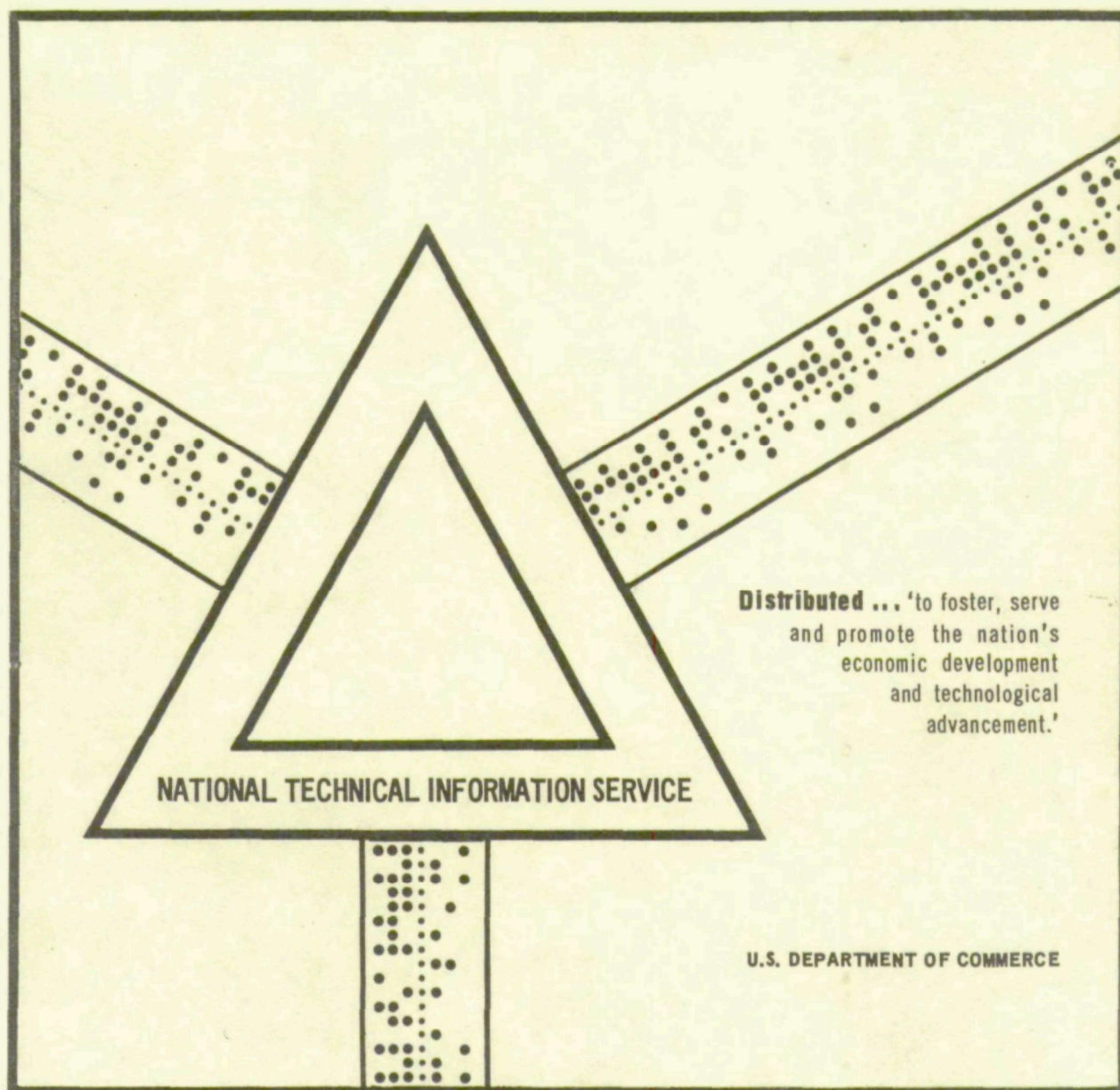


TRANSPORTATION COSTS OF FOSSIL FUELS

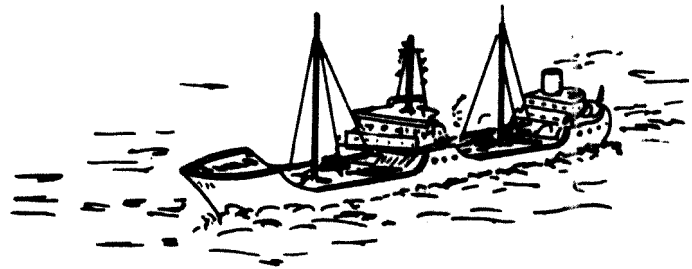
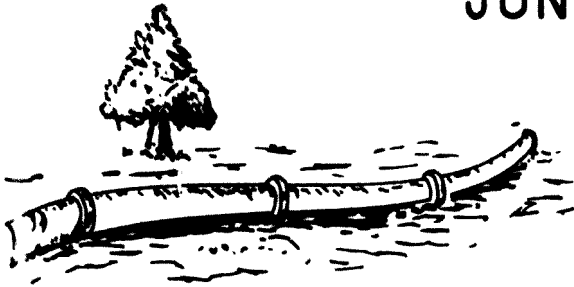
Bureau of Mines
Washington, D.C.

June 1971



TRANSPORTATION COSTS OF FOSSIL FUELS

INTERIM REPORT
JUNE 1971



Conducted in cooperation with the Office of Air Programs of Environmental Protection Agency by the Bureau of Mines under a Working Fund Agreement.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
MINERAL SUPPLY

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ABSTRACT

This interim report delineates some of the important factors relating to the costs of transporting fossil fuels from regions of production to sites of consumption. The costs of shipping coal have been presented in a quantified fashion for selected producing area to areas of consumption. The costs of shipping residual fuel oil and natural gas from domestic and foreign sources to New York and San Francisco Standard Metropolitan Statistical Areas also are provided. Transportation data were collected from published tariffs, transportation associations, and personal communication with railroad, electric utility, oil, gas, and coal company representatives. The data were stratified to determine the general effects stratification had upon transportation costs. Diagrams showing the various levels of stratification for the fossil fuels and the basic data from which the diagrams were derived are included.

Economies of haul for coal do exist for longer versus shorter distances, larger trainload versus smaller trainload sizes, and company-owned car ownership versus railroad car ownership. Most of the rates for the longer voyages for the tanker and barge transportation of residual oil also show economies of haul. No apparent economies of haul exist relative to volume and/or distance shipped for natural gas based on the data studied.

INTRODUCTION

The purpose of this report is to present a schedule of transportation costs for coal, residual fuel oil, and natural gas and to analyze the costs to reflect their significance. The costs analyses of coal transportation attempts to show the comparative costs of transportation between coal districts and points of consumption on a per ton mile basis. The transportation factors and comparative costs of moving natural gas and residual fuel oil are analyzed on a long ton mile and heat value basis. For purposes of convenience throughout the report, residual fuel oil will be referred to as oil and natural gas as gas.

The work was completed for and funded by the Office of Air Programs of the Environmental Protection Agency.

TRANSPORTATION OF COAL

This section provides an analysis of coal transportation data from points of production to points of consumption. The costs of transporting coal have been compiled, stratified, and regressed so that a meaningful analysis could be made of the data.

Methodology

Data were compiled that reflected the cost differences resulting from transporting coal from various origin points to consumption sites. Data were collected from Interstate Commerce Commission (ICC) tariffs, tables published by railroad associations, and telephone conversations with representatives of railroad and electric utility companies (tables A-1 and A-2). Table A-1 shows transportation characteristics of bituminous coal received at oven-coke plants in the United States. Data pertaining to origin and destination of coal consumed by oven-coke plants are accompanied by the characteristics of the resulting transportation charges. Table A-2 shows data for the movement of bituminous coal by railroad only to electric utility and cement manufacturing consumers. Origin and destination data of bituminous coal are accompanied by transportation rate data based on various conditions of haul.

Regression analyses were performed on a cost per ton mile versus distance basis. The data were stratified by coal district, size of trainloads, car ownership, and annual minimum tonnages in an attempt to reduce the variations of data points about the regression line. These variations are caused by different transportation parameters affecting each point in the scatter diagram. The problem of variation reduction has been a perplexing block to the meaningful analysis of the transportation data available for this study. Further stratification that what is shown by the 13 diagrams was desirable but not

possible because of the lack of data. The trade-off between variation reduction and the number of points remaining that represent a specific universe was too great; that is, the number of data points remaining were too small to make an adequate evaluation of the universe.

Several functions are presented on each graph so that the function which best fits the data points can be compared with other functions. The intercept, slope, and coefficient of correlation are presented with each function. The coefficient of correlation (r) shown for each function reflects the relative fit of the function in relation to the data points.

Caution should be taken when interpreting the coal diagrams. The regression equations and corresponding regression lines are presented only as indicators of possible tendencies within certain areas. Because a great deal of variation exists in most of the diagrams, the discrepancy between any actual rate within a particular coal district and the estimated rate may be large.

Analysis of Data

On most graphs three functions are fit to the data to see which best minimizes the variance about the regression line. Figure 1 is data plotted for 18 of the 23 coal-producing districts for which data was available. Figure 2 shows the 23 coal producing districts in the United States. The best fitting function is $Y = aX^b$ with an r of approximately 0.68. What seems to be reflected in the slope of the

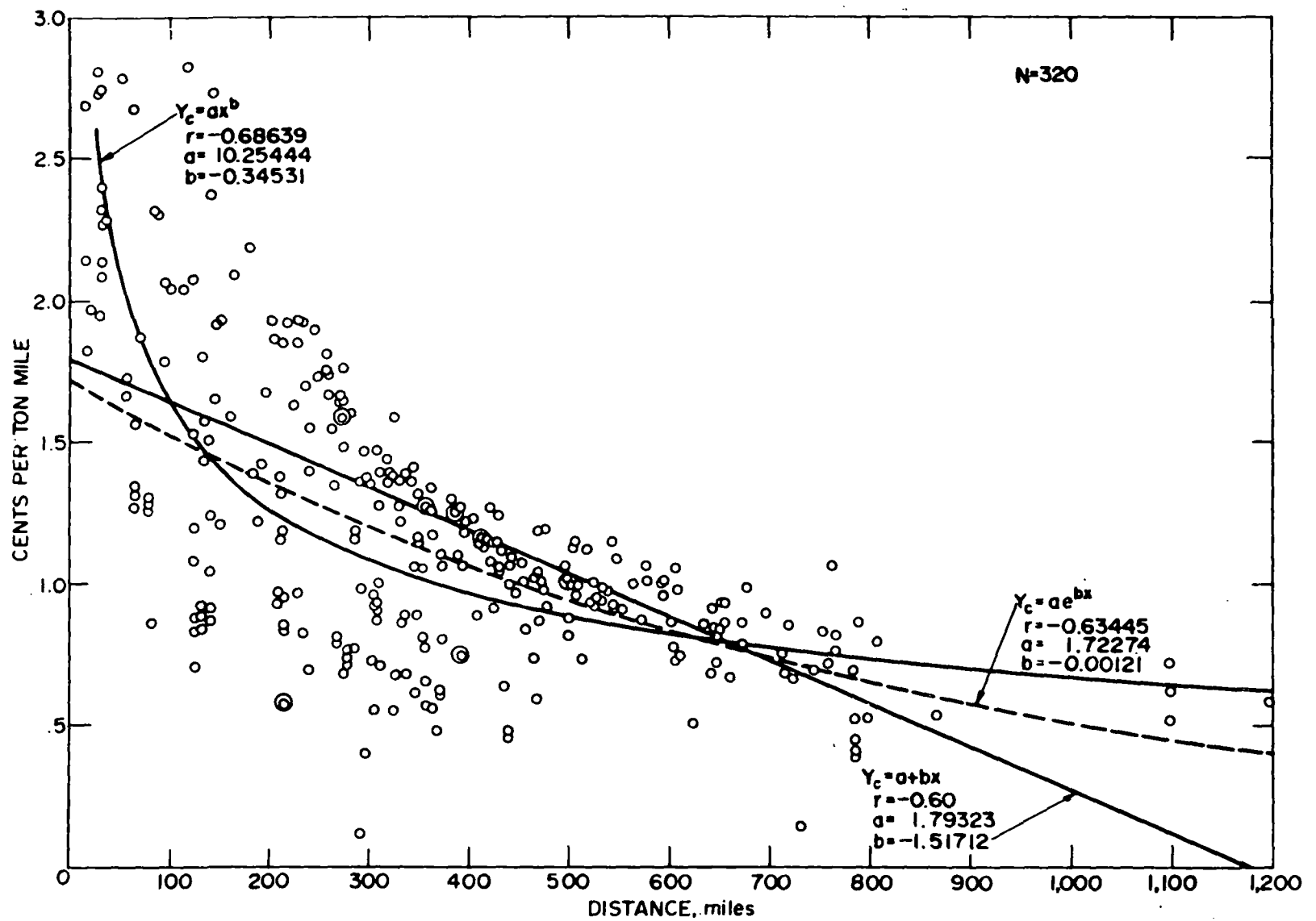


FIGURE 1. - Cost per ton mile for coal shipped by rail from 18 coal producing districts by length of haul.

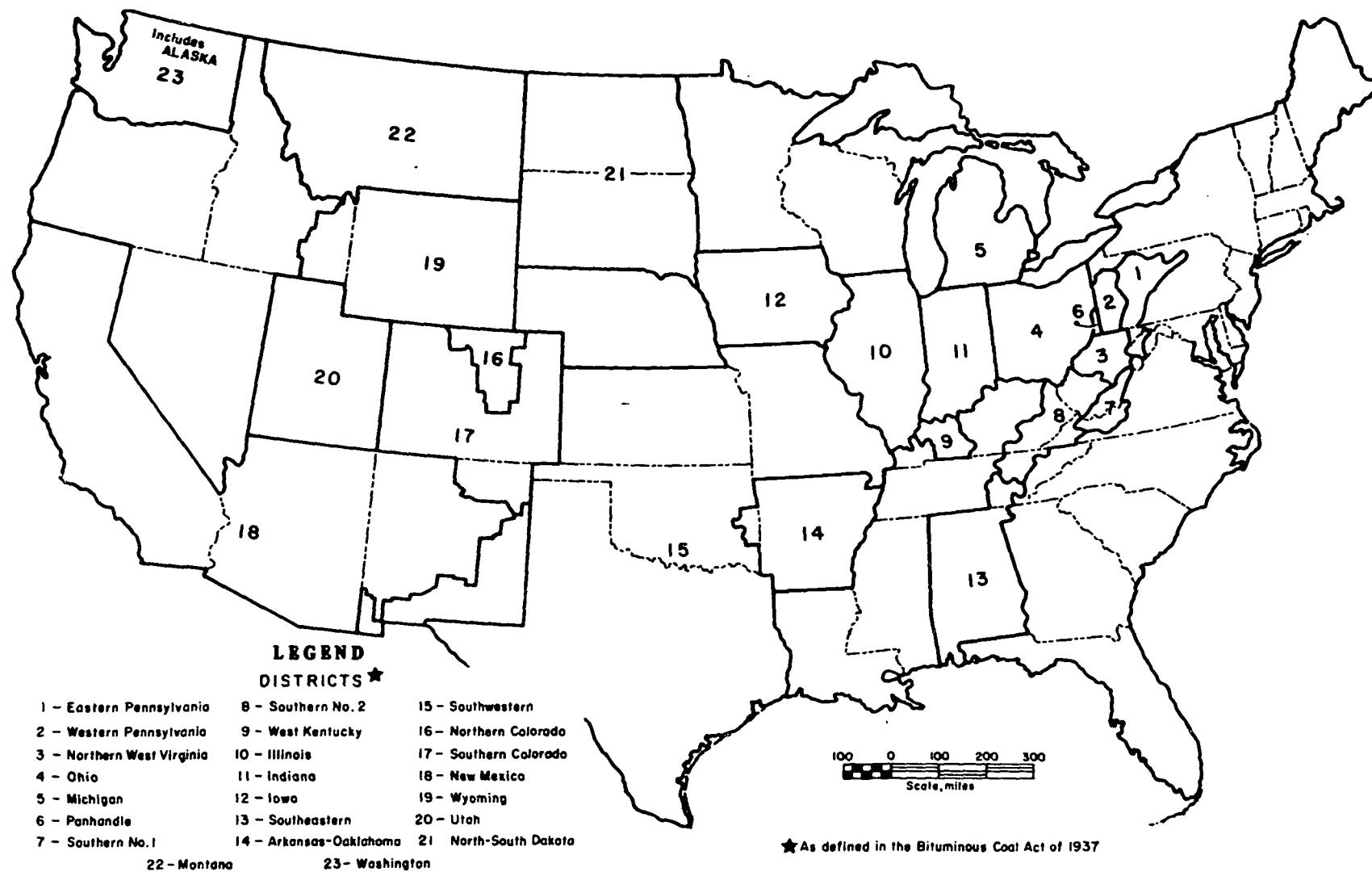


FIGURE 2. - Coal producing districts in the United States.

regression line, is significant economies of haul, especially within the 0-500 mile range. Although economies of haul do exist beyond the 500 mile range, they are significantly smaller than those economies realized under 500 miles. An r of 0.68 could be judged good, when considering the heterogeneity of the arrayed data.

Figures 3 through 10 are data subsets of figure 1, stratified by coal producing district. In most instances, the best fit function for the individual coal district has a higher r than does the best fit function for figure 1. This would generally be expected since variation in data dispersion is usually reduced when more variables are held constant. In several instances the best fit regression line is linear because no data points were observed within the 0-100 mile range. However, the best fit regression equations in Districts 7 and 8 (figures 7 and 8) have a lower r value than the r for the 18 districts (figure 1). The lower r value for Districts 7 and 8 may be explained in several ways: the small number of observations in District 7, topography and location of coal markets, and train size and length of haul are all factors which may increase the variation.

Figure 11 shows data points stratified by minimum annual tonnages of coal shipped. The diagram shows on the average smaller costs per ton mile for larger versus smaller minimum annual tonnage contracts. The greatest economies of haul are again realized for all categories when the length of haul increases up to approximately the 400-500 mile distance.

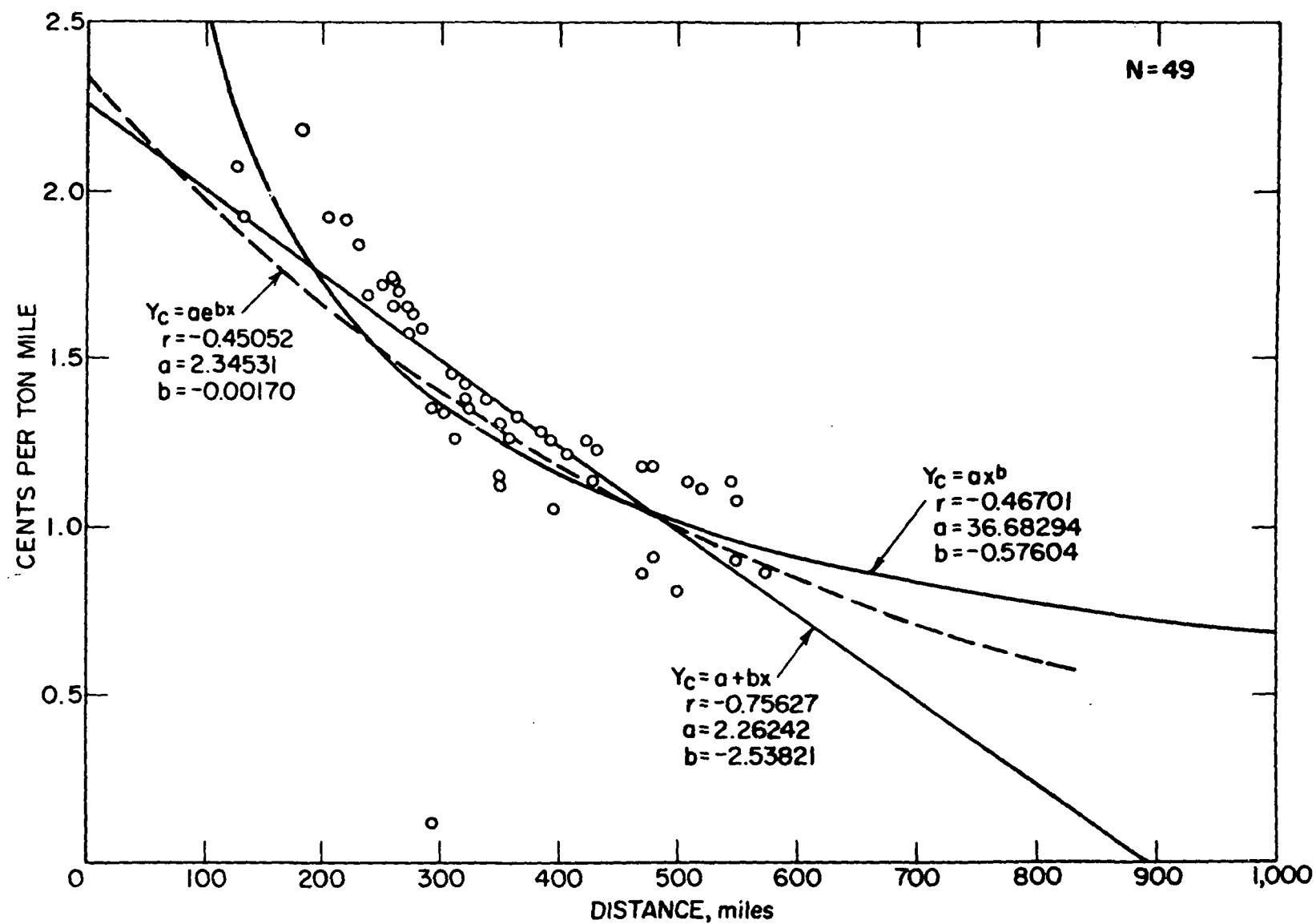


FIGURE 3. - Cost per ton mile for coal shipped by rail from various origins in Coal District 1 by length of haul.

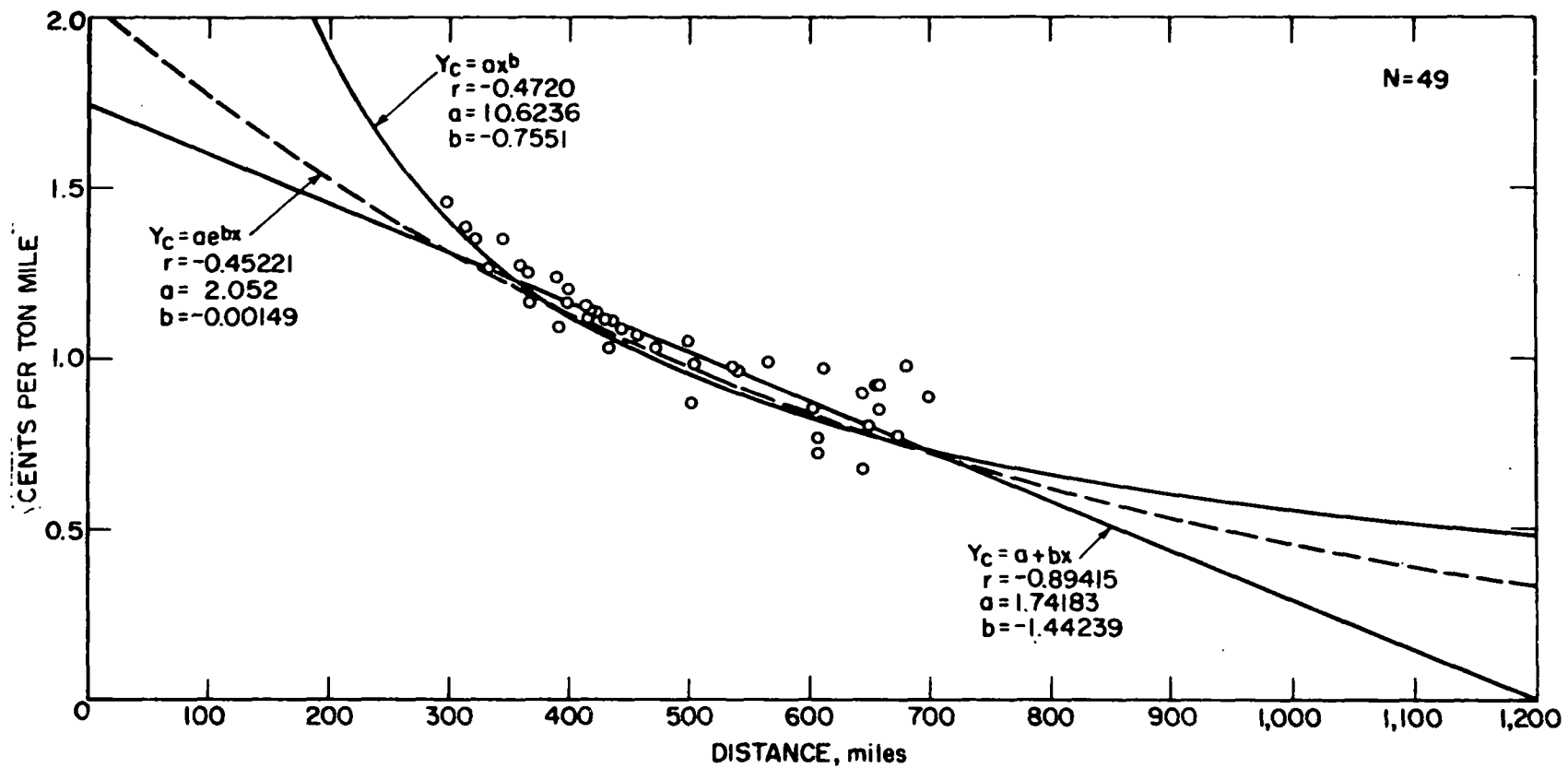


FIGURE 4. - Cost per ton mile for coal shipped by rail from various origins in Coal District 2 by length of haul.

