed, it was equipped with a packer and two 2-1/16" tubing strings to isolate the fluids. In 1974 the Commission approved a UIC application to allow the Operator to cease production from the Morrow and, rather, inject water into the Morrow sand as part of the enhanced oil recovery operation being conducted in the WMSU waterflood. This is essentially the same dual completion program that Merit seeks approval for in the present Application.

The Gore D2 dual completion remained active from 1974 until 1994, when the well was plugged back to produce only from the Chase formation. The three completion reports filed with the KCC from 1962, 1974, and 1994 are attached as Exhibit M-7.

Q. Commission Staff initially denied Merit's Application to dually complete the WMSU 1602 well. Do you have an understanding as to Commission Staff's reasons for denying the Application?

A. Yes. Staff has communicated essentially three concerns with the Application. First, the corrosiveness of the water produced from the Topeka formation. Second, an alleged lack of cement behind the production casing above the Topeka formation. Third, that there would be no way to demonstrate mechanical integrity above the Morrow and below the Topeka after the initial mechanical integrity test is conducted within the well.

Q. Have you attempted to address these concerns with Commission staff?

A. Yes. First, Merit attempted to demonstrate that the water from the Topeka is not corrosive. A water sample was taken and analyzed in a lab by Merit's chemical contractor, SGB Solutions. The sample is attached as Exhibit M-3. The water sample showed low levels of Iron and Manganese, which indicate that corrosion is not currently occurring. If corrosion was currently occurring on the production casing or tubing, then the metal that was being corroded would be present in the produced fluid in the form of iron and manganese cations. Additionally carbonate and iron sulfide levels were low, which indicates that the produced water from the Topeka has a low tendency to produce scale – or solid precipitates, which can cause corrosion. The water sample did contain a high chloride content of approximately 160,000 mg/L. For reference Ocean water has a chloride content of about 20,000 mg/L. Chlorides do not necessarily cause corrosion, and are more likely to precipitate as salt in the well according to SGB Solutions, the chemical contractor. Additionally, the fact that the Pearson C2 has been producing from the Topeka since 1985 without damage to the casing demonstrates that the produced water is in fact, not extremely corrosive.

Second, staff was not aware that Oxy, the predecessor operator of the well, conducted a remedial cement job and circulated cement from 3400', just below the Topeka perforations, to 700', well above the surface casing shoe. The top of cement at 700' is reported by Oxy's well history reports and on the recompletion form submitted to the KCC in 1989. The 1989 completion report is attached as Exhibit M-8. Oxy's report states that a Cement Bond Log was run on April 7, 1989 to confirm the top of cement, but that log cannot be found. Merit

has proposed to run a cement bond log during the recompletion work to demonstrate good cement quality as a condition of approval.

Third, Merit has offered to conduct conventional casing integrity tests on the intervals from the top of the Topeka to surface and from the top of the Morrow to the base of the Topeka to demonstrate mechanical integrity at all operative depths. This would be done utilizing a retrievable bridge plug and packer. This test would be completed as part of the work preparing the WMSU 1602 for injection and would be witnessed by a state representative. This work would meet the requirements of the dual completion regulations laid out in K.A.R. 82-3-407(b)(4)(A). In fact, what Merit is proposing exceeds the requirements for dually completed wells, because K.A.R. 82-3-401(b) only requires mechanical integrity be demonstrated above the producing interval, and not below that interval.

After the initial mechanical integrity test and injection into the Morrow Sand commences, Merit would follow the period reporting requirements for gas-to-water ratios and fluid level monitoring set forth in Commission regulations. If the packer, tubing, or casing began leaking, the injected fluid would immediately show up as a significantly increased gas-to-water ratio. By following the reporting guidelines spelled out in K.A.R. 82-3-407(b)(4)(B) mechanical integrity and isolation between the injection completion and production completion will be demonstrated.

Finally, Merit proposes to utilize a radioactive tracer survey on a 5 year basis in-lieu of a repeating the conventional pressure test. The radioactive tracer survey is an alternative method to demonstrate mechanical integrity that is expressly authorized by K.A.R. 82-3-407(a)(2).

For reference, I have attached K.A.R. 82-3-407 as Exhibit M-6.

Q. Can you explain how radioactive tracer testing works, and why you believe it is a superior way to demonstrate mechanical integrity?

A. A radioactive tracer survey is a common test performed in injection and disposal wells within the oil and gas industry that can determine where an injected fluid is going behind the casing. A radioactive solution is selectively released into the flow stream of the injected fluid under normal injection operations. A gamma ray detector located in a tool that is deployed via wireline is then lowered through the injection string, below the injection

packer, and past the perforations the water is entering. The gamma ray tool measures the level of radioactivity at various depths. A baseline measurement is taken before the radioactive tracer is injected. Then a second pass is taken after the tracer is injected to determine where fluid exited the casing. By comparing the two wireline measurements, Merit can determine the path that the injected fluid is taking even after the injected fluid exits the well through its perforations.

A standard pressure test can confirm that the casing does not have any leaks between the packer and surface wellhead, but does not provide any information as to the direction that the injected water is moving behind the casing. If cement quality has degraded behind the casing, the injected fluid can channel upwards and enter into a zone different than intended and the pressure test will not be able to detect that. The tracer would allow Merit to not only demonstrate casing integrity, but also confinement of fluid in the formations behind the casing. Again, doing this test below the producing interval exceeds the requirements of K.A.R. 82-3-401(b).

Q. Did the mitigating measures you proposed satisfy Commission Staff's concerns regarding the Application?

A. It is not entirely clear. Staff maintains that the high chloride levels in the Topeka means it is corrosive but does not seem to acknowledge that the well has been producing from the Topeka for 33 years without any problem. Beyond that, Staff would not commit to supporting the Application even if the cement bond log and conventional casing pressure test demonstrated good cement behind the producing casing and mechanical integrity. Because the cost to conduct these operations is approximately $45,000, Merit was not comfortable spending this money without any assurances the Application would be granted, and doing so could result in economic waste. Finally, staff has made no communication either way about the efficacy of gas-to-water ratio and fluid level reporting, and the use of the alternative mechanical integrity test prescribed by Commission regulations.

Q. Do you believe granting the Application presents a threat to freshwater?

A. No. Any threat to freshwater will be mitigated after demonstrating mechanical integrity of the wellbore via cement bond log, initial mechanical casing pressure tests, subsequent

radioactive tracer surveys, and regularly reporting the produced gas-to-water ratios of fluid levels of the gas producing formations

Q. Did Merit propose any other monitoring or testing requirements to demonstrate the WMSU 1602 does not present a threat to freshwater?

A. Yes. Merit's risk mitigation plan is attached as Exhibit M-4. This plan explicitly follows the guidelines outlined for dual completion injection wells laid out in KAR 82-3-407. Merit believes these guidelines to be well written by the Commission to provide adequate protection to shallow freshwater sources.

Q. K.A.R. 82-3-402 requires notice of the Application to be mailed to all offsets described in K.A.R. 82-3-135a(c), and published in the official county newspaper. Has Merit provided notice in accord with the K.A.R. 82-3-402?

A. Yes. Notice was published on June 16, 2022 in the Elkhart Tri-State Newspaper, and the publisher's affidavit is attached as Exhibit M-5. Notice to offsets was mailed contemporaneous with the Application, as evidenced therein.

Q. Is there any other information you would like to provide to the Commission concerning this Application?

A. I would like to summarize Merit's argument in support of approving the UIC permit to inject fluids into the Morrow Sand in the WMSU 1602. Achieving this goal will require a dual completion inside the wellbore, which is not the norm for injection wells but has significant amount of precedent within the industry. Indeed, the Gore D2 is a direct analog to what Merit seeks to accomplish. Merit does not believe the Commission would have adopted regulations regarding dually completed injection wells and historically approved similar projects if it were not permissible or possible to protect freshwater. The denial of the permit seems to be because of the dual completion, and not due to any known wellbore integrity issue. Therefore, Merit's position is that this Application should be granted on the condition that the wellbore pass a casing integrity test as described above, and a cement bond log shows top of cement above the shoe of the surface casing.

Q. Does this conclude your testimony?

A. Yes.

VERIFICATION

STATE OF TEXAS)
) ss:
COUNTY OF DALLAS)

Nick Lahutsky, being first duly sworn, deposes and says that he is the Nick Lahutsky referred to in the foregoing "PRE-FILED DIRECT TESTIMONY OF NICK LAHUTSKY" to be filed before the State Corporation Commission of the State of Kansas in Docket No. 23-CONS-3080-CUIC, and that the contents thereof are true and correct to the best of his information, knowledge, and belief.

Nick Lahutsky

SIGNED AND SWORN to before me on this 26TH day of January, 2023.

