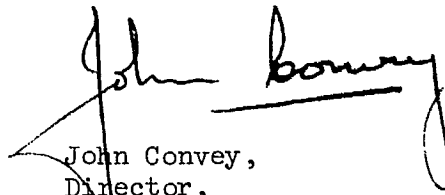


F O R E W O R D

Numerous samples of crude oil collected in various regions of Canada have been analysed, over a period of several decades, at the Fuels Research Centre, Mines Branch, Department of Energy, Mines and Resources, in Ottawa, as part of the resource evaluation program. For general documentation, as well as for specialized studies, it has been considered desirable to publish nearly 400 of these analyses of typical oil samples, together with some reservoir data.

The present publication is part of a series which will cover separately the Maritime Provinces (New Brunswick, Newfoundland and Nova Scotia), Quebec, Ontario, Manitoba, Saskatchewan, Alberta, and British Columbia and Northwest Territories. All these analyses were performed according to the United States Bureau of Mines Routine Method of Distillation. In the more recent analyses, refractive index and dispersion were determined at 20°C, using an Abbé-type refractometer equipped with compensating prisms. The refractive index thus determined is for the Sodium D line of light, and the dispersion $(N_F - N_C) 10^4$ is calculated from the position of the compensating prisms.

Most of the reservoir data are estimates obtained in the mid 1960's and grateful acknowledgement is hereby given for the excellent cooperation received from the various provincial authorities (Departments of Mines, and others concerned with oil resources development and conservation) and from the numerous oil companies which contributed to this project. In order to improve further editions of this publication, it would be greatly appreciated if any errors, additional data, or supplementary bibliographical references were reported to the authors.


John Convey,
Director,
Mines Branch.

Ottawa, June 16, 1969.

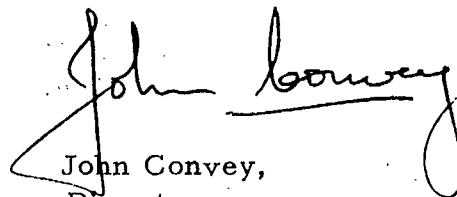
AVANT-PROPOS

Au cours d'une période de plusieurs décennies, de nombreux échantillons de pétrole brut recueillis dans diverses régions du Canada ont été analysés au Centre de recherches sur les combustibles, Direction des mines, ministère de l'Énergie, des Mines et des Ressources, à Ottawa, dans le cadre du programme de l'évaluation des ressources. Pour la documentation générale, aussi bien que pour des études spécialisées, il a semblé désirable de publier presque 400 de ces analyses d'échantillons de pétrole typiques, ainsi que quelques caractéristiques des gisements.

La présente publication fait partie d'une série de rapports qui traitera séparément les Provinces Maritimes (Nouveau-Brunswick, Terre-Neuve et Nouvelle-Écosse), le Québec, l'Ontario, le Manitoba, la Saskatchewan, l'Alberta, et la Colombie-Britannique et les Territoires du Nord-Ouest. Toutes ces analyses ont été faites d'après la méthode "Routine" de distillation du Bureau des Mines des États-Unis d'Amérique. Dans les analyses plus récentes, l'indice de réfraction et la dispersion ont été déterminés à 20°C à l'aide d'un réfractomètre de type Abbé équipé de prismes compensateurs. L'indice de réfraction ainsi obtenu correspond à la raie de lumière D du sodium, et la dispersion $(N_D - N_C)10^4$ est calculée d'après les positions des prismes compensateurs.

La plupart des caractéristiques de gisement sont des estimations obtenues vers 1965, et l'on doit rendre hommage à l'excellente collaboration reçue des diverses autorités provinciales (Ministères des mines, et autres intéressés au développement et à la conservation des ressources pétrolières) ainsi que des nombreuses sociétés de pétrole qui contribuèrent à ce projet.

Pour l'amélioration de rééditions de cette publication, il serait très apprécié que toute erreur, caractéristique ou référence bibliographique supplémentaire soit indiquée aux auteurs.



John Convey,
Directeur,
Direction des mines.

Ottawa, le 16 juin 1969.

Mines Branch Information Circular IC 232

ANALYSES AND CHARACTERISTICS
OF OIL SAMPLES FROM ALBERTA

by

R. P. Charbonnier¹, R. G. Draper¹,

W. H. Harper² and A. Yates¹

ABSTRACT

The 198 oil analyses gathered in this publication have been performed in the Fuels Research Laboratories of the Mines Branch in Ottawa, according to the U. S. B. M. Routine Method of Distillation. Some reservoir characteristics are also included.

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Direction des mines

Circulaire d'information IC 232

ANALYSES ET CARACTÉRISTIQUES D'ÉCHANTILLONS
DE PÉTROLE DE L'ALBERTA

par

R. P. Charbonnier¹, R. G. Draper¹,

W. H. Harper² et A. Yates¹

RÉSUMÉ

Les 198 analyses de pétrole rassemblées dans cette publication ont été faites aux laboratoires de recherches sur les combustibles de la Direction des mines, à Ottawa, suivant la méthode U. S. B. M. de distillation. On a aussi inclus quelques caractéristiques des gisements.

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ALBERTA
OIL SAMPLES

OIL FIELD DATA

Field and Pool: Acheson D-3

Location: Twps. 52 & 53, Rge. 26, West of 4th Meridian

DISCOVERY DETAILS

Method: Subsurface geology, including seismic and structure test holes

Well: Name: Calstan Acheson Province #1 in 13-2-53-26 W 4 M

Completed: September 2, 1950

Perforated: None

Treatment: None

Initial Potential: On six-hour test with $\frac{1}{2}$ " choke, the well flowed 1,248 BOPD with a GOR of 676 cu.ft./bbl.

GEOLOGY

Producing Zone(s): Leduc Formation (D3), Woodbend group of Upper Devonian

Nisku Formation, Winterburn group of Upper Devonian

Ellerslie Member, Manville Group, Lower Cretaceous
(Gas and Oil)

Viking Formation, Colorado group of Upper Cretaceous
(One Gas Well)

Other Shows: None

Trap Type: Stratigraphic, Reef Bioherm Surrounded by Impermeable Shale

Lithology: Fine and Medium Crystalline White Dolomite, very vuggy and moderately fossiliferous, abundant fracturing

Maximum Reservoir Thickness: 1,170'

Regional Setting: Situated on the East flank of the Alberta Syncline, along the Rimbey Meadowbrook Reef Trend. Bioherm arises from the southwesterly sloping Cooking Lake carbonate platform.

Deepest Formation Penetrated: Elk Point (Imperial Stony Plain No. 1 in 8-21-52-26 W 4 M)

DEVELOPMENT DATA

Total Wells: Completed Oil: 92. Gas: Nil

Dry and Abandoned: 26

Producing Oil: 89. Suspended Oil: 3

Injection or Disposal: Water: 2. Gas: 0

Well Spacing: 40 Acres

Logging Practice: At Calstan Acheson No. 10-3-53-26 completed in February 1959, a Schlumberger Induction Electrical Survey and a Microlog-Caliper were run to total depth (Leduc Formation).

Completion Practice: Most wells were completed open hole. Where the indicated pay section was 30' or more, casing was run after first contact was made with the reef, or to a point estimated to be 10' to 30' above the reef; production tubing was then landed 10' off bottom. The method was designed to lessen lost circulation problems in the Nisku and Leduc. When the indicated pay section was less than 30' the well was cased to approximately 10' below the water line and perforated. No treatment was necessary.

RESERVOIR DATA

Type of Drive: Bottom Water and Injection

Estimated Oil in Place: 128,000,000 S.T.bbls (433 bbls/acre foot)

Estimated Recoverable Oil: 85,550,000 S.T.bbls (289 bbls/acre foot)

Oil Zone Thickness: Maximum: 234 feet. Average: 84 feet.

Gas Zone Thickness: A small gas cap was found in only one well. It is 42' thick. (Imperial Acheson 7-26-52-26 W 4)

Porosity: 9.1%. Permeability: 1000 md.

Area: 3,800 Acres

Oil Characteristics: Gravity: 38° API

Sulphur: 0.75%

Initial Solution GOR: 522 cu ft /bbl

Base: Paraffin

Pour Point: 20°F.

Pressure Maintenance: In December 1956, Calstan Altmiks No. 1-35-52-26 was redrilled to become a fresh water injection well into the Leduc. The well opened 422' of reef, which was acidized with 4,000 gals. Dowell XMFV. Water from the North Saskatchewan River was injected at the rate of 11,000 to 13,000 bbls./day. Pool pressure is maintained very near 1,598 psig.

PRODUCTION

MPR: 20,000 BOPD (pool)

Economic Allowance: Present: 28 BOPD

Operating: 28 BOPD

Market Outlet: Imperial Pipeline to Edmonton Terminal

Bibliographical References: Coveney, J.W. and Brown, A.A., Geology and Development History of the Acheson Field; CIMM Bulletin, Vol. 47, No. 505, May 1954, pp 310-317.

Smith, W.D., Oil Fields of Alberta, ASPG Special Publication, April 1960, pp 54-55.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 350-53

FIELD: Acheson

POOL:

ZONE: Leduc (D-3)

Well Name: California Standard Acheson Province No. 14-2
 Location: Lsd. 14, Sec. 2, Twp. 53, Rge. 26, W 4th
 Interval tested, depth, feet: 4911-4930
 Producing Zone: Leduc (D-3)
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: Imperial Oil Ltd.
 Date Sampled: June 24, 1951
 Sampled at: 480 feet above tool
 in well

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.851
 Sulphur, percent by weight: 0.23
 Saybolt Universal Viscosity:
 at 100°F., sec. 42

A.P.I. gravity at 60°F.: 34.8
 Pour point, °F.: 35
 Colour: Dark Green
 Carbon residue, percent by weight: 2.3
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 762 mm. Hg.
 First drop, 24°C. (75°F.)

Frac- tion No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Corre- lation Index	Aniline Point, °C.	Visc. S.U. 100°F.	Cloud Test, °F.	Refractive Index 20°C.
	°C.	°F.									
1.	50	122	1.5	1.5	0.665	81.3	-	-			-
2.	75	167	2.3	3.8	0.692	73.0	18	-			1.4012
3.	100	212	4.6	8.4	0.732	61.8	27	50.4			1.4050
4.	125	257	6.5	14.9	0.754	56.2	28	50.4			1.4148
5.	150	302	5.0	19.9	0.770	52.3	28	50.8			1.4252
6.	175	347	4.8	24.7	0.786	48.5	29	51.2			1.4360
7.	200	392	4.6	29.3	0.803	44.7	31	52.2			1.4458
8.	225	437	5.2	34.5	0.816	41.9	32	56.4			1.4536
9.	250	482	5.4	39.9	0.831	38.8	33	60.8			1.4602
10.	275	527	6.4	46.3	0.842	36.6	34	66.2			1.4665

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	4.0	50.3	0.855	34.0	36	70.4	40	10	1.4739
12.	225	437	5.7	56.0	0.862	32.6	36	73.6	45	30	1.4778
13.	250	482	5.0	61.0	0.873	30.6	37	76.8	57	50	1.4838
14.	275	527	5.2	66.2	0.887	28.0	41	79.8	80	70	1.4911
15.	300	572	5.9	72.1	0.898	26.1	43	83.8	154	85	1.5018
Residuum			26.7	98.8	0.963	15.4					

Carbon residue of residuum: 7.5%

Carbon residue of crude: 2.3%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	8.4	0.709	68.1	
Total gasoline and naphtha	29.3	0.757	55.4	
Kerosine distillate	5.2	0.816	41.9	
Gas oil	20.9	0.847	35.6	
Nonviscous lubricating distillate	9.7	0.867-0.890	31.7-27.5	50-100
Medium lubricating distillate	7.0	0.890-0.904	27.5-25.0	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	26.7	0.963	15.4	
Distillation loss	1.2			

Remarks: The sample as received contained 0.44% by vol. water and sediment (by centrifuge)
 and 11 lb. salt (as NaCl) per 1000 bbl,

CRUDE PETROLEUM ANALYSIS

Laboratory Number 351-53

FIELD: Acheson

POOL:

ZONE: Leduc (D-3)

Well Name: California Standard Acheson Province No. 1 Province: Alberta
 Location: Lsd. 13, Sec. 2, Twp. 53, Rge. 26, W. 4th Sample From: Imperial Oil Ltd.
 Interval tested, depth, feet: 5009-5030
 Producing Zone: Leduc (D-3) Date Sampled: September 1950
 Geological Age: Upper Devonian Sampled at: Well

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.844 A.P.I. gravity at 60°F.: 36.2
 Sulphur, percent by weight: 0.30 Pour point, °F.: 15
 Saybolt Universal Viscosity: Colour: Dark Green
 at 100°F., sec. 40 Carbon residue, percent by weight: 2.1
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 759 mm. Hg.
 First drop, 28°C. (82°F.)

Frac- tion No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Corre- lation Index	Aniline Point, °C.	Visc. S.U. 100°F.	Cloud Test, °F.	Refractive Index 20°C.
	°C.	°F.									
1.	50	122	2.6	2.6	0.660	82.9	-				1.3859
2.	75	167	2.8	5.4	0.682	76.0	13	56.0			1.3873
3.	100	212	4.8	10.2	0.721	64.8	22	52.2			1.4004
4.	125	257	6.2	16.4	0.746	58.2	25	50.8			1.4142
5.	150	302	5.0	21.4	0.764	53.7	26	50.8			1.4242
6.	175	347	4.5	25.9	0.784	49.0	28	51.0			1.4352
7.	200	392	4.7	30.6	0.799	45.6	29	52.4			1.4451
8.	225	437	4.7	35.3	0.816	41.9	32	56.2			1.4534
9.	250	482	4.0	39.3	0.828	39.4	32	60.6			1.4600
10.	275	527	6.8	46.1	0.838	37.4	32	66.2			1.4659

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	4.0	50.1	0.852	34.6	35	69.6	39	10	1.4742
12.	225	437	5.3	55.4	0.859	33.2	34	74.2	46	30	1.4780
13.	250	482	4.6	60.0	0.871	31.0	37	76.6	56	50	1.4848
14.	275	527	4.7	64.7	0.882	28.9	39	80.0	79	65	1.4918
15.	300	572	6.4	71.1	0.898	26.1	43	83.6	156	85	1.5029
Resi- dium			25.9	97.0	0.961	15.7					

Carbon residue of residuum: 7.2%

Carbon residue of crude: 2.1%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	10.2	0.695	72.1	
Total gasoline and naphtha	30.6	0.746	58.2	
Kerosine distillate	4.7	0.816	41.9	
Gas oil	19.4	0.844	36.2	
Nonviscous lubricating distillate	9.1	0.864-0.886	32.3-28.2	50-100
Medium lubricating distillate	7.3	0.886-0.907	28.2-24.5	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	25.9	0.961	15.7	
Distillation loss	3.0			

Remarks: The sample as received contained 0.35% by vol. water and sediment (by centrifuge) and 5 lb. salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 237-56.

FIELD: Acheson

POOL:

ZONE: Basal Quartz Ss.

Well Name: California Standard Fournel No. 6-35 A-1
 Location: Lsd. 6, Sec. 35, Twp. 52, Rge. 26, W 4th
 Interval tested, depth, feet; 4142-4165
 Producing Zone: Basal Quartz Ss.
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: June 19, 1956
 Sampled at: After separator

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.872
 Sulphur, percent by weight: 0.90
 Saybolt Universal Viscosity:
 at 70°F., sec. 70
 at 100°F., sec. 51
 A.P.I. gravity at 60°F.: 30.8
 Pour point, °F.: -15
 Colour: Brownish Black
 Carbon residue, percent by weight: 3.6
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 759 mm. Hg.
 First drop, 85°C. (185°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167								
3.	100	212	1.6	1.6	0.722	64.5	-			
4.	125	257	4.8	6.4	0.741	59.5	22	51.6		
5.	150	302	6.1	12.5	0.762	54.2	25	50.5		
6.	175	347	5.7	18.2	0.778	50.4	25	50.1		
7.	200	392	4.9	23.1	0.796	46.3	28	53.0		
8.	225	437	5.3	28.4	0.811	43.0	29	56.4		
9.	250	482	5.1	33.5	0.824	40.2	30	60.2		
10.	275	527	7.2	40.7	0.838	37.4	32	64.5		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	4.6	45.3	0.856	33.8	37	66.8	38	5
12.	225	437	6.5	51.8	0.866	31.9	37	71.3	44	30
13.	250	482	5.3	57.1	0.880	29.3	41	74.8	56	50
14.	275	527	6.0	63.1	0.894	26.8	44	77.9	84	65
15.	300	572	5.7	68.8	0.904	25.0	46	80.6	156	80
Residuum			29.8	98.6	0.976	13.5				

Carbon residue of residuum: 10.8%

Carbon residue of crude: 3.6%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	1.6	0.722	64.5	
Total gasoline and naphtha	23.1	0.766	53.2	
Kerosine distillate	10.4	0.817	41.7	
Gas oil	18.0	0.852	34.6	
Nonviscous lubricating distillate	9.9	0.873-0.896	30.6-26.4	50-100
Medium lubricating distillate	7.4	0.896-0.909	26.4-24.2	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	29.8	0.976	13.5	
Distillation loss	1.4			

Remarks: The sample as received contained 11 lb. of salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 238-56

FIELD: Acheson

POOL: West L.C.

ZONE: Basal Quartz Ss.

Well Name: California Standard Welbourn No. 3-3-A1 Province: Alberta
 Location: Lsd. 3, Sec. 3, Twp. 53, Rge. 26, W 4th Sample From: D.M.T.S.
 Interval tested, depth, feet: 4159-4169
 Producing Zone: Basal Quartz Ss. Date Sampled: June 19, 1956
 Geological Age: Lower Cretaceous Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.845 A.P.I. gravity at 60°F.: 36.0
 Sulphur, percent by weight: 0.64 Pour point, °F.: -15
 Saybolt Universal Viscosity: Colour: Brownish Black
 at 100°F., sec. 40 Carbon residue, percent by weight: 3.0
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 763 mm. Hg.
 First drop, 45°C. (113°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167	4.9	4.9	0.686	74.8	-			
3.	100	212	2.9	7.8	0.715	66.4	19			
4.	125	257	5.5	13.3	0.738	60.2	21	54.0		
5.	150	302	6.1	19.4	0.759	54.9	23	53.1		
6.	175	347	4.5	23.9	0.777	50.6	25	52.5		
7.	200	392	5.8	29.7	0.796	46.3	28	53.5		
8.	225	437	4.4	34.1	0.810	43.2	29	57.5		
9.	250	482	5.2	39.3	0.823	40.4	30	61.4		
10.	275	527	6.7	46.0	0.837	37.6	32	66.0		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	2.9	48.9	0.854	34.2	36	69.2	39	10
12.	225	437	5.7	54.6	0.864	32.3	37	73.0	44	30
13.	250	482	5.3	59.9	0.876	30.0	39	77.8	55	50
14.	275	527	5.3	65.2	0.888	27.8	41	80.1	81	65
15.	300	572	6.0	71.2	0.899	25.9	44	83.5	136	80
Residuum			24.8	96.0	0.967	14.8				

Carbon residue of residuum: 10.4%

Carbon residue of crude: 3.0%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	7.8	0.697	71.5	
Total gasoline and naphtha	29.7	0.749	57.4	
Kerosine distillate	9.6	0.817	41.7	
Gas oil	15.5	0.851	34.8	
Nonviscous lubricating distillate	9.7	0.871-0.892	31.0-27.1	50-100
Medium lubricating distillate	6.7	0.892-0.905	27.1-24.8	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	24.8	0.967	14.8	
Distillation loss	4.0			

Remarks: The sample as received contained 260 lb. of salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 239-56

FIELD: Acheson

POOL: North L.C.

ZONE: Basal Quartz Ss.

Well Name: California Standard Acheson Province No. 10-11-A1 Province: Alberta
 Location: Lsd. 10, Sec. 11, Twp. 53, Rge. 26, W 4th Sample From: D.M.T.S.
 Interval tested, depth, feet: 4045-4055
 Producing Zone: Basal Quartz Ss. Date Sampled: June 19, 1956
 Geological Age: Lower Cretaceous Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.844 A.P.I. gravity at 60°F.: 36.2
 Sulphur, percent by weight: 0.38 Pour point, °F.: 5
 Saybolt Universal Viscosity: Colour: Brownish Black
 at 100°F., sec. 39 Carbon residue, percent by weight: 2.4
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 760 mm. Hg.
 First drop, 45°C. (113°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Corre-lation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167	2.3	2.3	0.691	73.3	-			
3.	100	212	8.2	10.5	0.716	66.1	19	54.9		
4.	125	257	4.2	14.7	0.744	58.7	24	53.0		
5.	150	302	5.6	20.3	0.760	54.7	24	52.0		
6.	175	347	5.7	26.0	0.777	50.6	25	52.1		
7.	200	392	5.1	31.1	0.792	47.2	26	53.8		
8.	225	437	5.2	36.3	0.807	43.8	27	56.7		
9.	250	482	5.1	41.4	0.821	40.8	29	62.5		
10.	275	527	6.7	48.1	0.834	38.2	30	66.8		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	3.3	51.4	0.854	34.2	36	70.0	39	10
12.	225	437	5.3	56.7	0.863	32.5	36	74.3	44	30
13.	250	482	5.3	62.0	0.874	30.4	38	77.4	55	50
14.	275	527	4.9	66.9	0.886	28.2	40	81.0	76	70
15.	300	572	5.7	72.6	0.900	25.7	44	83.9	127	85
Residuum			22.5	95.1	0.963	15.4				

Carbon residue of residuum: 9.4%

Carbon residue of crude: 2.4%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	10.5	0.711	67.5	
Total gasoline and naphtha	31.1	0.749	57.4	
Kerosine distillate	10.3	0.814	42.3	
Gas oil	15.5	0.849	35.2	
Nonviscous lubricating distillate	10.1	0.869-0.893	31.3-27.0	50-100
Medium lubricating distillate	5.6	0.893-0.908	27.0-24.3	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	22.5	0.963	15.4	
Distillation loss	4.9			

Remarks: The sample as received contained 550 lb. of salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 1700-52

FIELD: Acheson

POOL:

ZONE: Nisku (D-2)

Well Name: Composite 5 Wells: California Standard Acheson Province: Alberta
 Province No. 2-11A, 3-11A, 7-11A, 10-11A and
 11-11A

Location: Lsd. 2, 3, 7, 10 & 11, Sec. 11, Twp. 53, Sample From: D.M.T.S.
 Rge. 26, W 4th

Interval tested, depth, feet: approx. 4600

Producing Zone: Nisku (D-2)

Date Sampled: August 29, 1952

Geological Age: Upper Devonian

Sampled at: After separator
 from tank

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.826
 Sulphur, percent by weight: 0.36
 Saybolt Universal Viscosity:
 at 70°F., sec. 40
 at 100°F., sec. 36

A.P.I. gravity at 60°F.: 39.8
 Pour point, °F.: -5
 Colour: Dark Green
 Carbon residue, percent by weight: 1.6
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 759 mm. Hg.
 First drop, 25°C. (77°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	2.5	2.5	0.657	83.9	-	-		
2.	75	167	3.2	5.7	0.675	78.1	10	-		
3.	100	212	5.3	11.0	0.711	67.5	17	55.0		
4.	125	257	7.3	18.3	0.738	60.2	21	52.9		
5.	150	302	6.7	25.0	0.759	54.9	23	52.0		
6.	175	347	5.7	30.7	0.778	50.4	25	52.6		
7.	200	392	5.3	36.0	0.794	46.7	27	54.9		
8.	225	437	4.7	40.7	0.808	43.6	28	61.0		
9.	250	482	4.9	45.6	0.821	40.9	29	63.8		
10.	275	527	7.1	52.7	0.834	38.2	30	68.6		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	4.7	57.4	0.849	35.2	33	71.2	39	10
12.	225	437	4.0	61.4	0.857	33.6	33	76.0	45	30
13.	250	482	4.8	66.2	0.867	31.7	35	79.4	55	50
14.	275	527	4.8	71.0	0.879	29.5	37	82.7	75	65
15.	300	572	6.2	77.2	0.888	27.9	38	87.4	135	80
Residuum			20.8	98.0	0.947	17.9				

Carbon residue of residuum: 6.9%

Carbon residue of crude: 1.6%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	11.0	0.688	74.2	
Total gasoline and naphtha	36.0	0.741	59.5	
Kerosine distillate	9.6	0.815	42.1	
Gas oil	16.0	0.845	36.0	
Nonviscous lubricating distillate	9.3	0.862-0.883	32.7-28.8	50-100
Medium lubricating distillate	6.3	0.883-0.893	28.8-27.0	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	20.8	0.947	17.9	
Distillation loss	2.0			

Remarks: The sample as received contained 6.9% by vol. water and sediment (by centrifuge) and 2600 lb. salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 1701-52

FIELD: Acheson

POOL:

ZONE: Leduc (D-3)

Well Name: Composite 9 wells: California Standard Acheson Province: Alberta
Province

Location: Lsd. 2,3,4,5,6,7,10,14 & 15, Sec. 11, Twp. 53,
Rge. 26, W 4th

Sample From: D.M.T.S.

Interval tested, depth, feet: approx. 5050

Producing Zone: Leduc (D-3)

Date Sampled: August 29, 1952

Geological Age: Upper Devonian

Sampled at: After separator
from tank

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.834
Sulphur, percent by weight: 0.23
Saybolt Universal Viscosity:
at 70°F., sec. 45
at 100°F., sec. 39

A.P.I. gravity at 60°F.: 38.2
Pour point, °F.: 0
Colour: Dark Green
Carbon residue, percent by weight: 2.0
(Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 755 mm. Hg.
First drop, 25°C. (77°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	2.9	2.9	0.655	84.5	-	-		
2.	75	167	2.9	5.8	0.675	78.1	10	-		
3.	100	212	4.5	10.3	0.714	66.7	18	51.8		
4.	125	257	6.5	16.8	0.744	58.7	24	50.3		
5.	150	302	5.0	21.8	0.763	54.0	25	50.2		
6.	175	347	4.5	26.3	0.782	49.5	27	50.9		
7.	200	392	4.2	30.5	0.798	45.8	29	52.6		
8.	225	437	5.0	35.5	0.812	42.8	30	56.4		
9.	250	482	4.1	39.6	0.825	40.0	31	60.8		
10.	275	527	6.7	46.3	0.834	38.2	30	65.7		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	4.7	51.0	0.851	34.8	34	69.9	40	20
12.	225	437	5.2	56.2	0.860	33.0	35	75.0	47	40
13.	250	482	5.1	61.3	0.871	31.0	37	76.6	59	55
14.	275	527	4.3	65.6	0.883	28.8	39	80.6	89	70
15.	300	572	6.2	71.8	0.895	26.6	42	84.6	170	85
Residuum			24.6	96.4	0.942	18.7				

Carbon residue of residuum: 7.2%

Carbon residue of crude: 2.0%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	10.3	0.686	74.8	
Total gasoline and naphtha	30.5	0.741	59.5	
Kerosine distillate	9.1	0.818	41.5	
Gas oil	15.3	0.846	35.8	
Nonviscous lubricating distillate	9.2	0.863-0.884	32.5-28.6	50-100
Medium lubricating distillate	6.5	0.884-0.899	28.6-25.9	100-200
Viscous lubricating distillate	1.2	0.899-0.902	25.9-25.4	Above 200
Residuum	24.6	0.942	18.7	
Distillation loss	3.6			

Remarks: The sample as received contained 0.5% by vol. water and sediment (by centrifuge) and 8 lb. salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 16619

FIELD: Aldersyde

POOL:

ZONE: Cardium

Well Name: New Valley No. 1
 Location: Lsd. 4, Sec. 6, Twp. 21, Rge. 2, W 5th
 Interval tested, depth, feet: 6657-6780
 Producing Zone: Cardium
 Geological Age: Upper Cretaceous

Province: Alberta
 Sample From: Dept. of Mines
 and Resources
 Date Sampled: January 1937

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.836
 Sulphur, percent by weight: 0.12
 Saybolt Universal Viscosity:

A.P.I. gravity at 60°F.: 37.8
 Pour point, °F.: 50
 Colour: Dark Green
 Carbon residue, percent by weight: 0.5
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 750 mm. Hg.
 First drop, 34°C. (93°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	0.4	0.4)						
2.	75	167	0.7	1.1)						
3.	100	212	2.1	3.2)	0.708	68.4	-			
4.	125	257	5.7	8.9	0.743	58.9	23			
5.	150	302	5.8	14.7	0.759	54.9	23			
6.	175	347	5.1	19.8	0.773	51.6	23			
7.	200	392	4.9	24.7	0.786	48.5	23			
8.	225	437	5.3	30.0	0.799	45.6	24			
9.	250	482	6.4	36.4	0.812	42.8	24			
10.	275	527	7.1	43.5	0.824	40.2	25			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	5.5	49.0	0.838	37.4	28		40	25
12.	225	437	7.1	56.1	0.845	36.0	28		46	45
13.	250	482	6.6	62.7	0.854	34.2	28		59	65
14.	275	527	6.3	69.0	0.863	32.5	30		82	80
15.	300	572	7.3	76.3	0.872	30.8	31		132	95
Residuum			21.7	98.0	-	-				

Carbon residue of residuum: 2.1%

Carbon residue of crude: 0.5%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	3.2	0.708	68.4	
Total gasoline and naphtha	24.7	0.757	55.4	
Kerosine distillate	18.8	0.813	42.6	
Gas oil	11.2	0.841	36.8	
Nonviscous lubricating distillate	13.6	0.848-0.866	35.4-31.9	50-100
Medium lubricating distillate	8.0	0.866-0.877	31.9-29.9	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	21.7			
Distillation loss	2.0			

Remarks: The sample as received contained a trace of water (A.S.T.M.)

CRUDE PETROLEUM ANALYSIS

Laboratory Number 375-58

FIELD: Alhambra

POOL:

ZONE: Cardium

Well Name: Texaco McColl Alhambra D-2-1
 Location: Lsd. 2, Sec. 1, Twp. 42, Rge. 6, W 5th
 Interval tested, depth, feet: 6098-6111
 Producing Zone: Cardium
 Geological Age: Upper Cretaceous

Province: Alberta
 Sample From: D.E.M.R.
 Date Sampled: October 9, 1958
 Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.820
 Sulphur, percent by weight: 0.24
 Saybolt Universal Viscosity:
 at 100°F., sec. 35

A.P.I. gravity at 60°F.: 41.1
 Pour point, °F.: 5
 Colour: Brownish Black
 Carbon residue, percent by weight: 0.9
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 753 mm. Hg.
 First drop, 31°C. (88°F.)

Fraction No.	Cut at °F.	Sum Per Cent	Specific Gravity 60/60°F.	Degrees A.P.I. °60 F.	Correlation Index	Aniline Point, °C.	Visc. S.U. 100°F.	Cloud Test, °F.	Refractive Index @ 20°C.	Dispersion (N _F -N _C) 10 ⁴
1.	122	1.8	0.649	86.5	-	-				
2.	167	5.1	0.671	79.4	8	-				
3.	212	11.1	0.711	67.5	17	55.0				
4.	257	19.2	0.740	59.7	22	51.5				
5.	302	26.3	0.763	54.0	25	51.0				
6.	347	31.8	0.778	50.4	25	53.6				
7.	392	36.9	0.790	47.6	25	58.0				
8.	437	41.7	0.803	44.7	25	62.2				
9.	482	47.3	0.815	42.1	26	67.0				
10.	527	53.4	0.827	39.6	27	71.4				

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	392	58.5	0.842	36.6	30	74.0	39	15		
12.	437	64.2	0.851	34.8	30	77.9	44	35		
13.	482	69.3	0.861	32.8	32	83.0	55	55		
14.	527	74.0	0.872	30.8	34	87.2	76	70		
15.	572	79.2	0.884	28.6	37	90.9	131	85		
Residuum		97.8	0.938	19.4						

Carbon residue of residuum: 4.1%

Carbon residue of crude: 0.9%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	11.1	0.689	73.9	
Total gasoline and naphtha	36.9	0.742	59.2	
Kerosine distillate	10.4	0.809	43.4	
Gas oil	16.9	0.840	37.0	Below 50
Nonviscous lubricating distillate	9.7	0.856-0.877	33.8-30.0	50-100
Medium lubricating distillate	5.3	0.877-0.890	30.0-27.5	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	18.6	0.938	19.4	
Distillation loss	2.2			

CRUDE PETROLEUM ANALYSIS

Laboratory Number 12110

FIELD: Athabaska

POOL:

ZONE: Grand Rapids

Well Name: Athadome No. 2

Location: Lsd. 3, Sec. 15, Twp. 66, Rge. 23, W 4th

Interval tested, depth, feet: 1650-1677

Producing Zone: Grand Rapids

Geological Age: Lower Cretaceous

Province: Alberta

Sample From: Athadome Oil Co.

Date Sampled: May 22, 1933

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.993

Sulphur, percent by weight: 4.0

Saybolt Furol Viscosity:

at 100°F., sec. 1090

A.P.I. gravity at 60°F.: 11.0

Pour point, °F.: 30

Colour: Black

Carbon residue, percent by weight: 12.7
(Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 761 mm. Hg.

First drop, 125°C. (257°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167								
3.	100	212								
4.	125	257								
5.	150	302								
6.	175	347	0.9	0.9	0.803	44.7	-			
7.	200	392	1.1	2.0	0.822	40.6	40			
8.	225	437	1.7	3.7	0.838	37.4	42			
9.	250	482	2.6	6.3	0.850	35.0	42			
10.	275	527	5.1	11.4	0.864	32.3	44			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	1.5	12.9	0.875	30.2	46		39	-
12.	225	437	6.3	19.2	0.894	26.8	51		48	-
13.	250	482	5.8	25.0	0.910	24.0	55		60	Below 5
14.	275	527	8.4	33.4	0.927	21.1	60		131	" 5
15.	300	572	4.5	37.9	0.935	19.8	61		280	" 10
Residuum			60.9	98.8	-	-				

Carbon residue of residuum: 20.8%

Carbon residue of crude: 12.7%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	-	-	-	
Total gasoline and naphtha	2.0	0.813	42.6	
Kerosine distillate	-	-	-	
Gas oil	14.9	0.865	32.1	
Nonviscous lubricating distillate	9.2	0.896-0.919	26.4-22.5	50-100
Medium lubricating distillate	6.0	0.919-0.930	22.5-20.7	100-200
Viscous lubricating distillate	5.8	0.930-0.938	20.7-19.4	Above 200
Residuum	60.9	-	-	
Distillation loss	1.2			

Remarks: The sample as received contained 5.0% by vol. water (A.S.T.M.)

OIL FIELD DATA

Field and Pool: Bashaw D-3

Location: Twp(s) 41, 42, Rge(s) 22, 23, W 4 M

DISCOVERY DETAILS

Well: Name: American Leduc Bashaw #1 (Lsd. 16-31-41-22 W4M)

Completed: July 27, 1951

Perforated: 5815-5817'. 8 Shots

Initial Potential: 960 barrels per day

GEOLOGY

Producing Zone(s): D-3 Reef

Other Shows: D-2, Ireton and Basal Quartz Gas

Trap Type: Structural Stratigraphic

Lithology: Dolomite

Maximum Reservoir Thickness: 595'

Regional Setting: Bashaw Reef Trend

Deepest Formation Penetrated: D-3

DEVELOPMENT DATA

Total Wells: Completed Oil: 26. Gas: 3. Dry and Abandoned: 12

Producing Oil: 24. Suspended Oil: 2

Injection or Disposal: Water: 1. Gas: 0

Well Spacing: 160 Acres

Logging Practice: Resistivity Logs, Sonic Log and Neutron Log

Completion Practice: Cement production casing through the zone and perforate.
Acid wash if necessary.

RESERVOIR DATA

Type of Drive: Gas expansion

Estimated Oil in Place: 13.36 MM S.T.bbls (297 bbls/acre-foot)

Estimated Recoverable Oil: 6.14 MM S.T.bbls (136 bbls/acre-foot)

Oil Zone Thickness: Maximum: 10 feet. Average: 10 feet

Gas Zone Thickness: Maximum: 52 feet

Porosity: 7.1%. Permeability: 800 md

Area: 4,500 Acres

Oil Characteristics: Gravity: 41 °API. Sulphur: 0.5%

Pour Point: 10. Initial Solution GOR: 800

Pressure Maintenance or Secondary Recovery: Nil

PRODUCTION

MPR: 30 BOPD

Economic Allowance: 30

Market Outlet: Trucked to Britamoil Pipeline at New Norway

CRUDE PETROLEUM ANALYSIS

Laboratory Number 1419-51

FIELD: Bashaw

POOL:

ZONE: Leduc (D-3)

Well Name: American Leduc Bashaw No. 1
 Location: Lsd. 16, Sec. 31, Twp. 41, Rge. 22, W 4th
 Interval tested, depth, feet: 5804-5815
 Producing Zone: Leduc (D-3)

Province: Alberta
 Sample From: D.M.T.S.

Date Sampled: September 20,
 1951

Sampled at: Separator

Geological Age: Upper Devonian

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.820
 Sulphur, percent by weight: 0.64
 Saybolt Universal Viscosity:
 at 70°F., sec. 39
 at 100°F., sec. 37

A.P.I. gravity at 60°F.: 41.1
 Pour point, °F.: 30
 Colour: Brownish Green
 Carbon residue, percent by weight: 1.3
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 765 mm. Hg.
 First drop, 24°C. (75°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	3.1	3.1	0.650	86.2	-			
2.	75	167	3.7	6.8	0.687	74.5	16	55.3		
3.	100	212	6.5	13.3	0.719	65.3	21	52.5		
4.	125	257	8.3	21.6	0.745	58.4	24	51.2		
5.	150	302	5.3	26.9	0.764	53.7	26	52.2		
6.	175	347	5.6	32.5	0.780	49.9	26	53.9		
7.	200	392	5.3	37.8	0.794	46.7	27	56.6		
8.	225	437	5.0	42.8	0.810	43.2	29	60.9		
9.	250	482	5.4	48.2	0.823	40.4	30	65.4		
10.	275	527	6.2	54.4	0.836	37.8	31	69.5		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	4.0	58.4	0.850	35.0	34	72.5	40	20
12.	225	437	4.9	63.3	0.859	33.2	34	75.0	46	40
13.	250	482	5.0	68.3	0.870	31.1	36	79.4	59	60
14.	275	527	4.7	73.0	0.882	28.9	39	86.2	85	80
15.	300	572	5.2	78.2	0.889	27.7	39	88.5	155	95
Residuum			19.1	97.3	0.945	18.2				

Carbon residue of residuum: 6.0%

Carbon residue of crude: 1.3%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	13.3	0.694	72.4	
Total gasoline and naphtha	37.8	0.742	59.2	
Kerosine distillate	10.4	0.817	41.7	
Gas oil	14.2	0.846	35.8	
Nonviscous lubricating distillate	9.4	0.863-0.884	32.5-28.6	50-100
Medium lubricating distillate	6.4	0.884-0.893	28.6-27.0	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	19.1	0.945	18.2	
Distillation loss	2.7			

Remarks: The sample as received contained no water (A.S.T.M.) and no salt (as NaCl) per 1000 bbl.

OIL FIELD DATA

Field and Pool: Battle Viking

Location: Twp. 46, Rge. 20, W 4 M

DISCOVERY DETAILS

Method: Subsurface Geology

Well: Name: T.G.T. J. Woods No. 1 (originally Bay S. Camrose 6-11)
Lsd. 6-11-46-20 W 4 M.

Completed: February 21, 1953.

Abandoned: August 12, 1959.

Perforated: 3228'-3239'.

Treatment: None

Initial Potential: 89 BOPD on pump on a 3/16" choke.

GOR: 200 (est) cu.ft/bbl, cut 1-1.5% BS & W.

GEOLOGY

Producing Zone: Viking Formation Colorado Group of Upper Cretaceous

Trap Type: Sandstone Lentil Surrounded by Impermeable Shale and Silty Shale.

Lithology: Med. grained, well rounded white qtz. and chert, salt and pepper sandstone. Secondary silica cement, glauconite, white chert, kaolin and iron stone concretions are found in varying amounts.

Maximum Reservoir Thickness: 25 ft.

Regional Setting: Approximately 48 miles S.E. Edmonton on the Eastern up dip limit of a large northwest trending Viking Sand lentil. The Battle Field is a continuation of the Joseph Lake-Armena-Camrose trend.

Deepest Formation Penetrated: Cooking Lake

DEVELOPMENT DATA

Total Wells: Completed Oil: 13. Dry and Abandoned: 8

Producing Oil: 7. Suspended Oil: 2

Injection or Disposal: Water: 3. Gas: --

Well Spacing: 40 Acres. Pattern: Centre of Lsd.

Logging Practice: Electrical log to total depth (3230'). Microlog or Microlog-Caliper run over Viking formation.

Completion Practice: 600' surface casing. 7" casing set through Viking Sand and perforated. 2 7/8" tubing run and pump installed.

RESERVOIR DATA

Type of Drive: Water

Estimated Oil in Place: 2,670,000 S.T.bbls (513 bbls/acre-foot)

Estimated Recoverable Oil: 800,000 S.T.bbls (154 bbls/acre-foot)

Oil Zone Thickness: Maximum: 14 feet. Average: 10 feet.

Gas Zone Thickness: None

Porosity: 17%. Permeability: 250 md. Area: 520 Acres

Oil Characteristics: Gravity: 37° API. Sulphur: 0.15%

Pour Point: 50°. Initial Solution GOR: 225 cu.ft/bbl

Base: Paraffin

Pressure Maintenance or Secondary Recovery: None

PRODUCTION

MPR: Less than 30 BOPD

Economic Allowance: Present: 30 BOPD. Operating: 25 BOPD

Market Outlet: Edmonton Terminal via Britamoil Pipeline.

Bibliographical References: Hunt, C.W. The Joseph Lake-Armena-Camrose Producing Trend, Alberta; A.A.P.G. Western Canada Sedimentary Basin Symposium, pp. 452-463, 1954.

Edie, R.W. The Inclined Oil-Water Contact at the Joarcam Field; A.S.P.G. Jour., v 3, pp. 99-103, 1955.

Jardine, D. The Joarcam Viking Oil Field; Oil in Canada, v 6, p. 107-18, August 16, 1954.

OIL FIELD DATA

Field and Pool: Battle South-Viking

Location: Twp. 45, Rge. 20, W 4 M

DISCOVERY DETAILS

Method: Sub**surface** Geology

Well: Name: Cleary Dried Meat L. 2, Lsd. 13-25-45-20 W 4

Completed: November 5, 1954 FTD 3,240' in Viking Form.

Perforated: 3,168'-3,178'

Treatment: 250 Gals. Mud Acid

Initial Potential: 60 BOPD

GEOLOGY

Producing Zone(s): Viking Form., Colorado Group of U. Cretaceous

Other Shows: None

Trap Type: Sandstone Lentil Surrounded by Impermeable Shale & Silty Shale

Lithology: Med. Grnd. Well Rnd., Wh. Qtz. & Cht, Salt & Pepper ss. Secondary silica cmt., glauc., wh. cht., kaolin & ironstone concretions are found in varying amounts.

Maximum Reservoir Thickness: 20'

Regional Setting: 48 mi. SE of Edmonton, on eastern up dip limit of a large NW trending Vik. sand lentil. The Battle fields are a continuation of the Joseph L. - Armena-Camrose productive trend and range from 3 to 9 miles south of southern limit of Joarcam field.

Deepest Formation Penetrated: Cooking Lake: 5,225'

DEVELOPMENT DATA

Total Wells: Completed Oil: 10

Producing Oil: 10

Injection or Disposal: Water: 1

Well Spacing: 40 Acres

Logging Practice: E. log to T.D. (3,230') ML & MLC run over Vik. Formation

Completion Practice: 600' surface casing, 7" casing set through Viking sand and perforated. 2 7/8" tubing run and pump installed.

RESERVOIR DATA

Type of Drive: Water

Estimated Oil in Place: 5,272,000 S.T.bbls (673 bbls/acre-foot)

Estimated Recoverable Oil: 1,286,000 S.T.bbls (164 bbls/acre-foot)

Oil Zone Thickness: Average: 12.7'

Gas Zone Thickness: None

Porosity: 15%. Permeability: 172 md

Area: 440 Acres

Oil Characteristics: Gravity: 36.8 °API. Sulphur: 0.15%

Base: Paraffin. Initial Solution GOR: 200 Scf/STB

Pressure Maintenance or Secondary Recovery: None

PRODUCTION

Economic Allowance: Present 30 BOPD. Operating: 25 BOPD

Market Outlet: Edmonton terminal via Britamoil pipeline

Bibliographical References: Hunt, C.W. The Joseph Lake-Armena-Camrose Producing Trend, Alberta; AAPG Western Canada Sedimentary Basin Symposium, pp 452-463, 1954.

Edie, R.W. The Inclined Oil-Water Contact at the Joarcam Field; ASPG Journ., v.3, pp 99-103, 1955.
Jardine, D. The Joarcam Viking Oil Field; Oil in Canada, v.6, p. 107-18, August 16, 1954.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 209-56

FIELD: Battle

POOL:

ZONE: Viking

Well Name: Dome West Canadian Battle No. 11-2
 Location: Lsd. 11, Sec. 2, Twp. 46, Rge. 20, W 4th
 Interval tested, depth, feet: 3204-3219
 Producing Zone: Viking
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: June 1, 1956
 Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.840
 Sulphur, percent by weight: 0.15
 Saybolt Universal Viscosity:
 at 100°F., sec. 44

A.P.I. gravity at 60°F.: 37.0
 Pour point, °F.: 50
 Colour: Brownish Black
 Carbon residue, percent by weight: 1.6
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 757 mm. Hg.
 First drop, 39°C. (102°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167	1.9	1.9	0.683	75.7	-	60.3		
3.	100	212	3.6	5.5	0.709	68.1	16	57.8		
4.	125	257	5.3	10.8	0.734	61.3	19	57.4		
5.	150	302	5.1	15.9	0.753	56.4	20	58.3		
6.	175	347	4.6	20.5	0.768	52.7	21	60.4		
7.	200	392	4.3	24.8	0.783	49.2	22	62.0		
8.	225	437	4.9	29.7	0.798	45.8	23	65.2		
9.	250	482	5.0	34.7	0.812	42.8	24	68.9		
10.	275	527	7.0	41.7	0.824	40.2	25	73.1		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	4.3	46.0	0.840	37.0	29	75.4	39	15
12.	225	437	5.7	51.7	0.847	35.6	28	80.0	44	35
13.	250	482	5.8	57.5	0.856	33.8	29	84.5	53	55
14.	275	527	6.2	63.7	0.867	31.7	31	89.0	74	75
15.	300	572	6.2	69.9	0.878	29.7	34	93.8	120	90
Residuum			27.6	97.5	0.935	19.8				

Carbon residue of residuum: 5.3%

Carbon residue of crude: 1.6%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	5.5	0.700	70.6	
Total gasoline and naphtha	24.8	0.745	58.4	
Kerosine distillate	16.9	0.813	42.6	
Gas oil	10.9	0.845	36.0	
Nonviscous lubricating distillate	11.5	0.853-0.873	34.4-30.6	50-100
Medium lubricating distillate	5.8	0.873-0.883	30.6-28.8	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	27.6	0.935	19.8	
Distillation loss	2.5			

Remarks: The sample as received contained 1 lb. salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 385-58

FIELD: Battle North

POOL:

ZONE: Viking

Well Name: Shermak No. 1
 Location: Lsd. 1b, Sec. 15, Twp. 46, Rge. 20, W 4
 Interval tested, depth, feet: 3242-3247
 Producing Zone: Viking
 Geological Age: Upper Cretaceous

Province: Alberta
 Sample From: D.E.M.R.
 Date Sampled: October 30, 1958
 Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.839	A.P.I. gravity at 60°F.: 37.2
Sulphur, percent by weight: 0.33	Pour point, °F.: 45
Saybolt Universal Viscosity: at 100°F., sec. 44	Colour: Brownish Black
	Carbon residue, percent by weight: 1.6 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 761 mm. Hg.
 First drop, 38°C. (100.4°F.)

Fraction No.	Cut at °F.	Sum Per Cent	Specific Gravity 60/60°F.	Degrees A.P.I. °60 F.	Correlation Index	Aniline Point, °C.	Visc. S.U. 100°F.	Cloud Test, °F.	Refractive Index @ 20°C.	Dispersion (N _F -N _C) 10 ⁴
1.	122									
2.	167	1.9	0.692	73.0	18					
3.	212	11.3	0.728	62.9	25	57.5				
4.	257	14.7	0.752	56.7	27	56.8				
5.	302	16.5	0.761	54.4	24	58.1				
6.	347	19.5	0.771	52.0	22	59.0				
7.	392	24.1	0.786	48.5	23	61.4				
8.	437	29.0	0.801	45.2	24	64.2				
9.	482	34.0	0.815	42.1	26	67.5				
10.	527	41.0	0.828	39.4	27	72.3				

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	392	44.1	0.841	36.8	29	75.6	39	25		
12.	437	50.0	0.848	35.4	29	79.8	43	45		
13.	482	56.0	0.857	33.6	30	84.4	53	65		
14.	527	61.5	0.867	31.7	31	87.5	70	80		
15.	572	68.6	0.879	29.5	34	91.0	115	95		
Residuum		96.3	0.934	20.0						

Carbon residue of residuum: 5.3%

Carbon residue of crude: 1.6%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	11.3	0.722	64.5	
Total gasoline and naphtha	24.1	0.747	57.9	
Kerosine distillate	9.9	0.808	43.6	
Gas oil	17.2	0.839	37.2	Below 50
Nonviscous lubricating distillate	11.8	0.854-0.875	34.2-30.2	50-100
Medium lubricating distillate	5.6	0.875-0.885	30.2-28.4	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	27.7	0.934	20.0	
Distillation loss	3.7			

CRUDE PETROLEUM ANALYSIS

Laboratory Number 257-56

FIELD: Battle South

POOL:

ZONE: Viking

Well Name: Dome-West Canadian - Driedmeat Lake No. 15-26
 Location: Lsd. 15, Sec. 26, Twp. 45, Rge. 20, W 4th
 Interval tested, depth, feet: 3176-3190
 Producing Zone: Viking
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: D.M.T.S.

Date Sampled: June 28, 1956
 Sampled at: Before separator

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.845
 Sulphur, percent by weight: 0.14
 Saybolt Universal Viscosity:
 at 100°F., sec. 46

A.P.I. gravity at 60°F.: 36.0
 Pour point, °F.: 45
 Colour: Greenish Black
 Carbon residue, percent by weight: 1.7
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 761 mm. Hg.
 First drop, 60°C. (140°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167								
3.	100	212	3.4	3.4	0.705	69.2	-	59.9		
4.	125	257	5.8	9.2	0.733	61.5	18	57.6		
5.	150	302	4.3	13.5	0.752	56.7	20	58.6		
6.	175	347	4.7	18.2	0.767	53.0	20	60.1		
7.	200	392	4.6	22.8	0.782	49.4	21	62.5		
8.	225	437	4.9	27.7	0.797	46.0	23	65.7		
9.	250	482	5.4	33.1	0.811	43.0	24	69.0		
10.	275	527	7.1	40.2	0.824	40.2	25	72.9		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	4.1	44.3	0.837	37.6	28	75.0	38	15
12.	225	437	5.6	49.9	0.844	36.2	27	79.2	43	35
13.	250	482	6.0	55.9	0.855	34.0	29	84.0	54	55
14.	275	527	6.3	62.2	0.865	32.1	31	87.7	71	70
15.	300	572	7.4	69.6	0.877	29.8	33	91.9	117	90
Residuum			28.2	97.8	0.938	19.4				

Carbon residue of residuum: 5.3%

Carbon residue of crude: 1.7%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	3.4	0.705	69.2	
Total gasoline and naphtha	22.8	0.749	57.4	
Kerosine distillate	17.4	0.812	42.8	
Gas oil	10.6	0.842	36.6	
Nonviscous lubricating distillate	12.6	0.851-0.872	34.8-30.8	50-100
Medium lubricating distillate	6.2	0.872-0.883	30.8-28.8	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	28.2	0.938	19.4	
Distillation loss	2.2			

Remarks: The sample as received contained 3 lb. salt (as NaCl) per 1000 bbl.

OIL FIELD DATA

Field and Pool: Bellshill Lake Field, Blairmore Oil Pool

Location: Twp. 41, Rge. 12, W 4 M

DISCOVERY DETAILS

Method: **Subsurface** Geology

Well: Name: Richfield McLennan 6-32-41-12

Completed: January 1956

Perforated: 2964-2975'. 2 1/2" BHPF

Treatment: None

Initial Potential: 118 BOPD, GOR: 253 SCF/bbl, 0.8% BS & W,
29/64" Bean

GEOLOGY

Producing Zone(s): Blairmore Sand

Other Shows: Viking Gas

Trap Type: Stratigraphic

Lithology: Sandstone: fine-medium grained, sub-rounded, well sorted with occasional thin streaks black shale.

Maximum Reservoir Thickness: 250'

Regional Setting: Basal Blairmore sand deposited on Devonian unconformity.

Deepest Formation Penetrated: Devonian-Leduc

DEVELOPMENT DATA

Total Wells: Completed Oil: 91. Gas: 0. Dry and Abandoned: 11

Producing Oil: 88. Suspended Oil: 3

Injection or Disposal: Water: 6. Gas: 0

Well Spacing: 40 Acres/Well. Pattern: Centre of Legal Sub-Division

Logging Practice: Induction-Electric and Microlog-Caliper from total depth to surface casing.

Completion Practice: Case through and perforate. Penetrate top sand section, case and perforate.

RESERVOIR DATA

Type of Drive: Partial Water

Estimated Oil in Place: 196,000,000 S.T.bbls (1698 bbls/acre-foot)

Estimated Recoverable Oil: 24,500,000 S.T.bbls (212 bbls/acre-foot)

Oil Zone Thickness: Maximum: 70'. Average: 29.9'

Gas Zone Thickness: Maximum: 15'

Porosity: 27.1%. Permeability: 806 md (H)

Area: 4075 Acres

Oil Characteristics: Gravity: 28 °API. Sulphur: 1.39%

Pour Point: +25°F. Initial Solution GOR: 139 SCF/bbl

Pressure Maintenance or Secondary Recovery: No

PRODUCTION

MPR: 50 BOPD

Economic Allowance: 25 BOPD Present, Operating: 25 BOPD

Market Outlet: Gibson Petroleum Co. Ltd. to Inter-Provincial Pipeline.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 386-58

FIELD: Bellshill Lake

POOL:

ZONE: Basal Blairmore

Well Name: Richfield McLennan "F" 2-32
 Location: Lsd. 2, Sec. 32, Twp. 41, Rge. 12, W 4
 Interval tested, depth, feet: 2945-2965
 Producing Zone: Blairmore Basal Quartz
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: D.E.M.R.
 Date Sampled: October 29, 1958
 Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.890
 Sulphur, percent by weight: 1.74
 Saybolt Universal Viscosity:
 at 100°F., sec. 71
 at 70°F., sec. 122
 A.P.I. gravity at 60°F.: 27.5
 Pour point, °F.: 15
 Colour: Black
 Carbon residue, percent by weight: 4.1
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 756 mm. Hg.
 First drop, 44°C. (111°F.)

Fraction No.	Cut at °F.	Sum Per Cent	Specific Gravity 60/60°F.	Degrees A.P.I. °60 F.	Correlation Index	Aniline Point, °C.	Visc. S.U. 100°F.	Cloud Test, °F.	Refractive Index @ 20°C.	Dispersion _h (N _F -N _C) 10 ⁴
1.	122									
2.	167	1.5	0.680	76.6	12					
3.	212	3.9	0.707	68.6	15	57.5				
4.	257	6.7	0.732	61.8	18	56.2				
5.	302	9.7	0.751	56.9	19	58.9				
6.	347	12.9	0.772	51.8	23	60.0				
7.	392	15.6	0.792	47.2	26	61.3				
8.	437	20.0	0.810	43.2	29	61.6				
9.	482	25.5	0.828	39.4	32	62.5				
10.	527	33.4	0.847	35.6	36	64.0				

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	392	37.8	0.866	31.9	41	66.0	39	15		
12.	437	42.9	0.875	30.2	42	68.6	45	35		
13.	482	47.1	0.887	28.0	44	71.2	56	55		
14.	527	53.8	0.901	25.6	48	73.9	84	75		
15.	572	60.6	0.912	23.6	50	74.6	156	95		
Residuum		95.3	0.989	11.6						

Carbon residue of residuum: 10.6%

Carbon residue of crude: 4.1%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	3.9	0.697	71.5	
Total gasoline and naphtha	15.6	0.745	58.4	
Kerosine distillate	4.4	0.810	43.2	
Gas oil	22.5	0.852	34.6	Below 50
Nonviscous lubricating distillate	9.5	0.880-0.903	29.3-25.2	50-100
Medium lubricating distillate	8.6	0.903-0.918	25.2-22.6	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	34.7	0.989	11.6	
Distillation loss	4.7			

CRUDE PETROLEUM ANALYSIS

Laboratory Number 428-57

FIELD: Bentley

POOL:

ZONE: Viking

Well Name: California Std. Bentley No. 14-10
 Location: Lsd. 14, Sec. 10, Twp. 40, Rge. 1, W 5
 Interval tested, depth, feet: 5509-5517
 Producing Zone: Viking
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: D.E.M.R.
 Date Sampled: November 27, 1957.
 Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.820
 Sulphur, percent by weight: 0.31
 Saybolt Universal Viscosity:
 at 100°F., sec. 41

A.P.I. gravity at 60°F.: 41.1
 Pour point, °F.: Below -50
 Colour: Brownish Green
 Carbon residue percent by weight: 1.1
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 755 mm. Hg.
 First drop, 26°C. (79°F.)

Fraction No.	Cut at °F.	Sum Per Cent	Specific Gravity 60/60°F.	Degrees A.P.I. °60 F.	Correlation Index	Aniline Point, °C.	Visc. S.U. 100°F.	Cloud Test, °F.	Refractive Index @ 20°C.	Dispersion (N _F -N _C) 10 ⁴
1.	122	2.3	0.656	84.2	-	-				
2.	167	5.7	0.677	77.5	11	58.5				
3.	212	10.7	0.710	67.8	17	55.5				
4.	257	16.8	0.738	60.2	21	53.2				
5.	302	21.9	0.760	54.7	24	53.0				
6.	347	26.6	0.776	50.9	24	55.8				
7.	392	31.3	0.789	47.8	24	59.2				
8.	437	36.0	0.802	44.9	25	64.0				
9.	482	40.5	0.816	41.9	26	68.2				
10.	527	46.3	0.828	39.4	27	72.6				

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	392	50.2	0.842	36.6	30	76.9	40	25		
12.	437	56.4	0.850	35.0	30	82.0	46	45		
13.	482	61.4	0.860	33.0	31	86.1	60	65		
14.	527	65.0	0.868	31.5	32	90.5	80	80		
15.	572	71.5	0.879	29.5	34	94.2	133	95		
Residuum		96.3	0.924	21.6						

Carbon residue of residuum: 3.9%

Carbon residue of crude: 1.1%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	10.7	0.688	74.2	
Total gasoline and naphtha	31.3	0.738	60.2	
Kerosine distillate	9.2	0.809	43.4	
Gas oil	14.5	0.839	37.2	Below 50
Nonviscous lubricating distillate	10.2	0.853-0.872	34.4-30.8	50-100
Medium lubricating distillate	6.3	0.872-0.886	30.8-28.2	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	24.8	0.924	21.6	
Distillation loss	3.7			

CRUDE PETROLEUM ANALYSIS

Laboratory Number 2436

FIELD: Blood Indian Reserve

POOL:

ZONE: Rundle

Well Name: Northwest West No. 1
 Location: Lsd. 3, Sec. 20, Twp. 5, Rge. 23, W 4
 Interval tested, depth, feet: 6137-6142

Province: Alberta
 Sample From: Indian Affairs
 Branch, Dept. of
 Mines & Resources
 Date Sampled: January 22, 1941
 Sampled at: Wellhead

Producing Zone: Rundle
 Geological Age: Mississippian

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.848
 Sulphur, percent by weight: 0.81
 Saybolt Universal Viscosity:
 at 70°F., sec. 53
 at 100°F., sec. 42

A.P.I. gravity at 60°F.: 35.4
 Pour point, °F.: 20
 Colour: Dark Green
 Carbon residue, percent by weight: 1.0
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 760 mm. Hg.
 First drop, 38°C. (100°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	0.3	0.3)						
2.	75	167	1.7	2.0)	0.683	75.7	-			
3.	100	212	1.6	3.6	0.716	66.1	19			
4.	125	257	4.4	8.0	0.738	60.2	21			
5.	150	302	6.8	14.8	0.759	54.9	23			
6.	175	347	6.3	21.1	0.779	50.1	26			
7.	200	392	6.4	27.5	0.793	46.9	26			
8.	225	437	6.8	34.3	0.807	43.8	27			
9.	250	482	7.3	41.6	0.820	41.1	28			
10.	275	527	8.2	49.8	0.837	37.6	32			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	5.3	55.1	0.854	34.2	36		40	15
12.	225	437	6.6	61.7	0.864	32.3	37		47	35
13.	250	482	7.6	69.3	0.877	29.9	39		63	55
14.	275	527	4.4	73.7	0.889	27.7	42		94	75
15.	300	572	6.7	80.4	0.895	26.6	42		155	90
Residuum			19.2	99.6	0.936	19.7				

Carbon residue of residuum: 5.4%

Carbon residue of crude: 1.0%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	3.6	0.698	71.2	
Total gasoline and naphtha	27.5	0.760	54.7	
Kerosine distillate	14.1	0.814	42.3	
Gas oil	18.1	0.848	35.4	
Nonviscous lubricating distillate	12.4	0.867-0.890	31.7-27.5	50-100
Medium lubricating distillate	8.3	0.890-0.899	27.5-25.9	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	19.2	0.936	19.7	
Distillation loss	0.4			

Remarks: The sample as received contained 0.3% by vol. water and sediment (by centrifuge)

CRUDE PETROLEUM ANALYSIS

Laboratory Number 2452

FIELD: Blood Indian Reserve

POOL:

ZONE: Rundle

Well Name: Northwest West No. 1
 Location: Lsd. 3, Sec. 20, Twp. 5, Rge. 23, W 4
 Interval tested, depth, feet: Approx. 6200

Province: Alberta
 Sample From: Indian Affairs Branch,
 Dept. of Mines and
 Resources

Producing Zone: Rundle
 Geological Age: Mississippian

Date Sampled: January 28, 1941
 Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.846
 Sulphur, percent by weight: 0.80
 Saybolt Universal Viscosity:
 at 70°F., sec. 49
 at 100°F., sec. 40

A.P.I. gravity at 60°F.: 35.8
 Pour point, °F.: 15
 Colour: Dark Green
 Carbon residue, percent by weight: 0.9
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 754 mm. Hg.
 First drop, 40°C. (104°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	0.5	0.5)	-	-	-			
2.	75	167	1.3	1.8)	0.678	77.2	-			
3.	100	212	3.2	5.0	0.716	66.1	19			
4.	125	257	5.7	10.7	0.740	59.7	22			
5.	150	302	7.0	17.7	0.761	54.4	24			
6.	175	347	6.0	23.7	0.779	50.1	26			
7.	200	392	6.1	29.8	0.794	46.7	27			
8.	225	437	6.3	36.1	0.808	43.6	28			
9.	250	482	6.2	42.3	0.822	40.6	29			
10.	275	527	7.2	49.5	0.835	38.0	31			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	5.3	54.8	0.851	34.8	34		40	10
12.	225	437	6.5	61.3	0.862	32.7	36		47	35
13.	250	482	7.0	68.3	0.876	30.0	39		61	55
14.	275	527	6.1	74.4	0.888	27.9	41		93	70
15.	300	572	6.1	80.5	0.896	26.4	42		158	90
Residuum			19.0	99.5	0.931	20.5				

Carbon residue of residuum: 4.9%

Carbon residue of crude: 0.9%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	5.0	0.702	70.1	
Total gasoline and naphtha	29.8	0.757	55.4	
Kerosine distillate	12.5	0.815	42.1	
Gas oil	17.2	0.847	35.6	
Nonviscous lubricating distillate	12.6	0.865-0.889	32.1-27.7	50-100
Medium lubricating distillate	8.4	0.889-0.900	27.7-25.7	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	19.0	0.931	20.5	
Distillation loss	0.5			

Remarks: The sample as received contained 0.1% by vol. water and sediment (by centrifuge)

CRUDE PETROLEUM ANALYSIS

Laboratory Number 2552

FIELD: Blood Indian Reserve

POOL:

ZONE: Rundle

Well Name: Northwest West No. 1
 Location: Lsd. 3, Sec. 20, Twp. 5, Rge. 23, W 4
 Interval tested, depth, feet: 6118-6160

Province: Alberta
 Sample From: Indian Affairs Branch,
 Dept. of Mines and
 Resources

Producing Zone: Rundle
 Geological Age: Mississippian

Date Sampled: April 29, 1941
 Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.846
 Sulphur, percent by weight: 1.00
 Saybolt Universal Viscosity:
 at 70°F., sec. 54
 at 100°F., sec. 42

A.P.I. gravity at 60°F.: 35.8
 Pour point, °F.: 35
 Colour: Dark Green
 Carbon residue, percent by weight: 1.1
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 751 mm. Hg.
 First drop, 40°C. (104°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	-	-	-	-	-	-	-	-
2.	75	167	2.3	2.3	0.677	77.5	-	-	-	-
3.	100	212	9.6	11.9	0.727	63.1	25	-	-	-
4.	125	257	2.0	13.9	0.749	57.4	26	-	-	-
5.	150	302	3.4	17.3	0.764	53.7	26	-	-	-
6.	175	347	7.1	24.4	0.778	50.4	25	-	-	-
7.	200	392	4.9	29.3	0.793	46.9	26	-	-	-
8.	225	437	6.3	35.6	0.805	44.3	26	-	-	-
9.	250	482	6.9	42.5	0.819	41.3	28	-	-	-
10.	275	527	6.2	48.7	0.835	38.0	31	-	-	-

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	4.3	53.0	0.850	35.0	34	39	10
12.	225	437	6.8	59.8	0.859	33.2	34	45	30
13.	250	482	6.1	65.9	0.873	30.6	37	56	50
14.	275	527	6.3	72.2	0.885	28.4	40	81	70
15.	300	572	4.9	77.1	0.892	27.1	40	137	90
Residuum			21.0	98.1	0.937	19.5			

Carbon residue of residuum: 5.4%

Carbon residue of crude: 1.1%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	11.9	0.717	65.9	
Total gasoline and naphtha	29.3	0.752	56.7	
Kerosine distillate	13.2	0.812	42.8	
Gas oil	16.7	0.848	35.4	
Nonviscous lubricating distillate	11.7	0.865-0.888	32.1-27.9	50-100
Medium lubricating distillate	6.2	0.888-0.895	27.9-26.6	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	21.0	0.937	19.5	
Distillation loss	1.9			

Remarks: The sample as received contained 2.4% by vol. water and sediment (by centrifuge).

CRUDE PETROLEUM ANALYSIS

Laboratory Number 2629

FIELD: Blood Indian Reserve

POOL:

ZONE: Rundle

Well Name: Lethbridge Petroleum & Refining No. 1
 Location: Lsd. 12, Sec. 11, Twp. 8, Rge. 22, W 4
 Interval tested, depth, feet: 4144-4290

Province: Alberta
 Sample From: Indian Affairs Branch,
 Dept. of Mines and
 Resources

Producing Zone: Rundle
 Geological Age: Mississippian

Date Sampled: July 10, 1941
 Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.885
 Sulphur, percent by weight: 0.93
 Saybolt Universal Viscosity:
 at 70°F., sec. 131
 at 100°F., sec. 67

A.P.I. gravity at 60°F.: 28.4
 Pour point, °F.: 45
 Colour: Dark Green
 Carbon residue, percent by weight: 2.2
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 756 mm. Hg.
 First drop, 90°C. (194°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167								
3.	100	212								
4.	125	257	2.3	2.3	0.746	58.2	-			
5.	150	302	1.4	3.7	0.772	51.8	29			
6.	175	347	2.4	6.1	0.783	49.2	28			
7.	200	392	3.5	9.6	0.795	46.5	27			
8.	225	437	4.3	13.9	0.809	43.4	28			
9.	250	482	5.4	19.3	0.822	40.6	29			
10.	275	527	9.2	28.5	0.838	37.4	32			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	9.5	38.0	0.856	33.8	37		40	20
12.	225	437	7.8	45.8	0.868	31.5	38		46	35
13.	250	482	7.0	52.8	0.881	29.1	41		59	55
14.	275	527	7.5	60.3	0.887	28.0	41		81	70
15.	300	572	9.7	70.0	0.896	26.4	42		141	85
Residuum			28.0	98.0	0.954	16.8				

Carbon residue of residuum: 7.9%

Carbon residue of crude: 2.2%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline				
Total gasoline and naphtha	9.6	0.777	50.6	
Kerosine distillate	9.7	0.816	41.9	
Gas oil	25.1	0.852	34.6	
Nonviscous lubricating distillate	14.8	0.872-0.890	30.8-27.5	50-100
Medium lubricating distillate	10.8	0.890-0.901	27.5-25.6	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	28.0	0.954	16.8	
Distillation loss	2.0			

Remarks: The sample as received contained 1.5% by vol. water and sediment (by centrifuge).

CRUDE PETROLEUM ANALYSIS

Laboratory Number 2840

FIELD: Blood Indian Reserve

POOL:

ZONE: Rundle

Well Name: Northwest Treaty No. 1
 Location: Lsd. 4, Sec. 17, Twp. 8, Rge. 23, W 4
 Interval tested, depth, feet: 6031-6074

Province: Alberta
 Sample From: Indian Affairs
 Branch, Dept. of
 Mines & Resources

Producing Zone: Rundle
 Geological Age: Mississippian

Date Sampled: August 14, 1941
 Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.868
 Sulphur, percent by weight: 1.5
 Saybolt Universal Viscosity:
 at 100°F., sec. 47

A.P.I. gravity at 60°F.: 31.5
 Pour point, °F.: 15
 Colour: Dark Green
 Carbon residue, percent by weight: 2.4
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure; 752 mm. Hg.
 First drop, 55°C. (131°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167	1.1	1.1)	-	-				
3.	100	212	1.0	2.1)	0.706	68.9				
4.	125	257	4.1	6.2	0.741	59.5	22			
5.	150	302	5.8	12.0	0.764	53.7	26			
6.	175	347	7.6	19.6	0.784	49.0	28			
7.	200	392	5.9	25.5	0.799	45.6	29			
8.	225	437	5.3	30.8	0.811	43.0	29			
9.	250	482	7.7	38.5	0.828	39.4	32			
10.	275	527	6.7	45.2	0.843	36.4	34			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	6.1	51.3	0.858	33.4	37		41	10
12.	225	437	5.9	57.2	0.870	31.1	39		48	30
13.	250	482	6.9	64.1	0.885	28.4	43		63	50
14.	275	527	6.4	70.5	0.897	26.3	46		98	70
15.	300	572	6.8	77.3	0.906	24.7	47		179	90
Residuum			22.2	99.5	0.970	14.4				

Carbon residue of residuum: 10.6%

Carbon residue of crude: 2.4%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	2.1	0.706	68.9	
Total gasoline and naphtha	25.5	0.770	52.3	
Kerosine distillate	5.3	0.811	43.0	
Gas oil	24.3	0.846	35.8	
Nonviscous lubricating distillate	12.3	0.872-0.897	30.8-26.3	50-100
Medium lubricating distillate	8.1	0.897-0.908	26.3-24.3	100-200
Viscous lubricating distillate	1.8	0.908-0.911	24.3-23.8	Above 200
Residuum	22.2	0.970	14.4	
Distillation loss	0.5			

Remarks: The sample as received contained 9.0% by vol. water and sediment (by centrifuge).

OIL FIELD DATA

Field and Pool: Bonnie Glen D-3 'A'

Location: Twp. 47, Rge. 27, W 4 M

DISCOVERY DETAILS

Method: Seismic Reflection, Subsurface Geology

Well Name: Texaco Bonnie Glen A-1, 3-20-47-27-W 4 M

Completed: January 3, 1952. Perforated: 6,930-6,990 feet.

GEOLOGY

Producing Zone(s): Leduc D-3. Other Shows: Cardium, Viking, Ellerslie, D-2 Nisku

Trap Type: Biohermal Reef. Lithology: Dolomitized Reef Facies.

Maximum Reservoir Thickness: 800 feet. Regional Setting: Rimbey-Meadowbrook Reef Trend.

Deepest Formation Penetrated: Cooking Lake, Devonian.

DEVELOPMENT DATA

Total Wells: Completed Oil: 155; Producing Oil: 155;

Injection or Disposal: Water: 2. Gas: 1 (LPG)

Well Spacing: 40 Acres. Pattern: Square. Logging Practice: Various

Completion Practice: Various (Barefoot, Linor, Cemented Oil String)

RESERVOIR DATA

Type of Drive: Gas and Partial Water

Estimated Oil in Place: 600,000,000 S.T.bbls (454 bbls/acre-foot)

Estimated Recoverable Oil: 390,000,000 S.T.bbls (295 bbls/acre-foot)

Oil Zone Thickness: Maximum: 305'. Average: 195'

Gas Zone Thickness: Maximum: 400'

Porosity: 9.44%. Permeability: 350 md (extreme range). Area: 6,800 Acres

Oil Characteristics: Gravity: 42° API. Sulphur: 0.25%

Pour Point: +20° F. Initial Solution GOR: 760 cf/b

Base: Paraffin

Pressure Maintenance or Secondary Recovery: None

PRODUCTION

MPR: Not applicable

Economic Allowance: Present: 33 BOPD/well

Operating: 33 BOPD/well

Market Outlet (pipeline): Texaco pipeline

CRUDE PETROLEUM ANALYSIS

Laboratory Number 244-56

FIELD: Bonnie Glen

POOL:

ZONE: Leduc (D-3)

Well Name: Texaco Bonnie Glen C.P.R. A-2
 Location: Lsd. 12, Sec. 17, Twp. 47, Rge. 27, W 4
 Interval tested, depth, feet: 6780-6790
 Producing Zone: Leduc (D-3)
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: June 20, 1956
 Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.823
 Sulphur, percent by weight: 0.19
 Saybolt Universal Viscosity:
 at 100°F., sec. 35

A.P.I. gravity at 60°F.: 40.4
 Pour point, °F.: 30
 Colour: Brownish Black
 Carbon residue, percent by weight: 0.8
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 756 mm. Hg.
 First drop, 33°C. (91°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	1.0	1.0)						
2.	75	167	2.1	3.1)	0.669	80.0	-			
3.	100	212	5.6	8.7	0.711	67.5	17	53.6		
4.	125	257	8.1	16.8	0.744	58.7	24	49.5		
5.	150	302	7.9	24.7	0.765	53.5	26	48.5		
6.	175	347	6.3	31.0	0.781	49.7	27	49.4		
7.	200	392	5.1	36.1	0.796	46.3	28	53.5		
8.	225	437	5.9	42.0	0.808	43.6	28	58.6		
9.	250	482	5.7	47.7	0.819	41.3	28	63.1		
10.	275	527	7.2	54.9	0.832	38.6	29	68.6		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	4.0	58.9	0.846	35.8	32	71.2	38	5
12.	225	437	5.4	64.3	0.854	34.2	32	76.0	43	30
13.	250	482	5.6	69.9	0.866	31.9	34	79.9	54	50
14.	275	527	4.8	74.7	0.877	29.8	36	83.5	71	65
15.	300	572	5.5	80.2	0.887	28.0	38	88.0	120	80
Residuum			17.7	97.9	0.938	19.4				

Carbon residue of residuum: 4.0%

Carbon residue of crude: 0.8%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	8.7	0.696	71.8	
Total gasoline and naphtha	36.1	0.751	56.9	
Kerosine distillate	11.6	0.813	42.6	
Gas oil	17.5	0.843	36.4	
Nonviscous lubricating distillate	10.1	0.862-0.883	32.6-28.8	50-100
Medium lubricating distillate	4.9	0.883-0.892	28.8-27.1	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	17.7	0.938	19.4	
Distillation loss	2.1			

Remarks: The sample as received contained 3 lb. of salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 1537-51

FIELD: Bonnyville

POOL:

ZONE: Colony

Well Name: Tor American Bonnyville No. 1
 Location: Lsd. 11, Sec. 29, Twp. 60, Rge. 5, W 4
 Interval tested, depth, feet: 1168-1178
 Producing Zone: Colony
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: October 12, 1951
 Sampled at: Tank

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.971
 Sulphur, percent by weight: 3.66
 Saybolt Universal Viscosity:
 at 100°F., sec. 404
 at 130°F., sec. 145
 A.P.I. gravity at 60°F.: 14.2
 Pour point, °F.: 15
 Colour: Brownish Black
 Carbon residue, percent by weight: 9.9
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 753 mm. Hg.
 First drop, 68°C. (154°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	-	-						
2.	75	167	-	-						
3.	100	212	1.0	1.0	0.742	59.2	-	-		
4.	125	257	1.1	2.1	0.760	54.7	31	-		
5.	150	302	1.5	3.6	0.773	51.6	30	45.2		
6.	175	347	1.3	4.9	0.793	46.9	32	47.5		
7.	200	392	1.9	6.8	0.812	42.8	35	49.0		
8.	225	437	2.7	9.5	0.831	38.8	39	52.5		
9.	250	482	4.0	13.5	0.848	35.4	41	54.2		
10.	275	527	6.5	20.0	0.867	31.7	46	55.6		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	3.2	23.2	0.885	28.4	50	56.5	42	-
12.	225	437	5.0	28.2	0.899	25.9	53	58.0	53	-
13.	250	482	5.3	33.5	0.915	23.1	57	59.8	77	-
14.	275	527	4.8	38.3	0.928	21.0	60	62.5	136	-
15.	300	572	6.3	44.6	0.937	19.5	62	63.6	327	-5
Residuum			54.6	99.2	1.032	5.6				

Carbon residue of residuum: 16.1%

Carbon residue of crude: 9.9%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	1.0	0.742	59.2	
Total gasoline and naphtha	6.8	0.781	49.7	
Kerosine distillate	-	-	-	
Gas oil	17.8	0.863	32.5	
Nonviscous lubricating distillate	8.3	0.895-0.920	26.6-22.3	50-100
Medium lubricating distillate	4.9	0.920-0.931	22.3-20.5	100-200
Viscous lubricating distillate	6.8	0.931-0.942	20.5-18.7	Above 200
Residuum	54.6	1.032	5.6	
Distillation loss	0.8			

Remarks: The sample as received contained 0.05% by vol. water (A.S.T.M.), 0.12% by wt. ash and 27 lb. salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 2016-53

FIELD: Bonnyville

POOL:

ZONE: Colony

Well Name: Continental Bonnyville No. 23
 Location: Lsd. 9, Sec. 25, Twp. 63, Rge. 5, W 4
 Interval tested, depth, feet: 1114-1243
 Producing Zone: Colony
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: August 20, 1953
 Sampled at: Tank

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.982
 Sulphur, percent by weight: 4.1
 Saybolt Universal Viscosity:
 at 100°F., sec. 5,900
 at 130°F., sec. 2,100
 A.P.I. gravity at 60°F.: 12.6
 Pour point, °F.: 25
 Colour: Brownish Black
 Carbon residue, percent by weight: 11.7
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 758 mm. Hg.
 First drop **

Frac- tion No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Corre- lation Index	Aniline Point, °C.	Visc. S.U. 100°F.	Cloud Test, °F.	Refractive Index 20°C.
	°C.	°F.									
1.	50	122									
2.	75	167									
3.	100	212									
4.	125	257									
5.	150	302	0.9	0.9	0.810	43.2	-				1.4450
6.	175	347	0.5	1.4	-	-	-				1.4490
7.	200	392	1.4	2.8	0.814	42.3	36				1.4458
8.	225	437	1.9	4.7	0.829	39.2	38				1.4566
9.	250	482	3.4	8.1	0.851	34.8	43	53.8			1.4666
10.	275	527	7.4	15.5	0.867	31.7	46	54.8			1.4775

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	2.1	17.6	0.881	29.1	48	-	41	-	1.4881
12.	225	437	4.8	22.4	0.895	26.6	51	56.2	48	-	1.4932
13.	250	482	5.3	27.7	0.911	23.8	55	57.8	63	-	1.5029
14.	275	527	5.3	33.0	0.925	21.5	59	57.6	101	-	1.5105
15.	300	572	7.8	40.8	0.940	19.0	63	58.8	250	Below 0	1.5214
Residuum			57.8	98.6	1.050	3.3					

Carbon residue of residuum: 18.9%

Carbon residue of crude: 11.7%

**0.7% water in sample.

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	-	-	-	
Total gasoline and naphtha	2.8	0.812	42.8	
Kerosine distillate	-	-	-	
Gas oil	17.9	0.866	31.9	
Nonviscous lubricating distillate	9.5	0.897-0.925	26.2-21.5	50-100
Medium lubricating distillate	4.5	0.925-0.935	21.5-19.8	100-200
Viscous lubricating distillate	6.1	0.935-0.949	19.8-17.6	Above 200
Residuum	57.8	1.050	3.3	
Distillation loss	1.4			

Remarks: The sample as received contained 1.90% by vol. water (A.S.T.M.), 0.55% by wt. ash and 200 lb. salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 6779

FIELD: Bragg Creek

POOL:

ZONE:

Well Name: Moose Oils No. 1
 Location: Lsd. 16, Sec. 29, Twp. 22, Rge. 6, W 5
 Interval tested, depth, feet: 2220-2236
 Producing Zone: -
 Geological Age: Cambrian

Province: Alberta
 Sample From: Moose Oils Ltd.
 Date Sampled: March 1930

GENERAL CHARACTERISTICS

Specific gravity at 60° F.: 0.795
 Sulphur, percent by weight: 1.00
 Saybolt Universal Viscosity
 at 100° F., sec. 30

A.P.I. gravity at 60° F.: 46.5
 Pour point, °F.: Below 0
 Colour: A.S.T.M. No. 2
 Carbon residue, percent by weight: 0.1
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 751 mm. Hg.
 First drop, 29°C. (84°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	0.8	0.8	0.636	91.0	-			
2.	75	167	3.0	3.8	0.677	77.5	11			
3.	100	212	11.8	15.6	0.715	66.4	19			
4.	125	257	15.9	31.5	0.745	58.4	24			
5.	150	302	16.8	48.3	0.774	51.3	30			
6.	175	347	12.6	60.9	0.791	47.4	32			
7.	200	392	9.0	69.9	0.805	44.3	32			
8.	225	437	7.1	77.0	0.824	40.2	35			
9.	250	482	6.1	83.1	0.840	36.9	38			
10.	275	527	4.8	87.9	0.861	32.8	43			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	3.3	91.2	0.891	27.3	53		42	25
12.	225	437	2.7	93.9	0.911	23.8	59		52	45
13.	250	482	1.9	95.8	0.926	21.3	63		70	65
14.	275	527	1.3	97.1	0.941	18.9	67		110	85
15.	300	572	1.0	98.1	0.960	15.9	73		203	95
Residuum			1.6	99.7	-	-				

Carbon residue of residuum: 9.4%

Carbon residue of crude: 0.1%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	15.6	0.703	69.8	
Total gasoline and naphtha	69.9	0.759	54.9	
Kerosine distillate	7.1	0.824	40.2	
Gas oil	14.9	0.860	33.0	
Nonviscous lubricating distillate	4.2	0.906-0.937	24.7-19.5	50-100
Medium lubricating distillate	1.4	0.937-0.959	19.5-16.0	100-200
Viscous lubricating distillate	0.6	0.959-0.970	16.0-14.4	Above 200
Residuum	1.6	-	-	
Distillation loss	0.3			

CRUDE PETROLEUM ANALYSIS

Laboratory Number 6794

FIELD: Bragg Creek

POOL:

ZONE: Blairmore

Well Name: Greystone Oils No. 2
 Location: Lsd. 9, Sec. 34, Twp. 23, Rge. 5, W 5
 Interval tested, depth, feet: 3905-3907
 Producing Zone: Blairmore
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: Signal Hill Oil Co.
 Date Sampled: April 1930

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.799
 Sulphur, percent by weight: 0.13
 Saybolt Universal Viscosity:
 at 70°F., sec. 36
 at 100°F., sec. 33

A.P.I. gravity at 60°F.: 45.6
 Pour point, °F.: 30
 Colour: Green
 Carbon residue, percent by weight: 0.5
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 771 mm. Hg.
 First drop, 23°C. (73°F.)

