NATIONAL PETROLEUM COUNCIL

REPORT OF THE COMMITTEE ON

PETROLEUM STORAGE CAPACITY (1954)

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NATIONAL PETROLEUM COUNCIL

REPORT OF THE COMMITTEE ON PETROLEUM STORAGE CAPACITY (1954)

October 19, 1954

Members of the
National Petroleum Council:

Gentlemen:

This report is being made in response to the action taken by the Council at its March meeting, after recommendation of the Agenda Committee in connection with a communication dated March 22nd from Mr. H. A. Stewart then Acting Director, Oil and Gas Division, Department of the Interior. In accord with this action your committee on Petroleum Storage Capacity was re-activated and requested to bring up-to-date its report of December 9, 1952, but in addition to the information gathered at that time, which subdivided the figures developed for the East Coast, Indiana-Illinois-Kentucky and the Pacific Coast Bureau of Mines districts into smaller subdivisions thereof, to survey the underground storage capacity also.

As in previous reports your committee related the current analysis to a previously reported inventory situation and chose March 31 of this year as the reporting date, since such information was the latest available when the questionnaires were distributed, and also because of the desirability of determining principal product inventory and storage relationships at the end of the most recent winter season.

A total of about 350 questionnaires were distributed to refiners and other holders of crude oil and principal product inventories and storage facilities. Based on the inventories reported in comparison with those previously developed by the Bureau of Mines, the crude oil section of this report represents 96.4 per cent of the refinery, pipe line and tank farm stocks of crude, and the crude oil in transit; the clean products group (gasoline, kerosine and distillate fuel oils) about 97 per cent; while the residual fuel oil portion represents 96.5 per cent of all of the inventories in these various categories that were reported to the Bureau of Mines for the United States as a whole as of March 31st last.

Your committee appreciates this extremely gratifying response, and takes this opportunity to thank the industry for it and for so promptly returning the information requested.

Returns were not received from a few relatively small companies. It is believed, however, that most of these are crude producers who carry lease stock only, an item for which no analysis was requested. Your committee retained the opinion expressed in its previous reports that such inventories in practically all circumstances represent working inventories required on producing properties.

Attached to the report, in consolidated form, are reproductions of all the questionnaire forms used in the survey, showing all of the details, including information on underground storage capacity for the first time, as well as additional information with respect to

the assignment of clean product storage capacity to gasoline, kerosine and distillate fuel oils individually as of October 31, 1953 and March 31, 1954.

The significant facts which may be noted from this survey are:

CRUDE OIL

(1) That the total capacity for storage of crude oil in tanks above ground in the country as a whole amounted to 425 million barrels on March 31st last, a slight decline from the 1952 level. This includes almost 10 million barrels of reservoir storage in California, a decline in this type of 4 million barrels.

(2) That total crude oil in tanks and all other facilities including pipe lines, tankers, etc., but not Producers' Lease Stocks was 244 million barrels.

(3) That the amount in tanks alone was 195 million--thus indicating above ground storage to have been 46.7 per cent full. In this connection it should be borne in mind that much of the reported tankage is in areas where it is not currently available for use, and some of it even so not susceptible to relocation elsewhere because of its condition. Still other portions are available only for limited use.

(4) That approximately 49 million barrels or about 19.2 per cent of all reported crude, are constantly required as main trunk and tank farm pipe line fill (44.3 million), as well as aver-

age required fill for tankers, barges, tank cars and trucks hauling crude (4.5 million).

(5) That over 76 million barrels, not including line fill shown above, are required to assure continuous operation of pipe lines and as crude tank bottoms; while 41 million are required to assure continuous processing and the handling and blending of the many grades of crude oil produced in the United States and processed in its refineries.

(6) That the combined total of all unavailable stocks of crude which is the combination of number (4) and number (5) above, amounted to about 68 per cent of all of the crude oil in storage as of March 31st last.

Table I, which follows, shows consolidated crude oil comparisons by general supply and demand districts of the country.

TABLE I

ANALYSIS OF ACTUAL AND UNAVAILABLE CRUDE OIL INVENTORIES AND STORAGE CAPACITY

MARCH 31, 1954 - (Barrels 42 Gallons)

District	Actual B. of M. March 31,1954 (1)	Questionnaires Returned Total (2)	Questionnaires Returned % (3)	Unavailable in Column 2 Total (4)	Unavailable in Column 2 % (5)	Storage March 31,1954 Capacity Reported (6)	Storage March 31,1954 Amount in Tanks (7)	Estimated Storage Capacity December 31, 1954 Total (8)
Inventories at Refineries, in Pipe Line and Tank Farm and in Transit Thereto								
I	21,176,000	21,296,000	100.6	13,935,000	65.4	32,502,000	17,160,000	32,755,000
II	77,475,000	74,692,000	96.4	50,046,000	67.0	117,622,000	54,951,000	113,246,000
III	109,929,000	104,562,000	95.1	79,151,000	75.7	189,425,000	83,913,000	186,058,000
IV	11,852,000	11,133,000	93.9	5,424,000	48.7	18,538,000	9,284,000	17,827,000
V	32,940,000	32,009,000	97.2	18,092,000	56.5	*66,774,000	29,544,000	*67,726,000
TOTAL U.S.	253,372,000	243,692,000	96.2	166,648,000	68.4	424,861,000	194,852,000	417,612,000
Producers' Lease Stocks - No Analysis Requested - Considered Operating Stocks (Shown as reported by U.S. Bureau of Mines)								
TOTAL U.S.	18,495,000	18,495,000	100.0	18,495,000	100.0	Not Available	18,495,000	Not Available
Total all Crude Oil Stocks - B. of M.								
UNITED STATES	271,867,000	262,187,000	96.4	185,143,000	70.6	Not Available	213,347,000	Not Available

* Includes 9,945,000 barrels of reservoir storage assigned to heavy crude oil on March 31st last.

CLEAN PRODUCTS

The companies which submitted figures to this survey had in their manufacturing, storage and distribution systems about 251 million barrels of clean products including gasoline, kerosine and distillate fuel oil on March 31st of this year. As an indication of the coverage of this survey, the figure shown is 97 per cent of all of the clean products all companies reported to the Bureau of Mines as in storage country-wide as of that date.

Further details shown by the returns reveal:

(1) That the total storage capacity assigned to Clean Products as of March 31st last amounted to 467 million barrels, and that this capacity contained 231 million barrels as of that date, thus indicating assigned capacity to have been approximately 49.6 per cent full on the date indicated.

(2) That of the 251 million barrels of these products reported as in storage, 92 million barrels or about 36.5 per cent of reported inventories were unavailable for shipment. Included in this figure are 12.7 million barrels required for pipe line fill and 7.2 million barrels average unavailable in transit by tanker, barge, tank car and truck. The balance of the total indicated unavailable is composed of amounts required as tank bottoms, unavailable unfinished, amounts in refinery lines and operating equipment, pipe line operating requirements, etc. All details are shown on the consolidated forms included in the appendix hereof.

(3) That the 467 million barrels of clean products storage capacity reported for March 31, 1954, is expected to increase to 496 million barrels by December 31st next.

Consolidated clean product figures are shown in Table II, which follows, by Bureau of Mines refining districts. Consult attached consolidated forms for additional district break down including New England, North Central areas and the Pacific Northwest.

