

THE STATE CORPORATION COMMISSION
 OF THE STATE OF KANSAS

Before Commissioners: Shari Feist Albrecht, Chair
 Jay Scott Emler
 Dwight D. Keen

In the Matter of the Application of Summit) Docket No.: 19-CONS-3171-CFLA
 Operating, LLC for Permission To Flare Natural Gas)
 From Five Wells In Order To Recover Helium in) CONSERVATION DIVISION
 Rush County, Kansas, pursuant to K.A.R. §§ 82-3-)
314.) License No.: 35382

Summit Operating, LLC (“Summit”) submits this Amended Application, pursuant to K.A.R. § 82-3-314 for an order granting Summit permission to flare natural gas from five wells in Township 16 South, Range 17 East in Rush County. Specifically, Summit seeks permission to flare natural gas produced from the below-referenced wells as part of a pilot project to evaluate the operation of a prototype modular helium processing plant. In support of its Application, Summit states and alleges as follows:

1. Summit is a Kansas limited liability company with its principal business address at 2760 29th St., Ste. 2A, Boulder, CO 80301.
2. Summit operates five wells in Rush County, KS. Specifically,

<u>WELL</u>	<u>API #</u>	<u>LOCATION</u>
R. Berens Unit 1-8	API: 15-165-22011	T16S, R17W, Sec. 8 NE/4NE/4
Urban 1-9	API: 15-165-21959	T16S, R17W, Sec. 9 SE/4NW/4
David Urban 1-21	API: 15-165-21994	T16S, R17W, Sec. 21 NW/4NE/4
Barry Urban 1-17	API: 15-165-22070	T16S, R17W, Sec. 17 NW/4NE/4
Roth-Robben 1-21	API: 15-165-22007	T16S, R17W, Sec. 21 SE/4SE/4

3. Each of these wells are capable of producing some oil, with small amounts of accompanying natural gas. However, more importantly, each of these wells contain significant amounts of recoverable helium.

4. Summit desires to install a prototype modular helium recovery plant in SW/4SW/4 of Section 15 Township 16 South, Range 17 West. This plant will gather the gas streams from the five referenced wells and remove recoverable natural gas liquids (“NGLs”) for sale. Chemical tests indicate that the remaining gas stream will consist of almost 88% nitrogen, less than 1% carbon dioxide, and less than 12% methane (with no hydrogen sulfide). Anticipated volume of the entire gas stream from the five-well system is approximately 2,000 Mcf/day (the maximum capacity of the plant).

5. Pursuant to K.S.A. § 55-102(b), natural gas produced from natural gas wells or in connection with the production of oil may be flared if such flaring is authorized by order or rules or regulations of the Commission.

6. Summit’s request to flare natural gas does not fit squarely within any specific regulation promulgated by the Commission. Therefore, Summit requests authorization to flare pursuant to KAR § 82-3-314(e), which provides that flaring non-casinghead gas may be authorized by the Commission under any conditions not addressed in that regulation.

7. However, Summit believes that KAR § 82-3-208(b)(1)-(8) (flaring of casinghead gas) addresses situations analogous to its request, and therefore states the following for the Commission’s consideration:

- a. Due to the low methane concentration and high nitrogen content of the gas stream, it is unsuitable for delivery to any gas-gathering system without cost-prohibitive pre-processing.

- b. Probable recoverable reserves of natural gas from the five-well system have been calculated to be 3,772 MMcf.
- c. The target formation containing the high-helium-content gas can be water-flooded to recover reserves lost due to removal of the gas cap. Furthermore, reinjecting the gas will dilute the concentration of the remaining helium in place. This will reduce the overall economically recoverable amount of helium.
- d. The project will require, at a minimum, twelve months of testing and evaluation due to the unique combination of natural resource and prototype recovery technology.
- e. The gas-to-oil ratio will decrease as the gas pressure is removed.
- f. Summit is concurrently obtaining the required air-quality permits from the Kansas Department of Health and Environment to operate its on-site plant.
- g. This is a unique project for Kansas. The normal concentration of most “helium wells” is 1-3% helium with the methane concentration of greater than 50%. Such ratios will typically make the processing of the natural gas economic in some market environments. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[Redacted text block]

h. [Redacted text block]

i. [Redacted text block]

j. [Redacted text block]

