State of Illinois
William G. Stratton, Governor
DEPARTMENT OF REGISTRATION AND EDUCATION
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Division of the

STATE GEOLOGICAL SURVEY

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CIRCULAR NO. 193

SUMMARY OF WATER FLOOD OPERATIONS IN ILLINOIS OIL POOLS DURING 1953

By

Paul A. Witherspoon, Edwin G. Jackson, and Members of the
Illinois Secondary Recovery and Pressure Maintenance Study Committee

Reprint of the Report Published
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PREFACE

The Interstate Oil Compact Commission, through its Secondary Recovery Division, with Albert E. Sweeney, Jr., Director, and Paul D. Torrey, Chairman of the Secondary Recovery and Pressure Maintenance Committee, takes great pleasure in presenting this "Summary of Water Flood Operations in Illinois Oil Pools During 1953."

We have heretofore cooperated with the State of Illinois in preparing and publishing the following reports:

> "Summary, Water Flooding Operations in Illinois, 1950" covering the 1949 operations.
>
> "Summary, Water Flooding Operations in Illinois to 1951" covering the operations in 1950.
>
> "Summary of Water Flooding Operations in Illinois Oil Pools During 1951," in which the Compact Commission did not officially participate but did render all assistance possible to the state.
>
> "Summary of Water Flood Operations in Illinois Oil Pools During 1952" covering the operations in 1952.

We are honored to cooperate fully in the publication of this pamphlet which has been prepared with the cooperation of the Illinois State Geological Survey, and we feel sure that this report, together with the others above mentioned, will be of great interest and most helpful not only to the State of Illinois and the Compact, but also to the other states and the oil and gas industries generally.

The Interstate Oil Compact Commission wishes to express its appreciation, especially to Paul A. Witherspoon, Chairman, and members of the State Secondary Recovery and Pressure Maintenance Study Committee of the State of Illinois, and to all companies, organizations, and individuals who have assisted in gathering the data on this project. It is published in order that the states, the public in general, and the oil and gas industries in particular may have factual information regarding secondary recovery and pressure maintenance operations in the State of Illinois.

EARL FOSTER
Executive Secretary

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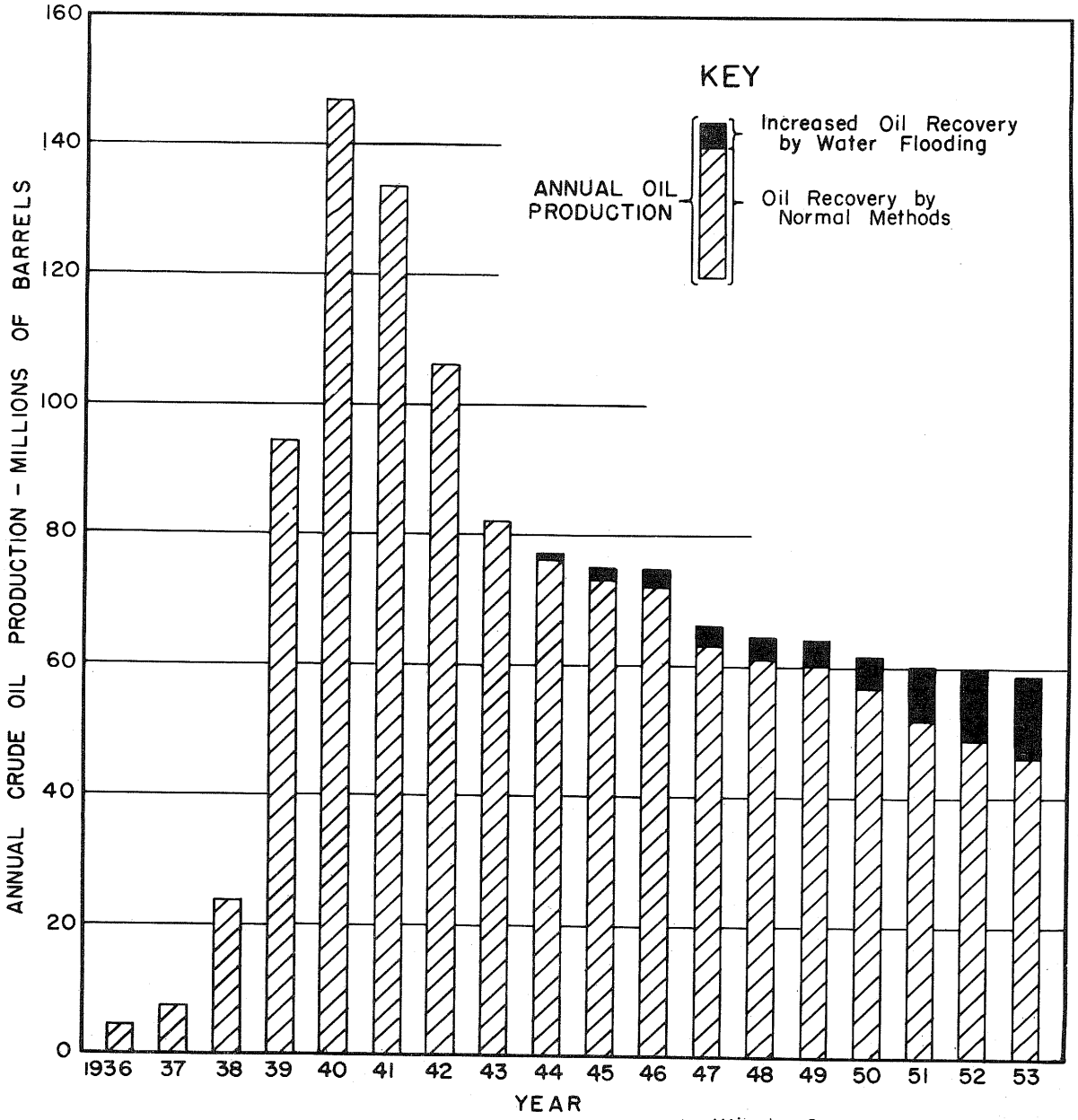

Illinois State Geological Survey

SUMMARY OF WATER FLOOD OPERATIONS IN ILLINOIS OIL POOLS DURING 1953

INTRODUCTION

This report is the result of a joint effort by the Illinois State Geological Survey and the Illinois Secondary Recovery and Pressure Maintenance Study Committee of the Interstate Oil Compact Commission. The following persons were appointed to the Study Committee by Governor William G. Stratton to assist in the compilation of data on the water flood and pressure maintenance projects that were in operation in Illinois during 1953.

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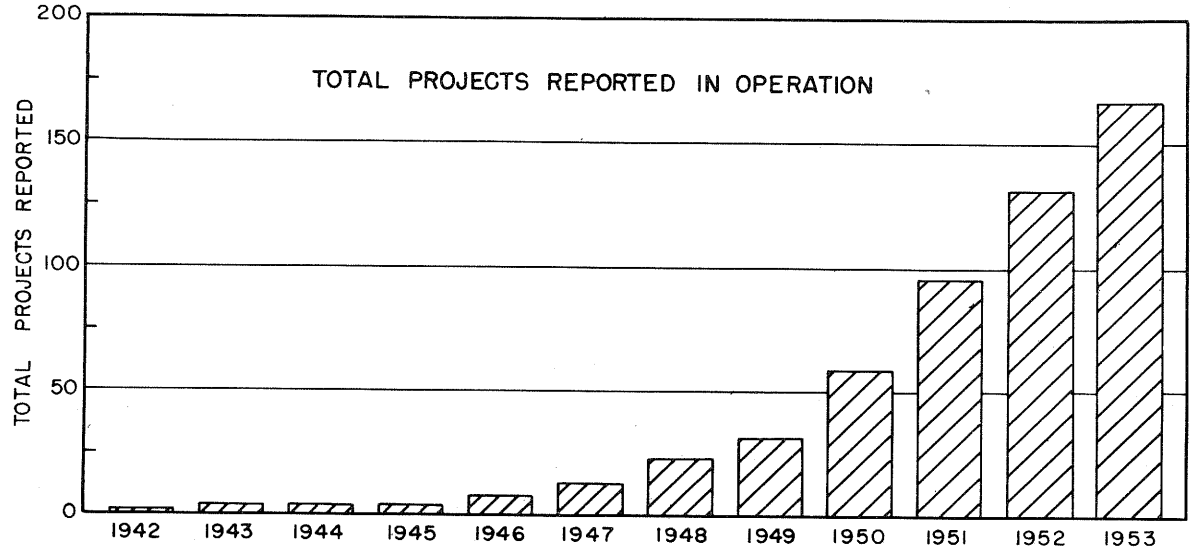
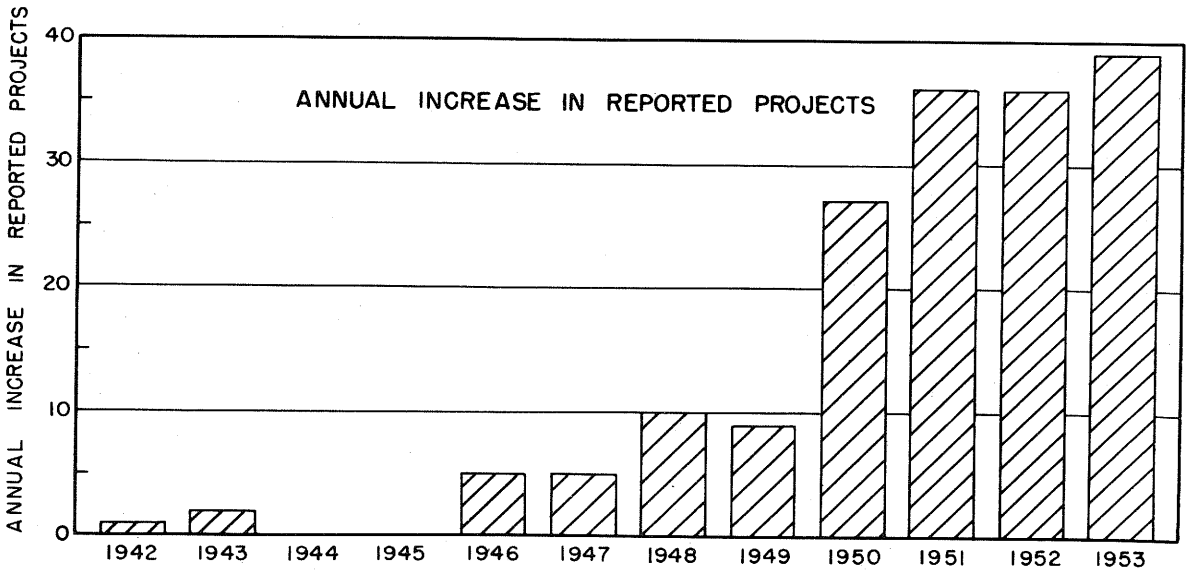
Evansville, Indiana

R. A. Wilson
Tide Water Associated Oil Company
Robinson, Illinois

Figure 2

REPORTED DEVELOPMENT OF WATER FLOOD PROJECTS IN ILLINOIS





Illinois State Geological Survey

As a means to collect information on water injection and pressure maintenance projects in operation during 1953, the Study Committee met in Olney, Illinois, and set up a questionnaire on January 14, 1954. The Geological Survey sent this questionnaire to all water flood operators in Illinois and compiled the data returned.

This report supplements four previous summaries of water flood operations as follows:

(1) "Summary of Water Flooding Operations in Illinois, 1950," which reported operations during 1949. Published by Interstate Oil Compact Commission and reprinted by Illinois State Geological Survey as Circular 165.

(2) "Summary of Water Flooding Operations in Illinois to 1951," which reported operations during 1950. Published by Interstate Oil Compact Commission and reprinted by Illinois State Geological Survey as Circular 176.

