

IN THE MATTER OF
ETHYL CORPORATION, ET AL.

FINAL ORDER, OPINION, ETC., IN REGARD TO ALLEGED VIOLATION OF
SEC. 5 OF THE FEDERAL TRADE COMMISSION ACT

Docket 9128. Complaint, May 30, 1979—Final Order, March 22, 1983

This Final Order requires the nation's two leading producers of lead-based antiknock gasoline additives, among other things, to cease announcing price changes in advance of the period contractually required for advance notice to customers, and using a "most-favored-nation" clause in any contract for the sale or delivery of lead-based antiknock compounds. Further, when stating a delivered price for any lead-based antiknock compound, the companies must also quote the product's point of origin price, a separate price for shipment, and allow customers to arrange for their own shipping and delivery. While the order does not prohibit the companies when acting individually from selecting their own customers, establishing their own prices, and selling at a delivered price or point of origin in good faith to meet the equally low price of a competitor, it does not exempt the companies' pricing practices from antitrust law.

Appearances

For the Commission: *Robert A. Burka, Edward T. Colbert, Thomas J. Keary, Stephen C. Palmer, Peter M. Kazon and Raymond T. Diamond.*

For the respondents: *Daniel K. Mayers, John H. Harwood, David Westin and Kathleen M. Russo, Wilmer, Cutler & Pickering, Washington, D.C., for Ethyl Corporation. Daniel M. Gribbon, Allan J. Topol, Terry Coleman and Edward R. Mackiewicz, Covington & Burling, Washington, D.C. and W.E. MacIntyre, in-house counsel, for E.I. du Pont de Nemours and Co. Alan S. Ward, Shirley Z. Johnson, Thomas J. Segal and Phillip A. Proger, Baker & Hostetler, Washington, D.C., Louis R. Sernoff and Michael Kelly, Morgan, Lewis & Bockius, Washington, D.C. and John W. Thomas, in-house counsel, for PPG Industries, Inc. Champ W. Davis and David C. Bogan, Chadwell, Kayser, Ruggles, McGee & Hastings, Chicago, Ill. and James S. Lambe, in-house counsel, for Nalco Chemical Co.*

COMPLAINT

The Federal Trade Commission, having reason to believe that the above-named respondents, each subject to the jurisdiction of the Commission, have violated and are now violating Section 5 of the Federal Trade Commission Act, as amended, 15 U.S.C. 45, and that a proceed-

ing by it in respect thereof is in the public interest, hereby issues its complaint charging as follows:

Definition

1. For the purpose of this complaint the following definition shall apply:

Leadbased antiknock compounds mean additives to gasoline which increase its octane rating and which contain tetraethyl or tetramethyl lead.

ETHYL CORPORATION

2. Respondent Ethyl Corporation ("Ethyl") is a corporation organized under the laws of the Commonwealth of Virginia, with its principal place of business at 330 South Fourth Street, Richmond, Virginia. In 1977, its sales were in excess of \$1.2 billion, assets were over \$974 million, and net income was approximately \$78 million.

3. Ethyl is a manufacturer and seller of leadbased antiknock compounds in the United States with production [2] facilities in Baton Rouge, Louisiana and Pasadena, Texas. Its gross sales of leadbased antiknock compounds in 1977 were in excess of \$200 million, or more than 30% of domestic United States leadbased antiknock compound sales.

E.I. DU PONT DE NEMOURS AND COMPANY

4. Respondent E.I. du Pont de Nemours and Company ("Du Pont") is a corporation organized under the laws of the State of Delaware with its principal place of business at 1007 Market Street, Wilmington, Delaware. In 1977, its sales were in excess of \$9.4 billion, assets were over \$7.4 billion, and net income was approximately \$545 million.

5. Du Pont is a manufacturer and seller of leadbased antiknock compounds in the United States with production facilities in Deepwater, New Jersey and Antioch, California and a blending facility in Houston, Texas. Its gross sales of leadbased antiknock compounds in 1977 were in excess of \$200 million, or more than 30% of domestic United States leadbased antiknock compound sales.

PPG INDUSTRIES, INC.

6. Respondent PPG Industries, Inc. ("PPG") is a corporation organized under the laws of the Commonwealth of Pennsylvania with its principal place of business at One Gateway Center, Pittsburgh, Pennsylvania. In 1977, its sales were in excess of \$2.5 billion, assets were over \$2.1 billion, and net income was approximately \$91 million.

7. PPG is a manufacturer and seller of leadbased antiknock compounds in the United States with a production facility located in Beaumont, Texas. Its gross sales of leadbased antiknock compounds in 1977 were in excess of \$75 million, or more than 10% of the domestic United States leadbased antiknock compound sales.

NALCO CHEMICAL COMPANY

8. Respondent Nalco Chemical Company ("Nalco") is a corporation organized under the laws of the State of Delaware with its principal place of business at 2901 Butterfield Road, Oak Brook, Illinois. In 1977, its sales were in excess of \$445 million, assets were over \$285 million, and net income was approximately \$50 million. [3]

9. Nalco is a manufacturer and seller of leadbased antiknock compounds in the United States with a production facility in Freeport, Texas. Its gross sales of leadbased antiknock compounds in 1977 were in excess of \$75 million, or more than 10% of domestic United States leadbased antiknock compound sales.

LEADBASED ANTIKNOCK COMPOUND MARKET

10. The leadbased antiknock compounds produced by each respondent are substantially identical. The four respondents are the only firms which sell leadbased antiknock compounds in the United States. There has been no entry into the market for over 15 years, and during much of the period from at least 1974 to the present, the industry has operated at substantially less than capacity.

JURISDICTION

11. Leadbased antiknock compounds are sold and shipped by respondents from their principal places of business and production facilities to customers located throughout the United States. In the course and conduct of such sales, respondents have engaged in the acts and practices hereinbelow alleged in or affecting such commerce within the meaning of Section Four of the Federal Trade Commission Act, as amended, 15 U.S.C. 44.

