RESERVOIR PRESSURES.

Hittle Pool, Cowley County, Kansas

May 4-8, 1939.

Company	Lease	Well	Pressure at WELL-head	1000	2000	2750	-2075 datum
Harbar et. al.	Waite	1	112	470	826	1099	1306 (1)
Brewer	Lewis	1	88	453	822	1095	1308
		2	42	414	780	1055	1300 (2)
	King	1		Tubing and rods in well			
Hartman-Blair	Waite	1	122	484	845	1121	1314
		2	128	483	840	1111	1311
		3	112	470	831	1108	1315
		4	132	490	850	1120	1309
McKnab-Blair	K. Hittle	1	108		817	1088	1304
	Hittle	1A		Tubing and rods in well			
	Hrs.	2A	112	464	826	1099	1313
		3A	120				1316
Texas	Goodrich	1	130	498	860	1128	1327
		4	144		845	1122	1300
	Ross	1	112	480	837	1102	1300
	Hittle	6	117	485	850	1131	1345
		7	122	485	842	1112	1303
		8	135	485	837	1108	1304
Trees	Lewis	3	108	450	816	1111	1299
		4	108	463	827	1108	1315
		5	112	468	827	1098	1301
		6	102	463	821	1094	1304

(1) Commission engineers, Apr. 22, 1939 1309 lb. at -2075

(2) Water in bottom of hole.

Average of 20 wells 1309.7 at -2075 datum.

Average of 18 wells 1306.8 at -2075 datum.

OWLL

31s 4E

LYNDON L. FOLEY
PETROLEUM ENGINEER AND GEOLOGIST
~~2409 NATIONAL BANK OF TULSA BUILDING~~
TULSA, OKLAHOMA
514 McBirney Bldg.

March 22, 1940.

Mr. B. B. Blair,
Tulsa Oil Corp.,
Tulsa, Oklahoma.

Dear Sir:

The following is my report of reservoir pressure tests taken in the Hittle Pool this week. Key wells were selected on the Hartman-Tulsa Oil and the Hawkeye-Tulsa Oil leases to give a fair spread over those leases and it is my opinion that these pressures bive a fair idea of the average conditions of the field.

The bottom-hole sampler was run on the pressure bomb to determine whether water was present in the wells. No water was found and, since several of the wells were structurally low, I am satisfied that there is no water in any of the wells on the above mentioned properties.

Well			Date	Pressure at -2075 datum	
Hartman-Tulsa	Waite	1	3-21-40	1305	
		5	"	1305	
		9	"	1305	
Hawkeye-Tulsa	K. Hittle	1	3-20-40	1300	
		3	"	1303	
	Hittle	4A	"	1303	
		5A	"	1300	
	Waite	1	"	1305	
		4	"	1300	
Tulsa Oil	Waite C	1	3-21-40	1300	Average 1302.6

Cities Service is cementing back and acidizing their No. 2 Watite. As soon as this is finished, they plan to do the same with their No. 1 Hittle. Their engineer told me that their No. 1 Hittle is now pumping 15% oil and 85% water. Their No. 1 Waite which was pumping was plugged back and is now flowing.

Respectfully submitted,

L. L. Foley.

L. L. Foley.

OWLL

LYNDON L. FOLEY
PETROLEUM ENGINEER AND GEOLOGIST
~~6100 NATIONAL BANK OF TULSA BUILDING~~
TULSA, OKLAHOMA
514 McBirney Bldg.

July 29, 1940

Mr. B. B. Blair,
Tulsa Oil Corp.,
Tulsa, Oklahoma.

Dear Sir:

The following is my report of bottom-hole pressures run in the Hittle Pool, Cowley Co., Kansas during the past week:

Operator	Lease	Well	Date	Pressure at -2075
Hartman-Blair & Tulsa Oil Corp.	Waite	1	7-25-40	1291
		5	"	1296
		6	"	1294
		9	"	1299
		10	"	1303
		12	"	1301
Hawkeye Oil Co. & Tulsa Oil Corp.	Hittle Hrs.	3	7-26-40	1299
		4	"	1299
	K. Hittle	1	"	1299
		3	"	1301
	Waite	4	"	1304
Tulsa Oil Corp.	Waite	1	"	1296
	Average of 12 wells			1298.5

In March 1940, the average of 10 wells was 1302.6 so our present survey shows a loss of 4.1 lb.

It is my opinion that the field is in good shape as the wells will continue to flow until the pressure has declined another 100 lb., or until they go to water. Mr. Bonney tells me that the tests he made recently showed no water in any well which he tested and my own survey shows no sign of serious water encroachment.

Respectfully submitted,

L. L. Foley.

L. L. Foley.

OWLL

LYNDON L. FOLEY
PETROLEUM ENGINEER AND GEOLOGIST
2400 NATIONAL BANK OF TULSA BUILDING
TULSA, OKLAHOMA
514 McBirney Bldg.

Sept. 4, 1940

Mr. B. B. Blair,
Tulsa Oil Corp.,
Tulsa, Okla.

Dear Sir:

The following is my report of my reservoir pressure survey in the Hittle Pool, Cowley Co., Kansas.

Operator	Lease	Well	Date	Pressure at -2075 datum	Water
Hartman & Tulsa Oil	Waite	1	9-2	1298	None
		5	"	1305	"
		6	"	1307	"
		9	"	1310	"
		10	"	1309	Trace at T.D.
		11	"	1307	" " "
Hawkeye & Tulsa Oil	K. Hittle	1	9-3	1314	None
		3	"	1308	"
	Hittle Hrs	3A	"	1302	Trace at T.D.
		4A	"	1312	" " "
	Waite	1	"	1307	None
		4	"	1298	"
Tulsa Oil	Waite	1C	"	1306	600 ft. of water

Average of 13 wells- 1306.4 at -2075 datum. The pressure shows an increase over the last two surveys.

The showing of water in several of the wells is caused by the high rate of production due to producing most of the allowable production during the last few days of the month. The water may be expected to disappear as more moderate rates of production will probably prevail in the immediate future.

Respectfully submitted,

L. L. Foley.

L. L. Foley.

OWLL

Tulsa, Okla.
Sept. 18, 1940.

Mr. B. B. Blair,
Tulsa Oil Corp.,
Tulsa, Okla.

Dear Sir:

The following is my report of my recent reservoir pressure survey in the Hittle Pool, Cowley Co., Kansas.

Operator	Lease	Well No.	Date	Pressure at -2075 datum.
Hartman & Tulsa Oil	Waite	1	9-14-40	1297
		5	"	1300
		6	"	1293
		9	"	1304
		10	"	1302
Hawkeye & Tulsa Oil	K. Hittle	1	9-15-40	1302
		3	"	1310
	Hittle Hrs.	3	"	1307
		4	"	1302
		5	"	1302
	Waite	1	"	1307
		4	"	1307
Tulsa Oil	Waite	1 C	9-14-40	1293

Average of 13 wells- 1302.0 lb. per sq. in. at -2075 datum.

The pressure gradients showed 500 ft. of water in Tulsa Oil Corp. No. 1 C Waite.

The Hawkeye wells were tested with a bailer and none of them showed any water at the total depth.

The Hartman wells were not tested with the bailer as all of them had been tested by Mr. Bonney a few days before. He reorts that none of them showed any water.

Respectfully submitted,

L. L. Foley. OWL

L. L. Foley.

31s 4E

LYNDON L. FOLEY
PETROLEUM ENGINEER AND GEOLOGIST
514 McBIRNEY BUILDING
TULSA, OKLAHOMA

October 21, 1940

Mr. B. B. Blair,
Tulsa Oil Corp.,
Tulsa, Okla.

Dear Sir:

The results of the reservoir pressure measurements recently made in the Hittle Pool, Dowley County, Kansas are as follows;

Operator	Lease	Well No.	Date	Pressure at -2075 datum
Hartman & Tulsa Oil	Waite	1	10-16-40	1300
		5	"	1298
		6	"	1300
		9	"	1298
		10	"	1298
Hawkeye & Tulsa Oil	K. Hittle	1	10-17-40	1306
		3	"	1313
	Hittle Hrs.	3A	"	1306
		4A	"	1308
		5A	"	1308
	Waite	1	10-16-40	1300
		4	"	1298
Tulsa Oil	Waite	1C	10-16-40	1293

Average of 13 wells- 1302 lb. per sq. in. at -2075 datum.

The average of the 13 wells is exactly the same as shown in my report of Sept. 18th. It was expected that the pressures would be higher than last month because the runs have been less this month. It may be noted that the pressures taken on the 17th are all higher than those taken on the 16th, and the difference may be due to variations in the daily field runs.

Mr. Bonney has recently tested the Hartman wells and the Waite C for water and found none in any of them. Water tests were xx not run in the Hawkeye wells as Mr. Bonney was pressed for time and needed the test car. The test car belonging to the Hawkeye was not available.

Respectfully submitted,

L. L. Foley

L. L. Foley.

OWLL

LYNDON L. FOLEY
PETROLEUM ENGINEER AND GEOLOGIST
514 McBIRNEY BUILDING
TULSA, OKLAHOMA

Nov. 19, 1940.

Mr. B. B. Blair,
Tulsa Oil Corp.,
Tulsa, Oklahoma.

Dear Sir:

The following is my report of recent reservoir pressure measurments in the Hittle Pool, Cowley County, Kansas.

Operator	Lease	Well	Date	Pressure at -2075 datum
Hartman & Tulsa Oil	Waite	1	11-15-40	1309
		5	"	1305
		6	"	1296
		9	"	1312
		10	"	1300
Hawkeye & Tulsa Oil	Hittle Hrs	3A	11-16-40	1309
		4A	"	1300
	K. Hittle	1	"	1312
		3	"	1305
	Waite	4	"	1312
Tulsa Oil	Waite	1 C	"	1296

The average is 1305 lb. at -2075 datum. This is 3 lb. higher than the average pressure of last month.

Respectfully submitted,

L. L. Foley,

L. L. Foley.

OWLL

31S-4E

LYNDON L. FOLEY
PETROLEUM ENGINEER AND GEOLOGIST
514 McBIRNEY BUILDING
TULSA, OKLAHOMA

Dec.14, 1940.

Mr. B. B. Blair,
Tulsa Oil Corp.,
Tulsa, Oklahoma.

Dear Sir:

The following is my report of the reservoir pressure tests made in the Hittle Pool during this week.

Operator	Lease	Well	Date	Pressure at -2075
Hartman & Tulsa Oil	Waite	1	12-12-40	1302
		5	"	1310
		6	"	1302
		9	"	1305
		10	"	1310
Hawkeye & Tulsa Oil	Hittle Hrs.	3 A	12-13-40	1310
		4 A	"	1310
		5 A	"	1313
	K. Hittle	1	"	1313
		3	"	1307
	Waite	1	"	1307
		4	"	1310
Tulsa Oil	Waite	1 C	12-12-40	1305

Average of 13 wells- 1308 lb. at -2075 datum.

You will remember that in a recent conversation I expressed the opinion that the pressures in the field were lower than would be expected with the current rate of production. During the past week, Texas Co. No. 7 Hittle started leaking oil at the surface outside the casing. I have just learned that 3 water wells in the field have shown oil. It is possible that oil from leaking casing strings has gone into shallow sands for some time before it showed up at the surface. This may account for the discrepancy between the reservoir pressure and the pipeline runs. It will be interesting to see whether repairing this casing leak will result in an increase in reservoir pressure.

Respectfully submitted,

L. L. Foley

L. L. Foley.

LYNDON L. FOLEY
PETROLEUM ENGINEER AND GEOLOGIST
514 McBIRNEY BUILDING
TULSA, OKLAHOMA

March 1, 1941.

Mr. B. B. Blair,
Tulsa Oil Corp.,
Tulsa, Oklahoma.

Dear Sir:

The following is my report of reservoir pressure measurements in the Hittle Pool, Cowley Co., Kansas.

