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SECURITY INFORMATION CONFIDENTIAL

PROVISIONAL INTELLIGENCE REPORT

PETROLEUM IN THE SOVIET BLOC

PRODUCTION AND EXPLORATION OF PETROLEUM IN RUMANIA

CIA/RR PR-17 (II-3)

30 June 1952

Note

The data and conclusions in this report do not necessarily represent the final position of ORR and should be regarded as provisional only and subject to revision. Additional data or comments which may be available to the user are solicited.

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FOREWORD

This report is one of a series of provisional reports pertaining to petroleum in the Soviet Bloc. The entire series is intended to cover all phases of petroleum, natural gas, and synthetic liquid fuels in the Soviet Bloc. These reports are presented as an intermediate step in consolidating pertinent intelligence on the subject and not as a finished study. In the consolidation of the available information, various reports and documents representing research by other intelligence agencies were utilized along with the results of research and analysis by members of the staff of CIA.

It is intended that this series of reports will serve the following purposes:

a. Represent a base for contributions and additions by CIA and other agencies actively interested in petroleum intelligence.

b. Facilitate the selection of the specific and detailed gaps in intelligence warranting priority attention.

c. Provide the basis for a broad study on petroleum in the Soviet Bloc and various studies directed toward specific critical problems.

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PRODUCTION AND EXPLORATION OF PETROLEUM IN RUMANIA*

Summary

Rumanian Petroleum Production Prior to 1951.

The earliest commercial petroleum production in the world is recorded in Rumania. This production began in 1857, two years before the Pennsylvania Drake well was discovered in the US, and two years before the Wallachia and Moldavia Principalities were combined to form Rumania. Not credited to commercial Rumania production is the oil obtained from hand-dug pits presumably as early as 1844.

In productivity rank among the countries or other unit oil productive areas of the world Rumania has variously ranged from first and second place in the first few years to a rank as low as the seventh in later periods. Considering Malaysia and the Middle east to be unit areas, Rumania was in 1950 in the seventh place in production. In this respect it was specifically subordinate to ten individual countries, including four in the Middle East and Indonesia in Malaysia.

The peak Rumanian production occurred in 1936 with the country then ranking in the fourth place on a global basis; the 1936 Rumanian production is recorded as 8.7 million metric tons, equivalent to 3.6% of the corresponding world total. In 1950 Rumania produced an estimated 4.6 million metric tons of petroleum or about 0.9% of the world total. In cumulative production prior to 1951, Rumania has contributed about 1.9% of the total for the world.

The Rumanian petroleum industry was nationalized in 1948, and all foreign companies have since been excluded from operation in that country. Now the most important oil-producing satellite of the USSR, Rumania furnished a 1950 production equal to 12.3% of that of the USSR.

The following table shows an estimated breakdown of Rumanian crude production by regions, applicable to the calendar year (i.e., 1947) immediately preceding nationalization. Except for a trival yield (520 metric tons) on record from a small region (Maramures) reportedly depleted in 1927, all prior Rumanian crude production has been derived from the three regions still active in 1947.

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Estimated Petroleum Production by Areas in Rumania, 1947

Thousand Metric Tons

Area	Quantity	Percent
Rasvad-Ochiuri	547.2	14.07
Gura Ocnitei	626.0	16.10
Moreni-Ghirdoveni-Piscuri-Filipesti de Padure-Margineni	655.5	16.86
Floresti-Baicoi-Liliesti-Tintea	927.8	23.86
Boldesti-Paulesti-Harsa	423.3	10.89
Ceptura-Urlati	399.4	10.27
Other Ploesti fields	136.1	3.50
Ploesti Region a/	3,715.3	95.55
Buzau Region	119.6	3.08
Bacau Region	53.3	1.37
RUMANIA	3,888.2	100.00

a/ The component Ploesti areas are designated by the names of the major so-called "fields" within each exploited area.

Data are not generally available for the Rumanian regional crude productions obtained under Communist control. Estimates for 1950 are as follows for the state-controlled organizations then handling the production. Current 1952 intelligence data are reasonably conclusive in evidence that Sovrompetrol has absorbed the other two state organizations here listed. There was some indication of the amalgamation by mid-year 1951, this being the period during which the text of the attached report was written. Sovrompetrol is reportedly a joint stock company of the Communist Rumanian and Soviet Russian states, but in it the Soviet influence is inferred to be dominant.

Estimated Petroleum Production in Rumania; 1950

Producing Organization	Thousand Metric Tons Quantity	Percent
Ploesti Region	2,877.7	62.6
Buzu Region	112.3	2.4
Muntenia Organization	2,990.0	65.0
Sovrompetrol Organization a/	1,564.0	34.0
Moldovo Organization b/	46.0	1.0
RUMANIA	4,600.0	100.0

a/ Most of this Sovrompetrol production appears to have been from the Ploesti and Bacau regions with the former contributing nearly all of it.

b/ Moldovo activities are believed to have been confined to the Bacau region.

Cumulative Rumanian crude production is recorded and estimated as follows through 1950:

Cumulative Rumanian Crude Production

Period	Thousand Metric Tons Production
1857 - 1938, inclusive	115,006
1939	6,240
1940	5,834
1941	5,602
1942	5,338
1943	4,975
1944	4,576
1945	4,662
1946	4,252
1947	3,888
1948	4,206
1949	4,462
1950	4,600
1857 - 1950, inclusive	173,641

Petroleum Reserves and Oil-Productive Regions.

Responsible data provide a basis for the following estimate of proved Rumanian crude reserves, prevailing as of 1 January 1947.

Estimated Petroleum Reserves in Rumania

Basis 1 January 1947

Area	Thousand Metric Tons: Quantity	Percent
Ochiura-Gura Ocnitei West	10,432	14.99
Moreni-Gura Ocnitei East	15,928	22.89
Ditesti-Calinesti-Floresti	2,598	3.73
Bucsani	1,006	1.45
Baicoi-Tintea	10,958	15.75
Pitigaia-Campina-Runcu	6,241	8.97
Pacureti	436	0.64
Margineni	912	1.32
Aricesti	363	0.52
Boldesti	9,138	13.14
Ceptura-Orlea	6,788	9.75
Other Ploesti fields	604	0.86
Ploesti Region a/	65,404	94.01
Buzau Region	2,196	3.16
Bacau Region	1,970	2.83
RUMANIA	69,570	100.00

a/ The component Ploesti areas are designated by the names of the major so-called "fields" within each reserve area.

Similarly with a basis in responsible but obviously less definite data, a published estimate of total proved reserves was 45,333 thousand metric tons as of 1 January 1951. In numerical value, this reflects a net downward revision of 7,081 in addition to an accounting of the estimated 17,156 figure for subsequent production (1947-1950, inclusive). The latter estimate probably does not include, however, any value in the proved status for several new Communist oil strikes, reportedly made before 1951 but uncertain as to physical extent and productivity.

An extensive sedimentary basin known as the Southern Carpathian contains the three major Rumanian regions previously established as oil-productive. This basin lies on the outer side of an arc of mountain ranges which roughly bound on the other or convex side of the arc the northwestern quadrant of Rumania. The three producing regions are situated upon the flanks of the mountain ranges, and the principal (i.e., Ploesti) region lies in the central southern sector of the country. The Buzau and Bacau regions lie in the eastern sector with the Buczau area to the north of Buzau.

The Southern Carpathian sedimentaries in total cover about 800,000 acres of Rumanian area. Prior to 1948 in a series of intensified programs resulting in exploration of the known geologic structures favorable for oil in this area, there were no discoveries of petroleum reserves of portentious extent. Rumania has other and more or less untested possible prospects for oil, however, in the Transylvanian Basin and other western portions of the country. The Transylvanian Basin lies on the convex side of the major Rumanian mountain arc, and in the southern end of this basin near the center of Rumania, northward across the mountains from Ploesti, prolific natural gas wells are exploited, yielding dry gas but no oil.

Post-War Oil Exploration and Future Productivity Prospects.

Rumanian interests became active in oil exploration after the close of World War II, and this activity has been continued and intensified under the Communist government. Without the necessary numerical data provided to establish potentials since the time of nationalization in 1948, but generally in the post-war period before and after the beginning of 1951, various new oil discoveries have been reported as results of the exploration. The exploration has been reported in the immediate areas of the previously established productive regions and also in certain prospect regions not formerly productive. Commercial strikes have been reported in several of the latter prospects, and other reported new oil discoveries have involved stepouts, field extensions, and deeper pays in the formerly established areas.

In the period from 1945 through 1948 about fourteen new oil-producing acreages or "fields" were thus reportedly discovered as follows in the more western portion of the Ploesti region: in the Viforata-Rasvad-Gorgota-Doicesti-Glodina-Ocnita district to the north of Targoviste; in the Edera-Cheboasa-Valea district to the

north of Moreni; and in the Draganeasa-Brebu-Plaiul Campinei district on the outer or northern fringe of the older fields in the Campina sector. A compilation of the reported values results in an apparent productivity potential of about 636 thousand metric tons per year by 1950 in these fourteen acreages. Reports also show that a new Targoviste field was discovered by the Germans during World War II, and that this field is a southward extension of the Gura Ocnitei field in the western portion of the Ploesti region. While there was inference of considerable Targoviste field production under Communist exploitation in 1950, there were other inferences that the potential reserves of this new field did not much exceed one million metric tons.

By midyear 1951 new productions were also reported from deeper horizons in the older Ploesti fields, especially in the Campina sector and in the more eastern portions such as the Floresti-Baicoi-Liliesti-Tintea sector. Sovrompetrol exploration in the Bacau region was reported to have resulted in discoveries of new reserves equal to those in the Ploesti region. Among a number of Communist oil strikes reported to have established entirely new productive regions, the only one with fairly firm evidence relates to the Suta Seaca field southwest of Targoviste. By 1950 the Communist exploitation of the Suta Seaca field appeared to be represented by only one well, and in it the production potential was given as only about 7,300 metric tons per year.

At the time of writing the text of the attached report, mid-year 1951, intensive exploitation of the Rumanian reserves was evident under Soviet guidance, without conservation techniques apparent. There was definite evidence of promiscuous drilling in tapping these reserves. Reports indicated that old and formerly abandoned wells were being reopened, however, and while all of the known productive Rumanian areas appeared to be then on the decline with respect to potential, a probability still existed that the Communists would continue to obtain new or additional production from the established fields, by further stepouts from them and by more drilling to deeper pools within the producing areas.

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[redacted] there is reasonable confirmation of Communist success in expanding the Rumanian production.

The 1951 production is estimated at 6.0 million metric tons, compared to the estimated value of 4.6 million metric tons for 1950. There is also some current evidence that the Rumanian Communists are exploiting the fields more scientifically relative to the practice apparent by the beginning of 1951, and that more attention is being given to secondary and optimum ultimate recovery. Much of the increased production appears to be coming from three areas as follows: the new Suta Seaca region; the more recently opened pools in the Targoviste-Teis-Doicesti sector of the western part of the Ploesti region; and the expanded Bacau region. While the most optimistic claims are still to be confirmed with respect to the new discoveries in the Bacau region, it is probable that this old area has actually advanced from its former minor status to a current rating of major importance. In the generalized Buzau region, likewise an old productive area with minor rating in the past, 1952 intelligence further infers new discoveries rivalling the reported large discoveries in Bacau. However, the reports of the new Buzau discoveries are at present little more than rumors, similarly as were the reports of new Bacau discoveries by the beginning of 1951.