Notary Public

My Commission expires:

MATTHEW RETTKE
Notary Public, State of Texas
Comm. Expires 02-03-2025
Notary ID 126532019

MERIT ENERGY COMPANY

WELLBORE DIAGRAM

LEASE & WELL NO.	Pearson C-2/WMSU 1602	FORMER NAME	Odell U 2, WMSU 1602
FIELD NAME	Wilburton	COUNTY & STATE	Morton, KS
LOCATION	32 - 34S - 41W	API NO.	15-129-20675
		WBS DATE	8/31/2022 CIA

KB 11'

SURFACE CASING

SIZE	8 5/8"	WEIGHT	24.#	DEPTH	1457'
GRADE	K-55	SX. CMT.	800 sx	TOC	Surface

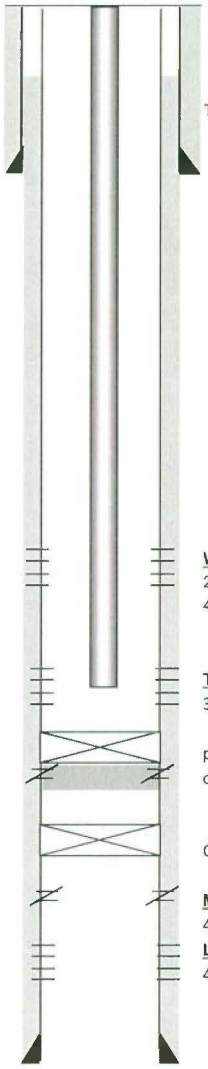
PRODUCTION CASING

SIZE	5 1/2"	WEIGHT	14.#	DEPTH	5010'
GRADE	K-55	SX. CMT.	175 sx	TOC	3754'
Remedial cement		SX. CMT.	450 sx	TOC	700'

PBTD@ 3300'
TD@ 5011'

TUBING (2/24/2012)
109 jts 2-3/8" tbg
SN @ 3273'
MA @ 3288'

RODS (2/28/2012)
1-1/2" x 16' PR w/ 8' PRL
8', 4', 4', 4' 5/8" rod subs
129 5/8" rods
2x1.25x12' RWBC
6' GA



TOC @ 700' - Cbl run 4/7/1989

Wabaunse (8/10/2004)
2895'-2897', 2886-2889', 2872'-2878'
4 spf

Topeka (4/11/1989) total 29' & 116 holes
3121'-25', 3130'-46', 3168'71', 3224'-26', 3242'-44', 3256'-58'

perf'd 4 sqz holes at 3400
circulated 450 sx cmt up to 700'

CIBP @ 4850'. Set 4/5/1989.

Morrow: **Squeezed 8/7/1985 w/ 112 sx cmt**
4868'-72'
L Morrow (8/10/85)
4915'-34' 4 SPF, 76 holes

EXHIBIT M-1

MERIT ENERGY COMPANY

WELLBORE DIAGRAM

LEASE & WELL NO.	Pearson C-2/WMSU 1602	FORMER NAME	Odell U 2, WMSU 1602	WI	100%
FIELD NAME	Wilburton	COUNTY & STATE	Morton, KS	NRI	88%
LOCATION	32 - 34S - 41W	API NO.	15-129-20675		
		WBS DATE	9/1/2022 CIA		

KB 11'

SURFACE CASING

SIZE	8 5/8"	WEIGHT	24.#	DEPTH	1457'
GRADE	K-55	SX. CMT.	800 sx	TOC	Surface

PRODUCTION CASING

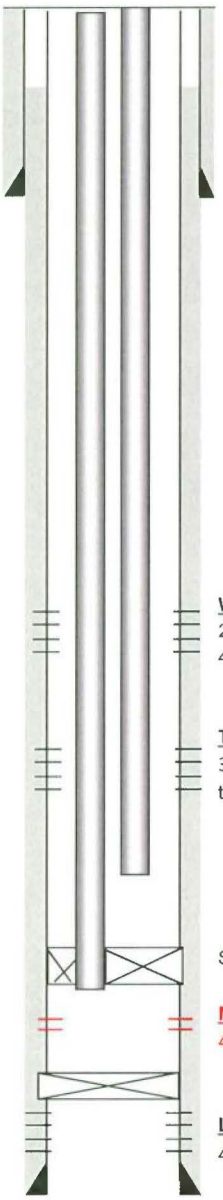
SIZE	5 1/2"	WEIGHT	14.#	DEPTH	5010'
GRADE	K-55	SX. CMT.	175 sx	TOC	3754'
Remedial cement		SX. CMT.	450 sx	TOC	700'

PBTD@ 3300'
TD@ 5011'

L. Morrow Tubing
~157 jts of fiberglass lined 2-1/16" IJ tbg
Pkr @ ~4865'

Topeka Tubing
~107 jts 2-1/16" IJ tbg
EOT @ 3310

Topeka Rods
~131 5/8" rods w/ slimhole boxes
.5" x 1.25" Insert pump



TOC @ 700' - Cbl run 4/7/1989

Wabaunse (8/10/2004)
2895'-2897', 2886-2889', 2872'-2878'
4 spf

Topeka (4/11/1989)
3121'-25', 3130'-46', 3168'71', 3224'-26', 3242'-44',
total 29' & 116 holes

Set pkr @ 4818'

Morrow (Recompletion)
4868'-72'

L Morrow (8/10/85)
4915'-34' 4 SPF, 76 holes

EXHIBIT M-2

MERIT ENERGY COMPANY

3256'-58'

1/23/2023

NTL

DownHole SAT®

FORMATION WATER CHEMISTRY INPUT

Merit Energy
Pearson C-2
Wellhead

Tripp Pool - SGB Rep
Prepared by SGB Solutions

Report Date: 12-12-2022
Sample #: 15156

Sampled: 12-05-2022 at 1047
Sample ID: WBaten

CATIONS		ANIONS	
Calcium (as Ca)	6690	Chloride (as Cl)	160630
Magnesium (as Mg)	1798	Sulfate (as SO_4)	622.00
Barium (as Ba)	69.00	Bromine (as Br)	0.00
Strontium (as Sr)	0.00	Dissolved CO_2 (as CO_2)	56.00
Sodium (as Na)	91592	Bicarbonate (as HCO_3)	100.00
Potassium (as K)	0.00	Carbonate (as CO_3)	0.00
Lithium (as Li)	0.00	Oxalic acid (as C_2O_4)	0.00
Ammonia (as NH_3)	0.00	Silica (as SiO_2)	0.00
Aluminum (as Al)	0.00	Phosphate(as PO_4)	0.00
Iron (as Fe)	9.88	H_2S (as H_2S)	0.00
Manganese (as Mn)	0.419	Fluoride (as F)	0.00
Zinc (as Zn)	0.00	Nitrate (as NO_3)	0.00
Lead (as Pb)	0.00	Boron (as B)	0.00

PARAMETERS

Calculated T.D.S.	243989
Molar Conductivity	476681
Resistivity	2.10
Sp.Gr.(g/mL)	1.16
Pressure(psia)	14.70
pCO_2(psia)	0.0176
pH_2S(atm)	0.00
Temperature (^oF)	70.00
pH	6.40

CORROSION RATE PREDICTION

CO_2 - H_2S Rate(mpy)	0.0139

COMMENTS All cations & anions are in mg/l

SGB Solutions
5918 S County Road 1273, Midland, TX 79706

EXHIBIT M-3

DownHole SAT®

FORMATION WATER
DEPOSITION POTENTIAL INDICATORS

Merit Energy
Pearson C-2
Wellhead

Tripp Pool - SGB Rep
Prepared by SGB Solutions

Report Date: 12-12-2022
Sample #: 15156

Sampled: 12-05-2022 at 1047
Sample ID: WBaten

SATURATION LEVEL	
Calcite ($CaCO_3$)	0.489
Aragonite ($CaCO_3$)	0.460
Witherite ($BaCO_3$)	< 0.001
Strontianite ($SrCO_3$)	0.00
Calcium oxalate (CaC_2O_4)	0.00
Magnesite ($MgCO_3$)	0.161
Anhydrite ($CaSO_4$)	0.292
Gypsum ($CaSO_4*2H_2O$)	0.353
Barite ($BaSO_4$)	66.67
Celestite ($SrSO_4$)	0.00
Fluorite (CaF_2)	0.00
Calcium phosphate	0.00
Hydroxyapatite	0.00
Silica (SiO_2)	0.00
Brucite ($Mg(OH)_2$)	< 0.001
Magnesium silicate	0.00
Iron hydroxide ($Fe(OH)_3$)	0.457
Strengite ($FePO_4*2H_2O$)	0.00
Siderite ($FeCO_3$)	0.244
Halite (NaCl)	0.356
Thenardite ($Na2SO_4$)	< 0.001
Iron sulfide (FeS)	0.00