TABLE II - ANALYSIS OF ACTUAL AND UNAVAILABLE CLEAN PRODUCT INVENTORIES AND STORAGE CAPACITY
MARCH 31, 1954 - INCLUDES GASOLINE, KEROSINE, AND DISTILLATE FUEL OILS
(Barrels 42 Gallons)

B. of M. Refining Districts	Actual B. of M. March 31, 1954 (1)	Questionnaires Returned Total (2)	Questionnaires Returned % (3)	Unavailable in Column 2 Total (4)	Unavailable in Column 2 % (5)	Storage March 31,1954 Capacity Reported (6)	Storage March 31,1954 Amount in Tanks (7)	Estimated Storage Capacity December 31,1954 Total (8)
Includes Inventories at Refineries, Terminals, Pipe Lines and In Transit Thereto; Excludes Jet Fuels; also Middle Distillate Cracking Stock, the latter being classified by the Bureau of Mines as an Unfinished Oil								
East Coast	65,111,000	64,589,000	99.2	27,566,000	42.7	136,024,000	57,823,000	147,964,000
Appalachian:								
District I	5,937,000	5,775,000	97.3	2,056,000	35.6	10,637,000	5,048,000	11,500,000
District II	3,356,000	3,025,000	90.1	1,369,000	45.3	6,265,000	2,818,000	5,974,000
Ind. Ill. Ky.	53,747,000	53,500,000	99.5	16,729,000	31.3	98,330,000	50,015,000	101,779,000
Okla. Kans. Mo.	27,952,000	26,404,000	94.5	9,009,000	34.1	44,279,000	22,809,000	46,373,000
Texas Inland	8,363,000	7,827,000	93.6	2,635,000	33.7	13,105,000	7,140,000	13,430,000
Texas Gulf	31,755,000	27,987,000	88.1	9,628,000	34.4	54,426,000	27,436,000	60,124,000
Louisiana Gulf	13,355,000	13,169,000	98.6	3,489,000	26.5	23,227,000	12,713,000	25,423,000
North La.-Ark.	5,515,000	5,395,000	97.8	2,776,000	51.5	8,767,000	4,210,000	8,959,000
New Mexico	322,000	289,000	89.8	72,000	24.9	550,000	289,000	852,000
Other Rocky Mountain	10,293,000	10,185,000	99.0	2,855,000	28.0	14,290,000	9,301,000	14,354,000
Total East of California	225,706,000	218,145,000	96.7	78,184,000	35.8	409,900,000	199,602,000	436,732,000
California	33,394,000	33,305,000	99.7	13,610,000	40.9	57,104,000	31,862,000	59,307,000
TOTAL U. S.	259,100,000	251,450,000	97.0	91,794,000	36.5	467,004,000	231,464,000	496,039,000

RESIDUAL FUEL OIL

The companies which replied under this section of the survey held 96.5 per cent of the residual fuel oil reported to the Bureau of Mines on last March 31st.

They also reported:

(1) That they had a combined residual fuel oil storage capacity of 99 million barrels, including 50 million barrels in California of which 32 million were reservoir storage.

(2) That the above storage held 42 million barrels of product and was therefore 42.6 per cent full.

(3) That of total reported inventories, about 14.4 million barrels were unavailable for shipment to market because they had to be retained in order that residual operating facilities could continue to function.

(4) That storage capacity assigned to residual as of December 31 next would total 106 million barrels, including 55 million in the Pacific Coast Five State area, of which 36 million are to be in reservoir storage.

Consolidated details of the returned questionnaires are included for this product also in the tabulations attached as an appendix hereto.

TABLE III - ANALYSIS OF ACTUAL & UNAVAILABLE RESIDUAL FUEL OIL INVENTORIES AND STORAGE CAPACITY
MARCH 31, 1954 (Barrels 42 Gallons)

B. of M. Refining Districts	Actual B. of M. March 31, 1954 (1)	Questionnaires Returned Total (2)	Questionnaires Returned % (3)	Unavailable in Column 2 Total (4)	Unavailable in Column 2 % (5)	Storage March 31, 1954 Capacity Reported (6)	Storage March 31, 1954 Amount in Tanks (7)	Estimated Storage Capacity December 31, 1954 Total (8)
	Includes Inventories at Refineries, Terminals, Pipe Lines and In Transit Thereto; Excludes Heavy Residual Cracking Stock, which the Bureau of Mines classifies as an Unfinished Oil							
East Coast	8,804,000	8,835,000	100.4	3,867,000	43.8	17,765,000	8,618,000	19,624,000
Appalachian:								
District I	582,000	570,000	97.9	125,000	21.9	1,357,000	570,000	1,399,000
District II	345,000	346,000	100.3	80,000	23.1	685,000	346,000	677,000
Ind.Ill.Ky.	4,308,000	4,307,000	99.9	1,055,000	24.5	9,431,000	4,306,000	9,316,000
Okla.Kans.Mo.	1,325,000	1,078,000	81.4	410,000	38.0	2,805,000	1,076,000	2,847,000
Texas Inland	1,315,000	432,000	32.9	168,000	38.9	1,731,000	432,000	1,683,000
Texas Gulf	4,694,000	4,429,000	94.4	1,117,000	25.2	10,136,000	4,426,000	10,214,000
Louisiana Gulf	1,019,000	1,105,000	108.4	240,000	21.7	2,467,000	1,105,000	2,487,000
North La.-Ark.	143,000	140,000	97.9	18,000	12.9	258,000	140,000	283,000
New Mexico	37,000	31,000	83.8	7,000	22.6	76,000	31,000	75,000
Other Rocky Mountain	817,000	872,000	106.7	190,000	21.8	1,836,000	872,000	2,488,000
Total East of California	23,389,000	22,145,000	94.7	7,277,000	32.9	48,547,000	21,922,000	51,093,000
California	20,860,000	20,559,000	98.6	7,125,000	34.7	*50,348,000	20,188,000	**54,980,000
Total U. S.	44,249,000	42,704,000	96.5	14,402,000	33.7	98,895,000	42,110,000	106,073,000

* Includes 31,938,000 barrels of reservoir storage.
** Includes 36,362,000 barrels of reservoir storage.

COMPARISON OF STORAGE CAPACITY REPORTED IN THIS AND EARLIER SURVEYS

The industry's capacity to store and handle crude oil and refined products has increased greatly in the last six years, particularly in the clean products group for which large additional growth is reported during the last three quarters of this year also.

Comparative storage capacity figures follow:

	Survey: 1948 March 31	1950 June 30	1952 March 31	1954 March 31	1954 December 31
			(Millions of Barrels)		
Crude Oil	416.7	432.3	429.4	424.9	417.6
Clean Products	319.8	348.1	425.5	467.0	496.0
Residual Fuel Oil	123.4	106.1	103.6	98.9	106.1
Total Above Services	859.9	886.5	958.5	990.8	1,019.7

The above figures are shown in district detail in Table IV, which follows. Further break down for New England and other sections of the East Coast, Indiana-Illinois, Kentucky and Pacific Coast areas are attached in consolidated questionnaire form.

Interesting in connection with the above is the large increase in clean product storage--about 175 million barrels from March 31, 1948 to anticipated December 31, 1954, or 46 per cent. As might be expected the majority of this increase (167 million) occurred in Districts I and II, the large demand areas.

TABLE IV — COMPARISON OF STORAGE CAPACITY REPORTED MARCH 31, 1948, JUNE 30, 1950, MARCH 31, 1952 AND MARCH 31, 1954
(Figures in Thousands of Barrels)

NOTE: The 1952 relationship with prior years is somewhat overstated in Clean Products and to a lesser extent in Residual Fuel because of the broadened definition of a bulk terminal which became effective January 1, 1951. Also 1954 is somewhat understated in comparison with 1952 because of the exclusion in 1954 of the storage capacity assigned to jet fuel, the component parts of which in 1952 were being included in the over-all inventories of each clean product.

