KOLAR Document ID: 1533617

Confidentiality Requested:
☐ Yes ☑ No

KANSAS CORPORATION COMMISSION
OIL & GAS CONSERVATION DIVISION

Form ACO-1
January 2018
Form must be Typed
Form must be Signed
All blanks must be Filled

WELL COMPLETION FORM
WELL HISTORY - DESCRIPTION OF WELL & LEASE

OPERATOR: License # 5091
Name: Howell Oil Company, Inc.
Address 1: 2400 RIVERBIRCH RD
Address 2:
City: HUTCHINSON State: KS Zip: 67502 + 9280
Contact Person: Larry Ressler
Phone: (620) 664-5320
CONTRACTOR: License # 35589
Name: Lighthouse Drilling, LLC
Wellsite Geologist: Roger Martin
Purchaser: CHS

Designate Type of Completion:
☑ New Well ☐ Re-Entry ☐ Workover
☑ Oil ☐ WSW ☐ SWD
☐ Gas ☐ DH ☐ EOR
☐ OG ☐ GSW
☐ CM *(Coal Bed Methane)*
☐ Cathodic ☐ Other *(Core, Expl., etc.)*:

If Workover/Re-entry: Old Well Info as follows:
Operator:
Well Name:
Original Comp. Date: Original Total Depth:
☐ Deepening ☐ Re-perf. ☐ Conv. to EOR ☐ Conv. to SWD
☐ Plug Back ☐ Liner ☐ Conv. to GSW ☐ Conv. to Producer

☐ Commingled Permit #:
☐ Dual Completion Permit #:
☐ SWD Permit #:
☐ EOR Permit #:
☐ GSW Permit #:

09/16/2020 Spud Date or Recompletion Date
09/22/2020 Date Reached TD
10/22/2020 Completion Date or Recompletion Date

API No.: 15-155-21778-00-00
Spot Description:
E2 - NW - NE - SE Sec. 13 Twp. 23 S. R. 4 ☐ East ☑ West
2310 Feet from ☐ North / ☑ South Line of Section
971 Feet from ☑ East / ☐ West Line of Section
Footages Calculated from Nearest Outside Section Corner:
☐ NE ☐ NW ☑ SE ☐ SW
GPS Location: Lat: *(e.g. xx.xxxxx)* , Long: *(e.g. -xxx.xxxxx)*
Datum: ☐ NAD27 ☐ NAD83 ☐ WGS84
County: Reno
Lease Name: DOLE Well #: 5
Field Name:
Producing Formation: Mississippi
Elevation: Ground: 1468 Kelly Bushing: 1480
Total Vertical Depth: 3502 Plug Back Total Depth:
Amount of Surface Pipe Set and Cemented at: 315 Feet
Multiple Stage Cementing Collar Used? ☐ Yes ☑ No
If yes, show depth set: Feet
If Alternate II completion, cement circulated from:
feet depth to: w/ sx cmt.

Drilling Fluid Management Plan
(Data must be collected from the Reserve Pit)
Chloride content: 5000 ppm Fluid volume: 2000 bbls
Dewatering method used: Hauled to Disposal
Location of fluid disposal if hauled offsite:
Operator Name: Howell Oil Co., Inc
Lease Name: Howell License #: 5091
Quarter NE Sec. 24 Twp. 23 S. R. 4 ☐ East ☑ West
County: Reno Permit #: 15-155-21726

AFFIDAVIT
I am the affiant and I hereby certify that 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.

Submitted Electronically

KCC Office Use ONLY
☐ **Confidentiality Requested**
Date:
☐ **Confidential Release Date:**
☑ **Wireline Log Received** ☐ **Drill Stem Tests Received**
☑ **Geologist Report / Mud Logs Received**
☐ **UIC Distribution**
ALT ☑ **I** ☐ **II** ☐ **III** **Approved by:** Karen Ritter **Date:** 11/12/2020

Operator Name: Howell Oil Company, Inc. Lease Name: DOLE Well #: 5

Sec. 13 Twp. 23 S. R. 4 ☐ East ☑ West County: Reno

INSTRUCTIONS: Show important tops of formations penetrated. Detail all cores. Report all final copies of drill stems 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 test, along with final chart(s). Attach extra sheet if more space is needed.