MOMENTARY EXCESS (Lbs/1000 Barrels)	
Calcite ($CaCO_3$)	-0.00474
Aragonite ($CaCO_3$)	-0.00533
Witherite ($BaCO_3$)	-15.68
Strontianite ($SrCO_3$)	-9.09
Calcium oxalate (CaC_2O_4)	-0.00441
Magnesite ($MgCO_3$)	-0.0199
Anhydrite ($CaSO_4$)	-153.51
Gypsum ($CaSO_4*2H_2O$)	-131.94
Barite ($BaSO_4$)	39.90
Celestite ($SrSO_4$)	-277.73
Fluorite (CaF_2)	-2.09
Calcium phosphate	>-0.001
Hydroxyapatite	-232.53
Silica (SiO_2)	-24.16
Brucite ($Mg(OH)_2$)	< 0.001
Magnesium silicate	-80.29
Iron hydroxide ($Fe(OH)_3$)	< 0.001
Strengite ($FePO_4*2H_2O$)	>-0.001
Siderite ($FeCO_3$)	-0.0162
Halite (NaCl)	-54247
Thenardite ($Na2SO_4$)	-87481
Iron sulfide (FeS)	-0.438

SIMPLE INDICES	
Langelier	0.487
Ryznar	5.43
Puckorius	4.63
Larson-Skold Index	3031
Stiff Davis Index	0.480
Oddo-Tomson	-0.579

BOUND IONS	TOTAL	FREE
Calcium	6690	6582
Barium	69.00	69.00
Carbonate	5.16	0.00781
Phosphate	0.00	0.00
Sulfate	622.00	131.59

OPERATING CONDITIONS

Temperature (^0F)	70.00
Time(mins)	3.00

SGB Solutions
5918 S County Road 1273, Midland, TX 79706

BACKGROUND:

The Pearson C-2 (aka WMSU 1602) well currently produces from the Topeka formation at the rate of a 47 mcf/d and 3 barrels of water per day. The well is situated within the boundaries of the Wilburton Morrow Sand Unit (WMSU) and is also completed in the Morrow formation below a cast iron bridge plug. Merit would like to inject water produced from the WMSU into the Morrow to support the WMSU waterflood while continuing to produce gas from the Topeka formation above a packer, and accordingly has proposed to dually complete the Pearson C-2 in the Topeka and the Morrow by the U-1 Application submitted in Docket No. 23-CONS-3080-CUIC. By producing from the Topeka and injecting into the Morrow, Merit will be preventing waste in Topeka by continuing to produce economic gas reserves, and in the Morrow formation by fully utilizing the wellbore and optimizing the WMSU waterflood. A procedure for the work is attached along with the current wellbore diagram and proposed wellbore diagram.

ISSUE:

KCC staff initially denied the U-1 Application to dually complete the Pearson C-2 well for the various reasons stated in its letter dated August 8, 2022, which is on file in Docket No. 23-CONS-3080-CUIC. A video conference was held on October 12, 2022, to discuss staff concerns with the proposed dually completed well. After that conference, it is Merit's understanding that staff's primary concerns with the proposed engineering of the well is the presence of Topeka water resting inside the casing of the well above the packer that would isolate the Morrow injection zone.

PROPOSED MITIGATION:

Merit proposes dual completion of the Pearson C-2 well be considered under K.A.R. 82-3-403, and proposes the following mitigating measures to alleviates staff's concerns regarding the proposed engineering of the well.

Initially, Merit would establish the mechanical integrity of the well above the Topeka by conventional MIT. Then, the mechanical integrity between the base of the Topeka to the top of the injection zone (Morrow) would be established by conducting an MIT utilizing a packer set below the Topeka and a retrievable bridge plug set above the Morrow, which is consistent with the guidelines outlined in K.A.R. 82-3-407(b)(4)(A). Mechanical integrity of the wellbore has been maintained for the 33 years since the 1989 recompletion to Topeka production, indicating that the produced fluids and gas are not corrosive to the J55 grade casing and cement.

Subsequently, to continue to demonstrate mechanical integrity in the well, Merit proposes conducting the following periodic tests, which are consistent with the guidelines outlined in K.A.R. 82-3-407(a)(4) for dually completed injection wells:

1) Fluid level determination of the producing fluid level contained in the tubing-casing annulus that will be producing Topeka gas. The producing fluid level of the Topeka water will be monitored and kept below the lowest know freshwater source. This active monitoring will ensure produced or injected water does not enter any freshwater aquifers. Reporting frequency will be "performed once every three months during the first year of the well's five-year test cycle, and then once a year for the next four years. The repeat test cycle of quarterly reports for one year and annual reports for four years shall begin on the five-year anniversary of the first fluid level test." K.A.R. 82-3-407(a)(4)(C). Merit would also be willing to conduct this test on an ad hoc basis, at staff's request.

EXHIBIT M-4

Producing water-gas ratio of the Topeka gas completion will be monitored using monthly volumes. A significant deviation from the 3 barrels of water per day currently produced from the Topeka would indicate a casing leak or packer leak and require immediate well intervention. Reporting frequency will be "performed once every three months during the first year of the well's five-year test cycle, and then once a year for the next four years. The repeat test cycle of quarterly reports for one year and annual reports for four years shall begin on the five-year anniversary of the first fluid level test." *Id.*

2) Since subsequent mechanical integrity tests cannot be performed without an intervention, Merit proposes utilizing radioactive tracer, temperature, and velocity spinner surveys performed via wireline. These types of tests are expressly allowed pursuant to K.A.R. 82-3-407(a)(2), which provides:

> "(2) Alternate tests. Alternative test methods approved by the commission, including radioactive tracer surveys and temperature surveys, may be used to establish mechanical integrity if conditions are appropriate. The test shall be run at least once every five years under the supervision of a representative of the operator. The date for this test shall be mutually agreed upon by the operator's representative and a representative of the commission. Test results shall be verified by the operator's representative and shall be interpreted as specified in commission-approved procedures. A minimum of 25 percent of the tests conducted each year shall be witnessed by a representative of the commission."

Merit's preference would be to perform a radioactive tracer survey, which it believes to be more accurate and reliable than even a conventional pressure test. The first tracer survey will be completed at initial completion and subsequently completed every 5 years in lieu of a standard MIT.

Alternatively, if it would make staff more comfortable, Merit would be willing to conduct conventional pressure tests on the every five years. This would be done by pulling both strings of tubing and the packer from the well every 5 years to pressure test the casing as described above for the initial pressure test. This option is not preferable to Merit because it is more costly and will shorten the economic life of the dually complete wellbore, which will result in waste.

The recompletion form submitted to the KCC in 1989 is also included. It shows that before the Topeka was completed in 1989, a remedial cement job was performed to provide continuous cement across the producing interval as is required in KAR 82-3-403(b)(3). The top of cement in the wells is at 700' as is stated in the recompletion form and in the attached daily report from the job performed. Squeeze holes were shot at 3400' and the casing was cemented with 450 sacks of cement. A CBL was run and confirmed that the top of cement is at 700'. The top of cement being found to be above the shoe of the Surface casing ensures full wellbore isolation and that all freshwater aquifers are protected from either produced Topeka water or EOR injection fluids. Merit believes that the mechanical integrity of the casing can be confirmed and monitored using the steps proposed to ensure that the full isolation stays in place for the duration of the dual completion.

Proof of Publication

Notice of Filing Application

Legal Notice

First published in the Elkhart Tri-State News, Thursday, June 16, 2022.

BEFORE THE STATE CORPORATION COMMISSION OF THE STATE OF KANSAS
NOTICE OF FILING APPLICATION

RE: Merit Energy Company LLC- Applications for permit to authorize the injection of saltwater into the following wells located in Morton County, Kansas:

WMSU 1602W	NE-SE Sec. 32 T34S-R41W
WENU 1104W	SW-NW Sec. 33 T34S-R41W

TO: All Oil and Gas Producers, Unleased Minerals Interest Owners, Landowners, and all persons whomever concerned.

You, and each of you, are hereby notified that Merit Energy Company LLC, has filed an application for permit to authorize the Enhanced Recovery by injection of saltwater into the Morrow formations at the Wilburton Morrow Sand Unit, located in the section noted above in Morton County, Kansas, with a maximum operating pressure of 1,500 psi and a maximum injection rate of 3,500 bbls per day.

Any persons who object to or protest this application shall be required to file their objections or protests with the Conservation Division of the State Corporation Commission of the State of Kansas within thirty (30) days from the date of this publication. These protests shall be filed pursuant to Commission regulations and must state specific reasons why the grant of the application may cause waste violate correlative rights or pollute the natural resources of the State of Kansas.

All persons interested or concerned shall take notice of the foregoing and shall govern themselves accordingly.