Fraction No.	Cut, at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	2.1	2.1	0.624	95.3	-			
2.	75	167	3.1	5.2	0.668	80.3	7			
3.	100	212	6.8	12.0	0.710	67.8	17			
4.	125	257	9.9	21.9	0.736	60.8	20			
5.	150	302	7.2	29.1	0.752	56.7	20			
6.	175	347	6.8	35.9	0.767	53.0	20			
7.	200	392	5.6	41.5	0.778	50.4	19			
8.	225	437	5.6	47.1	0.793	46.9	21			
9.	250	482	6.5	53.6	0.808	43.6	22			
10.	275	527	7.7	61.3	0.820	41.1	23			

Stage 2 - Distillation continued at 40 mm. Hg. Pressure

11.	200	392	6.3	67.6	0.830	39.0	24		39	35
12.	225	437	5.9	73.5	0.834	38.2	22		44	60
13.	250	482	6.0	79.5	0.844	36.1	24		54	80
14.	275	527	5.1	84.6	0.854	34.2	25		71	95
15.	300	572	4.7	89.3	0.868	31.5	29		101(est.)	105
Residuum			9.2	98.5	-	-				

Carbon residue of residuum: 5.7%

Carbon residue of crude: 0.5%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	12.0	0.684	75.4	
Total gasoline and naphtha	41.5	0.735	61.0	
Kerosine distillate	19.8	0.808	43.6	
Gas oil	12.7	0.832	38.6	
Nonviscous lubricating distillate	12.8	0.840-0.868	36.9-31.5	50-100
Medium lubricating distillate	2.5	0.868-0.875	31.5-30.2	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	9.2	-	-	
Distillation loss	1.5			

CRUDE PETROLEUM ANALYSIS

Laboratory Number 18185

FIELD: Bragg Creek

POOL:

ZONE: Fairholme

Well Name: Moose Oils No. 2
 Location: Lsd. 8, Sec. 29, Twp. 22, Rge. 6, W 5
 Interval tested, depth, feet: 1532-1553
 Producing Zone: Fairholme
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: Dept. of Mines
 and Resources
 Date Sampled: October 23, 1937
 Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.804
 Sulphur, percent by weight: 1.12
 Saybolt Universal Viscosity:
 at 70°F., sec. 31

A.P.I. gravity at 60°F.: 44.5
 Pour point, °F.: -10
 Colour: A.S.T.M. No. 3
 Carbon residue, percent by weight: 0.1
 (Conradson)
 Cloud point, °F.: 20

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 757 mm. Hg.
 First drop, 29°C. (84°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	0.5	0.5)						
2.	75	167	1.2	1.7)	0.676	77.8	-			
3.	100	212	4.8	6.5	0.719	65.3	21			
4.	125	257	18.7	25.2	0.746	58.2	25			
5.	150	302	17.7	42.9	0.773	51.6	30			
6.	175	347	12.6	55.5	0.791	47.4	32			
7.	200	392	9.4	64.9	0.805	44.3	32			
8.	225	437	7.8	72.7	0.820	41.1	33			
9.	250	482	6.5	79.2	0.838	37.4	37			
10.	275	527	5.9	85.1	0.858	33.4	41			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	4.6	89.7	0.886	28.2	51		41	20
12.	225	437	3.3	93.0	0.905	24.9	56		52	40
13.	250	482	2.1	95.1	0.919	22.5	59		69	60
14.	275	527	1.3	96.4	0.936	19.7	64		100	75
15.	300	572	1.6	98.0	0.944	18.4	65		170	90
Residuum			1.2	99.2						

Carbon residue of residuum: 11.0%

Carbon residue of crude: 0.1%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	6.5	0.708	68.4	
Total gasoline and naphtha	64.9	0.767	53.0	
Kerosine distillate	7.8	0.820	41.1	
Gas oil	17.9	0.860	33.0	
Nonviscous lubricating distillate	5.2	0.902-0.936	25.4-19.7	50-100
Medium lubricating distillate	2.0	0.936-0.946	19.7-18.1	100-200
Viscous lubricating distillate	0.2	0.946-0.948	18.1-17.8	Above 200
Residuum	1.2			
Distillation loss	0.8			

Remarks: The sample as received contained 0.2% by vol. water and sediment (by centrifuge).

CRUDE PETROLEUM ANALYSIS

Laboratory Number 2235

FIELD: Brazeau

POOL:

ZONE: Kootenay-Fernie

Well Name: Home Brazeau No. 1
 Location: Lsd. 16, Sec. 7, Twp. 43, Rge. 17, W 5
 Interval tested, depth, feet: 8250-8330

Province: Alberta
 Sample From: Indian Affairs Branch
 Dept. of Mines
 & Resources
 Date Sampled: August 21, 1940
 Sampled at: Separator

Producing Zone: Kootenay-Fernie
 Geological Age: Jurassic

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.763	A.P.I. gravity at 60°F.: 54.0
Sulphur, percent by weight: 0.16	Pour point, °F.: Below -30
Saybolt Universal Viscosity: at 70°F., sec. 30	Colour: Saybolt Colour No. +4
	Carbon residue, percent by weight: 0.01 (Conradson)
	Cloud point, °F.: 10

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 745 mm. Hg.
 First drop, 33°C. (91°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	0.7	0.7)						
2.	75	167	0.8	1.5)						
3.	100	212	2.0	3.5)	0.701	70.4	-			
4.	125	257	8.0	11.5	0.740	59.7	22			
5.	150	302	17.9	29.4	0.751	56.9	19			
6.	175	347	20.5	49.9	0.760	54.7	17			
7.	200	392	20.0	69.9	0.766	53.2	14			
8.	225	437	14.1	84.0	0.779	50.1	14			
9.	250	482	8.2	92.2	0.793	46.9	15			
10.	275	527*	2.3	94.5	0.805	44.3	16			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392								
12.	225	437								
13.	250	482								
14.	275	527								
15.	300	572								
Residuum			4.0	98.5	0.816	41.9				70

Carbon residue of residuum: 0.2%

Carbon residue of crude: 0.01%

* - Cracking at 260°C. (500°F.)

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	3.5	0.701	70.4	
Total gasoline and naphtha	69.9	0.754	56.2	
Kerosine distillate	24.6	0.786	48.5	
Gas oil	-	-	-	
Nonviscous lubricating distillate	-	-	-	50-100
Medium lubricating distillate	-	-	-	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	4.0	0.816	41.9	
Distillation loss	1.5			

Remarks: The sample as received contained 0.03% by vol. water and sediment (by centrifuge)

CRUDE PETROLEUM ANALYSIS

Laboratory Number 2236

FIELD: Brazeau

POOL:

ZONE: Kootenay-Fernie

Well Name: Home Brazeau No. 1
 Location: Lsd. 16, Sec. 7, Twp. 43, Rge. 17, W 5
 Interval tested, depth, feet: 8480-8550
 Producing Zone: Kootenay-Fernie
 Geological Age: Jurassic

Province: Alberta
 Sample From: Indian Affairs
 Branch, Dept. of
 Mines & Resources
 Date Sampled: August 22, 1940
 Sampled at: Separator

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.751
 Sulphur, percent by weight: 0.16
 Saybolt Universal Viscosity:
 at 70°F., sec. 29

A.P.I. gravity at 60°F.: 56.9
 Four point, °F.: Below -30
 Colour: A.S.T.M. No. 1
 Carbon residue, percent by weight: 0.01
 (Conradson)
 Cloud point, °F.: 25

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 751 mm. Hg.
 First drop, 30°C. (86°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	1.6	1.6)						
2.	75	167	2.1	3.7)	0.666	81.0	-			
3.	100	212	7.9	11.6	0.717	65.9	20			
4.	125	257	21.4	33.0	0.740	59.7	22			
5.	150	302	20.3	53.3	0.755	55.9	21			
6.	175	347	18.3	71.6	0.761	54.4	17			
7.	200	392	9.7	81.3	0.769	52.5	15			
8.	225	437	7.3	88.6	0.779	50.1	14			
9.	250	482	4.9	93.5	0.791	47.4	14			
10.	275	527*	1.2	94.7	0.806	44.1	-			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392								
12.	225	437								
13.	250	482								
14.	275	527								
15.	300	572								
Residuum			3.4	98.1	0.816	41.9				100

Carbon residue of residuum: 0.3%

Carbon residue of crude: 0.01%

* - Cracking at 260°C. (500°F.)

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	11.6	0.701	70.4	
Total gasoline and naphtha	81.3	0.746	58.2	
Kerosine distillate	13.4	0.786	48.5	
Gas oil	-	-	-	
Nonviscous lubricating distillate	-	-	-	50-100
Medium lubricating distillate	-	-	-	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	3.4	0.816	41.9	
Distillation loss	1.9			

Remarks: The sample as received contained no water and sediment (by centrifuge).

CRUDE PETROLEUM ANALYSIS

Laboratory Number 1929-52.

FIELD: Brooks-Bantry

POOL:

ZONE: Basal Blairmore

Well Name: Cal.-Imperial Bantry No. 11-2-18-13
 Location: Lsd. 1, Sec. 2, Twp. 18, Rge. 13, W 4
 Interval tested, depth, feet: 3250-3259
 Producing Zone: Basal Blairmore
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: October 2, 1952
 Sampled at: Tank

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.917
 Sulphur, percent by weight: 2.44
 Saybolt Universal Viscosity:
 at 70°F., sec. 371
 at 100°F., sec. 172

A.P.I. gravity at 60°F.: 22.8
 Pour point, °F.: -45
 Colour: Brownish Black
 Carbon residue, percent by weight: 6.5
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 755 mm. Hg.
 First drop, 38°C. (100°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	0.6	0.6						
2.	75	167	1.4	2.0	0.675	78.1	-	-		
3.	100	212	1.6	3.6	0.700	70.6	12	58.2		
4.	125	257	2.6	6.2	0.729	62.6	17	59.0		
5.	150	302	3.4	9.6	0.752	56.7	20	57.3		
6.	175	347	3.5	13.1	0.776	50.9	24	54.0		
7.	200	392	3.5	16.6	0.800	45.4	30	51.9		
8.	225	437	4.0	20.6	0.821	40.9	34	52.5		
9.	250	482	3.7	24.3	0.838	37.4	37	54.9		
10.	275	527	6.3	30.6	0.858	33.4	41	56.9		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	3.9	34.5	0.872	30.8	44	58.5	39	-5
12.	225	437	5.6	40.1	0.887	28.0	47	60.2	47	15
13.	250	482	3.6	43.7	0.903	25.2	52	61.5	59	35
14.	275	527	5.8	49.5	0.914	23.3	54	62.6	92	50
15.	300	572	5.8	55.3	0.927	21.1	57	65.8	181	65
Residuum			44.3	99.6	1.004	9.4				

Carbon residue of residuum: 13.5%

Carbon residue of crude: 6.5%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	3.6	0.686	74.8	
Total gasoline and naphtha	16.6	0.749	57.4	
Kerosine distillate	4.0	0.821	40.9	
Gas oil	17.8	0.863	32.5	
Nonviscous lubricating distillate	8.7	0.891-0.915	27.3-23.1	50-100
Medium lubricating distillate	6.6	0.915-0.930	23.1-20.7	100-200
Viscous lubricating distillate	1.6	0.930-0.934	20.7-20.0	Above 200
Residuum	44.3	1.004	9.4	
Distillation loss	0.4			

Remarks: The sample as received contained 0.28% by vol. water and sediment (by centrifuge) and 27 lb. salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 1420-51

FIELD: Bulwark

POOL:

ZONE:

Well Name: Canadian Fina Bulwark Province No. 1
 Location: Lsd. 3, Sec. 20, Twp. 38, Rge. 12, W 4
 Interval tested, depth, feet: 2911-2953
 Producing Zone: Viking
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: September 19, 1951
 Sampled at: Tank

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.858
 Sulphur, percent by weight: 0.37
 Saybolt Universal Viscosity:
 at 70°F., sec. 125
 at 100°F., sec. 52

A.P.I. gravity at 60°F.: 33.4
 Pour point, °F.: 45
 Colour: Brownish Green
 Carbon residue, percent by weight: 1.4
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 760 mm. Hg.
 First drop, 32°C. (90°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	-	-	-	-	-	-	-	-
2.	75	167	1.3	1.3	0.680	76.6	-	-	-	-
3.	100	212	2.7	4.0	0.714	66.7	18	56.4	-	-
4.	125	257	5.8	9.8	0.738	60.2	21	55.4	-	-
5.	150	302	5.0	14.8	0.759	54.9	23	52.2	-	-
6.	175	347	5.1	19.9	0.779	50.1	26	55.0	-	-
7.	200	392	4.1	24.0	0.795	46.5	27	57.3	-	-
8.	225	437	4.4	28.4	0.811	43.0	29	61.0	-	-
9.	250	482	5.4	33.8	0.824	40.2	30	64.9	-	-
10.	275	527	6.7	40.5	0.836	37.8	31	69.4	-	-

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	5.3	45.8	0.848	35.4	33	72.3	40	25
12.	225	437	5.0	50.8	0.855	34.0	32	77.5	47	40
13.	250	482	6.2	57.0	0.864	32.3	33	81.7	58	60
14.	275	527	5.5	62.5	0.875	30.2	35	85.2	82	75
15.	300	572	6.2	68.7	0.884	28.6	37	90.4	139	90
Residuum			30.5	99.2	0.928	21.0				

Carbon residue of residuum: 4.1%

Carbon residue of crude: 1.4%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	4.0	0.703	69.8	
Total gasoline and naphtha	24.0	0.755	55.9	
Kerosine distillate	9.8	0.818	41.5	
Gas oil	16.1	0.845	36.0	
Nonviscous lubricating distillate	11.7	0.858-0.878	33.4-29.7	50-100
Medium lubricating distillate	7.1	0.878-0.889	29.7-27.7	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	30.5	0.928	21.0	
Distillation loss	0.8			

Remarks: The sample as received contained a trace of water (A.S.T.M.) and no salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 8752

FIELD: Campbell

POOL:

ZONE: Basal Quartz Ss.

Well Name: Trans Empire Campbell No. 3
 Location: Lsd. 5, Sec. 27, Twp. 54, Rge. 25, W 4
 Interval tested, depth, feet: 3695-3708
 Producing Zone: Basal Quartz Ss.
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: Stettler Leaseholds Limited, Edmonton.
 Date Sampled: October 30, 1950
 Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.853
 Sulphur, percent by weight: 0.85
 Saybolt Universal Viscosity:
 at 70°F., sec. 59
 at 100°F., sec. 44

A.P.I. gravity at 60°F.: 34.4
 Pour point, °F.: -15
 Colour: Brownish Black
 Carbon residue, percent by weight: 2.3
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 763 mm. Hg.
 First drop, 34°C. (93°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	1.1	1.1	0.668	80.3				
2.	75	167	2.7	3.8	0.675	78.1	10			
3.	100	212	4.6	8.4	0.710	67.8	17			
4.	125	257	5.5	13.9	0.738	60.2	21			
5.	150	302	6.2	20.1	0.759	54.9	23			
6.	175	347	5.2	25.3	0.778	50.4	25			
7.	200	392	4.3	29.6	0.797	46.0	28			
8.	225	437	5.2	34.8	0.810	43.2	29			
9.	250	482	5.0	39.8	0.824	40.2	30			
10.	275	527	6.7	46.5	0.838	37.4	32			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	6.2	52.7	0.857	33.6	37		39	5
12.	225	437	4.9	57.6	0.867	31.7	38		47	30
13.	250	482	5.5	63.1	0.882	28.9	42		63	50
14.	275	527	5.1	68.2	0.892	27.1	43		97	70
15.	300	572	5.7	73.9	0.903	25.2	46		189	85
Residuum			24.8	98.7	0.954	16.8				

Carbon residue of residuum: 9.4%

Carbon residue of crude: 2.3%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	8.4	0.693	72.7	
Total gasoline and naphtha	29.6	0.745	58.4	
Kerosine distillate	10.2	0.817	41.7	
Gas oil	16.2	0.851	34.8	
Nonviscous lubricating distillate	9.8	0.870-0.893	31.1-27.0	50-100
Medium lubricating distillate	6.0	0.893-0.904	27.0-25.0	100-200
Viscous lubricating distillate	2.1	0.904-0.909	25.0-24.2	Above 200
Residuum	24.8	0.954	16.8	
Distillation loss	1.3			

Remarks: The sample as received contained 0.6% by vol. water and sediment (by centrifuge).

CRUDE PETROLEUM ANALYSIS

Laboratory Number 830-51

FIELD: Campbell

POOL:

ZONE: Basal Quartz Ss.

Well Name: Trans Empire Campbell No. 2
 Location: Lsd. 8, Sec. 28, Twp. 54, Rge. 25, W 4
 Interval tested, depth, feet: 3686-3749
 Producing Zone: Basal Quartz Ss.
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: July 4, 1951
 Sampled at: Tank

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.858
 Sulphur, percent by weight: 0.92
 Saybolt Universal Viscosity:
 at 70°F., sec. 59
 at 100°F., sec. 45

A.P.I. gravity at 60°F.: 33.4
 Pour point, °F.: -5
 Colour: Brownish Black
 Carbon residue, percent by weight: 2.4
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 756 mm. Hg.
 First drop, 32°C. (90°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	-	-	-	-	-	-		
2.	75	167	2.2	2.2	0.675	78.1	-	-		
3.	100	212	3.8	6.0	0.717	65.9	20	53.0		
4.	125	257	6.4	12.4	0.743	58.9	23	51.0		
5.	150	302	5.9	18.3	0.764	53.7	26	51.1		
6.	175	347	5.4	23.7	0.783	49.2	28	51.4		
7.	200	392	5.1	28.8	0.797	46.0	28	53.6		
8.	225	437	5.1	33.9	0.813	42.6	30	58.5		
9.	250	482	5.5	39.4	0.827	39.6	31	62.9		
10.	275	527	6.3	45.7	0.842	36.6	34	66.6		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	4.8	50.5	0.857	33.6	37	67.6	39	10
12.	225	437	5.7	56.2	0.866	31.9	37	72.2	45	30
13.	250	482	6.0	62.2	0.879	29.5	40	76.0	59	50
14.	275	527	5.5	67.7	0.893	27.0	44	79.5	91	70
15.	300	572	5.2	72.9	0.906	24.7	47	-	174	85
Residuum			26.2	99.1	0.962	15.6				

Carbon residue of residuum: 9.0%

Carbon residue of crude: 2.4%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	6.0	0.702	70.1	
Total gasoline and naphtha	28.8	0.756	55.7	
Kerosine distillate	5.1	0.813	42.6	
Gas oil	21.4	0.847	35.6	
Nonviscous lubricating distillate	10.2	0.870-0.894	31.1-26.8	50-100
Medium lubricating distillate	6.4	0.894-0.910	26.8-24.0	100-200
Viscous lubricating distillate	1.0	0.910-0.912	24.0-23.7	Above 200
Residuum	26.2	0.962	15.6	
Distillation loss	0.9			

Remarks: The sample as received contained no water (A.S.T.M.) and 21 lb. salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 211-56

FIELD: Cessford

POOL: Basal Colorado "A"

ZONE: Basal Colorado

Well Name: Amurex-Trans Empire-Chris No. 1-10
 Location: Lsd. 10, Sec. 6, Twp. 24, Rge. 12, W 4
 Interval tested, depth, feet: 2944-2954
 Producing Zone: Basal Colorado
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: May 31, 1956
 Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.902
 Sulphur, percent by weight: 1.62
 Saybolt Universal Viscosity:
 at 100°F., sec. 115
 at 130°F., sec. 72

A.P.I. gravity at 60°F.: 25.4
 Pour point, °F.: Below -60
 Colour: Brownish Black
 Carbon residue, percent by weight: 6.6
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 753 mm. Hg.
 First drop, 40°C. (104°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167	2.9	2.9	0.673	78.8	-	63.5		
3.	100	212	2.7	5.6	0.702	70.1	13	59.7		
4.	125	257	3.9	9.5	0.728	62.9	16	57.2		
5.	150	302	3.4	12.9	0.756	55.7	22	54.0		
6.	175	347	3.5	16.4	0.780	49.9	26	51.1		
7.	200	392	2.8	19.2	0.800	45.4	30	49.6		
8.	225	437	3.4	22.6	0.821	40.8	34	51.2		
9.	250	482	4.6	27.2	0.842	36.5	39	54.7		
10.	275	527	6.1	33.3	0.860	33.0	42	56.7		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	2.3	35.6	0.877	29.8	46	58.9	41	-
12.	225	437	5.1	40.7	0.889	27.7	48	60.3	48	-
13.	250	482	5.0	45.7	0.904	25.0	52	62.5	67	-
14.	275	527	4.8	50.5	0.916	23.0	55	65.2	115	-
15.	330	572	6.3	56.8	0.926	21.3	56	68.8	240	Below 0
Residuum			40.5	97.3	1.001	9.9				

Carbon residue of residuum: 14.8%

Carbon residue of crude: 6.6%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	5.6	0.687	74.5	
Total gasoline and naphtha	19.2	0.741	59.5	
Kerosine distillate	3.4	0.821	40.8	
Gas oil	16.1	0.862	32.6	
Nonviscous lubricating distillate	7.9	0.891-0.912	27.3-23.6	50-100
Medium lubricating distillate	5.3	0.912-0.923	23.6-21.8	100-200
Viscous lubricating distillate	4.9	0.923-0.932	21.8-20.3	Above 200
Residuum	40.5	1.001	9.9	
Distillation loss	2.7			

Remarks: The sample as received contained 33 lb. salt (as NaCl) per 1000 bbl.

OIL FIELD DATA

Field and Pool: Chauvin Blairmore Pool

Location: Twp. 43, Rge. 1, W 4 M

DISCOVERY DETAILS

Method: Gravity meter survey. **Subsurface** Geology.

Well: Name: Prado Chauvin 8-28-43-1 W 4

Completed: July 1952

Perforated: 2144-2152 - Squeezed and Reperforated 2145-2149

Treatment: 5 Gal. Acid and 500 Gal. Diesel Fuel

Initial Potential: 50 BOPD

GEOLOGY

Producing Zone(s): Sparky Sand

Other Shows: Lower Sparky

Trap Type: Stratigraphic

Lithology: White, fine to very fine grained, silty, quartzose. Sandstone containing partings and inclusions of argillaceous and carbonaceous material.

Maximum Reservoir Thickness: 20 ft.

Regional Setting: Located on east flank of Alberta synclinal basin.

Deepest Formation Penetrated: Cooking Lake.

DEVELOPMENT DATA

Total Wells: Completed Oil: 24. Dry and Abandoned: 9

Producing Oil: 24

Injection or Disposal: Water: 4

Well Spacing: 40 Acres

Logging Practice: Electric Log and Microlog

Completion Practice: Casing set through productive zone and perforated.
Generally sand fractured.

RESERVOIR DATA

Type of Drive: Solution Gas

Estimated Oil in Place: 23,800,000 S.T.bbls (1,848 bbls/acre-foot)

Estimated Recoverable Oil: 8,330,000 S.T.bbls (648 bbls/acre-foot)

Oil Zone Thickness: Maximum: 19 ft. Average: 11.5 ft.

Gas Zone Thickness: Maximum: 5 ft.

Porosity: 29.6%. Permeability: 150-200 md

Area: 1,120 Acres

Oil Characteristics: Gravity: 23 °API. Sulphur: 2.3%

Four Point: Below -30°F. Initial Solution GOR: 93

Pressure Maintenance or Secondary Recovery: Line Drive Water Injection

PRODUCTION

(1950's)

Operating: 25

Market Outlet: Pipeline to Chauvin then Tankcar.

Bibliographical References: Oil Fields of Alberta - ASPG
Analysis of Crude Oil. Lab Report 643-2, P1-454.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 141-56

FIELD: Chauvin

POOL:

ZONE: Sparky

Well Name: Prado C.P.R. No. 5-27
 Location: Lsd. 5, Sec. 27, Twp. 43, Rge. 1, W 4
 Interval tested, depth, feet: 2052-2078
 Producing Zone: Sparky
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: April 23, 1956
 Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.919
 Sulphur, percent by weight: 2.40
 Saybolt Universal Viscosity:
 at 100°F., sec. 225
 at 130°F., sec. 122

A.P.I. gravity at 60°F.: 22.5
 Pour point, °F.: -30
 Colour: Brownish Black
 Carbon residue, percent by weight: 8.1
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 763 mm. Hg.
 First drop, 62°C. (144°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167								
3.	100	212	2.9	2.9	0.704	69.5	-	-		
4.	125	257	3.3	6.2	0.734	61.3	19	55.3		
5.	150	302	3.3	9.5	0.757	55.4	22	53.6		
6.	175	347	3.3	12.8	0.781	49.7	27	52.3		
7.	200	392	2.7	15.5	0.799	45.6	29	53.2		
8.	225	437	3.3	18.8	0.816	41.9	32	55.0		
9.	250	482	3.9	22.7	0.834	38.2	35	57.5		
10.	275	527	6.5	29.2	0.853	34.4	39	58.8		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	3.3	32.5	0.876	30.0	46	59.1	40	-
12.	225	437	5.1	37.6	0.887	28.0	47	61.0	48	-
13.	250	482	3.8	41.4	0.902	25.4	51	63.1	64	-
14.	275	527	5.5	46.9	0.914	23.3	54	65.6	106	-10
15.	300	572	6.1	53.0	0.925	21.5	56	68.5	210	+25
Residuum			44.9	97.9	1.012	8.3				

Carbon residue of residuum: 16.4%

Carbon residue of crude: 8.1%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	2.9	0.704	69.5	
Total gasoline and naphtha	15.5	0.755	55.9	
Kerosine distillate	3.3	0.816	41.9	
Gas oil	16.8	0.859	33.2	
Nonviscous lubricating distillate	7.9	0.889-0.912	27.7-23.6	50-100
Medium lubricating distillate	5.9	0.912-0.924	23.6-21.6	100-200
Viscous lubricating distillate	3.6	0.924-0.931	21.6-20.5	Above 200
Residuum	44.9	1.012	8.3	
Distillation loss	2.1			

Remarks: The sample as received contained 8 lb. salt (as NaCl) per 1000 bbl.

OIL FIELD DATA

Field and Pool: Clive D-2A

Location: Twp. 40, Rge. 24, W 4 M

DISCOVERY DETAILS

Method: Subsurface Geology, Seismic Reflection Survey

Well: Name: B.A. CS Clive #1, L.S.D. 13-16-40-24 W 4

Completed: October 1951

Perforated: 6223'-6225'

Treatment: Acidized

Initial Potential: 238 BOPD through 10/64" choke with GOR: 1,196 cu ft /bbl
& 2% water.

GEOLOGY

Producing Zone(s): Nisku formation, Winterburn group of Upper Devonian and Leduc formation.

Other Shows: Viking and Ellerslie Gas

Trap Type: Structural - Stratigraphic, sealed by impermeable dolomite and limestone

Lithology: Dolomite buff to tan and some grey, fine to medium crystalline, very limy, scattered anhydrite crystals and anhydrite filled vugs.

Maximum Reservoir Thickness: 162'

Regional Setting: Located approximately 10 miles northeast of the Joffre field on the Bashaw reef complex

Deepest Formation Penetrated: Leduc formation

DEVELOPMENT DATA

Total Wells: Completed Oil: 19

Producing Oil: 14

Well Spacing: 40 Acres

Logging Practice: Induction E-log from bottom of surface casing to top of the D-1 (Wabamun). Gamma-Sonic from D-1 to T.D.

Completion Practice: 600' surface casing; 7" casing is run to T.D. or PBTD & cemented to cover upper gas zones. Generally 3' of casing is perforated (4 shots/ft about 6' or 7' above O/W contact). The wells are then produced through 2 1/2" tubing set at about 6,300' without a production packer.

RESERVOIR DATA

Type of Drive: Combination gas cap expansion and bottom water drive

Estimated Oil in Place: 8,400,000 S.T.bbls (230 bbls/acre-foot)

Estimated Recoverable Oil: 1,680,000 S.T.bbls (58 bbls/acre-foot)

Oil Zone Thickness: Maximum: 19'. Average: 15.7'

Gas Zone Thickness: Maximum: 59'. Average: 25'

Porosity: 5.3%. Permeability: 70 md

Area: 1,055 Acres

Oil Characteristics: Gravity: 38-40 °API. Sulphur: 0.3%

Initial Solution GOR: 863 cu ft /bbl

Base: Paraffin

Pressure Maintenance or Secondary Recovery: None

PRODUCTION

Economic Allowance: Present: 47 BOPD. Operating: 31 BOPD

Market Outlet: via Britamoil Pipeline to Edmonton terminal

OIL FIELD DATA

Field and Pool: Clive D-3

Location: Twp. 40, Rge. 24, W 4 M

DISCOVERY DETAILS

Method: **Subsurface** Geology, Seismic Reflection Survey

Well: Name: Can. Sup. Pohl No. 4-21, in 4-21-40-24 W 4 M

Completed: June 1952 (Dual D-2 and D-3)

Perforated: 6,305' with 2 Shots/ft Open Hole

Treatment: Acidized

Initial Potential: 250 BOPD through various chokes

GEOLOGY

Producing Zone(s): Leduc formation, Woodbend Group of Upper Devonian
Nisku formation (see Clive D-2 Pool)

Other Shows: Viking Gas and Ellerslie Gas

Trap Type: Stratigraphic - Reef Bioherm Surrounded by Impermeable Lime and Shale

Lithology: Dolomite, Cream to Buff Coloured, Generally Fair Porosity with
Some Pin Point and Vug Porosity.

Maximum Reservoir Thickness: Not completely penetrated

Regional Setting: Located Approximately 10 Miles Northeast of the Joffre Field
in the Bashaw Reef Complex

Deepest Formation Penetrated: Leduc formation

DEVELOPMENT DATA

Total Wells: Completed Oil: 36

Producing Oil: 35

Injection or Disposal: Water: 1

Well Spacing: 40 Acres

Logging Practice: Induction E-log from the Bottom of the Surface Casing to the Top of the D-1 (Wabamun), Gamma-Sonic from D-1 to Total Depth.

Completion Practice: 600' Surface Casing, 7" Casing run to T.D. & Cemented to approximately 5,700'. Generally 3' of Casing is Perforated (4 shots/ft) about 6' or 7' above Water Line or Produced through Open Hole above Water Line. The Well is then Produced through 2 1/2" Tubing String set at approx. 6,400' without a Production Packer.

RESERVOIR DATA

Type of Drive: Water

Estimated Oil in Place: 10,300,000 S.T.bbls (223 bbls/acre-foot)

Estimated Recoverable Oil: 4,100,000 S.T.bbls (112 bbls/acre-foot)

Oil Zone Thickness: Average: 27'

Gas Zone Thickness: Maximum: 34'. Average: 16'

Porosity: 5.3%. Permeability: 300-400 md

Area: 961 Acres

Oil Characteristics: Gravity: 38-40 °API. Sulphur: 0.3%

Initial Solution GOR: 895 cu ft/bbl

Base: Paraffin

Pressure Maintenance or Secondary Recovery: Began using D-3 Aquifer for Salt Water Disposal in September 1957

PRODUCTION

Economic Allowance: Present: 47 BOPD. Operating: 31 BOPD

Market Outlet: Via Britamoil to Edmonton Terminal

CRUDE PETROLEUM ANALYSIS

Laboratory Number 224-56

FIELD: Clive

POOL:

ZONE: Nisku (D-2)

Well Name: B.A. Cities Service Clive No. 11-16
 Location: Lsd. 11, Sec. 16, Twp. 40, Rge. 24, W 4
 Interval tested, depth, feet: 6233-6238
 Producing Zone: Nisku (D-2)
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: June 14, 1956
 Sampled at: After separator

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.825
 Sulphur, percent by weight: 0.30
 Saybolt Universal Viscosity:
 at 100°F., sec. 36

A.P.I. gravity at 60°F.: 40.0
 Pour point, °F.: 35
 Colour: Dark Green
 Carbon residue, percent by weight: 0.9
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 750 mm. Hg.
 First drop, 28°C. (82°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	2.1	2.1	0.665	81.3	-			
2.	75	167	2.6	4.7	0.690	73.6	17			
3.	100	212	5.0	9.7	0.720	65.0	21	52.9		
4.	125	257	6.5	16.2	0.743	58.9	23	51.6		
5.	150	302	7.1	23.3	0.761	54.4	24	52.8		
6.	175	347	5.7	29.0	0.778	50.4	25	54.2		
7.	200	392	4.8	33.8	0.793	46.9	26	57.2		
8.	225	437	5.3	39.1	0.806	44.1	27	61.0		
9.	250	482	5.6	44.7	0.818	41.5	27	65.1		
10.	275	527	6.4	51.1	0.830	39.0	28	70.4		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	3.9	55.0	0.847	35.6	32	74.8	39	20
12.	225	437	4.7	59.7	0.851	34.8	30	78.2	43	40
13.	250	482	5.1	64.8	0.862	32.6	32	82.5	53	55
14.	275	527	5.1	69.9	0.872	30.8	34	86.2	71	70
15.	300	572	5.9	75.8	0.880	29.3	35	91.0	113	85
Residuum			21.2	97.0	0.933	20.2				

Carbon residue of residuum: 3.8%

Carbon residue of crude: 0.9%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	9.7	0.700	70.6	
Total gasoline and naphtha	33.8	0.747	57.9	
Kerosine distillate	10.9	0.812	42.8	
Gas oil	16.1	0.842	36.6	
Nonviscous lubricating distillate	10.3	0.859-0.877	33.2-29.8	50-100
Medium lubricating distillate	4.7	0.877-0.884	29.8-28.6	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	21.2	0.933	20.2	
Distillation loss	3.0			

Remarks: The sample as received contained 19 lb. salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 230-56

FIELD: Clive

POOL:

ZONE: Leduc (D-3)

Well Name: British American-Cities Service Clive No. 4-15
 Location: Lsd. 4, Sec. 15, Twp. 40, Rge. 24, W 4
 Interval tested, depth, feet: 6332-6358
 Producing Zone: Leduc (D-3)
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: June 14, 1956
 Sampled at: After separator

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.821
 Sulphur, percent by weight: 0.33
 Saybolt Universal Viscosity:
 at 100°F., sec. 36

A.P.I. gravity at 60°F.: 40.8
 Pour point, °F.: 35
 Colour: Brownish Black
 Carbon residue, percent by weight: 0.9
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 760 mm. Hg.
 First drop, 28°C. (82°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	2.6	2.6	0.656	84.2	-			
2.	75	167	3.4	6.0	0.686	74.8	15			
3.	100	212	5.7	11.7	0.716	66.1	19	52.0		
4.	125	257	6.3	18.0	0.742	59.2	23	51.0		
5.	150	302	7.4	25.4	0.761	54.4	24	53.8		
6.	175	347	5.2	30.6	0.778	50.4	25	55.6		
7.	200	392	5.0	35.6	0.792	47.2	26	57.0		
8.	225	437	4.5	40.1	0.806	44.1	27	61.0		
9.	250	482	5.5	45.6	0.817	41.7	27	65.0		
10.	275	527	6.7	52.3	0.830	39.0	28	69.8		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	2.7	55.0	0.844	36.2	31	73.4	38	20
12.	225	437	5.7	60.7	0.852	34.6	31	77.2	43	40
13.	250	482	5.1	65.8	0.863	32.5	33	82.0	53	55
14.	275	527	5.0	70.8	0.874	30.4	35	86.2	74	75
15.	300	572	5.6	76.4	0.883	28.8	36	91.0	118	90
Residuum			20.2	96.6	0.933	20.2				

Carbon residue of residuum: 3.9%

Carbon residue of crude: 0.9%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	11.7	0.694	72.4	
Total gasoline and naphtha	35.6	0.742	59.2	
Kerosine distillate	10.0	0.812	42.8	
Gas oil	16.1	0.842	36.6	
Nonviscous lubricating distillate	9.7	0.860-0.879	33.0-29.5	50-100
Medium lubricating distillate	5.0	0.879-0.888	29.5-27.8	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	20.2	0.933	20.2	
Distillation loss	3.4			

Remarks: The sample as received contained 24 lb. of salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 1677-52

FIELD: Conrad

POOL:

ZONE: Ellis

Well Name: Composite 15 wells: California Standard Co.
 Location: Twp. 5 & 6, Rge. 15, W 4
 Interval tested, depth, feet: approx. 2960
 Producing Zone: Ellis
 Geological Age: Jurassic

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: August 21, 1952
 Sampled at: After separator from tank

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.896
 Sulphur, percent by weight: 1.94
 Saybolt Universal Viscosity:
 at 70°F., sec. 188
 at 100°F., sec. 96

A.P.I. gravity at 60°F.: 26.4
 Pour point, °F.: -35
 Colour: Brownish Black
 Carbon residue, percent by weight: 7.7
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 750 mm. Hg.
 First drop, 27°C. (81°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	1.7	1.7)						
2.	75	167	2.2	3.9)	0.670	79.7	-			
3.	100	212	2.8	6.7	0.698	71.2	11	60.3		
4.	125	257	3.0	9.7	0.726	63.4	15	56.8		
5.	150	302	3.4	13.1	0.752	56.7	20	54.6		
6.	175	347	3.5	16.6	0.772	51.8	23	53.4		
7.	200	392	3.6	20.2	0.793	46.9	26	54.6		
8.	225	437	4.0	24.2	0.811	43.0	29	57.4		
9.	250	482	4.0	28.2	0.828	39.4	32	60.9		
10.	275	527	5.7	33.9	0.845	36.0	35	63.4		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	4.2	38.1	0.865	32.1	41	64.6	41	10
12.	225	437	5.0	43.1	0.876	30.0	42	67.0	48	30
13.	250	482	5.2	48.3	0.891	27.3	46	68.9	63	50
14.	275	527	4.8	53.1	0.907	24.5	50	70.8	99	65
15.	300	572	6.9	60.0	0.918	22.6	53	74.2	202	80
Residuum			38.8	98.8	1.010	8.6				

Carbon residue of residuum: 17.6%

Carbon residue of crude: 7.7%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	6.7	0.682	76.0	
Total gasoline and naphtha	20.2	0.736	60.8	
Kerosine distillate	4.0	0.811	43.0	
Gas oil	17.1	0.851	34.8	
Nonviscous lubricating distillate	9.5	0.878-0.907	29.7-24.5	50-100
Medium lubricating distillate	5.6	0.907-0.918	24.5-22.6	100-200
Viscous lubricating distillate	3.6	0.918-0.925	22.6-21.5	Above 200
Residuum	38.8	1.010	8.6	
Distillation loss	1.2			

Remarks: The sample as received contained a trace of water and no salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 310-56

FIELD: Del Bonita

POOL:

ZONE: Rundle

Well Name: Spring Coulee Pete National Milk River No. 1
 Location: Lsd. 5, Sec. 19, Twp. 1, Rge. 21, W 4
 Interval tested, depth, feet: 5116-5136
 Producing Zone: Rundle
 Geological Age: Mississippian

Province: Alberta
 Sample From: D.M.T.S.

Date Sampled: August 8, 1956
 Sampled at: Tank

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.842
 Sulphur, percent by weight: 0.62
 Saybolt Universal Viscosity:
 at 100°F., sec. 38

A.P.I. gravity at 60°F.: 36.6
 Pour point, °F.: 15
 Colour: Greenish Black
 Carbon residue, percent by weight: 1.1
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 745 mm. Hg.
 First drop, 72°C. (162°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167								
3.	100	212	2.3	2.3	0.710	67.8	-			
4.	125	257	6.3	8.6	0.739	60.0	21	53.0		
5.	150	302	8.3	16.9	0.762	54.2	25	51.2		
6.	175	347	7.2	24.1	0.780	49.9	26	51.0		
7.	200	392	6.0	30.1	0.794	46.7	27	54.1		
8.	225	437	6.6	36.7	0.806	44.1	27	57.5		
9.	250	482	5.8	42.5	0.819	41.3	28	61.4		
10.	275	527	7.8	50.3	0.833	38.4	30	66.2		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	4.3	54.6	0.849	35.2	33	68.9	38	10
12.	225	437	6.5	61.1	0.860	33.0	35	73.9	44	30
13.	250	482	6.3	67.4	0.872	30.8	37	76.4	54	50
14.	275	527	5.7	73.1	0.882	28.9	39	80.6	74	70
15.	300	572	6.0	79.1	0.893	27.0	41	85.8	119	85
Residuum			19.6	98.7	0.944	18.4				

Carbon residue of residuum: 5.0%

Carbon residue of crude: 1.1%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	2.3	0.710	67.8	
Total gasoline and naphtha	30.1	0.764	53.7	
Kerosine distillate	12.4	0.812	42.8	
Gas oil	19.2	0.847	35.6	
Nonviscous lubricating distillate	11.9	0.867-0.888	31.7-27.8	50-100
Medium lubricating distillate	5.5	0.888-0.899	27.8-25.9	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	19.6	0.944	18.4	
Distillation loss	1.3			

Remarks: The sample as received contained 8 lb. salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 5972

FIELD: Dina (Ribstone)

POOL:

ZONE: Sparky

Well Name: London-Ribstone No. 1
 Location: Lsd. 14, Sec. 10, Twp. 43, Rge. 3, W 4
 Interval tested, depth, feet: 2121-2137
 Producing Zone: Sparky
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: London-Ribstone
 Pet. Ltd.
 Date Sampled: May 1929

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.954
 Sulphur, percent by weight: 3.34
 Saybolt Universal Viscosity:
 at 100°F., sec. 2,100

A.P.I. gravity at 60°F.: 16.8
 Pour point, °F.: Below 5
 Colour: Brownish Black
 Carbon residue, percent by weight: 10.3
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 753 mm. Hg.
 First drop, 60°C. (140°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167	0.8	0.8)						
3.	100	212	0.7	1.5)	0.700	70.6	-			
4.	125	257	1.5	3.0	0.725	63.7	15			
5.	150	302	1.8	4.8	0.743	58.9	16			
6.	175	347	1.8	6.6	0.763	54.0	18			
7.	200	392	2.2	8.8	0.786	48.5	23			
8.	225	437	3.1	11.9	0.811	43.0	29			
9.	250	482	3.2	15.1	0.831	38.8	33			
10.	275	527	7.1	22.2	0.853	34.4	39			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	1.5	23.7	0.869	31.3	43		39	0
12.	225	437	5.8	29.5	0.891	27.3	49		55	20
13.	250	482	4.7	34.2	0.902	25.4	51		72	35
14.	275	527	5.1	39.3	0.913	23.5	53		125	55
15.	300	572	6.7	46.0	0.931	20.5	59		260	75
Residuum			50.3	96.3	-	-				

Carbon residue of residuum: 20.5%

Carbon residue of crude: 10.3%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	1.5	0.700	70.6	
Total gasoline and naphtha	8.8	0.748	57.7	
Kerosine distillate	3.1	0.811	43.0	
Gas oil	13.6	0.854	34.2	
Nonviscous lubricating distillate	9.0	0.884-0.908	28.6-24.3	50-100
Medium lubricating distillate	5.5	0.908-0.923	24.3-21.8	100-200
Viscous lubricating distillate	6.0	0.923-0.942	21.8-18.7	Above 200
Residuum	50.3			
Distillation loss	3.7			

Remarks: The sample as received contained 1.0% by vol. water (A.S.T.M.)

CRUDE PETROLEUM ANALYSIS

Laboratory Number 5987

FIELD: Dina (Ribstone)

POOL:

ZONE: Sparky

Well Name: Meridian No. 1
 Location: Lsd. 3, Sec. 16, Twp. 45, Rge. 1, W 4
 Interval tested, depth, feet: 1822-1833
 Producing Zone: Sparky
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: Ribstone Oils Ltd.
 Date Sampled: May 1929

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.981
 Sulphur, percent by weight: 2.96
 Saybolt Universal Viscosity:
 at 100°F., sec. 4,170

A.P.I. gravity at 60°F.: 12.7
 Pour point, °F.: Below 5
 Colour: Brownish Black
 Carbon residue, percent by weight: 10.2
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 760 mm. Hg.
 First drop, 170°C. (338°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167								
3.	100	212								
4.	125	257								
5.	150	302								
6.	175	347	0.5	0.5)						
7.	200	392	1.3	1.8)	0.827	39.6	-			
8.	225	437	2.2	4.0	0.843	36.4	44			
9.	250	482	3.6	7.6	0.858	33.4	46			
10.	275	527	7.8	15.4	0.868	31.5	46			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	6.9	22.3	0.884	28.6	50		42	0
12.	225	437	5.6	27.9	0.897	26.3	52		50	15
13.	250	482	6.8	34.7	0.909	24.2	55		77	30
14.	275	527	8.6	43.3	0.925	21.5	59		137	55
15.	300	572	9.9	53.2	0.940	19.0	63		357	75
Residuum			42.8	96.0						

Carbon residue of residuum: 23.8%

Carbon residue of crude: 10.2%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	-	-	-	
Total gasoline and naphtha	-	-	-	
Kerosine distillate	-	-	-	
Gas oil	25.1	0.869	31.3	
Nonviscous lubricating distillate	9.1	0.897-0.915	26.3-23.1	50-100
Medium lubricating distillate	7.5	0.915-0.929	23.1-20.8	100-200
Viscous lubricating distillate	11.5	0.929-0.948	20.8-17.8	Above 200
Residuum	42.8	-	-	
Distillation loss	4.0			

Remarks: The sample as received contained 14.2% by vol. water (A.S.T.M.)

CRUDE PETROLEUM ANALYSIS

Laboratory Number 621

FIELD: Dina (Ribstone)

POOL:

ZONE:

Field Sample

Province: Alberta

Sample From: Dina Oil and Refining Co.

Date Sampled: November 21, 1938

Sampled at: Tank

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.967
Sulphur, percent by weight: 2.9
Saybolt Furol Viscosity:
at 100°F., sec. 328

A.P.I. gravity at 60°F.: 14.8
Pour point, °F.: 10
Colour: Black
Carbon residue, percent by weight: 9.2
(Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 748 mm. Hg.
First drop, 180°C. (356°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167								
3.	100	212								
4.	125	257								
5.	150	302								
6.	175	347								
7.	200	392								
8.	225	437	1.7	1.7	0.847	35.6	46			
9.	250	482	4.4	6.1	0.856	33.8	45			
10.	275	527	5.7	11.8	0.868	31.5	46			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	5.1	16.9	0.883	28.8	49		41	
12.	225	437	5.4	22.3	0.893	27.0	50		52	
13.	250	482	6.6	28.9	0.909	24.2	55		76	
14.	275	527	6.7	35.6	0.922	22.0	58		139	
15.	300	572	8.8	44.4	0.932	20.3	59		278	
Residuum			54.2	98.6	1.004	9.4				

Carbon residue of residuum: 16.9%

Carbon residue of crude: 9.2%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	-	-	-	
Total gasoline and naphtha	-	-	-	
Kerosine distillate	-	-	-	
Gas oil	18.7	0.870	31.1	
Nonviscous lubricating distillate	9.5	0.891-0.914	27.3-23.3	50-100
Medium lubricating distillate	7.4	0.914-0.926	23.3-21.3	100-200
Viscous lubricating distillate	8.8	0.926-0.937	21.3-19.5	Above 200
Residuum	54.2	1.004	9.4	
Distillation loss	1.4			

Remarks: The sample as received contained 12.0% by vol. water and sediment (by centrifuge).

CRUDE PETROLEUM ANALYSIS

Laboratory Number 2368

FIELD: Dina (Ribstone)

POOL:

ZONE: Sparky

Well Name: Dina No. 4
 Location: Lsd. 13, Sec. 9, Twp. 45, Rge. 1, W 4
 Interval tested, depth, feet: 1694-1698
 Producing Zone: Sparky
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: Lands, Parks & Forests
 Br., Dept. of Mines &
 Resources
 Date Sampled: November 13, 1940

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.971
 Sulphur, percent by weight: 2.8
 Saybolt Furol Viscosity:
 at 122°F., sec. 160

A.P.I. gravity at 60°F.: 14.2
 Pour point, °F.: 10
 Colour: Black
 Carbon residue, percent by weight: 9.1
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 757 mm. Hg.

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167								
3.	100	212								
4.	125	257								
5.	150	302								
6.	175	347								
7.	200	392	0.5	0.5						
8.	225	437	1.8	2.3	0.846	35.8	46			
9.	250	482	3.3	5.6	0.857	33.6	46			
10.	275	527	7.4	13.0	0.868	31.5	46			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	3.4	16.4	0.887	28.0	51	44	-
12.	225	437	6.4	22.8	0.896	26.4	52	52	-
13.	250	482	7.0	29.8	0.911	23.8	55	76	-
14.	275	527	7.4	37.2	0.925	21.5	59	140	0
15.	300	572	8.2	45.4	0.936	19.7	61	309	10
Residuum			53.7	99.1	1.010	8.6			

Carbon residue of residuum: 16.9%

Carbon residue of crude: 9.1%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	-	-	-	
Total gasoline and naphtha	-	-	-	
Kerosine distillate	-	-	-	
Gas oil	18.5	0.870	31.1	
Nonviscous lubricating distillate	10.7	0.894-0.916	26.8-23.0	50-100
Medium lubricating distillate	7.0	0.916-0.929	23.0-20.8	100-200
Viscous lubricating distillate	9.2	0.929-0.942	20.8-18.7	Above 200
Residuum	53.7	1.010	8.6	
Distillation loss	0.9			

Remarks: The sample as received contained 25% by vol. water and sediment (by centrifuge).

OIL FIELD DATA

Field and Pool: Drumheller Field, D-2A

Location: Twp. 29, Rge. 19 & 20, W 4 M

DISCOVERY DETAILS

Method: Subsurface Geology, Seismic Reflection Survey

Well: Name: Dome Naco Drumheller 30-14, located in 14-30-29-19 W 4 M.

Completed: July 1951

Perforated: 5392.5'-5397.5'

Treatment: 300 gals. mud acid

Initial Potential: 1560 BOPD through a 1/8" choke (1 day test); 2% B.S. & W.

GOR: 400 cu ft /bbl

GEOLOGY

Producing Zone(s): Nisku Formation* - Winterburn group of Upper Devonian. The Nisku (D-2) Pool is essentially split into a north pool and a south pool, the former with an original oil-water contact at 2738' subsea and latter at 2751' subsea.

Other Shows: Ellerslie Formation - See Appendix A

Trap Type: Stratigraphic. The Drumheller Nisku pool is caused by a rapid thickening of the upper dense anhydrite and dolomite at the expense of the lower porous dolomite. Slight closure occurs on the base of the Nisku.

Lithology: Dolomite, grey, green-grey, fine to medium crystalline, fractured and brecciated in part. Porosity is intercrystalline, vugular and fracture.

Maximum Reservoir Thickness: 62'

Regional Setting: The field is located on, and near the edge of, the Southern Alberta Leduc shelf margin reef complex at the south end of the shale basin.

Deepest Formation Penetrated: Leduc. In the following wells: Western Dome Naco Drumheller 2-19-29-19. Western Dome Naco Drumheller 14-19-29-19. Great Plains Okanagan 6-30-29-19. Dome Naco Drumheller 14-30-29-19. Naco Drumheller 3-34-29-19.

DEVELOPMENT DATA

Total Wells: Completed Oil: 13. Gas: Nil. Dry and Abandoned: 7.

Producing Oil: 12. Suspended Oil: 1

Injection or Disposal - Water: 1 (suspended), gas, nil.

Well Spacing: 40 Acres (80 acres previous to October 1, 1955)

Logging Practice: Radioactivity log, surface to total depth (approx. 5500'). Electrical, Micro and Caliper logs generally run. Temperature log run to pick cementing tops. (Salt mud was used in drilling.)

Completion Practice: 600' surface casing; 7" casing set through production zone and perforated or 7" casing set at top of production zone and completed open hole (two wells only). Small acid jobs.

RESERVOIR DATA

Type of Drive: Strong, efficient water drive

Estimated Oil in Place: 8,700,000 S.T.bbls (400 bbls/acre-foot)

Estimated Recoverable Oil: 3,480,000 S.T.bbls (160 bbls/acre-foot)

Oil Zone Thickness: Maximum: 62'. Average: 28'.

Gas Zone Thickness: None

Porosity: 7.4%. Permeability: 480 md. (horizontal)

Area: 1,100 Acres (zero isopach)

Oil Characteristics: Gravity: 33° API. Sulphur: 0.93% (weight)

Initial Solution GOR: 382 to 343 cu ft /bbl (flash)

Base: Paraffin

Pressure Maintenance or Secondary Recovery: None

PRODUCTION

MPR: 70 BOPD (1960): Proration Plan Change

Economic Allowance: Present: 29 BOPD. Operating: 29 BOPD (est.)

Market Outlet: Edmonton via Britamoil Pipeline

Bibliographical References: Roop, M.R. (1959): Drumheller Oil Fields, Alberta; Alberta Soc. Petrol. Geol., 9th Ann. Field Conf. Guidebook, pp 145-152.

Belyea, H.R. (1951): Correlation of Devonian Sub-surface Formations, Southern Alberta; Geol. Surv. Canada, Paper 55-38.

Remarks: * - Part of the reservoir in this pool occurs in the Camrose tongue of the Woodbend group. Since the boundaries of this unit are difficult to establish the term 'Nisku' has been used herein to include the Camrose as well as the thin Nisku correlative.

SOURCE: Oil Fields of Alberta, A.S.P.G., 1960, revised.

OIL FIELD DATA

Field and Pool: West Drumheller D-2A

Location: Twp(s) 29 & 30, Rge. 21, W 4 M

DISCOVERY DETAILS

Method: Wildcat -- neither subsurface nor seismic. Rumoured to be located by waterwitcher.

Well: Name: Mazal Drum 1, Lsd 12-36-29-21 W 4

Completed: September 17, 1952

Initial Potential: 1,200 BOPD

GEOLOGY

Producing Zone(s): Nisku form., Winterburn group of Upper Devonian Leduc form.
(See West Drumheller Field D-3 Pool.)

Other Shows: DSTs from wells around field indicate possible commercial production from Glauconite & Eillerslie sandstones. These zones would not be expected to be productive over the field. Eillerslie gas bearing at 14-25-29-21 W 4 M, gas at 6,000 Metd. (S. flank)

Trap Type: Structural

Lithology: Dolomite, tan to cream, fine to coarse crystalline with local bands of brown granular dolomite and minor anhydrite porosity primarily vugular and intercrystalline with minor oblique fractures.

Maximum Reservoir Thickness: approx. 100' on structure to more than 230' off structure.

Regional Setting: Located on the front edge of the widespread southern Alberta reef complex. It is more or less bordered on the north by the U. Dev. Ireton shale basin and to the south by an evaporitic back reef facies.

Deepest Formation Penetrated: Cooking Lake

DEVELOPMENT DATA

Total Wells: Completed Oil: 67

Producing Oil: 43

Injection or Disposal: Water: 2

Well Spacing: (Acres): 80 north, 40 south

Logging Practice: Generally, Gamma-Sonic from surface to T.D.

Completion Practice: 600' to 800' surface casing depending on coal seams.
Seven inch to T.D. & perforate with 4 shots per foot.
Acidize with 1,000 gals. regular 15%. Tubing 2 7/8"

RESERVOIR DATA

Type of Drive: Bottom water

Estimated Oil in Place: 41,443,000 S.T.bbls (221 bbls/acre-foot)

Estimated Recoverable Oil: 29,010,000 S.T.bbls (155 bbls/acre-foot)

Oil Zone Thickness: Maximum: 70'. Average: 55'

Gas Zone Thickness: Average: 34'

Porosity: 4.77%. Permeability: 239 md, 1,500 (See Roop*)

Area: 3,802 Acres

Oil Characteristics: Gravity: 41.7 °API. Sulphur: 0.28%

Initial Solution GOR: 600 cu ft/bbl

Base: Paraffin

Pressure Maintenance or Secondary Recovery: None

PRODUCTION

Economic Allowance: Present: 29 BOPD. Operating: 29 BOPD

Market Outlet: Britamoil Pipeline to Edmonton terminal

Bibliographical Reference: *Roop, M.R., Drumheller Oil Fields, Alberta, ASPG
Ninth Annual Field Conference, Guidebook, pp. 145-151

OIL FIELD DATA

Field and Pool: West Drumheller D-3A

Location: Twp(s) 29 & 30, Rge. 21, W 4 M

DISCOVERY DETAILS

Method: Seismic reflection survey, **subsurface** geology

Well: Name: B.A. West Drumheller No. 12-1-30-21 W 4 M

Completed: September 1953

Initial Potential: 2,136 BOPD

GEOLOGY

Producing Zone(s): Leduc formation. Woodbend group of U. Devonian

Other Shows: Nisku formation - See West Drumheller Field (D-2)

Trap Type: Stratigraphic

Lithology: Dolomite, ivory to tan, medium to coarse crystalline. Porosity intercrystalline & vugular.

Maximum Reservoir Thickness: Leduc reef 672' at Sup. Drumheller No. 4-36-29-21
W 4 M

Regional Setting: Located on the front edge of the widespread southern Alberta reef complex. It is more or less bordered on the north by the U. Dev. Ireton shale basin & to the south by an evaporitic back reef facies.

Deepest Formation Penetrated: Cooking Lake

DEVELOPMENT DATA

Total Wells: Completed Oil: 12

Producing Oil: 7

Well Spacing: 40 Acres

Logging Practice: Generally, Gamma-Sonic from surface to T.D.

Completion Practice: 600' to 800' of 10 3/4" surface casing depending on coal seams. Seven inch to top of Leduc & complete open hole. Run 2 7/8" tubing.

RESERVOIR DATA

Type of Drive: Water

Estimated Oil in Place: 8,418,000 S.T.bbls (477 bbls/acre-foot)

Estimated Recoverable Oil: 4,630,000 S.T.bbls (262 bbls/acre-foot)

Oil Zone Thickness: Average: 23.8'

Gas Zone Thickness: None

Porosity: 8.0%. Permeability: 700 md

Area: 718 Acres

Oil Characteristics: Gravity: 40 °API. Sulphur: 0.47%

Initial Solution GOR: 403 SCF/STB

Base: Paraffin

Pressure Maintenance or Secondary Recovery:

PRODUCTION

Economic Allowance: Present: 29 BOPD. Operating: 29 BOPD

Market Outlet: Britamail Pipeline to Edmonton

Bibliographical Reference: Roop, M.R., Drumheller Oil Fields, Alberta, ASPG
Ninth Annual Field Conference, Guidebook, pp. 142-151.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 171-56

FIELD: Drumheller

POOL:

ZONE: Camrose (D-2)

Well Name: Western Dome Naco Drumheller No. 25-14
 Location: Lsd. 14, Sec. 25, Twp. 29, Rge. 20, W 4
 Interval tested, depth, feet: 5408-5430
 Producing Zone: Camrose (D-2)
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: D.M.T.S.

Date Sampled: May 16, 1956
 Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.861
 Sulphur, percent by weight: 1.09
 Saybolt Universal Viscosity:
 at 100°F., sec. 48

A.P.I. gravity at 60°F.: 32.8
 Pour point, °F.: 25
 Colour: Brownish Black
 Carbon residue, percent by weight: 4.0
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 752 mm. Hg.
 First drop, 37°C. (99°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	0.7	0.7	0.662	82.2	-	-		
2.	75	167	2.4	3.1	0.680	76.6	12	-		
3.	100	212	3.1	6.2	0.714	66.7	18	53.0		
4.	125	257	4.5	10.7	0.740	59.7	22	50.4		
5.	150	302	4.1	14.8	0.759	54.9	23	48.5		
6.	175	347	4.8	19.6	0.774	51.3	23	50.2		
7.	200	392	3.8	23.4	0.789	47.8	24	53.8		
8.	225	437	4.7	28.1	0.802	44.9	25	57.9		
9.	250	482	4.9	33.0	0.817	41.7	27	61.4		
10.	275	527	6.8	39.8	0.832	38.6	29	65.6		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	3.9	43.7	0.851	34.8	34	68.1	38	15
12.	225	437	6.3	50.0	0.861	32.8	35	71.2	44	35
13.	250	482	4.4	54.4	0.876	30.0	39	74.5	55	55
14.	275	527	5.2	59.6	0.889	27.7	42	76.0	76	75
15.	300	572	6.6	66.2	0.903	25.2	46	79.3	137	95
Residuum			30.2	96.4	0.982	12.6				

Carbon residue of residuum: 11.6%

Carbon residue of crude: 4.0%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	6.2	0.695	72.1	
Total gasoline and naphtha	23.4	0.746	58.2	
Kerosine distillate	9.6	0.810	43.2	
Gas oil	16.8	0.847	35.6	
Nonviscous lubricating distillate	9.5	0.869-0.895	31.3-26.6	50-100
Medium lubricating distillate	6.9	0.895-0.911	26.6-23.8	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	30.2	0.982	12.6	
Distillation loss	3.6			

Remarks: The sample as received contained 5 lb. salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 173-56

FIELD: Drumheller

POOL:

ZONE: Home

Well Name: Western Dome Naco Drumheller No. 36-12
 Location: Lsd. 12, Sec. 36, Twp. 29, Rge. 20, W 4
 Interval tested, depth, feet: 4425-4432
 Producing Zone: Home
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: May 16, 1956
 Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.878
 Sulphur, percent by weight: 1.36
 Saybolt Universal Viscosity:
 at 70°F., sec. 95
 at 100°F., sec. 64

A.P.I. gravity at 60°F.: 29.7
 Pour point, °F.: 35
 Colour: Brownish Black
 Carbon residue, percent by weight: 4.9
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 756 mm. Hg.
 First drop, 45°C. (113°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	0.5	0.5)						
2.	75	167	1.3	1.8)	0.667	80.6	-			
3.	100	212	2.7	4.5	0.701	70.4	12			
4.	125	257	4.8	9.3	0.732	61.8	18	56.0		
5.	150	302	4.8	14.1	0.753	56.4	20	55.0		
6.	175	347	4.2	18.3	0.771	52.0	22	56.7		
7.	200	392	3.9	22.2	0.787	48.3	23	58.5		
8.	225	437	4.2	26.4	0.801	45.2	24	61.9		
9.	250	482	4.3	30.7	0.819	41.3	28	64.5		
10.	275	527	6.5	37.2	0.838	37.4	32	66.5		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	3.1	40.3	0.858	33.4	37	68.7	39	15
12.	225	437	5.4	45.7	0.866	31.9	37	72.4	45	40
13.	250	482	6.3	52.0	0.877	29.8	39	75.0	56	60
14.	275	527	5.6	57.6	0.892	27.1	43	78.1	82	75
15.	300	572	6.8	64.4	0.904	25.0	46	81.6	152	85
Residuum			33.4	97.8	0.997	10.4				

Carbon residue of residuum: 13.0%

Carbon residue of crude: 4.9%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	4.5	0.687	74.5	
Total gasoline and naphtha	22.2	0.745	58.4	
Kerosine distillate	8.5	0.810	43.2	
Gas oil	14.9	0.852	34.6	
Nonviscous lubricating distillate	10.8	0.871-0.895	31.0-26.6	50-100
Medium lubricating distillate	8.0	0.895-0.911	26.6-23.8	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	33.4	0.997	10.4	
Distillation loss	2.2			

Remarks: The sample as received contained 16 lb. salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 172-56

FIELD: West Drumheller

POOL:

ZONE: Fairholme

Well Name: West Drumheller No. 11-1
 Location: Lsd. 11, Sec. 1, Twp. 30; Rge. 21, W 4
 Interval tested, depth, feet: 5500-5600
 Producing Zone: Fairholme
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: May 16, 1956
 Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.826
 Sulphur, percent by weight: 0.44
 Saybolt Universal Viscosity:
 at 100°F., sec. 37

A.P.I. gravity at 60°F.: 39.8
 Pour point, °F.: 35
 Colour: Brownish Green
 Carbon residue, percent by weight: 0.9
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 758 mm. Hg.
 First drop, 40°C. (104°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	0.7	0.7)						
2.	75	167	2.2	2.9)	0.696	71.8	-	-		
3.	100	212	4.7	7.6	0.717	65.8	20	-		
4.	125	257	7.1	14.7	0.742	59.2	23	49.0		
5.	150	302	6.7	21.4	0.763	54.0	25	51.5		
6.	175	347	6.1	27.5	0.779	50.1	26	52.0		
7.	200	392	5.7	33.2	0.791	47.4	25	56.1		
8.	225	437	5.6	38.8	0.804	44.5	26	60.5		
9.	250	482	5.9	44.7	0.818	41.5	27	65.1		
10.	275	527	6.7	51.4	0.829	39.2	28	69.1		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	4.6	56.0	0.843	36.4	30	72.6	38	15
12.	225	437	5.5	61.5	0.850	35.0	30	76.4	42	40
13.	250	482	5.0	66.5	0.860	33.0	31	81.6	51	60
14.	275	527	5.7	72.2	0.872	30.8	34	84.9	70	75
15.	300	572	6.4	78.6	0.882	28.9	36	90.4	109	90
Residuum			19.5	98.1	0.939	19.2				

Carbon residue of residuum: 4.2%

Carbon residue of crude: 0.9%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	7.6	0.709	68.1	
Total gasoline and naphtha	33.2	0.754	56.2	
Kerosine distillate	11.5	0.811	43.0	
Gas oil	18.7	0.841	36.8	
Nonviscous lubricating distillate	10.6	0.859-0.880	33.2-29.3	50-100
Medium lubricating distillate	4.6	0.880-0.888	29.3-27.8	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	19.5	0.939	19.2	
Distillation loss	1.9			

Remarks: The sample as received contained 9 lb. salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 174-56

FIELD: West Drumheller

POOL:

ZONE: Leduc (D-3)

Well Name: West Drumheller Leduc No. 12-1
 Location: Lsd. 12, Sec. 1, Twp. 30, Rge. 21, W 4
 Interval tested, depth, feet: 5655-5668
 Producing Zone: Leduc (D-3)
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: May 16, 1956
 Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.851
 Sulphur, percent by weight: 0.80
 Saybolt Universal Viscosity:
 at 100°F., sec. 42

A.P.I. gravity at 60°F.: 34.8
 Pour point, °F.: 35
 Colour: Brownish Black
 Carbon residue, percent by weight: 3.0
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 763 mm. Hg.
 First drop, 50°C. (122°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167	1.4	1.4	0.682	76.0	-			
3.	100	212	3.6	5.0	0.710	67.8	17	50.0		
4.	125	257	5.2	10.2	0.739	60.0	21	48.0		
5.	150	302	5.6	15.8	0.758	55.2	23	47.8		
6.	175	347	4.8	20.6	0.777	50.6	25	49.2		
7.	200	392	4.3	24.9	0.791	47.4	25	51.5		
8.	225	437	4.6	29.5	0.807	43.8	27	54.7		
9.	250	482	5.3	34.8	0.822	40.6	29	58.2		
10.	275	527	7.2	42.0	0.833	38.4	30	63.6		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	5.0	47.0	0.851	34.8	34	66.1	38	5
12.	225	437	5.6	52.6	0.860	33.0	35	69.6	43	30
13.	250	482	5.4	58.0	0.873	30.6	37	73.4	53	50
14.	275	527	5.2	63.2	0.887	28.0	41	77.2	77	70
15.	300	572	6.5	69.7	0.900	25.7	44	81.0	133	85
Residuum			26.4	96.1	0.962	15.6				

Carbon residue of residuum: 9.9%

Carbon residue of crude: 3.0%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	5.0	0.702	70.1	
Total gasoline and naphtha	24.9	0.752	56.1	
Kerosine distillate	9.9	0.815	42.1	
Gas oil	18.8	0.847	35.6	
Nonviscous lubricating distillate	9.4	0.870-0.892	31.1-27.1	50-100
Medium lubricating distillate	6.7	0.892-0.907	27.1-24.5	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	26.4	0.962	15.6	
Distillation loss	3.9			

Remarks: The sample as received contained 7 lb. salt (as NaCl) per 1000 bbl.

OIL FIELD DATA

Field and Pool: Duhamel D-2

Location: Twp. 45, Rge. 21, W 4 M

DISCOVERY DETAILS

Method: Seismograph

Well: Name: -

Completed: July 8, 1951

Perforated: 4540'-4545'

Treatment: 1,200 gals 15% Hydrochloric Acid

Initial Potential: 75 BOPD cut 5% water

GEOLOGY

Producing Zone(s): Nisku D-2

Trap Type: Structural

Lithology: Biostrom Reef

Maximum Reservoir Thickness: 155

Regional Setting: Edge of Devonian Green Shale Basin

DEVELOPMENT DATA

Total Wells: Completed Oil: 17. Dry and Abandoned: 4

Producing Oil: 13. Suspended Oil: 3

Injection or Disposal: Water: 2

Well Spacing: 40 Acres

Logging Practice: Electrical log and microlog

Completion Practice: Drill through and perforate

RESERVOIR DATA (1-1-65)

Type of Drive: Water Drive

Estimated Oil in Place: 12,300,000 S.T.bbls (296 bbls/acre-foot)

Estimated Recoverable Oil: 5,540,000 S.T.bbls (133 bbls/acre-foot)

Oil Zone Thickness: Maximum: 53.4 feet. Average: 49 feet

Gas Zone Thickness: -

Porosity: 5.2%. Permeability: 229 md

Area: 1,896 Acres

Oil Characteristics: Gravity: 37.1 °API. Sulphur: 0.98%

Pour Point: 15°F. Initial Solution GOR: 335

Pressure Maintenance or Secondary Recovery: Natural Water Drive

PRODUCTION

MPR: 355 BOPD (September 1965 Allowable)

Economic Allowance: Operating: 26

Market Outlet (pipeline): Britamoil

OIL FIELD DATA

Field and Pool: Duhamel D-3

Location: Twp. 45, Rge. 21, W 4 M

DISCOVERY DETAILS

Method: Seismograph

Well: Name: Socony Flint No. 1; 13-17-45-21 W 4 M

Completed: September 10, 1950

Perforated: At 4826', 4819' - 4821', 4806' - 4820', 4524', 4503' - 4524'

Treatment: 2,000 gals 15% Hydrochloric Acid

Initial Potential: 361 BOPD on 1/4" choke

GEOLOGY

Producing Zone(s): Leduc D-3

Trap Type: Strat. Reef

Lithology: Biohermal Reef

Maximum Reservoir Thickness: 204' (oil and gas pay)

Regional Setting: Edge of Devonian Green Shale Basin

DEVELOPMENT DATA

Total Wells: Completed Oil: 13. Dry and Abandoned: 4

Producing Oil: 11. Suspended Oil: 2

Injection or Disposal: Gas: 1

Well Spacing: 40 Acres

Logging Practice: Electrical log and Microlog

Completion Practice: Case through and perforate

RESERVOIR DATA (1-1-65)

Type of Drive: Gas Injection

Estimated Oil in Place: 13,916,168 S.T.bbls (400 bbls/acre-foot)

Estimated Recoverable Oil: 7,018,000 S.T.bbls (200 bbls/acre-foot)

Oil Zone Thickness: Maximum: 137 feet. Average: 67.9 feet

Porosity: 8.0%. Permeability: 298 md

Area: 516 Acres

Oil Characteristics: Gravity: 36 °API. Sulphur: 0.55%

Pour Point: 25°F. Initial Solution GOR: 355

Pressure Maintenance or Secondary Recovery: Gas Injection

PRODUCTION

MPR: 432 BOPD (September 1965 Allowable)

Economic Allowance: Operating: 27

Market Outlet (pipeline): Britamoil

CRUDE PETROLEUM ANALYSIS

Laboratory Number 1737-52

FIELD: Duhamel

POOL:

ZONE: Nisku (D-2)

Well Name: Mobil Oil Duhamel No. 29-14A
 Location: Lsd. 14, Sec. 29, Twp. 45, Rge. 21, W 4
 Interval tested, depth, feet: 4500-4520
 Producing Zone: Nisku (D-2)
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: September 2, 1952
 Sampled at: After separator

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.846
 Sulphur, percent by weight: 0.83
 Saybolt Universal Viscosity:
 at 70°F., sec. 45
 at 100°F., sec. 39
 A.P.I. gravity at 60°F.: 35.8
 Pour point, °F.: 0
 Colour: Brownish Green
 Carbon residue, percent by weight: 2.3
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 756 mm. Hg.
 First drop, 23°C. (73°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	2.3	2.3						
2.	75	167	2.4	4.7	0.672	79.1	-			
3.	100	212	4.7	9.4	0.719	65.3	21	52.6		
4.	125	257	6.3	15.7	0.743	58.9	23	49.5		
5.	150	302	6.0	21.7	0.765	53.5	26	48.4		
6.	175	347	6.0	27.7	0.783	49.2	28	48.8		
7.	200	392	4.7	32.4	0.799	45.6	29	51.2		
8.	225	437	4.7	37.1	0.814	42.3	31	55.8		
9.	250	482	5.1	42.2	0.827	39.6	31	59.7		
10.	275	527	7.0	49.2	0.844	36.2	35	63.5		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	4.3	53.5	0.863	32.5	40	66.6	40	20
12.	225	437	5.5	59.0	0.871	31.0	40	69.0	47	35
13.	250	482	5.1	64.1	0.884	28.6	43	73.0	59	55
14.	275	527	4.9	69.0	0.896	26.4	45	76.5	89	70
15.	300	572	6.3	75.3	0.912	23.7	50	80.6	178	85
Residuum			22.2	97.5	0.971	14.2				

Carbon residue of residuum: 9.2%

Carbon residue of crude: 2.3%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	9.4	0.696	71.8	
Total gasoline and naphtha	32.4	0.749	57.4	
Kerosine distillate	4.7	0.814	42.3	
Gas oil	20.5	0.849	35.2	
Nonviscous lubricating distillate	9.6	0.874-0.898	30.4-26.1	50-100
Medium lubricating distillate	6.3	0.898-0.916	26.1-23.0	100-200
Viscous lubricating distillate	1.8	0.916-0.921	23.0-22.1	Above 200
Residuum	22.2	0.971	14.2	
Distillation loss	2.5			

Remarks: The sample as received contained 0.25% by vol. water and sediment (by centrifuge) and no salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 1738-52

FIELD: Duhamel

POOL:

ZONE: Leduc (D-3)

Well Name: Mobil Oil Duhamel No. 29-14
 Location: Lsd. 14, Sec. 29, Twp. 45, Rge. 21, W 4
 Interval tested, depth, feet: 4730-4820
 Producing Zone: Leduc (D-3)
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: September 2, 1952
 Sampled at: After separator

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.846
 Sulphur, percent by weight: 0.38
 Saybolt Universal Viscosity:
 at 70°F., sec. 57
 at 100°F., sec. 44

A.P.I. gravity at 60°F.: 35.8
 Pour point, °F.: 35
 Colour: Brownish Green
 Carbon residue, percent by weight: 2.3
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 760 mm. Hg.
 First drop, 26°C. (79°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	1.8	1.8)						
2.	75	167	2.4	4.2)	0.682	76.0	-			
3.	100	212	4.7	8.9	0.724	63.9	23	49.4		
4.	125	257	6.5	15.4	0.749	57.4	26	48.4		
5.	150	302	4.5	19.9	0.765	53.5	26	49.8		
6.	175	347	4.3	24.2	0.782	49.5	27	51.6		
7.	200	392	3.9	28.1	0.798	45.8	29	54.0		
8.	225	437	4.4	32.5	0.812	42.8	30	57.2		
9.	250	482	4.8	37.3	0.825	40.0	31	61.2		
10.	275	527	6.3	43.6	0.836	37.8	31	66.0		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	3.7	47.3	0.849	35.2	33	69.5	40	15
12.	225	437	5.8	53.1	0.855	34.0	32	73.2	45	35
13.	250	482	6.1	59.2	0.867	31.7	35	77.3	58	55
14.	275	527	4.3	63.5	0.879	29.5	37	80.6	83	75
15.	300	572	6.7	70.2	0.891	27.3	40	84.6	146	85
Residuum			26.5	96.7	0.967	14.8				

Carbon residue of residuum: 7.5%

Carbon residue of crude: 2.3%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	8.9	0.704	69.5	
Total gasoline and naphtha	28.1	0.749	57.4	
Kerosine distillate	9.2	0.819	41.3	
Gas oil	15.2	0.845	36.0	
Nonviscous lubricating distillate	10.3	0.860-0.882	33.0-28.9	50-100
Medium lubricating distillate	7.4	0.882-0.898	28.9-26.1	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	26.5	0.967	14.8	
Distillation loss	3.3			

Remarks: The sample as received contained 0.4% by vol. water and sediment (by centrifuge) and no salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 352-53

FIELD: Ellerslie

POOL:

ZONE: Basal Quartz Ss.

Well Name: C.P.R. L. Ellerslie No. 1
 Location: Lsd. 10, Sec. 31, Twp. 51, Rge. 24, W 4
 Interval tested, depth, feet: 3907-3936
 Producing Zone: Basal Quartz Ss.
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: Imperial Oil Ltd.
 Date Sampled: October 7, 1950
 Sampled at: Well

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.880
 Sulphur, percent by weight: 1.15
 Saybolt Universal Viscosity:
 at 70°F., sec. 85
 at 100°F., sec. 57

A.P.I. gravity at 60°F.: 29.3
 Pour point, °F.: 30
 Colour: Brownish Green
 Carbon residue, percent by weight: 3.5
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 758 mm. Hg.
 First drop, 59°C. (138°F.)

Frac- tion No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Corre- lation Index	Aniline Point, °C.	Visc. S.U. 100°F.	Cloud Test, °F.	Refractive Index 20°C.
	°C.	°F.									
1.	50	122									
2.	75	167									
3.	100	212	1.9	1.9	0.734	61.3	-	-			1.4011
4.	125	257	4.8	6.7	0.742	59.2	23	55.2			1.4118
5.	150	302	3.6	10.3	0.764	53.7	26	54.6			1.4238
6.	175	347	5.9	16.2	0.780	49.9	26	53.8			1.4333
7.	200	392	5.2	21.4	0.797	46.0	28	54.2			1.4428
8.	225	437	4.9	26.3	0.812	42.8	30	57.8			1.4510
9.	250	482	5.7	32.0	0.827	39.6	31	62.2			1.4591
10.	275	527	7.3	39.3	0.842	36.6	34	65.8			1.4680

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	4.5	43.8	0.861	32.8	39	68.6	40	15	1.4774
12.	225	437	4.9	48.7	0.868	31.5	38	71.8	46	30	1.4828
13.	250	482	6.7	55.4	0.881	29.1	41	74.6	58	50	1.4898
14.	275	527	5.3	60.7	0.895	26.6	45	-	84	70	-
15.	300	572	7.0	67.7	0.905	24.8	46	82.2	156	85	1.5066
Resi- duum			31.9	99.6	0.982	12.6					

Carbon residue of residuum: 9.8%

Carbon residue of crude: 3.5%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	1.9	0.734	61.3	
Total gasoline and naphtha	21.4	0.769	52.5	
Kerosine distillate	4.9	0.812	42.8	
Gas oil	21.9	0.847	35.6	
Nonviscous lubricating distillate	11.2	0.872-0.897	30.8-26.2	50-100
Medium lubricating distillate	8.3	0.897-0.911	26.2-23.8	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	31.9	0.982	12.6	
Distillation loss	0.4			

Remarks: The sample as received contained 0.06% by vol. water and sediment (by centrifuge) and 20 lb. salt (as NaCl) per 1000 bbl.

OIL FIELD DATA

Field and Pool: Erskine D-3

Location: Twp. 39, Rge(s) 20 & 21, W 4 M

DISCOVERY DETAILS

Method: Not Known

Well: Name: Canadian Pipelines Merrill & Assoc. No. 5-1 Lsd. 5-1-39-21 W 4 M

Completed: January 16, 1953

Perforated: 5377'-5385'

Initial Potential: 1,200 BOPD

GEOLOGY

Producing Zone(s): Leduc formation, Woodbend group of U. Devonian, Ellerslie form. (Gas - 2 Wells)

Other Shows: Vik. gas in Sec. 12. Ellerslie gas in Secs. 1, 7 & 21. Nisku oil in Sec. 13 & 24

Trap Type: Stratigraphic reef bioherm with Ireton cover

Lithology: Brn., coarsely crystalline reef dolomite. Porosity vugular & intercrystalline.

Maximum Reservoir Thickness: 800' (est.)

Regional Setting: Central portion of the U. Dev. Ireton basin - a N.W. extension of the Big Valley-Stettler reef trend.

Deepest Formation Penetrated: No well within field has penetrated deeper than the Leduc; some nearby wells have penetrated to the Beaverhill L.

DEVELOPMENT DATA

Total Wells: Completed Oil: 94

Producing Oil: 53

Injection or Disposal: Water: 3

Well Spacing: 40 Acres

Logging Practice: IE log - to evaluate Cretaceous and Mississippian Gamma Sonic - surface to T.D.

Completion Practice: 300' surface casing, 7" production stringer set in Ireton and completed open hole. Where wells penetrate the O/W, casing is run to T.D. perfs.

RESERVOIR DATA

Type of Drive: Water

Estimated Oil in Place: 42,094,000 S.T.bbls (331 bbls/acre-foot)

Estimated Recoverable Oil: 21,047,000 S.T.bbls (165 bbls/acre-foot)

Oil Zone Thickness: Maximum: 36'. Average: 31.7'

Gas Zone Thickness: Maximum: 92'. Average: 34'

Porosity: 6.25%. Permeability: 713 md

Area: 4,744 Acres

Oil Characteristics: Gravity: 27.5 °API. Sulphur: 1.87%

Initial Solution GOR: 403 SCF/STB

Pressure Maintenance or Secondary Recovery: None

PRODUCTION

Economic Allowance: Present: 28 BOPD. Operating: 28 BOPD

Market Outlet: Via Britam oil Pipeline to Edmonton

CRUDE PETROLEUM ANALYSIS

Laboratory Number 227-56

FIELD: Erskine

POOL:

ZONE: Leduc (D-3)

Well Name: C.P.R. Clark No. 6
 Location: Lsd. 6, Sec. 7, Twp. 39, Rge. 20, W 4
 Interval tested, depth, feet: 5368-5392
 Producing Zone: Leduc (D-3)
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: June 13, 1956
 Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.895
 Sulphur, percent by weight: 2.49
 Saybolt Universal Viscosity:
 at 70°F., sec. 97
 at 100°F., sec. 68

A.P.I. gravity at 60°F.: 26.6
 Pour point, °F.: -5
 Colour: Brownish Black
 Carbon residue, percent by weight: 5.6
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 751 mm. Hg.
 First drop, 48°C. (118°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167	1.0	1.0	0.680	76.6	-			
3.	100	212	2.2	3.2	0.717	65.8	20	50.7		
4.	125	257	4.1	7.3	0.745	58.4	24	48.0		
5.	150	302	4.3	11.6	0.764	53.7	26	48.2		
6.	175	347	4.0	15.6	0.780	49.9	26	49.2		
7.	200	392	3.6	19.2	0.795	46.5	27	50.9		
8.	225	437	4.3	23.5	0.812	42.8	30	52.7		
9.	250	482	4.7	28.2	0.829	39.2	32	55.1		
10.	275	527	6.7	34.9	0.844	36.2	35	57.8		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	3.9	38.8	0.863	32.5	40	58.5	38	5
12.	225	437	6.1	44.9	0.876	30.0	42	61.2	45	30
13.	250	482	5.8	50.7	0.893	27.0	47	63.3	60	50
14.	275	527	5.6	56.3	0.909	24.2	51	64.0	90	65
15.	300	572	7.5	63.8	0.923	21.8	55	65.3	183	80
Residuum			33.9	97.7	1.004	9.4				

Carbon residue of residuum: 14.8%

Carbon residue of crude: 5.6%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	3.2	0.705	69.2	
Total gasoline and naphtha	19.2	0.759	54.9	
Kerosine distillate	4.3	0.812	42.8	
Gas oil	20.4	0.852	34.6	
Nonviscous lubricating distillate	10.3	0.882-0.910	28.9-24.0	50-100
Medium lubricating distillate	7.0	0.910-0.925	24.0-21.5	100-200
Viscous lubricating distillate	2.6	0.925-0.931	21.5-20.5	Above 200
Residuum	33.9	1.004	9.4	
Distillation loss	2.3			

Remarks: The sample as received contained 115 lb. of salt (as NaCl) per 1000 bbl.

OIL FIELD DATA

Field and Pool: Ewing Lake D-3A

Location: Twp. 37, Rge. 21, W 4 M

DISCOVERY DETAILS

Method: Seismic

Well: Name: B.A. CPR Ewing Lake 14-23-37-21

Completed: January 1953

Perforated: 5,510-13

Initial Potential: 80 BOPD 20/64" choke

GEOLOGY

Producing Zone(s): Leduc, Woodbend group, U. Devonian
Nisku, Winterburn group, U. Devonian

Trap Type: Stratigraphic

Maximum Reservoir Thickness: Not Penetrated

Regional Setting: Located in Twp. 37, Rge. 21, W4M in SE portion of the U. Dev. -
Ireton basin. The field is part of an extensive reef mass
which trends N-S and includes the Stettler Field to the
northeast and Fenn-Big Valley to the east.

Deepest Formation Penetrated: Leduc

DEVELOPMENT DATA

Total Wells: Completed Oil: 14

Producing Oil: 10

Well Spacing: 40 Acres

RESERVOIR DATA

Type of Drive: Water

Estimated Oil in Place: 4,106,000 S.T.bbls (355 bbls/acre-foot)

Estimated Recoverable Oil: 1,642,000 S.T.bbls (142 bbls/acre-foot)

Oil Zone Thickness: Maximum: 31'. Average: 18'

Gas Zone Thickness: None

Porosity: 6.3%. Permeability: 143H, 9.6V (md)

Area: 1,280 Acres

Oil Characteristics: Gravity: 30.2 °API

Initial Solution GOR: 410 cu ft/bbl.

PRODUCTION

Economic Allowance: Present: 29 BOPD. Operating: 29 BOPD

Market Outlet: Trucked to Stettler Station

CRUDE PETROLEUM ANALYSIS

Laboratory Number 456-57

FIELD: Ewing Lake

POOL:

ZONE: Leduc

Well Name: CPR Ewing No. 14
 Location: Lsd. 14, Sec. 23, Twp. 37, Rge. 21, W 4
 Interval tested, depth, feet: 5510'-5516'
 Producing Zone: Leduc
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: DEMR
 Date Sampled: December 3, 1957
 Sampled at: After treater

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.868
 Sulphur, percent by weight: 0.84
 Saybolt Universal Viscosity:
 at 100°F., sec. 414
 at 130°F., sec. 284

A.P.I. gravity at 60°F.: 31.5
 Pour point, °F.: 25
 Colour: Black
 Carbon residue, percent by weight: 3.6
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 758 mm. Hg.										
First drop, 32°C. (90°F.)										
Fraction No.	Cut at °F.	Sum Per Cent	Specific Gravity 60/60°F.	Degrees A.P.I. 60 F.	Correlation Index	Aniline Point, °C.	Visc. S.U. 100°F.	Cloud Test, °F.	Refractive Index @ 20°C.	Dispersion (N _F -N _C) 10 ⁴
1.	122									
2.	167	2.7	0.678	77.2	-	-				
3.	212	6.2	0.719	65.3	21	51.5				
4.	257	11.0	0.747	57.9	25	49.2				
5.	302	15.8	0.767	53.0	27	49.0				
6.	347	19.6	0.783	49.2	28	50.7				
7.	392	23.1	0.800	45.4	30	52.9				
8.	437	26.9	0.815	42.1	31	55.8				
9.	482	31.2	0.828	39.4	32	58.9				
10.	527	36.4	0.842	36.6	34	63.0				
Stage 2 - Distillation continued at 40 mm. Hg. pressure										
11.	392	39.8	0.856	33.8	37	65.5	38	20		
12.	437	45.1	0.866	31.9	37	69.5	44	40		
13.	482	50.0	0.877	29.9	39	72.9	54	60		
14.	527	55.1	0.891	27.3	43	76.6	79	75		
15.	572	61.3	0.904	25.0	46	80.6	143	90		
Residuum		96.4	0.977	13.3						
Carbon residue of residuum: 9.0%					Carbon residue of crude: 3.6%					

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	6.2	0.701	70.4	
Total gasoline and naphtha	23.1	0.753	56.4	
Kerosene distillate	3.8	0.815	42.1	
Gas oil	18.7	0.849	35.2	Below 50
Nonviscous lubricating distillate	8.8	0.873-0.895	30.6-26.6	50-100
Medium lubricating distillate	6.9	0.895-0.911	26.6-23.8	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	35.1	0.977	13.3	
Distillation loss	3.6			

OIL FIELD DATA

Field and Pool: Excelsior D-2 (Nisku) Pool

Location: Twp. 56, Rge. 24, W 4 M

DISCOVERY DETAILS

Method: Reflection seismograph and subsurface geology

Well: Name: Imperial Excelsior #1 (13-3-56-24 W 4)

Completed: November 1949

Perforated: 3820-3840

Treatment: None

Initial Potential: 778 BOPD with a GOR of 200 cu.ft/bbl open flow

GEOLOGY

Producing Zone(s): Nisku formation, Winterburn group of Upper Devonian

Other Shows: Viking and Ellerslie formation

Trap Type: Structure - through differential compaction of underlying Ireton shales over Leduc reef

Lithology: Dolomite grey and brown, crystalline, granular, vuggy, porous

Maximum Reservoir Thickness: 170 feet

Regional Setting: Located between the Redwater reef and the Morinville reef of the Rimbey-Morinville reef trend.