Operator	Lease	Well	Date	Pressure at -2075
Hartman & Tulsa Oil	Waite	1	2-25-41	1295 -5
		5	"	1295 - 7
		6	2-26-41	1292 + 9
		9	"	1292 - 8
		10	"	1290 - 2
Hawkeye & Tulsa Oil	Hittle Est.	3A	2-27-41	1300
		4A	"	1303 + 5
		5A	"	1297 - 5
	K. Hittle	1	2-26-41	1303 - 2
		3	"	1294 - 9
	Waite	1	2-27-41	1313 +13
		4	"	1303 + 3
Tulsa Oil Corp.	Waite	1C	2-25-41	1287 -13

Average of 13 wells- 1297.2 at -2075 datum.

Mr. Bonney tested all of the Hartman wells for water. He found about 200 feet of water in No. 9 and none in any of the others.

Tulsa Oil Corp. NO. 1C Waite had 1300 ft. of water.

Hawkeye Nos. 3, 4, and 5 Hittle, Nos. 1 and 3 K. Hittle and No. 4 Waite had a little water at the total depth.

A water test was attempted in No. 4 K. Hittle but the instrument was damaged and no test was obtained. From the well-head pressure, I would estimate that there was about 200 ft. of water in the well.

Respectfully sub,itted,

L. L. Foley

L. L. Foley.

LYNDON L. FOLEY
PETROLEUM ENGINEER AND GEOLOGIST
514 McBIRNEY BUILDING
TULSA, OKLAHOMA

May 20, 1941.

Mr. B. B. Blair,
Tulsa Oil Corp.,
Tulsa, Okla.

Dear Sir:

The following is my report of reservoir pressure measurements just completed in the Hittle Pool.

Operator	Lease	Well	Date	Pressure at -2075 datum
Hartman & Tulsa Oil	Waite	1	5-16-41	1295
		2	"	1298
		3	"	1291
		4	5-17-41	1297
		5	5-16-41	1300
		6	5-17-41	1301
		7	5-16-41	1298
		8	5-14-41	1298
		9	5-16-41	1300
		10	5-14-41	1298
		11	5-17-41	1300
		12	5-16-41	1303
Leader & Tulsa Oil	K. Hittle	1	5-17-41	1303
		2	"	1305
		3	"	1300
		4	"	1297
	Hittle Hrs.	2A	5-19-41	1303
		3A	"	1303
		4A	"	1302
		5A	"	1303
		6A	"	1303
		7A	"	1305
	Waite	1	5-18-41	1303
		2	"	1300
		3	"	1300
		4	"	1300

Average of 26 wells- 1300.2 lb. at -2075 datum

Leader No. 4 K. Hittle and No. 4 Hittle Hrs. had a trace of water at the total depth. Leader No. 4 Waite had 1000 ft. of water. All other wells had no water.

Respectfully submitted,

L. L. Foley

L. L. Foley.

LYNDON L. FOLEY
PETROLEUM ENGINEER AND GEOLOGIST
514 McBIRNEY BUILDING
TULSA, OKLAHOMA

March 28, 1941.

Mr. B. B. Blair,
Tulsa Oil Corp.,
Tulsa, Oklahoma.

Dear Sir:

The following is my report of reservoir pressure measurements and water tests in the Hittle Pool, Cowley Co., Kansas.

Operator	Lease	Well	Date	Pressure at -2075 datum	Water
Hartman & Tulsa Oil	Waite	1	3-22-41	1309	
		5	"	1314	
		6	"	1304	
		9	"	1314	
		10	"	1315	
Hawkeye & Tulsa Oil	K. Hittle	1	3-23-41	1304	Trace
		3	3-22-41	1310	None
	Hittle Hrs.	3A	3-23-41	1314	None
		4A	"	1304	Trace
		5A	"	1309	None
	Waite	1	"	1314	None
		4	"	1304	Trace

Average of 12 wells- 1309.6 at -2075 datum.

Mr. Bonney tested all of the Hartman wells for water and found none in any of them.

The pressures are higher than last month, and the water situation has improved. Several wells which showed water last month had no water in them at the time of this survey.

Respectfully submitted,

L. L. Foley.

L. L. Foley.

LYNDON L. FOLEY
PETROLEUM ENGINEER AND GEOLOGIST
514 McBIRNEY BUILDING
TULSA, OKLAHOMA

Aug. 3, 1941

Mr. B. B. Blair,
Tulsa Oil Corp.,
Tulsa, Okla.

Dear Sir:

The following is my report of reservoir pressure measurments recently made in the Hittle Pool, Cowley County, Kansas.

Operator	Lease	Well No.	Date	Pressure at -2075 Datum
Hartman & Tulsa Oil	Waite	1	7-24-41	1301
		3	7-25-41	1301
		5	7-24-41	1301
		6	"	1301
		9	"	1303
		10	"	1301
Leader & Tulsa Oil	K. Hittle	1	7-25-41	1301
		3	"	1306
	Hittle Hrs.	3A	"	1301
		4A	"	1298
		5A	"	1303
	Waite	1	"	1301
		4	"	1303

Average of 13 wells- 1301.6 lb. at -2075 datum.

Water tests were made in the Hartman wells by Mr. Bonney who reports no water in any of them. All of the above Leader wells were tested for water by me. Leader No. 4A Hittle had a trace of water at the total depth. None of the others had any water. The water found in Leader No. 4 Waite on the last previous test has disappeared.

Respectfully submitted,

L. L. Foley.

L. L. Foley.

LYNDON L. FOLEY
PETROLEUM ENGINEER AND GEOLOGIST
514 McBIRNEY BUILDING
TULSA, OKLAHOMA

August 28, 1941.

Mr. B. B. Blair,
Tulsa Oil Corp.,
Tulsa, Oklahoma.

Dear Sir:

The following is my report of the reservoir pressure measurements just completed in the Hittle Pool, Cowley Co., Kans.

Operator	Lease	Well	Date	Pressure at -2075 datum
Hartman & Tulsa Oil	Waite	1	8-26-41	1302
		2	8-27-41	1303
		3	"	1305
		4	"	1303
		5	8-26-41	1303
		6	8-27-41	1303
		7	8-26-41	1303
		8	"	1305
		9	"	1303
		10	"	1305
		11	8-25-41	1303
		12	8-26-41	1305
Leader & Tulsa Oil	K. Hittle	1	8-25-41	1303
		2	"	1303
		3	"	1308
		4	8-24-41	1305
	Hittle Hrs.	2 A	8-24-41	1303
		3 A	"	1305
		4 A	"	1304
		5 A	"	1303
		6 A	"	1308
		7 A	"	1303
	Waite	1	8-25-41	1305
		2	"	1303
		3	"	1303
		4	"	1303

Average of 26 wells- 1303.9 lb. at -2075 datum.

Mr. Bonney tested the Hartman wells for water and found none in any of them. The Leader No. 4A Hittle Hrs. and the Leader No. 4 K. Hittle had a trace of water at the total depth. All other Leader wells had no water in them.

Respectfully submitted,

L. L. Foley

L. L. Foley.

LYNDON L. FOLEY
PETROLEUM ENGINEER AND GEOLOGIST
514 McBIRNEY BUILDING
TULSA, OKLAHOMA

Sept. 29, 1941

Mr. B. B. Blair,
Tulsa Oil Corp.,
Tulsa, Okla.

Dear Sir:

The following is my report of reservoir pressure measurements in the Hittle Pool, Cowley County, Kansas.

Operator	Lease	Well	Date	Pressure at -2075 datum
Hartman & Tulsa Oil	Waite	1	9-25-41	1300 - 1302
		5	"	1300 - 1303
		6	"	1303 - 1303
		9	"	1297 - 1303
		10	"	1303 - 1305
Leader & Tulsa Oil	Hittle Hrs.	3A	9-26-41	1303 - 1305
		4A	"	1305 - 1304
		5A	"	1297 - 1303
	K. Hittle	1	"	1305 - 1303
		3	"	1303 - 1308
	Waite	1	"	1303 - 1305
		4	"	1305 - 1303

Average of 12 wells 1302.0 lb. per sq. in. ~~15647~~ 1304

The pressures in Hartman No. 9 Waite and Leader No. 5A Hittle appear to be surprisingly low. They may be in line with the others by next month.

Mr. Bonney ran water tests in the Hartman wells and reports no water in any of them. Leader No. 4A Hittle had a trace of water at the total depth and none of the other Leader wells tested had any water.

Respectfully submitted,

L. L. Foley

L. L. Foley

LYNDON L. FOLEY
PETROLEUM ENGINEER AND GEOLOGIST
514 McBIRNEY BUILDING
TULSA, OKLAHOMA

Nov. 1, 1941.

Mr. B. B. Blair,
Tulsa Oil Corp.,
Tulsa, Okla.

Dear Sir:

The following is my report of reservoir pressure measurements recently taken in the Hittle Pool, Cowley County, Kansas.

Operator	Lease	Well	Date	Pressure at -2075 datum
Hartman & Tulsa Oil	Waite	1	10-24-41	1300
		5	"	1303
		6	"	1300
		9	"	1303
		10	"	1300
Leader & Tulsa Oil	Hittle Hrs.	3A	10-25-41	1308
		4A	"	1300
		5A	"	1308
	K. Hittle	1	"	1305
		3	"	1305
	Waite	1	"	1305
		4	"	1308

Average of 12 wells- 1303.75 lb. at -2075 datum.

Mr. Bonney tested the Hartman wells and found no water in any of them. All of the Leader wells above listed were tested and none was found in any of them. No. 4A Hittle has shown a trace of water for the past several months but had none at the time of this survey.

Respectfully submitted,

L. L. Foley

L. L. Foley.

O W L.

LYNDON L. FOLEY
PETROLEUM ENGINEER AND GEOLOGIST
514 McBIRNEY BUILDING
TULSA, OKLAHOMA

Dce. 20, 1941.

Mr. B. B. Blair,
Tulsa Oil Corp.,
Tulsa, Oklahoma.

Dear Sir:

The following is my report of reservoir pressure measurements recently made in the Hittle Pool, Cowley Co., Kansas.

Operator	Lease	Well No.	Date	Pressure at -2075 datum
Hartman & Tulsa Oil	Waite	1	12-16-41	1300
		2	"	1300
		3	"	1303
		4	"	1299
		5	"	1308
		6	"	1298
		7	12-17-41	1305
		8	12-16-41	1305
		9	12-17-41	1305
		10	12-16-41	1303
		11	12-17-41	1301
		12	12-16-41	1300
Leader & Tulsa Oil	K. Hittle	1	12-18-41	1305
		2	"	1308
		3	"	1305
		4	12-19-41	1305
	Hittle Hrs.	2A	12-18-41	1301
		3A	"	1303
		4A	12-19-41	1305
		5A	12-18-41	1303
		7A	"	1308
	Waite	1	12-17-41	1303
		2	12-18-41	1303
		3	"	1303
		4	"	1308

OWLL

Average of 25 wells- 1303.5 lb. per sq. in. at -2075 datum

Average of 12 key wells-1303.8 lb. at -2075 datum

The Hartman wells were testes with the bailer by Mr. Bonney who reports no water. Bailer tests were run in all

of the Leader wells except No. 7A Hittle and No. 4 K. Hittle which have 2 inch connections. No water was found in any of them except No. 4A Hittle which showed a trace of water at the total depth. Pressure gradient tests were taken in No. 7A Hittle and in No. 4 K. Hittle. Neither of them had enough water to show in the gradients

As far as reservoir pressure and water encroachment are concerned, the condition of the field appears to be very favorable.

Respectfully submitted,

L. L. Foley

L. L. Foley.

OWL

LYNDON L. FOLEY
PETROLEUM ENGINEER AND GEOLOGIST
514 McBIRNEY BUILDING
TULSA, OKLAHOMA

May 22- 1942.

Mr. B.B. Blair,
Tulsa, Oklahoma,

Dear Sir:

The following are the results of my reservoir pressure survey just completed in the Hittle Pool, Cowley County, Kansas.