(3) "Summary of Water Flooding Operations in Illinois Oil Pools During 1951." Published by Illinois State Geological Survey as Circular 182.

(4) "Summary of Water Flooding Operations in Illinois Oil Pools During 1952." Published by Interstate Oil Compact Commission and reprinted by Illinois State Geological Survey as Circular 185.

SUMMARY OF RESULTS

Water flooding is continuing to play an increasingly important role in oil production in Illinois. This method of secondary recovery produced approximately 12,500,000 barrels of oil during 1953, or 21 per cent of the State's total recovery of 59,025,000 barrels. Of this water flood oil, 10,086,000 barrels are reported in Table I and an additional 2,250,000 barrels are estimated to have been recovered by "dump" flooding. The 1953 water flood recovery is 14 per cent higher than the 1952 recovery of approximately 11,000,000 barrels.

Figure 1 shows the effect of water flood (including "dump" flood) operations on the State's annual oil production since 1936. The cumulative water flood recovery at the end of 1953 was approximately 54,400,000 barrels, which includes 14,600,000 barrels of "dump" flood oil.

Table I presents a summary of the information collected on water flood projects in operation during 1953. The data are arranged alphabetically by fields and include 167 water flood projects. Excluding the "dump" floods, there were approximately 180 water floods in operation in Illinois during 1953. Table I provides data on 93 per cent of these projects, although in terms of cumulative figures, this summary approaches 100 per cent coverage.

Based on the reported data in Table I, a total of 118,409,000 barrels of water was injected during 1953 in recovering 10,086,000 barrels of water flood oil, or a ratio of 11.7 barrels of water for each barrel of oil. A cumulative total of 335,727,000 barrels of water had been injected by the end of 1953 in recovering 39,042,000 barrels of oil, or an overall input water-oil ratio of 8.6.

Figure 2 shows the reported development of water flood projects in Illinois by years since 1942. The rapid increase in the number of projects since 1949 is very evident. As a result, the number of projects has increased by a factor of five in the past four years from 33 projects at the end of 1949 to 167 projects at the end of 1953. As shown in Table I, these 167 projects had developed 37,854 acres for water flooding, or nine per cent of the State's total oil-productive acreage.

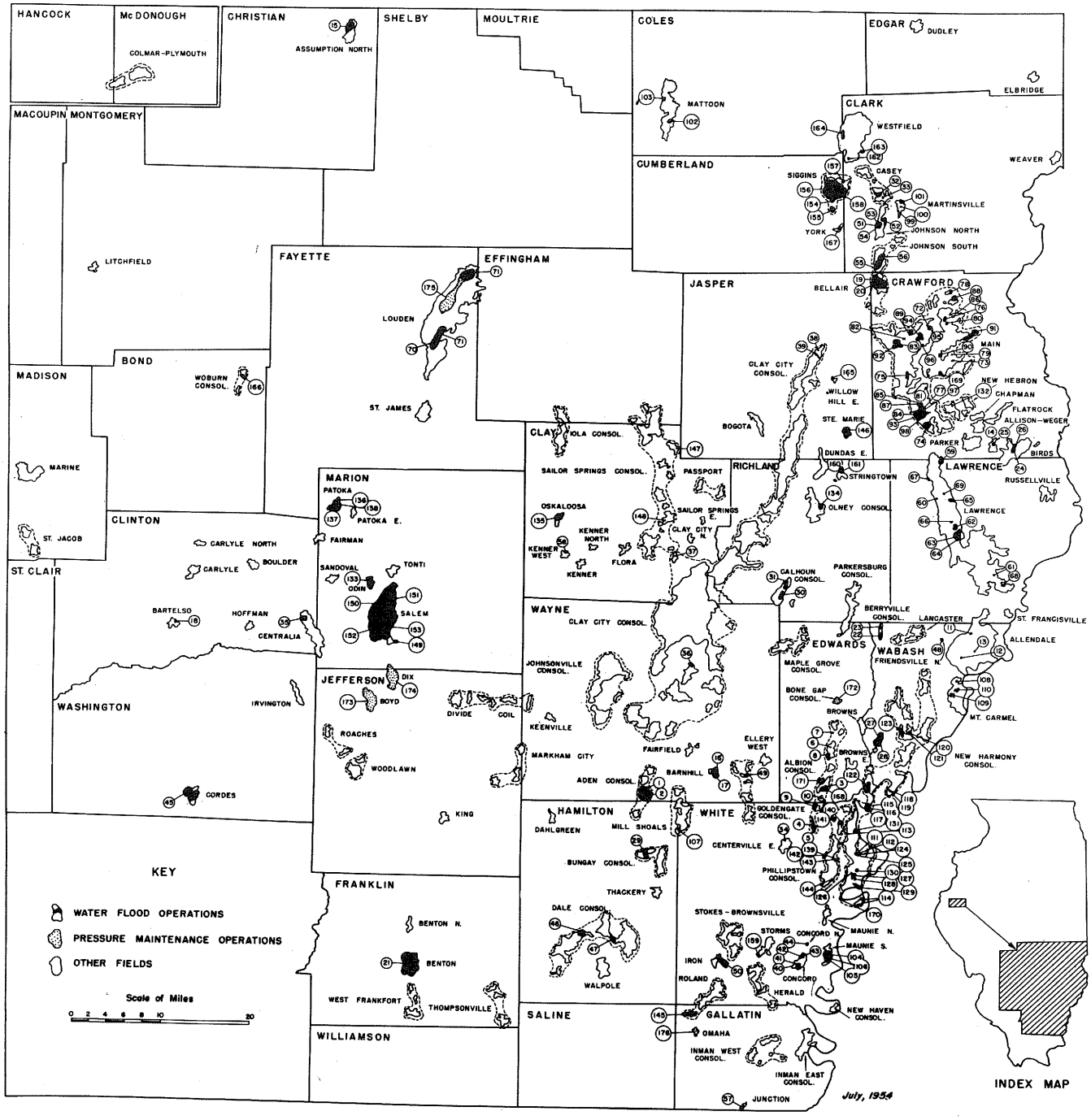
Table II presents data on the water flood projects that have been reported abandoned and Table III includes data on the six pressure maintenance operations that used water injection during 1953. The oil-production statistics in Table III include both primary recovery and any additional oil obtained by pressure maintenance operations.

Figure 3

MAP SHOWING

WATER FLOOD AND PRESSURE MAINTENANCE

OPERATIONS IN ILLINOIS DURING 1953

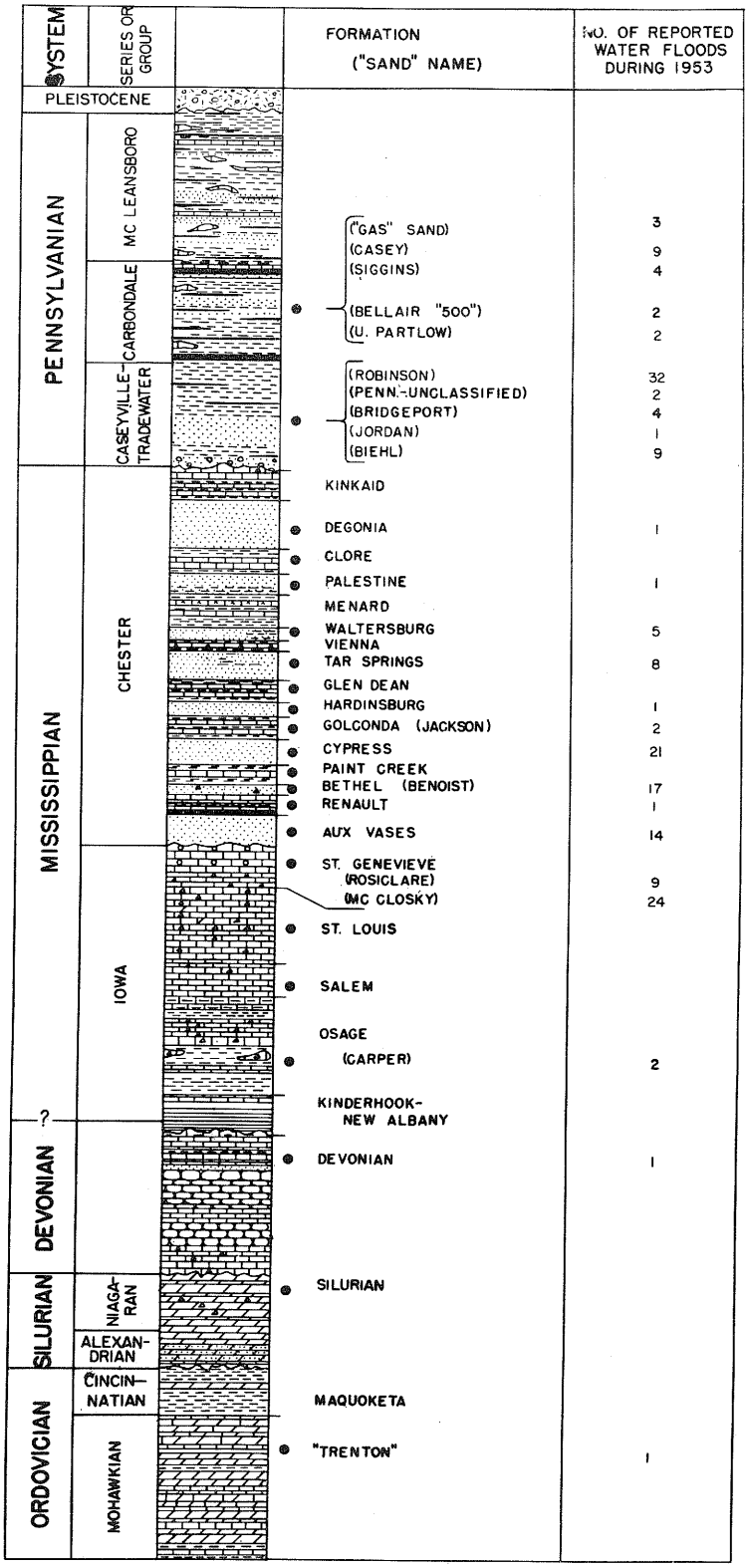


Each project listed in Tables I, II, and III has been numbered and corresponding numbers on Figure 3 show the locations of the water flood and pressure maintenance operations.

A generalized geologic column is given in Figure 4 which indicates the stratigraphic sequence of oil-producing formations in the Illinois basin. Listed opposite these oil-producing formations are the number of reported water floods as taken from Table I. An index map of counties, townships, and ranges in Illinois is shown in Figure 5.

Figure 4.