It is quite probable that the Rumanians are currently maintaining a rate of discovery of new potential oil reserves, at least equal to the rate of extraction. The present evidence also supports a possibility that the Rumanians may be able to attain a goal formerly considered to be very improbable, and within a very few years increase the annual Rumanian production to the planned value of 10 million metric tons (this value was projected for 1955 in the Rumanian "State Plan"). Rumania contains a very large total expanse of sedimentaries favorable for oil accumulation. While exploration of these sedimentaries has been extensive it has not been exhaustive. Even though there has been no evidence of extraordinary discoveries attending the exploration in the past, it is fully possible that huge oil deposits may be present in the Rumanian sedimentaries.

I. Sedimentary Basins and Oil Productive Regions.

The major productive oilfields of Rumania are confined to the central southern portion of the country with small production also obtained from the eastern portion. These productive areas are situated upon the southern and eastern flanks of mountain ranges, formed by the Transylvanian Alps and Carpathian Mountains. The Transylvanian Alps lie south of the east-west center line through Rumania, and the Carpathians lie east of the north-south center line; the mountain ranges meet to form an arc near the center of the country, and the oilfields lie in an extensive sedimentary basin on the concave or outer side of the arc. The basin comprises the valley of the Danube River in the south and the valley of the Siret River in the east.

This productive basin is the one known as the Southern Subcarparthian. It is the western-most basin in a major geosyncline or chain of basins forming the southern portion of the important Black Sea-Caspian Sea oil province of the USSR. The southern chain extends eastward across the Black Sea to include the Southern Caucasia or Transcaucasia part of the Caucasus isthmus between the two seas, and thence across the Caspian Sea to include the southwestern part of the Turkmen SSR east of the Caspian. In the USSR this southern chain includes the Baku oil region of Transcaucasia together with the productive region in Turkmen. While the Rumanian oilfields are thus geologically related to those of Baku, the Rumanian fields are far from comparable with the Baku area in productivity.

About 600,000 acres of sedimentary beds exist in the Southern Subcarpathian Basin of Rumania. Extraordinarily productive petroleum deposits are yet to be discovered in the area. Prior to 1948 the well-established structures favorable for oil were intensively explored by Anglo-American interests without discovery of large deposits.

The major oil-productive region of Rumania embraces the Ploesti fields, in the political Provinces (Judetuls, Counties or Districts) of

Prahova and Dambovita. The Ploesti Region is located in central southern Rumania, in the upper valleys of the Dambovita and Ialomita Rivers, tributaries of the Danube. The oilfields lie south of the Transylvania Alps, extending around the city of Ploesti from the west to the northeast. The Ploesti Region has accounted for about 97% of the past cumulative Rumanian petroleum production and it contributes about 95% of the current production.

Two other areas are the only effective sources of the remaining current Rumanian production and these two areas have likewise contributed virtually all of the remaining cumulative production in the past. Like Ploesti, the two areas are situated in the Southern Subcarpathian Basin; the most important of the two regions is in Buzau Province, while the other is in Bacau Province. The Buzau Region is located west and northwest of the city of Buzau, east of the Ploesti area and southeastward from the Carpathian Mountain arc, in the upper valley of the Buzau River, a tributary of the Siret. The Bacau Region is situated southwest and west of the city of Bacau. It is northward from the Buzau area, east of the Carpathians and west of the Siret, and it lies about 300 miles northeast of the Ploesti fields.

The only other commercially productive area on record in Rumania is a depleted region that furnished insignificant production in Maramures Province. It is east of the Carpathians near the Polish border at the northern end of the Transylvania Basin, a second major expanse of sedimentaries in Rumania. The Transylvania Basin is on the inner or convex side of the Carpathian Mountain arc, and it is bounded on the west by a north and south trending Rumanian mountain range called Monts Apuseni. At the southern end of the basin there is a prolific natural gas producing region, devoid of oil. At the northern end of this basin the Maramuras oil region was opened in 1919, and is said to have produced a trivial quantity of about 520 metric tons of petroleum, prior to depletion in 1927.

2. Designations, Locations, and Productive Ranks of Oil-Productive Areas in Rumania.

While conventional practice defines an integral area or a separate deposit as a separate oilfield, the matter is complicated in Rumania. In this country a number of "oilfields", typically small, are sometimes practically contiguous so as to form a major productive area, where the oilfields represent (1) adjoining separate deposits; (2) fault blocks or other differentiated areas, contiguous in a given structural trend; or (3) adjoining areas separately named because of original ownership, or because of other special features of exploitation. Data are sometimes separately reported for the separate "oilfields" in such a major area; the area is sometimes designated in part or in total, by applying the name or names of one or more separate "oilfields" of major importance contained therein. Even in adjacent but actually separate oil-producing areas the major oilfields are frequently (and variously) combined in the intelligence reports.

For correlation of the data reported on production, 44 supposedly oil-bearing areas in Rumania are designated in Table 1, "Outline of oil-productive areas in Rumania". These areas are identified by names of the "oilfields" ordinarily described in them. This outline does not include a number of regions situated elsewhere in Rumania where there have been reports of new but doubtful oil discoveries made recently by Communist Rumanian explorations. At least 91 separate Rumanian "oilfields" are listed in the intelligence records including a good many areas that are minor or depleted. Possibly a score or more other "oilfields" of similar minor status have been inferred. Among the ones thus inferred are the Cerveni and Palanca fields, presumably in the Ploesti Region and possibly still productive, and the Voevozilor field associated with the Moreni-Gura Ocnitei area. It is noted that adjacent but separate areas sometimes belong to a single structural trend. In most cases where a separate field is reported, the usual convention is followed in that the field is designated by the name of a nearby city, town, or village.

Table 1

Outline of Oil-Productive Areas in Rumania

Ploesti Region

1. Moreni-Baicoi structural trend.

   a. Moreni-Gura Ocnitei area.

      Fields in Dambovita: Teis, Aninoasi, Viforata, Rasvad, Targoviste, Gura Ocnitei West. Fields in Dambovita, extending eastward into Prahova: Gura Ocnitei East, Moreni, Moreni North. Fields in Prahova: Ghirdoveni, Bana, Piscuri North, Piscuri, Ocolnita, Ditesti, Calinesti.

   b. Baicoi-Tintea area.

      Fields in Prahova: Floresti, Baicoi, Liliesti, Tintea.

2. Dambovita areas north of Moreni-Baicoi trend.

   a. Ochiuri field and area.

   b. Gorgota field and area.

   c. Doicesti field and area.

   d. Glodeni field and area.

   e. Ocnita field and area.

3. Dambovita areas south of Moreni-Baicoi trend.

   a. Bucsani field and area.

   b. Suta Seaca field and area.

4. Prahova areas north of Moreni-Baicoi trend.

   a. Edera (Ederile) field and area.

   b. Cheboasa field and area.

   c. Valea (Valea Lunga) field and area.

   d. Filipesti de Padure field and area.

5. Draganeasa-Runcu structural trend in Prahova.

   a. Pitigaia-Draganeasa area. Fields: Pitigaia, Draganeasa.

   b. Campina field and area.

   c. Plaiul Compinei field and area.

Table 1
(cont'd)

d. Brebu (Brebul) field and area.

e. Bustenaria area. Fields: Grausor, Calinet, Telaga, Bustenaria.

f. Chiciura-Runcu area. Fields: Chiciura, Gropi, Tontesti, Runcu, Scortina, Bordeni, Recca, Valcanesti, Poenareanca.

g. Mislea field and area.

6. Prahova areas south of Moreni-Baicoi trend.

a. Margineni field and area.

b. Aricesti field and area.

7. Prahova areas in Teleajen River Valley.

a. Boldesti area. Fields: Boldesti, Paulesti, Harsa, Gageni, Sipotu, Scaeni.

b. Ceptura area. Fields: Ceptura, Orlea, Urlati, Strehaia, Plavia (Flavia?), Secrus.

c. Podeni Vechi field and area.

d. Pacureti-Matita structural trend.

(1) Magurele area. Fields: Malaesti, Magurele, Gornetul Cuib.

(2) Pacureti area. Fields: Pacureti, Matita, Atarnati.

e. Sarani field and area.

f. Varbilau field and area.

g. Scaiosi field and area.

h. Copaceni area. Fields: Copaceni, Oparlti.

8. Early depleted Dambovita areas.

a. Colibasi field and area.

b. Mahil Rosu field and area.

Buzau Region

1. Sarata field and area.

2. Monteoru field and area.

3. Berca field and area.

4. Arbanasi (Beciu-Beceni) area. Fields: Arbanasi, Policiori.

Table 1
(cont'd)

Bacau (Moldavo) Region

1. Targul Ocna field and area.
2. Moinesti area. Fields: Moinesti, Lucacesti.
3. Zemes Tazlau field and area.
4. Solont (Solorti?) field and area.
5. Stanesti field and area.
6. Tetcani (Tescani)(Tescanai?) field and area.
7. Bacau field and area.

The Gura Ocnitei and Bucsani fields were formerly the most productive separate areas in Dambovita, but Bucsani later fell below the Ochiuri field in this respect; dominant rank in Dambovita is probably now shared by the new Targoviste field, situated east of the city of Targoviste and actually an area extension southward of the Gura Ocnitei fields, on the southern flank of the Moreni-Baicoi trend. The Boldesti field was formerly the largest separate producer in Prahova, but it was superseded by the Tintea field prior to 1939. The Ceptura and Moreni-Piscuri fields have likewise become major Ploesti Region producers. Except for Tintea and the minor Margenini field, all important Rumanian productive areas had passed their exploitation peaks by 1944, insofar as the areas had been established as producers. Except for the Targoviste field no new major productive area is known to have subsequently come into existence in Rumania. Exploitation has exhausted reserves in all of the important Rumanian fields, even including Targoviste, and without concurrent discovery of new reserves to compensate for this extraction the net results have been substantial reductions in the remaining proved reserves of the country.

Table 2 shows percentages of total Rumanian oil production, for the periods and productive areas and fields indicated. While these data may not be completely restricted to, or representative of, the major areas explicitly designated, they are substantially applicable to the respective major areas.