Final Radioactivity Log, Final Logs run to obtain Geophysical Data and Final Electric Logs must be emailed to kcc-well-logs@kcc.ks.gov. Digital electronic log files must be submitted in LAS version 2.0 or newer AND an image file (TIFF or PDF).

Drill Stem Tests Taken *(Attach Additional Sheets)*	☐ Yes	☑ No
Samples Sent to Geological Survey	☐ Yes	☑ No
Cores Taken	☐ Yes	☑ No
Electric Log Run	☑ Yes	☐ No
Geologist Report / Mud Logs	☑ Yes	☐ No

List All E. Logs Run:

Porosity
Induction

☑ Log Formation (Top), Depth and Datum ☐ Sample

Name	Top	Datum
Lansing	2497	-1019
Base / KC	2990	-1512
Mississippi	3266	-1788

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	17.5	13.375	48	307	60/40 poz	450	2%gel 3%CC
Production	7.875	5.5	15.5	3494	Common	250	1200gal. Gilsonite

ADDITIONAL CEMENTING / SQUEEZE RECORD

Purpose:	Depth Top Bottom	Type of Cement	# Sacks Used	Type and Percent Additives
☐ Perforate ☐ Protect Casing ☐ Plug Back TD ☐ Plug Off Zone	-			
	-			

1. Did you perform a hydraulic fracturing treatment on this well? ☐ Yes ☑ No *(If No, skip questions 2 and 3)*
2. Does the volume of the total base fluid of the hydraulic fracturing treatment exceed 350,000 gallons? ☐ Yes ☐ No *(If No, skip question 3)*
3. Was the hydraulic fracturing treatment information submitted to the chemical disclosure registry? ☐ Yes ☐ No *(If No, fill out Page Three of the ACO-1)*

Date of first Production/Injection or Resumed Production/ Injection:	Producing Method:					
11/02/2020	☐ Flowing	☑ Pumping	☐ Gas Lift	☐ Other *(Explain)*		
Estimated Production Per 24 Hours	**Oil Bbls.**	**Gas Mcf**	**Water Bbls.**	**Gas-Oil Ratio**	**Gravity**	
	5		400			

DISPOSITION OF GAS:	METHOD OF COMPLETION:	PRODUCTION INTERVAL:	
		Top	Bottom
☐ Vented ☐ Sold ☐ Used on Lease	☐ Open Hole ☑ Perf. ☐ Dually Comp. ☐ Commingled	3332	3355
(If vented, Submit ACO-18.)	*(Submit ACO-5)* *(Submit ACO-4)*		

Shots Per Foot	Perforation Top	Perforation Bottom	Bridge Plug Type	Bridge Plug Set At	Acid, Fracture, Shot, Cementing Squeeze Record *(Amount and Kind of Material Used)*
2	3332	3336			750 gal. 15% NE FE
2	3345	3355			500 gal. 15% NE FE

TUBING RECORD:	Size:	Set At:	Packer At:	
	2.875	3470		

Mail to: KCC - Conservation Division, 266 N. Main, Suite 220, Wichita, Kansas 67202

Form	ACO1 - Well Completion
Operator	Howell Oil Company, Inc.
Well Name	DOLE 5
Doc ID	1533617

Casing

Purpose Of String	Size Hole Drilled	Size Casing Set	Weight	Setting Depth	Type Of Cement	Number of Sacks Used	Type and Percent Additives
Surface	17.5	13.375	48	307	60/40 poz	450	2%gel 3%CC
Production	7.875	5.5	15.5	3494	Common	250	1200gal. Gilsonite

COPELAND Acid & Cement

Conductor

TREATMENT REPORT

Acid Stage No. _____

Date 9/17/2020 District GB F.O. No. C60184

Company HOWELL OIL CO.

Well Name & No. DOLE #5

Location _____ Field _____

County RENO State KS

Casing: Size 13 3/8 Type & Wt. _____ Set at _____ ft.

Formation: _____ Perf. _____ to _____

Formation: _____ Perf. _____ to _____

Formation: _____ Perf. _____ to _____

Liner: Size _____ Type & Wt. _____ Top at _____ ft. Bottom at _____ ft.

Cemented: Yes Perforated from _____ ft. to _____ ft.