Deepest Formation Penetrated: Beaverhill Lake - Imp. Excelsior No. 20 in 10-10-56-24 W4M

DEVELOPMENT DATA

Total Wells: Completed Oil: 35. Gas: Nil. Dry and Abandoned: 11

Producing Oil: 33. Suspended Oil: 2

Injection or Disposal: Water: 2. Gas: Nil

Well Spacing: 40 Acres

Logging Practice: Electrolog survey to total depth and Microlog of potential horizons.

Completion Practice: 10 3/4" surface casing set at 300', 7" casing in top of Ireton. Perforated, acid wash, and squeeze.

RESERVOIR DATA

Type of Drive: Bottom water drive

Estimated Oil in Place: 35,500,000 S.T.bbls (332 bbls/acre-foot)

Estimated Recoverable Oil: 24,850,000 S.T.bbls (234 bbls/acre-foot)

Oil Zone Thickness: Maximum: 162'. Average: 81'

Gas Zone Thickness: None

Porosity: 5.5%. Permeability: Excellent (md) kh 1000, kv 10

Area: 1,320 Acres

Oil Characteristics: Gravity: 35 °API. Sulphur: 1.24%

Pour Point: 15°F. Initial Solution GOR: 200 cu ft/bbl

Base: Paraffin

Pressure Maintenance or Secondary Recovery: None

PRODUCTION

MPR: N/A. BOPD (Pool): 1,100

Economic Allowance: Operating: 25 BOPD/well

Market Outlet: Imperial Pipeline to Edmonton terminal.

Bibliographical References: Bain, W.A.: A reservoir study of the Excelsior Pool; C.I.M.M. Trans., Vol. 44, pp. 320-325.
Lill, R.G.: Excelsior Oil Field; A.S.P.G. News Bull. Vol. 2, No. 2, pp. 5-10.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 831-51

FIELD: Excelsior

POOL:

ZONE: Nisku (D-2)

Well Name: Composite sample from 4 wells: Imperial
Excelsior Nos. 1, 4, 7 & 11
Location: N.W. 1/4 of sec. 3, Twp. 56, Rge. 24, W 4
Interval tested, depth, feet: 3820-3926
Producing Zone: Nisku (D-2)
Geological Age: Upper Devonian

Province: Alberta

Sample From: D.M.T.S.

Date Sampled: July 4, 1951

Sampled at: Tank

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.841
Sulphur, percent by weight: 0.65
Saybolt Universal Viscosity:
at 70°F., sec. 54
at 100°F., sec. 45

A.P.I. gravity at 60°F.: 36.8
Pour point, °F.: -10
Colour: Dark Green
Carbon residue, percent by weight: 2.1
(Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 764 mm. Hg.
First drop, 28°C. (82°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	2.2	2.2	0.635	91.3	-	-		
2.	75	167	2.4	4.6	0.670	79.7	8	-		
3.	100	212	4.3	8.9	0.708	68.4	16	57.8		
4.	125	257	5.7	14.6	0.736	60.8	20	56.6		
5.	150	302	5.7	20.3	0.759	54.9	23	56.6		
6.	175	347	5.7	26.0	0.778	50.4	25	56.5		
7.	200	392	3.9	29.9	0.795	46.5	27	57.9		
8.	225	437	5.2	35.1	0.812	42.8	30	61.2		
9.	250	482	4.7	39.8	0.824	40.2	30	64.8		
10.	275	527	5.7	45.5	0.836	37.8	31	69.4		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	6.3	51.8	0.853	34.4	35	71.9	40	15
12.	225	437	6.5	58.3	0.863	32.5	36	79.0	50	40
13.	250	482	5.5	63.8	0.876	30.0	39	82.6	69	60
14.	275	527	4.4	68.2	0.887	28.0	41	87.6	111	75
15.	300	572	4.8	73.0	0.896	26.4	42	91.0	197	90
Residuum			24.7	97.7	0.953	17.0				

Carbon residue of residuum: 8.6%

Carbon residue of crude: 2.1%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	8.9	0.680	76.6	
Total gasoline and naphtha	29.9	0.739	60.0	
Kerosine distillate	9.9	0.818	41.5	
Gas oil	15.3	0.849	35.2	
Nonviscous lubricating distillate	9.6	0.863-0.884	32.5-28.6	50-100
Medium lubricating distillate	6.1	0.884-0.896	28.6-26.4	100-200
Viscous lubricating distillate	2.2	0.896-0.901	26.4-25.6	Above 200
Residuum	24.7	0.953	17.0	
Distillation loss	2.3			

Remarks: The sample as received contained no water (A.S.T.M.) and 2 lb. salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 338-53

FIELD: Excelsior

POOL:

ZONE: Nisku (D-2)

Well Name: Imperial Excelsior No. 1
 Location: Lsd. 13, Sec. 3, Twp. 56, Rge. 24, W 4
 Interval tested, depth, feet: 3811-3850
 Producing Zone: Nisku (D-2)
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: Imperial Oil Ltd.
 Date Sampled: (1949)
 Sampled at: Well

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.843
 Sulphur, percent by weight: 0.54
 Saybolt Universal Viscosity:
 at 100°F., sec. 43

A.P.I. gravity at 60°F.: 36.4
 Pour point, °F.: 35
 Colour: Dark Green
 Carbon residue, percent by weight: 2.2
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 753 mm. Hg.
 First drop, 28°C. (82°F.)

Frac- tion No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Corre- lation Index	Aniline Point, °C.	Visc. S.U. 100°F.	Cloud Test, °F.	Refractive Index 20°C.
	°C.	°F.									
1.	50	122	1.2	1.2)							
2.	75	167	2.5	3.7)	0.666	81.0	-				1.3830
3.	100	212	4.7	8.4	0.715	66.4	19	56.6			1.3992
4.	125	257	6.2	14.6	0.740	59.7	22	55.8			1.4103
5.	150	302	5.4	20.0	0.761	54.4	24	56.0			1.4218
6.	175	347	5.3	25.3	0.781	49.7	27	56.3			1.4329
7.	200	392	4.7	30.0	0.797	46.0	28	57.5			1.4416
8.	225	437	4.3	34.3	0.811	43.0	29	59.7			1.4494
9.	250	482	5.2	39.5	0.824	40.2	30	64.2			1.4565
10.	275	527	6.6	46.1	0.836	37.8	31	68.8			1.4640

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	6.0	52.1	0.855	34.0	36	74.3	42	20	1.4741
12.	225	437	4.1	56.2	0.861	32.8	35	77.0	46	35	1.4769
13.	250	482	3.9	60.1	0.870	31.1	36	80.9	57	50	1.4825
14.	275	527	5.0	65.1	0.880	29.3	38	84.4	77	65	1.4883
15.	300	572	6.6	71.7	0.890	27.5	39	88.5	139	80	1.4973
Resi- dium			26.5	98.2	0.965						

Carbon residue of residuum: 7.3%

Carbon residue of crude: 2.2%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	8.4	0.693	72.7	
Total gasoline and naphtha	30.0	0.747	57.9	
Kerosine distillate	9.5	0.818	41.5	
Gas oil	16.0	0.848	35.4	
Nonviscous lubricating distillate	9.3	0.864-0.884	32.3-28.6	50-100
Medium lubricating distillate	6.9	0.884-0.896	28.6-26.4	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	26.5	0.965	15.1	
Distillation loss	1.8			

Remarks: The sample as received contained a trace of water and sediment (by centrifuge) and 21 lb. salt (as NaCl) per 1000 bbl.

OIL FIELD DATA

Field and Pool: Fairydell D-2 Nisku

Location: Twp. 57, Rge. 24, W 4 M

DISCOVERY DETAILS

Method: Drill Stem Test

Well: Name: Union Fairydell 3-21-57-24 W4 (Later Abandoned in D-2)
Union Fairydell 4-21A-57-24 W4

Completed: Cased and Perforated

Perforated: 3717-3718, 3734-44, 3751-58, 3765-70

Treatment: Acidized with 1000 gals. XF 15% HCl acid

Initial Potential: 75 b/d

GEOLOGY

Producing Zone(s): D-2 Nisku

Other Shows: Gas in Basal Quartz and Viking Zones (Not Commercial)
Oil in Leduc D-3

Trap Type: Structure over reef

Lithology: Dolomite

Maximum Reservoir Thickness: 60 feet

Regional Setting: North end of Leduc Morinville reef trend

Deepest Formation Penetrated: Leduc D-3

DEVELOPMENT DATA

Total Wells: Completed Oil: 6. Gas: Nil

Producing Oil: 6. Suspended Oil: 1 (Used for Pressure Observation)

Injection or Disposal: Nil.

Well Spacing: 40 Acres

Logging Practice: E-log, Micro log

Completion Practice: Open hole or perforate

RESERVOIR DATA

Type of Drive: Water

Estimated Oil in Place: 4,427,000 S.T.bbls (346 bbls/acre-foot)

Estimated Recoverable Oil: 1,771,000 S.T.bbls (138 bbls/acre-foot)

Oil Zone Thickness: Maximum: 60 feet. Average: 40 feet

Porosity: 5.7%. Permeability: 227 md

Area: 515 Acres

Oil Characteristics: Gravity: 27 °API. Sulphur: 1.02%

Pour Point: +30

Pressure Maintenance or Secondary Recovery: -

PRODUCTION

MPR: 490 BOPD

Economic Allowance: Present: 25. Operating: 25

Market Outlet (pipeline): Imperial Oil

OIL FIELD DATA

Field and Pool: Fairydell D-3 (Leduc) Pool

Location: Twp. 57, Rge. 24, W 4 M

DISCOVERY DETAILS

Method: Subsurface geology, seismic reflection and structure test hole surveys.

Well: Name: Union Fairydell No. 3-21-57-24 W 4

Completed: March 5, 1953

Perforated: 4012'-4026' and 4042'-4052'

Treatment: Small acid wash

Initial Potential: Well pumped 237 BOPD through 1" choke with a GOR of 140 cu.ft/bbl

GEOLOGY

Producing Zone(s): Leduc formation, Woodbend group of Upper Devonian.

Other Shows: Nisku formation, Winterburn group of U. Devonian. Ellerslie formation (gas), Mannville sub-group of Lower Cretaceous. Viking formation (gas), Colorado group of Upper Cretaceous. Drill stem tests indicate commercial gas from the Glauconitic sand at the Union No. 3-21 well, and commercial oil from the Ellerslie sand at the Imperial No. 10-8 well. Gas shows were tested in the Upper Mannville sands at the Imperial No. 10-8 well; these sands appear to be of limited areal distribution.

Trap Type: Leduc: Stratigraphic reef bioherm, surrounded by impermeable dolomitic and calcareous shale.

Lithology: Greenish grey to grey, fine to coarse crystalline dolomite--porosity predominantly in vugs and fractures.

Maximum Reservoir Thickness: 825'

Regional Setting: Located in the central portion of the Upper Devonian Ireton basin on the eastern edge of the Morinville-Meadowbrook reef complex. Regional dip for the Devonian beds in the area is 50' to the mile in a S.65°W. direction.

Deepest Formation Penetrated: Leduc fm. (101') in Union No. 14-21 well.

DEVELOPMENT DATA

Total Wells: Completed Oil: 20. Gas: Viking 3, Ellerslie 1. Dry and Abandoned:
Leduc 9, Ellerslie 1

Producing Oil: 20. Suspended Oil: Nil

Injection or Disposal: Water: Nil. Gas: Nil

Well Spacing: 40 Acres

Logging Practice: Electric log from base surface casing to total depth. Microlog
from Viking sand to total depth. Radio activity log over
Devonian section.

Completion Practice: 600' surface casing, 7" casing to total depth and perforate
desired interval, or 7" casing set in top Leduc and completed
open hole.

RESERVOIR DATA

Type of Drive: Water drive

Estimated Oil in Place: 17,900,000 S.T.bbls (322 bbls/acre-foot)

Estimated Recoverable Oil: 10,200,000 S.T.bbls (183 bbls/acre-foot)

Oil Zone Thickness: Maximum: 115'. Average: 59.2'

Gas Zone Thickness: Nil

Porosity: 6.46%. Permeability: Excellent (kh: 100-1000 md, kv: 10-400 md)

Area: 940 Acres

Oil Characteristics: Gravity: 27 °API. Sulphur: 1.3%

Pour Point: 55°F. Initial Solution GOR: 140 cu ft/bbl

Base: Paraffin

Pressure Maintenance or Secondary Recovery: None

PRODUCTION

MPR: N/A. Pool: 650 BOPD

Economic Allowance: Operating: 25 BOPD/well

Market Outlet: Imperial Oil Pipeline to Edmonton terminal.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 1718-52

FIELD: Fairydell-Bon Accord

POOL:

ZONE: Nisku (D-2)

Well Name: Composite 4 wells: Imperial Bon Accord No. 1,
5 & 6 and Harry W. Bass Bon Accord No. 8

Province: Alberta

Location: Lsd. 1,4,16 & 3; Sec. 29, 28, 20 & 28,
Twp. 56, Rge. 23, W 4

Sample From: D.M.T.S.

Interval tested, depth, feet: approx. 3,600

Producing Zone: Nisku (D-2)

Date Sampled: August 29, 1952

Geological Age: Upper Devonian

Sampled at: Tank

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.844
Sulphur, percent by weight: 0.78
Saybolt Universal Viscosity:
at 70°F., sec. 49
at 100°F., sec. 41

A.P.I. gravity at 60°F.: 36.2
Pour point, °F.: 0
Colour: Dark Green
Carbon residue, percent by weight: 2.4
(Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 -- Distillation at atmospheric pressure, 754 mm. Hg.
First drop, 32°C. (90°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	1.4	1.4)	-	-	-	-	-	-
2.	75	167	1.4	2.8)	0.666	81.0	-	-	-	-
3.	100	212	4.1	6.9	0.707	68.6	15	59.4	-	-
4.	125	257	6.6	13.5	0.732	61.8	18	58.6	-	-
5.	150	302	6.3	19.8	0.753	56.4	20	58.3	-	-
6.	175	347	6.0	25.8	0.774	51.3	23	58.2	-	-
7.	200	392	5.1	30.9	0.794	46.7	27	58.9	-	-
8.	225	437	5.1	36.0	0.807	43.8	27	61.1	-	-
9.	250	482	5.5	41.5	0.821	40.9	29	64.8	-	-
10.	275	527	7.4	48.9	0.835	38.0	31	69.0	-	-

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	3.3	52.2	0.850	35.0	34	70.8	39	10
12.	225	437	4.9	57.1	0.858	33.4	34	75.4	44	30
13.	250	482	5.5	62.6	0.868	31.5	35	79.0	53	50
14.	275	527	4.8	67.4	0.881	29.1	38	82.2	75	65
15.	300	572	6.8	74.2	0.889	27.7	39	87.8	131	85
Residuum			25.0	99.2	0.951	17.3				

Carbon residue of residuum: 8.5%

Carbon residue of crude: 2.4%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	6.9	0.690	73.6	
Total gasoline and naphtha	30.9	0.740	59.7	
Kerosine distillate	10.6	0.814	42.3	
Gas oil	16.6	0.847	35.6	
Nonviscous lubricating distillate	9.5	0.865-0.885	32.1-28.4	50-100
Medium lubricating distillate	6.6	0.885-0.894	28.4-26.8	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	25.0	0.951	17.3	
Distillation loss	0.8			

Remarks: The sample as received contained 0.2% by vol. water and sediment (by centrifuge) and 12 lb. salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 235-56

FIELD: Fairydell - Bon Accord

POOL:

ZONE: Leduc (D-3)

Well Name: Imperial Fairydell No. 16-17L-57-24
 Location: Lsd. 16, Sec. 17, Twp. 57, Rge. 24, W 4
 Interval tested, depth, feet: 3982-4013
 Producing Zone: Leduc (D-3)
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: June 19, 1956
 Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.890
 Sulphur, percent by weight: 1.08
 Saybolt Universal Viscosity:
 at 100°F., sec. 145
 at 130°F., sec. 75

A.P.I. gravity at 60°F.: 27.5
 Pour point, °F.: 65
 Colour: Brownish Black
 Carbon residue, percent by weight: 3.2
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 756 mm. Hg.
 First drop, 120°C. (248°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167								
3.	100	212								
4.	125	257								
5.	150	302	1.9	1.9	0.750	57.2	-	65.2		
6.	175	347	1.8	3.7	0.767	53.0	20	66.4		
7.	200	392	2.5	6.2	0.781	49.7	21	67.7		
8.	225	437	3.3	9.5	0.798	45.8	23	68.5		
9.	250	482	4.4	13.9	0.812	42.8	24	70.3		
10.	275	527	7.0	20.9	0.826	39.8	26	73.0		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	3.3	24.2	0.843	36.4	30	75.8	39	15
12.	225	437	7.8	32.0	0.851	34.8	30	79.5	46	35
13.	250	482	7.4	39.4	0.864	32.3	33	81.9	56	55
14.	275	527	6.6	46.0	0.875	30.2	35	84.4	80	70
15.	300	572	8.9	54.9	0.887	28.0	38	86.9	142	90
Residuum			42.5	97.4	0.957	16.4				

Carbon residue of residuum: 6.9%

Carbon residue of crude: 3.2%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	-	-	-	
Total gasoline and naphtha	6.2	0.767	53.0	
Kerosine distillate	7.7	0.806	44.1	
Gas oil	17.2	0.839	37.2	
Nonviscous lubricating distillate	14.1	0.856-0.879	33.8-29.5	50-100
Medium lubricating distillate	9.7	0.879-0.894	29.5-26.8	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	42.5	0.957	16.4	
Distillation loss	2.6			

Remarks: The sample as received contained no salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 236-56

FIELD: Fairydell-Bon Accord

POOL:

ZONE: Nisku (D-2)

Well Name: Imperial Fairydell No. 16-17N-57-24
 Location: Lsd. 16, Sec. 17, Twp. 57, Rge. 24, W 4
 Interval tested, depth, feet: 3752-3765
 Producing Zone: Nisku (D-2)
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: D.M.T.S.

Date Sampled: June 19, 1956
 Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.884
 Sulphur, percent by weight: 1.40
 Saybolt Universal Viscosity:
 at 100°F., sec. 33

A.P.I. gravity at 60°F.: 28.6
 Pour point, °F.: 65
 Colour: Brownish Black
 Carbon residue, percent by weight: 3.6
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 758 mm. Hg.
 First drop, 100°C. (212°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Tst., °F.
	°C.	°F.								
1.	50	122								
2.	75	167								
3.	100	212								
4.	125	257	1.9	1.9	0.734	61.3	-	62.7		
5.	150	302	3.3	5.2	0.751	56.9	19	61.7		
6.	175	347	3.3	8.5	0.772	51.8	23	63.7		
7.	200	392	1.8	10.3	0.787	48.3	23	64.5		
8.	225	437	3.3	13.6	0.801	45.2	24	65.6		
9.	250	482	4.2	17.8	0.817	41.7	27	67.8		
10.	275	527	7.0	24.8	0.831	38.8	29	70.0		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	2.9	27.7	0.845	36.0	31	74.0	39	5
12.	225	437	7.6	35.3	0.852	34.6	31	77.1	45	25
13.	250	482	7.0	42.3	0.864	32.3	33	80.4	57	45
14.	275	527	6.3	48.6	0.876	30.0	36	83.2	79	65
15.	300	572	9.6	58.2	0.887	28.0	38	86.4	141	80
Residuum			38.8	97.0	0.962	15.6				

Carbon residue of residuum: 8.5%

Carbon residue of crude: 3.6%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	-	-	-	
Total gasoline and naphtha	10.3	0.761	54.4	
Kerosine distillate	7.5	0.810	43.2	
Gas oil	16.6	0.841	36.8	
Nonviscous lubricating distillate	13.8	0.857-0.880	33.6-29.3	50-100
Medium lubricating distillate	10.0	0.880-0.894	29.3-26.8	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	38.8	0.962	15.6	
Distillation loss	3.0			

Remarks: The sample as received contained a trace of salt (as NaCl) per 1000 bbl.

OIL FIELD DATA

Field and Pool: Fenn-Big Valley D-2

Location: Twp(s) 35, 36 & 37; Rge 20, W 4 M

DISCOVERY DETAILS

Method: Seismic reflection survey & core drill

Well: Name: B.A. Big Valley 9-10-35-20 W 4 M

Completed: November 2, 1950

Perforated: Nil, open hole completion

Initial Potential: 528 BOPD, 24/64" choke, GOR 357 cu ft/bbl. No BS & W

GEOLOGY

Producing Zone(s): Nisku form., Winterburn group of U. Devonian
Leduc form., Woodbend group of U. Devonian
Viking form., Colorado group, U. Cretaceous

Other Shows: Viking form - gas shows, max. 3,000 mcfd

Trap Type: Structural trap caused by differential compaction of Ireton shale over underlying Leduc reef.

Lithology: Nisku is overlain by Calmar silt. It consists of buff & tan dol., dns, fm, porosity is pin point & vuggy, becomes dark brown near base. The Ireton green shale underlies the Nisku.

Maximum Reservoir Thickness: 138'

Regional Setting: Located in the SE portion of the U. Devonian - Ireton basin in Twps. 35, 36, 37, Rge. 20, W 4 M. The D-2 pool overlies an extensive reef mass that trends N-S and includes the large Stettler field to the North and the Ewing Lake field to the west.

Deepest Formation Penetrated: Cooking Lake (Gulf CPR Gough 10-23-36-20 W 4 M) to a depth of 6170'

DEVELOPMENT DATA

Total Wells: Completed Oil: 298

Producing Oil: 140

Injection or Disposal: Water: 4

Well Spacing: 40 Acres

Logging Practice: Induction - Electrical log surface to D-1 (Wabamun).
Gamma-Sonic D-1 to T.D.

Completion Practice: Generally 5 1/2" casing, sometimes 7", set to top of producing horizon and completed open hole.

RESERVOIR DATA

Type of Drive: Water, Gas Cap (Negligible)

Estimated Oil in Place: 355,886,000 S.T.bbls (432 bbls/acre-foot)

Estimated Recoverable Oil: 249,120,000 S.T.bbls (303 bbls/acre-foot)

Oil Zone Thickness: Maximum: 138'. Average: 62.6'

Gas Zone Thickness: Maximum: Where G/O is - 2,402' max.: 22' (av. 10')
Where G/O is - 2,439' max.: 53' (av. 22')

Porosity: 8.0%. Permeability: 1,575 md.

Area: 15,500 Acres

Oil Characteristics: Gravity: 31.8 °API. Sulphur: 0.92%

Initial Solution GOR: 407 cu ft/bbl

Base: Asphalt

Pressure Maintenance or Secondary Recovery: Water Injection: 1,343,836 bbls
injected November 1959

PRODUCTION

Economic Allowance: Present: 28 BOPD. Operating: 28 BOPD

Market Outlet: Via Britamoil Pipeline to Edmonton terminal

CRUDE PETROLEUM ANALYSIS

Laboratory Number 1096-52

FIELD: Fenn-Big Valley

POOL:

ZONE: Leduc (D-3)

Well Name: Big Valley No. 3

Location: Lsd. 3, Sec. 10, Twp. 35, Rge. 20, W 4

Interval tested, depth, feet: 5310-5322

Producing Zone: Leduc (D-3)

Geological Age: Upper Devonian

Province: Alberta

Sample From: D.M.T.S.

Date Sampled: June 18, 1952

Sampled at: Tank

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.849

Sulphur, percent by weight: 0.62

Saybolt Universal Viscosity:

at 70°F., sec. 61

at 100°F., sec. 47

A.P.I. gravity at 60°F.: 35.2

Pour point, °F.: 30

Colour: Brownish Green

Carbon residue, percent by weight: 2.3
(Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 757 mm. Hg.
First drop, 24°C. (75°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	2.0	2.0	0.645	87.9	-	-		
2.	75	167	2.0	4.0	0.683	75.7	14	-		
3.	100	212	4.1	8.1	0.719	65.3	21	50.7		
4.	125	257	6.5	14.6	0.746	58.2	25	50.2		
5.	150	302	4.0	18.6	0.766	53.2	27	51.8		
6.	175	347	4.2	22.8	0.783	49.2	28	53.9		
7.	200	392	3.4	26.2	0.800	45.4	30	55.5		
8.	225	437	4.0	30.2	0.813	42.6	30	58.2		
9.	250	482	4.3	34.5	0.823	40.4	30	61.8		
10.	275	527	5.9	40.4	0.835	38.0	31	67.5		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	5.7	46.1	0.850	35.0	34	71.0	41	15
12.	225	437	4.1	50.2	0.857	33.6	33	74.8	46	35
13.	250	482	4.1	54.3	0.867	31.7	35	78.5	59	55
14.	275	527	6.3	60.6	0.879	29.5	37	80.7	84	75
15.	300	572	6.2	66.8	0.895	26.6	42	84.1	178	105
Residuum			30.3	97.1	0.937	19.5				

Carbon residue of residuum: 6.9%

Carbon residue of crude: 2.3%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	8.1	0.692	73.0	
Total gasoline and naphtha	26.2	0.745	58.4	
Kerosine distillate	8.3	0.818	41.5	
Gas oil	15.0	0.845	36.0	
Nonviscous lubricating distillate	9.0	0.860-0.882	33.0-28.9	50-100
Medium lubricating distillate	6.7	0.882-0.899	28.9-25.9	100-200
Viscous lubricating distillate	1.6	0.899-0.903	25.9-25.2	Above 200
Residuum	30.3	0.937	19.5	
Distillation loss	2.9			

Remarks: The sample as received contained 2.0% by vol. water and sediment (by centrifuge) and 600 lb. salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 1099-52

FIELD: Fenn-Big Valley

POOL:

ZONE: Camrose (D-2)

Well Name: C.P.R. Edwards No. 9
 Location: Lsd. 9, Sec. 9, Twp. 35, Rge. 20, W 4
 Interval tested, depth, feet: 5209-5239
 Producing Zone: Camrose (D-2)
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: June 18, 1952
 Sampled at: Tank

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.862	A.P.I. gravity at 60°F.: 32.7
Sulphur, percent by weight: 0.89	Pour point, °F.: 10
Saybolt Universal Viscosity:	Colour: Brownish Green
at 70°F., sec. 96	Carbon residue, percent by weight: 3.7
at 100°F., sec. 55	(Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 755 mm. Hg.
 First drop, 26°C. (79°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrass A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	2.0	2.0	0.658	83.6	-	-		
2.	75	167	2.3	4.3	0.672	79.1	8	-		
3.	100	212	3.3	7.6	0.713	67.0	18	51.4		
4.	125	257	4.8	12.4	0.743	58.9	23	49.2		
5.	150	302	4.7	17.1	0.766	53.2	27	50.3		
6.	175	347	4.0	21.1	0.781	49.7	27	-		
7.	200	392	3.6	24.7	0.796	46.3	28	53.2		
8.	225	437	3.7	28.4	0.812	42.8	30	56.3		
9.	250	482	4.2	32.6	0.824	40.2	30	59.9		
10.	275	527	6.0	38.6	0.837	37.6	32	64.0		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	4.7	43.3	0.855	34.0	36	68.5	40	15
12.	225	437	4.4	47.7	0.865	32.1	37	72.4	47	35
13.	250	482	4.5	52.2	0.878	29.7	40	74.6	60	55
14.	275	527	4.5	56.7	0.890	27.5	42	77.6	93	75
15.	300	572	7.2	63.9	0.902	25.4	45	80.8	188	90
Residuum			34.9	98.8	0.942	18.7				

Carbon residue of residuum: 10.2%

Carbon residue of crude: 3.7%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	7.6	0.686	74.8	
Total gasoline and naphtha	24.7	0.744	58.7	
Kerosine distillate	7.9	0.818	41.5	
Gas oil	14.0	0.850	35.0	
Nonviscous lubricating distillate	8.3	0.868-0.891	31.5-27.3	50-100
Medium lubricating distillate	6.2	0.891-0.904	27.3-25.0	100-200
Viscous lubricating distillate	2.8	0.904-0.909	25.0-24.2	Above 200
Residuum	34.9	0.942	18.7	
Distillation loss	1.2			

Remarks: The sample as received contained 0.4% by vol. water and sediment (by centrifuge) and 10 lb. salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 226-56

FIELD: Fenn-Big Valley

POOL:

ZONE: Camrose (D-2)

Well Name: Imperial Hudson's Bay Caprona No. 3-26N-36-20
 Location: Lsd. 3, Sec. 26, Twp. 36, Rge. 20, W 4
 Interval tested, depth, feet: 5153-5190
 Producing Zone: Camrose (D-2)
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: June 14, 1956
 Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.876
 Sulphur, percent by weight: 1.16
 Saybolt Universal Viscosity:
 at 70°F., sec. 86
 at 100°F., sec. 58

A.P.I. gravity at 60°F.: 30.0
 Pour point, °F.: 15
 Colour: Brownish Black
 Carbon residue, percent by weight: 3.8
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 756 mm. Hg.
 First drop, 42°C. (108°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167	2.1	2.1	0.682	76.0	-			
3.	100	212	3.0	5.1	0.715	66.4	19	50.6		
4.	125	257	4.9	10.0	0.741	59.5	22	49.0		
5.	150	302	4.6	14.6	0.764	53.7	26	49.5		
6.	175	347	3.7	18.3	0.782	49.4	27	51.0		
7.	200	392	3.7	22.0	0.798	45.8	29	53.0		
8.	225	437	4.3	26.3	0.813	42.6	30	55.8		
9.	250	482	4.3	30.6	0.827	39.6	31	59.5		
10.	275	527	6.5	37.1	0.843	36.4	34	63.5		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	2.3	39.4	0.854	34.2	36	66.4	38	5
12.	225	437	5.3	44.7	0.865	32.1	37	69.5	44	25
13.	250	482	5.1	49.8	0.876	30.0	39	72.0	56	45
14.	275	527	5.1	54.9	0.890	27.5	42	74.8	83	65
15.	300	572	7.0	61.9	0.906	24.7	47	76.6	160	85
Residuum			34.6	96.5	0.984	12.3				

Carbon residue of residuum: 9.7%

Carbon residue of crude: 3.8%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	5.1	0.701	70.4	
Total gasoline and naphtha	22.0	0.753	56.4	
Kerosine distillate	4.3	0.813	42.6	
Gas oil	18.3	0.847	35.6	
Nonviscous lubricating distillate	9.1	0.870-0.894	31.1-26.8	50-100
Medium lubricating distillate	7.9	0.894-0.915	26.8-23.1	100-200
Viscous lubricating distillate	0.3	0.915-0.915	23.1-23.1	Above 200
Residuum	34.6	0.984	12.3	
Distillation loss	3.5			

Remarks: The sample as received contained 16 lb. of salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 228-56

FIELD: Fenn-Big Valley

POOL:

ZONE: Camrose (D-2)

Well Name: Imperial Oxyoke No. 4-2N-37-20
 Location: Lsd. 4, Sec. 2, Twp. 37, Rge. 20, W 4
 Interval tested, depth, feet: 5285-5295
 Producing Zone: Camrose (D-2)
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: June 14, 1956
 Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.874
 Sulphur, percent by weight: 1.22
 Saybolt Universal Viscosity:
 at 70°F., sec. 88
 at 100°F., sec. 58
 A.P.I. gravity at 60°F.: 30.4
 Pour point, °F.: 15
 Colour: Brownish Black
 Carbon residue, percent by weight: 4.1
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 754 mm. Hg.
 First drop, 38°C. (100°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167	2.6	2.6	0.694	72.4	-			
3.	100	212	3.5	6.1	0.716	66.1	19	51.5		
4.	125	257	4.5	10.6	0.747	57.9	25	48.8		
5.	150	302	4.2	14.8	0.767	53.0	27	48.6		
6.	175	347	3.8	18.6	0.783	49.2	28	50.4		
7.	200	392	3.6	22.2	0.800	45.4	30	52.6		
8.	225	437	4.3	26.5	0.813	42.6	30	55.5		
9.	250	482	4.2	30.7	0.828	39.4	32	58.8		
10.	275	527	5.9	36.6	0.842	36.6	34	62.8		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	3.1	39.7	0.858	33.4	37	65.2	39	15
12.	225	437	5.0	44.7	0.866	31.9	37	68.2	45	30
13.	250	482	5.3	50.0	0.879	29.5	40	71.3	57	50
14.	275	527	4.9	54.9	0.893	27.0	44	74.1	82	65
15.	300	572	6.1	61.0	0.904	25.0	46	76.9	155	85
Residuum			35.9	96.9	0.981	12.7				

Carbon residue of residuum: 10.2%

Carbon residue of crude: 4.1%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	6.1	0.707	68.6	
Total gasoline and naphtha	22.2	0.754	56.2	
Kerosine distillate	4.3	0.813	42.6	
Gas oil	17.9	0.848	35.4	
Nonviscous lubricating distillate	9.4	0.871-0.896	31.0-26.4	50-100
Medium lubricating distillate	7.2	0.896-0.910	26.4-24.0	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	35.9	0.981	12.7	
Distillation loss	3.1			

Remarks: The sample as received contained 16 lb. of salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 229-56

FIELD: Fenn-Big Valley

POOL:

ZONE: Camrose (D-2)

Well Name: Imperial Hudson's Bay Big Valley No. 2A-26N-35-20
 Location: Lsd. 2, Sec. 26, Twp. 35, Rge. 20, W 4
 Interval tested, depth, feet: 5200-5239
 Producing Zone: Camrose (D-2)
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: June 14, 1957
 Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.873
 Sulphur, percent by weight: 1.09
 Saybolt Universal Viscosity:
 at 70°F., sec. 84
 at 100°F., sec. 59

A.P.I. gravity at 60°F.: 30.6
 Pour point, °F.: 10
 Colour: Brownish Black
 Carbon residue, percent by weight: 4.3
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 755 mm. Hg.
 First drop, 42°C. (108°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167	2.1	2.1	0.685	75.1	-	-		
3.	100	212	3.3	5.4	0.712	67.2	18	51.3		
4.	125	257	4.4	9.8	0.741	59.5	22	50.3		
5.	150	302	5.0	14.8	0.763	54.0	25	50.4		
6.	175	347	3.4	18.2	0.780	49.9	26	51.2		
7.	200	392	3.7	21.9	0.795	46.5	27	53.1		
8.	225	437	4.1	26.0	0.811	43.0	29	56.5		
9.	250	482	4.4	30.4	0.826	39.8	31	60.2		
10.	275	527	6.3	36.7	0.839	37.2	32	64.1		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	3.1	39.8	0.855	34.0	36	67.0	39	15
12.	225	437	5.5	45.3	0.865	32.1	37	71.0	44	35
13.	250	482	4.9	50.2	0.877	29.8	39	72.3	57	50
14.	275	527	5.3	55.5	0.891	27.3	43	74.8	87	65
15.	300	572	6.3	61.8	0.904	25.0	46	76.2	163	80
Residuum			34.3	96.1	0.984	12.3				

Carbon residue of residuum: 11.0%

Carbon residue of crude: 4.3%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	5.4	0.702	70.1	
Total gasoline and naphtha	21.9	0.751	56.9	
Kerosine distillate	4.1	0.811	43.0	
Gas oil	18.9	0.846	35.8	
Nonviscous lubricating distillate	8.9	0.870-0.893	31.1-27.0	50-100
Medium lubricating distillate	7.7	0.893-0.910	27.0-24.0	100-200
Viscous lubricating distillate	0.3	0.910-0.911	24.0-23.8	Above 200
Residuum	34.3	0.984	12.3	
Distillation loss	3.9			

Remarks: The sample as received contained 7 lb. of salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 231-56

FIELD: Fenn-Big Valley

POOL:

ZONE: Leduc (D-3)

Well Name: Imperial Hudson's Bay Caprona No. 3-26L-36-20
 Location: Lsd. 3, Sec. 26, Twp. 36, Rge. 20, W 4
 Interval tested, depth, feet: 5319-5344
 Producing Zone: Leduc (D-3)
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: D.M.T.S.

Date Sampled: June 14, 1956
 Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.948
 Sulphur, percent by weight: 2.94
 Saybolt Universal Viscosity:
 at 100°F., sec. 47

A.P.I. gravity at 60°F.: 17.8
 Four point, °F.: Below -60
 Colour: Brownish Black
 Carbon residue, percent by weight: 6.7
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 754 mm. Hg.
 First drop, 70°C. (158°F.)

Fraction No.	Cut at:		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Corre-lation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167								
3.	100	212	3.7	3.7	0.717	65.8	-			
4.	125	257	3.8	7.5	0.746	58.2	25	46.3		
5.	150	302	2.9	10.4	0.765	53.5	26	46.0		
6.	175	347	2.4	12.8	0.784	49.0	28	-		
7.	200	392	2.5	15.3	0.800	45.4	30	44.6		
8.	225	437	2.9	18.2	0.820	41.1	33	45.0		
9.	250	482	3.4	21.6	0.836	37.8	36	46.8		
10.	275	527	5.1	26.7	0.855	34.0	40	48.2		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	1.4	28.1	0.876	30.0	46	-	40	20
12.	225	437	4.5	32.6	0.884	28.6	46	51.5	47	35
13.	250	482	5.0	37.6	0.900	25.7	50	53.2	57	50
14.	275	527	5.2	42.8	0.919	22.5	56	55.3	92	65
15.	300	572	6.5	49.3	0.933	20.2	60	58.2	204	80
Residuum			49.3	98.6	1.047	3.6				

Carbon residue of residuum: 12.3%

Carbon residue of crude: 6.7%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	3.7	0.717	65.8	
Total gasoline and naphtha	15.3	0.757	55.4	
Kerosine distillate	2.9	0.820	41.1	
Gas oil	13.5	0.860	33.0	
Nonviscous lubricating distillate	8.9	0.888-0.920	27.8-22.3	50-100
Medium lubricating distillate	5.2	0.920-0.933	22.3-20.2	100-200
Viscous lubricating distillate	3.5	0.933-0.941	20.2-18.9	Above 200
Residuum	49.3	1.047	3.6	
Distillation loss	1.4			

Remarks: The sample as received contained 1500 lb. salt (as NaCl) per 1000 bbl.

OIL FIELD DATA

Field and Pool: Gilby Viking A

Location: Twp(s) 39, 40 & 41; Rge(s) 28, W 4 M; 1, 2, 3, W 5 M

DISCOVERY DETAILS

Method: Subsurface geology, Seismic Reflection Survey

Well: Name: Seaboard Sylvan Lake; Lsd. 10-4-41-3 W 5 M

Completed: November 8, 1953

Perforated: 6232-6237 with 4 shots/ft

Treatment: Acidized with 500 gals

Initial Potential: Well flowed 318 bbls in 23 hrs. through 21/64" choke with a GOR of 220 cu ft/bbl

GEOLOGY

Producing Zone(s): Viking formation, Colorado group of Upper Cretaceous Ellerslie formation. Mannville Sub-group of Lower Cretaceous Pekisko formation. Rundle group of Mississippian.

Trap Type: Stratigraphic - porous sand surrounded by impermeable sandy shale and shale.

Lithology: Dark grey to black, medium to coarse grained, glauconitic sand with well rounded chert pebbles; intergranular porosity.

Maximum Reservoir Thickness: 18 ft

Regional Setting: Located immediately NW of Red Deer. Approx. 22 miles long and up to one mile in width. It represents the western half of the Joffre-Gilby trend which strikes N60°W over a distance of 50 miles. Cretaceous beds dip westerly at 35 to 40 ft per mile.

Deepest Formation Penetrated: Cambrian (California Standard East Gilby No. 4-5-41-2 W 5 M)

DEVELOPMENT DATA

Total Wells: Completed Oil: 96. Gas: 2. Dry and Abandoned: 24 (Includes flooded out wells now abandoned)
Producing Oil: 52. Suspended Oil: 8

Injection or Disposal: Water: 12. Gas: Nil

Well Spacing: Gilby: 160 Acres; Bentley: 80 Acres. Pattern: Lsd. 2, 4, 10 & 12,
Even numbered Lsd.

Logging Practice: Electric log and micro-caliper.

Completion Practice: 600' surface casing set either through producing zone and
perforated or set above producing zone and completed open hole.

RESERVOIR DATA

Type of Drive: Waterflood

Estimated Oil in Place: 37,700,000 S.T.bbls (457 bbls/acre-foot)

Estimated Recoverable Oil: 17,000,000 S.T.bbls (206 bbls/acre-foot)

Oil Zone Thickness: Maximum: 18 ft Average: 5.6 ft

Porosity: 10.3%. Permeability: 193H md, 109V md

Area: 15,325 Acres

Oil Characteristics: Gravity: 40 °API. Sulphur: 0.06% by weight

Initial Solution GOR: 480-500 scfpb.

Base: Paraffin

PRODUCTION

MPR: Gilby: 71 BOPD/Producing Well; Bentley: 74 BOPD/Producing Well.

Economic Allowance: Present: 30 BOPD/W. Operating: 30 BOPD/W

Market Outlet: Rangeland Pipeline and Texaco Pipeline to Edmonton terminal

Bibliographical References: 1) Oilfields of Alberta, 1960, pp. 115.
2) Reservoir Engineering Digest.

SECONDARY RECOVERY

RESERVOIR DATA

- 1) Field: Gilby
- 2) Pool: Viking A
- 3) Province: Alberta
- 4) Location: Twp(s) 40 & 41, Rge(s) 2 & 3; W 4 M
- 5) Operator: California Standard
- 6) Project: #2 Unit
- 7) Reservoir: Viking formation, Colorado group, Lower Cretaceous
- 8) Discovery Date: November 1953
- 9) Date Injection Began: January 1963
- 10) Main Structural Feature: Stratigraphic Trap
- 11) Gas Cap: Originally: No. At Present: No
- 12) Time Required for Initial Results: - Response noted in April 1963
- 13) Initial Results on Production: BHP: 872 psig. GOR: 2,500
- 14) Main Drive in Primary Production: Solution Gas
- 15) Productive Area(acres) of Reservoir: 13,777. Of Project: 6,480
Affected by Injection: 6,480
- 16) Average Depth to Top of Pay (feet): 5,849
- 17) Average Effective Thickness(feet): 6.1
- 18) Average Porosity %: 8.2
- 19) Average Horizontal Permeability(millidarcys): 253
- 20) Connate Water (% of Pore Space): 32
- 21) Viscosity at Initial Reservoir Conditions (centipoises): 1.27
- 22) API Gravity: 40
- 23) Solution Gas/Oil Ratio at Saturation Pressure (cu ft/bbl): 310
- 24) Bubble Point Pressure: 1,307 psig
- 25) Original Pressure: 1,445 psig
- 26) Reservoir Pressure at Start of Injection (psi): 900
- 27) Latest Reservoir Pressure: 832 psi on December 31, 1964
- 28) Injection Fluid: Salt Water, Fresh Water
- 29) Injection Fluid Source: Paskapoo Formation
- 30) System: Open
- 31) Fluid Treatment before Injection: Filtration, Chlorination
- 32) Injection Pattern: Line
- 33) Structural position Injection Wells: Oil Zone

- 34) Distance Injection Wells to Producers (feet): 2,640 to nearest producer,
15,840 to furthest
- 35) Number of Injection Wells at Start: 4
- 36) Number of Injection Wells at Present: 4 (August 1965)
- 37) Average Daily Injection Rate per Injection Well at Start: 900 BWPD
- 38) Average Daily Injection Rate per Injection Well at Present: 500 BWPD
on May 31, 1965)
- 39) Average Injection Pressure at Start (psi): 1,400
- 40) Average Injection Pressure at Present (psi): 716 on May 31, 1965)
- 41) Number of Producing Wells in Project Area at Start: 37
- 42) Number of Producing Wells in Project Area at Present: 35 (August 1965)
- 43) Average Production Rate in Project Area at Start (bbls/day): 599
- 44) Average Production Rate in Project Area at Present: 30,000 B/D on May 31, 1965
- 45) Original Oil in Place in Project Area (bbls): 16,483,000
- 46) Original Oil Saturation (% of pore space): 68
- 47) Primary Recovery from Project Area when Injection Started (bbls): 2,528,656
- 48) Oil Saturation at Start of Project (% of pore space): 58
- 49) Oil Production from Project Area from Start of Injection to Now (bbls): 778,852 on
May 31, 1965
- 50) Total Volume of Injected Fluids at Present (bbls): 1,907,406 on May 31, 1965
- 51) Estimated Primary Ultimate Recovery from Project Area (bbls): 7,680,000
- 52) Estimated Increase in Ultimate Recovery from Project Area (bbls): 3,198,780
- 53) Well Spacing: 160 Acres
- 54) Oil Volume Factor (initial reservoir barrels per Stock-Tank barrel): 1.165
- 55) Remark: Gas Saturation = 7.6% of total.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 140-56

FIELD: Gilby

POOL:

ZONE: Viking

Well Name: Cal-Standard East Gilby No. 4-5
 Location: Lsd. 4, Sec. 5, Twp. 41; Rge. 2, W 5
 Interval tested, depth, feet: 5982-5992
 Producing Zone: Viking
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: April 24, 1956
 Sampled at: Before separator

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.825
 Sulphur, percent by weight: 0.12
 Saybolt Universal Viscosity:
 at 100°F., sec. 40

A.P.I. gravity at 60°F.: 40.0
 Pour point, °F.: 15
 Colour: Brownish Green
 Carbon residue, percent by weight: 0.6
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 760 mm. Hg. First drop, 28°C. (82°F.)											
Fraction No.	Cut at °C. °F.		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Visc. S.U. 100°F.	Cloud Test, °F.	Refractive Index 20°C.
1.	50	122	1.3	1.3)							
2.	75	167	2.1	3.4)	0.691	73.3	-	-			-
3.	100	212	4.1	7.5	0.707	68.6	15	55.7			1.3963
4.	125	257	6.5	14.0	0.736	60.8	20	52.6			1.4098
5.	150	302	5.6	19.6	0.758	55.2	23	51.8			1.4207
6.	175	347	4.7	24.3	0.774	51.3	23	54.2			1.4298
7.	200	392	4.2	28.5	0.786	48.5	23	57.6			1.4368
8.	225	437	4.5	33.0	0.800	45.4	24	62.0			1.4439
9.	250	482	5.2	38.2	0.814	42.3	25	66.3			1.4514
10.	275	527	6.7	44.9	0.827	39.6	27	70.7			1.4589
Stage 2 - Distillation continued at 40 mm. Hg. pressure											
11.	200	392	4.3	49.2	0.841	36.8	29	74.8	39	20	1.4666
12.	225	437	5.4	54.6	0.849	35.2	29	80.3	45	40	1.4700
13.	250	482	5.5	60.1	0.857	33.6	30	84.4	53	60	1.4749
14.	275	527	4.7	64.8	0.866	31.9	31	89.0	72	75	1.4804
15.	300	572	6.6	71.4	0.875	30.2	32	95.1	114	90	-
Residuum			25.3	96.7	0.920	22.3					
Carbon residue of residuum: 2.2%						Carbon residue of crude: 0.6%					

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	7.5	0.700	70.6	
Total gasoline and naphtha	28.5	0.744	58.7	
Kerosine distillate	9.7	0.807	43.8	
Gas oil	17.1	0.839	37.2	
Nonviscous lubricating distillate	10.9	0.854-0.872	34.2-30.8	50-100
Medium lubricating distillate	5.2	0.872-0.880	30.8-29.3	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	25.3	0.920	22.3	
Distillation loss	3.3			

Remarks: The sample as received contained no water (A.S.T.M.) and 17 lb. salt (as NaCl) per 1000 bbl.

OIL FIELD DATA

Field and Pool: Glen Park D-3

Location: Twp(s) 48 & 49, Rge. 27, W 4 M

DISCOVERY DETAILS

Method: Seismic Reflection Survey, Subsurface Geology

Well: Name: B.A. S. Calmar 6-2, Lsd. 6-2-49-27 W 4

Completed: September 1951

Initial Potential: 1,761 BOPD on 3/4" choke

GEOLOGY

Producing Zone(s): Leduc form., Woodbend group, U. Devonian
Nisku form., Winterburn group, U. Devonian
Glauconitic sand, Mannville Sub-group of L. Cretaceous
Ellerslie form., Mannville Sub-group of L. Cretaceous

Other Shows: Viking form., Colorado group. U. Cretaceous

Trap Type: Stratigraphic - reef bioherm, surrounded by impermeable limy shale

Lithology: Grey to buff coarsely crystalline dolomite. Vug. fracture and inter-crystalline porosity.

Maximum Reservoir Thickness: 800'

Regional Setting: Located in the middle portion of the Rimbey-Meadowbrook reef trend at the south end of the Leduc field and approx. 30 miles S-SW of Edmonton.

Deepest Formation Penetrated: Cooking Lake (Cabeen Expl. Glen Park 9-34)

DEVELOPMENT DATA

Total Wells: Completed Oil: 11

Producing Oil: 10

Injection or Disposal: Water: 2

Well Spacing: 40 Acres

Logging Practice: E log from surface casing to T.D. Occasionally Microlog run

Completion Practice: 600' surface casing, 5 1/2" or 7" casing set in Ireton formation above production zone and 5" liner set through and perforated or completed open hole, with tubing landed in oil reservoir.

RESERVOIR DATA

Type of Drive: Bottom water drive

Estimated Oil in Place: 26,700,000 S.T.bbls (499 bbls/acre-foot)

Estimated Recoverable Oil: 19,171,000 S.T.bbls (358 bbls/acre-foot)

Oil Zone Thickness: Maximum: 422. Average: 125.5'

Gas Zone Thickness: None

Porosity: 9.6%. Permeability: 1,604 md

Area: 426 Acres

Oil Characteristics: Gravity: 37.5 °API. Sulphur: 0.08%

Initial Solution GOR: 496 cu ft/bbl

Base: Paraffin

Pressure Maintenance or Secondary Recovery: None

PRODUCTION

Economic Allowance: Present: 31 BOPD. Operating: 31 BOPD

Market Outlet: Via Texaco Exploration Pipeline to Edmonton Terminal

Bibliographical References: Ralph, H.D., Reef area promising; Canadians optimistic over prospects of trend lying south of Leduc; Oil and Gas Journal, Oct. 6, 1952, pp. 73-74.

Luttes, L.L., Savit, C.H. & Brustad, J.T., Glen Park field, Alberta, a reef detailing problem. Geophys. Case Histories, Vol. 2, 1956, p. 169.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 242-56.

FIELD: Glen Park

POOL:

ZONE: Nisku (D-2)

Well Name: British American South Calmar No. 3-A-2
 Location: Lsd. 3, Sec. 2, Twp. 49, Rge. 27, W 4
 Interval tested, depth, feet: 5524-5546
 Producing Zone: Nisku (D-2)
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: D.M.T.S.

Date Sampled: June 20, 1956
 Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.843
 Sulphur, percent by weight: 0.15
 Saybolt Universal Viscosity:
 at 100°F., sec. 40

A.P.I. gravity at 60°F.: 36.4
 Pour point, °F.: -10
 Colour: Brownish Black
 Carbon residue, percent by weight: 1.6
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 757 mm. Hg.
 First drop, 30°C. (86°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167	2.9	2.9	0.700	70.6	-			
3.	100	212	5.1	8.0	0.726	63.4	24	52.9		
4.	125	257	7.1	15.1	0.747	57.9	25	52.0		
5.	150	302	5.9	21.0	0.768	52.7	27	50.2		
6.	175	347	5.6	26.6	0.785	48.8	29	50.7		
7.	200	392	4.9	31.5	0.801	45.2	30	54.0		
8.	225	437	4.6	36.1	0.815	42.1	31	57.8		
9.	250	482	4.9	41.0	0.827	39.6	31	62.0		
10.	275	527	6.7	47.7	0.839	37.1	32	67.4		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	2.4	50.1	0.851	34.8	34	71.1	38	10
12.	225	437	5.7	55.8	0.859	33.2	34	75.0	44	30
13.	250	482	5.1	60.9	0.869	31.3	36	78.8	54	50
14.	275	527	5.8	66.7	0.882	28.9	39	82.8	79	70
15.	300	572	6.2	72.9	0.894	26.8	41	85.2	141	85
Residuum			24.4	97.3	0.951	17.3				

Carbon residue of residuum: 5.7%

Carbon residue of crude: 1.6%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	8.0	0.717	65.8	
Total gasoline and naphtha	31.5	0.758	55.2	
Kerosine distillate	4.6	0.815	42.1	
Gas oil	20.0	0.844	36.2	
Nonviscous lubricating distillate	9.7	0.865-0.886	32.1-28.2	50-100
Medium lubricating distillate	7.1	0.886-0.900	28.2-25.7	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	24.4	0.951	17.3	
Distillation loss	2.7			

Remarks: The sample as received contained 6 lb. of salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 243-56

FIELD: Glen Park

POOL:

ZONE: Leduc (D-3)

Well Name: British American South Calmar No. 4-2
 Location: Lsd. 4, Sec. 2, Twp. 49, Rge. 27, W 4
 Interval tested, depth, feet: 6085-6115
 Producing Zone: Leduc (D-3)
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: June 20, 1956
 Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.850
 Sulphur, percent by weight: 0.14
 Saybolt Universal Viscosity:
 at 100°F., sec. 43

A.P.I. gravity at 60°F.: 35.0
 Pour point, °F.: 40
 Colour: Greenish Black
 Carbon residue, percent by weight: 1.9
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 756 mm. Hg.
 First drop, 45°C. (113°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167	1.3	1.3	0.693	72.7	-			
3.	100	212	4.4	5.7	0.714	66.7	18	53.5		
4.	125	257	6.4	12.1	0.740	59.7	22	51.0		
5.	150	302	5.5	17.6	0.762	54.2	25	49.0		
6.	175	347	6.1	23.7	0.782	49.4	27	48.7		
7.	200	392	4.2	27.9	0.800	45.4	30	49.1		
8.	225	437	4.8	32.7	0.815	42.1	31	52.9		
9.	250	482	5.7	38.4	0.826	39.8	31	56.8		
10.	275	527	6.6	45.0	0.838	37.4	32	62.8		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	2.9	47.9	0.852	34.6	35	66.9	39	5
12.	225	437	5.9	53.8	0.860	33.0	35	73.1	44	30
13.	250	482	5.7	59.5	0.872	30.8	37	78.0	57	50
14.	275	527	5.0	64.5	0.884	28.6	40	83.8	81	70
15.	300	572	6.3	70.8	0.896	26.4	42	88.2	143	85
Residuum			26.1	96.9	0.956	16.5				

Carbon residue of residuum: 6.5%

Carbon residue of crude: 1.9%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	5.7	0.709	68.1	
Total gasoline and naphtha	27.9	0.756	55.7	
Kerosine distillate	4.8	0.815	42.1	
Gas oil	20.8	0.842	36.6	
Nonviscous lubricating distillate	10.2	0.865-0.888	32.1-27.8	50-100
Medium lubricating distillate	7.1	0.888-0.903	27.8-25.2	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	26.1	0.956	16.5	
Distillation loss	3.1			

Remarks: The sample as received contained a trace of salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 246-56

FIELD: Glen Park

POOL:

ZONE: Glauconitic Ss.

Well Name: Homestead Glen Park No. 4
 Location: Lsd. 4, Sec. 1, Twp. 49, Rge. 27, W 4
 Interval tested, depth, feet: 4609-4645
 Producing Zone: Glauconitic Ss.
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: June 22, 1956
 Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.897
 Sulphur, percent by weight: 1.28
 Saybolt Universal Viscosity:
 at 70°F., sec. 123
 at 100°F., sec. 69
 A.P.I. Gravity at 60°F.: 26.2
 Pour point, °F.: -50
 Colour: Brownish Black
 Carbon residue, percent by weight: 5.3
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 758 mm. Hg.
 First drop, 65°C. (149°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167								
3.	100	212	3.2	3.2	0.714	66.7	-			
4.	125	257	4.4	7.6	0.732	61.8	18			
5.	150	302	3.9	11.5	0.764	53.7	26	45.4		
6.	175	347	3.8	15.3	0.783	49.2	28	46.0		
7.	200	392	3.8	19.1	0.799	45.6	29	49.5		
8.	225	437	3.8	22.9	0.812	42.8	30	54.0		
9.	250	482	5.2	28.1	0.830	39.0	33	57.5		
10.	275	527	7.6	35.7	0.848	35.4	37	61.2		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	4.4	40.1	0.870	31.1	43	62.5	39	0
12.	225	437	5.7	45.8	0.881	29.1	45	64.5	46	25
13.	250	482	6.5	52.3	0.894	26.8	47	66.8	60	50
14.	275	527	5.6	57.9	0.908	24.3	51	69.9	90	65
15.	300	572	7.1	65.0	0.920	22.3	54	72.3	184	80
Residuum			33.5	98.5	1.008	8.9				

Carbon residue of residuum: 14.1%

Carbon residue of crude: 5.3%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	3.2	0.714	66.7	
Total gasoline and naphtha	19.1	0.759	54.9	
Kerosine distillate	3.8	0.812	42.8	
Gas oil	21.8	0.855	34.0	
Nonviscous lubricating distillate	11.1	0.885-0.909	28.4-24.2	50-100
Medium lubricating distillate	6.7	0.909-0.922	24.2-22.0	100-200
Viscous lubricating distillate	2.5	0.922-0.927	22.0-21.1	Above 200
Residuum	33.5	1.008	8.9	
Distillation loss	1.5			

Remarks: The sample as received contained 2850 lb. salt (as NaCl) per 1000 bbl.

OIL FIELD DATA

Field and Pool: Golden Spike South D-3A (Leduc) Pool

Location: Twp. 51, Rge. 27, W 4 M

DISCOVERY DETAILS

Method: Reflection Seismograph

Well: Name: Imperial Schoepp No. 1, in 9-22-51-27 W 4 M

Completed: April 1949, Open Hole

Treatment: None

Initial Potential: 7,320 BOPD open flow with a GOR of 500 cu ft/bbl
and no water

GEOLOGY

Producing Zone(s): Leduc formation, Woodbend group of Upper Devonian. Nisku formation, Wabamun group (gas) of Upper Devonian. Ellerslie formation (gas), Mannville sub-group of Lower Cretaceous. Viking formation (gas), Colorado group of Upper Cretaceous.

Other Shows: None

Trap Type: Stratigraphic--reef bioherm surrounded by limy shale.

Lithology: Limestone, grey and brown, crystalline, fossiliferous, porous

Maximum Reservoir Thickness: 620'

Regional Setting: Located in the Upper Devonian Ireton shale basin, west of the Woodbend reef of the Rimbey-Morinville reef chain.

Deepest Formation Penetrated: Beaverhill Lake (Imp. G.S. No. 11 in
11-23-51-27 W 4 M)

DEVELOPMENT DATA

Total Wells: Completed Oil: 11. Gas: Nil. Dry and Abandoned: 3

Producing Oil: 11. Suspended Oil: Nil

Injection or Disposal: Solvent: 2. Gas: 1

Well Spacing: 160 Acres

Logging Practice: Electric log survey to total depth. Microlog or microlaterolog over selected portions. Radioactive survey to total depth.

Completion Practice: 10 3/4" surface casing set at 300', 7" casing to Leduc reef top. Open hole completion.

RESERVOIR DATA

Type of Drive: Solution Gas

Estimated Oil in Place: 319,000,000 S.T.bbls (480 bbls/acre-foot)

Estimated Recoverable Oil: 301,000,000 S.T.bbls (453 bbls/acre-foot)

Oil Zone Thickness: Maximum: 620'. Average: 478'

Gas Zone Thickness: Maximum: No Original Gas Cap.

Porosity: 8.79%. Permeability: 321 md (kh)

Area: 1,390 Acres

Oil Characteristics: Gravity: 37° °API. Sulphur: Trace.

Pour Point: 20°F. Initial Solution GOR: 410 cu ft/bbl

Base: Paraffin

Pressure Maintenance or Secondary Recovery: Gas pressure maintenance using gas produced from formations and residue gas from Leduc Conservation Plant. Now with miscible flooding, LPG is introduced between the oil zone and gas cap forming a bank of solvent.

PRODUCTION

MPR: N/A

Economic Allowance: Present: 9,000 BOPD (pool). Operating: 29 BOPD/well

Market Outlet: Imperial Pipeline to Edmonton terminal

Bibliographical Reference: Haskett, Irene, Analysis of Canada's Golden Spike reservoir; Oil & Gas Journal, Vol. 50, pp. 259-261.

SECONDARY RECOVERY

RESERVOIR DATA

- 1) Field: Golden Spike South
- 2) Pool: D-3A
- 3) Province: Alberta
- 4) Location: Twp. 51, Rge. 27, W 4 M
- 5) Operator: Imperial
- 6) Project: #1 Unit
- 7) Reservoir: Leduc D-3, Upper Devonian
- 8) Discovery Date: April 1949
- 9) Date Injection Began: March 1953 (Pilot) Full PM May 1954
- 10) Main Structural Feature: Reef
- 11) Gas Cap: Originally: No. At Present: Yes
- 12) Time Required for Initial Results: Immediate
- 13) Initial Results on Production: BHP: 1596 psig. GOR: 394. WOR: 0
- 14) Main Drive in Primary Production: Solution Gas, Water Drive
- 15) Productive Area(acres) of Reservoir: 1465. Of Project: 2560 Acres
Affected by Injection: 2560 Acres
- 16) Average Depth to Top of Pay (feet): 5194
- 17) Average Effective Thickness (feet): 480
- 18) Average Porosity %: 8.8
- 19) Average Horizontal Permeability (millidarcys): 174
- 20) Connate Water (% of Pore Space): 10
- 21) Viscosity at Initial Reservoir Conditions (centipoises) : 0.77
- 22) API Gravity: 37°
- 23) Solution Gas/Oil Ratio at Saturation Pressure (cu ft/bbl): 414
- 24) Bubble Point Pressure (psi): 1,393
- 25) Original Pressure (psi): 2,095
- 26) Reservoir Pressure at Start of Injection (psi): 1,390
- 27) Latest Reservoir Pressure: 1,660 psi (December 31, 1964)
- 28) Injection Fluid: Gas, Solvent Bank
- 29) Injection Fluid Source: Gas Cycling, Leduc gas conservation plant: Propane, Butane (condensate), Pentane
- 30) System: Closed
- 31) Fluid Treatment before Injection: Remove wet "ends" from produced gas before re-injecting.
- 32) Injection Pattern: line, crestal

- 33) Structural Position Injection Wells: Gas Cap (solvent bank above gas-oil contact,
gas into gas cap)
- 34) Distance Injection Wells to Producers (feet): 1,320 ft to nearest producer,
3,960 to farthest producer
- 35) Number of Injection Wells at Start: 1
- 36) Number of Injection Wells at Present: 4 (July 31, 1965)
- 37) Average Daily Injection Rate per Injection Well at Start (Mcf): 876
- 38) Average Daily Injection Rate per Injection Well at Present: 2,962 Mcf. gas;
408 bbls solvent
(December 31, 1964)
- 39) Average Injection Pressure at Start (psi): Not Available
- 40) Average Injection Pressure at Present: Solvent 1000 psig. Gas: 1600 psig
(December 31, 1964)
- 41) Number of Producing Wells in Project Area at Start: 10
- 42) Number of Producing Wells in Project Area at Present: 7 (August 1965)
- 43) Average Production Rate in Project Area at Start (bbls/day): --
- 44) Average Production Rate in Project Area at Present: 8100 BOPD 1964
- 45) Original Oil in Place in Project Area (bbls): 310,000,000
- 46) Original Oil Saturation (% of pore space): 90
- 47) Primary Recovery from Project Area when Injection Started: 5 MM bbls before full
PM in May 1954
- 48) Oil Saturation at Start of Project (% of pore space): 90
- 49) Oil Production from Project Area from Start of Injection to Now (bbls): 28,000,000
(December 31, 1964). Total Cum. Oil Prod. to December 31, 1964: 32,709,448
- 50) Total Volume of Injected Fluids at Present (Mcf): 25,737,535 (December 31, 1964)
- 51) Estimated Primary Ultimate Recovery from Project Area (bbls): 217,000,000
- 52) Estimated Increase in Ultimate Recovery from Project Area (bbls): 62,000,000
- 53) Well Spacing: 40 Acres
- 54) Oil Volume Factor (initial reservoir barrels per Stock-Tank barrel): 1.2795

CRUDE PETROLEUM ANALYSIS

Laboratory Number 8587

FIELD: Golden Spike

POOL:

ZONE: Leduc (D-3)

Well Name: Imperial Schoepp No. 1
 Location: Lsd. 9, Sec. 22, Twp. 51, Rge. 27, W 4
 Interval tested, depth, feet: 5363-5965
 Producing Zone: Leduc (D-3)
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: June 28, 1950
 Sampled at: Tank

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.843
 Sulphur, percent by weight: 0.24
 Saybolt Universal Viscosity:
 at 70°F., sec. 57
 at 100°F., sec. 43

A.P.I. gravity at 60°F.: 36.4
 Pour point, °F.: 20
 Colour: Dark Green
 Carbon residue, percent by weight: 1.8
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 751 mm. Hg.
 First drop, 24°C. (75°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	2.2	2.2	0.651	85.9	-			
2.	75	167	2.6	4.8	0.687	74.5	16			
3.	100	212	5.5	10.3	0.721	64.8	22			
4.	125	257	5.7	16.0	0.744	58.7	24			
5.	150	302	6.5	22.5	0.768	52.7	27			
6.	175	347	4.1	26.6	0.791	47.4	32			
7.	200	392	4.7	31.3	0.805	44.3	32			
8.	225	437	4.9	36.2	0.820	41.1	33			
9.	250	482	4.7	40.9	0.831	38.8	33			
10.	275	527	5.5	46.4	0.841	36.8	33			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	4.4	50.8	0.854	34.2	36		40	15
12.	225	437	5.3	56.1	0.860	33.0	35		47	30
13.	250	482	5.1	61.2	0.872	30.8	37		60	50
14.	275	527	5.0	66.2	0.884	28.6	40		100	70
15.	300	572	6.7	72.9	0.895	26.6	42		184	85
Residuum			24.8	97.7	0.942	18.7				

Carbon residue of residuum: 7.2%

Carbon residue of crude: 1.8%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	10.3	0.697	71.5	
Total gasoline and naphtha	31.3	0.749	57.4	
Kerosine distillate	4.9	0.820	41.1	
Gas oil	18.6	0.845	36.0	
Nonviscous lubricating distillate	8.9	0.863-0.884	32.5-28.6	50-100
Medium lubricating distillate	7.0	0.884-0.897	28.6-26.3	100-200
Viscous lubricating distillate	2.2	0.897-0.901	26.3-35.6	Above 200
Residuum	24.8	0.942	18.7	
Distillation loss	2.3			

Remarks: The sample as received contained 0.6% by vol. water and sediment (by centrifuge).

CRUDE PETROLEUM ANALYSIS

Laboratory Number 337-53.

FIELD: Golden Spike

POOL:

ZONE: Wabamun (D-1)

Well Name: Imperial Golden Spike No. 11
 Location: Lsd. 11, Sec. 23, Twp. 51, Rge. 27, W 4
 Interval tested, depth, feet: 4618-4660
 Producing Zone: Wabamun (D-1)
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: Imperial Oil Ltd.
 Date Sampled: April 17, 1953
 Sampled at: Well

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.846
 Sulphur, percent by weight: 0.62
 Saybolt Universal Viscosity:
 at 100°F., sec. 40
 A.P.I. gravity at 60°F.: 35.8
 Pour point, °F.: -10
 Colour: Dark Green
 Carbon residue, percent by weight: 2.5
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 745 mm. Hg.
 First drop, 30°C. (86°F.)

Frac- tion No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I.. 60°F.	Corre- lation Index	Aniline Point, °C.	Visc. S.U. 100°F.	Cloud Test, °F.	Refractive Index 20°C.
	°C.	°F.									
1.	50	122	0.9	0.9)							
2.	75	167	2.0	2.9)	0.674	78.4	-				1.3873
3.	100	212	3.7	6.6	0.721	64.8	22	52.3			1.4025
4.	125	257	8.5	15.1	0.743	58.9	23	51.4			1.4134
5.	150	302	6.7	21.8	0.766	53.2	27	51.8			1.4256
6.	175	347	7.0	28.8	0.782	49.4	27	53.0			1.4343
7.	200	392	5.8	34.6	0.799	45.6	29	54.6			1.4430
8.	225	437	5.3	39.9	0.814	42.3	31	59.9			1.4509
9.	250	482	5.1	45.0	0.827	39.6	31	64.0			1.4581
10.	275	527	6.7	51.7	0.842	36.6	34	66.5			1.4666

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	3.1	54.8	0.859	33.2	38	67.5	42	20	1.4766
12.	225	437	5.8	60.6	0.867	31.7	38	70.1	48	35	1.4810
13.	250	482	5.8	66.4	0.880	29.3	41	73.4	64	55	1.4882
14.	275	527	3.6	70.0	0.891	27.3	43	78.5	97	70	1.4951
15.	300	572	5.7	75.7	0.901	25.6	45	79.9	168	80	1.5031
Resi- dium			23.7	99.4	0.965	15.1					

Carbon residue of residuum: 9.4%

Carbon residue of crude: 2.5%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	6.6	0.700	70.6	
Total gasoline and naphtha	34.6	0.757	55.4	
Kerosine distillate	5.3	0.814	42.3	
Gas oil	18.6	0.845	36.0	
Nonviscous lubricating distillate	9.9	0.869-0.891	31.3-27.3	50-100
Medium lubricating distillate	6.5	0.891-0.906	27.3-24.7	100-200
Viscous lubricating distillate	0.8	0.906-0.908	24.7-24.3	Above 200
Residuum	23.7	0.965	15.1	
Distillation loss	0.6			

Remarks: The sample as received contained 2.9% by vol. water and sediment (by centrifuge) and 124 lb. salt (as NaCl) per 1000 bbl.

OIL FIELD DATA

Field and Pool: Hamilton Lake Viking A

Location: Twp(s) 34 & 35, Rge(s) 9 & 10, W 4 M

DISCOVERY DETAILS

Method: Subsurface Geology

Well: Name: **Ranchman's** Hamilton Lake No. 1; Lsd. 8-14-35-9 W 4 M

Completed: October 27, 1952

Perforated: 3015'-3025'

Treatment: Sand fractured after some production

Initial Potential: 70 BOPD on 24-hour pump test

GEOLOGY

Producing Zone(s): Hamilton Lake sand, Viking formation, Colorado group of Upper Cretaceous

Other Shows: None

Trap Type: Stratigraphic Trap - Shale-out of Porous Sand

Lithology: Sandstone, light grey to brown, medium to fine grained, grading to siltstone, argillaceous, cherty, numerous shale partings.

Maximum Reservoir Thickness: 11 ft.

Regional Setting: Located in the eastern portion of the shelf margin reef complex of the Upper Devonian and in an area where the Base of Fish Scales generally strikes N30°W and dips 10'-15' per mile to the SW.

Deepest Formation Penetrated: Southesk formation (8-14-35-9 W 4 M)

DEVELOPMENT DATA

Total Wells: Completed Oil: 82. Gas: 1. Dry and Abandoned: 26

Producing Oil: 61. Suspended Oil: 3

Injection or Disposal: Water: 15. Gas: 0

Well Spacing: 40, 80, 160 Acres. Pattern: 1 Well/Lsd., odd-numbered Lsd's

Logging Practice: E. log - total depth (3,000') to surface casing,
RA - total depth to surface,
Micro - total depth to 200' or 300' above Viking

Completion Practice: Surface casing 150' to 300', 7" prod. casing used in earlier completions but later 4 1/2" was favored. Casing set through zone and perforated; fracture treatment used on large percentage of wells.

RESERVOIR DATA

Type of Drive: Solution gas and waterflood. Gas Cap

Estimated Oil in Place: 18,913,000 S.T.bbls (1,125 bbls/acre-foot)

Estimated Recoverable Oil: 6,840,000 S.T.bbls (180 bbls/acre-foot, 405 bbls/acre-foot waterflood)

Oil Zone Thickness: Maximum: 11 ft. Average: 4 ft

Porosity: 23.5%. Permeability: 245 md

Area: 37,760 Acres

Oil Characteristics: Gravity: 30 °API. Sulphur: 0.22%

Initial Solution GOR: 150 scfpb

Base: Paraffin

Pressure Maintenance or Secondary Recovery: Waterflood

PRODUCTION

MPR: 37 BOPD/producing well

Economic Allowance: Present: 25 BOPD/W. Operating: 25 BOPD/W

Market Outlet: Bow River Pipeline

Bibliographical References: 1) Lee, C.L., and Morris, R., 1959, Hamilton Lake Field; Oil Fields of Alberta 1960, pp. 125, ASPG, Western Leaseholds Limited.

2) Reservoir Engineering Digest.

SECONDARY RECOVERY

RESERVOIR DATA

- 1) Field: Hamilton Lake
- 2) Pool: Viking
- 3) Province: Alberta
- 4) Location: Twp. 35, Rge. 10, W 4 M
- 5) Operator: California Standard
- 6) Project: #1 Unit
- 7) Reservoir: Viking Formation, Lower Cretaceous
- 8) Discovery Date: November 1952
- 9) Date Injection Began: November 1962
- 10) Main Structural Feature: Stratigraphic Trap
- 11) Gas Cap: Originally: Yes. At Present: Yes
- 12) Time Required for Initial Results: 4 months
- 13) Initial Results on Production: 225 BOPD, 1,300 GOR (November 1962)
- 14) Main Drive in Primary Production: Gas Cap
- 15) Productive Area (acres) of Reservoir: 5,182. Of Project: 1,680
Affected by Injection: 1,680
- 16) Average Depth to Top of Pay (feet): 2,933
- 17) Average Effective Thickness (feet): 5.5
- 18) Average Porosity %: 24.2
- 19) Average Horizontal Permeability(millidarcys): 242.53
- 20) Connate Water (% of pore space): 30
- 21) Viscosity at Initial Reservoir Conditions (centipoises): 3.96
- 22) API Gravity: 33
- 23) Solution Gas/Oil Ratio at Saturation Pressure (cu ft/bbl): 139
- 24) Bubble Point Pressure (psi): 750
- 25) Original Pressure (psi): 750

- 26) Reservoir Pressure at Start of Injection (psi): 625
- 27) Latest Reservoir Pressure: 700 psi (December 31, 1964)
- 28) Injection Fluid: Fresh Water
- 29) Injection Fluid Source: Formation
- 30) System: Closed
- 31) Fluid Treatment before Injection: Sodium-hypochlorite
- 32) Injection Pattern: 5-Spot
- 33) Structural Position Injection Wells: Oil Zone
- 34) Distance Injection Wells to Producers: 2,600 ft. to nearest, 3,300 ft. to farthest
- 35) Number of Injection Wells at Start: 10
- 36) Number of Injection Wells at Present: 10 (August 1965)
- 37) Average Daily Injection Rate per Injection Well at Start: 100 bbls
- 38) Average Daily Injection Rate per Injection Well at Present: 90 bbls
(January 31, 1965)
- 39) Average Injection Pressure at Start (psi): 360
- 40) Average Injection Pressure at Present (psi): 1,242 (January 31, 1965)
- 41) Number of Producing Wells in Project Area at Start: 11
- 42) Number of Producing Wells in Project Area at Present: 11 (August 1965)
- 43) Average Production Rate in Project Area at Start (bbls/day): 225
- 44) Average Production Rate in Project Area at Present: 516 (August 1965)
- 45) Original Oil in Place in Project Area (bbls): 11.8 million
- 46) Original Oil Saturation (% of pore space): 70
- 47) Primary Recovery from Project Area when Injection Started (bbls): 177,226
- 48) Oil Saturation at Start of Project (% of pore space): 59
- 49) Oil Production from Project Area from Start of Injection to now (bbls): 421,367
(August 1965)
- 50) Total Volume of Injected Fluids at Present: 1,309,722 bbls (August 1965)
- 51) Estimated Primary Ultimate Recovery from Project Area (bbls): 1,888,000
- 52) Estimated Increase in Ultimate Recovery from Project Area (bbls): 2,832,000
- 53) Well Spacing: 80 Acres
- 54) Oil Volume Factor (initial reservoir barrels per Stock-Tank barrel): 1.07

CRUDE PETROLEUM ANALYSIS

Laboratory Number 225-56

FIELD: Hamilton Lake

POOL:

ZONE: Viking

Well Name: Dragon Ranchmen's No. 6-31
 Location: Lsd. 6, Sec. 31, Twp. 35, Rge. 9, W 4
 Interval tested, depth, feet: 2970-2995
 Producing Zone: Viking
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: June 13, 1956
 Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.872
 Sulphur, percent by weight: 0.22
 Saybolt Universal Viscosity:
 at 70°F., sec. 100
 at 100°F., sec. 62
 A.P.I. gravity at 60°F.: 30.8
 Pour point, °F.: 15
 Colour: Brownish Black
 Carbon residue, percent by weight: 2.4
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 760 mm. Hg.
 First drop, 50°C. (122°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167	0.7	0.7	0.670	79.7	-			
3.	100	212	3.6	4.3	0.716	66.1	19	56.8		
4.	125	257	4.9	9.2	0.744	58.7	24	52.5		
5.	150	302	4.9	14.1	0.769	52.5	28	50.0		
6.	175	347	4.2	18.3	0.790	47.6	31	48.6		
7.	200	392	3.3	21.6	0.810	43.2	34	48.8		
8.	225	437	3.5	25.1	0.826	39.8	36	51.8		
9.	250	482	4.1	29.2	0.840	37.0	38	55.0		
10.	275	527	6.3	35.5	0.851	34.8	38	60.9		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	4.1	39.6	0.864	32.3	40	66.8	39	-10
12.	225	437	6.0	45.6	0.870	31.1	39	71.0	46	10
13.	250	482	5.5	51.1	0.878	29.7	40	75.4	59	35
14.	275	527	5.8	56.9	0.888	27.8	41	80.4	93	55
15.	300	572	7.0	63.9	0.898	26.1	43	85.5	168	75
Residuum			34.6	98.5	0.948	17.8				

Carbon residue of residuum: 6.4%

Carbon residue of crude: 2.4%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	4.3	0.709	68.1	
Total gasoline and naphtha	21.6	0.762	54.2	
Kerosine distillate	-	-	-	
Gas oil	22.8	0.851	34.8	
Nonviscous lubricating distillate	10.2	0.873-0.889	30.6-27.7	50-100
Medium lubricating distillate	8.6	0.889-0.903	27.7-25.2	100-200
Viscous lubricating distillate	0.7	0.903-0.904	25.2-25.0	Above 200
Residuum	34.6	0.948	17.8	
Distillation loss	1.5			

Remarks: The sample as received contained no salt (as NaCl) per 1000 bbl.

OIL FIELD DATA

Field and Pool: Harmattan Elkton Main Rundle Pool

Location: Twp(s) 31 & 32, Rge(s) 3 & 4, W 5 M

DISCOVERY DETAILS

Method: Subsurface Geology Seismic Reflection Survey

Well: Name: Oilwell Operators C & E Harmattan 1-7-32-4 W 5 M

Completed: December 27, 1955

Perforated: 9165'-9180'

Treatment: 1500 gal. acid

Initial Potential: 2,400 BOPD on a 30/64" choke. GOR of 910-1,031 cu ft/bbl,
cut 2% BS & W

GEOLOGY

Producing Zone(s): Elkton member of the Rundle formation (oil & gas)
Shunda (oil & gas)
Leduc D-3 (gas)

Other Shows: -

Trap Type: Stratigraphic erosional truncation of the Elkton member and facies.
Change from porous dolomite to tight limestone.

Lithology: Dolomite lt. buff to lt. brown fine to medium dolomitized
crinoidal calcarenite.

Maximum Reservoir Thickness: 142 ft. gross

Regional Setting: Situated near the truncated edge of the Elkton member a
few miles east of the disturbed belt. Regional dip is in
the order of 80'/mile.

Deepest Formation Penetrated: Elk Point

DEVELOPMENT DATA

Total Wells: Completed Oil: 74. Gas: 19. Dry and Abandoned: 9

Producing Oil: 39. Shut in Oil: 35

Injection or Disposal: Water: 2. Gas: 6

Well Spacing: 80 Acres. Pattern: North-South

Logging Practice: E-S induction or electrical log and micro-caliper to total depth. R/A log after production casing is in the hole.

Completion Practice: 600' 10 3/4" surface casing, 5 1/2" production casing set through the prod. zone. Perf. W/4 shots/ft. acid treat. from 250 gal. to 1500 gal. About 1/4 of the wells are open hole comp.

RESERVOIR DATA

Type of Drive: Combination gas cap expansion and solution gas drive

Estimated Oil in Place: 203,000,000 S.T.bbls (555 bbls/acre-foot)

Estimated Recoverable Oil: 61,000,000 S.T.bbls (167 bbls/acre-foot)

Oil Zone Thickness: Maximum: 86' gross. Average: 49.3'

Gas Zone Thickness: Maximum: 142' gross

Porosity: 12.3%. Permeability: 35.5 md

Area: 11,222 Acres

Oil Characteristics: Gravity: 35°-38° API. Sulphur: 0.85% by wt.

Pour Point: 20°F. Initial Solution GOR: 800cf./bbl (3-stage sep.)

Pressure Maintenance or Secondary Recovery: The gas zone is being cycled, with the products sold and dry gas injected back to the reservoir.

PRODUCTION

MPR: 130 BOPD

Economic Allowance: Present: 41. Operating: 41

Market Outlet: Cremona Pipelines

Bibliographical References: Hemphill, C.R. - "History and Development of the Sundre, Westward Ho, and Harmattan Oil Fields"; Journ. Alta. Soc. Petrol. Geol.; Vol. 5, No. 10, pp. 232-247, November 1957.

Penner, D.G. - "The Elkton Member"; Jour. Alta. Soc. Petrol. Geol.; Vol. 5, pp. 101-104, May 1957.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 155-56

FIELD: Harmattan

POOL:

ZONE: Rundle

Well Name: Home Oil C. & E. Harmattan No. 5-5
 Location: Lsd. 5, Sec. 5, Twp. 32, Rge. 4, W 5
 Interval tested, depth, feet: 9130-9165
 Producing Zone: Rundle
 Geological Age: Mississippian

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: May 14, 1956
 Sampled at: Before Separator

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.841
 Sulphur, percent by weight: 0.40
 Saybolt Universal Viscosity:
 at 100°F., sec. 38

A.P.I. gravity at 60°F.: 36.8
 Pour point, °F.: Below -60
 Colour: Brownish Green
 Carbon residue, percent by weight: 0.8
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 756 mm. Hg.
 First drop, 42°C. (108°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167	1.6	1.6	0.687	74.5	-	-		
3.	100	212	3.5	5.1	0.718	65.6	20	48.7		
4.	125	257	6.1	11.2	0.752	56.7	27	40.8		
5.	150	302	6.9	18.1	0.777	50.6	32	37.1		
6.	175	347	6.5	24.6	0.794	46.7	33	41.2		
7.	200	392	5.0	29.6	0.803	44.7	31	46.7		
8.	225	437	5.4	35.0	0.814	42.3	31	55.5		
9.	250	482	6.5	41.5	0.829	39.2	32	62.4		
10.	275	527	7.8	49.3	0.843	36.4	34	66.4		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	5.1	54.4	0.862	32.6	39	68.9	39	0
12.	225	437	7.3	61.7	0.872	30.8	40	74.5	46	20
13.	250	482	6.8	68.5	0.884	28.6	43	78.9	58	40
14.	275	527	5.8	74.3	0.891	27.3	43	84.3	84	65
15.	300	572	5.9	80.2	0.897	26.2	43	90.5	140	80
Residuum			17.8	98.0	0.932	20.3				

Carbon residue of residuum: 4.3%

Carbon residue of crude: 0.8%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	5.1	0.708	68.4	
Total gasoline and naphtha	29.6	0.768	52.7	
Kerosine distillate	5.4	0.814	42.3	
Gas oil	25.3	0.850	35.0	
Nonviscous lubricating distillate	12.8	0.876-0.893	30.0-27.0	50-100
Medium lubricating distillate	7.1	0.893-0.900	27.0-25.7	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	17.8	0.932	20.3	
Distillation loss	2.0			

Remarks: The sample as received contained 4 lb. salt (as NaCl) per 1000 bbl.

OIL FIELD DATA

Field and Pool: Homeglen-Rimbey

Location: Twp(s) 42 & 43, Rge(s) 1 & 2, W 5 M

DISCOVERY DETAILS

Method: Structural test hole drilling followed by seismic reflection survey

Well: Name: Cal. Std. Gulf Rimbey 11-3-42-2 W 5 M (Abandoned)
Cal. Std. Homeglen No. 3-29 (3-29-43-1 W 5 M)

Completed: March 1953

Perforated: 7980-7982 (3-29-43-1)

Treatment: Plugged back as gas well (July 1953)

Initial Potential: 11,300 mcf/d (3-29-43-1)

GEOLOGY

Producing Zone(s): Leduc formation, Woodbend group of Upper Devonian

Other Shows: Small non-commercial gas blows and oil recoveries have been obtained from the Viking, Blairmore, Mississippian and Nisku.

Trap Type: Stratigraphic, a reef bioherm

Lithology: Dolomite, cream, grey, medium to coarsely crystalline, vuggy

Maximum Reservoir Thickness: 860' (approx.)

Regional Setting: South end of the Rimbey-Morinville reef trend which lies on the east side of Ireton shale basin.

Deepest Formation Penetrated: Leduc

DEVELOPMENT DATA

Total Wells: Completed Oil: 39. Gas: 11. Dry and Abandoned: 2

Producing Oil: 35. Suspended Oil: 4

Injection or Disposal: Water: 1. Gas: 1

Well Spacing: 160 Acres. Pattern: Lsd. 1, 3, 9 & 11

Logging Practice: Electric and microcaliper logs to total depth. Radioactive logs sometimes run over Paleozoic section.