Table 2

Rumanian Crude Petroleum Production:

Percentage Yields from Designated Areas

Area	Percent
1. 1939 Production	
Rasvad field	3.7
Gura Ocnitei fields	20.5
Moreni fields	11.4
Piscuri field	5.4
Baicoi-Lilliesti fields	1.7
Tintea field	17.5
Other areas in Moreni-Baicoi trend	1.3
MORENI-BAICOI TREND	61.5
Ochiuri field	4.3
Bucsani field	5.0
Draganeasa-Runcu trend	4.1
Boldesti field	11.1
Ceptura field	11.1
Other areas in Ploesti Region	1.5
PLOESTI REGION	98.6
2. 1943 Production	
Rasvad field	3.0
Gura Ocnitei field	15.3
Moreni-Piscuri fields	14.9
Baicoi-Lilliesti fields	4.4
Tintea field	27.3
Other areas in Moreni-Baicoi trend	0.6
MORENI-BAICOI TREND	65.5

Table 2
(cont'd)

Area	Percent
Ochiuri field	4.2
Bucsani field	3.2
Draganeasa-Runcu trend	3.7
Boldesti field	11.9
Ceptura field	7.8
Other areas in Ploesti region	2.0
PLOESTI REGION	98.3
3. 1946 Productions	
Ochiuri field, Moreni-Gura Ocnitei block	40.5
Baicoi-Tintea block	23.7
Ochiuri field and Moreni-Baicoi trend - - - - - -	64.2
Bucsani field	3.1
Filipesti de Padure field	3.8
Draganeasa-Runcu trend	2.7
Boldesti block	10.9
Ceptura block	9.8
Other areas in Ploesti Region	1.5
PLOESTI REGION	96.0
4. Cumulative Production Through 1946	
Ochiuri field, Moreni-Gura Ocnitei block	53.3
Baicoi-Tintea block	9.4
Ochiuri field and Moreni-Baicoi trend	62.7
Bucsani field	3.7
Draganeasa-Runcu trend	12.8
Boldesti block	9.2
Ceptura block	5.5
Other areas in Ploesti Region	2.7
PLOESTI REGION	96.6

Table 2
(cont'd)

Area	Percent
5. 1947 Production	
Moreni-Gura Ocnitei block; Ochiuri & other fields a/	47.0
Baicoi-Tintea block	23.9
Moreni-Baicoi trend; Ochiuri and other fields a/	70.9
Boldesti bloc	10.9
Ceptura block	10.3
Other areas in Ploesti Region	3.5
PLOESTI REGION	95.6

a/ Includes Ochiuri, Filipesti de Padure, and Margineni fields.

At least 20 separate fields have been described in the two areas designated as Moreni-Gura Ocnitei and Baicoi-Tintea (Table 1) situated along the Moreni-Baicoi trend. Only a few of these fields have been of consequence as producers. The Piscuri-Ocolnita-Ditesti-Calinesti fields are located upon a single structural reservoir. The two designated areas adjoin in the trend, at the boundary between the structural extensions of the Floresti field and the Piscuri-Ocolnita-Ditesti-Calinesti fields. The trend begins north of the city of Targoviste, in the vicinity of the villages of Viforata and Resvad, between the Dambovita and Ialomita Rivers in Dabovita. The trend extends eastward across the provincial boundary into Prahova. It extends past the town or village of Gura Ocnitei, and thence past the settlements called Moreni and Piscuri on the Cricova stream tributary of the Ialomita; it reaches eastward beyond the town or village of Baicoi, to terminate in the valley of the Prahova River tributary of the Ialomita, in the vicinity of the villages of Liliesti and Tintea.

On the northern flank of the Moreni-Baicoi trend, a fault serves to separate the Ochiuri field from the Gura Ocnitei area (Table 1). The Gorgota-Doicesti-Glodeni-Ocnita fields are minor, with Communist Rumanian exploitation activity recently reported in them. The Gorgota field lies on the west of the Ochiuri area, south of the village of the same name, northeast of Targoviste. The Doicesti field is located on a hill to the east of Doicesti village, northward up the Ialomita from Targoviste. Glodeni village lies about 3 miles east of a railroad line along the Ialomita, about 11 miles north of Targoviste; the Glodeni field comprises two productive districts, one to the east of the village, and the other, a new area, to the south of the hamlet. The Ocnita field is situated about nine miles northeast of Targoviste, in the vicinity of Ocnita village.

Targoviste is a name for a new field, apparently divided into districts, or fields, respectively near the villages of Haimanalele, Adania, Seceni, and Soseaua. The Bucsani field (Table 1) lies southeastward down the Ialomita River from Targoviste. Southwestward from Targoviste and about midway between that city and the town of Gaesti, a station on the Bucharest-Pitesti railroad, the new field at Suta Seaca village (Table 1), has apparently developed only as a minor area, although the original test wells have produced some oil.

In the Prahova areas north of Moreni-Baicoi trend (Table 1) the Edera-Cheboasa-Valea fields are other minor productive areas possibly subjected to recent Communist Rumanian exploitation. The first field lies in wooded mountains northeast of Edera (Ederile) village, about 5 miles northwesterly up the Cricova stream valley from Moreni village, and about 5 miles northeast from Ocnita village. The second field is situated to the south of Cheboasa village, about one and a half miles northeastward up the Cricova from Edera. The third field is on the south of Valea (Valea Lunga) village, about two and a half miles further northwestward up the Cricova from Cheboasa. The Filipesti de Padure field listed in this area is located just north of the Ditesti field, which is on the Moreni-Baicoi trend in the Moreni-Gura Ocnitei area.

Fields of the Dragneasa-Runcu structural trend (Table 1) contributed about 12.8% to the total cumulative production prior to 1947 in Rumania. Although they have been evidently declining in importance for several years, Communist Rumanian exploration - exploitation activities have been intensive along the trend. The Pitigaia-Draganeasa block is located northward from the Filipesti de Padure field, at the western end of the Draganeasa-Runcu trend. The Draganeasa field is more recent in discovery as compared to the Pitigaia area with Pitigaia the more western of the two fields. Three districts of the Draganeasa field are respectively on the west, east, and southeast of the

village of Draganeasa (Gura Draganeasa, situated on the Provita stream tributary of the Prahova), about three miles southwest from the city of Campina.

From the important field at Campina itself (Table 1), probably a fourth of the total cumulative production from the trend has been obtained. Most of the remaining past production from this trend has been obtained /from the Bustenaria and Chiciura areas. West of the Doftana River tributary of the Prahova, four miles northeast of Campina, there is the village of Plaiul Campinei, with a minor oilfield to the south. The two districts of the minor Brebu field are located about two miles east of Brebu village, east of the Doftana and northeast from Campina.

East of Campina the productive Bustenaria area (Table 1) terminates the Draganeasa-Runcu trend on the east, and the Chiciuri-Runcu block lies immediately south of this terminal area. South of the productive areas around the villages of Bustenaria and Runcu, another minor field has been indicated, called Mislea, located about 4½ miles north of Tintea village.

In the Prahova areas south of the Moreni-Baicoi trend (Table 1) the Margineni field is located south of the Ditesti field, and it is probably at present in the stripper stage if productive at all. Situated eastward from the Margineni area, the minor Aricesti field was near depletion by 1948.

In the valley of the Teleajen River (Table 1) tributary of the Ialomita, the productive Boldesti and Ceptura areas include the only oilfields of importance within the entire Teleajen valley. The Boldesti area lies east of the Moreni-Baicoi trend, and the Ceptura area is east of the Boldesti area. Podeni Vechi is a minor area north of the Boldesti-Ceptura areas, and it is situated about 5 miles north of Harsa village. The Pacureti-Matita structural trend extends north of the Boldesti-Ceptura-Podeni Vechi areas, along a line extending to the east from the much more important Draganeasa-Runcu trend. The Varbilau-Scaiosi-Copaceni areas extend from

west to east in the order named on the north of the Pacureti-Matita trend, and the Sarani field has been inferred to exist to the north of these, at a point about 20 miles north of the city of Ploesti. The Scaiosi field was practically exhausted prior to 1948.

The earliest commercial production of crude petroleum in the world is recorded from the Boldesti field (Table 1), an area currently productive in Prahova, and from the Colibasa field (Table 1), a Dambovita area abandoned as depleted in 1931. Colibasa village lies north of the Glodeni field and northeastward from the Ocnita field, on the north of the Moreni-Cura Ocnitei productive block. In the depleted Mahil Rosu field (Table 1) in a locality not at present identified, in Dambovita, the relatively unimportant Miocene Samartian sands yielded about 4,800 metric tons of oil; in the likewise exhausted Maramures region, the same formation accounted for about 500 metric tons of oil. Elsewhere in the Ploesti Region itself, the Samartian is reported to bear petroleum in small quantities.

In the Buzau Region (Table 1) the Sarata field is located in the vicinity of Sarata village, south of the Buzau River, west of the city of Buzau, and eastward from the city of Campina. The field and village of Monteoru lie north of Sarata, between Sarata and the Buzau River. The Berca field is situated north of Monteoru, on the north bank of the Buzau, northwestward up the river valley from Buzau city. Northward from the Berca area, up the valley of the Stanic River tributary of the Buzau, there is an oilfield near Policiori village, and northwesterly from Policiori, north of Beciu village and near Beceni (Dimioni-Beceni) village, there is the productive Arbanasi area proper, due west of the city of Ramnicul Sarat (Ramnicul Sarat Province).

In Bacau Province (Table 1) the productive region is situated in the valleys of the Trotus-Tazlau Rivers. The Lucacesti settlement lies north of Moinesti village; westward from Bacau city and north of Lucacesti, there are the Zemes Tazlau, Solont and Stanesti fields. These fields are

presumably near depletion, and are located in direct line from west to east in the order given, to the south of Solont village on the Tazlau River. In the vicinity of Tetcani (Tescani) village, between Bacau city and the Stanesti area, there is an oilfield of some importance, at least formerly. Still another distinct oilfield has been inferred in the vicinity of Bacau city itself.

Other villages (oilfields?) have been mentioned in the Bacau productive region thus: Prajesti, Slanic (?), Baia de Petrol, and Tazlau Sarat de Sus (located on the Tazlau Sarat River?). The Soviet-dominated Sovrompetrol organization has recently claimed discovery of prolific but rather improbable new oil deposits in the Bacau Region.

Among other regions in which the Communist-controlled petroleum agencies of Rumania are supposed to have recently discovered at least traces of oil, there may be mentioned the following: (1) an area in the northeastern portion of Maramures Province; (2) an area in the northwestern portion of the Transylvanian Basin, west of Maramures Province; (3) an area near Pitesti in Arges Province, westward from Targoviste, and another in the southwestern part of Olt Province, southward from Pitesti, where these Provinces are contained along with Buzau, Prahova, Dambovita, and adjoining Provinces, in the former Muntenia, or Great Wallachia region of what is now Rumania; (4) an area near Ramnicul Valcea in Valcea Province, southward from Pitesti, in the former Oltenia, or Little Wallachia region that is presently contained in Rumania to the west of Great Wallachia; and (5) an area possibly now containing exploited gas wells, in the former Banat region which has become the southwestern part of Rumania.

3. Petroleum Production by Areas in Rumania.

Table 3* gives reported and estimated production data for recent years in Rumania, by areas and in total. The reported values are presumably firm and accurate prior to 1948. Data are here compiled from intelligence

* Table 3 follows on p. 26.

estimates for subsequent Rumania productions. These estimates are believed to be reasonably accurate, although they show appreciable variation from certain values recently published. Reported productions include considerable breakdown by separate areas prior to 1947. Available reports are restricted to consolidated areas for 1947.

