Berexco Wellington KGS #2-32
650 ft at 7 am 3-22-15
drilling cement plug at base of surface casing

• Spudded well 7 am on Friday 3-20-15 with Fossil Drilling Rig #3
• Drilled 140 ft and set conductor pipe
• 12 ¾ inch hole to 650 ft. (depth of surface casing)
• Samples will be caught from base of conductor pipe to TD
• Halliburton ran GR, SP, Caliper, $\Phi$neutron, $\Phi$density, p-wave sonic, microlog, Array resistivity to 650 ft. prior to running surface casing
Berexco Wellington KGS #2-32

Wellington KGS 2-32
NE NW NE SE 32-31S-1W
Sumner County, KS
API Number: 15-191-22770

Estimated Tops:
Topeka ............................................................1990'
Heebner .......................................................... 2410
Stalnaker .........................................................2690’
LKC ..................................................................3040’
BKC .................................................................3275’

Elevation: 1257' GL, 1269' KB
Pawnee........................................................... 3455’
Cherokee Shale .............................................. 3510’
2680' from South line of Section
Mississippi....................................................... 3660’
709’ from East line of Section Total Depth
................................................................. 3815’
Notes:
1. Set (2) wood stakes at location site.
2. All flogging Red & Yellow.
3. Overhead power available at N., S. & E. lines, Sec. 32.
4. Kansas One Call System Inc. should be notified before excavation (1-800-344-7233).
5. CAUTION Various pipelines in Sec. 32.
6. Section 32 is irregular N-S.
7. Contact landowner for best access and as to location of wood stakes in wheat.
8. Location fall 75' SE. of the east edge of E-W tree-row, no alternate set.

Drill site Location
Wellington KGS 22-32
2120' FSL 709' FEL
Ground Elevation = 1257
Y = 236209 x = 2307752
State Plane 16-2 Kansas South (WGS84 and State Plane 16-2 Kansas South)
Latitdue 37.3165889
Longitude -97.4418448
NAD 27

Date: March 10, 2015

CENTRAL KANSAS OILFIELD SERVICES, INC. (620) 792-1977
Anticipated schedule

- **Tuesday**
  - reach core point at top of Mississippian
- **Wednesday**
  - coring
- **Thursday**
  - drilling to TD and running *Drill Stem Test*
- **Friday**
  - Logging TD to base of surface casing.
**Hutchinson Salt (halite)**

**Lower Sumner Group**
- Anhydrite & shale

**Chase Group**

**Stemigraphic Units**
- Members
- Formations

**Base conductor pipe**

**Wellington Shale**

**Hutchinson Salt (halite)**

**Base Surface Casing**
Gamma ray and sample log cross section between KGS #1-32, KGS #1-28, and SW-2 (shallow water well) datum = ground level

Base of SW-2 is ~35 ft above top of Hutchinson Salt

Hutchinson Salt (low gamma ray relative to shale and silt)
NOTICE OF INTENT TO DRILL

Must be approved by KCC five (5) days prior to commencing well
Form KSONA-1, Certification of Compliance with the Kansas Surface Owner Notification Act, MUST be submitted with this form.

Expected Spud Date: 03/19/2015

Operator: Licensee: BERECO LLC
Name: REBECCA LLC
Address: 1203 N. Bramblewood
City: Wichita
Street: 752
Zip: 67206

Contractor: Licensee: 34854
Name: Field Drilling Inc.
Address: 216 N. 29th St.
City: Wichita
Zip: 67207

Well Drilled For:
Well Class: Water Well
Type of Well: Oil or Gas Well
Drilling Method:

Well No. 1

Datum:

Section:

T abrupt

R abrupt

W abrupt

Nearest Leased or Unit Boundary Line (in feet)

Water well within one-quarter mile:

Water well within one-half mile:

Depth to bottom of fresh water:

Depth to bottom of usable water:

Surface Pipe by Alternate:

Length of Surface Pipe Planned to Set:

Length of Conductor Pipe (if any):

Projected Total Depth:

Formation at Total Depth:

Water Source for Drilling Operations:

Wells: 1

Rig: 1

Rig permit #: 1216

Will cores be taken:

If yes, proposed zone:

Submission:

For KCC Use Only
APR 15 - 15-191-22770-00-00

Conductor pipe required: 30 ft

Minimum surface pipe required: 220 ft

Proposed Spud Date: 03/19/2015

Signature of Operator or Agent:

NOTE: In all cases locate the spot of the proposed drilling location.