OPERATOR	LEASE	WELL	DATE	PRESSURE SURFACE	PRESSURE at -2075
Barnett	Waite	1	5-15-42	115	1305
		2	"	45	1305
		3	"	31	1311
		4	"	135	1311
Blair	Waite C	1	5-14-42	0	1300
Brewer	Lewis	1	5-14-42	111	1308
		4	"	121	1311
		3	"	118	1311
Hartman	Waite	1	5-14-42	121	1300
		2	5-15-42	128	1305
		3	"	122	1311
		4	5-14-42	126	1305
		5	5-16-42	115	1305
		6	5-14-42	121	1308
		7	5-20-42	118	1300
		8	5-16-42	120	1308
		9	5-17-42	65	1305
		10	5-16-42	132	1300
		11	5-18-42	135	1311
		12	5-16-42	115	1308
Leader	K Hittle	1	5-17-42	16	1305
		2	"	115	1305
		3	"	30	1307
		4	"	50	1308
	Hittle Est.	2	5-18-42	126	1308
		3	"	130	1305
		4	"	128	1308
		5	"	114	1308
		6	"	132	1314
		7	"	122	1305

OPERATOR	LEASE	WELL	DATE	PRESSURE SURFACE	PRESSURE at -2075
Leader	Waite	1	5-17-42	122	1305
		2	"	137	1303
		3	"	139	1303
Texas	Hittle	6	5-19-42	115	1303
		7	"	128	1303
		8	"	128	1303
		9	"	69	1308
		10	5-20-42	115	1305
		11	"	116	1313
		12	5-19-42	128	1309
	Goodrich	1	5-19-42	125	1308
		4	"	130	1307
		5	"	132	1305
		6	"	123	1311
	Ross	1	5-20-42	122	1309
		3	"	120	1302

Average of 46 wells 1306.5

Average of 11 key wells 1305.1

HITTLE POOL
COWLEY COUNTY, KANSAS.

Water Report - May 1942

There are 69 wells in the Hittle Arbuckle Pool, 18 of which are equipped with rods and pumps.

The following pump their production and make water.

OPERATOR	LEASE	WELL	Bottom-hole DATUM
Blair	Waite C	1	-2126
Cities Service	Waite	1	-2116 PB -2109
		2	-2130 PB -2119
	Hittle	1	-2127
	Scott	1	-2132

OPERATOR	LEASE	WELL	Bottom-hole DATUM
Garden	Tonkinson	1	-2136
Texas	Ross	4	-2152

The following pump off water occasionally.

Barnett	Waite	5	-2129
		6	-2133
		7	-2133
		8	-2129
Brewer	Lewis	2	-2101
		5	-2099
	Curfman	1	-2120
Cities Service	K.Hittle	2	-2127
Leader	Waite	4	-2120

The following were equipped with rods and pumps on completion but do not pump.

Leader	Hittle Est.	1	-2068
Brewer	Lewis	6	-2105

Results of bailer tests in flowing wells

OPERATOR	LEASE	WELL	SURFACE PRESSURE	BOTTOM-HOLE DATUM	WATER LEVEL
Barnett	Waite	1	115	-2115	none
		2	45	-2112	2520
		3	31	-2123	2320
		4	135	-2120	none
Blair	Waite C	1	0	-2126	1500
Brewer	Lewis	1	111	-2093	(1)
		3	118	-2099	(1)
		4	121	-2109	(1)
Hartman	Waite	1	121	-2075	none
		2	128	-2073	"
		3	122	-2079	"
		4	126	-2080	"
		5	115	-2101	"
		6	121	-2098	"
		7	118	-2106	"
		8	120	-2105	"
		9	65	-2118	2600

OPERATOR	LEASE	WELL	SURFACE PRESSURE	BOTTOM-HOLE DATUM	WATER LEVEL
		10	132	-2105	Trace
		11	135	-2114	none
		12	115	-2103	"
Leader	K.Hittle	1	16	-2128	2400
		2	115	-2129	Trace
		3	30	-2129	2430
		4	50	-2117 PB-2108	2560
	Hittle Est.	2	126	-2080	none
		3	130	-2075	Trace
		4	128	-2077	Trace
		5	114	-2099	none
		6	132	-2080	"
		7	122	2086	(1)*
	Waite	1	122	-2101	none
		2	137	-2103	"
		3	139	-2119	"
Texas	Hittle	6	115	-2068	none
		7	128	-2062	"
		8	128	-2074	"
		9	69	-2098	2720
		10	115	-2062	none
		11	116	-2071	"
		12	128	-2067	Trace
	Goodrich	1	125	-2059	none
		4	130	-2067	"
		5	132	-2082	"
		6	123	-2058	"
	Ross	1	122	-2057	Trace
		3	120	-2062	none

*(1) No bailer test-no water showing in pressure gradient.

SUMMARY.

Wells pumping water with production	7
" " " occasionally	9
Flowing wells showing water in bailer	13
Total wells showing water	29
Wells having no water	28
" showing no water in pressure gradient	4
Not tested (rods) (1)*	2
" " Trees-Lewis lease (1)*	6
Total	69

1) Probably no water.

WATER PRODUCTION BY LEASES

OPERATOR	LEASE	Daily	Monthly
Barnett	Waite		Negligible
Brewer	Curfman		"
	Lewis		"
Blair	Waite C	300	9,000 (1)*
Cities Service	Waite	340 bbl	10,200 bbl
	Hittle	110	3,300
	Scott	165	4,950
Garden	Tonkinson	170	5,100
Hartman	Waite	0	0
Leader	Hittle	0	0
	K Hittle	0	0
	Waite		(2)*
Texas	Hittle	0	0
	Ross		Negligible
	Goodrich	0	0
Trees	Lewis	0	0
		1085 bbl.	32,550 bbl.

*(1) Before plugging back 4 ft. on 4-16-42

*(2) Began pumping 4-15-42. Pumps off water and then flows. Water production unknown.

Respectfully submitted,

L. L. Foley.

L.L. Foley.

LLF-u

31s 4E

LYNDON L. FOLEY
PETROLEUM ENGINEER AND GEOLOGIST
514 McBIRNEY BUILDING
TULSA, OKLAHOMA

July 21, 1942.

Mr. B. B. Blair,
Tulsa, Oklahoma.

Dear Sir:

The following is my report of reservoir pressure measurements and water tests in the Hittle Pool, Cowley County, Kansas.

Operator	Lease	Well	Date	Pressure at -2075 datum
Hartman	Waite	1	7-17-42	1303
		5	"	1300
		6	"	1305
		9	"	1300
		10	"	1305
Leader	K. Hittle	2	7-18-42	1305
	Hittle Est.	2A	"	1300
		3A	"	1305
		4A	"	1308
	Waite	1	7-20-42	1305

Average of 10 wells 1303.6 lb. per sq. in. at -2075 datum

Average of 11 key wells, May 1942 1305.1 at -2075 datum.

Leader No. 1 & No. 3 K. Hittle which were formerly used as key wells have been put on the pump so I have substituted No. 2 K. Hittle and No. 2A Hittle.

Water tests were made in all of the Hartman and Leader wells not on the pump with the following results:

Operator	Lease	Well	Water Level
Hartman	Waite	1	none
		2	"
		3	Trace
		4	none
		5	"
		6	"
		7	Trace
		8	"
		9	2600
		10	Trace
		11	none
		12	"

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Operator	Lease	Well	Water Level
Leader	K. Hittle	2	Trace
		4	2420
	Hittle Est.	2A	none
		3A	Trace
		4A	"
		5A	"
		6A	none
		7A	"
	Waite	1	Trace
		3	none
		2	2200

Since the water report of May 1942, two wells have been placed on pumps.

Leader No. 1 K. Hittle
Leader No. 3 K. Hittle.

The following wells which had no water in May 1942 showed water on this survey.

Hartman No. 3 Waite
" 7 "
" 8 "

Leader No. 5 Hittle Est.
" 6 "

Leader 1 Waite
3 "

Respectfully submitted,

L. L. Foley

L. L. Foley.

OWLL

21-31S-4E

LYNDON L. FOLEY
PETROLEUM ENGINEER AND GEOLOGIST
514 McBIRNEY BUILDING
TULSA, OKLAHOMA

RESERVOIR PRESSURE AND WATER REPORT.

HITTLE POOL

COWLEY COUNTY, KANSAS.

August 1942.

Reservoir Pressure

Operator	Lease	Well	Date	Pressure at -2075
Brewer	Lewis	1	8-21-42	1299
		3	"	1303
		4	"	1295
Hartman	Waite	1	8-17-42	1300
		5	"	1299
		6	"	1300
		9	8-18-42	1300
		10	8-17-42	1295
Leader	K. Hittle	2	8-18-42	1305
	Hittle Est.	2	8-19-42	1295
		3	"	1295
		4	"	1293
	Waite	1	8-18-42	1305
Texas	Goodrich	5	8-22-42	1300
	Hittle	6	8-22-42	1299
		8	"	1292
		11	"	1305
	Ross	3	8-22-42	1302
Trees	Lewis	1	8-20-42	1293
		4	"	1293
		5	"	1295

Average of 21 wells 1298.2 lb. at -2075.

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Water Report.

Since the report of May, 1942, 5 wells have been put on the pump.

Leader	No 1	K. Hittle
	No 3	K. Hittle
Barnett	No 2	Waite
	No 3	Waite
Texas	No 9	Hittle

The rods have been pulled from Leader No 1 Hittle which had been equipped for pumping on completion.

Wells pumping continuously	6
" " part time	13
Pumping wells shut down	2
Equipped but not pumping	1
Total equipped for pumping	22
Wells not equipped	47
Total	69

Garden No 1 Tarkinson is shut down and it is reported that it will be abandoned. Cities Service No 2 Waits is shut down for engine.

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Water Tests in Flowing Wells

Operator	Lease	Well	Date	Surface Pressure	Water Level
Brewer	Lewis	1	8-21-42	108	trace
		3	"	115	slight trace
		4	"	117	none
		6	"	50	2800
Hartman	Waite	1	8-17-42	132	none
		2	"	123	slight trace
		3	"	123	" "
		4	"	132	none
		5	"	115	"
		6	"	-	"
		7	8-18-42	117	"
		8	"	120	"
		9	"	80	2800
		10	8-17-42	126	trace.
		11	"	135	none
		12	8-18-42	117	"
Leader	K.Hittle	2	8-18-42	111	trace
		4	"	13	2340
	Hittle	1	8-19-42	125	none
		2	"	122	"
		3	"	127	slight trace
		4	"	123	trace
		5	"	112	slight trace
		6	"	117	" "
		7	8-22-42	125	none.
	Waite	1	8-18-42	119	slight trace
		2	"	18	2000
		3	"	132	none
Texas	Goodrich	5	8-21-42	127	none
	Hittle	6	8-22-42	110	slight trace
		8	8-21-42	132	" "
		11	8-22-42	110	none
		12	8-21-42	130	slight trace
	Ross	1	8-22-42	117	trace
		3	"	115	slight trace
Trees	Lewis	1	8-20-42	113	slight trace
		2	"	115	none
		3	"	112	"
		4	"	98	3200
		5	"	110	none
		6	"	107	trace.

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Water Production by Leases.

		Per Day	Per Month	May 1942
Barnett	Waite	200 bbl.	6,200	negligible
Brewer	Curfman		negligible	"
	Lewis		"	"
Blair	Waite C	412	12,772	9.000
Cities Service	Hittle	121	3,630	10,200
	Scott	98	3,038	3,300
	Waite	121	3,630	4,950
Garden	Tonkinson	0	0	5,100
Hartman	Waite	0	0	0
Leader	Hittle	0	0	0
	K. Hittle		negligible	0
	Waite		"	negligible
Texas	Goodrich	0	0	0
	Hittle		negligible	0
	Ross		"	Negligible
Tees	Lewis	0	0	0
	Total	952 bbl.	29,270 bbl.	32,550 bbl

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GENERAL COMMENTS.