Tubing: Size & Wt. _____ Swung at _____ ft.

Perforated from _____ ft. to _____ ft.

Open Hole Size _____ T.D. _____ ft. P.B. to _____ ft.

Type Treatment:	Amt.		Type Fluid	Sand Size	Pounds of Sand
Bkdown		Bbl./Gal.			
		Bbl./Gal.			
		Bbl./Gal.			
		Bbl./Gal.			
Flush		Bbl./Gal.			

Treated from _____ ft. to _____ ft. No. ft. 0

from _____ ft. to _____ ft. No. ft. 0

from _____ ft. to _____ ft. No. ft. 0

Actual Volume of Oil / Water to Load Hole: _____ Bbl./Gal.

Pump Trucks. No. Used: Std. 320 Sp. _____ Twin _____

Auxiliary Equipment 360-308T

Personnel GREG CLARENCE

Auxiliary Tools _____

Plugging or Sealing Materials: Type _____

_____ Gals. _____ lb.

Company Representative LARRY RESSLER Treater GREG CURTIS

TIME	PRESSURES		Total Fluid Pumped	REMARKS
a.m./p.m.	Tubing	Casing		
6:15				ON LOCATION
				RUN 315' OF 13 3/8" PIPE
				BREAK CIRCULATION WITH MUD PUMP AND CIRCULATE FOR 30 MINUTES
				PUMP 350 SKS 60/40 2% GEL & 3% CC
				DISPLACE WITH 47 BBLS OF FRESH WATER.
8:15				CEMENT DID NOT CIRCULATE TO SURFACE. WAIT 1 HOUR
9:15				TAGGED CEMENT @ 30'
				RUN 30' OF 1" PIPE. PUMP 100 SKS 60/40 2% GEL 3% CC, CIRCULATED
				CEMENT TO SURFACE.
10:00				HOLE STAYED FULL
10:30				JOB COMPLETE
				THANK YOU!!!

COPELAND Acid & Cement

Production

TREATMENT REPORT

Acid Stage No. _____

Date 9/22/2020 District GB F.O. No. C60186

Company HOWELL OIL COMPANY

Well Name & No. DOLE #5

Location _____ Field _____

County RENO State KS

Casing: Size 5 1/2 Type & Wt. 15.5# Set at 3493.3 ft.

Formation: _____ Perf. _____ to _____

Formation: _____ Perf. _____ to _____

Formation: _____ Perf. _____ to _____

Liner: Size _____ Type & Wt. _____ Top at _____ ft. Bottom at _____ ft.

Cemented: Yes Perforated from _____ ft. to _____ ft.

Tubing: Size & Wt. _____ Swung at _____ ft.

Perforated from _____ ft. to _____ ft.

Open Hole Size _____ T.D. _____ ft. P.B. to _____ ft.

Type Treatment:	Amt.		Type Fluid	Sand Size	Pounds of Sand
Bkdown	_____	Bbl./Gal.	_____		
	_____	Bbl./Gal.	_____		
	_____	Bbl./Gal.	_____		
	_____	Bbl./Gal.	_____		
Flush	_____	Bbl./Gal.	_____		

Treated from _____ ft. to _____ ft. No. ft. 0

from _____ ft. to _____ ft. No. ft. 0

from _____ ft. to _____ ft. No. ft. 0

Actual Volume of Oil / Water to Load Hole: _____ Bbl./Gal.

Pump Trucks. No. Used: Std. 365 Sp. _____ Twin _____

Auxiliary Equipment 327

Personnel GREG TIM CLARENCE

Auxiliary Tools _____

Plugging or Sealing Materials: Type 300 SKS COMMON

_____ Gals. _____ lb.

Company Representative _____ Treater _____

TIME a.m./p.m.	PRESSURES Tubing	PRESSURES Casing	Total Fluid Pumped	REMARKS
10:30				ON LOCATION
				PIPE DEPTH: 3493.3' INSERT: 3491'
				BASKETS: JTS 3 & 4. CENTRALIZERS: JTS 2,4,6,8,10,12
2:30				CIRCULATE HOLE FOR 1 HOUR
				PUMP 600 GALS MUD FLUSH.
				PLUG RATHOLE WITH 30 SKS, PLUG MOUSEHOLE WITH 20 SKS
				CEMENT 5 1/2 WITH 250 SKS COMMON @ 6.5 BPM
				FLUSH PUMP & LINE OUT.
				DISPLACE CEMENT WITH 83 BBLS OF H20. PLUG LANDED WITH 81 BBLS
5:15				OUT. PSI TO 1500#, RELEASE PRESSURE, PLUG HELD.
				JOB COMPLETE
				THANK YOU!!!