EXAMPLE:

In plotting the proposed location of the well, you must show:

1. The manner in which you are using the depicted plat by identifying section lines, i.e. 1 section, 1 section with 5 surrounding sections, 4 sections, etc.

2. The distance of the proposed drilling location from the south line and east line outside section lines.

3. The distance to the nearest lease or unit boundary line (in feet).

4. If proposed location is located on a prorated or spaced field a certificate of acreage attribution plat must be attached (CG-F for oil wells; CG-R gas wells).

5. The predicted locations of lease roads, tank batteries, pipelines, and electrical lines.
APPLICATION FOR SURFACE PIT

Submit in Duplicate

Operator Name: BEREXCO LLC
License Number: 34318
Address: 2020 N. Bramblewood
Wichita KS 67206

Contact Person: Dana Wraith
Phone Number: 316-265-3311

Lease Name & Well No.: Wellington KGS 2-32

Pit Location (QZQQQ):

NE  NW  SE

2680 Feet from North Line of Section

2680 Feet from East Line of Section

700 Feet from West Line of Section

Summer

Is the pit located in a Sensitive Ground Water Area? Yes No
Chloride concentration: mg/l

Is the bottom below ground level? Yes No
Artificial Liner? Yes No
How is the pit lined if a plastic liner is not used? Mud seal with Bentonite Clay in freshwater clitting mud, native mud and clay.

Pit dimensions (all but working pits):

Length (feet) 100
Width (feet) 100
Depth from ground level to deepest point: 4

If the pit is lined give a brief description of the liner material, thickness and installation procedure.

Describe procedures for periodic maintenance and determining liner integrity, including any special monitoring.

Distance to nearest water well within one-mile of pit:

N/A feet Depth of water well __________ feet.

Emergency, Sessing and Burs Pits ONLY:

Producing Formation:

Number of producing wells on lease:

Barrels of fluid produced daily:

Does the slope from the tank battery allow all spilled fluids to flow into the pit? Yes No

Submitted Electronically

KCC OFFICE USE ONLY

Date Received: 03/17/2015
15-191-22770.00.00 Permit Number
03/18/2015 Permit Date
03/18/2015 Lease Inspection: Yes No

Mail to: KCC - Conservation Division, 130 S. Market - Room 2078, Wichita, Kansas 67202
NOTICE TO OPERATORS FILING INTENT TO DRILL FOR DISPOSAL OR ENHANCED RECOVERY INJECTION WELLS, (CLASS II INJECTION WELLS)

The attached approved Notice of Intent to Drill indicates the proposed well is to be used for injection. An approved "Intent to Drill" does not approve injection authority as a Class II Injection Well in Kansas.

Before any well is used for injection purposes, the operator must file an application for injection authority in accordance with K.A.R. 82-3-401 and provide notice in accordance with K.A.R. 82-3-402. The Conservation Division must issue a written permit granting the application before commencement of injection.

The Conservation Division requirements and restrictions associated with Class II Injection are identified in K.A.R. 82-3-400 et seq of our regulations. Associated regulations governing drilling, completion and injection applications may be found in K.A.R. 82-3-135, Table I, Table II, in the Cedar Hills Sandstone Moratorium, (Docket #158,397-C), and the Eastern Kansas Surface Casing Order, (Docket #133,891-C).

If you have questions regarding the approval of injection authority, an injection application may be filed as a "Design Approval" before actual drilling and completion of the well occurs. If you have any questions or concerns regarding Class II injection wells or regulations, call the Underground Injection Control Department at 316-357-5200.

Failure to obtain commission approval before beginning injection is punishable by a penalty, shut-in of the well or both.