8. Summit will continue to monitor the quality of the gas stream produced from the wells on a regular basis to determine whether the composition of that gas and the volume of gas produced changes. If so, Summit will evaluate the economics of and ability to deliver that gas to a gas purchaser.
9. If tests are successful, Summit anticipates drilling and operating additional helium wells in the vicinity.
10. The volume of gas flared by Summit will be metered, measured and monitored and the records thereof will be retained by Summit for a period of two years. Summit is willing to report this information to the Commission semiannually or as otherwise designated by the Commission.
11. Summit requests that the Commission enter an order allowing the Staff to permit the flaring of gas from the five referenced wells when Summit files a satisfactory Affidavit and notifies the District Office, in advance, of the commencement of flaring operations.
12. Notices to affected owners of Summit's Application were previously sent and publication in both Wichita and Rush County newspapers have been previously documented in this matter.
13. No valid or timely protest was filed, therefore Summit requests that the Commission grant this Application administratively without the necessity for a hearing.
14. The relief requested by this Application will not result in a violation of correlative rights, will not cause waste, and is otherwise consistent with the statutory duties of the Commission.

WHEREFORE, Summit Exploration & Production, LLC requests that, after due notice and hearing, the Commission enter an order granting this Application for:

- I. Permission to flare gas from the specified wells.
- II. An exception to testing requirements of K.A.R. § 82-3-303 for good cause shown, and for determination of a system-wide (*i.e.* five-well) allowable based on evidence submitted with this Amended Application.
- III. Other and further relief as the Commission deems just and proper.



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VERIFICATION

STATE OF KANSAS)
) ss:
COUNTY OF SEDGWICK)

Anthony T. Hunter, of lawful age, being first duly sworn upon his oath, deposes and states:
That he is the attorney for Summit Exploration and Production, LLC which is the Applicant in
the attached Application; that he is authorized to make and makes this statement for and on
behalf of said Applicant; that he is familiar with the contents thereof, and that all statements,
allegations and averments therein contained are true and correct to the best of his knowledge and
belief.


Anthony T. Hunter

SUBSCRIBED AND SWORN to before me this 25th day of January, 2019.
My Appointment Expires: 5/19/21




Notary Public

EXHIBIT B

ABSOLUTE OPEN FLOW (AOF) ESTIMATE

Open-hole drilling stem testing (DST) of the Downing-Nelson Oil Company's Urban 1-9 well tested the Conglomerate formation from 3,460' to 3,525'. During the DST, gas production rates from 3,974 to 4,598 Mscf/d were measured. Flowing and shut-in bottomhole pressures were measured during the test.

This data was subsequently entered into IHS Fekete's pressure transient analysis software, WellTest™, and analyzed, using a derivative type-curve analysis, to determine initial reservoir pressure (P_r), formation permeability-thickness (kh) and completion skin (S). This analysis resulted in the following reservoir / well completion parameters: $P_r = 1104$ psig, $kh = 720$ md-ft and $S = 0.687$.

Then, utilizing Petroleum Experts inflow performance relationship (IPR) modeling software, Prosper™, those reservoir properties were entered, along with the following additional parameters: Reservoir Thickness (h) = 6', Perforation Interval (h_p) = 6', Drainage Area (A_d) = 60 acres, Flow Time (t_f) = 30 days, Formation Porosity (ϕ) = 0.22, Connate Water Saturation (S_w) = 0.20 and a Dietz Shape Factor (D_{sf}) = 31.

From this data, Prosper™ calculated a Non-Darcy Flow Factor (D) of 0.0011047 / Mscf/d and an AOF of 5.99 MMscf/d.

If a Back-Pressure reservoir model ($Q = C (P_c^2 - P_w^2)^n$) is used to characterize the IPR curve, the Back-Pressure model's values of C and n become 0.0090597 Mscf/d/psi² and 0.95457, respectively, with n being this model's non-Darcy flow factor. The non-Darcy flow factor varies between 1 and 0.5 with 1 indicating laminar flow and 0.5 indicating completely turbulent flow.

The Figure below is a plot of the C and n reservoir model's IPR curve.