Completion Practice: 600' of 10" surface casing. 7" casing run to a few feet above water line and perforated. Others set 7" in Ireton and run 5" lines through and perforate.

RESERVOIR DATA

Type of Drive: Gas caps and water drive

Estimated Oil in Place: 110,000,000 S.T.bbls (353 bbls/acre-foot)

Estimated Recoverable Oil: 6,680,000 S.T.bbls (37 bbls/acre-foot)

Oil Zone Thickness: Maximum: 24'. Average: 24'

Gas Zone Thickness: Maximum: 439'. Average: 167'

Porosity: 7.6%. Permeability: 425 md

Area: 11,600 Acres

Oil Characteristics: Gravity: 41.5 °API. Sulphur: under 1/2%

Initial Solution GOR: 1,057 scfpb

Base: Paraffin

Pressure Maintenance or Secondary Recovery: None

PRODUCTION

MPR: 82 BOPD (December 1964) (per producing well)

Economic Allowance: Present: 37 BOPD/W. Operating: 37 BOPD/W

Market Outlet: Texaco Pipeline Co. to Edmonton

Bibliographical References: 1) Kirker, R.J., 1959, Homeglen-Rimbey Field, Oil Fields of Alberta, 1960, pp. 131, ASPG, Western Decalta Petroleum Ltd.

2) Reservoir Engineering Digest.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 138-56

FIELD: Homeglen-Rimbey

POOL:

ZONE: Leduc (D-3)

Well Name: Cal-Standard Rimbey No. 9-14
 Location: Lsd. 9, Sec. 14, Twp. 42, Rge. 2, W 5
 Interval tested, depth, feet: 7822-7828
 Producing Zone: Leduc (D-3)
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: April 23, 1956
 Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.818
 Sulphur, percent by weight: 0.28
 Saybolt Universal Viscosity:
 at 100°F., sec. 34

A.P.I. gravity at 60°F.: 41.5
 Pour point, °F.: 25
 Colour: Brownish Black
 Carbon residue, percent by weight: 0.7
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 750 mm. Hg.
 First drop, 33°C. (91°F.)

Frac- tion No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Corre- lation Index	Aniline Point, °C.	Visc. S.U. 100°F.	Cloud Test, °F.	Refractive Index 20°C.
	°C.	°F.									
1.	50	122	1.2	1.2)							
2.	75	167	2.7	3.9)	0.691	73.3	-	-			-
3.	100	212	6.1	10.0	0.715	66.4	19	54.6			1.3990
4.	125	257	9.3	19.3	0.740	59.7	22	51.8			1.4120
5.	150	302	8.1	27.4	0.762	54.2	25	51.5			1.4231
6.	175	347	7.1	34.5	0.777	50.6	25	-			-
7.	200	392	6.7	41.2	0.795	46.5	27	56.0			1.4412
8.	225	437	5.5	46.7	0.809	43.4	28	60.4			1.4488
9.	250	482	5.7	52.4	0.820	41.1	28	64.5			1.4549
10.	275	527	7.1	59.5	0.833	38.4	30	69.0			1.4624

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	2.7	62.2	0.848	35.4	33	71.6	38	10	1.4702
12.	225	437	6.0	68.2	0.856	33.8	33	75.2	43	30	1.4751
13.	250	482	4.9	73.1	0.870	31.1	36	79.6	54	50	1.4812
14.	275	527	4.6	77.7	0.880	29.3	38	84.2	74	70	1.4883
15.	300	572	5.1	82.8	0.887	28.0	38	87.6	112	85	-
Resi- duum			15.4	98.2	0.928	21.0					

Carbon residue of residuum: 3.9%

Carbon residue of crude: 0.7%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	10.0	0.706	68.9	
Total gasoline and naphtha	41.2	0.751	56.9	
Kerosine distillate	11.2	0.815	42.1	
Gas oil	16.3	0.845	36.0	
Nonviscous lubricating distillate	10.0	0.865-0.885	32.1-28.4	50-100
Medium lubricating distillate	4.1	0.885-0.891	28.4-27.3	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	15.4	0.928	21.0	
Distillation loss	1.8			

Remarks: The sample as received contained no water (A.S.T.M.) and 13 lb. salt (as NaCl) per 1000 bbl.

OIL FIELD DATA

Field and Pool: Innisfail Field, Innisfail D-3 Pool

Location: Twp(s) 34 & 35, Rge 1, W 5 M

DISCOVERY DETAILS

Method: Seismic and Subsurface Geology

Well: Name: White Rose C & E 1-16 (1-16-35-1 W 5)

Completed: June 1957

Perforated: 8498-8518

Treatment: Small Acid Wash

Initial Potential: 509 B/D 15/64" choke; GOR 1500 cu ft/bbl

GEOLOGY

Producing Zone(s): Leduc

Other Shows: Possible commercial oil in Nisku. Gas in Pekisko and Stettler.

Trap Type: Stratigraphic - reef bioherm

Lithology: Medium to coarsely crystalline dolomite. Porosity predominantly vugs and fractures.

Maximum Reservoir Thickness: 800'

Regional Setting: May lie in an isolated bioherm or be connected to Bashaw reef trend a few miles to the east.

Deepest Formation Penetrated: Cooking Lake (Imperial Innisfail 15-8L-35-1)

DEVELOPMENT DATA

Total Wells: Completed Oil: 91. Gas: 0. Dry and Abandoned: 8

Producing Oil: 26. Suspended Oil: 3. Unit Surplus: 62

Injection or Disposal: Water: 0. Gas: 0

Well Spacing: 80 Acres. Pattern: N/S wells in odd-numbered Lsd's

Logging Practice: GRN, Laterolog 7, Induction & Micro-Caliper

Completion Practice: 7" casing set in Ireton. 5" liner set through and perforated or else completed open hole below liner. Small acid wash.

RESERVOIR DATA

Type of Drive: Gas cap and bottom water

Estimated Oil in Place: 128,000,000 S.T.bbls (218 bbls/acre-foot)

Estimated Recoverable Oil: 72,000,000 S.T.bbls (123 bbls/acre-foot)

Oil Zone Thickness: Maximum: 147'. Average: 79.4'

Gas Zone Thickness: Maximum: 45'

Porosity: 6.01%. Permeability: kh: 240 md; kv: 37 md

Area: 7404 Acres

Oil Characteristics: Gravity: 44 °API. Sulphur: 0.58%

Initial Solution GOR: 1610

Pressure Maintenance or Secondary Recovery: None

PRODUCTION

MPR: 176 BOPD

Economic Allowance: Present: 39. Operating: 39

Market Outlet: Rangeland Pipeline to Edmonton

Bibliographical references: Oil Fields of Alberta - ASPG 1960
Submission to Ultimate Reserves Hearing February 1965,
Operating Committee, Innisfail Leduc Reef Unit

CRUDE PETROLEUM ANALYSIS

Laboratory Number 432-57

FIELD: Innisfail

POOL:

ZONE: D-3

Well Name: HB WR CE Innisfail 11-10-35-1
 Location: Lsd. 11, Sec. 10, Twp. 35, Rge 1, W 5
 Interval tested, depth, feet: 8499-8504
 Producing Zone: Leduc D-3
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: E.M.R.
 Date Sampled: November 27, 1957
 Sampled at: After Separation

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.805
 Sulphur, percent by weight: 0.58
 Saybolt Universal Viscosity:
 at 100°F., sec. 33
 A.P.I. gravity at 60°F.: 44.3
 Pour point, °F.: -25
 Colour: Light Brown
 Carbon residue, percent by weight: 0.5
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 754 mm. Hg.
 First drop, 31°C. (88°F.)

Fraction No.	Cut at °F.	Sum Per Cent	Specific Gravity 60/60°F.	Degrees A.P.I. 60 F.	Correlation Index	Aniline Point, °C.	Visc. S.U. 100°F.	Cloud Test, °F.	Refractive Index @ 20°C.	Dispersion (N _F -N _C) 10 ⁴
1.	122	2.9	0.666	81.0	-	-				
2.	167	7.3	0.684	75.4	14	-				
3.	212	14.2	0.716	66.1	19	52.4				
4.	257	22.2	0.744	58.7	24	50.5				
5.	302	30.1	0.766	53.2	27	50.5				
6.	347	37.3	0.784	49.0	28	50.6				
7.	392	42.9	0.798	45.8	29	56.2				
8.	437	48.8	0.810	43.2	29	61.7				
9.	482	54.0	0.823	40.4	30	66.7				
10.	527	61.7	0.835	38.0	31	-				

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	392	64.5	0.846	35.8	32	71.7	39	+10		
12.	437	69.3	0.854	34.2	32	77.4	45	30		
13.	482	74.7	0.865	32.1	34	83.1	56	50		
14.	527	79.2	0.874	30.4	35	89.3	75	70		
15.	572	84.3	0.882	28.9	36	93.9	115.0	90		
Residuum		96.8	0.920	22.3						

Carbon residue of residuum: 3.0%

Carbon residue of crude: 0.5%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	14.2	0.696	71.8	
Total gasoline and naphtha	42.9	0.746	58.2	
Kerosine distillate	11.1	0.816	41.9	
Gas oil	15.1	0.843	36.4	Below 50
Nonviscous lubricating distillate	11.0	0.858-0.878	33.4-29.7	50-100
Medium lubricating distillate	4.2	0.878-0.887	29.7-28.0	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	12.5	0.920	22.3	
Distillation loss	3.2			

OIL FIELD DATA

Field and Pool: Joarcam, Joarcam Viking Pool

Location: Twp(s) 46 to 50, Rge(s) 20 to 22, W 4 M

DISCOVERY DETAILS

Method: Seismic Survey, **Subsurface** Geology (in search of Devonian production).

Wells: Joseph Lake Field. - Superior Joseph Lake No. 1 in 11-22-50-22 W 4 M.
Completed March 25, 1949, the first commercial
Viking oil well in Alberta.

Perforated: 3264'-3265'

Initial Potential: Approximately 70 BOPD through 10/64" choke

Camrose Field. - Anglo Home C & E Camrose No. 3 in 14-29-47-20 W 4 M.
Completed March 8, 1951.

Perforated: 3213.5'-3216'

Initial Potential: 70 BOPD on pump

Armena Field. - Homestead North Canadian Armena No. 2 in 9-27-48-21 W 4 M.
Completed November 2, 1951. Perforated 3249'-3257'.

Initial Potential: Unknown.

Joarcam Field. - On February 19, 1954, under the Board Order No. F-132,
Joseph Lake, Armena and Camrose Fields were combined into the
Joarcam Field. On May 13, 1954, under Board Order No. F-139,
South Camrose was included.

GEOLOGY

Producing Zone(s): Viking formation, Colorado group of Upper Cretaceous

Other Shows: Drill stem test in Imperial Dinant No. 1 gave uncommercial gas show
in the Ellerslie formation and an oil show from the Nisku formation.
Anglo Home C & E Camrose No. 3 gave indication of sub-commercial
gas in the **Sideritic** zone or possibly the Glauconitic sandstone zone
equivalent.

Trap Type: Stratigraphic trap caused by shaling out of the sand to the northeast
on a homoclinal structure which dips southwest. There is a gas cap in
the north portion of the field. The oil-water interface varies due to
local structures, permeability variations, and the effect of shale
partings.

Lithology: Generally a light grey, silty, fine-grained sandstone at the north and east, grading to a coarse grained clean sandstone to the south and west. Occasionally containing black chert pebbles and thin interbedded shales. A stratum of bentonite occurs near the base of the main oil sand over most of the south half of the field.

Maximum Reservoir Thickness: 30' (est.)

Regional Setting: The north western limit of the Joarcam field is located approximately 20 miles southeast of Edmonton and the southeastern limit is two miles south of the city of Camrose. The trend is roughly 30 miles long and from two to four miles wide.

Deepest Formation Penetrated: Cambrian (Imperial Dinant No. 1 in 16-17-48-20 W 4 M; total depth 8266').

DEVELOPMENT DATA

Total Wells: Completed Oil: 437 (March 1961). Gas: 2. Dry and Abandoned: 72

Producing Oil: 382. Suspended Oil: 7

Injection or Disposal: Water: 25. Gas: Nil

Well Spacing: 40 Acres

Logging Practice: Electric well log from surface to total depth. Contract-Caliper log or Microlog-Caliper over Viking formation. Occasionally Radioactivity log from surface to total depth.

Completion Practice: 150' of surface casing was required until 1952. From then on 400' was required, with some wells cased to 630'. 5 1/2" or 7" production casing was set through the Viking formation and perforated.

RESERVOIR DATA

Type of Drive: Combination of water, gas cap expansion, and solution gas drive

Estimated Oil in Place: 139,000,000 S.T.bbls (1104 bbls/acre-foot)

Estimated Recoverable Oil: 62,550,000 S.T.bbls (497 bbls/acre-foot)

Oil Zone Thickness: Maximum: 28'. Average: 7.2'

Gas Zone Thickness: Maximum: 23'. Average: 11.6'

Porosity: 20.1%. Permeability: 700 md (k_h)

Area: 17,480 Acres

Oil Characteristics: Gravity: 38.2 °API. Sulphur: 0.09%

Pour Point: 35°F. Initial Solution GOR: 230 cu ft/bbl

Base: Paraffin

Pressure Maintenance or Secondary Recovery: Conversion of 9 wells for pressure maintenance by waterflood

PRODUCTION

MPR: N/A 7,300 BOPD

Economic Allowance: -. Present: -. Operating: 25 BOPD/well

Market Outlet: Edmonton via Edmonton Pipeline

Bibliographical References: *Hunt, C.W., 1954, "The Joseph Lake Armena-Camrose Production Trend, Alberta." A.A.P.G. Rutherford Memorial Volume, Western Canada Sedimentary Basin, pp. 452-463.

Hunt, C.W., 1950, "Preliminary Report on Joseph Lake Oil Field, Alberta, Canada." A.A.P.G. Bull., Vol. 34, No. 9, pp. 1802-1806.

Edie, R.W., 1955, "The Inclined Oil-Water Contact at the Joarcam Field," A.A.P.G. Jour., Vol. 3, No. 7, pp. 99-103.

Jardine, D., 1954, "The Joseph Lake-Armena-Camrose Viking Trend" Bull. Can. Inst. Min., & Met., May, pp. 304-306.

*Jardine, D., 1954, "The Joarcam Viking Oil Field," Oil in Canada, Vol. 66, No. 42, pp. 10718-10726.

Oil Fields of Alberta, A.S.P.G., 1960.

* Major sources of information.

SECONDARY RECOVERY

RESERVOIR DATA

- 1) Field: Joarcam
- 2) Pool: Viking
- 3) Province: Alberta
- 4) Location: Twp(s) 47 & 48, Rge(s) 20 & 21, W 4 M
- 5) Operator: Imperial Oil
- 6) Project: #1 Unit
- 7) Reservoir: Lower Cretaceous
- 8) Discovery Date: February 1949
- 9) Date Injection Began: September 1963
- 10) Main Structural Feature: Stratigraphic Trap
- 11) Gas Cap: Originally: Yes. At Present: Yes
- 12) Time Required for Initial Results (months): Offsetting wells showed response by December 1963
- 13) Initial Results on Production, BHP: 540. GOR: 500. WOR: constant at 0.10
- 14) Main Drive in Primary Production: Solution Gas, Water Drive
- 15) Productive Area (acres) of Reservoir: 20,000 Acres. Of Project: 5,440 Acres
Affected by Injection: 5,440
- 16) Average depth to top of pay (feet): 3,241
- 17) Average Effective Thickness (feet): 7.0
- 18) Average Porosity %: 21.0
- 19) Average Horizontal Permeability (millidarcys): 500
- 20) Connate Water (% of pore space): 27
- 21) Viscosity at Initial Reservoir Conditions (centipoises): 1.97
- 22) API Gravity: 37°
- 23) Solution Gas/Oil Ratio at Saturation Pressure (cu ft/bbl): 206
- 24) Bubble Point Pressure: 855 psig
- 25) Original Pressure MFD: 856 psig

- 26) Reservoir Pressure at Start of Injection: 540 psig
- 27) Latest Reservoir Pressure: 578 psi (December 31, 1964)
- 28) Injection Fluid: Salt Water and Fresh Water
- 29) Injection Fluid Source: Formation, Calgary Power Reservoir
- 30) System: Open
- 31) Fluid Treatment before Injection: Filtration, Chlorination
- 32) Injection Pattern: Line, Peripheral (planned)
- 33) Structural Position Injection Wells: Below WOC
- 34) Distance Injection Wells to Producers (feet): Approx. 1,300 ft to nearest and 6,920 ft. to farthest
- 35) Number of Injection Wells at Start: 2
- 36) Number of Injection Wells at Present: 12 (April 30, 1965)
- 37) Average Daily Injection Rate per Injection Well at Start: 145 BPD
- 38) Average Daily Injection Rate per Injection Well at Present: 2,753 BPD (April 30, 1965)
- 39) Average Injection Pressure at Start: 200 psig
- 40) Average Injection Pressure at Present: 637 psig (April 30, 1965)
- 41) Number of Producing Wells in Project Area at Start: 126
- 42) Number of Producing Wells in Project Area at Present: 123 (December 31, 1964)
- 43) Average Production Rate in Project Area at Start (bbls/day): 2,700
- 44) Average Production Rate in Project Area at Present: 2,382 (December 31, 1964)
- 45) Original Oil in Place in Project Area (bbls): 41,213,000 STOIP
- 46) Original Oil Saturation (% of pore space): 73
- 47) Primary Recovery from Project Area when Injection Started (bbls): Cumulative
12,105,408
- 48) Oil Saturation at Start of Project (% of pore space): 59
- 49) Oil Production from Project Area from Start of Injection to now (bbls): 1,542,992
(April 30, 1965)
- 50) Total Volume of Injected Fluids at Present: 3,960,846 bbls (April 30, 1965)
- 51) Estimated Primary Ultimate Recovery from Project Area (bbls): 16,485,000
- 52) Estimated Increase in Ultimate Recovery from Project Area (bbls): 4,122,000
- 53) Well Spacing: 40 Acres
- 54) Oil Volume Factor (initial reservoir barrels per Stock-Tank barrel): 1.11

CRUDE PETROLEUM ANALYSIS

Laboratory Number 1739-52

FIELD: Joarcam (Camrose)

POOL:

ZONE: Viking

Well Name: Composite 8 Wells: Anglo-Home C & E Camrose
Nos. 3, 4, 6, 7, 8, 9, 11 & 12

Province: Alberta

Location: Sec. 29 & 32, Twp. 47, Rge. 20, W 4

Sample From: D.M.T.S.

Interval tested, depth, feet: approx. 3200

Producing Zone: Viking

Date Sampled: September 2, 1952

Geological Age: Lower Cretaceous

Sampled at: Tank, through treater

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.836
Sulphur, percent by weight: 0.14
Saybolt Universal Viscosity:
at 70°F., sec. 52
at 100°F., sec. 43

A.P.I. gravity at 60°F.: 37.8
Pour point, °F.: 45
Colour: Dark Green
Carbon residue, percent by weight: 1.6
(Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 766 mm. Hg.
First drop, 26°C. (79°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	1.1	1.1	-	-	-	-	-	-
2.	75	167	1.8	2.9	0.664	81.6	-	-	-	-
3.	100	212	4.0	6.9	0.705	69.2	14	57.8	-	-
4.	125	257	5.9	12.8	0.732	61.8	18	56.2	-	-
5.	150	302	4.6	17.4	0.751	56.9	19	57.2	-	-
6.	175	347	4.9	22.3	0.767	53.0	20	58.7	-	-
7.	200	392	4.1	26.4	0.784	49.0	22	60.9	-	-
8.	225	437	4.8	31.2	0.798	45.8	23	64.4	-	-
9.	250	482	5.2	36.4	0.811	43.0	24	67.6	-	-
10.	275	527	7.2	43.6	0.824	40.2	25	71.8	-	-

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	4.5	48.1	0.841	36.8	29	76.2	40	20
12.	225	437	6.3	54.4	0.847	35.6	28	80.4	45	40
13.	250	482	5.0	59.4	0.856	33.8	29	84.4	54	55
14.	275	527	6.7	66.1	0.866	31.9	31	88.7	75	75
15.	300	572	6.3	72.4	0.876	30.0	33	93.2	133	90
Residuum			26.3	98.7	0.932	20.3				

Carbon residue of residuum: 5.3%

Carbon residue of crude: 1.6%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	6.9	0.679	76.9	
Total gasoline and naphtha	26.4	0.736	60.8	
Kerosine distillate	17.2	0.813	42.6	
Gas oil	10.7	0.845	36.0	
Nonviscous lubricating distillate	11.3	0.852-0.871	34.6-31.0	50-100
Medium lubricating distillate	6.8	0.871-0.881	31.0-29.1	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	26.3	0.932	20.3	
Distillation loss	1.3			

Remarks: The sample as received contained a trace of water and sediment (by centrifuge) and 7 lb. salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 1848-52 .

FIELD: Joarcam (Camrose)

POOL:

ZONE: Viking

Well Name: Composite 2 Wells: Canadian Pipeline and Associates Province: Alberta
Camrose Nos. 2 & 3

Location: Lsd. 14 & 11, Sec. 27, Twp. 46, Rge. 20, W 4 Sample From: D.M.T.S.

Interval tested, depth, feet: 3244-3253

Producing Zone: Viking

Date Sampled: September 17, 1952

Geological Age: Lower Cretaceous

Sampled at: After treater

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.842

A.P.I. gravity at 60°F.: 36.6

Sulphur, percent by weight: 0.12

Pour point, °F.: 45

Saybolt Universal Viscosity:

Colour: Dark Green

at 70°F., sec. 57

Carbon residue, percent by weight: 1.6

at 100°F., sec. 46

(Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 765 mm. Hg.
First drop, 28°C. (82°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Corre-lation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	0.7	0.7)	-	-	-			
2.	75	167	1.6	2.3)	0.656	84.2	-			
3.	100	212	3.4	5.7	0.709	68.1	16	57.4		
4.	125	257	5.5	11.2	0.735	61.0	19	56.6		
5.	150	302	5.4	16.6	0.751	56.9	19	57.8		
6.	175	347	4.5	21.1	0.770	52.3	22	59.4		
7.	200	392	4.9	26.0	0.786	48.5	23	61.6		
8.	225	437	4.3	30.3	0.801	45.2	24	65.0		
9.	250	482	5.4	35.7	0.814	42.3	25	68.8		
10.	275	527	6.3	42.0	0.827	39.6	27	72.4		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	5.4	47.4	0.842	36.6	30	75.3	39	15
12.	225	437	6.0	53.4	0.847	35.6	28	80.3	45	35
13.	250	482	6.3	59.7	0.857	33.6	30	84.8	56	60
14.	275	527	5.1	64.8	9.868	31.5	32	88.8	75	75
15.	300	572	6.6	71.4	0.879	29.5	34	93.6	127	90
Residuum			28.1	99.5	0.932	20.3				

Carbon residue of residuum: 5.1%

Carbon residue of crude: 1.6%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	5.7	0.688	74.2	
Total gasoline and naphtha	26.0	0.744	58.7	
Kerosine distillate	9.7	0.808	43.6	
Gas oil	17.5	0.839	37.2	
Nonviscous lubricating distillate	11.9	0.852-0.873	34.6-30.6	50-100
Medium lubricating distillate	6.3	0.873-0.885	30.6-28.4	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	28.1	0.932	20.3	
Distillation loss	0.5			

Remarks: The sample as received contained a trace of water and sediment (by centrifuge) and 32 lb. salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 698-53

FIELD: Joarcam (Joseph Lake)

POOL:

ZONE: Viking

Well Name: Imperial Joseph Lake No. 6-12V
 Location: Lsd. 6, Sec. 12, Twp. 50, Rge. 22, W 4
 Interval tested, depth, feet: 3239-3251
 Producing Zone: Viking
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: Imperial Oil Ltd.
 Date Sampled: April 2, 1957
 Sampled at: Battery

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.832
 Sulphur, percent by weight: 0.13
 Saybolt Universal Viscosity:
 at 100°F., sec. 41

A.P.I. gravity at 60°F.: 38.6
 Pour point, °F.: 20
 Colour: Dark Green
 Carbon residue, percent by weight: 1.5
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 753 mm. Hg.
 First drop, 28°C. (82°F.)

Frac- tion No.	Cut, at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Corre- lation Index	Aniline Point, °C.	Visc. S.U. 100°F.	Cloud Test, °F.	Refractive Index 20°C.
	°C.	°F.									
1.	50	122	1.5	1.5)							
2.	75	167	2.3	3.8)	0.671	79.4	-	-			1.3838
3.	100	212	4.2	8.0	0.713	67.0	18	56.5			1.3986
4.	125	257	6.0	14.0	0.736	60.8	20	55.5			1.4090
5.	150	302	5.2	19.2	0.755	55.9	21	56.8			1.4191
6.	175	347	4.9	24.1	0.774	51.3	23	57.7			1.4288
7.	200	392	4.7	28.8	0.789	47.8	24	59.8			1.4371
8.	225	437	4.5	33.3	0.803	44.7	25	63.5			1.4449
9.	250	482	4.5	37.8	0.817	41.7	27	67.2			1.4522
10.	275	527	5.0	42.8	0.829	39.2	28	71.3			1.4598

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	4.1	46.9	0.844	36.2	31	73.8	38	15	1.4671
12.	225	437	5.7	52.6	0.849	35.2	29	78.8	44	35	1.4708
13.	250	482	5.8	58.4	0.859	33.2	31	83.0	53	55	1.4756
14.	275	527	4.7	63.1	0.868	31.5	32	87.0	70	70	1.4808
15.	300	572	6.5	69.6	0.877	29.8	33	91.5	114	85	1.4926
Resi- duum			26.8	96.4	0.931	20.5					

Carbon residue of residuum: 5.1%

Carbon residue of crude: 1.5%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	8.0	0.693	72.7	
Total gasoline and naphtha	28.8	0.743	58.9	
Kerosine distillate	9.0	0.810	43.2	
Gas oil	15.7	0.841	36.8	
Nonviscous lubricating distillate	11.1	0.855-0.874	34.0-30.4	50-100
Medium lubricating distillate	5.0	0.874-0.883	30.4-28.8	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	26.8	0.931	20.5	
Distillation loss	3.6			

Remarks: The sample as received contained 0.09% by vol. water and sediment (by centrifuge) and 11 lb. salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 1472-53

FIELD: Joarcam (Camrose)

POOL:

ZONE: Viking

Well Name: Composite 2 wells: Imperial Dinant Nos. 4-7V
& 5-7V

Province: Alberta

Location: Sec. 7, Twp. 48, Rge. 20, W 4
Interval tested, depth, feet: 3204-3230

Sample From: D.M.T.S.

Producing Zone: Viking

Date Sampled: June 27, 1953

Geological Age: Lower Cretaceous

Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.839
Sulphur, percent by weight: 0.15
Saybolt Universal Viscosity:
at 100°F., sec. 42

A.P.I. gravity at 60°F.: 37.2
Pour point, °F.: 45
Colour: Dark Green
Carbon residue, percent by weight: 1.3
(Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 755 mm. Hg.
First drop, 30°C. (86°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Visc. S.U. 100°F.	Cloud Test, °F.	Refractive Index 20°C.
	°C.	°F.									
1.	50	122	-	-	-	-	-	-	-	-	-
2.	75	167	3.2	3.2	0.666	81.0	-	59.0	-	-	1.3851
3.	100	212	4.0	7.2	0.706	68.9	15	57.6	-	-	1.3969
4.	125	257	5.9	13.1	0.735	61.0	19	56.6	-	-	1.4077
5.	150	302	5.1	18.2	0.754	56.2	21	57.4	-	-	1.4205
6.	175	347	4.5	22.7	0.772	51.8	23	58.8	-	-	1.4278
7.	200	392	4.6	27.3	0.785	48.8	23	61.2	-	-	1.4361
8.	225	437	4.7	32.0	0.799	45.6	24	64.8	-	-	1.4440
9.	250	482	5.1	37.1	0.815	42.1	26	68.4	-	-	1.4512
10.	275	527	7.2	44.3	0.828	39.4	27	72.2	-	-	1.4592

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	4.5	48.8	0.844	36.2	31	74.8	39	15	1.4676
12.	225	437	5.8	54.6	0.849	35.2	29	80.2	45	35	1.4709
13.	250	482	6.0	60.6	0.859	33.2	31	84.6	55	55	1.4760
14.	275	527	5.3	65.9	0.865	32.1	31	88.4	75	70	1.4828
15.	300	572	6.7	72.6	0.877	29.8	33	96.0	126	85	1.4920
Residuum			27.0	99.6	0.930	20.6					

Carbon residue of residuum: 4.5%

Carbon residue of crude: 1.3%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	7.2	0.688	74.2	
Total gasoline and naphtha	27.3	0.741	59.5	
Kerosine distillate	9.8	0.807	43.8	
Gas oil	17.4	0.839	37.2	
Nonviscous lubricating distillate	11.7	0.854-0.871	34.2-31.0	50-100
Medium lubricating distillate	6.4	0.871-0.884	31.0-28.6	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	27.0	0.930	20.6	
Distillation loss	0.4			

Remarks: The sample as received contained 0.10% by vol. water and sediment (by centrifuge) and 178 lb. salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 1473-53

FIELD: Joarcam (Camrose)

POOL:

ZONE: Viking

Well Name: Imperial Camrose No. 14-33V
 Location: Lsd. 14, Sec. 33, Twp. 47, Rge. 20, W 4
 Interval tested, depth, feet: 3189-3216
 Producing Zone: Viking
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: June 27, 1953
 Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.839
 Sulphur, percent by weight: 0.17
 Saybolt Universal Viscosity:
 at 100°F., sec. 43

A.P.I. gravity at 60°F.: 37.2
 Pour point, °F.: 50
 Colour: Dark Green
 Carbon residue, percent by weight: 1.5
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 759 mm. Hg.
 First drop, 29°C. (84°F.)

Frac- tion No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Corre- lation Index	Aniline Point, °C.	Visc. S.U. 100°F.	Cloud Test, °F.	Refractive Index 20°C.
	°C.	°F.									
1.	50	122)									
2.	75	167)	3.0	3.0	0.664	81.6	-	59.0			1.3778
3.	100	212	4.1	7.1	0.712	67.2	18	57.6			1.3952
4.	125	257	6.3	13.4	0.736	60.8	20	57.0			1.4088
5.	150	302	4.7	18.1	0.756	55.7	22	58.4			1.4188
6.	175	347	4.9	23.0	0.771	52.0	22	59.8			1.4282
7.	200	392	4.3	27.3	0.788	48.1	24	62.4			1.4373
8.	225	437	4.9	32.2	0.802	44.9	25	65.8			1.4452
9.	250	482	5.1	37.3	0.816	41.9	26	69.6			1.4526
10.	275	527	6.7	44.0	0.829	39.2	28	73.6			1.4602

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	4.1	48.1	0.844	36.2	31	76.6	40	25	1.4673
12.	225	437	6.0	54.1	0.850	35.0	30	80.8	46	40	1.4722
13.	250	482	5.5	59.6	0.860	33.0	31	85.2	57	65	1.4762
14.	275	527	5.2	64.8	0.865	32.1	31	89.2	76	80	1.4820
15.	300	572	6.2	71.0	0.877	29.8	33	93.0	129	90	1.4930
Resi- dium			27.3	98.3	0.924	21.6					

Carbon residue of residuum: 5.1%

Carbon residue of crude: 1.5%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	7.1	0.692	73.0	
Total gasoline and naphtha	27.3	0.742	59.2	
Kerosine distillate	10.0	0.809	43.4	
Gas oil	15.9	0.839	37.2	
Nonviscous lubricating distillate	11.6	0.854-0.870	34.2-31.1	50-100
Medium lubricating distillate	6.2	0.870-0.883	31.1-28.8	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	27.3	0.924	21.6	
Distillation loss	1.7			

Remarks: The sample as received contained 0.30% by vol. water and sediment (by centrifuge) and 79 lb. salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 1725-53

FIELD: Joarcam (Armena)

POOL:

ZONE: Viking

Well Name: Composite 4 wells: Homestead North Canadian Armena Province: Alberta

No. 3-27, 6-27, 11-27 & 13-27

Location: Lsd. 3, 6, 11 & 13, Sec. 27, Twp. 48, Rge. 21, W 4

Sample From: D.M.T.S.

Interval tested, depth, feet: 3221-3293

Producing Zone: Viking

Date Sampled: June 27, 1953

Geological Age: Lower Cretaceous

Sampled at: Before Separator

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.840
Sulphur, percent by weight: 0.16
Saybolt Universal Viscosity:
at 100°F., sec. 42

A.P.I. gravity at 60°F.: 37.0
Pour point, °F.: 10
Colour: Dark Green
Carbon residue, percent by weight: 1.5
(Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 749 mm. Hg.
First drop, 26°C. (79°F.)

Frac- tion No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Corre- lation Index	Aniline Point, °C.	Visc. S.U. 100°F.	Cloud Test, °F.	Refractive Index 20°C.
	°C.	°F.									
1.	50	122	1.4	1.4	0.672	79.1	-	-			-
2.	75	167	1.9	3.3	0.678	77.2	11	-			1.3900
3.	100	212	4.3	7.6	0.716	66.1	19	56.4			1.3990
4.	125	257	6.0	13.6	0.741	59.5	22	56.1			1.4110
5.	150	302	5.3	18.9	0.759	54.9	23	56.8			1.4195
6.	175	347	4.7	23.6	0.778	50.4	25	58.0			1.4297
7.	200	392	4.3	27.9	0.793	46.9	26	60.4			1.4380
8.	225	437	4.9	32.8	0.807	43.8	27	63.9			1.4456
9.	250	482	6.2	39.0	0.821	40.8	29	67.7			1.4537
10.	275	527	5.9	44.9	0.835	38.0	31	72.4			1.4618

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	4.6	49.5	0.847	35.6	32	75.5	40	20	1.4675
12.	225	437	5.0	54.5	0.852	34.6	31	79.8	45	35	1.4716
13.	250	482	6.8	61.3	0.861	32.8	32	84.1	56	60	1.4770
14.	275	527	4.9	66.2	0.871	31.0	33	87.7	77	80	1.4830
15.	300	572	5.9	72.1	0.880	29.3	55	92.3	126	95	-
Resi- dium			27.4	99.5	0.936	19.7					

Carbon residue of residuum: 5.0%

Carbon residue of crude: 1.5%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	7.6	0.698	71.2	
Total gasoline and naphtha	27.9	0.747	57.9	
Kerosine distillate	11.1	0.815	42.1	
Gas oil	15.7	0.844	36.2	
Nonviscous lubricating distillate	11.6	0.856-0.875	33.8-30.2	50-100
Medium lubricating distillate	5.8	0.875-0.885	30.2-28.4	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	27.4	0.936	19.7	
Distillation loss	0.5			

Remarks: The sample as received contained 2.0% by vol. water and sediment (by centrifuge) and 23 lb. salt (as NaCl) per 1000 bbl.

OIL FIELD DATA

Field and Pool: Joffre, Joffre-Viking Pool

Location: Twp(s) 38 & 39, Rge(s) 25-26-27, W 4 M

DISCOVERY DETAILS

Method: **Subsurface** Geology, Seismic Reflection Survey

Well: Name: Canadian Superior Unit Morton No. 9, 19-38-25 W 4 M

Completed: September 12, 1953

Perforated: 4890'-4910'

Treatment: None

Initial Potential: Wells flowed 145 BOPD through 16/64" choke with a GOR of 1112 cu.ft/bbl with BS & W less than 0.1%

GEOLOGY

Producing Zone(s): Viking formation, Colorado group of Upper Cretaceous.
Nisku formation, Winterburn group of Upper Devonian. (See Joffre Field - D-2 Pool)

Other Shows: Tests of the Belly River sands have recovered relatively fresh water, however a few weak gas blows have been obtained from the basal Belly River sand. The Ellerslie sands are of spotty occurrence, and have given up to 3725' of oil on drill stem test with gas flows up to 4100 Mcf/d rate. The Leduc fm at California Standard Joffre 13-33-38-26 flowed gas at 2341 Mcf/d rate and 180' of oil was recovered on drill stem test.

Trap Type: Stratigraphic - porous sand surrounded by impermeable sandy shale and shale.

Lithology: Dark grey to black, medium to coarse grained, glauconitic sand with well rounded chert pebbles, intergranular porosity.

Maximum Reservoir Thickness: 30'

Regional Setting: The Joffre Viking sand pool is located immediately east of Red Deer in south-central Alberta. The field is approximately 23 miles long and up to 1 1/2 miles in width. It represents the eastern half of a localized sand development known as the Joffre-Gilby trend, which strikes N60°W over a distance of 50 miles. Cretaceous beds dip westerly at 30' per mile at the eastern end, increasing to 35' per mile at the western extremity.

Deepest Formation Penetrated: Cambrian (Imp. H.B. Joffre 9-8-39-26).

DEVELOPMENT DATA

Total Wells: Completed Oil: 400. Gas: 5. Dry and Abandoned: 23

Producing Oil: 123. Suspended Oil: 98

Injection or Disposal: Water: 27. Gas: Nil

Well Spacing: 40 Acres

Logging Practice: Electric Log and Micro-Caliper

Completion Practice: 600' surface casing; 5 1/2" or 7" casing set either through producing zone and perforated or set above the producing zone and completed open hole.

RESERVOIR DATA

Type of Drive: Original Solution Gas, Presently Waterflood

Estimated Oil in Place: 78,500,000 S.T.bbls (611 bbls/acre-foot)

Estimated Recoverable Oil: 36,110,000 S.T.bbls (281 bbls/acre-foot)

Oil Zone Thickness: Maximum: 30'. Average: 10.0'

Porosity: 13.2%. Permeability: k_h ; 467 md

Area: 12,840 Acres

Oil Characteristics: Gravity: 41 °API. Sulphur: 0.07%

Pour Point: -5°F. Initial Solution GOR: 1104 cu ft/bbl

Base: Paraffin

Pressure Maintenance or Secondary Recovery: Waterflood, Initial Water Injection Commenced December 27, 1957.

PRODUCTION

MPR: N/A. 1300 BOPD (Pool)

Economic Allowance: Operating: 27 BOPD/well

Market Outlet (pipeline): East of Red Deer River by Britamoil to Stettler then to Edmonton terminal.
West of Red Deer River by Rangeland to Rimbey then to Edmonton terminal.

Bibliographical References: Love, A.M., "Geology and Development, Joffre Oil Field, Alberta," Can. Inst. Min. & Metall., Trans., V. 48, July 1955, pp. 433-437.

Oil Fields of Alberta, ASPG, 1960 (revised)

SECONDARY RECOVERY

RESERVOIR DATA

- 1) Field: Joffre
- 2) Pool: Viking
- 3) Province: Alberta
- 4) Location: Twp(s) 38 & 39, Rge(s) 25-26-27, W 4 M
- 5) Operator: Imperial Oil
- 6) Project: Seg. "E" Unit
- 7) Reservoir: Viking Formation, Lower Cretaceous
- 8) Discovery Date: September 1953
- 9) Date Injection Began: January 1958
- 10) Main Structural Feature: Stratigraphic Trap
- 11) Gas Cap: Originally: Yes (Locally in High Knobs on Structure)
At Present: No
- 12) Time Required for Initial Results: Immediate Response
- 13) Initial Results on Production, BHP: 900. GOR: 850
- 14) Main Drive in Primary Production: Solution Gas, Water Drive
- 15) Productive Area (acres) of Reservoir: 10,257. Of Project: 2,040
Affected by Injection: 2,040
- 16) Average Depth to Top of Pay (feet): 4,967
- 17) Average Effective Thickness (feet): 11.7
- 18) Average Porosity %: 11.2
- 19) Average Horizontal Permeability (millidarcys): 400
- 20) Connate Water (% of pore space): 28
- 21) Viscosity at Initial Reservoir Conditions (centipoises): 1.07
- 22) API Gravity: 41
- 23) Solution Gas/Oil Ratio at Saturation Pressure (cu ft/bbl): 378
- 24) Bubble Point Pressure (psi): 1105
- 25) Original Pressure (psi): 1114
- 26) Reservoir Pressure at Start of Injection (psi): 900

- 27) Latest Reservoir Pressure: 935 psi (June 1965)
- 28) Injection Fluid: Salt Water, Fresh Water
- 29) Injection Fluid Source: Formation
- 30) System: Closed
- 31) Fluid Treatment before Injection: Chlorination, Calgon
- 32) Injection Pattern: Peripheral
- 33) Structural Position Injection Wells: Oil Zone
- 34) Distance Injection Wells to Producers (feet): 2,600 ft to nearest, 3,900 ft to
farthest
- 35) Number of Injection Wells at Start: 4 (inside) 1/2 inject. from 9 wells outside
- 36) Number of Injection Wells at Present: 1/2 inject. from 6 outside wells,
1 inside well (June 1965)
- 37) Average Daily Injection Rate for all injectors Seg. E at Start: 4,000 bbls
- 38) Average Daily Injection Rate for all injectors Seg. E at Present: 1,820 bbls
(June 1965)
- 39) Average Injection Pressure at Start (psi): No Pressures Indicated
- 40) Average Injection Pressure at Present (psi): 175 (January 1965)
- 41) Number of Producing Wells in Project Area at Start: 42
- 42) Number of Producing Wells in Project Area at Present: 7 (June 1965)
- 43) Average Production Rate in Project Area at Start (bbls/day): 1,750
- 44) Average Production Rate in Project Area at Present: 299 (June 1965)
- 45) Original Oil in Place in Project Area (bbls): 15,804,419
- 46) Original Oil Saturation (% of pore space): 72 (2.5% Gas Saturation)
- 47) Primary Recovery from Project Area when Injection Started (bbls): 1,000,000
- 48) Oil Saturation at Start of Project (% of pore space): 69.5
- 49) Oil Production from Project Area from Start of Injection to Now (bbls): 4,546,162
(May 1965)
- 50) Total Volume of Injected Fluids at Present (bbls): 7,645,232 (May 1965)
- 51) Estimated Primary Ultimate Recovery from Project Area (bbls): 2,686,751
- 52) Estimated Increase in Ultimate Recovery from Project Area (bbls): 3,793,061
- 53) Well Spacing: 40 Acres
- 54) Oil Volume Factor (initial reservoir barrels per Stock-Tank barrel): 1.222

CRUDE PETROLEUM ANALYSIS

Laboratory Number 139-56

FIELD: Joffre

POOL:

ZONE: Viking

Well Name: Cal-Standard Joffre No. 12-25
 Location: Lsd. 12, Sec. 25, Twp. 38, Rge. 26, W 4
 Interval tested, depth, feet: 5103-5126
 Producing Zone: Viking
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: D.M.T.S.

Date Sampled: April 23, 1956
 Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.818
 Sulphur, percent by weight: 0.14
 Saybolt Universal Viscosity:
 at 100°F., sec. 38

A.P.I. gravity at 60°F.: 41.5
 Pour point, °F.: -40
 Colour: Brownish Green
 Carbon residue, percent by weight: 1.1
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 756 mm. Hg.
 First drop, 29°C. (84°F.)

Frac- tion No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Corre- lation Index	Aniline Point, °C.	Visc. S.U. 100°F.	Cloud Test, °F.	Refractive Index 20°C.
	°C.	°F.									
1.	50	122	1.7	1.7	0.647	87.2	-	-			-
2.	75	167	4.3	6.0	0.675	78.1	10	59.1			1.3857
3.	100	212	4.8	10.8	0.708	68.4	16	56.8			1.3972
4.	125	257	6.1	16.9	0.738	60.2	21	53.8			1.4108
5.	150	302	5.4	22.3	0.759	54.9	23	53.9			1.4212
6.	175	347	4.5	26.8	0.775	51.1	24	55.7			1.4303
7.	200	392	3.9	30.7	0.786	48.5	23	59.0			1.4372
8.	225	437	4.5	35.2	0.802	44.9	25	63.6			1.4446
9.	250	482	4.9	40.1	0.813	42.6	25	67.6			1.4517
10.	275	527	6.5	46.6	0.827	39.6	27	72.1			1.4591

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	2.4	49.0	0.842	36.6	30	74.4	38	10	1.4667
12.	225	437	4.7	53.7	0.848	35.4	29	80.0	43	30	1.4698
13.	250	482	5.2	58.9	0.855	34.0	29	83.8	50	50	1.4729
14.	275	527	4.8	63.7	0.865	32.1	31	88.7	68	70	1.4784
15.	300	572	6.2	69.9	0.876	30.0	33	92.3	107	85	-
Resi- dium			25.3	95.2	0.922	22.0					

Carbon residue of residuum: 3.7%

Carbon residue of crude: 1.1%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	10.8	0.685	75.1	
Total gasoline and naphtha	30.7	0.735	61.0	
Kerosine distillate	9.4	0.808	43.6	
Gas oil	16.2	0.840	37.0	
Nonviscous lubricating distillate	9.5	0.855-0.874	34.0-30.4	50-100
Medium lubricating distillate	4.1	0.874-0.882	30.4-28.9	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	25.3	0.922	22.0	
Distillation loss	4.8			

Remarks: The sample as received contained no water (A.S.T.M.) and 9 lb. salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 137-56

FIELD: Joffre

POOL:

ZONE: Viking

Well Name: Cal-Standard Burbank No. 5-14
 Location: Lsd. 5, Sec. 14, Twp. 39, Rge. 27, W 4
 Interval tested, depth, feet: 5032-5092
 Producing Zone: Viking
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: D.M.T.S.

Date Sampled: April 23, 1956
 Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.819
 Sulphur, percent by weight: 0.04
 Saybolt Universal Viscosity:
 at 100°F., sec. 38

A.P.I. gravity at 60°F.: 41.3
 Pour point, °F.: Below -60
 Colour: Brownish Black
 Carbon residue, percent by weight: 0.9
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 750 mm. Hg.
 First drop, 32°C. (90°F.)

Frac- tion No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Corre- lation Index	Aniline Point, °C.	Visc. S.U. 100°F.	Cloud Test, °F.	Refractive Index 20°C.
	°C.	°F.									
1.	50	122	2.3	2.3	0.647	87.2	-	-			-
2.	75	167	2.9	5.2	0.668	80.3	6	60.2			1.3842
3.	100	212	5.5	10.7	0.706	68.9	15	56.5			1.3949
4.	125	257	6.7	17.4	0.736	60.8	20	53.0			1.4096
5.	150	302	5.4	22.8	0.757	55.4	22	52.4			1.4207
6.	175	347	4.7	27.5	0.771	52.0	22	54.8			1.4291
7.	200	392	4.3	31.8	0.784	49.0	22	58.6			1.4362
8.	225	437	4.9	36.7	0.798	45.8	23	63.1			1.4432
9.	250	482	5.0	41.7	0.811	43.0	24	67.6			1.4507
10.	275	527	6.1	47.8	0.824	40.2	25	71.7			1.4582

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	2.6	50.4	0.840	37.0	29	74.1	38	10	1.4658
12.	225	437	4.7	55.1	0.847	35.6	28	79.8	43	30	1.4696
13.	250	482	5.2	60.3	0.856	33.8	29	84.9	53	50	1.4741
14.	275	527	4.9	65.2	0.864	32.3	30	88.8	70	65	1.4792
15.	300	572	5.6	70.8	0.874	30.4	32	92.7	107	80	-
Resi- dium			25.4	96.2	0.923	21.8					

Carbon residue of residuum: 3.0%

Carbon residue of crude: 0.9%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	10.7	0.683	75.7	
Total gasoline and naphtha	31.8	0.733	61.5	
Kerosine distillate	16.0	0.812	42.8	
Gas oil	8.4	0.845	36.0	
Nonviscous lubricating distillate	10.8	0.853-0.872	34.4-30.8	50-100
Medium lubricating distillate	3.8	0.872-0.879	30.8-29.5	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	25.4	0.923	21.8	
Distillation loss	3.8			

Remarks: The sample as received contained no water (A.S.T.M.) and 8 lb. salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 427-57

FIELD: South Joffre

POOL:

ZONE: Viking

Well Name: Yankee Canadian Chief
 Location: Lsd. 13, Sec. 5, Twp. 38, Rge. 25, W 4
 Interval tested, depth, feet: 4850'-4876'
 Producing Zone: Viking
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: D.E.M.R.
 Date Sampled: November 27, 1957
 Sampled at: After Separator

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.813
 Sulphur, percent by weight: 0.19
 Saybolt Universal Viscosity:
 at 100°F., sec. 38.3

A.P.I. gravity at 60°F.: 42.6
 Pour point, °F.: -40°
 Colour: Brownish Green
 Carbon residue, percent by weight: 0.9
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 758 mm. Hg.
 First drop, 26°C. (79°F.)

Fraction No.	Cut at °F.	Sum per Cent	Specific Gravity 60/60°F.	Degrees A.P.I. °60 F.	Correlation Index	Aniline Point, °C.	Visc. S.U. 100°F.	Cloud Test, °F.	Refractive Index @ 20°C.	Dispersion (N _D -N _C) 10 ⁴
1.	122	2.8	0.646	87.5	-					
2.	167	6.8	0.671	79.4	8	68.7				
3.	212	12.8	0.704	69.5	14	55.9				
4.	257	19.8	0.734	61.3	19	52.6				
5.	302	25.1	0.754	56.2	21	52.3				
6.	347	29.6	0.771	52.0	22	55.4				
7.	392	34.0	0.785	48.8	23	58.8				
8.	437	38.9	0.798	45.8	23	63.3				
9.	482	43.6	0.812	42.8	24	67.6				
10.	527	49.9	0.826	39.8	26	72.2				

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	392	54.1	0.840	37.0	29	73.1	39	15		
12.	437	58.6	0.846	35.8	28	79.7	44	35		
13.	482	63.5	0.855	34.0	29	84.2	54	55		
14.	527	68.3	0.866	31.9	31	88.8	74	70		
15.	572	74.0	0.875	30.2	32	94.7	122	85		
Residuum		97.2	0.922	22.0						

Carbon residue of residuum: 3.2%

Carbon residue of crude: 0.9%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	12.8	0.681	76.3	
Total gasoline and naphtha	34.0	0.729	62.6	
Kerosine distillate	9.6	0.805	42.3	
Gas oil	15.3	0.836	37.8	Below 50
Nonviscous lubricating distillate	9.8	0.851-0.872	34.8-30.8	50-100
Medium lubricating distillate	5.3	0.872-0.881	30.8-29.1	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	23.2	0.922	22.0	
Distillation loss	2.8			

CRUDE PETROLEUM ANALYSIS

Laboratory Number 842-52

FIELD: Jumping Pound

POOL:

ZONE: Rundle

Well Name: Composite 3 wells: Shell Jumping Pound

Province: Alberta

Location: Well Lsd. Sec. Twp. Rge. W.

7-13-J 7 13 25 5 5th
5-7-I 5 7 25 4 5th
1-26-J 1 26 25 5 5th

Sample From: D.M.T.S.

Interval tested, depth, feet: approx. 9,860

Date Sampled: May 9, 1952

Producing Zone: Rundle

Sampled at: Tank

Geological Age: Mississippian

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.791
Sulphur, percent by weight: 0.13
Saybolt Universal Viscosity:
at 70°F., sec. Less than 32

A.P.I. gravity at 60°F.: 47.4
Pour point, °F.: -55; Cloudpoint °F.: -10
Colour: A.S.T.M. Colour No. 1 1/2
Carbon residue, percent by weight: Less than 0.01 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 760 mm. Hg.
First drop, 38°C. (100°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122		-	-	-	-	-		
2.	75	167	1.4	1.4	0.697	71.5	-	-		
3.	100	212	9.0	10.4	0.737	60.5	29	38.8		
4.	125	257	21.7	32.1	0.765	53.5	24	30.5		
5.	150	302	22.7	54.8	0.784	49.0	35	25.5		
6.	175	347	11.1	65.9	0.793	46.9	32	35.0		
7.	200	392	7.3	73.2	0.800	45.4	30	50.4		
8.	225	437	6.5	79.7	0.807	43.8	27	62.0		
9.	250	482	6.0	85.7	0.820	41.1	28	68.2		
10.	275	527	5.1	90.8	0.836	37.8	31	72.0		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	2.7	93.5	0.859	33.2	38	-	40	20
12.	*225	437	2.7	96.2	0.865	32.1	37	-	46	45
13.	*250	482	1.0	97.2	0.879	29.5				
14.	275	527								
15.	300	572								
Residuum			1.9	99.1						

Carbon residue of still bottoms**: 0.04%

Carbon residue of crude: Less than 0.01 %.

* - Distillation discontinued at 230°C. (446°F.) - Cracking.

** - A second distillation was made, and the aniline point of the fractions and carbon residue of the still bottoms from the atmospheric distillation were determined.

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	10.4	0.732	61.8	
Total gasoline and naphtha	73.2	0.774	51.3	
Kerosine distillate	12.5	0.813	42.6	
Gas oil	11.5	0.852	34.6	
Nonviscous lubricating distillate	-	-	-	50-100
Medium lubricating distillate	-	-	-	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	1.9	-	-	
Distillation loss	0.9			

Remarks: The sample as received contained 2.1% by vol. water and sediment (by centrifuge) and 14 lb. salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 387-58

FIELD: Keystone

POOL:

ZONE: Cardium

Well Name: Keystone 14-14
 Location: Lsd. 14, Sec. 14, Twp. 48, Rge. 4, W 5
 Interval tested, depth, feet: 4269-4279
 Producing Zone: Cardium
 Geological Age: Upper Cretaceous

Province: Alberta
 Sample From: D.E.M.R.
 Date Sampled: October 30, 1958
 Sampled at: After Separator

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.852
 Sulphur, percent by weight: 0.38
 Saybolt Universal Viscosity:
 at 100°F., sec. 50

A.P.I. gravity at 60°F.: 34.6
 Pour point, °F.: +10
 Colour: Brownish Black
 Carbon residue, percent by weight: 2.4
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 753 mm. Hg.
 First drop, 32°C. (90°F.)

Fraction No.	Cut at °F.	Sum Per Cent	Specific Gravity 60/60°F.	Degrees A.P.I. 60 F.	Correlation Index	Aniline Point, °C.	Visc. S.U. 100°F.	Cloud Test, °F.	Refractive Index @ 20°C.	Dispersion (N _F -N _C) 10 ⁴
1.	122	1.7	0.660	82.9						
2.	167	4.1	0.683	75.7	14					
3.	212	7.8	0.716	66.1	19	55.3				
4.	257	12.2	0.740	59.7	22	54.7				
5.	302	16.9	0.763	54.0	25	54.0				
6.	347	20.8	0.779	50.1	26	55.5				
7.	392	24.3	0.794	46.7	27	58.0				
8.	437	28.1	0.807	43.8	27	61.5				
9.	482	32.9	0.820	41.1	28	65.0				
10.	527	39.0	0.831	38.8	29	69.2				

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	392	42.5	0.844	36.2	31	73.8	39	+25		
12.	437	47.8	0.851	34.8	30	76.5	44	+45		
13.	482	53.0	0.861	32.8	32	79.4	55	+65		
14.	527	57.7	0.875	30.2	35	83.0	71	+80		
15.	572	64.0	0.884	28.6	37	88.5	124	+95		
Residuum		96.7	0.955	16.7						

Carbon residue of residuum: 6.6%

Carbon residue of crude: 2.4%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	7.8	0.694	72.4	
Total gasoline and naphtha	24.3	0.744	58.7	
Kerosine distillate	8.6	0.814	42.3	
Gas oil	15.2	0.842	36.6	Below 50
Nonviscous lubricating distillate	10.3	0.857-0.880	33.6-29.3	50-100
Medium lubricating distillate	5.6	0.880-0.889	29.3-27.7	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	32.7	0.955	16.7	
Distillation loss	3.3			

OIL FIELD DATA

Field and Pool: Leduc Woodbend D-2A (Nisku) Pool

Location: Twp(s) 49, 50 & 51, Rge(s) 25 & 26, W 4 M

DISCOVERY DETAILS

Method: Reflection Seismograph and Subsurface Geology

Well: Name: Imperial Leduc No. 1 in 5-22-50-26 W 4 M

Completed: February 13, 1947

Initial Potential: 976 BOPD on 24 hour test open flow. Completed open hole. Deepest unit penetrated was Nisku at final total depth of 5066'.

GEOLOGY

Producing Zone(s): Nisku formation, Winterburn group of Upper Devonian.

Trap Type: Stratigraphic - through facies change in biostrome.
Structural - through differential compaction of underlying shales over reef bioherm.

Lithology: Grey, brown, buff, fine to coarsely crystalline dolomite. Porosity, crystalline and vuggy, fractures. Anhydrite infilling.

Maximum Reservoir Thickness: 160'

Regional Setting: Located southwest of Edmonton in Ireton shale basin at the western edge of Cooking Lake shelf along the Rimbey-Morinville reef trend.

Deepest Formation Penetrated: Precambrian - Imperial Leduc No. 530 in 8-17-50-26 W 4 M

DEVELOPMENT DATA

Total Wells: Completed Oil: 412. Gas: 1. Dry and Abandoned: 52

Producing Oil: 411. Suspended Oil: 105

Injection or Disposal: Water: 11. Gas: 4

Well Spacing: 40 Acres

Logging Practice: Electric log survey to total depth.

Completion Practice: Open hole with 7" casing set to Nisku top or cased through with casing set in Ireton. Acid treatment usual.

RESERVOIR DATA

Type of Drive: Solution Gas Drive

Estimated Oil in Place: 214,000,000 S.T.bbls

Estimated Recoverable Oil: 107,000,000 S.T.bbls

Oil Zone Thickness: Maximum: 119'. Average: 71'

Gas Zone Thickness: Maximum: 50'

Porosity: 2.46%. Permeability: Fair

Area: 29,720 Acres

Oil Characteristics: Gravity: 39 °API. Sulphur: Trace to 1.0%

Pour Point: -35°F. Initial Solution GOR: 580 cu ft/bbl

Base: Paraffin

Pressure Maintenance or Secondary Recovery: 6 Water and 4 gas injection wells

PRODUCTION

MPR: N/A. 7,500 BOPD

Economic Allowance: Operating: 28 BOPD/Well

Market Outlet: Imperial Pipeline Ltd. to Edmonton terminal

Bibliographical References: Layer, D.B. and members of staff Imperial Oil Ltd., 1949, Leduc Oil Field, a Devonian Coral Reef Discovery; Bull. Amer. Assoc. Petrol. Geol., Vol. 33 No. 4, pp. 572-602.

McCourt, G.B., Recent Developments in Leduc Woodbend Field; A.S.P.G., Journal, Vol. I, No. 11, Nov. 53, pp. 3-5.

For further references see Bibliography of Alberta Geology, p. 228.

Oil Fields of Alberta, A.S.P.G., 1960.

SECONDARY RECOVERY

RESERVOIR DATA

- 1) Field: Leduc Woodbend
- 2) Pool: D-2A
- 3) Province: Alberta
- 4) Location: Twp(s) 50 & 51, Rge(s) 26, W 4 M
- 5) Operator: Imperial Oil
- 6) Project: Project No. 1 Unit
- 7) Reservoir: Upper Devonian
- 8) Discovery Date: February 1947
- 9) Date Injection Began: October 1960
- 10) Main Structural Feature: Combination Structural and Stratigraphic
- 11) Gas Cap: Originally: Yes. At Present: Yes
- 12) Time Required for Initial Results: 3 months
- 13) Initial Results on Production: BHP: 972. GOR: 1,350. WOR: 0.09
- 14) Main Drive in Primary Production: Solution Gas
- 15) Productive Area (acres) of Reservoir: 20,662. Of Project: 14,000
Affected by Injection: 14,000
- 16) Average Depth to Top of Pay (feet): 5,047
- 17) Average Effective Thickness (feet): 56.0
- 18) Average Porosity %: 3.4
- 19) Average Horizontal Permeability (millidarcys): 60
- 20) Connate Water (% of pore space): 25
- 21) Viscosity at Initial Reservoir Conditions (centipoises): 0.85
- 22) API Gravity: 38
- 23) Solution Gas/Oil Ratio at Saturation Pressure (cu ft/bbl): 600
- 24) Bubble Point Pressure (psi): 1,770
- 25) Original Pressure (psi): 1,770
- 26) Reservoir Pressure at Start of Injection (psi): 972
- 27) Latest Reservoir Pressure: 898 psi (August 1965)

- 28) Injection Fluid: Gas, Salt Water; Fresh Water
- 29) Injection Fluid Source: Formation, North Sask. River
- 30) System: Open
- 31) Fluid Treatment before Injection: Filtration, Chlorination
- 32) Injection Pattern: Irregular
- 33) Structural Position Injection Wells: Below WOC, Gas Cap
- 34) Distance Injection Wells to Producers (feet): 660 to nearest; 13,200 to farthest
- 35) Number of Injection Wells at Start: 4 Water and 3 gas
- 36) Number of Injection Wells at Present: 7 Water and 3 Gas (August 1965)
- 37) Average Daily Injection Rate per Injection Well at Start: 997 bbls
- 38) Average Total Daily Injection Rate at Present: 17,010 bbls and 10,153 Mcf.
(April 1965)
- 39) Average Injection Pressure at Start (psi): N/A
- 40) Average Injection Pressure at Present (psi): Water 400 (April 1965)
- 41) Number of Producing Wells in Project Area at Start: 356
- 42) Number of Producing Wells in Project Area at Present: 253 (April 1965)
- 43) Average Production Rate in Project Area at Start (bbls/day): 12,736
- 44) Average Production Rate in Project Area at Present: 6,934 (June 1965)
- 45) Original Oil in Place in Project Area (bbls): 205,000,000
- 46) Original Oil Saturation (% of pore space): 75
- 47) Primary Recovery from Project Area when Injection Started (bbls): App. 43 million
- 48) Oil Saturation at Start of Project (% of pore space): 67
- 49) Oil Production from Project Area from Start of Injection to Now (bbls): 16,121,058
(April 1965)
- 50) Total Volume of Injected Fluids at Present: Water: 26,165,185 bbls
Gas: 304,586 Mcf. (April 1965)
- 51) Estimated Primary Ultimate Recovery from Project Area (bbls): 71,000,000
- 52) Estimated Increase in Ultimate Recovery from Project Area (bbls): 21,250,000
- 53) Well Spacing: 40 Acres
- 54) Oil Volume Factor (initial reservoir barrels per Stock-Tank barrel): 1.333
- 55) Remarks: Gas Saturation: 8% of Pore Vol.

OIL FIELD DATA

Field and Pool: Leduc Woodbend D-3A (Leduc) Pool

Location: Twp(s) 49, 50 & 51, Rge(s) 25 & 26, W 4 M

DISCOVERY DETAILS

Method: Reflection Seismograph

Well: Name: Imperial Leduc No. 2 in 1-16-50-26 W 4 M

Completed: May 20, 1947 at total depth of 5423' in Leduc fm.

Perforated: 5382'-5394' and acidized with 250 gallons

Treatment: Acidized with 250 gallons

Initial Potential: 1056 BOPD on 24-hour test with GOR 478 cu ft/bbl

GEOLOGY

Producing Zone(s): Leduc formation, Woodbend group of Upper Devonian

Other Shows: Wabamun group (oil and gas). Nisku, Ellerslie, Viking

Trap Type: Stratigraphic--reef bioherm surrounded by shale

Lithology: Dolomite, grey buff brown, medium crystalline, crystalline and vuggy porosity, fractures

Maximum Reservoir Thickness: 1000'

Regional Setting: Located southwest of Edmonton in Ireton shale basin at western edge of Cooking Lake shelf along the Rimbey-Morinville reef trend.

Deepest Formation Penetrated: Precambrian--Imp. Leduc 530 in 8-17-50-26 W 4 M

DEVELOPMENT DATA

Total Wells: Completed Oil: 535. Gas: Nil. Dry and Abandoned: 58

Producing Oil: 491. Suspended Oil: 44

Injection or Disposal: Water: 5. Gas: 1

Well Spacing: 40 Acres

Logging Practice: First run electric log to 35 feet above Ireton, second run to total depth

Completion Practice: 10 3/4" surface casing set at 300'. 7" casing 35' above reservoir, 5 1/2" liner to total depth. Perforate, possible acidization.

RESERVOIR DATA

Type of Drive: Comb. gas cap and water drive

Estimated Oil in Place: 294,000,000 S.T.bbls (414 bbls/acre-foot)

Estimated Recoverable Oil: 202,000,000 S.T.bbls (284 bbls/acre-foot)

Oil Zone Thickness: Maximum: 38'. Average: 36.2

Gas Zone Thickness: Maximum: 208'. Average: 57'

Porosity: 8%. Permeability: Excellent (k_h : 1000 + md. k_v : 5-100 md)

Area: 19,640 Acres

Oil Characteristics: Gravity: 39 °API. Sulphur: Trace

Initial Solution GOR: 508 cu ft/bbl

Base: Paraffin

Pressure Maintenance or Secondary Recovery: One water injection and one gas injection well have provided pressure maintenance.

PRODUCTION

MPR: N/A. BOPD (pool): 14,000

Economic Allowance: Operating: 28 BOPD/well

Market Outlet: Imperial Pipeline Limited to Edmonton terminal.

Bibliographical References: Layer, D.B. and members of staff Imperial Oil Ltd., 1949, Leduc Oil Field, a Devonian Coral Reef Discovery; Bull. Amer. Assoc. Petrol. Geol., Vol. 33, No. 4, pp. 572-602.

McCourt, G.B., Recent Developments in Leduc Woodbend Field; A.S.P.G., Journal, Vol. I, No. 11, Nov. 53, pp. 3-5.

Horsefield, R., Performance of the Leduc D-3 reservoir; Jour. Pet. Tech., Feb., 1959, p. 21.

For further references see Bibliography of Alberta Geology, p. 228.

SECONDARY RECOVERY

RESERVOIR DATA

- 1) Field: Leduc Woodbend
- 2) Pool: D-3A
- 3) Province: Alberta
- 4) Location: Twp(s) 49, 50 51, Rge(s) 25, 26, W 4 M
- 5) Operator: Imperial Oil
- 6) Project: Project No. 1 Unit
- 7) Reservoir: Upper Devonian
- 8) Discovery Date: May 1947
- 9) Date Injection Began: October 1960. Although approval Order No. 364 called for water injection on or before October 1, 1960, in actual fact the water injection project has functioned since July 1955. (All data given assume injection starting date of October 1960)
- 10) Main Structural Feature: Reef, Stratigraphic Trap, Bioherm Reef
- 11) Gas Cap: Originally: Yes. At Present: Yes
- 12) Time required for Initial Results: Immediate Response
- 13) Initial Results on Production: 1,674 BHP, 508 GOR
- 14) Main Drive in Primary Production: Gas Cap, Water Drive
- 15) Productive Area (acres) of Reservoir: 21,477. Of Project: 19,940
Affected by Injection: 17,920
- 16) Average Depth to Top of Pay (feet): 5,280.85
- 17) Average Effective Thickness (feet): 34.5
- 18) Average Porosity %: 8
- 19) Average Horizontal Permeability (millidarcys): 1000
- 20) Connate Water (% of pore space): 14
- 21) Viscosity at Initial Reservoir Conditions (centipoises): 0.63
- 22) API Gravity: 41
- 23) Solution Gas/Oil Ratio at Saturation Pressure (cu ft/bbl): 480
- 24) Bubble Point Pressure (psi): 1,895
- 25) Original Pressure (psi): 1,894
- 26) Reservoir Pressure at Start of Injection (psi): 1,674

- 27) Latest Reservoir Pressure: 1,678 psi (August 1965)
- 28) Injection Fluid: Gas, Salt Water, Fresh Water
- 29) Injection Fluid Source: Formation (gas), North Sask. River (water)
- 30) System: Closed
- 31) Fluid Treatment before Injection: No Treatment Required for D-3
- 32) Injection Pattern: Irregular
- 33) Structural Position Injection Wells: Below WOC, Gas Cap
- 34) Distance Injection Wells to Producers: 700 ft. to nearest and 26,400 ft to farthest
- 35) Number of Injection Wells at Start: 1 Water and 1 Gas
- 36) Number of Injection Wells at Present: 1 Water and 1 Gas (August 1965)
- 37) Average Daily Injection Rate per Injection Well at Start: No gas at this time.
Water: 10,388 bbls /day
- 38) Average Daily Injection Rate per Injection Well at Present (bbls or Mcf):
Water: 9,034, Gas: 8,509
(August 1965)
- 39) Average Injection Pressure at Start (psi): Vacuum Injection
- 40) Average Injection Pressure at Present (psig): 200 (June 1964)
- 41) Number of Producing Wells in Project Area at Start: 448
- 42) Number of Producing Wells in Project Area at Present: 126 (August 1965)
- 43) Average Production Rate in Project Area at Start: 16,743 STB/day
- 44) Average Production Rate in Project Area at Present: 13,887 (August 1965)
- 45) Original Oil in Place in Project Area (bbls): 295,000,000
- 46) Original Oil Saturation (% of pore space): 86
- 47) Primary Recovery from Project Area when Injection Started (bbls): 111,500,000
(Estimate)
- 48) Oil Saturation at Start of Project (% of pore space): 82
- 49) Oil Production from Project Area from Start of Injection to now: 32,564,173 STB
(August 1965)
- 50) Total Volume of Injected Fluids at Present (bbls): 53,457,735
- 51) Estimated Primary Ultimate Recovery from Project Area (bbls): 162,250,000
- 52) Estimated Increase in Ultimate Recovery from Project Area (bbls): 29,500,000
- 53) Well Spacing: 40 Acres
- 54) Oil Volume Factor (initial reservoir barrels per Stock-Tank barrel): 1.459
- 55) Remarks: Gas Saturation = 4% of Pore Vol.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 7005

FIELD: Leduc-Woodbend

POOL:

ZONE: Nisku (D-2)

Well Name: Imperial Leduc No. 1
 Location: Lsd. 5, Sec. 22, Twp. 50, Rge. 26, W 4
 Interval tested, depth, feet: 5024-5066
 Producing Zone: Nisku (D-2)
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: Imperial Oil Ltd.
 Date Sampled: October 21, 1947
 Sampled at: Separator

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.825
 Sulphur, percent by weight: 0.42
 Saybolt Universal Viscosity:
 at 70°F., sec. 40
 at 100°F., sec. 37

A.P.I. gravity at 60°F.: 40.0
 Pour point, °F.: -10
 Colour: Dark Green
 Carbon residue, percent by weight: 1.5
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 760 mm. Hg.
 First drop, 25°C. (77°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	2.9	2.9	0.645	87.9	-			
2.	75	167	3.4	6.3	0.677	77.5	11			
3.	100	212	5.4	11.7	0.716	66.1	19			
4.	125	257	6.9	18.6	0.745	58.4	24			
5.	150	302	6.3	24.9	0.764	53.7	26			
6.	175	347	5.3	30.2	0.781	49.7	27			
7.	200	392	5.2	35.4	0.797	46.0	28			
8.	225	437	5.0	40.4	0.812	42.8	30			
9.	250	482	5.0	45.4	0.825	40.0	31			
10.	275	527	5.9	51.3	0.837	37.6	32			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	4.2	55.5	0.850	35.0	34		40	10
12.	225	437	5.2	60.7	0.858	33.4	34		47	35
13.	250	482	5.9	66.6	0.871	31.0	37		62	55
14.	275	527	4.8	71.4	0.885	28.4	40		99	75
15.	330	572	5.3	76.7	0.894	26.8	41		195	90
Residuum			20.2	96.9	0.938	19.4				

Carbon residue of residuum: 7.5%

Carbon residue of crude: 1.5%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	11.7	0.687	74.5	
Total gasoline and naphtha	35.4	0.742	59.2	
Kerosine distillate	10.0	0.818	41.5	
Gas oil	13.9	0.846	35.8	
Nonviscous lubricating distillate	9.7	0.861-0.885	32.8-28.4	50-100
Medium lubricating distillate	5.3	0.885-0.895	28.4-26.6	100-200
Viscous lubricating distillate	2.4	0.895-0.899	26.6-25.9	Above 200
Residuum	20.2	0.938	19.4	
Distillation loss	3.1			

Remarks: The sample as received contained no water (A.S.T.M.)

CRUDE PETROLEUM ANALYSIS

Laboratory Number 8589

FIELD: Leduc-Woodbend

POOL:

ZONE: Leduc (D-3)

Well Name: Composite sample 5 wells: Home Anglo Woodbend
No. 5, 6, 12, 14 & 17

Province: Alberta

Location: All of the south half of Sec. 4, Twp. 51,
Rge. 26, W 4

Sample From: D.M.T.S.

Interval tested, depth, feet: Range 5200-5300

Producing Zone: Leduc (D-3)

Date Sampled: June 29, 1950

Geological Age: Upper Devonian

Sampled at: Tank

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.828
Sulphur, percent by weight: 0.36
Saybolt Universal Viscosity:
at 70°F., sec. 41
at 100°F., sec. 38

A.P.I. gravity at 60°F.: 39.4
Pour point, °F.: -15
Colour: Brownish Green
Carbon residue, percent by weight: 1.5
(Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 765 mm. Hg.
First drop, 24°C. (75°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	2.6	2.6	0.650	86.2	-			
2.	75	167	3.0	5.6	0.674	78.4	9			
3.	100	212	5.2	10.8	0.716	66.1	19			
4.	125	257	6.6	17.4	0.744	58.7	24			
5.	150	302	6.3	23.7	0.763	54.0	25			
6.	175	347	5.5	29.2	0.783	49.2	28			
7.	200	392	5.3	34.5	0.797	46.0	28			
8.	225	437	5.0	39.5	0.812	42.8	30			
9.	250	482	4.7	44.2	0.823	40.4	30			
10.	275	527	6.6	50.8	0.837	37.6	32			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	5.4	56.2	0.852	34.6	35		38	10
12.	225	437	4.9	61.1	0.861	32.8	35		46	30
13.	250	482	5.2	66.3	0.875	30.2	38		59	55
14.	275	527	2.8	69.1	0.883	28.8	39		81	75
15.	300	572	6.7	75.8	0.893	27.0	41		132	90
Residuum			22.6	98.4	0.929	20.8				

Carbon residue of residuum: 6.6%

Carbon residue of crude: 1.5%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	10.8	0.688	74.2	
Total gasoline and naphtha	34.5	0.744	58.7	
Kerosine distillate	9.7	0.817	41.7	
Gas oil	16.0	0.848	35.4	
Nonviscous lubricating distillate	9.2	0.865-0.887	32.1-28.0	50-100
Medium lubricating distillate	6.4	0.887-0.900	28.0-25.7	100-200
Viscous lubricating distillate	nil			Above 200
Residuum	22.6	0.929	20.8	
Distillation loss	1.6			

Remarks: The sample as received contained 0.3% by vol. water and sediment (by centrifuge).

CRUDE PETROLEUM ANALYSIS

Laboratory Number 8590

FIELD: Leduc-Woodbend

POOL:

ZONE: Leduc (D-3)

Well Name: Imperial Leduc No. 244
 Location: Lsd. 3, Sec. 32, Twp. 50, Rge. 26, W 4
 Interval tested, depth, feet: 5252-5324
 Producing Zone: Leduc (D-3)
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: June 29, 1950
 Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.833
 Sulphur, percent by weight: 0.34
 Saybolt Universal Viscosity:
 at 70°F., sec. 44
 at 100°F., sec. 39
 A.P.I. gravity at 60°F.: 38.4
 Pour point, °F.: 0
 Colour: Dark Green
 Carbon residue, percent by weight: 1.2
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 755 mm. Hg.
 First drop, 24°C. (75°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	1.6	1.6	0.667	80.6	-			
2.	75	167	2.4	4.0	0.685	75.1	15			
3.	100	212	5.1	9.1	0.723	64.2	23			
4.	125	257	7.4	16.5	0.752	56.7	27			
5.	150	302	6.1	22.6	0.770	52.3	28			
6.	175	347	6.0	28.6	0.791	47.4	32			
7.	200	392	4.9	33.5	0.806	44.1	32			
8.	225	437	5.1	38.6	0.820	41.1	33			
9.	250	482	5.5	44.1	0.832	38.6	34			
10.	275	527	6.1	50.2	0.844	36.2	35			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	6.4	56.6	0.860	33.0	38		38	5
12.	225	437	5.0	61.6	0.869	31.3	39		47	35
13.	250	482	5.1	66.7	0.883	28.8	42		60	55
14.	275	527	4.5	71.2	0.892	27.1	43		83	70
15.	300	572	5.5	76.7	0.902	25.4	45		147	85
Residuum			21.2	97.9	0.936	19.7				

Carbon residue of residuum: 5.8%

Carbon residue of crude: 1.2%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	9.1	0.703	69.8	
Total gasoline and naphtha	33.5	0.757	55.4	
Kerosine distillate	5.1	0.820	41.1	
Gas oil	21.6	0.850	35.0	
Nonviscous lubricating distillate	11.1	0.872-0.895	30.8-26.6	50-100
Medium lubricating distillate	5.4	0.895-0.908	26.6-24.3	100-200
Viscous lubricating distillate	nil			Above 200
Residuum	21.2	0.936	19.7	
Distillation loss	2.1			

Remarks: The sample as received contained 0.3% by vol. water and sediment (by centrifuge).

CRUDE PETROLEUM ANALYSIS

Laboratory Number 347-53

FIELD: Leduc-Woodbend

POOL:

ZONE: Nisku (D-2)

Well Name: Imperial Ireton No. 1
Location: Lsd. 4; Sec. 10; Twp. 49; Rge. 26; W 4
Interval tested, depth, feet: 5385-5396
Producing Zone: Nisku (D-2)
Geological Age: Upper Devonian

Province: Alberta
Sample From: Imperial Oil Ltd.
Date Sampled: Sept. 25, 1949
Sampled at: Separator

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.858
Sulphur, percent by weight: 0.25
Saybolt Universal Viscosity:
at 100°F., sec. 43

A.P.I. gravity at 60°F.: 33.4
Pour point, °F.: 25
Colour: Greenish Black

Remarks: The sample as received contained 0.5% by vol. water and sediment (by centrifuge) and 500 lb. salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 241-56

FIELD: Leduc-Woodbend

POOL:

ZONE: Basal Quartz Ss.

Well Name: Texaco South Calmar No. 9
 Location: Lsd. 1, Sec. 24, Twp. 49, Rge. 27, W 4
 Interval tested, depth, feet: 4540-4578
 Producing Zone: Basal Quartz Ss.
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: June 20, 1956
 Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.877
 Sulphur, percent by weight: 1.38
 Saybolt Universal Viscosity:
 at 100°F., sec. 49

A.P.I. gravity at 60°F.: 29.8
 Pour point, °F.: -15
 Colour: Brownish Black
 Carbon residue, percent by weight: 4.3
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 761 mm. Hg.
 First drop, 52°C. (126°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167	1.7	1.7	0.685	75.1	-			
3.	100	212	4.7	6.4	0.711	67.5	17	51.6		
4.	125	257	4.9	11.3	0.740	59.7	22	47.1		
5.	150	302	4.7	16.0	0.763	54.0	25	42.0		
6.	175	347	4.6	20.6	0.780	49.9	26	45.1		
7.	200	392	4.4	25.0	0.796	46.3	28	48.1		
8.	225	437	4.3	29.3	0.809	43.4	28	53.4		
9.	250	482	5.3	34.6	0.827	39.6	31	57.0		
10.	275	527	6.8	41.4	0.846	35.8	36	60.8		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	4.0	45.4	0.865	32.1	41	62.4	38	10
12.	225	437	6.2	51.6	0.878	29.7	43	65.8	46	30
13.	250	482	5.7	57.3	0.894	26.7	47	68.7	58	50
14.	275	527	5.1	62.4	0.906	24.7	50	71.0	88	65
15.	300	572	5.5	67.9	0.917	22.8	52	74.6	155	80
Residuum			30.7	98.6	0.999	10.1				

Carbon residue of residuum: 12.3%

Carbon residue of crude: 4.3%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	6.4	0.704	69.5	
Total gasoline and naphtha	25.0	0.752	56.7	
Kerosine distillate	4.3	0.809	43.4	
Gas oil	21.2	0.852	34.6	
Nonviscous lubricating distillate	10.3	0.883-0.908	28.8-24.3	50-100
Medium lubricating distillate	7.1	0.908-0.923	24.3-21.8	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	30.7	0.999	10.1	
Distillation loss	1.4			

Remarks: The sample as received contained 27 lb. of salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 1538-51

FIELD: Leduc-Woodbend

POOL:

ZONE: Nisku (D-2)

Well Name: Composite 3 wells: Imperial Leduc Nos. 143A,
212 & 234

Province: Alberta

Location: Lsd. 6, 4 & 5, Sec. 7, Twp. 50, Rge. 26, W 4

Sample From: D.M.T.S.

Interval tested, depth, feet: 5134-5200

Producing Zone: Nisku (D-2)

Date Sampled: Oct. 15, 1951

Geological Age: Upper Devonian

Sampled at: Tank

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.819
Sulphur, percent by weight: 0.22
Saybolt Universal Viscosity:
at 100°F., sec. 39

A.P.I. gravity at 60°F.: 41.3
Pour point, °F.: 20
Colour: Dark Green
Carbon residue, percent by weight: 1.4
(Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 758 mm. Hg.
First drop, 26°C. (79°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	2.8	2.8	0.656	84.2	-	-		
2.	75	167	3.3	6.1	0.677	77.5	11	56.3		
3.	100	212	5.1	11.2	0.713	67.0	18	53.0		
4.	125	257	6.8	18.0	0.741	59.5	22	50.6		
5.	150	302	6.2	24.2	0.761	54.4	24	50.5		
6.	175	347	5.9	30.1	0.779	50.1	26	51.1		
7.	200	392	5.0	35.1	0.794	46.7	27	53.7		
8.	225	437	5.0	40.1	0.809	43.4	28	58.5		
9.	250	482	5.1	45.2	0.821	40.9	29	63.4		
10.	275	527	6.1	51.3	0.833	38.4	30	67.7		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	5.2	56.5	0.849	35.2	33	71.3	40	10
12.	225	437	4.8	61.3	0.858	33.4	34	76.2	46	30
13.	250	482	5.0	66.3	0.870	31.1	36	80.1	57	50
14.	275	527	4.7	71.0	0.882	28.9	39	84.0	85	70
15.	300	572	4.8	75.8	0.891	27.3	40	88.8	155	90
Residuum			20.2	96.0	0.946	18.1				

Carbon residue of residuum: 6.0%

Carbon residue of crude: 1.4%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	11.2	0.688	74.2	
Total gasoline and naphtha	35.1	0.742	59.2	
Kerosine distillate	10.1	0.815	42.1	
Gas oil	15.5	0.845	36.0	
Nonviscous lubricating distillate	9.0	0.862-0.884	32.7-28.6	50-100
Medium lubricating distillate	6.1	0.884-0.895	28.6-26.6	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	20.2	0.946	18.1	
Distillation loss	4.0			

Remarks: The sample as received contained no water (A.S.T.M.) and no salt (as NaCl) per 1000 bbl.

OIL FIELD DATA

Field and Pool: Lloydminster Sparky Sand (Alberta)

Location: Twp(s) 49, 50 & 51, Rge(s) 1, 2 & 3, W 4 M

DISCOVERY DETAILS

Method: Random Drilling

Well: Name: Lloydminster Royalties No. 1 (SW 4 - 36 - 49 - 1 W 4)

Completed: November 10, 1938

Perforated: Open Hole 1925'-1929'

Treatment: Probably Bailing in Open Hole

Initial Potential: Unknown; produced only 858 bbls of about 14 °API gravity

GEOLOGY

Producing Zone(s): Sparky and underlying GP sand of Mannville formation

Other Shows: Colony sand, Lloydminster sand

Trap Type: Stratigraphic

Lithology: Clean, sub-rounded, unconsolidated, fine sand

Maximum Reservoir Thickness: 61'

Regional Setting: Centre of Western Canada sedimentary basin

Deepest Formation Penetrated: Elk Point

DEVELOPMENT DATA

Total Wells: Completed Oil: 531. Gas: 27. Dry and Abandoned: 100

Producing Oil: 210. Suspended Oil: 16

Injection or Disposal: Water: 17. Gas: 3 (suspended)

Well Spacing: Was 10 & 20 Acres, now 40 Acres. Pattern: SE 10 Acres in each Lsd

Logging Practice: Electrical

Completion Practice: Case through and gun perforate

RESERVOIR DATA

Type of Drive: Solution Gas and Water

Estimated Oil in Place: 435,000,000 S.T.bbls (1,760 bbls/acre-foot)

Estimated Recoverable Oil: 27,000,000 S.T.bbls (109 bbls/acre-foot)

Oil Zone Thickness: Maximum: 30'. Average: 7 1/2'

Gas Zone Thickness: Maximum: 15'

Porosity: 32%. Permeability: 1000 md

Area: 33,000 Acres

Oil Characteristics: Gravity: 16.2 °API. Sulphur: 3.2%

Pour Point: 10. Initial Solution GOR: 60

Pressure Maintenance or Secondary Recovery: Presently Experimental.

PRODUCTION

MPR: 25 BOPD

Economic Allowance: Present: 25. Operating: 25

Market Outlet (pipeline): Local and Husky Lloydminster - Hardisty Line.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 755

FIELD: Lloydminster

POOL:

ZONE: Sparky

Well Name: Lloydminster Royalties No. 1
Location: Lsd. 4, Sec. 36, Twp. 49, Rge. 1, W 4

Province: Alberta
Sample From: Saskatchewan Dept.
of Natural Resources

Interval tested, depth, feet: 1922-1929

Producing Zone: Sparky

Geological Age: Lower Cretaceous

Date Sampled: January 28, 1939

Sampled at: Well

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.985
Sulphur, percent by weight: 3.92
Saybolt Furol Viscosity:
at 122°F., sec. 475

A.P.I. gravity at 60°F.: 12.2
Pour point, °F.: 35
Colour: Black
Carbon residue, percent by weight: 11.7
(Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 774 mm. Hg.
First drop, 190°C. (374°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167								
3.	100	212								
4.	125	257								
5.	150	302								
6.	175	347								
7.	200	392	0.4	0.4)						
8.	225	437	1.9	2.3)	0.848	35.4				
9.	250	482	3.3	5.6	0.857	33.6	46			
10.	275	527	6.9	12.5	0.867	31.7	47			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	3.4	15.9	0.886	28.2	51		41	
12.	225	437	4.9	20.8	0.897	26.3	52		51	
13.	250	482	5.6	26.4	0.912	23.7	56		75	
14.	275	527	6.7	33.1	0.927	21.1	60		137	
15.	300	572	12.6	45.7	0.939	19.2	63		294	-5
Residuum			52.4	98.1	1.026	6.4				

Carbon residue of residuum: 22.4%

Carbon residue of crude: 11.7%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline				
Total gasoline and naphtha				
Kerosine distillate				
Gas oil	18.0	0.869	31.3	
Nonviscous lubricating distillate	8.1	0.896-0.918	26.4-22.6	50-100
Medium lubricating distillate	7.4	0.918-0.932	22.6-20.3	100-200
Viscous lubricating distillate	12.2	0.932-0.947	20.3-17.9	Above 200
Residuum	52.4	1.026	6.4	
Distillation loss	1.9			

Remarks: The sample as received contained 4.2% by vol. water and sediment (by centrifuge).