ACTS AND PRACTICES

12. In the course of their leadbased antiknock compound businesses, respondents have engaged and continue to engage in the following acts, practices, and methods of competition, among others:

- (a) Each respondent has quoted and sold leadbased antiknock compounds only on the basis of a delivered price inclusive of transportation;
- (b) Respondents Ethyl and Du Pont have utilized a "most favored

nation" clause in their standard form sales contracts which promises that the buyer will receive the lowest price at which the same product is sold to any other customer, and have followed a policy of granting such treatment when sales are on a spot basis and not pursuant to an existing contract. Respondent Nalco has used a "most favored nation" clause in a substantial number of its sales contracts; [4]

(c) Each respondent (i) has utilized a 30-day advance notice of price change clause in sales contracts, and (ii) has frequently given advance notice of price changes to the press, directly or indirectly to other respondents, and to existing and potential customers in excess of 30 days.

EFFECT AND VIOLATION

13. The acts, practices, and methods of competition of respondents as hereinabove alleged have individually and in combination had the effect of reducing uncertainty about competitors' prices of leadbased antiknock compounds. Such reduced uncertainty has unfairly facilitated the maintenance of substantially uniform price levels and the reduction or elimination of price competition in the leadbased antiknock compound market.

14. The aforesaid acts, practices, and methods of competition of the respondents, individually and in combination, constitute unfair methods of competition in or affecting commerce and unfair acts and practices in or affecting commerce in violation of Section 5 of the Federal Trade Commission Act, as amended, 15 U.S.C. 45.

INITIAL DECISION BY

ERNEST G. BARNES, ADMINISTRATIVE LAW JUDGE

AUGUST 5, 1981

PRELIMINARY STATEMENT

On May 30, 1979, the Commission filed the complaint in this proceeding charging that respondents Ethyl Corporation, E.I. du Pont de Nemours and Company, PPG Industries, Inc., and Nalco Chemical Company had violated Section 5 of the Federal Trade Commission Act, 15 U.S.C. 45.¹ It is alleged that these four companies have engaged in certain marketing practices which had the effect of reducing uncertainty about competitors' prices of lead-based antiknock compounds; such reduced uncertainty, it is alleged, unfairly facilitated

¹ Respondents, individually, were formally notified of the Commission's investigation of their marketing practices in the lead-based antiknock compound market in early January, 1978. (CX 2210A-D)

the maintenance of substantially uniform price levels and the reduction or elimination of price competition in the lead-based antiknock compound market. (Complaint, Par. 13)

Paragraph 12 of the complaint identifies these marketing practices as follows:

- (a) Each respondent has quoted and sold lead-based antiknock compounds only on the basis of a delivered price inclusive of transportation;
- (b) Respondents Ethyl and Du Pont have utilized a "most favored nation" clause in their standard form sales contracts which promises that the buyer will receive the lowest price at which the same product is sold to any other customer, and have followed a policy of granting such treatment when sales are on a spot basis and not pursuant to an existing contract. Respondent Nalco has used a "most favored nation" clause in a substantial number of its sales contracts; and
- (c) Each respondent (i) has utilized a 30-day advance notice of price change clause in sales contracts, and (ii) has frequently given advance notice of price changes to the press, directly or indirectly to other respondents, and to existing and potential customers in excess of 30 days.

In separately filed answers, each respondent generally admitted the use of some or all of these practices, as alleged in the complaint, but denied that they had the effect of reducing uncertainty about competitors' prices, or that they facilitated uniform price levels in the lead-based antiknock compound market. In addition to denying that these practices had any effect on competition, respondents also raised issues [3] concerning the relationship between the practices and the free speech protection provided in the First Amendment to the Constitution of the United States. While respondents admitted certain jurisdictional facts and that each respondent shipped lead-based antiknock compounds in interstate commerce, each denied that the challenged practices violated the Federal Trade Commission Act.

Nalco, joined by Ethyl and Du Pont, moved on May 20, 1980, for summary decision, which was denied by an order dated June 10, 1980.

Following reciprocal discovery by all parties, the administrative trial commenced on June 9, 1980. Complaint counsel concluded its case-in-chief on July 24, 1980, after 25 days of hearings. Complaint counsel called as witnesses 12 employees of respondents, seven employees of various-sized oil refining companies, and Dr. George Hay, a professor of law and economics from Cornell Law School. Respondents' motions to dismiss at the close of complaint counsel's case-in-chief were denied.

Ethyl's defense began on October 7, 1980, continued for four days during which it called to testify two of its employees, three employees of independent refining companies, an employee of National Economic Research Associates, and Jesse W. Markham, an economist from the Harvard Business School. Du Pont's defense began October 14,

1980, continued for six days, and consisted of the testimony of four of its employees, the employee of an independent refining company, and H. Michael Mann, an economist from Boston College. PPG's defense began October 23, 1980, continued for five days, and consisted of the testimony of three of its employees, two employees of consulting firms, and Michael Glassman, an economist from Glassman-Oliver Economic Consultants Inc. Nalco's defense began November 5, 1980, continued for three days, and consisted of the testimony of one of its employees, and Dennis William Carlton, an economist from the University of Chicago.

On rebuttal, complaint counsel presented two employees of the Federal Trade Commission—Charles A. Pidano, Jr., a certified public accountant, and David T. Sheffman, an economist,² during the week of December 8, 1980. Respondents Du Pont and Nalco each presented one surrebuttal witness, an employee of Du Pont, and Nalco's economist, Dr. Carlton, during February 1980. [4]

During the course of the proceeding over 3300 exhibits were admitted in evidence, and the transcript of testimony exceeds 8,000 pages. The record was formally closed on March 23, 1981.

A motion to dismiss the complaint was filed by Du Pont on October 10, 1980. By order of October 22, 1980, a ruling on the motion was deferred until after the close of the record and submission of briefs. In November, Nalco renewed its motion for summary decision. A ruling on this motion was deferred as well.