Merit Energy Company
13727 Noel Road Suite 1200
Dallas, TX 75240
(972) 628-1660

Publication Fee $ 210.00

Clifford Blackmore

Being first duly sworn, deposes and says: that he is the Publisher of the ELKHART TRI-STATE NEWS, a weekly newspaper published in the State of Kansas, with a general paid circulation on a weekly basis in Morton County, Kansas, and that said newspaper is not a trade, religious or fraternal publication. Said newspaper is a weekly, published at least 50 times a year; and has been so published continuously and uninterruptedly in said county and state for a period of more than five years prior to the first publication of said notice; and has been admitted at the Post Office of Elkhart in said County as second class matter. That the attached notice is a true copy thereof and was published in the regular and entire issue of said newspaper, publications thereof being made as aforesaid on the following dates:

6/16	20 22	____	20 ___
____	20 ___	____	20 ___
____	20 ___	____	20 ___
____	20 ___	____	20 ___

C. F. Blackmore

Subscribed and Sworn to before me this 16 day of June 2022

NOTARY PUBLIC - State of Kansas
JAYME M. STRICKER
My Appt. Exp. 7/11/2025

Approved _____ 20 ___

_____
Clerk or Judge

EXHIBIT M-5

82-3-407. MECHANICAL INTEGRITY REQUIREMENTS; PENALTY.

(a) Each injection well shall be completed, equipped, operated, and maintained in a manner that will prevent pollution of fresh and usable water, prevent damage to sources of oil or gas, and confine fluids to the interval or intervals approved for injection.

An injection well shall be considered to have mechanical integrity if there are no significant leaks in the tubing, casing, or packer and no fluid movement into fresh or usable water. Mechanical integrity shall be established on each well by one of the following:

(1) Pressure test. The annulus above the packer, or the injection casing in wells not equipped with a packer, shall be pressure tested at least once every five years under the supervision of a representative of the operator. The date for this test shall be mutually agreed upon by the operator's representative and a representative of the commission. Test results shall be verified by the operator's representative. A minimum of 25 percent of the tests conducted each year shall be witnessed by a representative of the commission. The test shall be conducted in accordance with subsection (b). Injection wells within tubing shall be tested in accordance with K.A.R. 82-3-406.

(2) Alternate tests. Alternative test methods approved by the commission, including radioactive tracer surveys and temperature surveys, may be used to establish mechanical integrity if conditions are appropriate. The test shall be run at least once every five years under the supervision of a representative of the operator. The date for this test shall be mutually agreed upon by the operator's representative and a representative of the commission. Test results shall be verified by the operator's representative and shall be interpreted as specified in commission-approved procedures. A minimum of 25 percent of the tests conducted each year shall be witnessed by a representative of the commission.

(3) Monitoring. Once a month, the operator shall monitor and record, during actual injection, the pressure or fluid level in the annulus and any other information deemed necessary by the conservation division. An annual report of information logged shall be submitted to the conservation division in accordance with K.A.R. 82-3-409.

(4) Dually completed injection wells. For dually completed injection wells, the testing requirements shall include the following:

(A) The operator shall determine the fluid level in the annular space in the production casing and the fluid level within the injection tubing. All fluid level determinations shall be performed under static well conditions. The minimum shut-in time shall be 24 hours before determining the fluid level. Fluid level tapes shall be submitted as verification of measurements.

(B) The operator shall measure and report the oil-to-water ratio of produced fluids from the well. In the case of gas wells, the operator shall report changes in monthly production volumes.

(C) The fluid level determination and oil-to-water ratios shall be performed once every three months during the first year of the well's five-year test cycle, and then once a year for the next four years. The repeat test cycle of quarterly reports for one year and annual reports for four years shall begin on the five-year anniversary of the first fluid level test.

(b) Before operating a well drilled or converted to injection after December 8, 1982, an operator choosing to use a pressure test for the initial mechanical integrity test shall perform the test in the following manner:

(1) Wells constructed with tubing and a packer shall be pressure tested with the packer in place. A fluid pressure of 300 psig shall be applied. If the operator requests a pressure in excess of 300 psig on the injection application, a test pressure up to the requested pressure may be required. The duration of the test shall be at least 30 minutes. Maintenance of the fluid pressure during the test shall provide assurance of the integrity of the injection casing.

(2) For wells constructed with tubing and no packer, a retrievable plug or packer shall be set

immediately above the uppermost perforation or open hole zone. A fluid pressure of 300 psig shall be applied. The duration of the test shall be at least 30 minutes. Maintenance of the fluid pressure during the test shall provide assurance of the integrity of the injection casing.

(3) For wells constructed with tubing and no packer, a method of pressure testing known as fluid depression may be conducted with prior approval and under guidelines established by the appropriate district office. The fluid in the well shall be depressed with gas pressure to a point in the wellbore immediately above the perforations or open hole interval. The minimum calculated pressure required to depress the fluid in the wellbore shall be no less than 100 psig.

(4) For simultaneous injection wells, the following requirements shall be met:

(A) Mechanical integrity shall initially be demonstrated at a pressure of 300 psig before installation of downhole simultaneous injection equipment and shall be demonstrated in the same manner each time that the downhole simultaneous injection equipment is removed; and

(B) after the initial mechanical integrity test, the operator shall monitor the well once each month and record the oil-to-water or gas-to-water ratio. The operator shall report the oil-to-water or gas-to-water ratio to the commission within 30 days for the first month and then annually at the time of filing the annual report according to K.A.R. 82-3-409. The operator shall immediately report an oil-to-water or gas-to-water ratio at or in excess of 10% over the prior month's ratio to the appropriate district office.

(5) In lieu of paragraph (b)(3), the casing may be tested before perforating, upon approval of the conservation division. A fluid pressure of 300 psig shall be applied. If the operator requests a pressure in excess of 300 psig on the injection application, a test pressure up to the requested pressure may be required. The duration of the test shall be at least 30 minutes. Maintenance of the fluid pressure during the test shall provide assurance of the integrity of the injection casing.

(c) The operator of any well failing to demonstrate mechanical integrity by one of the above methods shall have no more than 90 days from the date of initial failure in which to perform one of the following:

(1) Repair and retest the well to demonstrate mechanical integrity;

(2) plug the well; or

(3) isolate the leak or leaks to demonstrate that the well will not pose a threat to fresh or usable water resources or endanger correlative rights.

(d) Mechanical failures or other conditions indicating that a well is not, or may not be, directing the injected fluid into the permitted or authorized zone shall be cause to shut in the well. The operator shall orally notify the conservation division of any of these failures or conditions within 24 hours of knowledge of any failure or condition. The operator shall submit written notice of a well failure to the conservation division within five days of the occurrence together with a plan for testing and repairing the well. Results of the testing and well repair shall be reported to the conservation division, and all information shall be included in the annual monitoring report to the conservation division. Any mechanical downhole well repair performed on the well that was not previously reported shall also be included in the annual report.

(e) If the district office has approved the use of any chemical sealant or other mechanical device to isolate the leak before use, the injection pressure into the well shall not exceed the maximum mechanical integrity test pressure. Additionally, the well shall demonstrate mechanical integrity on an annual basis for the duration the well is completed in this manner.

(f) Each operator choosing a pressure mechanical integrity test on a well permitted for injection before December 8, 1982 or on a well having passed an initial pressure mechanical integrity test as specified in subsection (b) shall conduct the test in the following manner:

(1) Wells located in areas having saltwater bearing zones with sufficient bottom hole

(1) Wells located in areas having saltwater-bearing zones with sufficient bottom-hole pressure to sustain a static fluid level at or above fresh or usable water bearing zones shall be pressure tested as specified in paragraphs (b)(1) and (2), except that the maximum required test pressure shall be limited to 300 psi.

(2) Wells located in areas without saltwater-bearing zones with sufficient bottom-hole pressure to sustain a static fluid level at or above fresh or usable water bearing zones shall be pressure tested as specified in paragraphs (b)(1) and (2), except that the maximum required test pressure shall be limited to 100 psi.

(3) For wells constructed with tubing and no packer, a method of pressure testing known as fluid depression may be conducted with prior approval and under guidelines established by the commission. The fluid in the well shall be depressed with gas pressure to a point in the wellbore immediately above the perforations or open hole interval. The minimum calculated pressure required to depress the fluid in the wellbore shall be no less than 100 psi unless otherwise approved by the appropriate district office.

(g) No injection well shall be operated before having passed a mechanical integrity test. The operator's failure to test a well to show its mechanical integrity or to report the oil-to-water or gas-to-water ratio as required under paragraph (b)(4)(B) above shall be punishable by a $1,000 penalty, and these wells shall be shut in until the required test has been passed or the reports have been furnished.

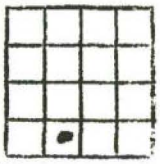
Company. CITIES SERVICE PETROLEUM CO.
Farm. Gore "D" No. 2

SEC. 4 T. 35 R. 41W
C SE SW

4-35-41W

Total Depth. 5258'
Comm. 1-17-62 Comp. 2-5-62
Shot or Treated.
Contractor. Lohmann-Johnson
Issued. 6-23-62

County Morton
KANSAS



Elevation. 3502' DF

CASING:
8 5/8" 1504'
5 1/2" 4981' cem w/300 sx.

Production. 61 BO & 57 BWPD/Top
475 BOPD/U. Morr.