CRUDE PETROLEUM ANALYSIS

Laboratory Number 1430

FIELD: Lloydminster

POOL:

ZONE: Sparky

Well Name: Shaw No. 2
 Location: Lsd. 10, Sec. 25, Twp. 49, Rge. 1, W 4
 Interval tested, depth, feet: 1750-1756
 Producing Zone: Sparky
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: Sask. Dept. of
 Natural Resources
 Date Sampled: September 1939
 Sampled at: Well

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.969
 Sulphur, percent by weight: 3.1
 Saybolt Furol Viscosity:
 at 122°F., sec. 144

A.P.I. gravity at 60°F.: 14.5
 Pour point, °F.: 10
 Colour: Black
 Carbon residue, percent by weight: 9.1
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 751 mm. Hg.

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167								
3.	100	212								
4.	125	257								
5.	150	302	0.2	0.2)						
6.	175	347	0.1	0.3)						
7.	200	392	1.0	1.3)	0.830	39.0	-			
8.	225	437	3.0	4.3	0.842	36.6	44			
9.	250	482	4.7	9.0	0.854	34.2	44			
10.	275	527	6.2	15.2	0.869	31.3	47			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	4.7	19.9	0.883	28.8	49		40	-25
12.	225	437	6.2	26.1	0.901	25.6	54		52	-10
13.	250	482	5.4	31.5	0.917	22.8	58		78	5
14.	275	527	7.3	38.8	0.930	20.7	61		141	15
15.	300	572	8.8	47.6	0.940	19.0	63		301	30
Residuum			51.4	99.0	1.011	8.5				

Carbon residue of residuum: 17.7%

Carbon residue of crude: 9.1%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline				
Total gasoline and naphtha				
Kerosine distillate				
Gas oil	22.2	0.866	31.9	
Nonviscous lubricating distillate	8.8	0.898-0.921	26.1-22.1	50-100
Medium lubricating distillate	7.0	0.921-0.934	22.1-20.0	100-200
Viscous lubricating distillate	9.6	0.934-0.946	20.0-18.1	Above 200
Residuum	51.4	1.011	8.5	
Distillation loss	1.0			

Remarks: The sample as received contained 32% by vol. water and sediment (by centrifuge).

CRUDE PETROLEUM ANALYSIS

Laboratory Number 1463

FIELD: Lloydminster

POOL:

ZONE: Sparky

Well Name: Shaw No. 2

Location: Lsd. 10, Sec. 25, Twp. 49, Rge. 1, W 4

Interval tested, depth, feet: 1750-1756

Producing Zone: Sparky

Geological Age: Lower Cretaceous

Province: Alberta

Sample From: Bureau of Geology
& Topography, Dept.
of Mines &
Resources, Ottawa

Date Sampled: Sept. 29, 1939

Sampled at: Outside Pit

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.976

Sulphur, percent by weight: 3.05

Saybolt Furol Viscosity:

at 122°F., sec. 176

A.P.I. gravity at 60°F.: 13.5

Pour point, °F.: 10

Colour: Black

Carbon residue, percent by weight: 10.1
(Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 752 mm. Hg.

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167								
3.	100	212								
4.	125	257								
5.	150	302	0.2	0.2)						
6.	175	347	0.2	0.4)						
7.	200	392	0.3	0.7)						
8.	225	437	1.1	1.8)	0.836	37.8	-			
9.	250	482	3.0	4.8	0.849	35.2	37			
10.	275	527	7.5	12.3	0.867	31.7	46			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	5.3	17.6	0.887	28.0	51		42	-
12.	225	437	6.3	23.9	0.901	25.6	54		53	-
13.	250	482	6.8	30.7	0.917	22.8	58		83	-5
14.	275	527	6.5	37.2	0.932	20.3	62		159	10
15.	300	*572	8.6	45.8	0.938	19.4	62		238	20
Residuum			53.1	98.9	1.019	7.4				

Carbon residue of residuum: 19.1%

Carbon residue of crude: 10.1%

* - Distillation discontinued at 290°C. on account of cracking.

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline				
Total gasoline and naphtha				
Kerosine distillate				
Gas oil	19.3	0.869	31.3	
Nonviscous lubricating distillate	9.4	0.897-0.920	26.3-22.3	50-100
Medium lubricating distillate	9.1	0.920-0.935	22.3-19.8	100-200
Viscous lubricating distillate	8.0	0.935-0.941	19.8-18.9	Above 200
Residuum	53.1	1.019	7.4	
Distillation loss	1.1			

Remarks: The sample as received contained 16% by vol. water.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 1464

FIELD: Lloydminster

POOL:

ZONE: Sparky

Well Name: Lloydminster Royalties No. 1
 Location: Lsd. 4, Sec. 36, Twp. 49, Rge. 1, W 4
 Interval tested, depth, feet: 1922-1929
 Producing Zone: Sparky
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: Bureau of Geology
 & Topography, Dept.
 of Mines & Resources
 Date Sampled: Sept. 29, 1939
 Sampled at: Well

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.983
 Sulphur, percent by weight: 3.95
 Saybolt Furol Viscosity:
 at 122°F., sec. 510

A.P.I. gravity at 60°F.: 12.5
 Pour point, °F.: 30
 Colour: Black
 Carbon residue, percent by weight: 11.8
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 762 mm. Hg.

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167								
3.	100	212								
4.	125	257								
5.	150	302								
6.	175	347	0.2	0.2)						
7.	200	392	0.4	0.6)	0.844	36.2	-			
8.	225	437	1.4	2.0	0.848	35.4	47			
9.	250	482	2.3	4.3	0.864	32.3	49			
10.	275	527	6.9	11.2	0.874	30.4	49			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	3.0	14.2	0.893	27.0	54		42	-20
12.	225	437	4.8	19.0	0.904	25.0	55		53	0
13.	250	482	5.7	24.7	0.919	22.5	59		78	10
14.	275	527	7.1	31.8	0.934	20.0	63		153	30
15.	300	*572	8.0	39.8	0.942	18.7	64		255	45
Residuum			59.1	98.9	1.027	6.3				

Carbon residue of residuum: 20.0%

Carbon residue of crude: 11.8%

* - Distillation discontinued at 290°C. on account of cracking.

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline				
Total gasoline and naphtha				
Kerosine distillate				
Gas oil	15.4	0.875	30.2	
Nonviscous lubricating distillate	8.4	0.900-0.923	25.7-21.8	50-100
Medium lubricating distillate	7.8	0.923-0.938	21.8-19.4	100-200
Viscous lubricating distillate	8.2	0.938-0.947	19.4-17.9	Above 200
Residuum	59.1	1.027	6.3	
Distillation loss	1.1			

Remarks: The sample as received contained 3.4% by vol. water and sediment (by centrifuge).

OIL FIELD DATA

Field and Pool: Malmo Field, D-3 Pool

Location: Twp 44, Rge 22, W 4 M

DISCOVERY DETAILS

Method: Seismic Reflection Survey, **Subsurface** Geology

Well: Name: Scurry Exploration Malmo No. 1

Completed: February 5, 1952

Perforated: 5262-5264; 5270-5282

Treatment: 500 Gals Acid

Initial Potential: Flowed 3528 BOPD through 14/64" choke, with a
GOR of 596 cu ft/bbl

GEOLOGY

Producing Zone(s): D-3 Leduc formation, Woodbend group of Upper Devonian

Other Shows: Drill stem tests indicate commercial gas production from the
Viking formation throughout most of the field.

Trap Type: Stratigraphic - reef bioherm overlain by impermeable limy shales

Lithology: Light grey to buff, fine to medium crystalline dolomite with vuggy
and fine inter-crystalline porosity.

Maximum Reservoir Thickness: 800 feet

Regional Setting: Located along the Malmo - New Norway - Duhamel reef trend,
striking northeast off the Bashaw reef complex.

Deepest Formation Penetrated: Leduc formation

DEVELOPMENT DATA

Total Wells: Completed Oil: 14. Gas: Nil. Dry and Abandoned: Nil

Producing Oil: 13

Injection or Disposal: Water: 1. Gas: Nil

Well Spacing: 40 Acres

Logging Practice: Radioactivity log and/or Electrical log from surface to total depth. Micro-Caliper through the Cretaceous.

Completion Practice: 300' or 600' **surface** casing, 7" casing set in Ireton shale and 5" liner set through and perforated, or 5" casing set into the producing zone and completed open hole.

RESERVOIR DATA

Type of Drive: Combination gas cap expansion and bottom water drive in all pools.

Estimated Oil in Place: 9,530,000 S.T.bbls (348 bbls/acre-foot)

Estimated Recoverable Oil: 4,760,000 S.T.bbls (174 bbls/acre-foot)

Oil Zone Thickness: Maximum: 73 feet. Average: 49 feet

Gas Zone Thickness: Maximum: 66 feet

Porosity: 6.7%. Permeability: 225 md

Area: 530 Acres

Oil Characteristics: Gravity: 40 °API. Sulphur: 0.5%

Pour Point: +20. Initial Solution GOR: 1,925 cu ft/bbl

Base: Paraffin

Pressure Maintenance or Secondary Recovery: Water Disposal into Aquifer

PRODUCTION

MPR: 28 BOPD

Economic Allowance: Present: 28. Operating: 28

Market Outlet (pipeline): Britamoil

Bibliographical References: ¹Oil Fields of Alberta, Reference Vol. (1960), by the Alberta Society of Petroleum Geologists.

²Alberta Oil and Gas Conservation Board. MPR and Reserve Reports.

OIL FIELD DATA

Field and Pool: Malmo Field D-2

Location: Twp 44, Rge 22, W 4 M

DISCOVERY DETAILS

Method: Seismic Reflection Survey, Subsurface Geology

Well: Name: Scurry Exploration Malmo No. 2

Completed: March 25, 1952

Perforated: 5094-5104; 5108-5114

Treatment: 500 Gals Acid

Initial Potential: Flowed 779 BOPD 16/64 choke. GOR: 439 cu ft/bbl.

GEOLOGY

Producing Zone(s): Nisku formation, Woodbend group of Upper Devonian

Other Shows: Drill stem tests indicate commercial gas production from the Viking formation throughout most of the field.

Trap Type: Structural - formed through differential compaction of underlying Ireton Shales.

Lithology: Buff, brown, fine to medium crystalline, dolomite, porosity predominantly vugs, intergranular, intercrystalline and fractures.

Maximum Reservoir Thickness: 137 feet

Regional Setting: Located along the Malmo - New Norway - Duhamel reef trend, striking northeast off the Bashaw reef complex.

Deepest Formation Penetrated: Leduc formation

DEVELOPMENT DATA

Total Wells: Completed Oil: 27. Gas: Nil. Dry and Abandoned: 9

Producing Oil: 24. Suspended Oil: 3

Injection or Disposal: Water: 1. Gas: Nil

Well Spacing: 40 Acres

Logging Practice: Radioactivity Log and/or Electrical log from surface to total depth.

Completion Practice: 300' or 600' surface casing, 7" casing in Ireton shale and 5" liner set through and perforated, or 5" casing set in producing zone and completed open hole.

RESERVOIR DATA

Type of Drive: Combination gas cap expansion and bottom water drive in all pools.

Estimated Oil in Place: 16,200,000 S.T.bbls (228 bbls/acre-foot)

Estimated Recoverable Oil: 697,000 S.T.bbls (98 bbls/acre-foot)

Oil Zone Thickness: Maximum: 98 feet. Average: 76 feet

Gas Zone Thickness: Maximum: 107 feet

Porosity: 4.7%. Permeability: 135 md

Area: 1,376 Acres

Oil Characteristics: Gravity: 38 °API. Sulphur: 0.6%

Pour Point: +10

Pressure Maintenance or Secondary Recovery: Water Disposal into Aquifer.

PRODUCTION

MPR: 28 BOPD

Economic Allowance: Present: 28. Operating: 28

Market Outlet (pipeline): Britamoil

Bibliographical References: ¹Oil Fields of Alberta, reference Vol. (1960), by Alberta Society of Petroleum Geologists.

²Alberta Oil and Gas Conservation Board. MPR and Reserve Reports.

OIL FIELD DATA

Field and Pool: Malmo Field, Blairmore Pool

Location: Twp 44, Rge 22, W 4 M

DISCOVERY DETAILS

Method: Seismic Reflection Survey, Subsurface Geology

Well: Name: Sun McCarty Coleman Poplar 6A-14

Completed: September 22, 1952

Perforated: Open Hole

Treatment: Nil

Initial Potential: Flowed 240 BOPD through 15/64" choke. GOR: 360 cu ft/bbl.

GEOLOGY

Producing Zone(s): Poplar sand, Ellerslie formation, Mannville Sub-Group of Lower Cretaceous.

Other Shows: Drill stem tests indicate commercial gas production from the Viking formation throughout most of the field.

Trap Type: Structural, formed through differential compaction of underlying Ireton shales.

Lithology: Sandstone, white, salt and pepper fine grained, quartzitic with fair to good porosity.

Maximum Reservoir Thickness: 80'

Regional Setting: Located along the Malmo - New Norway - Duhamel reef trend, striking northeast off the Bashaw reef complex.

Deepest Formation Penetrated: Leduc formation

DEVELOPMENT DATA

Total Wells: Completed Oil: 9. Gas: Nil. Dry and Abandoned: 9

Producing Oil: 7. Suspended Oil: 2

Injection or Disposal: Water: Nil. Gas: Nil

Well Spacing: 40 Acres

Logging Practice: Radioactivity log and/or Electrical log from surface to total depth. Micro - Caliper through the Cretaceous.

Completion Practice: 300' or 600' surface casing, 7" casing set in Ireton shale and 5" liner set through and perforated, or 5" casing set into the producing zone and completed open hole.

RESERVOIR DATA

Type of Drive: Combination gas cap expansion and bottom water drive.

Estimated Oil in Place: 5,240,000 S.T.bbls (1190 bbls/acre-foot)

Estimated Recoverable Oil: 1,050,000 S.T.bbls (238 bbls/acre-foot)

Oil Zone Thickness: Maximum: 24'. Average: 13.8'

Gas Zone Thickness: Maximum: 39'

Porosity: 25.2%. Permeability: 500 md

Area: 316 Acres

Oil Characteristics: Gravity: 39 °API. Sulphur: 0.5%

Pour Point: +35. Initial Solution GOR: 1410 cf/b

Base: Paraffin

Pressure Maintenance or Secondary Recovery: Nil

PRODUCTION

MPR: 27 BOPD

Economic Allowance: Present: 27. Operating: 27

Market Outlet (pipeline): Britamoil to Edmonton Terminal

Bibliographical References: (1) Oil Fields of Alberta, reference Vol. (1960), by Alberta Society of Petroleum Geologists.

(2) Alberta Oil & Gas Conservation Board, MPR & Reserve Reports.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 1497-53

FIELD: Malmo

POOL:

ZONE: Camrose (D-2)

Well Name: Scurry Explorers New Norway No. 1
 Location: Lsd. 16, Sec. 10, Twp. 44, Rge. 22, W 4
 Interval tested, depth, feet: 5264-5282
 Producing Zone: Camrose (D-2)
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: June 29, 1953
 Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.828
 Sulphur, percent by weight: 0.49
 Saybolt Universal Viscosity:
 at 100°F., sec. 36

A.P.I. gravity at 60°F.: 39.4
 Pour point, °F.: 30
 Colour: Dark Green
 Carbon residue, percent by weight: 1.7
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 755 mm. Hg.
 First drop, 31°C. (88°F.)

Frac- tion No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Corre- lation Index	Aniline Point, °C.	Visc. S.U. 100°F.	Cloud Test, °F.	Refractive Index 20°F.
	°C.	°F.									
1.	50	122	-	-	-	-	-	-	-	-	-
2.	75	167	5.7	5.7	0.669	80.0	-	-	-	-	1.3774
3.	100	212	5.3	11.0	0.714	66.7	18	52.4	-	-	1.3985
4.	125	257	8.1	19.1	0.742	59.2	23	50.8	-	-	1.4119
5.	150	302	6.7	25.8	0.762	54.2	25	51.8	-	-	1.4238
6.	175	347	6.1	31.9	0.779	50.1	26	53.2	-	-	1.4330
7.	200	392	5.2	37.1	0.793	46.9	26	56.2	-	-	1.4415
8.	225	437	5.3	42.4	0.808	43.6	28	60.6	-	-	1.4491
9.	250	482	5.1	47.5	0.820	41.1	28	64.8	-	-	1.4556
10.	275	527	7.0	54.5	0.836	37.8	31	69.0	-	-	1.4647

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	5.2	59.7	0.852	34.6	35	71.8	40	20	1.4730
12.	225	437	5.7	65.4	0.863	32.5	36	77.6	49	45	1.4798
13.	250	482	4.0	69.4	0.874	30.4	38	80.4	63	65	1.4862
14.	275	527	4.5	73.9	0.885	28.4	40	84.3	88	85	1.4948
15.	300	572	6.0	79.9	0.898	26.1	43	89.2	166	100	1.5038
Resi- dium			18.1	98.0	0.957	16.4					

Carbon residue of residuum: 7.3%

Carbon residue of crude: 1.7%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	11.0	0.691	73.3	
Total gasoline and naphtha	37.1	0.744	58.7	
Kerosine distillate	10.4	0.814	42.3	
Gas oil	15.4	0.846	35.8	
Nonviscous lubricating distillate	9.6	0.864-0.887	32.3-28.0	50-100
Medium lubricating distillate	6.7	0.887-0.904	28.0-25.0	100-200
Viscous lubricating distillate	0.7	0.904-0.905	25.0-24.8	Above 200
Residuum	18.1	0.957	16.4	
Distillation loss	2.0			

Remarks: The sample as received contained 1.0% by vol. water and sediment (by centrifuge) and 15 lb. salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 1498-53

FIELD: Malmo

POOL:

ZONE: Leduc (D-3)

Well Name: Scurry Explorers Malmo No. 3
 Location: Lsd. 15, Sec. 10, Twp. 44, Rge. 22, W 4
 Interval tested, depth, feet: 5210-5217
 Producing Zone: Leduc (D-3)
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: June 29, 1953
 Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.847
 Sulphur, percent by weight: 0.33
 Saybolt Universal Viscosity:
 at 100°F., sec. 40

A.P.I. gravity at 60°F.: 35.6
 Pour point, °F.: 0
 Colour: Dark Green
 Carbon residue, percent by weight: 2.1
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 756 mm. Hg.
 First drop, 27°C. (81°F.)

Frac- tion No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Corre- lation Index	Aniline Point, °C.	Visc. S.U. 100°F.	Cloud Test, °F.	Refractive Index 20°C.
	°C.	°F.									
1.	50	122	3.3	3.3	0.661	82.6	-	55.0			1.3809
2.	75	167	2.5	5.8	0.687	74.5	16	53.8			1.3867
3.	100	212	6.0	11.8	0.733	61.5	27	48.8			1.4091
4.	125	257	6.9	18.7	0.754	56.2	28	48.0			1.4182
5.	150	302	5.0	23.7	0.769	52.5	28	50.0			1.4276
6.	175	347	3.9	27.6	0.785	48.8	29	51.6			1.4357
7.	200	392	4.1	31.7	0.802	44.9	31	54.2			1.4442
8.	225	437	4.6	36.3	0.812	42.8	30	57.8			1.4527
9.	250	482	4.9	41.2	0.827	39.6	31	62.4			1.4590
10.	275	527	6.1	47.3	0.831	38.8	29	67.2			1.4658

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	3.8	51.1	0.850	35.0	34	70.4	40	10	1.4726
12.	225	437	5.5	56.6	0.857	33.6	33	75.2	46	35	1.4757
13.	250	482	5.6	62.2	0.870	31.1	36	78.0	58	55	1.4831
14.	275	527	4.9	67.1	0.883	28.8	39	81.4	82	75	1.4900
15.	300	572	6.7	73.8	0.892	27.1	40	84.4	160	90	1.5010
Resi- dium			25.2	99.0	0.967	14.8					

Carbon residue of residuum: 7.4%

Carbon residue of crude: 2.1%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	11.8	0.703	69.8	
Total gasoline and naphtha	31.7	0.747	57.9	
Kerosine distillate	4.6	0.812	42.8	
Gas oil	19.5	0.840	37.0	
Nonviscous lubricating distillate	10.2	0.862-0.885	32.6-28.4	50-100
Medium lubricating distillate	7.4	0.885-0.897	28.4-26.2	100-200
Viscous lubricating distillate	0.4	0.897-0.897	26.2-26.2	Above 200
Residuum	25.2	0.967	14.8	
Distillation loss	1.0			

Remarks: The sample as received contained 0.40% by vol. water and sediment (by centrifuge) and 118 lb. salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 205-56

FIELD: Malmo

POOL:

ZONE: Basal Quartz Ss.

Well Name: Sun McCarty & Coleman Poplar No. 5A-14
 Location: Lsd. 5, Sec. 14, Twp. 44, Rge. 22, W 4
 Interval tested, depth, feet: 4710-4725
 Producing Zone: Basal Quartz Ss.
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: May 31, 1956
 Sampled at: Before Separator

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.831
 Sulphur, percent by weight: 0.61
 Saybolt Universal Viscosity:
 at 100°F., sec. 37

A.P.I. gravity at 60°F.: 38.8
 Pour point, °F.: 35
 Colour: Brownish Green
 Carbon residue, percent by weight: 1.5
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 764 mm. Hg.
 First drop, 42°C. (108°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167	2.5	2.5	0.699	70.9	-			
3.	100	212	6.0	8.5	0.716	66.1	19	52.5		
4.	125	257	7.1	15.6	0.743	58.9	23	50.0		
5.	150	302	7.2	22.8	0.761	54.4	24	50.2		
6.	175	347	7.0	29.8	0.778	50.4	25	52.1		
7.	200	392	4.6	34.4	0.791	47.4	25	55.0		
8.	225	437	5.3	39.7	0.807	43.8	27	58.1		
9.	250	482	5.5	45.2	0.818	41.5	27	62.5		
10.	275	527	6.7	51.9	0.832	38.6	29	66.9		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	4.1	56.0	0.849	35.2	33	69.2	38	10
12.	225	437	5.3	61.3	0.858	33.4	34	74.1	43	30
13.	250	482	5.3	66.6	0.870	31.1	36	78.0	54	50
14.	275	527	5.0	71.6	0.882	28.9	39	82.1	75	65
15.	300	572	5.5	77.1	0.892	27.1	40	87.0	130	85
Residuum			20.4	97.5	0.954	16.8				

Carbon residue of residuum: 6.2%

Carbon residue of crude: 1.5%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	8.5	0.711	67.5	
Total gasoline and naphtha	34.4	0.752	56.7	
Kerosine distillate	10.8	0.813	42.6	
Gas oil	16.7	0.846	35.8	
Nonviscous lubricating distillate	9.6	0.865-0.886	32.1-28.2	50-100
Medium lubricating distillate	5.6	0.886-0.897	28.2-26.2	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	20.4	0.954	16.8	
Distillation loss	2.5			

Remarks: The sample as received contained no salt (as NaCl) per 1000 bbl.

BITUMEN ANALYSIS

Laboratory Number 7921

FIELD: McMurray

POOL:

ZONE: McMurray

Bitumen from International Bitumens Ltd.
Experimental Separation Plant, Bitumont
Location: Athabasca River near McMurray, Alta.

Province: Alberta

Sample From: Mines Branch

Producing Zone: McMurray
Geological Age: Lower Cretaceous

Date Sampled: October 1930

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 1.035
Sulphur, percent by weight: 5.26.
Saybolt Furol Viscosity:
at 130°F., sec. 2080
at 150°F., sec. 849

A.P.I. gravity at 60°F.: 5.2
Pour point, °F.: -
Colour: Black
Carbon residue, percent by weight: 14.1
(Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 757 mm. Hg.
First drop, 78°C. (172°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167								
3.	100	212								
4.	125	257								
5.	150	302								
6.	175	347								
7.	200	392	0.2	0.2	0.823	40.4	-			
8.	225	437	1.1	1.3	0.847	35.6	46			
9.	250	482	3.7	5.0	0.865	32.1	50			
10.	275	527	13.8	18.8	0.878	29.7	51			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	1.5	20.3	0.876	30.0	46	36	Below 0
12.	225	437	4.8	25.1	0.931	20.5	68	62	Below 0
13.	250	482	7.7	32.8	0.951	17.3	74	125	Below 0
14.	275	527	2.6	35.4	0.961	15.7	76	251	Below 0
15.	300	572	-	-	-	-	-	-	-
Residuum			63.1	98.5	-	-	-	-	-

Carbon residue of residuum: 22.3%

Carbon residue of crude: 14.1%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	-	-	-	
Total gasoline and naphtha	0.2	0.823	40.4	
Kerosine distillate	-	-	-	
Gas oil	21.0	0.875	30.2	
Nonviscous lubricating distillate	5.3	0.905-0.943	24.9-18.6	50-100
Medium lubricating distillate	5.5	0.943-0.957	18.6-16.4	100-200
Viscous lubricating distillate	3.4	0.957-0.964	16.4-15.3	Above 200
Residuum	63.1	-	-	
Distillation loss	1.5			

Remarks: The sample as received contained 0.1% by vol. water (A.S.T.M.)

BITUMEN ANALYSIS

Laboratory Number 7295

FIELD: McMurray

POOL:

ZONE: McMurray

Bitumen from Research Council of Alberta
 Clearwater separation plant, McMurray
 Location: Athabaska river near McMurray, Alta.
 Interval tested, depth, feet: -
 Producing Zone: McMurray
 Geological Age: Lower Cretaceous

Province: Alberta

Sample From: Research Council of Alberta

Date Sampled: July 1930

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 1.030
 Sulphur, percent by weight: 5.84
 Saybolt Furol Viscosity:
 at 210°F., sec. 820
 at 250°F., sec. 236

A.P.I. gravity at 60°F.: 5.9
 Pour point, °F.: -
 Colour: Black
 Carbon residue, percent by weight: 19.6
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 762 mm. Hg.

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167								
3.	100	212								
4.	125	257								
5.	150	302	0.9	0.9)						
6.	175	347	0.8	1.7)	0.809	43.4	-			
7.	200	392	1.1	2.8	0.823	40.4	41			
8.	225	437	1.1	3.9	0.848	35.4	47			
9.	250	482	4.1	8.0	0.866	31.9	50			
10.	275	527	11.9	19.9	0.867	31.7	46			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	1.6	21.5	0.878	29.7	47	36	Below 0
12.	225	437	3.2	24.7	0.929	20.8	67	66	" 0
13.	250	482	6.1	30.8	0.947	17.9	73	118	" 0
14.	275	527	6.4	37.2	0.958	16.2	75	178	" 0
15.	300	572	10.6	47.8	0.972	14.1	78	508	" 0
Residuum			49.5	97.3					

Carbon residue of residuum: 39.6%

Carbon residue of crude: 19.6%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	-	-	-	
Total gasoline and naphtha	2.8	0.818	41.5	
Kerosine distillate	-	-	-	
Gas oil	19.0	0.867	31.7	
Nonviscous lubricating distillate	4.3	0.901-0.940	25.6-19.0	50-100
Medium lubricating distillate	8.5	0.940-0.959	19.0-16.1	100-200
Viscous lubricating distillate	13.2	0.959-0.981	16.1-12.7	Above 200
Residuum	49.5	-	-	
Distillation loss	2.7			

Remarks: The sample as received contained 0.5% by vol. water (A.S.T.M.)

BITUMEN ANALYSIS

Laboratory Number 3355

FIELD: McMurray

POOL:

ZONE: McMurray

Bitumen from research Council of Alberta
Experimental plant, Edmonton

Province: Alberta

Location: Athabasca river near McMurray, Alta.

Sample From: Research Council
of Alberta

Interval tested, depth, feet: -

Date Sampled: October 1925

Producing Zone: McMurray

Geological Age: Lower Cretaceous

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 1.061

A.P.I. gravity at 60°F.: 1.9

Sulphur, percent by weight: 5.20

Pour point, °F.: -

Saybolt Furol Viscosity:

Colour: Black

at 210°F., sec. 995

Carbon residue, percent by weight: 18.8
(Conradson)

at 250°F., sec. 282

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 760 mm. Hg.
First drop, 64°C. (147°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. °60 F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167								
3.	100	212	0.7	0.7	0.764	53.7	-			
4.	125	257	0.2	0.9	0.770	52.3	36			
5.	150	302	0.9	1.8	0.797	46.0	41			
6.	175	347	0.7	2.5	0.802	44.9	37			
7.	200	392	1.0	3.5	0.821	40.9	40			
8.	225	437	1.2	4.7	0.843	36.4	44			
9.	250	482	2.5	7.2	0.864	32.3	49			
10.	275	527	13.9	21.1	0.868	31.5	46			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	1.4	22.5	0.878	29.7	47		36	Below 0
12.	225	437	2.1	24.6	0.923	21.8	64		53	" 0
13.	250	482	4.3	28.9	0.946	18.1	72		92	" 0
14.	275	527	8.7	37.6	0.961	15.7	76		212	-
15.	300	572	6.9	44.5	0.974	13.8	79		533	-
Residuum			51.3	95.8						

Carbon residue of residuum: 36.7%

Carbon residue of crude: 18.8%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	0.7	0.764	53.7	
Total gasoline and naphtha	3.5	0.794	46.7	
Kerosine distillate	-	-	-	
Gas oil	19.8	0.868	31.5	
Nonviscous lubricating distillate	3.9	0.915-0.947	23.1-17.9	50-100
Medium lubricating distillate	5.4	0.947-0.959	17.9-16.1	100-200
Viscous lubricating distillate	11.9	0.959-0.980	16.1-12.9	Above 200
Residuum	51.3	-	-	
Distillation loss	4.2			

CRUDE PETROLEUM ANALYSIS

Laboratory Number 355-53

FIELD: Morinville

POOL:

ZONE: Viking

Well Name: Imperial Excelsior No. 10-30V

Location: Lsd. 10, Sec. 30, Twp. 56, Rge. 24, W 4

Interval tested, depth, feet: 2818-2833

Producing Zone: Viking

Geological Age: Lower Cretaceous

Province: Alberta

Sample From: Imperial Oil Ltd.

Date Sampled: February 5, 1952

Sampled at: Well

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.862

Sulphur, percent by weight: 0.45

Saybolt Universal Viscosity:

at 70°F., sec. 92

at 100°F., sec. 55

A.P.I. gravity at 60°F.: 32.6

Pour point, °F.: 50

Colour: Dark Green

Carbon residue, percent by weight: 3.2
(Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 757 mm. Hg.
First drop, 40°C. (104°F.)

Frac- tion No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Corre- lation Index	Aniline Point, °C.	Visc. S.U. 100°F.	Cloud Test, °F.	Refractive Index 20°C.
	°C.	°F.									
1.	50	122	-	-	-	-	-	-	-	-	-
2.	75	167	3.3	3.3	0.684	75.4	-	61.0	-	-	1.3868
3.	100	212	2.0	5.3	0.716	66.1	19	-	-	-	1.3999
4.	125	257	4.1	9.4	0.738	60.2	21	58.2	-	-	1.4089
5.	150	302	4.3	13.7	0.754	56.2	21	59.4	-	-	1.4180
6.	175	347	4.1	17.8	0.772	51.8	23	60.2	-	-	1.4278
7.	200	392	4.3	22.1	0.788	48.1	24	61.8	-	-	1.4368
8.	225	437	4.9	27.0	0.803	44.7	25	65.0	-	-	1.4440
9.	250	482	4.8	31.8	0.816	41.9	26	68.4	-	-	1.4509
10.	275	527	7.0	38.8	0.829	39.2	28	73.2	-	-	1.4580

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	3.0	41.8	0.842	36.6	30	75.4	39	20	1.4659
12.	225	437	7.1	48.9	0.850	35.0	30	80.2	44	25	1.4699
13.	250	482	4.9	53.8	0.859	33.2	31	83.2	55	55	1.4760
14.	275	527	6.0	59.8	0.870	31.1	33	86.8	74	70	1.4820
15.	300	572	7.2	67.0	0.882	28.9	36	90.8	123	90	-
Resi- dium			31.9	98.9	0.965	15.1					

Carbon residue of residuum: 8.9%

Carbon residue of crude: 3.2%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	5.3	0.696	71.8	
Total gasoline and naphtha	22.1	0.747	57.9	
Kerosine distillate	9.7	0.809	43.4	
Gas oil	16.9	0.840	37.0	
Nonviscous lubricating distillate	11.6	0.855-0.876	34.0-30.0	50-100
Medium lubricating distillate	6.7	0.876-0.888	30.0-27.8	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	31.9	0.965	15.1	
Distillation loss	1.1			

Remarks: The sample as received contained 1.53% by vol. water and sediment (by centrifuge) and 210 lb. salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 487-57

FIELD: Namao

POOL:

ZONE: Basal Quartz

Well Name: Wagner Matlo Ad Astra No. 4
 Location: Lsd. 11. Sec. 36; Twp. 54, Rge. 25, W 4
 Interval tested, depth, feet: 3543-3663
 Producing Zone: Basal Quartz
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: D.E.M.R.
 Date Sampled: December 24, 1957
 Sampled at: Before Separator

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.884
 Sulphur, percent by weight: 1.26
 Saybolt Universal Viscosity:
 at 70°F., sec. 65
 at 100°F., sec. 51
 A.P.I. gravity at 60°F.: 28.6
 Pour point, °F.: 40
 Colour: Brownish Black
 Carbon residue, percent by weight: 3.7
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 750 mm. Hg.
 First drop, 35°C. (95°F.)

Fraction No.	Cut at °F.	Sum Per Cent	Specific Gravity 60/60°F.	Degrees A.P.I. 60 F.	Correlation Index	Aniline Point, °C.	Visc. S.U. 100°F.	Cloud Test, °F.	Refractive Index @ 20°C.	Dispersion (N _F -N _C) 10 ⁴
1.	122									
2.	167	3.0	0.720	65.0	31	61.8				
3.	212	6.1	0.742	59.2	32	58.0				
4.	257	8.9	0.761	54.4	32	54.2				
5.	302	11.0	0.778	50.4	32	50.1				
6.	347	14.5	0.780	49.9	36	48.1				
7.	392	17.5	0.818	41.5	38	47.0				
8.	437	21.6	0.832	38.6	39	51.0				
9.	482	25.9	0.840	37.0	38	56.1				
10.	527	34.0	0.848	35.4	37	64.5				

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	392	38.4	0.861	32.8	39	69.0	40	10		
12.	437	44.8	0.868	31.5	38	73.0	46	30		
13.	482	50.8	0.880	29.3	41	76.7	57	50		
14.	527	57.4	0.892	27.1	43	81.0	84	65		
15.	572	64.2	0.904	25.0	46	87.0	157	80		
Residuum		96.8	0.976	13.5						

Carbon residue of residuum: 10.3%

Carbon residue of crude: 3.7%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	6.1	0.731	62.1	
Total gasoline and naphtha	17.5	0.766	53.2	
Kerosine distillate	-	-	-	
Gas oil	26.5	0.851	34.8	Below 50
Nonviscous lubricating distillate	11.6	0.873-0.895	30.6-26.6	50-100
Medium lubricating distillate	8.6	0.895-0.909	26.6-24.2	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	32.6	0.976	13.5	
Distillation loss	3.2			

OIL FIELD DATA

Field and Pool: New Norway Field, D-3 Pool

Location: Twp 45, Rge 22, W 4 M

DISCOVERY DETAILS

Method: Seismic Reflection Survey, Subsurface Geology

Well: Name: Sun Orr 2-1

Completed: December 3, 1951

Perforated: 4879-4887

Treatment: None

Initial Potential: Flowed 1128 BOPD with a GOR of 540 cu ft/bbl on a 1/4" choke.

GEOLOGY

Producing Zone(s): D-3 Leduc formation, Woodbend group of upper Devonian.

Other Shows: Drill stem tests indicate possible commercial oil and gas production from the Ellerslie formation, also commercial gas in the Viking formation.

Trap Type: Stratigraphic - reef bioherm overlaid by impermeable limey shales.

Lithology: Light grey to buff, fine to medium crystalline dolomite with vuggy and fine inter-crystalline porosity.

Maximum Reservoir Thickness: 800'

Regional Setting: Located along the Malmo - New Norway - Duhamel reef trench, striking northeast off the Bashaw reef complex.

Deepest Formation Penetrated: Leduc formation

DEVELOPMENT DATA

Total Wells: Completed Oil: 6. Gas: Nil. Dry and Abandoned: 6

Producing Oil: 5. Suspended Oil: 1

Injection or Disposal: Water: Nil. Gas: Nil

Well Spacing: 40 Acres

Logging Practice: Radioactivity log - surface to total depth (4900')
Induction and Mico - Caliper may also be run to (4500') as a
further aid in evaluation of the Cretaceous.

Completion Practice: 300' or 600' surface casing, 7" casing set in Ireton
formation above productive zone, and 5" liner set through
and perforated, or 5 1/2" casing set into the producing zone
and completed open hole.

RESERVOIR DATA

Type of Drive: Combination gas cap expansion and bottom water drive.

Estimated Oil in Place: 2,000,000 S.T.bbls (207 bbls/acre-foot)

Estimated Recoverable Oil: 1,000,000 S.T.bbls (104 bbls/acre-foot)

Oil Zone Thickness: Maximum: 60'. Average: 39.6'

Gas Zone Thickness: Maximum: 47'

Porosity: 4.4%. Permeability: 115 md

Area: 140 Acres

Oil Characteristics: Gravity: 33 °API. Sulphur: 1.0%

Pour Point: +45. Initial Solution GOR: 400 cf/b

Base: Paraffin

Pressure Maintenance or Secondary Recovery: Water disposal into aquifer

PRODUCTION

MPR: 27 BOPD

Economic Allowance: Present: 27. Operating: 27

Market Outlet (pipeline): Britamoil

- Bibliographical References:
- (1) Oil Fields of Alberta, reference Vol. (1960), by Alberta Society of Petroleum Geologists.
 - (2) Alberta Oil & Gas Conservation Board. MPR & Reserve Reports.

OIL FIELD DATA

Field and Pool: New Norway Field, D-2 Pool

Location: Twp 44, Rge 22, W 4 M

DISCOVERY DETAILS

Method: Seismic Reflection Survey, **Subsurface** Geology

Well: Name: Canadian Gulf Holt No. 14-36

Completed: November 17, 1951

Perforated: 4626-4673 w/4 shots per foot

Treatment: None

Initial Potential: Flowed 1308 BOPD on 4-hour test with variable choke.

GEOLOGY

Producing Zone(s): Nisku formation, Winterburn group of Upper Devonian

Other Shows: Drill stem tests indicate possible commercial oil and gas from the Ellerslie formation, also commercial gas in the Viking formation.

Trap Type: Structural, formed through differential compaction of underlying Ireton shale.

Lithology: Buff, brown, fine to medium crystalline, dolomite, porosity predominantly vugs, intergranular, intercrystalline and fractures.

Maximum Reservoir Thickness: 140'

Regional Setting: Located along the Malmo - New Norway - Duhamel reef trend, striking northeast off the Bashaw reef complex.

Deepest Formation Penetrated: Leduc formation

DEVELOPMENT DATA

Total Wells: Completed Oil: 11. Gas: Nil

Producing Oil: 11. Suspended Oil: Nil

Injection or Disposal: Water: Nil. Gas: Nil

Well Spacing: 40 Acres

Logging Practice: Radioactivity log - surface to total depth.
Induction and Micro - Caliper may also be run to 4500'
as a further aid in evaluation of the
Cretaceous.

Completion Practice: 300' or 600' of surface casing, 7" casing set in Ireton
formation and producing zone perforated.

RESERVOIR DATA

Type of Drive: Combination gas cap expansion and bottom water drive

Estimated Oil in Place: 12,000,000 S.T.bbls (454 bbls/acre-foot)

Estimated Recoverable Oil: 7,200,000 S.T.bbls (372 bbls/acre-foot)

Oil Zone Thickness: Maximum: 96'. Average: 62'

Gas Zone Thickness: Maximum: 29'

Porosity: 8.5%. Permeability: 475 md

Area: 414 Acres

Oil Characteristics: Gravity: 40 °API. Sulphur: 0.7%

Pour Point: +35. Initial Solution GOR: 400 cf/b

Base: Paraffin

Pressure Maintenance or Secondary Recovery:

PRODUCTION

MPR: 27 BOPD

Economic Allowance: Present: 27. Operating: 27

Market Outlet (pipeline): Britamoil

Bibliographical References: (1) Oil Fields of Alberta, reference Vol. (1960), by
Alberta Society of Petroleum Geologists.
(2) Alberta Oil & Gas Conservation Board. MPR & Reserve
Reports.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 207-56

FIELD: New Norway

POOL:

ZONE: Leduc (D-3)

Well Name: Sun Orr No. 8-1
 Location: Lsd. 8, Sec. 1, Twp. 45, Rge. 22, W 4
 Interval tested, depth, feet: 4886-4889
 Producing Zone: Leduc (D-3)
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: June 1, 1956
 Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.862
 Sulphur, percent by weight: 1.17
 Saybolt Universal Viscosity:
 at 100°F., sec. 46
 A.P.I. gravity at 60°F.: 32.6
 Pour point, °F.: 40
 Colour: Greenish Black
 Carbon residue, percent by weight: 2.8
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 760 mm. Hg.
 First drop, 45°C. (113°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167	2.0	2.0	0.674	78.4	-			
3.	100	212	4.0	6.0	0.717	65.8	20	49.2		
4.	125	257	5.5	11.5	0.748	57.7	26	47.0		
5.	150	302	4.6	16.1	0.764	53.7	26	47.3		
6.	175	347	3.9	20.0	0.782	49.4	27	48.8		
7.	200	392	4.0	24.0	0.798	45.8	29	50.6		
8.	225	437	4.3	28.3	0.814	42.3	31	53.2		
9.	250	482	4.9	33.2	0.828	39.4	32	56.2		
10.	275	527	5.3	38.5	0.842	36.6	34	60.0		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	4.0	42.5	0.857	33.6	37	63.9	39	10
12.	225	437	6.0	48.5	0.866	31.9	37	67.8	45	30
13.	250	482	4.6	53.1	0.878	29.7	40	69.4	56	55
14.	275	527	5.3	58.4	0.891	27.3	43	72.4	79	75
15.	300	572	6.6	65.0	0.905	24.8	46	76.0	148	80
Residuum			30.6	95.6	0.966	15.0				

Carbon residue of residuum: 8.3%

Carbon residue of crude: 2.8%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	6.0	0.703	69.8	
Total gasoline and naphtha	24.0	0.754	56.2	
Kerosine distillate	4.3	0.814	42.3	
Gas oil	19.6	0.848	35.4	
Nonviscous lubricating distillate	9.7	0.871-0.895	31.0-26.6	50-100
Medium lubricating distillate	7.4	0.895-0.913	26.6-23.5	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	30.6	0.966	15.0	
Distillation loss	4.4			

Remarks: The sample as received contained 46 lb. salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 208-56

FIELD: New Norway

POOL:

ZONE: Camrose (D-2)

Well Name: Sun Orr No. 1A-1
 Location: Lsd. 1, Sec. 1, Twp. 45, Rge. 22, W 4
 Interval tested, depth, feet: 4610-4622
 Producing Zone: Camrose (D-2)
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: June 1, 1956
 Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.827
 Sulphur, percent by weight: 0.52
 Saybolt Universal Viscosity:
 at 100°F., sec. 36
 A.P.I. gravity at 60°F.: 39.6
 Four point, °F.: 35
 Colour: Brownish Black
 Carbon residue, percent by weight: 1.5
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 761 mm. Hg.
 First drop, 34°C. (93°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167	4.4	4.4	0.670	79.7	-			
3.	100	212	5.1	9.5	0.710	67.8	17	52.8		
4.	125	257	7.6	17.1	0.738	60.2	21	51.0		
5.	150	302	6.7	23.8	0.758	55.2	23	51.4		
6.	175	347	5.6	29.4	0.776	50.8	24	53.1		
7.	200	392	5.3	34.7	0.789	47.8	24	56.4		
8.	225	437	5.1	39.8	0.804	44.5	26	59.8		
9.	250	482	5.2	45.0	0.817	41.7	27	63.5		
10.	275	527	6.9	51.9	0.829	39.2	28	67.5		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	3.6	55.5	0.847	35.6	32	70.5	38	15
12.	225	437	6.0	61.5	0.856	33.8	33	74.0	43	35
13.	250	482	4.7	66.2	0.869	31.3	36	79.2	54	55
14.	275	527	4.7	70.9	0.880	29.3	38	83.9	74	75
15.	300	572	5.8	76.7	0.890	27.5	39	86.1	124	90
Residuum			19.8	96.5	0.956	16.5				

Carbon residue of residuum: 6.4%

Carbon residue of crude: 1.5%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	9.5	0.691	73.3	
Total gasoline and naphtha	34.7	0.743	58.9	
Kerosine distillate	10.3	0.811	43.0	
Gas oil	16.9	0.843	36.4	
Nonviscous lubricating distillate	9.4	0.864-0.885	32.3-28.4	50-100
Medium lubricating distillate	5.4	0.885-0.895	28.4-26.6	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	19.8	0.956	16.5	
Distillation loss	3.5			

Remarks: The sample as received contained no salt (as NaCl) per 1000 bbl.

OIL FIELD DATA

Field and Pool: Normandville Field, D3'A' & 'B' Pools

Location: Twp. 79, Rge. 22, W 5 M

DISCOVERY DETAILS

Method: Seismic Reflection Survey, **Subsurface** Geology

Well: Name: Colorado et al Normandville 1-16 (originally Imperial Normandville No. 1 in 1-16-79-22, W 5 M).

Completed: October 14, 1949

Perforated: 6730'-6745'

Treatment: 2,000 gallons 15% HCl

Initial Potential: 600 BOPD through 14 1/2/64" choke with a GOR of 380 cu ft/bbl and 6.8% BS & W. Well shut-in April, 1954 when BS & W reached 57%. Cumulative production 89,084 bbls.

Recompleted: June 9, 1956. Squeezed off original perforations.

Perforated: 6696'-6730'

Treatment: 3,500 gallons acid

Initial Potential: 245 BOPD through 10/64" choke with a GOR of 550 cu ft/bbl and 0% BS & W

GEOLOGY

Producing Zone(s): Leduc formation, Woodbend group of Upper Devonian
Wabamun group of Upper Devonian
Debolt formation (gas & oil), Rundle group of Mississippian

Bluesky formation (gas), Ft. St. John group of Lower Cretaceous

Other Shows: Jurassic ss. (27° Oil)

Trap Type: Structural -- stratigraphic; fringe-reef bioherm flanked by impermeable calcareous green shale and cut by normal faults

Lithology: Light brown, medium to coarsely crystalline dolomite

Maximum Reservoir Thickness: 650'

Regional Setting: 30 miles south of Peace River, Alberta, on the northern flank of the Upper Devonian basin which contains the Sturgeon Lake, Virginia Hills, Kaybob and Swan Hills productive reefs.

Deepest Formation Penetrated: Precambrian

DEVELOPMENT DATA

Total Wells: Completed Oil: 7. Gas: Nil. Dry and Abandoned: 3

Producing Oil: 7

Injection or Disposal: Water: Nil. Gas: Nil

Well Spacing: 80 Acres

Logging Practice: Radioactivity log surface to total depth (6800'). ES Induction, Micro-caliper and Sonic logs surface to total depth. Use Gamma Collar log for perforating.

Completion Practice: 600' surface casing, 5 1/2" casing set into production zone and completed open hole or set through productive zone and perforated. Well may or may not be acidized, depending on conditions.

RESERVOIR DATA

Type Of Drive: Bottom Water Drive

Estimated Oil in Place: 7,500,000 bbls

Estimated Recoverable Oil: 4,000,000 bbls

Oil Zone Thickness: Maximum: 169'. Average: 105'

Gas Zone Thickness: None

Porosity: 4%. Permeability: 250 md

Area: 820 Acres

Oil Characteristics: Gravity: 38° API. Sulphur: None. Initial Solution GOR: -
Base: Paraffin

Pressure Maintenance or Secondary Recovery: None

PRODUCTION

MPR: N/A

Economic Allowance: Present: 33 BOPD. Operating: 33 BOPD (est.) (both pools)

Market Outlet: Refinery at Edmonton

Bibliographical References: ASPG Journal "Peace River Symposium Number", March 1958.
Oil Fields of Alberta, ASPG, 1960.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 966-51

FIELD: Normandville

POOL:

ZONE: Dolomite

Well Name: Colorado et al. Normandville No. 1
 Location: Lsd. 1, Sec. 16, Twp. 79, Rge. 22, W 5
 Interval tested, depth, feet: 6734-6760
 Producing Zone: Dolomite
 Geological Age: Devonian

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: July 31, 1951
 Sampled at: Well

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.827
 Sulphur, percent by weight: 0.18
 Saybolt Universal Viscosity:
 at 70°F., sec. 43
 at 100°F., sec. 38
 A.P.I. gravity at 60°F.: 39.6
 Pour point, °F.: -40
 Colour: Dark Green
 Carbon residue, percent by weight: 2.0
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 760 mm. Hg.
 First drop, 24°C. (75°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	2.7	2.7	0.638	90.3	-	-		
2.	75	167	2.8	5.5	0.676	77.8	10	58		
3.	100	212	5.2	10.7	0.715	66.4	19	54		
4.	125	257	7.9	18.6	0.740	59.7	22	53		
5.	150	302	5.7	24.3	0.761	54.4	24	52		
6.	175	347	5.7	30.0	0.779	50.1	26	53		
7.	200	392	4.9	34.9	0.795	46.5	27	55		
8.	225	437	4.4	39.3	0.814	42.3	31	60		
9.	250	482	5.4	44.7	0.822	40.6	29	65		
10.	275	527	5.4	50.1	0.835	38.0	31	69		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	3.7	53.8	0.850	35.0	34	72	40	15
12.	225	437	5.4	59.2	0.856	33.8	33	76	45	35
13.	250	482	5.0	64.2	0.866	31.9	34	80	58	50
14.	275	527	4.9	69.1	0.878	29.7	37	84	86	70
15.	300	572	5.2	74.3	0.890	27.5	39	87	161	95
Residuum			22.9	97.2	0.948	17.8				

Carbon residue of residuum: 8.6%

Carbon residue of crude: 2.0%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	10.7	0.685	75.1	
Total gasoline and naphtha	34.9	0.741	59.5	
Kerosine distillate	9.8	0.818	41.5	
Gas oil	13.7	0.846	35.8	
Nonviscous lubricating distillate	9.2	0.860-0.880	33.0-29.3	50-100
Medium lubricating distillate	6.7	0.880-0.896	29.3-26.4	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	22.9	0.948	17.8	
Distillation loss	2.8			

Remarks: The sample as received contained no water (A.S.T.M.) and 14 lb. salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 2108-52

FIELD: Okotoks

POOL:

ZONE: Wabamun (D-1)

Well Name: Shell Blackwood & Norris No. 1
 Location: Lsd. 10, Sec. 13, Twp. 21, Rge. 29, W 4
 Interval tested, depth, feet: 8670-8755
 Producing Zone: Wabamun (D-1)
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: November 10, 1952
 Sampled at: Tank, after separator

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.853
 Sulphur, percent by weight: 2.29
 Saybolt Universal Viscosity:
 at 70°F., sec. 33

A.P.I. gravity at 60°F.: 34.4
 Pour point, °F.: Below -60
 Colour: Greenish Black
 Carbon residue, percent by weight: 0.4
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 761 mm. Hg.
 First drop, 260°C. (79°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122)								
2.	75	167)	1.1	1.1	0.794	46.7	-			
3.	100	212	2.0	3.1	0.797	46.0	58	0.8		
4.	125	257	9.3	12.4	0.808	43.6	54	6.0		
5.	150	302	17.0	29.4	0.815	42.1	50	13.0		
6.	175	347	13.5	42.9	0.823	40.4	47	22.1		
7.	200	392	12.3	55.2	0.834	38.2	46	36.2		
8.	225	437	13.1	68.3	0.850	35.0	48	43.4		
9.	250	482	9.0	77.3	0.871	31.0	52	46.0		
10.	275	527	10.1	87.4	0.885	28.4	54	51.6		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	3.3	90.7	0.907	24.5	61	54.5	42	10
12.	225	437	3.7	94.4	0.918	22.6	62	58.1	49	30
13.	250	482	1.9	96.3	0.927	21.1	63	61.0	62	45
14.	(1)275	527	2.2	98.5	0.939	19.2	-	-	90	-
15.	300	572	-	-	-	-	-	-	-	-
Residuum			1.5	100.0						

Carbon residue of still bottoms(2): 3.1%

Carbon residue of crude: 0.4%

(1) Distillation discontinued at 260°C. (500°F.).

(2) A second distillation was made and the carbon residue of the still bottoms, from the distillation at atmospheric pressure, was determined.

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	3.1	0.796	46.3	
Total gasoline and naphtha	42.9	0.815	42.1	
Kerosine distillate	-	-	-	
Gas oil	49.9	0.863	32.5	
Nonviscous lubricating distillate	5.3	0.919-0.944	22.5-18.4	50-100
Medium lubricating distillate	0.4	0.944-0.946	18.4-18.1	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	1.5	-	-	
Distillation loss	0.0			

Remarks: The sample as received contained 0.5% by vol. water and sediment (by centrifuge) and 84 lb. salt (as NaCl) per 1000 bbl.

OIL FIELD DATA

Field and Pool: Pembina Cardium

Location: Twp(s) 46, 47, 48, 49, 50, 51, Rge(s) 1 to 12 inclusive, W 5 M

DISCOVERY DETAILS

Method: Drilling

Well: Name: Mobil Oil Seals #1

Completed: June 1, 1953

GEOLOGY

Producing Zone(s): Cardium Formation

Other Shows: Belly River, Glauconite, Mississippian, Basal Quartz

Trap Type: Combination Stratigraphic Lithological

Lithology: Fine to medium sand, shaley

Maximum Reservoir Thickness: 40'

Regional Setting: Blanket Sand Deposit

Deepest Formation Penetrated: Devonian D-3

DEVELOPMENT DATA

Total Wells: Completed Oil: 2953(+). Gas: Nil

Producing Oil: 2606(+)

Injection or Disposal: Water: 106(+). Gas: 42(+)

Well Spacing: 80 & 160 Acres. Pattern: Even Lsd's or NE/Lsd's

Logging Practice: Variable - Mainly Electric logs and Gamma Ray Neutron

Completion Practice: Cased, perforated and often times hydrofraced

RESERVOIR DATA

Type of Drive: Solution Gas

Estimated Oil in Place: 7,690,000,000* S.T.bbls

Estimated Recoverable Oil: 1,790,000,000* S.T.bbls

Oil Zone Thickness: Maximum: 40'

Gas Zone Thickness: Maximum: 0'

Porosity: 10 to 15%. Permeability: 5 to 500 md

Area: 513,890 Acres

Oil Characteristics: Gravity: 39° API. Sulphur: 0%

Initial Solution GOR: under 1000 (variable)

Pressure Maintenance or Secondary Recovery: Waterflood, gas flood, miscible flood

PRODUCTION

Economic Allowance: Present: 28 BOPD. Operating: 28

Market Outlet: Pembina Pipelines

*Reservoir Engineering Digest, Source - Alberta Oil & Gas Conservation Board.

SECONDARY RECOVERY

RESERVOIR DATA

- 1) Field: Pembina
- 2) Pool: Cardium
- 3) Province: Alberta
- 4) Location: Twp. 47, Rge. 7, W 5 M
- 5) Operator: Socony Mobil
- 6) Project: #4 Block 10 Unit
- 7) Reservoir: Cardium Colorado, Upper Cretaceous
- 8) Discovery Date: July 1953
- 9) Date Injection Began: March 1958
- 10) Main Structural Feature: Stratigraphic Trap
- 11) Gas Cap: Originally: No. At Present: No
- 12) Time Required for Initial Results: 7 months
- 13) Initial Results on Production: 1674 BHP. 1564 GOR. 0 WOR
- 14) Main Drive in Primary Production: Solution Gas
- 15) Productive Area (Acres) of Reservoir: 166,240. Of Project: 3,520
Affected by Injection: 3,520
- 16) Average Depth to Top of Pay (feet): 5,062
- 17) Average Effective Thickness(feet): 19.2
- 18) Average Porosity %: 15.9
- 19) Average Horizontal Permeability (millidarcys): 21.3
- 20) Connate Water (% of pore space): 11
- 21) Viscosity at Initial Reservoir Conditions (centipoises): 1.00
- 22) API Gravity: 38°
- 23) Solution Gas/Oil Ratio at Saturation Pressure (cu.ft/bbl): 450
- 24) Bubble Point Pressure (psi): 1,750(pool aver.)-1,586 from Company for Area Block 10
- 25) Original Pressure (psi): 2,740
- 26) Reservoir Pressure at Start of Injection (psi): 1,674 (Average)
- 27) Latest Reservoir Pressure: 1,979 psi (March 1, 1962)
- 28) Injection Fluid: Fresh Water

- 29) Injection Fluid Source: N. Sask. River
- 30) System: Closed
- 31) Fluid Treatment before Injection: Filtration
- 32) Injection Pattern: 5-Spot
- 33) Structural Position Injection Wells: Oil Zone
- 34) Distance Injection Wells to Producers (feet): 2,600
- 35) Number of Injection Wells at Start: 16 (March 31, 1958), 22 (July 31, 1958)
- 36) Number of Injection Wells at Present: 22 (August 1965)
- 37) Average Daily Injection Rate per Injection Well at Start: 200-300 BWPD
- 38) Average Daily Injection Rate per Injection Well at Present (bbls): 121
(March 31, 1965)
- 39) Average Injection Pressure at Start (psi): 900
- 40) Average Injection Pressure at Present (psi): 1,098 (March 31, 1965)
- 41) Number of Producing Wells in Project Area at Start: 22
- 42) Number of Producing Wells in Project Area at Present: 22 (August 1965)
- 43) Average Production Rate in Project Area at Start (bbls/day): 1,739
- 44) Average Production Rate in Project Area at Present: 1,497 (March 31, 1965)
- 45) Original Oil in Place in Project Area (bbls): 60,100,000
- 46) Original Oil Saturation (% of pore space): 89
- 47) Primary Recovery from Project Area when Injection Started (bbls): 2,457,259
- 48) Oil Saturation at Start of Project (% of pore space): 87
- 49) Oil Production from Project Area from Start of Injection to Now (bbls): 4,037,864
(May 31, 1965)
- 50) Total Volume of Injected Fluids at Present (bbls): 7,138,416 (May 31, 1965)
- 51) Estimated Primary Ultimate Recovery from Project Area: 8,307,200 bbls at 2,360 b/acre
- 52) Estimated Increase in Ultimate Recovery from Project Area: 1,478,400 bbls
at 2,780 b/acre
- 53) Well Spacing: 80 Acres
- 54) Oil Volume Factor (initial reservoir barrels per Stock-Tank barrel): 1.25
- 55) Remarks: The company estimated the scheme to be very close to the bubble point when injection commenced.

SECONDARY RECOVERY

RESERVOIR DATA

- 1) Field: Pembina
- 2) Pool: Cardium
- 3) Province: Alberta
- 4) Location: Twp. 47, Rge. 8, W 5 M
- 5) Operator: Pan American
- 6) Project: #5 Unit
- 7) Reservoir: Cardium Colorado, Upper Cretaceous
- 8) Discovery Date: July 1953
- 9) Date Injection Began: April 1956 (Pilot Flood)
- 10) Main Structural Feature: Stratigraphic Trap
- 11) Gas Cap: Originally: No. At Present: No
- 12) Time Required for Initial Results (months): 8-12 mos. (GOR Control on Offsetting Wells)
- 13) Initial Results on Production: 2034 BHP. 1400 GOR. 0 WOR
- 14) Main Drive in Primary Production: Solution Gas
- 15) Productive Area (acres) of Reservoir: 166,240. Of Project: 4,800
Affected by Injection: 4,800
- 16) Average Depth to Top of Pay (feet): 5,268
- 17) Average Effective Thickness (feet): 22.7
- 18) Average Porosity (%): 16.3
- 19) Average Horizontal Permeability (millidarcys): 13.8
- 20) Connate Water (% of pore space): 11
- 21) Viscosity at Initial Reservoir Conditions (centipoises): 0.86
- 22) API Gravity: 38°
- 23) Solution Gas/Oil Ratio at Saturation Pressure (cu ft/bbl): 600
- 24) Bubble Point Pressure (psi): 1,550
- 25) Original Pressure (psi): 2,740
- 26) Reservoir Pressure at Start of Injection (psi): 2,034
- 27) Latest Reservoir Pressure: 1,990 psi (November 1962)
- 28) Injection Fluid: Fresh Water

- 29) Injection Fluid Source: Formation
- 30) System: Closed
- 31) Fluid Treatment before Injection: No Treatment
- 32) Injection Pattern: 5-Spot
- 33) Structural Position Injection Wells: Oil Zone
- 34) Distance Injection Wells to Producers (feet): 1,320
- 35) Number of Injection Wells at Start: 8 (Pilot), 29 when on full PM
- 36) Number of Injection Wells at Present: 29 (August 1965)
- 37) Average Daily Injection Rate per Injection Well at Start: 290 bbls
- 38) Average Daily Injection Rate per Injection Well at Present: 148 bbls
(March 30, 1965)
- 39) Average Injection Pressure at Start: 330 psig
- 40) Average Injection Pressure at Present (psi): 1,598 (May 1965)
- 41) Number of Producing Wells in Project Area at Start: 27 (Reporting Production)
- 42) Number of Producing Wells in Project Area at Present: 32 (September 2, 1965)
- 43) Average Production Rate in Project Area at Start (bbls/day): 1,800
- 44) Average Production Rate in Project Area at Present (bbls/day): 1,050 (June 30, 1965)
- 45) Original Oil in Place in Project Area (bbls): 99,500,000
- 46) Original Oil Saturation (% of pore space): 89
- 47) Primary Recovery from Project Area when Injection Started (bbls): 3,600,000
- 48) Oil Saturation at Start of Project (% of pore space): 84.8
- 49) Oil production from Project Area from Start of Injection to Now (bbls): 5,313,000
(March 31, 1965)
- 50) Total Volume of Injected Fluids at Present (bbls): 13,662,507 (March 31, 1965)
- 51) Estimated Primary Ultimate Recovery from Project Area (bbls): 12,835,500
- 52) Estimated Increase in Ultimate Recovery from Project Area (bbls): 16,000,000
- 53) Well Spacing: 80 Acres
- 54) Oil Volume Factor (initial reservoir barrels per Stock-Tank barrel): 1.25
- 55) Remarks: This scheme commenced as a pilot flood in April 1956 with one injector and by March 1957 had 8 injectors. Full PM commenced February 1958.
N.B. All data are taken at start of full PM.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 158-55

FIELD: Pembina

POOL:

ZONE: Cardium

Well Name: Pan Am - H.B. Pembina Crown "F" No. 4
 Location: Lsd. 8, Sec. 33, Twp. 47, Rge. 8, W 5
 Interval tested, depth, feet: 5137-5273
 Producing Zone: Cardium
 Geological Age: Upper Cretaceous

Province: Alberta
 Sample From: D.M.T.S.

Date Sampled: June 16, 1955
 Sampled at: Tank

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.841
 Sulphur, percent by weight: 0.24
 Saybolt Universal Viscosity:
 at 100°F., sec. 46

A.P.I. gravity at 60°F.: 36.8
 Pour point, °F.: 15
 Colour: Brownish Black
 Carbon residue, percent by weight: 2.1
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 755 mm. Hg.
 First drop, 27°C. (81°F.)

Frac- tion No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Corre- lation Index	Aniline Point, °C.	Visc. S.U. 100°F.	Cloud Test, °F.	Refractive Index 20°C.
	°C.	°F.									
1.	50	122	2.3	2.3	0.660	82.9	-	-			
2.	75	167	2.9	5.2	0.678	77.2	11	-			1.3866
3.	100	212	4.5	9.7	0.715	66.4	19	54.6			1.4057
4.	125	257	5.5	15.2	0.740	59.7	22	52.5			1.4129
5.	150	302	4.7	19.9	0.761	54.4	24	52.8			1.4226
6.	175	347	4.3	24.2	0.777	50.6	25	54.8			1.4318
7.	200	392	3.8	28.0	0.792	47.2	26	57.6			1.4398
8.	225	437	3.9	31.9	0.807	43.8	27	61.4			1.4473
9.	250	482	4.7	36.6	0.823	40.4	30	65.4			1.4549
10.	275	527	6.5	43.1	0.832	38.6	29	69.5			1.4624

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	3.0	46.1	0.846	35.8	32	72.8	39	15	1.4700
12.	225	437	5.5	51.6	0.854	34.2	32	77.1	44	35	1.4734
13.	250	482	4.7	56.3	0.863	32.5	33	82.0	55	55	1.4788
14.	275	527	4.3	60.6	0.872	30.8	34	86.3	72	70	1.4841
15.	300	572	6.5	67.1	0.881	29.1	35	90.2	118	85	1.4937
Resi- dium			30.1	97.2	0.949	17.6					

Carbon residue of residuum: 6.3%

Carbon residue of crude: 2.1%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	9.7	0.691	73.3	
Total gasoline and naphtha	28.0	0.739	60.0	
Kerosine distillate	8.6	0.816	41.9	
Gas oil	12.7	0.840	37.0	
Nonviscous lubricating distillate	12.4	0.855-0.877	34.0-29.8	50-100
Medium lubricating distillate	5.4	0.877-0.886	29.8-28.2	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	30.1	0.949	17.6	
Distillation loss	2.8			

Remarks: The sample as received contained 0.1% by vol. water and sediment (by centrifuge) and 10 lb. salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 159-55

FIELD: Pembina

POOL:

ZONE: Cardium

Well Name: Composite 3 wells: Mobile Oil Sbd. Violet Grove Province: Alberta
 No. 29-14, 31-2 and 32-4

Location: Sec. 29, 31 and 32, Twp. 48, Rge. 7, W 5
 Interval tested, depth, feet: Range 4754-4870

Sample From: D.M.T.S.

Producing Zone: Cardium

Date Sampled: June 15, 1955

Geological Age: Upper Cretaceous

Sampled at: Tank after Separator

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.838
 Sulphur, percent by weight: 0.21
 Saybolt Universal Viscosity:
 at 100°F., sec. 45

A.P.I. gravity at 60°F.: 37.4
 Pour point, °F.: 15
 Colour: Brownish Black
 Carbon residue, percent by weight: 1.9
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 762 mm. Hg.
 First drop, 26°C. (79°F.)

Frac- tion No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Corre- lation Index	Aniline Point, °C.	Visc. S.U. 100°F.	Cloud Test, °F.	Refractive Index 20°C.
	°C.	°F.									
1.	50	122	1.9	1.9	0.658	83.6	-	-			-
2.	75	167	2.7	4.6	0.677	77.5	11	-			-
3.	100	212	4.2	8.8	0.709	68.1	16	54.9			1.4002
4.	125	257	5.7	14.5	0.737	60.5	20	53.0			1.4109
5.	150	302	5.4	19.9	0.760	54.7	24	52.5			1.4213
6.	175	347	4.9	24.8	0.777	50.6	25	53.8			1.4307
7.	200	392	4.0	28.8	0.792	47.2	26	57.0			1.4389
8.	225	437	4.2	33.0	0.806	44.1	27	60.2			1.4467
9.	250	482	4.3	37.3	0.818	41.5	27	64.8			1.4540
10.	275	527	6.5	43.8	0.831	38.8	29	69.6			1.4620

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	2.7	46.5	0.847	35.6	32	72.0	39	15	1.4696
12.	225	437	5.1	51.6	0.852	34.6	31	76.5	43	35	1.4729
13.	250	482	4.9	56.5	0.862	32.7	32	81.0	53	50	1.4782
14.	275	527	5.0	61.5	0.872	30.8	34	85.0	72	70	1.4848
15.	300	572	7.1	68.6	0.882	28.9	36	90.0	123	90	1.4952
Resi- duum			28.1	96.7	0.946	18.1					

Carbon residue of residuum: 6.0%

Carbon residue of crude: 1.9%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	8.8	0.688	74.2	
Total gasoline and naphtha	28.8	0.741	59.5	
Kerosine distillate	8.5	0.812	42.8	
Gas oil	15.2	0.842	36.6	
Nonviscous lubricating distillate	9.8	0.859-0.878	33.2-29.7	50-100
Medium lubricating distillate	6.3	0.878-0.888	29.7-27.8	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	28.1	0.946	18.1	
Distillation loss	3.3			

Remarks: The sample as received contained 0.1% by vol. water and sediment (by centrifuge) and 10 lb. salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 160-55

FIELD: Pembina

POOL:

ZONE: Cardium

Well Name: Composite 4 wells: Mobile Oil Sbd. Pembina
No. 11-10, 11-16, 12-12 and 14-2

Province: Alberta

Location: Sec. 11, 11, 12, 14
Twp. 48, Rge. 8, W 5

Sample From: D.M.T.S.

Interval tested, depth, feet: Range 5124-5154

Producing Zone: Cardium

Date Sampled: June 15, 1955

Geological Age: Upper Cretaceous

Sampled at: Tank after Separator

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.840

A.P.I. gravity at 60°F.: 37.0

Sulphur, percent by weight: 0.25

Pour point, °F.: -5

Saybolt Universal Viscosity:

Colour: Brownish Black

at 100°F., sec. 44

Carbon residue, percent by weight: 1.8
(Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 755 mm. Hg.
First drop, 32°C. (90°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Visc. S.U. 100°F.	Cloud Test, °F.	Refractive Index 20°C.
	°C.	°F.									
1.	50	122	1.5	1.5	0.656	84.2	-	-			-
2.	75	167	1.9	3.4	0.674	78.4	9	-			1.3913
3.	100	212	4.4	7.8	0.708	68.4	16	56.0			1.3970
4.	125	257	6.7	14.5	0.738	60.2	21	53.0			1.4106
5.	150	302	5.3	19.8	0.759	54.9	23	52.9			1.4211
6.	175	347	3.8	23.6	0.775	51.1	24	53.2			1.4299
7.	200	392	4.3	27.9	0.790	47.6	25	57.0			1.4381
8.	225	437	4.4	32.3	0.803	44.7	25	60.4			1.4459
9.	250	482	4.3	36.6	0.818	41.5	27	64.0			1.4537
10.	275	527	6.9	43.5	0.831	38.8	29	69.0			1.4612

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	2.3	45.8	0.846	35.8	32	73.2	39	20	1.4693
12.	225	437	5.5	51.3	0.852	34.6	31	76.8	43	35	1.4727
13.	250	482	5.6	56.9	0.862	32.6	32	82.0	53	55	1.4781
14.	275	527	5.1	62.0	0.873	30.6	34	85.5	73	70	1.4850
15.	300	572	6.6	68.6	0.883	28.8	36	90.1	124	90	1.4959
Residuum			28.0	96.6	0.947	17.9					

Carbon residue of residuum: 5.7%

Carbon residue of crude: 1.8%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	7.8	0.690	73.6	
Total gasoline and naphtha	27.9	0.742	59.2	
Kerosine distillate	8.7	0.810	43.2	
Gas oil	16.0	0.842	36.6	
Nonviscous lubricating distillate	9.9	0.859-0.878	33.2-29.7	50-100
Medium lubricating distillate	6.1	0.878-0.889	29.7-27.7	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	28.0	0.947	17.9	
Distillation loss	3.4			

Remarks: The sample as received contained 0.1% by vol. water and sediment (by centrifuge) and 9 lb. salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 284-56

FIELD: Pembina

POOL:

ZONE: Belly River

Well Name: Imperial Canadian Superior Buck Creek Province: Alberta
 No. 16-30 BR-48-6
 Location: Lsd. 16, Sec. 30, Twp. 48, Rge. 6, W 5 Sample From: D.M.T.S.
 Interval tested, depth, feet: 3592-3627 Date Sampled: June 22, 1956
 Producing Zone: Belly River Sampled at: Before separator
 Geological Age: Upper Cretaceous

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.833 A.P.I. gravity at 60°F.: 38.4
 Sulphur, percent by weight: 0.14 Pour point, °F.: -15
 Saybolt Universal Viscosity: Colour: Greenish Black
 at 100°F., sec. 40 Carbon residue, percent by weight: 1.8
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 763 mm. Hg.
 First drop, 25°C. (77°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	1.9	1.9	0.654	84.9	-			
2.	75	167	2.9	4.8	0.674	78.4	9			
3.	100	212	4.8	9.6	0.704	69.5	14	56.8		
4.	125	257	6.3	15.9	0.734	61.3	19	54.0		
5.	150	302	5.8	21.7	0.756	55.7	22	53.0		
6.	175	347	4.4	26.1	0.774	51.3	23	54.2		
7.	200	392	3.9	30.0	0.789	47.8	24	57.1		
8.	225	437	4.0	34.0	0.804	44.5	26	60.5		
9.	250	482	4.4	38.4	0.816	41.9	26	64.6		
10.	275	527	6.4	44.8	0.829	39.2	28	68.9		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	4.8	49.6	0.845	36.0	31	73.4	39	20
12.	225	437	4.3	53.9	0.852	34.6	31	78.2	45	40
13.	250	482	4.9	58.8	0.863	32.5	33	82.0	56	60
14.	275	527	4.9	63.7	0.871	31.0	33	86.0	77	75
15.	300	572	6.4	70.1	0.879	29.5	34	90.2	133	90
Residuum			26.1	96.2	0.948	17.8				

Carbon residue of residuum: 6.2%

Carbon residue of crude: 1.8%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	9.6	0.685	75.1	
Total gasoline and naphtha	30.0	0.736	60.8	
Kerosine distillate	8.4	0.810	43.2	
Gas oil	15.4	0.840	37.0	
Nonviscous lubricating distillate	9.8	0.857-0.874	33.6-30.4	50-100
Medium lubricating distillate	6.5	0.874-0.884	30.4-28.6	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	26.1	0.948	17.8	
Distillation loss	3.8			

Remarks: The sample as received contained 3 lb. salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 2553

FIELD: Pincher Creek

POOL:

ZONE: Dalhousie (?)

Well Name: Pincher Creek No. 2
 Location: Lsd. 5, Sec. 7, Twp. 6, Rge. 1, W 5
 Interval tested, depth, feet: 4855 (?)

Province: Alberta
 Sample From: Indian Affairs Br.,
 Dept. of Mines &
 Resources

Producing Zone: Dalhousie (?)
 Geological Age: Lower Cretaceous

Date Sampled: April 30, 1941
 Sampled at: Bailer at Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.818	A.P.I. gravity at 60°F.: 41.5
Sulphur, percent by weight: 0.27	Pour point, °F.: 30
Saybolt Universal Viscosity:	Colour: Dark Green
at 70°F., sec. 45	Carbon residue, percent by weight: 0.7
at 100°F., sec. 36	(Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 756 mm. Hg.
 First drop, 30°C. (86°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	0.8	0.8	0.642	88.9	-			
2.	75	167	5.8	6.6	0.707	68.6	25			
3.	100	212	2.3	8.9	0.731	62.1	27			
4.	125	257	7.6	16.5	0.744	58.7	24			
5.	150	302	6.8	23.3	0.757	55.4	22			
6.	175	347	8.4	31.7	0.772	51.8	23			
7.	200	392	5.7	37.4	0.786	48.5	23			
8.	225	437	6.2	43.6	0.800	45.4	24			
9.	250	482	6.8	50.4	0.812	42.8	24			
10.	275	527	7.1	57.5	0.822	40.6	24			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	4.7	62.2	0.836	37.8	27		39	20
12.	225	437	6.8	69.0	0.842	36.6	26		45	40
13.	250	482	5.7	74.7	0.852	34.6	28		56	60
14.	275	527	5.2	79.9	0.861	32.8	29		80	80
15.	300	572	5.4	85.3	0.868	31.5	29		138	90
Residuum			13.5	98.8	0.919	22.5				

Carbon residue of residuum: 5.1%

Carbon residue of crude: 0.7%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	8.9	0.707	68.6	
Total gasoline and naphtha	37.4	0.750	57.2	
Kerosene distillate	20.1	0.812	42.8	
Gas oil	10.7	0.839	37.2	
Nonviscous lubricating distillate	10.9	0.846-0.863	35.8-32.5	50-100
Medium lubricating distillate	6.2	0.863-0.871	32.5-31.0	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	13.5	0.919	22.5	
Distillation loss	1.2			

Remarks: The sample as received contained 2.1% by vol. water and sediment (by centrifuge).

CRUDE PETROLEUM ANALYSIS

Laboratory Number 1930-52

FIELD: Princess

POOL:

ZONE: Fairholme

Well Name: Composite 2 wells: Princess C.P.R. No. 38-22A & 58-22A

Province: Alberta

Location: Lsd. 15 & 14; Sec. 22; Twp. 20, Rge. 12, W 4

Sample From: D.M.T.S.

Interval tested, depth, feet: 3943-3977

Producing Zone: Fairholme

Date Sampled: October 2, 1952

Geological Age: Upper Devonian

Sampled at: Tank, after Treater

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.865

A.P.I. gravity at 60°F.: 32.1

Sulphur, percent by weight: 1.32

Pour point, °F.: 0

Saybolt Universal Viscosity:

Colour: Brownish Green

at 70°F., sec. 54

Carbon residue, percent by weight: 3.2

at 100°F., sec. 44

(Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 750 mm. Hg.
First drop, 28°C. (82°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	0.7	0.7)						
2.	75	167	1.4	2.1)	0.695	72.1	-			
3.	100	212	4.5	6.6	0.721	64.8	22	52.0		
4.	125	257	6.3	12.9	0.747	57.9	25	49.4		
5.	150	302	7.0	19.9	0.768	52.7	27	47.2		
6.	175	347	5.7	25.6	0.787	48.3	30	47.5		
7.	200	392	6.3	31.9	0.804	44.5	32	50.6		
8.	225	437	4.9	36.8	0.819	41.3	33	55.2		
9.	250	482	5.7	42.5	0.834	38.2	35	58.5		
10.	275	527	7.5	50.0	0.852	34.6	39	61.8		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	2.7	52.7	0.868	31.5	42	64.2	40	15
12.	225	437	5.1	57.8	0.877	29.9	43	65.7	45	30
13.	250	482	5.0	62.8	0.888	27.9	45	67.6	56	45
14.	275	527	5.5	68.3	0.900	25.7	47	70.2	81	65
15.	300	572	5.9	74.2	0.917	22.8	52	73.4	158	80
Residuum			25.8	100.0	0.992	11.1				

Carbon residue of residuum: 10.8%

Carbon residue of crude: 3.2%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	6.6	0.713	67.0	
Total gasoline and naphtha	31.9	0.763	54.0	
Kerosine distillate	4.9	0.819	41.3	
Gas oil	20.7	0.855	34.0	
Nonviscous lubricating distillate	9.5	0.882-0.904	28.9-25.0	50-100
Medium lubricating distillate	7.2	0.904-0.926	25.0-21.3	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	25.8	0.992	11.1	
Distillation loss	0.0			

Remarks: The sample as received contained 0.2% by vol. water and sediment (by centrifuge) and 2 lb. salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 2442

FIELD: Princess

POOL:

ZONE: Rundle

Well Name: Princess C.P.R. No. 2
 Location: Lsd. 3, Sec. 13, Twp. 20, Rge. 12, W 4
 Interval tested, depth, feet: 3215-3297

Province: Alberta
 Sample From: Indian Affairs Br.,
 Dept. of Mines &
 Resources

Producing Zone: Rundle
 Geological Age: Mississippian

Date Sampled: February 3, 1941

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.890
 Sulphur, percent by weight: 1.72
 Saybolt Universal Viscosity:
 at 70°F., sec. 119
 at 100°F., sec. 75

A.P.I. gravity at 60°F.: 27.5
 Pour point, °F.: Below -35
 Colour: Brownish Green
 Carbon residue, percent by weight: 4.9
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 761 mm. Hg.
 First drop, 29°C. (84°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	2.1	2.1	0.637	90.6	-			
2.	75	167	4.4	6.5	0.673	78.8	9			
3.	100	212	5.1	11.6	0.708	68.4	16			
4.	125	257	3.8	15.4	0.737	60.5	20			
5.	150	302	2.8	18.2	0.764	53.7	26			
6.	175	347	3.2	21.4	0.791	47.4	32			
7.	200	392	2.9	24.3	0.816	41.9	37			
8.	225	437	3.3	27.6	0.834	38.2	40			
9.	250	482	3.9	31.5	0.849	35.2	42			
10.	275	527	5.4	36.9	0.862	32.7	43			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	4.7	41.6	0.877	29.9	46	41	-10
12.	225	437	6.1	47.7	0.887	28.0	47	50	15
13.	250	482	6.2	53.9	0.901	25.6	51	75	35
14.	275	527	6.0	59.9	0.916	23.0	55	135	55
15.	300	572	6.2	66.1	0.928	21.0	57	281	75
Residuum			33.4	99.5	0.990	11.4			

Carbon residue of residuum: 14.7%

Carbon residue of crude: 4.9%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	11.6	0.682	76.0	
Total gasoline and naphtha	24.3	0.730	62.3	
Kerosine distillate	-	-	-	
Gas oil	20.4	0.862	32.7	
Nonviscous lubricating distillate	8.6	0.887-0.907	28.0-24.5	50-100
Medium lubricating distillate	6.3	0.907-0.921	24.5-22.1	100-200
Viscous lubricating distillate	6.5	0.921-0.934	22.1-20.0	Above 200
Residuum	33.4	0.990	11.4	
Distillation loss	0.5			

Remarks: The sample as received contained 4.7% by vol. water and sediment (by centrifuge).

CRUDE PETROLEUM ANALYSIS

Laboratory Number 6329

FIELD: Red Coulee

POOL:

ZONE: Basal Blairmore

Well Name: Vanalta No. 1
 Location: Lsd. 3, Sec. 4, Twp. 1, Rge. 16, W 4
 Interval tested, depth, feet: 2470-2478
 Producing Zone: Basal Blairmore
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: Dept. of Interior
 Date Sampled: September 1929

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.871
 Sulphur, percent by weight: 1.20
 Saybolt Universal Viscosity:
 at 70°F., sec. 70
 at 100°F., sec. 54
 A.P.I. gravity at 60°F.: 31.0
 Pour point, °F.: Below 0
 Colour: Dark Green
 Carbon residue, percent by weight: 2.4
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 751 mm. Hg.
 First drop, 37°C. (99°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	0.3	0.3)						
2.	75	167	1.0	1.3)	0.663	81.9	-			
3.	100	212	2.0	3.3	0.708	68.4	16			
4.	125	257	3.3	6.6	0.731	62.1	18			
5.	150	302	4.2	10.8	0.757	55.4	22			
6.	175	347	5.3	16.1	0.782	49.5	27			
7.	200	392	5.7	21.8	0.803	44.7	31			
8.	225	437	5.6	27.4	0.820	41.1	33			
9.	250	482	6.0	33.4	0.836	37.8	36			
10.	275	527	8.5	41.9	0.853	34.4	39			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	6.8	48.7	0.872	30.8	44		42	Below 0
12.	225	437	7.1	55.8	0.884	28.6	46		51	10
13.	250	482	7.3	63.1	0.899	25.9	50		69	30
14.	275	527	6.5	69.6	0.908	24.3	51		112	55
15.	300	572	7.3	76.9	0.910	24.0	49		192	70
Residuum			21.0	97.9						

Carbon residue of residuum: 11.2%

Carbon residue of crude: 2.4%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	3.3	0.691	73.3	
Total gasoline and naphtha	21.8	0.761	54.4	
Kerosine distillate	5.6	0.820	41.1	
Gas oil	24.0	0.857	33.6	
Nonviscous lubricating distillate	13.0	0.882-0.906	28.9-24.7	50-100
Medium lubricating distillate	9.6	0.906-0.910	24.7-24.0	100-200
Viscous lubricating distillate	2.9	0.910-0.911	24.0-23.8	Above 200
Residuum	21.0	-	-	
Distillation loss	2.1			

CRUDE PETROLEUM ANALYSIS

Laboratory Number 426-57

FIELD: Red Deer

POOL:

ZONE: Nisku

Well Name: Calstan Red Deer 4-26
 Location: Lsd. 4, Sec. 26, Twp. 38, Rge. 27, W 4
 Interval tested, depth, feet: 7125-7148
 Producing Zone: Nisku
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: D.E.M.R.
 Date Sampled: November 27, 1957
 Sampled at: After Separator

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.814
 Sulphur, percent by weight: 0.31
 Saybolt Universal Viscosity:
 at 100°F., sec. 36
 A.P.I. gravity at 60°F.: 42.3
 Pour point, °F.: 50
 Colour: Brownish Green
 Carbon residue, percent by weight: 0.8
 (Comradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 754 mm. Hg. First drop, 31°C. (88°F.)											
Fraction No.	Cut at °F.	Sum Per Cent	Specific Gravity 60/60°F.	Degrees A.P.I. 60 F.	Correlation Index	Aniline Point, °C.	Visc. S.U. 100°F.	Cloud Test, °F.	Refractive Index @ 20°C.	Dispersion (N _D -N _C) 10 ⁴	
1.	122	2.7	0.655	84.5	-	-					
2.	167	5.6	0.672	79.1	8	-					
3.	212	10.5	0.712	67.2	18	52.8					
4.	257	18.0	0.740	59.7	22	50.6					
5.	302	24.4	0.761	54.4	24	51.1					
6.	347	30.0	0.777	50.6	25	52.5					
7.	392	35.6	0.792	47.2	26	55.9					
8.	437	40.7	0.806	44.1	27	61.4					
9.	482	46.9	0.818	41.5	27	66.1					
10.	527	53.8	0.831	38.8	29	69.9					
Stage 2 - Distillation continued at 40 mm. Hg. pressure											
11.	392	57.8	0.846	35.8	32	74.1	39	20			
12.	437	63.6	0.852	34.6	31	78.9	45	40			
13.	482	69.0	0.863	32.5	33	83.0	55	55			
14.	527	73.8	0.874	30.4	35	87.5	75	75			
15.	572	80.1	0.885	28.4	37	92.2	130	95			
Residuum		96.9	0.932	20.3							
Carbon residue of residuum: 4.0%						Carbon residue of crude: 0.8%					

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	10.5	0.686	74.8	
Total gasoline and naphtha	35.6	0.742	59.2	
Kerosine distillate	11.3	0.813	42.6	
Gas oil	16.6	0.842	36.6	Below 50
Nonviscous lubricating distillate	10.4	0.857-0.879	33.7-29.5	50-100
Medium lubricating distillate	6.2	0.879-0.891	29.5-27.3	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	16.8	0.932	20.3	
Distillation loss	3.1			

OIL FIELD DATA

Field and Pool: Redwater D-3 Leduc Pool

Location: Twp(s) 56, 57 & 58, Rge(s) 20, 21 & 22, W 4 M

DISCOVERY DETAILS

Method: Reflection Seismograph

Well: Name: Imperial Redwater No. 1 in 1-32-57-21 W 4 M

Completed: October 12, 1948

Perforated: 3131'-3218'

Treatment: Acidized with 944 Gallons

Initial Potential: 459 BOPD Open Flow

GEOLOGY

Producing Zone(s): Leduc Formation, Woodbend group of Upper Devonian

Other Shows: Ellerslie Formation, Wabamun Group

Trap Type: Stratigraphic -- Reef Bioherm Surrounded by Impermeable Shale

Lithology: Limestone, grey and brown, fossiliferous, crystalline, granular and fractures

Maximum Reservoir Thickness: 1,040'

Regional Setting: Located northeast of Edmonton in the Upper Devonian Ireton basin east of the Rimbey-Morinville reef chain, and separate from it.

