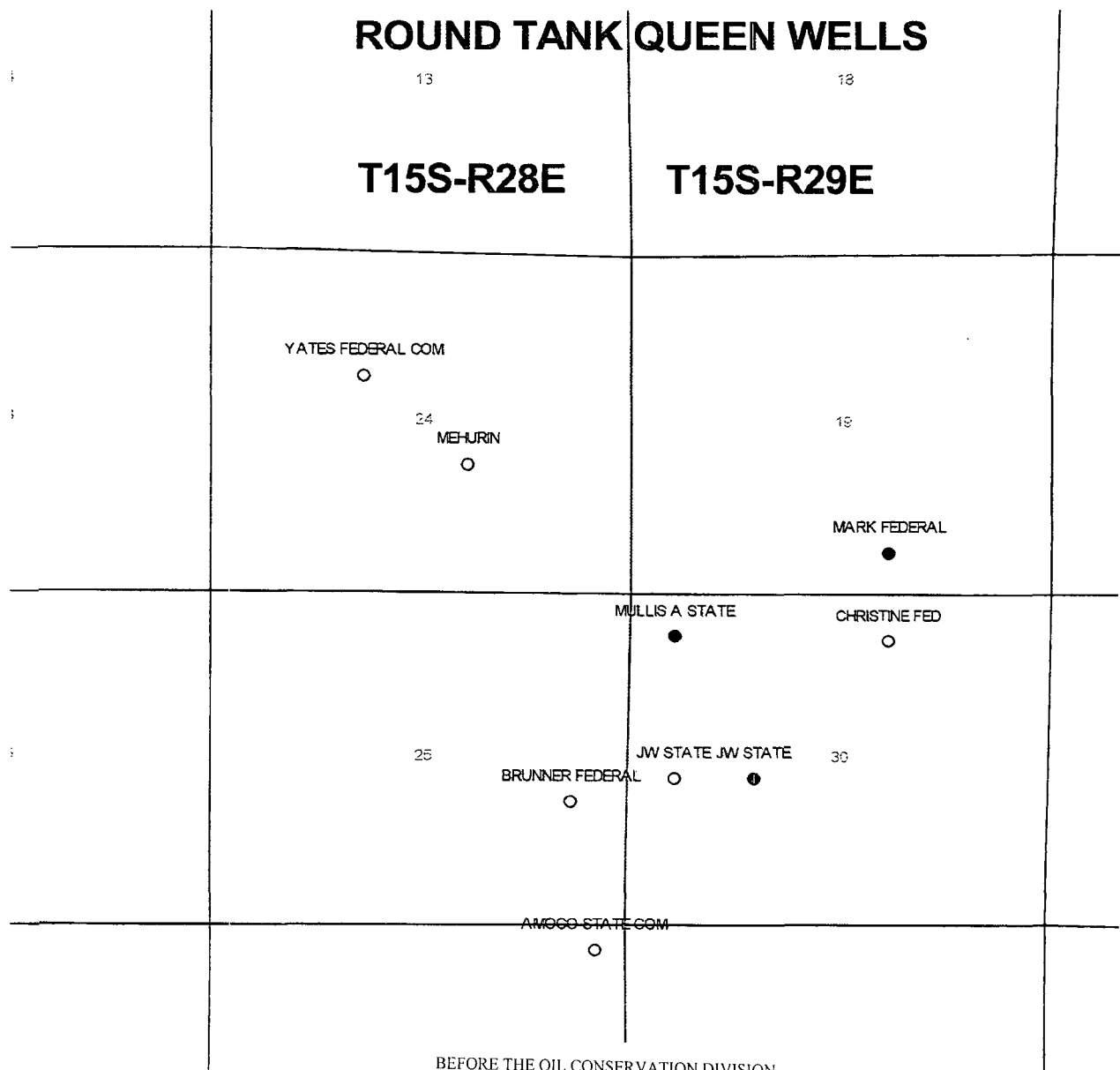


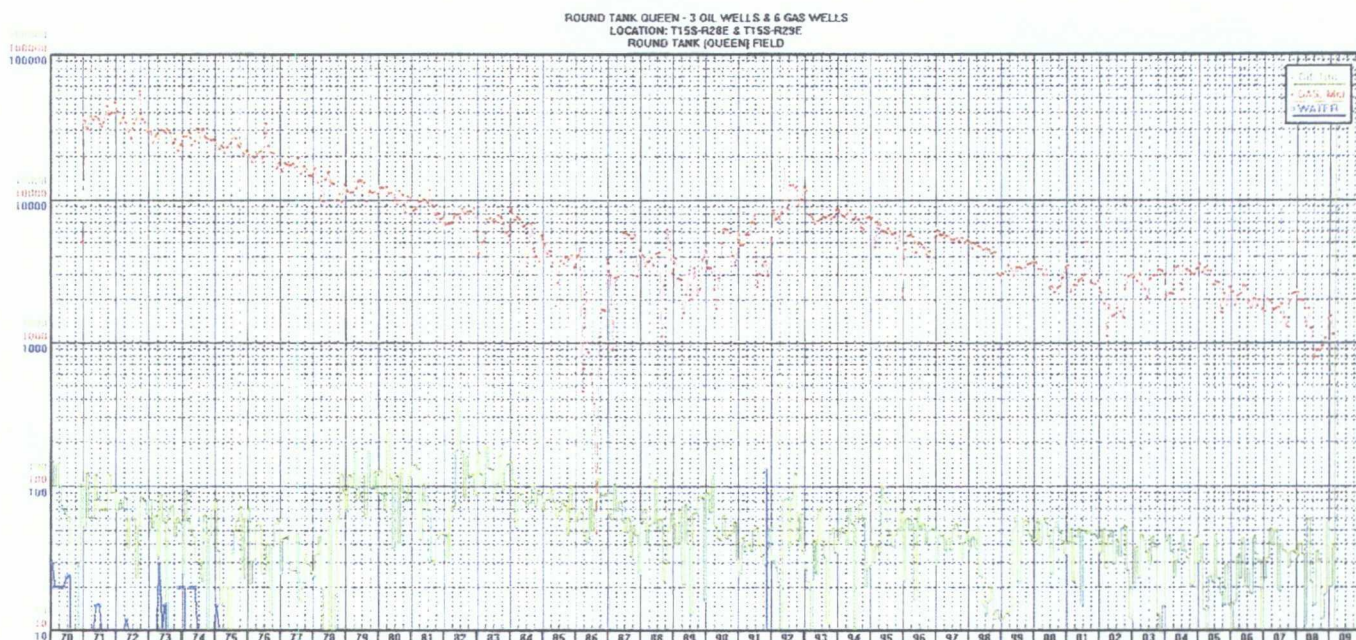
**Round Tank Queen Field  
T15S-R28E & T15S-R29E  
Chaves County, New Mexico**

The Round-Tank Queen Associated Pool was established on March 1, 1970 by Order No.: R-3922. The discovery well was the JW State #1, located in Unit K Section 30, T15S-R29E. The JW State #1 produced 8,526 BO, 20 MCFG and 788 BW. There are a total of nine (9) wells that have produced a total of 26,084 BO, 4,193,607 MCFG and 917 BW. The wells are shown in the following map.