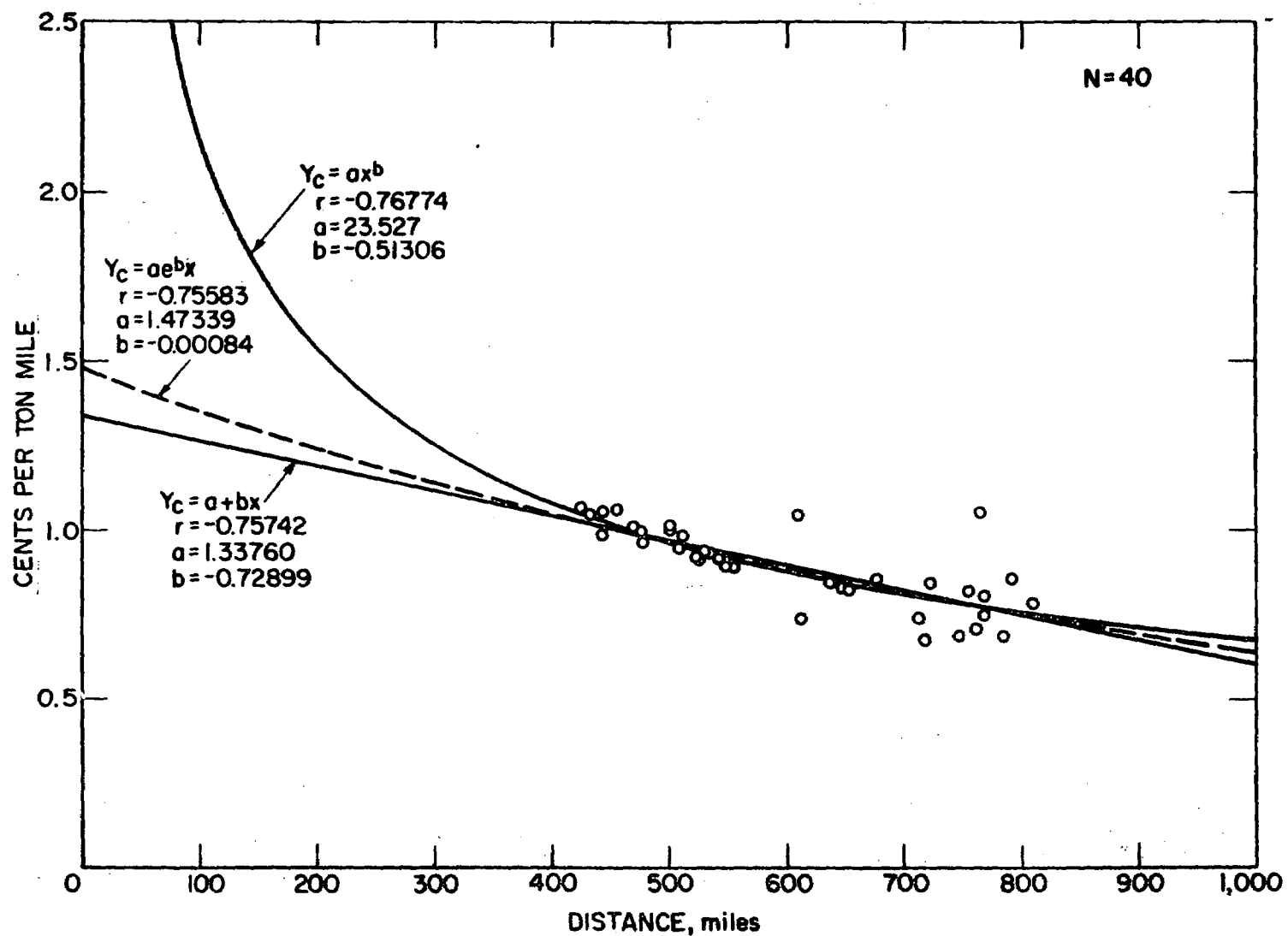


FIGURE 5. - Cost per ton mile for coal shipped by rail from various origins in Coal District 3 by length of haul.

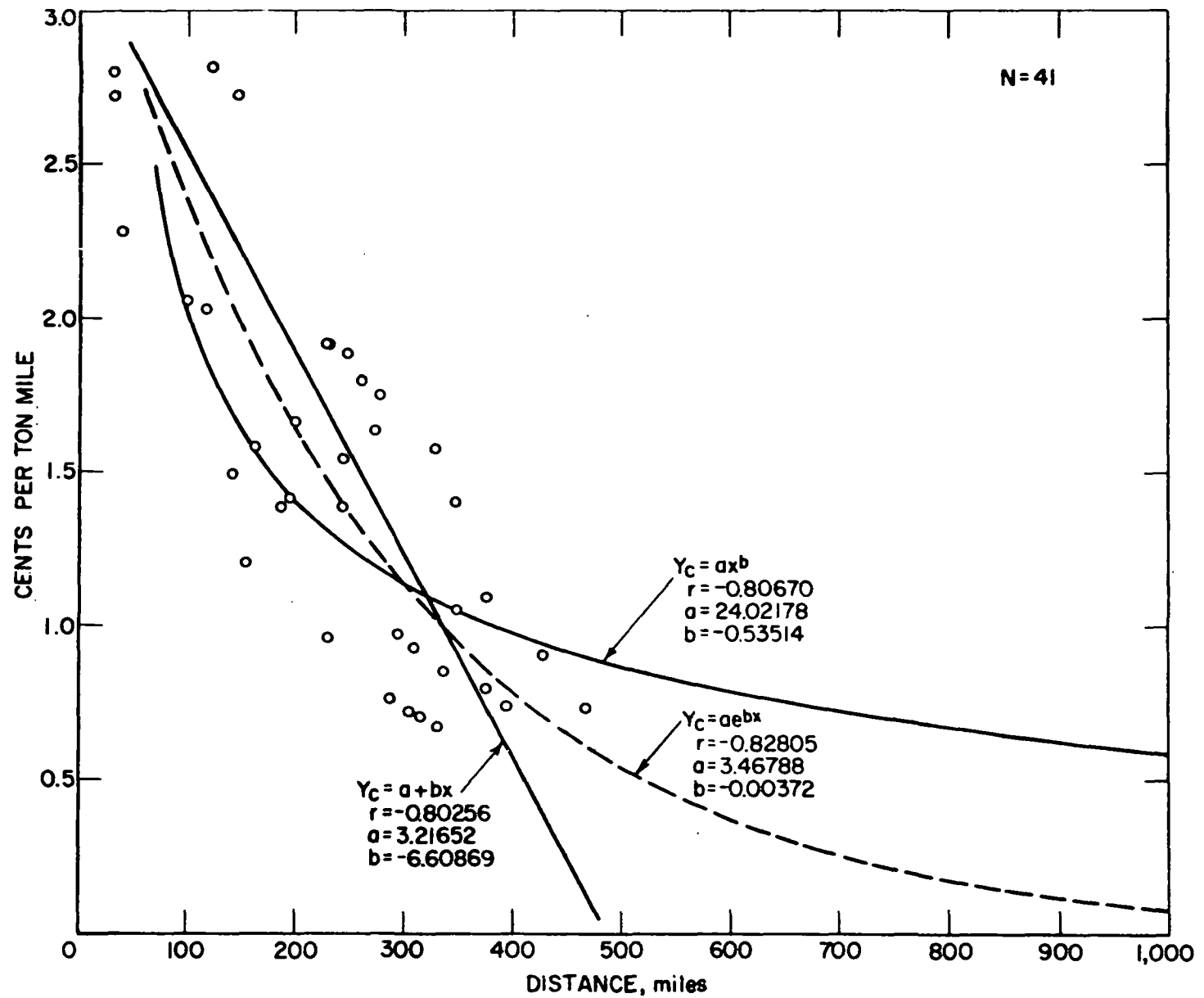


FIGURE 6. - Cost per ton mile for coal shipped by rail from various origins in Coal District 4 by length of haul.

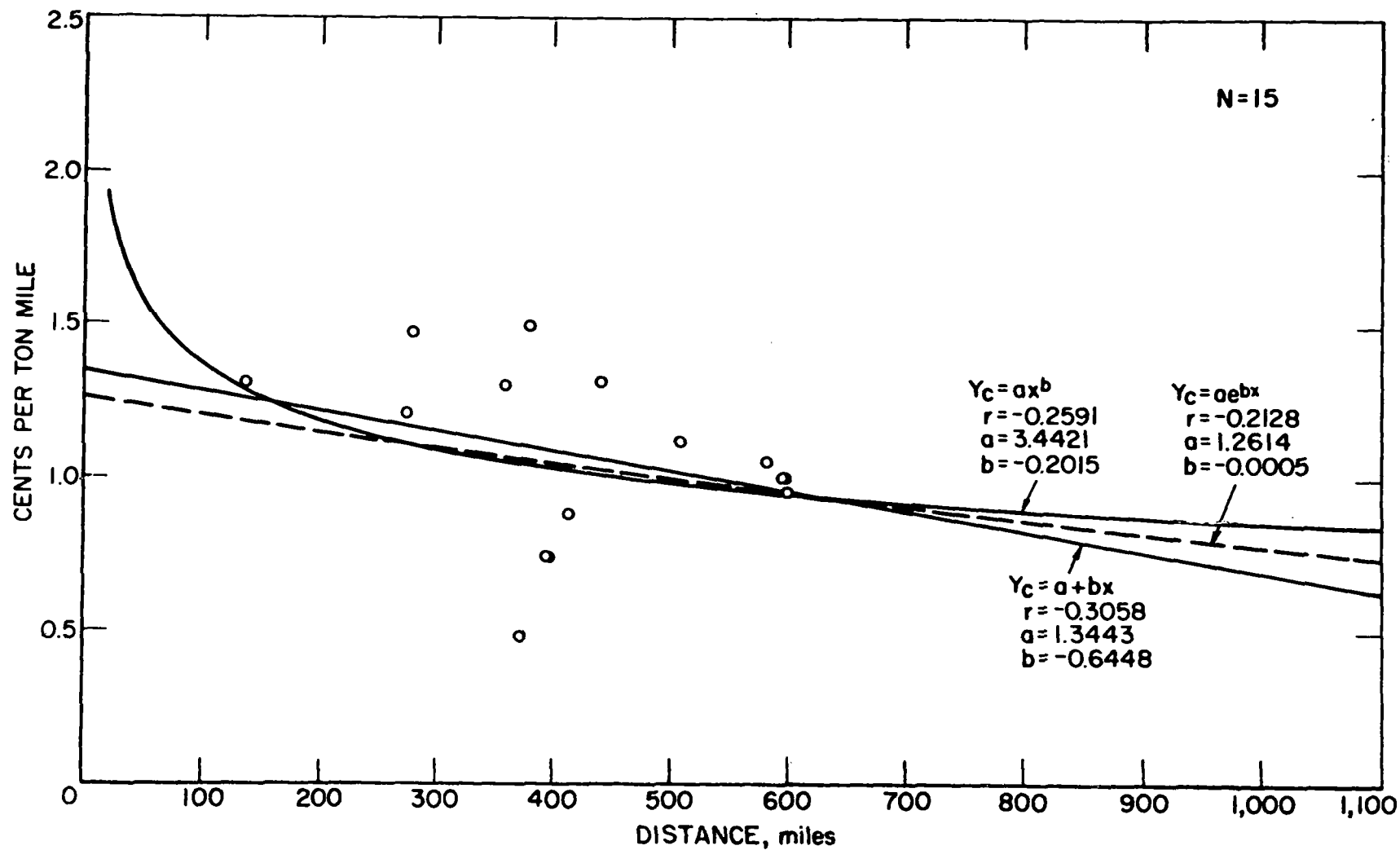


FIGURE 7. - Cost per ton mile for coal shipped by rail from various origins in Coal District 7 by length of haul.

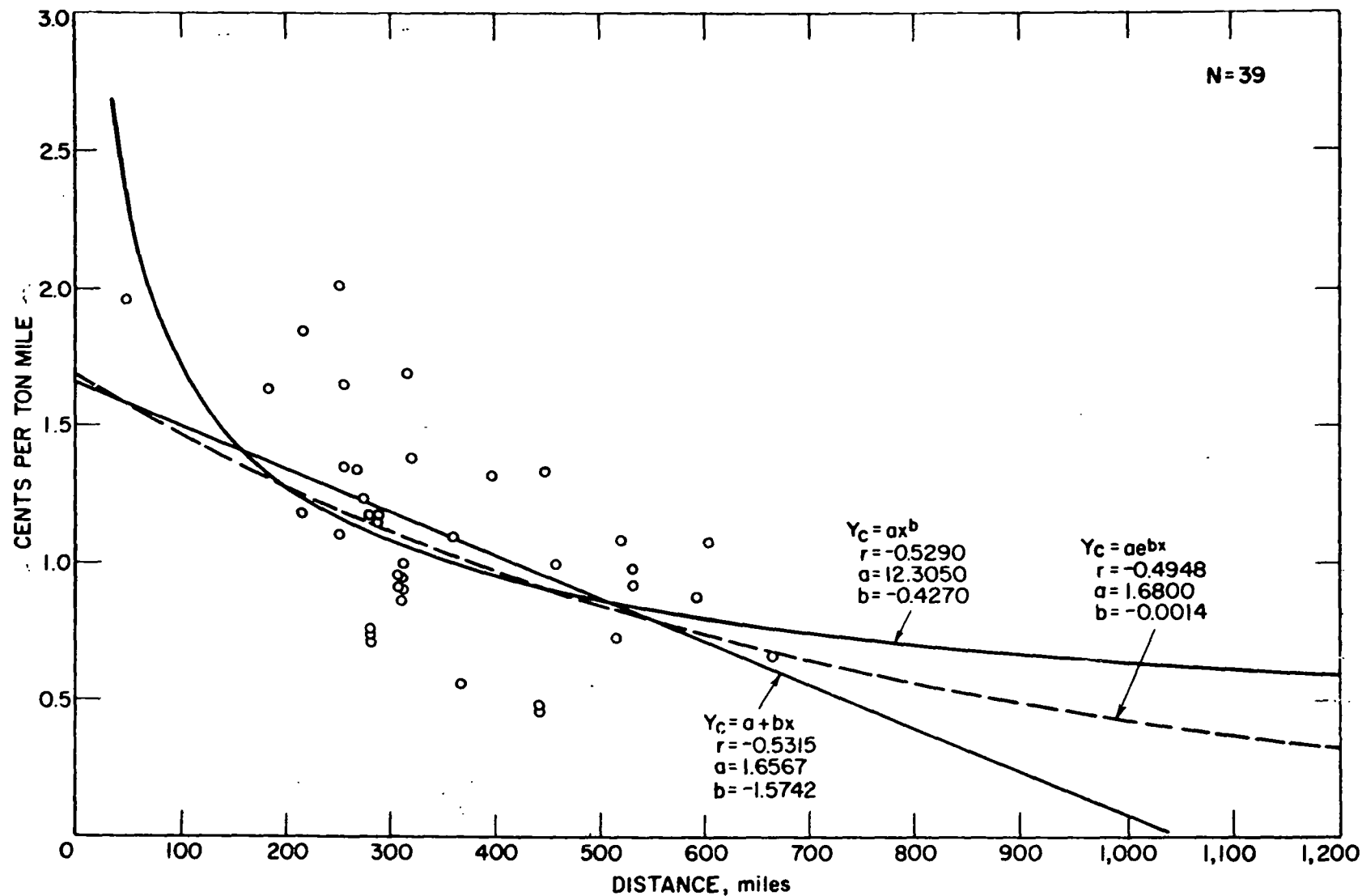


FIGURE 8. - Cost per ton mile for coal shipped by rail from various origins in Coal District 8 by length of haul.

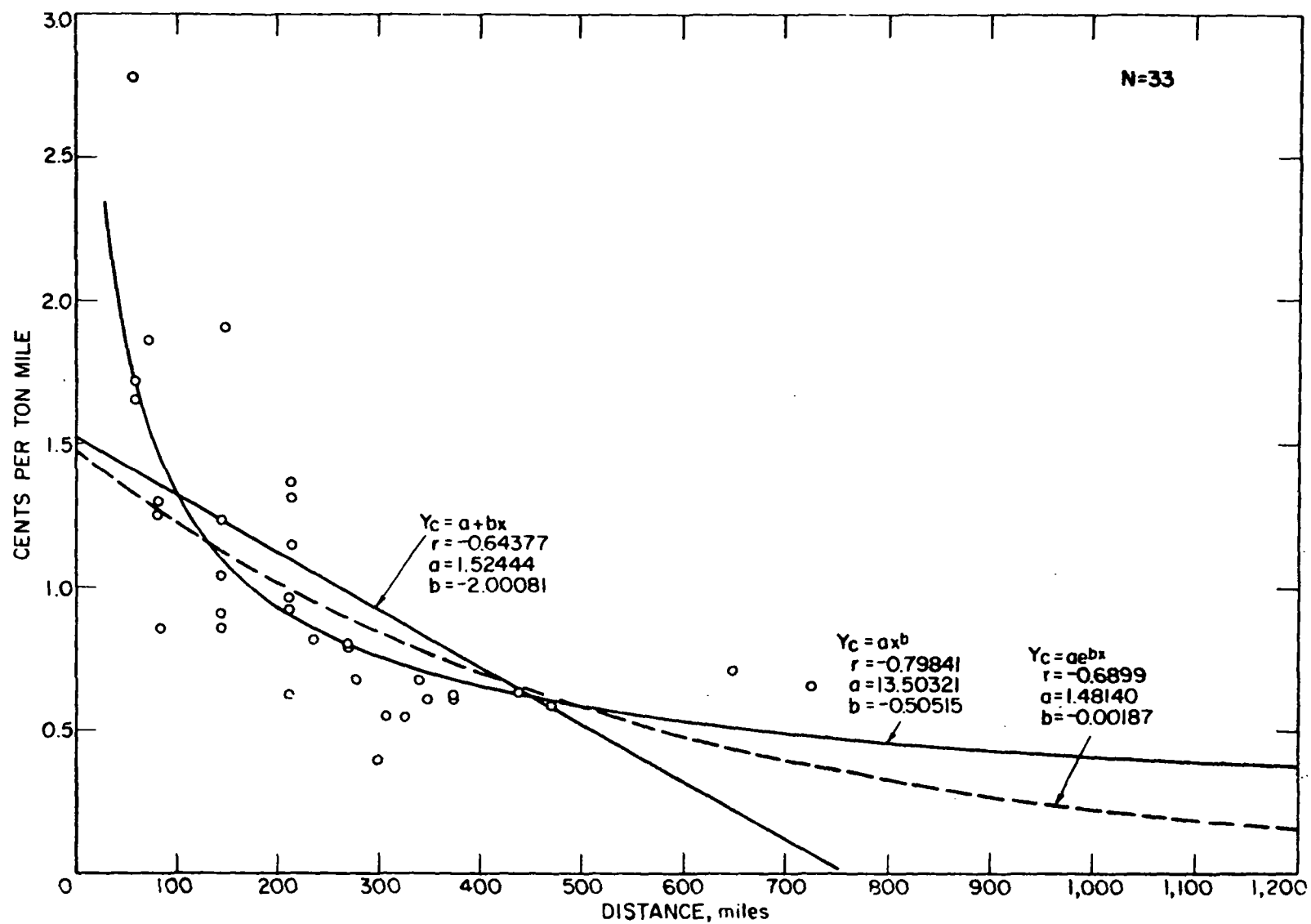


FIGURE 9. - Cost per ton mile for coal shipped by rail from various origins in Coal District 10 by length of haul.

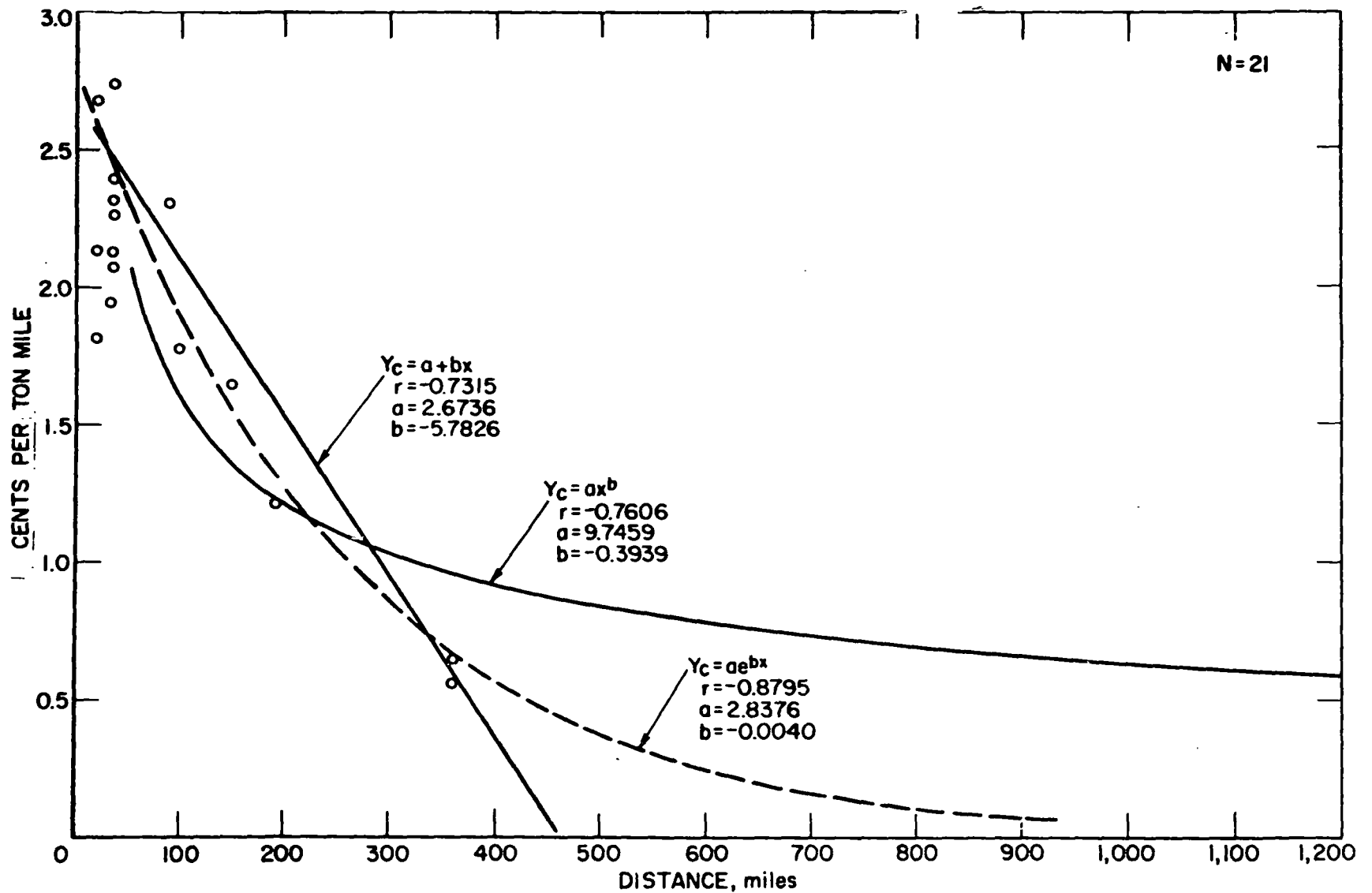


FIGURE 10. - Cost per ton mile for coal shipped by rail from various origins in Coal District 11 by length of haul.

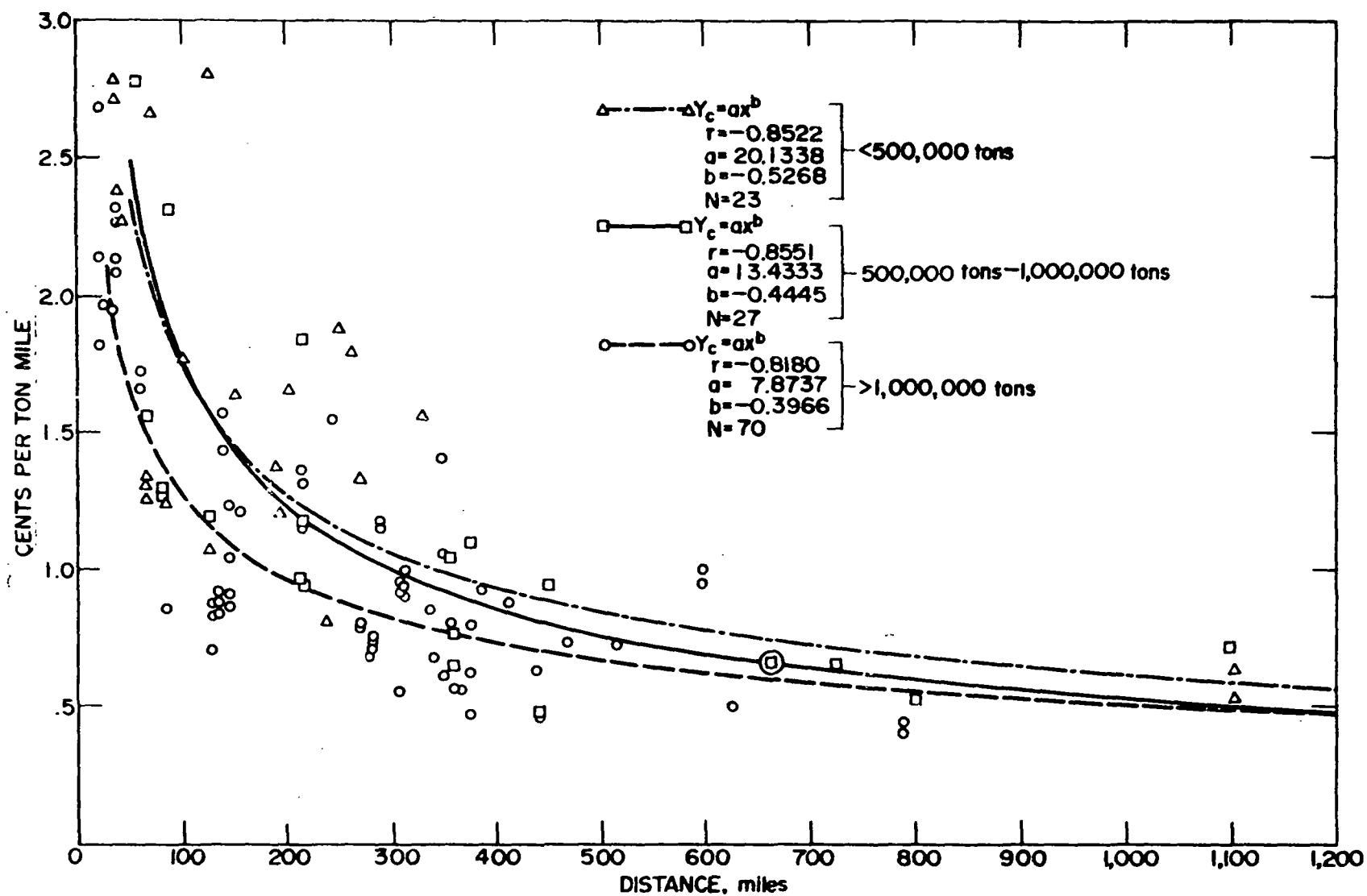


FIGURE 11. - Cost per ton mile for coal shipped by rail for minimum annual tonnage contracts.