On October 1, 1979, Du Pont filed a lawsuit against the Commission and its individual Commissioners in U.S. District Court for the District of Delaware. Du Pont, subsequently joined by Ethyl and PPG as *amici curiae*, sought a declaration (but no injunctive relief) that the issuance of the instant complaint exceeded the scope of the Commission's authority because the challenged practices are not unfair or unlawful under Section 5 of the Federal Trade Commission Act, 15 U.S.C. 45. Du Pont also asserted that the prohibition on public announcements of antiknock compound prices in the Commission's Notice Order violated Du Pont's rights under the First Amendment to the Constitution. In November 1979, Du Pont moved for summary judgment before the district court and the Commission subsequently moved to dismiss the complaint. The district court, per Chief Judge Latham, denied Du Pont's motion on April 9, 1980 and granted the Commission's motion to dismiss the complaint because of Du Pont's failure to exhaust its administrative remedies. The court further held that issuance of the complaint did not impede constitutionally-protected speech. *E. I. du Pont de Nemours and Co. v. FTC*, 488 F. Supp.

² Dr. Sheffman is a tenured Associate Professor of Economics at the University of Western Ontario, and a visiting staff economist at the FTC's Bureau of Economics.

747 (D. Del. 1980). No notice of appeal from the district court's judgment was filed.

This proceeding is now before the Administrative Law Judge for decision based upon the complaint, the answers, pleadings, testimony and other documentary evidence of record, proposed findings of fact and conclusions of law, and legal authority submitted by the parties. These submissions have been given careful consideration and, to the extent not adopted herein in the form proposed or in substance, are rejected as not supported by the record or as immaterial. All motions not heretofore or herein specifically ruled upon, either directly or by the necessary effect of the conclusions in this Initial Decision, are hereby denied.

Having heard and observed the witnesses and after having carefully reviewed the entire record in this proceeding, together with the proposed findings of fact and conclusions of law submitted by the parties, the Administrative Law Judge makes [5] the following findings of fact and conclusions, and issues the Order set out at the end hereof.³

FINDINGS OF FACT

I. IDENTITY OF THE RESPONDENTS

1. Respondent Ethyl Corporation ("Ethyl") is a Virginia corporation with its principal place of business at 330 South Fourth Street, Richmond, Virginia. In 1977, its sales were in excess of \$1.2 billion, its assets were over \$974 million, and its net income was approximately \$78 million. Ethyl manufactures and sells lead-based antiknock compounds in the United States, with production facilities located in Baton Rouge, Louisiana and Pasadena, Texas. In 1977, its gross sales of antiknock compounds were in excess of \$200 million. (Complaint ¶¶ 2-3; Ethyl Answer ¶ 2)

At all times relevant hereto Ethyl has sold and shipped lead-based antiknock compounds in interstate commerce. (Complaint ¶ 2; Ethyl Answer ¶ 5) [6]

2. Respondent E. I. du Pont de Nemours and Company ("Du Pont")

³ The findings of fact include references to supporting evidentiary items in the record. The supporting evidence cited in each instance is not necessarily all-inclusive of the record evidence. The following abbreviations have been used:

- F. - Findings of this Initial Decision followed by the number of the finding being referenced.
- References to the transcript are designated by the name of the witness and followed by the page number(s).
- CX.- Complaint counsel's exhibits followed by its number and the referenced page(s).
- REX.- Ethyl's Exhibits followed by its number and the referenced page(s).
- RDX.- Du Pont's Exhibits followed by its number and the referenced page(s).
- RPX.- PPG's Exhibits followed by its number and the referenced page(s).
- RNX.- Nalco's Exhibits followed by its number and the referenced page(s).

is a Delaware corporation with its principal place of business at 1007 Market Street, Wilmington, Delaware. In 1977, its sales were in excess of \$9.4 billion, its assets were over \$7.4 billion, and its net income was approximately \$545 million. Du Pont manufactures and sells lead-based antiknock compounds in the United States with production facilities located in Deepwater, New Jersey and Antioch, California. Du Pont also has an antiknock compound blending facility in Beaumont, Texas. In 1977, Du Pont's gross domestic antiknock compound sales exceeded \$200 million. (Complaint ¶¶ 4-5; Du Pont Answer ¶¶ 4-5)

At all times relevant hereto, Du Pont has sold and shipped lead-based antiknock compounds in interstate commerce. (Complaint ¶2; Du Pont Answer ¶¶ 5, 11)

3. Respondent PPG Industries, Inc. ("PPG") is a Pennsylvania corporation with its principal place of business at One Gateway Center, Pittsburgh, Pennsylvania. In 1977, PPG's sales exceeded \$2.5 billion, assets were over \$2.1 billion, and net income was approximately \$91 million. PPG manufactures and sells lead-based antiknock compounds in the United States with its production facility located in Beaumont, Texas. PPG's gross sales of antiknock compounds were over \$75 million in 1977. (Complaint ¶¶ 6-7; PPG Answer ¶¶ 6-7)

At all times relevant hereto PPG has sold and shipped lead-based antiknock compounds in interstate commerce. (Complaint ¶ 2; PPG Answer ¶¶ 7, 11)

4. Respondent Nalco Chemical Company ("Nalco") is a Delaware corporation with its principal place of business at 2901 Butterfield Road, Oak Brook, Illinois. In 1977, Nalco's sales were over \$445 million, assets were over \$285 million, and net income was approximately \$50 million. Nalco manufactures and sells lead-based antiknock compounds in the United States, with its production facility located in Freeport, Texas. Its gross antiknock compound sales were over \$75 million in 1977. (Complaint ¶¶ 8-9; Nalco Answer ¶¶ 8-9).