The reservoir pressure is lower than in May 1942, and several additional wells show water. It is the writer's opinion that this is caused by higher allowable production.

	May 1942	August 1942
Pool Allowable	57,536 bbl	82,862 bbl
Water Production	32,550	29,270
Total fluid production	90,086 bbl.	112,132 bbl.
Average reservoir pressure	1306.5	1298.2 lb.
Number of wells showing water	31	44

Since the August proration schedule was published, additional allowable has been granted to the Leader Hittle Est., K.Hittle, and Waite leases.

Allowable according to schedule	75,168 bbl.
Increase	7,694
Total	82,862 bbl.

Higher rates of production permit more coning of the water table and results in water encroachment into wells. It is the writer's opinion that increasing allowable production, at a time when water encroachment is becoming serious, will aggravate the encroachment. It is also his opinion that reducing the allowable to about that of May 1942 would cause the water to disappear from a number of the wells now showing slight traces of water.

Respectfully submitted,

L. L. Foley

L.L. Foley.

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HITTIE POOL

COWLEY COUNTY, KANSAS

PRODUCTION TO 12/31/42.

BY

OPERATORS AND PROPERTIES

Submitted by:
L. L. Foley

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HITTLE POOL

		Recovery per well to 12/31/42
Barnett	- Waite	50,228
Blair	- Hittle	59,390
	- K. Hittle	30,729
	- Waite B	84,927
	- Waite C	65,776
Brewer	- Curfman	18,759
	- Hughes	2,605
	- Lewis	45,612
Cities Service	- Hittle	31,356
	- Scott	15,188
	- Waite	43,809
Garden	- Tonkinson	13,222
Hartman	- Waite	76,545
Texas	- Goodrich	55,855
	- Hittle	48,083
	- Ross	28,811
Trees	- Lewis	39,894

		Recovery per well to 12/31/42
Blair	- Waite B	84,927
Hartman	- Waite	76,545
Blair	- Waite C	65,776
	- Hittle	59,390
Texas	- Goodrich	55,855
Barnett	- Waite	50,228
Texas	- Hittle	48,083
Brewer	- Lewis	45,612
Cities Service	- Waite	43,809
Trees	- Lewis	39,894
Cities Service	- Hittle	31,356
Blair	- K. Hittle	30,729
Texas	- Ross	28,811
Brewer	- Curfman	18,759
Cities Service	- Scott	15,188
Garden	- Tonkinson	13,222
Brewer	- Hughes	2,605

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HITTLE ARBUCKLE PRODUCTION RECORD
1 9 4 1

		To 12/31/40	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Prod. to 1/1/41
Barnett	- Waite	209,176	8,409	7,804	8,228	8,622	9,082	9,104	7,690	7,974	7,679	8,707	7,997	8,507	308,978
Brewer	- Curfman	8,232	525	448	453	449	444	442	439	219	358	396	443	447	13,295
	- Hughes	2,605	-	-	-	-	-	-	-	-	-	-	-	-	2,605
	- Lewis	94,743	3,712	4,045	3,908	4,053	4,073-	4,158	3,462	3,577	3,499	3,973	3,616	3,694	140,513
Cities	- Hittle	34,382	1,331	1,285	1,317	1,332	1,539	1,536	1,020	1,599	1,228	1,431	1,367	1,461	50,826
Service	- Scott	6,790	469	450	492	525	537	370	220	217	167	-	530	511	11,278
	- Waite	55,386	2,299	2,192	2,259	2,339	2,521	2,608	2,174	2,493	2,049	2,303	1,476	1,350	81,449
Garden	- Tonkinson	7,209	408	435	471	480	485	466	465	159	442	481	159	293	11,961
Hartman	- Waite	509,145	17,150	16,221	16,985	17,592	19,002	19,347	16,107	17,032	16,418	19,098	17,469	18,137	719,701
Leader	- Hittle	229,679	7,816	7,272	7,566	7,903	8,621	8,763	7,324	7,700	7,396	8,572	7,880	8,227	324,719
	- K. Hittle	59,586	2,364	2,341	2,451	2,526	2,768	2,917	2,374	2,520	2,435	2,815	2,608	2,769	90,474
	- Waite	169,776	6,585	6,092	6,376	6,609	7,178	7,431	6,569	6,649	6,341	7,701	6,726	7,102	251,033
Texas	- Goodrich	118,426	3,747	3,591	3,672	3,953	4,083	4,726	4,069	4,131	3,816	4,581	4,227	4,440	167,462
	- Hittle	170,681	6,297	6,053	6,348	6,361	7,089	7,104	6,089	5,730	5,875	6,819	6,809	7,050	248,305
	- Ross	39,466	1,531	1,613	1,592	1,639	1,761	1,740	1,499	1,529	1,586	1,725	1,513	2,106	59,300
Trees	- Lewis	156,128	3,506	3,362	3,614	3,583	3,769	3,957	3,301	3,517	3,332	3,778	3,585	3,576	198,308
Tulsa Oil	- Waite	38,261	1,450	1,363	1,103	1,512	1,592	1,725	1,381	1,468	1,354	1,663	1,501	1,559	56,932
Totals		1,909,668	67,597	64,565	66,835	69,478	74,542	76,394	64,183	66,214	63,975	74,043	67,906	71,229	2,736,629

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HITTLE ARBUCKLE PRODUCTION RECORD
1 9 4 2

		To 12/31/41	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Prod. to 1/1/43
Barnett	- Waite	308,978	7,946	6,555	6,869	6,982	7,033	8,338	7,445	8,346	9,952	8,898	6,927	7,564	401,828
Blair	- Waite C	55,982	1,536	1,168	1,257	1,257	617	223	652	653	673	675	680	453	65,776
Brewer	- Curfman	13,295	469	404	479	451	449	481	466	446	449	479	453	456	18,759
	- Hughes	2,605	-	-	-	-	-	-	-	-	-	-	-	-	2,605
	- Lewis	140,513	3,587	3,031	3,298	3,252	3,302	3,777	3,825	3,738	3,869	3,984	3,059	3,225	182,450
Cities	- Hittle	50,826	1,276	1,062	1,132	1,102	1,118	991	1,141	1,017	448	1,072	679	849	62,713
Service	- Scott	11,278	432	417	435	576	406	359	360	301	192	224	225	193	15,188
	- Waite	61,449	1,167	925	626	842	821	569	319	347	174	119	112	158	87,618
Garden	- Tonkinson	11,951	126	-	192	240	462	-	251	-	-	-	-	-	13,222
Hartman	- Waite	719,701	16,957	15,655	14,368	14,572	14,279	18,338	18,705	18,040	18,968	19,605	15,217	16,132	918,537
Leader	- Hittle	324,719	7,734	6,203	6,622	6,686	6,635	8,242	8,452	8,636	8,993	8,759	6,825	7,221	415,727
	- K. Hittle	90,474	2,566	2,020	2,170	2,166	2,150	2,736	2,772	4,028	4,227	2,918	2,270	2,421	122,917
	- Waite	251,033	6,552	5,275	5,615	5,691	5,490	7,080	7,588	12,328	13,613	7,461	5,881	6,201	339,708
Texas	- Goodrich	167,462	4,212	3,412	3,646	3,669	3,614	4,366	3,633	5,922	5,560	6,258	6,124	6,416	224,273
	- Hittle	248,306	6,849	5,308	5,504	5,744	5,714	7,404	6,509	9,446	10,191	8,911	8,719	9,980	336,584
	- Ross	59,300	1,955	2,126	2,003	1,963	2,087	2,581	2,489	2,541	2,791	2,133	2,140	2,325	86,434
Trees	- Lewis	198,808	3,385	2,756	3,149	2,910	3,094	3,737	3,756	3,751	3,780	3,968	3,143	3,148	239,365
Totals		2,736,629	66,749	54,517	55,566	57,863	57,271	69,205	68,366	79,540	83,750	75,444	62,454	66,742	3,533,704

OWLL

LYNDON L. FOLEY
PETROLEUM ENGINEER AND GEOLOGIST
514 McBIRNEY BUILDING
TULSA, OKLAHOMA

Dec. 31, 1942

Mr. B. B. Blair,
604 Atlas Life Bldg.,
Tulsa, Okla.

Dear Sir:

The following is my report of reservoir pressure measurements recently made in the Hittle Pool, Cowley Co., Kansas.

Operator	Lease	Well	Date	Surface Pressure	Pressure at -2075 datum
Blair	K. Hittle	2	12-23-42	22	?
	Hittle Est.	2A	"	120	1305
		3A	"	125	1302
		4A	"	120	1302
	Waite B	1	"	120	1302
Hartman	Waite	1	12-22-42	130	1302
		5	"	115	1300
		6	"	132	1307
		9	"	85	1300
		10	"	130	1305

Average of 9 wells- 1302.8 lb per sq in at -2075 datum.

The average pressure is 4.8 lb. lower than shown by the survey made in November. Several of the surface pressures are a little lower than in November which checks the apparent decrease in reservoir pressure.

Respectfully submitted,

L. L. Foley.

L. L. Foley.

OWLL

LYNDON L. FOLEY
PETROLEUM ENGINEER AND GEOLOGIST
2400 NATIONAL BANK OF TULSA BUILDING
TULSA, OKLAHOMA
514 McBirney Bldg.

Feb. 2, 1943

Mr. B. B. Blair,
Tulsa, Okla.

Dear Sir:

The following are the results of my recent reservoir pressure measurements in the Hittle Pool, Cowley Co., Kansas.

Operator	Lease	Well	Date	Surface Pressure	Pressure at -2075 datum
Blair	Hittle	2A	1-28-43	118	1305
		3A	"	125	1310
		4A	"	120	1313
	Waite B	1	"	75	1290*
Hartman	Waite	1	1-27-43	132	1313
		5	"	113	1305
		6	"	132	1313
		9	"	82	1313
		10	"	112	1305

* Well flowing, not included in average

Average of 8 wells- 1309.6 lb. per sq. in. at -2075 datum.

Hartman 9 Waite had water at about 2700 feet.

Blair 1 Waite B had water at about 2600 feet.

Blair 4A Hittle and H artman 10 Waite had water at the total depth.

Blair 3A Hittle and Hartman 1 Waite had a slight trace of water.

Blair 2A Hittle, Hartman 5 & 6 Waite had no water.

Respectfully submitted,

L. L. Foley.

L. L. Foley.

JWLL

LYNDON L. FOLEY
PETROLEUM ENGINEER AND GEOLOGIST
2400 NATIONAL BANK OF TULSA BUILDING
TULSA, OKLAHOMA
514 McBirney Bldg.

Feb. 25, 1943.

Mr. B. B. Blair
Tulsa, Okla.

Dear Sir:

The following is my report of reservoir pressure and water survey completed yesterday in the Hittle Pool, Cowley Co., Kansas.

Operator	Lease	Well	Date	Surface Pressure	Pressure at -2075 datum
Blair	Hittle	2A	2-23-43	109	1298
		3A	"	126	1298
		4A	"	125	1305
	Waite B	1	"	26	1303
Hartman	Waite	1	2-24-43	131	1305
		5	"	114	1308
		6	"	128	1308
		9	2-23-43	87	1305
		10	2-24-43	49	1303

Average of 9 wells- 1303.7 lb. per sq. in. at -2075 datum.

			Water Level
Blair	Hittle	2A	trace
		3A	slight trace
		4A	trace
	Waite B	1	2515
Hartman	Waite	1	slight trace
		5	trace
		6	none
		9	3200
		10	2570

Blair 2A Hittle showed water for the first time. No.1 Waite B had more water than on the January survey. Hartman 10 Waite has had a trace of water for several months but this is the first time it has had an appreciable amount.

Respectfully submitted,

L. L. Foley

L. L. Foley.

OWLL

LYNDON L. FOLEY
PETROLEUM ENGINEER AND GEOLOGIST
2400 NATIONAL BANK OF TULSA BUILDING
TULSA, OKLAHOMA

March 30, 1943.