March 10, 2015

CENTRAL KANSAS OILFIELD SERVICES, INC. 16201792-1977
March 18, 2015

Dana Wraith
BEREXCO LLC
2020 N. Bramblewood
Wichita, KS 67208-1094

Re: Drilling Pit Application
Wellington KGS 2-32
SE/4 Sec.32-31S-01W
Sumner County, Kansas

Dear Dana Wraith:

District staff has inspected the above referenced location and has determined that the reserve pit shall be constructed without slots, the bottom shall be flat and reasonably level, and the free fluids must be removed. The fluids are to be removed from the reserve pit within 2 weeks of completion of drilling operations.

If production casing is set all completion fluids shall be removed from the working pits daily. NO completion fluids or non-exempt wastes shall be placed in the reserve pit.

The fluids should be taken to an authorized disposal well. Please call the District Office at (316) 630-4000 when the fluids have been removed. Please file form CDP-5 (August 2008), Exploration and Production Waste Transfer, through KOLAR within 30 days of fluid removal.

A copy of this letter should be posted in the doghouse along with the approved Intent to Drill. If you have any questions or concerns please feel free to contact the District Office at (316) 630-4000.
A) 15- Seismic Array (Sept 2014) – Miller, ERS
   CGPS & InSAR (Sept 2014) & 3D seismic interp.
   – KU/KGS - Taylor, Schwab, & Tsoflia, Bidgoli

B) Drill Miss Injection Well (April 2015) & Inject CO₂ (~May 2015)
   – Berexco, Praxair, Linde

C) Drill Arbuckle Monitoring Well (Fall 2015) - Berexco

D) Equip KGS 2-28 for MVA & KGS 1-28 for CO₂ Injection
   (~October 2015 to March 2016)
   – LBNL (Daley, Freifeld), Berexco
   -- Distributed Fiber Optic Arrays, pending, EPRI (Trautz)

E) Begin Arbuckle CO₂ Injection, ~ March 2016

F) Fluid sampling & analysis for Pre- and post-Injection Monitoring
   -- Berexco, KSU (Datta and Reese)

G) Geomodeling, simulation, and testing (ongoing)
   -- KGS Energy Research (ERS)

H) Class VI permitting & reporting – Birdie, KGS

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MVA Activity at Wellington CO₂ injection site
Sumner County, Kansas
Twn 31S - R 1W

Sources: USGS, Kansas Geological Survey, Kansas Corporation Commission, DASC.
Map Created October 14, 2014
Milestone 3. Site Characterization of the Mississippian Reservoir for CO$_2$-EOR

*Porosity Inversion of the 3D Seismic Wellington Field*

Total Miss thickness ~400 ft including caprock
Pay <50 ft at top (warmer colors)
Complex westward offlapping geometries of porous lithofacies -- Looking SW

Porosity Model (log/3D seismic) of the Siliceous Dolomite Reservoir
Upper Mississippian, Wellington Field

Rush, KGS
Milestone 3. Site Characterization of the Mississippian

\[ RQI = 0.0314 \left( \frac{K}{\Phi_e} \right)^{0.5} \]

- Montalvo, KU & Barker, KSU
- Fazelalavi, KGS

Oil Pay

50 ft

No Osage or Kinderhook - Midramp Dolomite

Moderately thick Miss.

Cherty Sucrosic Dolomite

Sedimentary Features Have Been Masked During Dolomitization

Convoluted dark gray chert nodules are scattered in the matrix and appear auto brecciated

Montalvo, KU & Barker, KSU

Drainage Capillary Pressure Curves for Each RQI Range in the Mississippian

Relative Permeability Curves for Each RQI Range in the Mississippian

Fazelalavi, KGS
NW-SE PSDM Seismic Profile
Mississippian Oil Reservoir
Projected Through 5-Spot Injection (CO₂-EOR) & Wellington KGS #2-32 (star)

Note westward progradation of porous flow units

PsDM Top Miss. horizon 
& location of 20 ft offset

Seismic amplitude

“doublet”

Porosity attribute

High porosity

200 ft (60 m)

J. Rush, KGS