ROGER L. MARTIN

INDEPENDENT PETROLEUM GEOLOGIST 316-250-6970

GEOLOGIST'S REPORT

DRILLING TIME AND SAMPLE LOG

COMPANY HOWELL OIL COMPANY INC.

LEASE DOLE #5

FIELD BURRTON

LOCATION 2310'FSL & 971'FEL (E/2-NW-NE-SE/4)

SECTION 13 TOWNSHIP 23S RANGE 04W

COUNTY RENO STATE KANSAS

ELEVATIONS

KB 1478' GL 1466'

Measurements Are All From KB:1478

API 15-155-21778-00-00

CONTRACTOR LIGHTHOUSE DRILLING

SPUD 09/16/2020 COMP 09/21/2020

RTD 3502' (-2024) LTD 3497' (-2019)

ELECTRICAL SURVEYS

MIDWEST WIRELINE: DIL & CNL/CDL

No DST's

CASING

SURFACE 13&3/8" @ 307' KB

PRODUCTION 5&1/2"

FORMATION TOPS	LOG	SAMPLES
HEEBNER SH	2332' (-854)	2338' (-860)
LANSING	2497' (-1019)	2504'(corrected)(-1026)
DENNIS LS	2853' (-1375)	2860' (-1382)
SWOPE LS	2915' (-1437)	2920' (-1442)
HUSHPUCKNEY SH	2941' (-1463)	2946' (-1468)
HERTHA POROSITY	2960' (-1482)	2965' (-1487)
BASE/ KANSAS CITY	2990' (-1512)	2996' (-1518)
MARMATON	3004' (-1526)	3010' (-1532)
PAWNEE	3078' (-1600)	3084' (-1606)
FORT SCOTT	3105' (-1627)	3112' (-1634)
CHEROKEE	3126' (-1648)	3131' (-1653)
LOWER CHEROKEE SH	3153' (-1675)	3160' (-1682)
MISSISSIPPIAN LS	3266' (-1788)	3272' (-1794)
UPPER MISS. POROSITY	3280' (-1802)	3287' (-1809)
LOWER MISS.DOLO.&CHERT PORO.	3327' (-1849)	3333' (-1855)
TOTAL DEPTH (LTD/RTD)	3497' (-2019)	3502' (-2024)

CHRONOLOGY

9/4/20; MIRU Lighthouse Rig

9/16/20; Spud

9/17/20; PTD:326'; Cementing 13&3/8"csg @ 307'.

9/18/20; PTD:326' WOC & WOR.

9/19/20; Drlg 7&7/8" hole @ 1882' @~7:40am; Md.Wt:10.0; Vis:30; PV:4; YP:7; pH:7.0; WL:NC; Cl:18000ppm; Ca:1560ppm; Solids:10.9%; LCM:0; ECD:11.26#/gal.

9/20/20; Drlg@ 2898'@~9:25am

9/21/20; Drlg@~3415'@~9:00am; RTD:3502'@~Noon E-Logs complete @~6:30pm on 9/21/2020.

9/22/2020; 5&1/2" production casing set to further evaluate the Mississippian System.

REMARKS: ON 09/22/2020, 5&1/2" PRODUCTION CASING WAS SET TO FURTHER EVALUATE THE MISSISSIPPIAN SYSTEM; UNDER SUPERVISION OF LARRY RESSLER OF RESSLER WELL SERVICE, INC.

REPECTFULLY SUBMITTED,
ROGER L MARTIN, GEOLOGIST AT WELL-SITE

(print length: 78")

LITH | POROSITY | DRILLING TIME MIN/FT | DST | SAMPLE DESCRIPTION | REMARKS

{2319'spl} Rare{Rr} LS: cm-bf-tn, microXln{ux} to fnXln, sm granlr- Pkst, sm dn; Vpr-pr Visbl Porosity{Poro) Inter-Xln-Poro (IXP) & Inter-Granular-Poro(IGrP) w/ No Show of oil {NS or NSO}; Pred SH: gy, Rr bk-carb & sub-carb, sm mrn-rd-SH.