	CRUDE OIL (Includes all Crude categories except Producers' Storage)				CLEAN PRODUCTS (Gasoline, Kerosine and Distillate Fuels)				RESIDUAL FUEL (Residual Fuel Oils Only)			
District	1948	1950	1952	1954	1948	1950	1952	1954	1948	1950	1952	1954
East Coast	21,587	23,194	24,491	26,799	74,364	85,001	120,179	136,024	14,575	17,602	20,471	17,765
Appalachian:												
District I	5,277	7,002	5,999	5,703	5,060	5,336	8,908	10,637	455	378	933	1,357
District II	3,121	2,628	1,955	1,834	3,148	3,971	5,471	6,265	383	372	635	685
Ind. Ill. Ky.	37,356	44,322	46,045	44,200	60,275	69,118	85,114	98,330	8,814	8,611	9,536	9,431
Okla. Kans. Mo.	80,142	75,683	69,625	71,588	24,501	28,526	38,474	44,279	4,034	3,831	3,267	2,805
Texas Inland	82,393	82,344	80,541	84,522	7,387	8,604	12,253	13,105	1,705	1,969	1,868	1,731
Texas Gulf	79,787	83,922	83,526	76,314	54,285	56,797	61,458	54,426	10,715	10,317	11,675	10,136
Louisiana Gulf	16,196	15,937	16,012	18,957	16,673	17,811	20,574	23,227	3,726	3,457	3,208	2,467
North La.-Ark.	10,581	11,288	9,620	6,682	5,685	5,005	8,127	8,767	431	308	340	258
New Mexico	2,167	2,604	2,764	2,950	197	333	308	550	62	99	95	76
Other Rocky Mountain	18,525	18,482	18,448	18,538	7,669	11,036	11,373	14,290	1,888	1,942	2,057	1,836
Total East of California	357,132	367,406	359,026	358,087	259,244	291,538	372,239	409,900	46,788	48,886	54,085	48,547
California	(a)59,595	(a) 64,912	(a) 70,325	(a)66,774	60,515	56,526	53,221	57,104	(b)76,592	(b)57,172	(b)49,522	(b)50,348
TOTAL U. S.	416,727	432,318	429,351	424,861	319,759	348,064	425,460	467,004	123,380	106,058	103,607	98,895
(a) Includes reservoir storage assigned to heavy crude oil as follows:	2,525	11,733	13,912	9,945								
(b) Includes residual reservoir storage as follows									41,574(c)	34,751	31,447	31,938

(c) Revised to correct previous error in reporting.

COMPARISON OF UNAVAILABLE INVENTORIES REPORTED IN THIS AND EARLIER SURVEYS

Unavailable inventories, or amount of crude oil and refined products which, in a sense, have to be locked up in the industry's far flung operating system before normal operating levels can be achieved, have also increased over the last six year period, as will be seen from the following tabulations of United States totals:

	Survey: 1948 March 31	1950 June 30	1952 March 31	1954 March 31
		(Millions of Barrels)		
Crude Oil	132.9	142.4	150.9	166.6
Clean Products	75.2	74.0	87.0	91.8
Residual Fuel Oil	20.8	16.2	15.8	14.4
Total Above Services	228.9	232.6	253.7	272.8

The above figures are shown in district detail in Table V. They may be said to reflect just another item in the cost of doing business in an industry which has been so rapidly expanding as petroleum.

TABLE I - COMPARISON OF UNAVAILABLE INVENTORIES MARCH 31, 1948, JUNE 30, 1950, MARCH 31, 1952 AND MARCH 31, 1954
(Figures in Thousands of Barrels)

Note: The 1952 relationship with prior years is somewhat overstated in Clean Products and to a lesser extent in Residual Fuel because of the broadened definition of a bulk terminal which became effective January 1, 1951

	CRUDE OIL (Includes all Crude categories except Producers' Storage)				CLEAN PRODUCTS (Gasoline, Kerosine and Distillate Fuels)				RESIDUAL FUEL (Residual Fuel Oils Only)			
District	1948	1950	1952	1954	1948	1950	1952	1954	1948	1950	1952	1954
East Coast	9,975	10,220	11,055	11,870	20,289	21,465	27,226	27,566	4,351	4,737	4,510	3,867
Appalachian:												
District I	1,159	2,006	1,848	2,065	954	1,030	1,691	2,056	72	83	142	125
District II	1,246	971	1,161	1,086	545	665	827	1,369	67	53	66	80
Ind. Ill. Ky.	15,662	18,783	22,129	20,598	12,483	13,434	14,790	16,729	1,240	1,131	1,007	1,055
Okla. Kans. Mo.	21,467	21,490	23,399	28,362	6,165	5,141	8,098	9,009	520	526	280	410
Texas Inland	25,663	32,009	31,950	39,682	2,049	2,239	2,310	2,635	314	245	169	168
Texas Gulf	29,301	27,152	29,595	30,514	10,329	10,764	10,984	9,628	1,808	1,398	1,195	1,117
Louisiana Gulf	3,104	4,240	4,579	5,410	3,399	3,307	3,254	3,489	349	413	373	240
North La.-Ark.	2,791	3,580	2,593	2,484	1,452	739	1,999	2,776	35	20	28	18
New Mexico	1,037	1,067	1,039	1,061	21	81	29	72	5	17	7	7
Other Rocky Mountain	3,520	3,697	4,397	5,424	1,201	1,670	2,066	2,855	204	236	215	190
Total East of California	114,925	125,215	133,745	148,556	58,887	60,535	73,274	78,184	8,965	8,859	7,992	7,277
California	18,000	17,224	17,161	18,092	16,346	13,417	13,717	13,610	11,838	7,373	7,845	7,125
TOTAL U. S.	132,925	142,439	150,906	166,648	75,233	73,952	86,991	91,794	20,803	16,232	15,837	14,402

UNDERGROUND STORAGE CAPACITY

March 31, 1954

In response to the request of the Oil and Gas Division, the committee included in this survey a study of the Underground Storage Capacity of the industry. Each company was asked to report the underground capacity (a) "assigned to L.P.G. and/or L.R.G."; and (b) "other products, if any"; the former being the only ones for which figures were reported. They are set out below in 42 U. S. gallon barrels by Bureau of Mines districts:

District	Amount
East Coast	19,000
Appalachian	-
Ind.-Ill.-Ky.	565,100
Okla.-Kans.-Mo	536,100
Texas Inland	2,175,900
Texas Gulf	655,400
Louisiana Gulf	32,900
Ark.-La. Inland	748,300
New Mexico	232,000
Other Rocky Mt.	420,000
California	100,000
United States	5,484,700

As in all of the previous surveys by this committee, the most interesting finding is again the very large petroleum storage capacity indicated as necessary to maintain normal flexibility of industry operations.

The first survey which was as of March 31, 1948 showed an average of 100 barrels of storage capacity to every 41 barrels of inventories held in steel storage or reservoirs. The second survey as of October 31, 1950 showed an average of 100 barrels of capacity to every 45 barrels of inventory. In the 1952 study the relationship was the same. This year the figures show 47 barrels of inventory to each 100 barrels of capacity.

The committee wishes to again point out to those not familiar with oil industry operating problems that in no sense can the difference between inventories and capacities herein shown, be taken as an indication of available storage space. The industry must enjoy complete flexibility at all times if normal operation of its far flung transportation, manufacturing and distribution systems is to prevail, and if supplies to consumers are to be delivered efficiently and on schedule.

These four surveys, the only ones of their kind developed for the industry as a whole, may be said to have definitely confirmed what individual long term operating experience has indicated, - that relatively low ratios of actual inventories to total storage

capacity in service is essential if difficulties in processing, handling and distribution are to be avoided, and if the industry is to operate efficiently and well. The committee therefore again stresses as proof of the foregoing reflections the operating relationships once more derived as a result of this latest survey.

None of the figures in this report include stocks or storage capacity, if any, in the hands of the military.

Respectfully submitted,

FOR THE COMMITTEE ON PETROLEUM
STORAGE CAPACITY

/S/ L. S. Wescoat
L. S. Wescoat, Chairman

Note: Figures should be shown in Barrels of 42 U. S. Gallons by location in Bureau of Mines refining districts and should include only those categories of stocks regularly reported to the Bureau. Include foreign oil actually in storage but not crude or products in transit from foreign sources. The questionnaire forms covering the Pacific Coast Territory (Five States) were necessarily different from those used East of California. They did, however, indicate specific form and line numbers in asking for information on the Bureau of Mines national basis. Jet fuel, light and heavy cracking stock excluded.