Responsible estimates for separate areas are not at present available for analysis after 1947. The lack of these details is not considered to be of much consequence for intelligence purposes. A summary analysis is given elsewhere in this paper (Section 7), with respect to what is known about recent Communist oil exploration activities, and about the results obtained thereby. New discoveries of real importance have not been indicated.

The estimated Rumanian 1948 production of about 4.2 million metric tons is a value generally accepted. The intelligence estimates have varied considerably for the 1949 production, and somewhat more so in the case of the 1950 total. The first one-year "State Plan" was released in 1948, reportedly projecting a production of 4.75 million metric tons for 1949. Rumanian publications have indicated that 95.5% of the 1949 plan was in fact realized, showing an actual increase of 8% over 1948, so that the 1949 production would appear to be about 4.5 million metric tons. Other intelligence has indicated that the 1949 plan was for a production exceeding 4.9 million metric tons, and estimates for the actual 1949 production have varied from near the reported plan values, to a low of about 3.5 million metric tons.

Another one-year "State Plan" appears to have projected a total production of up to 6.0 million metric tons for 1950. A current "Five-Year Plan" has been announced, and there seems to be little probability that the 1955 goal of 10 million metric tons can be realized. The Rumanian government has admitted that the 1950 plan itself was not fulfilled; estimates have varied from about 4.0 to 5.5 for the actual 1950 production in millions of metric tons.

It is not known just how the separate producing fields are divided among the three State-controlled organizations now in charge of all petroleum production in Rumania. Of these three organizations, Sovrompetrol is a company jointly owned by the Rumanian and Russian governments; it was organized 15 July 1945 to control 30% of the crude production, and was established by government decree 27 October 1947. Sovrompetrol has absorbed various small companies such as Creditul Minier, a smaller state-controlled concern, and 1949 agreements are indicated to have expanded the new joint-stock company. The joint-stock company is reportedly operated under strict control of the Soviets.

All other Rumanian oil companies were nationalized immediately after 11 June 1948. "Petrolifera Muntenia" or "Centrala Muntenia", popularly "Muntenia Oil Center", was then set up to absorb the major Astra-Romano (Shell) and Romano-Americana (Standard of New Jersey) concerns, along with most of the smaller Anglo-American, French, Italian, and other foreign companies; the "Moldovo (Oltenia) Oil Center", or "Centrala Petrolifera Moldovo," was set up to absorb various small companies in Bacau (Moldavia).

The three producing organizations control the refining and other processing operations in Rumania, while "Competrol", successor to "Distributia", is a nationalized "oil center" supplying 70% of the inland oil market. Most of the refineries were pooled in Muntenia, a concern with three principal departments, respectively designated for Fields, Refineries, and Administration. The Fields Department has headquarters in Campina, while the Refineries Department is centered in Ploesti; the Muntenia general management offices are located in Bucharest. Together with Competrol and various mining agencies, the three oil-producing organizations are under the authority of the Ministry for Mining and Crude Oil Production. Soviet influence is predominant in the Rumanian oil industry. A planned merger of Muntenia and Competrol with Sovrompetrol has been recently reported. If

true this would give the Soviets almost complete control. Formerly reported Czech participation in Muntenia appears not to have become factual.

Muntenia has field operations in eight "drilling districts", with field administrative offices set up in the main city in each district and probably also in Gura Ocnitei. The operations of Sovrompetrol have been reported within two "regions". Although the Buzau productive region appears to constitute one drilling district for Muntenia, it is not known how the separate Ploesti region oilfields are partitioned among the field operating subdivisions of Muntenia and Sovrompetrol. Muntenia probably controls the Buzau productive region, with the remaining and major part of its operations confined to the Ploesti Region fields. Moldova is probably restricted to the Bacau productive region, while Sovrompetrol also operates there. Major Sovrompetrol operations are in the Ploesti fields.

Table 3 shows production data for the three producing organizations since 1947, for the separate Muntenia drilling districts, and in one period also separately for the Sovrompetrol operating regions. Sovrompetrol production statistics are reportedly falsified and exaggerated, even before the data are entered upon the company records. The values shown in Table 3 appear to be conservative estimates.

Table 3

Petroleum Production by Areas in Rumania

Thousand Metric Tons

Area	1939		1943	
	Quantity	Percent to Total	Quantity	Percent to Total
Teis-Aninoasa	52.3	0.84	20.0	0.40
Viforata	22.3	0.36	9.0	0.18
Rasvad	232.4	3.72	150.0	3.02
Gura Ocnitei	1,279.8	20.51	760.0	15.27
Moreni	710.6	11.39	-	-
Piscuri	337.6	5.41	-	-
Moreni-Piscuri	-	-	740.0	14.87
Bucsani	308.9	4.95	160.0	3.22
Glodeni	1.3	0.02	1.3	0.03
Ochiuri	266.2	4.27	210.0	4.22
Baicoi	51.9	0.83	140.0	2.81
Liliesti	55.5	0.89	78.0	1.57
Tintea	1,093.3	17.52	1,360.0	27.33
Pitigaia-Gura Draganeasa	12.2	0.20	20.0	0.40
Campina	28.7	0.46	30.0	0.60
Bustenaria-Chiciura-Bordeni	117.6	1.88	-	-
Grausor-Calinet-Bustenaria	-	-	12.5	0.25
Chiciura-Gropi-Tontesti	-	-	62.0	1.25
Bordeni-Reeca	-	-	2.2	0.04
Runcu	97.2	1.56	-	-
Scortina-Runcu	-	-	56.0	1.13
Scaiosi	1.3	0.02	0.4	0.01
Copaceni	14.5	0.23	-	-
Copaceni-Opariti	-	-	14.0	0.28
Magurele	1.1	0.02	4.0	0.08
Margineni	52.5	0.84	80.0	1.61
Aricesti	27.6	0.44	5.0	0.10
Boldesti	694.0	11.12	590.0	11.86
Ceptura	693.4	11.11	386.0	7.76
Ploesti Region	6,152.2	98.59	4,890.4	98.29
Sarata	6.4	0.10	-	-
Sarata-Monteoru	-	-	6.4	0.13
Arbanasi	35.3	0.57	-	-
Policiori-Arbanasi	-	-	33.6	0.68
Buzau Region	41.7	0.67	40.0	0.81
Bacau Region	46.1	0.74	44.6	0.90
RUMANIA	6,240.0	100.00	4,975.0	100.00

Table 3
(cont'd)

Thousand Metric Tons

Area	Year of Discovery	1946 Quantity	1946 Percent to total	Cumulative Through 1946 Quantity	Cumulative Through 1946 Percent to total
a/* Viforata-Basvad-Ochiuri-) Gura Ocnitei-Moreni-) Ghidoveni-Pacuri-) Ochiuri-Valea-Voevozilor)	1903	1,720.2	40.45	83,344.6	53.27
Bucsani	1933	131.2	3.09	5,794.7	3.70
Glodeni	1897	?	?	80.3	0.05
Doicesti	1912	?	?	12.6	0.01
Mahil Rosu	1903	Depleted	Depleted	4.8	Negligible
b/ Floresti	1943	71.4	1.68	130.4	0.08
c/ Baicoi-Liliesti-Tintea	1868	935.8	22.01	14,534.1	9.29
Filipesti de Padure	1910	163.3	3.84	975.4	0.62
Fitigaia-Gura Draganeasa	1938	16.2	0.38	134.1	0.09
Campina	1884	27.5	0.65	4,680.4	2.99
d/ Bustenaria-Runcu	1857	69.6	1.64	15,267.6	9.76
Scaiosi	1930	0.2	0.01	16.7	0.01
Copaceni	1904	18.4	0.43	348.4	0.22
Magurele-Mislaesti	1938	3.2	0.08	6.8	Negligible
e/ Matita-Atarnati	1899	?	?	13.8	0.01
Margineni	1935	32.4	0.76	765.8	0.49
Aricesti	1921	1.9	0.04	1,103.1	0.70
Boldesti-Paulesti-Harsa	1922	464.7	10.93	14,464.1	9.24
Ceptura-Urlati	1913	415.9	9.78	8,653.1	5.53
Other Ploesti Fields		8.0	0.19	886.3	0.57
Ploesti Region		4,079.9	95.96	151,217.1	96.63
Sarata-Monteoru	1869	3.7	0.09	530.2	0.34
Arbanasi	1869	21.0	0.49	2,321.7	1.48
Berca	1903	94.0	2.21	251.0	0.16
Buzau Region		118.7	2.79	3,102.9	1.98
Zemes-Tazlau	1860	33.8	0.79	864.1	0.55
Stanesti-Solont	1860	6.5	0.15	697.9	0.45
Tescani	1860	Depleted	Depleted	135.4	0.09
Other Bacau fields		13.0	0.31	466.7	0.30
Bacau Region		53.3	1.25	2,164.1	1.39
Maramures Region	1919	Depleted	Depleted	0.5	Negligible
RUMANIA		4,251.9	100.00	156,484.6	100.000

* Footnotes for Table 3 follow on p. 32.

Table 9
(cont'd)

Petroleum Production by Areas in Rumania

Thousand Metric Tons

Area	1947 Quantity	1947 Percent to total
Rosvad-Ochiuri	547.2	14.07
Gura-Ocnitei	626.0	16.10
Moreni-Ghirdoveni-Pisouri-Filipesti de Padure-Mirgineni)	655.5	16.86
Floresti-Baicoi-Liliesti-Tintea	927.8	23.86
Boldesti-Paulesti-Mursa	423.3	10.89
Ceptura-Urlati	399.4	10.27
Other Ploesti fields	136.1	3.50
Ploesti Region	3,715.3	95.55
Buzau Region	119.6	3.08
Bacau Region	53.3	1.37
RUMANIA	3,888.2	100.00

Petroleum Production by Organizations in Rumania

Producing Organization	1948 Quantity	1948 Percent to total
Sovrompetrol	1,357	32.3
Muntonia f/	2,806	66.7
Moldovo f/	43	1.0
RUMANIA	4,206	100.00

Table 3
(cont'd)

Petroleum Production by Areas in Rumania

Thousand Metric Tons

	1949 Production					
	First Quarter		Second Quarter		First Half	
	Quantity	Percent to total	Quantity	Percent to total	Quantity	Percent to total
Government Regions						
Ploesti (Region I) g/	N.A.	N.A.	124.9	32.5	N.A.	N.A.
Moreni (Region II) h/	N.A.	N.A.	258.9	67.5	N.A.	N.A.
total	357.4	100.0	383.8	100.0	741.2	100.0
Muntenia Drilling Districts						
Urlati	78.1	11.4	83.4	11.6	161.5	11.4
Boldesti	88.5	12.9	89.7	12.4	178.2	12.7
Campina	28.4	4.1	33.2	4.6	61.6	4.4
Baicoi	204.6	29.7	193.2	26.7	397.8	28.2
Moreni	116.5	16.9	122.4	16.9	238.9	16.9
Targoviste	46.2	6.7	62.5	8.6	108.7	7.7
Ochiuri	104.2	15.2	111.8	15.5	216.0	15.3
Ploesti Area	666.5	96.9	696.2	96.3	1,362.7	96.6
Berca (Buzau)	21.5	3.1	26.4	3.7	47.9	3.4
Total	688.0	100.0	722.6	100.0	1,410.6	100.0
Moldova	3.8	-	14.2	-	18.0	-
RUMANIA	1,049.2		1,120.6		2,169.8	

