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April 3, 1997

HAND DELIVERED

Mr. David R. Catanach
Hearing Examiner
Oil Conservation Division
2040 South Pacheco
Santa Fe, New Mexico 87505

Re: **SUMMARY OF TECHNICAL EVIDENCE**
NMOCD Case 11736
Application of Thompson Engineering
for an "off-pattern" coal/gas well location,
San Juan County, New Mexico

Dear Mr. Catanach:

On behalf of Texakoma Oil & Gas Corporation, and in accordance with your direction at the hearing held on March 20, 1997, please find enclosed our summary of the technical evidence submitted to you in the referenced case.

Very truly yours,

W. Thomas Kellahin

cc: William F. Carr, Esq.
Attorney for Thompson Engineering
Texakoma Oil & Gas Corporation
Attn: David Williams
Brad Salzman

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION DIVISION FOR THE PURPOSE OF CONSIDERING:

CASE 11728

APPLICATION OF THOMPSON ENGINEERING & PRODUCTION COMPANY, FOR AN OFF PATTERN COAL/GAS WELL LOCATION, SAN JUAN COUNTY, NEW MEXICO.

TEXAKOMA OIL & GAS CORPORATION'S SUMMARY OF TECHNICAL EVIDENCE

On behalf of Texakoma Oil & Gas Corporation and in accordance with the directions of the Division Examiner at the hearing of the referenced matter held on March 20, 1997, the following summary of the technical evidence is provided:

THOMPSON'S EVIDENCE

( ) In support of its application, Thompson Engineering & Production Company ("Thompson") presented the following evidence:

(a) based upon a structure map of the base of the Fruitland Coal and an isopach of the basal Fruitland Coal of the immediate area and upon a cum production map of certain coal/gas wells in Valencia Canyon, Colorado Thompson's geologist concluded that:

> (i) coal thickness, depth, fracturing, coal-gas content, water volumes, proximity to the outcrop were not geologic issues relevant to locating its well in the E/2 of said Section 28;
>
> (ii) the **only** geologic issue involved in this case was to determine the location of the syncline flexure which is located at the base of the basal coal monocline;

(iii) Thompson believed that Texakoma's 5-1 Well located at +4111 feet on the structure is uneconomic because it is located at the base of the monocline and therefore Thompson wanted to locate its well farther down structure of that point;

(iv) Thompson estimated that it wanted to be located **lower** on structure than the Texakoma's 5-1 Well (+4100 feet contour line) and the "on-pattern" location would be at least +4700 feet which would be uneconomic.

(v) the requested off-pattern location was necessary in order to locate the well down structure of the syncline flexure of the basal coal;

(vi) if the well was in the fold or up structure of the fold then they would get a well like Texakoma's 5-1 which Thompson considered to be non-commercial.

(b) based upon a ten-well "averaging model" of initial gas/water rates compared to annual gas/water rates, a forecast of the EUR of a "typical well" utilizing production plots of the Texakoma coal/gas wells 5-1, 33-1 and 33-2, and a 3-well economic analysis, Thompson's petroleum engineer concluded that:

(i) reservoir pressure, coal thickness, depth, fracturing, coal-gas content, water volumes, proximity to the outcrop were not reservoir engineering issues relevant to locating the well;

(ii) Texakoma's 33-2 [immediately to the south of the Thompson proposed location] would recover an estimated 4 BCF of gas while Thompson's proposed location would recover only 1 BCF of gas;

(iii) Texakoma's 5-1 well in Section 5 would recover only 0.522 BCF of gas;

(iv) while Thompson did not know how much gas was recoverable from their spacing unit, Thompson contended that it was essential to have the off-pattern location or they would be drained by Texakoma's 33-2 Well;

(v) Thompson would not be able to protect themselves if their well was in the NE/4 of Section 28 because it would be up structure from the syncline fold;

(vi) Thompson could not estimate the gas in place nor the amount of gas to be drained at its proposed "off pattern" location from the adjoining spacing units.

TEXAKOMA'S EVIDENCE

( ) Texakoma Oil & Gas Corporation ("Texakoma"), in opposition to the applicant, presented a structure map on the base of the basal Fruitland coal, a cumulative water production map, a first month average daily water production map, and production data from wells in the area which demonstrated that:

Texakoma's 5-1 well

(a) Texakoma's 5-1 well had not yet been "de-watered" and when that occurred, the well would be economic and capable of producing an estimated 3 BCF of gas reserves.

(b) Texakoma's 5-1, 4-1, 33-1 and 33-2 wells should be comparable wells when fully dewatered because of similar coal thickness, permeability derived from micrologs and initial gas and water production.