	East Coast (1)	Appalachian District I (2)	Appalachian District II (3)	Indiana Illinois Kentucky (4)	Oklahoma Kansas Missouri (5)	Texas Inland (6)	Texas Gulf (7)	Louisiana Gulf (8)	Arkansas-Louisiana Inland (9)	New Mexico (10)	Other Rocky Mountain (11)	California (12)	Total United States (13)
CRUDE OIL - Barrels													
1. Fill in here amount of crude oil stocks you reported to B.of M. as of March 31, 1954 as at refineries or in transit thereto from domestic sources - Section 1 Form 6-1311	17,051,885	812,565	77,120	10,107,939	4,998,889	1,755,495	16,240,589	4,142,679	556,883	117,139	2,200,758	13,689,150	71,841,091
(a) Of the above quantity, how much was unavailable, - such as oil content of tank bottoms, in refinery pipe lines, and the minimum quantity required to assure continuous processing, handling and blending various grades of crude.	8,014,000	754,147	95,318	6,883,774	2,298,340	862,932	13,487,276	1,230,995	235,841	15,610	1,240,229	6,304,036	41,422,498
(b) As In Transit to refineries by truck, tank car, barge or tanker from Domestic Sources.	3,497,194	-	-	125,135	-	14	171,766	194,697	-	-	2,969	506,402	4,498,177
Total Unavailable Refinery - In Transit Crude Oil. (Sum of (a) and (b) above).	11,511,194	754,147	95,318	7,008,909	2,298,340	862,946	13,659,042	1,425,692	235,841	15,610	1,243,198	6,810,438	45,920,675
2. Fill in here amount you report to B.of M. as Pipe Line and Tank Farm Stocks of Crude. Section 2, Form 6-1311, as of March 31, 1954.	875,390	2,556,241	1,674,500	20,443,135	37,300,661	45,417,445	26,374,077	5,604,800	3,112,339	1,240,282	8,931,830	18,320,224	171,850,924
(a) Of the above quantity, how much was unavailable as pipe line fill.	79,043	559,264	482,527	5,667,889	13,465,187	14,091,875	2,939,832	1,559,236	1,323,896	367,912	1,846,310	1,958,502	44,341,473
(b) As minimum required in tankage to assure continuous operation of pipe lines, and oil content of bottoms of tank farm tanks.	279,031	751,760	508,500	7,921,444	12,598,030	24,727,562	13,914,557	2,424,882	924,525	677,802	2,334,727	9,322,906	76,385,726
Total Unavailable Pipe Line-Tank Farm Crude Oil. (Sum of (a) and (b) above).	358,074	1,311,024	991,027	13,589,333	26,063,217	38,819,437	16,854,389	3,984,118	2,248,421	1,045,714	4,181,037	11,281,408	120,727,199
Note: For the purpose of this survey Producers' Lease Stocks, Section 3 Form 6-1311 will be considered as completely unavailable.													
CLEAN PRODUCTS - Barrels (Include only gasoline, kerosine and distillate fuel oils and deal with only those inventories regularly reported to the Bureau of Mines on Form 6-1300; 6-1302 and 6-1303.)													
1. Fill in here amount you reported to B.of M. as at Refineries, at Terminals, or in Pipe Lines or In Transit thereto as of March 31, 1954 on Forms 6-1300; 6-1302; 6-1303.	64,588,989	5,774,867	3,025,070	53,499,526	26,403,612	7,827,073	27,987,323	13,168,618	5,394,695	289,171	10,185,273	33,305,427	251,449,644
2. Memo: Total capacity all tankage in Clean Product Service (Copy from Questionnaire #2).	136,024,248	10,637,222	6,264,749	98,329,633	44,278,542	13,105,219	54,426,034	23,226,605	8,767,495	549,500	14,290,423	57,103,914	467,003,584
3. Analysis of Unavailable Stocks included in Item 1 above:													
(a) Tank bottom credit actual or maximum of 7% of Item 2 above.	8,760,723	655,581	424,204	5,159,294	2,538,696	821,958	3,744,513	1,410,478	497,994	37,361	886,836	3,927,722	28,865,360
(b) Unavailable Unfinished at Refineries.	913,020	91,324	20,150	1,939,944	796,924	494,138	2,301,772	164,241	75,641	24,966	118,311	293,750	7,234,181
(c) In Refinery Lines and Refinery Operating Equipment.	121,138	18,758	5,273	112,918	68,080	40,744	215,228	64,012	7,480	2,200	29,549	1,086,443	1,771,823
(d) One-Half of Average Size Water Cargo Receipt. (Total of each individual grade calculated separately.)	9,059,005	376,517	131,167	2,012,154	215,953	-	105,300	192,500	85,000	-	-	1,239,839	13,417,445
(e) Other Unavailable Stocks. (Include Filter House Naphtha and Unavailable Unblended Finished.)	931,660	139,549	347,000	1,818,025	466,083	84,551	1,291,722	1,201,352	-	7,000	776,382	5,493,344	12,556,668
(f) Pipe Line Fill.	1,975,919	508,820	156,793	2,627,437	3,518,057	687,186	542,194	366,699	1,149,100	-	883,583	331,141	12,746,929
(g) Pipe Line Operating Requirements.	1,014,900	47,100	234,320	2,202,060	1,328,129	507,000	1,417,775	-	925,000	-	160,300	126,000	7,962,584
(h) Unavailable in Transit by truck, tank car, barge or tanker from Domestic Sources (if reported to Bureau only.)	4,789,734	218,000	50,000	857,468	76,846	-	9,174	89,461	36,000	-	-	1,111,878	7,238,561
Total Unavailable Clean Products. (Sum of (a) to (h) above).	27,566,099	2,055,649	1,368,907	16,729,310	9,008,768	2,635,577	9,627,678	3,488,743	2,776,215	71,527	2,854,961	13,610,117	91,793,551
RESIDUAL FUEL OIL - Barrels (Deal only with those inventories regularly reported on B.of M. Forms 6-1300; 6-1302 and 6-1303)													
1. Fill in here amount you reported to B.of M. as at Refineries, at Terminals, or in Pipe Lines or In Transit thereto as of March 31, 1954 on Forms 6-1300; 6-1302; 6-1303.	8,834,689	570,314	346,570	4,306,580	1,077,532	432,443	4,428,936	1,105,207	140,299	31,366	871,734	20,558,823	42,704,493
2. Memo: Total Capacity all tankage in Residual Fuel Service (Copy from Questionnaire #2).	17,764,770	1,357,008	685,189	9,430,418	2,804,914	1,730,910	10,135,890	2,467,495	257,958	76,000	1,836,492	50,347,653	98,894,697
3. Analysis of Unavailable Stocks included in Item 1 above:													
(a) Tank bottom credit actual or maximum of 7% of Item 2 above.	1,226,950	87,149	41,301	457,925	152,640	124,682	701,732	174,821	16,713	5,465	110,660	2,160,983	5,261,021
(b) Unavailable Unfinished at Refineries.	195,000	5,121	-	183,636	44,100	6,000	139,000	2,000	-	1,225	53,500	899,000	1,528,582
(c) In Refinery Lines and Refinery Operating Equipment	36,563	737	80	60,226	27,900	7,125	46,930	10,506	1,250	70	10,155	357,100	568,642
(d) One-Half of Average Size Water Cargo Receipt. (Total of each individual grade calculated separately.)	1,864,100	17,300	13,000	20,000	-	-	34,000	43,500	-	-	-	590,322	2,582,222
(e) Other Unavailable Stocks.	327,408	14,879	5,550	312,310	182,891	30,136	192,030	8,869	-	-	16,063	2,203,855	3,293,991
(f) Pipe Line Fill.	200	150	600	-	-	-	-	-	-	7	-	93,429	94,386
(g) Pipe Line Operating Requirements.	-	-	20,000	20,000	-	-	-	-	-	-	-	533,000	573,000
(h) Unavailable in Transit by truck, tank car, barge or tanker from Domestic Sources (if reported to Bureau only).	216,380	-	-	1,100	2,000	-	3,000	-	-	-	-	277,400	499,880
Total Unavailable Residual Fuel Oil. (Sum of (a) to (h) above).	3,866,601	125,336	80,531	1,055,197	409,531	167,943	1,116,692	239,696	17,963	6,767	190,378	7,125,089	14,401,724

QUESTIONNAIRE FORM #1 (a) - TOTAL FIXED UNAVAILABLE STOCKS OF CRUDE OIL, CLEAN PRODUCTS AND RESIDUAL FUEL OIL AS OF MARCH 31, 1954, COVERING EAST COAST AND INDIANA, ILLINOIS, KENTUCKY AND CALIFORNIA BREAK-UP

Note: Figures should be shown in Barrels of 42 U. S. Gallons by location in Bureau of Mines refining districts and should include only those categories of stocks regularly reported to the Bureau. Include foreign oil actually in storage but not crude or products in transit from foreign sources. See additional note at bottom of page.