Figures Indicate Bottom of Formations.

sand, shale	163
sand, red bed, gyp	670
red bed	885
gyp	955
red rock, shale, gyp	1024
red bed, shale, gyp	1045
sand, shale	1464
sand, shale	1494
Anhydrite	1505
Anhydrite, gry dolomite	1580
red rock, shale	1790
shale	2650
shale, lime	2658
lime, shale	2890
shale, lime	3125
lime	3196
lime, sand, shale	3207
lime, shale	3236
lime	3335
lime, shale	3478
lime	3808
shale, lime	3913
lime	4018
shaly lime	4098
lime	4206
lime, shale	4360
lime	4422
lime, shale	4664
lime	4713
limy shale	4849
shale	4902
sand, shale	4920
shale, lime	4930
shale, sdy shale	5032
shale	5162
sand	5175
shale, sand	5258
Total Depth	

TOPS: SCOUT	
Topeka	3128
Gr. Lansing	3424
Heebner	3528
Lansing	3682
Marmaton	3956
Morrow	4776
Snd	4902-42
	4978-88
	5168-84
	5190-5250

EXHIBIT M-7

State Geological Survey — RECOMPLETION -
WICHITA, BRANCH

4-35-41 WW

REVISED
KANSAS DRILLERS LOG

Dual Completed WMSU 2302 Wtr Inj and Gore D-2 Topeka Gas Well

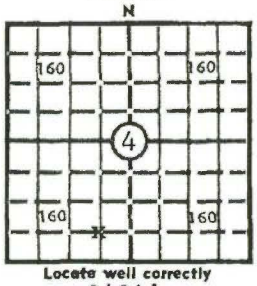
API No. 15 — ___ (County) — ___ (Number)

S. 4 T. 35S R. 41 ~~E~~ W

Loc. C SE SW

County Morton

640 Acres
N



Locate well correctly

Elev.: Gr. 3494'

DF ---- KB ----

Operator	
Cities Service Oil Company	
Address	
3545 N.W. 58th, Oklahoma City, Oklahoma 73112	
Well No.	**Lease Name**
2302W	WIBURTON MORROW "C" UNIT
Footage Location	
660 feet from ~~N~~ (S) line	1980 feet from ~~E~~ (W) line
Principal Contractor	**Geologist**
---	---
Spud Date	**Total Depth** / **P.B.T.D.**
---	5258' / 4945'
Date Completed	**Oil Purchaser**
January 8, 1974	---

CASING RECORD

Report of all strings set — surface, intermediate, production, etc.

Purpose of string	Size hole drilled	Size casing set (in O.D.)	Weight lbs/ft.	Setting depth	Type cement	Sacks	Type and percent additives
Surface	12-1/4"	8-5/8"	24	1504'	Common	975	---
Intermediate	7-1/4"	5-1/2"	14	4982'	Pozmix	300	w/75# flocele & 4% gel

LINER RECORD

Top, ft.	Bottom, ft.	Sacks cement
---	---	---

TUBING RECORD

Size	Setting depth	Packer set at
2-1/16"	4840'	4856'KB

PERFORATION RECORD

Shots per ft.	Size & type	Depth interval
5	.57 J	4906-12'
20	.57 J	4917-22'
2	.57 J	4932-40'

ACID, FRACTURE, SHOT, CEMENT SQUEEZE RECORD

Amount and kind of material used	Depth interval treated
Acidized w/Dowell 15% HCl & BDA approximately 3250 gals	Same @ Perf record

INITIAL PRODUCTION

Date of first ~~production~~ injection	Producing method (flowing, pumping, gas lift, etc.)
December 14, 1973	injecting

RATE OF PRODUCTION PER 24 HOURS	Oil	Gas	Water	Gas-oil ratio
	--- bbls.	--- MCF	Injecting 1100 bbls.	--- CFPB

Disposition of gas (vented, used on lease or sold)	Producing interval(s)
N.A.	same as Perf record

INSTRUCTIONS: As provided in KCC Rule 82-2-125, within 90 days after completion of a well, one completed copy of this Drillers Log shall be transmitted to the State Geological Survey of Kansas, 4150 Monroe Street, Wichita, Kansas 67209. Copies of this form are available from the Conservation Division, State Corporation Commission, 3830 So. Meridian (P.O. Box 17027), Wichita, Kansas 66217. Phone AC 316-522-2206. If confidential custody is desired, please note Rule 82-2-125. Drillers Logs will be on open file in the Oil and Gas Division, State Geological Survey of Kansas, Lawrence, Kansas 66044.

C-10-1972

Operator
Cities Service Oil Company

DESIGNATE TYPE OF COMP.: OIL, GAS, DRY HOLE, SWDW, ETC.:
Injection (Wtr.)

Well No.
2302 W

Lease Name
WILBURTON MORROW "C" SAND UNIT

S 4 T 35S R 41 ~~E~~ W

WELL LOG

Show all important zones of porosity and contents thereof; cored intervals, and all drill-stem tests, including depth interval tested, cushion used, time tool open, flowing and shut-in pressures, and recoveries.

SHOW GEOLOGICAL MARKERS, LOGS RUN, OR OTHER DESCRIPTIVE INFORMATION.

FORMATION DESCRIPTION, CONTENTS, ETC.	TOP	BOTTOM	NAME	DEPTH
Sand & Shale	0	163		
Sand, Red Bed & Gyp	163	670		
Red Bed	670	885		
Gyp	885	955		
Red Rock, Shale & Gyp	955	1045		
Sand & Shale	1045	1494		
Anhydrite	1494	1505		
Anhyd-Gray Dolomite	1504	1580		
Red Rock & Shale	1580	1790		
Shale	1790	2615		
Shale & Lime	2615	3125		
Lime	3125	3196		
Lime, Sand & Shale	3196	3335	NOTE: Taken from original drilling report.	
Lime & Shale	3335	3478		
Lime	3478	3808		
Shale & Lime	3808	3913		
Lime	3913	4018		
Shale & Lime	4018	4098		
Lime	4098	4206		
Lime & Shale	4206	4360		
Lime	4360	4422		
Lime Shale	4422	4664		
Lime	4664	4713		
Lime - Shale	4713	4849		
Shale	4849	4902		
Shale & Lime	4902	4930		
Shale & Sdy Shale	4930	5032		
Shale	5032	5162		
Sand	5162	5175		
Shale & Sand	5175	5258		
T.D.	5258			

USE ADDITIONAL SHEETS, IF NECESSARY, TO COMPLETE WELL RECORD.

Date Received
1974
RECEIVED
STATE GEOLOGICAL SURVEY OF KANSAS

H E Massey
Signature
H. E. Massey

Operations Manager - Mid-Continent South Region
Title

January 14, 1974
Date

REVISED
WELL RECORD

State Geological Survey
WICHITA, BRANCH

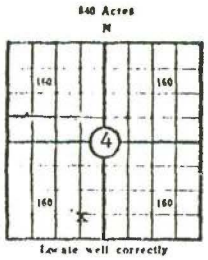
RECOMPLETE TO INJECTION WELL -

4-35-41W

KANSAS CORPORATION COMMISSION

WELL RECORD

(Mail to Kansas Geological Survey, 4150 Monroe Street, Wichita, Kansas 67209)



Lease Name: WILBURTON MORROW "C" UNIT Well No. 2302
Well Located:
C SE SW SEC 4 TWP 35S RGE 41W
Operator: Cities Service Oil Company
Address: 3545 N.W. 58th St., Oklahoma City, Okla. 73112
Elevation: Ground 3494' D.F. K.B.
Type Well: (Oil, gas, dry hole) Injection

Re-Completion ~~Drilling~~ Commenced: 10/8 1973
Well Completed: 1/8 1974
Initial Production:

Re-Completion ~~Drilling~~ Completed: 1/8 1974
Total Depth 5258', PBTD 4945'

Casing Record

Size:	8-5/8"	Set at 1504'	Size:		Set at
Size:	5-1/2"	Set at 4982'	Size:		Set at

Liner Record

Size: Packer Set ~~from~~ @ 4856'KB ~~To~~ 12/6/73

Cementing

Casing Size	Sacks	Type Cement and Additives
8-5/8"	975	Common Cement (Set 1/19/62)
5-1/2"	300	Cement (Pozmis w/75# flocele & 4% gel, set 2/7/62)

Perforations

Formation	Perforated Interval and Number Shots
Morrow "C"	4906-12'24 jets)
Morrow "C"	4917-22'20 jets) Re-acidized 10/11/73
Morrow "C"	4932-40'40 jets)

Electric Log Run. (Show type log and depths covered)

(Fill in formation and related information on reverse side)

NOTE: Dually completed as Morrow "C" injection well and Topeka gas well.
(1) Morrow "C" - WMSU 2302W
(2) Topeka - Gore D-2