GENERALIZED GEOLOGIC COLUMN SHOWING FORMATIONS SUBJECTED TO WATER FLOODING IN THE ILLINOIS BASIN



(● OIL PRODUCING FORMATIONS)

Figure 5
INDEX MAP FOR COUNTIES, TOWNSHIPS, AND RANGES

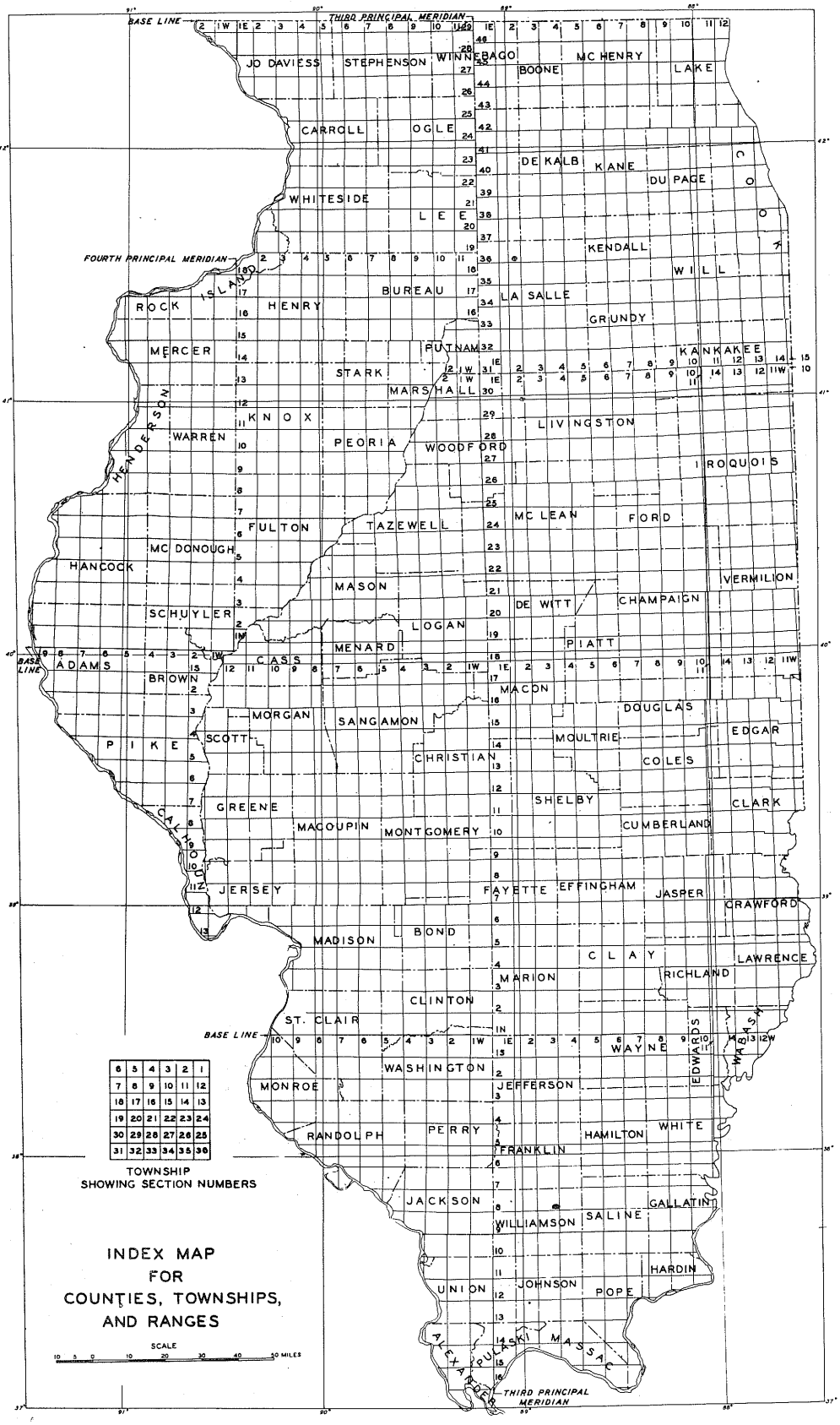


TABLE I

ILLINOIS WATER FLOOD PROJECTS REPORTED OPERATING DURING 1953

	GENERAL INFORMATION				
Map No.	Field	Operator	Project	Formation "Sand"	County
1	Aden Consolidated	Texas	Aden	Aux Vases	Wayne
2	Aden Consolidated	Texas	Aden	McClosky	Wayne
3	Albion Consolidated	Carter	Albion	Lower Bridgeport	Edwards
4	Albion Consolidated	Concho Petroleum	-	Tar Springs	White
5	Albion Consolidated	Concho Petroleum	-	Cypress	White
6	Albion Consolidated	Continental	Stafford	McClosky	Edwards
7	Albion Consolidated	First National Petroleum Trust	Brown Lease	Aux Vases	Edwards
8	Albion Consolidated	Jarvis Brothers & Marcel	-	McClosky	Edwards
9	Albion Consolidated	Yingling	Biehl Unit #1	Biehl	White
10	Albion Consolidated	Yingling	Biehl Unit #2	Biehl	Edwards
11	Allendale	B. Kidd	Allendale	Biehl & Jordan	Wabash
12	Allendale	Indiana Farm Bureau	Woods	Biehl	Wabash
13	Allendale	F. C. Luecking	Mattaliano et al.	Biehl	Wabash
14	Allison-Weger	Skiles	Weger	Robinson	Crawford
15	Assumption, North	Continental	Benoist	Bethel (Benoist)	Christian
16	Barnhill	Ashland	Barnhill	McClosky	Wayne
17	Barnhill	Wayne Development	Walter	McClosky	Wayne
18	Bartelso	T. R. Kerwin	-	Cypress	Clinton
19	Bellair	Forest	Bellair	Bellair "500"	Crawford
20	Bellair	Pure	Fulton	Bellair "500"	Crawford
21	Benton	Shell	Benton Unit	Tar Springs	Franklin
22	Berryville Consolidated	Phillips	Tarpley	McClosky	Wabash
23	Berryville Consolidated	Phillips	Townsend	McClosky	Wabash
24	Birds	Franchot	Highsmith Area*	Robinson	Crawford
25	Birds	Tide Water	Birds Area	Robinson	Crawford
26	Birds	Yingling	Lindsay	Robinson	Crawford
27	Browns East	George & Wrather	Bellmont Water Flood Association	Cypress	Wabash
28	Browns East	Magnolia	Bellmont	Cypress	Wabash
29	Bungay Consolidated	Texas	Blairsville	Aux Vases	Hamilton
30	Calhoun Consolidated	Ashland	Calhoun	McClosky	Richland
31	Calhoun Consolidated	Phillips	Bohlander	McClosky	Richland
32	Casey	Forest	Casey	Casey	Clark
33	Casey	Sapphire American	Shawyer	Casey	Clark
34	Centerville East	Sun	East Centerville	Tar Springs	White
35	Centralia	Sohio	Copple Trenton	Trenton	Clinton
36	Clay City Consolidated	F. & W. Oil Company	Miller Lambrich Unit	O'Hara, Rosiclare, & McClosky	Wayne

PRODUCTION AND INJECTION STATISTICS (Barrels)

Location			Date First	Water Injection		Secondary Recovery Oil Production		Water Production		Map
Section	Township	Range	Injection	Total 1953	Cumulative 12-31-53	Total 1953	Cumulative 12-31-53	Total 1953	Cumulative 12-31-53	No.
8,9,16,17, 20	3S	7E	August, 1946	294,795	1,447,843	79,661	255,263)	) 243,056)	454,151	1
8,9,16,17, 20	3S	7E	August, 1946	431,350	1,564,519	44,475	185,577)	)		2
11,12	3S	10E	December, 1947	54,076	289,216	5,056	55,956	44,617	219,841	3
26,27,34,35	3S	10E	October, 1952	-	28,858*	None	None	-	-	4
26,27,34,35	3S	10E	October, 1952	-	104,322*	None	None	-	-	5
13	2S	10E	May, 1943	155,080	159,789*	2,653	28,492	155,080	159,789*	6
6	2S	11E	April, 1952	-	-	-	-	-	-	7
24	2S	10E	July, 1951	59,589	112,093	None	None	66,992	117,739	8
23	3S	10E	August, 1949	502,157	1,875,559	123,593	488,625	7,200(est.)	-	9
14	3S	10E	December, 1950	292,206	766,958	97,268	233,277	5,400(est.)	-	10
3	1N	12W	September, 1953	33,900	33,900	None	None	None	None	11
20	1N	12W	November, 1953	22,563	22,563	-	-	30,000(est.)	30,000(est.)	12
15	1N	12W	June, 1952	28,800(est.)	45,050(est.)	13,200(est.)	13,200(est.)	14,400(est.)	22,800(est.)	13
18,19	5N	11W	November, 1952	190,720	203,495	155	155	12,000(est.)	16,000(est.)	14
13,24	5N	12W								
3,4,9,10,15, 16,21	13N	1E	July, 1950	549,481	1,968,335	124,586	419,868	121,081	401,639	15
26,34,35	2S	8E	January, 1951	-	-	-	-	-	-	16
26	2S	8E	December, 1950	10,250	133,015*	-	-	36,000(est.)	114,000(est.)	17
4	1N	3W	April, 1952	-	-	-	-	-	-	18
2,11.12	8N	14W	July, 1948	1,325,958	9,973,251	72,103	371,361	-	-	19
1,2,11,12	8N	14W	July, 1948	4,069,760	21,288,201	130,162	650,762	1,940,944	7,068,218	20
23,24,25,26,35,36	6S	2E	November, 1949	10,285,106	40,377,737	1,992,684	6,260,984	5,464,546	10,116,231	21
18,30,31	6S	3E								
2	1N	14W	September, 1952	6,603*	34,688*	None	None	86,412*	102,551*	22
35	2N	14W	February, 1952	31,534*	49,834*	None	None	64,185*	86,354*	23
21	5N	11W	June, 1951	1,009,473	1,718,443	34,018	48,630	91,844	158,614	24
16,20,21	5N	11W	February, 1952	154,549	185,472*	7,258	9,553	68,625	117,745	25
16	5N	11W	August, 1950	650,670	2,217,351	25,288	73,660	7,800	-	26
1,2,11,12	2S	14W	January, 1951	407,108	1,582,995	197,084	645,958*	151,220	213,228	27
2,11	2S	14W	November, 1947	63,500	600,453	56,882	458,532*	40,356	122,019	28
16,17,20,21	4S	7E	June, 1948	293,813	1,050,929	16,001	77,549	13,992	50,595	29
7,18	2N	10E	September, 1951	-	-	-	-	-	-	30
13	2N	9E								
6,7	2N	10E	June, 1950	308,020	715,157	47,892	94,359	184,282	294,501	31
14,15,23	10N	14W	March, 1950	793,619	2,985,253	65,324	222,601	-	-	32
23,24	10N	14W	August, 1953	22,990	22,990	None	None	None	None	33
7	4S	10E	October, 1950	53,682	134,905	14,585	27,748	23,067	35,512	34
35	2N	1W	November, 1951	19,251*	236,134	20,331*	48,276*	8,634	20,779	35
29	1N	8E	August, 1950	250,000*(est.)	500,000*(est.)	-	-	-	-	36

TABLE I (Continued)