	(a) EAST COAST	NEW ENGLAND	(c) NORTH ATLANTIC	(d) SOUTH ATLANTIC	(b) IND., ILL., KENTUCKY, ETC.	KENTUCKY-TENNESSEE	(e) PORTION OF OHIO IN DISTRICT AND MICHIGAN	ILL., IND., WISCONSIN	BALANCE (MINNESOTA)	TOTAL IN 5 PACIFIC COAST STATES	WASHINGTON AND OREGON ONLY	ARIZONA CALIFORNIA NEVADA
	Col. 1 (Col.2+3+4)	Col. 2	Col. 3	Col. 4	Col. 5 (Col.6+7+8+9)	Col. 6	Col. 7	Col. 8	Col. 9	Col. 10 (Col. 11+12)	Col. 11	Col. 12
CRUDE OIL - BARRELS												
1. Fill in here amount of crude oil stocks you reported to B.of M. as of March 31, 1954, as at refineries or in transit thereto from domestic sources - Section 1 Form 6-1311.	17,051,885	571,000	16,216,885	264,000	10,197,939	1,166,001	2,286,300	6,566,499	179,139	13,689,150	42,100	13,647,050
(a) Of the above quantity, how much was unavailable, - such as oil content of tank bottoms, in refinery pipe lines, and the minimum quantity required to assure continuous processing, handling and blending various grades of crude.	8,014,000	85,000	7,806,000	123,000	6,883,774	793,593	1,452,414	4,621,094	16,673	6,304,036	9,000	6,295,036
(b) As In Transit to refineries by truck, tank car, barge or tanker from Domestic Sources.	3,497,194	105,000	3,392,194	-	125,135	120,076	-	5,059	-	506,402	-	506,402
Total Unavailable Refinery - In Transit Crude Oil. (Sum of (a) and (b) above)	11,511,194	190,000	11,198,194	123,000	7,008,909	913,669	1,452,414	4,626,153	16,673	6,810,438	9,000	6,801,438
2. Fill in here amount you reported to B.of M. as Pipe Line and Tank Farm Stocks of Crude, Section 2, Form 6-1311, as of March 31, 1954.	875,390	-	586,000	289,390	20,443,135	1,061,867	4,714,183	14,667,085	-	18,320,224	-	18,320,224
(a) Of the above quantity, how much was unavailable as pipe line fill.	79,043	-	77,000	2,043	5,667,889	65,296	955,456	4,647,137	-	1,958,502	-	1,958,502
(b) As minimum required in tankage to assure continuous operation of pipe lines, and oil content of bottoms of tank farm tanks.	279,031	-	210,000	69,031	7,921,444	501,403	1,088,219	6,331,822	-	9,322,906	-	9,322,906
Total Unavailable Pipe Line-Tank Farm Crude Oil. (Sum of (a) and (b) above)	358,074	-	287,000	71,074	13,589,333	566,699	2,043,675	10,978,959	-	11,281,408	-	11,281,408

Note: For the purpose of this survey Producers' Lease Stocks, Section 3 Form 6-1311 will be considered as completely unavailable.

(a) Figures entered here should check those reported for East Coast on Form #1; (b) should also be same as on Form #1; (c) For this survey North Atlantic states are the portions of New York and Pennsylvania that are in the East Coast Refinery District, New Jersey, Delaware, Maryland and District of Columbia; (d) South Atlantic are Virginia, North and South Carolina, Georgia and Florida. (e) Only a portion of the State of Ohio is in the Indiana, Illinois, Kentucky refining district.

CLEAN PRODUCTS - BARRELS

(Include only gasoline, kerosine and distillate fuel oils and deal with only those inventories regularly reported to the Bureau of Mines on Forms 6-1300; 6-1302 and 6-1303.)

1. Fill in here amount you reported to B.of M. as at Refineries, at Terminals, or in Pipe Lines or In Transit thereto as of March 31, 1954 on Forms 6-1300; 6-1302; 6-1303.	64,588,989	11,588,204	38,872,103	14,128,682	53,499,526	4,302,621	13,170,545	32,432,569	3,593,791	33,305,427	6,163,104	27,142,323
2. Memo: Total Capacity all tankage in Clean Product Service (copy from Questionnaire #2 (a)	136,024,248	27,029,020	82,091,782	26,903,446	98,329,633	7,316,234	28,686,033	54,620,747	7,706,619	57,103,914	9,292,005	47,811,909
3. Analysis of Unavailable Stocks included in Item 1 above:												
(a) Tank bottom credit actual or maximum of 7% of Item 2 above.	8,760,723	1,600,683	5,535,765	1,624,275	5,159,294	468,973	1,509,155	2,778,226	402,940	3,927,722	576,313	3,351,409
(b) Unavailable Unfinished at Refineries.	913,020	58,235	854,785	-	1,939,944	20,682	150,337	1,768,925	-	293,750	-	293,750
(c) In Refinery Lines and Refinery Operating Equipment.	121,138	6,000	114,138	1,000	112,918	5,207	7,388	99,523	800	1,086,443	-	1,086,443
(d) One-Half of Average Size Water Cargo Receipt. (Total of each individual grade calculated separately.)	9,059,005	2,212,055	3,525,600	3,321,350	2,012,164	457,470	637,470	676,760	240,464	1,239,839	732,368	507,471
(e) Other Unavailable Stocks. (Include Filter House Naphtha and Unavailable Unblended Finished.)	931,660	5,000	919,660	7,000	1,818,025	119,200	591,500	1,103,225	4,100	5,493,344	707,000	4,786,344
(f) Pipe Line Fill.	1,975,919	75,254	1,029,107	871,558	2,627,437	35,742	649,153	1,486,192	456,350	331,141	279,441	51,700
(g) Pipe Line Operating Requirements.	1,014,900	108,500	680,800	225,600	2,202,060	55,000	517,390	1,629,670	-	126,000	95,900	30,100
(h) Unavailable in Transit by truck, tank car, barge or tanker from Domestic Sources (if reported to Bureau only).	4,789,734	1,554,628	2,351,191	883,915	857,468	466,902	136,119	115,756	138,691	1,111,878	724,278	387,600
Total Unavailable Clean Products. (Sum of (a) to (h) above).	27,566,099	5,620,355	15,011,046	6,934,698	16,729,310	1,629,176	4,198,512	9,658,277	1,243,345	13,610,117	3,115,300	10,494,817

RESIDUAL FUEL OIL - BARRELS

(Deal only with those inventories regularly reported on B.of M. Forms 6-1300; 6-1302 and 6-1303.)

1. Fill in here amount you reported to B.of M. as at Refineries, at Terminals, or in Pipe Lines or In Transit thereto as of March 31, 1954 on Forms 6-1300; 6-1302; 6-1303	8,834,689	1,533,346	5,577,557	1,723,786	4,306,580	148,894	1,224,490	2,758,480	174,716	20,558,823	1,534,335	19,024,488
2. Memo: Total Capacity all tankage in Residual Fuel Service (Copy from Questionnaire #2 (a).	17,764,770	2,695,209	12,497,861	2,571,700	9,430,418	314,287	2,537,044	6,274,801	304,286	50,347,653	3,032,638	47,315,015
3. Analysis of Unavailable Stocks included in Item 1 above:												
(a) Tank bottom credit actual or maximum of 7% of Item 2 above.	1,226,950	187,675	877,511	161,764	457,925	19,903	126,908	290,795	20,319	2,160,983	196,874	1,964,109
(b) Unavailable Unfinished at Refineries.	195,000	-	195,000	-	183,636	1,000	3,541	179,095	-	899,000	-	899,000
(c) In Refinery Lines and Refinery Operating Equipment.	36,563	3,000	32,563	1,000	60,226	400	2,680	56,546	600	367,100	1,000	366,100
(d) One-Half of Average Size Water Cargo Receipt. (Total of each individual grade calculated separately.)	1,864,100	549,500	780,400	534,200	20,000	-	-	20,000	-	590,322	430,766	159,556
(e) Other Unavailable Stocks.	327,408	17,493	307,915	2,000	312,310	12,277	6,091	293,242	700	2,203,855	167,000	2,036,855
(f) Pipe Line Fill.	200	-	-	200	-	-	-	-	-	93,429	-	93,429
(g) Pipe Line Operating Requirements.	-	-	-	-	20,000	-	-	20,000	-	533,000	-	533,000
(h) Unavailable in Transit by truck, tank car, barge or tanker from Domestic Sources (if reported to Bureau only).	216,380	-	126,362	90,018	1,100	-	1,100	-	-	277,400	127,000	150,400
Total Unavailable Residual Fuel Oil. (Sum of (a) to (h) above).	3,866,601	757,668	2,319,751	789,182	1,055,197	33,580	140,320	859,678	21,619	7,125,089	922,640	6,202,449

Note: The questionnaire forms covering the Pacific Coast Territory (Five States) were necessarily different from those used East of California. They did, however, indicate specific form and line numbers in asking for information on the Bureau of Mines national basis.