At all times relevant hereto Nalco has sold and shipped lead-based antiknock compounds in interstate commerce. (Complaint ¶ 2; Nalco Answer ¶¶ 9, 11)

II. LEAD-BASED ANTIKNOCK COMPOUNDS

A. *The Product, Its Characteristics And Uses*

5. There are two basic lead antiknock products: tetraethyl lead ("TEL") and tetramethyl lead ("TML"). (Tunis, 36-38; J. M. Robinson, 977-78; CX 922J, 923C) TEL has been commercially manufactured since the mid-1920's. (CX 960 O, 2002Z4) TML was first manufactured commercially in 1960. (CX 960 O) The basic compound is combined

with solvents, dyes, [7] antioxidants, and scavengers to form finished antiknock compound fluid. (Tunis, 39; CX 597E-N) The finished fluid is about 40% elemental (pig) lead. The scavengers combine with the lead in the engine's combustion chamber, so that the lead is exhausted as part of a gaseous compound instead of remaining in the engine. In most cases the scavenger consists of ethylene dichloride and ethylene dibromide. (Altman, 1326-37; Cantwell, 5211-12, 5236; Tunis, 39)

6. Lead-based antiknock compounds are added to motor fuel to improve the octane rating or performance of a gasoline engine. An octane rating is the measure of an engine's resistance to premature detonation, or "knock." (Tunis, 29) Antiknock compounds improve engine performance by slowing the combustion process of the engine to the point that the chemical energy of the fuel is equilibrated to the mechanical capability of the engine to absorb the chemical release, thus reducing "knock," or engine noise and vibration. Use of antiknock compounds allows an engine to do a given amount of work with less gasoline. (Tunis, 29-32, 37; Cantwell, 5168) Only a small amount of lead is contained in a gallon of gasoline. The cost of that lead per gallon of gasoline is minimal. (Day, 666-67; Werling, 3709; J. A. Robinson, 5385-86)

7. Antiknock compounds are usually sold as mixtures of TEL and TML. (Altman, 1382-83) However, some refiners use straight TEL; no refiner uses straight TML. (Altman, 1382-83) In 1976, Ethyl estimated that TML production constituted approximately 20% of total antiknock production. (REX 127P) Generally, TEL is more effective than TML in raising octane ratings when relatively small amounts of antiknock compounds are used. (Day, 611) The relative effect of TEL and TML on gasoline octane ratings is also a function of the gasoline blend available to the refiner. (Tunis, 42-44) TEL and TML may be combined into physical mixes, which are formed by blending the TEL and the TML without any chemical reaction. TEL and TML are more commonly combined into reacted mixes, which are formed by chemically reacting TEL and TML with a catalyst. (Tunis, 37-38; Altman, 1383) Types of antiknock compounds differ depending, *inter alia*, on the proportions of TEL and TML that are used in the physical mixes and the reaction mixes. (Tunis, 38; CX 597G, H, Q)

8. Individual antiknock compounds of a given type produced or sold by one respondent are substantially similar in composition to those of the same type produced or sold by another respondent. (Complaint ¶ 10; Ethyl Answer ¶ 4; Du Pont Answer ¶ 10; Nalco Answer ¶ 10; Steen, 3395) For example, the 50/50 mixture sold by Du Pont is not substantially different from that sold by Ethyl, Nalco or PPG. There are differences between a 50/50 mixture and a 75/25 mixture. (Tunis, 37-41)

9. Each respondent offers to sell a group of "standard" antiknock compound mixes. (Tunis, 182; Lockerbie, 698-700; J. M. Robinson, 1038; Altman, 1269; *e.g.*, CX 2A, 3A, [8] 4, 9, 13, 599F-G, 600-617, 1113Z22-Z33, 1142-62, 1345-49, 1360A-C) The standard antiknock compound mixes offered for sale by each respondent are listed by trade name on Appendix A, arranged so that each respondent's equivalent mixes are on the same line.

10. Ethyl, Du Pont and PPG offered several "special" or "nonstandard" antiknock compounds. (Lockerbie, 600; Fremd, 1599; Park, 1824-25; McNally, 2192-93; Werling, 3650-51) An Ethyl official testified that less than 1% of sales were nonstandard mixes. (Lockerbie, 820) The composition of special or nonstandard mixes was generally the same as each company's comparably-named standard mix with the exception of the scavenger: the special mixes contained only ethylene dichloride and had no ethylene dibromide. (Tunis, 39-40; Fremd, 1670; Werling, 3623) Special or non-standard mixes are listed on Appendix B, arranged so that equivalent mixes are on the same line.

11. [***]*

12. Lead-based antiknock compounds sold by each of the four respondents are homogenous. (Tunis, 369; CX 960Q; Complaint ¶ 10; Ethyl Answer ¶4; Du Pont Answer ¶10; Nalco Answer ¶ 10; Steen, 3395; Hay, 3803-04, 3998, 4123; J. M. Robinson, 979; Markham, 6781; Carlton, 6959-60; Mann, 5429) There is no variation in the quality or performance of the products sold by each of the four respondents. (Tunis, 369; Charles, 2510; McCormick, 2646, 2702; Solomon, 2816; Wilson, 3195; Steen, 3395; Dana, 4465; CX 960Q)

13. Lead-based antiknock compounds are dangerous to handle because organic lead is flammable and explosive (J. M. Robinson, 1181; Koehnle, 4585-86; Baker, 5757), and can cause serious illness or death if they are ingested or come into direct contact with the human body because they are highly toxic. (Tunis, 46; Altman, 1286; Baker, 5757; White, 5945-46, 5975)

B. Substitutes for Lead-Based Antiknock Compounds

14. Products other than lead-based antiknock compounds can be used to increase octane rating. (Tunis, 32-33) Chemicals such as toluene, benzene, and MMT, a manganese-based compound, can be added to gasoline to improve engine performance. (Altman, 1248; Park, 1907-09; McCormick, 2793-96, 2811-12; Werling, 3680; Cantwell, 5170; CX 1953N) These products have not gained commercial acceptance since they are available in only limited quantities and are more costly to use than lead-based antiknock compounds. (Altman, 1248; Park, 1907, 1924; McCormick, 2793-96; Cantwell, 5170; CX

* Throughout this document, [***] refers to *in camera* material that has been excised.

1953N) Certain [9] alcohols may also be used as octane enhancers, but they must be used in significant volumes and are substantially more expensive to use than lead-based antiknock compounds. (McCormick, 2794-96, 2811-12).