{2351'spl} sm LS: gy-tn-wh, dn- ux- fnXln, sm chlky, sm dn- Mdst, pred poor to No Visible Porosity {pr-NVP} w/ NS.

{2382'spl} HEEBNER SH} sharp incrs bk-carb- subcarb to V.carb SH, & gy & V-gated SH: As Above {AA}; & sm LS: tn-gy-wh, Mdst-Wkst &ux, sl fos, Vpr-NVP; NS.

2338' (-860) HEEBNER SH

{2413'spl} Pred V-gated SH, & sm LS:AA; pred pr-NVP; NS.

{2445'spl} SH: pred gy, sm silty- micac, Very rare {Vrr} pyrtc.

{2476'spl} SH: V-gated; gy & gn-gy, & bk-carb, sm mrn-rd; sm SILTS: Lt-dk-gy, sm sl sndy.

{2506'spl} SH-SILTS: AA; & sm Sd Clusters: Lt-gy-bf, Vfn-Gr'd, silty, Vpr-pr-Visbl-Poro w/ NS & No FLR {NF) & No Cut {NC) & No Odor {NO}; & sm Sndy SILTS: NS; NF; NC; NO.

{2538'spl} SS-> ~25% Sd Clusters: gy-bf-wh, sm mot, Vfn-md-Gr'd, pred fn-Gr'd, well Rnd'd- subanglr, sm silty & shly, sl calc, well cmt'd to friabl w/ pr-Fr-Visbl-Poro, Rr Gd Poro; NS; NF; NC; NO.

{2569'spl} Abndt SH: V-gated; gn-gy, bk, rd; sm Sd Clust:AA; NS;

2504' (-1026) LANSING

{2569'spl.cont'd} LANSING} sm LS: wh-gy-tn, dn- ux-VfnXln, & sm sl fos- Wkst-Pkst w/ pr-Fr Visbl Poro; NS.

{2600'spl} Abndt LS: wh-gy-tn, sm mot'd- Wkst-Pkst, sm prt chlky, sm sl ool & fos w/ pred pr Visbl Poro w/ NS.

{2632'spl} LS: wh-tn-gy, prt chlky & subchlky, sm ux-fnXln- sm 2nd ReX, sm Wkst-Pkst, pred pr-NVP; Vrr Fr-Gd Visbl Poro w/ NS; sm (~30%} SH: AA; (sm SH cavings).

{2662'spl} ~30% LS:pred chlky to dn w/ NS; ~70% SH: V-gated- AA {cavings- pr spls).

{2694'spl} incrs LS {~50%) gy-tn-wh, pred dn to chlky, pred dn to chky w/ pred pr-NVP; NS; ~50% SH: AA; pred gy, sm bk-carb (sm cavings; pr spls).

{2725'spl} ~25% LS: AA; & sm Wkst-Pkst, pred pr-NVP w/ NS; ~75% SH: pred dk-gy-bk, Rr bk-carb; (pr spls).

{2756'spl} Abndt SH: AA; pred gn-gy, sm rd SH;

{2756'spl.cont'd & 2787'spl} sm LS: wh-tn-gy, Wkst-Pkst, & ux-fnXln; Trc pr-Fr- pin point {pp} Poro w/ NS.

{2787'spl.cont'd} Abndt LS: tn-gy-wh, pred dn to chlky w/ pr-NVP; NS.

{2818'spl} >60% LS: tn-gy-wh, pred dn to chlky; cryptoX-fnX- sm 2nd ReX; pred pr-NVP w/ NS;

{2818'spl.cont'd} <40% SH: pred gy, sm bk-carb.

{2850'spl} ~30% LS: AA; NS.

{2850'spl.cont'd} Abndt SH: dk-gy & bk-carb & subcarb, sm calc & sm Lmy; & sm argil-shly-LS-gy-bk-Mdst w/ Vpr-NVP; NS.