Deepest Formation Penetrated: Precambrian -- Imperial Eastgate No. 1-34-57-22 W 4 M

DEVELOPMENT DATA

Total Wells: Completed Oil: 889. Gas: Nil. Dry and Abandoned: 33

Producing Oil: 839. Suspended Oil: 50

Injection or Disposal: Water: 8. Gas: Nil

Well Spacing: 40 Acres

Logging Practice: Electric log survey to top of Leduc formation

Completion Practice: 10 3/4" surface casing set at 600', 7" casing set at the top of Leduc reef. Open hole completion

RESERVOIR DATA

Type of Drive: Water Drive

Estimated Oil in Place: 1,277,000,000 S.T.bbls (355 bbls/acre-foot)

Estimated Recoverable Oil: 817,000,000 S.T.bbls (227 bbls/acre-foot)

Oil Zone Thickness: Maximum: 220'. Average: 101'

Gas Zone Thickness: None

Porosity: 6.53%. Permeability: Excellent (k_h : 500 md, k_v : 10 md)

Oil Characteristics: Gravity: 34-36 °API. Sulphur: 0.69%

Pour Point: +5°F. Initial Solution GOR: 155 cu ft/bbl

Base: Paraffin

Pressure Maintenance or Secondary Recovery: None - produced water returned to the reservoir through eight disposal wells.

Area: 35,600 Acres

PRODUCTION

MPR: N/A BOPD (pool): 36,000

Economic Allowance: Operating: 25 BOPD/well

Market Outlet: Imperial Pipeline Ltd. & British American Pipeline Ltd. to Edmonton terminal.

Bibliographical References: Baugh, J.E., Redwater field; Can. Oil and Gas Industries, Vol. 3, No. 4, pp. 21-25. World Oil, Vol. 131, No. 7, pp. 260-261, 263-264.

Chapman, C.J., Case history of the Redwater oil field; Geophysics, April, 1957, p. 504.

Haskett, Irene, Reservoir analysis of the Redwater pool; C.I.M.M., Trans., Vol. 54, pp. 140-150; Bull., Ap. 1951. Oil and Gas Jour., Vol. 50, pp. 90-92. Can. Oil and Gas Indust., July, 1951, pp. 39-49.

Redwater Working Committee, Structure and porosity characteristics of the Redwater field, Alberta, Canada, 1953, Calgary Redwater Working Committee.

Rose, W., et al., Effective and total porosity in Redwater D-3 reservoir, Alberta, Canada; Petrol. Eng., Vol. 23,

B 14, pp. 16-18.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 1728-52

FIELD: Redwater

POOL:

ZONE: Leduc (D-3)

Well Name: Composite 4 wells: B.A.-H.B. Redwater
 No. 1-30, 8-30, 9-30 & 16-30
 Location: Lsd. 1, 8, 9 & 16, Sec. 30, Twp. 57, Rge. 21
 W 4

Province: Alberta

Sample From: D.M.T.S.

Interval tested, depth, feet: 3226-3265

Producing Zone: Leduc (D-3)

Date Sampled: August 30, 1952

Geological Age: Upper Devonian

Sampled at: Tank, after separator

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.848

A.P.I. gravity at 60°F.: 35.4

Sulphur, percent by weight: 0.32

Pour point, °F.: 0

Saybolt Universal Viscosity:

Colour: Brownish Green

at 70°F., sec. 52

Carbon residue, percent by weight: 3.5

at 100°F., sec. 43

(Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 758 mm. Hg.
 First drop, 26°C. (79°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	1.9	1.9	0.670	79.7	-			
2.	75	167	2.7	4.6	0.683	75.7	14			
3.	100	212	4.5	9.1	0.721	64.8	22	54.8		
4.	125	257	6.1	15.2	0.739	60.0	21	53.6		
5.	150	302	5.2	20.4	0.762	54.2	25	53.5		
6.	175	347	4.5	24.9	0.779	50.1	26	53.5		
7.	200	392	4.3	29.2	0.799	45.6	29	55.0		
8.	225	437	4.1	33.3	0.811	43.0	29	57.9		
9.	250	482	4.6	37.9	0.825	40.0	31	62.2		
10.	275	527	6.0	43.9	0.837	37.6	32	66.7		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	3.4	47.3	0.853	34.4	35	69.0	39	10
12.	225	437	5.0	52.3	0.861	32.8	35	73.4	45	30
13.	250	482	4.8	57.1	0.872	30.8	37	76.6	56	50
14.	275	527	4.9	62.0	0.884	28.6	40	79.4	81	70
15.	300	572	6.2	68.2	0.896	26.4	42	83.5	158	85
Residuum			28.0	96.2	0.973	13.9				

Carbon residue of residuum: 10.8%

Carbon residue of crude: 3.5%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	9.1	0.699	70.9	
Total gasoline and naphtha	29.2	0.746	58.2	
Kerosine distillate	8.7	0.818	41.5	
Gas oil	14.1	0.849	35.2	
Nonviscous lubricating distillate	8.9	0.866-0.887	31.9-28.0	50-100
Medium lubricating distillate	7.3	0.887-0.903	28.0-25.2	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	28.0	0.973	13.9	
Distillation loss	3.8			

Remarks: The sample as received contained 0.05% by vol. water and sediment (by centrifuge) and no salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 1540-53

FIELD: Redwater

POOL:

ZONE: Leduc (D-3)

Well Name: Composite 3 wells: Imperial Redwater No. 13, 29 & 52 Province: Alberta
 Location: Sec. 22, Twp. 57, Rge. 21, W 4 Sample From: D.M.T.S.
 Interval tested, depth, feet: 3220-3284
 Producing Zone: Leduc (D-3) Date Sampled: June 25, 1953
 Geological Age: Upper Devonian Sampled at: Separator

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.851 A.P.I. gravity at 60°F.: 34.8
 Sulphur, percent by weight: 0.41 Pour point, °F.: -30
 Saybolt Universal Viscosity: Colour: Brownish Black
 at 100°F., sec. 45 Carbon residue, percent by weight: 3.6
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 755 mm. Hg.
 First drop, 31°C. (88°F.)

Frac- tion No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Corre- lation Index	Aniline Point, °C.	Visc. S.U. 100°F.	Cloud Test, °F.	Refractive Index 20°C.
	°C.	°F.									
1.	50	122	2.8	2.8	0.658	83.6	-	-			1.3905
2.	75	167	3.0	5.8	0.684	75.4	14	56.6			1.3918
3.	100	212	4.9	10.7	0.723	64.2	23	54.6			1.4019
4.	125	257	5.5	16.2	0.747	57.9	25	53.2			1.4136
5.	150	302	5.4	21.6	0.766	53.2	27	53.4			1.4244
6.	175	347	5.1	26.7	0.783	49.2	28	53.6			1.4353
7.	200	392	3.7	30.4	0.801	45.2	30	55.4			1.4450
8.	225	437	4.1	34.5	0.816	41.9	32	58.4			1.4520
9.	250	482	4.5	39.0	0.827	39.6	31	63.2			1.4598
10.	275	527	5.8	44.8	0.840	37.0	33	66.8			1.4670

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	3.7	48.5	0.856	33.8	37	69.4	39	15	1.4750
12.	225	437	5.0	53.5	0.862	32.6	36	73.8	46	35	1.4790
13.	250	482	4.4	57.9	0.873	30.6	37	77.2	58	55	1.4859
14.	275	527	4.5	62.4	0.887	28.0	41	80.2	80	70	1.4923
15.	300	572	6.3	68.7	0.896	26.4	42	84.4	151	85	1.5039
Residuum			28.1	96.8	0.975	13.6					

Carbon residue of residuum: 11.3%

Carbon residue of crude: 3.6%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	10.7	0.695	72.1	
Total gasoline and naphtha	30.4	0.745	58.4	
Kerosine distillate	4.1	0.816	41.9	
Gas oil	18.0	0.845	36.0	
Nonviscous lubricating distillate	9.2	0.865-0.890	32.1-27.5	50-100
Medium lubricating distillate	7.0	0.890-0.901	27.5-25.6	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	28.1	0.975	13.6	
Distillation loss	3.2			

Remarks: The sample as received contained 0.1% by vol. water and sediment (by centrifuge) and no salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 7872

FIELD: Redwater

POOL:

ZONE: Leduc (D-3)

Well Name: Imperial Redwater No. 15
 Location: Lsd. 15, Sec. 29, Twp. 57, Rge. 21, W 4
 Interval tested, depth, feet: 3040-3186
 Producing Zone: Leduc (D-3)
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: Imperial Oil Ltd.
 Date Sampled: July 5, 1949
 Sampled at: Tank

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.847
 Sulphur, percent by weight: 0.48
 Saybolt Universal Viscosity:
 at 70°F., sec. 51
 at 100°F., sec. 46

A.P.I. gravity at 60°F.: 35.6
 Pour point, °F.: -30
 Colour: Brownish Green
 Carbon residue, percent by weight: 2.7
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 758 mm. Hg.
 First drop, 37°C. (99°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	2.1	2.1	0.666	81.0	-			
2.	75	167	2.7	4.8	0.679	76.9	12			
3.	100	212	4.4	9.2	0.716	66.1	19			
4.	125	257	5.9	15.1	0.743	58.9	23			
5.	150	302	5.3	20.4	0.766	53.2	27			
6.	175	347	4.8	25.2	0.785	48.8	29			
7.	200	392	4.4	29.6	0.802	44.9	31			
8.	225	437	5.0	34.6	0.817	41.7	32			
9.	250	482	4.9	39.5	0.830	39.0	33			
10.	275	527	5.9	45.4	0.842	36.6	34			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	3.5	48.9	0.855	34.0	36		39	10
12.	225	437	6.2	55.1	0.863	32.5	36		46	40
13.	250	482	5.0	60.1	0.877	29.9	39		61	60
14.	275	527	4.8	64.9	0.889	27.7	42		94	75
15.	300	572	5.8	70.7	0.902	25.4	45		187	95
Residuum			26.9	97.6	0.967	14.8				

Carbon residue of residuum: 10.0%

Carbon residue of crude: 2.7%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	9.2	0.694	72.4	
Total gasoline and naphtha	29.6	0.747	57.9	
Kerosine distillate	5.0	0.817	41.7	
Gas oil	18.8	0.846	35.8	
Nonviscous lubricating distillate	9.4	0.867-0.890	31.7-27.5	50-100
Medium lubricating distillate	5.8	0.890-0.904	27.5-25.0	100-200
Viscous lubricating distillate	2.1	0.904-0.909	25.0-24.2	Above 200
Residuum	26.9	0.967	14.8	
Distillation loss	2.7			

Remarks: The sample as received contained a trace of water and sediment (by centrifuge).

OIL FIELD DATA

Field and Pool: St. Albert D-3

Location: Twp(s) 53 & 54, Rge 26, W 4 M

DISCOVERY DETAILS

Method: Seismic

Well: Name: Pan Am et al S.A. 3-1-54-26 W 4 M

Completed: Open Hole

Perforated: None

Treatment: None

Initial Potential: 1328 BOPD

GEOLOGY

Producing Zone(s): D-3

Other Shows: Viking Sand, Ostracod Sand, Basal Quartz Sand

Trap Type: Stratigraphic Reef

Lithology: Vugular Dolomite

Maximum Reservoir Thickness: 123'

DEVELOPMENT DATA

Total Wells: Completed Oil: 5. Gas: 0. Dry and Abandoned: 0

Producing Oil: 5. Suspended Oil: 0

Injection or Disposal: Water: 0. Gas: 0

Well Spacing: 40 Acres. Pattern: Each Lsd.

Logging Practice: Electric and Induction Logs

Completion Practice: Open Hole

RESERVOIR DATA

Type of Drive: Natural Water

Estimated Oil in Place: 9,150,000* S.T.bbls (650 bbls/acre-foot)

Estimated Recoverable Oil: 5,948,000* S.T.bbls (422 bbls/acre-foot)

Oil Zone Thickness: Maximum: 123'

Gas Zone Thickness: 0

Porosity: 9.92%. Permeability: 1160 md

Area: 230 Acres

Oil Characteristics: Gravity: 34.1° API. Sulphur: 0%

Initial Solution GOR: 410

Base: Paraffin

Pressure Maintenance or Secondary Recovery: None

PRODUCTION

Economic Allowance: Present: 27 BOPD. Operating: 27 BOPD

Market Outlet: Gibson Petroleum Co. Ltd. pipeline to Edmonton.

* - Reservoir Engineering Digest, Source - Operator.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 485-57

FIELD: (St. Albert) Big Lake

POOL:

ZONE: D-2 Nisku

Well Name: Imperial Trans-Empire Big Lake 12-25L-53-26
 Location: Lsd. 12, Sec. 25N, Twp. 53, Rge. 26, W 4
 Interval tested, depth, feet: 4380'-4359'
 Producing Zone: D-2 Nisku
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: D.E.M.R.

Date Sampled: December 24, 1957
 Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.849
 Sulphur, percent by weight: 0.45
 Saybolt Universal Viscosity:
 at 100°F., sec. 44

A.P.I. gravity at 60°F.: 35.2
 Pour point, °F.: 15
 Colour: Greenish Black
 Carbon residue, percent by weight: 2.0
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 754 mm. Hg.
 First drop, 31°C. (88°F.)

Fraction No.	Cut at °F.	Sum Per Cent	Specific Gravity 60/60°F.	Degrees A.P.I. °60 F.	Correlation Index	Aniline Point, °C.	Visc. S.U. 100°F.	Cloud Test, °F.	Refractive Index @ 20°C.	Dispersion (N _D -N _C)10 ⁴
1.	122	1.7	0.659	83.2	-	-				
2.	167	4.8	0.678	77.2	11	57.8				
3.	212	9.2	0.717	65.9	20	51.7				
4.	257	14.3	0.744	58.7	24	49.3				
5.	302	19.8	0.766	53.2	27	49.5				
6.	347	24.9	0.780	49.9	26	49.4				
7.	392	29.0	0.798	45.8	29	50.5				
8.	437	33.0	0.816	41.9	32	53.5				
9.	482	37.4	0.828	39.4	27	56.7				
10.	527	44.1	0.840	37.0	33	62.0				

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	392	48.4	0.853	34.4	35	64.6	39	5		
12.	437	53.7	0.863	32.5	36	69.3	46	30		
13.	482	59.0	0.875	30.2	38	73.3	59	50		
14.	527	63.4	0.888	27.9	41	74.6	86	65		
15.	572	70.6	0.898	26.1	43	79.7	175	80		
Residuum		96.9	0.961	15.7						

Carbon residue of residuum: 6.7%

Carbon residue of crude: 2.0%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	9.2	0.693	72.7	
Total gasoline and naphtha	29.0	0.746	58.2	
Kerosine distillate	4.0	0.816	41.9	
Gas oil	19.6	0.845	36.0	Below 50
Nonviscous lubricating distillate	9.5	0.867-0.890	31.7-27.5	50-100
Medium lubricating distillate	6.5	0.890-0.902	27.5-25.4	100-200
Viscous lubricating distillate	2.0	0.902-0.906	25.4-24.7	Above 200
Residuum	26.3	0.961	15.7	
Distillation loss	3.1			

CRUDE PETROLEUM ANALYSIS

Laboratory Number 486-57.

FIELD: (St. Albert) Big Lake

POOL:

ZONE: Leduc

Well Name: Imperial Trans-Empire Big Lake 12-25L
 Location: Lsd. 12, Sec. 25N; Twp. 53, Rge. 26, W 4
 Interval tested, depth, feet: 4727-4733
 Producing Zone: Leduc
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: D.E.M.R.
 Date Sampled: December 19, 1957
 Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.852
 Sulphur, percent by weight: 0.51
 Saybolt Universal Viscosity:
 at 100°F., sec. 44

A.P.I. gravity at 60°F.: 34.6
 Pour point, °F.: 20
 Colour: Brownish Green
 Carbon residue, percent by weight: 2.1
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 750 mm. Hg.
 First drop, 30°C. (86°F.)

Fraction No.	Cut at °F.	Sum Per Cent	Specific Gravity 60/60°F.	Degrees A.P.I. °60 F.	Correlation Index	Aniline Point, °C.	Visc. S.U. 100°F.	Cloud Test, °F.	Refractive Index @ 20°C.	Dispersion (N _F -N _C) 10 ⁴
1.	122	1.6	0.652	85.5	-	-				
2.	167	3.7	0.685	75.1	15	54.0				
3.	212	8.3	0.721	64.8	22	50.6				
4.	257	13.7	0.747	57.9	25	49.9				
5.	302	19.2	0.768	52.7	27	50.4				
6.	347	23.3	0.785	48.8	29	50.6				
7.	392	27.5	0.803	44.7	31	51.6				
8.	437	31.9	0.818	41.5	33	52.5				
9.	482	36.6	0.830	39.0	33	56.5				
10.	527	43.2	0.840	37.0	33	61.5				

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	392	47.9	0.856	33.8	37	65.5	40	10		
12.	437	52.9	0.863	32.5	36	68.3	45	30		
13.	482	58.2	0.875	30.2	38	71.9	59	50		
14.	527	63.7	0.890	27.5	42	74.5	88	70		
15.	572	70.3	0.903	25.2	46	76.9	175	85		
Residuum		97.6	0.964	15.3						

Carbon residue of residuum: 6.8%

Carbon residue of crude: 2.1%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	8.3	0.699	70.9	
Total gasoline and naphtha	27.5	0.751	57.2	
Kerosine distillate	4.4	0.818	41.5	
Gas oil	20.3	0.846	35.8	Below 50
Nonviscous lubricating distillate	9.6	0.868-0.892	31.5-27.1	50-100
Medium lubricating distillate	7.0	0.892-0.907	27.1-24.5	100-200
Viscous lubricating distillate	1.5	0.907-0.910	24.5-24.0	Above 200
Residuum	27.3	0.964	15.3	
Distillation loss	2.4			

CRUDE PETROLEUM ANALYSIS

Laboratory Number 5866

FIELD: Skiff

POOL:

ZONE: Ellis

Well Name: Devenish No. 3
 Location: Lsd. 4, Sec. 27, Twp. 5, Rge. 14, W 4
 Interval tested, depth, feet: 3054-3067
 Producing Zone: Ellis
 Geological Age: Jurassic

Province: Alberta
 Sample From: Devenish Pet. Ltd.
 Date Sampled: April 1929

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.943
 Sulphur, percent by weight: 2.90
 Saybolt Universal Viscosity:
 at 70°F., sec. 1618
 at 100°F., sec. 693

A.P.I. gravity at 60°F.: 18.5
 Pour point, °F.: Below 0
 Colour: Brownish Black
 Carbon residue, percent by weight: 8.0
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 757 mm. Hg.
 First drop, 45°C. (113°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	0.4	0.4)						
2.	75	167	2.0	2.4)	0.675	78.1	-			
3.	100	212	1.5	3.9	0.719	65.3	21			
4.	125	257	1.7	5.6	0.746	58.2	25			
5.	150	302	2.5	8.1	0.756	55.7	22			
6.	175	347	3.1	11.2	0.776	50.9	24			
7.	200	392	2.7	13.9	0.796	46.3	28			
8.	225	437	3.3	17.2	0.815	42.1	31			
9.	250	482	4.0	21.2	0.830	39.0	33			
10.	275	527	6.8	28.0	0.851	34.8	38			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	3.0	31.0	0.875	30.2	46		42	10
12.	225	437	5.4	36.4	0.887	28.0	47		50	25
13.	250	482	4.9	41.3	0.904	25.0	52		70	50
14.	275	527	5.0	46.3	0.919	22.5	56		116	65
15.	300	572	6.3	52.6	0.929	20.8	58		232	80
Residuum			45.1	97.7	-	-				

Carbon residue of residuum: 17.8%

Carbon residue of crude: 8.0%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	3.9	0.692	73.0	
Total gasoline and naphtha	13.9	0.750	57.2	
Kerosine distillate	3.3	0.815	42.1	
Gas oil	16.5	0.856	33.8	
Nonviscous lubricating distillate	8.3	0.887-0.913	28.0-23.5	50-100
Medium lubricating distillate	6.0	0.913-0.926	23.5-21.3	100-200
Viscous lubricating distillate	4.6	0.926-0.935	21.3-19.8	Above 200
Residuum	45.1	-	-	
Distillation loss	2.3			

CRUDE PETROLEUM ANALYSIS

Laboratory Number 5618

FIELD: Skiff

POOL:

ZONE: Ellis

Well Name: Devenish No. 1
 Location: Lsd. 5, Sec. 27, Twp. 5, Rge. 14, W 4
 Interval tested, depth, feet: 3080
 Producing Zone: Ellis
 Geological Age: Jurassic

Province: Alberta
 Sample From: Devenish Pet. Ltd.
 Date Sampled: April 1929

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.939
 Sulphur, percent by weight: 2.82
 Saybolt Universal Viscosity:
 at 70°F., sec. 1384
 at 100°F., sec. 558

A.P.I. gravity at 60°F.: 19.2
 Pour point, °F.: Below 0
 Colour: Brownish Black
 Carbon residue, percent by weight: 9.8
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 752 mm. Hg.
 First drop, 43°C. (109°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	0.3	0.3)						
2.	75	167	0.9	1.2)	0.662	82.3	-			
3.	100	212	2.0	3.2	0.708	68.4	16			
4.	125	257	1.7	4.9	0.730	62.3	17			
5.	150	302	2.3	7.2	0.755	55.9	21			
6.	175	347	2.8	10.0	0.780	49.9	26			
7.	200	392	2.8	12.8	0.792	47.2	26			
8.	225	437	3.1	15.9	0.807	43.8	27			
9.	250	482	3.9	19.8	0.827	39.6	31			
10.	275	527	7.1	26.9	0.848	35.4	37			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	2.3	29.2	0.871	31.0	44		41	10
12.	225	437	5.2	34.4	0.888	27.9	48		50	25
13.	250	482	5.4	39.8	0.905	24.9	53		70	45
14.	275	527	5.5	45.3	0.921	22.1	57		119	60
15.	300	572	6.5	51.8	0.928	21.0	57		236	80
Residuum			45.3	97.1						

Carbon residue of residuum: 21.6%

Carbon residue of crude: 9.8%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	3.2	0.693	72.7	
Total gasoline and naphtha	12.8	0.750	57.2	
Kerosine distillate	3.1	0.807	43.8	
Gas oil	15.9	0.852	34.6	
Nonviscous lubricating distillate	8.7	0.888-0.915	27.8-23.1	50-100
Medium lubricating distillate	6.4	0.915-0.926	23.1-21.3	100-200
Viscous lubricating distillate	4.9	0.926-0.932	21.3-20.3	Above 200
Residuum	45.3	-	-	
Distillation loss	2.9			

CRUDE PETROLEUM ANALYSIS

Laboratory Number 354-53

FIELD: Spring Coulee

POOL:

ZONE: Rundle

Well Name: National Spring Coulee Malmberg No. 1
 Location: Lsd. 14, Sec. 36, Twp. 3, Rge. 23, W 4
 Interval tested, depth, feet: 5880-5899
 Producing Zone: Rundle
 Geological Age: Mississippian

Province: Alberta
 Sample From: Imperial Oil Ltd.
 Date Sampled: April 18, 1950
 Sampled at: Well

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.845
 Sulphur, percent by weight: 0.62
 Saybolt Universal Viscosity:
 at 100°F., sec. 38
 A.P.I. gravity at 60°F.: 36.0
 Pour point, °F.: 10
 Colour: Dark Green
 Carbon residue, percent by weight: 1.1
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 762 mm. Hg.
 First drop, 54°C. (129°F.)

Frac- tion No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Corre- lation Index	Aniline Point, °C.	Visc. S.U. 100°F.	Cloud Test, °F.	Refractive Index 20°C.
	°C.	°F.									
1.	50	122	-	-	-	-	-	-	-	-	-
2.	75	167	1.3	1.3	0.660	82.9	-	-	-	-	-
3.	100	212	3.5	4.8	0.706	68.9	15	55.8	-	-	1.3953
4.	125	257	6.0	10.8	0.734	61.3	19	52.4	-	-	1.4108
5.	150	302	6.9	17.7	0.757	55.4	22	49.8	-	-	1.4232
6.	175	347	6.6	24.3	0.777	50.6	25	50.2	-	-	1.4341
7.	200	392	6.5	30.8	0.792	47.2	26	52.4	-	-	1.4422
8.	225	437	6.0	36.8	0.807	43.8	27	58.0	-	-	1.4493
9.	250	482	6.0	42.8	0.820	41.1	28	62.4	-	-	1.4568
10.	275	527	8.1	50.9	0.834	38.2	30	66.8	-	-	1.4651

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	4.3	55.2	0.852	34.6	35	69.4	39	10	1.4745
12.	225	437	5.8	61.0	0.860	33.0	35	72.6	43	30	1.4788
13.	250	482	7.1	68.1	0.874	30.4	38	76.6	53	50	1.4866
14.	275	527	6.0	74.1	0.887	28.0	41	80.0	76	65	1.4943
15.	300	572	6.3	80.4	0.897	26.2	43	84.6	130	75	1.5022
Resi- duum			19.6	100.0	0.945	18.2					

Carbon residue of residuum: 5.0%

Carbon residue of crude: 1.1%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	4.8	0.694	72.4	
Total gasoline and naphtha	30.8	0.754	56.2	
Kerosine distillate	12.0	0.814	42.3	
Gas oil	19.9	0.848	35.4	
Nonviscous lubricating distillate	11.1	0.870-0.891	31.1-27.3	50-100
Medium lubricating distillate	6.6	0.891-0.902	27.3-25.4	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	19.6	0.945	18.2	
Distillation loss	0.0			

Remarks: The sample as received contained 1.26% by vol. water and sediment (by centrifuge) and 149 lb. salt (as NaCl) per 1000 bbl.

OIL FIELD DATA

Field and Pool: Stettler D-2

Location: Twp 38, Rge 20, W 4 M

DISCOVERY DETAILS

Method: Seismic Reflection Survey, Structure Test Hole Survey

Well: Name: Gulf N.J. Ellis No. 4 in 4-10-38-20 W 4 (now B.A. Stettler Unit
4-10Mu-38-20)

Completed: As a dual producer, June 14, 1949

Initial Potential: 528 BOPD (D-2)

GEOLOGY

Producing Zone(s): Nisku form., Winterburn group of U. Devonian
Leduc form., see Stettler field (Main D-3 Pool)

Other Shows: Ellerslie ss has possible commercial oil at B.A. Leschert No. 9 in
9-14-38-20 W 4. Viking gas in sections 15 and 22 definitely commercial.

Trap Type: Stratigraphic - Structural. Impermeable barrier along west flank of
field with draping over Leduc bioherm.

Lithology: Brown-white reefoid - like dolomite vug and intergranular porosity
with anhydrite infilling.

Maximum Reservoir Thickness: 191'

Deepest Formation Penetrated: Precambrian granite.

DEVELOPMENT DATA

Total Wells: Completed Oil: 91

Producing Oil: 54

Injection or Disposal: Water: 3

Well Spacing: 40 Acres (except in NW portion where it is 80 acres)

Logging Practice: Induction E-log surface to D-1 (Wabamun); Gamma-Sonic D-1 to T.D.

Completion Practice: 300' surface casing. Open hole if Nisku waterfree, otherwise selective perforating. 7" casing used. Acid sometimes necessary.

RESERVOIR DATA

Type of Drive: Edge Water, Water Injection

Estimated Oil in Place: 45,364,000 S.T.bbls (277 bbls/acre-foot)

Estimated Recoverable Oil: 25,762,000 S.T.bbls (157 bbls/acre-foot)

Oil Zone Thickness: Maximum: 108'. Average: 41.2 net

Gas Zone Thickness: None

Porosity: 5.62%. Permeability: 235 md

Area: 4,560 acres

Oil Characteristics: Gravity: 29.7 °API. Sulphur: 1.3%

Initial Solution GOR: 395 cu ft/bbl

Base: Asphalt

Pressure Maintenance or Secondary Recovery: Pressure maintenance program has been in operation since May 21, 1957. Reservoir pressure of 1,300 psi can be maintained by fresh water injection and salt water disposal program.

PRODUCTION

Economic Allowance: Present: 28 BOPD. Operating: 28 BOPD

Market Outlet: Britamoil Pipeline to Edmonton terminal.

SECONDARY RECOVERY

RESERVOIR DATA

- 1) Field: Stettler
- 2) Pool: D-2
- 3) Province: Alberta
- 4) Location: Twp. 38, Rge. 20, W 4 M
- 5) Operator: British American
- 6) Project: Unit
- 7) Reservoir: D-2 formation, Upper Devonian
- 8) Discovery Date: November 1948
- 9) Date Injection Began: May 1957
- 10) Main Structural Feature: Reef
- 11) Gas Cap: Originally: No. At Present: No
- 12) Time Required for Initial Results: GOR's show a substantial decrease about December 1958.
- 13) Initial Results on Production: 1475 BHP. 360 GOR. Watercut: 15%
- 14) Main Drive in Primary Production: Water Drive
- 15) Productive Area (acres) of Reservoir: 5,426. Of Project: 6,360
Affected by Injection: 6,360
- 16) Average Depth to Top of Pay (feet): 5,137
- 17) Average Effective Thickness (feet): 66.2
- 18) Average Porosity %: 4.3
- 19) Average Horizontal Permeability (millidarcys): 132
- 20) Connate Water (% of pore space): 20
- 21) Viscosity at Initial Reservoir Conditions (centipoises): 1.90
- 22) API Gravity: 30
- 23) Solution Gas/Oil Ratio at Saturation Pressure (cu ft/bbl): 392
- 24) Bubble Point Pressure (psi): 1,480
- 25) Original Pressure (psi): 1,740
- 26) Reservoir Pressure at Start of Injection (psi): 1,475
- 27) Latest Reservoir Pressure: 1,219 psi (December 1964)

- 28) Injection Fluid: Salt Water, Fresh Water
- 29) Injection Fluid Source: Nevis Gas Processing Plant
- 30) System: Closed
- 31) Fluid Treatment before Injection: Not stated.
- 32) Injection Pattern: Line
- 33) Structural Position Injection Wells: Below WOC
- 34) Distance Injection Wells to Producers: 1,320 feet to nearest producer,
18,480 feet to farthest producer
- 35) Number of Injection Wells at Start: 1
- 36) Number of Injection Wells at Present: 2 Disposal and 3 Fresh Water Injectors
(August 6, 1965)
- 37) Average Daily Injection Rate per Injection Well at Start: 1,320 BWPD
- 38) Average Daily Injection Rate per Injection Well: Fresh Water: 733 bbls
Water Disposal: 70 bbls
(December 31, 1964)
- 39) Average Injection Pressure at Start (psi): Gravity
- 40) Average Injection Pressure at Present (psi): 10 in. vac. (June 1965)
- 41) Number of Producing Wells in Project Area at Start: 72
- 42) Number of Producing Wells in Project Area at Present: 82 (August 9, 1965)
- 43) Average Production Rate in Project Area at Start (bbls/day): 4,500
- 44) Average Production Rate in Project Area at Present: 2,900 (December 31, 1964)
- 45) Original Oil in Place in Project Area (bbls): 48,900,000
- 46) Original Oil Saturation (% of pore space): 80
- 47) Primary Recovery from Project Area when Injection Started (bbls): 5,300,000
- 48) Oil Saturation at Start of Project (% of pore space): 78 (2% gas saturation)
- 49) Oil Production from Project Area from Start of Injection to Now (bbls): 7,500,000
(December 31/64)
- 50) Total Volume of Injected Fluids at Present (bbls): 4,975,055 (December 31, 1964)
- 51) Estimated Primary Ultimate Recovery from Project Area (bbls): 14,670,000
- 52) Estimated Increase in Ultimate Recovery from Project Area (bbls): 5,379,000
- 53) Well Spacing: 160 Acres
- 54) Oil Volume Factor (initial reservoir barrels per Stock-Tank barrel): 1.245
- 55) Remarks: Gas saturation was estimated to be about 2%.

OIL FIELD DATA

Field and Pool: Stettler D-3

Location: Twp. 38, Rge. 20, W 4 M

DISCOVERY DETAILS

Method: Seismic Reflection Survey, Structure Test Hole Survey

Well: Name: Gulf N.J. Ellis No. 4 in 4-10-38-20 W 4 (now B.A. Stettler Unit
4-10-MU-38-20) Completed as dual producer June 14, 1949.

Initial Potential: 2,304 BOPD

GEOLOGY

Producing Zone(s): Leduc form., Woodbend group of U. Devonian
Nisku form. (see Stettler D-2 Pool)

Other Shows: Ellerslie ss has possible **commercial** oil at Gulf Leschert No. 9-14-38-20
W 4 M. Viking gas shows in Sections 15 and 20, definitely commercial.

Trap Type: Stratigraphic Reef bioherm surrounded by impermeable limy shale and
dense argillaceous dolomite.

Lithology: grey-buff-white, med to coarsely crystalline, dolomite. Vug porosity
with some intergranular & fractures. Some anhydrite infilling.

Maximum Reservoir Thickness: 822' (Gulf Swanson No. 10)

Regional Setting: Located in central portion of U. Devonian Ireton basin, 10 miles
east of Bashaw reef complex. Field in probably isolated bioherm.

Deepest Formation Penetrated: Precambrian granite.

DEVELOPMENT DATA

Total Wells: Completed Oil: 38

Producing Oil: 26

Injection or Disposal: Water: 2

Well Spacing: 40 Acres (except in NW portion where it is 80 acres)

Logging Practice: Induction E-log surface to D-1 (Wabamun); Gamma-Sonic D-1 to T.D.

Completion Practice: 300' surface casing. Open Hole 10-15' of zone is open below production casing (5 1/2" or 7") which is generally 15'-20' above O/W contact.

RESERVOIR DATA

Type of Drive: Water

Estimated Oil in Place: 37,870,000 S.T.bbls (314 bbls/acre-foot)

Estimated Recoverable Oil: 25,370,000 S.T.bbls (210 bbls/acre-foot)

Oil Zone Thickness: Maximum: 63'. Average: 35.1'

Gas Zone Thickness: None

Porosity: 5.75%. Permeability: 532 md

Area: 4,162 Acres

Oil Characteristics: Gravity: 28.3 °API. Sulphur: 1.57%

Initial Solution GOR: 389 cu ft/bbl

Base: Asphalt

Pressure Maintenance or Secondary Recovery: None

PRODUCTION

Economic Allowance: Present: 28 BOPD. Operating: 28 BOPD

Market Outlet: Britamoil Pipeline to Edmonton Terminal

CRUDE PETROLEUM ANALYSIS

Laboratory Number 1097-52

FIELD: Stettler

POOL:

ZONE: Leduc (D-3)

Well Name: C.A. Swanson No. 1
 Location: Lsd. 1, Sec. 16, Twp. 38, Rge. 20, W 4
 Interval tested, depth, feet: 5324
 Producing Zone: Leduc (D-3)
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: June 17, 1952
 Sampled at: After Separator

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.892
 Sulphur, percent by weight: 1.69
 Saybolt Universal Viscosity:
 at 70°F., sec. 128
 at 100°F., sec. 75
 A.P.I. gravity at 60°F.: 27.1
 Pour point, °F.: -30
 Colour: Brownish Green
 Carbon residue, percent by weight: 5.8
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 752 mm. Hg.
 First drop, 19°C. (66°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	1.1	1.1)						
2.	75	167	1.5	2.6)	0.672	79.1	-			
3.	100	212	3.3	5.9	0.720	65.0	21	49.8		
4.	125	257	4.3	10.2	0.747	57.9	25	47.8		
5.	150	302	4.0	14.2	0.765	53.5	26	48.0		
6.	175	347	3.7	17.9	0.784	49.0	28	49.2		
7.	200	392	3.7	21.6	0.801	45.2	30	50.4		
8.	225	437	3.5	25.1	0.818	41.5	33	52.6		
9.	250	482	4.4	29.5	0.834	38.2	35	54.8		
10.	275	527	6.2	35.7	0.850	35.0	38	57.0		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	4.0	39.7	0.867	31.7	42	58.0	39	10
12.	225	437	5.6	45.3	0.878	29.7	43	61.8	46	30
13.	250	482	5.6	50.9	0.894	26.8	47	63.4	61	50
14.	275	527	5.3	56.2	0.910	24.0	52	64.6	100	70
15.	300	572	6.6	62.8	0.926	21.3	56	67.2	221	85
Residuum			36.1	98.9	0.999	10.1				

Carbon residue of residuum: 14.4%

Carbon residue of crude: 5.8%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	5.9	0.699	70.9	
Total gasoline and naphtha	21.6	0.753	56.4	
Kerosine distillate	3.5	0.818	41.5	
Gas oil	18.8	0.856	33.8	
Nonviscous lubricating distillate	9.7	0.882-0.910	28.9-24.0	50-100
Medium lubricating distillate	4.9	0.910-0.923	24.0-21.8	100-200
Viscous lubricating distillate	4.3	0.923-0.935	21.8-19.8	Above 200
Residuum	36.1	0.999	10.1	
Distillation loss	1.1			

Remarks: The sample as received contained 0.4% by vol. water and sediment (by centrifuge) and 11 lb. salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 1098-52

FIELD: Stettler

POOL:

ZONE: Camrose (D-2)

Well Name: Skow Unit No. 11
 Location: Lsd. 11, Sec. 15, Twp. 38, Rge. 20, W 4
 Interval tested, depth, feet: 5138-5215
 Producing Zone: Camrose (D-2)
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: June 17, 1952
 Sampled at: Tank

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.875
 Sulphur, percent by weight: 1.28
 Saybolt Universal Viscosity:
 at 70°F., sec. 174
 at 100°F., sec. 91
 A.P.I. gravity at 60°F.: 30.2
 Pour point, °F.: -5
 Colour: Brownish Green
 Carbon residue, percent by weight: 4.6
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 746 mm. Hg.
 First drop, 26°C. (79°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	2.3	2.3)						
2.	75	167	2.7	5.0)	0.678	77.2	-	-		
3.	100	212	3.7	8.7	0.725	63.7	24	49.8		
4.	125	257	5.1	13.8	0.751	56.9	27	47.8		
5.	150	302	4.1	17.9	0.769	52.5	28	48.4		
6.	175	347	3.8	21.7	0.786	48.5	29	50.4		
7.	200	392	3.3	25.0	0.802	44.9	31	57.0		
8.	225	437	4.1	29.1	0.818	41.5	33	55.4		
9.	250	482	4.3	33.4	0.832	38.6	34	58.5		
10.	275	527	6.4	39.8	0.848	35.4	37	62.2		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	3.1	42.9	0.863	32.5	40	-	41	15
12.	225	437	3.7	46.6	0.872	30.8	40	67.9	46	30
13.	250	482	5.3	51.9	0.884	28.6	43	69.0	58	50
14.	275	527	5.2	57.1	0.896	26.4	45	70.1	89	65
15.	300	572	6.6	63.7	0.909	24.2	48	74.0	183	85
Residuum			36.3	100.0	0.963	15.4				

Carbon residue of residuum: 11.4%

Carbon residue of crude: 4.6%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	8.7	0.698	71.2	
Total gasoline and naphtha	25.0	0.748	57.7	
Kerosine distillate	4.1	0.818	41.5	
Gas oil	17.1	0.851	34.8	
Nonviscous lubricating distillate	9.0	0.876-0.898	30.0-26.1	50-100
Medium lubricating distillate	6.2	0.898-0.911	26.1-23.8	100-200
Viscous lubricating distillate	2.3	0.911-0.916	23.8-23.0	Above 200
Residuum	36.3	0.963	15.4	
Distillation loss	0.0			

Remarks: The sample as received contained 0.3% by vol. water and sediment (by centrifuge) and 24 lb. salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 1846-52

FIELD: Stettler

POOL:

ZONE: Blairmore

Well Name: Casagama No. 1
 Location: Lsd. 5, Sec. 7, Twp. 39, Rge. 19, W 4
 Interval tested, depth, feet: 4209-4224
 Producing Zone: Blairmore
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: Sept. 15, 1952
 Sampled at: Tank

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.878
 Sulphur, percent by weight: 1.32
 Saybolt Universal Viscosity:
 at 70°F., sec. 90
 at 100°F., sec. 59
 A.P.I. gravity at 60°F.: 29.7
 Pour point, °F.: 35
 Colour: Brownish Green
 Carbon residue, percent by weight: 5.0
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 760 mm. Hg.
 First drop, 30°C. (86°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	0.6	0.6)						
2.	75	167	1.2	1.8)	0.668	80.3	-	-		
3.	100	212	2.2	4.0	0.706	68.9	15	56.2		
4.	125	257	5.1	9.1	0.736	60.8	20	52.8		
5.	150	302	5.1	14.2	0.759	54.9	23	51.6		
6.	175	347	4.5	18.7	0.776	50.9	24	52.6		
7.	200	392	4.6	23.3	0.792	47.2	26	56.0		
8.	225	437	4.6	27.9	0.806	44.1	27	60.4		
9.	250	482	4.7	32.6	0.823	40.4	30	64.5		
10.	275	527	7.3	39.9	0.842	36.6	34	66.8		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	4.3	44.2	0.862	32.7	39	67.5	40	10
12.	225	437	5.0	49.2	0.869	31.3	39	70.9	46	30
13.	250	482	6.8	56.0	0.880	29.3	41	74.2	58	50
14.	275	527	5.9	61.9	0.895	26.6	45	77.0	86	70
15.	300	572	6.8	68.7	0.908	24.3	48	81.1	168	85
Residuum			31.3	100.0	0.993	11.0				

Carbon residue of residuum: 14.1%

Carbon residue of crude: 5.0%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	4.0	0.689	73.9	
Total gasoline and naphtha	23.3	0.752	56.7	
Kerosene distillate	9.3	0.815	42.1	
Gas oil	16.0	0.855	34.0	
Nonviscous lubricating distillate	11.5	0.873-0.897	30.6-26.3	50-100
Medium lubricating distillate	7.6	0.897-0.913	26.3-23.5	100-200
Viscous lubricating distillate	1.0	0.913-0.915	23.5-23.1	Above 200
Residuum	31.3	0.993	11.0	
Distillation loss	0.0			

Remarks: The sample as received contained 0.4% by vol. water and sediment (by centrifuge) and 77 lb. salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 1847-52

FIELD: Stettler

POOL:

ZONE: Blairmore

Well Name: Cordasun Casagama No. 2
 Location: Lsd. 6, Sec. 7, Twp. 39, Rge. 19, W 4
 Interval tested, depth, feet: 4226-4241
 Producing Zone: Blairmore
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: Sept. 15, 1952
 Sampled at: Tank

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.877
 Sulphur, percent by weight: 1.34
 Saybolt Universal Viscosity:
 at 70°F., sec. 86
 at 100°F., sec. 58
 A.P.I. gravity at 60°F.: 29.9
 Pour point, °F.: 35
 Colour: Brownish Green
 Carbon residue, percent by weight: 4.7
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 760 mm. Hg.
 First drop, 29°C. (84°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	0.7	0.7						
2.	75	167	0.8	1.5	0.657	83.9	-			
3.	100	212	2.6	4.1	0.705	69.2	14	58.0		
4.	125	257	4.3	8.4	0.733	61.5	18	53.3		
5.	150	302	4.7	13.1	0.754	56.2	21	51.4		
6.	175	347	4.5	17.6	0.773	51.6	23	52.0		
7.	200	392	4.3	21.9	0.789	47.8	24	55.4		
8.	225	437	5.1	27.0	0.802	44.9	25	60.1		
9.	250	482	4.9	31.9	0.820	41.1	28	64.1		
10.	275	527	6.5	38.4	0.838	37.4	32	66.6		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	4.3	42.7	0.861	32.8	39	66.6	39	5
12.	225	437	6.4	49.1	0.869	31.3	39	70.4	45	30
13.	250	482	6.0	55.1	0.881	29.1	41	74.0	57	50
14.	275	527	5.7	60.8	0.895	26.6	45	77.0	84	65
15.	300	572	7.3	68.1	0.905	24.9	46	80.2	152	80
Residuum			31.7	99.8	0.995	10.7				

Carbon residue of residuum: 13.1%

Carbon residue of crude: 4.7%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	4.1	0.687	74.5	
Total gasoline and naphtha	21.9	0.748	57.7	
Kerosine distillate	10.0	0.811	43.0	
Gas oil	16.5	0.854	34.2	
Nonviscous lubricating distillate	11.1	0.874-0.897	30.4-26.3	50-100
Medium lubricating distillate	8.6	0.897-0.911	26.3-23.8	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	31.7	0.995	10.7	
Distillation loss	0.2			

Remarks: The sample as received contained 0.2% by vol. water and sediment (by centrifuge) and 4 lb. salt (as NaCl) per 1000 bbl.

C R U D E P E T R O L E U M A N A L Y S I S

Laboratory Number 340-53

FIELD: Stettler

POOL:

ZONE: Blairmore

Well Name: Casagama No. 1
Location: Lsd. 5, Sec. 7, Twp. 39, Rge. 19, W 4
Interval tested, depth, feet: 4209-4224
Producing Zone: Blairmore
Geological Age: Lower Cretaceous

Province: Alberta
Sample From: Imperial Oil Ltd.
Date Sampled: Dec. 2, 1949
Sampled at: Separator

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.892
Sulphur, percent by weight: 1.17
Saybolt Universal Viscosity:
at 70°F., sec. 143
at 100°F., sec. 78

A.P.I. gravity at 60°F.: 27.1
Pour point, °F.: 30
Colour: Greenish Black
Carbon residue, percent by weight: -
(Conradson)

Remarks: The sample as received contained 0.3% by vol. water and sediment (by centrifuge) and 8 lb. salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 353-53

FIELD: Stettler

POOL:

ZONE: Camrose (D-2)

Well Name: Trans Empire Stettler No. 1
 Location: Lsd. 4, Sec. 27, Twp. 38, Rge. 20, W 4
 Interval tested, depth, feet: 5204-5228
 Producing Zone: Camrose (D-2)
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: Imperial Oil Ltd.
 Date Sampled: December 2, 1949
 Sampled at: Separator

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.886
 Sulphur, percent by weight: 1.17
 Saybolt Universal Viscosity:
 at 70°F., sec. 106
 at 100°F., sec. 65

A.P.I. gravity at 60°F.: 28.2
 Pour point, °F.: 30
 Colour: Brownish Green
 Carbon residue, percent by weight: 4.7
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 761 mm. Hg.
 First drop, 29°C. (84°F.)

Frac- tion No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Corre- lation Index	Aniline Point, °C.	Visc. S.U. 100°F.	Cloud Test, °F.	Refractive Index 20°C.
	°C.	°F.									
1.	50	122	1.7	1.7	0.644	88.2	-				
2.	75	167	1.7	3.4	0.671	79.4	8				1.3971
3.	100	212	3.3	6.7	0.716	66.1	19	49.4			1.4039
4.	125	357	4.7	11.4	0.746	58.2	25	47.2			1.4150
5.	150	302	4.5	15.9	0.766	53.2	27	48.2			1.4253
6.	175	347	3.5	19.4	0.783	49.2	28	49.8			1.4344
7.	200	392	3.7	23.1	0.798	45.8	29	52.0			1.4432
8.	225	437	4.3	27.4	0.816	41.9	32	55.2			1.4527
9.	250	482	4.0	31.4	0.830	39.0	33	58.0			1.4609
10.	275	527	6.0	37.4	0.845	36.0	35	61.8			1.4692

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	3.5	40.9	0.861	32.8	39	63.2	39	15	1.4782
12.	225	437	5.1	46.0	0.869	31.3	39	66.6	49	35	1.4835
13.	250	482	4.8	50.8	0.881	29.1	41	69.8	57	50	1.4909
14.	275	527	4.9	55.7	0.898	26.1	46	71.2	85	65	1.4991
15.	300	572	6.0	61.7	0.907	24.5	47	73.6	166	85	1.5102
Resi- duum			37.1	98.8	1.001	9.9					

Carbon residue of residuum: 11.2%

Carbon residue of crude: 4.7%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	6.7	0.686	74.8	
Total gasoline and naphtha	23.1	0.747	57.9	
Kerosine distillate	4.3	0.816	41.9	
Gas oil	16.7	0.849	35.2	
Nonviscous lubricating distillate	10.1	0.871-0.900	31.0-25.7	50-100
Medium lubricating distillate	6.8	0.900-0.910	25.7-24.0	100-200
Viscous lubricating distillate	0.7	0.910-0.912	24.0-23.6	Above 200
Residuum	37.1	1.001	9.9	
Distillation loss	1.2			

Remarks: The sample as received contained 0.24% by vol. water and sediment (by centrifuge) and 13 lb. salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 349-53

FIELD: Stettler

POOL:

ZONE: Leduc (D-3)

Well Name: N.J. Ellis No. 4
 Location: Lsd. 4, Sec. 10, Twp. 38, Rge. 20, W 4
 Interval tested, depth, feet: 5335-5340
 Producing Zone: Leduc (D-3)
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: Imperial Oil Ltd.
 Date Sampled: December 1, 1949
 Sampled at: Separator

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.894
 Sulphur, percent by weight: 1.58
 Saybolt Universal Viscosity:
 at 70°F., sec. 102
 at 100°F., sec. 65

A.P.I. gravity at 60°F.: 26.8
 Pour point, °F.: 20
 Colour: Brownish Green
 Carbon residue, percent by weight: 6.2
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 755 mm. Hg.
 First drop, 26°C. (79°F.)

Frac- tion No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Corre- lation Index	Aniline Point, °C.	Visc. S.U. 100°F.	Cloud Test, °F.	Refractive Index 20°C.
	°C.	°F.									
1.	50	122	1.7	1.7	0.639	89.9	-	-			
2.	75	167	2.2	3.9	0.692	73.0	18	-			1.3913
3.	100	212	3.4	7.3	0.722	64.5	22	50.2			1.4057
4.	125	257	4.5	11.8	0.748	57.7	26	48.2			1.4157
5.	150	302	4.2	16.0	0.767	53.0	27	48.5			1.4263
6.	175	347	3.7	19.7	0.786	48.5	29	49.1			1.4367
7.	200	392	3.7	23.4	0.804	44.5	32	50.3			1.4462
8.	225	437	4.1	27.5	0.821	40.8	34	52.9			1.4561
9.	250	482	4.9	32.4	0.836	37.8	36	55.2			1.4652
10.	275	527	6.0	38.4	0.854	34.2	40	57.4			1.4755

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	3.5	41.9	0.872	30.8	44	57.5	40	15	1.4848
12.	225	437	4.0	45.9	0.884	28.6	46	-	48	-	1.4910
13.	250	482	6.4	52.3	0.895	26.6	48	63.4	62	55	1.4988
14.	275	527	4.1	56.4	0.910	24.0	52	64.1	94	70	1.5078
15.	300	572	7.6	64.0	0.926	21.3	56	66.2	197	90	1.5189
Resi- duum			35.9	99.9	1.011	8.5					

Carbon residue of residuum: 15.3%

Carbon residue of crude: 6.2%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	7.3	0.694	72.4	
Total gasoline and naphtha	23.4	0.749	57.4	
Kerosine distillate	4.1	0.821	40.8	
Gas oil	17.1	0.857	33.6	
Nonviscous lubricating distillate	10.1	0.885-0.911	28.4-23.8	50-100
Medium lubricating distillate	5.7	0.911-0.927	23.8-21.1	100-200
Viscous lubricating distillate	3.6	0.927-0.937	21.1-19.5	Above 200
Residuum	35.9	1.011	8.5	
Distillation loss	0.1			

Remarks: The sample as received contained 0.3% by vol. water and sediment (by centrifuge) and 18 lb. salt (as NaCl) per 1000 bbl.

OIL FIELD DATA

Field and Pool: Stettler South, D-2

Location: Twp 37, Rge 20, W 4 M

DISCOVERY DETAILS

Method: Reflection seismograph, structure test hole program, and subsurface geology

Well: Name: B.A. CPR Anderson 7, Lsd 7-27-37-20 W 4

Completed: February 19, 1951

Treatment: Acid

Initial Potential: 76 BOPD

GEOLOGY

Producing Zone(s): Nisku formation, Winterburn group, U. Devonian
Leduc formation, Woodbend group, U. Devonian

Other Shows: None

Trap Type: Structural - Stratigraphic. Draping over the underlying Leduc bioherm with variable porosity throughout Nisku reservoir.

Lithology: Dense to finely crystalline tan and dolomite vugs predominate.
Few fractures.

Maximum Reservoir Thickness: 138'

Regional Setting: Located in Central portion of Upper Devonian Ireton basin, 15 miles SW of Bashaw reef complex.

Deepest Formation Penetrated: Cooking Lake (CPR Anderson No. 7)

DEVELOPMENT DATA

Total Wells: Completed Oil: 6

Producing Oil: 6

Well Spacing: 40 Acres

Logging Practice: Induction E-log: surface casing to D-1 (Wabamun). Gamma-Sonic D-1 to total depth.

Completion Practice: 300' to 600' surface casing, 5 1/2" to 7" production string - selective perforations based on structural elevations of well and porosity development; some open hole completions. Acid generally required.

RESERVOIR DATA

Type of Drive: Limited water drive and solution gas drive

Estimated Oil in Place: 12,497,000 S.T.bbls (681 bbls/acre-foot)

Estimated Recoverable Oil: 3,124,000 S.T.bbls (170 bbls/acre-foot)

Oil Zone Thickness: Average: 49.2'

Gas Zone Thickness: None

Porosity: 11.0%. Permeability: 100 md

Area: 710 Acres

Oil Characteristics: Gravity: 30.2 °API. Sulphur: 1.9%

Initial Solution GOR: 333 cu ft/bbl

Base: Asphalt

Pressure Maintenance or Secondary Recovery: None

PRODUCTION

Economic Allowance: Present: 28 BOPD. Operating: 28 BOPD

Market Outlet: Britamoil pipeline to Edmonton terminal

CRUDE PETROLEUM ANALYSIS

Laboratory Number 444-57

FIELD: Stettler South

POOL:

ZONE:

Well Name: CPR Anderson No. 6
 Location: Lsd. 6, Sec. 27, Twp. 37, Rge. 20, W 4
 Interval tested, depth, feet: 5409-5411
 Producing Zone: Leduc D-3
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: D.E.M.R.

Date Sampled: December 3, 1957
 Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 1.024
 Sulphur, percent by weight: 2.53
 Saybolt Universal Viscosity
 at 100°F., sec. 149
 at 130°F., sec. 87

A.P.I. gravity at 60°F.: 6.7
 Pour point, °F.: 45
 Colour: Black
 Carbon residue, percent by weight: 21.2
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 756 mm. Hg.
 First drop, 70°C. (158°F.)

Frac- tion No.	Cut at °F.	Sum Per Cent	Specific Gravity 60/60°F.	Degrees A.P.I. °60 F.	Corre- lation Index	Aniline Point, °C.	Visc. S.U. 100°F.	Cloud Test, °F.	Refractive Index @ 20°C.	Dispersion, ($n_D - n_C$) 10 ⁴
1.	122									
2.	167									
3.	212	2.3	0.737	60.5	-	49.0				
4.	257	5.1	0.760	54.7	31	51.0				
5.	302	6.9	0.776	50.9	31	-				
6.	347	9.7	0.791	47.4	32	48.0				
7.	392	12.7	0.807	43.8	33	48.5				
8.	437	16.1	0.822	40.6	34	49.5				
9.	482	19.8	0.837	37.6	36	52.0				
10.	527	25.7	0.855	34.0	40	53.9				

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	392	28.2	0.875	30.2	46	55.0	39	15		
12.	437	34.6	0.885	28.4	46	56.6	45	35		
13.	482	39.9	0.899	25.9	50	58.1	60	55		
14.	527	44.7	0.913	23.5	53	60.0	91	75		
15.	572	52.3	0.929	20.8	58	61.8	197	90		
Resi- duum		99.4	1.203							

Carbon residue of residuum: 38.3%

Carbon residue of crude: 21.2%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	2.3	0.737	60.5	
Total gasoline and naphtha	12.7	0.776	50.9	
Kerosine distillate	3.4	0.822	40.6	
Gas oil	17.4	0.863	32.5	Below 50
Nonviscous lubricating distillate	9.4	0.890-0.914	27.5-23.3	50-100
Medium lubricating distillate	9.4	0.914-0.939	23.3-19.2	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	47.1	1.203		
Distillation loss	0.6			

Remarks: Water content of original sample was 66%.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 457-57

FIELD: Stettler South

POOL:

ZONE: Nisku

Well Name: Dannewald No. 2
 Location: Lsd. 2, Sec. 22, Twp. 37, Rge. 20, W 4
 Interval tested, depth, feet: 5251'-5258'
 Producing Zone: Nisku
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: D.E.M.R.
 Date Sampled: December 3, 1957
 Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.872	A.P.I. gravity at 60°F.: 30.8
Sulphur, percent by weight: 1.44	Pour Point, °F.: 35
Saybolt Universal Viscosity:	Colour: Greenish Black
at 100°F., sec. 54	Carbon residue, percent by weight: 4.8
at 70°F., sec. 72	(Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 760 mm. Hg. First drop, 30°C. (86°F.)										
Fraction No.	Cut at °F.	Sum Per Cent	Specific Gravity 60/60°F.	Degrees A.P.I. °60 F.	Correlation Index	Aniline Point, °C.	Visc. S.U. 100°F.	Cloud Test, °F.	Refractive Index @ 20°C.	Dispersion _D (N _F -N _C) 10 ⁴
1.	122	2.0	0.662	82.3	-	-				
2.	167	4.1	0.687	74.5	16	52.7				
3.	212	7.6	0.722	64.5	22	48.7				
4.	257	12.1	0.750	57.2	27	46.2				
5.	302	16.9	0.768	52.7	27	47.3				
6.	347	20.6	0.787	48.3	30	49.0				
7.	392	24.0	0.804	44.5	32	51.6				
8.	437	27.9	0.818	41.5	33	54.1				
9.	482	31.2	0.831	38.8	33	56.9				
10.	527	37.4	0.845	36.0	35	57.9				
Stage 2 - Distillation continued at 40 mm. Hg. pressure										
11.	392	40.8	0.859	33.2	33	59.6	39	10		
12.	437	45.7	0.870	31.1	39	65.3	46	30		
13.	482	50.2	0.883	28.8	42	65.8	58	50		
14.	527	54.7	0.896	26.4	45	67.5	84	65		
15.	572	61.6	0.911	23.8	49	70.5	179	80		
Residuum		96.0	0.988	11.7						
Carbon residue of residuum: 12.3%					Carbon residue of crude: 4.8%					

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	7.6	0.697	71.5	
Total gasoline and naphtha	24.0	0.750	57.2	
Kerosine distillate	3.9	0.818	41.5	
Gas oil	17.0	0.851	34.8	Below 50
Nonviscous lubricating distillate	8.5	0.875-0.898	30.2-26.1	50-100
Medium lubricating distillate	6.2	0.898-0.914	26.1-23.3	100-200
Viscous lubricating distillate	2.0	0.914-0.920	23.3-22.3	Above 200
Residuum	34.4	0.988	11.7	
Distillation loss	4.0			

CRUDE PETROLEUM ANALYSIS

Laboratory Number 339-53.

FIELD: Stony Plain

POOL:

ZONE: Leduc (D-3)

Well Name: Imperial Stony Plain No. 1
 Location: Lsd. 8, Sec. 21, Twp. 52, Rge. 26, W 4
 Interval tested, depth, feet: 5120-5137
 Producing Zone: Leduc (D-3)
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: Imperial Oil Ltd.
 Date Sampled: August 22, 1950
 Sampled at: Tank

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.841
 Sulphur, percent by weight: 0.10
 Saybolt Universal Viscosity:
 at 100°F., sec. 39

A.P.I. gravity at 60°F.: 36.8
 Pour point, °F.: 15
 Colour: Dark Green
 Carbon residue, percent by weight: 1.6
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 756 mm. Hg.
 First drop, 27°C. (81°F.)

Frac- tion No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Corre- lation Index	Aniline Point, °C.	Visc. S.U. 100°F.	Cloud Test, °F.	Refractive Index 20°C.
	°C.	°F.									
1.	50	122	1.5	1.5)							
2.	75	167	2.5	4.0)	0.673	78.8	-	-			1.3853
3.	100	212	5.1	9.1	0.722	64.5	22	52.2			1.4114
4.	125	257	6.6	15.7	0.747	57.9	25	51.5			1.4149
5.	150	302	6.0	21.7	0.766	53.2	27	51.0			1.4246
6.	175	347	5.1	26.8	0.786	48.5	29	50.0			1.4359
7.	200	392	4.9	31.7	0.803	44.7	31	51.0			1.4456
8.	225	437	5.2	36.9	0.816	41.9	32	55.9			1.4531
9.	250	482	5.5	42.4	0.829	39.2	32	61.0			1.4594
10.	275	527	6.4	48.8	0.840	37.0	33	66.8			1.4660

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	3.3	52.1	0.852	34.6	35	71.4	39	10	1.4732
12.	225	437	5.1	57.2	0.858	33.4	34	75.0	45	25	1.4762
13.	250	482	5.1	62.3	0.868	31.5	35	78.8	54	45	1.4818
14.	275	527	4.9	67.2	0.880	29.3	38	83.5	77	65	1.4884
15.	300	572	5.8	73.0	0.889	27.7	39	85.5	138	80	1.4969
Resi- dium			25.7	98.7	0.948	17.8					

Carbon residue of residuum: 5.4%

Carbon residue of crude: 1.6%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	9.1	0.700	70.6	
Total gasoline and naphtha	31.7	0.752	56.7	
Kerosine distillate	5.2	0.816	41.9	
Gas oil	20.5	0.844	36.2	
Nonviscous lubricating distillate	9.4	0.863-0.883	32.5-28.8	50-100
Medium lubricating distillate	6.2	0.883-0.894	28.8-26.8	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	25.7	0.948	17.8	
Distillation loss	1.3			

Remarks: The sample as received contained 0.3% by vol. water and sediment (by centrifuge) and 116 lb. salt (as NaCl) per 1000 bbl.

OIL FIELD DATA

Field and Pool: Sturgeon Lake - D-3

Location: Twp(s) 71 and 72, Rge(s) 23 and 24, W 5 M

DISCOVERY DETAILS

Method: Geophysical

Well: Name: Amerada Crown 'O' 7-32-71-23

Completed: October 18, 1952

Perforated: 8970'-8976'; 8955'-8918'

Treatment: 10 bbls - 15% HCl

Initial Potential: 232 bpd

GEOLOGY

Producing Zone(s): D-3 Reef

Other Shows: Triassic

Trap Type: Stratigraphic (Reef build-up)

Lithology: Reefoid Dolomite

Maximum Reservoir Thickness: 142

Regional Setting: On east edge of Sturgeon Reef

Deepest Formation Penetrated: Cambrian

DEVELOPMENT DATA

Total Wells: Completed Oil: 20. Dry and Abandoned: 5

Producing Oil: 20

Injection or Disposal: Water: 1

Well Spacing: 80 Acres. Pattern: Odd Lsds.

Logging Practice: E Log - G.R. Log through casing; Sonic
Completion Practice: Perforate and acidize if necessary

RESERVOIR DATA

Type of Drive: Water

Estimated Oil in Place: 46,000,000 S.T.bbls (174 bbls/acre-foot)

Estimated Recoverable Oil: 23,000,000 S.T.bbls (87 bbls/acre-foot)

Oil Zone Thickness: Maximum: 142'. Average: 71'

Gas Zone Thickness: None

Porosity: 4.39%. Permeability: 1,336 md

Area: 3,722 Acres

Oil Characteristics: Gravity: 38 °API. Sulphur: 0.21% weight

Pour Point: Below 30°F. Initial Solution GOR: 1,134

Pressure Maintenance or Secondary Recovery: Nil

PRODUCTION

MPR: 4,500 BOPD (Pool M.P.R.)

Economic Allowance: Present: 40. Operating: 40

Market Outlet: Peace River Pipeline

CRUDE PETROLEUM ANALYSIS

Laboratory Number 447-54

FIELD: Sturgeon Lake

POOL:

ZONE: Woodbend

Well Name: Amerada Crown "O" No. 7-6
 Location: Lsd. 7, Sec. 6, Twp. 72, Rge. 23, W 5
 Interval tested, depth, feet: 8865-8907
 Producing Zone: Woodbend
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: Northern Affairs
 and Nat. Res.
 Date Sampled: February 20, 1954
 Sampled at: Tank

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.835
 Sulphur, percent by weight: 0.36
 Saybolt Universal Viscosity:
 at 100°F., sec. 36
 A.P.I. gravity at 60°F.: 38.0
 Pour point, °F.: 10
 Colour: Brownish Green
 Carbon residue, percent by weight: 1.5
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 745 mm. Hg.
 First drop, 24°C. (75°F.)

Frac- tion No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Corre- lation Index	Aniline Point, °C.	Visc. S.U. 100°F.	Cloud Test, °F.	Refractive Index 20°C.
	°C.	°F.									
1.	50	122	3.3	3.3	0.650	86.2	-	-			1.3821
2.	75	167	3.1	6.4	0.682	76.0	13	56.7			-
3.	100	212	5.3	11.7	0.728	62.9	25	49.6			1.4046
4.	125	257	8.4	20.1	0.754	56.2	28	47.5			1.4170
5.	150	302	5.8	25.9	0.774	51.3	30	47.5			1.4274
6.	175	347	5.6	31.5	0.792	47.2	32	48.1			1.4378
7.	200	392	4.6	36.1	0.810	43.2	34	51.5			1.4480
8.	225	437	5.1	41.2	0.823	40.4	35	55.9			1.4556
9.	250	482	5.2	46.4	0.836	37.8	36	59.5			1.4621
10.	275	527	6.4	52.8	0.847	35.6	36	65.2			1.4703

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	3.1	55.9	0.861	32.8	39	67.9	40	10	1.4780
12.	225	437	5.2	61.1	0.867	31.7	38	71.6	46	30	1.4823
13.	250	482	5.2	66.3	0.880	29.3	41	75.0	59	45	1.4894
14.	275	527	4.7	71.0	0.891	27.3	43	77.2	84	60	1.4961
15.	300	572	5.5	76.5	0.903	25.2	46	81.5	163	85	-
Resi- duum			20.6	97.1	0.946	18.1					

Carbon residue of residuum: 6.5%

Carbon residue of crude: 1.5%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	11.7	0.694	72.4	
Total gasoline and naphtha	36.1	0.751	56.9	
Kerosine distillate	5.1	0.823	40.4	
Gas oil	19.0	0.851	34.8	
Nonviscous lubricating distillate	9.5	0.871-0.894	31.0-26.8	50-100
Medium lubricating distillate	6.5	0.894-0.909	26.8-24.2	100-200
Viscous lubricating distillate	0.3	0.909-0.910	24.2-24.0	Above 200
Residuum	20.6	0.946	18.1	
Distillation loss	2.9			

Remarks: The sample as received contained 0.2% by vol. water and sediment (by centrifuge) and no salt (as NaCl) per 1000 bbl.

OIL FIELD DATA

Field and Pool: Sturgeon Lake South, D-3

Location: Twp(s) 68 & 69, Rge(s) 21 & 22, W 5 M

DISCOVERY DETAILS

Method: Seismic Reflection Survey, Subsurface Geology

Well: Name: Amerada - H.B. - Crown 5-19-69-22

Completed: March 16, 1953

Perforated: 8710'-8728'. 8728'-8740'

Treatment: None

Initial Potential: 1,860 BOPD thru 29/64" choke

GEOLOGY

Producing Zone(s): Leduc (D-3), Triassic & Wabamun

Other Shows: Nisku & Cadomin

Trap Type: Stratigraphic

Lithology: Reef Dolomite

Maximum Reservoir Thickness: 1,100' gross

Regional Setting: Located on the Updip Edge of a Large Isolated Reef on the
Western Edge of the Upper Devonian Woodbend Shale Basin

Deepest Formation Penetrated: Precambrian (HB-Union-Liberal St. Lake S.
7-33-68-22 W 5 M)

DEVELOPMENT DATA

Total Wells: Completed Oil: 128. Dry and Abandoned: 16

Producing Oil: 110. Suspended Oil: 18

Injection or Disposal: Water: 3. Gas: Nil

Well Spacing: 80 Acres. Pattern: Wells located in Odd Numbered Lsd's

Logging Practice: Electric Log & Microlog Run to Total Depth

Completion Practice: 5 1/2" production casing set through the oil/water interface on most wells

RESERVOIR DATA

Type of Drive: Partial Water Drive

Estimated Oil in Place: 262,900,000 S.T.bbls (209 bbls/acre-foot)

Estimated Recoverable Oil: 144,600,000 S.T.bbls (115 bbls/acre-foot)

Oil Zone Thickness: Maximum: 220'. Average: 114'

Gas Zone Thickness: Maximum: 100'

Porosity: 4.8%. Permeability: 465 md

Area: 15,080 Acres

Oil Characteristics: Gravity: 37.7 °API. Sulphur: 0.50%

Pour Point: +10°F. Initial Solution GOR: 936 cu ft/bbl

Pressure Maintenance or Secondary Recovery: None

PRODUCTION

MPR: (Pool) 33,000 BOPD

Economic Allowance: Present: 39 BOPD. Operating: 39 BOPD

Market Outlet: Via Peace River Pipeline to Edson Terminal

Bibliographical References: Producers Records, Reservoir Engineering Digest, and "Oil Fields of Alberta" by The Alberta Society of Petroleum Geologists.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 129-56

FIELD: Sturgeon Lake South

POOL:

ZONE: Leduc (D-3)

Well Name: Shell Sturgeon Lake "SA" No. 9-16
 Location: Lsd. 9, Sec. 16, Twp. 69, Rge. 22, W 5
 Interval tested, depth, feet: 8557-8572
 Producing Zone: Leduc (D-3)
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: April 5, 1956
 Sampled at: After separator

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.834
 Sulphur, percent by weight: 0.37
 Saybolt Universal Viscosity:
 at 100°F., sec. 37

A.P.I. gravity at 60°F.: 38.2
 Pour point, °F.: 20
 Colour: Brownish Green
 Carbon residue, percent by weight: 1.5
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 750 mm. Hg.
 First drop, 25°C. (77°F.)

Frac- tion No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Corre- lation Index	Aniline Point, °C.	Visc. S.U. 100°F.	Cloud Test, °F.	Refractive Index 20°C.
	°C.	°F.									
1.	50	122	2.2	2.2	0.657	83.9	-	-			-
2.	75	167	2.8	5.0	0.677	77.5	11	55.6			1.3852
3.	100	212	5.7	10.7	0.719	65.3	21	50.2			1.4030
4.	125	257	6.7	17.4	0.747	57.9	25	48.0			1.4149
5.	150	302	6.3	23.7	0.768	52.7	27	48.6			1.4260
6.	175	347	5.3	29.0	0.783	49.2	28	49.7			1.4361
7.	200	392	4.7	33.7	0.800	45.4	30	51.3			1.4450
8.	225	437	4.7	38.4	0.815	42.1	31	55.0			1.4533
9.	250	482	5.5	43.9	0.828	39.4	32	59.6			1.4608
10.	275	527	6.7	50.6	0.840	37.0	33	64.5			1.4680

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	3.9	54.5	0.856	33.8	37	68.4	40	5	1.4771
12.	225	437	5.2	59.7	0.864	32.3	37	72.5	45	25	1.4813
13.	250	482	5.7	65.4	0.877	29.8	39	76.5	60	50	1.4890
14.	275	527	4.3	69.7	0.889	27.7	42	79.4	85	65	1.4949
15.	300	572	6.2	75.9	0.901	25.6	45	83.5	152	85	1.5032
Residuum			20.6	96.5	0.954	16.8					

Carbon residue of residuum: 6.4%

Carbon residue of crude: 1.5%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	10.7	0.695	72.1	
Total gasoline and naphtha	33.7	0.748	57.7	
Kerosine distillate	4.7	0.815	42.1	
Gas oil	20.5	0.845	36.0	
Nonviscous lubricating distillate	9.8	0.868-0.892	31.5-27.1	50-100
Medium lubricating distillate	7.2	0.892-0.908	27.1-24.3	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	20.6	0.954	16.8	
Distillation loss	3.5			

Remarks: The sample as received contained no water (A.S.T.M.) and no salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 130-56

FIELD: Sturgeon Lake South

POOL:

ZONE: Triassic

Well Name: Shell South Sturgeon Lake "SB" No. 7-12
 Location: Lsd. 7, Sec. 12, Twp. 69, Rge. 22, W 5
 Interval tested, depth, feet: 4925-4935
 Producing Zone: Triassic
 Geological Age: Triassic

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: April 6, 1956
 Sampled at: Before Separator

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.834
 Sulphur, percent by weight: 1.36
 Saybolt Universal Viscosity:
 at 100°F., sec. 38
 A.P.I. gravity at 60°F.: 38.2
 Pour point, °F.: -5
 Colour: Brownish Black
 Carbon residue, percent by weight: 2.5
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 755 mm. Hg. First drop, 31°C. (88°F.)										
Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	1.4	1.4	0.652	85.5	-	-		
2.	75	167	3.0	4.4	0.670	79.7	8	-		
3.	100	212	4.0	8.4	0.697	71.5	10	57.2		
4.	125	257	5.1	13.5	0.726	63.4	15	55.0		
5.	150	302	5.7	19.2	0.748	57.7	18	54.0		
6.	175	347	5.4	24.6	0.768	52.7	21	54.2		
7.	200	392	5.5	30.1	0.783	49.2	22	57.4		
8.	225	437	5.3	35.4	0.797	46.0	23	60.2		
9.	250	482	5.2	40.6	0.810	43.2	23	64.1		
10.	275	527	6.6	47.2	0.825	40.0	26	67.8		
Stage 2 - Distillation continued at 40 mm. Hg. pressure										
11.	200	392	3.7	50.9	0.844	36.2	31	69.6	38	15
12.	225	437	5.7	56.6	0.856	33.8	33	72.1	43	35
13.	250	482	4.8	61.4	0.870	31.1	36	75.1	52	55
14.	275	527	5.1	66.5	0.884	28.6	40	78.4	71	70
15.	300	572	5.0	71.5	0.896	36.4	42	80.2	115	85
Residuum			24.4	95.9	0.967	14.8				
Carbon residue of residuum: 8.9%			Carbon residue of crude: 2.5%							

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	8.4	0.680	76.6	
Total gasoline and naphtha	30.1	0.735	61.0	
Kerosine distillate	17.1	0.812	42.8	
Gas oil	10.6	0.853	34.4	
Nonviscous lubricating distillate	9.5	0.867-0.892	31.7-27.1	50-100
Medium lubricating distillate	4.2	0.892-0.902	27.1-25.4	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	24.4	0.967	14.8	
Distillation loss	4.1			

Remarks: The sample as received contained 5 lb. salt (as NaCl) per 1000 bbl.

OIL FIELD DATA

Field and Pool: Sundre, Rundle A (Waterflood)

Location: Twp(s) 33 & 34, Rge 5, W 5 M

DISCOVERY DETAILS

Method: Seismic Reflection Survey, Sub**surface** Geology

Well: Name: Hudson's Bay Sundre No. 1 in 1-4-34-5 W 5 M

Completed: January 29, 1955

Perforated: 9130'-9145'; 9162'-9178'; 9193'-9199'

Treatment: 1,000 Gallons Acid

Initial Potential: 2,808 BOPD

GEOLOGY

Producing Zone(s): Elkton, Basal Quartz

Other Shows: Viking

Trap Type: Stratigraphic

Lithology: Fine to Coarse Crystalline Dolomite with Minor Amounts of Crystalline Limestone

Maximum Reservoir Thickness: 119' gross

Regional Setting: Located on East Flank of Alberta Syncline along the N.W. Extension of Harmattan - Westward Ho Trend

Deepest Formation Penetrated: Leduc

DEVELOPMENT DATA

Total Wells: Completed Oil: 59. Dry and Abandoned: 4

Producing Oil: 31. Shut-in Oil: 28

Injection or Disposal: Water: 4. Gas: 1

Well Spacing: 80 Acres. Pattern: Wells in Odd-No. Lsd's

Logging Practice: E.S. Induction, Radioactivity and Micro-Caliper Log

Completion Practice: 700' Surface Casing and 5 1/2" Casing set to Total Depth in the Mississippian Shunda and perforated in the Elkton

RESERVOIR DATA

Type of Drive: Combination Gas Cap Expansion and Bottom Water Drive

Estimated Oil in Place: 80,500,000 S.T.bbls (550 bbls/acre-foot)

Estimated Recoverable Oil: 33,826,000 S.T.bbls (231 bbls/acre-foot)

Oil Zone Thickness: Maximum: 65'. Average: 31.1'

Gas Zone Thickness: Maximum: 42'

Porosity: 10.8%. Permeability: 104 md

Area: 4,408 Acres

Oil Characteristics: Gravity: 32 °API. Sulphur: 0.64%

Pour Point: -30°F. Initial Solution GOR: 790 cu ft/bbl

Pressure Maintenance or Secondary Recovery: Waterflood

PRODUCTION

MPR: (Pool) Primary: 72 BOPD. Waterflood: 101 BOPD/Well

Economic Allowance: Present: 41 BOPD. Operating: 41 BOPD

Market Outlet (pipeline): Via Rangeland to Edmonton Terminal or to Calgary Via Cremona Pipeline

Bibliographical Reference: Producers Records, The Reservoir Engineering Digest, and "Oil Fields of Alberta" by the Alberta Society of Petroleum Geologists.

SECONDARY RECOVERY

RESERVOIR DATA

- 1) Field: Sundre
- 2) Pool: Rundle "A"
- 3) Province: Alberta
- 4) Location: Twp(s) 33 & 34, Rge 5, W 5 M
- 5) Operator: Hudson's Bay
- 6) Project: #1 Unit
- 7) Reservoir: Elkton, Turner **Valley** Rundle Mississippian
- 8) Discovery Date: January 1955
- 9) Date Injection Began: December 1959
- 10) Main Structural Feature: Structural folds and stratigraphic porous carbonate, eroded.
- 11) Gas Cap: Originally: Yes. At Present: Yes
- 12) Time Required for Initial Results (months): No GOR Response to Date (April 1965)
WOR Increasing
- 13) Initial Results on Production: 3,079 BHP. 900 GOR. 0.15 WOR
- 14) Main Drive in Primary Production: Gas Cap, Water Drive
- 15) Productive Area (Acres) of Reservoir: 4,820. Of Project: 3,680
Affected by Injection: 3,680
- 16) Average Depth to Top of Pay (feet): 9,023
- 17) Average Effective Thickness (feet): 38.5
- 18) Average Porosity %: 10.4
- 19) Average Horizontal Permeability (millidarcys): 104
- 20) Connate Water (% of pore space): 15
- 21) Viscosity at Initial Reservoir Conditions (centipoises): 0.67
- 22) API Gravity: 32°
- 23) Solution Gas/Oil Ratio at Saturation Pressure (cu ft/bbl): 730
- 24) Bubble Point Pressure (psi): 3,655
- 25) Original Pressure (psi): 3,655
- 26) Reservoir Pressure at Start of Injection (psi): 3,079

- 27) Latest Reservoir Pressure: 3,080 psi (December 31, 1964)
- 28) Injection Fluid: Gas, Fresh Water
- 29) Injection Fluid Source: Casing Head Gas, Re-injection Red Deer River
- 30) System: Open
- 31) Fluid Treatment before Injection: Filtration
- 32) Injection Pattern: Line
- 33) Structural Position Injection Wells: Below WOC, Gas Cap
- 34) Distance Injection Wells to Producers (feet): 1,400 to nearest, 5,300 to farthest
- 35) Number of Injection Wells at Start: 1 Gas
- 36) Number of Injection Wells at Present: 4 (May 31, 1965)
- 37) Average Daily Injection Rate per Injection Well at Start: 1,649 Mcf
- 38) Average Daily Injection Rate per Injection Well at Present: Water: 1,037 bbls
Gas: 2,319 Mcf
(April 1965)
- 39) Average Injection Pressure at Start (psi): 2,400 (Gas)
- 40) Average Injection Pressure at Present (psi): Water: 2,150. Gas: 2,825
(April 30, 1965)
- 41) Number of Producing Wells in Project Area at Start: 36
- 42) Number of Producing Wells in Project Area at Present: 42 (May 31, 1965)
- 43) Average Production Rate in Project Area at Start (bbls/day): 3,250
- 44) Average Production Rate in Project Area at Present: 2,120 (April 30, 1965)
- 45) Original Oil in Place in Project Area (bbls); 70,100,000
- 46) Original Oil Saturation (% of pore space): 85
- 47) Primary Recovery from Project Area when Injection Started (bbls): 4,100,000
- 48) Oil Saturation at Start of Project (% of pore space): 75.9
- 49) Oil Production from Project Area from Start of Injection to Now (bbls): 4,543,243
(May 31, 1965)
- 50) Total Volume of Injected Fluids at Present: Water 2,648,085 bbls
Gas 3,407,677 Mcf (April 30, 1965)
- 51) Estimated Primary Ultimate Recovery from Project Area (bbls): 17,525,000
- 52) Estimated Increase in Ultimate Recovery from Project Area (bbls): 10,515,000
- 53) Well Spacing: 80 Acres
- 54) Oil Volume Factor (initial reservoir barrels per Stock-Tank barrel): 1.370
- 55) Remarks: Effective Aug. 1, 1965, Projects 1 & 2 will be combined. Water injection in this project commenced February 1964.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 450-57

FIELD: Sundre

POOL:

ZONE: Elkton

Well Name: H.B. Sundre 1-3-34-5
 Location: Lsd. 1, Sec. 3, Twp. 34, Rge. 5, W 5
 Interval tested, depth, feet: 9040-9043
 Producing Zone: Elkton
 Geological Age: Mississippian

Province: Alberta
 Sample From: D.E.M.R.
 Date Sampled: December 4, 1957
 Sampled at: After Separator

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.866
 Sulphur, percent by weight: 0.64
 Saybolt Universal Viscosity:
 at 100°F., sec. 47.1

A.P.I. gravity at 60°F.: 31.9
 Pour point, °F.: -25
 Colour: Greenish Brown
 Carbon residue, percent by weight: 1.6
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 753 mm. Hg.
 First drop, 30°C. (86°F.)

Frac- tion No.	Cut at °F.	Sum Per Cent	Specific Gravity 60/60°F.	Degrees A.P.I. °60 F.	Corre- lation Index	Aniline Point, °C.	Visc. S.U. 100°F.	Cloud Test, °F.	Refractive Index @ 20°C.	Dispersion ($N_D - N_C$) 10 ⁴
1.	122	0.8	0.692	73.0	-	-				
2.	167	2.7	0.712	67.2	18	51.0				
3.	212	4.9	0.744	58.7	24	40.0				
4.	257	8.9	0.768	52.7	23	33.9				
5.	302	13.9	0.787	48.3	30	32.4				
6.	347	18.2	0.801	45.1	30	38.1				
7.	392	22.2	0.812	42.8	30	44.9				
8.	437	26.7	0.818	41.5	27	53.1				
9.	482	31.7	0.836	37.8	31	59.1				
10.	527	38.4	0.852	34.6	35	63.7				

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	392	43.2	0.872	30.8	44	68.1	42	-5		
12.	437	49.4	0.879	29.5	44	71.1	48	+20		
13.	482	57.0	0.891	27.3	46	75.0	62	45		
14.	527	63.9	0.899	25.9	47	79.8	93	60		
15.	572	72.0	0.906	24.7	47	86.5	176	75		
Resi- dium		98.0	0.944	18.4						

Carbon residue of residuum: 5.8%

Carbon residue of crude: 1.6%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	4.9	0.723	64.2	
Total gasoline and naphtha	22.2	0.776	54.6	
Kerosine distillate	4.5	0.818	41.5	
Gas oil	20.4	0.858	34.4	Below 50
Nonviscous lubricating distillate	14.0	0.881-0.900	29.1-25.7	50-100
Medium lubricating distillate	9.0	0.900-0.908	25.7-24.3	100-200
Viscous lubricating distillate	1.9	0.908-0.910	24.3-24.0	Above 200
Residuum	26.0	0.944	18.4	
Distillation loss	2.0			

OIL FIELD DATA

Field and Pool: Taber Mannville A & B

Location: Twp 9, Rge(s) 16 & 17, W 4 M

DISCOVERY DETAILS

Method: Geophysical

Well: Name: Standard Oil Company of British Columbia Taber Province No. 1 in
9-18-9-16 W 4 M

Completed: June 1942

Perforated: Open Hole

Initial Potential: 250 BOPD

GEOLOGY

Producing Zone(s): Cutbank Sands - Mannville Sub-Group of Lower Cretaceous

Other Shows: Mississippian (Rundle)

Trap Type: Stratigraphic

Lithology: A basal chert pebble conglomerate zone that grades upward into a
medium grained, salt-and-pepper sand with a white clay matrix.