4-35-4w

FORMATION, TESTING AND COMPLETION RECORD

Formation	Top	Bottom	Show Drill Stem Tests, Well Stimulation and Production Tests
Sand & Shale	0	163	
Sand,Red Bed & Gyp	163	670	
Red Bed	670	885	
Gyp	885	955	
RedRock,Shale &Gyp	955	1045	
Sand & Shale	1045	1494	
Anhydrite	1494	1505	
Anhyd-Gray Dolo	1504	1580	
Red Rock & Shale	1580	1790	
Shale	1790	2615	
Shale & Lime	2615	3125	
Lime	3125	3196	
Lime,Sand & Shale	3196	3335	
Lime & Shale	3335	3478	
Lime	3478	3808	
Shale & Lime	3808	3913	
Lime	3913	4018	NOTE: Taken from original drilling report.
Shale & Lime	4018	4098	
Lime	4098	4206	
Lime & Shale	4206	4360	
Lime	4360	4422	
Lime & Shale	4422	4664	
Lime	4664	4713	
Lime - Shale	4713	4849	
Shale	4849	4902	
Shale & Lime	4902	4930	
Shale & SdyShale	4930	5032	
Shale	5032	5162	
Sand	5162	5175	
Shale & Sand	5175	5258	
T.D.	5258		

State Geological Survey C-4
WICHITA, BRANCH

4-35-41W

REVISED
TWO-ZONE COMPLETION RECORD

DOCKET NO. 99,287-C
(C-17,111)
DATED: September 28, 1973

OPERATOR Cities Service Oil Company LOCATION OF WELL:
LEASE WILBURTON MORROW "C" UNIT 2302W GORE D-2 660 ft. From South Line
Well Number --- 1980 ft. From West Line
of the SW/4 of Sec. 4 T. 35S R. 41W
COUNTY Morton POOL Wilburton
UPPER PRODUCING FORMATION Topeka Greenwood TOP 3186' BASE 3266'
LOWER PRODUCING FORMATION Morrow "C" TOP 4906' BASE 4940'
DATE OF Re-COMPLETION January 8, 1974

CASING RECORD

Length	Size	Weight	Condition	Cement	Size Hole	Est. Height of Cement
1504	8-5/8"	24#	A	975	12-1/4	Circulated
4982	5-1/2"	14#	B-1966 A-3016	300	7-7/8	2390

* If liner, show top and bottom.

Description of Packer: Baker 5-1/2" plastic coated Lok-set packer

WHERE SET: TOP 4856 'KB BOTTOM 4859.7' DATE SET December 6, 1973

PERFORATING RECORD

Size Holes	Number of Holes	From	To	Date	By
Jets	40	4906	4912	2/13/62	McCullough
Jets	20	4917	4922	2/13/62	McCullough
Jets	24	4932	4940	2/13/62	McCullough
Frac Notch	--	3302	--	2/27/62	McCullough (squeezed off 10/24/71)
Jets	20	3216	3216	10/11/73	McCullough
Jets	8	3262	3266	10/11/73	McCullough

REVISED
ACID RECORD

Formation	Amount Acid	Date	By
Morrow (4906-12) (4917-22)	500 gals	10/11/73	Dowell
Morrow (4932-40)	500 gals	10/10/73	Dowell
(4932-40)	500 gals	11/15/73	Dowell
(4932-40)	750 gals	11/16/73	Dowell
Morrow (4906-40)	1000 gals (2 stages)	11/21/73	Dowell
Topeka (3216-26)	500 gals	10/17/73	Dowell
(3216-26)	6000 gals	10/18/73	Dowell
Topeka (3262-66)	500 gals	10/13/73	Dowell
(3262-66)	4000 gals	10/15/73	Dowell
Topeka (3216-66)	500 gals	11/24/73	Dowell
Topeka (3262-66)	500 gals	11/25/73	Dowell
Topeka (3216-26)	500 gals	11/25/73	Dowell
Topeka (3262-66)	5000 gals	11/27/73	Dowell
Topeka (3216-26)	7000 gals	11/30/73	Dowell

4-35-41w

PRODUCTIVITY RECORD

FORMATION	INITIAL	DATE	CURRENT	DATE
Morrow C	(Inj) 441 Bbls Wtr	12/14/73	1115 BW	1/8/74
Topeka	CAOF 2505 MCF	1/8/74	---	---

TUBING & EQUIPMENT RECORD

When Producing from Above Packer Greenwood (Topeka)

100 Jts. 1½" 2.75 10rd I.J. tbg	3,243.16'
1 Seating Nipple	.96'
1 Mud Anchor	17.20'
TOTAL	3,261.32'

Set @ 3272'KB

When ~~Producing~~ Injecting From Below Packer Wilburton (Morrow)

152 Jts. 2-1/16" 3.4# J-55 I.J. Duo-lined tbg	4,851.06'
1 Baker Loc-Set 5½" Plastic coated packer	3.70'
1 2-1/16" chgover cplg	.75'
1 2-1/16"-2-3/8" upset chgover cplg	.42'
TOTAL	4,855.93'

Pkr. set @ 4856' K.B.

REMARKS:

WITNESSES:

For State Gilbert P Lesker

For Operator Robert E. Guerin

For Offset _____

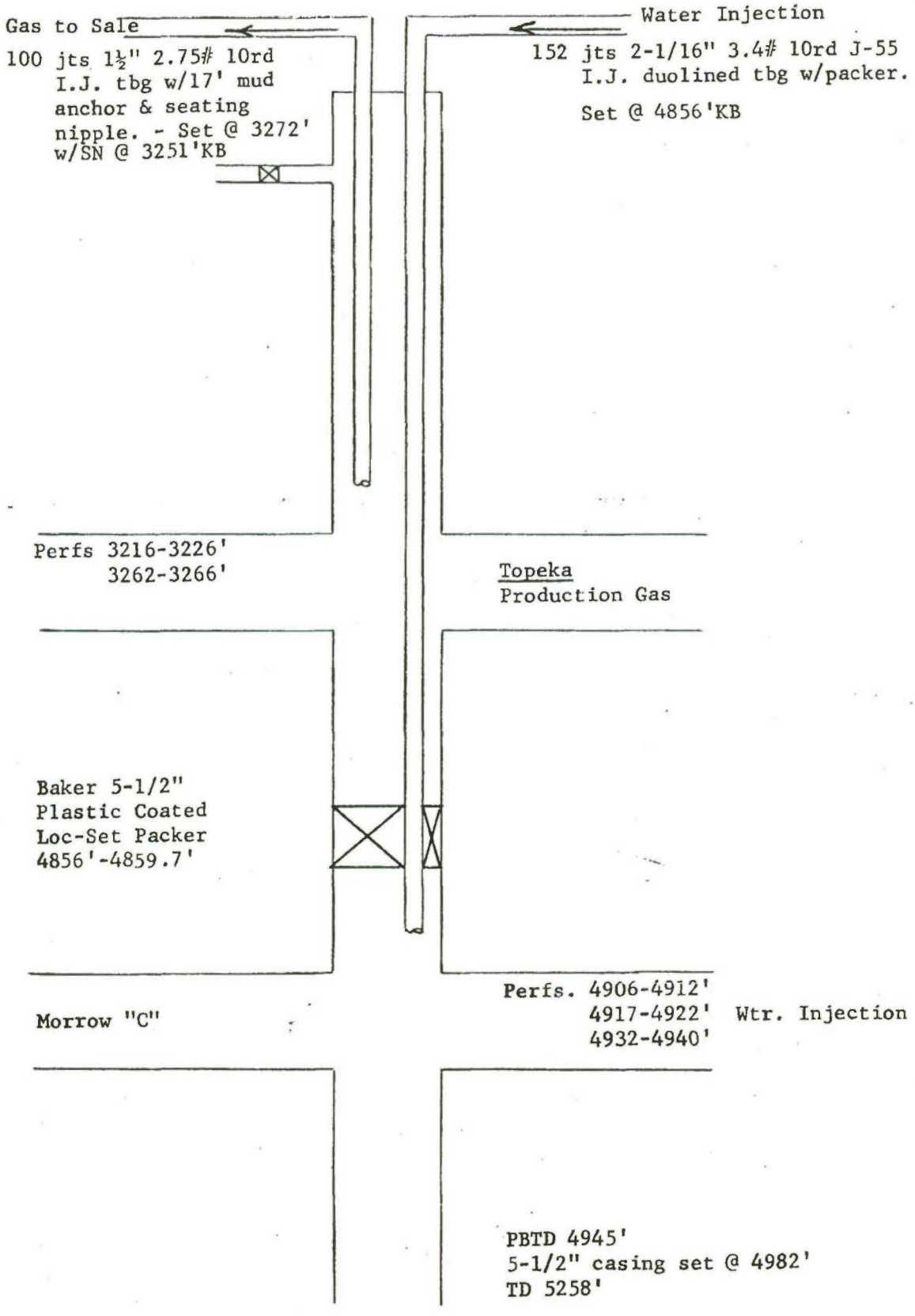
REVISED

WILBURTON MORROW "C" UNIT 2302W Water Injection
GORE D-2 Topeka Gas Production

4-35-41W

C SE SW Section 4-35S-41W - Morton County, Kansas

DIAGRAMMATIC SKETCH SHOWING MULTIPLE COMPLETION INSTALLATION



4-35-41W

WICHITA, BRANCH

PLAT AND CERTIFICATION OF ACREAGE ATTRIBUTABLE TO A GAS WELL

State Corporation Commission, Conservation Division
~~200 X Main X Building, X 212 N. Market X Wichita, Kansas X 67202~~
P. O. Box 17027, Wichita, Kansas 67217