Mr. B. B. Blair,
Tulsa, Okla.

Dear Sir:

The following is my reprt of reservoir pressure and water survey in the Hittle Pool, Cowley Co., Kansas.

Operator	Lease	Well	Date	Surface Pressure	Pressure at -2075	Water
Blair	Hittle	1	3-28-43	122	1311	trace
		2	"	125	1311	"
		3	"	128	1311	"
		4	"	123	1311	"
		5	"	116	?	"
		6	"	85	1313	400 ft.
		7	"	125	1308	trace
	Waite B	3	3-28-43	90	1308	400 ft.
Hartman	Waite	1	3-27-43	132	1311	0
		2	"	128	1307	trace
		3	"	122	1316	0
		4	"	133	1309	0
		5	"	117	1316	trace
		6	"	130	1309	0
		7	"	120	1313	0
		8	3-28-43	122	1311	0
		9	3-27-43	90	1308	250 ft.
		10	3-28-43	130	1311	trace
		11	"	134	1311	0
		12	3-27-43	115	1311	0

Average of 19 wells- 1310.8 lb. per sq. in. at -2075 datum.

This survey shows an increase in reservoir pressure and in surface pressure over the survey made in February.

Water encroachment has increased on the Blair Hittle lease and has decreased on the Hartman Waite lease.

Respectfully submitted,

L. L. Foley.

L. L. Foley.

OWLL

LYNDON L. FOLEY
PETROLEUM ENGINEER AND GEOLOGIST
2400 NATIONAL BANK OF TULSA BUILDING
TULSA, OKLAHOMA

April 28, 1943.

Mr. B. B. Blair,
Tulsa, Oklahoma.

Dear Sir:

The following is my report of reservoir pressure and water tests made this week in the Hittle Pool, Cowley Co., Kansas.

Operator	Lease	Well	Date	Surface Pressure	Pressure at -2075 datum
Blair et al	Hittle Est	2A	4-27-43	122	1305
		3A	"	127	1313
		4A	"	126	1308
Hartman	Waite	1	4-26-43	132	1310
		5	"	116	1303
		6	"	132	1305
		9	"	91	1310
		10	"	129	1308

Average of 8 key wells- 1307.8 lb. per sq. in. at -2075 datum

Water Report

Blair	Hittle Est	2A	none
		3A	slight trace
		4A	trace
Hartman	Waite	1	none
		5	none
		6	none
		9	water at 3160
		10	trace

Blair 2A Hittle and Hartman 5 Waite showed a slight trace of water last month but none on this survey.

Respectfully submitted,

L. L. Foley

L. L. Foley.

OWLL

21-28-315-4E

LYNDON L. FOLEY
PETROLEUM ENGINEER AND GEOLOGIST
514 McBIRNEY BUILDING
TULSA 3, OKLAHOMA

New Potentials, HITTLE POOL.

July and August 1943

Barnett	Waite	1	23	24 hour physical test
		2	37	" " "
		3	85	8 hour " "
		4	26	8 hr.45 min." "(called 24 hr test)
		5	14	24 hour physical "
		7	31	" " "
		8	32	" " "
			248	
Blair	K.Hittle	1	606	60% cut and water cut 57%
		2	956	" " " " " 28%
		3	230	" " " " " 70%
		4	412	" " " " " 55%
			2,204	
Blair	Hittle	1	657	60% cut
		2	1,695	" "
		3	2,864	" "
		4	1,002	" "
		5	2,834	" "
		6	1,519	" "
		7	3,000	" " and 3000 top potential
			13,571	
Blair	Waite B	1	2,608	60% cut
		2	1,026	" " and water cut 58%
		3	1,809	" " " " " 26%
		4	1,530	60% cut, 3000 bbl. top and 49% water cut.
			6,973	
Brewer	Curfman	1	96	3 hr.45 min.physical test of 32 bbl x 3 = 96
Brewer	Lewis	1	568	60% cut
		2	207	8 hr. physical test
		3	765	60% cut
		4	1242	" "
		5	32	24 hr. physical test
		6	2026	60% cut
			4,840	

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Cities Service	Hittle	2	15 bbl.	24 hr. physical test.
	Scott	1	7 bbl.	48 hr. physical test.
Hartman	Waite	1	1506	60% cut
		2	1534	" "
		3	2472	" "
		4	2778	" "
		5	3000	" " and 3000 top pot.
		6	1843	" "
		7	3000	" " and 3000 top pot.
		8	2842	" "
		9	2394	" "
		10	1708	" "
		11	2179	" "
		12	3000	" " and 3000 top pot.
			28256	
Texas Goodrich		1	932	60% cut
		4	1892	" "
		5	2378	" "
		6	2344	" "
			7546	
Hittle		6	982	60% cut
		7	1654	" "
		8	2093	" "
		9	868	" "
		10	2528	" "
		11	1501	" "
		12	1498	" "
			11124	

OWL

Texas	Ross	1	922	60% cut
		3	1200	" "
		4	207	8 hr. physical test
			2329	
Trees	Lewis	1	1198	60% cut
		2	1318	" "
		3	918	" "
		4	207	8 hr. physical test
		5	762	60% cut
		6	1052	" "
			5455	

OWLL

		July Pot.	New Pot.	% Loss
Barnett	Waite	28,921	248	99.1%
Blair	Hittle	30,515	13,571	55.5
	K. Hittle	10,137	2,204	78.3
	Waite B	26,143	6,973	73.3
	Waite C	10	1	90.0
Brewer	Curfman	92	96	4.3
	Lewis	12,548	4,840	61.4
Cities Serv.	Hittle	15	15	-
	Scott	7	7	-
Hartman	Waite	68,116	28,256	58.5
Texas	Goodrich	16,295	7,546	53.7
	Hittle	24,263	11,124	54.2
	Ross	5,059	2,329	54.0
Trees	Lewis	13,152	5.455	58.5
		235,273	82,665	

Average potential loss for field 64.9%

Average new potential 1292.

OWLL

HITTLE POOL ALLOWABLE

Calculated using new potentials and August normal percent.

Ave.Pot 1292 Normal % 2.29 Adj.% 1.69

Operator	Lease	Wells	Pot.	Allowable.	
Barnett	Waite	7M	248		5,022
Blair	Hittle	5	11,912	6,240	7,790
		2M	1,659	1,550	
	K.Hittle	4M	2,204		3,100
	Waite	3	5,947	3,116	3,891
		1M	1,026	775	
	Waite C	1M	1		31
Brewer	Curfman	1M	96		775
	Lewis	1	2,026	1,061	4,936
		5M	2,814	3,875	
Cities Service	Hittle	1M	15		465
	Scott	1M	7		217
Hartman	Waite	12	28,256		14,803
Texas	Goodrich	3	6,614	3,465	4,240
		1M	932	775	
	Hittle	5	9,274	4,859	6,409
		2M	1,850	1,550	
	Ross	3M	2,329		2,325
Trees	Lewis	6M	5,455		4,650
		64	82,665		58,654

Note: 34 minimum wells.

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	% of August Potential	% of New Potential
Barnett	12.3%	0.3%
Blair	28.7	30.9
Brewer	5.4	6.0
Carter	9.5	9.2
Cities Service	.01	.03
Hartman	14.5	17.1
Texas	19.4	25.4
Trees	5.6	6.6
Zephyr	4.7	4.6
	100.11%	100.13%

	% of August Allowable	% of New Allowable
Barnett	12.6	8.6%
Blair	26.4	25.2
Brewer	8.0	9.7
Carter	8.7	8.4
Cities Service	.6	1.2
Hartman	12.8	12.6
Texas	19.7	22.1
Trees	6.6	7.9
Zephyr	4.4	4.2
	99.8%	99.9%

OWLL

Nov. 7, 1944

Mr. B. B. Blair
601 Atlas Life Bldg.,
Tulsa, Okla.

Dear Sir:

The following is my report of reservoir conditions in the Hittle Pool, Cowley Co., Kansas.

Production Aug. 1944	54,327 bbl.
Ave. per well per day	30.2
Production to Sept. 1, 1944	4,725,682
" " Nov 1, 1944	4,825,000 approx.

Total oil wells completed	70
Abandoned	12
Now Producing	58

Flowing wells	32
Pumping part time	15
Pumping full time	11
Total	58

Leases producing	11
Leases abandoned	6
Total	17

Ten of the leases currently produce their allowable production. Barnett Waite, in Aug. 1944, produced 10.66 bbl. per well per day.

Two of the abandoned wells, Barnett 6 Waite and Garden No. 1 Tonkinson, have been converted to water disposal wells and most of the water produced in the field is being injected into the Arbuckle Lime. The water-oil ratio has been increasing.

The reservoir pressure fell slightly below 1,300 lb. for the months of Sept. and Oct. 1944. I have not recommended a decrease in the field allowable for the following reasons;

1. The pressure is not yet low enough to be very alarming.

2. We had reached a time at which we might expect new potentials which would decrease the field allowable.

3. The field now produces more water than oil. Most of the wells producing water are minimum wells, and a decrease in the field allowable would have practically no effect on the water production.

OWLL

315-4E

		Oil Prod.	Approximate Water Prod.	Water Injected	Net Fluid Withdrawal	Ave Reservoir Pressure
1943	Aug	67,130	42,000	18,000	91,130	
	Sept	53,425	48,000	20,000	81,425	1308.75
	Oct	51,601	54,000	20,000	85,601	1306.4
	Nov	50,467	60,000	24,000	86,467	1301.5
	Dec.	54,176	62,000	24,000	92,176	1307.0
1944	Jan	53,278	68,000	24,000	97,278	
	Feb	50,803	74,000	24,000	100,803	
	Mar	55,264	74,000	70,000	59,264	1306.1
	Apr	53,460	77,000	70,000	60,460	
	May	55,757	77,000	70,000	62,757	
	June	50,999	83,000	70,000	63,999	1303.1
	July	51,308	85,000	70,000	66,308	1301.0
	Aug	54,327	85,000	72,000	67,327	[illegible]
	Sept	52,000?	87,000	72,000	67,000?	1296.9
	Oct.	54,000?	88,000	72,000	70,000?	1297.9