QUESTIONNAIRE FORM #2 - CAPACITY OF CRUDE OIL, CLEAN PRODUCT AND RESIDUAL FUEL OIL TANKAGE AS OF MARCH 31, 1954, BY BUREAU OF MINES REFINING DISTRICTS

Note: Express figures in Barrels of 42 U. S. Gallons by Bureau of Mines refining districts and report all tankage available for storing Crude Oil, Clean Products and Residual Fuel Oil, as shown below, but deal only with the tankage that is located at the points (Refineries, Pipe Lines, Tank Farms and Terminals) included in the stock figures you regularly report to the Bureau of Mines on Forms 6-1311 Crude (except Producers' Lease Stocks), and Product Forms 6-1300; 6-1302 and 6-1303. Do not include tankage at bulk plants, service stations, etc., the inventories in which you do not report to the Bureau. The questionnaire forms covering the Pacific Coast Territory (Five States) were necessarily different from those used East of California. They did, however, indicate specific form and line numbers in asking for information on the Bureau of Mines national basis. Jet fuel, light and heavy cracking stock storage capacity excluded.

	East Coast (1)	Appalachian District I (2)	Appalachian District II (3)	Indiana Illinois Kentucky (4)	Oklahoma Kansas Missouri (5)	Texas Inland (6)	Texas Gulf (7)	Louisiana Gulf (8)	Arkansas-Louisiana Inland (9)	New Mexico (10)	Other Rocky Mountain (11)	California (12)	Total United States (13)
CRUDE OIL TANKAGE - Barrels													
1. Capacity of Tankage at Refineries - Section 1 Form 6-1311 - March 31, 1954	25,521,410	1,119,782	405,825	17,145,700	11,582,268	3,949,997	27,001,694	6,777,843	1,049,273	274,000	3,499,638	20,668,963	118,996,393
2. Capacity of Tankage along Pipe Lines and on Tank Farms - Section 2 Form 6-1311.	1,277,100	4,583,521	1,428,114	27,053,657	60,005,849	80,572,318	49,312,074	12,179,315	5,633,070	2,675,719	15,038,707	45,446,212	305,205,656
3. Capacity of Tankage at Bulk Terminals - (not Bulk Plants)	-	-	-	-	-	-	-	-	-	-	-	658,712	658,712
4. Total Crude Oil Tankage Capacity - (1), (2) and (3) above.	26,798,510	5,703,303	1,833,939	44,199,357	71,588,117	84,522,315	76,313,768	18,957,158	6,682,343	2,949,719	18,538,345	(a) 66,773,887	(a) 424,860,761

Note: Do not report tankage involved in Producers' (Lease) Stocks - Section 3 Form 6-1311.

(a) Includes 9,944,800 barrels of reservoir storage in California.

CLEAN PRODUCTS TANKAGE - Barrels

(Include only Gasoline, Kerosine and Distillate Fuel Oil and deal only with the tankage at the locations of inventories you regularly report to the Bureau of Mines)

1. Capacity of Tankage at Refineries - Form 6-1300 - March 31, 1954.	39,379,254	4,151,052	1,599,086	53,230,087	26,054,137	9,243,692	50,549,034	17,323,570	2,414,535	549,500	11,718,359	38,580,334	254,792,640
2. Capacity of Tankage along Pipe Lines and on Tank Farms (if any) - Form 6-1303.	7,038,049	177,200	1,581,137	13,260,183	5,810,417	1,295,507	2,289,000	2,471,700	4,138,600	-	1,742,200	4,716,345	44,520,338
3. Capacity of Tankage at Bulk Terminals - Form 6-1302.	89,606,945	6,308,970	3,084,526	31,839,363	12,413,988	2,566,020	1,588,000	3,431,335	2,214,360	-	829,864	13,807,235	167,690,606
4. Total Clean Product Tankage Capacity - (1), (2) and (3) above.	136,024,248	10,637,222	6,264,749	98,329,633	44,278,542	13,105,219	54,426,034	23,226,605	8,767,495	549,500	14,290,423	57,103,914	467,003,584

RESIDUAL FUEL OIL TANKAGE - Barrels

(Deal only with the tankage at the locations of inventories you regularly report to the Bureau of Mines)

1. Capacity of Tankage at Refineries - Form 6-1300 - March 31, 1954.	9,290,444	1,101,847	540,589	9,095,928	2,804,914	1,730,910	9,545,245	2,061,495	257,958	76,000	1,836,492	35,211,682	73,553,504
2. Capacity of Tankage along Pipe Lines and on Tank Farms (if any) - Form 6-1303.	-	-	-	172,000	-	-	-	-	-	-	-	10,789,750	10,961,750
3. Capacity of Tankage at Bulk Terminals - Form 6-1302.	8,474,326	255,161	144,600	162,490	-	-	590,645	406,000	-	-	-	4,346,221	14,379,443
4. Total Residual Fuel Oil Tankage Capacity - (1), (2) and (3) above.	17,764,770	1,357,008	685,189	9,430,418	2,804,914	1,730,910	10,135,890	2,467,495	257,958	76,000	1,836,492	(b) 50,347,653	(b) 98,894,697

(b) Includes 31,937,986 barrels of reservoir storage in California.

STEEL STORAGE CAPACITY DECEMBER 31, 1953 (ACTUAL) AND DECEMBER 31, 1954 (ESTIMATED)

CRUDE OIL TANKAGE

1. Actual December 31, 1953	24,952,510	5,669,226	1,833,939	43,297,857	65,502,269	79,641,474	75,957,358	16,696,658	7,993,080	2,822,719	17,796,387	(a) 65,517,887	(a) 407,681,364
2. Estimated December 31, 1954	27,009,510	5,745,417	1,664,425	43,851,757	67,729,669	81,272,645	77,297,411	18,376,158	6,304,343	2,807,719	17,826,845	(a) 67,725,967	(a) 417,611,866

(a) Includes 9,944,800 barrels of reservoir storage in California.

CLEAN PRODUCTS TANKAGE

1. Actual December 31, 1953	134,510,114	10,301,921	5,995,812	95,448,038	42,961,805	12,643,482	55,193,764	22,481,182	8,423,422	521,500	13,801,739	58,071,914	460,354,693
2. Estimated December 31, 1954	147,964,338	11,499,554	5,974,012	101,778,403	46,372,402	13,430,212	60,124,226	25,423,282	8,959,495	851,500	14,354,027	59,307,344	496,038,795

RESIDUAL FUEL OIL TANKAGE

1. Actual December 31, 1953	17,965,570	1,382,708	615,589	9,380,403	2,904,214	1,894,609	10,687,890	2,418,743	333,233	75,000	2,467,139	(b) 49,688,653	(b) 99,813,751
2. Estimated December 31, 1954	19,624,050	1,398,708	677,589	9,316,003	2,846,614	1,682,910	10,214,490	2,486,743	282,958	75,000	2,487,863	(c) 54,980,173	(c) 106,073,101

(b) Includes 31,479,986 barrels of reservoir storage in California.

(c) Includes 36,361,986 barrels of reservoir storage in California.