OPERATOR Cities Service Oil Company

LEASE GORE D

WELL NUMBER 2

FIELD Greenwood

LOCATION OF WELL

660 feet from the South line
1980 feet from the West line
Of the SW/4 of Sec. 4 T. 35SR. 41W

COUNTY Morton

ORDER GRANTING ALLOWABLE ENTERED IN DOCKET NO. 99,287-C (C-17,111)

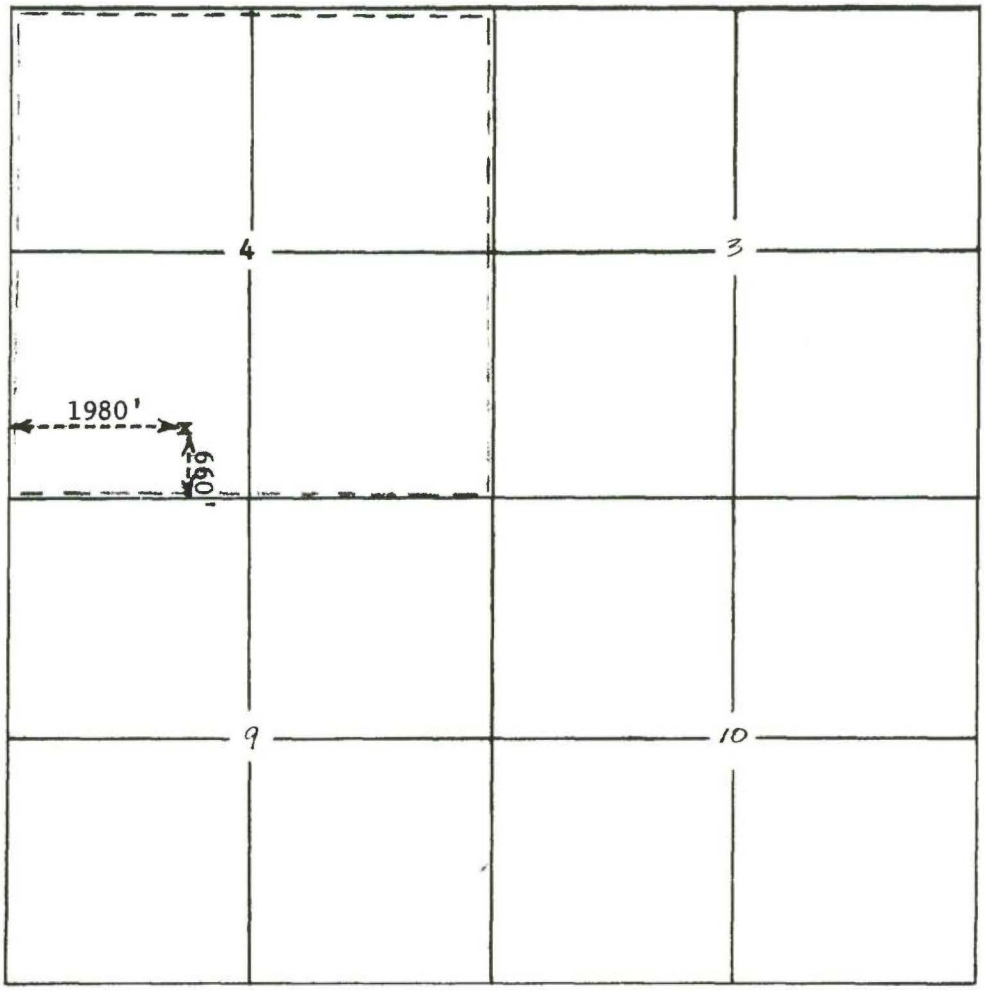
NUMBER OF ACRES ATTRIBUTABLE TO WELL 640

DESCRIPTION OF ACREAGE:

RECEIVED
1974
STATE GEOLOGICAL SURVEY OF KANSAS

P L A T

(Show location of Well and outline attributable acreage)



The undersigned hereby certifies that he is H. E. Massey for Cities Service Oil Company, a duly authorized agent, that all information shown hereon is true and correct to the best of his knowledge and belief, and that all acreage claimed as attributable to the well named herein is held by production from that well.

H.E.Massey
Operations Manager

FORM MUST BE TYPED

SIDE ONE

STATE CORPORATION COMMISSION OF KANSAS
OIL & GAS CONSERVATION DIVISION
WELL COMPLETION FORM
ACO-1 WELL HISTORY
DESCRIPTION OF WELL AND LEASE

API NO. 15- 129-01004-0003 ORIGINAL

Operator: License # 5447

Name: OXY USA Inc.

Address P. O. Box 26100

City/State/Zip Oklahoma City, Ok 73126-0100

Purchaser: Northern Natural

Operator Contact Person: Jerry Ledlow

Phone (405) 749-2309

Contractor: Name: Cheyenne

License: 5382

Wellsite Geologist:

Designate Type of Completion
____ New Well ____ Re-Entry __X__ Workover

____ Oil ____ SWD ____ SIOW ____ Temp. Abd.
__X__ Gas ____ ENHR ____ SIGW
____ Dry ____ Other (Core, WSW, Expl., Cathodic, etc)

If Workover:

Operator: OXY USA Inc

Well Name: Wilburtn Mor C SU #2302W

Comp. Date 2/20/62 Old Total Depth 5258

__X__ RENAMED & RENUMBERED
____ Deepening __X__ Re-perf. ____ Conv. to Inj/SWD
__X__ Plug Back 2941 PBTD
____ Commingled Docket No.
____ Dual Completion Docket No.
____ Other (SWD or Inj?) Docket No.

WO 8 /10/94 Spud Date OF START OF WORKOVER | Date Reached TD | WO 11/23/94 Completion Date OF WORKOVER

County Morton

____E
____-__C__-__SE__-__SW__ Sec. __4__ Twp. __35S__ Rge. ___41 __X__W

____660____ Feet from (S)/X (circle one) Line of Section

____3300____ Feet from (E)/W (circle one) Line of Section

Footages Calculated from Nearest Outside Section Corner:
XX, (SE), NW or SW (circle one)

Lease Name Crawley A Well # 2

Field Name Hugoton

Producing Formation Chase

Elevation: Ground 3494 KB 3502

Total Depth 5258 PBTD 2941

Amount of Surface Pipe Set and Cemented at _____ Feet

Multiple Stage Cementing Collar Used? _____ Yes __X__ No

If yes, show depth set _____ Feet

If Alternate II completion, cement circulated from _____

feet depth to _____ w/ _____ sx cmt.

Drilling Fluid Management Plan REWORK JH 10-12-95
(Data must be collected from the Reserve Pit)

Chloride content _____ppm Fluid volume _____bbls

Dewatering method used Evaporation

Location of fluid disposal if hauled offsite:

Operator Name

Lease Name License No.

____ Quarter Sec.____ Twp.____S Rng.____E/W

County Docket No.

INSTRUCTIONS: An original and two copies of this form shall be filed with the Kansas Corporation Commission, 130 S. Market Room 2078, Wichita, Kansas 67202, within 120 days of the spud date, recompletion, workover or conversion of a well. Rule 82-3-130, 82-3-106 and 82-3-107 apply. Information on side two of this form will be held confidential for a period of 12 months if requested in writing and submitted with the form (see rule 82-3-107 for confidentiality in excess of 12 months). **One copy of all wireline logs and geologist well report shall be attached with this form. ALL CEMENTING TICKETS MUST BE ATTACHED.** Submit CP-4 form with all plugged wells. Submit CP-111 form with all temporarily abandoned wells.

All requirements of the statutes, rules and regulations promulgated to regulate the oil and gas industry have been fully complied with and the statements herein are complete and correct to the best of my knowledge.