*Gas Field*

API	LEASE NAME	#	LOCATION	STATUS CODE	CUM. OIL	CUM. GAS	CUM. WTR	TD	U PERF	L PERF
3000560618	MARK FEDERAL	1	19O 15S 29E	INA	3,249	11	129	1552	1502	1508
3000561855	YATES FEDERAL COM	1	24F 15S 28E	ACT		349,462		1575	1470	1480
3000500392	MEHURIN	3	24J 15S 28E	ACT		616,204		3102	1463	1477
3000500396	BRUNNER FEDERAL	1	25I 15S 28E	ACT		240,589		3075	1454	1464
3000560482	CHRISTINE FED	3	30B 15S 29E	ACT	14,579			1559	1515	1525
3000560105	JW STATE	2	30 15S 29E	ACT		1,532,436		1660	1472	1482
3000560090	JW STATE	1	30K 15S 29E	INA	8,256	20	788	1705	1506	1510
3000500461	MULLIS A STATE	1	30 15S 29E	INA		693,886		10590	1452	1458
3000560232	AMOCO STATE COM	1	36A 15S 28E	ACT		760,999		1475	1416	1426
					26,084	4,193,607	917			

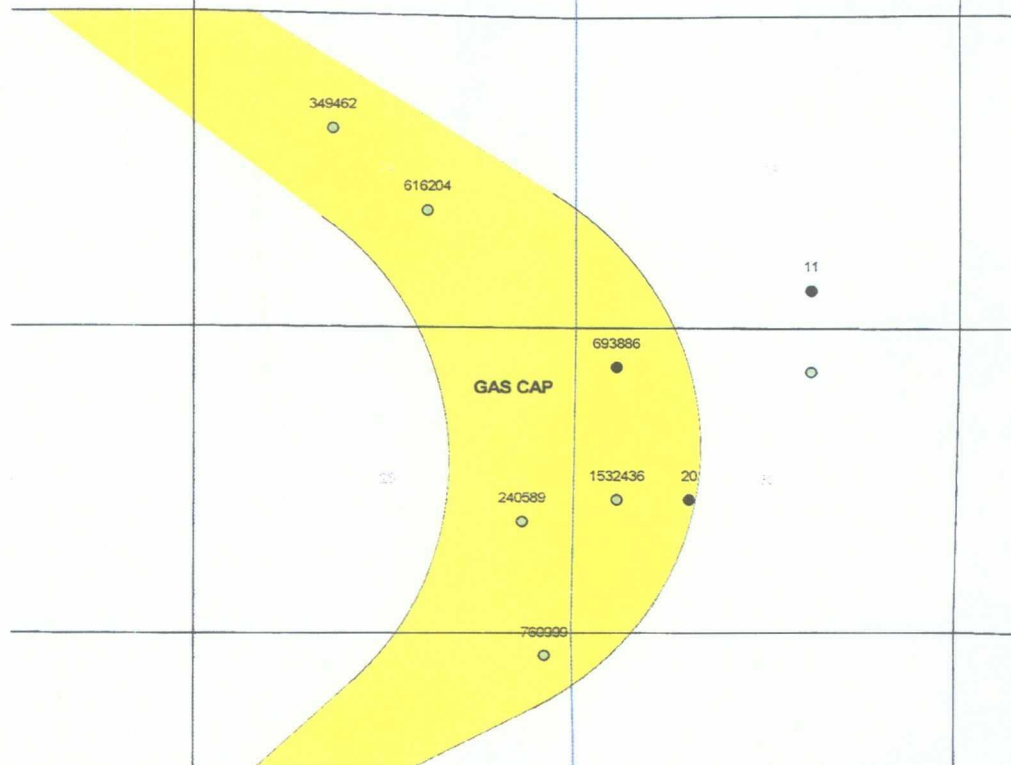


The Round Tank Queen has produced 4.194 BCFG for the associated gas cap. The produced gas contains 61% nitrogen and 39% hydrocarbon gas, with a S.G. of .894 and a BTU content of 513 BTU/ft<sup>3</sup>. The gas cap exists above the gas/oil contact at +2229'.

# ROUND TANK QUEEN CUMULATIVE GAS PRODUCTION

4,193,607 MCFG

T15S-R28E T15S-R29E



Volumetric analysis indicated the gas cap covers an area of approximately four (4) sections (2466.5 acres).

## GAS ANALYSIS INPUT

COMPONENT	INPUT		LIQ. DENSITY SPECIFIC			
	MOLE, %	S.G.	MW	(gm/cc)	GRAVITY	
HYDROGEN SULPHIDE	0.00	1.177	34.080	0.0000	0.000	
CARBON DIOXIDE	0.00	1.520	44.010	0.0000	0.000	
NITROGEN	61.44	0.967	28.020	17.2155	0.594	
METHANE	27.47	0.554	16.040	4.4062	0.152	
ETHANE	6.53	1.038	30.070	1.9636	0.068	
PROPANE	3.06	1.523	44.090	1.3492	0.047	
iso-BUTANE	0.38	2.007	58.120	0.2209	0.008	
n-BUTANE	0.70	2.007	58.120	0.4068	0.014	
iso-PENTANE	0.15	2.491	72.150	0.1082	0.004	
n-PENTANE	0.14	2.491	72.150	0.1010	0.003	
HEXANES	0.08	2.975	86.770	0.0694	0.002	
HEPTANES	0.05	3.702	100.200	0.0501	0.002	
OCTANES	0.00		114.200	0.0000	0.000	
NONANES	0.00		128.300	0.0000	0.000	
DECANES	0.00		142.300	0.0000	0.000	
UNDECANES PLUS	0.00		150.000	0.0000	0.000	
	100.00	22.451		25.8908	0.894	
AIR, MW	28.97	GRAVITY=		0.8937		