QUESTIONNAIRE FORM #2 (a) - CAPACITY OF CRUDE OIL, CLEAN PRODUCT AND RESIDUAL FUEL OIL TANKAGE AS OF MARCH 31, 1954, COVERING EAST COAST, INDIANA, ILLINOIS, KENTUCKY AND CALIFORNIA BREAK-UP

Note: Express figures in Barrels of 42 U. S. Gallons by Bureau of Mines refining districts and report all tankage available for storing Crude Oil, Clean Products and Residual Fuel Oil, as shown below, but deal only with the tankage that is located at the points (Refineries, Pipe Lines, Tank Farms and Terminals) included in the stock figures you regularly report to the Bureau of Mines on Forms 6-1311 Crude (except Producers' Lease Stocks), and Product Forms 6-1300; 6-1302 and 6-1303. Do not include tankage at bulk plants, service stations, etc., the inventories in which you do not report to the Bureau. The questionnaire forms covering the Pacific Coast Territory (Five States) were necessarily different from those used East of California. They did, however, indicate specific form and line numbers in asking for information on the Bureau of Mines national basis.

	(a) EAST COAST	NEW ENGLAND	(c) NORTH ATLANTIC	(d) SOUTH ATLANTIC	(b) IND., ILL., KENTUCKY, ETC.	KENTUCKY - TENNESSEE	(e) PORTION OF OHIO IN DISTRICT AND MICHIGAN	ILL., IND., WISCONSIN	BALANCE (MINNESOTA)	TOTAL IN 5 PACIFIC COAST STATES	WASHINGTON AND OREGON ONLY	ARIZONA CALIFORNIA NEVADA
	Col. 1 (Col. 2+3+4)	Col. 2	Col. 3	Col. 4	Col. 5 (Cols. 6+7+8+9)	Col. 6	Col. 7	Col. 8	Col. 9	Col. 10 (Col. 11+12)	Col. 11	Col. 12
CRUDE OIL TANKAGE - Barrels												
1. Capacity of Tankage at Refineries - Section 1 Form 6-1311 - March 31, 1954	25,521,410	986,000	23,964,410	571,000	17,145,700	1,337,904	4,353,409	11,090,600	363,787	20,668,963	80,100	20,588,863
2. Capacity of Tankage along Pipe Lines and on Tank Farms - Section 2 Form 6-1311	1,277,100	-	1,077,100	200,000	27,053,657	1,901,970	6,410,758	18,740,929	-	45,446,212	-	45,446,212
3. Capacity of Tankage at Bulk Terminals - (not Bulk Plants)	-	-	-	-	-	-	-	-	-	658,712	-	658,712
4. Total Crude Oil Tankage Capacity - (1), (2) and (3) above	26,798,510	986,000	25,041,510	771,000	44,199,357	3,239,874	10,764,167	29,831,529	363,787	(f) 66,773,887	80,100	(f) 66,693,787
Note: Tankage involved in Producers' (Lease) Stocks not included.												

(a) Figures entered here should check those reported for East Coast on Form #2; (b) should also be same as on Form #2; (c) For this survey North Atlantic states are the portions of New York and Pennsylvania that are in the East Coast Refining District, New Jersey, Delaware, Maryland and District of Columbia; (d) South Atlantic are Virginia, North and South Carolina, Georgia and Florida. (e) Only a portion of the State of Ohio is in the Indiana, Illinois, Kentucky refining district. (f) Includes 9,944,800 barrels of reservoir storage in California.

CLEAN PRODUCTS TANKAGE - Barrels

(Include only Gasoline, Kerosine and Distillate Fuel Oil and deal only with the tankage at the locations of inventories you regularly report to the Bureau of Mines)

1. Capacity of Tankage at Refineries - Form 6-1300 - March 31, 1954	39,379,254	1,385,000	37,350,254	644,000	53,230,087	2,232,547	13,924,308	36,337,680	735,552	38,580,334	177,100	38,403,234
2. Capacity of Tankage along Pipe Lines and on Tank Farms (if any) - Form 6-1303	7,038,049	369,000	3,653,711	3,015,338	13,260,183	350,000	4,078,745	7,481,871	1,349,567	4,716,345	2,000	4,714,345
3. Capacity of Tankage at Bulk Terminals - Form 6-1302	89,606,945	25,301,020	41,061,817	23,244,108	31,839,363	4,834,287	10,844,880	10,538,696	5,621,500	13,807,235	9,112,905	4,694,330
4. Total Clean Product Tankage Capacity - (1), (2) and (3) above	136,024,248	27,055,020	82,065,782	26,903,446	98,329,633	7,416,834	28,847,933	54,358,247	7,706,619	57,103,914	9,292,005	47,811,909

RESIDUAL FUEL OIL TANKAGE - Barrels

(Deal only with the tankage at the locations of inventories you regularly report to the Bureau of Mines)

1. Capacity of Tankage at Refineries - Form 6-1300 - March 31, 1954	9,290,444	276,000	8,889,444	125,000	9,095,928	259,287	2,487,654	6,044,701	304,286	35,211,682	38,800	35,172,882
2. Capacity of Tankage along Pipe Lines and on Tank Farms (if any) - Form 6-1303	-	-	-	-	172,000	-	-	172,000	-	10,789,750	-	10,789,750
3. Capacity of Tankage at Bulk Terminals - Form 6-1302	8,474,326	2,418,209	3,608,417	2,447,700	162,490	55,000	49,390	58,100	-	4,346,221	2,993,838	1,352,383
4. Total Residual Fuel Oil Tankage Capacity - (1), (2) and (3) above.	17,764,770	2,694,209	12,497,861	2,572,700	9,430,418	314,287	2,537,044	6,274,801	304,286	(a) 50,347,653	3,032,638	(a) 47,315,015

(a) Includes 31,937,986 barrels of reservoir storage in California.

STEEL STORAGE CAPACITY DECEMBER 31, 1953 (ACTUAL) AND DECEMBER 31, 1954 (ESTIMATED)

CRUDE OIL TANKAGE

1. Actual December 31, 1953	24,952,510	1,066,000	23,195,510	691,000	43,297,857	3,239,874	10,607,667	29,006,529	443,787	(a) 65,517,887	80,100	(a) 65,437,787
2. Estimated December 31, 1954	27,009,510	1,066,000	25,172,510	771,000	43,851,757	3,244,744	10,952,667	29,210,559	443,787	(a) 67,725,967	818,180	(a) 66,907,787

(a) Includes 9,944,800 barrels of reservoir storage in California.

CLEAN PRODUCTS TANKAGE

1. Actual December 31, 1953	134,510,114	26,779,194	81,433,787	26,297,133	95,448,038	7,256,049	27,476,473	53,008,897	7,706,619	58,071,914	9,292,005	48,779,909
2. Estimated December 31, 1954	147,964,338	27,811,660	91,004,461	29,148,217	101,778,403	7,872,534	29,831,675	55,722,595	8,351,599	59,307,344	10,500,935	48,806,409

RESIDUAL FUEL OIL TANKAGE

1. Actual December 31, 1953	17,965,570	2,578,509	12,649,361	2,737,700	9,380,403	389,587	2,386,929	6,379,601	224,286	(b) 49,688,653	3,032,638	(b) 46,656,015
2. Estimated December 31, 1954	19,624,050	2,652,209	14,168,141	2,803,700	9,316,003	389,587	2,468,329	6,233,801	224,286	(c) 54,980,173	3,211,158	(c) 51,769,015

(b) Includes 31,479,986 barrels of reservoir storage in California. (c) Includes 36,361,986 barrels of reservoir storage in California.

QUESTIONNAIRE FORM #3 UNDERGROUND STORAGE CAPACITY MARCH 31, 1954, AND ASSIGNMENT OF CLEAN PRODUCTS STORAGE CAPACITY, OCTOBER 31, 1953 AND MARCH 31, 1954.

(Barrels 42 U. S. Gallons)

	East Coast	Appalachian District I	Appalachian District II	Indiana Illinois Kentucky	Oklahoma Kansas Missouri	Texas Inland	Texas Gulf	Louisiana Gulf	Arkansas-Louisiana Inland	New Mexico	Other Rocky Mountain	California	Total United States
1. Capacity of Underground Storage Installations:													
(a) Assigned to L.P.G. and/or L.R.G.	18,972	-	-	565,097	536,150	2,175,855	655,384	32,933	748,308	231,966	420,000	100,000	5,484,665
(b) Other products, if any, - please specify.													