DEVELOPMENT AS OF 12-31-53							INJECTION WATER			
Map No.	Number of Wells Injection	Number of Wells Producers	Injection Pattern	Spacing Acres Per Input Well	Productive Acreage Subjected To Injection	Productive Acreage Total	Source	Type	Avg. Bbls. Per Day Per Well Per Foot	Average Wellhead Pressure PSI
1	6	20	Perimeter	-	640	1,050	Pennsylvanian sand	Brine	13.5	1,439
2	6	20	Perimeter	-	520	920	Pennsylvanian sand	Brine	54.7	1,439
3	1	5	Flank	-	60	60	Produced	Brine	11.4	200
4	4	-	Perimeter	-	-	-	Little Wabash River	Fresh	-	-
5	8	21	Perimeter	-	250	300	Little Wabash River	Fresh	-	-
6	1	7	-	-	80	80	Produced	Brine	106.2	0
7	1	1	Spot	-	30	50	Hardinsburg	Brine	-	-
8	1	6	-	-	140	140	-	Brine	5.4	0
9	3	13	Flank	-	220	220	Pennsylvanian sand	Brine	30.0	638
10	1	6	Flank	-	90	90	Pennsylvanian sand	Brine	36.4	754
11	1	4	5 spot	-	60	60	Shallow sand	Fresh	6.2	0
12	5	7	-	10	147	147	Produced	Brine	8.8	175
13	1	2	-	-	44	44	Shallow sand	Fresh	5.3	0
14	9	11	5 spot	10	90	110	Creek and produced	Fresh and brine	2.9	500
15	13	27	Perimeter	-	440	440	Shallow sand and produced	Brine	9.1	869
16	7	22	-	-	320	-	Cypress	Brine	-	-
17	1	2	-	10	40	40	Cypress	Brine	1.6	-
18	2	5	5 spot	5	10	350	Tar Springs	Brine	-	-
19	56	51	5 spot	4.4	200	-	Gravel bed	Fresh	1.7	244
20	131	125	5 spot	4.4	443	443	Gravel bed	Fresh	4.1	265
21	107	119	5 spot	20	2,200	2,200	Lake and produced	Fresh and brine	7.5	467
22	1	2	-	-	14	30	Produced and Tar Springs	Brine	-	0
23	1	2	-	-	27	30	Produced and Tar Springs	Brine	17.2	0
24	29	19	5 spot	10	200	2,100	Tar Springs	Brine	4.0	300
25	11	32	5 spot	10	113	277	Tar Springs	Brine	2.1	284
26	23	24	5 spot	4.4	160	360	1,300 ft. sand	Brine	2.5	430
27	15	18	5 spot	20	290	330	Shallow sand	Fresh	5.7	1,300
28	3	11	Line Drive	10	184	184	Tar Springs	Brine	-	1,350
29	4	19	-	-	640	640	Pennsylvanian sand	Brine	13.0	1,034
30	3	7	Flank	-	195	-	Cypress	Brine	-	-
31	3	10	Irregular	-	160	280	Upper sand and Produced	Brine	28.1	1,090
32	62	39	5 spot	4.4	240	-	Gravel bed	Fresh	3.5	220
33	9	4	5 spot	4.4	13	215	Shallow sand	Fresh	0.8	188
34	1	5	Flank	-	80	-	Gravel bed	Fresh	24.5	1,291
35	0*	12	-	20	160	200	Devonian	Brine	-	-
36	4	11	Irregular	10	120	180	Cypress and Produced	Brine	-	-

RESERVOIR STATISTICS (Average Value)						REMARKS	
Depth Feet	Net Pay Thickness Feet	Porosity Per Cent	Permeability Millidarcys	Oil Gravity API	Oil Viscosity Centipoises		Map No.
3,200	10	22	150	35.4	-		1
3,350	3.6	-	-	35.4	6.5 @ 100° F.		2
1,900	13	20	305	35	6.0 @ 100° F.		3
2,460	6	18	-	37	-	* As of 1-1-53.	4
2,850	12	18	-	37	-	* As of 1-1-53.	5
3,222	4	16.3	898	39	-	* Since 1-1-52.	6
3,005	21	-	-	-	-		7
3,150	30	-	-	37	-		8
2,000	17	20.2	265	37.6	5.3@ 88° F.	Original BHP 800 psi	9
1,950	22	19.3	303	35.8	6.0@ 84° F.		10
1,490	45	18	600	37	7.6@ 79° F.		11
1,520	15	-	-	28.4	8 to 9		12
1,385	15	-	-	34.5	-		13
900	20	17	37	-	-		14
1,050	12.7	19.4	102.5	39.8	-		15
3,350	9	-	-	39	-		16
3,450	18	-	-	-	-	* Corrected Figure	17
971	15	22.2	1,655	37	-		18
550	38	17.1	148	32.4	16 @ 77° F.	Previously Subjected to Gas Injection.	19
560	21	18.6	149	32	18.7 @ 77° F.		20
2,100	35	19	65	40.4	3.5 @ 86° F.		21
2,890	10	-	-	-	-	* Injection stopped February 1953. Property sold to S. W. Brown, effective 7-1-53.	22
2,890	10	-	-	-	-	* As of 7-1-53. Property sold to S. W. Brown, effective 7-1-53	23
950	24	18.9	162	31.7	21	* Includes 5 separate leases.	24
950	18	19.4	197	30.1	-	* Corrected Figure. Subjected to gas injection, 1946 to 1952.	25
960	31	19.1	135	31.6	17 @ 80° F.		26
2,570	13	-	-	-	-	* Includes primary production since start of flood.	27
2,570	-	-	-	36	4.6 @ 90° F.	* Includes primary production since start of flood.	28
3,330	15.5	19.6	92	35 to 40	1.8 @ 99° F.		29
3,150	6	-	-	37	-		30
3,130	10	11.2	67.5	36	-		31
450	10	17.4	173	31.9	16.6 @ 70° F.	Previously subjected to gas injection.	32
450	21.5	22.4	108	31.8	13.6 @ 65° F.		33
2,530	6	-	-	36.6	-		34
3,950	22	10	-	39.8	2.7	* Temporarily abandoned as of 3-31-53. Oil production includes primary since start of flood.	35
3,060	5	-	-	-	-	* Dump flood.	36

TABLE I (Continued)

Map No.	Field	Operator	Project	GENERAL INFORMATION Formation "Sand"	County
37	Clay City Consolidated	Phillips	Minnie	Rosiclare	Clay
38	Clay City Consolidated	Robinson & Puckett	N. E. McClosky Unit #1	McClosky	Jasper
39	Clay City Consolidated	Robinson & Puckett	S. W. McClosky Unit #2	McClosky	Jasper
40	Concord	Great Lakes Carbon	McClosky	Rosiclare & McClosky	White
41	Concord	Phillips	Dallas	Rosiclare & McClosky	White
42	Concord	Phillips	Kerwin	Rosiclare & McClosky	White
43	Concord	Phillips	Tuley	McClosky	White
44	Concord North	C. E. Brehm	Concord North	Aux Vases	White
45	Cordes	Shell	Cordes Cooperative*	Bethel (Benoist)	Washington
46	Dale Consolidated	Inland	North Rural Hill Unit	Aux Vases	Hamilton
47	Dale Consolidated	Texas	West Dale Unit	Aux Vases	Hamilton
48	Friendsville, North	Magnolia	J. L. Litherland	Biehl	Wabash
49	Golden Gate Consolidated	Cities Service	Golden Gate Water Flood Unit	McClosky	Wayne
50	Iron	Shell	Iron Unit	Hardinsburg	White
51	Johnson, North	McMahon	Block A	Casey	Clark
52	Johnson, North	McMahon	Block B	Casey	Clark
53	Johnson, North	H. V. Sherrill	V. Jones	Casey	Clark
54	Johnson, North	Tide Water	Clark County #1	Casey	Clark
55	Johnson, South	Forest	South Johnson	Upper Partlow	Clark
56	Johnson, South	Pure	Weaver-Bennett	Upper Partlow	Clark
57	Junction	J. A. Lewis Engineering	-	Waltersburg	Gallatin
58	Kenner, West	Phillips	West Kenner Unit	Cypress	Clay
59	Lawrence	George & Wrather	Klondike	Bethel (Benoist)	Lawrence
60	Lawrence	W. W. Holden	Gray	Jackson & Bethel (Benoist)	Lawrence
61	Lawrence	National Cylinder & Gas	Snyder	Cypress	Lawrence
62,63, 64	Lawrence	Ohio	3 Projects	Bridgeport	Lawrence
65, 66	Lawrence	Ohio	2 Projects	Cypress (Kirkwood)	Lawrence
67	Lawrence	Sapphire American	Piper	Cypress	Lawrence
68	Lawrence	Sapphire American	Waller	Cypress	Lawrence
69	Lawrence	H. V. Sherrill	Applegate	Jackson & Cypress	Lawrence
70	Louden	D. L. Burtschi	-	Cypress (Stein)	Fayette
71	Louden	Carter	Louden	Chester	Fayette
72	Main	Arkansas Fuel	North Morris	Robinson	Crawford
73	Main	E. Constantin	J. S. Kirk	Robinson	Crawford
74	Main	E. Constantin	Sanders	Robinson	Crawford
75	Main	E. Constantin	Short	Robinson	Crawford
76	Main	E. Constantin	Wood	Robinson	Crawford

PRODUCTION AND INJECTION STATISTICS (Barrels)

Location			Date First Injection	Water Injection		Secondary Recovery Oil Production		Water Production		Map No.
Section	Township	Range		Total 1953	Cumulative 12-31-53	Total 1953	Cumulative 12-31-53	Total 1953	Cumulative 12-31-53	
24	3N	7E	July, 1953*	22,260*	22,260*	11,202	61,719	88,269	305,457	37
13,14,24	7N	10E	May, 1953	130,761	130,761	14,584	14,584	5,050	5,050	38
23,26	7N	10E	April, 1953	317,132	317,132	5,639	5,639	17,820	17,820	39
28	6S	10E	June, 1953	87,406	87,406	None	None	1,497	1,497	40
28	6S	10E	August, 1953	45,806	45,806	None	None	None	None	41
21	6S	10E	February, 1953	279,135	279,135	858	858	14,182	14,182	42
21	6S	10E	July, 1951	316,835	728,263	9,604	44,451	313,412	557,718	43
10	6S	10E	December, 1952	55,324	55,342	None	None	None	None	44
14,15,22,23	3S	3W	August, 1950	1,244,892	4,557,193	403,761	1,528,710	886,628	2,216,682	45
5,6,7,8	6S	6E	February, 1952	790,718	1,013,238	85,279	85,279*	13,401	13,401*	46
11	6S	6E	July, 1951	403,198	924,398	32,096	40,659	90,033	103,466	47
1,12	1N	13W	July, 1947	84,444	383,630	9,106	131,015*	40,698	132,992	48
28,32,33	2S	9E	October, 1953	29,354	29,354	None	None	-	-	49
23,24,25	6S	8E	December, 1950	954,485	3,365,232	309,061	470,366	177,616	260,082	50
2	9N	14W	April, 1949	852,695	4,269,928	26,515	213,000	669,108	2,055,722	51
35,36	10N	14W	May, 1951	219,215	538,190	19,582	21,406	63,005	67,215	52
1,3	9N	14W	September, 1951	36,364	71,652	810	1,135	2,260	2,260	53
2	9N	14W	February, 1950	284,350	873,700	13,116	45,484	162,390	406,902	54
27,34,35	9N	14W	March, 1949	3,407,157	11,900,313	82,454	400,664	-	-	55
27	9N	14W	January, 1953	1,546,424	1,546,424	81,970	81,970	176,349	176,349	56
16,17,20,21	9S	9E	May, 1951	168,461	378,461(est.)	24,025	31,725	-	-	57
23	3N	5E	February, 1952	733,344	1,033,200	2,330	2,330	533,910	1,026,800	58
25	5N	13W	June, 1952	460,356	640,666	58,144	63,121	-	-	59
13	4N	13W	May, 1953	83,801	83,801	456*	456*	350*	350*	60
30	3N	11W	October, 1952	5,840*(est.)	9,956*(est.)	301*	425*	32,850(est.)	32,850(est.)	61
-	-	-	August, 1948	5,133,297	14,893,556	1,054,522	2,310,748	1,970,459	3,596,152	62,63, 64
-	-	-	January, 1952	800,463	1,177,451	110,655	128,866	66,688	70,498	65,66
2,11	4N	13W	December, 1953	6,177	6,177	-	-	-	-	67
5,6	2N	11W	March, 1953	410,047	410,047	4,925*	4,925*	144,000(est.)	144,000(est.)	68
7	4N	12W	September, 1952	81,109	125,231	1,897	2,237	2,000(est.)	2,000(est.)	69
18	7N	3E	October, 1953	23,167	23,167	None	None	None	None	70
-	7N 8N	3E	October, 1950	9,570,435	12,660,323	702,569	1,170,048	232,740	-	71
2	7N	13W	April, 1951	179,151	384,544	9,633	21,054	53,490	271,843	72
29,30,31,32	7N	12W	August, 1951	8,154*	48,520	2,320	3,920	-	-	73
1,2,3, 26,34,35,36	5N 6N	13W 13W	August, 1952	821,775	909,123	12,630	12,630	-	-	74
5,6,31,32	6N 7N	13W 13W	February, 1952	523,497	838,754	24,247	24,247	-	-	75
31,32	8N	12W	August, 1952	498,516	687,444	7,460	7,460	-	-	76