## Z FACTOR

RESERVOIR PRESSURE =	600	PSI			
RESERVOIR TEMPERATURE =	75	F			
Pr=P/Pc	=	1.072856	Ppr=	1.072856	
Pc=	559.3	PSI			
Tr=T/Tc	=	1.769984	Tpr=	1.769984	
Tc=	302.3	Deg R	T=	0.564977	
		<u>Pc-PSIA</u>	<u>Tc-F</u>	<u>pPc</u>	<u>pTc</u>
HYDROGEN SULPHIDE	1308.0		212.70	0.00	0.00
CARBON DIOXIDE	1071.0		87.90	0.00	0.00
NITROGEN	493.0		-232.40	302.90	139.84
METHANE	667.8		-116.63	183.44	94.32
ETHANE	707.8		90.09	48.22	35.92
PROPANE	616.3		206.01	18.86	20.38
iso-BUTANE	529.1		274.98	2.01	2.79
n-BUTANE	550.7		305.65	3.85	5.36
iso-PENTANE	490.4		369.10	0.74	1.24
n-PENTANE	488.6		385.70	0.68	1.18
HEXANES	436.9		457.70	0.35	0.73
HEPTANES	396.8		512.80	0.20	0.49
OCTANES	360.6		564.22	0.00	0.00
NONANES	332.0		610.68	0.00	0.00
DECANES	304.0		652.10	0.00	0.00
UNDECANES PLUS	270.0		620.00	0.00	0.00
TOTAL			559.26	302.2626	

$$Z = \frac{0.06125 \text{ Pprte}^{1.21(1-y)^2}}{y} = \frac{0.0296}{0.0312} = 0.948195$$

$$y = 0.0312$$

GAS FORMATION VOLUME FACTOR 0.023329

SCFG/CU.FT. = 42.86

CARBON DIOXIDE 0.00%

HYDROCARBON GAS 38.56%

### VOLUMETRIC ANALYSIS

WELL NAME: ROUND TANK QUEEN PROJECT

LOCATION: T15S-28E & T15S-R29E

OPERATOR: ARMSTRONG ENERGY CORPORATION

FIELD: ROUND TANK QUEEN PROJECT

FORMATION: QUEEN

DEPTH INTERVAL: 1500-1516

OIL OR GAS RESERVOIR: GAS "GAS OR OIL"

GAS GRAVITY: 0.894 AIR=1.00

GAS-OIL RATIO: 100000 MCFG/BO

INITIAL GAS FORMATION VOLUME FACTOR Bg: 0.023329

INITIAL OIL FORMATION VOLUME FACTOR Bo: 1.03

INITIAL FORMATION PRESSURE: 600 PSI

FINAL GAS FORMATION VOLUME FACTOR Bg: 0.240117

FINAL OIL FORMATION VOLUME FACTOR Bo: 1.03

FINAL FORMATION PRESSURE: 50 PSI

BOTTOM HOLE TEMPERATURE: 75 °F

DRAINAGE AREA: 2466.5 ACRES

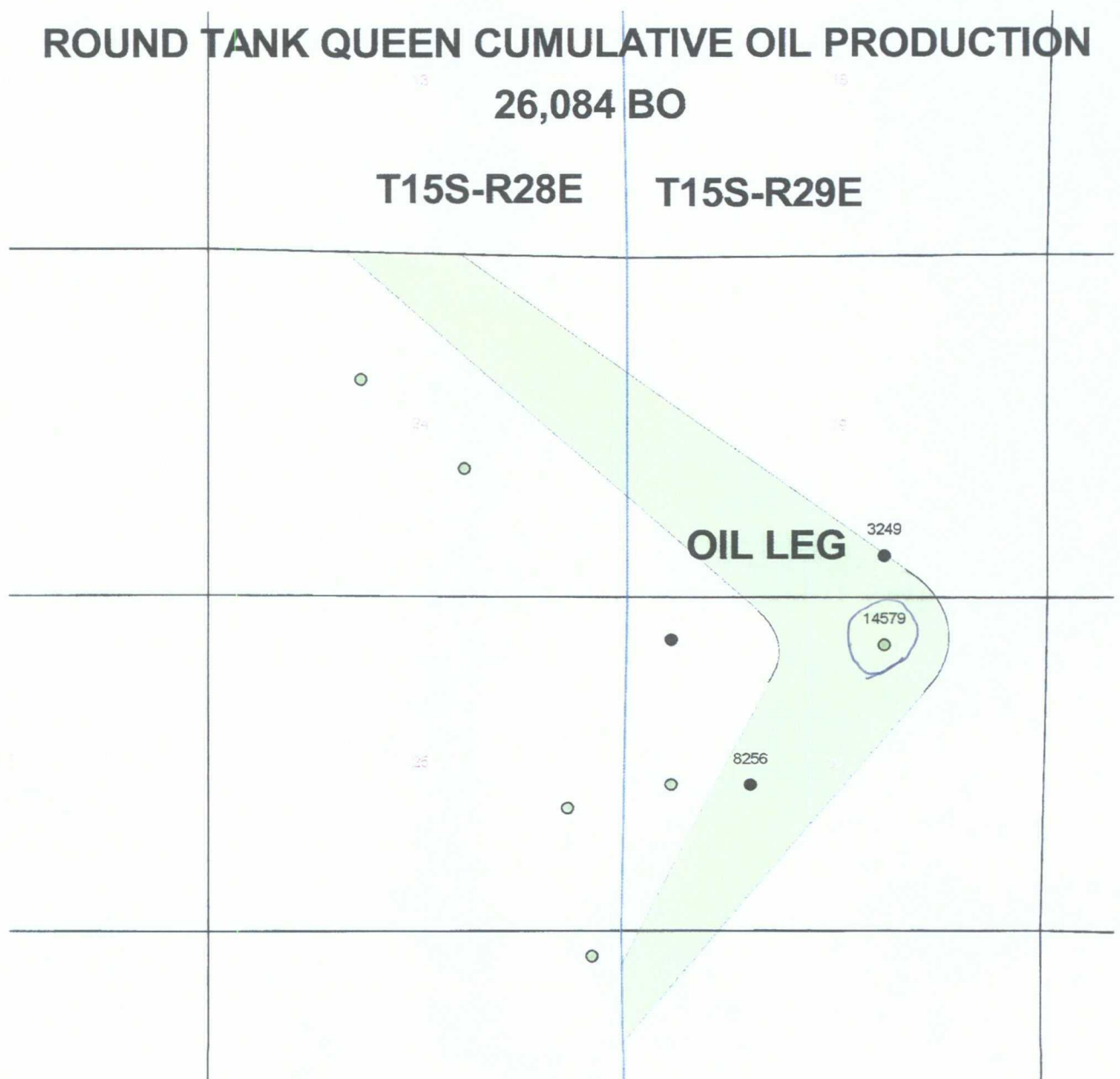
INTERVAL	INTERVAL		Hn	POROSITY	POR-FT.	Sw	RECOVERY		RESERVES	
	UPPER	LOWER					GAS FACTOR	OIL FACTOR	BO	MCFG
1	1,500	1,501	0.58	15.20%	0.09	15.00%	90.00%	20.00%	1	312,370
2	1,501	1,502	0.58	15.70%	0.09	15.00%	90.00%	20.00%	1	322,646
3	1,502	1,504	1.83	19.10%	0.35	15.00%	90.00%	20.00%	3	1,233,676
4	1,504	1,505	0.83	20.50%	0.17	15.00%	90.00%	20.00%	1	601,852
5	1,505	1,507	2.08	18.10%	0.38	15.00%	90.00%	20.00%	3	1,328,509
6	1,507	1,508	0.67	16.80%	0.11	15.00%	90.00%	20.00%	1	394,615
7			0.00		0.00				0	0
8			0.00		0.00				0	0
9			0.00		0.00				0	0
10			0.00		0.00				0	0
TOTAL			6.58		1.19				9	4,193,667
AVERAGE				18.08%						