Table 3
(cont'd)

Petroleum Production by Areas in Rumania

Thousand Metric Tons

Muntenia Drilling Districts	Second Half 1949 Quantity	Second Half 1949 Percent to Total	Year 1949 Quantity	Year 1949 Percent to Total
Urlati	145.1	10.5	306.6	11.0
Boldesti	172.6	12.5	350.8	12.6
Campina	64.1	4.6	125.7	4.5
Baicoi	342.4	24.8	740.2	26.5
Moreni	215.1	15.6	454.0	16.2
Targoviste	174.8	12.6	283.5	10.1
Ochiuri	219.4	15.9	435.4	96.5
Ploesti Area	1,333.5	96.5	2,696.2	96.5
Berca (Buzau)	48.8	3.5	96.7	3.5
	1,382.3	100.0	2,792.9	100.0

1949 Production

Producing Organization	First Half Quantity	First Half Percent to Total	Second Half Quantity	Second Half Percent to total	Total Quantity	Total Percent to total
Ploesti Area	1,362.7	62.8	1,333.5	58.2	2,696.2	60.4
Buzau Area	47.9	2.2	48.8	2.1	96.7	2.2
Muntenia	1,410.6	65.0	1,382.3	60.3	2,792.9	62.6
Moldovo	18.0	0.8	18.3	0.8	36.3	0.8
Sovrompetrol	741.2	34.2	891.7	38.9	1,632.9	36.6
RUMANIA	2,169.8	100.0	2,292.3	100.0	4,462.1	100.0

1950 Production

	First Half Quantity	First Half Percent to total	Second Half Quantity	Second Half Percent to total	Total Quantity	Total Percent to total
Muntenia Drilling Districts						
Urlati	165.9	11.1	165.5	11.1	331.4	11.1
Boldesti	172.7	11.5	167.0	11.2	339.7	11.4
Campina	68.2	4.6	62.6	4.2	130.8	4.4
Baicoi	385.9	25.7	378.8	25.4	764.7	25.6
Moreni	221.4	14.8	225.2	15.1	446.6	14.9
Targoviste	215.8	14.4	235.7	15.8	451.5	15.1
Ochiuri	213.1	14.2	199.9	13.4	413.0	13.8
Ploesti Area	1,443.0	96.3	1,434.7	96.2	2,877.7	96.3
Berca (Buzau)	55.6	3.7	56.7	3.8	112.3	3.7
	1,498.6	100.0	1,491.4	100.0	2,990.0	100.0

Table 7
(cont'd)

Petroleum Production by Areas in Rumania

Thousand Metric Tons

Producing Organization	Total 1950 production: Quantity	Total 1950 production: Percent to total
Ploesti Area	2,877.7	62.6
Buzau Area	112.3	2.4
Muntenia Total	2,990.0	65.0
Sovrompetrol	1,564.0	34.0
Moldovo	46.0	1.0
RUMANIA	4,600.0	100.0

RUMANIA	QUANTITY
1857-1938, inclusive	115,006
1939	6,240
1940	5,834
1941	5,602
1942	5,338
1943	4,975
1944	4,576
1945	4,662
1946	4,252
1947	3,888
1948*	4,206
1949*	4,462
1950*	4,600
1857-1950, inclusive*	173,641

* Estimated

Footnotes for Table 3

a/ The main Moreni-Gura Ocnitei East sector was reportedly opened in 1903, while corresponding dates are 1927 for the Pascuri-Pascuri North sector, 1929 for the Gura Ocnitei West sector, and 1934 for the Calinesti-Ditesti sector. Records indicate that oil was obtained from hand-dug wells in Moreni prior to 1855.

b/ Oil was possibly discovered in 1933 in Floresti, but was presumably not exploited until 1943.

c/ The first oil was possible discovered in 1860 in this area; the first exploitation appears to have been delayed until 1868.

d/ The first commercial production in the world is credited to the Boldesti field in 1857, and this field is still producing; a minor field called Colibasi (Dambovita Province) reportedly began to be exploited at about the same time, but Colibasi is on record as depleted in 1931. Records show that oil was obtained from pits dug by hand in oil seepage zones in the Boldesti area, as early as 1844.

e/ In the Pacureti field on a small, tightly folded anticline structure in this area block, oil is said to have been first obtained from wells dug by hand in seepages, before the first commercial well was drilled in 1904.

f/ Including 1948 productions obtained from areas, prior to the 1948 operation of the same areas by the designated State organizations after nationalization.

g/ The Ploesti (Campina?) operating region is reported to consist of areas at Baicoi, Tintea, Floresti, Plavia (Flavia?), Moldovo.

h/ The Moreni Operating Region is reported to consist of areas at Moreni, Targoviste, Teis, Ochiuri, Bucsani.

i/ N.A. - data not available.

4. General Geology of the Oil-Productive Regions.

True Tertiary sands constitute the important oil-productive formations in the Rumanian oilfields. The formations known as the Meotic and Dacic are by far the most productive, with the Dacic of less importance compared to the Meotic. Below the overburden Pliocene Levantine formation, the typical productive formations are as follows, listed in order of increasing age:

Formations	Geologic Age	Regions or Provinces
Dacic (Dacian)	Pliocene	Ploesti, Buzau
Pontic (Pontian)	Pliocene	Prahova
Meotic	Pliocene	Ploesti, Buzau, Bacau
Sarmatian (Sarmatic)	Miocene	Ploesti, Maramures
Helvetian	Miocene	Prahova, Bacau
Oligocene	Oligocene	Prahova, Bacau
Eocene	Eocene	Bacau

Anticlinal folds are the featured productive structures in the Rumanian oilfields. The anticlines are sometimes simple, but are often complex: they sometimes appear as diaper folds, and in some cases they have been reported as anticlinoriums. Other reported data indicate trends to dome structures with quaquaversal dip. The actual oil deposits may occur on synclines or monoclines in certain instances. Complex faulting is quite common, and another predominant feature is the presence of intrusive salt dikes or stocks, often associated with diaper folds.

5. General Physical Features of Principal Oilfields.

The following condensed summaries are prepared upon basis of a fixed pattern of intelligence data. Where items of the indicated pattern for a given area are omitted or are not mentioned in these summaries, the pertinent details are at present not available.

In the Baicoi-Tintea area block of the Moreni-Baicoi trend, the Baicoi-Liliesti-Tintea fields are situated on an anticline-syncline structure. This structure exists along an east-west trending thrust fault through which salt has intruded and locally distended itself. The central area was thus broadened as a salt stock, with the thrust fault extending out from either end. Oil reservoirs are found on both the upthrown and downthrown sides of the fault; the most prolific areas are along the fault, on the east and west of the salt mass. Meotic sands bear oil throughout the area. Dacic sands are oil reservoirs at the eastern and western extremities, while local oil accumulations occur in the steeply dipping, violently folded and faulted Miocene beds below the Pliocene-Miocene unconformity. With prevailing clay section and complex distortion, the producing formations appear to offer poor prospects for deeper oil pools in these fields.

Producing depths in the Baicoi-Liliesti-Tintea fields range from 600 to 9,000 feet, with an average pay thickness of at least 200 feet in the oil-bearing formations. Standard Oil interests alone had drilled about 230 wells in the area prior to nationalization. On 1 January 1946 the total productive area was about 850 acres (744 acres in Standard Oil holdings).

The Floresti field terminates the Baicoi-Tintea block on the west, and it is an area similar to that of the Baicoi-Liliesti-Tintea fields, in that salt has intruded upward along a thrust plane and locally distended itself, but not as widely as in the more eastern area. Pay sands exist on the south or under thrust side of the structure, below the northward sloping salt mass. Meotic sands are oil reservoirs with some oil also found in Miocene beds; no commercial oil has been reported from the Dacic. Producing depths range up to 9,000 feet; Standard Oil's interest was restricted to 49 productive acres here with actual Standard Oil participation in a total of only 5 wells.

The eastern extremity of the western part of the Moreni-Baicoi trend, i.e., the Moreni-Gura Ocnitei area, is in the Piscuri-Ocolnita-Ditesti-Calinesti anticline, or syncline-anticline, constituting a fold with thrust to the south. Local salt intrusions pierce the core of this structure, and diagonal faults of minor character are present. In the easternmost (Calinesti) and central (Ditesti) fields of the anticline, the Standard Oil interests had holdings of only 49 acres in a total of 540 or more reported 1 January 1946, with Standard Oil participation in only 22 of the wells drilled prior to nationalization. Meotic formations are productive at depths of from 5,000 to 7,300 feet in the Calinesti-Ditesti fields, with average pay thickness of 50 feet; there are scattered shows of oil also present in the Miocene beds. Together with the Piscuri North field situated outside of the anticline, to the north of the westernmost or Piscuri field of the structure, the entire Piscuri field comprises a structural high area of the Moreni salt block. In the Piscuri-Piscuri North fields, the Meotic and Dacic sands are productive at depths of from 1,000 to 6,000 feet. Standard Oil had interests in 600 productive acres, and in a total of 91 wells drilled in the two fields.

The Moreni-Gura Ocnitei fields are likewise located upon the general syncline-anticline of the Moreni-Baicoi trend western area, formed as a fold with thrust toward the south. The Gura Ocnitei East-Moreni-Moreni North fields locally comprise a thrust with salt intruded along the crestal portion of a separate anticline. These fields together constitute an eastern sector, separated from the Gura Ocnitei West field by a diagonal fault. In the eastern sector anticline, the north flank is short and steep while the south flank is long and gentle. The major part of the oil deposits are present on the south flank. The Dacic and Meotic sands are well-developed in

the eastern sector and have been prolific oil reservoirs there. Moreni-Gura Ocnitei area production began on the southern flank in this eastern sector, in shallow Dacic wells drilled next to the salt mass. There was subsequent deeper Meotic production in the same locality, following the Meotic formations down the dip. Production since 1903 has spread out east and west from Moreni, along the structural trend in the Moreni-Gura Ocnitei area. Production depths range from 1,000 to 7,000 feet in the Gura Ocnitei East-Moreni-Moreni North fields. Standard Oil interests in that area applied to a total of 222 wells drilled on 493 productive acres.

On 1 January 1946, the Moreni field was reported to consist of 3,700 productive acres, with an average pay thickness of 300 feet in the reservoir sands; for the Moreni North field the corresponding values were 1,100 acres and 90 feet of average thickness; and for the Gura Ocnitei fields altogether 1,300 acres and 150 feet of average thickness. In the Gura Ocnitei West field, Standard Oil had interests in a total of 43 wells drilled on 494 productive acres.