15. Octane ratings can also be increased by further refining the crude oil used to produce gasoline. (Tunis, 32-33; Altman, 1392-93; Cantwell, 5168-69) A number of different refining processes may be used, but the most important is catalytic reforming. (Altman, 1392-93; Cantwell, 5169) All of these processes, however, result in a yield loss; that is, more crude oil must be used to produce a given quantity of gasoline. (Tunis, 32-35; Cantwell, 169-70) Therefore, further refining, alone, is nearly always more expensive than adding antiknock compounds because of the increased crude oil costs. (Tunis, 33) Because each incremental unit of antiknock compound has less of an impact on raising octane ratings, at some point the cost of using additional antiknock compounds will exceed the cost of further refining. (Cantwell, 5169-70, 5185-86; RDX 332C) As the price of crude oil increased during the 1970s, the cost of reforming increased, making lead antiknock compounds relatively more valuable to refiners. (Tunis, 35, 51, 370; Day, 552-53; Cantwell, 5173-74) Witnesses uniformly testified that antiknock compounds were the most economical method of enhancing octane. (McCormick, 2634-35; Shouse, 2879; Steen, 3456-57; Fetter, 4538) Refiners had no real alternative to lead-based antiknock compounds. (Day, 554)

III. THE LEAD-BASED ANTIKNOCK COMPOUND MARKET

A. *Early History of the Market*

16. Ethyl's corporate predecessor was formed in 1924 as a joint venture of General Motors Corporation and Standard Oil Company of New Jersey to exploit a patent monopoly on lead-based antiknock compounds. Du Pont controlled General Motors at that time. (Glassman, Tr. 6015)⁴ Du Pont, in 1959, was enjoined from voting its General Motors stock and subsequently disposed of its General Motors stock holdings (*see United States v. E. I. du Pont de Nemours and Co.*, 177 F. Supp. 1 (N.D. Ill. 1959)). Prior to 1948 Ethyl was the sole domestic marketer of lead-based antiknock compounds, which were first manufactured commercially by Du Pont at Deepwater, New Jersey. After 1938, antiknock compounds were also manufactured by Ethyl [10] in Baton Rouge, Louisiana. (Koehnle, 4645; Glassman, 6015-17) In 1962 Ethyl was purchased by the Albemarle Paper Company and all con-

⁴The history of Ethyl's formation and early relationship with Du Pont is described in detail by the district court in *United States v. E. I. du Pont de Nemours & Co.*, 126 F. Supp. 235, 301-13 (N.D. Ill. 1954), *rev'd on other grounds*, 353 U.S. 586 (1957).

nections with General Motors and with the Standard Oil Company of New Jersey were terminated. (Lockerbie, 851)

17. Du Pont began selling lead-based antiknock compounds in 1948 and until the early 1960's, Ethyl and Du Pont were the only domestic producers and marketers of lead-based antiknock compounds. (Lockerbie, 721; Glassman, 6016-17) The Houston Chemical Company entered the lead-based antiknock compound market in August 1961. (J. M. Robinson, 965; Fremd, 1734) Houston Chemical Company, acquired by PPG in March 1963, marketed antiknock compounds under the Houston Chemical Company name until 1978 when the Houston Chemical Company division was merged into PPG's Chemical Division - U.S. Thereafter, antiknock compounds were marketed under the PPG corporate name. (J. M. Robinson, 965-67) Nalco Chemical Company entered the market as a TML manufacturer in approximately 1964, when TML was a relatively new product. (CX 1956N, 9600; Altman, 1387)

B. The Sellers of Lead-Based Antiknock Compounds

18. The four respondents are the only domestic marketers of lead-based antiknock compounds. (Complaint ¶ 10; Ethyl Answer ¶4; Du Pont Answer ¶ 10; PPG Answer ¶ 10; Nalco Answer ¶10) No foreign firm has ever sold lead-based antiknock compounds in the United States. (Tunis, 218; Wilson, 3286-87, 3358-60) There are only three commercial manufacturers of each of the two basic lead antiknock products, TEL and TML. Ethyl, Du Pont and PPG each manufactures TEL (Tunis, 40-41; Werling 3630; Baker, 5763; CX 105); Ethyl, Du Pont and Nalco each manufactures TML. (Tunis, 40-41; Altman, 1383-84; Werling, 3630; Hay 3805; CX 105)

C. The Purchasers of Lead-Based Antiknock Compounds

19. Antiknock compounds are used exclusively by gasoline refiners and blenders. (Cantwell, 5168) Purchasers of antiknock compounds include six of the ten largest industrial corporations in the United States, *i.e.*, Exxon, Mobil, Texaco, Chevron, Gulf and Amoco (*Fortune* rankings August 1979). (CX 220M) During the period 1974-1979, there were 154 antiknock compound purchasers, with the ten largest accounting for more than 30 percent of total purchases. (REX 324A-Z17) The larger refiners operate more than one refinery; for example, Texaco operates eleven refineries (Wilson, 3233-34),⁵ Exxon operates [11] five refineries (Payne, 3503),⁶ and Chevron operates seven refin-

⁵ Two refineries are located on the West Coast, one on Puget Sound, and one in Wilmington, California; others are located at Casper, Wyoming; Amarillo, Port Arthur and El Paso, Texas; Tulsa, Oklahoma; Lawrenceville and Lockport, Illinois; Eagle Point, New Jersey; and Baton Rouge, Louisiana. (Wilson, 3233-34)

⁶ The Exxon refineries are located at Baton Rouge, Louisiana; Baytown, Texas; Bayway, New Jersey; Benicia, California; and Billings, Montana. (Payne, 3503)

eries.⁷ (REX 198A) The larger oil refineries tend to be located near the antiknock compound production facilities on the Gulf, East and West Coasts. (Lockerbie, 789; J. M. Robinson, 1020-21; Charles, 2540; McCormick 2648; Wilson, 3233-34; Payne, 3516; Fetter, 4518-19) The gasoline refineries located inland tend to be smaller ones placed near crude oil production fields. (Tunis, 297; Solomon, 2823-25; Pittinger, 4556-57)