Area  
2466 acres  
~ 4 Sections



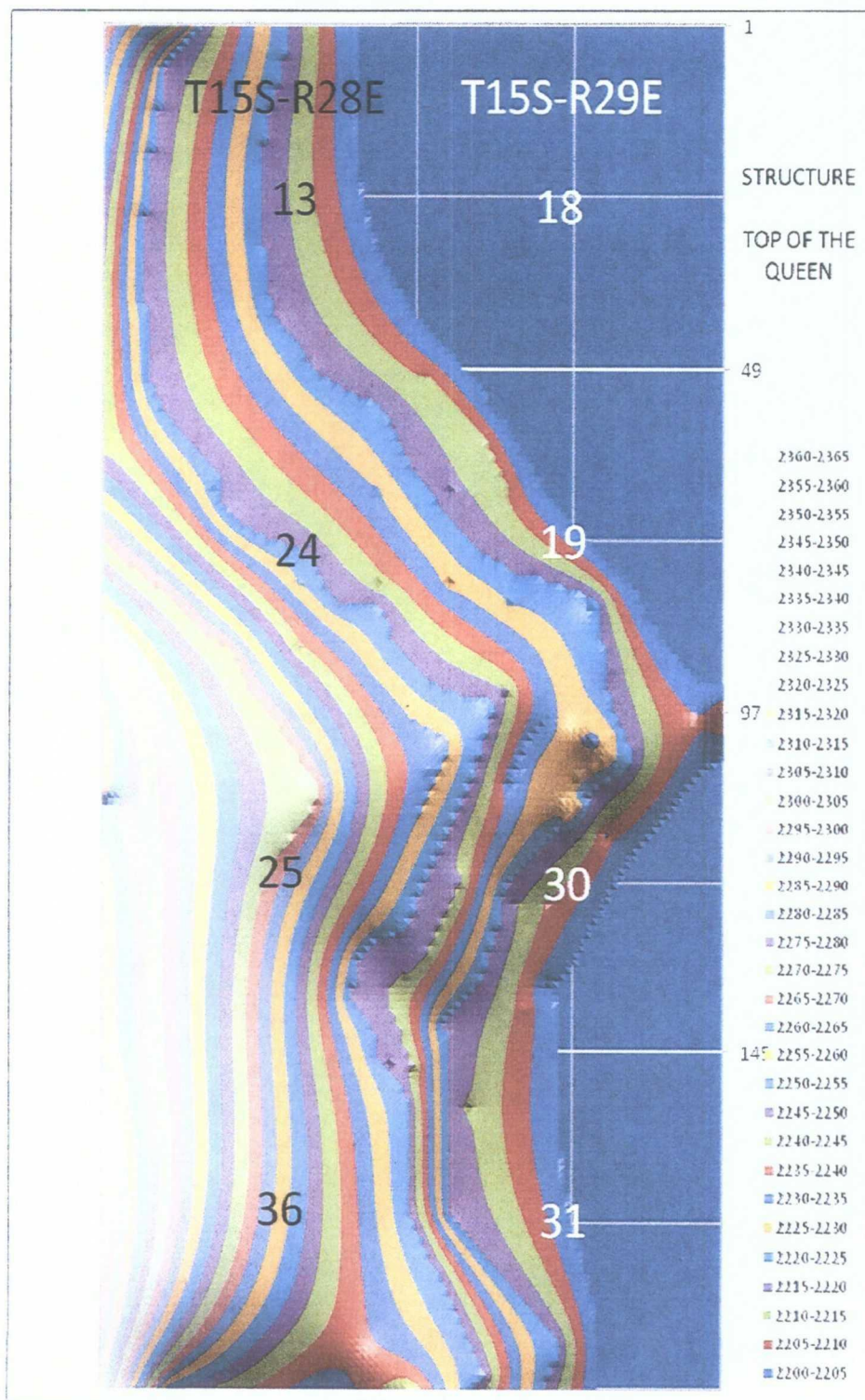
There is a thin oil rim underlying the gas cap. The oil column exists between the gas/oil contact at +2229' and the oil/water contact at +2211'. Three wells have produced from the oil column and have cumulative production of 26,084 BO. The Christine Federal #3 produces entirely from the oil column (top +2226', bottom +2212', Hg 14') and cumulative production of 14,579 BO and 0 BW. The Mark Federal #1 produced 3,249 BO and 129 BW, from +2219' to +2203', Hg 16'. With the oil/water contact at +2211', there is 8' above the oil/water contact. The JW State #1 produced 8,256 BO, 20 MCFG and 788 BW from +2215' to +2198', Hg 17', with 4' above the oil/water contact.