TABLE I (Continued)

DEVELOPMENT AS OF 12-31-53							INJECTION WATER			
Map No.	Number of Wells Injection	Number of Wells Producers	Injection Pattern.	Spacing Acres Per Input Well	Productive Acreage Subjected To Injection	Productive Acreage Total	Source	Type	Avg. Bbls. Per Day Per Well Per Foot	Average Wellhead Pressure PSI
37	1	1	-	-	10	20	Produced	Brine	4.2	0
38	1	7	Modified Line	-	235	235	Shallow sand and Produced	Fresh and brine	92.1	686
39	5	15	Modified Line	-	415	415	Shallow sand and Produced	Fresh and brine	31.3	243
40	3	8	Modified Periphery	-	140	150	Gravel bed	Fresh	6.5	0
41	1	5	-	-	40	60	Shallow sand and Produced	Fresh and brine	10.0	0
42	1	6	-	-	40	100	Shallow sand and Produced	Fresh and brine	29.4	0
43	1	5	Irregular	-	65	120	Upper sand and Produced	Brine	28.9	0
44	1	3	Irregular	-	40	40	Gravel bed	Fresh	12.6	446
45	36	68	5 spot	20	640	640	Pottsville	Brine	6.8	344
46	11	15	5 spot	20	310	325	Cypress	Brine	13.4	142
47	3	14	-	-	295	295	Shallow sand and Produced	Fresh and brine	26.3	398
48	2	3	5 spot	10	12	50	Shallow sand	Fresh	-	1,000
49	1	15	-	-	51.5	340	Pennsylvanian sand	Brine	46.4	None
50	20	22	5 spot	20	390	430	Tar Springs	Brine	5.2	465
51	32	26	5 spot	4.4	125	-	Shallow sand and Produced	Fresh and brine	-	350
52	29	12	5 spot	4.4	80	-	Shallow sand and Produced	Fresh and brine	0.9	350
53	3	2	5 spot	4.4	15	65	Shallow sand	Fresh	1.7	120
54	15	20	5 spot	4.4	80	102	Shallow sand and Produced	Fresh and brine	3.1	295
55	67	59	5 spot	4.4	360	-	Produced	Brine	2.9	229
56	38	34	5 spot	4.4	114	151	Gravel beds	Fresh	3.1	200
57	5	9	Modified 5 spot	-	50	-	Gravel bed	Fresh	6.6	780
58	4	23	Edge	10	35	300	Produced	Brine	19.3	483
59	10	14	5 spot	13.5	195	300	Shallow sand	Fresh	7.0	711
60	4	2	5 spot	10	10	120	Pennsylvanian sand	Brine	3.8	208
61	1	2	-	2.5	10	230	Tar Springs	Brine	0.6	80
62,63, 64	98	174	-	-	901	-	-	2 Fresh 1 Brine	-	-
65,66	24	43	-	-	263	-	-	Fresh	-	-
67	4	2	5 spot	10	10	380	Shallow sand	Brine	2.0	357
68	8	8	5 spot	10	35	625	Shallow Gravel bed	Fresh	3.4	235
69	4	1	5 spot	10	10	225	Gravel bed	Fresh	2.4	315
70	1	3	-	10	20	-	*	Brine	8.4	400
71	117	-	5 spot	20	3,119	16,000	Tar Springs	Brine	7.5	255
72	5	7	Modified 5 spot	4.4	44	100	Buchanan	Brine	8.2	432
73	14	31	5 spot	10	80	540	City water	Fresh	-	-
74	53	85	5 spot	10	460	1,640	Lower Pennsylvanian	Brine	2.1	-
75	28	34	5 spot	10	160	533	300-foot sand	Brine	1.7	-
76	26	18	5 spot	10	150	425	Lower Pennsylvanian	Brine	1.8	-

RESERVOIR STATISTICS (Average Value)						REMARKS	
Depth Feet	Net Pay Thickness Feet	Porosity Per Cent	Permeability Millidarcys	Oil Gravity API	Oil Viscosity Centipoises		Map No.
2,990	30	-	-	-	-	* Previously affected by dump flood, surface injection began 7-9-53	37
2,530	6.2	14	-	39.8	2.9 @ 92° F.		38
2,580	8.2	14	-	39.8	2.9 @ 92° F.		39
2,980	22	-	-	37.5	-		40
2,960	30	-	-	-	-		41
2,960	30	-	-	-	-		42
2,960	30	-	-	-	-		43
2,950	12	21.1	218	35.1	5 @ 103° F.		44
1,230	14	20	250	37	-	* Cooperative: Shell, Magnolia, McBride, Horton.	45
3,125	14.7	23.9	-	-	-	* Total production since 1-1-53.	46
3,050	14	17	125	38.0	-	Previously subjected to gas injection	47
1,620	-	-	-	35.6	7.5 @ 86° F.	* Includes primary production since start of flood	48
3,308	8	-	-	34	-		49
2,500	25	17.6	152	38.5	-		50
450	10 to 30	20.8	399	33.9	19	Previously subjected to gas injection.	51
480	22	18.3	66	33	10 @ 70° F.	Previously subjected to gas injection.	52
440	19	19.8	252	35.4	17 @ 67° F.		53
425	17	20.6	415	33.9	10.7 @ 70° F.	Subjected to gas injection 1946-1947.	54
490	48	16.6	319	29.2	14.7 @ 77° F.	Previously subjected to gas injection.	55
467	35.5	18.6	285	29.7	25.5 @ 65° F.		56
1,750	14	-	-	34.7	6.7 @ 81° F.		57
2,600	26	18	125	-	-		58
1,625	18	17.2	80	37.8	5.2 @ 80° F.		59
1,428	8	18.4	95	-	5 @ 85° F.	* Includes primary production since 1-1-53.	60
1,611	14.5	14.6	13				
1,580	25	21.2	125	38.6	4.1 @ 85° F.	* Dump flood. Includes primary production since start of flood.	61
-	-	-	-	-	-	Previously subjected to gas injection.	62,63
							64
-	-	-	-	-	-		65,66
1,520	25	20.8	33	38.6	3.5 @ 86° F.		67
1,535	50	18.5	70	-	5 @ 85° F.	* Includes primary production since 1-1-53.	68
1,320	22.7	20.1	62	34.7	4.3 @ 81° F.	Pilot flood.	69
1,492	30	-	-	-	-	* Water supplied by Carter-previously subjected to gas injection.	70
1,500	30	20	105	38	2.6 @ 79° F.	Previously subjected to gas injection	71
983	12	21	243	32	73 @ 65° F.	Pilot flood. Previously subjected to gas injection	72
900	50	17.0	170	34	-	* Injection stopped June through December 1953.	73
880	20	21	205	32	-		74
850	30	22	130	32	-	Previously subjected to gas injection	75
850	30	21	105	32	-	Previously subjected to gas injection	76

TABLE I (Continued)

Map No.	Field	Operator	Project	Formation "Sand"	County
				GENERAL INFORMATION	
77	Main	Kewanee	Wright	Robinson	Crawford
78	Main	A. J. Leverton	Stanfield	Robinson	Crawford
79	Main	Logan Oil	Alexander-Reynolds	Robinson	Crawford
80	Main	National Cylinder & Gas	Culver	Robinson	Crawford
81	Main	National Cylinder & Gas	Meserve	Robinson	Crawford
82,83, 84,85	Main	Ohio	4 Projects	Robinson	Crawford
86	Main	Petroleum Producing Company	-	Robinson	Crawford
87	Main	W. L. Pickens	Hughes-Robinson	Robinson	Crawford
88	Main	Sapphire American	Bishop	Robinson	Crawford
89	Main	Sapphire American	Grogan	Robinson	Crawford
90	Main	Sapphire American	Mitchell	Robinson	Crawford
91	Main	Skiles	Correll-Gurley	Robinson #4	Crawford
92	Main	Tide Water	Clarke-Hulse	Robinson	Crawford
93	Main	Tide Water	Dennis-Hardin	Robinson	Crawford
94	Main	Tide Water	Henry-Ikemire	Robinson	Crawford
95	Main	Tide Water	W. A. Howard	Robinson	Crawford
96	Main	Tide Water	Stifle-Drake	Robinson	Crawford
97	Main	Tide Water	G. L. Thompson	Robinson	Crawford
98	Main	Wilson	Hughes-Walker	Robinson	Crawford
99	Martinsville	J. B. Buchman	-	Carper	Clark
100	Martinsville	Magnolia	Carper	Carper	Clark
101	Martinsville	Magnolia	Casey	Casey	Clark
102	Mattoon	Carter	Mattoon	Cypress & Rosiclare	Coles
103	Mattoon	Phillips	Mattoon	Rosiclare	Coles
104	Maunie South	Magnolia	Palestine Sand Unit	Palestine	White
105	Maunie South	Magnolia	Tar Springs Unit	Tar Springs	White
106	Maunie South	Magnolia	Tar Springs Unit #2	Tar Springs	White
107	Mill Shoals	Sohio	B. R. Gray, Trustee	Aux Vases	Hamilton
108	Mt. Carmel	G. S. Engle	G. Dunkel	Biehl	Wabash
109	Mt. Carmel	First National Petroleum Trust	Shaw Courter	Biehl	Wabash
110	Mt. Carmel	Texas	Stein	Tar Springs	Wabash
111	New Harmony Consolidated	Calstar	Ford B*	Bethel	White
112	New Harmony Consolidated	Calstar	Ford B*	Aux Vases	White
113	New Harmony Consolidated	Herdon & Ashland	Calvin	Aux Vases	White
114	New Harmony Consolidated	Inland	Bowmen's Bend Unit	Tar Springs	White
115	New Harmony Consolidated	Luboil	Helm	Waltersburg	Wabash

PRODUCTION AND INJECTION STATISTICS (Barrels)