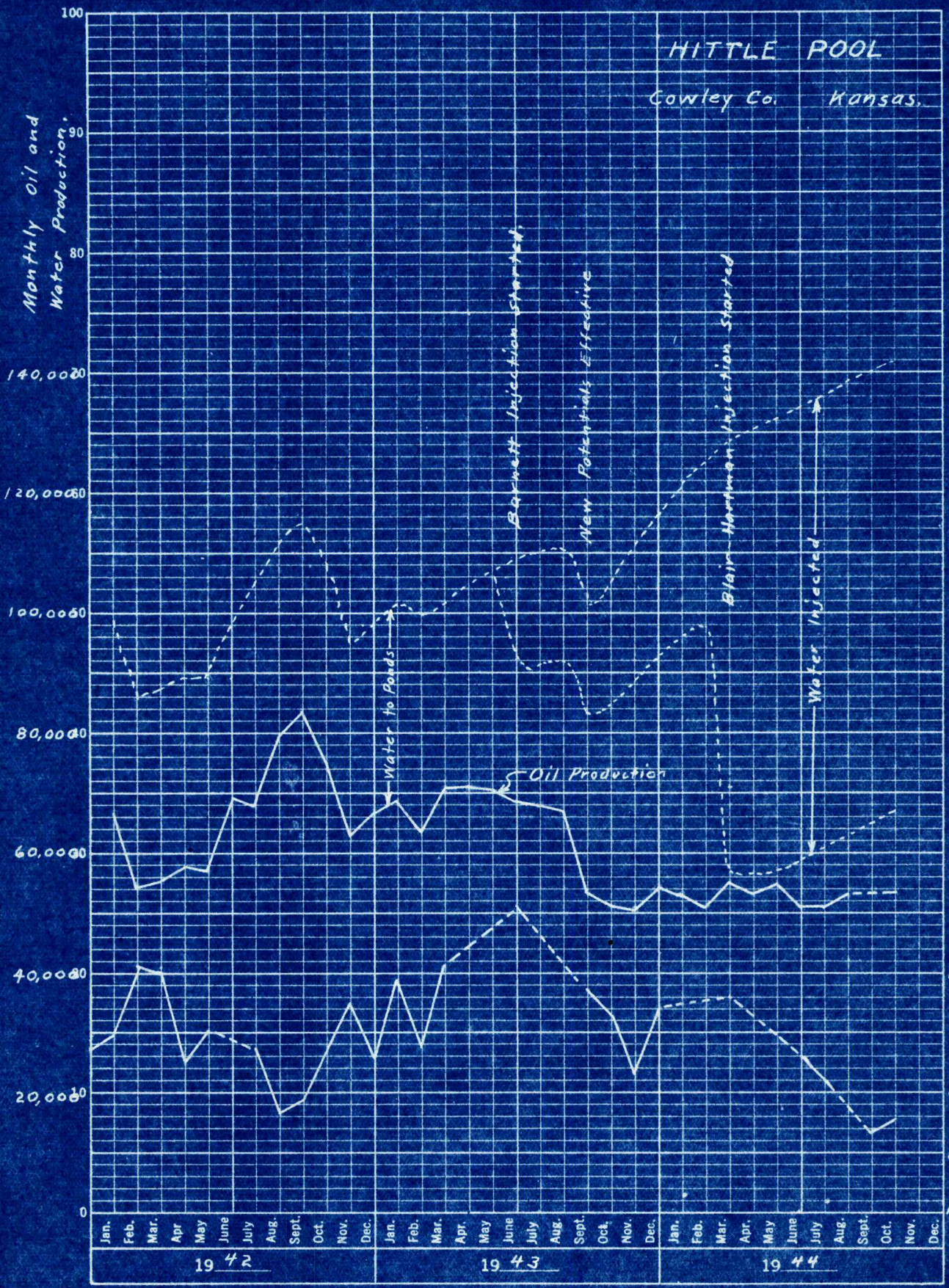
A reduction of allowable amounting to 20% of the oil produced would reduce the total fluid by omly 7%.

Respectfully submitted,

OWLL

L. L. Foley.

L. L. Foley.



KEUFFEL & ESSER CO., N.Y. NO. 359-180
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OWLL

L. L. Foley.

May 31, 1945

Mr. W. L. Hartman,
Box 54,
Wichita, Kansas.

OWLL

Dear Sir:

The following are the results of tests made to calibrate positive chokes on the Waite lease, Hittle Pool, Cowley Co., Kansas. The tests were made on the No. 3 well, flowing into a 250 bbl. test tank at the well. Flowing into a lead line, the capacity of a given choke would be determined by the difference between the well-head pressure and the line pressure.

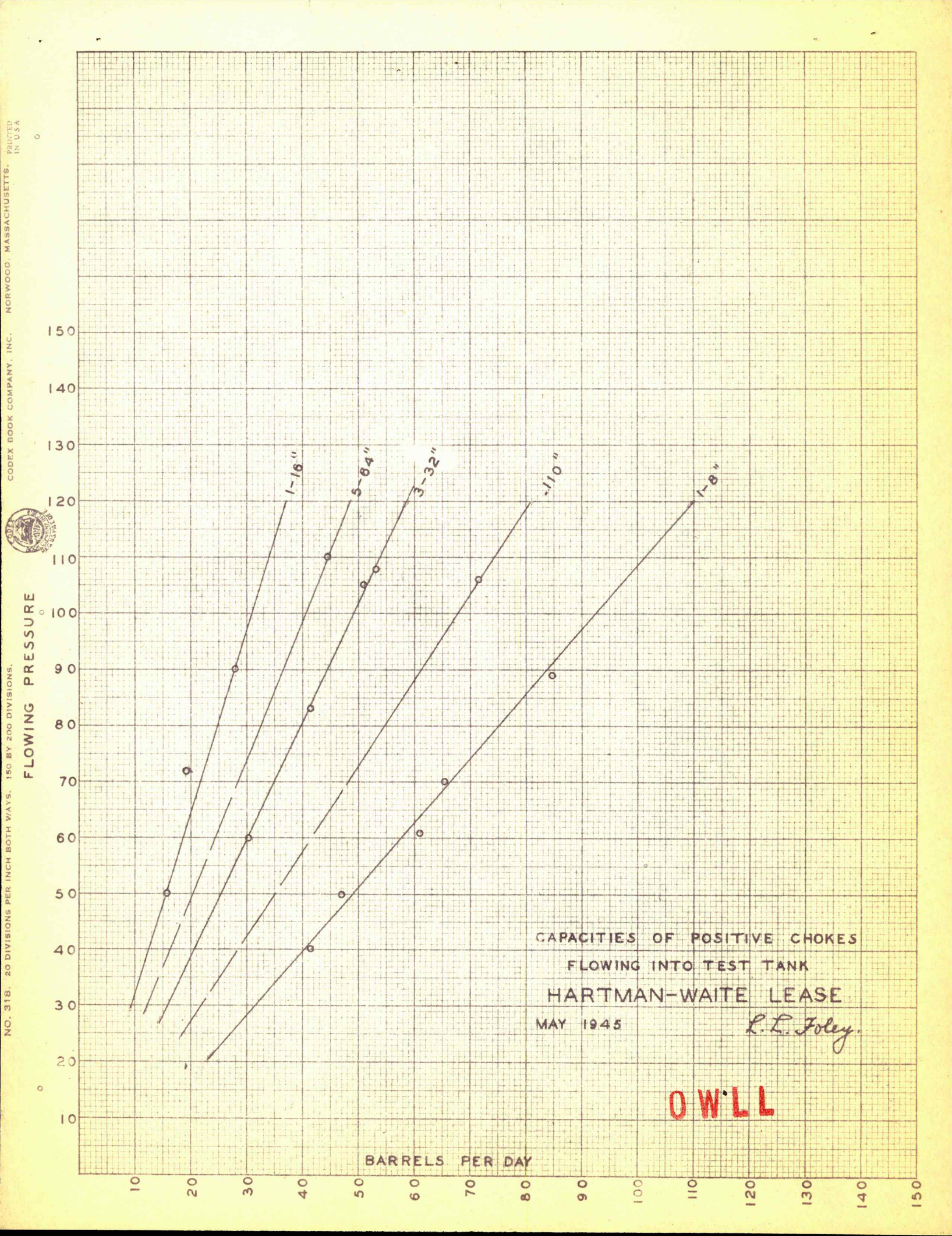
Choke	Flowing Pressure	Time	Barrels Flowed	Bbl. per Hour	Bbl. per Day
1/16 in.	90 lb.	12 hr.	14.15	1.18	28.29
	72	" "	9.66	.81	19.32
	50	24 "	15.87	.66	15.87
5/64 in.	110 lb.	11½ "	21.39	1.86	44.64
3/32 in.	108 lb.	15¼ "	33.81	2.22	53.21
	105	12 "	25.53	2.13	51.06
	83	12 "	20.70	1.73	41.40
	60	12 "	15.18	1.27	30.36
.110 in.	106 lb.	12 hr.	35.88	2.99	71.76
1/8 in.	89 lb.	12 "	42.44	3.51	84.88
	70	11 "	30.02	2.73	65.49
	61	11 "	27.95	2.54	60.96
	50	12 "	23.46	1.95	46.92
	40	12 "	20.70	1.73	41.40

The results of these tests are shown graphically on the chart attached to this report.

Respectfully submitted,

L. L. Foley.

L. L. Foley.


1-16"
5-64"
3-32"
7-110"
1-8"
FLOWING PRESSURE
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
BARRELS PER DAY
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
CAPACITIES OF POSITIVE CHOKES
FLOWING INTO TEST TANK
HARTMAN-WAITE LEASE
MAY 1945
L. L. Foley.
OWLL
NO. 318. 20 DIVISIONS PER INCH BOTH WAYS. 150 BY 200 DIVISIONS.
CODEX BOOK COMPANY, INC. NORWOOD, MASSACHUSETTS. PRINTED IN U.S.A.

LYNDON L. FOLEY
PETROLEUM ENGINEER AND GEOLOGIST
530 McBIRNEY BUILDING
TULSA 3, OKLAHOMA

Jan. 21, 1946

Mr. B. B. Blair,
Atlas Life Bldg.,
Tulsa, Okla.

Dear Sir:

The following is my report of reservoir pressure measurements in the Hittle Pool, Cowley Co., Kans.

Operator	Lease	Well	Date	Surface Press.	Pressure at -2075	Water level
B. B. Blair	Hittle	1A	1-18-46	121	1315	none
		2A	"	116	1328	"
		3A	"	123	1330	sl tr
		4A	"	120	1322	trace
		5A	"	108	1330	3300
		6A	"	112	1330	3250
		7A	"	120	1322	none
W. L. Hartman	Waite	1	1-17-46	117	1322	trace
		2	"	122	1322	sl tr
		3	"	116	1320	sl tr
		4	"	117	1322	trace
		5	1-16-46	0	1325	2000
		6	1-17-46	60	1325	2650
		7	1-16-46	112	1325	trace
		8	"	13	1317	2150
		10	"	26	1330	2300
		11	1-17-46	122	1330	trace
		12	"	98	1320	2900

Average of 18 wells :- 1324.2 lb. at -2075 datum.

The Barnett Waite lease has been abandoned and no longer pumps water into the pit. The Trees Lewis lease was shut down temporarily for pit space. All of the Hartman and Blair water was being returned to the Arbuckle pay zone. The consequent decrease in net fluid withdrawal is considered to be responsible for the unusually high reservoir pressure.

Respectfully submitted,

L. L. Foley

L. L. Foley.

OWLL

31S-4E

LYNDON L. FOLEY
PETROLEUM ENGINEER AND GEOLOGIST
530 McBIRNEY BUILDING
TULSA 3, OKLAHOMA

March 30, 1946

HITTLE POOL
Cowley Co., Kansas.

OWLL

Potentials taken March 18th to March 30th.

Operator	Lease		1945 Pot.	Wtr.	New Pot.	Wtr.	Type of Test
B. B. Blair	K. Hittle	1	39	92%	37	96%	24 hr. Phys.
		2	44	93			
		3	32	93	24	96	" " "
		4	46	94	43	90	" " "
	Hittle	1	657	0	657	0	Water Cut
		2	1695	0	1695	0	" "
		3	2864	0	2864	0	" "
		4	1002	0	1002	0	" "
		6	1519	0	1519	0	" "
		7	3000	0	3000	0	" "
	Waite B	1	209	70	50	91	24 hr Phys
		2	32	96	21	98	" " "
		4	29	94	18	98	" " "
Hartman	Waite	1	1506	0	1506	0	Water Cut
		2	1534	0	1534	0	" "
		3	2472	0	2472	0	" "
Texas	Curfman	1	141	0½	83	36	24 hr Phys
	Goodrich	1	932	0	932	0	Water Cut
		4	1892	0	1892	0	" "
		6	2344	0	2344	0	" "
	Hittle	6	982	0	982	0	" "
		7	1654	0	1654	0	" "
		8	2093	0	2093	0	" "
		9	115	13	28	17	24 hr Phys
		10	2528	0	2528	0	Water Cut
		11	1501	0	1501	0	" "
		12	1498	0	1498	0	" "
	Lewis	1	119	49	51	81½	24 hr Phys
		3	76	?	33	85	" " "
		4	30	90	23	85	" " "
		6	29	92	14	96	" " "
	Ross	1	922	0	922	0	Water Cut
		3	1200	0	1200	0	" "
		4	66	15	77	17	Phys.