Figure 12 shows cost per ton mile for coal shipped by rail by minimum trainload tonnages. The graph does not exhibit the expected economies of haul for trainload sizes. The middle class, on the average, shows the highest average costs of haul of the three sizes. This again may be attributable to too few data points. However, whatever the cause may be, without significant additional investigation it is only a matter of speculation.

Figure 13 shows that the shipper who owns his own cars pays less than when shipping by railroad-owned cars. The average distance between the regression lines is approximately 0.25 to 0.30 cents per ton mile. A greater savings is realized on the average than in figure 12 when coal is shipped by the largest rather than the smallest trainload size.

Figure 14 shows cost per ton mile for coal shipped by rail to oven-coke plants and exhibits approximately the same data dispersion pattern as that shown in figure 1. The regression lines on figure 14 are higher positioned (cost more per ton mile to ship) than those of figure 1, due to higher overall transportation rates for coking coal.

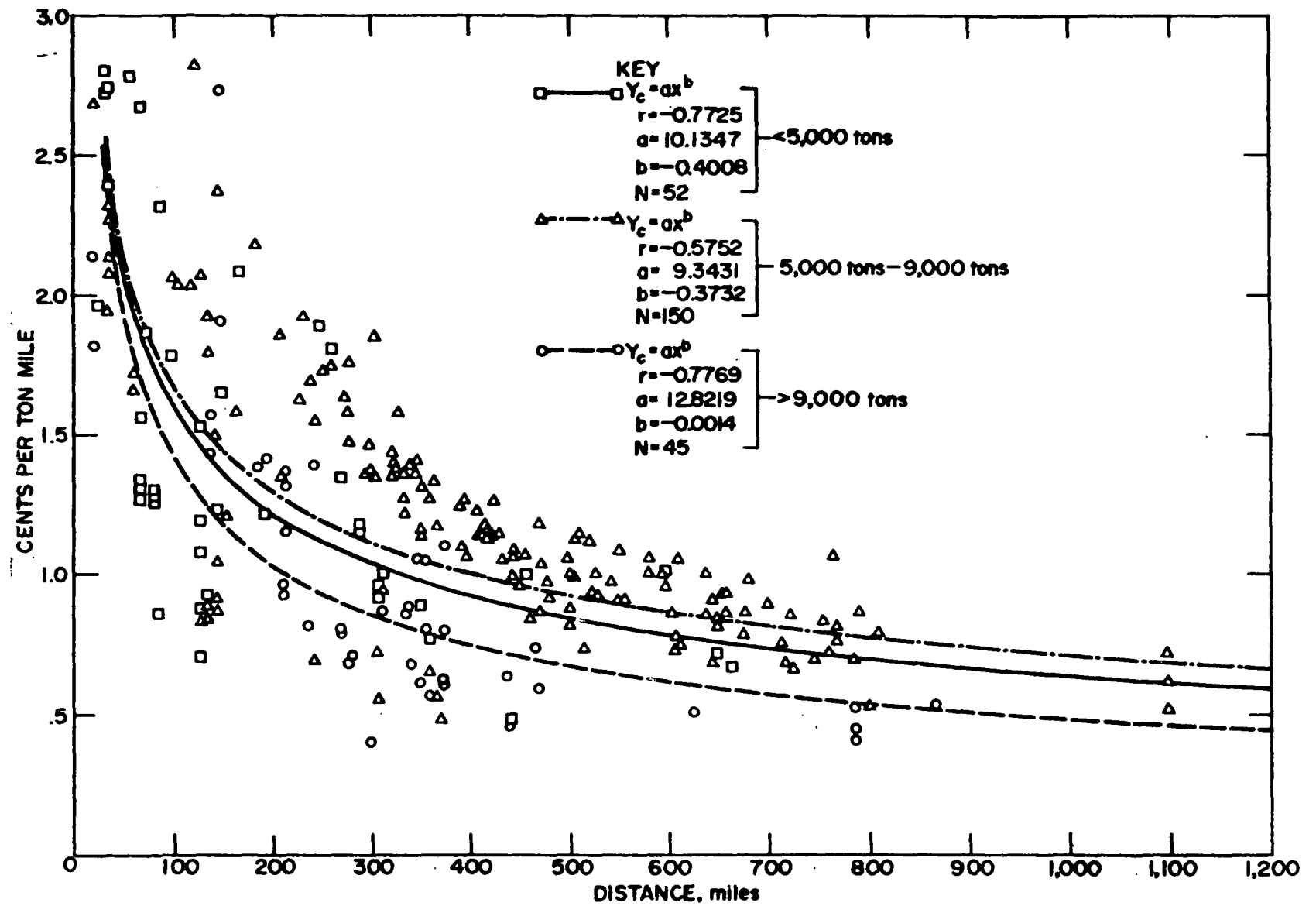


FIGURE 12. - Cost per ton mile for coal shipped by rail by minimum trainload tonnages.

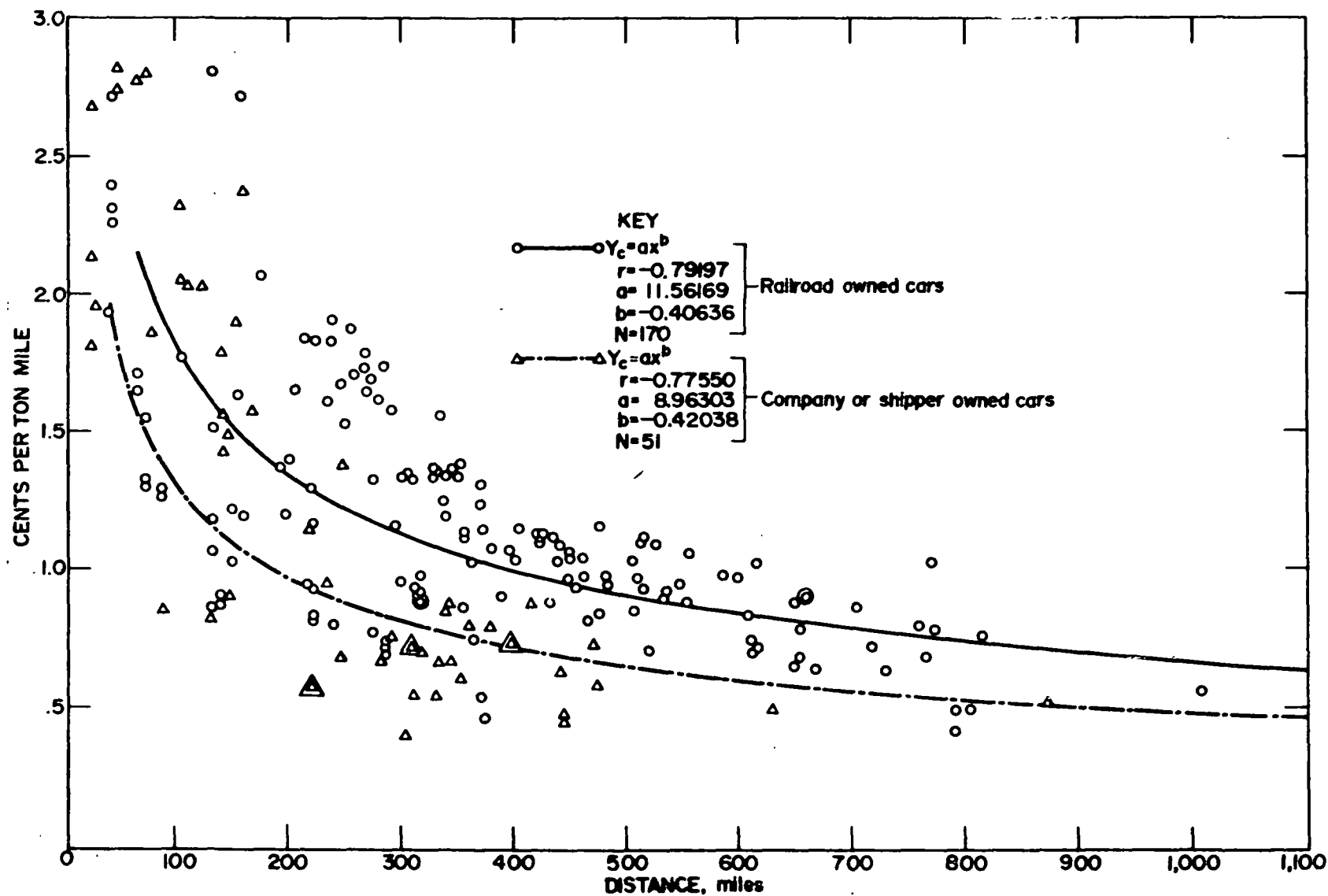


FIGURE 13. - Cost per ton mile for coal shipped by rail by car ownership.

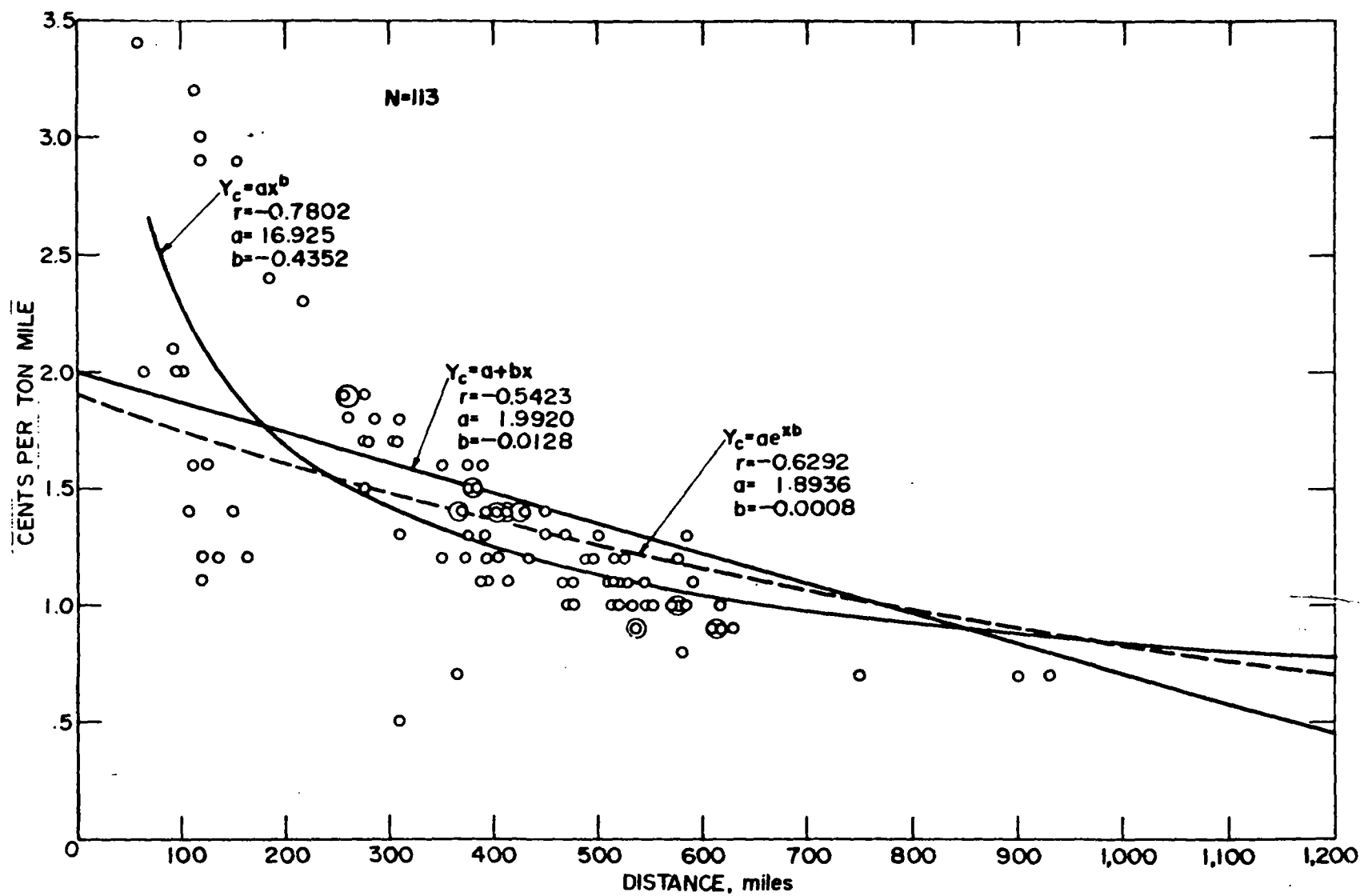


FIGURE 14. - Cost per ton mile for coal shipped by rail to oven-coke destinations.

Table 1 shows a relative comparison of the average calculated cost of shipping coal on a Btu basis for a common distance from different coal-producing districts. If the calculated value presented were the observed value for any distance, real costs of energy input could be determined for the coal districts presented. Although it is unlikely that calculated and observed values coincide, comparisons still can be made to determine the cheapest source of energy inputs from different geographic areas.

TABLE 1. - Summary of Btu values and railroad transport costs
for coal in selected coal producing districts

Coal district	Average Btu's per ton of coal <u>1/</u> (in thousands)	Costs to transport coal selected distances by railroad <u>2/</u> (in cents per ton mile)			
		200	400	600	800
1	27,224	1.80	1.24	0.80	<u>3/</u> 0.47
2	26,672	1.45	1.33	0.82	0.60
3	26,992	<u>3/</u> 1.59	1.12	0.87	0.77
4	24,468	1.65	0.80	0.39	<u>3/</u> 0.15
7	28,080	1.22	1.10	0.95	0.69
8	27,326	1.30	1.05	0.70	0.39
10	22,800	0.94	0.68	0.55	0.48
11	22,980	1.25	0.57	<u>3/</u> 0.24	<u>3/</u> 0.13

1/ Btu's on an as-received basis.

2/ Costs were extrapolated from best-fit regression equations for data available.

3/ Outside of the range of reported data.

Summary

Some major facts concerning transportation costs in the movement of coal from production area to point of consumption are revealed by this analysis. Significant economies of haul do exist for (1) longer versus shorter distances; (2) larger trainload sizes versus smaller trainload sizes; (3) company car ownership versus railroad car ownership. In addition to economies of haul, some comparisons can be made concerning the real costs of shipping energy from one coal producing area to all coal markets. Comparisons of the various figures with one another will serve this purpose.

A need for additional data is necessary to further delineate (1) the approximate costs of shipping coal from all coal producing districts in the U.S.; (2) the effect of annual coal tonnage contracts on costs; (3) the additional cost savings for unit trains and ownership of cars; and (4) the theoretical economies of haul for coal shipped from western coal producing areas to eastern coal markets.

TRANSPORTATION OF RESIDUAL FUEL OIL

Oil tanker and barge freight rates, cents per long ton mile, cents per million Btu, and nautical miles from the U.S. Gulf, Caribbean, Mexico, Mediterranean-North Africa, Europe, Persian Gulf, and Indonesia to New York-Long Island harbors and San Francisco, and from the San Francisco Bay area to inland ports on the San Joaquin and Sacramento Rivers are shown in tables 2-4. The rates shown in these tables pertain to the transportation of residual fuel oil and for crude oil hauled in dirty tankers. The lighter products are transported in clean tankers.

Foreign flag tankers carry almost all imported oil because operating costs for U.S. flag tankers are too high to be competitive. U.S. flag tanker activities is mainly confined to U.S. coastal movements of oil. Foreign flag tankers do not operate in this area (14).^{1/} According to the Jones Act (9) merchandise may not be transported by foreign vessels, or American vessels not entitled to engage in coastwise trade, except by authorization, if and when in the interest of national defense.

Little oil moves from the U.S. Gulf to the West Coast and most of the fuel oil shipped up and down the West Coast is in oil company tankers (12).

^{1/} Underlined numbers in parentheses refer to items in the list of references at the end of this report.

TABLE 2. - Residual fuel oil tanker freight rates per long ton, from specified origins to New York City, 1970

Origin	Average miles	Voyage dollars per long ton	Cents per long ton mile	Cents per million Btu
U.S. Gulf				
Port Isabel or Brownsville, Tex.	1,952	\$6.50	0.33	13.60
Corpus Christi, Tex.	1,864	6.50	0.33	13.60
Texas City, Freeport or Baytown, Tex.	1,888	6.30	0.33	13.20
Port Arthur, Tex.	1,837	6.15	0.33	12.85
Lake Charles or Beaumont, Tex.	1,842	6.15	0.33	12.85
New Orleans or Norco, La.	1,707	5.75	0.34	12.00
Ostrica or Pilot Town, La.	1,700	5.60	0.33	11.70
Baton Rouge, La.	1,840	6.10	0.33	12.75
Empire, La.	1,700	5.60	0.33	11.70
Mobile, Ala.	1,635	5.60	0.34	11.70
Baytown, Tex., and Baton Rouge, La.	1,888	7.25	0.38	15.15
Baytown and Freeport, Tex.	1,888	6.85	0.36	14.30
Baytown, Tex., and Lake Charles, La.	1,888	6.85	0.36	14.30
Corpus Christi and Port Arthur, Tex.	1,964	7.05	0.36	14.75
Mobile, Ala., and Ostrica, La.	1,635	6.20	0.38	13.00
Port Arthur, Tex., and Baton Rouge, La.	1,837	7.15	0.39	15.00
Caribbean				
Arroyo, Puerto Rico	1,425	5.39	0.38	11.30
Guayanilla, Puerto Rico	1,399	5.39	0.38	11.30
San Juan, Puerto Rico	1,275	5.29	0.41	11.10
Trinidad	1,932	6.40	0.33	13.40
St. Croix, Virgin Islands	1,300	5.48	0.42	11.50
Aruba, Netherlands West Indies	1,763	5.88	0.33	12.30
Curacao, Netherlands West Indies	1,770	5.88	0.33	12.30
Caripito, Venezuela	2,016	6.52	0.32	13.60
Puerto La Cruz, Venezuela	1,909	6.36	0.35	13.30
Puerto Las Minas, Venezuela	2,010	6.43	0.32	13.50
Punta Cardon, Venezuela	1,812	6.03	0.33	12.60
Cristobol, Panama	1,911	6.40	0.33	13.40
Kingston, Jamaica	1,270	5.26	0.41	11.00
St. Johns, Antigua	1,274	5.32	0.42	11.10
Covenas, Colombia	1,902	6.61	0.35	13.80
Mamonal, Colombia	1,846	6.43	0.35	13.50
Puerto Mexico, Mexico	1,907	6.40	0.34	13.40
Tampico, Mexico	1,999	6.73	0.34	14.10

TABLE 2. - Residual fuel oil tanker freight rates per long ton, from specified origins to New York City, 1970--continued

Origin	Average miles	Voyage dollars per long ton	Cents per long ton miles	Cents per million Btu
Mediterranean/Africa				
Algiers, Algeria	3,618	\$7.80	0.22	16.32
Arzew, Algeria	3,463	7.70	0.22	16.10
Port Augusta, Sicily	5,224	8.91	0.17	18.60
Bonny, Nigeria	6,549	10.58	0.16	22.15
Cagliari, Sardinia	3,930	7.82	0.20	16.40
Raslanuf, Libya	5,240	9.60	0.18	20.10
Gela, Italy	4,100	8.75	0.21	18.30
Genoa, Italy	4,053	8.63	0.21	18.00
Huelva, Spain	3,135	7.08	0.23	14.80
Naples, Italy	4,185	8.82	0.21	18.50
Port Gentil, Gabon	5,100	10.74	0.21	22.50
Port Harcourt, Nigeria	5,111	10.70	0.21	22.40
Porto Torres, Italy	4,000	8.38	0.21	21.00
Sidon, Lebanon	5,202	10.23	0.20	21.40
Teneriffe, Canary Islands	2,926	6.64	0.23	13.90
Uskudar, Turkey	4,847	9.79	0.20	20.50
Europe				
Antwerp, Belgium	3,523	7.82	0.22	16.30
Bordeaux, France	3,241	8.19	0.25	17.10
Donges, France	3,500	7.61	0.22	15.90
Ghent, Belgium	3,136	7.75	0.25	16.20
Humber River, United Kingdom	3,075	7.75	0.25	16.20
Isle of Grain, United Kingdom	3,075	7.75	0.25	16.20
LaVera, France	3,502	8.51	0.24	17.80
Rotterdam, Netherlands	3,532	7.59	0.21	15.90
Southampton, United Kingdom	3,425	7.33	0.21	15.30
Persian Gulf				
Rasat Tannura, Saudi Arabia	10,728	21.51	0.20	45.00
Kuwait, Kuwait	12,000	24.26	0.20	50.80

TABLE 3. - Residual fuel oil tanker freight rates per long ton,
from specified origins to San Francisco, 1970

Origin	Average Miles	Voyage dollars per long ton	Panama Canal dollars	Total dollars	Cents per long ton mile	Cents per million Btu
Caribbean						
Aruba, Netherlands West Indies	3,922	\$ 9.58	\$0.91	\$10.49	0.24	20.00
Caripito, Venezuela	4,470	10.80	0.91	11.71	0.24	22.60
Puerto La Cruz, Venezuela	4,362	10.38	0.91	11.29	0.24	21.70
Puerto Las Minas, Venezuela	3,890	8.45	0.91	9.36	0.22	17.70
Punta Cardon, Venezuela	3,920	9.61	0.91	10.52	0.24	20.10
Covenas, Colombia	3,554	9.19	0.91	9.19	0.26	19.20
Mamonal, Colombia	3,562	9.16	0.91	9.16	0.26	19.15
Curacao, Netherlands West Indies	3,981	9.66	0.91	10.57	0.24	20.20
Guayanilla, Puerto Rico	4,282	10.38	0.91	11.29	0.24	21.70
Guayaquil, Ecuador	4,083	8.74	0.91	9.65	0.21	18.30
Tampico, Mexico	4,763	11.56	0.91	12.47	0.24	26.10
Trinidad Isle	4,430	10.72	0.91	11.63	0.24	24.30
Europe						
Rotterdam, Netherlands	8,091	19.05	0.91	19.96	0.24	41.80
Indonesia						
Palembang, Sumatra	8,833	16.77	---	16.77	0.19	35.10
Singapore, Malaya	8,500	16.19	---	16.19	0.19	33.90

TABLE 4. - Residual fuel oil barge freight rates per long ton,
from San Francisco to inland destinations, 1970 for
single voyages of the 1,300-3,200 long ton class

Origin	Destination	Miles	Voyage dollars	Cents	Cents per
				per long ton mile	million Btu
San Francisco Bay Area	Emeryville	10	\$0.76	7.6	0.16
	Alameda	12	0.76	6.3	0.13
	Oakland	15	0.76	5.1	0.11
	Richmond	20	0.76	3.8	0.08
	Oleum	34	0.76	2.2	0.05
	Mare Island	34	0.76	2.2	0.05
	Vallejo	34	0.76	2.2	0.05
	Petaluma	35	0.87	2.5	0.05
	Redwood City	35	1.03	2.9	0.06
	Port Costa	38	0.76	2.0	0.04
	Martinez	40	0.76	1.9	0.04
	Avon	42	0.76	1.8	0.04
	Pittsburg	53	0.87	1.6	0.03
	Antioch	59	0.87	1.5	0.03
	Rio Vista	65	1.33	2.0	0.04
	Stockton	86	1.18	1.4	0.03
	Sacramento	92	1.33	1.4	0.03

Oil imported to New York harbors in 1970 was estimated to be 31 million long tons (236 million barrels), an additional estimated 12 million barrels of oil was delivered from the U.S. Gulf. For the same period 5.5 million barrels were imported to the U.S. West Coast (2), of which 1.6 million barrels were barged to San Francisco Bay and inland ports (4).

Methodology

Oil tanker transportation rates are percentage variations negotiated from a flat rate applicable to the particular voyage for which the vessel is fixed. The percentage variation is referred to as a fixture (16). The rates used as a basis to construct the attached oil graphs were obtained by multiplying the fixture of each voyage made in 1970 by the average flat rate from the ports of each country and then summing the two.

Subsequently, the rates were grouped into three class sizes, namely, 16-25,000; 26-35,000; and 36-50,000 long-ton tankers. From these classes, the mean and standard deviation for the three class sizes sailing over the same route were estimated. By this method, comparisons of transportation costs between class sizes of tankers traveling the same number of miles were made.

The nautical miles used in the oil diagrams for distances from port to port and the tanker class size groups are representative of the average voyage distances and vessel sizes predominately in use by the shipping trade.

The data for the barge table and curve were obtained from a rate schedule published by the San Francisco Barge Traffic Bureau, San Francisco, Calif. (11).

The data and analyses are for tankers and barges-for-hire only and no estimation of costs of shipping are made for leased or oil company owned ships because data is not available. The trade refers to rates made for tankers-for-hire as the spot market.

The tanker freight rates listed in the tables are the sum of the average fixtures and the flat rate quoted for the respective tanker voyages. The distances for each voyage in nautical miles were obtained from the British-Petroleum Tanker Co., Ltd., London, England (1).

Analysis

The analyses of the data for oil differs from the analyses for coal. Regression analyses could not be used to show comparative transportation costs relative to distance because data for distance of haul were not available for tanker voyages other than the mean distance for the voyages by tankers-for-hire.

The dispersion of rate charges between classes and within classes for the same route are mainly caused by the supply and demand of available tankers at a particular location at a point in time. Periods of greatest demand occur during the fall and winter months.

About 30 percent of the total world tanker fleet operates in the spot market at any one time. The supply of tankers in the spot market is inelastic. In times of great demand, additional tonnage cannot be

obtained in the short term and when freight tanker demand is low, the scrapping of obsolete and worn tankers is increased (16).

Forecasting the supply, demand, and price relationship of oil tanker transportation in the spot market would be almost impossible. However, the data and the analyses have value. Freight costs for specific voyages by tankers of the same class size sailing at different periods of time during 1970 differ because rates are negotiated on a single voyage basis at a point in time, and they are dependent on the supply of and demand for tankers. Figures 15-18 show that rates on the average for the tankers in the 16,000 to 25,000 ton class are always higher than the rates of the larger ton classes. Analysis of barge rates to San Francisco inland ports shown in figure 19 indicates the economies associated with distance for barges in the 1,300 to 3,200 long ton class.