Location			Date First	Water Injection		Secondary Recovery Oil Production		Water Production		Map
Section	Township	Range	Injection	Total 1953	Cumulative 12-31-53	Total 1953	Cumulative 12-31-53	Total 1953	Cumulative 12-31-53	No.
23,26	6N	13W	January, 1953	251,332	251,332	None	None	40,605	40,605	77
17	8N	12W	June, 1952	22,400(est.)	46,800(est.)	430(est.)	430(est.)	5,300(est.)	5,300(est.)	78
20	7N	12W	December, 1951	153,279	292,833	14,769	17,284	18,150(est.)	20,250(est.)	79
5,6,7	7N	12W	February, 1953	179,109	179,109	747*	747*	7,920(est.)	7,920(est.)	80
11	6N	13W	November, 1953	26,551	26,551	144*	144*	300(est.)	300(est.)	81
-	-	-	May, 1948	6,770,170	19,189,723	696,704	1,669,800	2,541,075	5,540,626	82,83, 84,85
29,32	8N	12W	September, 1951	-	-	-	-	-	-	86
22,27,28	6N	13W	June, 1951	338,618	454,790	26,110	26,110	11,500	11,500	87
20	8N	12W	November, 1953	10,972	10,972	None	None	5,400(est.)	5,400(est.)	88
4,9	7N	13W	October, 1953	51,717	51,717	153*	153*	12,000(est.)	12,000(est.)	89
24,25	7N	13W	June, 1953	58,201	58,201	2,569*	2,569*	7,200(est.)	7,200(est.)	90
10	7N	12W	July, 1951	482,380	639,710	12,106	14,661	72,000(est.)	73,060(est.)	91
18	7N	13W	January, 1952	98,917	198,342	15,388	24,359	43,595	58,967	92
27,34	6N	13W	August, 1950	452,006	1,091,089	78,242	113,715	219,000	361,480	93
10,15	7N	13W	February, 1948	334,660	1,791,101	49,646	262,017	216,480	694,441	94
11	7N	13W	December, 1952	101,257	106,042	6,884	7,318	36,560	39,040	95
10	7N	13W	June, 1952	166,315	283,743	None	None	34,310	54,426	96
26,27	6N	13W	September, 1952	105,912	138,687	1,396	1,396	2,566	2,932	97
26	6N	13W	August, 1950	-	-	14,831*	26,197*	16,490	16,490	98
31	10N	13W	October, 1952	236,506	282,697	None	None	3,600	4,800	99
30	10N	13W	January, 1951	364,594	953,651	2,818	7,708*	1,696	6,498	100
19	10N	13W	August, 1950	34,274	872,185	406	2,246*	7,746	30,168	101
35	12N	7E	May, 1952	290,593	431,295	36,478	36,478	37,841	38,631	102
22	12N	7E	November, 1950	96,683	129,222	859	859	32,032	32,032	103
13,24	6S	10E	February, 1953	736,250	736,250	67,374*	67,374*	11,488	11,488	104
24	6S	10E	August, 1947	850,199	3,343,524	40,780	764,733*	327,155	1,251,649	105
19	6S	11E								
24	6S	10E	November, 1949	281,207	597,207	1,867	60,987*	82,498	198,995	106
19	6S	11E								
1	4S	7E	May, 1952	249,249	347,343	32,495*	32,495*	13,255	25,255	107
5	1S	12W	June, 1952	52,805	75,610	5,507	11,747*	-	-	108
7	1S	12W	February, 1950	-	-	-	-	-	-	109
5,8	1S	12W	February, 1952	129,502	243,335	14,484	16,106	17,130	18,460	110
21	4S	14W	March, 1953	49,798	49,798	None	None	None	None	111
21	4S	14W	March, 1953	54,878	54,878	None	None	None	None	112
8	4S	14W	November, 1952	815,917	824,417	21,349	21,349	-	-	113
15,16,21,22	5S	14W	December, 1953	7,523	7,523	None	None	-	-	114
22	3S	14W	December, 1950	-	-	-	-	-	-	115

TABLE I (Continued)

DEVELOPMENT AS OF 12-31-53							INJECTION WATER			
Map No.	Number of Wells Injection	Number of Wells Producers	Injection Pattern	Spacing Acres Per Input Well	Productive Acreage Subjected To Injection	Productive Acreage Total	Source	Type	Avg. Bbls. Per Day Per Well Per Foot	Average Wellhead Pressure PSI
77	15	34	5 spot	10	113	210	Lake, produced, and Pennsylvania sand	Fresh and brine	3.3	189
78	3	3	5 spot	4.4	20	140	Shallow sand and Produced	Fresh and brine	0.7	275
79	7	20	5 spot	-	20	330	Cypress	Brine	2.7	178
80	8	8	5 spot	10	20	710	Lake	Fresh	1.3	243
81	4	4	5 spot	10	10	525	Pennsylvanian sand	Brine	5.0	36
82,83, 84,85	204	267	-	-	1,165	-		3 Fresh	-	-
86	4	2	5 spot	10	40	700	Shallow sand and Pond	Fresh	-	-
87	15	12	5 spot	10	40	298	Shallow sand	Fresh	2.1	300
88	4	1	5 spot	10	10	350	Pennsylvanian sand	Brine	2.0	79
89	8	3	5 spot	10	25	400	Pennsylvanian sand	Brine	3.1	64
90	6	15	5 spot	10	20	195	Pennsylvanian sand	Brine	2.1	137
91	18	17	5 spot	10	180	-	Creek and Pennsylvanian sand	Fresh and brine	3.7	533
92	12	19	5 spot	7	59	98	Gravel bed	Fresh	1.1	257
93	10	21	5 spot	10	89	93.5	Gravel bed	Fresh	3.6	311
94	24	44	5 spot	4.4	100	115	Gravel bed and Pennsylvanian sand	Fresh and brine	2.7	446
95	4	8	5 spot	10	30	90	Gravel bed and Pennsylvanian sand	Fresh and brine	5.3	218
96	6	10	5 spot	10	52	160	Pennsylvanian sand	Brine	5.1	307
97	4	6	5 spot	10	40	40	Gravel bed	Fresh	3.5	235
98	8*	7	-	-	30*	40	Gravel bed	Fresh	-	-
99	2	6	5 spot	20	40	40	Shallow sand	Fresh	8.1	375
100	4	1	5 spot	10	10	50	Gravel bed	Fresh	-	650
101	8	3	5 spot	10	23	110	Gravel bed	Fresh	-	-
102	4	8	5 spot	20	70	120	Pennsylvanian sand	Brine	15.3	180
103	2	5	Irregular	-	30	60	Produced	Brine	13.2	0
104	21	22	5 spot	20	237	430	Gravel bed	Fresh	-	1,000
105	12	12	5 spot	20	230	240	Gravel bed	Fresh	-	900
106	3	2	5 spot	20	50	50	Gravel bed	Fresh	-	900
107	7	6	5 spot	20	170	170	Gravel bed	Fresh	8.9	-
108	1	3	Modified	28.9	87	68	Shallow sand	Fresh	21.6	650
109	1	2	Spot	-	30	30	Shallow sand and Produced	Fresh and brine	-	-
110	2	8	-	-	50	73	Shallow Sand and Produced	Fresh and brine	15.3	897
111	1*	3	-	-	20*	35	Gravel Bed	Fresh	13.7	183
112	1*	4	-	-	20*	80	Gravel bed	Fresh	4.5	865
113	4	9	5 spot	10	100	100	-	Fresh	18.6	104
114	2	19	Peripheral	-	200	200	Gravel bed	Fresh	6.2	0
115	3	4	Irregular	3.3	10	15	Shallow Sand	Fresh	-	-

RESERVOIR STATISTICS (Average Value)						REMARKS	
Depth Feet	Net Pay Thickness Feet	Porosity Per Cent	Permeability Millidarcys	Oil Gravity API	Oil Viscosity Centipoises		Map No.
900	15	20	245	-	-	Previously subjected to gas injection	77
977	30	23	57	36	-		78
940	22	20.5	167	36	7 @ 80° F.		79
950	50	22.7	101	-	10 @ 78° F.	* Includes primary production since 1-1-53.	80
950	22.7	21.9	89	-	10 @ 79° F.	* Includes primary production since 1-1-53.	81
-	-	-	-	-	-	Previously subjected to gas injection.	82, 83 84, 85
1,000	15	20	75	-	-		86
850	30	19.5	125	32	10 @ 80° F.		87
950	22.4	22.1	156	-	10 @ 78° F.		88
950	22.4	22.1	156	-	10 @ 78° F.	* Includes primary production since 1-1-53.	89
880	22.0	23.8	94	-	10 @ 78° F.	* Includes primary production since 1-1-53.	90
1,035	20	22.2	100	33	13.5 @ Reservoir temperature	Previously subjected to gas injection.	91
910	20	19.9	278	34	-	Subjected to gas injection since 1941.	92
875	34	19.8	178	32.7	-	Subjected to gas injection 1932 to 1950.	93
935	14	21	175	35	7 @ 60° F.	Subjected to gas injection 1934 to 1948.	94
950	13	19.6	184	35.3	-	Subjected to gas injection 1935 to 1953.	95
980	15	18.2	221	33.5	-	Subjected to gas injection since 1934.	96
860	21	19.8	108	33	-		97
880	25	19	83	32	-	* Due to Ohio line input wells. Previously subjected to gas injection.	98
1,346	40	16	11	34	-		99
1,334	-	-	-	-	-	*Pilot Flood. Includes primary production since start of flood.	100
464	-	-	-	-	-	*Includes primary production since start of flood. Project temporarily shut down.	101
1,750 & 1,950	13	16	84	39	1.7 @ 85° F.		102
1,952	10	15	990	37	-		103
2,010	-	-	-	-	-	*Includes primary production since start of flood.	104
2,270	-	-	-	37.3	4.6 @ 89° F.	*Includes primary production since start of flood.	105
2,275	-	-	-	-	-	* Includes primary production since start of flood.	106
3,245	11	21	-	-	-	* Includes primary production since 1-1-53.	107
1,500	6.7	15.3	310	36.6	3.9 @ 104° F.	* Includes primary production since start of flood.	108
1,375	16	-	-	40.2	4.7 @ 70° F.		109
2,040	11.6	18.9	221	36	4.0		110
2,695	12	-	-	32.5	-	* Cooperative pilot flood with Sun	111
2,850	40	-	-	32.5	-	* Cooperative pilot flood with Sun	112
2,800	30	14	10	41	-		113
2,260	19.5	17.9	120	35.5	-		114
2,115	25	20.1	171	-	-		115

TABLE I (Continued)

Map No.	Field	Operator	Project	GENERAL INFORMATION Formation "Sand"	County
116	New Harmony Consolidated	Luboil	Helm	Bethel (Benoist)	Wabash
117	New Harmony Consolidated	Luboil	Helm	Aux Vases	Wabash
118	New Harmony Consolidated	Phillips	Schultz	Upper Cypress	Wabash
119	New Harmony Consolidated	Phillips	Schultz	Lower Cypress	Wabash
120	New Harmony Consolidated	Skiles	East Maud	Cypress	Wabash
121	New Harmony Consolidated	Skiles	East Maud	Bethel (Benoist)	Wabash
122	New Harmony Consolidated	Skiles	Siegert Bottoms	Bethel (Benoist)	Wabash, Edwards
123	New Harmony Consolidated	Skiles	West Maud	Bethel (Benoist)	Wabash
124	New Harmony Consolidated	Sun	Ford B	Bethel	White
125	New Harmony Consolidated	Sun	Ford B	Aux Vases	White
126	New Harmony Consolidated	Sun	Greathouse	Cypress	White
127	New Harmony Consolidated	Sun	Greathouse	Bethel	White
128	New Harmony Consolidated	Sun	Greathouse	McClosky	White
129	New Harmony Consolidated	Superior	Waltersburg	Waltersburg	White, Illinois Posey, Indiana
130	New Harmony Consolidated	Tide Water	E. S. Dennis "A"	Bethel	White
131	New Harmony Consolidated	Tide Water	O. R. Evans	Aux Vases	White
132	New Hebron	Davison & Ryerson	Little John	Robinson	Crawford
133	Odin	Ashland	Odin	Cypress	Marion
134	Olney Consolidated	Texas	East Olney Unit	McClosky	Richland
135	Oskaloosa	Texas	Oskaloosa Unit	Bethel (Benoist)	Clay
136	Patoka	Sohio	Patoka Benoist	Bethel (Benoist)	Marion
137	Patoka	Sohio	Patoka Rosiclare	Rosiclare	Marion
138	Patoka	Sohio	Stein Unit	Cypress (Stein)	Marion
139	Phillipstown Consolidated	C. E. Brehm	Phillipstown Unit "A"	Pennsylvanian	White
140	Phillipstown Consolidated	British American	North Calvin	Pennsylvanian #7 Sand	White
141	Phillipstown Consolidated	Magnolia	Schmidt-Seifried	Biehl	White
142	Phillipstown Consolidated	Phillips	Flora	Degonia	White
143	Phillipstown Consolidated	Phillips	Laura	Bethel (Benoist)	White
144	Phillipstown Consolidated	Sun	Phillipstown	Tar Springs	White
145	Roland	Indiana Farm Bureau	Omaha	Waltersburg	Gallatin
146	Ste. Marie	J. R. Randolph	Ste. Marie	McClosky	Jasper
147	Sailor Springs Consolidated	Cities Service	Wyatt	Aux Vases	Clay
148	Sailor Springs Consolidated	W. C. McBride	Duff Cypress	Cypress	Clay
149	Salem	Texas	Rosiclare Sand Unit	Rosiclare	Marion
150	Salem	Texas	Salem Unit	Bethel (Benoist)	Marion
151	Salem	Texas	Salem Unit	Renault-Aux Vases	Marion
152	Salem	Texas	Salem Unit	McClosky	Marion