Meotic and Miocene (Helvetian) sands are productive in the Gura Ocnitei West field. An angular Pliocene-Miocene unconformity exists in the strata sequence of this field, representing a stratification discontinuity otherwise prevailing in the Moreni-Baicoi trend and in most of the Ploesti Region sediments in general. The salt intrusive does not penetrate the Pliocene in some cases in the Gura Ocnitei West field in particular, and the Meotic (Pliocene) oil may have migrated upward from original accumulation in the Miocene. Miocene production has been available in the field since 1938, but has been indicated to be none too satisfactory. The productive Helvetian formations are mostly confined to the central portion of the field where the Helvetian series contains porous beds, 675 to 820 feet below the Meotic. By midyear 1948, 154 wells were reported drilled below the Meotic

into the Miocene; 78 of these wells were in good structural location, but of the 78 only half proved to be commercial Miocene producers. Productive depths have been reported to be from 1,300 to 5,000 feet in the Gura Ocnitei fields.

The Gura Ocnitei West field is separated by a fault from the Ochiuri field, located on an anticline on the north. Production has extended westward from the Gura Ocnitei fields into the Nasvad and Teis areas, with the Pliocene beds becoming successively thinner and less favorable in general oil prospects westward.

The Bucsani field is a domal and anticlinal fold featured by faulting. A small area of salt intrusive exists below the Pliocene-Miocene contact in the structure. The Meotic sands are productive in the field, at depths of from 5,000 to 7,300 feet; the productive area was reported to be one of 3,900 acres on 1 January 1946 with an average thickness of 30 feet in the pay sands. Minor quantities of oil and gas are obtained from the crestal portion of the structure. Standard Oil interests were confined to a total of 23 wells, drilled on 185 productive acres.

The Draganeasa-Runcu structural trend is related, (a) to the regional Draganeasa fault, trending to the northeast from the west, and then eastward, and (b) to a shorter regional fault trending northeastward through the Chiciura-Runcu block so that the two faults intersect on the east of the productive area of the trend. These faults were thrusts at low angles, producing monocline fault structures.

The Pitigaia field was listed to have 580 productive acres, producing from depths as shallow as 700 feet, with an average pay thickness of 140 feet, 1 January 1946. Meotic and possibly Miocene (Helvetian) formations are productive in the Pitigaia-Dragneasa fields; production was at first thought to be all from the Miocene. The final interests of the Standard Oil in the Pitigaia-Draganeasa field consisted of five wells,

drilled to depths of from 4,500 to 5,500 feet, on 169 productive acres. The oil is accumulated on the southeast or down side of the thrust in the area. A minor thrust fault exists just south of the main fault.

On 1 January 1946 the Bustenaria-Chiciura-Runcu areas were listed to have 5,250 acres productive, producing at depths of from 100 to 2,500 feet, with an average pay thickness of 160 feet in the reservoir beds. Production comes from the Dacic, Meotic, Oligocene and possibly Helvetian sands in the various fields; Standard Oil interests controlled 1,201 productive acres in the areas, and had drilled 102 wells for oil by the time of nationalization.

The Margineni field is an anticline with gentle dip prevailing in the beds, crossed by a number of normal faults. The structure is bounded on the north by a high-angle thrust fault. Meotic and Miocene (Sarmatian) sands are productive, but the Meotic series is poorly developed. The upper and lower members of the Meotic have produced gas and distillate, and small amounts of oil have come from a basal thin sand in the Meotic in a few wells. The Dacic has also produced gas.

Most of the Margineni oil has been furnished by Miocene formations. The Miocene sands are well developed on the southern flank wedge of the structure, and are productive in the southeastern portion of the field. Miocene beds are gently disturbed on the southern flanks; they are only slightly steeper than the overlying Meotic strata, so that the latter truncate the Miocene beds, leaving the Miocene sands as reservoirs. Meotic and Miocene sands are invaded by water on the northern flank of the anticline. The Margineni field actually developed as only a small producer, probably now exhausted. The average pay thickness has been reported as 20 feet, at depths from 6,000 to 7,500 feet. The final Standard Oil interest in this field consisted of 31 wells, drilled on 580 productive acres.

The Aricesti reservoir structure is a dome in contour, with salt stock and complicated faulting present. The salt stock may be a local intrusive in a general anticline-syncline structure, coming in along a regional fault zone similarly as in the Moreni-Baicoi trend. The Aricesti field was a minor productive area, however, and is probably now depleted. Meotic sands are productive in the field, yielding gas from the upper members and oil from the lower. Productive depths are listed at from 4,000 to 7,400 feet, with average pay thickness of 30 feet. Reports show 1,000 productive acres in the field on 1 January 1946. Standard Oil had final field interest in 17 wells, drilled on 420 productive acres.

The prolific Boldesti field is situated on an anticline with strike east and west, and with the north flank under thrust along a fault similarly as in the Margineni field. The overburden Levantine beds are gas-bearing; gas is also obtained from the Dacic and the uppermost sands of the Meotic. Oil is accumulated in the lower three sand complexes of the Meotic. On 1 January 1946 the field was reported to have 5,000 productive acres, producing at depths from 5,000 to 9,000 feet, from pay sands averaging 90 feet in thickness. Standard Oil interests had drilled 179 wells in the field by the time of nationalisation, on 1,581 productive acres.

The Ceptura reservoir structure is a prominent anticlinal fold in the sedimentaries, featured by a large thrust fault along the southern flank. The northern flank has been dissected by minor normal faulting after the oil had already accumulated. In the southwest in the Urlati area, there is thrust at the crest of the anticline, overriding the south. Most of the oil comes from the three sand complexes of the Meotic; the Dacic is barren. The Miocene beds are much distorted, folded, and faulted, but they nevertheless carry shows of oil, especially in limestones in the fractured crestal portion of the anticline. Reports show that the field had 2,100 productive

acres on 1 January 1946, producing at depths of from 2,400 to 5,000 feet, with average pay thickness of 110 feet in the reservoir beds. Standard Oil controlled 1,250 acres in the Ceptura-Orlea fields, with 154 wells drilled for oil by the time of nationalization. The Orlea field is on an extension of the Ceptura anticline. This anticline strikes eastward through the Orlea field; the strike bends to the northeastward on the east, passing through the Ceptura field.

The Pacureti-Matita trend is along the Pacureti-Matita regional fault, trending east and west with thrust southward. The Pacureti structure is a small, tightly folded anticline formed on the south of the fault, possibly by drag; this fold is underlain by another thrust, where the lower movement occurred at low angle. Standard Oil interests developed practically all of the Pacureti field, with a total of 14 wells drilled on 279 productive acres prior to nationalization. Producing depths have been reported at from 2,000 to 5,000 feet, with 180 feet average thickness in the pay sand, an unusually sandy phase of the Pontic. The Dacic and possibly the Meotic have yielded minor quantities of oil at the shallower depths.

The Magurele field produces from the Meotic, in a thrust fault structure located southwestward along the main fault from Pacureti in the same structural trend. Creditul Minier brought in the Magurele discovery well in 1938, while the Standard Oil Neopetrol subsidiary appears to have completed another well in the field at about the same time. The Malaesti field lies at the western end of the structural trend west of Magurele.

Among the several remaining minor fields in the Ploesti Region, the Doicesti, Podeni Vechi, and Serani fields are located upon anticlines. A Valea Boului anticline is known to branch off to the north from the east-west trending Podeni Vechi anticline; the strike is northward and to the east in

the Valea Boului structure, situated between Podeni Vechi and Pacureti-Matita. Still another anticline with northeastward trend lies between Ceptura and Podeni Vechi. It is an unexploited anticline known as Tatarul.

With trends northeastward in faults and anticlines, the Sarani anticline is located south of a regional fault having thrust to the southeast in Prahova, near the Buzau border northeastward from Pacureti. A Surani anticlinal fold lies between the Sarani structure and the fault on the north. A Soimari anticlinal structure extends across the boundary into Buzau, between the Sarani and Pacureti fields, and a Lopos Robesti anticline lies in Buzau east of Pacureti. In Dambovita the new Suta Seaca field may be situated upon an anticline called Bratesti, trending east and west.

The following minor Ploesti Region fields have been reported producing from Meotic sands: Filipesti de Padure, Campina, Scaiosi, Copaceni, Doicesti, and Glodeni. The Buzau Region fields apparently all produce from the Meotic.

In the Tescani (Tescausi, or Tetcani) field of the Bacau Region, Standard Oil interests produced nearly 30,000 tons of oil from 35 wells drilled to Miocene (Helvetian) productive sands before abandoning the field. A test well was drilled by Standard Oil in 1943, with good prospects indicated; deeper production was considered to be possible from Oligocene reservoirs. A cumulative production of 135.4 thousand metric tons of oil has been reported from Helvetian sands in the Tetcani field. Standard Oil had 299 acres of proved productive area in the field, representing 60% of the structure.

Otherwise in the Bacau Region, the Zemes-Tazlau and Stanesti-Solont fields have been reported productive from Oligocene sands. The Modnesti

field is currently the chief producing area in the region as far as known, producing from Meotic, Oligocene, and Eocene sands. Sovrompetrol has reported extensive new discoveries in the region, but the reality of this is questionable. On 1 January 1946 the Moinesti-Lucacesti fields were reported to have "proved" productive area of 275 acres, containing pay sands averaging 40 feet in effective thickness, producing at depths from 200 to 1,000 feet in an anticlinal structure.

b. Petroleum Reserves in Rumania.

Based upon estimates made by the Rumanian corporation known as Romano-Americana, a former operating subsidiary of the Standard Oil Company (New Jersey), the proved Rumanian crude petroleum reserves were reported thus as of 1 January 1947:

ESTIMATED PETROLEUM RESERVES IN RUMANIA

Area	Thousand Metric Tons Quantity	Percent to Total
Ochiuri-Gura Ocnitei West	10,432	14.99
Moreni-Gura Ocnitei East	15,928	22.89
Ditesti-Campinesti-Floresti	2,598	3.73
Bucsani	1,006	1.45
Baicoi-Tintea	10,958	15.75
Pitigaia-Campino-Runcu	6,241	8.97
Pacureti	436	0.64
Margineni	912	1.32
Aricesti	363	0.52
Boldesti	9,138	13.14
Ceptura-Orlea	6,788	9.75
Other Ploesti fields	604	0.86
Ploesti Region	65,404	94.01
Buzau Region	2,196	3.16
Bacau Region	1,970	2.83
RUMANIA	69,570	100.00

In terms of percentages of the total these 1 January 1947 reserves were indicated to be controlled by operating companies as shown below.