The Christine Federal #3 indicates that the water below +2211 is static and there is not an active water-drive. The bottom of the Queen zone is at +2212', 1' above the oil/water contact. To date the Christine Federal #3 has not produced any formation water.



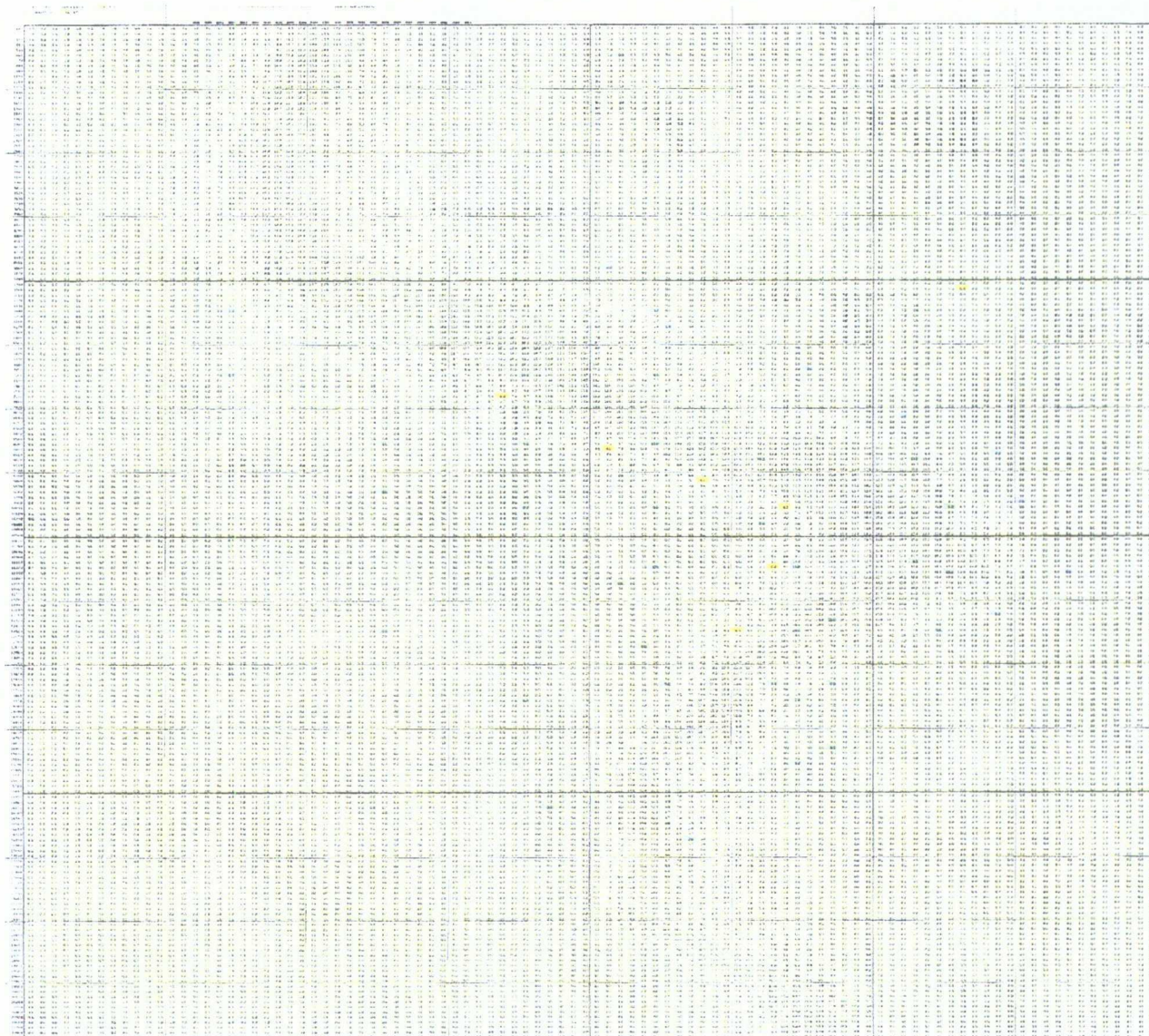
A cellular model was created with grid blocks that are 110' x110' and the area is eight (8) square miles. The model contains a total of 18,432 grid blocks. The area modeled is sections 13, 24, 25, and 36 in T15S-R28E and sections 18, 19, 30 and 31 in T15S-R29E, approximately 5120 acres.

Subsea depths were entered for the appropriate location for each well that penetrated the Queen formation. Using a nearest-neighbor algorithm, intermediate values were computed to generate a surface representing the top of the Queen. This structure map is shown in the following plot.





Using the Top of Queen Surface map, a value of the height of the oil column above the oil/water contact at +2211' and below the gas/oil contact at +2229' was calculated for each grid block. As shown in the following plot.



By applying typical log attributes from the Eskimo State #2 log to each grid block an original-oil-in-place value was calculated for each tract. Volumetric analysis is based on the following assumptions:

$$Bo = 1.03$$

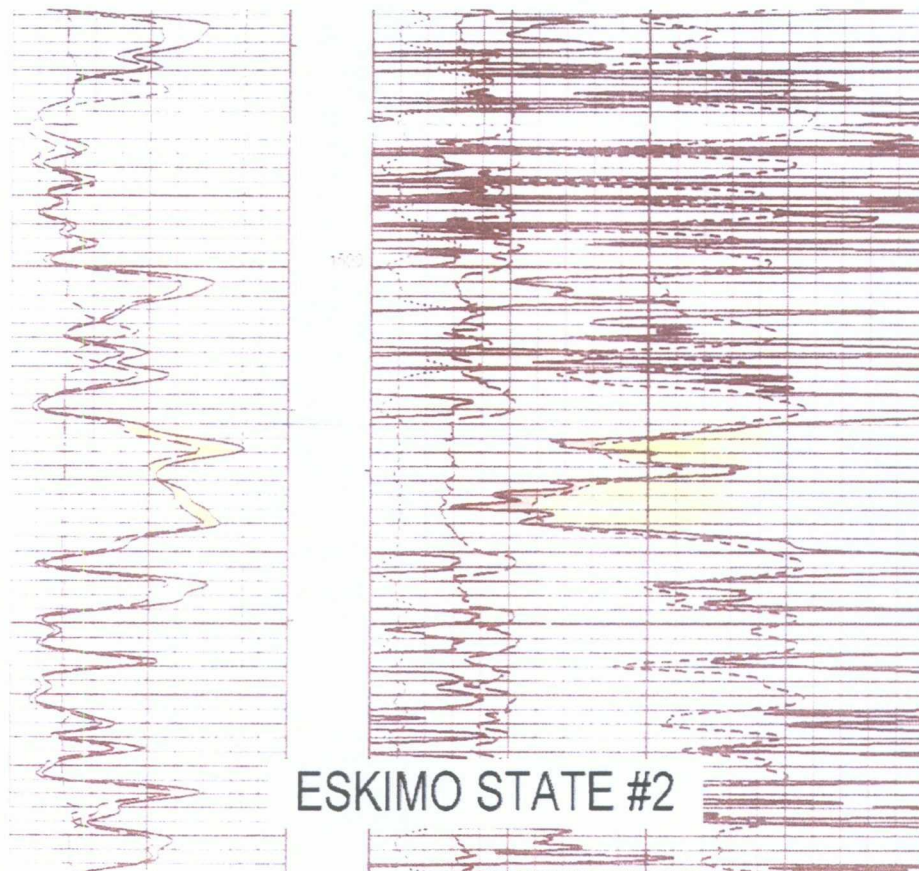
$$\text{Porosity} = (\text{Density} + \text{Neutron}) / 2$$

$$Sw = (Fr \times R_w / R_t)^{0.5}$$

$$R_w = .04$$

$$\text{Formation Factor} = 0.81$$





Sands are continuous across the project area as shown in the following cross section, running west to east, through the Christine Federal #3.

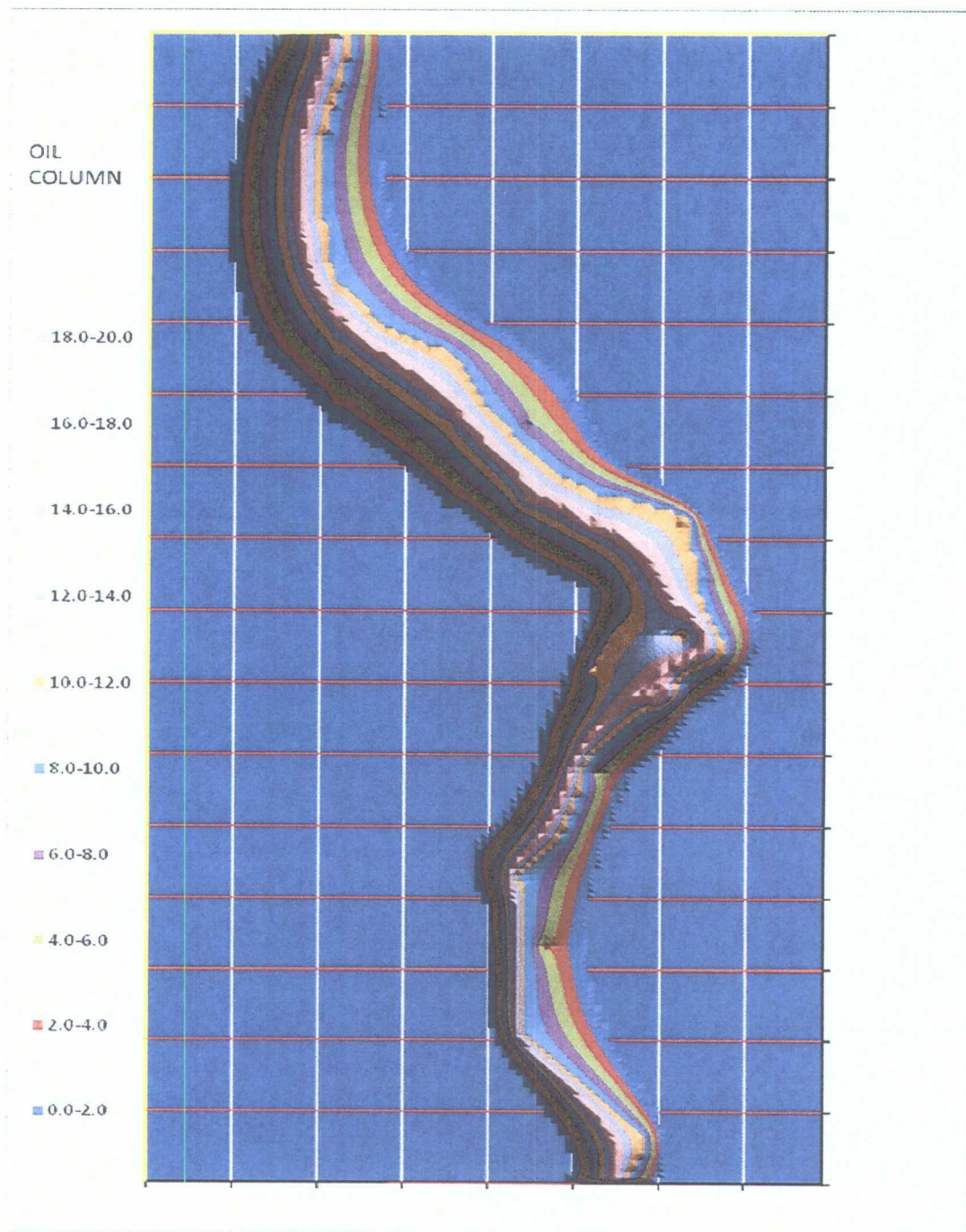


Using the type log attributes, structure and fluid properties, an OOIP value was calculated for each grid block. The resulting gross thickness of oil column is shown in the following plot.





A graphical representation is shown in the following plot.





By summing the OOIP values for each grid block associated with each Tract, an OOIP value for each Tract can be calculated. As shown in the following table.