	Total East Coast Col. 1 (Cols. 2, 3 & 4)	Details of East Coast District: New England Col. 2	North Atlantic Col. 3	South Atlantic Col. 4	Total Ind. - Ill. Kentucky Col. 5 (Cols. 6+7+8+9)	Details of Indiana, Illinois, Kentucky District: Kentucky Tennessee Col. 6	Portion of Ohio in the District and Mich. Col. 7	Ind. - Ill. and Wisconsin Col. 8	Balance (Minnesota) Col. 9	Total in 5 Pacific Coast States Col. 10 (Cols. 11 & 12)	Washington and Oregon Only Col. 11	Arizona California Nevada Col. 12
2. Additional District Break-Up of Underground Storage Capacity:												
(a) Assigned to L.P.G. and/or L.R.G.	18,972	-	18,972	-	565,097	-	205,847	359,250	-	100,000	-	100,000
(b) Other products, if any, - please specify.												

Note: East Coast (Column 1) and Indiana, Illinois, Kentucky (Column 5) in Section 2 above should coincide with figures for those refining districts in Section 1 above. Columns 2, 3 and 4; and 6, 7, 8 and 9 call for further break-up of these two. See Questionnaire Forms #1 (a) or 2 (a) for definitions of these areas.

	East Coast	Appalachian District I	Appalachian District II	Indiana Illinois Kentucky	Oklahoma Kansas Missouri	Texas Inland	Texas Gulf	Louisiana Gulf	Arkansas-Louisiana Inland	New Mexico	Other Rocky Mountain	California	Total United States
3. Additional Information With Respect to Clean Product Storage Capacity:													
(a) Set in for each district clean products capacity totals shown on Questionnaire #2, as of March 31, 1954.	136,024,248	10,637,222	6,264,749	98,329,633	44,278,542	13,105,219	54,426,034	23,226,605	8,767,495	549,500	14,290,423	57,103,914	467,003,584
(b) To what products was this capacity assigned as of March 31, 1954?													
Gasoline	59,166,467	6,962,168	4,526,344	63,275,119	26,842,538	10,008,537	35,634,373	14,570,204	6,191,360	325,250	10,441,840	38,249,465	276,193,665
Kerosine	19,202,543	902,143	692,255	7,526,150	2,105,887	1,070,315	4,813,466	2,666,812	886,745	19,125	253,205	1,435,254	41,573,900
Distillate Fuel Oil	57,655,238	2,772,911	1,046,150	27,528,364	15,330,117	2,026,367	13,978,195	5,989,589	1,689,390	205,125	3,595,378	17,419,195	149,236,019
(c) Set in for each district Clean Products capacity as of October 31, 1953.	133,979,804	10,221,413	6,279,352	94,343,350	43,064,867	13,036,417	52,374,173	24,284,182	8,159,119	521,500	13,615,058	56,650,326	456,529,561
(d) To what products was capacity indicated above in (c) assigned on October 31, 1953?													
Gasoline	52,607,334	6,509,135	4,287,019	51,314,647	23,209,468	8,807,159	31,263,086	12,829,432	5,369,185	302,250	9,166,184	35,141,439	240,806,338
Kerosine	19,565,095	900,026	867,347	8,621,779	2,068,243	1,044,668	5,697,741	2,997,056	1,218,158	19,125	249,735	1,411,593	44,660,566
Distillate Fuel Oil	61,807,375	2,812,252	1,124,986	34,406,924	17,787,156	3,184,590	15,413,346	8,457,694	1,571,776	200,125	4,199,139	20,097,294	171,062,657

STATEMENT BY

L. S. WESCOAT, CHAIRMAN OF THE COMMITTEE
ON PETROLEUM STORAGE CAPACITY

AS PRESENTED AT
MEETING OF THE NATIONAL PETROLEUM COUNCIL
HELD IN WASHINGTON, D. C., OCTOBER 19, 1954

The current report of the Committee on Petroleum Storage Capacity is the fourth in a series which began in 1948. These surveys of unavailable inventories and storage capacity for crude oil, clean products as a group, and residual fuel oil have been made at approximately two-year intervals. The current report was compiled after recommendation to the Council by the Agenda Committee in connection with a communication dated March 22nd last from Mr. H. A. Stewart, then Acting Director of the Oil and Gas Division, Department of the Interior.

This survey bears out the basic findings of all the others in that it again establishes the inherent need of the industry for large storage capacity in relation to the amount of crude oil and products moving into and out of such storage in order to conveniently and economically supply the current and forward requirements of our customers.

The March 1954 ratio indicates that 100 barrels of storage is required for every 47 barrels of inventories contained therein, if the industry is to enjoy complete flexibility at all times in normal operation of its facilities. The 1952 ratio was 100 barrels

of storage to 45 barrels of inventories; the 1950 ratio also was 100 to 45, while in 1948 it was 100 to 41. The 1954 crude oil ratio alone is 100 to 46; clean products 100 to 50, while residual showed 100 to 43.

Total storage capacity reported for crude oil, clean products and residual fuel was 991 million barrels, more than half of which was assigned to clean products--gasoline, kerosine and distillate fuel oils. By the end of this year an additional 29 million of capacity will have been added to bring the December 31 total to 1 billion 20 million barrels, an increase over March 31, 1948 of 160 million. Interesting in connection with these figures is the fact that clean product storage by itself increased about 175 million barrels from March 31, 1948 to anticipated December 31, 1954, or 46 per cent. As might be expected, the majority of this increase (167 million) occured in Districts I and II, the large demand areas.

Another point confirmed by this survey as in the others, is the large portion of total reported inventories that are unavailable for shipment, in other words, that are wrapped up in the industry's far-flung manufacturing, storage and transportation systems, that must be kept intact if the industry is to function. On March 31 of this year these unavailables totaled almost 273 million barrels or 50.7 per cent of the 538 million barrels that were reported as in crude oil, clean product and residual inventories.

Included in these surveys for the first time this year is a study of the underground storage capacity of the industry. Each company

was asked to report the underground capacity (a) "assigned to L.P.G. and/or L.R.G." and (b) "other products, if any". The only figures reported were in connection with L.P.G. or L.R.G. The total for the United States was approximately 5 million 500 thousand barrels as of March 31 last, almost half of which was found to be in the Texas Inland area. Arkansas-Louisiana Inland accounted for almost 750 thousand barrels, with Texas Gulf, Indiana-Illinois-Kentucky and Oklahoma-Kansas-Missouri areas all having sizeable amounts.

The Committee wishes to again point out to those not familiar with oil industry operating problems that in no sense can the difference between the inventories and capacities shown in the survey be taken as an indication of available storage space. The four surveys completed to date may again be said to have definitely confirmed what individual long term operating experience has indicated--that relatively low ratios of actual inventories to total storage capacity in service is essential if difficulties in processing, handling and distribution are to be avoided, and if the industry is to operate efficiently and well. The Committee therefore again stresses as proof of the foregoing reflections the operation relationships once more derived as a result of the current survey. It should perhaps be pointed out here, however, that some of the reported crude oil storage capacity is in areas where it is not currently available for use, and some of it, even so, not susceptible to relocation elsewhere because of its condition. Still other portions are available only for limited use.

None of the figures in this report include stocks or storage capacity, if any, in the hands of the military.

A total of about 350 questionnaires were distributed to refiners and other holders of crude oil and principal product inventories and storage facilities. Based on the inventories reported in comparison with those previously developed by the Bureau of Mines, the crude oil section of this survey represents 96.4 per cent of the refinery, pipeline and tank farm stocks of crude, and the crude oil in transit; about 97 per cent of the clean products group, and 96.5 per cent of the residual fuel oil inventories as reported last March 31.

Your Committee appreciates this extremely gratifying response and takes this opportunity to thank the industry for it and for so promptly returning the information requested. Attached to the report in consolidated form are reproductions of all of the questionnaire forms used in the survey, showing all of the details of the inventory and storage capacity figures and amounts unavailable for shipment, for each of the Bureau of Mines refining districts with added separations for the East Coast, Indiana-Illinois-Kentucky and the Pacific Coast areas.