Signature

Title Staff Analyst Date 2/24/95

Subscribed and sworn to before me this 24th day of February, 19 95

Notary Public Tammy L Padilla

Date Commission Expires 8-21-96

K.C.C. OFFICE USE ONLY
F ✓ Letter of Confidentiality Attached
C ✓ Wireline Log Received
C ____ Geologist Report Received

Distribution
✓ KCC ____ SWD/Rep ____ NGPA
____ KGS ____ Plug ____ Other (Specify)

RECEIVED
STATE CORPORATION COMMISSION
3-1-95
MAR 01 1995
CONSERVATION DIVISION

Form ACO-1 (7-91)

C:\DATA\WPFILES\KCCCOMP\WC_.HUG

SIDE TWO

Operator Name OXY USA Inc. Lease Name Crawley A Well # 2

Sec. 4 Twp. 35S Rge. 41 ☐ East ☒ West County Morton

INSTRUCTIONS: Show important tops and base of formations penetrated. Detail all cores. Report all drill stem tests giving interval tested, time tool open and closed, flowing and shut-in pressures, whether shut-in pressure reached static level, hydrostatic pressures, bottom hole temperature, fluid recovery, and flow rates if gas to surface during test. Attach extra sheet if more space is needed. Attach copy of log.

Drill Stem Tests Taken (Attach Additional Sheets.)	☐ Yes	☒ No	☐ Log	☐ Sample
Samples Sent to Geological Survey	☐ Yes	☒ No		
Cores Taken	☐ Yes	☒ No		
Electric Log Run (Submit Copy.)	☒ Yes	☐ No		

List All E.Logs Run:

Compensated Neutron

Formation (Top), Depth and Datums

Name | Top | Datum

CASING RECORD ☒ New ☐ Used

Report all strings set-conductor, surface, intermediate, production, etc.

Purpose of String	Size Hole Drilled	Size Casing Set (In O.D.)	Weight Lbs./Ft.	Setting Depth	Type of Cement	# Sacks Used	Type and Percent Additives
Surface	12 1/4"	8 5/8"	24	1504	C		
Production	7 3/4"	5 1/2"	14	4982	C		

ADDITIONAL CEMENTING/SQUEEZE RECORD

Purpose:	Depth Top	Bottom	Type of Cement	#Sacks Used	Type and Percent Additives
_X_ Perforate	2365		65/35 C	150	6% gel
____ Protect Casing			50/50 C	165	2% gel
____ Plug Back TD			H	50	
____ Plug Off Zone					

Shots Per Foot	PERFORATION RECORD - Bridge Plugs Set/Type Specify Footage of Each Interval Perforated	Acid, Fracture, Shot, Cement Squeeze Record (Amount and Kind of Material Used)	Depth
	CIBP @ 4850 2sks cmt., CIBP @ 2950 2 sks cmt	Acidize w/1500 gal 15 % HCL	2252-62
4	2252-62	Treated w/671 bbls 1% KCLW, 2000#	
		40/70 sand & 30,000 gal fluid 46,000#	
		20/40 sand.	

TUBING RECORD	Size	Set At	Packer At	Liner Run
	2 3/8	2365		☐ Yes ☒ No

Date of First, Resumed Production, SWD or Inj.	Producing Method
11/18/94	☐ Flowing ☒ Pumping ☐ Gas Lift ☐ Other (Explain)

Estimated Production Per 24 Hours	Oil Bbls.	Gas Mcf	Water Bbls.	Gas-Oil Ratio	Gravity
		560			

Disposition of Gas: **METHOD OF COMPLETION**

☐ Vented ☐ Sold ☐ Used on Lease (If vented, submit ACO-18.)

☐ Open Hole ☒ Perf. ☐ Dually Comp. ☐ Commingled

☐ Other (Specify) _____

Production Interval 2252-2262

C:\DATA\WPFILES\KCCCOMP\WC_.HUG

SIDE ONE

STATE CORPORATION COMMISSION OF KANSAS
OIL & GAS CONSERVATION DIVISION
RECOMPLETION FORM
ACO-2 AMENDMENT TO WELL HISTORY

API NO. 15- 129-20675-00-01

County Morton

CNE/4 SE/4 Sec. 32 Twp. 34 Rge. 41 X East ___ West

1980 Ft. North from Southeast Corner of Section

660 Ft. West from Southeast Corner of Section

(NOTE: Locate well in section plat below.)

Operator: License # 5447

Name: OXY USA Inc.

Address: P. O. Box 26100

City/State/Zip: Okla. City, OK 73126-0100

(Formerly named Odell U #2)

Lease Name Pearson C Well # 2

Field Name Greenwood

Producing Formation Topeka

Elevation: Ground 3464' KB Unknown

Purchaser: OXY NGL

Operator Contact Person: Raymond Hui
Phone: (405) 749-2471

Designate Type of Original Completion
___ New Well ___ Re-Entry X Workover

Date of Original Completion 9-10-85

Name of Original Operator Cities Service Oil & Gas Corp.

Original Well Name Odell U #2

Date of Recompletion:

4-4-89 Commenced

9-26-89 Completed

Re-entry ☐ Workover ☒

Designate Type of Recompletion/Workover:
___ Oil ___ SWD ___ Temp. Abd.
X Gas ___ Inj ___ Delayed Comp.
___ Dry ___ Other (Core, Water Supply, etc.)

___ Deepening ___ Re-perforation
X Plug Back 3306 PBTD
___ Conversion to Injection/Disposal

Is recompleted production:
___ Commingled Docket No. ___
___ Dual Completion Docket No. ___
___ Other (Disposal or Injection?) Docket No. ___

RECEIVED
STATE CORPORATION COMMISSION
OCT 03 1989
CONSERVATION DIVISION
Wichita, Kansas

K.C.C. OFFICE USE ONLY
F ___ Letter of Confidentiality Attached
C ___ Wireline Log Received
C ___ Drillers Timelog Received

Distribution
✓ KCC ___ SWD/Rep ___ NGPA
✓ KGS ___ Plug ___ Other (Specify)

INSTRUCTIONS: This form shall be completed in triplicate and filed with the Kansas Corporation Commission, 200 Colorado Derby Building, Wichita, Kansas 67202, within 120 days of the recompletion of any well. Rules 82-3-107 and 82-3-141 apply. Information on side two of this form will be held confidential for a period of 12 months if requested in writing and submitted with the form. See rule 82-3-107 for confidentiality in excess of 12 months. One copy of any additional wireline logs and driller's time logs (not previously submitted) shall be attached with this form. Submit ACO-4 or ACO-5 prior to or with this form for approval of commingling or dual completions. Submit CP-1 with all plugged wells. Submit CP-111 with all temporarily abandoned wells. NOTE: Conversion of wells to either disposal or injection must receive approval before use; submit form U-1.

All requirements of the statutes, rules and regulations promulgated to regulate the oil and gas industry have been fully complied with and the statements herein are complete and correct to the best of my knowledge.

Signature for Bryan Humphries Title Manager Engineering Date 9-29-89

Subscribed and sworn to before me this 29th day of September 19 89

Notary Public Marsha G. Wilson Date Commission Expires 4-1-92

EXHIBIT M-8

FORM ACO-2
7/89

SIDE TWO

Operator Name OXY USA Inc. Lease Name Pearson C Well # 2

☐ East

Sec. 32 Twp. 34S Rge. 41 ☒ West County Morton

RECOMPLETION FORMATION DESCRIPTION

☒ Log ☐ Sample

Name	Top	Bottom
Topeka	3121'	3258'

ADDITIONAL CEMENTING/SQUEEZE RECORD

Purpose:	Depth Top	Depth Bottom	Type of Cement	# Sacks Used	Type and Percent Additives
X Perforate ___ Protect Casing X Plug Back TD ___ Plug Off Zone	3121	3258	Set CIBP at 4850'. RIH w/cement retainer & set at 3306'. Pumped 25 BFW w/300 SCF/bbl. of Nitrogen followed by 25 sx Cl H cmt., followed by 275 sx 50/50 Cl H Poz w/6% total gel, followed by 150 sx Cl. H cmt. TOC at 700'.		

Shots Per Foot	PERFORATION RECORD Specify Footage of Each Interval Perforated	Acid, Fracture, Shot, Cement Squeeze Record (Amount and Kind of Material Used)
4	3121-3125 (4'; 16 holes)	Acidized 3121-3258' w/5000 gals. 15%
	3130-3146' (16'; 64 holes)	15% FE acid
	3168-3171' (3'; 12 holes)	
	3256-3258' (2'; 8 holes)	

PBTD 3306' Plug Type CIBP & cement retainer

TUBING RECORD

Size 2-3/8" Set At 3271' Packer At --- Was Liner Run ___ Y X N

Date of Resumed Production, Disposal or Injection ---

Estimated Production Per 24 Hours Oil --- Bbls. Water --- Bbls. ___ Gas-Oil-Ratio

Gas 159 Mcf pd

Disposition of Gas:

☐ Vented ☒ Sold ☐ Used on Lease (If vented, submit ACO-18.)

CERTIFICATE OF SERVICE

I, the undersigned, certify that a true and correct copy of the attached Pre-Filed Direct Testimony of Nicholas Lahutsky has been served to the following by means of electronic service on January 27, 2023:

Todd Bryant, Geologist Specialist
Kansas Corporation Commission
266 N. Main, Ste. 220
Wichita, KS 67202-1513
t.byrant@kcc.ks.gov

Kelcey Marsh, Litigation Counsel
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Central Office
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Jonathan A. Schlatter