ROUND TANK QUEEN UNIT OOIP PER TRACT		↓	
	DESCRIPTION	OOIP	TOTAL
TRACT 1			
	E/2 NE/4, SE/4 SEC. 30	311	
	SE/4 SEC. 25	1,095	
	TOTAL		1,406
TRACT 2			
	SE/4, S/2 NE/4, E/2 SW/4, SE/NW SEC. 24	265,846	
	NE/4 SEC. 25	0	
	TOTAL		265,846
TRACT 3			
	S/2 NW/4, W/2 SW/4 SEC. 19	222,935	
	W/2 NE/4 SEC. 30	123,364	
	TOTAL		346,300
TRACT 4			
	N/2 NE/4, NE/NW SEC. 24	275,211	
	N/2 NW/4	4,247	
	TOTAL		279,458
TRACT 5			
	S/2 SE/4 SEC. 19	60,964	
	TOTAL		60,964
TRACT 6			
	N/2 SE/4 SEC. 19	8,771	
	TOTAL		8,771
TRACT 7			
	E/2 SW/4 SEC. 19	229,980	
	W/2 SEC. 30	492,155	
	TOTAL		722,135
	TOTAL	1,684,880	1,684,880

Cumulative primary oil production from the Queen formation is 26,084 BO, 1.55% of the estimated OOIP value of 1,684,880 BO in the proposed unitized area. Since the Queen has limited primary oil production, the primary factors in the tract participation calculation are OOIP and acreage contribution. The formula used to calculate each tract's participation factor is:

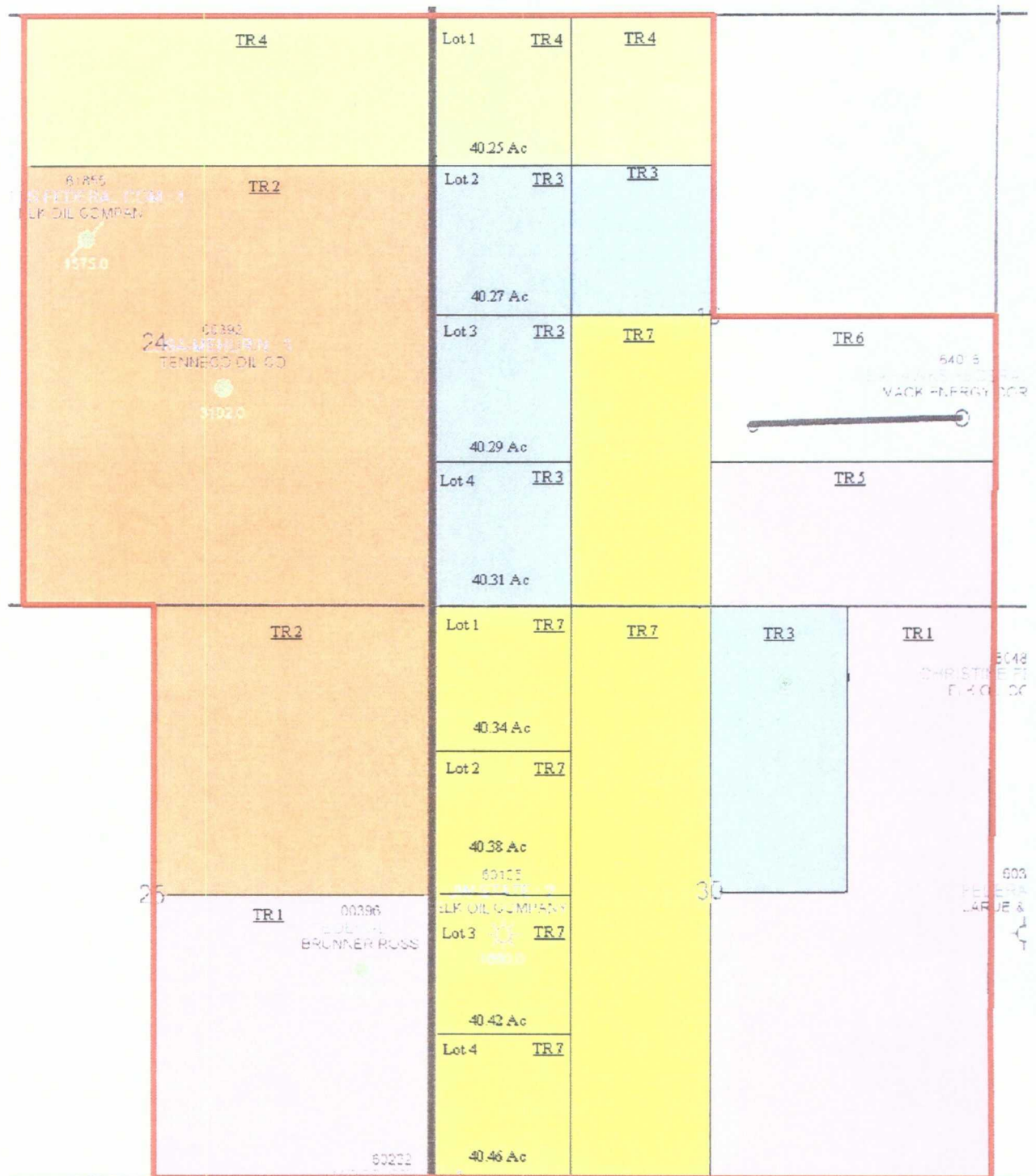
$$\text{Tract Participation} = 1/3 A + 2/3 B$$

A = Acreage Factor

B = OOIP Factor

$$\text{Acreage Factor} = \frac{\text{Tract Acreage}}{\text{Total Acres}}$$

$$\text{OOIP Factor} = \frac{\text{Tract OOIP}}{\text{Total OOIP}}$$



## ROUND TANK QUEEN UNIT TRACT MAP

The proposed Unit contains a total of 1,922.72 acres, 1,521.12 acres (79.1129%) Federal lands and 401.60 acres (20.8871%) State lands. All of the State lands are located in Tract #7.



To develop the reserves in the Round Tank Queen unit a series of injection wells will be drilled along the downdip edge of the oil column in the water leg of the reservoir. Producers will be drilled along the updip edge of the oil column at the gas/oil contact. Water will be injected at a moderate rate to pressure the water leg and move oil updip to the producers. Depending on the movement of the oil bank, partial repressurization of the gas cap may be necessary.

Due to the high mobility ratio, high injection rates will be avoided to limit channeling of injection water to the producers. Reservoir modeling will dictate the placement of wells and injection rates to optimize recovery.

Preliminary modeling, using the Boast 98 Black Oil Simulator, indicates that 23.2% of the OOIP could be recovered. This suggests 390,000 BO could be recovered from this project.