EXHIBIT B (cont'd)

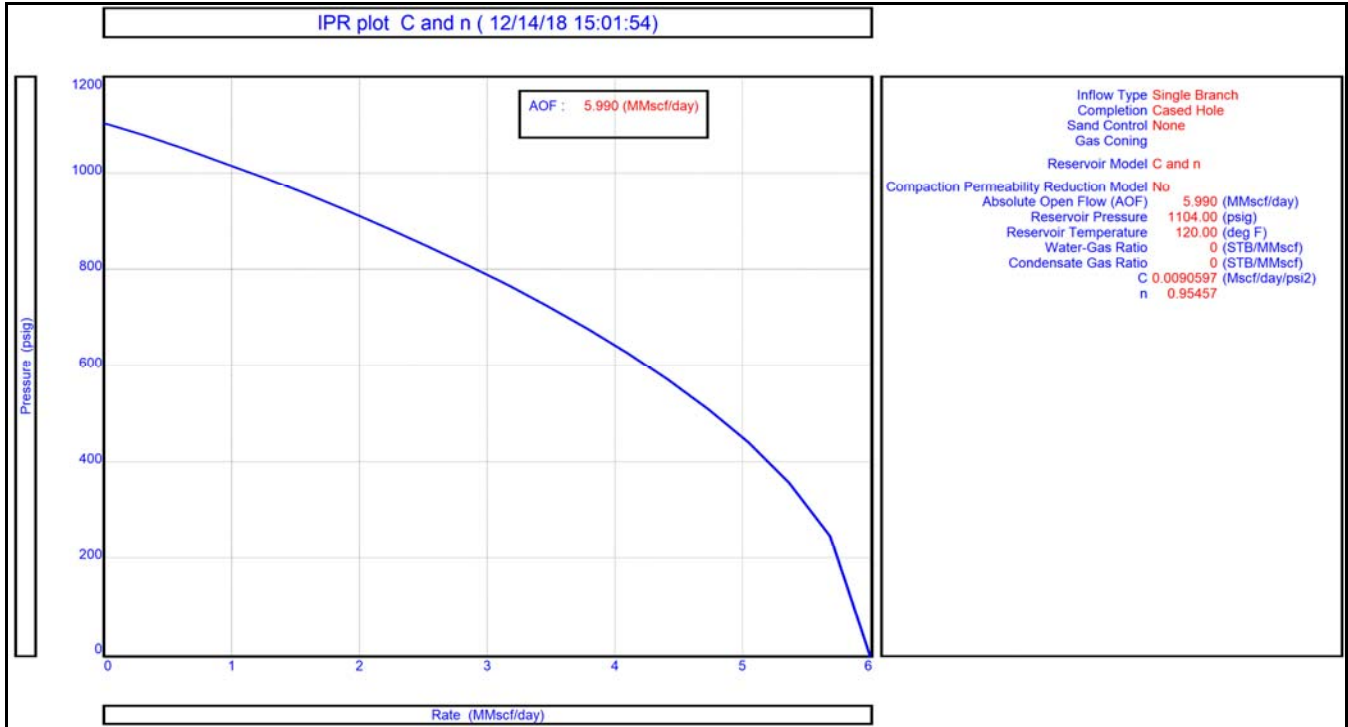


EXHIBIT B (cont'd)

FORMATION DAMAGE

Following the open-hole DST, the well was subsequently cased and cemented and completed in the Arbuckle formation, below the Conglomerate, for oil production. After oil production ceased, the Arbuckle perforations were abandoned and the well was completed in the Conglomerate for additional testing. During this testing, gas production rates and flowing and shut-in bottomhole pressures were collected. Gas production rates varied from about 400 Mscf/d down to 220 Mscf/d.

When the rate and pressure data were analyzed, again using Fekete's WellTest™, the skin factor had increased to over 200, indicating tremendous formation damage. It is believed that the damage occurred during the time the Conglomerate was sitting behind pipe and not being produced. Once the Conglomerate is drilled through, it is important that it be immediately produced to prevent the introduction of fluids that can react with its clays and cause formation damage. The shut-ins (72 hrs) for well testing purposes that the State of Kansas' General Rules and Regulations for the Conservation of Oil and Gas 82-3-303 Determination of Open Flow of a Gas Well should be avoided.

The low-BTU, gas-containing Conglomerate formation appears to contain swelling clays, that if exposed to certain fluids will expand to clog pore throats and damage the formation's permeability. This permeability reduction will reduce the volume of the economically recoverable gas.

Any liquids that are being lifted to the surface by a well's gas stream will be introduced to the gas bearing formation when the well is shut-in. When gas flow stops, the liquids, being denser than the gas, will fall to the bottom of the well. As this phase segregation occurs, the shut-in bottomhole pressure will increase to above the existing reservoir pressure, pushing liquids into the formation and potentially causing formation damage.

To establish an open flow potential for a well, the use of a relatively short-duration, pressure drawdown/buildup, derivative type curve analysis, as was done in establishing the AOF for the Urban 1-9 (5.990 MMscf/d) in the analysis above, should be considered.