PRODUCTION AND INJECTION STATISTICS (Barrels)

Location			Date First	Water Injection		Secondary Recovery Oil Production		Water Production		Map
Section	Township	Range	Injection	Total 1953	Cumulative 12-31-53	Total 1953	Cumulative 12-31-53	Total 1953	Cumulative 12-31-53	No.
22	3S	14W	December, 1951	-	-	-	-	-	-	116
22	3S	14W	December, 1951	-	-	-	-	-	-	117
7	3S	13W	May, 1952	181,245	284,286	31,145	32,447	53,428	53,428	118
7	3S	13W	July, 1951	439,423	803,361	10,511	60,191	313,106	361,401	119
32,33	1S	13W	November, 1952	87,100	90,969	4,385	4,385	12,500(est.)	13,400(est.)	120
4,5	2S	13W								
32,33	1S	13W	April, 1952	152,485	244,376	18,025	18,025	4,600(est.)	6,450(est.)	121
4,5	2S	13W								
34	2S	14W	October, 1951	354,910	819,593	80,216	82,566	5,450	6,680	122
2,3,10	3S	14W								
5	2S	13W	October, 1950	264,435	678,377	84,613	128,901	20,800	27,800	123
32	1S	13W								
21	4S	14W	March, 1953	50,074	50,074	None	None	None	None	124
21	4S	14W	March, 1953	46,554	46,554	None	None	None	None	125
33	4S	14W	January, 1953	153,115	153,115	None	None	None	None	126
33	4S	14W	January, 1949	193,791	1,515,304	28,400	79,392	88,607	248,457	127
4	5S	14W								
33	4S	14W	August, 1947	116,687	756,285	17,814	98,050	32,729	134,416	128
4	5S	14W								
4,5,9,10	5S	14W	August, 1946	1,690,242*	4,836,103*	203,017*	847,979*	76,928*	649,165*	129
28,33	4S	14W	July, 1951	1,543,849	2,654,053	129,945	184,945	179,688	200,128	130
4,5	4S	14W	October, 1949	106,383	372,717	20,831	60,186	43,576	51,044	131
20	6N	12W	October, 1952	59,536	71,294	362	470*	2,000(est.)	2,000(est.)	132
-	2N	1E	October, 1949	-	-	190,000(est.)	815,000(est.)	-	-	133
	2N	2E								
23,24,25,26	4N	10E	March, 1951	90,941	279,253	3,691	7,835	23,263	38,851	134
26,27,34,35	4N	5E	January, 1953	581,598	581,598	72,829	72,829	24,310	24,310	135
20,21,28,29	4N	1E	September, 1943	3,987,479	31,836,398	117,673	5,988,776	3,302,298	22,880,952	136
21,28,29	4N	1E	1948	678,253	2,985,043	93,413	1,110,514*	236,067	804,201	137
28	4N	1E	August, 1951	83,285	177,115	10,533	23,860*	47,792	98,121	138
30	4S	11E	June, 1952	79,373	90,079	18,641	23,020*	5,460	5,460	139
19,30	4S	14W								
31	3S	14W	June, 1951	268,529	994,245*	204,142	641,163	79,609	205,132	140
30,31	3S	11E	May, 1951	171,356	545,528	81,407	290,212*	56,558	102,813	141
24	4S	10E	September, 1953	34,719	34,719	5,261	5,261	9,909	9,909	142
19	4S	11E	March, 1952	8,898	25,250	None	None	None	None	143
6	5S	11E	January, 1953	51,530	51,530	None	None	168,247	168,247	144
20,21,28,29	7S	8E	March, 1953*	593,951	593,951	None	None	13,500	13,500	145
5,6,7,8	5N	14W	October, 1948	120,000(est.)	1,106,000(est.)	7,200(est.)	38,200(est.)	60,000(est.)	404,000(est.)	146
13	5N	7E	September, 1953	19,784	19,784	297	297	None	None	147
35	4N	7E	July, 1953	21,150	21,150	4,232	4,232	5,000	5,000	148
15	1N	2E	April, 1950	196,547	642,214	15,402	47,121	17,952	62,034	149
-	1N	2E	October, 1950	14,848,718	15,661,860	94,235	138,457	626,249	1,183,859*	150
	2N	2E								
-	1N	2E	October, 1950	1,672,748	2,408,412	8,941	8,941	303,000	653,600*	151
	2N	2E								
-	1N	2E	April, 1951	6,429,394	9,452,134	160,136	247,759	982,615	1,891,355*	152
	2N	2E								

TABLE I (Continued)

DEVELOPMENT AS OF 12-31-53							INJECTION WATER			
Map No.	Number of Wells Injection	Number of Wells Producers	Injection Pattern	Spacing Acres Per Input Well	Productive Acreage Subjected To Injection	Productive Acreage Total	Source	Type	Avg. Bbls. Per Day Per Well Per Foot	Average Wellhead Pressure PSI
116	15	17	5 spot	12	180	300	Shallow sand	Fresh	-	-
117	8	10	5 spot & Irregular	12	50	150	Shallow sand	Fresh	-	-
118	1	2	-	-	9	30	Shallow sand and Produced	Fresh and brine	49.7	287
119	2	5	Irregular	-	21	70	Shallow sand and Produced	Fresh and brine	30.1	727
120	2	12	5 spot	20	20	100	Creek and Hardinsburg	Fresh and brine	14.9	-
121	6	20	5 spot	20	60	140	Creek and Hardinsburg	Fresh and brine	8.2	1,375
122	17	22	5 spot	20	170	-	Gravel bed	Fresh	2.5	1,500
123	17	26	5 spot	20	340	-	Hardinsburg	Brine	3.6	1,375
124	1*	1	-	-	10*	20	Gravel bed	Fresh	13.8	38
125	1*	4	-	-	20*	80	Gravel bed	Fresh	15.4	742
126	1*	-	-	-	10*	-	Gravel bed	Fresh	41.9	778
127	6	10	5 spot	20	130	-	Gravel bed	Fresh	3.8	1,338
128	1	2	Flank	-	100	-	Gravel bed	Fresh	63.9	1,346
129	7	32	-	-	725	725	Shallow sand and Produced	Fresh and brine	15.4	115
130	18	18	5 spot	10	160	185	Gravel bed and Produced	Fresh * Brine *	7.8	750
131	4	9	5 spot	20	140	160	Shallow sand	Fresh	3.0	1,700
132	2	9	Irregular	4.5	9	100	Lake	Fresh	3.4	95
133	10	22	Perimeter	-	196	290	Tar Springs	Brine	-	-
134	1	20	-	-	90	515	Weiler Sand and Produced	Brine	47.0	540
135	8	-	-	-	407	407	Pennsylvanian sand	Brine	17.0	1,252
136	65	65	5 spot	10	527	-	Tar Springs	Brine	6.2	396
137	16	11	Perimeter	-	445	445	Tar Springs	Brine	12.9	499
138	5	5	Peripheral	-	61	61	Tar Springs	Brine	4.6	455
139	1	5	Irregular	-	90	90	Pennsylvanian sand	Brine	9.5	1,419
140	9	15	5 spot	10	130	130	Produced water and 1300 ft sand	Brine	2.8	771
141	5	9	5 spot	10	60	140	Shallow sand	Fresh	-	1,400
142	2	5	5 spot	10	25	70	Shallow Sand and Produced	Fresh and brine	9.7	935
143	1	3	-	-	16	40	Produced	Brine	2.4	0
144	1*	9	-	-	10*	-	Produced	Brine	14.1	1,057
145	9	22	Flank	10	336	336	Produced	Brine	15.5	0
146	1	14	Spot	-	400	500	Cypress	Brine	47.0(est)	0
147	1	3	-	-	9.4	30	Pennsylvanian sand	Brine	19.4	17
148	1*	4	5 spot	20	50*	160	Tar Springs and Produced	Brine	11.1	423
149	3	5	Flank	-	100	100	Pennsylvanian sand	Brine	12.8	672
150	151	835	Peripheral & 5 spot	20	7,975	7,975	Gravel bed and Produced	Fresh and brine	9.6	180
151	14	580	Peripheral	-	4,881	4,881	Gravel bed and Produced	Fresh and brine	9.9	290
152	92	557	Peripheral	-	7,711	7,711	Gravel bed and Produced	Fresh and brine	9.6	115

RESERVOIR STATISTICS (Average Value)						REMARKS	
Depth Feet	Net Pay Thickness Feet	Porosity Per Cent	Permeability Millidarcys	Oil Gravity API	Oil Viscosity Centipoises		Map No
2,640	14	17.1	44	-	-		116
2,750	12	16	20	-	-		117
2,500	10	-	-	-	-		118
2,500	20	18	50	-	-		119
2,400	8	18.5	75	36.2	5.0 @ 90° F.		120
2,520	8.5	17	57	36.1	5.1 @ 94° F.		121
2,680	18	17	75	36.5	3.8 @ 81° F.		122
2,620	12	17.2	57	37	4.6 @ Reservoir temperature		123
2,696	12	-	-	32.5	-	* Cooperative pilot flood with Calstar.	124
2,855	10	13(est)	30(est)	32.5	-	* Cooperative pilot flood with Calstar	125
2,650	10	-	-	36.9	-	* Pilot Flood. Previously subjected to gas injection.	126
2,750	23.2	18	20	36.9	-	Previously subjected to gas injection.	127
2,900	5	-	-	36.9	-	Previously subjected to gas injection.	128
2,200	43	19.2	475	36.8	2.9 @ 86° F.	* Includes Indiana data. Previously subjected to gas injection.	129
2,700	30	16	50	39	2.2 @ 92° F.	* Two separate injection systems. Previously subjected to gas injection.	130
2,800	24	14.5	50	-	-	Previously subjected to gas injection.	131
850	24	20.0	50	-	10 @ 78° F.	* Includes primary production since start of flood.	132
1,700	15	20	78	38	8.3 @ 69° F.		133
3,100	5.3	13.8	522	36	2.6 @ 99° F.		134
2,600	14.2	15.6	54	37.8	6.4 @ 60° F.		135
1,410	27	19	110	39	-		136
1,550	9	18.8	223	40	4.1	* Includes primary production since start of flood	137
1,280	10	21	32	39	3.5 @ 60° F.	* Includes primary production since start of flood.	138
1,912	23	13	36	38	4.5 @ 84° F.	* Includes primary production since start of flood.	139
1,550	29	17.6	86	29	20 @ Reservoir temperature	* Includes estimated 300,000 barrels in pilot flood from 4-49 to 5-51.	140
1,830	-	-	-	32.2	11.2 @ 78° F.	* Includes primary production since start of flood. Pilot flood (1-input) from 9-47 to 5-51.	141
2,000	15	-	-	-	-		142
2,800	10	15	46	-	-		143
2,248	10	-	-	34.5	-	* Pilot flood.	144
1,695	14	19	200-250	29.2	8 @ 32° F.	* Injected gas 3 months before starting water. Two sand zones affected.	145
2,860	7	-	-	-	-	Dump flood.	146
2,771	9.2	21.9	164	34.2	-		147
2,600	12	19	60	38	-	* Pilot Flood	148
2,093	14	11.5	43	36.5	-		149
1,770	28	17.9	150	37	3.9 @ 93° F.	* Since 1-1-52	150
1,825	7 26	16.5 16.3	18 28	37	4.8 @ 93° F. 4.4 @ 93° F.	* Since 1-1-52.	151
1,950	20	15.8	700	37	-	* Since 1-1-52.	152

TABLE I (Continued)