20. The respondents also were purchasers at certain times in order to meet their TEL and TML requirements. (Altman, 1333-34, 1476, 6651-53) Ethyl and Du Pont were generally self-sufficient in all types of antiknock compounds, but from time to time Du Pont purchased additional amounts of TML from Nalco. (Altman, 1333-35) PPG purchased most of its TML requirements from Nalco and some from Du Pont. (CX 1115C) PPG produced TML only sporadically (J. M. Robinson, 981), and has not produced any TML since 1977. (Baker, 5765) Nalco generally purchased its TEL requirements from PPG (Altman, 1476), and between 1974 and 1979 was PPG's second largest customer with purchases ranging between 12 to 24 million pounds annually. (RPX 1517E) Because many customers require mixtures of TEL and TML, Nalco both purchases TEL and exchanges its TML for TEL, so that it can supply mixed fluids to its customers. (Altman, 1356, 1476-77) Similarly and for the same reason, PPG both purchases TML and exchanges its TEL for TML. (Altman, 1292, 1334-35, 1356; CX 1955Z22) Respondents also swapped needed products on a pound for pound basis. (Altman, 1478, 6652-53)

21. Under another arrangement unreacted TEL and TML were sold to refiners who, pursuant to several different financial arrangements, had the antiknock compounds shipped to another respondent, which supplied additional antiknock compounds, reacted them, and had the completed mixes shipped to the customer for use. This procedure, by which a refiner purchased antiknock compounds from one respondent and had them shipped to another respondent, is sometimes referred to as a "multileg transaction." (Altman, 1423, 6643-44) [12]

D. How Lead-Based Antiknock Compounds are Sold and Shipped

1. General Character of Sales

22. Testimony by respondents' officials estimated that Ethyl had sales agreements with roughly half of its lead antiknock customers (Gill, 4720); Du Pont sold about half of its lead antiknock volume pursuant to sales contracts (Tunis, 357-58; McNally, 2116); PPG sold 15%-20% of its total lead antiknock sales volume pursuant to its

⁷ The Chevron refineries are located at Richmond, El Segundo and Bakersfield, California; Salt Lake City, Utah; El Paso, Texas; Perth Amboy, New Jersey; and Pascagoula, Mississippi. (REX 198A)

standard form contract (Fremd, 1698-1700); and Nalco had between 30 and 40 lead antiknock customers, but it had contracts with fewer than 10 of these. (Altman, 1255-56) There were other contractual arrangements between respondents and their customers. For example, there were contracts of a continuing nature between PPG and Shell (CX 1167), PPG and Amoco (CX 1165; J. M. Robinson, 1090-91), PPG and Mobil (RPX 7), Nalco and Chevron (RNX 1289), Nalco and Union (RNX 1583), and Ethyl and Exxon (CX 1792).

23. Contracts used by the respondents with their antiknock customers were usually signed to cover a year's requirements and they called for a fixed minimum/maximum quantity to be purchased. (REX 6) The minimum amounts stated in the sales agreements were not regarded by either the antiknock suppliers or their customers as firm commitments and the volume requirements were not rigidly enforced. (Tunis, 357; J. M. Robinson, 1025-26; McNally, 2116, 2228-29; Charles, 2605; McCormick, 2718; Steen, 3493; Dana, 4474-76; Fetter, 4526-27; J. A. Robinson, 5349; *see* CX 915, 1267A, 1268A, 1549B; REX 6A-Z136) For instance, PPG's contracts were "more a production forecast than a rigid contract." (J. M. Robinson, 1026) Du Pont used its contracts to get estimates of amounts the customer would purchase in a calendar year. (Tunis, 357) As a result, customers often failed to purchase the minimum amount specified in their antiknock contracts. (*Compare* REX 6 with REX 324) Respondents, however, were alert to remind the refiners that they were not purchasing the amounts specified in the contracts, and continuous sales efforts were directed at assuring that the supplier would get the business which had been committed under the contracts. (RDX 193; RNX 1545-48, 1539) Some refiners awarded business to each supplier on a percentage basis. (Lockerbie, 795) These percentages, like the estimated poundage specified in the contracts, were not rigidly adhered to. (Tunis, 357; CX 1100D; RNX 1543, 1546-47; RDX 10B) Respondents' sales representatives, however, made every effort to assure that each supplier got its promised percentage or more. (CX 1075B; RNX 1543-45; RDX 70A, 193) Refiners were willing to commit significant volumes of business in exchange for direct price concessions. (Miller, 1992-94; McCormick, 2648-54; Solomon, 2814-15; Wilson, 3197-201; Payne, 3522; CX 1584B, 1588B) Nalco had a small sales force which made frequent customer contact more difficult. (CX 1956L; Altman, 1391-92) Ethyl, [13] Du Pont and PPG with larger sales forces were able to have frequent customer contact, even every day. (Tunis, 885; REX 295D)

24. [***]

25. Refiners have limited facilities for storing lead antiknock compounds and they maintain inventories of about 10 days supply. (J. M.

Robinson, 1078; Charles, 2525; Fetter, 4516) They also do not wish to store large quantities of lead antiknocks because of their toxic and explosive nature (Pittinger, 4571-72), and the cost associated with maintaining a large inventory. (Charles, 2525; Solomon, 2828, 2833; McCormick, 2664-65) Therefore, refiners rely on regular delivery from respondents to assure a supply of antiknock compounds. (J. M. Robinson, 1078) Under the contractual or percentage arrangements which the respondents have with their customers, a large number of individual transactions take place. For instance, in 1977, Ethyl alone had 4,856 separate transactions with its customers. (CX 32A-Z117)

26. Multiple sources of supply are also important to lead antiknock customers. (Charles, 2547; Solomon, 2853) Therefore, almost all the lead antiknock customers buy from at least two suppliers and some buy from all four. (Tunis, 241-42; Park, 1862, 1876; Charles, 2546-47, 2569-71; McCormick, 2636-37, 2699, 2754-55; Wilson, 3259; Shouse, 2869, 2871; Dana 4465; Fetter, 4506-07; Pittinger, 4550; J. A. Robinson, 5349; RDX 324; REX 324A-Z17)