Maximum Reservoir Thickness: 70'

Regional Setting: Located on the east limb of the Alberta syncline and northwest
flank of the Sweetgrass Arch.

Deepest Formation Penetrated: Rundle (several wells)

DEVELOPMENT DATA

Total Wells: Completed Oil: 27. Gas: 0. Dry and Abandoned: 10

Producing Oil: 20. Suspended Oil: 3

Injection or Disposal: Water: 1. Gas: 0

Well Spacing: 40 Acres. Pattern: 1 Well/Lsd.

Logging Practice: Electric Log

Completion Practice: Approximately 150' of 10 3/4" surface casing. 7" casing cemented below sand and perforated on open hole completion.

RESERVOIR DATA

Type of Drive: Solution Gas and Edge Water

Estimated Oil in Place: 11,700,000 S.T.bbls (1195 bbls/acre-foot)

Estimated Recoverable Oil: 2,900,000 S.T.bbls (296 bbls/acre-foot)

Oil Zone Thickness: Maximum: 40. Average: 15'

Gas Zone Thickness: -

Porosity: East 21%, West 17.3%. Permeability: East 2,860 md, West 325 md

Area: 4,480 Acres

Oil Characteristics: Gravity: East 18 °API, West 22 °API. Sulphur: East 3.2% by weight
West 2.7%

Pour Point: East 20°F., West 60°F. Base: Asphalt

Pressure Maintenance or Secondary Recovery: None

PRODUCTION

MPR: BOPD/Producing Well: East 44, West 8

Economic Allowance: Present and Operating: Good Production Practice

Market Outlet: Bow River Pipeline

Bibliographical References: Coveney,, J.W., 1959, Taber (East) Field, and Taber (West) Field; Oil Fields of Alberta, 1960, p. 203-205, ASFG (The California Standard Company).

CRUDE PETROLEUM ANALYSIS

Laboratory Number 491

FIELD: Taber

POOL:

ZONE: Sunburst

Well Name: Plains No. 2
 Location: Lsd. 11, Sec. 25, Twp. 9, Rge. 17, W 4
 Interval tested, depth, feet: 3212-3219
 Producing Zone: Sunburst
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: Alberta Pet. & Nat. Gas Div.
 Date Sampled: Sept. 21, 1938
 Sampled at: Tank

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.898
 Sulphur, percent by weight: 2.15
 Saybolt Universal Viscosity:
 at 70°F., sec. 183
 at 100°F., sec. 96
 A.P.I. gravity at 60°F.: 26.1
 Pour point, °F.: -10
 Colour: Black
 Carbon residue, percent by weight: 6.3
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 775 mm. Hg.
 First drop, 25°C. (77°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	0.7	0.7	0.652	85.5	-			
2.	75	167	2.3	3.0	0.672	79.1	8			
3.	100	212	1.6	4.6	0.706	68.9	15			
4.	125	257	2.7	7.3	0.732	61.8	18			
5.	150	302	4.0	11.3	0.753	56.4	20			
6.	175	347	4.0	15.3	0.776	50.9	24			
7.	200	392	4.1	19.4	0.795	46.5	27			
8.	225	437	4.3	23.7	0.812	42.8	30			
9.	250	482	4.6	28.3	0.829	39.2	32			
10.	275	527	5.8	34.1	0.845	36.0	35			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	6.7	40.8	0.865	32.1	41		40	0
12.	225	437	5.7	46.5	0.880	29.3	44		51	30
13.	250	482	5.5	52.0	0.898	26.1	49		73	50
14.	275	527	5.2	57.2	0.910	24.0	52		119	70
15.	300	572	5.8	63.0	0.919	22.5	53		222	85
Residuum			36.2	99.2	0.933	20.2				

Carbon residue of residuum: 17.3%

Carbon residue of crude: 6.3%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	4.6	0.681	76.3	
Total gasoline and naphtha	19.4	0.747	57.9	
Kerosine distillate	4.3	0.812	42.8	
Gas oil	19.4	0.852	34.6	
Nonviscous lubricating distillate	9.3	0.879-0.905	29.5-24.9	50-100
Medium lubricating distillate	6.5	0.905-0.917	24.9-22.8	100-200
Viscous lubricating distillate	4.1	0.917-0.924	22.8-21.6	Above 200
Residuum	36.2	0.933	20.2	
Distillation loss	0.8			

Remarks: The sample as received contained 0.4% by vol. water and sediment (by centrifuge).

CRUDE PETROLEUM ANALYSIS

Laboratory Number 1678-52

FIELD: Taber

POOL:

ZONE: Ellis

Well Name: Bralsaman Taber No. 1
 Location: Lsd. 6, Sec. 19, Twp. 8, Rge. 15, W 4
 Interval tested, depth, feet: 3182-3194
 Producing Zone: Ellis
 Geological Age: Jurassic

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: August 21, 1952
 Sampled at: Tank

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.898
 Sulphur, percent by weight: 2.02
 Saybolt Universal Viscosity:
 at 70°F., sec. 219
 at 100°F., sec. 104
 at 130°F., sec. 68

A.P.I. gravity at 60°F.: 26.1
 Pour point, °F.: 20
 Colour: Brownish Black
 Carbon residue, percent by weight: 6.6
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 759 mm. Hg.
 First drop, 33°C. (91°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	0.5	0.5)						
2.	75	167	1.5	2.0)	0.681	76.3	-			
3.	100	212	2.1	4.1	0.702	70.1	13	61.0		
4.	125	257	2.3	6.4	0.729	62.6	17	60.5		
5.	150	302	3.0	9.4	0.751	56.9	19	59.9		
6.	175	347	3.5	12.9	0.771	52.0	22	60.4		
7.	200	392	3.6	16.5	0.790	47.6	25	60.4		
8.	225	437	4.2	20.7	0.808	43.6	28	61.8		
9.	250	482	4.5	25.2	0.825	40.0	31	63.8		
10.	275	527	6.7	31.9	0.842	36.6	34	65.9		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	3.7	35.6	0.860	33.0	38	66.8	40	10
12.	225	437	5.6	41.2	0.870	31.1	39	68.7	46	30
13.	250	482	6.0	47.2	0.882	28.9	42	71.2	59	50
14.	275	527	5.7	52.9	0.897	26.3	46	73.7	88	65
15.	300	572	7.3	60.2	0.909	24.2	48	77.0	170	80
Residuum			39.8	100.0	0.983	12.5				

Carbon residue of residuum: 15.0%

Carbon residue of crude: 6.6%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	4.1	0.692	73.0	
Total gasoline and naphtha	16.5	0.746	58.2	
Kerosine distillate	8.7	0.817	41.7	
Gas oil	14.9	0.855	34.0	
Nonviscous lubricating distillate	10.9	0.874-0.899	30.4-25.9	50-100
Medium lubricating distillate	8.0	0.899-0.914	25.9-23.3	100-200
Viscous lubricating distillate	1.2	0.914-0.916	23.3-23.0	Above 200
Residuum	39.8	0.983	12.5	
Distillation loss	0.0			

Remarks: The sample as received contained 1.1% by vol. water and sediment (by centrifuge) and 52 lb. salt (as NaCl) per 1000 bbl.

OIL FIELD DATA

Field and Pool: Turner Valley Madison (Mississippian) Limestone

Location: Twp(s) 18, 19, 20 & 21, Rge(s) 2 & 3, W 5 M

DISCOVERY DETAILS

Method: Oil Seepages and Surface Geology

Well:	Name:	<u>Royalite #4 (Gas)</u>	<u>Turner Valley Royalties #1</u>	<u>Home Millerville # 2</u>
Completed:		October 7, 1924	June 16, 1936	January 8, 1939
Treatment:		-	30,000 US gals 15% HCl Acid	3,000 US gals 15% HCl Acid
Initial Daily				
Potential:		22 MMcf 500 bbls naphtha	850 bbls oil	2,425 bbls oil

GEOLOGY

Producing Zone(s): Paleozoic Madison Limestone of Mississippian Age

Other Shows: In the Lower Cretaceous

Trap Type: Fault Trap

Lithology: Limestone and some Dolomite

Maximum Reservoir Thickness: Over 5000' of Relief

Regional Setting: In the Foothills of the Rocky Mountains

Deepest Formation Penetrated: Devonian

DEVELOPMENT DATA

Total Wells: Completed Oil: 316. Gas: 90. Dry and Abandoned: 34

Producing Oil: 141 (103 Shut-in). Suspended Oil: 6

Injection or Disposal: Water: 47. Gas: 7.

Well Spacing: 40 Acres. Pattern: Centre of Lsd

Logging Practice: Only the latter wells have Electrologs and Gamma-Neutron Logs

Completion Practice: Mostly barefoot - 7" production casing being cemented 10' in the Madison Limestone.

RESERVOIR DATA

Type of Drive: Gas-in-Solution

Estimated Oil in Place: 1,100,000,000 S.T.bbls (422 bbls/acre-foot)

Estimated Recoverable Oil: (Primary) 120,000,000 S.T.bbls (46 bbls/acre-foot)
(Secondary) 100,000,000 S.T.bbls (38 bbls/acre-foot)

Oil Zone Thickness: Maximum: 900'. Average: 156'

Gas Zone Thickness: Maximum: 400'

Porosity: 9%. Permeability: 2.8 md

Area: Oil - 16,700 Acres. Gas - 7,920 Acres

Oil Characteristics: Gravity: 41 °API. Sulphur: 0.3%

Pour Point: -10°F. Initial Solution GOR: 900 cu ft per bbl
at 14.4 and 60°F.

Pressure Maintenance or Secondary Recovery: Water Flood and Gas Drive.
Field is restricted by a gas quota and reservoir voidage replacement by water and gas injection.

Market Outlet: Valley Pipeline System to Calgary Refineries

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SECONDARY RECOVERY

RESERVOIR DATA

- 1) Field: Turner Valley
- 2) Pool: Rundle
- 3) Province: Alberta
- 4) Location: Twp. 18, Rge. 2, W 5 M
- 5) Operator: Western Decalta
- 6) Project: #3 Unit
- 7) Reservoir: T.V. formation, Rundle Group, Mississippian
- 8) Discovery Date: October 1924
- 9) Date Injection Began: December 1958. Pilot Waterflood Test, August 1948
- 10) Main Structural Feature: Overthrust Anticline, some Stratigraphic Control
- 11) Gas Cap: Originally: Yes. At Present: Yes
- 12) Time Required for Initial Results (months):
- 13) Initial Results on Production: 9,258 GOR. 0.088 WOR
- 14) Main Drive in Primary Production: Solution Gas
- 15) Productive Area (acres) of Reservoir: 16,265. Of Project: 2,120
Affected by Injection: 2,120
- 16) Average Depth to Top of Pay (feet): 8,233
- 17) Average Effective Thickness (feet): 156.0
- 18) Average Porosity %: 8.2
- 19) Average Horizontal Permeability and Range in Brackets (millidarcys): 6.84
(2.46-23.1)
- 20) Connate Water (% of pore space): 10
- 21) Viscosity at Initial Reservoir Conditions (centipoises): 2.1
- 22) API Gravity: 39°
- 23) Solution Gas/Oil Ratio at Saturation Pressure (cu ft/bbl): 820
- 24) Bubble Point Pressure (psi): 2,400
- 25) Original Pressure (psi): 2,775
- 26) Reservoir Pressure at Start of Injection (psi): 420
- 27) Latest Reservoir Pressure: 369 psi (April, 1965)

- 28) Injection Fluid: Fresh Water and Gas
- 29) Injection Fluid Source: Highwood River
- 30) System: Closed
- 31) Fluid Treatment before Injection: Chlorination, Calgon
- 32) Injection Pattern: Peripheral
- 33) Structural Position Injection Wells: Below WOC, Oil Zone
- 34) Distance Injection Wells to Producers (feet): 1,300 to nearest, 5,900 to farthest
- 35) Number of Injection Wells at Start: 1
- 36) Number of Injection Wells at Present: 12 (August 1965)
- 37) Average Daily Injection Rate per Injection Well at Start: 1,450 bbls.
- 38) Average Daily Injection Rate per Injection Well at Present: Water: 215 bbls
Gas: 1,028 Mcf
(April 1965)
- 39) Average Injection Pressure at Start (psi): 2,200
- 40) Average Injection Pressure at Present (psi): Water: 863, Gas: 600 (April 1965)
- 41) Number of Producing Wells in Project Area at Start: 31 (out of 45 oil wells)
- 42) Number of Producing Wells in Project Area at Present: 15 (May 31, 1965) (36 capable)
- 43) Average Production Rate in Project Area at Start: 354 bbls/day
- 44) Average Production Rate in Project Area at Present: 397 (April 1965)
- 45) Original Oil in Place in Project Area (bbls): 128,599,597 (estimated in 1964)
- 46) Original Oil Saturation (% of pore space): 90
- 47) Primary Recovery from Project Area when Injection Started (bbls): 18,302,325
- 48) Oil Saturation at Start of Project (% of pore space): 69 (21% gas)
- 49) Oil Production from Project Area from Start of Injection to Now (bbls): 919,006
(April 1965)
- 50) Total Volume of Injected Fluids at Present: Water: 12,676,513 bbls.
Gas: 1,031,771 Mcf (April 1965)
- 51) Estimated Primary Ultimate Recovery from Project Area: 14% (for the beginning of
the pressure maintenance)
- 52) Estimated Increase in Ultimate Recovery from Project Area: 2% (due to the flooding
mechanism, as estimated
in 1964)
- 53) Well Spacing: 40 Acres
- 54) Oil Volume Factor (initial reservoir barrels per Stock-Tank barrel): 1.46
- 55) Remarks: Gas injection commenced September 1961.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 401

FIELD: Turner Valley

POOL:

ZONE: Home

Well Name: Royalite No. 1 (Dingman No. 1)
 Location: Lsd. 14, Sec. 6, Twp. 20, Rge. 2, W 5
 Interval tested, depth, feet: 2718-3825
 Producing Zone: Home
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: Calgary Petroleum
 Prod. Co.
 Date Sampled: October 1914

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.759
 Sulphur, percent by weight: 0.13
 Saybolt Universal Viscosity:
 at 100°F., sec. 28

A.P.I. gravity at 60°F.: 54.9
 Pour point, °F.: Below 0
 Colour: A.S.T.M. No. 3
 Carbon residue, percent by weight: 0.0
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 751 mm. Hg.
 First drop, 38°C. (100°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	0.6	0.6						
2.	75	167	2.9	3.5	0.670	79.7	-			
3.	100	212	18.6	22.1	0.712	67.2	18			
4.	125	257	28.9	51.0	0.738	60.2	21			
5.	150	302	17.3	68.3	0.758	55.2	23			
6.	175	347	11.6	79.9	0.774	51.3	23			
7.	200	392	6.5	86.4	0.788	48.1	24			
8.	225	437	4.2	90.6	0.805	44.3	26			
9.	250	482	3.1	93.7	0.823	40.4	30			
10.	275	527	2.3	96.0	0.838	37.4	32			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392								
12.	225	437								
13.	250	482								
14.	275	527								
15.	300	572								
Residuum			3.7	99.7						

Carbon residue of residuum: 0.9%

Carbon residue of crude: 0.0%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	22.1	0.705	69.2	
Total gasoline and naphtha	86.4	0.742	59.2	
Kerosine distillate	7.3	0.812	42.8	
Gas oil	2.3	0.838	37.4	
Nonviscous lubricating distillate	-	-	-	50-100
Medium lubricating distillate	-	-	-	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	3.7	-	-	
Distillation loss	0.3			

CRUDE PETROLEUM ANALYSIS

Laboratory Number 5543

FIELD: Turner Valley

POOL:

ZONE: Blairmore

Well Name: New McDougall Segure No. 1
 Location: Lsd. 14, Sec. 12, Twp. 20, Rge. 3, W 5
 Interval tested, depth, feet: 2450-2495
 Producing Zone: Blairmore
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: Dept. of Interior
 Date Sampled: August 1928

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.758
 Sulphur, percent by weight: 0.15
 Saybolt Universal Viscosity:
 at 100°F., sec. 29

A.P.I. gravity at 60°F.: 55.2
 Pour point, °F.: Below 0
 Colour: A.S.T.M. No. 6
 Carbon residue, percent by weight: 0.2
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 752 mm. Hg.
 First drop, 35°C. (95°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	1.5	1.5	0.636	91.0	-			
2.	75	167	14.7	16.2	0.699	70.9	21			
3.	100	212	9.1	25.3	0.718	65.6	20			
4.	125	257	18.8	44.1	0.732	61.8	18			
5.	150	302	12.8	56.9	0.755	55.9	21			
6.	175	347	9.9	66.8	0.774	51.3	23			
7.	200	392	7.4	74.2	0.787	48.3	23			
8.	225	437	5.1	79.3	0.801	45.2	24			
9.	250	482	4.3	83.6	0.817	41.7	27			
10.	275	527	4.1	87.7	0.833	38.4	30			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	1.8	89.5	0.848	35.4	33		41	35
12.	225	437	1.8	91.3	0.857	33.6	33		47	50
13.	250	482	1.6	92.9	0.873	30.6	37		59	70
14.	275	527	1.0	93.9	0.886	28.2	40		78	85
15.	300	572	1.3	95.2	0.905	24.9	46		136	95
Residuum			2.9	98.1						

Carbon residue of residuum: 6.1%

Carbon residue of crude: 0.2%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	25.3	0.702	70.1	
Total gasoline and naphtha	74.2	0.737	60.5	
Kerosine distillate	9.4	0.809	43.4	
Gas oil	7.2	0.842	36.6	
Nonviscous lubricating distillate	3.1	0.861-0.895	32.8-26.6	50-100
Medium lubricating distillate	1.3	0.895-0.916	26.6-23.0	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	2.9	-	-	
Distillation loss	1.9			

CRUDE PETROLEUM ANALYSIS

Laboratory Number 5545

FIELD: Turner Valley

POOL:

ZONE: Blairmore

Well Name: Royalite No. 10
 Location: Lsd. 10, Sec. 12, Twp. 20, Rge. 3, W 5
 Interval tested, depth, feet: 2268-2332
 Producing Zone: Blairmore
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: Dept. of Interior
 Date Sampled: August 1928

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.750
 Sulphur, percent by weight: 0.15
 Saybolt Universal Viscosity:
 at 100°F., sec. 29

A.P.I. gravity at 60°F.: 57.2
 Pour point, °F.: Below 0
 Colour: A.S.T.M. No. 4 1/2
 Carbon residue, percent by weight: 0.1
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 752 mm. Hg.
 First drop, 26°C. (79°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	2.3	2.3	0.637	90.6	-			
2.	75	167	8.1	10.4	0.675	78.1	10			
3.	100	212	18.8	29.2	0.712	67.2	18			
4.	125	257	18.6	47.8	0.742	59.2	23			
5.	150	302	13.1	60.9	0.762	54.2	25			
6.	175	347	10.2	71.1	0.776	50.9	24			
7.	200	392	6.0	77.1	0.790	47.6	25			
8.	225	437	4.7	81.8	0.804	44.5	26			
9.	250	482	4.1	85.9	0.820	41.1	28			
10.	275	527	3.2	89.1	0.835	38.0	31			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	2.0	91.1	0.849	35.2	33		42	33
12.	225	437	1.6	92.7	0.859	33.2	34		50	34
13.	250	482	1.2	93.9	0.876	30.0	39		64	36
14.	275	527	1.1	95.0	0.885	28.4	40		96	40
15.	300	572	1.7	96.7	0.914	23.3	51		240(est.)	48
Residuum			1.7	98.4						

Carbon residue of residuum: 6.0%

Carbon residue of crude: 0.1%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	29.2	0.696	71.8	
Total gasoline and naphtha	77.1	0.736	60.8	
Kerosine distillate	8.8	0.811	43.0	
Gas oil	6.0	0.842	36.6	
Nonviscous lubricating distillate	2.6	0.859-0.886	33.2-28.2	50-100
Medium lubricating distillate	0.9	0.886-0.904	28.2-25.0	100-200
Viscous lubricating distillate	1.3	0.904-0.930	25.0-20.6	Above 200
Residuum	1.7	-	-	
Distillation loss	1.6			

CRUDE PETROLEUM ANALYSIS

Laboratory Number 5546

FIELD: Turner Valley

POOL:

ZONE: Home

Well Name: Home No. 2
 Location: Lsd. 14, Sec. 20, Twp. 19, Rge. 2, W 5
 Interval tested, depth, feet: 4794-4807
 Producing Zone: Home
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: Dept. of Interior
 Date Sampled: August 1928

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.793
 Sulphur, percent by weight: 0.14
 Saybolt Universal Viscosity:
 at 70°F., sec. 33
 at 100°F., sec. 31

A.P.I. gravity at 60°F.: 46.9
 Pour point, °F.: Below 0
 Colour: A.S.T.M. No. 6
 Carbon residue, percent by weight: 0.2
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 761 mm. Hg.
 First drop, 29°C. (84°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	0.7	0.7						
2.	75	167	3.0	3.7	0.671	79.4	-			
3.	100	212	8.5	12.2	0.721	64.8	22			
4.	125	257	12.3	24.5	0.744	58.7	24			
5.	150	302	11.2	35.7	0.762	54.2	25			
6.	175	347	11.3	47.0	0.779	50.1	26			
7.	200	392	7.8	54.8	0.789	47.8	24			
8.	225	437	7.3	62.1	0.803	44.7	25			
9.	250	482	6.1	68.2	0.818	41.5	27			
10.	275	527	6.2	74.4	0.832	38.6	29			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	4.1	78.5	0.845	36.0	31		40	20
12.	225	437	4.4	82.9	0.852	34.6	31		47	50
13.	250	482	3.1	86.0	0.859	33.2	31		58	70
14.	275	527	2.5	88.5	0.870	31.1	33		83	90
15.	300	572	2.1	90.6	0.881	29.1	35		143	100
Residuum			7.3	97.9						

Carbon residue of residuum: 3.0%

Carbon residue of crude: 0.2%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	12.2	0.706	68.9	
Total gasoline and naphtha	54.8	0.752	56.7	
Kerosine distillate	13.4	0.810	43.2	
Gas oil	13.5	0.840	36.9	
Nonviscous lubricating distillate	6.2	0.854-0.873	34.2-30.6	50-100
Medium lubricating distillate	2.7	0.873-0.886	30.6-28.2	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	7.3	-	-	
Distillation loss	2.1			

CRUDE PETROLEUM ANALYSIS

Laboratory Number 5547

FIELD: Turner Valley

POOL:

ZONE: Home

Well Name: Foothills No. 2
 Location: Lsd. 8, Sec. 1, Twp. 20, Rge. 3, W 5
 Interval tested, depth, feet: 3700-3707
 Producing Zone: Home
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: Dept. of Interior
 Date Sampled: August 1928

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.772
 Sulphur, percent by weight: 0.08
 Saybolt Universal Viscosity:
 at 70°F., sec. 32
 at 100°F., sec. 30

A.P.I. gravity at 60°F.: 51.8
 Pour point, °F.: Below 0
 Colour: A.S.T.M. No. 8
 Carbon residue, percent by weight: 0.3
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 758 mm. Hg.
 First drop, 33°C. (91°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	2.3	2.3)						
2.	75	167	5.9	8.2)	0.671	79.4	-			
3.	100	212	14.3	22.5	0.712	67.2	18			
4.	125	257	13.3	35.8	0.744	58.7	24			
5.	150	302	13.7	49.5	0.760	54.7	24			
6.	175	347	9.8	59.3	0.776	50.8	24			
7.	200	392	7.7	67.0	0.788	48.1	24			
8.	225	437	5.5	72.5	0.802	44.9	25			
9.	250	482	5.3	77.8	0.819	41.3	28			
10.	275	527	4.2	82.0	0.832	38.6	29			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	3.5	85.5	0.844	36.1	31		41	25
12.	225	437	2.4	87.9	0.855	34.0	32		48	45
13.	250	482	1.9	89.8	0.868	31.5	35		61	65
14.	275	527	1.9	91.7	0.880	29.3	38		90	85
15.	300	572	1.2	92.9	0.892	27.1	40		158	95
Residuum			5.8	98.7						

Carbon residue of residuum: 4.7%

Carbon residue of crude: 0.3%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	22.5	0.698	71.2	
Total gasoline and naphtha	67.0	0.741	59.5	
Kerosine distillate	10.8	0.810	43.2	
Gas oil	9.3	0.840	36.9	
Nonviscous lubricating distillate	3.9	0.857-0.882	33.6-28.9	50-100
Medium lubricating distillate	1.9	0.882-0.896	28.9-26.4	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	5.9	-	-	
Distillation loss	1.3			

CRUDE PETROLEUM ANALYSIS

Laboratory Number 5548

FIELD: Turner Valley

POOL:

ZONE: Dalhousie

Well Name: Dalhousie No. 5
 Location: Lsd. 16, Sec. 30, Twp. 19, Rge. 2, W 5
 Interval tested, depth, feet: 4810-4870
 Producing Zone: Dalhousie
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: Dept. of Interior
 Date Sampled: August 1928

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.772
 Sulphur, percent by weight: 0.09
 Saybolt Universal Viscosity:
 at 100°F., sec. 30

A.P.I. gravity at 60°F.: 51.8
 Pour point, °F.: Below 0
 Colour: A.S.T.M. No. 5

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 750 mm. Hg.
 First drop, 28°C. (82°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	1.9	1.9	0.633	92.0	-			
2.	75	167	5.2	7.1	0.674	78.4	9			
3.	100	212	12.4	19.5	0.714	66.7	18			
4.	125	257	14.1	33.6	0.744	58.7	24			
5.	150	302	11.5	45.1	0.765	53.5	26			
6.	175	347	9.4	54.5	0.780	49.9	26			
7.	200	392	7.3	61.8	0.791	47.4	25			
8.	225	437	6.1	67.9	0.805	44.3	26			
9.	250	482	5.6	73.5	0.819	41.3	28			
10.	275	527	5.3	78.8	0.832	38.6	29			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	3.0	81.8	0.848	35.4	33		41	30
12.	225	437	3.2	85.0	0.853	34.4	31		47	55
13.	250	482	2.8	87.8	0.857	33.6	30		57	80
14.	275	527	2.4	90.2	0.859	33.2	28		75	100
15.	300	572	2.7	92.9	0.862	32.7	26		100(est.)	120
Residuum			6.1	99.0						

Carbon residue of residuum: 3.3%

Carbon residue of crude: 0.2%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	19.5	0.695	72.1	
Total gasoline and naphtha	61.8	0.743	58.9	
Kerosine distillate	11.7	0.812	42.8	
Gas oil	10.8	0.841	36.7	
Nonviscous lubricating distillate	7.3	0.854-0.862	34.2-32.6	50-100
Medium lubricating distillate	1.3	0.862-0.863	32.6-32.5	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	6.1	-	-	
Distillation loss	1.0			

CRUDE PETROLEUM ANALYSIS

Laboratory Number 5549

FIELD: Turner Valley

POOL:

ZONE: Blairmore

Well Name: Okalta No. 2
 Location: Lsd. 8, Sec. 1, Twp. 20, Rge. 3, W 5
 Interval tested, depth, feet: 3058-3060
 Producing Zone: Blairmore
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: Dept. of Interior
 Date Sampled: September 1928

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.773
 Sulphur, percent by weight: 0.12
 Saybolt Universal Viscosity:
 at 100°F., sec. 29

A.P.I. gravity at 60°F.: 51.5
 Pour point, °F.: Below 0
 Colour: A.S.T.M. No. 8
 Carbon residue, percent by weight: 0.2
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 753 mm. Hg.
 First drop, 29°C. (84°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	2.1	2.1	0.630	93.1	-			
2.	75	167	5.7	7.8	0.672	79.1	8			
3.	100	212	13.4	21.2	0.710	67.8	17			
4.	125	257	17.0	38.2	0.739	60.0	21			
5.	150	302	13.2	51.4	0.761	54.4	24			
6.	175	347	9.7	61.1	0.775	51.1	24			
7.	200	392	7.4	68.5	0.787	48.3	23			
8.	225	437	6.0	74.5	0.802	44.9	25			
9.	250	482	5.2	79.7	0.816	41.9	26			
10.	275	527	5.4	85.1	0.832	38.6	29			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	2.5	87.6	0.848	35.4	33		41	30
12.	225	437	2.3	89.9	0.855	34.0	32		48	50
13.	250	482	1.8	91.7	0.868	31.5	35		59	65
14.	275	527	1.7	93.4	0.878	29.7	37		85	85
15.	300	572	1.9	95.3	0.906	24.7	47		160	95
Residuum			3.7	99.0						

Carbon residue of residuum: 5.6%

Carbon residue of crude: 0.2%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	21.2	0.692	73.0	
Total gasoline and naphtha	68.5	0.739	60.0	
Kerosine distillate	11.2	0.808	43.6	
Gas oil	9.4	0.839	37.1	
Nonviscous lubricating distillate	3.7	0.858-0.883	33.4-28.7	50-100
Medium lubricating distillate	2.5	0.883-0.921	28.7-22.1	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	3.7	-	-	
Distillation loss	1.0			

CRUDE PETROLEUM ANALYSIS

Laboratory Number 5550

FIELD: Turner Valley

POOL:

ZONE: Blackstone

Well Name: Calmont No. 1
 Location: Lsd. 2, Sec. 1, Twp. 20, Rge. 3, W 5
 Interval tested, depth, feet: 3735
 Producing Zone: Blackstone
 Geological Age: Cretaceous

Province: Alberta
 Sample From: Dept. of Interior
 Date Sampled: November 1928

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.777
 Sulphur, percent by weight: 0.16
 Saybolt Universal Viscosity:
 at 100°F., sec. 29

A.P.I. gravity at 60°F.: 50.6
 Pour point, °F.: Below 0
 Colour: A.S.T.M. No. 2
 Carbon residue, percent by weight: 0.0
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 753 mm. Hg.
 First drop, 34°C. (93°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	0.6	0.6)						
2.	75	167	1.2	1.8)	0.668	80.3	-			
3.	100	212	4.0	5.8	0.714	66.7	18			
4.	125	257	13.1	18.9	0.741	59.5	22			
5.	150	302	17.3	36.2	0.760	54.7	24			
6.	175	347	18.5	54.7	0.773	51.6	23			
7.	200	392	19.9	74.6	0.786	48.5	23			
8.	225	437	14.6	89.2	0.803	44.7	25			
9.	250	482	6.9	96.1	0.824	40.2	30			
10.	275	527	2.4	98.5	0.842	36.6	34			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392								
12.	225	437								
13.	250	482								
14.	275	527								
15.	300	572								
Residuum			1.1	99.6	-	-				

Carbon residue of residuum: 0.6%

Carbon residue of crude: 0.0%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	5.8	0.700	70.6	
Total gasoline and naphtha	74.6	0.762	54.2	
Kerosine distillate	21.5	0.810	43.2	
Gas oil	2.4	0.842	36.6	
Nonviscous lubricating distillate	-	-	-	50-100
Medium lubricating distillate	-	-	-	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	1.1	-	-	
Distillation loss	0.4			

CRUDE PETROLEUM ANALYSIS

Laboratory Number 6248

FIELD: Turner Valley

POOL:

ZONE: Home

Well Name: Model No. 1
 Location: Lsd. 8, Sec. 22, Twp. 20, Rge. 3, W 5
 Interval tested, depth, feet: 5200-5206
 Producing Zone: Home
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: Model Oils Ltd.
 Date Sampled: August 1929

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.875
 Sulphur, percent by weight: 0.12
 Saybolt Universal Viscosity:
 at 100°F., sec. 126

A.P.I. gravity at 60°F.: 30.2
 Pour point, °F.: 75
 Colour: Brownish Green
 Carbon residue, percent by weight: 2.6
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 759 mm. Hg. First drop, 65°C. (149°F.)										
Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	-							
2.	75	167	0.5	0.5)						
3.	100	212	1.3	1.8)	0.707	68.6	-			
4.	125	257	2.5	4.3	0.734	61.3	19			
5.	150	302	3.3	7.6	0.751	56.9	19			
6.	175	347	3.8	11.4	0.762	54.2	18			
7.	200	392	4.4	15.8	0.777	50.6	19			
8.	225	437	3.7	19.5	0.790	47.6	19			
9.	250	482	4.9	24.4	0.804	44.5	21			
10.	275	527	6.5	30.9	0.815	42.1	21			
Stage 2 - Distillation continued at 40 mm. Hg. pressure										
11.	200	392	3.9	34.8	0.828	39.4	23		39	40
12.	225	437	5.7	40.5	0.832	38.6	21		43	60
13.	250	482	6.0	46.5	0.839	37.2	21		51	80
14.	275	527	6.7	53.2	0.849	35.2	23		66	100
15.	300	572	5.9	59.1	0.866	31.9	28		98(est.)	105
Residuum			38.8	97.9	-	-				
Carbon residue of residuum: 6.7%					Carbon residue of crude: 2.6%					

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	1.8	0.706	68.9	
Total gasoline and naphtha	15.8	0.754	56.2	
Kerosine distillate	15.1	0.805	44.3	
Gas oil	11.5	0.831	38.8	
Nonviscous lubricating distillate	14.2	0.838-0.867	37.4-31.7	50-100
Medium lubricating distillate	2.5	0.867-0.874	31.7-30.4	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	38.8			
Distillation loss	2.1			

Remarks: The sample as received contained 1.6% by vol. water (A.S.T.M.)

CRUDE PETROLEUM ANALYSIS

Laboratory Number 6262

FIELD: Turner Valley

POOL:

ZONE: Dalhousie

Well Name: British Dominion No. 2
 Location: Lsd. 6, Sec. 12, Twp. 20, Rge. 3, W 5
 Interval tested, depth, feet: 4820-4900
 Producing Zone: Dalhousie
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: British Dominion Oil Co.
 Date Sampled: August 1929

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.763
 Sulphur, percent by weight: 0.09
 Saybolt Universal Viscosity:
 at 100°F., sec. 29

A.P.I. gravity at 60°F.: 53.9
 Pour point, °F.: Below 0
 Colour: A.S.T.M. No. 2
 Carbon residue, percent by weight: 0.0
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 761 mm. Hg. First drop, 27°C. (81°F.)										
Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	2.7	2.7	0.632	92.4	-			
2.	75	167	6.9	9.6	0.671	79.4	8			
3.	100	212	15.1	24.7	0.711	67.5	17			
4.	125	257	18.7	43.4	0.741	59.5	22			
5.	150	302	13.7	57.1	0.762	54.2	25			
6.	175	347	11.3	68.4	0.777	50.6	25			
7.	200	392	7.7	76.1	0.789	47.8	24			
8.	225	437	5.9	82.0	0.804	44.5	26			
9.	250	482	4.9	86.9	0.820	41.1	28			
10.	275	527	5.0	91.9	0.838	37.4	32			
Stage 2 - Distillation continued at 40 mm. Hg. pressure										
11.	200	392	2.2	94.1	0.857	33.6	37		42	30
12.	225	437	1.5	95.6	0.863	32.5	36		48	50
13.	250	482	1.4	97.0	0.877	29.9	39		61	70
14.	275	527	1.1	98.1	0.900	25.7	47		82	85
15.	300	572	1.0	99.1	0.911	23.8	49		142	100
Residuum			0.9	100.0	-					
Carbon residue of residuum: 1.1%					Carbon residue of crude: 0.0%					

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	24.7	0.691	73.3	
Total gasoline and naphtha	76.1	0.739	60.0	
Kerosine distillate	10.8	0.811	43.0	
Gas oil	8.2	0.846	35.8	
Nonviscous lubricating distillate	2.7	0.866-0.902	31.9-25.4	50-100
Medium lubricating distillate	1.3	0.902-0.917	25.4-22.8	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	0.9			
Distillation loss	0.0			

CRUDE PETROLEUM ANALYSIS

Laboratory Number 10601

FIELD: Turner Valley

POOL:

ZONE: Home

Well Name: Hyl0 No. 1
 Location: Lsd. 12, Sec. 4, Twp. 19, Rge. 2, W 5
 Interval tested, depth, feet: 4948-4958
 Producing Zone: Home
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: Mines Branch
 Date Sampled: November 12, 1931

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.826
 Sulphur, percent by weight: 0.25
 Saybolt Universal Viscosity:
 at 70°F., sec. 43
 at 100°F., sec. 39

A.P.I. gravity at 60°F.: 39.8
 Pour point, °F.: 45
 Colour: Green
 Carbon residue, percent by weight: 0.5
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 760 mm. Hg.
 First drop, 26°C. (79°F.)

Fraction No.	Cut at		Per Cent	Sum. Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	1.8	1.8	0.641	89.3	-			
2.	75	167	2.4	4.2	0.674	78.4	9			
3.	100	212	5.0	9.2	0.718	65.6	20			
4.	125	257	7.0	16.2	0.748	57.7	26			
5.	150	302	5.8	22.0	0.767	53.0	27			
6.	175	347	4.4	26.4	0.780	49.9	26			
7.	200	392	4.4	30.8	0.791	47.4	25			
8.	225	437	4.7	35.5	0.801	45.2	24			
9.	250	482	5.2	40.7	0.816	41.9	26			
10.	275	527	7.5	48.2	0.829	39.2	28			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	8.0	56.2	0.843	36.4	30		40	30
12.	225	437	6.9	63.1	0.847	35.6	28		48	55
13.	225	482	7.6	70.7	0.857	33.6	30		62	75
14.	275	527	4.9	75.6	0.864	32.3	30		88	90
15.	300	572	6.7	82.3	0.875	30.2	32		137	100
Residuum			15.5	97.8	-	-	-		-	-

Carbon residue of residuum: 3.1%

Carbon residue of crude: 0.5%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	9.2	0.691	73.3	
Total gasoline and naphtha	30.8	0.745	58.4	
Kerosine distillate	9.9	0.808	43.6	
Gas oil	20.0	0.838	37.4	
Nonviscous lubricating distillate	13.8	0.848-0.867	35.4-31.7	50-100
Medium lubricating distillate	7.8	0.867-0.882	31.7-28.9	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	15.5	-	-	
Distillation loss	2.2			

CRUDE PETROLEUM ANALYSIS

Laboratory Number 16136

FIELD: Turner Valley

POOL:

ZONE: Rundle

Well Name: Turner Valley Royalties No. 1
 Location: Lsd. 13, Sec. 28; Twp. 18, Rge. 2, W 5
 Interval tested, depth, feet: 6400-6510
 Producing Zone: Rundle
 Geological Age: Mississippian

Province: Alberta
 Sample From: Alberta Dept. of
 Lands & Mines
 Date Sampled: August 27, 1936
 Sampled at: Separator

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.795
 Sulphur, percent by weight: 0.30
 Saybolt Universal Viscosity:
 at 70°F., sec. 33

A.P.I. gravity at 60°F.: 46.5
 Pour point, °F.: Below -30
 Colour: A.S.T.M. No. 5
 Carbon residue, percent by weight: 0.3
 (Conradson)
 Cloud Point, °F.: 25

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 763 mm. Hg.
 First drop, 22°C. (72°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	-	-	-	-	-	-	-	-
2.	75	167	7.1	7.1	0.659	83.2	2	-	-	-
3.	100	212	7.4	14.5	0.712	67.2	18	-	-	-
4.	125	257	10.3	24.8	0.744	58.7	24	-	-	-
5.	150	302	8.8	33.6	0.767	53.0	27	-	-	-
6.	175	347	8.7	42.3	0.782	49.5	27	-	-	-
7.	200	392	6.6	48.9	0.794	46.7	27	-	-	-
8.	225	437	6.3	55.2	0.807	43.8	27	-	-	-
9.	250	482	7.5	62.7	0.820	41.1	28	-	-	-
10.	275	527	7.6	70.3	0.836	37.8	31	-	-	-

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	5.5	75.8	0.853	34.4	35	-	41	15
12.	225	437	5.1	80.9	0.862	32.7	36	-	48	40
13.	250	482	4.3	85.2	0.873	30.6	37	-	61	60
14.	275	527	3.1	88.3	0.882	28.9	39	-	96	80
15.	300	572	3.4	91.7	0.890	27.5	39	-	150	90
Residuum			6.1	97.8	-	-	-	-	-	-

Carbon residue of residuum: 4.4%

Carbon residue of crude: 0.3%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	14.5	0.686	74.8	
Total gasoline and naphtha	48.9	0.744	58.7	
Kerosine distillate	13.8	0.814	42.3	
Gas oil	16.4	0.847	35.6	
Nonviscous lubricating distillate	7.8	0.864-0.882	32.3-28.9	50-100
Medium lubricating distillate	4.8	0.882-0.894	28.9-26.8	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	6.1			
Distillation loss	2.2			

Remarks: The sample as received contained a trace of water (A.S.T.M.).

CRUDE PETROLEUM ANALYSIS

Laboratory Number 18186

FIELD: Turner Valley

POOL:

ZONE: Rundle

Well Name: Anaconda No. 2
 Location: Lsd. 15, Sec. 28, Twp. 18, Rge. 2, W 5
 Interval tested, depth, feet: 5110-5155
 Producing Zone: Rundle
 Geological Age: Mississippian

Province: Alberta
 Sample From: Alberta Pet. &
 Natural Gas Division
 Date Sampled: October 13, 1937
 Sampled at: Tank

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.741
 Sulphur, percent by weight: 0.34
 Saybolt Universal Viscosity:
 at 70°F., sec. 28

A.P.I. gravity at 60°F.: 59.5
 Pour point, °F.: Below -35
 Colour: A.S.T.M. No. 3
 Carbon residue, percent by weight: 0.04
 (Conradson)
 Cloud point, °F.: 10

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 764 mm. Hg.
 First drop, 25°C. (77°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	2.8	2.8	0.636	91.0	-			
2.	75	167	7.7	10.5	0.676	77.8	10			
3.	100	212	25.9	36.4	0.710	67.8	17			
4.	125	257	27.0	63.4	0.740	59.7	22			
5.	150	302	16.1	79.5	0.764	53.7	26			
6.	175	347	6.0	85.5	0.782	49.5	27			
7.	200	392	2.7	88.2	0.796	46.3	28			
8.	225	437	2.0	90.2	0.809	43.4	28			
9.	250	482	1.8	92.0	0.823	40.4	30			
10.	275	527	1.9	93.9	0.837	37.6	32			
Residuum			4.2	98.1	-	-	-			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392)	Residue too small for distillation at 40 mm.
12.	225	437)	
13.	250	482)	
14.	275	527)	
15.	300	572)	
Residuum			

Carbon residue of residuum: 1.0%

Carbon residue of crude: 0.04%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	36.4	0.697	71.5	
Total gasoline and naphtha	88.2	0.731	62.1	
Kerosine distillate	3.8	0.816	41.9	
Gas oil	1.9	0.837	37.6	
Nonviscous lubricating distillate	-	-	-	50-100
Medium lubricating distillate	-	-	-	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	4.2	-	-	
Distillation loss	1.9			

Remarks: The sample as received contained no water and sediment (by centrifuge).

CRUDE PETROLEUM ANALYSIS

Laboratory Number 18187

FIELD: Turner Valley

POOL:

ZONE: Rundle

Well Name: Brown No. 1
 Location: Lsd. 14, Sec. 16, Twp. 18; Rge. 2, W 5
 Interval tested; depth, feet: 6506-6780
 Producing Zone: Rundle
 Geological Age: Mississippian

Province: Alberta
 Sample From: Alberta Pet. and
 Natural Gas Div.
 Date Sampled: October 1937
 Sampled at: Tank

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.789
 Sulphur, percent by weight: 0.58
 Saybolt Universal Viscosity:
 at 70°F., sec. 33

A.P.I. gravity at 60°F.: 47.8
 Pour point, °F.: -30
 Colour: A.S.T.M. No. 6
 Carbon residue, percent by weight: 0.3
 (Conradson)
 Cloud point, °F.: 40

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 766 mm. Hg.
 First drop, 25°C. (77°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	4.2	4.2	0.640	89.6	-			
2.	75	167	3.8	8.0	0.667	80.6	6			
3.	100	212	6.6	14.6	0.715	66.4	19			
4.	125	257	9.8	24.4	0.747	57.9	25			
5.	150	302	8.7	33.1	0.768	52.7	27			
6.	175	347	7.6	40.7	0.784	49.0	28			
7.	200	392	6.7	47.4	0.794	46.7	27			
8.	225	437	6.7	54.1	0.807	43.8	27			
9.	250	482	6.9	61.0	0.821	40.9	29			
10.	275	527	7.1	68.1	0.835	38.0	31			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	5.4	73.5	0.851	34.8	34		39	10
12.	225	437	5.1	78.6	0.860	33.0	35		46	35
13.	250	482	4.4	83.0	0.869	31.3	36		58	55
14.	275	527	3.4	86.4	0.879	29.5	37		81	70
15.	300	572	3.2	89.6	0.888	37.9	38		133	85
Residuum			8.3	97.9	-	-	-		-	-

Carbon residue of residuum: 3.2%

Carbon residue of crude: 0.3%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	14.6	0.681	76.3	
Total gasoline and naphtha	47.4	0.743	58.9	
Kerosine distillate	13.6	0.814	42.3	
Gas oil	16.6	0.847	35.6	
Nonviscous lubricating distillate	8.3	0.863-0.882	32.5-28.9	50-100
Medium lubricating distillate	3.7	0.882-0.892	28.9-27.1	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	8.3			
Distillation loss	2.1			

Remarks: The sample as received contained no water and sediment (by centrifuge).

CRUDE PETROLEUM ANALYSIS

Laboratory Number 18188

FIELD: Turner Valley

POOL:

ZONE: Rundle

Well Name: Brown No. 2
 Location: Lsd. 8; Sec. 20, Twp. 18, Rge. 2, W 5
 Interval tested, depth, feet: 6860-6980
 Producing Zone: Rundle
 Geological Age: Mississippian

Province: Alberta
 Sample From: Alberta Pet. & Natural Gas Div.
 Date Sampled: October 1937
 Sampled at: Tank

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.798
 Sulphur, percent by weight: 0.51
 Saybolt Universal Viscosity:
 at 70°F., sec. 34

A.P.I. gravity at 60°F.: 45.8
 Pour point, °F.: Below -35
 Colour: A.S.T.M. No. 7
 Carbon residue, percent by weight: 0.3
 (Conradson)
 Cloud point, °F.: 40

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 757 mm. Hg.
 First drop, 22°C. (72°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	3.4	3.4	0.637	90.6	-			
2.	75	167	4.6	8.0	0.669	80.0	7			
3.	100	212	6.0	14.0	0.713	67.0	18			
4.	125	257	8.6	22.6	0.746	58.2	25			
5.	150	302	8.5	31.1	0.770	52.3	28			
6.	175	347	6.7	37.8	0.785	48.8	29			
7.	200	392	6.1	43.9	0.797	46.0	28			
8.	225	437	6.2	50.1	0.809	43.4	28			
9.	250	482	6.9	57.0	0.822	40.6	29			
10.	275	527	7.0	64.0	0.837	37.6	32			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	8.6	72.6	0.854	34.2	36		41	20
12.	225	437	5.5	78.1	0.866	31.9	37		50	45
13.	250	482	4.3	82.4	0.875	30.2	38		66	60
14.	275	527	4.1	86.5	0.882	28.9	39		94	75
15.	300	572	3.7	90.2	0.891	27.3	40		166	90
Residuum			7.4	97.6	0.930	20.7				

Carbon residue of residuum: 4.1%

Carbon residue of crude: 0.3%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	14.0	0.680	76.6	
Total gasoline and naphtha	43.9	0.743	58.9	
Kerosine distillate	13.1	0.816	41.9	
Gas oil	18.4	0.849	35.2	
Nonviscous lubricating distillate	9.4	0.866-0.883	31.9-28.8	50-100
Medium lubricating distillate	5.4	0.883-0.895	28.8-26.6	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	7.4	0.930	20.7	
Distillation loss	2.4			

Remarks: The sample as received contained no water and sediment (by centrifuge).

CRUDE PETROLEUM ANALYSIS

Laboratory Number 18189

FIELD: Turner Valley

POOL:

ZONE: Rundle

Well Name: Century Royalties No. 1
 Location: Lsd. 14, Sec. 28, Twp. 18, Rge. 2, W 5
 Interval tested, depth, feet: 6230-6535
 Producing Zone: Rundle
 Geological Age: Mississippian

Province: Alberta
 Sample From: Alberta Pet. and
 Natural Gas Div.
 Date Sampled: October 13, 1937
 Sampled at: Tank

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.780
 Sulphur, percent by weight: 0.43
 Saybolt Universal Viscosity:
 at 70°F., sec. 31

A.P.I. gravity at 60°F.: 49.9
 Pour point, °F.: Below -35
 Colour: A.S.T.M. No. 6
 Carbon residue, percent by weight: 0.2
 (Conradson)
 Cloud point, °F.: 40

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 747 mm. Hg.
 First drop, 19°C. (66°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	2.7	2.7	0.637	90.6	-			
2.	75	167	5.4	8.1	0.674	78.4	9			
3.	100	212	11.9	20.0	0.713	67.0	18			
4.	125	257	13.9	33.9	0.744	58.7	24			
5.	150	302	11.3	45.2	0.766	53.2	27			
6.	175	347	8.4	53.6	0.783	49.2	28			
7.	200	392	6.8	60.4	0.795	46.5	27			
8.	225	437	6.0	66.4	0.808	43.6	28			
9.	250	482	6.1	72.5	0.821	40.9	29			
10.	275	527	6.0	78.5	0.836	37.8	31			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	6.5	85.0	0.853	34.4	35		41	20
12.	225	437	3.5	88.5	0.867	31.7	38		52	45
13.	250	482	2.5	91.0	0.878	29.7	40		71	65
14.	275	527	2.3	93.3	0.886	28.2	40		105	80
15.	300	572	2.2	95.5	0.899	25.9	44		212	90
Residuum			2.8	98.3	-	-	-		-	-

Carbon residue of residuum: 5.3%

Carbon residue of crude: 0.2%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	20.0	0.692	73.0	
Total gasoline and naphtha	60.4	0.742	59.2	
Kerosine distillate	12.1	0.815	42.1	
Gas oil	13.3	0.846	35.8	
Nonviscous lubricating distillate	6.0	0.865-0.885	32.1-28.4	50-100
Medium lubricating distillate	2.4	0.885-0.898	28.4-26.1	100-200
Viscous lubricating distillate	1.3	0.898-0.905	26.1-24.9	Above 200
Residuum	2.8			
Distillation loss	1.7			

Remarks: The sample as received contained no water and sediment (by centrifuge).

CRUDE PETROLEUM ANALYSIS

Laboratory Number 18190

FIELD: Turner Valley

POOL:

ZONE: Rundle

Well Name: Granville No. 1
 Location: Lsd. 16; Sec. 29; Twp. 18, Rge. 2, W 5
 Interval tested, depth, feet: 7250-7290
 Producing Zone: Rundle
 Geological Age: Mississippian

Province: Alberta
 Sample From: Alberta Pet. and
 Natural Gas Division
 Date Sampled: October 21, 1937
 Sampled at: Tank

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.808
 Sulphur, percent by weight: 0.56
 Saybolt Universal Viscosity:
 at 70°F., sec. 35

A.P.I. gravity at 60°F.: 43.6
 Pour point, °F.: -25
 Colour: A.S.T.M. No. 7
 Carbon residue, percent by weight: 0.3
 (Conradson)
 Cloud point, °F.: 40

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 756 mm. Hg.
 First drop, 26°C. (79°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	2.7	2.7	0.638	90.3	-			
2.	75	167	3.8	6.5	0.676	77.8	10			
3.	100	212	6.3	12.8	0.718	65.6	20			
4.	125	257	8.8	21.6	0.751	56.9	27			
5.	150	302	8.0	29.6	0.771	52.0	29			
6.	175	347	7.1	36.7	0.786	48.5	29			
7.	200	392	6.3	43.0	0.799	45.6	29			
8.	225	437	6.2	49.2	0.811	43.0	29			
9.	250	482	6.8	56.0	0.826	39.8	31			
10.	275	527	7.3	63.3	0.840	37.0	33			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	6.4	69.7	0.855	34.0	36		40	15
12.	225	437	5.6	75.3	0.864	32.3	37		47	35
13.	250	482	6.1	81.4	0.875	30.2	38		61	60
14.	275	527	4.3	85.7	0.883	28.8	39		91	75
15.	300	572	3.7	89.4	0.890	27.5	39		150	90
Residuum			9.0	98.4	0.926	21.3				

Carbon residue of residuum: 3.6%

Carbon residue of crude: 0.3%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	12.8	0.689	73.9	
Total gasoline and naphtha	43.0	0.749	57.4	
Kerosine distillate	6.2	0.811	43.0	
Gas oil	24.6	0.844	36.2	
Nonviscous lubricating distillate	10.3	0.867-0.884	31.7-28.6	50-100
Medium lubricating distillate	5.3	0.884-0.893	28.6-27.0	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	9.0	0.926	21.3	
Distillation loss	1.6			

Remarks: The sample as received contained no water and sediment (by centrifuge).

CRUDE PETROLEUM ANALYSIS

Laboratory Number 18191

FIELD: Turner Valley

POOL:

ZONE: Rundle

Well Name: Miracle No. 2
 Location: Lsd. 16, Sec. 5, Twp. 19, Rge. 2, W 5
 Interval tested, depth, feet: 6723
 Producing Zone: Rundle
 Geological Age: Mississippian

Province: Alberta
 Sample From: Alberta Pet. and
 Natural Gas Division
 Date Sampled: October 14, 1937
 Sampled at: Tank

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.778
 Sulphur, percent by weight: 0.50
 Saybolt Universal Viscosity:
 at 70°F., sec. 31

A.P.I. gravity at 60°F.: 50.4
 Pour point, °F.: Below -35
 Colour: A.S.T.M. No. 5
 Carbon residue, percent by weight: 0.1
 (Conradson)
 Cloud point, °F.: 40

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 756 mm. Hg.
 First drop, 19°C. (66°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	3.2	3.2	0.633	92.0	-			
2.	75	167	5.2	8.4	0.675	78.1	10			
3.	100	212	11.8	20.2	0.714	66.7	18			
4.	125	257	16.1	36.3	0.746	58.2	25			
5.	150	302	11.6	47.9	0.767	53.0	27			
6.	175	347	8.4	56.3	0.784	49.0	28			
7.	200	392	6.1	62.4	0.795	46.5	27			
8.	225	437	5.8	68.2	0.808	43.6	28			
9.	250	482	5.9	74.1	0.822	40.6	29			
10.	275	527	5.8	79.9	0.836	37.8	31			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	4.3	84.2	0.850	35.0	34		40	15
12.	225	437	3.5	87.7	0.861	32.8	35		48	40
13.	250	482	2.7	90.4	0.873	30.6	37		63	60
14.	275	527	2.2	92.6	0.880	29.3	38		87	75
15.	300	572	2.2	94.8	0.887	28.0	38		150	90
Residuum			3.3	98.1	0.927	21.1				

Carbon residue of residuum: 3.9%

Carbon residue of crude: 0.1%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	20.2	0.691	73.3	
Total gasoline and naphtha	62.4	0.742	59.2	
Kerosine distillate	11.7	0.815	42.1	
Gas oil	12.3	0.845	36.0	
Nonviscous lubricating distillate	5.7	0.862-0.882	32.7-28.9	50-100
Medium lubricating distillate	2.7	0.882-0.890	28.9-27.5	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	3.3	0.927	21.1	
Distillation loss	1.9			

Remarks: The sample as received contained a trace of water and sediment (by centrifuge).

CRUDE PETROLEUM ANALYSIS

Laboratory Number 18192

FIELD: Turner Valley

POOL:

ZONE: Rundle

Well Name: Model No. 1
 Location: Lsd. 8, Sec. 22, Twp. 2C, Rge. 3, W 5
 Interval tested, depth, feet: 5801-5905
 Producing Zone: Rundle
 Geological Age: Mississippian

Province: Alberta
 Sample From: Alberta Pet. and
 Natural Gas Division
 Date Sampled: October 14, 1937
 Sampled at: Tank

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.807
 Sulphur, percent by weight: 0.44
 Saybolt Universal Viscosity:
 at 70°F., sec. 34

A.P.I. gravity at 60°F.: 43.8
 Pour point, °F.: -30
 Colour: A.S.T.M. No. 7
 Carbon residue, percent by weight: 0.2
 (Conradson)
 Cloud point, °F.: 50

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 765 mm. Hg.
 First drop, 28°C. (82°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	1.3	1.3)						
2.	75	167	2.7	4.0)	0.663	81.9				
3.	100	212	6.7	10.7	0.718	65.6	20			
4.	125	257	10.5	21.2	0.749	57.4	26			
5.	150	302	9.1	30.3	0.770	52.3	28			
6.	175	347	7.7	38.0	0.787	48.3	30			
7.	200	392	7.1	45.1	0.797	46.0	28			
8.	225	437	6.5	51.6	0.810	43.2	29			
9.	250	482	7.3	58.9	0.824	40.2	30			
10.	275	527	7.6	66.5	0.840	37.0	33			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	6.9	73.4	0.854	34.2	36		40	15
12.	225	437	6.8	80.2	0.864	32.3	37		49	40
13.	250	482	4.5	84.7	0.876	30.0	39		64	60
14.	275	527	4.5	89.2	0.884	28.6	40		95	75
15.	300	572	3.6	92.8	0.893	27.0	41		179	95
Residuum			6.1	98.9	-	-				

Carbon residue of residuum: 3.3%

Carbon residue of crude: 0.2%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	10.7	0.697	71.5	
Total gasoline and naphtha	45.1	0.755	55.9	
Kerosine distillate	13.8	0.817	41.7	
Gas oil	18.3	0.850	35.0	
Nonviscous lubricating distillate	10.0	0.865-0.885	32.1-28.4	50-100
Medium lubricating distillate	4.8	0.885-0.896	28.4-26.4	100-200
Viscous lubricating distillate	0.8	0.896-0.898	26.4-26.1	Above 200
Residuum	6.1			
Distillation loss	1.1			

Remarks: The sample as received contained no water and sediment (by centrifuge).

CRUDE PETROLEUM ANALYSIS

Laboratory Number 18193

FIELD: Turner Valley

POOL:

ZONE: Rundle

Well Name: Model Spooner No. 1
 Location: Lsd. 4, Sec. 28, Twp. 18, Rge. 2, W 5
 Interval tested, depth, feet: 6750-6900
 Producing Zone: Rundle
 Geological Age: Mississippian

Province: Alberta
 Sample From: Alberta Pet. and
 Natural Gas Division
 Date Sampled: October 1937
 Sampled at: Tank

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.800
 Sulphur, percent by weight: 0.47
 Saybolt Universal Viscosity:
 at 70°F., sec. 33
 A.P.I. gravity at 60°F.: 45.4
 Pour point, °F.: Below -35
 Colour: A.S.T.M. No. 6
 Carbon residue, percent by weight: 0.2
 (Conradson)
 Cloud point, °F.: 35

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 760 mm. Hg.
 First drop, 23°C. (73°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	0.9	0.9)						
2.	75	167	2.1	3.0	0.667	80.6				
3.	100	212	6.4	9.4	0.714	66.7	18			
4.	125	257	11.7	21.1	0.744	58.7	24			
5.	150	302	11.9	33.0	0.766	53.2	27			
6.	175	347	9.5	42.5	0.783	49.2	28			
7.	200	392	8.0	50.5	0.794	46.7	27			
8.	225	437	7.5	58.0	0.806	44.1	27			
9.	250	482	7.9	65.9	0.821	40.9	29			
10.	275	527	7.5	73.4	0.835	38.0	31			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	7.0	80.4	0.851	34.8	34		40	15
12.	225	437	4.7	85.1	0.863	32.5	36		49	40
13.	250	482	3.5	88.6	0.875	30.2	38		62	60
14.	275	527	3.1	91.7	0.883	28.8	39		92	75
15.	300	572	2.4	94.1	0.894	26.8	41		161	90
Residuum			4.9	99.0	0.931	20.5				

Carbon residue of residuum: 3.7%

Carbon residue of crude: 0.2%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	9.4	0.699	70.9	
Total gasoline and naphtha	50.5	0.756	55.7	
Kerosine distillate	15.4	0.814	42.3	
Gas oil	17.2	0.846	35.8	
Nonviscous lubricating distillate	7.4	0.864-0.884	32.3-28.6	50-100
Medium lubricating distillate	3.6	0.884-0.899	28.6-25.9	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	4.9	0.931	20.5	
Distillation loss	1.0			

Remarks: The sample as received contained no water and sediment (by centrifuge).

CRUDE PETROLEUM ANALYSIS

Laboratory Number 482

FIELD: Turner Valley

POOL:

ZONE: Rundle

Well Name: Coronation Royalties No. 1
 Location: Lsd. 15, Sec. 17, Twp. 18, Rge. 2, W 5
 Interval tested, depth, feet: 7110-7140
 Producing Zone: Rundle
 Geological Age: Mississippian

Province: Alberta
 Sample From: Alberta Pet. & Natural Gas Division
 Date Sampled: October 5, 1938
 Sampled at: Tank

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.824
 Sulphur, percent by weight: 0.45
 Saybolt Universal Viscosity:
 at 70°F., sec. 39

A.P.I. gravity at 60°F.: 40.2
 Pour point, °F.: 0
 Colour: A.S.T.M. No. 8
 Carbon residue, percent by weight: 0.5
 (Conradson)
 Cloud point, °F.: 50

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 767 mm. Hg.
 First drop, 27°C. (81°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	1.8	1.8	0.640	89.6	-			
2.	75	167	2.7	4.5	0.671	79.4	8			
3.	100	212	4.9	9.4	0.714	66.7	18			
4.	125	257	8.1	17.5	0.747	57.9	25			
5.	150	302	7.1	24.6	0.769	52.5	28			
6.	175	347	6.7	31.3	0.787	48.3	30			
7.	200	392	5.7	37.0	0.796	46.3	28			
8.	225	437	5.9	42.9	0.810	43.2	29			
9.	250	482	6.2	49.1	0.824	40.2	30			
10.	275	527	7.7	56.8	0.840	37.0	33			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	10.0	66.8	0.859	33.2	38		41	15
12.	225	437	5.3	72.1	0.873	30.6	41		53	45
13.	250	482	5.3	77.4	0.882	28.9	42		69	60
14.	275	527	5.3	82.7	0.887	28.0	41		103	80
15.	300	572	3.1	85.8	0.891	27.3	40		148	90
Residuum			12.0	97.8	0.922	22.0				

Carbon residue of residuum: 4.1%

Carbon residue of crude: 0.5%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	9.4	0.688	74.2	
Total gasoline and naphtha	37.0	0.751	56.9	
Kerosine distillate	12.1	0.817	41.7	
Gas oil	18.5	0.852	34.6	
Nonviscous lubricating distillate	11.9	0.870-0.887	31.1-28.0	50-100
Medium lubricating distillate	6.3	0.887-0.893	28.0-27.0	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	12.0	0.922	22.0	
Distillation loss	2.2			

Remarks: The sample as received contained 0.5% by vol. water and sediment (by centrifuge).

CRUDE PETROLEUM ANALYSIS

Laboratory Number 483

FIELD: Turner Valley

POOL:

ZONE: Rundle

Well Name: Frontier Royalties No. 1
 Location: Lsd. 11, Sec. 16; Twp. 18; Rge. 2, W 5
 Interval tested, depth, feet: 6630-6700
 Producing Zone: Rundle
 Geological Age: Mississippian

Province: Alberta
 Sample From: Alberta Pet. and
 Natural Gas Div.
 Date Sampled: October 5, 1938
 Sampled at: Tank

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.797
 Sulphur, percent by weight: 0.44
 Saybolt Universal Viscosity:
 at 70°F., sec. 34

A.P.I. gravity at 60°F.: 46.0
 Pour point, °F.: -30
 Colour: A.S.T.M. No. 7
 Carbon residue, percent by weight: 0.3
 (Conradson)
 Cloud point, °F.: 45

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 762 mm. Hg.
 First drop, 25°C. (77°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	3.5	3.5	0.639	89.9	-			
2.	75	167	4.1	7.6	0.671	79.4	8			
3.	100	212	6.7	14.3	0.713	67.0	18			
4.	125	257	9.4	23.7	0.745	58.4	24			
5.	150	302	8.2	31.9	0.768	52.7	27			
6.	175	347	8.1	40.0	0.784	49.0	28			
7.	200	392	6.1	46.1	0.795	46.5	27			
8.	225	437	6.4	52.5	0.806	44.1	27			
9.	250	482	6.5	59.0	0.822	40.6	29			
10.	275	527	7.1	66.1	0.836	37.8	31			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	6.8	72.9	0.850	35.0	34		39	10
12.	225	437	5.2	78.1	0.862	32.7	36		47	40
13.	250	482	5.5	83.6	0.875	30.2	38		62	60
14.	275	527	3.2	86.8	0.881	29.1	38		93	80
15.	300	572	4.2	91.0	0.892	27.1	40		172	90
Residuum			6.5	97.5						

Carbon residue of residuum: 4.4%

Carbon residue of crude: 0.3%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	14.3	0.683	75.7	
Total gasoline and naphtha	46.1	0.743	58.9	
Kerosine distillate	12.9	0.814	42.3	
Gas oil	17.6	0.847	35.6	
Nonviscous lubricating distillate	9.0	0.865-0.882	32.1-28.9	50-100
Medium lubricating distillate	4.5	0.882-0.895	28.9-26.6	100-200
Viscous lubricating distillate	0.9	0.895-0.898	26.6-26.1	Above 200
Residuum	6.5	-	-	
Distillation loss	2.5			

Remarks: The sample as received contained 0.04% by vol. water and sediment (by centrifuge).

CRUDE PETROLEUM ANALYSIS

Laboratory Number 484

FIELD: Turner Valley

POOL:

ZONE: Rundle

Well Name: National Petroleum Corp. No. 2
 Location: Lsd. 14, Sec. 9, Twp. 18, Rge. 2, W 5
 Interval tested, depth, feet: 7250-7290
 Producing Zone: Rundle
 Geological Age: Mississippian

Province: Alberta
 Sample From: Alberta Pet. and
 Natural Gas Div.
 Date Sampled: October 5, 1938
 Sampled at: Tank

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.812
 Sulphur, percent by weight: 0.45
 Saybolt Universal Viscosity:
 at 70°F., sec. 37

A.P.I. gravity at 60°F.: 42.8
 Pour point, °F.: -30
 Colour: A.S.T.M. No. 8
 Carbon residue, percent by weight: 0.3
 (Conradson)
 Cloud point, °F.: 50

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 755 mm. Hg.
 First drop, 26°C. (79°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	2.2	2.2	0.640	89.6	-			
2.	75	167	3.2	5.4	0.674	78.4	9			
3.	100	212	6.0	11.4	0.719	65.3	21			
4.	125	257	8.6	20.0	0.750	57.2	27			
5.	150	302	7.9	27.9	0.772	51.8	29			
6.	175	347	7.3	35.2	0.787	48.3	30			
7.	200	392	6.3	41.5	0.800	45.4	30			
8.	225	437	6.1	47.6	0.811	43.0	29			
9.	250	482	6.6	54.2	0.826	39.8	31			
10.	275	527	7.3	61.5	0.839	37.2	32			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	7.1	68.6	0.853	34.4	35		39	15
12.	225	437	5.4	74.0	0.865	32.1	37		48	40
13.	250	482	5.7	79.7	0.876	30.0	39		62	60
14.	275	527	4.4	84.1	0.881	29.1	38		88	75
15.	300	572	5.1	89.2	0.888	27.9	38		155	90
Residuum			8.9	98.1	0.924	21.6				

Carbon residue of residuum: 3.1%

Carbon residue of crude: 0.3%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	11.4	0.691	73.3	
Total gasoline and naphtha	41.5	0.752	56.7	
Kerosine distillate	6.1	0.811	43.0	
Gas oil	24.4	0.843	36.4	
Nonviscous lubricating distillate	10.8	0.866-0.883	31.9-28.8	50-100
Medium lubricating distillate	6.4	0.883-0.892	28.8-27.1	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	8.9	0.924	21.6	
Distillation loss	1.9			

Remarks: The sample as received contained 1.5% by vol. water and sediment (by centrifuge).

CRUDE PETROLEUM ANALYSIS

Laboratory Number 485

FIELD: Turner Valley

POOL:

ZONE: Rundle

Well Name: Royalite No. 29

Location: Lsd. 2, Sec. 27, Twp. 20, Rge. 3, W 5

Interval tested, depth, feet: 6810-6890

Producing Zone: Rundle

Geological Age: Mississippian

Province: Alberta

Sample From: Alberta Pet. and

Natural Gas Div.

Date Sampled: October 5, 1938

Sampled at: Tank

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.798

Sulphur, percent by weight: 0.42

Saybolt Universal Viscosity:

at 70°F., sec. 34

A.P.I. gravity at 60°F.: 45.8

Pour point, °F.: Below -35

Colour: A.S.T.M. No. 6

Carbon residue, percent by weight: 0.3

(Conradson)

Cloud point, °F.: 35

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 751 mm. Hg.
First drop, 25°C. (77°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	4.2	4.2	0.635	91.3	-			
2.	75	167	4.5	8.7	0.674	78.4	9			
3.	100	212	6.4	15.1	0.716	66.1	19			
4.	125	257	9.5	24.6	0.749	57.4	26			
5.	150	302	8.7	33.3	0.771	52.0	29			
6.	175	347	7.1	40.4	0.787	48.3	30			
7.	200	392	6.0	46.4	0.798	45.8	29			
8.	225	437	5.9	52.3	0.811	43.0	29			
9.	250	482	6.7	59.0	0.826	39.8	31			
10.	275	527	7.5	66.5	0.840	37.0	33			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	6.7	73.2	0.857	33.6	37		41	20
12.	225	437	5.4	78.6	0.870	31.1	39		52	45
13.	250	482	5.4	84.0	0.880	29.3	41		75	70
14.	275	527	3.5	87.5	0.887	28.0	41		130	85
15.	300	572	2.5	90.0	0.899	25.9	44		241	95
Residuum			6.0	96.0	0.934	20.0				

Carbon residue of residuum: 4.3%

Carbon residue of crude: 0.3%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	15.1	0.681	76.3	
Total gasoline and naphtha	46.4	0.743	58.9	
Kerosine distillate	5.9	0.811	43.0	
Gas oil	22.2	0.842	36.6	
Nonviscous lubricating distillate	8.8	0.867-0.883	31.7-28.8	50-100
Medium lubricating distillate	4.3	0.883-0.895	28.8-26.6	100-200
Viscous lubricating distillate	2.4	0.895-0.904	26.6-25.0	Above 200
Residuum	6.0	0.934	20.0	
Distillation loss	4.0			

Remarks: The sample as received contained a trace of water and sediment (by centrifuge).

CRUDE PETROLEUM ANALYSIS

Laboratory Number 486

FIELD: Turner Valley

POOL:

ZONE: Rundle

Well Name: Royalite No. 30
 Location: Lsd. 11, Sec. 32, Twp. 18, Rge. 2, W 5
 Interval tested, depth, feet: 7570-7680
 Producing Zone: Rundle
 Geological Age: Mississippian

Province: Alberta
 Sample From: Alberta Pet. and
 Natural Gas Div.
 Date Sampled: October 5, 1938
 Sampled at: Tank

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.817
 Sulphur, percent by weight: 0.45
 Saybolt Universal Viscosity:
 at 70°F., sec. 38

A.P.I. gravity at 60°F.: 41.7
 Pour point, °F.: 0
 Colour: A.S.T.M. No. 8
 Carbon residue, percent by weight: 0.5
 (Conradson)
 Cloud point, °F.: 55

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 754 mm. Hg.
 First drop, 22°C. (72°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	2.7	2.7	0.639	89.9	-			
2.	75	167	3.2	5.9	0.674	78.4	9			
3.	100	212	5.1	11.0	0.717	65.9	20			
4.	125	257	7.7	18.7	0.749	57.4	26			
5.	150	302	7.2	25.9	0.771	52.0	29			
6.	175	347	6.6	32.5	0.787	48.3	30			
7.	200	392	5.6	38.1	0.800	45.4	30			
8.	225	437	5.6	43.7	0.812	42.8	30			
9.	250	482	6.1	49.8	0.828	39.4	32			
10.	275	527	7.2	57.0	0.843	36.4	34			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	6.1	63.1	0.856	33.8	37		39	10
12.	225	437	6.0	69.1	0.867	31.7	38		48	35
13.	250	482	5.9	75.0	0.880	29.3	41		62	60
14.	275	527	5.0	80.0	0.884	28.6	40		92	75
15.	300	572	5.3	85.3	0.894	26.8	41		164	95
Residuum			12.4	97.7	0.929	20.8				

Carbon residue of residuum: 3.9%

Carbon residue of crude: 0.5%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	11.0	0.685	75.1	
Total gasoline and naphtha	38.1	0.749	57.4	
Kerosine distillate	5.6	0.812	42.8	
Gas oil	23.3	0.846	35.8	
Nonviscous lubricating distillate	11.2	0.869-0.885	31.3-28.4	50-100
Medium lubricating distillate	7.1	0.885-0.899	28.4-25.9	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	12.4	0.929	20.8	
Distillation loss	2.3			

Remarks: The sample as received contained 0.3% by vol. water and sediment (by centrifuge).

CRUDE PETROLEUM ANALYSIS

Laboratory Number 487

FIELD: Turner Valley

POOL:

ZONE: Rundle

Well Name: Royalite No. 31
 Location: Lsd. 6, Sec. 29, Twp. 18, Rge. 2, W 5
 Interval tested, depth, feet: 7990-8055
 Producing Zone: Rundle
 Geological Age: Mississippian

Province: Alberta
 Sample From: Alberta Pet. and
 Natural Gas Div.
 Date Sampled: October 5, 1938
 Sampled at: Tank

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.825
 Sulphur, percent by weight: 0.46
 Saybolt Universal Viscosity:
 at 70°F., sec. 38

A.P.I. gravity at 60°F.: 40.0
 Pour point, °F.: 15
 Colour: A.S.T.M. No. 8
 Carbon residue, percent by weight: 0.5
 (Conradson)
 Cloud point, °F.: 50

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 763 mm. Hg.
 First drop, 25°C. (77°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	1.8	1.8	0.648	86.9	-			
2.	75	167	2.7	4.5	0.676	77.8	10	57.2		
3.	100	212	5.0	9.5	0.717	65.9	20	50.0		
4.	125	257	7.7	17.2	0.749	57.4	26	43.9		
5.	150	302	7.4	24.6	0.771	52.0	29	42.2		
6.	175	347	6.5	31.1	0.788	48.1	30	45.0		
7.	200	392	5.7	36.8	0.799	45.6	29	51.0		
8.	225	437	5.5	42.3	0.812	42.8	30	57.8		
9.	250	481	6.4	48.7	0.826	39.8	31	63.3		
10.	275	527	7.6	56.3	0.841	36.8	33	67.2		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	6.4	62.7	0.856	33.8	37	80.0	39	10
12.	225	437	5.9	68.6	0.867	31.7	38	76.1	47	35
13.	250	482	6.2	74.8	0.879	29.5	40	80.0	60	55
14.	275	527	5.5	80.3	0.886	28.2	40	85.6	88	75
15.	300	572	4.8	85.1	0.892	27.1	40	91.1	148	90
Residuum			13.5	98.6	0.933	20.2				

Carbon residue of residuum: 4.0%

Carbon residue of crude: 0.5%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	9.5	0.692	73.0	
Total gasoline and naphtha	36.8	0.753	56.4	
Kerosine distillate	5.5	0.812	42.8	
Gas oil	24.6	0.845	36.0	
Nonviscous lubricating distillate	11.6	0.869-0.887	31.3-28.0	50-100
Medium lubricating distillate	6.6	0.887-0.895	28.0-26.6	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	13.5	0.933	20.2	
Distillation loss	1.4			

Remarks: The sample as received contained 0.03% by vol. water and sediment (by centrifuge).

CRUDE PETROLEUM ANALYSIS

Laboratory Number 488

FIELD: Turner Valley

POOL:

ZONE: Rundle

Well Name: Royalite No. 32
 Location: Lsd. 8, Sec. 17, Twp. 18, Rge. 2, W 5
 Interval tested, depth, feet: 7030-7280
 Producing Zone: Rundle
 Geological Age: Mississippian

Province: Alberta
 Sample From: Alberta Pet. and
 Natural Gas Div.
 Date Sampled: October 5, 1938
 Sampled at: Tank

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.818
 Sulphur, percent by weight: 0.47
 Saybolt Universal Viscosity:
 at 70°F., sec. 37

A.P.I. gravity at 60°F.: 41.5
 Pour point, °F.: 15
 Colour: A.S.T.M. No. 8
 Carbon residue, percent by weight: 0.4
 (Conradson)
 Cloud point, °F.: 55

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 740 mm. Hg.
 First drop, 26°C. (79°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	2.3	2.3	0.651	85.9	-			
2.	75	167	3.0	5.3	0.678	77.2	11			
3.	100	212	5.4	10.7	0.719	65.3	21			
4.	125	257	7.1	17.8	0.748	57.7	26			
5.	150	302	7.9	25.7	0.771	52.0	29			
6.	175	347	6.8	32.5	0.786	48.5	29			
7.	200	392	5.6	38.1	0.800	45.4	30			
8.	225	437	6.1	44.2	0.811	43.0	29			
9.	250	482	6.2	50.4	0.826	39.8	31			
10.	275	527	7.3	57.7	0.839	37.2	32			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	8.7	66.4	0.857	33.6	37		40	15
12.	225	437	7.4	73.8	0.874	30.4	41		54	50
13.	250	482	5.5	79.3	0.883	28.8	42		82	70
14.	275	527	7.3	86.6	0.892	27.1	43		161	90
15.	300	572	1.8	88.4	0.902	25.4	45		340(est.)	105
Residuum			8.3	96.7	-	-				

Carbon residue of residuum: 5.2%

Carbon residue of crude: 0.4%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	10.7	0.693	72.7	
Total gasoline and naphtha	38.1	0.752	56.7	
Kerosine distillate	6.1	0.811	43.0	
Gas oil	23.5	0.844	36.2	
Nonviscous lubricating distillate	10.3	0.869-0.885	31.3-28.4	50-100
Medium lubricating distillate	5.9	0.885-0.894	28.4-26.8	100-200
Viscous lubricating distillate	4.5	0.894-0.904	26.8-25.0	Above 200
Residuum	8.3	-	-	
Distillation loss	3.3			

Remarks: The sample as received contained 0.75% by vol. water and sediment (by centrifuge).

CRUDE PETROLEUM ANALYSIS

Laboratory Number 489

FIELD: Turner Valley

POOL:

ZONE: Rundle

Well Name: Vulcan-Brown No. 1
 Location: Lsd. 10, Sec. 5, Twp. 19, Rge. 2, W 5
 Interval tested, depth, feet: 7260-7374
 Producing Zone: Rundle
 Geological Age: Mississippian

Province: Alberta
 Sample From: Alberta Pet. and
 Natural Gas Div.
 Date Sampled: October 5, 1938
 Sampled at: Tank

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.803
 Sulphur, percent by weight: 0.48
 Saybolt Universal Viscosity:
 at 70°F., sec. 35

A.P.I. gravity at 60°F.: 44.7
 Pour point, °F.: -30
 Colour: A.S.T.M. No. 7
 Carbon residue, percent by weight: 0.4
 (Conradson)
 Cloud point, °F.: 60

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 754 mm. Hg.
 First drop, 29°C. (84°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	4.0	4.0	0.640	89.6	-			
2.	75	167	3.7	7.7	0.672	79.1	8			
3.	100	212	5.7	13.4	0.716	66.1	19			
4.	125	257	8.1	21.5	0.749	57.4	26			
5.	150	302	7.5	29.0	0.771	52.0	29			
6.	175	347	6.5	35.5	0.786	48.5	29			
7.	200	392	5.9	41.4	0.799	45.6	29			
8.	225	437	5.7	47.1	0.811	43.0	29			
9.	250	482	5.9	53.0	0.825	40.0	31			
10.	275	527	7.2	60.2	0.841	36.8	33			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	6.8	67.0	0.854	34.2	36		40	10
12.	225	437	5.2	72.2	0.865	32.1	37		48	40
13.	250	482	5.9	78.1	0.876	30.0	39		63	60
14.	275	527	4.7	82.8	0.880	29.3	38		97	80
15.	300	572	4.3	87.1	0.892	27.1	40		175	95
Residuum			9.7	96.8	0.929	20.8				

Carbon residue of residuum: 3.7%

Carbon residue of crude: 0.4%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	13.4	0.681	76.3	
Total gasoline and naphtha	41.4	0.744	58.7	
Kerosine distillate	11.6	0.818	41.5	
Gas oil	17.3	0.850	35.0	
Nonviscous lubricating distillate	10.4	0.866-0.881	31.9-29.1	50-100
Medium lubricating distillate	5.7	0.881-0.896	29.1-26.4	100-200
Viscous lubricating distillate	0.7	0.896-0.898	26.4-26.1	Above 200
Residuum	9.7	0.929	20.8	
Distillation loss	3.2			

Remarks: The sample as received contained 0.2% by vol. water and sediment (by centrifuge).

CRUDE PETROLEUM ANALYSIS

Laboratory Number 490

FIELD: Turner Valley

POOL:

ZONE: Rundle

Well Name: York No. 1
 Location: Lsd. 2, Sec. 20, Twp. 18, Rge. 2, W 5
 Interval tested, depth, feet: 7360-7430
 Producing Zone: Rundle
 Geological Age: Mississippian

Province: Alberta
 Sample From: Alberta Pet. and
 Natural Gas Div.
 Date Sampled: October 5, 1938
 Sampled at: Tank

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.813
 Sulphur, percent by weight: 0.49
 Saybolt Universal Viscosity:
 at 70°F., sec. 37

A.P.I. gravity at 60°F.: 42.6
 Pour point, °F.: 10
 Colour: A.S.T.M. No. 8
 Carbon residue, percent by weight: 0.4
 (Comradson)
 Cloud point, °F.: 55

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 757 mm. Hg.
 First drop, 25°C. (77°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	3.1	3.1	0.636	91.0	-			
2.	75	167	3.4	6.5	0.671	79.4	8			
3.	100	212	5.1	11.6	0.713	67.0	18			
4.	125	257	7.4	19.0	0.746	58.2	25			
5.	150	302	7.3	26.3	0.769	52.5	28			
6.	175	347	6.6	32.9	0.785	48.8	29			
7.	200	392	5.6	38.5	0.797	46.0	28			
8.	225	437	5.5	44.0	0.810	43.2	29			
9.	250	482	6.3	50.3	0.823	40.4	30			
10.	275	527	7.3	57.6	0.839	37.2	32			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	6.8	64.4	0.855	34.0	36		39	10
12.	225	437	5.4	69.8	0.867	31.7	38		47	35
13.	250	482	5.3	75.1	0.877	29.9	39		60	55
14.	275	527	7.1	82.2	0.883	28.8	39		96	80
15.	300	572	3.3	85.5	0.892	27.1	40		184	95
Residuum			11.6	97.1	-	-				

Carbon residue of residuum: 3.7%

Carbon residue of crude: 0.4%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	11.6	0.680	76.6	
Total gasoline and naphtha	38.5	0.745	58.4	
Kerosine distillate	11.8	0.817	41.7	
Gas oil	18.0	0.851	34.8	
Nonviscous lubricating distillate	10.6	0.869-0.884	31.3-28.6	50-100
Medium lubricating distillate	5.9	0.884-0.894	28.6-26.8	100-200
Viscous lubricating distillate	0.7	0.894-0.895	26.8-26.6	Above 200
Residuum	11.6	-	-	
Distillation loss	2.9			

Remarks: The sample as received contained 1.65% by vol. water and sediment (by centrifuge).

CRUDE PETROLEUM ANALYSIS

Laboratory Number 1410

FIELD: Turner Valley

POOL:

ZONE:

Turner Valley Pipeline Sample

Province: Alberta

Sample From: The Petroleum & Natural Gas Conservation Board

Date Sampled: September 5, 1939

Sampled at: Imperial Oil Refinery, Calgary

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.810
Sulphur, percent by weight: 0.40
Saybolt Universal Viscosity:
at 70°F., sec. 36

A.P.I. gravity at 60°F.: 43.2
Pour point, °F.: -10
Colour: A.S.T.M. No. 8
Carbon residue, percent by weight: 0.4
(Conradson)
Cloud point, °F.: 65

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 758 mm. Hg.
First drop, 26°C. (79°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	3.2	3.2	0.639	89.9	-			
2.	75	167	3.9	7.1	0.676	77.8	10			
3.	100	212	6.1	13.2	0.719	65.3	21			
4.	125	257	7.0	20.2	0.750	57.2	27			
5.	150	302	7.8	28.0	0.770	52.3	28			
6.	175	347	6.7	34.7	0.785	48.8	29			
7.	200	392	5.8	40.5	0.797	46.0	28			
8.	225	437	6.0	46.5	0.809	43.4	28			
9.	250	482	7.1	53.6	0.825	40.0	31			
10.	275	527	6.5	60.1	0.839	37.2	32			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	6.5	66.6	0.855	34.0	36		39	15
12.	225	437	5.1	71.7	0.865	32.1	37		47	40
13.	250	482	6.0	77.7	0.878	29.7	40		61	60
14.	275	527	4.1	81.8	0.884	28.6	40		86	80
15.	300	572	5.1	86.9	0.891	27.3	40		170	95
Residuum			10.2	97.1	0.923	21.8				

Carbon residue of residuum: 3.9%

Carbon residue of crude: 0.4%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	13.2	0.687	74.5	
Total gasoline and naphtha	40.5	0.746	58.2	
Kerosine distillate	13.1	0.818	41.5	
Gas oil	16.6	0.851	34.8	
Nonviscous lubricating distillate	10.4	0.867-0.885	31.7-28.4	50-100
Medium lubricating distillate	5.5	0.885-0.893	28.4-27.0	100-200
Viscous lubricating distillate	0.8	0.893-0.895	27.0-26.6	Above 200
Residuum	10.2	0.923	21.8	
Distillation loss	2.9			

Remarks: The sample as received contained 0.04% by vol. water and sediment (by centrifuge).