Foreign tanker freight rates to the New York SMSA for an average distance of 1,800 miles from ports in the Caribbean are on the average 0.36 cents per long ton mile (table 2). The long ton mile average cost for an average distance of about 4,000 miles from the Mediterranean, North Africa, and Europe is 0.21 cents. The average cost per long ton mile from the Persian Gulf via the Cape of Good Hope, a distance of about 12,000 miles, is 0.20 cents. Therefore, economies of haul probably exist.

From the Caribbean the cost of transporting oil per million Btu average 12.50 cents while the same cost from the Mediterranean, North Africa, and Europe is 17.50 cents. The average Btu cost for the

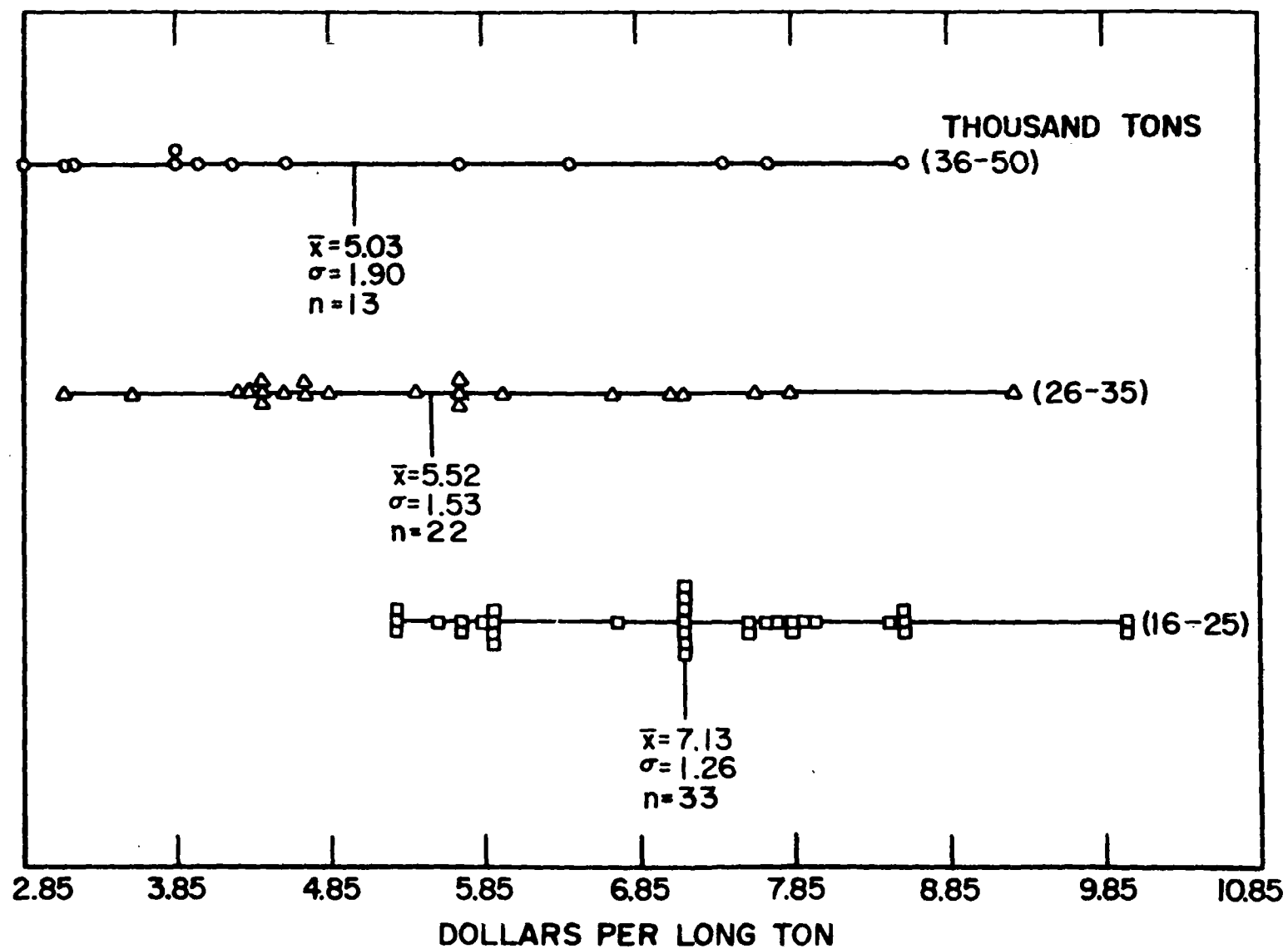


FIGURE 15. - Negotiated tanker rates from U.S. Gulf to U.S. Atlantic Coast, 1970, by size of tankers carrying residual fuel oil for single voyages, average 1,800 miles.

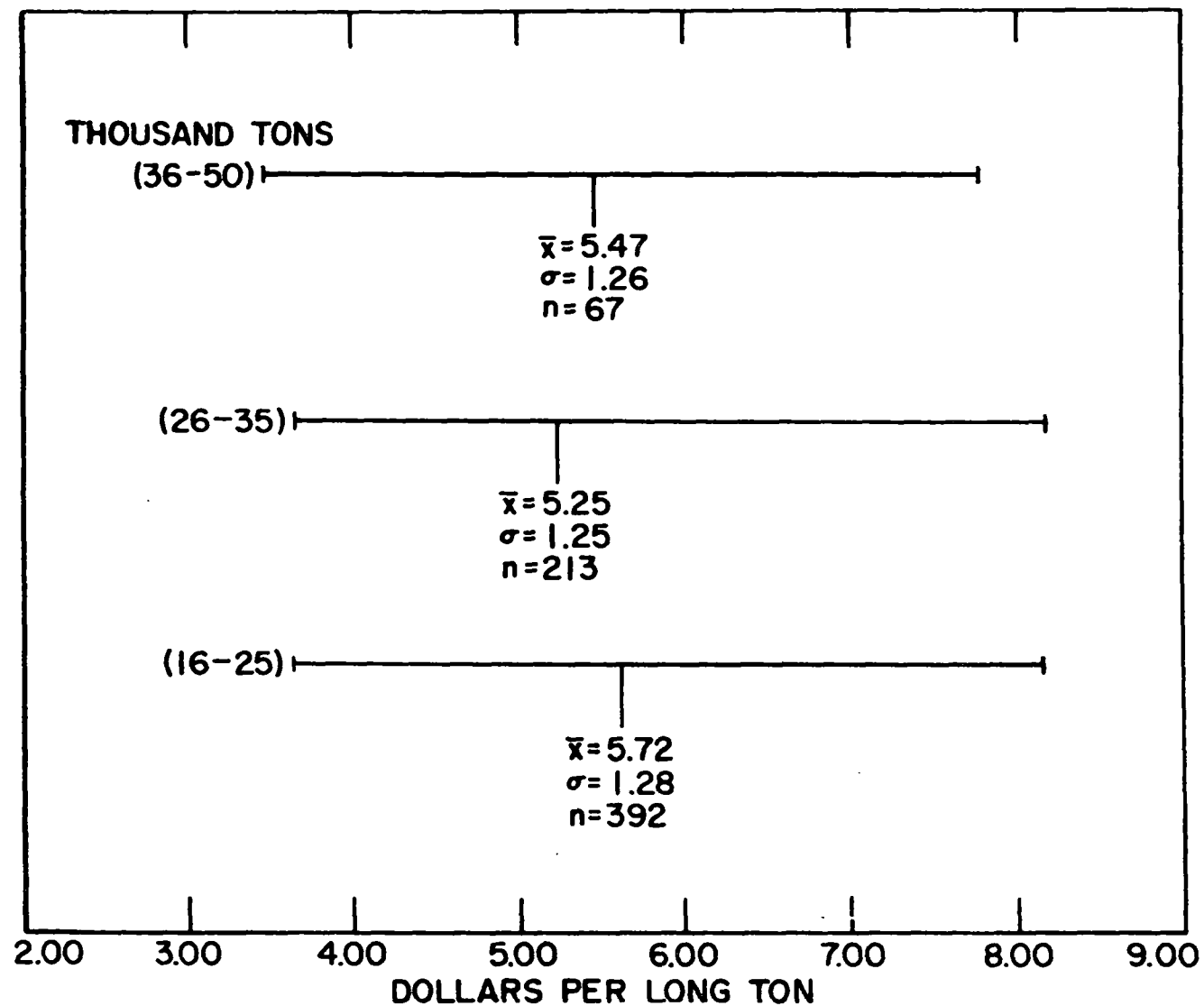


FIGURE 16. - Negotiated tanker rates from the Caribbeans to U.S. Atlantic Coast, 1970, by size of tankers carrying residual fuel oil for single voyages, average 1,800 miles.

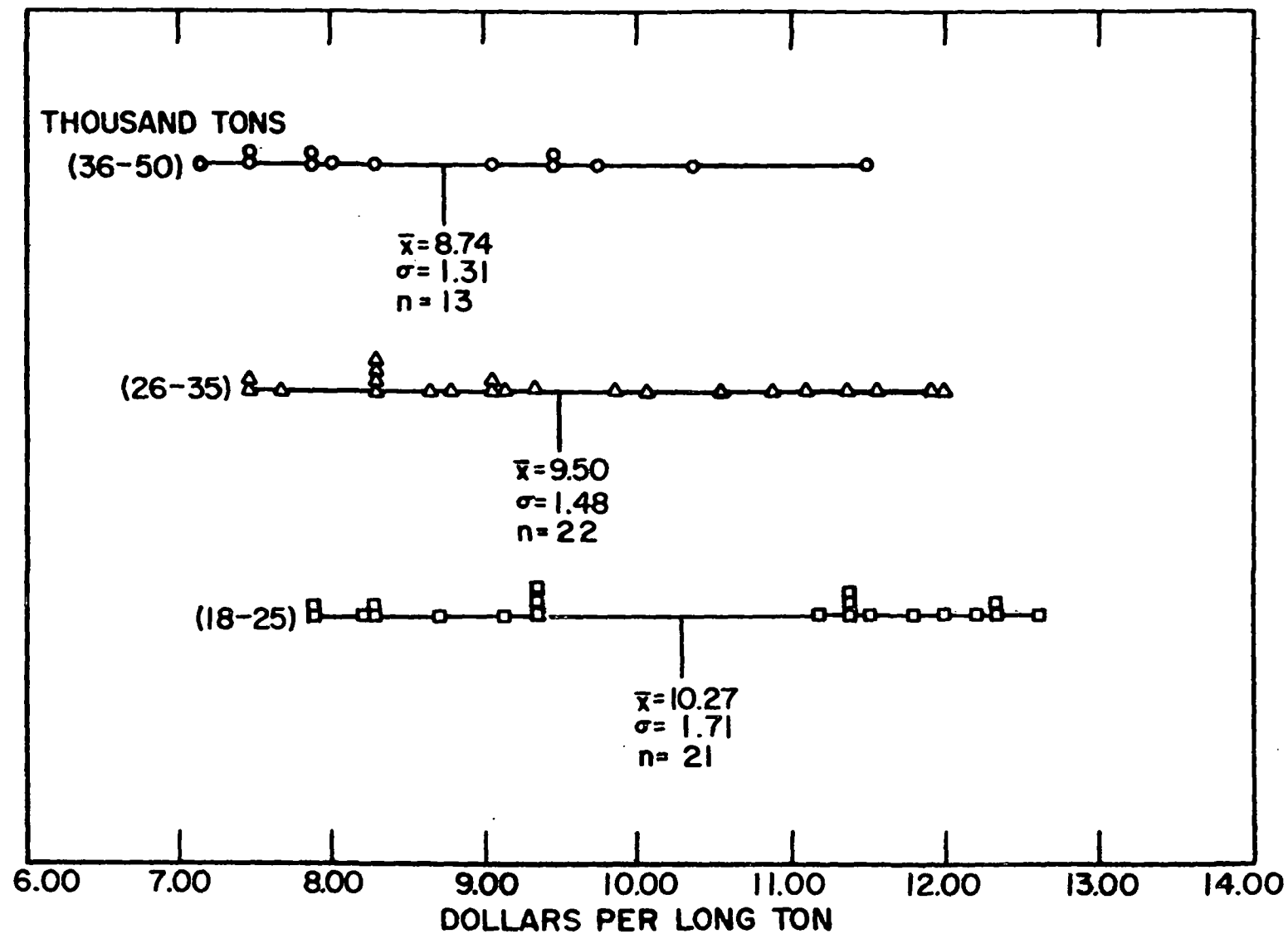


FIGURE 17. - Negotiated tanker rates from the Mediterranean to U.S. Atlantic Coast, 1970, by size of tankers carrying residual fuel oil for single voyages, average 5,200 miles.

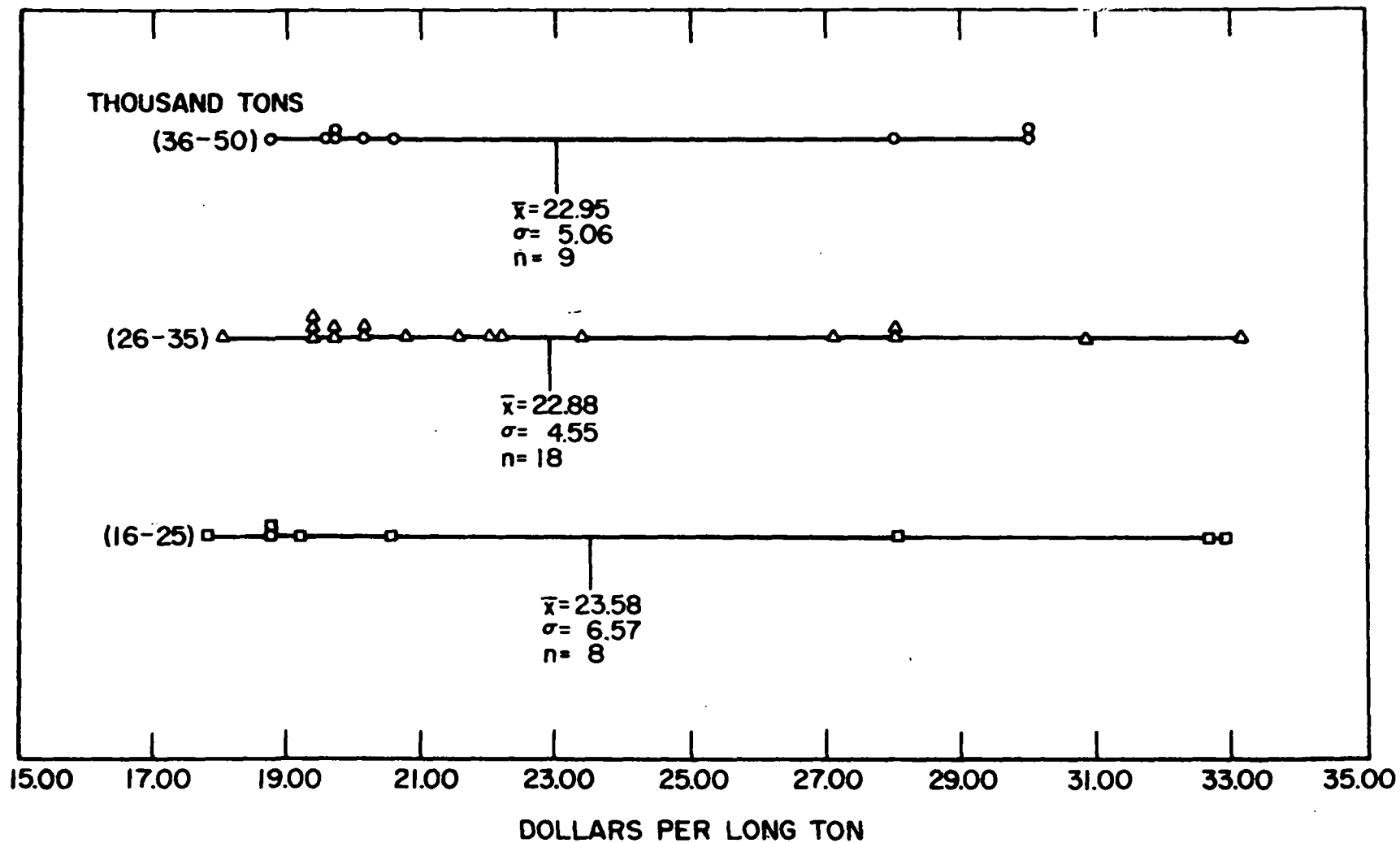


FIGURE 18. - Negotiated tanker rates from Persian Gulf to U.S. Atlantic Coast, 1970, by size of tankers carrying residual fuel oil for single voyages, average 12,000 miles via Cape of Good Hope.

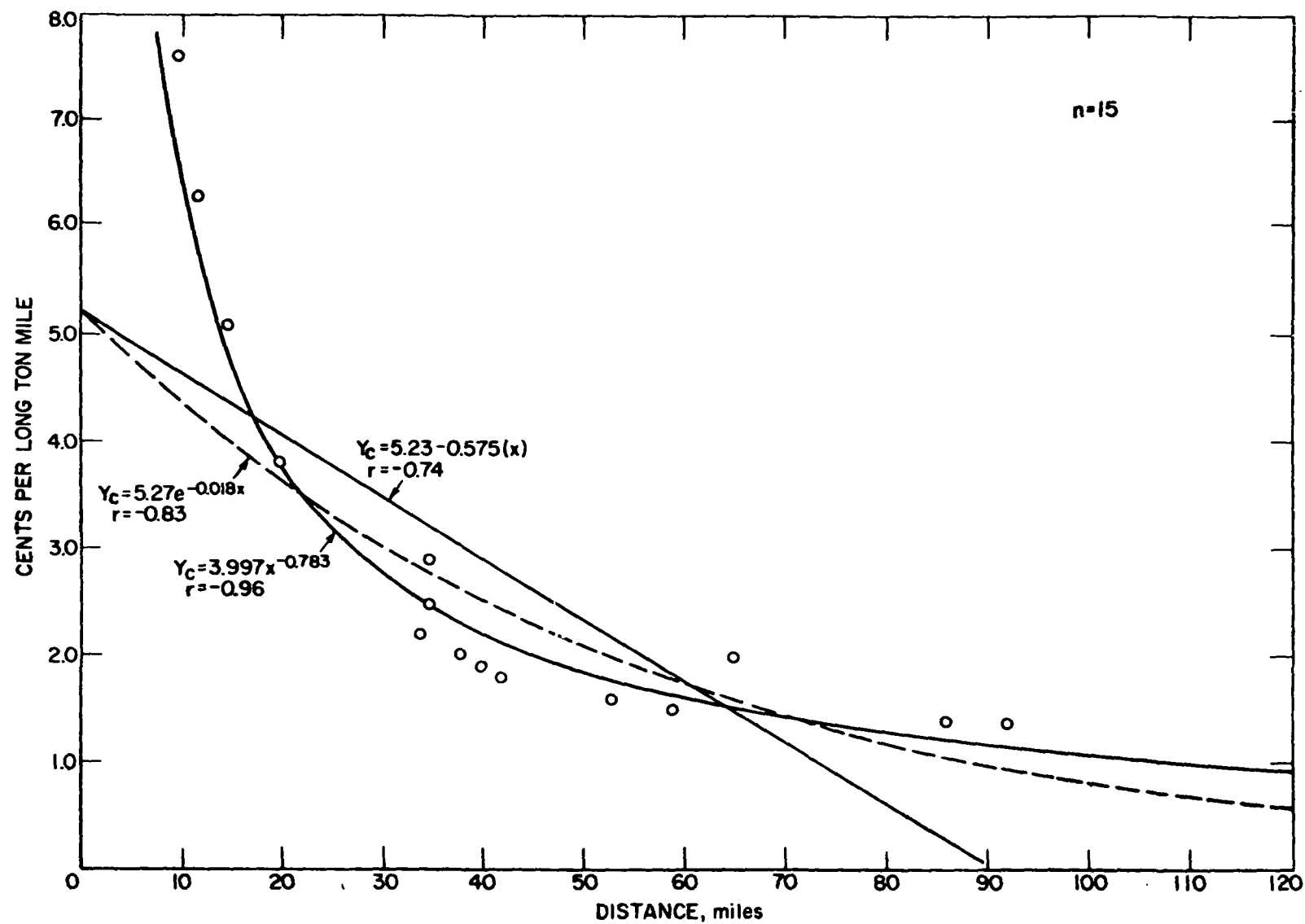


FIGURE 19. - Residual fuel oil barge freight rates per long ton from San Francisco to inland destinations, 1970, for single voyages of the 1,300-3,200 long ton class size.

Persian Gulf voyage was about 48.0 cents per million. Therefore, the higher Btu costs from areas outside the Caribbean area partly explains why only 30 percent (9.3 million long tons) is imported to the New York SMSA and 70 percent (21.7 million long tons) comes from the Caribbean.

In 1970 approximately 1.65 million long tons (12 million barrels) were transported from the U.S. Gulf to the New York SMSA.

Table 3, showing data for oil transported to San Francisco SMSA in 1970, reveals that no oil was transported from the U.S. Gulf and imported from the Persian Gulf and only 5.6 million barrels were delivered from the Caribbean, Europe, and Indonesia.

A comparison of costs per million Btu indicates why practically all of the residual received at San Francisco harbor was imported from the Caribbean. The average cost per million Btu from this area was 21.0 cents compared to about 42.0 cents from Europe and 34.0 cents from Indonesia. Oil does not move from the U.S. Gulf to the West Coast because can be brought in from the Caribbean for less money. It costs twice as much to deliver oil from the U.S. Gulf to the West Coast as it does to ship it from the Gulf to ports in the North Atlantic (16).

Summary

Analysis of the data reveals that tanker rates for transporting residual oil are on the average less when transporting by larger versus smaller tankers. The most economical supply of oil for use in the San Francisco and New York SMSA's is shipped from the Caribbean.

One of the greatest problems encountered in this section was the inability to gather data on flat rates and negotiated fixture rates that could be directly correlated to distance and size of tanker. Because of this, mean distances and grouped tanker sizes were used in place of regression analyses.

For a more thorough analysis of the cost parameters in shipping oil, data should be collected for similar time periods to isolate those costs associated with the supply and demand of tankers at a point in time. Regression analyses could then be used in a more meaningful manner to show any economies of haul which may be associated with distance or size of tanker.

TRANSMISSION OF NATURAL GAS

A description of natural gas pipeline systems and transmission costs for delivery of gas to the New York and San Francisco SMSA's is presented in this section. Natural gas pipeline systems to the two study areas are shown in figure 20 for 1970.

The selling price of gas transported by interstate pipeline is regulated by the Federal Power Commission (FPC) to the extent that it allows a reasonable rate of return to the transmission gas company.

According to the gas industry, the higher rates are caused by costs incurred to build new pipelines or modernize old ones which must necessarily be paid for through sales revenues.

Table 5 shows the systems, points of origin, effective date of rate, annual volume of gas to SMSA, pipeline distance, and cost of transmission.

Gas transmission companies and pipeline routes were obtained from the FPC (7). Transmission rates, pipeline mileage, and volume of gas delivered were obtained from transmission companies, gas utilities, and FPC reports (6).

Tennessee Gas Pipeline Co., Transcontinental Gas Pipe Line Corp., El Paso National Gas Co., and Pacific Gas and Electric Utility Co. contributed all necessary data and information. Rates and gas volumes for Texas Eastern Transmission Co. and Manufacturers Light and Heat Co. were obtained by subtracting their total gas purchases from sales to the New York SMSA in 1969. The pipeline mileage for each of these two systems was measured from an FPC pipeline systems map.

TABLE 5. - Natural gas pipeline transmission rates to New York and San Francisco SMSA's

Transmission company	Origin	Date effective	Annual volume million c.f.	Line miles	Cents per Mcf and million B.T.U./mile
Transcontinental Gas Pipeline Corp. to New York SMSA	Willacy, Texas	1970	238,000	1,800	0.011
Texas Eastern Transmission Co. to New York SMSA and Algonquin Gas Transmission Co. to Newark SMSA	Hidalgo Co., Texas Warren Co., N.J.	1969 1969	54,000 128,000	1,885	0.013
Tennessee Gas Pipeline Co. to New York SMSA	Willacy Co., Texas Vermillion Co., La. New Orleans, La.	1971	20,075	1,900	0.020
Manufacturers Light & Heat Co. and Home Gas Co. to New York SMSA	Monongalia Co., W. Va. Wood Co., W. Va.	1971	8,000	450	0.031
El Paso Natural Gas Co. - Texas to Ariz. - Cal. border	Yoakum Co., Texas San Juan Co., Utah San Juan Co., N.M.	1972	412,000	1,000	0.019
Pacific Gas and Electric Co. Ariz. - Cal. border to San Francisco SMSA	Topok, Mohave Co., Ariz.	1972	412,000	550	0.008
Pacific Gas Transmission Co. Canada to Oregon - Cal. border	Kingsgate, B.C., Canada	1972	431,000	600	0.015
Pacific Gas and Electric Co. Oregon Cal. border to San Francisco SMSA	Malin, Klamath Co., Oregon	1972	427,000	350	0.010



FIGURE 20. - Natural gas pipeline systems to the New York and San Francisco SMSA's, 1970

Analysis of Data

Based on information and estimated purchases and costs for 1972 (10), Pacific Gas and Electric Co. will purchase some 839 billion cubic feet of gas for resale. Of this, about 427 billion cubic feet (51 percent) will come from Canada and 412 billion cubic feet (49 percent) will be supplied by El Paso Natural Gas Co., Texas.

The Canadian gas will be received at Kingsgate, B. C., by Pacific Gas Transmission Company and transmitted 600 miles to Malin, Oregon, at the California border at a total trip cost of 9.00 cents per Mcf or 0.015 cents per mile which is also the cost per million Btu.

From Malin, Oregon, Pacific Gas and Electric Co. will transmit the gas to the San Francisco SMSA at 0.010 cent per Mcf per mile or million Btu for the 350 mile run.

Gas from the Permian and San Juan Basins will provide about 412 million cubic feet at a pipeline transmission cost of 19.0 cents per thousand cubic feet or 0.019 cents per mile for the 1,000 mile trip to the Arizona border (5). From the California-Arizona border the gas will be transmitted at a cost of 0.008 cents per thousand cubic feet per mile or a million Btu for the 550 mile run.

Four major gas pipeline systems supply New York SMSA. Transcontinental Gas Pipeline starts at Brownsville, Texas. About 238 billion cubic feet of gas per year moves to New York SMSA at a cost of 0.011 cents per million Btu per mile. This cost is applicable only when the 100 percent load-supply factor of 600 million cubic feet delivered to Philadelphia SMSA, New Jersey SMSA, and New York SMSA is considered (15).