{2881'spl} LS: gy-wh, sm mot'd, subchky- Wkst-Pkst, Trc Grst: oolc & sl fos, Trc oomldc w/ Fr-Gd Poro w/ NS; pred dn & argil LS w/ NS; & SH:AA; (pr-Fr-spls-cavings).

2860' (-1382) DENNIS LS

{2911'spl} LS: cm-bf-tn; Rr Pkst-Grst: fn oolc & fos & prt oomldc, & sm ux-fnXln, sm Fr-VGd-Poro: IGr & u-IXP & moldc Poro w/ NS.

{2942'spl} (abndt SH:AA) sm LS: cm-bf-gy, pred dn - sm wh-chlky; pred pr-NVP w/ NS; (Vrr prt oomldc w/ Poro w/ NS).

{2974'spl} sm LS: gy-bf-cm, dn- ux & Mdst w/ pr-NVP w/ NS;

Mud-Co Report 09/20/20; 9:25am Drlg @ 2898' Wt:8.85 Vis:43 PV:13 YP:12 pH:10.0 WL:9.1 CT:1/32" Cl: 4,300 ppm Ca: 20 ppm Solids: 4.1% LCM: 0# ECD: 9.76#/gal.

{2974'spl.cont'd} & SH: abndt dk-gy & bk carb.

2920' (-1442) SWOPE LS {Trc SFO)

{2974'spl.cont'd} sm LS: gy-tn-wh, ux-fnXln, Vrr prt mdXln, oolc & oomldc w/ Fr-VGd-oomldc-Poro & sm IXP & u-Frac's & Edges; Trc FLR & Trc SFO} u-spts Free Oil on brk; >99% Barren;

Abndt dn to chlky & Barren LS.

2946' (-1468) Hushpuckney SH

{2974'spl.cont'd & 3005'spl} Hushpuckney SH: abndt bk carb- V.carb

2965' (-1487) HERTHA PORO

{3005'spl.cont'd} LS: gy-tn-cm, sm ux & sm Mdst & Wkst-Pkst- sl fos, sm argil, pred Vpr-pr-Visbl Poro; pred Barren; Trc FLR & Vpr Cut, NSFO.

{3005'spl.cont'd} LS: AA; pred Vpr-pr Visbl Poro; Trc u-IXP & u-Frac's & Edges w/ FLR & Vpr-pr Cut; NSFO.

{3036'spl} LS: dk-gy-bk, & gy-bn, dn- Mdst- sm argil, & ux-dn w/ Vpr-NVP & Barren

2996' (-1518) B/KC

{3036'spl} B/KC} SH: gy-bk- subcarb, sm Lmy & V.calc.

3010' (-1532) MARMATON

{3067'spl} LS: dk-Lt-gy-tn-wh, pred dn & ux, sm argil-Mdst w/ Vpr-NVP; NSO; & SH: pred gy & bk, sm calc & Lmy.

{3098'spl} Abndt LS: cm-bf-tn, ux-VfnXln, sm Vfnly granulr, sm Pkst w/ Vpr-NVP; NS; sm wh-chlky w/ pr-NVP; NS; sm argil- dn- Mdst; & SH:AA.

{3128'spl} SH: sm bk-carb to V.carb; & gy;

3084' (-1606) PAWNEE

{3128'spl.cont'd} LS: gy-bf-cm, pred dn- ux, & Mdst, w/ Vpr-NVP; NS.

{3160'spl} SH: Rr bk-carb; pred gy-SH.

3111' (-1633) FT. SCOTT

{3160'spl.cont'd} LS: dk-Lt-gy-wh, pred dn- ux, & Mdst w/ Vpr-NVP; NS.

3131' (-1653) CHEROKEE

{3191'spl} LS: pred dk-gy & gy-wh, dn & argil-Mdst & ux-dn w/ Vpr-NVP; NS.

3160' (-1682) Lower CKE.SH

{3222'spl} SH: incrs dk-gy, & bk, sm carb - V.carb, sm calc & Lmy SH; & sm LS- Mdst- argil & ux-dn w/ Vpr-NVP; NS.

{3254'KD.spl} SH: AA; & V-gated- yel-gn, & rd-mrn, sm waxy, sm calc & Lmy.

{3254'KD.spl.cont'd} LS: dk-gy & wh, dn-Mdst- ux-dn LS w/ Vpr-NVP; NS.