27. Refiners often would increase or decrease an individual supplier's share of their requirements. (REX 324A-Z17; CX 882; RPX 1335). Refiners exerted pressure on lead antiknock suppliers for lower prices, pressing for explanation or rescission of price increases (CX 1175F, 1225, 1229, 1231), seeking competitive bids (CX 1228; Wilson, 3202-03; Steen, 3392-94, 3404; F. 28-30, 152-155), threatening to shift business (CX 1231A-B), and negotiating for price discounts or other preferential treatment. (Wilson, 3203; Steen, 3404; CX 1310A, 1312, 1949; F. 156) Refiners frequently sought below-list prices. (J.M. Robinson, 1055) Refiners awarded additional business as a reward to a supplier who undercut a rival's list [14] price increase and as punishment to the supplier which first raised list prices. (Tunis, 398-99, 450; Wilson, 3305; RNX 1526; RPX 50B) Respondents have recognized that their large refinery customers have exerted pressure on suppliers to keep prices lower and competitive. (Lockerbie, 827-28; Glassman, 6100-01)

2. Bid Requests

(a) *Exxon*

28. Exxon solicited bids in 1975 for its 1976 antiknock compound business. (Steen, 3379-80, 3401-07) Each respondent was notified of the cancellation of existing contracts and the request for innovative pricing for Exxon's 1976 antiknock requirements. (CX 914, 1094A-C, 1413, 1745, 1949; Altman, 1369-71) Exxon requested pricing proposals such as an F.O.B. manufacturing-site pricing option, a volume-related discount option, an option to evaluate services separately, a weight

adjustment on tankcar loads, and a long-term contract arrangement with or without price escalators. (J. M. Robinson, 1059; Steen, 3396-97, 3401-07, 3423-36, 3480; Payne, 3511-18, 3522-28, 3539-40; CX 620, 631, 914, 122A, 1313, 1323, 1746, 1757, 1914, 1932A, 1949) Mr. W. C. Steen, a buyer for Exxon, testified that his "primary objective [in soliciting bids] was to try to create a competitive atmosphere" similar to that existing in the market for other chemical products that Exxon purchased. (Steen, 3403) Nalco, PPG, Ethyl and Du Pont responded to the bid request with their list prices. (Altman, 1369-71; Steen, 3418-20; CX 634, 636A-B; *see F. 152*)

In the fall of 1976, Exxon again requested bids from each of the respondents for its 1977 antiknock compound business. (Steen, 3423-27; CX 631A-B, 632, 1103, 1222A-B, 1373, 1750, 1751, 1956Z87) Du Pont, Ethyl and Nalco responded with list price bids. (CX 630; Altman, 1373; Miller, 1959-60; Steen, 3396, 3495) PPG, which had been excluded from Exxon's 1976 antiknock business, responded with a list price bid and an offer of a special service, which Exxon declined. (Steen, 3424-28; CX 1222; RPX 1517C; *see F. 152*)

Exxon solicited bids again late in 1977 for 1978 antiknock supplies. Again all respondents responded with list price bids. (Altman, 1373; Steen, 3428, 3431; CX 1320A-C, 1755; *see F. 152*)

In 1978, Exxon requested bids for its 1979 antiknock business, this time requesting bids on its entire needs, or simply its needs at the Baytown refinery, the world's largest refinery, located in proximity to antiknock facilities of each respondent. (Payne, 3522-27, 3530; Bonner, 5880) Each producer again quoted list prices with no separate quotation for Baytown. (Payne, 3528-31, 3538; CX 395A-C, 396A-B, 492H, 1081A-E, 1418A-B, 1571A-G) PPG's reply went beyond previous [15] responses, but was rejected "because no price concession was made." (Payne, 3531-37; CX 1273; *see F. 152*)

(b) *Texaco*

29. In 1975, Texaco requested bids for its business from each of the respondents. (CX 878A-C, 879, 1287A-C; *see also* Wilson, 3196-203, 3229-32; REX 948) The Texaco request asked for the option of a volume discount and a price exclusive of all services or, in the alternative, services unrelated to health and safety. (Wilson, 3192-98, 3327-28, 3245; CX 896, 898, 1194, 1713C-D) Each respondent ultimately responded to Texaco with a list price quotation. (Tunis, 426-29; Lock-erbie, 765-66, 773-75, 778, 851; CX 903A-B, 1287A-C, 1713A-D); *see F. 153*)

(c) *Sun*

30. In 1973 and 1975, Sun requested bids for its antiknock com-

pound requirements from each of the respondents. Sun solicited volume discounts, F.O.B. manufacturing-site pricing, and pricing exclusive of services. (McCormick, 2648-54; CX 882A-B, 899, 1227, 1383, 1384, 1584, 1588, 1741, 1742A-B) Each respondent replied to the Sun requests by quoting list prices. (Tunis, 256-69; Lockerbie, 781, 851; McCormick, 2651-52, 2653, 2656-58; CX 1228A-B, 1385, 1584A-B, 1587A-B, 1588, 1692, 1691A-B, 1733; see F. 155)

3. Shipping

31. Because of their high toxicity, lead-based antiknock compounds require expensive tankcars and storage tanks specially designed and insulated to assure maximum protection against explosion or exposure to humans. Such tankcars and storage tanks cannot be used for purposes other than the transportation and storage of lead antiknocks. When no longer used for these purposes, such containers and any attachments which had contact with lead fluids are decontaminated, cut up and destroyed. (Tunis, 2197; Werling, 3697; White, 5961-62, 5973) Some small amounts of lead antiknocks compounds are shipped in 55-gallon drums and tanktrucks. (Gill, 4778; Krippahne, 5052)

Lead antiknock compounds are shipped in railroad tankcars owned or leased by each respondent. (Krippahne, 5148; Werling, 3697) In a few instances tankcars are "trip-leased" to a specific customer, which means that the car is loaded by a respondent and sent to a particular customer, unloaded, returned to the supplier, and loaded again for the same customer. The car at times will not be unloaded promptly, but held at the refinery. Under the trip-lease arrangement, no demurrage charge is assessed against the refiner. (Altman, 1545, 1547)

Respondents also utilize rail side tracks around the country where loaded tankcars are maintained as a storage depot [16] to enable respondents to respond quickly to a customer's request for lead antiknock compounds. (Tunis, 262; Altman, 1293; Krippahne, 5084, 5086)