Of the 987 billion cubic feet of gas that flowed through Texas Eastern's lines to consumers in Ohio, Pennsylvania, New Jersey, and New York in 1969, only 54 billion were delivered to New York SMSA (6). Algonquin Gas Transmission Co. pipeline, partially owned by Texas Eastern, takes off from Texas Eastern's line at the Pennsylvania-New Jersey border below Phillipsburg, New Jersey. It supplied some 128 billion cubic feet of gas to the Newark area, a part of New York SMSA (6) in 1969. The line is about 125 miles in length (7). The average transmission rate for this 1,885 mile pipeline system is 0.013 cents per billion Btu per mile (6).

Tennessee Gas Pipeline Co. currently transmits about 20 billion cubic feet of gas to the New York SMSA (13). Gas through this system traveled 1,900 miles, and according to Tennessee Gas, the transmission cost for their system to the New York SMSA is about 0.020 cents per thousand cubic feet per mile.

Manufacturers Light and Heat Co. sold about 8 billion cubic feet of gas in the New York SMSA in 1969 through its affiliate Home Gas Co. (6). The pipeline system is about 450 miles long. Gas purchases in West Virginia, Pennsylvania, and Ohio were added to complement the supply. The transportation rates which include profit are calculated by subtracting the weighted average purchase price of gas (34.05 cents per Mcf) from the weighted average delivered selling price (48.28 cents per Mcf) (6). This yields a rate of 0.031 cents per million Btu per mile.

Gas selling price in the New York SMSA by transmission companies to electric utilities and gas distributing companies was 42.22 cents per million Btu in 1970 (8). The average cost for transmitting gas on a national basis is about 1.0 cent per million Btu per 100 miles.

Summary

The natural gas industry including its interstate transmission systems, operating practices, and rate adjustments which include a normal profit is regulated by the FPC.

Gas transmission companies indicate that for a rule-of-thumb estimate, 1,000 cubic feet of gas can be moved 100 miles for 1.0 cent. The average rate for the pipeline systems in this report was 1.5 cents/ thousand cubic feet per 100 miles.

The average cost of transmitting gas from the Texas fields to the New York SMSA is 28.0 cents per thousand cubic feet. The cost of moving gas from the Texas fields to the San Francisco SMSA is 16 cents per thousand cubic feet.

For future study, it may be possible that costs of transmission only could be obtained for most companies serving several major metropolitan areas from rate adjustment applications filed with FPC in 1970 and 1971.

RECOMMENDATIONS

This report perused the parameters of the complex fossil fuel transportation universe. Although a significant amount of data have been collected, certain areas are still incomplete. It is therefore recommended that a more thorough analysis be made of the individual parameters within the transportation system by (1) gathering all the data possible to complete the transportation universe; (2) making greater stratifications of the data collected to gain more precise information of the parameters in the system which affect cost; (3) obtaining theoretical cost structures for fossil fuels to markets where they are currently not marketed, i.e., the cost of shipping western coal to eastern markets and the cost of marketing residual fuel oil further into the interior of the continental U.S. It is also recommended that an analysis be made to compare and offer an explanation for the consumption of coal, oil, and gas in major SMSA's.

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COAL APPENDIX

TABLE A-1. - Bituminous coal received at oven-coke plants in the United States, 1969

Oven-coke plant	Location of plant	Coal purchases		Mine location				Coal producing district	Freight rate district	Method of movement	Rate per ton	Transportation charges		Rate per ton-mile (cents)	
		Name of company	Name of mine	Shipping point	County	State	Application					Mileage			
Alabama															
Empire Coke Co.	Holt	Bankhead Mining Co.	Cobb	Jasper	Walker	Alabama	13	Alabama	All-rail	\$ 3.38	Single-car	96	3.5		
		Consolidation Coal Co.	Craig Creek	McCombs	Walker	West Virginia	7	Pocahontas	All-rail	5.79	5,000 ton-trainload	529	1.1		
		Hawks West Mining Co.	Hawks West	Page	Fayette	West Virginia	8	Kanawha	All-rail	5.91	5,000 ton-trainload	629	.9		
Republic Steel Corp.	Gadsden	Republic Steel Corp.	Sayre	Sayre	Jefferson	Alabama	13	Alabama	All-rail	1.98	Single-car	53	2.1		
		Black Diamond Coal Mining Co.	No. 3	Black Diamond	Jefferson	Alabama	13	Alabama	All-rail	2.06	Single-car	101	2.0		
		Bankhead Mng. Co., Inc.	Cobb	Jasper	Walker	Alabama	13	Alabama	All-rail	2.51	Single-car	365	0.7		
		Clinchfield Coal-Div. of the Pittston Co.	Moss No. 2	Sante	Russell	Virginia	8	Tiller	All-rail	5.91	5,000 ton-trainload	375	1.6		
Republic Steel Corp.	Thomas	Republic Steel Corp.	Sayre	Sayre	Jefferson	Alabama	13	Alabama	All-rail	NA	Single-car	26	NA		
		Clinchfield Coal-Div. of the Pittston Co.	Moss No. 2	Clinchfield	Russell	Virginia	8	Tiller	All-rail	5.91	5,000 ton-trainload	412	1.4		
U.S. Pipe and Foundry Co.	Birmingham	U.S. Pipe & Fdry. Co.	Beesie	Beesie Mine	Jefferson	Alabama	13	Alabama	All-rail	NA	Operates own railroad	NA	NA		
		U.S. Pipe & Fdry. Co.	Flat Top	Flat Top	Jefferson	Alabama	13	Alabama	All-rail	NA	Operates own railroad	NA	NA		
		Slab Fork Coal Co.	Slab Fork	Slab Fork	Raleigh	West Virginia	7	Virginian	All-rail	5.77	5,000 ton-trainload	412	1.4		
		Winding Gulf Coal, Inc.	MacAlpin	MacAlpin	Raleigh	West Virginia	7	New River	All-rail	5.77	5,000 ton-trainload	412	1.4		
Alabama By-Products	Tarrant	Itmann Coal Co.	Itmann	Itmann	Wyoming	West Virginia	7	Virginian	All-rail	5.77	5,000 ton-trainload	415	1.4		
		Alabama By-Products	Marine	Marine	Jefferson	Alabama	13	Alabama	All-rail	NA	Single-car	26	NA		
		Winding Gulf Coals, Inc.	Cliff Top 1, 2, & 3	Cliff Top	Payette	West Virginia	7	New River	All-rail	5.77	5,000 ton-trainload	487	1.2		
		Winder Sewell Coal Co.	No. 2	Rock Lick	Fayette	West Virginia	7	New River	All-rail	5.77	5,000 ton-trainload	510	1.1		
U.S. Steel Corp.	Fairfield	Beards Fork Coal Mng. Corp.	Beards Fork	Beards Fork	Fayette	West Virginia	7	Virginian	All-rail	5.77	5,000 ton-trainload	515	1.1		
		U.S. Steel Corp.	Concord	Concord	Jefferson	Alabama	13	Alabama	Operates own R.R.	NA		NA	NA		
		Westmoreland Coal Co.	Pine Branch	Pine Branch	Wise	Virginia	8	Clinch Valley	All-rail	4.89	5,000 ton-trainload	375	1.3		
		Westmoreland Coal Co.	Oakha	Stonega	Wise	Virginia	8	Clinch Valley	All-rail	4.89	5,000 ton-trainload	375	1.3		
Woodward Iron Co.	Woodward	Westmoreland Coal Co.	Prescott	Oakha	Wise	Virginia	8	Clinch Valley	All-rail	4.89	5,000 ton-trainload	375	1.3		
		Burgess, A. E. Co.	West Elckton	West Elckton	Bibb	Alabama	13	Alabama	All-rail	2.07	5,000 ton-trainload	40	5.2		
		Woodward Iron Co.	Mulga	Woodward	Jefferson	Alabama	13	Alabama	Operates own R.R.	NA		NA	NA		
		Coal Processing Corp.	Dixiana	Dixiana	Wise	Virginia	8	Clinch Valley	All-rail	4.89	5,000 ton-trainload	NA	NA		
Consolidation Coal Co.	Jenkins Jones	Pageston	McDowell	West Virginia	7	Pocahontas	All-rail	5.77	5,000 ton-trainload	450	1.3				
		California													
		Kaiser Steel Corp.	Pontana	Kaiser Steel Corp.	No. 1	Bannyside	Carbon	Utah	20	Castle Gate	All-rail	4.89	Not less than 200,000 tons annually	750	0.7
				Kaiser Steel Corp.	York Canyon	York Canyon	Colfax	New Mexico	18	Baton	All-rail	6.15	-----	900	0.7
Mid-Continent Coal and Coke Co.	Dutch Creek			Pageston	Pitkin	Colorado	16	Carbondale	All-rail	6.09		930	0.7		
Consolidation Coal Co.	Jenkins Jones	Pageston	McDowell	West Virginia	7	Pocahontas	All-rail	16.93	5,000 ton-trainload	2,400	0.7				
		Colorado													
		Colorado Fuel & Iron Steel Co.	Pueblo	Colorado Fuel & Iron Steel Co.	Allen	Weston	Las Animas	Colorado	17	Oak Hills	Operates own R.R.	NA		NA	NA
				Silengo Coal Co.	Wise Hill No. 3	Craig	Moffat	Colorado	17	Oak Hills	All-rail	4.25	Single-car	275	1.5
Winding Gulf Coal, Inc.	Cliff Top No. 1, 2, 3			Cliff Top	Fayette	West Virginia	7	New River	All-rail	12.16	7,200 ton-trainload	1,450	0.8		
Winding Gulf Coal, Inc.	East Gulf	East Gulf	Raleigh	West Virginia	7	New River	All-rail	12.16	7,200 ton-trainload	1,400	0.9				
		Illinois													
		General Motors Corp.	Vandalia	Harman Mng. Corp.	Harman	Harman	Buchanan	Virginia	8	Thacker	All-rail	7.12	Single-car	575	1.2
				Eastern Associated Coal Corp.	Keystone No. 1	Keystone	McDowell	West Virginia	7	Pocahontas	All-rail	7.37	Single-car	585	1.3
Freeman Coal Mng. Corp.	Orient No. 3			Orient	Jefferson	Illinois	10	Group 6	All-rail	1.49	2,500 ton-trainload	180	1.2		
Granite City Steel Co.	Granite City	Freeman Coal Mng. Corp.	Orient No. 5	West Frankfort	Franklin	Illinois	10	Group 6	All-rail	1.63	2,500 ton-trainload	135	1.2		
		Sabara Coal Co., Inc.	Sabara No. 6	Sabara	Saline	Illinois	10	Group 6	All-rail	---	2,500 ton-trainload	180	NA		
		Old Ben Coal Corp.	No. 21	Sesser	Franklin	Illinois	10	Group 6	All-rail	1.49	2,500 ton-trainload	107	1.4		
		Eastern Associated Coal Corp.	Wharton No. 4	Wharton	Boone	West Virginia	8	Kanawha	All-rail	5.99	Single-car	545	1.1		
Winding Gulf Coals, Inc.	Winding Gulf No. 5	Winding Gulf Coals, Inc.	West Gulf No. 5	Wharton	Raleigh	West Virginia	7	Kanawha	All-rail	5.75	5,000 ton-trainload	575	1.0		

TABLE A-1. - Bituminous coal received at oven-coke plants in the United States, 1969-Continued

Oven-coke plant	Location of plant	Coal purchases		Shipping point	County	Mine location		Coal producing district	Freight rate district	Method of movement	Rate per ton	Transportation charges		Rate per ton-mile (cents)
		Name of company	Name of mine			State	Application					Mileage		
Illinois (continued)														
Interlake Steel Corp.	Chicago	Island Creek Coal Co.	No. 28	Holden	Logan	West Virginia	8	Logan	All-rail	5.52	7,200 ton-trainload	512	1.0	
		Consolidation Coal Co.	Westball	Westball	McDowell	West Virginia	7	Pocahontas	All-rail	5.77	7,200 ton-trainload	545	1.0	
		Consolidation Coal Co.	Eckman	Holden	McDowell	West Virginia	7	Pocahontas	All-rail	5.77	7,200 ton-trainload	545	1.0	
		Winding Gulf Coals, Inc.	West Gulf No. 6	Eckles	Raleigh	West Virginia	7	Virginian	All-rail	5.77	7,200 ton-trainload	536	1.0	
		Freeman Coal Mng. Corp.	Orient No. 5	West Frankfort	Franklin	Illinois	10	Group 6	All-rail	2.99	2,500 ton-trainload	309	.96	
International Harvester Co.	Chicago	International Harvester Co.	Wisconsin Steel Co.	Benhas	Marion	Kentucky	8	Marion	All-rail	5.52	7,200 ton-trainload	512	1.0	
		United Pocahontas Coals, Inc.	Indian Ridge No. 6	North Fork	McDowell	West Virginia	7	Pocahontas	All-rail	5.77	7,200 ton-trainload	571	1.2	
		Royalty Smokeless Coal Co.	Premier	Premier	McDowell	West Virginia	7	Pocahontas	All-rail	5.77	7,200 ton-trainload	545	1.2	
		Old Ben Coal Corp.	No. 21	Sesser	Franklin	Illinois	10	Group 6	All-rail	2.99	2,500 ton-trainload	309	1.8	
		Amigo Smokeless Coal Co.	Amigo	Amigo	Raleigh	West Virginia	7	Virginian	All-rail	5.77	7,200 ton-trainload	552	1.0	
		Itmann Coal Co.	Itmann	Itmann	Wyoming	West Virginia	7	Virginian	All-rail	5.77	7,200 ton-trainload	552	1.0	
		Republic Steel Corp.	Republic	Marion	Marion	Kentucky	8	Marion	All-rail	5.52	7,200 ton-trainload	512	1.0	
Republic Steel Corp.	Chicago	Winding Gulf Coals, Inc.	East Gulf	East Gulf	Raleigh	West Virginia	7	Virginian	All-rail	5.77	7,200 ton-trainload	549	1.0	
Indiana (6)														
Citizens Gas & Coke Utility	Indianapolis	Morton Coal Co.	Morton	Morton	Wise	Virginia	8	Clinch Valley No. 7	All-rail	4.83	5,000 ton-trainload	580	.8	
		Margaret Ann Coal Co.	Margaret Ann	Conaway	Buchanan	Virginia	8	Thacker	All-rail	4.83	5,000 ton-trainload	535	.9	
		Jewell Ridge Coal Corp.	Jewell Valley	Jewell Valley	Buchanan	Virginia	7	Upper Buchanan	All-rail	4.95	5,000 ton-trainload	535	.9	
		Winding Gulf Coals, Inc.	No. 4	Winding Gulf	Raleigh	West Virginia	7	New River	All-rail	4.95	5,000 ton-trainload	504	1.2	
		Island Creek Coal Co.	Coal Mountain	Coal Mountain	Wyoming	West Virginia	8	Virginian	All-rail	4.83	5,000 ton-trainload	394	1.2	
Indiana Gas & Chemical Corp.	Terre Haute	Winding Gulf Coals, Inc.	MacAlpin	MacAlpin	Raleigh	West Virginia	7	New River	All-rail	5.24	5,000 ton-trainload	476	1.1	
		Lundale Coal Co.	Lundale No. 1	Amberst	Logan	West Virginia	8	Logan	All-rail	5.12	5,000 ton-trainload	433	1.2	
		Consolidation Coal Co.	Jenkins	Jenkins	McDowell	West Virginia	7	Pocahontas	All-rail	5.24	5,000 ton-trainload	466	1.1	
		Itmann Coal Co.	Itmann	Itmann	Wyoming	West Virginia	7	Virginian	All-rail	5.12	5,000 ton-trainload	476	1.0	
		Natliff Elkhorn Mng. Co.	Raccoon	Pikeville	Pike	Kentucky	8	Thacker	All-rail	5.12	5,000 ton-trainload	458	1.1	
Inland Steel Co.	East Chicago	Bishop Coal Co.	Bishop	Bishop	McDowell	West Virginia	7	Pocahontas	All-rail	5.77	7,200 ton-trainload	545	1.1	
		Inland Steel Co.	Inland	Sesser	Jefferson	Illinois	10	Group 6	All-rail	3.67	2,500 ton-trainload	309	1.2	
		Freeman Coal Mng. Corp.	Orient No. 3	Orient	Jefferson	Illinois	10	Group 6	All-rail	3.67	2,500 ton-trainload	309	1.2	
		Freeman Coal Mng. Corp.	Orient No. 5	West Frankfort	Franklin	Illinois	10	Group 6	All-rail	1.63	2,500 ton-trainload	309	.5	
		Kentland-Elkhorn Coal Corp.	Spruce Fork	Biggs	Pike	Kentucky	8	Thacker	All-rail	5.52	7,200 ton-trainload	535	1.0	
		Kentland-Elkhorn Coal Corp.	Peter Creek	Phelps	Pike	Kentucky	8	Thacker	All-rail	5.52	7,200 ton-trainload	535	1.0	
		Island Creek Coal Co.	Ound	W & W	Pike	Kentucky	8	Thacker	All-rail	5.52	7,200 ton-trainload	535	1.0	
U.S. Steel Corp.	Gary	Jewell Ridge Coal Corp.	Jewell Valley	Jewell Valley	Buchanan	Virginia	7	Upper Buchanan	All-rail	5.77	7,200 ton-trainload	535	1.1	
		U.S. Steel Corp.	No. 2, 6, 9, 10, 14	Munson	McDowell	West Virginia	7	Pocahontas	All-rail	5.77	7,200 ton-trainload	542	1.1	
		U.S. Steel Corp.	No. 7 & 32	Lynch	Marion	Kentucky	8	Marion	All-rail	5.52	7,200 ton-trainload	530	1.1	
		Island Creek Coal Co.	No. 27	Holden	Logan	West Virginia	8	Logan	All-rail	5.52	7,200 ton-trainload	542	1.0	
		Freeman Coal Mng. Corp.	Orient No. 3	Orient	Jefferson	Illinois	10	Group 6	All-rail	2.99	2,500 ton-trainload	309	NA	
Youngstown Sheet & Tube Co.	East Chicago	Youngstown Mines Corp.	Debus	Debus	Logan	West Virginia	7	Logan	All-rail	5.52	7,200 ton-trainload	512	1.1	
		Oiga Coal Co.	Oiga	Suzanna	McDowell	West Virginia	7	Tug River	All-rail	5.77	7,200 ton-trainload	545	1.1	
		Cumberland Collieries Inc.	Clistwood No. 1	Mallins	Dickinson	Virginia	8	Tiller	All-rail	5.52	7,200 ton-trainload	553	.99	
		Cumberland Collieries Inc.	Bird No. 2	Borton	Dickinson	Virginia	8	Tiller	All-rail	5.52	7,200 ton-trainload	580	.95	
		Gaulley Coal & Coke Co.	Tinga No. 1	Tinga	Nicholas	West Virginia	3	Gaulley	All-rail	5.77	7,200 ton-trainload	612	.94	
Bethlehem Steel Corp.	Burns Harbor	Beth-Elkhorn	No. 27	Durham	Letcher	Kentucky	8	Kentucky	All-rail	5.52	2,000 ton-trainload	551	1.0	
		Bethlehem Mines Corp.	Idamay	Idamay	Marion	West Virginia	3	Palmoot	All-rail	5.52	2,000 ton-trainload	505	NA	
		Esperanza Smokeless Coal Co.	Esperanza	Lee	Nicholas	West Virginia	7	Greenbrier	All-rail	5.77	5,000 ton-trainload	536	1.1	
		Consolidation Coal Co.	Turkey Gap	Springton	Marion	West Virginia	7	Pocahontas	All-rail	5.77	5,000 ton-trainload	577	1.0	
		Old Ben Coal Corp.	No. 21	Besser	Franklin	Illinois	10	Group 6	All-rail	2.99	5,000 ton-trainload	309	.96	

TABLE A-1. - Bituminous coal received at oven-coke plants in the United States, 1969-Continued

Oven-coke plant	Location of plant	Coal purchases		Mine location				Freight rate district	Method of movement	Rate per ton	Transportation charges		Rate per ton-mile (cents)
		Name of company	Name of mine	Shipping point	County	State	Coal producing district				Application	Mileage	
Kentucky Allied Chemical Corp.	Ashland	Somet-Solvey Div. (Allied)	Harewood	Harewood	Fayette	West Virginia	8	Kanawha	Rail-river	1.80	Rail to Huntington, W. Va. 1/80 cents-barged to plant	60	3.0 8/
		Somet-Solvey Div. (Allied)	Shannon Branch	Capels	McDowell	West Virginia	7	Tug River	Rail-river	1.96	-----do-----	125	1.6
		Somet-Solvey Div. (Allied)	Tralee	Capels	McDowell	West Virginia	7	Virginian	Rail-river	1.96	-----do-----	161	1.2
		Armo Steel Corp.	Robin Hood	Robin Hood	Boone	West Virginia	8	Kanawha	Rail-river	1.75	-----do-----	112	1.6
Maryland Bethlehem Steel Corp.	Sparrows Point Consolidation Coal Co.	Crane Creek	McComas	Mercer	West Virginia	7	Pocahontas	Rail-tide (Balto)	5.78	Barge to Baltimore Harbor 3/1	375	1.5	
		Bethlehem Mines Corp.	Kayford	Kayford	Kanawha	West Virginia	8	Kanawha	Rail-tide (Balto)	6.10	-----do-----	419	1.4
		Bethlehem Mines Corp.	Century No. 101	Century	Barbour	West Virginia	3	Clarksburg	Rail-tide (Balto)	5.04	-----do-----	304	1.7
		Bethlehem Mines Corp.	No. 32	Ebensturg	Cambria	Pennsylvania	1	Clearfield	Rail-tide (Balto)	4.76	-----do-----	257	1.9
		Bethlehem Mines Corp.	No. 73	Revoloc	Cambria	Pennsylvania	1	Clearfield	Rail-tide (Balto)	4.76	-----do-----	260	1.7
		Bethlehem Mines Corp.	No. 58	Johnstown	Cambria	Pennsylvania	1	Clearfield	Rail-tide (Balto)	4.76	-----do-----	260	1.8
		Bethlehem Mines Corp.	No. 41	Idamay	Washington	Pennsylvania	2	Westmoreland	Rail-tide (Balto)	5.37	-----do-----	307	1.7
		Bethlehem Mines Corp.	No. 44	Century	Marion	West Virginia	3	Fairmont	Rail-tide (Balto)	5.04	-----do-----	295	1.8
		Beth-Elkhorn Corp.	No. 27	Dunham	Letcher	Kentucky	8	Fairmont	Rail-tide (Balto)	5.04	-----do-----	304	1.7
		Beth-Elkhorn Corp.	No. 22	Denne	Letcher	Kentucky	8	Elkhorn	Rail-tide (Balto)	6.10	-----do-----	425	1.4
		Beth-Elkhorn Corp.	No. 25	Fenn	Pike	Kentucky	8	Elkhorn	Rail-tide (Balto)	6.10	-----do-----	430	1.4
		Island Creek Coal Co.	Slab Fork	Slab Fork	Logan	West Virginia	8	Logan	Rail-tide (Balto)	6.10	-----do-----	425	1.4
		Slab Fork Coal Co.	Gaston No. 2	Alpoca	Raleigh	West Virginia	7	Virginian	Rail-tide (Balto)	5.78	-----do-----	469	1.3
		Ashland Mining Corp.	Ashland	Northfork	Wyoming	West Virginia	7	Virginian	Rail-tide (Balto)	5.78	-----do-----	378	1.5
		Peoples Eagle Coal Co.	No. 1	McDowell	McDowell	West Virginia	7	Pocahontas	Rail-tide (Balto)	5.78	-----do-----	403	1.4
		New River Co.	No. 2	Cornelia	Nicholas	West Virginia	8	New River	Rail-tide (Balto)	5.78	-----do-----	376	1.5
				Lochgelly	Fayette	West Virginia	7	Virginian	Rail-tide (Balto)	6.10	-----do-----	390	1.6
									Rail-tide (Balto)	5.78	-----do-----	384	1.5
Michigan Allied Chemical Corp.	Detroit	Somet-Solvey Div. (Allied)	Harewood	Harewood	Fayette	West Virginia	8	Kanawha	All-rail	5.53	5,000 ton-trainload	350	1.6
		Somet-Solvey Div. (Allied)	Tralee	Tralee	Wyoming	West Virginia	7	Virginian	All-rail	5.84	5,000 ton-trainload	495	1.2
		Somet-Solvey Div. (Allied)	Shannon Branch	Capels	McDowell	West Virginia	7	Pocahontas	All-rail	5.84	5,000 ton-trainload	515	1.2
		Jewell Ridge Coal Corp.	Jewell Valley	Jewell Valley	Buchanan	Virginia	7	Upper Buchanan	All-rail	5.84	5,000 ton-trainload	525	1.2
Ford Motor Co.	Dearborn	Western Coal Corp.	Pine Branch	Pine Branch	Wise	Virginia	8	Clinch Valley No. 2	All-rail	5.53	5,000 ton-trainload	520	1.1
		Olga Coal Co.	Olga	Susanna	McDowell	Kentucky	8	Thacker	Rail-lake	4.34	Lake vessel charge \$1.30 per ton	351	1.2
		Carbon Fuel Co.	Carbon No. 6	West Carbon	Kanawha	West Virginia	7	Tug River	Rail to Toledo/	4.34	-----do-----	394	1.1
		Island Creek Coal Co.	No. 27	Holden	Kanawha	West Virginia	8	Logan	-----do-----	4.14	-----do-----	309	2.3
		Winding Gulf Coals, Inc.	Clifftop No. 1	Clifftop	Logan	West Virginia	8	Logan	-----do-----	4.14	-----do-----	394	1.1
		Spruce River Coal Co.	No. 9A	Jeffrey	Fayette	West Virginia	7	Greenbrier	-----do-----	4.14	-----do-----	394	1.1
		Slab Fork Coal Co.	Slab Fork	Boone	West Virginia	8	Kanawha	-----do-----	4.34	-----do-----	388	1.2	
		Consolidation Coal Corp.	Turkey Gap	Raleigh	West Virginia	7	New River	-----do-----	4.34	-----do-----	349	1.2	
				Springton	Mercer	West Virginia	7	Pocahontas	-----do-----	4.34	-----do-----	392	1.1
									-----do-----	4.34	-----do-----	426	1.0
Great Lakes Steel Corp.	Zug Island	Johnson-Elkhorn Coal Co.	Johnson Elkhorn	Airco	Floyd	Kentucky	8	Big Sandy	Rail-lake	4.14	Lake vessel charge \$1.16 per ton	397	1.0
		Eastern Assoc. Coal Corp.	Keystone No. 2	Herndon	Wyoming	West Virginia	7	Virginian	Rail to Toledo/	4.34	-----do-----	394	1.1
		Eastern Assoc. Coal Corp.	Keystone No. 3	Herndon	Wyoming	West Virginia	7	Virginian	-----do-----	4.34	-----do-----	394	1.1
		Island Creek Coal Co.	No. 10	Dewett	Logan	West Virginia	8	Logan	-----do-----	4.34	-----do-----	351	1.1
		National Coal Mfg. Co.	No. 25	Scarlett Glen	Mingo	West Virginia	8	Thacker	-----do-----	4.14	-----do-----	309	1.3
		Island Creek Coal Co.	No. 34	Mitchell Jct.	Mingo	West Virginia	8	Thacker	-----do-----	4.14	-----do-----	351	1.2
		Island Creek Coal Co.	No. 17	Mabley	Mingo	West Virginia	8	Thacker	-----do-----	4.14	-----do-----	351	1.2
		Pocahontas Empire	Jacob's Fork	Squire	McDowell	West Virginia	7	Pocahontas	-----do-----	4.34	-----do-----	394	1.1
Minnesota Koppers Co., Inc.	St. Paul	Eastern Assoc. Coal Corp.	Keystone No. 2	Herndon	Wyoming	West Virginia	7	Virginian	Rail-lake	3.79	Vessel-1.75; Rail-1.80	394	1.0
		Island Creek Coal Co.	Beatrice	Cruncy	Buchanan	Virginia	7	Upper Buchanan	Rail to Toledo/	3.79	-----do-----	384	1.0
		Eastern Assoc. Coal Corp.	Keystone No. 1	Keystone	McDowell	West Virginia	7	Pocahontas	-----do-----	3.79	-----do-----	394	1.0
U.S. Steel Corp.	Duluth	Eastern Assoc. Coal Corp.	Wharton No. 2	Wharton	Boone	West Virginia	8	Kanawha	-----do-----	3.61	-----do-----	349	1.0
		U.S. Steel Corp.	Cary No. 9	Pilbert	McDowell	West Virginia	7	Pocahontas	Rail-lake	3.79	Vessel-1.75	394	1.0 8/
		Clinchfield Coal Div. of the Pittston Co.	Moss No. 3	B & W RR	Russell	Virginia	8	Filler	Rail to Toledo/	3.79	-----do-----	361	1.0 8/
		Buffalo Mining Co.	Buffalo	Lorado	Logan	West Virginia	8	Kanawha	-----do-----	3.61	-----do-----	361	1.0 8/