CRUDE PETROLEUM ANALYSIS

Laboratory Number 3588

FIELD: Turner Valley

POOL:

ZONE:

Turner Valley Pipeline Sample

Province: Alberta

Sample From: Imperial Oil Ltd., Calgary

Date Sampled: July 17, 1942

Sampled at: Pipeline

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.817
 Sulphur, percent by weight: 0.86
 Saybolt Universal Viscosity:
 at 70°F., sec. 36
 at 100°F., sec. 33

A.P.I. gravity at 60°F.: 41.7
 Pour point, °F.: 0
 Colour: Green
 Carbon residue, percent by weight: 0.3
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 755 mm. Hg.
 First drop, 27°C. (81°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	3.1	3.1	0.647	87.2	-			
2.	75	167	3.7	6.8	0.680	76.6	12			
3.	100	212	5.7	12.5	0.721	64.8	22			
4.	125	257	8.3	20.8	0.751	56.9	27			
5.	150	302	7.1	27.9	0.774	51.3	30			
6.	175	347	6.7	34.6	0.788	48.1	30			
7.	200	392	5.6	40.2	0.800	45.4	30			
8.	225	437	5.5	45.7	0.813	42.6	30			
9.	250	482	6.7	52.4	0.828	39.4	32			
10.	275	527	6.9	59.3	0.843	36.4	34			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	5.2	64.5	0.859	33.2	38		41	15
12.	225	437	6.2	70.7	0.867	31.7	38		47	35
13.	250	482	5.9	76.6	0.878	29.7	40		60	55
14.	275	527	5.1	81.7	0.886	28.2	40		87	75
15.	300	572	4.9	86.6	0.893	27.0	41		149	90
Residuum			10.9	97.5	0.929	20.8				

Carbon residue of residuum: 3.2%

Carbon residue of crude: 0.3%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	12.5	0.691	73.3	
Total gasoline and naphtha	40.2	0.749	57.4	
Kerosine distillate	5.5	0.813	42.6	
Gas oil	23.6	0.847	35.6	
Nonviscous lubricating distillate	10.9	0.870-0.887	31.1-28.0	50-100
Medium lubricating distillate	6.4	0.887-0.896	28.0-26.4	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	10.9	0.929	20.8	
Distillation loss	2.5			

Remarks: The sample as received contained a trace of water and sediment (by centrifuge).

CRUDE PETROLEUM ANALYSIS

Laboratory Number 18072

FIELD: Turner Valley

POOL:

ZONE:

Pipeline (Imperial) Sample -- Province: Alberta
 Sample From: Imperial Oil Ltd.
 Date Sampled: October 8, 1957

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.794
 Sulphur, percent by weight: 0.28
 Saybolt Universal Viscosity:
 at 70°F., sec. 32

A.P.I. gravity at 60°F.: 46.7
 Pour point, °F.: Below -35
 Colour: A.S.T.M. No. 6
 Carbon residue, percent by weight: 0.3
 (Conradson)
 Cloud point, °F.: 20

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 753 mm. Hg.
 First drop, 24°C. (75°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	3.7	3.7	0.633	92.0	-			
2.	75	167	4.8	8.5	0.674	78.4	9	57.2		
3.	100	212	7.6	16.1	0.714	66.7	18	50.6		
4.	125	257	9.9	26.0	0.745	58.4	24	46.1		
5.	150	302	9.3	35.3	0.767	53.0	27	43.9		
6.	175	347	7.9	43.2	0.783	49.2	28	46.7		
7.	200	392	6.5	49.7	0.794	46.7	27	53.3		
8.	225	437	6.5	56.2	0.806	44.1	27	60.6		
9.	250	482	6.3	62.5	0.820	41.1	28	65.6		
10.	275	527	7.4	69.9	0.835	38.0	31	69.4		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	5.9	75.8	0.852	34.6	35	72.8	40	15
12.	225	437	4.8	80.6	0.860	33.0	35	78.3	47	35
13.	250	482	4.5	85.1	0.871	31.0	37	82.2	58	55
14.	275	527	3.6	88.7	0.880	29.3	38	87.8	85	75
15.	300	572	3.6	92.3	0.891	27.3	40	92.8	153	90
Residuum			6.3	98.6	-	-	-	-	-	-

Carbon residue of residuum: 4.2%

Carbon residue of crude: 0.3%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	16.1	0.683	75.7	
Total gasoline and naphtha	49.7	0.742	59.2	
Kerosine distillate	12.8	0.813	42.6	
Gas oil	16.9	0.846	35.8	
Nonviscous lubricating distillate	8.3	0.863-0.882	32.5-28.9	50-100
Medium lubricating distillate	4.6	0.882-0.896	28.9-26.4	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	6.3			
Distillation loss	1.4			

Remarks: The sample as received contained 0.02% by vol. water and sediment (by centrifuge).

CRUDE PETROLEUM ANALYSIS

Laboratory Number 18588

FIELD: Turner Valley

POOL:

ZONE: Rundle

Well Name: Firestone No. 1
 Location: Lsd. 13, Sec. 16, Twp. 18, Rge. 2, W 5
 Interval tested, depth, feet: 6840-6890

Province: Alberta
 Sample From: Anglo-Canadian
 Dev. & Holding Co.
 Limited

Producing Zone: Rundle
 Geological Age: Mississippian

Date Sampled: December 17, 1957

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.796
 Sulphur, percent by weight: 0.44
 Saybolt Universal Viscosity:
 at 70°F., sec. 34

A.P.I. gravity at 60°F.: 46.3
 Pour point, °F.: -10
 Colour: Dark Green
 Carbon residue, percent by weight: 0.4
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 766 mm. Hg.
 First drop, 23°C. (73°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Corr lation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	3.2	3.2	0.637	90.6				
2.	75	167	4.3	7.5	0.671	79.4	8			
3.	100	212	6.9	14.4	0.710	67.8	17			
4.	125	257	9.5	23.9	0.745	58.4	24			
5.	150	302	8.7	32.6	0.767	53.0	27			
6.	175	347	7.9	40.5	0.784	49.0	28			
7.	200	392	6.5	47.0	0.796	46.3	28			
8.	225	437	6.4	53.4	0.807	43.8	27			
9.	250	482	6.1	59.5	0.819	41.3	28			
10.	275	527	7.3	66.8	0.834	38.2	30			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	9.3	76.1	0.855	34.0	36		41	20
12.	225	437	4.4	80.5	0.869	31.3	39		53	45
13.	250	482	4.2	84.7	0.880	29.3	41		72	60
14.	275	527	3.5	88.2	0.888	27.9	41		111	75
15.	300	572	2.9	91.1	0.897	26.3	43		192	90
Residuum			6.2	97.3	0.938	19.4				

Carbon residue of residuum: 6.7%

Carbon residue of crude: 0.4%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	14.4	0.682	76.0	
Total gasoline and naphtha	47.0	0.743	58.9	
Kerosine distillate	12.5	0.813	42.6	
Gas oil	17.0	0.847	35.6	
Nonviscous lubricating distillate	8.8	0.865-0.885	32.1-28.4	50-100
Medium lubricating distillate	4.7	0.885-0.898	28.3-26.1	100-200
Viscous lubricating distillate	1.1	0.898-0.902	26.1-25.4	Above 200
Residuum	6.2	0.938	19.4	
Distillation loss	2.7			

Remarks: The sample as received contained 0.02% by vol. water and sediment (by centrifuge).

CRUDE PETROLEUM ANALYSIS

Laboratory Number 1465

FIELD: Vermilion

POOL:

ZONE: Vermilion (Sparky)

Well Name: Vermilion Consolidated No. 2
 Location: Lsd. 13, Sec. 20, Twp. 50, Rge. 5, W 4
 Interval tested, depth, feet: 1842-1858

Province: Alberta
 Sample From: Bureau of Geology &
 Topography
 Dept. of Mines &
 Resources

Producing Zone: Vermilion (Sparky)
 Geological Age: Lower Cretaceous

Date Sampled: September 29, 1939
 Sampled at: Outside pit

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.968
 Sulphur, percent by weight: 3.37
 Saybolt Furol Viscosity:
 at 122°F., sec. 127

A.P.I. gravity at 60°F.: 14.7
 Pour point, °F.: 10
 Colour: Black
 Carbon residue, percent by weight: 9.2
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 766 mm. Hg.

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167								
3.	100	212								
4.	125	257								
5.	150	302	0.1	0.1)						
6.	175	347	0.1	0.2)						
7.	200	392	0.5	0.7)	0.837	37.6	-			
8.	225	437	1.7	2.4	0.846	35.8	46	40.0		
9.	250	482	3.4	5.8	0.861	32.8	48	51.7		
10.	275	527	7.8	13.6	0.873	30.6	49	55.6		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	2.7	16.3	0.889	27.7	52	55.0	41	
12.	225	437	5.7	22.0	0.899	25.9	53	58.9	50	
13.	250	482	7.4	29.4	0.915	23.1	57	59.4	72	0
14.	275	527	7.4	36.8	0.930	20.7	61	61.7	143	15
15.	300	572	11.2	48.0	0.941	18.9	64	64.4	332	30
Residuum			51.0	99.0	1.006	9.2				

Carbon residue of residuum: 18.0%

Carbon residue of crude: 9.2%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline				
Total gasoline and naphtha				
Kerosine distillate				
Gas oil	19.2	0.873	30.6	
Nonviscous lubricating distillate	9.4	0.899-0.921	25.9-22.1	50-100
Medium lubricating distillate	7.2	0.921-0.934	22.1-20.0	100-200
Viscous lubricating distillate	12.2	0.934-0.948	20.0-17.8	Above 200
Residuum	51.0	1.006	9.2	
Distillation loss	1.0			

Remarks: The sample as received contained 1.5% by vol. water and sediment (by centrifuge).

CRUDE PETROLEUM ANALYSIS

Laboratory Number 2367

FIELD: Vermilion

POOL:

ZONE: Vermilion (Sparky)

Well Name: Vermilion Consolidated No. 2*

Province: Alberta

(* - This well was drilled as "Graham Norton" and was also referred to for some time as "Battleview #2".)

Location: Lsd. 13, Sec. 20, Twp. 50, Rge. 5, W 4
Interval tested, depth, feet: 1842-1858

Sample From: Lands, Parks & Forests
Branch
Dept. of Mines &
Resources

Date Sampled: October 20, 1940

Producing Zone: Vermilion (Sparky)
Geological Age: Lower Cretaceous

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.973
Sulphur, percent by weight: 3.2
Saybolt Furol Viscosity:
at 122°F., sec. 160

A.P.I. gravity at 60°F.: 13.9
Pour point, °F.: 10
Colour: Black
Carbon residue, percent by weight: 9.2
(Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 775 mm. Hg.

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167								
3.	100	212								
4.	125	257								
5.	150	302								
6.	175	347								
7.	200	392	0.5	0.5	0.840	37.0	-			
8.	225	437	1.7	2.2	0.844	36.2	45			
9.	250	482	3.2	5.4	0.859	33.2	47			
10.	275	527	8.5	13.9	0.869	31.3	47			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	4.0	17.9	0.887	28.0	51		43	
12.	225	437	6.2	24.1	0.900	25.7	54		55	
13.	250	482	8.0	32.1	0.915	23.1	57		80	
14.	275	527	6.2	38.3	0.930	20.7	61		168	0
15.	300	572	8.2	46.5	0.941	18.9	64		349	10
Residuum			52.9	99.4	1.006	9.2				

Carbon residue of residuum: 17.3%

Carbon residue of crude: 9.2%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline				
Total gasoline and naphtha				
Kerosine distillate				
Gas oil	18.9	0.870	31.1	
Nonviscous lubricating distillate	10.8	0.895-0.919	26.6-22.5	50-100
Medium lubricating distillate	6.7	0.919-0.932	22.5-20.3	100-200
Viscous lubricating distillate	10.1	0.932-0.948	20.3-17.8	Above 200
Residuum	52.9	1.006	9.2	
Distillation loss	0.6			

Remarks: The sample as received contained 8.0% by vol. water and sediment (by centrifuge).

CRUDE PETROLEUM ANALYSIS

Laboratory Number 2360

FIELD: Vermilion

POOL:

ZONE: Vermilion (Sparky)

Well Name: Vermilata No. 3
 Location: Lsd. 4, Sec. 29, Twp. 50, Rge. 5, W 4
 Interval tested, depth, feet: 1814-1816
 Producing Zone: Vermilion (Sparky)
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: Western Drilling Co.
 Vermilion, Alberta
 Date Sampled: November 8, 1940
 Sampled at: Tank

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.970
 Sulphur, percent by weight: 3.1
 Saybolt Furol Viscosity:
 at 122°F., sec. 160

A.P.I. gravity at 60°F.: 14.4
 Pour point, °F.: 20
 Colour: Black
 Carbon residue, percent by weight: 9.0
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 767 mm. Hg.

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167								
3.	100	212								
4.	125	257								
5.	150	302								
6.	175	347								
7.	200	392	0.9	0.9						
8.	225	437	2.2	3.1	0.848	35.4	47			
9.	250	482	3.6	6.7	0.857	33.6	46			
10.	275	527	6.9	13.6	0.868	31.5	46			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	3.9	17.5	0.885	28.4	50		44	-
12.	225	437	6.6	24.1	0.896	26.4	52		51	-
13.	250	482	7.4	31.5	0.912	23.7	56		75	-
14.	275	527	6.0	37.5	0.926	21.3	59		146	-
15.	300	572	10.3	47.8	0.937	19.5	62		312	Below 0
Residuum			51.2	99.0	1.000	10.0				

Carbon residue of residuum: 17.5%

Carbon residue of crude: 9.0%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline				
Total gasoline and naphtha				
Kerosine distillate				
Gas oil	20.1	0.868	31.5	
Nonviscous lubricating distillate	10.1	0.895-0.917	26.6-22.8	50-100
Medium lubricating distillate	6.9	0.917-0.930	22.8-20.7	100-200
Viscous lubricating distillate	10.7	0.930-0.944	20.7-18.4	Above 200
Residuum	51.2	1.000	10.0	
Distillation loss	1.0			

Remarks: The sample as received contained 9.0% by vol. water and sediment (by centrifuge).

OIL FIELD DATA

Field and Pool: Wainwright Field, Wainwright Sand.

Location: Twp(s) 45 & 46, Rge 6, W 4 M

DISCOVERY DETAILS

Method: Random Drilling

Well: Name: British Petroleums No. 2

Completed: 1923

Perforated: Open Hole

Treatment: Unknown

Initial Potential: Unknown

GEOLOGY

Producing Zone(s); Wainwright Sand

Other Shows: Nil

Trap Type: Stratigraphic

Lithology: Fine to very fine grained sandstone

Maximum Reservoir Thickness: 18'

Regional Setting: South Flank of East Central Alberta Plains Ridge

Deepest Formation Penetrated: Beaver Hill Lake

DEVELOPMENT DATA

Total Wells: Completed Oil: 249. Gas: 8. Dry and Abandoned: 29

Producing Oil: 215. Suspended Oil: 6

Injection: Water: 28. Gas: None

Well Spacing: 20 Acres. Pattern: NE & SW 1/4 of each Lsd

Logging Practice: E-Log

Completion Practice: Cased through producing sand and perforated

RESERVOIR DATA

Type of Drive: Solution gas drive with superimposed waterflood

Estimated Oil in Place: 112,000,000 S.T.bbls (1630 bbls/acre-foot)

Estimated Recoverable Oil: 27,500,000 S.T.bbls (400 bbls/acre-foot)

Oil Zone Thickness: Maximum: 18'

Gas Zone Thickness: Maximum: 10'

Porosity: 31.36%. Permeability: 295 md

Area: 6,850 Acres

Oil Characteristics: Gravity: 23.2 °API. Sulphur: 2.36%

Pour Point: -55°F. Initial Solution GOR: 167 SCF/bbl

PRODUCTION

MPR: Varying (Based on capability of wells, providing GOR below 400 cu ft/bbl)

Economic Allowance: In approved pressure maintenance schemes, production is not
(1965) restricted. In areas outside pressure maintenance scheme,
allowable is as follows: Economic Allowance 25 BOPD
Operating Allowance 25 BOPD

Market Outlet: Husky's Lloydminster - Hardisty Pipeline

SECONDARY RECOVERY

RESERVOIR DATA

- 1) Field: Wainwright
- 2) Pool: Wainwright Sand
- 3) Province: Alberta
- 4) Location: Twp 45, Rge. 6, W 4 M
- 5) Operator: Husky
- 6) Project: #2 Unit
- 7) Reservoir: Wainwright Sand, Lower Cretaceous
- 8) Discovery Date: June 1925
- 9) Date Injection Began: October 1962
- 10) Main Structural Feature: Combination
- 11) Gas Cap: Originally: Yes. At **Present**: Yes
- 12) Time Required for Initial **Results**: 12 months
- 13) Initial Results on Production: 267 BHP, 1000 GOR, 0.134 WOR
- 14) Main Drive in Primary Production: Solution Gas, Gas Cap, Water Drive
- 15) Productive Area (acres) of Reservoir: 10,518. Of Project: 2,800
Affected by Injection: 2,120
- 16) Average Depth to Top of Pay (feet): 2,085
- 17) Average Effective Thickness (feet): 12.5
- 18) Average Porosity %: 31.4
- 19) Average Horizontal Permeability (millidarcys): 247
- 20) Connate Water (% of pore space): 33
- 21) Viscosity at Initial Reservoir Conditions (**centipoises**): 20
- 22) API Gravity: 23°
- 23) Solution Gas/Oil Ratio at Saturation Pressure (cu ft/bbl): 167
- 24) Bubble Point Pressure (psi): 950
- 25) Original Pressure (psi): 950
- 26) Reservoir Pressure at Start of Injection (psi): 267
- 27) Latest Reservoir Pressure: 320 psi (December 31, 1964)

- 28) Injection Fluid: Salt Water, re-injection and fresh water
- 29) Injection Fluid Source: Formation
- 30) System (open, closed): N.A.
- 31) Fluid Treatment Before Injection: Filtration
- 32) Injection Pattern: Peripheral
- 33) Structural Position Injection Wells: Below WOC
- 34) Distance Injection Wells to Producers (feet): 700 to nearest, 1300 to farthest
- 35) Number of Injection Wells at Start: 10
- 36) Number of Injection Wells at Present: 10 (April 1965)
- 37) Average Daily Injection Rate per Injection Well at Start: 1,568 bbls
- 38) Average Daily Injection Rate per Injection Well at Present: 623 bbls (April 30, 1965)
- 39) Average Injection Pressure at Start: 202 psig.
- 40) Average Injection Pressure at Present (psi): 1,014 (April 1965)
- 41) Number of Producing Wells in Project Area at Start: 60
- 42) Number of Producing Wells in Project Area at Present: 58 (April 1965)
- 43) Average Production Rate in Project Area at Start (bbls/day): 935
- 44) Average Production Rate in Project Area at Present: 1,652 (April 1965)
- 45) Original Oil in Place in Project Area (bbls): 39,426,156 (Part I & II)
- 46) Original Oil Saturation (% of pore space): 67
- 47) Primary Recovery from Project Area when Injection Started (bbls): 3,147,591
- 48) Oil Saturation at Start of Project (% of pore space): 60
- 49) Oil Production from Project Area from Start of Injection to Now (bbls): 651, 367
(December 31, 1964)
- 50) Total Volume of Injected Fluids at Present (bbls): 3,196,002 (December 31, 1964)
- 51) Estimated Primary Ultimate Recovery from Project Area (bbls): 2,366,000
- 52) Estimated Increase in Ultimate Recovery from Project Area (bbls): 8,279,000
- 53) Well Spacing: 20 Acres
- 54) Oil Volume Factor (initial reservoir barrels per Stock-Tank barrel): 1.090
- 55) Remarks: A revaluation of the (1-Sw) from early data to 1965 data showed a decrease in (1-Sw) from 40% to 33%.
Gas Saturation: 6.9%.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 2940

FIELD: Wainwright

POOL:

ZONE: Sparky

Well Name: British Petroleum No. 4
 Location: Lsd. 13, Sec. 30, Twp. 45, Rge. 6, W 4
 Interval tested, depth, feet: 2025-2036
 Producing Zone: Sparky
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: Geological Survey
 Date Sampled: September 1924

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.969
 Sulphur, percent by weight: 2.60
 Saybolt Universal Viscosity:
 at 70°F., sec. 6,950
 at 100°F., sec. 1,877

A.P.I. gravity at 60°F.: 14.5
 Pour point, °F.: 5
 Colour: Brownish Black
 Carbon residue, percent by weight: 7.7
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 757 mm. Hg.
 First drop, 170°C. (338°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167								
3.	100	212								
4.	125	257								
5.	150	302								
6.	175	347	0.3	0.3						
7.	200	392	1.6	1.9	0.843	36.4	-			
8.	225	437	0.9	2.8	0.854	34.2	50			
9.	250	482	4.2	7.0	0.863	32.5	49			
10.	275	527	8.3	15.3	0.883	28.8	53			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	3.5	18.8	0.894	26.8	55		43	
12.	225	437	7.6	26.4	0.908	24.3	57		53	Below -5
13.	250	482	7.5	33.9	0.921	22.1	60		82	15
14.	275	527	7.1	41.0	0.934	20.0	63		164	50
15.	300	572	8.0	49.0	0.940	19.0	63		366	70
Residuum			49.9	98.9	-	-				

Carbon residue of residuum: 15.4%

Carbon residue of crude: 7.7%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline				
Total gasoline and naphtha				
Kerosine distillate				
Gas oil	20.8	0.877	29.8	
Nonviscous lubricating distillate	11.0	0.904-0.924	25.0-21.6	50-100
Medium lubricating distillate	7.0	0.924-0.935	21.6-19.8	100-200
Viscous lubricating distillate	10.2	0.935-0.943	19.8-18.6	Above 200
Residuum	49.9	-	-	
Distillation loss	1.1			

Remarks: The sample as received contained 1.3% by vol. water (A.S.T.M.).

CRUDE PETROLEUM ANALYSIS

Laboratory Number 3357

FIELD: Wainwright

POOL:

ZONE: Sparky

Well Name: British Petroleum No. 3B
 Location: Lsd. 4, Sec. 29, Twp. 45, Rge. 6, W 4
 Interval tested, depth, feet: 2233-2250
 Producing Zone: Sparky
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: Geological Survey
 Date Sampled: October 1925

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.944
 Sulphur, percent by weight: 2.70
 Saybolt Universal Viscosity:
 at 70°F., sec. 2200
 at 100°F., sec. 740
 A.P.I. gravity at 60°F.: 18.4
 Pour point, °F.: Below 0
 Colour: Brownish Black
 Carbon residue, percent by weight: 7.2
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 758 mm. Hg.
 First drop, 73°C. (163°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167	0.2	0.2)						
3.	100	212	2.0	2.2)	0.750	57.2	-			
4.	125	257	0.8	3.0	0.776	50.9	39			
5.	150	302	0.9	3.9	0.790	47.6	38			
6.	175	347	2.4	6.3	0.801	45.2	36			
7.	200	392	2.5	8.8	0.818	41.5	38			
8.	225	437	3.3	12.1	0.832	38.6	39			
9.	250	482	4.8	16.9	0.847	35.6	41			
10.	275	527	8.2	25.1	0.862	32.7	43			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	3.3	28.4	0.882	28.9	49		44	Below 0
12.	225	437	6.6	35.0	0.893	27.0	50		53	0
13.	250	482	6.0	41.0	0.908	24.3	54		79	20
14.	275	527	6.3	47.3	0.920	22.3	57		138	45
15.	300	572	7.3	54.6	0.928	21.0	57		273	60
Residuum			43.3	97.9	-	-				

Carbon residue of residuum: 16.7%

Carbon residue of crude: 7.2%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	2.2	0.750	57.2	
Total gasoline and naphtha	8.8	0.790	47.6	
Kerosine distillate	-	-	-	
Gas oil	21.3	0.860	33.0	
Nonviscous lubricating distillate	10.1	0.889-0.912	27.7-23.6	50-100
Medium lubricating distillate	7.1	0.912-0.923	23.6-21.8	100-200
Viscous lubricating distillate	7.3	0.923-0.932	21.8-20.3	Above 200
Residuum	43.3	-	-	
Distillation loss	2.1			

CRUDE PETROLEUM ANALYSIS

Laboratory Number 5542

FIELD: Wainwright

POOL:

ZONE: Sparky

Well Name: Wainwell No. 1
 Location: Lsd. 9, Sec. 36, Twp. 44, Rge. 7, W 4
 Interval tested, depth, feet: 2065-2072
 Producing Zone: Sparky
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: Wainwells Oils Ltd.
 Date Sampled: August 1928

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.971
 Sulphur, percent by weight: 2.82
 Saybolt Universal Viscosity:
 at 70°F., sec. Above 6000
 at 100°F., sec. 3030

A.P.I. gravity at 60°F.: 14.2
 Pour point, °F.: 15
 Colour: Brownish Black
 Carbon residue, percent by weight: 7.3
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 755 mm. Hg.
 First drop, 175°C. (347°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167								
3.	100	212								
4.	125	257								
5.	150	302								
6.	175	347								
7.	200	392	0.4	0.4)						
8.	225	437	0.7	1.1)	0.866	31.9	-			
9.	250	482	2.7	3.8	0.873	30.6	53			
10.	275	527	8.3	12.1	0.882	28.9	53			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	3.9	16.0	0.898	26.1	56		43	-
12.	225	437	8.1	24.1	0.909	24.2	58		53	0
13.	250	482	7.0	31.1	0.922	22.0	61		84	25
14.	275	527	8.7	39.8	0.935	19.8	64		162	40
15.	300	572	8.9	48.7	0.940	19.0	63		372	60
Residuum			49.9	98.6						

Carbon residue of residuum: 14.7%

Carbon residue of crude: 7.3%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline				
Total gasoline and naphtha				
Kerosine distillate				
Gas oil	18.1	0.886	28.2	
Nonviscous lubricating distillate	11.2	0.905-0.925	24.8-21.5	50-100
Medium lubricating distillate	7.8	0.925-0.936	21.5-19.7	100-200
Viscous lubricating distillate	11.6	0.936-0.943	19.7-18.6	Above 200
Residuum	49.9	-	-	
Distillation loss	1.4			

Remarks: The sample as received contained 0.5% by vol. water (A.S.T.M.).

CRUDE PETROLEUM ANALYSIS

Laboratory Number 5544

FIELD: Wainwright

POOL:

ZONE: Sparky

Well Name: British Petroleum No. 3B
 Location: Lsd. 4, Sec. 29, Twp. 45, Rge. 6, W 4
 Interval tested, depth, feet: 2233-2250
 Producing Zone: Sparky
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: Gypsy Oils Ltd.
 Date Sampled: August 1928

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.945
 Sulphur, percent by weight: 2.75
 Saybolt Universal Viscosity:
 at 70°F., sec. 1476
 at 100°F., sec. 556

A.P.I. gravity at 60°F.: 18.2
 Pour point, °F.: Below 0
 Colour: Brownish Black
 Carbon residue, percent by weight: 6.7
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 765 mm. Hg.
 First drop, 79°C. (174°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167								
3.	100	212	0.9	0.9	0.730	62.3	-			
4.	125	257	1.5	2.4	0.750	57.2	27			
5.	150	302	1.5	3.9	0.771	52.0	29			
6.	175	347	2.2	6.1	0.795	46.5	33			
7.	200	392	3.1	9.2	0.815	42.1	37			
8.	225	437	3.2	12.4	0.833	38.4	40			
9.	250	482	4.6	17.0	0.844	36.2	40			
10.	275	527	7.3	24.3	0.862	32.7	43			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	5.5	29.8	0.880	29.3	48		42	-5
12.	225	437	5.6	35.4	0.892	27.1	50		53	5
13.	250	482	5.9	41.3	0.907	24.5	54		61	20
14.	275	527	5.9	47.2	0.919	22.5	56		131	55
15.	300	572	7.2	54.4	0.927	21.1	57		275	65
Residuum			43.9	98.3						

Carbon residue of residuum: 15.3%

Carbon residue of crude: 6.7%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	0.9	0.730	62.3	
Total gasoline and naphtha	9.2	0.786	48.5	
Kerosine distillate	-	-	-	
Gas oil	21.6	0.860	33.0	
Nonviscous lubricating distillate	10.8	0.888-0.913	27.8-23.5	50-100
Medium lubricating distillate	5.7	0.913-0.923	23.5-21.8	100-200
Viscous lubricating distillate	7.1	0.923-0.931	21.8-20.5	Above 200
Residuum	43.9	-	-	
Distillation loss	1.7			

Remarks: The sample as received contained 1.0% by vol. water (A.S.T.M.).

CRUDE PETROLEUM ANALYSIS

Laboratory Number 5953

FIELD: Wainwright

POOL:

ZONE: Sparky

Well Name: Sasko Wainwright No. 1
 Location: Lsd. 1, Sec. 19, Twp. 45, Rge. 6, W 4
 Interval tested, depth, feet: 2239-2247
 Producing Zone: Sparky
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: Sasko-Wainwright Oil
 Co. Ltd.
 Date Sampled: April 1929

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.929
 Sulphur, percent by weight: 2.18
 Saybolt Universal Viscosity:
 at 70°F., sec. 942
 at 100°F., sec. 373

A.P.I. gravity at 60°F.: 20.8
 Pour point, °F.: Below 5
 Colour: Brownish Black
 Carbon residue, percent by weight: 6.2
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 760 mm. Hg.
 First drop, 50°C. (122°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167	0.5	0.5	0.659	83.2	-			
3.	100	212	1.4	1.9	0.729	62.6	26			
4.	125	257	2.1	4.0	0.751	56.9	27			
5.	150	302	2.1	6.1	0.768	52.7	28			
6.	175	347	2.7	8.8	0.791	47.4	32			
7.	200	392	3.3	12.1	0.813	42.6	36			
8.	225	437	3.0	15.1	0.827	39.6	37			
9.	250	482	4.6	19.7	0.841	36.8	38			
10.	275	527	8.3	28.0	0.860	33.0	42			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	4.5	32.5	0.880	29.3	48		43	Below 0
12.	225	437	5.5	38.0	0.894	26.8	51		55	10
13.	250	482	5.8	43.8	0.906	24.7	53		79	25
14.	275	527	5.9	49.7	0.919	22.5	56		137	50
15.	300	572	7.7	57.4	0.926	21.3	56		285	75
Residuum			40.7	98.1	-	-				

Carbon residue of residuum: 15.2%

Carbon residue of crude: 6.2%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	1.9	0.711	67.5	
Total gasoline and naphtha	12.1	0.774	51.3	
Kerosine distillate	-	-	-	
Gas oil	20.9	0.856	33.8	
Nonviscous lubricating distillate	10.0	0.888-0.911	27.8-23.8	50-100
Medium lubricating distillate	6.7	0.911-0.922	23.8-22.0	100-200
Viscous lubricating distillate	7.7	0.922-0.930	22.0-20.7	Above 200
Residuum	40.7	-	-	
Distillation loss	1.9			

CRUDE PETROLEUM ANALYSIS

Laboratory Number 6031

FIELD: Wainwright

POOL:

ZONE: Sparky

Well Name: British Wainwright No. 1
 Location: Lsd. 13, Sec. 20, Twp. 45, Rge. 6, W 4
 Interval tested, depth, feet: 2230-2238
 Producing Zone: Sparky
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: British Wainwright Oil
 & Dev. Co. Ltd.
 Date Sampled: June 1929

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.929
 Sulphur, percent by weight: 2.64
 Saybolt Universal Viscosity:
 at 70°F., sec. 897
 at 100°F., sec. 404

A.P.I. gravity at 60°F.: 20.8
 Pour point, °F.: Below 5
 Colour: Brownish Black
 Carbon residue, percent by weight: 5.9
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 765 mm. Hg.
 First drop, 65°C. (149°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167	0.7	0.7	0.679	76.9	-			
3.	100	212	1.5	2.2	0.723	64.2	23			
4.	125	257	2.4	4.6	0.747	57.9	25			
5.	150	302	2.3	6.9	0.770	52.3	28			
6.	175	347	2.8	9.7	0.792	47.2	32			
7.	200	392	3.1	12.8	0.813	42.6	36			
8.	225	437	3.0	15.8	0.828	39.4	37			
9.	250	482	4.6	20.4	0.843	36.4	39			
10.	275	527	7.4	27.8	0.859	33.2	42			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	3.7	31.5	0.874	30.4	45		42	5
12.	225	437	6.6	38.1	0.888	27.9	48		51	20
13.	250	482	6.0	44.1	0.903	25.2	52		73	35
14.	275	527	5.3	49.4	0.915	23.1	54		131	65
15.	300	572	7.9	57.3	0.927	21.1	57		249	80
Residuum			41.3	98.6	-	-				

Carbon residue of residuum: 14.4%

Carbon residue of crude: 5.9%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	2.2	0.709	68.1	
Total gasoline and naphtha	12.8	0.770	52.3	
Kerosine distillate	-	-	-	
Gas oil	21.3	0.857	33.6	
Nonviscous lubricating distillate	9.6	0.886-0.909	28.2-24.2	50-100
Medium lubricating distillate	6.9	0.909-0.922	24.2-22.0	100-200
Viscous lubricating distillate	6.7	0.922-0.934	22.0-20.0	Above 200
Residuum	41.3	-	-	
Distillation loss	1.4			

CRUDE PETROLEUM ANALYSIS

Laboratory Number 6083

FIELD: Wainwright

POOL:

ZONE: Sparky

Well Name: Wainwell No. 4
 Location: Lsd. 15, Sec. 36, Twp. 44, Rge. 7, W 4
 Interval tested, depth, feet: 2037-2047
 Producing Zone: Sparky
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: Wainwell Oils Ltd.
 Date Sampled: June 1929

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.957
 Sulphur, percent by weight: 2.92
 Saybolt Universal Viscosity:
 at 70°F., sec. 4600
 at 100°F., sec. 1220

A.P.I. gravity at 60°F.: 16.4
 Pour point, °F.: Below 5
 Colour: Brownish Black
 Carbon residue, percent by weight: 7.9
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 760 mm. Hg.
 First drop, 160°C. (320°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167								
3.	100	212								
4.	125	257								
5.	150	302								
6.	175	347	0.8	0.8	0.795	46.5	-			
7.	200	392	1.8	2.6	0.825	40.0	41			
8.	225	437	3.3	5.9	0.841	36.8	43			
9.	250	482	5.1	11.0	0.854	34.2	44			
10.	275	527	8.7	19.7	0.869	31.3	47			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	4.6	24.3	0.885	28.4	50		43	-0
12.	225	437	7.3	31.6	0.897	26.3	52		55	15
13.	250	482	6.6	38.2	0.912	23.7	56		85	30
14.	275	527	4.8	43.0	0.923	21.8	58		143	55
15.	300	572	8.2	51.2	0.930	20.7	58		302	70
Residuum			47.4	98.6						

Carbon residue of residuum: 16.7%

Carbon residue of crude: 7.9%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	-	-	-	
Total gasoline and naphtha	2.6	0.819	41.3	
Kerosine distillate	-	-	-	
Gas oil	22.6	0.866	31.9	
Nonviscous lubricating distillate	11.1	0.891-0.915	27.3-23.1	50-100
Medium lubricating distillate	6.5	0.915-0.925	23.1-21.5	100-200
Viscous lubricating distillate	8.4	0.925-0.935	21.5-19.8	Above 200
Residuum	47.4	-	-	
Distillation loss	1.4			

Remarks: The sample as received contained 1.6% by vol. water (A.S.T.M.).

CRUDE PETROLEUM ANALYSIS

Laboratory Number 2366

FIELD: Wainwright

POOL:

ZONE: Sparky

Well Name: Onalta No. 1
 Location: Lsd. 8, Sec. 20, Twp. 45, Rge. 6, W 4
 Interval tested, depth, feet: 2227-2232
 Producing Zone: Sparky
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: D.E.M.R.

Date Sampled: October 22, 1940

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.945
 Sulphur, percent by weight: 2.6
 Saybolt Universal Viscosity:
 at 100°F., sec. 850

A.P.I. gravity at 60°F.: 18.2
 Pour point, °F.: -10
 Colour: Black
 Carbon residue, percent by weight: 7.3
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 765 mm. Hg.

Fraction No.	Cut at °F.	Sum Per Cent	Specific Gravity 60/60°F.	Degrees A.P.I. °60F.	Correlation Index	Aniline Point, °C.	Visc. S.U. 100°F.	Cloud Test, °F.
1.	122							
2.	167							
3.	212							
4.	257							
5.	302	0.6						
6.	347	1.3						
7.	392	3.2	0.814	42.3	36			
8.	437	6.9	0.825	40.0	36			
9.	482	11.8	0.839	37.2	37			
10.	527	20.5	0.856	33.8	41			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	392	25.6	0.876	30.0	46		42	-5
12.	437	32.6	0.887	28.0	47		51	20
13.	482	40.5	0.903	25.2	52		75	40
14.	527	47.1	0.917	22.8	55		135	60
15.	572	54.7	0.926	21.3	56		261	75
Residuum		99.4	1.002	9.7				

Carbon residue of residuum: 16.4%

Carbon residue of crude: 7.3%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline				
Total gasoline and naphtha	3.2	-	-	
Kerosine distillate	3.7	0.825	40.0	
Gas oil	21.6	0.860	33.0	Below 50
Nonviscous lubricating distillate	11.2	0.886-0.909	28.2-24.2	50-100
Medium lubricating distillate	7.7	0.909-0.921	24.2-22.1	100-200
Viscous lubricating distillate	7.3	0.921-0.931	22.1-20.5	Above 200
Residuum	44.7	1.002	9.7	
Distillation loss	0.6			

Remarks: The sample as received contained 2.7% by vol. water and sediment (by centrifuge).

OIL FIELD DATA

Field and Pool: Wayne-Blairmore

Location: Twp(s) 26, 27, 28 & 29, Rge(s) 18, 19, 20, 21 & 22; W 4 M

DISCOVERY DETAILS

Method: **Subsurface** Geological Studies

Well: Name: Mobil et al Wayne 6-22-27-20 W 4

Completed: September 3, 1954

Perforated: 4480' -4498'

Treatment: None

Initial Potential: 262 BOPD on 1/4" choke

GEOLOGY

Producing Zone(s): Basal Blairmore

Trap Type: Stratigraphic

Lithology: Sandstone

Maximum Reservoir Thickness: 95'

Regional Setting: Edge of Devonian Green Shale Basin

DEVELOPMENT DATA

Total Wells: Completed Oil: 7

Producing Oil: 5. Suspended Oil: 2

Well Spacing: 80/160 Acres

Logging Practice: Electrical Log and Microlog

Completion Practice: Case through and perforate

RESERVOIR DATA (1-1-65)

Type of Drive: Dissolved Gas

Estimated Oil in Place: 4,206,700 S.T.bbls (295 bbls/acre-foot)

Estimated Recoverable Oil: 740,000 S.T.bbls (40 bbls/acre-foot)

Oil Zone Thickness: Maximum: 34. Average: 26.0

Gas Zone Thickness: -

Porosity: 16.7%. Permeability: 50 md

Area: 980 Acres

Oil Characteristics: Gravity: 29 °API. Sulphur: 1.39%

Pour Point: 35°F. Initial Solution GOR: 420

PRODUCTION

MPR: 52 BOPD (September 1965 allowable)

Economic Allowance: Operating: 26

Market Outlet (pipeline): Britamoil

CRUDE PETROLEUM ANALYSIS

Laboratory Number 170-56

FIELD: Wayne

POOL:

ZONE: Basal Blairmore

Well Name: Great Plains Triad Socony

Province: Alberta

C.P.R. Wayne "A" No. 4-22

Location: Lsd. 4, Sec. 22, Twp. 27, Rge. 20, W 4

Sample From: D.M.T.S.

Interval tested, depth, feet: 4493-4562

Producing Zone: Basal Blairmore

Date Sampled: May 17, 1956

Geological Age: Lower Cretaceous

Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.872
Sulphur, percent by weight: 1.32
Saybolt Universal Viscosity:
at 70°F., sec. 114
at 100°F., sec. 59

A.P.I. gravity at 60°F.: 30.8
Pour point, °F.: 25
Colour: Brownish Black
Carbon residue, percent by weight: 6.0
(Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 762 mm. Hg.
First drop, 32°C. (90°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	1.0	1.0)						
2.	75	167	2.1	3.1)	0.690	73.6	-	-		
3.	100	212	3.3	6.4	0.705	69.2	14	57.2		
4.	125	257	4.2	10.6	0.732	61.8	18	55.3		
5.	150	302	4.1	14.7	0.753	56.4	20	53.0		
6.	175	347	4.3	19.0	0.770	52.3	22	54.6		
7.	200	392	3.9	22.9	0.785	48.8	23	56.0		
8.	225	437	3.5	26.4	0.802	44.9	25	59.1		
9.	250	482	3.8	30.2	0.816	41.9	26	63.0		
10.	275	527	6.0	36.2	0.834	38.2	30	65.1		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	3.5	39.7	0.855	34.0	36	66.6	38	5
12.	225	437	5.5	45.2	0.864	32.3	37	69.1	43	25
13.	250	482	5.3	50.5	0.878	29.7	40	72.8	55	40
14.	275	527	4.9	55.4	0.892	27.1	43	75.6	78	60
15.	300	572	6.4	61.8	0.903	25.2	46	78.1	141	80
Residuum			34.9	96.7	0.997	10.4				

Carbon residue of residuum: 15.1%

Carbon residue of crude: 6.0%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	6.4	0.698	71.2	
Total gasoline and naphtha	22.9	0.742	59.2	
Kerosine distillate	7.3	0.809	43.4	
Gas oil	15.3	0.850	35.0	
Nonviscous lubricating distillate	9.4	0.872-0.896	30.8-26.4	50-100
Medium lubricating distillate	6.9	0.896-0.909	26.4-24.2	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	34.9	0.997	10.4	
Distillation loss	3.3			

Remarks: The sample as received contained 19 lb. salt (as NaCl) per 1000 bbl.

OIL FIELD DATA

Field and Pool: Westerosé D-3

Location: Twp(s) 45 & 46, Rge(s) 28, W 4 M & 1, W 5 M

DISCOVERY DETAILS

Method: Seismic Reflection Survey

Well: Name: B.A. Cal Stan. Husky-Phillips CPR Fiveland No. 4 in 4-3-46-28 W 4 M

Completed: September 24, 1952

Perforated: Open Hole

Initial Potential: 1,058 BOPD

GEOLOGY

Producing Zone(s): Leduc form., Woodbend group, Upper Devonian

Other Shows: Gas Show from Glauconitic sand at B.A. Norman 8-4-46-28 W 4 M
Nisku yielded gas at B.A. et al Fiveland No. 12-3

Trap Type: Elongated Stratigraphic - Reef Bioherm

Lithology: Mainly dolomite, grey to buff, crypto to coarsely crystalline,
reefoid, vuggy with abndt. open and closed fractures.

Maximum Reservoir Thickness: 589'

Regional Setting: Located on the Rimbey-Morinville Reef Trend between the
Pigeon Lake field to the northeast and Dick Lake Field to the
southwest.

Deepest Formation Penetrated: Leduc form.

DEVELOPMENT DATA

Total Wells: Completed Oil: 19. Gas: 1

Producing Oil: 18

Injection or Disposal: Gas: 1

Well Spacing: 80 Acres

Logging Practice: A variety of tools have been employed throughout the field; mainly RA and other porosity and resistivity devices.

Completion Practice: 600' to 10 3/4" surface casing. Drill to 50' above O/W interface. Set 7" production casing. Drill or core ahead approx. 30' and complete open hole.

RESERVOIR DATA

Type of Drive: Gas cap and gravity segregation with recycled gas injection process.

Estimated Oil in Place: 161,264,000 S.T.bbls (471 bbls/acre-foot)

Estimated Recoverable Oil: 125,786,000 S.T.bbls (367 bbls/acre-foot)

Oil Zone Thickness: Maximum: 238'. Average: 190.1'

Gas Zone Thickness: Maximum: 350'. Average: 175'

Porosity: 9.34%. Permeability: 1,934 md

Area: 1,801 acres

Oil Characteristics: Gravity: 42 °API. Sulphur: 0.25%

Initial Solution GOR: 82 cu ft/bbl

Base: Paraffin

Pressure Maintenance or Secondary Recovery: Recycled gas injection system. Gas injection commenced August 1955. Some 82% of produced gas has been re-injected.

PRODUCTION

MPR: 25,000 BOPD (Max. daily pool allowable)

Economic Allowance: Present: 34 BOPD. Operating: 34 BOPD

Market Outlet: Via Texaco Pipeline to Edmonton terminal

CRUDE PETROLEUM ANALYSIS

Laboratory Number 247-56

FIELD: Westeros

POOL:

ZONE: Leduc (D-3)

Well Name: Norman No. 8
 Location: Lsd. 8, Sec. 4, Twp. 46, Rge. 28, W 4
 Interval tested, depth, feet: 7271-7357
 Producing Zone: Leduc (D-3)
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: June 22, 1956
 Sampled at: Before Separator

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.819
 Sulphur, percent by weight: 0.24
 Saybolt Universal Viscosity:
 at 100°F., sec. 34

A.P.I. gravity at 60°F.: 41.3
 Pour point, °F.: 5
 Colour: Greenish Black
 Carbon residue, percent by weight: 0.8
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 764 mm. Hg.
 First drop, 32°C. (90°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167	3.4	3.4	0.674	78.4	-			
3.	100	212	5.2	8.6	0.707	68.6	15	53.8		
4.	125	257	8.0	16.6	0.742	59.2	23	49.7		
5.	150	302	7.5	24.1	0.763	54.0	25	46.5		
6.	175	347	6.5	30.6	0.778	50.4	25	48.5		
7.	200	392	5.3	35.9	0.791	47.4	25	52.7		
8.	225	437	5.7	41.6	0.805	44.3	26	57.7		
9.	250	482	6.1	47.7	0.816	41.9	26	60.9		
10.	275	527	6.1	53.8	0.828	39.4	27	65.5		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	4.5	58.3	0.846	35.8	32	71.0	39	5
12.	225	437	6.2	64.5	0.855	34.0	32	76.9	43	30
13.	250	482	4.8	69.3	0.868	31.5	35	79.4	55	50
14.	275	527	4.9	74.2	0.876	30.0	36	83.8	69	65
15.	300	572	5.6	79.8	0.886	28.2	37	88.8	124	80
Residuum			16.3	96.1	0.936	19.7				

Carbon residue of residuum: 4.3%

Carbon residue of crude: 0.8%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	8.6	0.694	72.4	
Total gasoline and naphtha	35.9	0.749	57.4	
Kerosine distillate	11.8	0.811	43.0	
Gas oil	16.9	0.843	36.4	
Nonviscous lubricating distillate	10.1	0.863-0.882	32.5-28.9	50-100
Medium lubricating distillate	5.1	0.882-0.892	28.9-27.1	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	16.3	0.936	19.7	
Distillation loss	3.9			

Remarks: The sample as received contained 4 lb. salt (as NaCl) per 1000 bbl.

OIL FIELD DATA

Field and Pool: Westward Ho, Rundle

Location: Twp 33; Rge 4, W 5 M

DISCOVERY DETAILS

Method: Seismic Reflection Survey, **Subsurface** Geology

Well: Name: H.B. Oilwell Operators Westward Ho No. 1 (7-8-33-4 W 5 M)

Completed: March 3, 1955

Perforated: 8757'-8774'. 8790'-8830'

Treatment: 1000 Gallons of Acid

Initial Potential: 1,002 BOPD thru 16/64" choke

GEOLOGY

Producing Zone(s): Elkton

Other Shows: Viking

Trap Type: Stratigraphic

Lithology: Mostly Limestone with Interbeds of Dolomite

Maximum Reservoir Thickness: 87' gross

Regional Setting: Located near the truncated edge of the Elkton Member of the Mississippian

Deepest Formation Penetrated: Woodbend

DEVELOPMENT DATA

Total Wells: Completed Oil: 40. Dry and Abandoned: 4

Producing Oil: 13. Shut-in Oil: 24

Injection or Disposal: Water: 3. Gas: Nil

Well Spacing: 80 Acres. Pattern: Two Lsd's, North-South with Wells Located in Odd No. Lsd's.

Logging Practice: E-S Induction or Electrical Log & Micro-Caliper to Total Depth (8,900')

Completion Practice: 600' to 700' of 10 3/4" surface casing; 5 1/2" production casing generally set thru the producing zone; Perf. 4 shots/foot.

RESERVOIR DATA

Type of Drive: Solution Gas Drive

Estimated Oil in Place: 31,296,000 S.T.bbls (223 bbls/acre-foot)

Estimated Recoverable Oil: 5,633,000 S.T.bbls (54 bbls/acre-foot)

Oil Zone Thickness: Maximum: 50'. Average: 23'

Gas Zone Thickness: Maximum: Unknown

Porosity: 9.1%. Permeability: 44 md

Area: 4,003 Acres

Oil Characteristics: Gravity: 36 °API. Sulphur: 0.52%

Pour Point: -10°F. Initial Solution GOR: 965 cu ft/bbl

Pressure Maintenance or Secondary Recovery: Water Flood

PRODUCTION

MPR: Same as E.A.

Economic Allowance: 40 BOPD. Operating: 40 BOPD

Market Outlet: Via Cremona Pipelines to Calgary Refinery, or Rangeland Pipelines to Edmonton Terminal.

Bibliographical References: HBO & G Records; The Reservoir Engineering Digest and "Oil Fields of Alberta", by the Alberta Society of Petroleum Geologists.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 154-56

FIELD: Westward Ho

POOL:

ZONE: Rundle (Elkton)

Well Name: Oilwell Operators C. & E. Westward Ho No. 7-7
 Location: Lsd. 7, Sec. 7, Twp. 33, Rge. 4, W 5
 Interval tested, depth, feet: 8955-9000
 Producing Zone: Rundle (Elkton)
 Geological Age: Mississippian

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: May 14, 1956
 Sampled at: Before Separator

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.848
 Sulphur, percent by weight: 0.47
 Saybolt Universal Viscosity:
 at 100°F., sec. 39

A.P.I. gravity at 60°F.: 35.4
 Pour point, °F.: -20
 Colour: Brownish Green
 Carbon residue, percent by weight: 1.0
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 761 mm. Hg.
 First drop, 33°C. (91°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167	2.0	2.0	0.690	73.6	-			
3.	100	212	3.3	5.3	0.718	65.6	20	49.5		
4.	125	257	5.6	10.9	0.753	56.4	28	44.0		
5.	150	302	5.5	16.4	0.776	50.8	31	38.2		
6.	175	347	5.4	21.8	0.790	47.6	31	41.0		
7.	200	392	5.0	26.8	0.803	44.7	31	46.9		
8.	225	437	5.1	31.9	0.816	41.9	32	54.8		
9.	250	482	6.7	38.6	0.831	38.8	33	59.5		
10.	275	527	8.0	46.6	0.848	35.4	37	64.4		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	3.6	50.2	0.864	32.3	40	68.1	40	5
12.	225	437	6.1	56.3	0.872	30.8	40	72.0	46	25
13.	250	482	6.4	62.7	0.882	28.9	42	76.1	56	45
14.	275	527	7.3	70.0	0.893	27.0	44	80.0	82	65
15.	300	572	6.4	76.4	0.902	25.4	45	86.0	155	85
Residuum			21.4	97.8	0.939	19.2				

Carbon residue of residuum: 4.1%

Carbon residue of crude: 1.0%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	5.3	0.707	68.6	
Total gasoline and naphtha	26.8	0.765	53.5	
Kerosine distillate	5.1	0.816	41.9	
Gas oil	23.8	0.851	34.8	
Nonviscous lubricating distillate	12.4	0.876-0.895	30.0-26.6	50-100
Medium lubricating distillate	8.3	0.895-0.906	26.6-24.7	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	21.4	0.939	19.2	
Distillation loss	2.2			

Remarks: The sample as received contained 9 lb. salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 967-51

FIELD: Whitelaw

POOL:

ZONE:

Well Name: Shell B.A. Whitelaw No. 1
 Location: Lsd. 2, Sec. 14, Twp. 82, Rge. 2, W 6
 Interval tested, depth, feet: 3882-3910

Province: Alberta
 Sample From: D.M.T.S.

Date Sampled: July 30, 1951
 Sampled at: Well

Geological Age: Permian-Pennsylvanian

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.896
 Sulphur, percent by weight: 1.81
 Saybolt Universal Viscosity:
 at 70°F., sec. 362
 at 100°F., sec. 158
 A.P.I. gravity at 60°F.: 26.4
 Four point, °F.: 40
 Colour: Brownish Green
 Carbon residue, percent by weight: 5.4
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 765 mm. Hg.
 First drop, 28°C. (82°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122								
2.	75	167	1.0	1.0)						
3.	100	212	1.3	2.3)	0.705	69.2	-	55.6		
4.	125	257	2.3	4.6	0.751	56.9	27	53.4		
5.	150	302	2.5	7.1	0.769	52.5	28	54.6		
6.	175	347	1.9	9.0	0.786	48.5	29	55.5		
7.	200	392	2.7	11.7	0.802	44.9	31	56.5		
8.	225	437	3.7	15.4	0.816	41.9	32	59.8		
9.	250	482	6.0	21.4	0.827	39.6	31	64.5		
10.	275	527	7.5	28.9	0.836	37.8	31	67.8		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	4.3	33.2	0.853	34.4	35	71.6	41	20
12.	225	437	6.7	39.9	0.859	33.2	34	75.0	48	35
13.	250	482	8.0	47.9	0.871	31.0	37	77.8	60	50
14.	275	527	7.0	54.9	0.883	28.8	39	82.0	93	70
15.	300	572	7.7	62.6	0.894	26.8	41	84.9	178	85
Residuum			36.3	98.9	0.965	15.1				

Carbon residue of residuum: 13.0%

Carbon residue of crude: 5.4%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	2.3	0.705	69.2	
Total gasoline and naphtha	11.7	0.763	54.0	
Kerosine distillate	3.7	0.816	41.9	
Gas oil	22.5	0.842	36.6	
Nonviscous lubricating distillate	14.0	0.861-0.884	32.8-28.6	50-100
Medium lubricating distillate	8.7	0.884-0.897	28.6-26.3	100-200
Viscous lubricating distillate	2.0	0.897-0.900	26.3-25.7	Above 200
Residuum	36.3	0.965	15.1	
Distillation loss	1.1			

Remarks: The sample as received contained 0.15% by vol. water and sediment (by centrifuge) and 38 lb. salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 8588

FIELD: Whitemud

POOL:

ZONE: Ostracod

Well Name: Imperial Whitemud No. 3
 Location: Lsd. 12, Sec. 14, Twp. 51, Rge. 25, W 4
 Interval tested, depth, feet: 4080-4092
 Producing Zone: Ostracod
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: June 30, 1950
 Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.841
 Sulphur, percent by weight: 0.67
 Saybolt Universal Viscosity:
 at 70°F., sec. 47
 at 100°F., sec. 41
 A.P.I. gravity at 60°F.: 36.8
 Pour point, °F.: 5
 Colour: Brownish Green
 Carbon residue, percent by weight: 2.0
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 755 mm. Hg.
 First drop, 38°C. (100°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	0.8	0.8	0.688	74.2	-			
2.	75	167	2.5	3.3	0.695	72.1	19			
3.	100	212	9.9	13.2	0.706	68.9	15			
4.	125	257	4.0	17.2	0.742	59.2	23			
5.	150	302	5.6	22.8	0.760	54.7	24			
6.	175	347	5.4	28.2	0.779	50.1	26			
7.	200	392	4.7	32.9	0.795	46.5	27			
8.	225	437	4.9	37.8	0.809	43.4	28			
9.	250	482	5.1	42.9	0.821	40.9	29			
10.	275	527	6.4	49.3	0.837	37.6	32			

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	6.7	56.0	0.854	34.2	36		39	5
12.	225	437	4.4	60.4	0.867	31.7	38		48	35
13.	250	482	4.8	65.2	0.880	29.3	41		62	50
14.	275	527	4.6	69.8	0.888	27.9	41		92	70
15.	300	572	5.8	75.6	0.900	25.7	44		180	85
Residuum			22.4	98.0	0.960	15.9				

Carbon residue of residuum: 9.1%

Carbon residue of crude: 2.0%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	13.2	0.703	69.8	
Total gasoline and naphtha	32.9	0.743	58.9	
Kerosine distillate	10.0	0.815	42.1	
Gas oil	15.9	0.849	35.2	
Nonviscous lubricating distillate	9.2	0.869-0.889	31.3-27.7	50-100
Medium lubricating distillate	5.9	0.889-0.903	27.7-25.2	100-200
Viscous lubricating distillate	1.7	0.903-0.907	25.2-24.5	Above 200
Residuum	22.4	0.960	15.9	
Distillation loss	2.0			

Remarks: The sample as received contained 5.0% by vol. water and sediment (by centrifuge).

OIL FIELD DATA

Field and Pool: Willesden Green, Cardium

Location: Twp(s) 41, 42 & 43; Rge(s) 5, 6, 7 & 8, W 5 M

DISCOVERY DETAILS

Method: Geological and Geophysical Exploration

Well: Name: Texaco 2-1-42-6 W 5,	and	Amerada 6-6-43-6 W 5
Completed: January 9, 1965		May 19, 1956
Perforated: 6099-6111		6063-6072
Treatment: Frac Job w/7100# Sd.		Frac Job w/16,200# Sd.
Initial Potential: 8.8 BOPhr 18/64" Chk.		80 BOPD on 16/64" Chk.

GEOLOGY

Producing Zone(s): Cardium Sand

Other Shows: Belly River Sand

Trap Type: Sand Pinchout (Stratigraphic Trap)

Lithology: Brown Fine-Grained Quartz Sand & Conglomerate

Maximum Reservoir Thickness: 18'

Regional Setting: Eastern margin of Alberta Syncline

Deepest Formation Penetrated: Beaverhill Lake

DEVELOPMENT DATA

Total Wells: Completed Oil: 284. Gas: 1. Dry and Abandoned: 18 (immediate Vicinity)

Producing Oil: 247. Suspended Oil: None

Injection or Disposal: Water: 38. Gas: None

Well Spacing: 160 & 320 Acres. Water Flooding Pattern: Inverted 9 Spot

Logging Practice: Induction E-Log & Micro Log

Completion Practice: Perforated Csg & Stimulated by Fracture Treatment

RESERVOIR DATA

Type of Drive: Solution Gas Drive & Artificial Water Drive

Estimated Oil in Place: 355,000,000 S.T.bbls (746 bbls/acre-foot) 1965

Estimated Recoverable Oil: 64,305,000 S.T.bbls (135 bbls/acre-foot) 1965

Oil Zone Thickness: Maximum: 18'. Average: 8.3'

Gas Zone Thickness: -

Porosity: 15.2%. Permeability: 8.6 md

Area: 57,280 Acres developed

Oil Characteristics: Gravity: 41 °API. Sulphur: 0.12%

Four Point: 20°F. Initial Solution GOR: 825

Pressure Maintenance or Secondary Recovery: 160 Ac. Area Under Flood.

PRODUCTION (On Average Well Basis)

MPR: (Not Valid Now)

Economic Allowance: Initial 47. Operating: 31 BOPD

Market Outlet: Pembina Pipeline to Edmonton

SECONDARY RECOVERY

RESERVOIR DATA

- 1) Field: Willesden Green
- 2) Pool: Willesden Green Cardium
- 3) Province: Alberta
- 4) Location: Twp(s) 42 & 43, Rge(s) 6 & 7, W 5 M
- 5) Operator: Amerada Petroleum Corp.
- 6) Project: 1 Unit
- 7) Reservoir: Colorado Group of Upper Cretaceous
- 8) Discovery Date: December 1954
- 9) Date Injection Began: January 1962
- 10) Main Structural Feature: Stratigraphic Trap
- 11) Gas Cap: Originally: No. At Present: No
- 12) Time Required for Initial Results (months): GOR's show substantial decrease in July 1963
- 13) Initial Results on Production: 2,140 BHP. GOR: 825. WOR: Nil
- 14) Main Drive in Primary Production: Solution Gas
- 15) Productive Area (acres) of Reservoir: 49,120. Of Project: 4,000
Affected by Injection: 2,520
- 16) Average Depth to Top of Pay (feet): 6235.2
- 17) Average Effective Thickness (feet): 11.8
- 18) Average Porosity %: 15.2
- 19) Average Horizontal Permeability (millidarcys): 9.12
- 20) Connate Water (% of pore space): 0.09
- 21) Viscosity at Initial Reservoir Conditions (centipoises): 0.52
- 22) API Gravity: 41
- 23) Solution Gas/Oil Ratio at Saturation Pressure (cu ft/bbl): 812
- 24) Bubble Point Pressure (psi): 2,269
- 25) Original Pressure (psi): 3,060
- 26) Reservoir Pressure at Start of Injection: 2,150 psig
- 27) Latest Reservoir Pressure: 2,259 psi (January 1964)

- 28) Injection Fluid: Salt Water, Fresh Water
- 29) Injection Fluid Source: Paskapoo Formation
- 30) System: Closed
- 31) Fluid Treatment before Injection: Filtration, Chlorination
- 32) Injection Pattern: Inverted 9 Spot
- 33) Structural Position Injection Wells: Oil Zone
- 34) Distance Injection Wells to Producers (feet): 2,600 to nearest, 10,500 to farthest
- 35) Number of Injection Wells at Start: 4
- 36) Number of Injection Wells at Present: 5 (August 1965)
- 37) Average Daily Injection Rate per Injection Well at Start: 200 to 250 bbl/day
- 38) Average Daily Injection Rate per Injection Well at Present: 1,912 bbls
- 39) Average Injection Pressure at Start: 1,500 to 1,550 psig.
- 40) Average Injection Pressure at Present (psi): 1,666 (August 1965)
- 41) Number of Producing Wells in Project Area at Start: 21
- 42) Number of Producing Wells in Project Area at Present: 23 (August 1965)
- 43) Average Production Rate in Project Area at Start (bbl/day): -
- 44) Average Production Rate in Project Area at Present: 971 bbl/day (August 1965)
- 45) Original Oil in Place in Project Area (bbls): 34,909,365
- 46) Original Oil Saturation (% of pore space): 91
- 47) Primary Recovery from Project Area when Injection Started (bbls): 1,573,176
- 48) Oil Saturation at Start of Project (% of pore space): 91
- 49) Oil Production from Project Area from Start of Injection to Now (bbls): 1,058,928
(August 1965)
- 50) Total Volume of Injected Fluids at Present: 1,835,713 bbl (June 1964)
- 51) Estimated Primary Ultimate Recovery from Project Area (bbls): 2,793,000
- 52) Estimated Increase in Ultimate Recovery from Project Area (bbls): 5,585,000
- 53) Well Spacing: 160 Acres
- 54) Oil Volume Factor (initial reservoir barrels per Stock-Tank barrel): 1.430

CRUDE PETROLEUM ANALYSIS

Laboratory Number 376-58

FIELD: Willesden Green

POOL:

ZONE: Cardium

Well Name: Texaco McColl A
 Location: Lsd. 8, Sec. 32, Twp. 42, Rge. 6, W 5
 Interval tested, depth, feet: 6065-6073
 Producing Zone: Cardium
 Geological Age: Upper Cretaceous

Province: Alberta
 Sample From: D.E.M.R.
 Date Sampled: October 9, 1958
 Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.816
 Sulphur, percent by weight: 0.23
 Saybolt Universal Viscosity:
 at 100°F., sec. 36

A.P.I. gravity at 60°F.: 41.9
 Pour point, °F.: 5
 Colour: Brownish Black
 Carbon residue, percent by weight: 1.3
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 752 mm. Hg.
 First drop, 26°C. (79°F.)

Fraction No.	Cut at °F.	Sum Per Cent	Specific Gravity 60/60°F.	Degrees A.P.I. °60 F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
1.	122	2.8	0.651	85.9	-	-		
2.	167	6.3	0.676	77.8	10	-		
3.	212	12.0	0.713	67.0	18	54.0		
4.	257	19.0	0.742	59.2	23	51.5		
5.	302	24.9	0.762	54.2	25	51.4		
6.	347	29.9	0.778	50.4	25	54.2		
7.	392	34.0	0.792	47.2	26	58.2		
8.	437	38.8	0.804	44.5	26	62.7		
9.	482	43.5	0.817	41.7	27	66.4		
10.	527	50.4	0.830	39.0	28	70.9		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	392	54.8	0.843	36.4	30	74.5	39	20
12.	437	60.4	0.852	34.6	31	79.0	46	40
13.	482	64.7	0.861	32.8	32	83.6	57	60
14.	527	69.2	0.872	30.8	34	87.5	79	75
15.	572	75.3	0.883	28.8	36	91.4	127	90
Residuum		95.7	0.935	19.8				

Carbon residue of residuum: 5.7%

Carbon residue of crude: 1.3%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	12.0	0.688	74.2	
Total gasoline and naphtha	34.0	0.738	60.2	
Kerosine distillate	9.5	0.810	43.2	
Gas oil	15.9	0.840	37.0	Below 50
Nonviscous lubricating distillate	9.8	0.855-0.877	34.0-29.8	50-100
Medium lubricating distillate	6.1	0.877-0.888	29.8-27.8	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	20.4	0.935	19.8	
Distillation loss	4.3			

OIL FIELD DATA

Field and Pool: Wimborne D-3

Location: Twp(s) 32, 33, 34, 35; Rge 26, W 4 M

DISCOVERY DETAILS

Method: Seismograph

Well: Name: Seaboard Banff Wimborne 7-9-34-26

Completed: October 1954

Perforated: 7467-7470

Treatment: 500 gallons mud acid

Initial Potential: Swabbed 125 BOPD

GEOLOGY

Producing Zone(s): Leduc D-3

Lithology: Biohermal Reef

Maximum Reservoir Thickness: 560'

Regional Setting: Devonian Green Shale Basin

DEVELOPMENT DATA

Total Wells: Completed Oil: 21. Gas: 2. Dry and Abandoned: 8

Producing Oil: 17. Suspended Oil: 4

Injection or Disposal: Water: 1.

Well Spacing: 160 Acres

Logging Practice: Electrical Log and Microlog

Completion Practice: Case through and perforate

RESERVOIR DATA (1-1-65)

Type of Drive: Gas Cap

Estimated Oil in Place: 94,700,000 S.T.bbls (316 bbls/acre-foot)

Estimated Recoverable Oil: 6,000,000 S.T.bbls (20 bbls/acre-foot)

Oil Zone Thickness: Maximum: 18'. Average: 18.0'

Gas Zone Thickness: Maximum: 88'

Porosity: 6.8%. Permeability: 200H md

Area: 17,000 Acres

Oil Characteristics: Gravity: 39.3 °API. Sulphur: 1.22%

Pour Point: -30°F.: Initial Solution GOR: 980

Pressure Maintenance or Secondary Recovery: Produced Water Returned to Formation

PRODUCTION

MPR: 490 BOPD (September 1965 Allowable)

Economic Allowance: 56. Present: 56. Operating: 35

Market Outlet: Rangeland Pipeline

CRUDE PETROLEUM ANALYSIS

Laboratory Number 431-57

FIELD: Wimborne

POOL:

ZONE: D-3

Well Name: BA Mobil CPR Elingetal No. 7
 Location: Lsd. 7, Sec. 23, Twp. 33, Rge. 26, W 4
 Interval tested, depth, feet: 7481-7484
 Producing Zone: Leduc D-3
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: D.E.M.R.
 Date Sampled: November 28, 1957
 Sampled at: Wellhead

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.821
 Sulphur, percent by weight: 1.03
 Saybolt Universal Viscosity:
 at 100°F., sec. 34

A.P.I. gravity at 60°F.: 40.8
 Pour point, °F.: -15
 Colour: Dark Brown
 Carbon residue, percent by weight: 0.9%
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 762 mm. Hg.
 First drop, 29°C. (84°F.)

Fraction No.	Cut at °F.	Sum Per Cent	Specific Gravity 60/60°F.	Degrees A.P.I. 60 F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
1.	122	2.0	0.650	86.2	-	-		
2.	167	5.6	0.682	76.0	13	58.3		
3.	212	11.3	0.715	66.4	19	54.2		
4.	257	18.9	0.742	59.2	23	51.5		
5.	302	26.8	0.764	53.7	26	50.4		
6.	347	33.8	0.782	49.5	27	50.4		
7.	392	40.1	0.798	45.8	29	54.1		
8.	437	46.3	0.811	43.0	29	58.6		
9.	482	52.8	0.825	40.0	31	62.8		
10.	527	60.4	0.840	37.0	33	65.5		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	392	64.6	0.858	33.4	37	67.3	39	10
12.	437	70.8	0.866	31.9	37	71.8	46	30
13.	482	76.0	0.878	29.7	40	-	57	50
14.	527	80.6	0.888	27.9	41	79.3	79	65
15.	572	85.5	0.899	25.9	44	84.1	130	80
Residuum		97.7	0.958	16.2				

Carbon residue of residuum: 6.1%

Carbon residue of crude: 0.9%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	11.3	0.693	72.7	
Total gasoline and naphtha	40.1	0.748	57.7	
Kerosine distillate	12.7	0.818	41.5	
Gas oil	17.2	0.852	34.6	Below 50
Nonviscous lubricating distillate	10.2	0.871-0.893	31.0-27.0	50-100
Medium lubricating distillate	5.3	0.893-0.905	27.0-24.9	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	12.2	0.958	16.2	
Distillation loss	2.3			

OIL FIELD DATA

Field and Pool: Wizard Lake D-3 'A'

Location: Twp. 48; Rge. 27, W 4 M

DISCOVERY DETAILS

Method: Seismic Reflection, Subsurface Geology

Well: Name: Texaco Wizard Lake B-1, 12-22-48-27-W 4 M

Completed: September 14, 1951

Perforated: Open Hole

GEOLOGY

Producing Zone(s): Leduc D-3

Other Shows: Viking, Ellerslie, D-2 Nisku

Trap Type: Biohermal Reef

Lithology: Dolomitized Reef Facies

Maximum Reservoir Thickness: 1,000'

Regional Setting: Rimbey Morinville Reef Trend

Deepest Formation Penetrated: Cooking Lake, Devonian

DEVELOPMENT DATA

Total Wells: Completed Oil: 51

Producing Oil: 16

Injection or Disposal: Water: 1. Gas: 1 (LPG)

Well Spacing: 40 Acres. Pattern: Square

Logging Practice: Various

Completion Practice: Various

RESERVOIR DATA

Type of Drive: Partial Water and Gravity Segregation

Estimated Oil in Place: 382,000,000 S.T.bbls (510 bbls/acre-foot)

Estimated Recoverable Oil: 220,000,000 S.T.bbls (295 bbls/acre-foot)

Oil Zone Thickness: Maximum: 630'. Average: 352'

Porosity: 9.6%. Permeability: 700H md

Area: 2,300 Acres

Oil Characteristics: Gravity: 38 °API. Sulphur: 0.4%

Pour Point: +25°F. Initial Solution GOR: 630 cu ft/bbl

Base: Paraffin

Pressure Maintenance or Secondary Recovery: None

PRODUCTION

MPR: Not Applicable

Economic Allowance: 32 BOPD/well. Operating: 32 BOPD/well

Market Outlet: Texaco Pipeline

CRUDE PETROLEUM ANALYSIS

Laboratory Number 1511-51

FIELD: Wizard Lake

POOL:

ZONE: Leduc (D-3)

Well Name: Texaco Wizard Lake No. B-3
 Location: Lsd. 11, Sec. 22; Twp. 48, Rge. 27, W 4
 Interval tested, depth, feet: 5955-6047
 Producing Zone: Leduc (D-3)
 Geological Age: Upper Devonian

Province: Alberta
 Sample From: D.M.T.S.
 Date Sampled: October 10, 1951
 Sampled at: After Separator from Tank

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.840
 Sulphur, percent by weight: 0.13
 Saybolt Universal Viscosity:
 at 100°F., sec. 39

A.P.I. gravity at 60°F.: 37.0
 Pour point, °F.: 20
 Colour: Dark Green
 Carbon residue, percent by weight: 2.1
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 752 mm. Hg.
 First drop, 23°C. (73°F.)

Fraction No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Correlation Index	Aniline Point, °C.	Viscosity S.U. 100°F.	Cloud Test, °F.
	°C.	°F.								
1.	50	122	2.0	2.0	0.647	87.2	-			
2.	75	167	3.1	5.1	0.684	75.4	14	55.0		
3.	100	212	6.4	11.5	0.723	64.2	23	52.4		
4.	125	257	7.2	18.7	0.746	58.2	25	50.5		
5.	150	302	5.5	24.2	0.769	52.5	28	51.0		
6.	175	347	5.3	29.5	0.790	47.6	31	51.4		
7.	200	392	4.9	34.4	0.805	44.3	32	52.9		
8.	225	437	4.5	38.9	0.821	40.9	34	57.6		
9.	250	482	5.1	44.0	0.831	38.8	33	62.2		
10.	275	527	4.8	48.8	0.842	36.6	34	66.5		

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	4.8	53.6	0.855	34.0	36	70.0	40	15
12.	225	437	4.9	58.5	0.864	32.3	37	74.2	48	35
13.	250	482	5.0	63.5	0.876	30.0	39	78.1	63	55
14.	275	527	5.3	68.8	0.887	28.0	41	82.0	98	75
15.	300	572	5.7	74.5	0.896	26.4	42	87.5	193	90
Residuum			23.1	97.6	0.957	16.4				

Carbon residue of residuum: 8.1%

Carbon residue of crude: 2.1%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	11.5	0.699	70.9	
Total gasoline and naphtha	34.4	0.749	57.4	
Kerosine distillate	4.5	0.821	40.9	
Gas oil	17.8	0.846	35.8	
Nonviscous lubricating distillate	9.6	0.865-0.887	32.1-28.0	50-100
Medium lubricating distillate	5.7	0.887-0.897	28.0-26.3	100-200
Viscous lubricating distillate	2.5	0.897-0.901	26.3-25.6	Above 200
Residuum	23.1	0.957	16.4	
Distillation loss	2.4			

Remarks: The sample as received contained no water (A.S.T.M.) and no salt (as NaCl) per 1000 bbl.

C R U D E P E T R O L E U M A N A L Y S I S

Laboratory Number 341-53

FIELD: Miscellaneous: Lesser Slave Lake

POOL:

ZONE: Gething

Well Name: Imperial Grouard No. 1
Location: Lsd. 12, Sec. 16, Twp. 75, Rge. 15, W 5
Interval tested, depth, feet: 2565-2572
Producing Zone: Gething
Geological Age: Lower Cretaceous

Province: Alberta
Sample From: Imperial Oil Ltd
Date Sampled: August 5, 1950
Sampled at: Well

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.978
Sulphur, percent by weight: 3.49
Saybolt Furol Viscosity:
at 122°F., sec. 138

A.P.I. gravity at 60°F.: 13.2
Pour point, °F.: 30
Colour: Brownish Black

Remarks: The sample as received contained 25% by vol. water and sediment (by centrifuge) and 1930 lb. salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 342-53

FIELD: Miscellaneous

POOL:

ZONE: Wabamun (D-1)

Well Name: Spruce Grove No. 1 (Shaw)

Location: Lsd. 4, Sec. 11, Twp. 53, Rge. 27, W 4

Interval tested, depth, feet: 4560-4588

Producing Zone: Wabamun (D-1)

Geological Age: Upper Devonian

Province: Alberta

Sample From: Imperial Oil Ltd.

Date Sampled: (1949)

Sampled at: Well

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.899

Sulphur, percent by weight: 1.20

A.P.I. gravity at 60°F.: 25.9

Pour point, °F.: 35

Colour: Brownish Black

Remarks: The sample as received contained 44% by vol. water and sediment (by centrifuge).

C R U D E P E T R O L E U M A N A L Y S I S

Laboratory Number 343-53

FIELD: Miscellaneous

POOL:

ZONE: Viking

Well Name: Imperial Bogg No. 15
Location: Lsd. 15, Sec. 5, Twp. 52, Rge. 23, W 4
Interval tested, depth, feet: 3138-3141
Producing Zone: Viking
Geological Age: Lower Cretaceous

Province: Alberta
Sample From: Imperial Oil Ltd.
Date Sampled: July 1952
Sampled at: Well

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.840
Sulphur, percent by weight: 0.12
Saybolt Universal Viscosity:
at 100°F., sec. 45

A.P.I. gravity at 60°F.: 37.0
Pour point, °F.: 40
Colour: Greenish Black

Remarks: The sample as received contained 0.5% by vol. water and sediment (by centrifuge) and 148 lb. salt (as NaCl) per 1000 bbl.

C R U D E P E T R O L E U M A N A L Y S I S

Laboratory Number 344-53

FIELD: Miscellaneous

POOL:

ZONE: Basal Quartz Ss.

Well Name: Imperial Labyrinth Lake No. 15-14
Location: Lsd. 15, Sec. 14, Twp. 48, Rge. 23, W 4
Interval tested, depth, feet: 4270-4275
Producing Zone: Basal Quartz Ss.
Geological Age: Lower Cretaceous

Province: Alberta
Sample From: Imperial Oil Ltd.
Date Sampled: 1952
Sampled at: Well

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.923
Sulphur, percent by weight: 2.15
Saybolt Universal Viscosity:
at 100°F., sec. 573
at 130°F., sec. 270

A.P.I. gravity at 60°F.: 21.8
Pour point, °F.: -40
Colour: Brownish Black

Remarks: The sample as received contained 50% by vol. water and sediment (by centrifuge) and 4650 lb. salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 345-53.

FIELD: Miscellaneous

POOL:

ZONE:

Well Name: Imperial Belloy No. 2
 Location: Lsd. 4, Sec. 20, Twp. 78, Rge. 1, W 6
 Interval tested, depth, feet: 4112-4129
 Producing Zone: -
 Geological Age: Permian-Pennsylvanian

Province: Alberta
 Sample From: Imperial Oil Ltd.
 Date Sampled: July 5, 1953
 Sampled at: Well

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.882
 Sulphur, percent by weight: 0.76
 Saybolt Universal Viscosity:
 at 70°F., sec. 125
 at 100°F., sec. 75
 A.P.I. gravity at 60°F.: 28.9
 Pour point, °F.: 40
 Colour: Greenish Black
 Carbon residue, percent by weight: 4.5
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 755 mm. Hg.
 First drop, 68°C. (154°F.)

Frac- tion No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Corre- lation Index	Aniline Point, °C.	Visc. S.U. 100°F.	Cloud Test, °F.	Refractive Index 20°C.
	°C.	°F.									
1.	50	122									
2.	75	167									
3.	100	212	1.5	1.5	0.700	70.6	-	-			-
4.	125	257	2.4	3.9	0.733	61.5	18	59.4			1.4065
5.	150	302	3.7	7.6	0.745	58.4	17	61.6			1.4150
6.	175	347	4.2	11.8	0.763	54.0	18	63.6			1.4229
7.	200	392	4.4	16.2	0.781	49.7	21	64.2			1.4331
8.	225	437	4.3	20.5	0.799	45.6	24	65.0			1.4428
9.	250	482	5.1	25.6	0.815	42.1	26	67.8			1.4518
10.	275	527	7.2	32.8	0.834	38.2	30	70.0			1.4608

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	3.9	36.7	0.849	35.2	33	73.0	39	10	1.4703
12.	225	437	6.0	42.7	0.858	33.4	34	74.8	44	30	1.4742
13.	250	482	6.6	49.3	0.870	31.1	36	76.8	54	50	1.4812
14.	275	527	5.8	55.1	0.882	28.9	39	80.8	76	65	1.4891
15.	300	572	7.7	62.8	0.894	26.8	41	84.0	141	80	1.4989
Resi- duum			37.2	100.0	0.971	14.2					

Carbon residue of residuum: 10.9%

Carbon residue of crude: 4.5%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	1.5	0.700	70.6	
Total gasoline and naphtha	16.2	0.754	56.2	
Kerosine distillate	9.4	0.808	43.6	
Gas oil	17.8	0.847	35.6	
Nonviscous lubricating distillate	11.3	0.865-0.886	32.1-28.2	50-100
Medium lubricating distillate	8.1	0.886-0.901	28.2-25.6	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	37.2	0.971	14.2	
Distillation loss	0.0			

Remarks: The sample as received contained 8.3% by vol. water and sediment (by centrifuge) and and 1200 lb. salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 346-53

FIELD: Miscellaneous

POOL:

ZONE:

Well Name: Imperial Belloy No. 12-14
 Location: Lsd. 12, Sec. 14, Twp. 78, Rge. 1, W 6
 Interval tested, depth, feet: 4078-4098
 Producing Zone: -
 Geological Age: Permian-Pennsylvanian

Province: Alberta
 Sample From: Imperial Oil Ltd.
 Date Sampled: September 22, 1952
 Sampled at: Well

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.880
 Sulphur, percent by weight: 0.77
 Saybolt Universal Viscosity:
 at 100°F., sec. 160
 at 130°F., sec. 93

A.P.I. gravity at 60°F.: 29.3
 Pour point, °F.: 40
 Colour: Brownish Green
 Carbon residue, percent by weight: 6.2
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 765 mm. Hg.
 First drop, 76°C. (169°F.)

Frac- tion No.	Cut, at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Corre- lation Index	Aniline Point, °C.	Visc. S.U. 100°F.	Cloud Test, °F.	Refractive Index 20°C.
	°C.	°F.									
1.	50	122									
2.	75	167									
3.	100	212	1.3	1.3	0.711	67.5	-	60.0			1.4087
4.	125	257	6.7	8.0	0.726	63.4	15	59.2			1.4043
5.	150	302	3.8	11.8	0.745	58.4	17	60.1			1.4144
6.	175	347	3.5	15.3	0.765	53.5	19	61.1			1.4253
7.	200	392	4.0	19.3	0.785	48.8	23	62.1			1.4369
8.	225	437	4.8	24.1	0.804	44.5	26	64.2			1.4468
9.	250	482	4.5	28.6	0.823	40.4	30	66.6			1.4550
10.	275	527	6.9	35.5	0.836	37.8	31	69.8			1.4632

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	2.8	38.3	0.858	33.4	37	71.0	40	10	1.4738
12.	225	437	4.0	42.3	0.861	32.8	35	74.3	44	25	1.4759
13.	250	482	5.5	47.8	0.870	31.1	36	77.4	54	45	1.4813
14.	275	527	6.7	54.5	0.882	28.9	39	80.9	77	60	1.4893
15.	300	572	7.1	61.6	0.896	26.4	42	84.4	131	80	1.4975
Resi- duum			38.4	100.0	0.995	10.7					

Carbon residue of residuum: 14.1%

Carbon residue of crude: 6.2%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	1.3	0.711	67.5	
Total gasoline and naphtha	19.3	0.748	57.7	
Kerosene distillate	9.3	0.813	42.6	
Gas oil	14.6	0.849	35.2	
Nonviscous lubricating distillate	10.9	0.866-0.888	31.9-27.8	50-100
Medium lubricating distillate	7.5	0.888-0.903	27.8-25.2	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	38.4	0.995	10.7	
Distillation loss	0.0			

Remarks: The sample as received contained 30% by vol. water and sediment (by centrifuge) and 10,900 lb. salt (as NaCl) per 1000 bbl.

CRUDE PETROLEUM ANALYSIS

Laboratory Number 348-53

FIELD: Miscellaneous

POOL:

ZONE: Viking

Well Name: Terra No. 1
 Location: Lsd. 3, Sec. 27, Twp. 51, Rge. 25, W 4
 Interval tested, depth, feet: 3332-3357
 Producing Zone: Viking
 Geological Age: Lower Cretaceous

Province: Alberta
 Sample From: Imperial Oil Ltd.
 Date Sampled: November 7, 1950
 Sampled at: Well

GENERAL CHARACTERISTICS

Specific gravity at 60°F.: 0.853
 Sulphur, percent by weight: 0.16
 Saybolt Universal Viscosity:
 at 100°F., sec. 48

A.P.I. gravity at 60°F.: 34.4
 Pour point, °F.: 55
 Colour: Dark Green
 Carbon residue, percent by weight: 2.3
 (Conradson)

DISTILLATION

(U.S. Bureau of Mines Routine Method)

Stage 1 - Distillation at atmospheric pressure, 755 mm. Hg.
 First drop, 24°C. (75°F.)

Frac- tion No.	Cut at		Per Cent	Sum Per Cent	Specific Gravity 60°F.	Degrees A.P.I. 60°F.	Corre- lation Index	Aniline Point, °C.	Visc. S.U. 100°F.	Cloud Test, °F.	Refractive Index 20°C.
	°C.	°F.									
1.	50	122	1.5	1.5	0.660	82.9	-	-			-
2.	75	167	1.3	2.8	0.673	78.8	9	-			-
3.	100	212	3.1	5.9	0.712	67.2	18	57.0			-
4.	125	257	4.4	10.3	0.736	60.8	20	57.2			1.4096
5.	150	302	4.3	14.6	0.751	56.9	19	59.3			1.4168
6.	175	347	4.6	19.2	0.768	52.7	21	61.3			1.4259
7.	200	392	4.3	23.5	0.783	49.2	22	63.6			1.4338
8.	225	437	4.6	28.1	0.798	45.8	23	66.0			1.4417
9.	250	482	4.6	32.7	0.811	43.0	24	68.6			1.4490
10.	275	527	7.4	40.1	0.825	40.0	26	73.4			1.4568

Stage 2 - Distillation continued at 40 mm. Hg. pressure

11.	200	392	4.1	44.2	0.840	37.0	29	75.6	39	20	1.4650
12.	225	437	6.0	50.2	0.847	35.6	28	81.0	45	40	1.4690
13.	250	482	6.8	57.0	0.857	33.6	30	84.4	56	60	1.4751
14.	275	527	5.9	62.9	0.869	31.3	32	89.0	80	75	1.4844
15.	300	572	5.6	68.5	0.880	29.3	35	92.8	137	90	1.4919
Resi- duum			30.9	99.4	0.945	18.2					

Carbon residue of residuum: 6.8%

Carbon residue of crude: 2.3%

APPROXIMATE SUMMARY

	Percent by Vol.	Specific Gravity	Degrees A.P.I.	Viscosity S.U. 100°F.
Light gasoline	5.9	0.690	73.6	
Total gasoline and naphtha	23.5	0.742	59.2	
Kerosine distillate	16.6	0.814	42.3	
Gas oil	10.0	0.844	36.2	
Nonviscous lubricating distillate	11.9	0.851-0.873	34.8-30.6	50-100
Medium lubricating distillate	6.5	0.873-0.885	30.6-28.4	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	30.9	0.945	18.2	
Distillation loss	0.6			

Remarks: The sample as received contained 0.48% by vol. water and sediment (by centrifuge) and 29 lb. salt (as NaCl) per 1000 bbl.