ESTIMATED PETROLEUM RESERVES IN RUMANIA

Operating Company Owner	Percent to Total
Astra-Romano	21.1
Sospiro (Societe Anonyme de Petrol)	3.1
Shell Interests	24.2
Steuna Romano	14.0
Unirea	7.1
Other British Interests	21.1
Romano-Americana, Agentia Americana, Etc.	14.0
Sospiro (Societe Anonyme de Petrol)	3.1
Standard Oil (New Jersey) Interests	17.1
Concordia	9.7
Creditul Minier	8.6
Colobia	5.3
Prahova	2.3
I. R. D. P.	3.7
Sovrompetrol Group	29.6
State	0.8
Other Companies	7.2
Miscellaneous Rumanian Interests	8.0
RUMANIA	100.0

Although later reserve data have not become available for separate areas, the estimate for the current total proved Rumanian reserves has been substantially reduced, not only by the estimated 17,156 thousand metric tons produced from 1947 through 1950, inclusive, but also by an additional 7,081 thousand metric tons, to equal the currently published estimate of 45,333 thousand metric tons for remaining proved petroleum reserves in Rumania as of 1 January 1951. This indicates a net loss in ultimate recovery of 7,081 thousand metric tons over and above any new reserves supposedly discovered since 1946. Of this net loss, 2,526 thousand metric tons was applied as of mid-year 1948 by the Standard Oil Company with respect only to those properties in which it had an interest.

The published estimate of 45,333 thousand metric tons of proved petroleum reserves for Rumania as of 1 January 1951 is less than one-half of one percent of the corresponding total world reserves. There is general evidence that this estimated value is reasonably correct.

7. Recent Oil Exploration and Development

Several minor new oilfields, but no new fields of consequence except for Floresti, were opened up in Rumania after the close of World War II and before the nationalization of the oil industry. Available details for some of these minor new oilfields are summarized as follows. These data were generally current 1 January 1949. The reported density of drilling is extraordinarily high on some of the acreages.

In the western or Dambovita portion of the Moreni-Gura Ocnitei area block in the Moreni-Baicoi trend immediately west of the Gura Ocnitei fields, a new Rasvad field had a productive area of about 30 acres in 1948. This new field is inferred to be distinct from an older and larger productive area also called Rasvad. The new field is located in hilly country between the villages of Rasvad de Jos and Rasvad de Sus, with the latter hamlet situated about 5 miles northeast of Targoviste. After prospecting in 1946, a well was completed in the spring of 1947 in the field, producing from a sand at a depth of 3,900 feet. Ten more wells were started in the spring of 1948, with four of the wells completed as producers by the end of the year. Potential annual oil production of about 146 thousand metric tons was then reported from the wells.

A test well in 1945 reportedly identified a new "oilfield" distinct from the older productive area generally called Viforata. This new field is situated on the southeast of the village of Viforata, a suburban settlement just one mile north of Targoviste proper, on the banks of the Ialomita. The 1945 discovery well in this new Viforata field was noted to have a flowing potential of 150 tons of oil per hour (?), with oil struck at a

depth of about 2,500 feet. Seven more wells were supposed to have been started in 1946 with drilling equipment supplied by the Soviets. The productive area of the new field in 1948 was reported to be about 640 acres.

The Gorgota oilfield of Dambovita was indicated to comprise 20 acres of productive area in 1948. The discovery well of the region was completed as a producer at a depth of about 4,000 feet in the fall of 1947. Seven wells were drilled in the new field by midyear 1950 (three dry and four producers). By the end of 1948 two wells had been completed as producers, while the other five wells were then scheduled; natural flow potential from the two wells was reported at that time to be about 44 thousand metric tons of oil per year.

Oil was discovered in a test well at 2,500 feet in the Doicesti field in 1943, but the first productive well was not completed until 1945. Sixteen other wells were drilled in the new field by March 1946, with a potential annual oil production of about 73 thousand metric tons reported. No additional drilling was indicated in the field prior to 1949. The field then had a productive area of about 1,300 acres.

Oil was discovered in 1947 in the new field at Glodeni, in distinction to the older field already exploited. This new pool was at a depth of about 3,000 feet. Additional drilling was being carried on in the new field by the close of 1948, with one productive oil well completed at a rated potential of about 7,500 metric tons per year.

The Edora oilfield was prospected in 1945, with oil-bearing sands identified at depths of 4,000 and 4,600 feet. Twenty-six producing wells were completed in the new field in 1946 and 1947, giving an annual potential of about 110 thousand metric tons of oil.

The new Cheboasa field produces from sands at about the same depths as at Edera. Cheboasa was prospected in 1946. Exploration wells were drilled in 1946, and seven exploitation wells were put down in 1947,

resulting in a total annual rated potential of about 26 thousand metric tons of oil. The Cheboasa productive area was reported to cover about 13 acres in 1948.

At Valea Lunga another new oilfield was reported to have about 76 acres of productive area in 1948. 1945 prospecting had indicated oilsands at a depth of 5,250 feet in this field. Exploration wells were drilled in 1946, and six exploitation wells were drilled during the summer of 1947. The latter six wells were all completed as producers, accounting for a rated potential of about 15 thousand metric tons of oil per year.

The three sectors of the Draganoasa field were discovered in 1944. In 1948, the sector to the west of the village had a productive area of about 23 acres; the sector to the southeast of the village, about 8 acres; and the one to the east of the village about 36 acres. Producing formations were found in the sector first mentioned, at a depth of 2,300 feet; and in the second and third, at a depth of 5,600 feet. Exploration wells were drilled in the first sector in 1946. Twenty exploitation wells were completed by 1948 but only six of these were productive (total potential at about 11 thousand metric tons of crude petroleum per year). Exploration wells were put down in the second sector in 1946, with some of them becoming producers. Five exploitation wells were drilled by 1948, but only three of them were completed as producers (total annual potential of this sector is about 9 thousand metric tons per year). Exploration wells, of which some were productive, and six exploitation wells, 4 productive, were completed in the third sector in 1947. The sector had a yearly potential of about 11 thousand metric tons in 1948.

The new Plaiul Campinei oilfield had a proved or productive area of about 25 acres in 1948. Discovery was made in 1945 with oilsand reported at a depth of 3,3[illegible]0 feet. Thirty wells were completed in the field prior to 1948, with 17 of these productive, accounting for a potential of about 73 thousand metric tons per year.

The more western sector of the Brebu oilfield was discovered in 1945, with oil-bearing formations found at depths of from 3,300 to 3,950 feet; the more eastern sector was discovered in 1946, with oilsands found at the same depths. In 1948 the productive area was about 30 acres in the eastern sector, and about 35 acres in the other. Exploration wells were drilled in both sectors in 1947, and some of these came in as commercial producers in the western sector. Production wells were then put down in 1948. At the close of 1948 four wells were productive in the eastern sector, while 14 smaller wells were producing in the western area. Each sector then had a rated potential of about 55 thousand metric tons of oil per year. Other wells were being drilled in the western sector in 1948.

Fourteen new oil-productive areas of minor extent are thus indicated to have been exploited in Rumania in the period from 1945 through 1948. These 14 areas were reported to show a total potential annual oil production of about 636 thousand metric tons, omitting the unusually large and probably erroneous value inferred for the new area called Viforata. Twelve of the areas were indicated to have a total productive or proved area of about 2,236 acres; acreage values for the new Glodeni and Edera fields are not available. Most of these new areas are not indicated to be effectively productive prior to 1948, and their productions are therefore not usually reflected in the statistics before 1948.

Upon proved areas held by Standard Oil interests in June 1948 no undrilled locations were considered to be available. For deeper pools and fields extensions in the productive holdings of this company, the prospects were considered to be mostly poor, and at the best in a few cases, only fair. In extensive exploration carried on throughout the sedimentary basins since the time of nationalization of the oil industry, with this prospecting done by Red Rumania and Soviet Russia agencies, the only important and certain new

oil production has been confined to the Targoviste field, an extension of the Gura Ocnitei fields. A new minor productive area may be in the Suta Seaca field, and the Communists have recently announced that prodigious but quite improbable new reserves have been discovered on the Moldavia plains near Bacau. Other purported new discoveries have already been mentioned, in the Maramures, Salaj (northwestern Transylvania), Arges, Olt, and Valcea Provinces as well as in the Banat.

Intensive Communist petroleum explorations have been reportedly concentrated in the Provinces or Judetals of Bacau, Botosani, Maramures, Salaj, Ciuc, Odorhei, Arges, Olt, Valcea, Gorj, and Bihor. Various new oil discoveries have been reported in these Provinces, in addition to those above noted.

The new Targoviste field is indicated to be within an exploration area of about 15,000 acres, although the unknown value for proved area is evidently much smaller since the field is reported to be about equivalent to Bucsani in reserves. The productive Targoviste area may be in four sectors, with each in the vicinity of a village. The Targoviste field was originally discovered by the Germans during World War II; Sovrompetrol began testing the field May 1946, after discovery of German records, and began exploitation March 1947. Major development of the field did not occur until after June 1948. The Communists thus did not actually discover the Targoviste field, but merely began developing it; they proved that more reserves than the Nazis suspected were present, and that earlier Rumanian wildcatting had not been deep enough.

In the Suta Seaca field Sovrompetrol apparently had one well producing prior to 1950, with a rated potential of about 7,300 metric tons per year. Four other wells were supposed to be then drilling in the field with plans reported for further exploitation.

Soviet interests appear to favor the Bacau Region for exploitation, possibly because of proximity to the USSR. Standard Oil Tetcani field holdings in this region were abandoned after 1945. The Soviets claim discovery of new Bacau oil reserves equal to those of the Ploesti Region, with the productive potential of the Bacau Region now 80 times that of 1948, equivalent thus to about 3.4 million metric tons per year; considerable known geologic data do not support this claim although deeper production has been indicated to be possible in the area.

All known productive areas of Rumania are on the decline with respect to potential. It is probable that the Soviets will continue to obtain some new or additional production from these fields, by further stepouts from them and by more drilling to deeper pools within the producing areas. The Targoviste production was obtained in this manner, and it is not known that the Communists have been able to appreciably increase the Rumanian production in any other way.

Intensive exploitation of the Rumanian reserves is evident under Soviet guidance, without conservation techniques apparent. The reserves are being tapped by promiscuous drilling. Old and formerly abandoned wells are being reopened.

Major exploitations of some of the older fields have been specifically described in reports as summarized below.

The only significant increase in production in 1950 was in the Targoviste-Rasvad-Teis area. Considerable development is indicated in the Teis field, in the Miocene oilsands discovered in 1947. The Boicesti field appears to have become quite productive by further exploitation under Sovrompetrol, the organization that is said to control the field.

New wells have been drilled to a newly discovered pool at depths of from 7,800 to 8,200 feet in the southern end of the Floresti field, with good production obtained. Annual potential of nearly 35 thousand tons per well has been reported from this horizon.

Major Muntenia exploitation has been reported in the Baicoi-Lilliesti-Tintea area. Good production has been obtained on the north flank of the Baicoi field at a depth of 6,600 feet; 60 wells were drilled to the deeper pool by 1950. A new productive zone was found in the Tintea field, at 10,500 feet below the surface. The deep Tintea pay was struck near the village of Hirsa.