TABLE A-1. - Bituminous coal received at oven-coke plants in the United States, 1969-Continued

Oven-coke plant	Location of plant	Coal purchases		Mine location				Freight rate district	Method of movement	Rate per ton	Transportation charges		Rate per ton-mile (cents)		
		Name of company	Name of mine	Shipping point	County	State	Coal producing district				Application	Mileage			
Missouri															
Great Lakes Carbon Corp.	St. Louis	Jewell Ridge Coal Corp.	Jewell Valley	Jewell Valley	Buchanan	Virginia	7	Upper Buchanan	All-rail	5.75	5,000 ton-trainload	608	0.9		
		Eastern Assoc. Coal Corp.	Keystone No. 1	Keystone	McDowell	West Virginia	7	Pocahontas	All-rail	5.75	5,000 ton-trainload	618	0.9		
		Eastern Assoc. Coal Corp.	No. 3	Wharton	Boone	West Virginia	8	Kanawha	All-rail	5.54	5,000 ton-trainload	583	1.0		
		Eastern Assoc. Coal Corp.	Kopperston No. 1	Kopperston	Wyoming	West Virginia	7	Virginian	All-rail	5.75	5,000 ton-trainload	618	0.9		
		Imperial Colliers Co.	Imperial No. 5	Burnwell	Kanawha	West Virginia	8	Kanawha	All-rail	5.54	5,000 ton-trainload	580	1.0		
New Jersey															
Koppers Co., Inc.	Pearrey	Eastern Assoc. Coal Corp.	Wharton No. 2	Wharton	Boone	West Virginia	8	Kanawha	Rail-Water	4.51	Vessel-1.46	470	1.0		
		Eastern Assoc. Coal Corp.	Keystone No. 1	Keystone	McDowell	West Virginia	7	Pocahontas	Rail to Hampton Falls, Va. 1/2	4.50	-----	372	1.2		
		Eastern Assoc. Coal Corp.	Kopperston No. 2	Kopperston	Wyoming	West Virginia	8	Virginian	-----	4.51	-----	414	1.1		
		Royalty Smokeless Coal Company	Premier	Premier	McDowell	West Virginia	7	Pocahontas	-----	4.50	-----	470	0.9		
		Island Creek Coal Co.	Beatrice	Grundy	Buchanan	Virginia	7	Upper Buchanan	-----	4.40	-----	409	0.9		
New York															
Allied Chemical Corp.	Buffalo	Seam-Solvey Div.	Tralce	Tralce	Wyoming	West Virginia	7	Virginian	All-rail	5.52	5,000 ton-trainload	546	1.2		
		Allied Chemical Corp.	Shannon Branch	Capels	McDowell	West Virginia	7	Pocahontas	All-rail	5.52	5,000 ton-trainload	587	1.1		
		Seam-Solvey Div.	Harewood	Harewood	Fayette	West Virginia	8	Kanawha	All-rail	5.37	5,000 ton-trainload	456	1.4		
		Allied Chemical Corp.	Island Creek Coal Co.	No. 19	Emmett	Logan	West Virginia	8	Kanawha	All-rail	5.37	5,000 ton-trainload	546	1.2	
		Jewell Smokeless Coal Co.	No. 1	Coronet	Buchanan	Virginia	7	Pocahontas	All-rail	5.52	5,000 ton-trainload	577	1.1		
		Clinchfield Coal Div.	Moss No. 2	Clinchfield	Russell	Virginia	8	Tiller	All-rail	5.37	5,000 ton-trainload	617	1.0		
		Pittston Co.	No. 2	Lee	Nicholas	West Virginia	7	Crownbrier	All-rail	5.52	5,000 ton-trainload	579	1.1		
		Reitz Coal Co.	No. 4	Calmbrook	Somerset	Pennsylvania	1	Somerset	All-rail	5.77	5,000 ton-trainload	259	2.2		
		Spruce River Coal Co.	Spruce River	Jeffrey	Boone	West Virginia	8	Kanawha	All-rail	5.37	5,000 ton-trainload	503	1.2		
		Carbon Fuel Co.	Carbon Nos. 9,20,29	Carbon	Kanawha	West Virginia	8	Kanawha	All-rail	5.37	5,000 ton-trainload	500	1.3		
		Bethlehem Steel Corp.	Lackawanna	Bethlehem Mines Corp.	No. 31	Banty Glo	Cambria	Pennsylvania	1	Clearfield	All-rail	5.04	5,000 ton-trainload	217	2.3
				Bethlehem Mines Corp.	No. 32	Revloc	Cambria	Pennsylvania	1	Clearfield	All-rail	5.04	5,000 ton-trainload	217	2.3
Bethlehem Mines Corp.	No. 51			Ellsworth	Washington	Pennsylvania	2	Westmoreland	All-rail	4.70	7,000 ton-trainload 2/3	276	1.7		
Bethlehem Mines Corp.	No. 58			Marion	Washington	Pennsylvania	2	Westmoreland	All-rail	4.70	7,000 ton-trainload 2/3	276	1.7		
Bethlehem Mines Corp.	No. 60			Ellsworth	Washington	Pennsylvania	2	Westmoreland	All-rail	4.70	7,000 ton-trainload 2/3	276	1.7		
Beth-Elkhorn Corp.	Hendrys No. 22			Deane	Letcher	Kentucky	8	Elkhorn	All-rail	5.37	5,000 ton-trainload	590	1.1		
Bethlehem Mines Corp.	No. 111			Shawrock	Kanawha	West Virginia	8	Kanawha	All-rail	5.37	5,000 ton-trainload	500	1.3		
Bethlehem Mines Corp.	Bunice			Bunice	Kanawha	West Virginia	8	Kanawha	All-rail	5.73	Single-car	503	1.3		
Clinchfield Coal Div. of the Pittston Co.	Moss No. 2			Clinchfield	Russell	Virginia	8	Tiller	All-rail	5.37	5,000 ton-trainload	617	1.0		
Amherst Coal Co.	Amherst No. 1			Amherstdale	Logan	West Virginia	8	Tiller	All-rail	5.37	5,000 ton-trainload	580	1.2		
Donner Hanna Coke Corp.															
Buffalo	Clinchfield Coal Div. of the Pittston Co.			Moss No. 1	Moss	Dichinson	Virginia	8		All-rail	5.10	5,000 ton-trainload	587	0.9	
	Westmoreland Coal Co.	Hampton No. 3	Hampton	Logan	West Virginia	8		All-rail	5.10	5,000 ton-trainload	416	1.2			
	Amherst Coal Co.	Lundale No. 1	Amherstdale	Logan	West Virginia	8		All-rail	5.10	5,000 ton-trainload	540	0.9			
	Crystal Block Coal Co.	Grapevine	Elda	Mingo	West Virginia	8		All-rail	5.25	5,000 ton-trainload	584	1.0			
	Kentland-Elkhorn Coal Corp.	Spruce Fork	Biggs	Pike	Kentucky	5		All-rail	5.25	5,000 ton-trainload	577	0.9			
	Consolidation Coal Co.	Hutchinson	Kutchninson	Westmoreland	Pennsylvania	2	Clearfield	All-rail	5.04	5,000 ton-trainload	313	1.6			
	Burnes & Tucker Co.	Lancashire No. 24	Stiles Crossing	Cambria	Pennsylvania	1	Clearfield	All-rail	5.04	5,000 ton-trainload	217	2.3			
	Consolidation Coal Co.	Champion	Champion	Allegheny	Pennsylvania	2	Clearfield	All-rail	5.04	5,000 ton-trainload	232	1.9			
	Reitz Coal Co.	Reitz	Calmbrook	Somerset	Pennsylvania	1	Clearfield	All-rail	5.04	5,000 ton-trainload	259	1.9			
	Ohio														
Armco Steel Corp.	Hamilton	Armco Steel Corp.	No. 7	Montcoal	Bellevue	West Virginia	8	Kanawha	All-rail	6/4.06	5,000 ton-trainload	249	1.6		
		Armco Steel Corp.	Robin Hood	Robin Hood	Boone	West Virginia	8	Kanawha	All-rail	5/4.06	5,000 ton-trainload	249	1.6		
		Eastern Assoc. Coal Corp.	Keystone No. 1	Keystone	McDowell	West Virginia	7	Pocahontas	All-rail	5.54	5,000 ton-trainload	284	2.0		
Armco Steel Corp.	Middletown	Armco Steel Corp.	No. 7	Montcoal	Bellevue	West Virginia	8	Kanawha	All-rail	6/4.06	5,000 ton-trainload	258	1.6		
		Armco Steel Corp.	Robin Hood	Robin Hood	Boone	West Virginia	8	Kanawha	All-rail	6/4.06	5,000 ton-trainload	258	1.6		
		Eastern Assoc. Coal Corp.	Keystone No. 1	Keystone	McDowell	West Virginia	7	Pocahontas	All-rail	5.54	5,000 ton-trainload	296	1.6		

TABLE A-1. - Bituminous coal received at oven-coke plants in the United States, 1969-Continued

Oven-coke plant	Location of plant	Coal purchases		Shipping point	Mine location			Freight rate district	Method of movement	Transportation charges			Rate per ton-mile (cents)
		Name of company	Name of mine		County	State	Coal producing district			Rate per ton	Application	Storage	
Ohio (continued) U.S. Steel Corp.	Lorain	U.S. Steel Corp.	Gary No. 14	Munson	McDowell	West Virginia	7	Pocahontas	All-rail	5.54	5,000 ton-trainload	-1	1.4
		U.S. Steel Corp.	Gary No. 2	Wilcox	McDowell	West Virginia	7	Pocahontas	All-rail	5.54	5,000 ton-trainload	-1	1.4
		U.S. Steel Corp.	Gary No. 10	Wilcox	McDowell	West Virginia	7	Pocahontas	All-rail	5.54	5,000 ton-trainload	-1	1.4
		Island Creek Coal Co.	No. 27	Milton	Logan	West Virginia	8	Logan	All-rail	5.24	5,000 ton-trainload	3.5	1.4
		Island Creek Coal Co.	No. 10	Lowell	Logan	West Virginia	8	Logan	All-rail	5.24	5,000 ton-trainload	3.5	1.4
		U.S. Steel Corp.	Nos. 7 & 10	Lynch	Marion	Kentucky	8	Marion	All-rail	5.24	5,000 ton-trainload	52	1.0
		Leetown Coal Co.	Leetown	Truitt	Buchanan	Virginia	8	Thacker	All-rail	5.24	5,000 ton-trainload	131	1.3
		Leetown Coal Co.	Poplar Creek	Truitt	Buchanan	Virginia	8	Thacker	All-rail	5.24	5,000 ton-trainload	131	1.3
Detroit Steel Corp.	Portsmouth	Winding Gulf Coals, Inc.	East Gulf	East Gulf	Raleigh	West Virginia	7	New River	Rail-barge-rail	2.10	Barge 40-45 cents 5	145	1.4
		Winding Gulf Coals, Inc.	MacAlpine	MacAlpine	Raleigh	West Virginia	7	New River	Rail-barge-rail	2.10	Barge 40-45 cents 5	145	1.4
		Winding Gulf Coals, Inc.	Tama	Tama	Raleigh	West Virginia	7	Virginian	Rail-barge-rail	2.10	Barge 40-45 cents 5	145	1.4
		Crystall Block Coal & Coke Co.	Trapevine No. 1	Flite	Mingo	West Virginia	8	Thacker	Rail-barge-rail	1.77	Barge 40-45 cents 5	5	2.0
Diamond Shamrock Corp.	Painesville	Cook Alma Coal Corp.	Cook Alma	Spring	Mingo	West Virginia	8	Thacker	Rail-barge-rail	1.77	Barge 40-45 cents 5	5	2.0
		Island Creek Coal Co.	No. 9 B	Coal Mountain	Wyoming	West Virginia	8	Virginian	All-rail	5.24	5,000 ton-trainload	421	1.2
Youngstown Sheet & Tube Co. Campbell		Harman Mining Corp.	Harman	Harman	Buchanan	Virginia	8	Thacker	All-rail	5.24	5,000 ton-trainload	421	1.3
		Slab Fork Coal Co.	Slab Fork	Slab Fork	Raleigh	West Virginia	7	New River	All-rail	5.54	5,000 ton-trainload	421	1.4
		Buckeye Coal Co.	Hemacolin	Hemacolin	Greene	Pennsylvania	2	Klondike	Barge-rail-barge	.62	Rail 1.31 7/8	111	1.1
		Mathies Coal Co.	Mathies	Courtney	Washington	Pennsylvania	2	Westmoreland	Barge-rail-barge	.41	Rail 1.31 7/8	111	2.0 8/
		Olga Coal Co.	Olga	Susanna	McDowell	West Virginia	7	Pocahontas	All-rail	5.54	5,000 ton-trainload	421	1.3
Republic Steel Corp.	Cleveland	Eastern Assoc. Coal Corp.	Kopperston No. 1	Kopperston	Wyoming	West Virginia	7	Virginian	All-rail	5.54	5,000 ton-trainload	421	1.4
		Woodruff Coal Co.	Base	H & W Hill	Pike	Kentucky	8	Kentucky	All-rail	5.24	5,000 ton-trainload	421	1.2
		Island Creek Coal Co.	Holten	Holten	Logan	West Virginia	8	Logan	All-rail	5.24	5,000 ton-trainload	366	1.4
		Republic Steel Corp.	Russellton	Russellton	Allegheny	Pennsylvania	2	Pittsburgh	All-rail	4.44	5,000 ton-trainload	131	3.4
		Republic Steel Corp.	Newfield	Verona	Allegheny	Pennsylvania	2	Pittsburgh	All-rail	4.44	5,000 ton-trainload	131	3.4
Republic Steel Corp.	Warren	Republic Steel Corp.	No. 4	Van Meter	Westmoreland	Pennsylvania	2	Westmoreland	All-rail	4.44	5,000 ton-trainload	155	2.4
		Beatrice Pocahontas Co.	Beatrice	Grundy	Buchanan	Virginia	7	Upper Buchanan	All-rail	5.54	5,000 ton-trainload	391	1.4
		Westmoreland Coal Co.	Hampton No. 4	Hampton	Boone	West Virginia	8	Kanawha	All-rail	5.24	5,000 ton-trainload	376	1.9
		Republic Steel Corp.	Republic	Marionbone	Pike	Kentucky	8	Kentucky	All-rail	5.81	5,000 ton-trainload	393	1.4
		Republic Steel Corp.	Russellton	Russellton	Allegheny	Pennsylvania	2	Pittsburgh	All-rail	4.44	5,000 ton-trainload	101	NA
Republic Steel Corp.	Massillon	Republic Steel Corp.	Van Meter	Van Meter	Westmoreland	Pennsylvania	2	Westmoreland	All-rail	4.42	Single-car	154	2.9
		Winding Gulf Coals, Inc.	East Gulf	East Gulf	Raleigh	West Virginia	7	New River	All-rail	5.54	5,000 ton-trainload	326	1.7
		Republic Steel Corp.	No. 4	Van Meter	Westmoreland	Pennsylvania	2	Westmoreland	All-rail	3.50	5,000 ton-trainload	119	2.9
		Republic Steel Corp.	Russellton	Russellton	Allegheny	Pennsylvania	2	Pittsburgh	All-rail	3.41	5,000 ton-trainload	65	5.2
		Beatrice Pocahontas Co.	Clyde	Fredericktown	Washington	Pennsylvania	2	Westmoreland	All-rail	3.62	5,000 ton-trainload	112	3.2
Republic Steel Corp.	Youngstown	Beatrice Pocahontas Co.	Beatrice	Grundy	Buchanan	Virginia	7	Upper Buchanan	All-rail	5.54	5,000 ton-trainload	413	1.3
		Republic Steel Corp.	No. 4	Van Meter	Westmoreland	Pennsylvania	2	Westmoreland	All-rail	3.50	5,000 ton-trainload	119	2.9
		Republic Steel Corp.	Clyde	Fredericktown	Washington	Pennsylvania	2	Westmoreland	All-rail	3.62	5,000 ton-trainload	119	3.0
		Slab Fork Coal Co.	Slab Fork	Slab Fork	Raleigh	West Virginia	7	New River	All-rail	5.54	5,000 ton-trainload	381	1.5
		Winding Gulf Coals, Inc.	Tama	Tama	Raleigh	West Virginia	7	Virginian	All-rail	5.54	5,000 ton-trainload	381	1.5
Allied Chemical Corp. Smet-Solvay Div.	Tronton	Smet-Solvay Div.	Harwood	Harwood	Fayette	West Virginia	8	Logan	Rail-barge-rail	1.97	Barge 40-50 cents 1/	58	3.4
		Smet-Solvay Div.	Trailee	Trailee	Wyoming	West Virginia	7	Virginian	Rail-barge-rail	2.10	Barge 40-50 cents 1/	149	1.4
		Smet-Solvay Div.	Shannon Branch	Capeia	McDowell	West Virginia	7	Pocahontas	Rail-barge-rail	2.10	Barge 40-50 cents 1/	139	1.5
		Island Creek Coal Co.	No. 93	Coal Mountain	Wyoming	West Virginia	7	Virginian	Rail-barge-rail	1.97	Barge 40-50 cents 1/	139	1.4
		Leckie Smokeless Coal Co.	Anjean No. 5	Watts	Greenbrier	West Virginia	7	Greenbrier	Rail-barge-rail	2.10	Barge 40-50 cents 1/	133	1.6
		Carbon Fuel Co.	No. 20	South Carbon	Kanawha	West Virginia	8	Kanawha	Rail-barge-rail	2.10	Barge 40-50 cents 1/	75	2.6
Interlake Steel Corp.	Toledo	Olga Coal Co.	Olga	Susanna	McDowell	West Virginia	7	Pocahontas	All-rail	5.54	5,000 ton-trainload	394	1.4
		Davis Coal Co., Inc.	No. 1	Kerritt	Mingo	West Virginia	8	Thacker	All-rail	5.24	5,000 ton-trainload	349	1.5
		Island Creek Coal Co.	Spurlock	Spurlock	Floyd	Kentucky	8	Big Sandy	All-rail	5.24	5,000 ton-trainload	377	1.4
Pennsylvania Pittsburgh Steel Co.	Monessen	Bird Coal Co.	Bird No. 3	Johnstown	Somerset	Pennsylvania	1	Somerset	Rail-barge-rail	1.40	Barge 40 cents per ton	85	1.6 8/
		Consolidation Coal Co.	Hutchinson	Hutchinson	Westmoreland	Pennsylvania	2	Westmoreland	Truck		Approx. 30 cents per ton	35	.9
		Gateway Coal Co.	Gateway	Clarksville	Greene	Pennsylvania	2	Klondike	Truck		Approx. 40 cents per ton	60	1.6
		Consolidation Coal Co.	Marshall	Marshall	McDowell	West Virginia	7	Pocahontas	Rail-barge-rail	2.00	Barge 60 cents 1/	139 + 267	1.4

TABLE A-1. - Bituminous coal received at over-coke plants in the United States, 1969-Continued