{3254'KD.spl.cont'd} SH: AA & sm bk-carb- V.carb.

{3254'+20min.circ.spl} SH: V-gated; gy-bn, ambr-gn, sm waxy, gy-bk; sm argil- dn- LS.

<-Bit Trip @ 3254' PDC out;Tri-cone in

SH: AA; sm violt-mrn-rd fiss SH.

{3254'+40min.circ.spl} SH: V-gated, gn-gy, & gy-bk, & violt-mrn-rd, amber-yel-gn; Vrr bk-carb SH; Trc dn-LS.

3272' (-1794) MISSISSIPPIAN

{3380'&3390'drlg.spls} MISS. LS: tn-gy-wh sm mot- Pkst, & ux-mdXln w/ pred pr-NVP w/ NS; sl incrs: ambr SH.

3287' (-1809) Upr.MISS.PORO. {Trc.SFO {Trace Show Free Oil)

{3300'&3310'drlg.spls} LS: cm--gy-tn, Pkst- fos & ool, & ux-VfnXln, pred pr-Fr Visbl Inter-Granular Porosity {IGr.Poro) & Inter-Xln-Poro.{IXP) w/ Trc SFO-STN-FLR-Cut, Trc oomoldic w/ Gd Poro w/ Trc SFO-FLR-STN-Cut; & Dolomitic LS {DLS) ux-VfnXln w/ pr-Gd u-IXP w/ Trc SFO-FLR-STN-Cut; Sl Cherty; Vsl Odor.

{VSl SFO) {Very Slight Show of Free Oil)

{3315'KD&circ.spls} DLS-LS: cm-bf-tn, microXln{ux) to VfnXln, sm silic & sl dolomc, sl Cherty; pred pr-Fr Visbl Poro: u-IGr & u-IXP & u-Frac's & Edg's w/ FLR; Very rare {Vrr) {<5%} w/ Lt O.STN & FLR & SlSFO & milky Cut w/ Vsl Show Gas Bubls {VSlSGB) on break {brk); Sl Cherty: cm-gy, opq, sharp; Sl Odor.

{Sl SFO)

{3325'drlg.&3335'drlg&circ.spls} LS: cm-bf-tn, ux-VfnXln, sm silic & Cherty; pred pr-Fr Visbl Poro: pp, u-IXP & u-IGr.Poro; Trc Gd Visbl Poro; SlSFO & SlSGB w/ brt.FLR & Lt.O.STN & Sl-Gd milky Cut; Vrr DOLO: bf-tn, ux-VfnXln, u-sucro, Cherty, Vrr Fr-Gd Poro: u-IXP w/ Sl-FrSFO & GB & sat-rich-bn-O.STN & brt.FLR & Fr-Gd milky Cut; & Cherty LS: AA; Frly Strong Odor.

{Sl SFO)

3333' (-1855) Lwr.MISS.PORO {Fr-Gd SFO) {Fair to Good Show Free Oil)

{3346'KD&circ.spls.&3356'&3366'drlg.spls} Dolo & DLS: cm-bf w/ tn-bn-O.STN, ux-VfnXln, u-sucro, sm sl silic, Cherty w/ Fr-VGd-Poro: pp & IXP w/ Fr-Gd SFO & Fr-Gd SGB; ~30% subsat-sat- brt-FLR & O-STN, w/ Fr-Gd Strmg-milky Cut, Strong Odor; sm prt dn LS & DLS w/ pr Visbl-Poro, & sm wj-chlky LS.

{Fr SFO)

{3377'KD&circ.spls} ~50% Dolo & DLS: cm-bf-gy, w/ tn-bn-O.STN; ux-VfnXln, u-sucro; sm Fr-Gd Poro: pp, u-IXP w/ FrSFO&GB & Cut & spt'd-subsat.O.STN; Rr dead Oil Stain {dd.O.Stn);
&~50% Chert: cm-gy-bf, mot, sharp & sm Wthr'd Chert w/ pp-vug.Poro & aprnt Frac'sw/ sm tn-bn- O.STN w/ FrSFO&GB, & Sl-Gd Cut, & Rare{Rr) bk- dead Oil Stain {dd.O.Stn.) Frly Strong Oil Odor & sour Odor.