Trees	Lewis	1	203	0%	123	0%	8	hr	Flow
		2	149	78	83	95	8	hr	Pump
		3	143	44	115	52	"	"	"
		4	116	81	87	46	"	"	"
		5	134	83	48	85	24	"	"
		6	122	8	81	98	8	"	"

Respectfully submitted,

L. L. Foley

L. L. Foley.

315-4E

LYNDON L. FOLEY
PETROLEUM ENGINEER AND GEOLOGIST
530 McBIRNEY BUILDING
TULSA 3, OKLAHOMA

April 20, 1946.

HITTLE POOL WATER DISPOSAL
Tests made April 18, 1946

Water Run to Disposal Wells

	Per Hour	Per Day
Waite C Well	155 bbl.	3,720 bbl.
Tonkinson Well	145	3,480
Total	300 bbl.	7,200 bbl.

Wells Pumping

K. Hittle	1,2,3, & 4.
Waite A	6,7,8,10 &11.
Waite B	1,2,3, & 4.

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Average water production per well 23 bbl. per hr., 554 bbl. per day.

Input Capacity.

Waite C	310 bbl. per hr.	7,440 bbl per day
Tonkinson	495	11,880
Total	805 bbl. per hr.	19,320 bbl per day

The input capacity of the Waite C was 220 bbl. per hour in January. The reservoir pressure at that time was about 20 lb. higher than at the time of the present tests. A change of 20 lb. in the reservoir pressure would have a material effect on the input capacity of the well. The recent increase in the input capacity of the Waite C well has been noticed by the field men.

The more water we run to the Tonkinson, the lower will be the reservoir pressure in the pay zone. Mr. Page says that he noticed that when all of the water is run to the Tonkinson, the production of the Waite B and the surface pressures on the Hittle estate show a noticeable decrease.

Respectfully submitted,

L. L. Foley

L. L. Foley.

LYNDON L. FOLEY
PETROLEUM ENGINEER AND GEOLOGIST
530 McBIRNEY BUILDING
TULSA 3, OKLAHOMA

July 5, 1946.

Mr. B. B. Blair,
601 Atlas Life Bldg.,
Tulsa, Okla.

Dear Sir:

The following is my report of reservoir pressures in the Hittle Pool, Cowley Co., Kansas.

Operator	Lease	Well	Date of Test	Surface Pressure	Pressure at -2075	Water
B. B. Blair	Hittle	2A	7-1-46	113	1300	sl. tr.
		3A	"	127	1303	" "
Hartman	Waite	1	"	120	1300	trace

Average of 3 wells, 1301 lb. per sq. inch at -2075

All of the water being produced on the Hittle, Waite A and Waite B leases was being run to the Waite C disposal well, which was taking all of the water. The Tonkinson disposal well has not been used since April.

Respectfully submitted,

L. L. Foley

L. L. Foley.

OWLL

LYNDON L. FOLEY
PETROLEUM ENGINEER AND GEOLOGIST
530 McBIRNEY BUILDING
TULSA 3, OKLAHOMA

Production Record

HITTLE POOL

Cowley County, Kansas.

Operator	Lease	Production in 1946	Production to 1-1-47	Per Well to 1-1-47
Barnett	Waite	0	497,596	62,200
Blair	Hittle Est.	103,853	802,736	114,677
	K. Hittle	31,463	262,669	65,667
	Waite B	23,344	517,740	129,435
	Waite C	0	66,875	66,875
Brewer	Hughes	0	2,605	2,605
Cities Service	Hittle	0	66,020	33,010
	Scott	0	17,007	17,007
	Waite	0	87,618	43,809
Garden	Tonkinson	0	13,222	13,222
Hartman	Waite	140,594	1,604,435	133,703
Texas Co.	Curfman	7,908	53,646	53,646
	Goodrich	60,727	438,871	109,718
	Hittle	95,813	667,792	95,399
	Lewis	29,779	378,861	63,144
	Ross	28,364	197,245	65,748
Trees	Lewis	47,496	447,454	74,576
		569,341	6,122,392	87,463

To June 1, 1947

Blair	Hittle	853,145
	K. Hittle	274,739
	Waite B	522,662
Hartman	Waite	1,667,182
	Total	3,317,728

OWLL

LYNDON L. FOLEY
PETROLEUM ENGINEER AND GEOLOGIST
530 McBIRNEY BUILDING
TULSA 3, OKLAHOMA

HITTLE POOL

Cowley County, Kansas.

Proration Schedule of July 1947 using Estimated New Potentials

Operator	Lease	Wells	Potential	Allowable	
Blair	Hittle	3	4,469	5,716)	
		3M	1,215	2,325)	8,351
		1M	10	310)	
	K Hittle	4M	69		2,139
	Waite B	3M	37		1,147
					11,637
Hartman	Waite	4M	948	3,100)	
		4M	45	1,395)	4,495
Texas	Curfman	1M	50		775
	Goodrich	4	6,952		8892
	Hittle	6	10,256	13,118)	
		1M	28	775)	13,893
	Lewis	4M	95		3,100
	Ross	2	2,122	2,714)	
		1M	50	775)	3,489
					30,149
Trees	Lewis	6M	375		4,650
		47	26,721		50,931

Ave. Pot. 569 Normal Percent 6.13% Adj. Percent 4.126%

	Pipeline Runs May 1947 Barrels	Percent	Est. Allow. July 1947 Barrels	Percent
Blair	13,994	25.00%	8,066	15.84%
Carter	4,787	8.55	3,879	7.62
Hartman	6,813	12.17	2,248	4.41
Texas	23,412	41.83	30,149	59.20
Trees	4,575	8.17	4,650	9.13
Zephyr	2,394	4.28	1,939	3.81
Totals	55,975	100.00%	50,931	100.01%

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Estimated New Potentials as of July 1947.

Blair	Hittle	1	657	WC
		2	812	"
		3	403	"
		4	259	"
		5	10	Phys.
		6	478	WC
		7	3,000	"
			5,694	
	K. Hittle		69	
	Waite B		37	
	Hartman Waite	1	322	WC
		2	336	WC
		3	15	"
		4	259	"
		5	10	Phys.
		6	31	WC
		8	10	Phys.
		10	10	Phys.
			993	
Texas	Curfman	1	50	Phys.
	Goodrich	1	932	WC
		4	1,892	"
		5	1,784	"
		6	2,344	"
			6,952	
	Hittle	6	982	WC
		7	1,654	"
		8	2,093	"
		9	28	Phys.
		10	2,528	WC
		11	1,501	"
		12	1,498	"
			10,284	
	Lewis	1	25	Phys.
		2	0	
		3	25	Phys.
		4	25	"
		6	20	"
			95	
Texas	Ross	1	922	WC
		2	1,200	"
		3	50	Phys.
			2,172	
Trees	Lewis	1	100	Phys.
		2	50	"
		3	100	"
		4	50	"
		5	25	"
		6	50	"
			375	

Total 47 wells	26,721
Average	569
Total official Pot. july 1947	40,730
Average (48 wells)	849

We have information to the effect that some of the Texas Hittle west line wells have weakened and are flowed a few hours per day. It is probable that they will be able to take water-cut tests and maintain their present potentials.

The potential of Goodrich 5 was based on an estimated water cut of 25% water.

Respectfully submitted

L. L. Foley

L. L. Foley.

315-4E

HITTLE POOL PRORATION

October, 1946.

OWLL

		20 bbl. minimum		15 bbl. minimum	
		Including Waite B 3	Excluding Waite B 3	Including Waite B 3	Excluding Waite B 3
Field Potential		40,943	40,939	40,943	40,939
No. of wells		53	52	53	52
Average Potential		773	787	773	787
Normal percent		4.13	4.13	4.13	4.13
Adjusted percent		2.86	2.87	3.21	3.22
ALLOWABLE PROD.					
Blair	Hittle	10,177	10,208	11,149	11,183
	K. Hittle	2,480	2,480	1,860	1,860
	Waite B	1,922	1,798	1,519	1,395
Hartman	Waite	12,093	12,119	11,907	11,933
Texas	Curfman	620	620	465	465
	Goodrich	6,602	6,625	7,410	7,433
	Hittle	9,713	9,745	10,671	10,703
	Lewis	2,542	2,542	2,077	2,077
	Ross	2,501	2,508	2,577	2,583
Trees	Lewis	3,720	3,720	2,790	2,790
Field Total		52,370	52,365	52,425	52,422
Blair	Total	13,335	13,303	13,218	13,186
Carter	"	4,860	4,828	4,842	4,812
Hartman	"	6,047	6,060	5,954	5,967
Texas	"	21,978	22,040	23,200	23,261
Trees	"	3,720	3,720	2,790	2,790
Zephyr	"	2,430	2,414	2,421	2,406
Total		52,370	52,365	52,425	52,422

At the beginning of the field potential tests in March of this year, the Texas Company announced that they would not take a test of their No. 2 Lewis as it was too small to pump profitably. At that time it appearred that abandoning Waite B No. 3 would place the field in the 800-900 classification, in which the normal percent would now be 3.74% and the monthly allowable 47,342 bbl. At the end of the tests, they decided to test it and got a potential of 8 bbl. With Texas No. 2 Lewis in the picture, abandoning No. 3 Waite B does not change the pool classification.

Respectfully submitted,

L. L. Foley

L. L. Foley.

INFORMATION PERTAINING TO WAITE LEASE-HITTLE POOL, 31-4 EAST
AND TESTING PRODUCTIVITY OR CAPACITY TO PRODUCE

Well No.	Present Potential Bbls.	Size & Weight of Casing	Total Depth Feet	Gals. per Lineal Foot	No. Gals. in Annular Space	No. Bbls. in Annular Space	Nov. Daily Allowable per day	No. Bbls. per Hour Ea. 24 Hrs.	No. Hours to Empty Annular Space	Hrs. to Empty Annular Space Twice	Days to Empty Annular Space Twice
1	1506	5-3/16" 17#Sms I.D. 4.892	3286'	.9764	3208	76.38	27.25	1.135	67.29	134	5.58 or 6 days
2	1534	5-3/16" 17#Sms	3291'	.9764	3213	76.50	27.76	1.156	66.71	134	5.58 or 6 days
3	2472	7" 24# L.W. I.D. 6.336	3318'	1.6379	5435	129.39	44.74	1.864	69.41	138	5.75 or 6 days
4	2778	7" 24# L.W.	3277'	1.6379	5367	127.78	50.28	2.095	60.99	122	5.08 or 5 days
5	3000	7" 24# L.W.	3350'	1.6379	5486	130.64	54.30	2.262	57.75	116	4.83 or 5 days
6	1843	7" 24# L.W.	3304'	1.6379	5412	128.85	33.35	1.389	92.76	186	7.75 or 8 days
7	3000	7" 24# L.W.	3351'	1.6379	5489	130.68	54.30	2.262	57.77	116	4.83 or 5 days
8	2842	7" 24# L.W.	3334'	1.6379	5461	130.00	51.44	2.143	60.66	122	5.08 or 5 days
9	2394	7" 24# L.W.	3380'	1.6379	5536	131.80	43.33	1.805	73.01	146	6.08 or 6 days
10	1708	7" 24# L.W.	3315'	1.6379	5430	129.80	30.91	1.287	100.45	200	8.33 or 8 days
11	2179	7" 24# L.W.	3313'	1.6379	5426	129.19	39.43	1.642	78.67	158	6.58 or 7 days
12	3000	7" 24# L.W.	3361'	1.6379	5505	131.07	54.30	2.262	57.94	116	4.83 or 5 days
TOTAL 28,256 bbls.					60,968 gals	1452.08 bbls	511.39 bbls per day	21.302 bbls per hour- 24 hrs. equal 51.248 bbls.	843.41 hrs. or 35 24-hr. days to take each well separate and empty annular space	1688 hrs.	72 days to treat each well separate and empty annular space twice before taking water test of 4 hours

OWLL

315-4E

THE CARTER OIL COMPANY

PRODUCTION DEPARTMENT

NATIONAL BANK OF TULSA BUILDING

TULSA, OKLAHOMA

J. R. McWILLIAMS
DIRECTOR

R. L. CLIFTON
ASSISTANT MANAGER

I. S. SALNIKOV
CHIEF ENGINEER

POST OFFICE BOX 801

December 18, 1942

Mr. B. B. Blair
Atlas Life Building
Tulsa, Oklahoma

Re: Pumping in the Hittle Pool

Dear Sir:

Our calculations indicate that it will be necessary to use 3" tubing in lifting 1,000 barrels of fluid per day from a depth of 2,000 feet and that 700 barrels is the maximum that can be produced with 2-1/2" tubing. These volumes are based on 24 - 54" strokes per minute with the 3" tubing and 26 - 54" strokes with the 2-1/2" tubing.