Over-coke plant	Location of plant	Coal purchases		Shipping point	Mine location		Coal producing district	Freight rate district	Method of movement	Transportation charges		Rate per ton-mile (cents)		
		Name of company	Name of mine		County	State				Rate per ton	Application		Mileage	
Pennsylvania (continued)														
Shenango, Inc.	Neville	Teteway Coal Co.	Teteway	Clarksville	Greene	Pennsylvania	2	Pittsburgh	All-river	Approx. 60 cents per ton	40	1.5		
		Buckeye Coal Co.	Hemlock	Nemadlin	Greene	Pennsylvania	2	Pittsburgh	All-river	-----	40	1.5		
		Consolidation Coal Co.	Hutchinson	Waterman	Westmoreland	Pennsylvania	2	Westmoreland	All-river	-----	40	1.5		
		Ashurst Coal Co.	Lardale No. 1	Ashurst	Logan	West Virginia	8	Logan	Rail-barge-rail	1.66	Barge 40-50 cents per ton 1/40	1.0		
		Winding Wolf Coal Co.	East Half	East Half	Raleigh	West Virginia	7	New River	Rail-barge-rail	2.00	Barge 40-50 cents per ton 1/40	1.0		
		Slab Fork Coal Co.	Slab Fork	Slab Fork	Raleigh	West Virginia	7	Virginian	Rail-barge-rail	2.00	Barge 40-50 cents per ton 1/40	1.0		
		Eastern Assoc. Coal Corp.	Keystone No. 1	Keystone	McDowell	West Virginia	7	Pocahontas	Rail-barge-rail	2.00	Barge 40-50 cents per ton 1/40	1.0		
		Eastern Assoc. Coal Corp.	Wharton No. 2	Wharton	Boone	West Virginia	8	Kanawha	Rail-barge-rail	1.66	Barge 40-50 cents per ton 1/40	1.0		
U.S. Steel Corp.	Clairton	U.S. Steel Corp.	Robena	Poland	Greene	Pennsylvania	2	All-river	All-river	Approx. 60 cents per ton	35	1.7		
		U.S. Steel Corp.	Maple Creek	New Creek	Washington	Pennsylvania	2	All-river	-----	35	1.7			
		U.S. Steel Corp.	Gary No. 1	Wilcox	McDowell	West Virginia	7	Pocahontas	Rail-barge-rail	2.00	Barge 60 cents per ton 1/139 + 267	1.4		
		U.S. Steel Corp.	Gary No. 2	Wilcox	McDowell	West Virginia	7	Pocahontas	Rail-barge-rail	2.00	Barge 60 cents per ton 1/139 + 267	1.4		
		U.S. Steel Corp.	Gary No. 7	Filter	McDowell	West Virginia	7	Pocahontas	Rail-barge-rail	2.00	Barge 60 cents per ton 1/139 + 267	1.4		
		U.S. Steel Corp.	Gary No. 10	Wilcox	McDowell	West Virginia	7	Pocahontas	Rail-barge-rail	2.00	Barge 60 cents per ton 1/139 + 267	1.4		
		U.S. Steel Corp.	Gary No. 14	Munson	McDowell	West Virginia	7	Pocahontas	Rail-barge-rail	2.00	Barge 60 cents per ton 1/139 + 267	1.4		
		U.S. Steel Corp.	Gary No. 17	Gary	McDowell	West Virginia	7	Pocahontas	Rail-barge-rail	2.00	Barge 60 cents per ton 1/139 + 267	1.4		
		U.S. Steel Corp.	Gary Countour	Gary	McDowell	West Virginia	7	Pocahontas	Rail-barge-rail	2.00	Barge 60 cents per ton 1/139 + 267	1.4		
		Buffalo Mining Co.	Lorado	Logan	Logan	West Virginia	8	Logan	Rail-barge-rail	1.66	Barge 60 cents per ton 1/206 + 267	1.4		
		Westmoreland Coal Co.	Hampton No. 3	Logan	Logan	West Virginia	8	Logan	Rail-barge-rail	1.66	Barge 60 cents per ton 1/206 + 267	1.4		
		Ashurst Coal Co.	McGregor	Logan	Logan	West Virginia	8	Logan	Rail-barge-rail	1.66	Barge 60 cents per ton 1/206 + 267	1.4		
		Ashurst Coal Co.	Ashurst No. 4	Logan	Logan	West Virginia	8	Logan	Rail-barge-rail	1.66	Barge 60 cents per ton 1/206 + 267	1.4		
		U.S. Steel Corp.	Fairless	Ashurst Coal Co.	Lundale No. 1	Ashurstdale	Logan	West Virginia	8	Logan	All-rail	6.80	5,000 ton-trainload	585
Ashurst Coal Co.	Ashurst No. 4			Ashurstdale	Logan	West Virginia	8	Logan	All-rail	6.80	5,000 ton-trainload	585	1.2	
Clinchfield Coal. Div.	Pittston Co.			Moss No. 2	Clinchfield	Russell	Virginia	8	Tiller	All-rail	6.80	5,000 ton-trainload	636	1.1
U.S. Steel Corp.	Gary No. 14			Munson	McDowell	West Virginia	7	Pocahontas	All-rail	6.47	5,000 ton-trainload	524	1.2	
Alan Wood Steel Co.	Swedeland	Gauley Coal & Coke Co.	Donesan No. 10	Donesan No. 10	Nicholas	West Virginia	3	Gauley	All-rail	5.51	5,000 ton-trainload	560	1.0	
		Consolidation Coal Co.	Lynco	Lynco	Wyoming	West Virginia	7	Virginian	All-rail	6.47	5,000 ton-trainload	545	1.2	
		Consolidation Coal Co.	Buckeye	Stephenson	Wyoming	West Virginia	7	Virginian	All-rail	6.47	5,000 ton-trainload	494	1.3	
		Bird Coal Co.	Bird No. 2	Johnstown	Pennsylvania	1	Somerset	All-rail	5.29	5,000 ton-trainload	254	2.1		
Bethlehem Steel Corp.	Bethlehem	Crystal Block Coal Co.	Grapevine No. 8	Elda	Mingo	West Virginia	8	Thacker	All-rail	5.60	5,000 ton-trainload	552	1.0	
		Kentland-Elkhorn Coal Corp.	Spruce Fork	Phelps	Pike	Kentucky	8	Thacker	All-rail	6.76	5,000 ton-trainload	590	1.1	
		Betta Coal Co.	Betta No. 4	Clairbrook	Somerset	Pennsylvania	1	Somerset	All-rail	6.76	5,000 ton-trainload	252	NA	
		Bethlehem Mines Corp.	No. 51	Ellsworth	Washington	Pennsylvania	2	Westmoreland	All-rail	3.25	7,000 ton-trainload	102	NA	
Bethlehem Steel Corp.	Bethlehem	Bethlehem Mines Corp.	Banty Glo No. 31	Banty Glo	Cambria	Pennsylvania	1	Clearfield	All-rail	5.23	5,000 ton-trainload	281	1.9	
		Bethlehem Mines Corp.	Reville No. 32	Reville	Cambria	Pennsylvania	1	Clearfield	All-rail	5.23	5,000 ton-trainload	281	1.9	
		Bethlehem Mines Corp.	Cambria Slope No. 33	Ebensburg	Cambria	Pennsylvania	1	Clearfield	All-rail	5.23	5,000 ton-trainload	366	1.4	
		Bethlehem Mines Corp.	Idamay No. 34	Idamay	Marion	West Virginia	3	Gauley	All-rail	5.51	5,000 ton-trainload	359	1.5	
Bethlehem Steel Corp.	Johnstown	Gauley Coal & Coke Co.	Tioga No. 1	Tioga	Nicholas	West Virginia	3	Gauley	All-rail	5.51	5,000 ton-trainload	481	1.1	
		Bethlehem Mines Corp.	Ellsworth No. 51	Ellsworth	Washington	Pennsylvania	2	Westmoreland	All-rail	3.25	7,000 ton-trainload	102	3.2	
		Bethlehem Mines Corp.	Marianna No. 58	Marianna	Washington	Pennsylvania	2	Westmoreland	All-rail	3.25	7,000 ton-trainload	102	3.2	
		Bethlehem Mines Corp.	Somerset No. 60	Cokeburg	Washington	Pennsylvania	2	Westmoreland	All-rail	3.25	7,000 ton-trainload	102	3.2	
Eastern Gas & Fuel Assoc.	Philadelphia	Bethlehem Mines Corp.	Bos. 31, 32	Ebensburg	Cambria	Pennsylvania	1	Clearfield	All-rail	NA	5,000 ton-trainload	43	NA	
		Bethlehem Mines Corp.	No. 41	Barrackville	Marion	West Virginia	3	Fairmont	All-rail	3.99	5,000 ton-trainload	141	2.5	
		Eastern Assoc. Coal Corp.	Keystone No. 2	Herdon	Wyoming	West Virginia	7	Virginian	All-rail	6.84	Single-car	491	1.4	
		Eastern Assoc. Coal Corp.	Wharton No. 2	Wharton	Boone	West Virginia	8	New River	All-rail	7.16	Single-car	537	1.3	
Jones & Laughlin	Alliquippa	Eastern Assoc. Coal Corp.	Kopperston No. 2	Kopperston	Wyoming	West Virginia	8	Virginian	All-rail	7.16	Single-car	530	1.3	
		Jones & Laughlin Steel Corp.	Shannonpin	Poland	Greene	Pennsylvania	2	Klondike	All-river	Approx. 55 cents per ton	35	1.6		
		Jones & Laughlin Steel Corp.	Vesta No. 4	Labella	Washington	Pennsylvania	2	Westmoreland	All-river	Approx. 65 cents per ton	35	1.8		
		Jones & Laughlin Steel Corp.	Vesta No. 5	Labella	Washington	Pennsylvania	2	Westmoreland	All-river	Approx. 65 cents per ton	35	1.8		
Jones & Laughlin Steel Corp.	Alliquippa	Consolidation Coal Co.	Crane Creek	McComas	Marion	West Virginia	7	Pocahontas	Rail-barge-rail	2.16	Barge 55 cents per ton 1/171 + 267	.8		
		Consolidation Coal Co.	Turkey Gap	Springton	Marion	West Virginia	7	Pocahontas	Rail-barge-rail	2.16	Barge 55 cents per ton 1/171 + 267	.8		
		United Pocahontas Coal Co.	Indian Ridge No. 6	Crumpler	McDowell	West Virginia	7	Pocahontas	Rail-barge-rail	2.16	Barge 55 cents per ton 1/171 + 267	.8		
		Buffalo Mining Co.	Lorado	Logan	Logan	West Virginia	8	Logan	Rail-barge-rail	1.66	Barge 55 cents per ton 1/106 + 267	.7		
		Ranger Fuel Corp.	Barrett	Barrett	Boone	West Virginia	8	Kanawha	Rail-barge-rail	1.66	Barge 55 cents per ton 1/104 + 267	.7		

TABLE A-1 - Bituminous coal received at oven-coke plants in the United States, 1969-Continued

Overseas plant	Overseas plant	Coal purchases		Shipping point	County	State	Coal producing district	Freight rate district	Mode of movement	Rate per ton	Transportation charges		Rate per ton-mile (cents)
		Name of company	Name of mine								Application	Mileage	
Pennsylvania continued:													
Jones & Laughlin Steel Corp., Pittsburgh	Jones & Laughlin Steel Corp.	Jones & Laughlin Steel Corp.	Shannopin	Poland	Greene	Pennsylvania	2	Kidder	All-river		Approx. 65 cents per ton	35	1.3
		Jones & Laughlin Steel Corp.	Vesta No. 4	Latelle	Washington	Pennsylvania	2	Westmoreland	All-river		Approx. 65 cents per ton	35	1.3
		Jones & Laughlin Steel Corp.	Vesta No. 4	Latelle	Washington	Pennsylvania	2	Westmoreland	All-river		Approx. 65 cents per ton	35	1.3
		Consolidation Coal Co.	Crane Creek	McDowell	West Virginia	7	Pocahontas	Rail-barge-rail	2.06	Barge-65 cents per ton 1/2	427	1.5	
		Consolidation Coal Co.	Turkey Top	Springer	West Virginia	7	Pocahontas	Rail-barge-rail	2.06	-----do-----	427	1.5	
		United Pocahontas Coal Co.	Indian Ridge No. 4	Crumpler	McDowell	West Virginia	7	Pocahontas	Rail-barge-rail	2.06	-----do-----	427	1.5
		Buffalo Mining Co.	Corbett	Lordsburg	Logan	West Virginia	8	Pocahontas	Rail-barge-rail	2.06	-----do-----	427	1.5
		Crucible, Inc.	Midland	Island Creek Coal Co.	Wheelwright	Price	Floyd	West Virginia	7	Big Sandy	Rail-barge-rail	2.14	Barge-50 cents per ton 1/2
Island Creek Coal Co.	No. 10			Emmett	Logan	West Virginia	7	Logan	Rail-barge-rail	2.14	-----do-----	322	1.6
Island Creek Coal Co.	No. 27			Wilder	Logan	West Virginia	7	Logan	Rail-barge-rail	2.14	-----do-----	322	1.6
Island Creek Coal Co.	Va. Potomac			Salwood	Buchanan	Virginia	7	Upper Buchanan	Rail-barge-rail	2.10	-----do-----	426	1.5
Beatrice Pocahontas Co.	Beatrice			Salwood	Buchanan	Virginia	7	Upper Buchanan	Rail-barge-rail	2.00	-----do-----	426	1.5
Tennessee	Chattanooga			Coal Processing Corp.	Indiana	Indiana	Greene	West Virginia	4	Clinch Valley No. 2	All-rail	5.21	Single-car
		Consolidation Coal Co.	Buckeye	Creppens	Wyoming	West Virginia	4	Virginian	All-rail	5.21	Single-car	372	1.6
Texas													
Arco Steel Corp.	Houston	Arco Steel Corp.	Robin Hood	Robin Hood	Scott	West Virginia	8	Granville	Rail-barge-rail	1.48	Barge-3.20 1/2	1,127	1.3
		United Pocahontas Coal Co.	Indian Ridge No. 5	Crumpler	McDowell	West Virginia	7	Pocahontas	Rail-barge-rail	2.14	Barge-3.20 1/2	1,111	1.3
Lone Star Steel Co.	Daingerfield	Evans Coal Co.	Evans	Bokard	Waskell	Oklahoma	14	Stidler	All-rail	5.35	Minimum of 1,000 tons	264	1.9
		Imperial Smokeless Coal Co.	Quinnwood No. 2	Lee	Nicholas	West Virginia	7	New River	Rail-barge-rail	1.96	Barge-2.30; rail-3.44	317	1.7
Lone Star Steel Co.	Daingerfield	Feastody Coal Co.	Robert Smith	Clarendon	Oklahoma	14	Stidler	All-rail	5.67	Single-car	251	2.3	
		Farland Coal Co.	Farland	Stidler	Waskell	Oklahoma	14	Stidler	All-rail	5.35	Single-car	251	2.3
Utah													
U.S. Steel Corp.	Geneva	Mid-Continent Coal and Coke Co.	Dixon Creek	Carbonate	Ft. Huerfano	Colorado	16	Carbonate	All-rail	3.76	Volume-Minimum 6,900 tons per week	571	1.7
		U.S. Steel Corp.	Geneva	Carbonate	Huerfano	Colorado	20	Emery	All-rail	2.08	Trainload-Minimum 3,100 tons	140	1.2
		U.S. Steel Corp.	Somerset	Somerset	Dunnison	Colorado	16	Crested Butte	All-rail	3.64	Trainload	376	1.9
West Virginia													
Wheeling Pittsburgh Steel Corp.	East Steubenville	Warner Coal Co.	Warner	Warnerville	Allegheny	Pennsylvania	2	Pittsburgh	Barge-Allegheny River		56 cents per ton	40	1.4
		Ande Smokeless Coal Co.	Wyo	Wyo	Wyo	West Virginia	7	Virginian	Rail-barge-rail	2.00	Barge-Approx. \$1.05 per ton	416	1.8
		Major Elkhorn Coal Co.	Major Elkhorn	Kite	Ketcher	Kentucky	8	Elkhorn	Rail-barge-rail	1.66	-----do-----	362	NA
		Eastern Assoc. Coal Corp.	Colver	Colver	Cambria	Pennsylvania	1	Clearfield	Rail-barge-rail	1.38	-----do-----	140	1.4
		Kitchikan Pocahontas Coal Mining Co.	Kitchikan	Moas Mills	West Virginia	7	Pocahontas	Rail-barge-rail	2.00	-----do-----	106 + 217	1.8	
		Amherst Coal Co.	Lundale No. 1	Amherstale	Logan	West Virginia	8	Logan	Rail-barge-rail	1.66	-----do-----	106 + 217	1.5
		Omar Mining Corp.	Omar No. 15	Omar	Logan	West Virginia	8	Logan	Rail-barge-rail	1.66	-----do-----	106 + 217	1.5
		Alma Coal Corp.	Pikeville	Pike	Kentucky	8	Thacker	Rail-barge-rail	1.66	-----do-----	131 + 217	1.3	
		Eastern Assoc. Coal Corp.	Keystone No. 1	Keystone	McDowell	West Virginia	7	Pocahontas	Rail-barge-rail	2.00	-----do-----	139 + 217	1.4
		Sharon Steel Corp.	Fairmont	Eastern Assoc. Coal Corp.	Keystone No. 1	Virian	McDowell	West Virginia	7	Pocahontas	All-rail	3.68	Single-car
Joanne Coal Co.	Joanne			Rachel	Marion	West Virginia	3	Fairmont	All-rail	1.58	Single-car	20	2.9
National Steel Corp.	Weirton	National Mines Corp.	Isabella	Isabella	Fayette	Pennsylvania	2	Pittsburgh	All-river	.69	Minimum 3,000 tons	115	.6
		Mathies Coal Co.	Mathies	Courtney	Washington	Pennsylvania	2	Pittsburgh	All-river	.69	Minimum 3,000 tons	105	.7
		Itmann Coal Co.	Itmann	Itmann	Wyo	West Virginia	7	Virginian	Rail-barge/rail	2.00	Barge Approx. \$1.05 per ton	339	.9
		Jewell Ridge Coal Corp.	No. 3	Seng Camp	Buchanan	Virginia	7	Buchanan	Rail-barge/rail	2.00	Barge Approx. \$1.05 per ton	339	.9
Wisconsin													
Milwaukee Solvay Coke Div., Pickands Mather	Milwaukee	Amherst Coal Co.	Lundale No. 1	Amherstale	Logan	West Virginia	8	Logan	Rail-Lake 5/ Rail 4.13		7,200 tons trainload-Vessel-2.40	361	1.1
		United Pocahontas Coal Co.	Indian Ridge No. 6	Crumpler	McDowell	West Virginia	7	Pocahontas	Rail-Lake 4/ Rail 4.33		-----do-----	426	1.0
		Island Creek Coal Co.	Beatrice	Grundy	Buchanan	Virginia	7	Buchanan	Rail-Lake 4/ Rail 4.33		-----do-----	384	1.1
		Imperial Elkhorn Coal Co.	Calora	Ligon	Kentucky	8	Big Sandy	Rail-Lake 5/ Rail 4.13		-----do-----	338	.8	
		Kentland-Elkhorn Coal Corp.	Spruce Fork	Mega	Pike	Kentucky	8	Thacker	Rail-Lake 4/ Rail 4.13		-----do-----	364	1.1
		Cannelton Coal Co.	No. 8	Cannelton	Fayette	West Virginia	8	Kanawha	-----do-----	4.33	-----do-----	302	1.4
		Cannelton Coal Co.	No. 3	Superior	McDowell	West Virginia	7	Pocahontas	-----do-----	4.33	-----do-----	394	1.1

- 1/ Charge for dumping coal into barges is approximately 20 cents per ton.
 2/ Includes dumping of coal into barges.
 3/ The contract charge for barging coal to Sparrows Point is approximately 22-24 cents per ton.
 4/ Charge for dumping coal into vessels is 23 cents per ton.
 5/ Subject to minimum of 200,000 tons annually from mines at Ellsworth and Marlana.
 6/ Subject to minimum of 750,000 tons annually.
 7/ Rate for transferring coal from barges to railroad car--23 cents per ton.
 8/ Approx. rail distances and rail rate.

NOTE: Railroad rates include Ex Parte 267A freight rate increase which became effective November 1970.

TABLE A-2 - Transportation cost characteristics of bituminous coal shipped to selected consumers

To	Origin point or district 2/	Min. train-load tonnage	Min. annual tonnage	Rate per ton in cents incl. F-267	Mileage	Rate per ton mile in cents	RR or shipper owned equipment	Tariff reference number 3/	Coal dist.	Average B.T.U. per pound
Alabama										
Yellowleaf	Cordova, Ala.	4,000	1st. 500,000	153	128	1.195	RR	SPR 830	13	13,306
		4,000	Next 500,000	138	128	1.078	RR		13	13,306
		4,000	Next 500,000	112	128	.875	RR		13	13,306
		4,000	Excess	90	128	.703	RR		13	13,306
	Parish, Ala.	5,000	1,400,000	184	135	.919	RR	BOU 261	13	13,306
		6,000	1,700,000	119	135	.881	RR		13	13,306
		7,000	2,000,000	113	135	.837	RR		13	13,306
	Doothton, Ala.	1,600	475,000	106	68	1.559	RR	BOU 260	13	13,306
		2,500	750,000	91	68	1.338	RR		13	13,306
		2,800	855,000	89	68	1.309	RR		13	13,306
		3,200	950,000	86	68	1.265	RR		13	13,306
California										
Kaiser	York Canyon, W.M.	6,700	500,000	794	1,100	.722	RR	ATSP 15641-B	18	11,749
			700,000	680	1,100	.680	RR	ATSP 15641-B	18	11,749
			Excess	570	1,100	.518	RR	ATSP 15641-B	18	11,749
	Sunnyvale, Utah	6,000	700,000	547	1,373	.398	RR	DRW 7509-A	19	10,860
	Bunnyside, Utah	5,600		586	1,349	.434	RR	DRW 7919-B	19	10,860
Connecticut										
Bridgeport	Clearfield Dist.	7,000		491	430	1.142	RR	ICC G-113	1	13,612
	Westmoreland Dist.	7,000		520	604	.861	RR	ICC G-113	2	13,336
	Gauley Dist.			537	715	.751	RR	ICC G-113	3	13,496
Devon	Clearfield Dist.	7,000		408	501	.814	RR	ICC G-113	1	13,612
	Westmoreland Dist.	7,000		441	608	.723	RR	ICC G-113	2	13,336
Hartford	Clearfield Dist.	7,000		407	471	.864	RR	ICC G-113	1	13,612
	Westmoreland Dist.			439	645	.681	RR	ICC G-113	2	13,336
Middletown	Clearfield Dist.	7,000		556	471	1.180	RR	ICC G-113	1	13,612
	Westmoreland Dist.			584	645	.905	RR	ICC G-113	2	13,336
	Gauley Dist.			627	756	.889	RR	ICC G-113	3	13,496
Montville	Clearfield Dist.	7,000		398	351	1.134	RR	ICC G-113	1	13,612
	Westmoreland Dist.			439	502	.875	RR	ICC G-113	2	13,336
	Gauley Dist.			456	613	.744	RR	ICC G-113	3	13,496
New Haven	Clearfield Dist.	7,000		406	351	1.137	RR	ICC G-113	1	13,612
	Westmoreland Dist.			439	508	.875	RR	ICC G-113	2	13,336
	Gauley Dist.			456	613	.745	RR	ICC G-113	3	13,496
Delaware										
Dover	Clearfield Dist.	7,000		461	322	1.432	RR	ICC G-113	1	13,612
	Westmoreland Dist.	7,000		490	457	1.078	RR	ICC G-113	2	13,336
Millsboro	Clearfield Dist.	7,000		461	352	1.310	RR	ICC G-113	1	13,612
	Westmoreland Dist.			490	473	1.036	RR	ICC G-113	2	13,336
Wilmington	Clearfield Dist.	7,000		437	277	1.578	RR	ICC G-113	1	13,612
	Westmoreland Dist.			469	413	1.136	RR	ICC G-113	2	13,336
	Gauley Dist.			487	525	.968	RR	ICC G-113	3	13,496
District of Columbia										
Bolling, D.C.	Clearfield Dist.	7,000		400	295	1.356	RR	ICC G-113	1	13,612
	Westmoreland Dist.	7,000		429	368	1.166	RR	ICC G-113	2	13,336
	Gauley Dist.	7,000		464	479	.969	RR	ICC G-113	3	13,496
	Thacker Dist.	7,000		536	316	1.696	RR		8	13,663
Georgia										
Dayton	Dayton, Tenn.	5,000		329	280	1.175	RR	SPR 970-B	8	13,663
							ICC B-757			
Atlanta	Western, Ky.	7,000		437	432	1.012	RR		9	12,895
Augusta	Allen, Va.	5,000	1,500,000	356	385	.925	RR	SPR 1123	8	13,663
Marlee	Arco, Tenn.	5,000	500,000	212	442	.480	Shipper	BOU 220-A	8	13,663
		10,000	1,400,000	202	442	.457	Shipper		8	13,663
Jasmar	Lewis, Ky.	7,000	1,400,000	205	367	.666	RR	SPR 914-B	8	13,663
Mitchell	Alva, Ky.	2,500	525,000	443	665	.666	RR	SPR 914-B	8	13,663
	Whiteside, Tenn.	7,000	225,000	458	458	1.000	RR		8	13,663
Milledgeville	Arco, Tenn.	10,000		235	312	.733	RR		13	13,306
	Harlan Dist.	7,000		340	275	1.236	RR	SPR 997-A	13	13,306
Port Westworth	Kanawha Dist.	7,000		653	604	1.081	RR	ICC B-759	8	13,663
Illinois										
Peru	Peru, Ill.	5,000	1,000,000	73	85	.859	Shipper	GM & O 3896-B	10	11,400
Joliet	Peru, Ill.	10,000		120	300	.400	Shipper		10	11,400
	Montana	10,000		700	1,200	.593	Shipper		10	11,400
	Belleville Dist.	5,000		163	238	.685	RR		10	11,400
Joppe	Central Illinois	5,400	1,000,000	109	61	1.721	RR	C & E 104	10	11,400
		5,400	1,300,000	101	61	1.636	RR	C & E 104	10	11,400
Pekin	Taylorville, Ill.	4,000		140	75	1.867	Shipper		10	11,400
Pewee	Cuba, Ill.	2,000		98					10	11,400
	Carlin	1,000		110					10	11,400
Plattine	Peru, Ill.	7,000	1,300,000	170	308	.552	Shipper	GM & O 3893-B	10	11,400
Rockford	Franklin-Williamson Dist. (Ill.)	5,000		443	110	1.429	RR		10	11,400
Venice	Belleville Dist. (Ill.)	10,000		139	84	1.655	RR		10	11,400
Waukegan	Philten, Co., Ill.	9,000	900,000	193	236	.818	RR	C & M 17160-B	10	11,400
	Peru, Ill.	10,000	1,600,000	231	341	.677	Company	GM & O 3897-C	10	11,400
	Carlinville, Ill.	10,000		286	150	1.907	Company		10	11,400
	Freeburg, Ill.	5,000		324	264	1.227	RR		10	11,400
Indiana										
Milltown	Booneville, Ind.	6,200	400,000	234	360	.650	RR	BOU 211	11	11,490
		9,000	1,000,000	203	360	.564	RR		11	11,490
Campbell	Sandborn, Ind.	4,500	700,000	187	70	2.671	RR	L & B 5078	11	11,490
Cayuga	Clinton-Brasil Dist. (Ind.)	10,000	2,900,000	40	22	1.818	Shipper or company	L & B 5078	11	11,490
		10,000	2,000,000	47	22	2.136		L & B 5078	11	11,490
		6,000	1,000,000	59	22	2.682		L & B 5078	11	11,490
Centerton	Sandborn, Ind.	4,500	700,000	178	100	1.780	RR	L & B 5078	11	11,490
Darwin	Vincennes, Ind.	354		170	208	.3	RR		11	11,490
E. Chicago	Springfield, Ill.	10,000	1,500,000	282	215	1.312	RR	IC 3347-C	10	11,400
		10,000	1,500,000	294	215	1.367	RR	IC 3347-C	10	11,400
		10,000	1,500,000	247	215	1.149	Shipper	IC 3347-C	10	11,400
Edwardport	Sandborn, Ind.			88	24	3.667	RR	PRR 13-13-B	11	11,490
Fayette	Elston-Bullman Dist. (Ind.)	1,000		154	38	4.053	RR	CHRTFF 18590-C	11	11,490
		2,500	500,000	104	38	2.737	RR	CHRTFF 18590-C	11	11,490
		3,400	748,000	91	38	2.395	RR	CHRTFF 18590-C	11	11,490
		5,900	1,300,000	86	38	2.116	RR	CHRTFF 18592-P	11	11,490
		6,800	1,500,000	86	38	2.263	RR	CHRTFF 18592-P	11	11,490
		7,000	2,000,000	81	38	2.132	RR	CHRTFF 18592-P	11	11,490
		7,200	2,250,000	79	38	2.079	RR	CHRTFF 18592-P	11	11,490
Gary	Ames, W. Va.	7,800		570	508	1.122	RR	C & O 3066-B	7	14,040
	Sand Patch, Pa.	7,200		595	595	1.020	RR	B & O C-198-A	7	14,040
	Lynch, Ky.	7,800	1,800,000	570	598	.953	RR	SPR 968-A	7	14,040
		5,000	1,800,000	601	598	1.005	RR			
	Booneville, Ind.	10,000		203	282	.720	RR		11	11,490
	Cato, Ind.	10,000		203	278	.730	RR		11	11,490
	Southern Illinois	10,000		283	320	.884	RR		10	11,400
Hammond	Callup, New Mexico	5,000		1,200	1,456	.754	Shipper or company	AT & SF 15530-C	18	11,749
	Booneville, Ind.	10,000		166	289	.574	RR	FC 338-A	11	11,490
Indiana Harbor										
Sesser, Ill.		12,500	1,500,000	189	278	.680	RR	ICC 2339	10	11,400
Indianapolis										
Princeton Dist. (Ind.)		4,000	700,000	233	192	1.214	RR	IC 1331	11	11,490
		4,000	700,000	247	150	1.647	RR	FC 325	11	11,490
	Sandborn, Ind.	1,000	250,000	208	90	2.311	RR		11	11,490
	Clinton-Brasil Dist.	1,000	250,000	208	90	2.311	RR		11	11,490
Lotta	Dugger, Ind.	7,800	2,250,000	68	35	1.983	RR		11	11,490
Petersburg	Lynnville Mine, Ind.	4,000	1,800,000	51	26	1.962	Shipper or company	FC-C4-A	11	11,490
Porter	Princeton-Ayshire Dist.	10,000		203	270	.742	RR		11	11,490
St. Joseph	Clinton-Brasil	10,000		385	209	1.842	RR		11	11,490
	Princeton-Ayshire	7,000		410	285	1.439	RR		11	11,490

TABLE A-2. - Transportation cost characteristics of bituminous coal shipped to selected consumers. Continued