(c) Texakoma's 5-1 well is located some 460 feet closer to the Fruitland Coal outcrop than an "on-pattern location in the NE/4 of Section 28 and some 1460 feet closer than Thompson's proposed location in the SE/4 of said Section 28 but is still a commercial well.

base of monocline

(d) Thompson's structure map shows Thompson's proposed "off-pattern" location is equivalent to the structural position of Texakoma's 5-1 Well which Thompson contends is uneconomic.

(e) Well 5-1 was located at +4111 feet on the structure which is at the base of the monocline and within the syncline flexure of the basal coal which is the area of maximum flexure and highest incidence of fracturing which provides:

-higher initial water rates
-faster dewatering
-more conductivity to wellbore
-higher peak rates
-higher ultimate recovery

(f) it was not necessary to be down structure of the syncline fold (basin side of the base of the monocline) as Thompson contended because Thompson needs to move north into the base of the monocline (towards the NE/4 of Section 28) in order to maximize its opportunity for a commercial well.

Thompson's statistical model

(g) Thompson's ten-well "average" statistical analysis was flawed and its model invalid because:

-the averaging ratios were arbitrary
-data based (10 wells) is too small;
-only 3 wells with 4th year data

(h) to be statistically reliable Thompson should have compared a large (20+ well) group of "reliable" data to predict average performance of a large group of wells while such a small 10-well prediction is not valid comparison.

(i) Despite its flaws, the Thompson's model shows:

-some statistical reliability (3 wells) at 1st year average rates of 700 MCFPD, but data varies wildly:

+/-400 MCFPD 3.75/20 being a 1.9 fold variance
+/-300 MCFPD 4.1/2.05 being a 2.0 fold variance
+/-200 MCFPD 6.3/2/75 being a 2.3 fold variance
+/-100 MCFPD 10.4/1.75 being a 5.9 fold variance

(j) Conclusions:

-largest amount of data is under 300 MCFD
-largest statistical variance under 300 MCFD
-model breaks down under 300 MCFD
-Thompson's one well prediction uses "broken model" and shows 1st year rate below 200 MCFD with a statistical variance of 2.3 which means that his economics can vary by 2.3 times.

-For example, instead of the 1 BCF projected Thompson could get 2.3 BCF even using his "poor" economic parameters.

-Thompson failed to "validate" his model with an "F-test" or T-Test" to prove his data was statistically reliable.

Thompson's economics

(k) Thompson's economics are arbitrary because:

-Thompson used $280,000 capital costs instead of Texakoma's average of $240,000;

-Thompson's gas price of $1.29/MMBTU is less than the average actual price is over $1.90/MMBTU

-Thompson used an arbitrary 15.8% decline rate when the actual data reflects a 11.6% decline.

-Thompson failed to present production estimates for EUR for either its proposed off-pattern location or an on-pattern location.

-By using arbitrary poor economic parameters, Thompson was able to estimate its location would recover only 1 BCF of gas while the direct offset well with less coal thickness is forecast by Thompson to recover 4 BCF of gas.

Thompson's "on-pattern" location

(l) a coal-gas well located at a standard "on-pattern" location in the NE/4 of Section 28 as compared to the off-pattern" location in the SE/4 of Section 28 would be a **better location** because of the coal was thicker and therefore the coal/gas content higher;

(m) the "on-pattern" location when compared to the "off-pattern" location would have adequate reservoir pressure, sufficient fracturing, comparable water volumes and peak gas rates to provide an acceptable location to drain the gas reserves in the E/2 of Section 28;

drainage at "off-pattern" location

(n) at its requested "off-pattern" location, Thompson would drain only about 57 acres of the E/2 of Section 28 being that portion of its spacing unit which is down structure of the syncline fold while draining the adjoining spacing units;

(o) Thompson's "off-pattern" location disrupts the established 320-acre pattern in the area and would result in the drilling of an unnecessary well.

(p) Thompson's requested location would gain an unfair advantage over the Texakoma 33-2 Well.

(q) if it is determined that Thompson's estimate that its well will recover only 1 BCF, once the well recovers that volume it should be plugged and abandoned.

lack of technical data submitted by Thompson

(r) Thompson failed to submit any detailed reservoir engineering study or data including coal/gas content, coal Sorption Isotherms, measured permeability, etc.

Thompson's Valencia Canyon analogy flawed

(s) The subject area ("La Plata") cannot be compared to the Valencia Canyon area in Colorado because of substantial geologic and reservoir differences.

(t) Thompson's analogy to Valencia Canyon Colorado ("VCU")is invalid because:
-VCU wells are shallower than La Plata
-VCU is in high recharge area
-VCU is in "fracture fairway"
-VCU coal thickness is 70 feet compared to 30 feet in La Plata

Respectfully submitted,

KELLAHIN AND KELLAHIN

By: _____

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