{Fr SFO)

{Fr SFO)

{3390'&3400'&3410'&3420'drlg.spls}~40% DLS-Dolo: cm-bf-tn-bn, ux-VfnXln, u-sucro, w/ Rr Fr-Gd Visbl & aprnt Poro: u-IXP w/ sm Fr-GdSFO w/ dull FLR to No FLR {NF) & spt'd to sat.O.STN w/ Sl to Gd Cut, & Sl-Fr Show Gas Bubls {SGB) & aprnt Condensate {Conds) sm Barren Poro & dd.O.Stn; Sl-Fr Cut;
& ~60% Chert: wh-cm-gy, sharp & Wthr'd w/ sm pr-Fr Visbl & aprnt Poro w/ Sl-Fr SFO w/ dull FLR to NF & SGB-Conds & sm dd.O.Stn; Frly Strong Oil & sour Odor.

{Sl-Fr SFO)

{Sl-Fr SFO)

{Sl-Fr SFO)

Mud-Co Report 09/21/20; 9:00am Drlg @ 3415' Wt:8.9 Vis:123 PV:22 YP:21 pH:10.5 WL:8.0 CT:1/32" Cl: 4,100 ppm Ca: 10 ppm Solids: 10% LCM: 4# ECD: 9.71#/gal.

{3430'&40'&50'drlg.spls} ~60% Dolo&DLS: cm-bf-gy, w/ sm tn-bn-O.STN, ux-VfnXln, u-sucro, w/ sm Fr-VGd Poro: IXP & pp-vug & moldc Poro w/ sm Sl-Fr SFO w/ dull FLR to NF, & Sl-Fr SGB; spt'd to sat- tn-bn-O.STN & Sl-Fr Cut, sm bk-dd.O.Stn; & sm Barren Poro; sm prt dn Dolo & DLS w/ Vpr-Pr Visbl Poro;
& ~40% Chert: cm-blu-gy, bf-tn, sharp & sm Wthr'd w/ sm 2nd Qtz ReX w/ pr-Gd Visbl & aprnt Poro w/ spt'd O.STN & SFO w/ dull FLR to NF w/ VSl-Fr Cut, Frly Strong Oil & "sour" Odor.

{Sl-Fr SFO)

{Sl SFO)

{VSl SFO)

{3460'&3470'drlg.spls} DLS-Dolo: cm-bf-gy, ux-fnXln-sucro, Trc prt mdXln w/ Fr-VGd Poro: IXP & vug Poro; Vrr {~5%} w/ VSlSFO w/ dull FLR to NF, & Vrr spt'd- subsat. Lt.O.STN & Sl-Fr Strmg-milky Cut;
V.Cherty: wh-cm-blu-gy, pred opq & sharp; sm Qtzic w/ 2nd Qtz ReX, sm vug Poro; Vrr {~5%} w/ spt'd Lt-O.STN & VSlSFO w/ dull FLR to NF, Sl-Fr Strmg-milky Cut, VSl Odor- sour.

{VSl SFO)

{VSl SFO)

{VSl SFO)

{3480'&90'&3500'drlg.spls} ~60% DLS-Dolo: cm-bf-gy, ux-VfnXln, Rr prt fnXln, Trc prt mdXln; Rr Fr-Gd Poro: IXP & pp-vug Poro; Vrr spt'd-subsat-O.STN & VSlSFO w/ dull FLR to NF, Sl Odor on brk; VSl-Fr Cut;
~40% Chert: cm-blu-gy, opq & sharp to sl Wthr'd, Trc SFO-w/ dull FLR-NF; Trc STN & Cut, Trc dd.Stn; VSl Odor.

{VSl SFO)

{Trc.SFO)

{3502'circ.spls} ~<40% DLS-Dolo:AA; pred Barren; Trc SFO-dull FLR-STN-Cut, Trc dd.Stn; Abndt Chert {~>60%} Chert: AA; pred Barren w/ Vpr-NVP.

{Trc.SFO)

RTD:3502'(-2024)
LTD: 3497'(-2019)

5&1/2"production csg.

Howell Oil Co. Inc.
Dole #5
2310' FSL &
971' FEL
Sec:12-T23S-R4W
Burrton Field
Reno Cnty. KS
API#15--155-21778-00-00