To	Origin point or district	Min. train-load tonnage	Min. annual tonnage	Rate per ton in cents incl. 1-207	Mileage	Rate per ton mile in cents	RR or shipper owned equipment	Tariff reference number	Coal dist.	Average B.T.U. per pound
Iowa										
Murlington	Canton, Ill.	2,000	400,000	109	81	1.301	RR	CB & Q 20510-A	13	11,400
		2,000	500,000	106	81	1.277	RR	CB & Q 20510-A	10	11,400
		2,000	600,000	104	81	1.253	RR	CB & Q 20510-A	10	11,400
Idonua	Lafayette, Ill.	2,500	300,000	104	99	2.780	RR	CR1 & P 36755-C	10	11,400
Kansas										
Kansas City	Chelera, Okla.	6,000		126	218	.578	Shipper or company	SVL 22-E	14	12,293
		6,000		185	218	.849	RR		14	12,293
Kentucky										
Louisa	Fikhorn Dist. (Ky.)	5,000		96	49	1.959	RR		8	13,663
Maryland										
Baltimore	Clearfield Dist.	7,000		437	253	1.727	RR	ICC G-113	1	13,612
	Westmoreland Dist.	7,000		469	346	1.355	RR	ICC G-113	2	13,336
	Gauley Dist.	7,000		487	457	1.066	RR	ICC G-113	3	13,496
	Clarkeburg Dist.	7,200		461	288	1.601	RR	ICC G-113	3	13,496
Chalk Point	Clearfield Dist.	7,000		448	123	1.387	RR	ICC G-113	1	13,612
	Westmoreland Dist.	7,000		481	416	1.156	RR	ICC G-113	2	13,336
	Brownstown, W.Va.			416	300	1.387	RR	ICC G-113	3	13,496
Dickerson	Westmoreland Dist.			422	333	1.267	RR	ICC G-113	2	13,336
	Gauley Dist.			440	444	.991	RR	ICC G-113	3	13,496
Lime Kiln	Westmoreland Dist.	7,000		454	334	1.359	RR	ICC G-113	2	13,336
	Gauley Dist.	7,000		472	445	1.061	RR	ICC G-113	3	13,496
Pope Creek	Westmoreland Dist.			469	418	1.122	RR	ICC G-113	2	13,336
	Gauley Dist.			487	429	.981	RR	ICC G-113	3	13,496
Union Bridge	Clearfield Dist.	7,000		406	240	1.698	RR	ICC G-113	1	13,612
	Westmoreland Dist.	7,000		437	323	1.353	RR	ICC G-113	2	13,336
	Gauley Dist.	7,000		457	434	1.053	RR	ICC G-113	3	13,496
Vienne	Clearfield Dist.	7,000		487	366	1.331	RR	ICC G-113	1	13,612
	Westmoreland Dist.	7,000		486	461	.837	RR	ICC G-113	2	13,336
Woodzell	Clearfield Dist.			448	326	1.374	RR	ICC G-113	1	13,612
	Westmoreland Dist.			481	419	1.148	RR	ICC G-113	2	13,336
Massachusetts										
Holyoke	Clearfield Dist.	7,000		583	522	1.117	RR	ICC G-113	1	13,612
	Westmoreland Dist.	7,000		611	559	.927	RR	ICC G-113	2	13,336
	Gauley Dist.	7,000		627	770	.814	RR	ICC G-113	3	13,496
Springfield	Clearfield Dist.	7,000		583	510	1.143	RR	ICC G-113	1	13,612
	Westmoreland Dist.	7,000		611	656	.931	RR	ICC G-113	2	13,336
	Gauley Dist.	7,000		613	767	1.060	RR	ICC G-113	3	13,496
Worcester	Clearfield Dist.	7,000		597	551	1.083	RR	ICC G-113	1	13,612
	Westmoreland Dist.	7,000		625	701	.892	RR	ICC G-113	2	13,336
	Gauley	7,000		643	812	.792	RR	ICC G-113	3	13,496
Michigan										
Belle River	Ohio #8 Dist.	10,000	4,000,000	367	348	1.055	RR	ICC 106	4	12,234
	Ohio #8 Dist.	7,000	10,000,000	489	348	1.405	RR	ICC 106	4	12,234
Detroit	Powhatan, Ohio	8,600		220	288	.764	Shipper or company	PRR 3308-B	4	12,234
	Powhatan, Ohio	8,600		288	310	.909	RR		4	12,234
	Ohio #8 Dist.	7,000		448	274	1.635	RR	PC C18-A	4	12,234
	Ohio #8 Dist.	10,000		236	252	.937	RR		4	12,234
	Sunnyhill, Ohio	8,600		288	295	.976	RR	ICC A-28	4	12,234
	Georgetown, Ohio	8,600		222	315	.705	Shipper	ICC A-28	4	12,234
	Hillier, Ohio	8,600		222	306	.724	Shipper	ICC A-28	4	12,234
	Onco, Ohio	8,600		222	330	.673	Shipper	ICC A-28	4	12,234
	Horeb Church, Ohio	8,600		222	231	.961	Shipper	ICC A-28	4	12,234
	Blacksville, W.Va.	8,600		293	399	.742	Shipper	ICC A-28	7	14,040
	Miracle Run, W.Va.	8,600		293	396	.740	Shipper	ICC A-28	7	14,040
	Wana, W.Va.	8,600		293	393	.746	Shipper	ICC A-28	7	14,040
	Jackson, Ohio	10,000		236	272	.868	RR	ICC A-28	4	12,234
							ICC A-28			
Esseneville	Freeport, Ohio	9,750	1,000,000	287	357	.804	Shipper or company	B & O C-212	4	12,234
		9,750	1,000,000	374	357	1.048	RR	B & O C-212		
	Triadelphia, W.Va.	7,000	1,000,000	364	412	.883	Shipper	B & O C-212	7	14,040
	Egypt, Ohio	9,750	1,000,000	300	376	.796	Shipper or company	B & O C-212	4	12,234
	Sunnyhill, Ohio	9,750	1,000,000	287	336	.854	Shipper	B & O C-212	4	12,234
	Crooksville	10,000		306	268	.832	RR	B & O C-212	4	12,234
Marysville	Ohio #8	7,000		490	279	1.756	RR	B & O C-212	4	12,234
Midland	Powhatan, Ohio	10,000		339	244	1.389	Shipper or company	PC C-3	4	12,234
							RR		4	12,234
	Ohio Middle Dist.	6,000	900,000	388	428	.907	RR		4	12,234
	Blacksville, W.Va.	7,000		519	329	1.578	RR	ICC 90	4	12,234
	Crooksville, Ohio	7,000	10,000,000	178	371	.480	RR	P & LE 375	7	14,040
Riverview	Ohio #8	7,000		377	244	1.545	RR	ICC G-118	4	12,234
Trenton	Georgetown, Ohio	7,800		448	233	1.923	RR		4	12,234
				220	306	.719	Shipper or company	PRR 3306-B	4	12,234
	Ohio #8	10,000		236	272	.868	RR		4	12,234
West Olive	Egypt, Ohio	9,750	1,200,000	344	468	.735	Shipper	B & O C-206-A	4	12,234
	Ohio #8	10,000	1,200,000	357	400	.893	RR		4	12,234
Wyandotte	Ohio #8	7,000		448	231	1.923	RR		4	12,234
Minnesota										
Cohasset	Colstrip, Mont.	10,000	400,000	412	789	.522	RR	BP 6061-A	22	10,280
		10,900	1,500,000	353	789	.447	RR		22	10,280
		10,900	1,500,000	321	789	.407	RR		22	10,280
		10,900	1,750,000	307	789	.389	RR		22	10,280
Minneapolis	Harrisburg, Ill.	1,000		464	650	.714	RR	CB & Q 15000-B	10	11,400
		6,000		480	727	.660	RR	BT 328	10	11,400
	Southern Ill. Group	10,000	150,000	460	640	.719	RR		10	11,400
Northtown	Colstrip, Mont.	7,000	300,000	422	802	.525	RR	BP 6075-A	22	10,280
Missouri										
Kennett	Chelera, Okla.	6,000		124	218	.569	Shipper or company	SVL 22-E	22	10,280
		6,000		181	218	.830	RR		22	10,280
		6,000	300,000	206	218	.945	RR		22	10,280
Macoma	Besser, Ill.	5,000	1,000,000	179	145	1.234	RR	CB & Q 20504-D	10	11,400
		7,000	1,000,000	151	145	1.041	RR		10	11,400
		7,000	1,000,000	132	145	.910	Shipper		10	11,400
		7,000	2,000,000	125	145	.862	RR		10	11,400
Sibley	Chelera, Okla.	6,000		168	243	.641	Shipper or company	SVL 22-E	22	10,280
West Labadie	Burning Star Mines	7,000	1,500,000	106	128	.828	RR	MP 183-A	22	10,280
New Hampshire										
Concord	Fairbairn, Pa.	9,000	900,000	466	870	.536	Shipper	P & LE 340-B	2	13,336
New Jersey										
Atlantic City	New River (W.Va.)	7,000		578	440	1.314	RR		7	14,040
	Clearfield (Pa.)	7,200		461	372	1.239	RR	ICC G-105	1	13,612
Carmey Pt.	Affinity, W.Va.	7,000		585	582	1.005	RR		7	14,040
Gibbstown	Affinity, W.Va.	7,000		616	582	1.058	RR		7	14,040
	Kanawha Dist.	7,000		599	448	1.335	RR		8	13,663
Gilbert	Kanawha Dist.	7,200		569	520	1.088	RR		8	13,663
	Clearfield Dist.	7,200		449	280	1.604	RR		1	13,612
Penna Grove	Pocahontas	7,200		565	378	1.495	RR		7	14,040

TABLE A-2. - Transportation cost characteristics of bituminous coal shipped to selected consumers ¹Continued

To	Origin point or district ²	Min. train-load tonnage	Min. annual tonnage	Rate per ton in cents incl. X-267	Rate per ton mile in cents	RR or shipper owned equipment	Tariff reference number ³	Coal dist.	Average B.T.U. per 100 lbs.
New York									
Albany	Clearfield Dist.	7,000		499	408	RR	ICC O-113	1	13,612
	Westmoreland Dist.	7,000		528	543	RR	ICC O-113	2	13,336
	Gauley Dist.	7,000		545	654	RR	ICC O-113	3	13,496
Astoria	Kanawha Dist.	10,000		523	532	RR	ICC O-113	8	13,663
Broom	Clearfield	7,200		414	224	RR	ICC O-105	1	13,612
Buffalo	Pittsburgh Dist.	7,000		410	300	RR	ICC O-105		
	Fairmont Dist.	7,000		430	393	RR	ICC O-105	2	13,336
	Clearfield Dist.	7,000		410	305	RR	ICC O-105	1	13,612
	Reynoldsville Dist.	7,000		388	209	RR	ICC O-105		
Corinth	Clearfield Dist.	7,000		537	434	RR	ICC O-113	1	13,612
	Westmoreland Dist.	7,000		564	567	RR	ICC O-113	2	13,336
	Gauley Dist.	7,000		583	678	RR	ICC O-113	3	13,496
Dresden	Clearfield Dist.	7,000		439	481	RR	ICC O-113	1	13,612
	Westmoreland Dist.	7,000		470	608	RR	ICC O-113	2	13,336
	Gauley Dist.	7,000		488	719	RR	ICC O-113	3	13,496
Dunkirk	Fairmont Dist.	7,000		406	335	RR	ICC O-105	2	13,336
	Butler-Mercer Dist.	7,000		348	147	RR	ICC O-105	2	13,336
	Reynoldsville Dist.	7,000		364	90	RR	ICC O-105	1	13,612
	Pittsburgh Dist.	7,000		372	229	RR	ICC O-105	2	13,336
Elm Falls	Clearfield Dist.	7,000		537	425	RR	ICC O-105	1	13,612
	Westmoreland Dist.	7,000		564	659	RR	ICC O-113	2	13,336
	Gauley Dist.	7,000		583	770	RR	ICC O-113	3	13,496
Johnson City	Clearfield Dist.	7,000		416	277	RR	ICC O-113	1	13,612
	Westmoreland Dist.	7,000		486	591	RR	ICC O-113	2	13,336
	Gauley Dist.	7,000		503	502	RR	ICC O-113	3	13,496
Kingston	Clearfield Dist.	7,000		499	396	RR	ICC O-113	1	13,612
	Westmoreland Dist.	7,000		528	535	RR	ICC O-113	2	13,336
	Gauley Dist.	7,000		545	649	RR	ICC O-113	3	13,496
Ludlowville	Clearfield Dist.	7,000		436	360	RR	ICC O-113	1	13,612
	Westmoreland Dist.	7,000		486	446	RR	ICC O-113	2	13,336
	Gauley Dist.	7,000		503	557	RR	ICC O-113	3	13,496
Owego	Adelphi, Pa.	7,000	500,000	432	451	RR	ICC O-113	1	13,612
	Clearfield Dist.	7,000		471	340	RR	ICC O-113	1	13,612
	Westmoreland Dist.	7,000		500	505	RR	ICC O-113	2	13,336
	Gauley Dist.	7,000		518	748	RR	ICC O-113	3	13,496
Rosewater	Pittsburgh Dist.	7,000		397	376	RR	ICC O-105		
	Fairmont Dist.	7,000		449	434	RR	ICC O-105	2	13,336
	Clearfield Dist.	7,000		397	313	RR	ICC O-105	1	13,612
	Reynoldsville	7,000		410	266	RR	ICC O-105		
Roseton	Clearfield Dist.	7,000		499	590	RR	ICC O-113	1	13,612
	Westmoreland Dist.	7,000		528	651	RR	ICC O-113	2	13,336
	Gauley Dist.	7,000		545	762	RR	ICC O-113	3	13,496
Seabrook	Clearfield Dist.	7,000		499	399	RR	ICC O-113	1	13,612
	Westmoreland Dist.	7,000		528	528	RR	ICC O-113	2	13,336
	Gauley Dist.	7,000		545	639	RR	ICC O-113	3	13,496
Solvey	Clearfield Dist.	7,000		436	312	RR	ICC O-113	1	13,612
	Westmoreland Dist.	7,000		486	426	RR	ICC O-113	2	13,336
	Gauley Dist.	7,000		503	537	RR	ICC O-113	3	13,496
T. comberga	Clearfield Dist.	7,000		469	449	RR	ICC O-113	1	13,612
	Westmoreland Dist.	7,000		507	613	RR	ICC O-113	2	13,336
	Gauley Dist.	7,000		616	724	RR	ICC O-113	3	13,496
Tomkins Cove	Clearfield Dist.	7,000		499	575	RR	ICC O-113	1	13,612
	Westmoreland Dist.	7,000		528	676	RR	ICC O-113	2	13,336
	Gauley Dist.	7,000		545	787	RR	ICC O-113	3	13,496
Torrey	Clearfield Dist.	7,200		431	300	RR	ICC O-113	1	13,612
Travis	Clearfield Dist.	7,000		420	397	RR	ICC O-113	1	13,612
	Westmoreland Dist.	7,000		528	500	RR	ICC O-113	2	13,336
	Gauley Dist.	7,000		543	611	RR	ICC O-113	3	13,496
North Carolina									
Blount	Appalachia, Va.	6,130	1,100,000	293	312	RR	BOU 231	8	13,663
		8,600	1,500,000	282	312	RR		8	13,663
		9,800	1,750,000	270	312	RR		8	13,663
	Clinch Valley #2 (Va.)	7,000	1,250,000	301	184	RR	BOU ICC All 682	8	13,663
Brice	St. Paul, Va.	100,000		401	217	RR	STPA 966	8	13,663
		350,000		296	217	RR		8	13,663
Catawba	Appalachia, Va.	6,130	1,100,000	214	282	RR	BOU 232	8	13,663
		8,600	1,500,000	207	282	RR		8	13,663
		9,800	1,750,000	200	282	RR		8	13,663
Myco	Banner, Va.	5,000	1,200,000	312	313	RR	B & W 168	8	13,663
		9,000	1,800,000	282	313	RR		8	13,663
Riverhead	Allen, Va.	5,000	1,600,000	289	340	RR	STPA 1104	8	13,663
Rushboro	Harris, V. Va.	7,200	2,500,000	332	289	RR	STPA 1104	8	13,663
Terrell	Allen, Va.	5,000	1,600,000	294	308	RR	STPA 1104	8	13,663
		5,000	2,500,000	282	308	RR	STPA 1104	8	13,663
Ohio									
Amherst	Ohio Middle	3,000		230		RR	ICC O-105	4	12,234
Avon Lake	Arnold, Ohio	10,000	2,500,000	127	155	RR	B & W C & A 121	4	12,234
Millmont	Miller, Ohio	5,000	600,000	98	22	RR	ICC O-105	4	12,234
	Portsmouth, Ohio	5,000	600,000	98	25	RR	ICC O-105	4	12,234
	Orion, Ohio	5,000	600,000	98	43	RR	ICC O-105	4	12,234
	Salineville	5,000	600,000	98	36	RR	ICC O-105	4	12,234
	Ohio #8	5,000	600,000	98	24	RR	ICC O-105	4	12,234
	Cader, Ohio	5,000		92	33	RR	ICC O-105	4	12,234
Celco	Burgin, Ohio	8,000		214	143	Company		4	12,234
	Piney Fork, Ohio	8,000		214	164	Company		4	12,234
Cleveland	Burgin, Ohio	8,000		206	101	Company		4	12,234
	Piney Fork, Ohio	8,000		244	120	Company		4	12,234
	Wama, Ohio	5,000		259		RR		4	12,234
	Cader, Ohio	5,000		259		RR		4	12,234
Dartons	Ohio #8		850,000	473	250	RR		4	12,234
	New Lexington, Ohio			352	125	RR		4	12,234
	Ohio #8			473	268	RR		4	12,234
Edgewater	Ohio #8	7,000		335	133	RR		4	12,234
Wiles	Windsorville, V. Va.			36	50	RR		6	12,768
White	Ohio #8	5,000		113	67	RR		4	12,234
Springfield	Ohio #8	7,000		422	186	RR		4	12,234
Toledo	Ohio #8	9,500	720,000	260	188	RR	B & W A175	4	12,234
	Arnold, Ohio	6,000	800,000	335	201	RR	ICC 92	4	12,234
	Lexington, Ohio	9,500	200,000	353	90	RR	ICC 92	4	12,234
	Thacker Dist.	9,500	480,000	413	376	RR	B & W A176	4	12,234
	Ohio Middle	10,000		409	150	RR	ICC O-115	4	12,234
		10,000		277	196	RR		4	12,234
	Kanawha	7,000	480,000	393	360	RR		8	13,663
Pennsylvania									
Beth	Clearfield Dist.	7,000		436	267	RR	ICC O-113	1	13,612
	Westmoreland Dist.	7,000		486	421	RR	ICC O-113	2	13,336
	Gauley Dist.	7,000		503	532	RR	ICC O-113	3	13,496
Bridgeport	Clearfield Dist.	7,000		437	263	RR	ICC O-113	1	13,612
	Westmoreland Dist.	7,000		469	420	RR	ICC O-113	2	13,336
	Gauley Dist.	7,000		487	511	RR	ICC O-113	3	13,496
Edystone	Clearfield Dist.	7,000		437	276	RR	ICC O-113	1	13,612
	Westmoreland Dist.	7,000		469	417	RR	ICC O-113	2	13,336
	Gauley Dist.	7,000		487	528	RR	ICC O-113	3	13,496
Erie	Mercer-Butler Dist.	7,000		276	88	RR		2	13,336
Evansville	Clearfield Dist.	7,000		428	232	RR	ICC 106	1	13,612
	Westmoreland Dist.	7,000		458	366	RR	ICC 106	2	13,336
	Gauley Dist.	7,000		478	477	RR	ICC 106	3	13,496
Hercules	Clearfield Dist.	7,000		456	275	RR	ICC 106	1	13,612
	Westmoreland Dist.	7,000		486	421	RR	ICC 106	2	13,336
	Gauley Dist.	7,000		503	532	RR	ICC 106	3	13,496
Martins Creek	Bakerton, Pa.	10,000		299	139	Shipper or company	ICC 106	2	13,336
	Clearfield Dist.	7,000		436	266	RR	ICC O-113	1	13,612
	Westmoreland Dist.	7,000		486	437	RR	ICC O-113	2	13,336
	Gauley Dist.	7,000		503	548	RR	ICC O-113	3	13,496

TABLE A-2. - Transportation cost characteristics of bituminous coal shipped to selected consumers^{1/} Continued

To	Origin point or district 2/	Min. train-load tonnage	Min. annual tonnage	Rate per ton in cents incl. 1-267	Mileage	Rate per ton mile in cents	RR or shipper owned equipment	Tariff reference number 3/	Coal dist.	Average B.T.U. per pound
Pennsylvania (cont.)										
Portland	Clearfield Dist.	7,000		456	278	1.640	RR	ICC 106	1	13,612
	Westmoreland Dist.	7,000		486	432	1.125	RR	ICC 106	2	13,336
Reading	Gauley Dist.	7,000		503	543	.926	RR	ICC 106	3	13,496
	Clearfield Dist.	7,000		426	222	1.919	RR	ICC 106	1	13,612
Saylor	Westmoreland Dist.	7,000		458	360	1.272	RR	ICC 106	2	13,336
	Gauley Dist.	7,000		478	470	1.017	RR	ICC 106	3	13,496
	Clearfield Dist.	7,000		456	263	1.734	RR	ICC 106	1	13,612
	Westmoreland Dist.	7,000		456	390	1.246	RR	ICC 106	2	13,336
	Gauley Dist.	7,000		507	501	1.012	RR	ICC 106	3	13,496
Shamokin Run	Penfield, Pa.	7,000		246	137	1.796	Shipper or company	PRR C3291A	1	13,612
	Cooks Run, Pa.	7,000		218	107	2.037	PRR	A3291C	1	13,612
Slagford	Clearfield E.	7,000		269	130	2.069			1	13,612
	Clearfield W.	7,000		102	157	1.904			1	13,612
	Clearfield Dist.	7,000		35	294	.119	RR	ICC 106	1	13,612
	Westmoreland Dist.	7,000		486	401	1.212	RR	ICC 106	2	13,336
Spring Grove	Gauley Dist.	7,000		507	512	.990	RR	ICC 106	3	13,496
	Clearfield Dist.	7,000		358	207	1.903	RR	ICC 106	1	13,612
Williamsburg	Westmoreland Dist.	7,000		437	315	1.387	RR	ICC 106	2	13,336
	Gauley Dist.	7,000		457	426	1.073	RR	ICC 106	3	13,496
York Haven	Somerset Dist.	10,000		218	139	1.568	Shipper or company	PRR C-20-B	2	13,336
	Shakertown, Pa.	10,000	1,800,000	199	139	1.432			2	13,336
	Clearfield Dist.	7,000		406	186	2.183		ICC G-113	1	13,612
	Westmoreland Dist.	7,000		437	299	1.462		ICC G-113	2	13,336
South Carolina										
Beach Island	Jellison Dist.	7,200		522	396	1.318	RR		8	13,663
Canadya	Allen, Va.	5,000	1,500,000	176	516	.729	RR	SPTB 1123	8	13,663
Charleston	Glenbrook, Ky.			522	592	.882	RR		8	13,663
Hartsville	Kanawha	7,200		490	532	.921	RR		8	13,663
Irmo	Cambridge, V.Va.	5,000		443	320	1.384	RR		8	13,663
Palmer	Allen, Va.	5,000	740,000	361	269	1.342	RR	SPTB 1104	8	13,663
Utah										
Geneva	Somerset, Colo.	3,100	1,300,000	310	351	.883	RR	DRGW 7510A	16	9,431
	Columbia, Utah	3,100	1,300,000	195	128	1.523	RR	DRGW 7510A	20	12,610
	Carbondale, Colo.	1,200	350,000	276	360	.767	RR	DRGW 7511B	16	9,431
Vermont										
Burlington	Clearfield Dist.	7,000		625	547	1.143	RR	ICC G-113	1	13,612
	Westmoreland Dist.	7,000		669	682	.981	RR	ICC G-113	2	13,336
	Gauley Dist.	7,000		684	793	.863	RR		3	13,496
Virginia										
Alexandria	Virginian Dist.	7,200		507	252	2.012	RR		8	13,663
	New River Group	5,000	2,800,000	410	278	1.475	RR		7	14,040
Broom	Kanawha	7,200		392	256	1.531	RR	C & O 25D	8	13,663
	Kanawha	7,200		424	256	1.656	RR		8	13,663
Chester	Potomac	7,200		331	274	1.208	RR		7	14,040
Dumfries	Virginian Dist.	7,000		178	136	1.309	RR		7	14,040
Glenn Lyn	Potomac	7,200		466	358	1.302	RR		7	14,040
Wisconsin										
Oak Creek	Sherwood Dist.	9,000	1,100,000	204	212	.962	RR	C & NW 17162B	10	11,400
		9,000	1,500,000	196	212	.925	RR	C & NW 17162B	10	11,400
	Pulmon Co. Ill.	9,000	1,100,000	218	271	.804	RR	C & NW 17162B	10	11,400
		9,300	1,500,000	213	271	.786	RR	C & NW 17162B	10	11,400
	Springfield Dist.	9,000	1,100,000	233	375	.621	RR	C & NW 17162B	10	11,400
		9,000	1,500,000	228	375	.608	RR	C & NW 17162B	10	11,400
	W. Frankfort, Ill.	9,100	1,000,000	278	471	.590	Shipper or company	IC 1349	10	11,400
	Vandalia, Ky.	9,500	1,000,000	316	627	.504			9	12,285
	Bessemer, Ill.	9,500	1,000,000	278	438	.635	Shipper or company	CB & Q 205..	10	11,400
Shenbogan	Elm, Ill.	8,500	850,000	179	127	.547		CHW 17172B	-	11,400

^{1/} Electric utility company consumers represent the largest share of the data. Cement manufacturing consumers are also represented.^{2/} Several seasons of collection of data were used in developing this table. Consequently, the point from which coal was shipped is listed by the location of the tipple, the freight rate district, or the coal field.^{3/} Railroad tariff reference numbers are preceded by the initials of the railroad. Interstate Commerce Commission tariff reference numbers are preceded by the initials ICC.

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16. Abstracts The report delineates some of the important factors relating to the costs of transporting fossil fuels from regions of production to sites of consumption. The costs of shipping coal have been presented in a quantified fashion for selected producing area to areas of consumption. The costs of shipping residual fuel oil and natural gas from domestic and foreign sources to New York and San Francisco Standard Metropolitan Statistical Areas are also provided. The collected transportation data were stratified to determine the general effects stratification had upon transportation costs. Economics of haul for coal do exist for longer versus shorter distances, larger trainload versus smaller trainload sizes, and company-owned car ownership versus railroad car ownership. Most of the rates for the longer voyages for the tanker and barge transportation of residual oil also show economies of haul.				
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