The peak torque polished rod loads and amount of counter balance are shown in the attached table for the 3" and 2-1/2" with 7/8" rods and also for the 2-1/2" with 3/4" rods. The polished rod loads for all three conditions are within the beam capacity of the OCS 22-1/2 DTA unit but the peak torques exceed the torque rating of this, excepting when 3/4" sucker rods are used. The unit stress of 25800 for 3/4" rods with a 2-1/4" plunger is only about 75 percent of the indurance limit of low nickel rods (Jones #7, Axelson #59, Oilwell "T", National 81) in salt water; therefore if this type of rod can be purchased and if there is not an excessive amount of H2S in the fluid, 3/4" rods should be satisfactory where 2-1/2" tubing is used. This will permit installing the OCS 22-1/2 D2A excepting on the wells where it seems necessary to use 3" tubing in order to have a capacity of 1000 barrels per day.

The horse power ratings tabulated for the several engines are conservative, being approximately 80 percent of the manufacturers ratings for continuous duty. Our recommendation on engines is to use the Allis Chalmers E-60 only where 3" tubing is used and to use the MZRU Waukesha engines with 2-1/2" tubing where 7/8" rods are used, the Allis Chalmers U-4 or International U-21 with 2-1/2" tubing and 3/4" rods.

Yours very truly,

P. F. Michael

PFM:gs
Attachment

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HITTLE POOL

Calculated Loads for Pumping Large Volumes of Fluid

Tubing Size	3"	2-1/2"	2-1/2"
Plunger Size	2-3/4"	2-1/4"	2-1/4"
Sucker Rods	7/8"	7/8"	3/4"
Length Stroke	54"	54"	54"
Number Stroke	24	26	26
Fluid Level	2,000'	2,000'	2,000'
Pump Depth	3,300'	3,300'	3,300'
Barrels per day	1,000	700	700
Polished Rod Load	15,700#	13,700#	11,400#
Effective Counter Balance	8,600#	7,700#	6,200#
Peak Torque	190,500"#	161,100"#	141,600"#
Indicated OCS Unit	32-1/2 D2	32-1/2 D2	22-1/2 D2A
Engine Horse Power	27.4	25	22
Unit Stress in Rods	26,200#	22,800#	25,800#

Calculated Engine Horse Power for Continuous Load

		R.P.M. 700	800	900
Allis-Chalmers	E-60	35	40	45
Allis-Chalmers	U-4	20	22	25
International	U-21	18.5	21	23
Waukesha	MZRU	25	28	32
Waukesha	BKU	17.5	20	22

PFM:gs
12-18-42'

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TAG CONTENT
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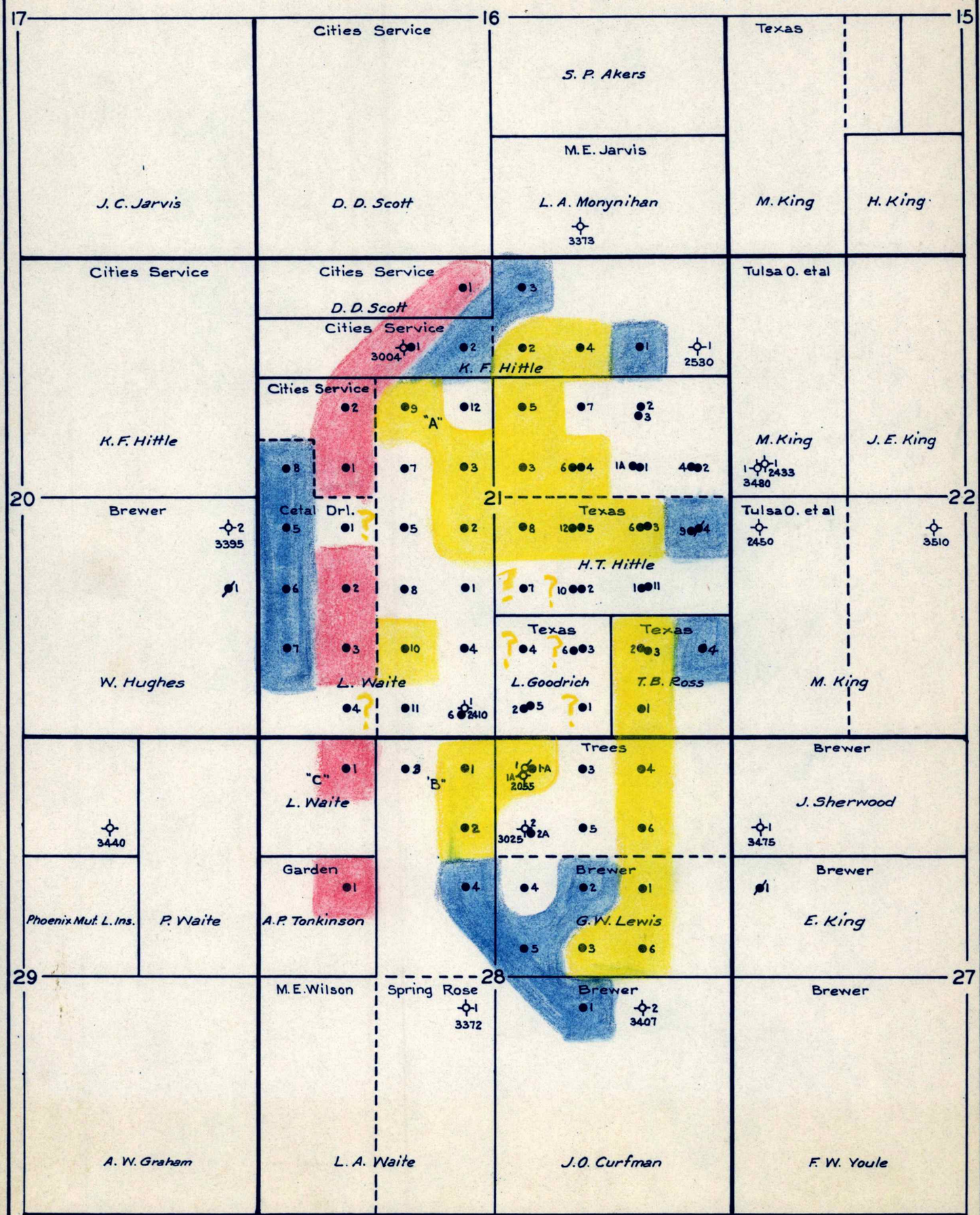
HITTLE POOL
COWLEY COUNTY, KANSAS
TWP. 31 S. RGE. 4 E.



Red Area- Wells pumping steadily
Blue Area- Wells pumping occasionally
Yellow Area- Flowing wells showing water
Question mark indicates wells not tested

August 1942.

OWLL

514 McBirney Building.

EFFECT OF ACREAGE ALLOWANCE

HITTLE POOL

Extra allowable for acreage was granted on the Texas Company Hittle and Ross leases for the months of November 1941 to September 1942 inclusive, and on the Blair Hittle, K. Hittle and Waite B leases for the months of August and September 1942. The Commission figures the extra production allowed, over the allowable for 10 acre spacing, as follows:

Blair Hittle	1,296 bbl.
K. Hittle	3,493 bbl.
Waite B	14,954 bbl.
Texas Hittle	7,052 bbl.
Ross	4,828 bbl.

The effect of extra acreage allowance on the allowable of each operator was calculated by figuring the field proration schedule for a typical month of 31 days in which the normal percent was assumed to be 1.00% to give a field allowable of about 75,000 bbl. for 10 acre spacing. The calculation sheet is attached hereto.

The principal effects of the acreage allowance are as follows:

1. Field allowable for the month is increased from 76,876 bbl. to 87,180 bbl., an increase of 10,304 bbl.

2. The Blair and Rooney interest is increased from 21,656 bbl. to 26,134 bbl., an increase of 4,478 bbl.

3. The Texas Company allowable is increased from 13,960 bbl. to 15,146 bbl., an increase of 1,186 bbl.

4. There are fewer minimum wells under wider spacing so the adjusted normal percent is increased slightly. This gives a slightly larger allowable to each prorated well.

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EFFECT OF ACREAGE ALLOWANCE

HITTLE POOL

Normal % 1.00

	10 acre Spacing			Extra Acreage Allowance		
	Potential		Allowable	Productivity		Allowable
Barnett Waite	6	28288	9261	6	28288	9349
	2 M	1600		2M	1600	
Blair Hittle	6	29381	9118		31094	9719
	1M	1134		1M	1512	
K.Hittle	4	10137	2985	4	15229	4532
Waite B	4	26143	7699	4	47948	14269
Waite C	1	5856	1725	1	5856	1743
Brewer Curtman Lewis	1M	92	465	1M	92	465
	3	9967	4330	3	9967	4361
	3M	2581		3M	2581	
C%t .Serv-Hittle	2	5125	1509	2	5125	1525
Scott	1M	7	465	1M	7	465
Waite	2M	30	930	2M	30	930
Garden-Tonkinson	1M	5	465	1M	5	465
Hartman-Waite	12	68116	20060	12	68116	20271
Texas-Goodrich	3	15007	4885	3	15007	4931
	1M	1288		1M	1288	
Hittle	6	23040	7250	7	26621	7922
	1M	1223				
Ross	2	4617	1825	2	6141	2293
	1M	442		1M	442	
Trees-Lewis	5	11677	3904	5	11677	3940
	1M	1475		1M	1475	
		247321	76876		280101	87180
	Ave. Pot	3584			Ave. Prod.	4,059
	Adj %	.95			Adj. %	.96
Hartman % of Allowable			13.05%			11.63%
Blair % of Allowable			28.17%			29.98%
Texas % of Allowable			18.16%			17.37%

Granting additional acreage allowances in the Hittle Pool would, in my opinion, be detrimental to every operator in the pool for the following reasons.

1. The pool allowable should be held to about 75,000 bbl. per month in order to conserve reservoir pressure and restrain water encroachment. The additional allowable would tend to cause waste.

2. The greatest increase in allowable would be on the Blair-Hittle and Waite B leases, the production of which would be nearly doubled. All of the K. Hittle wells make water, and so do two of the Waite B wells. A considerable increase in their allowable would aggravate the water situation and be wasteful.

3. The Blair-Rooney interest would gain 4,484 bbl. in the months allowable. They would gain in percent of the field allowable but this would be partly offset by a loss in percent of the field allowable on the Waite A lease. Their percent of the field allowable would be 28.17% under 10 acre spacing and 29.98% under wider spacing. To gain 1.63% of the field allowable, they would suffer the waste of increased field allowable and particularly the waste of nearly doubling the allowable of the K Hittle and Waite B leases which already make water.

4. The Texas Company would gain 1,186 bbl. in monthly allowable, but their gain would be small in comparison with the gain of the Blair Rooney interest. Under 10 acre spacing they would have 18.16% of the pool allowable and 17.37% under wider spacing. The decrease in their percent of the allowable would result in a smaller share in the ultimate recovery over the life of the field.

It is my opinion that the granting of extra acreage allowances in the Hittle Pool would be detrimental to every operator in the pool, even to those who appear to gain by it. I recommend that proration of the pool on a basis of 10 acre spacing be continued.

Respectfully submitted,

L. L. Foley.

L.L. Foley

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