In the spring of 1949 fourteen new oilwells were completed in the field north of Campina, west of the main road from Ploesti to Brazov. These wells were said to have increased the Campina field production by 15%. The Soviet-Rumanian firm called Creditul Minier, now in Sovrompetrol, had by then brought in oilfield equipment from the Kuban-Maikop area of the USSR. Approximately 30 wells were completed to the deeper pay at 5,200 feet in the Campina field by 1950. About 26 thousand metric tons per year were previously produced from shallow zones in the field.

The Rumanian Communist regime has a Five-Year Plan in progress, covering the period 1951-1955 in the Soviet pattern. The 1955 goals include a crude production of 10 million metric tons with a total of 4.1 million feet to be drilled in oilwells during that year. In the interval, the plan proposes a wide application of secondary recovery techniques in the failing Rumanian oilfields; no extensive secondary recovery practices have been actually indicated in the fields to date. New thermal and catalytic conversion charge capacities. Catalytic conversion units are nevertheless not at present known to exist in Rumania. Further, a pipeline 132 miles long was planned to carry methane gas from the Transylvania Basin, over the Carpathian Mountains to the Bacau Region. Improvements and expansions were planned in lube oil manufacturing facilities.

It is evident that Soviet Russia is rapidly gaining absolute control over the Rumanian oil industry, even if this is not already the fact. The Soviet-dominated Sovrompetrol organization is flourishing at the expense of all other petroleum agencies in Rumania. The Muntenia group and Rumanian nationalist resistance are currently blamed in Soviet propaganda, for the present poor progress in augmenting the Rumanian crude petroleum production.

25X1

[redacted] gives an account of a Soviet threat to take over the entire oil industry of Rumania through the agency of the Soviet military mission in Bucharest, unless the production status rapidly improves in the country. The Soviets have reportedly ordered the Rumanian government to reduce local nationalized refining in Rumania, and ship the crude to a new refinery constructed by the Soviets in Batum, with a crude charge capacity of two million tons per year in this plant.

c. Drilling Activities in Rumania.

Drilled footage statistics have been reported in some detail for petroleum developments in Rumania. The reported data for recent years are summarized in the following table. The Rumanian Communists are indicated to have overcome equipment shortages and other evident handicaps, sufficiently to achieve significant increases in the footages drilled compared to former times. Red Rumania has attained new annual records in both the total and exploration well footages drilled. The ratio of exploratory to total drilling has been much increased, and in view of the poor showings in the production and reserve increases attained to date, this expanded exploration would seem to indicate but small prospects for future large petroleum discoveries in

Rumania. According to the current Five-Year Plan Red Rumania has set an ambitious goal for drilling in 1955 far above what might be inferred to be possible, considering the present limited facilities correlated with the results of the past.

Early in 1951, 2,500 oilwells were reported to be producing in Rumania, covering an exploited (probable) area of about 1.2 million acres in an exploration (possible) area of about 5 million acres. Known data indicate that it is not possible, however, for the proved oil-productive area to cover more than a small portion of the probable expanse of sedimentaries. On 1 January 1946 the proved or productive area of Rumania is supposed to have included only about 26 thousand acres within the most important fields.

Table 4

Footage in Wells Drilled For Oil a/*

Year	Footage Drilled		
	Exploration	Exploitation	Total
1936			1,079,000
1937 b/			1,292,000
1938 c/	213,000	732,000	945,000
1939			840,000
1940			771,000
1941			830,000
1942 d/			1,128,000
1943			1,120,000
1944			482,000
1945	82,000	433,000	515,000
1946	43,000	400,000	443,000
1947	125,000	407,000	532,000
1948 e/	361,000	720,000	1,081,000
1949 f/			1,714,000
1950 g/ (Plan)			2,214,000
1955 (Plan)	1,804,000	2,296,000	4,100,000

Organization	Footage Drilled					
	1948			1949		
	First Half	Second Half	Total	First Half	Second Half	Total
Sovrompetrol	322,000	65,000	387,000	322,000	331,000	653,000
Muntenia h/	458,000	142,000	600,000	480,000	581,000	1,061,000
Moldova h/	26,000	-	26,000	-	-	-
Others	68,000	-	68,000	-	-	-
TOTAL	874,000	207,000	1,081,000	802,000	912,000	1,714,000

* Footnotes for Table 4 follow on p. 54.

Footnotes for Table 4

a/ These values presumably exclude footage in the wells primarily drilled for gas. The 1947 and earlier values are compiled from reported and recorded statistics that show some variation among themselves. The later values are based upon reported estimates, with considerable variation present in these data.

b/ 1937 was the year with maximum total footage indicated prior to nationalization.

c/ 1938 was the year with maximum exploration drilling on record before nationalization.

d/ 1942 was the year with maximum footage drilled by Nazi occupation agencies.

e/ Estimates for the total 1948 footage have varied from about 984,000 to about 1,094,000. Estimates have indicated a footage of 387,000 in all gas wells drilled in the Transylvania Basin during the year.

f/ Estimates for the total 1949 footage have varied from about 1,575,000 to about 1,771,000. The 1949 plan apparently projected a total drilling footage of 1,456,000 with 597,000 for exploration and 859,000 for exploitation. It is evident that at least the total plan goal was exceeded; estimates are not available for the footages separately attained for exploration and exploitation.

g/ Estimates are not available for the footages actually attained in 1950.

h/ The 1948 values include footages drilled by companies before these latter were respectively absorbed in the indicated nationalized concerns.

Communist Rumania appears to continue to have acute shortages in oilwell drilling and other petroleum industry equipment. This is especially true for units in good repair, and for apparatus of modern types. While Red Rumania evidently has sufficient capacity in the present refining and other processing installations such as they are, there has been sustained effort, at least formerly, on the part of the Communist regime to obtain petroleum industry equipment from non-Communist sources.

The oilfield equipment in Rumania has deteriorated and the industry has been limited in procurement of new items. At midyear 1950 from 80 to 100 drilling rigs were reported to be operating in Rumania. Included among these there were presumably several rotary rigs, representing the more modern equipment successfully introduced into the country by Anglo-American operators after 1920. Most of the Rumanian drilling rigs were, however, of the cable tool type, brough in from Russia and other Orbit countries, and at least in the case of some the older apparatus still in use, from the "West". Also included among these rigs there were reportedly some 20 to 30 old type steam units of Rumanian manufacture fabricated by the Resita and Concordia plants.

Although some intelligence reports assert the contrary, oilfield equipment is probably still manufactured in Rumania with a large part of the output sent to Russia for "reparations". Rumania reportedly manufactures spare parts in limited quantities for the drilling rigs used in the country, of both Rumanian and foreign make. Rumanian-manufactured items such as the following are being shipped to Russia for the so-called reparations, in accordance with recent reports: drilling bits, drill pipe, traveling and crown blocks, elevators for drill pipe and tubing, rotary drill tables or rotary machines, casing, tubing, derricks, liner hangars, rotary swivels, and other drill rig parts. It is apparent that but little of the Rumanian-manufactured equipment is left for use in Rumania.

9. Total Number of Oilwells in Rumania.

For gas and oil in Rumania in total, in areas exclusive of the regions in which gas and no oil is known to occur, with these gas producing regions constituted chiefly by the Targul Mures (Transylvania Basin) and subordinately Manesti (Prahova Province) gas fields, it is estimated that about 10,200 wells were drilled prior to 1948. This estimated number includes 8,050 productive oilwells, 1,750 dry holes, and 400 wells productive of gas only. Within this period of time prior to 1948, the Standard Oil (New Jersey) interests had accounted for more than 11.5% of the total petroleum produced in Rumania; the Standard Oil subsidiaries had, as of 10 June 1948, drilled about 1,175 wells primarily for oil in Rumania, with this number probably represented by 925 productive oilwells, 200 dry holes, and 50 wells productive of gas only.

As of January 1, 1945, 1,831 wells were reported to be producing oil in Rumania. By 1 January 1946, the corresponding number was reported to be 1,994. The average production rate per well is evidently decreasing in the old oilfields of Rumania and by 1 January 1951 it is estimated that about 2,500 oilwells were producing in the country, including a larger percentage of small producers in comparison to former times. The latter estimated number includes 600 flowing wells, 1,350 wells on pumps, and 550 wells on gas lift. Of the annual Rumanian production in 1947, the Standard Oil holdings contributed about 14.7% and as of 1 January 1948, the Rumanian Standard Oil productive oilwells appear to have been about 365 in number, consisting of 90 flowing wells, 200 wells on pumps, and 75 wells on gas lift.

While a break-down by separate areas is available for the Standard Oil company wells, giving the total drilled and the ones still productive at the time of nationalization, the known data are insufficient for

estimating a similar break-down of the other wells by areas. The corresponding data have become scattered and fragmentary since 1947.

In the Rumanian oilfields in 1944 the following well completions were reported: 98 productive oilwells, 8 gas wells, and 13 dry holes, a total of 119 wells. In 1945 the corresponding total was one of 91 wells completed, consisting of 73 oilwells, 10 gas wells, and 8 dry holes. In 1947 there were similarly but probably incompletely reported only 64 well completions (59 oilwells, 3 gas wells, and 2 dry holes). Versus 160 wells supposed to have been completed in the fields in 1949 under the Communist regime, the number of completions is reported to have dropped to 98 in 1950. The Soviet occupying authorities are said to have placed blame for this decrease, equally upon equipment shortages and upon sabotage by workers.

Reports have persistently indicated that Rumanian nationals are in considerable number opposing the domination of the Soviets with the resentment exhibited indirectly in this fashion. Although the Soviets are clearly vigorous within certain limits in their attempts to expand the petroleum production potential in Rumania, it is evident that the reserves are being exploited without much regard to conservation. The Soviets are virtually confiscating the oil products so as to make rigid rationing necessary in Rumania. In the construction of an oil pipeline from Ploesti to Odessa in the Ukraine, a project the true status of which is still open to question, reports have, for instance, indicated deliberate sabotage inspired by Rumanian nationalists. The completion of such a pipeline would carry still more oil and oil products away from Rumania.

10. General Characteristics of Rumanian Oil.

The 1939 Rumanian petroleum production was reported to consist of 60% paraffin base type, 32°- 43° API in gravity, and of 40% mixed paraffin and asphalt base type, 33°- 39° API in gravity. Average°API density data for the productions from the more important separate areas have been recorded as follows:

Productive Area	Average °API
Baicoi-Liliesti-Tintea	39
Floresti	39
Piscuri-Ditesti	33
Moreni-Gura Ocnitei	33
Bucsani	38
Doicesti	39
Glodeni	38
Mahil Rosu	37
Filipesti de Padure	43
Pitigaia	41
Draganeasa	36
Campina	41
Bustenaria-Runcu	42
Margineni	39
Aricesti	35
Boldesti-Paulesti	37
Ceptura	34
Malaesti-Magurele	32
Pacureti	52*
Scaiosi	40
Copaceni	41
Sarata-Monteoru	38
Berca	38
Arbanasi	39
Moinesti	43
Zeiues-Tazlau	43
Stanesti-Solont	43
Tetcani	43

*Distillate.