### Phase I – Pilot Project

6 m  
T15S wells  
- 2 -  
Res. Study

To acquire core data, create a reservoir model and implement a pilot project, two wells will be drilled. Well #1 will be located 660' FNL & 1705' FWL of section 30-T15S-R29E. This well will be designated as a producer and a core will be taken from 1470' to 1530', including the productive interval 1485' to 1504'. Well #2 will be located 715' FNL & 825' FEL of section 30-T15S-R29E. This well will be designated as an injector. Injection will be into the Queen formation in the equivalent zone as the Queen in the Christine Federal #3 from 1512-1526', Hg 14'. The monitoring well will be the Christen Federal #3 well located 680' FNL & 1980' FEL of section 30-T15S-R29E.

Using core relative permeability, core displacement and pilot data, a reservoir characterization and simulation model will be made to investigate injection and production strategies to optimize production. Once well locations are determined Phase II will be initiated.

### 1 yr Phase II - North Development

The oil column is wider in the north half of the unit due to a lower dip angle. Therefore, there is a larger amount of the OOIP in this area. Approximately four (4) injectors and five (5) producers will be drilled to develop this area. Modeling will determine the optimum location and number of wells. Reservoir modeling will determine the extent that repressurization of the gas cap will be necessary to prevent oil from being displaced into the gas cap or to move oil to down dip producers. The estimated volume of the gas cap is 22,770,000 bbls.

### 6 m - Phase III - South Development

The oil column is narrower in the south half of the unit due to a higher dip angle. Therefore, there is a smaller amount of the OOIP in this area. Approximately three (3) injectors and two (2) producers will be drilled and one (1) conversion will be needed to develop this area. Modeling will determine the optimum location and number of wells.

### Phase IV – Expansion

2 years  
Total

Should the Round Tank Queen Unit prove successful, expansion of the Unit could occur to the north and/or south. There is limited well data in these areas and new wells would need to be drilled to expand the unit.

## Injection

Water for injection into the Queen formation will be acquired from Mack Energy's San Andres wells in the area. The anticipated injection volume is estimated to be 100 BWPD per injection well. The anticipated injection pressure is 300 PSI or less.

## Well Construction

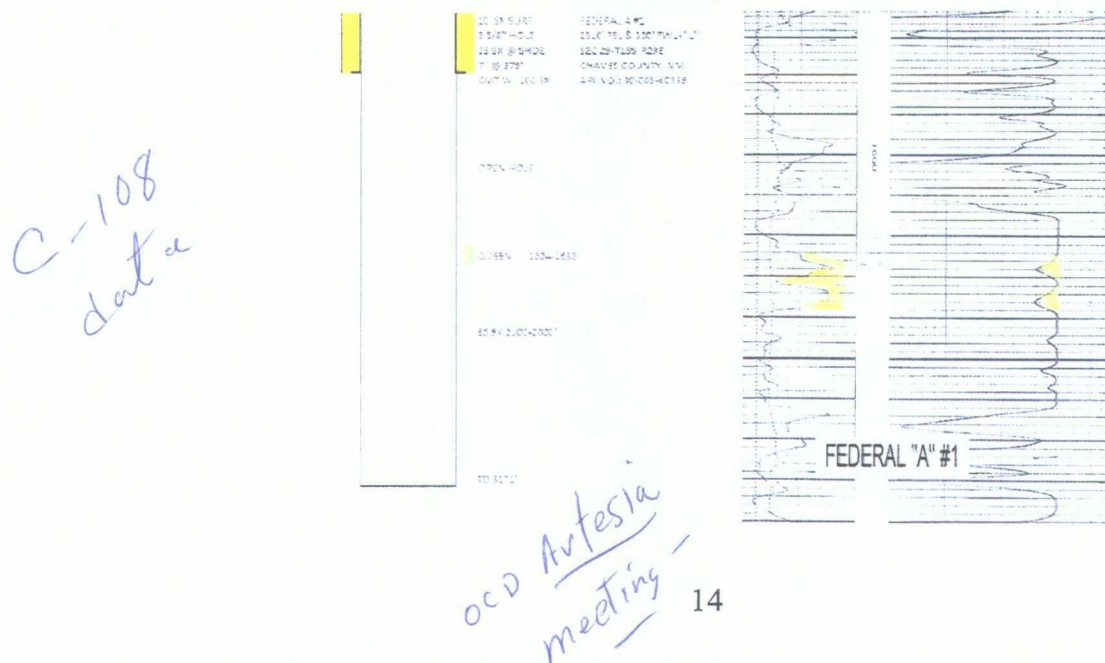
The injection wells will have 8 5/8" casing set into the Rustler formation at approximately 100-150' and cemented to surface. 4 1/2" or 5 1/2" casing will be set at T.D. and an attempt will be made to circulate cement to surface. Injection will be below a plastic coated tension packer with plastic coated 2 3/8" tubing run back to surface.

The Queen formation will be selectively perforated and acidized to clean-up the perforations. A 20,000 gallon fracturing treatment, carrying 20,000 pounds of 16-30 sand will be used to improve injectivity into the Queen interval.

## Area of Review

All wells within a one-mile radius of the proposed injection well location in 30A-T15S-R29E, were reviewed to determine if intervals across the Queen formation were properly cemented with casing or had cement spotted across the Queen formation when they were plugged. The public records indicate that all wells within the area of review were properly cemented and or plugged except for the Federal "A" #1 well located 330' FWL & 2310' FSL of section 29-T15S-R29E.

The Federal "A" #1 is located 2533' southeast of the proposed injection well location. There are two cement plugs which isolate the interval containing the Queen formation, from 2,000'-375', as shown in the following wellbore diagram. The Sidewall Neutron log, dated 5-9-75, on the Federal "A" #1 indicates the Queen formation is "tite". This indicates the well is located east of the porosity pinchout and should not be conductive of injected fluids in significant quantities.





We have examined the geological and engineering data and find no evidence of open faults or any other hydraulic connection between the injection zone and any underground source of drinking water. Review of the records of the State Engineers Office shows no water wells within one-mile of the proposed injection well. There is one (1) water well listed in T15S-R29E and that is four (4) miles to the northeast in section 3.

## Maps









Should you need additional information, please call me at 575-625-2222.

Sincerely,

Bruce A. Stubbs, P.E.  
Vice President - Operations

Armstrong Energy Corporation  
P.O. Box 1973  
Roswell, New Mexico 88202  
575-625-2222  
[bstubbs@armstrongenergycorp.com](mailto:bstubbs@armstrongenergycorp.com)