Map No.	Field	Operator	Project	Formation "Sand"	County
			GENERAL INFORMATION		
153	Salem	Texas	Salem Unit	Devonian	Marion
154	Siggins	Bell Brothers	Flood #1	Upper Siggins	Cumberland
155	Siggins	L. Fikes	Vevay Park	Siggins	Cumberland
156	Siggins	Forest	Siggins	First Siggins	Cumberland
157	Siggins	Oil Research	Siggins	Casey	Clark & Cumberland
158	Siggins	Pure	Union Group	1st & 2nd Siggins	Clark & Cumberland
159	Storms	Mabee	-	Waltersburg	White
160	Stringtown	N. C. Davies	Stringtown	McClosky	Richland
161	Stringtown	Skelly	Von Almen	McClosky	Richland
162	Westfield	Forest	Parker	Pennsylvanian "Gas Sand"	Clark
163	Westfield	Oil Research	Hawkins	"Gas Sand"	Clark
164	Westfield	Oil Research	Johnson	"Gas Sand"	Coles, Clark
165	Willow Hill, East	M. M. Spickler	-	McClosky	Jasper
166	Woburn	Arrow Drilling	Spindler	Bethel (Benoist)	Bond
167	York	Trans-Southern	York	Casey	Cumberland

TABLE II

ILLINOIS WATER FLOOD PROJECTS REPORTED ABANDONED

Map No.	Field	Operator	Project	Formation "Sand"	County
			GENERAL INFORMATION		
168	Albion Consolidated	Superior	South Albion	Bridgeport	Edwards
169	Main	Skiles	Walter Community	Robinson #1 & #3	Crawford
170	New Harmony	Sun	Ford "A"	McClosky	White

TABLE III

ILLINOIS PRESSURE MAINTENANCE PROJECTS USING WATER INJECTION DURING 1953

Map No.	Field	Operator	Project	Formation "Sand"	County
			GENERAL INFORMATION		
171	Albion Consolidated	Calvert	South Albion Biehl	Biehl	Edwards
172	Bone Gap Consolidated	Gallagher	-	Waltersburg	Edwards
173	Boyd	Superior	Boyd Repressure	Bethel	Jefferson
174	Dix	Carter	Dix	Bethel	Jefferson
175	Louden	Carter	Loudon Devonian	Devonian	Fayette
176	Omaha	Carter	Omaha	Palestine	Gallatin

PRODUCTION AND INJECTION STATISTICS (Barrels)

Location Section	Location Township	Location Range	Date First Injection	Water Injection Total 1953	Water Injection Cumulative 12-31-53	Secondary Recovery Oil Production Total 1953	Secondary Recovery Oil Production Cumulative 12-31-53	Water Production Total 1953	Water Production Cumulative 12-31-53	Map No.
-	1N	2E	October, 1950	9,263,001	18,563,540	93,797	133,049	3,522,857	5,667,226*	153
	2N	2E								
13	10N	10E	September, 1950	177,263	780,500	12,910	33,335	15,600(est.)	50,000(est.)	154
25	10N	14W	December, 1950	28,322	211,047	148	1,125	10,003	-	155
7	10N	11E	June, 1942	4,611,339	31,832,704	623,023	5,158,759	-	-	156
11,12,13,14	10N	10E								
7	10N	14W	December, 1951	249,931*	526,695	1,375	1,937	24,000(est.)	27,395(est.)	157
7	10N	11E								
13	10N	14W	December, 1946	1,246,638	9,417,229	182,533	1,820,871	1,250,950	6,041,375	158
18	10N	11E								
22	6S	9E	July, 1951	24,045*	90,110	None	None	None	None	159
31	5N	14W	December, 1953	4,950	4,950	None	None	None	None	160
31	5N	14W	December, 1953	7,000	7,000	120	120	None	None	161
30	11N	14W	June, 1950	111,493	476,727	8,488	18,674	-	-	162
20,21	11N	14W	August, 1951	110,913	265,199	1,846	1,982*	24,000(est.)	44,000(est.)	163
7,18	11N	11E	June, 1951	215,075	503,943	1,556	1,749	22,500(est.)	42,500(est.)	164
18	11N	14W								
36	7N	10E	June, 1952	*	*	1,073	1,073	-	-	165
10	6N	2W	September, 1951	68,716	121,247	3,044	9,684*	68,716	121,247	166
6	9N	11E	October, 1950	72,456	404,739	2,487	8,480	40,105	-	167
Totals of Reported Figures				118,409,146	335,727,117	10,086,243	39,042,351			

PRODUCTION AND INJECTION STATISTICS (Barrels)

Location Section	Location Township	Location Range	Date First Injection	Date Abandoned	Cumulative Water Injection	Cumulative Secondary Recovery Oil Production	Cumulative Water Production	Map No.
1,11,12	3S	10E	August, 1946	1952	854,511*	173,502*	789,679*	168
1	6N	13W	December, 1951	December, 1952	25,821	None	29,000	169
36	7N	13W						
18	5S	14W	May, 1948	July, 1952	57,823	13,076	626	170
Totals					938,155	186,578	819,305	

PRODUCTION AND INJECTION STATISTICS (Barrels)

Location Section	Location Township	Location Range	Date First Injection	Water Injection Total 1953	Water Injection Cumulative 12-31-53	Secondary Recovery Oil Production Total 1953	Secondary Recovery Oil Production Cumulative 12-31-53	Water Production Total 1953	Water Production Cumulative 12-31-53	Map No.
1	3S	10E	April, 1951	139,518	200,130*	97,345	347,816	121,200	192,868*	171
35,36	2S	10E								
18	1S	14W	June, 1952	-	-	-	-	-	-	172
18,19,30	1S	2E	June, 1945	1,140,173	6,311,198	391,376	6,565,160	921,027	5,933,374	173
13,24	1S	1E								
3,4,9,10,15, 16	1S	2E	January, 1948	874,864	2,522,484	315,349	6,804,375	217,866	2,871,517	174
-	8N	3E	September, 1943	11,548,787	87,045,832	592,306	14,375,334	9,609,965	86,739,965	175
33	7S	8E	October, 1944	109,913	780,980	93,293	1,640,396	96,269	886,898	176
4	8S	8E								
Totals				13,813,255	96,860,624	1,489,669	29,733,081	10,966,327	96,624,622	

TABLE I (Continued)

DEVELOPMENT AS OF 12-31-53							INJECTION WATER			
Map No.	Number of Wells Injection	Number of Wells Producers	Injection Pattern	Spacing Acres Per Input Well	Productive Acreage Subjected To Injection	Productive Acreage Total	Source	Type	Avg. Bbls. Per Day Per Well Per Foot	Average Wellhead Pressure PSI
153	29	238	Peripheral	-	5,414	5,414	Gravel bed, upper sand and Produced	Fresh and brine	46.1	0
154	9*	7	5 spot	4.4	80	80	Surface and Produced	Fresh and brine	-	192
155	2	4	5 spot	4.4	10	-	Surface and Produced	Fresh and brine	2.4	73
156	437	365	5 spot	4.4	1,800	-	Gravel bed and Produced	Fresh and brine	0.9	230
157	27	20	5 spot	4.4	135	227	Lake and Produced	Fresh and brine	0.5*	92
158	127	121	5 spot	4.4	468	575	Gravel bed	Fresh	0.9	245
159	1	2	-	-	40	40	Pennsylvanian sand	Brine	-	-
160	2	3	-	-	80	80	Tar Springs	Brine	9.2	0
161	2	2	-	20	80	80	Cypress	Brine	11.7	0
162	9	12	5 spot	2.5	20	-	Gravel bed	Fresh	1.4	125
163	15	8	5 spot	4.4	40	360	Devonian and Produced	Brine	0.7	159
164	26	13	5 spot	4.4	70	467	Lake and Produced	Fresh and brine	0.6	117
165	1	1	-	-	20	20	-	Brine	-	-
166	1	4	Spot	-	20	20	Produced	Brine	13.4	264
167	3	7	Line Drive	4.4	15	125	Shallow sand and Produced	Fresh and brine	6.6	163
					37,854†					

† Includes only 8,800 acres for the Salem Unit.

TABLE II

MAXIMUM DEVELOPMENT DURING OPERATION							INJECTION WATER	
Map No.	Number of Wells Injection	Number of Wells Producers	Injection Pattern	Spacing Acres Per Input Well	Productive Acreage Subjected To Injection	Productive Acreage Total	Source	Type
168	3	14	-	-	203	-	Produced	Brine
169	5	6	5 spot	10	40	-	Upper Pennsylvanian	Brine
170	1	1	Spot	-	40	40	Gravel bed	Fresh

TABLE III

DEVELOPMENT AS OF 12-31-53						INJECTION WATER		
Map No.	Number of Wells Injection	Number of Wells Producers	Injection Pattern	Productive Acreage Subjected To Injection	Productive Acreage Total	Source	Type	Average Wellhead Pressure PSI
171	2	7	Peripheral	60	119	Produced	Brine	831
172	1	11	-	40	120	Produced	Brine	-
173	3	60	Flank	750	750	Produced	Brine	65
174	4	64	Peripheral	1,200	1,200	Tar Springs and produced	Brine	95
175	6	69	Peripheral	2,600	2,600	Produced	Brine	135
176	1	15	Flank	260	260	Produced	Brine	225

RESERVOIR STATISTICS (Average Value)						REMARKS	
Depth Feet	Net Pay Thickness Feet	Porosity Per Cent	Permeability Millidarcys	Oil Gravity API	Oil Viscosity Centipoises		Map No
3,400	19	16.8	300	36.5	-	* Since 1-1-52.	153
320	16	18.9	73	34	12 @ 63° F.	* 15 line wells operated jointly with Forest. Previously subjected to gas injection.	154
600	16	20.3	349	30.1	-		155
400	32	17.5	56	36.6	8 @ 60° F.	Previously subjected to gas injection.	156
447	56	21.5	40.2	33.8	10.5 @ 68° F.	* Insufficient water after September, 1953. Previously subjected to gas injection.	157
404	25	18.5	45				158
464	6	18.3	66	36	8.8 @ 68° F.		
2,241	15	-	-	-	-	* No water injection after July 1953.	159
3,000	10	18	-	-	-		160
3,002	12	50	-	36	-		161
270	25	17.9	153	28.1	54 @ 60° F.	Previously subjected to gas injection	162
290	30	22	120	30	28 @ 62° F.	* Includes primary production since 1952.	163
320	35	21.5	86	29	323 @ 65° F.		164
2,615	10+	-	-	-	-	* Dump Flood.	165
1,006	14	-	-	-	-	* Includes primary production since start of flood.	166
590	10	21.9	231	30.3	10 @ 75° F.		167

RESERVOIR STATISTICS (Average Values)							
Depth Feet	Net Pay Thickness Feet	Porosity Per Cent	Permeability Millidarcys	Oil Gravity API	Oil Viscosity Centipoises		Map No
1,900	20	19.7	304	32.5	6.3 @ 95° F.	Stopped injection early in 1952. Now disposal project. * as of 6-1-52.	168
950	10				12.5 @ Reservoir		169
1,010	15	20.1	93	36	temperature		
2,900	7	-	-	38	-		170

RESERVOIR STATISTICS (Average Values)						REMARKS	
Depth Feet	Net Pay Thickness Feet	Porosity Per Cent	Permeability Millidarcys	Oil Gravity API	Oil Viscosity Centipoises		Map No
2,080	9.2	16.8	384	32.3	10.4 @ 85° F.	* Since May 1952.	171
2,310	20	18	120	34.6	5.6 @ 85° F.		172
2,065	19	17.5	175	39	3.4 @ 90° F.	Previously subjected to gas injection	173
1,950	12	16.4	128	39	2.5 @ 87° F.		174
3,100	-	-	-	29	6.5 @ 96° F.		175
1,700	17	18.9	427	27	17 @ 76° F.		176