IV. MARKET CHARACTERISTICS

A. *Production Methods and Costs*

32. Ethyl, Du Pont and PPG utilized similar production methods involving chemical reactions with sodium and lead to produce lead-based antiknock compounds. (Tunis, 86; J. M. Robinson, 1110; Altman, 1308-09) Lead is combined with sodium to form a lead-sodium alloy, which is then combined with ethyl chloride to form TEL and sodium chloride. The TEL produced is then washed, aerated and filtered, and eventually mixed with scavengers and other additives. (Baker, 5754; CX 1115C-D) TML is made in a similar manner except

that methyl chloride is used instead of ethyl chloride. (Baker, 5756) Nalco uses a different production process from that used by the other respondents. (Altman, 1309) Nalco's system produces lead in solution in an electrolytic cell and uses magnesium rather than sodium as a catalyst. (Altman, 1401; Carlton, 7068) Nalco developed this process through a joint research effort with Amoco which began in 1959. (RNX 1586) Du Pont produced TEL by each of the batch and continuous processes, principally the continuous one, and TML by the batch process. (Tunis, 85; CX 1955K) Ethyl and PPG produced antiknock compounds by the batch process only. (CX 1954N; J.M. Robinson, 1081-82) Nalco's manufacturing process was a continuous one. (Hay, 3805; Carlton, 7069-71)

33. The largest part of the cost of manufacturing lead antiknocks consists of raw materials. (Gill, 4732) Most—about 80 percent—of the costs of producing lead antiknocks are variable. (Gill, 4732-33; Baker, 5805-06) For instance, pig lead prices (pig lead constitutes approximately 40 percent of the finished antiknock fluid (F. 5)), rose 7 cents a pound in 60 days in 1978. (RPX 1400) Ethyl produced a portion of all the raw materials it needed to manufacture antiknocks, except for pig lead. (CX 1733B, 1747A, 2002-Z74; *see* Fremd, 1609) Du Pont produced all its necessary raw materials except for pig lead and scavengers. (CX 597N; *see* Fremd, 1609-10) The only raw material produced by PPG was ethyl chloride. (CX 115C; Fremd, 1609-10) Unlike either Du Pont or Ethyl, PPG also had to buy sodium. The sole source for sodium during the 1970's was Du Pont; Ethyl would not sell sodium to PPG. (CX 1279B; Fremd, 1722-23, 1610) Nalco did not produce any of the raw materials it needed to produce antiknock compounds. (CX 1330A-B; Fremd, 1610)

34. Because Nalco uses an electrolytic process, unlike other respondents, it had different [***] production costs. (Tunis, 86-87; Altman, 1308-09; RNX 714A-B, 735A-C; [17] RDX 135H) [***] Between 1973 and 1977, the cost of magnesium, a component of Nalco's process, escalated faster than the cost of sodium, which was used by the other manufacturers. (Altman, 1310, 1446; RNX 258, 714A-B, 735A-C, 747A-K) Nalco's cost comparison memorandum prepared for customers in April 1977, for example, compared Nalco's costs and profits for the years 1973 and 1976. During the intervening period Nalco's raw material costs increased 108% and the average selling price of antiknock increased 61%. (RNX 11B-C, 258) Between 1973 and 1977, the price of magnesium increased 173%. (RNX 12D) Between 1974 and 1977 various utilities, also a significant cost with Nalco's electrolytic process, increased 320% (electricity) and 341% (steam). (RNX 12E)

35. Ethyl, Du Pont and PPG could generally estimate the manufac-

turing costs of each other because they used similar processes. The respondents also were aware that Nalco's raw material and manufacturing costs were different from their own, [***] (Tunis, 85-87; Altman, 1308-09; Fremd, 1609-10; McNally, 2284-85; Baker, 5835-36; CX 1952Z100-Z101; RDX 135H; RNX 1198) TML, Nalco's principal product, was also more expensive to manufacture than TEL. (Fremd, 1748-49)

36. Du Pont's continuous process was more efficient and less costly to operate than any available batch process based on the lead-sodium reaction that Ethyl, PPG and Du Pont employed. (Tunis, 85-86; RDX 135H, CX 923I) Du Pont believed its manufacturing costs were also less than Nalco's manufacturing costs, but on a par with Ethyl's. (Tunis, 84-87; Altman, 1308-11; CX 2211)

37. Since five of the largest refiners owned Octel, a foreign antiknock compound producer, it can be assumed that these refiners had a good understanding of the basic costs involved in the antiknock compound manufacturing process. (See F. 104) Ethyl stated that the large refiners were able to accurately calculate the manufacturing costs of lead antiknock compounds. (CX 394Z2)

B. Production Capacity

1. Ethyl

38. Ethyl had two lead antiknock compound manufacturing facilities: one in Baton Rouge, Louisiana and one in Houston, Texas. (CX 591I-L, N-Z13; F. 1)

Ethyl's manufacturing department estimated the following production capacity for all lead-based antiknock compounds at these facilities: [18]

Initial Decision

101 F.T.C.

| <u>Year</u> | <u>Baton Rouge</u> | <u>Houston</u> | <u>Total</u> |
|-------------|--------------------|----------------|--------------|
| 1974 | 346 | 210 | 556 |
| 1975 | 320 | 200 | 520 |
| 1976 | 320 | 200 | 520 |
| 1977 | 310 | 165 | 475 |
| ***] | ***] | ***] | ***] |

(CX 591K; Day, 594, 646).

Ethyl's annual production in its U.S. facilities in 1974-1978 and the first five months of 1979 was:

| <u>Year</u> | <u>Total Production</u> |
|-------------|-------------------------|
| 1974 | 511 million lbs. |
| 1975 | 388 million lbs. |
| 1976 | 433 million lbs. |
| 1977 | 432 million lbs. |
| ***] | ***] |

(CX 591J, Z9-Z11).

Ethyl had the following excess capacity in the years 1974-1979:

| | |
|------|------|
| 1974 | 45 |
| 1975 | 132 |
| 1976 | 87 |
| 1977 | 43 |
| ***] | ***] |

These figures represent the difference between Ethyl's actual production and its nominal capacity. (CX 591Z9-Z11; REX 334B, 335B)

Ethyl had available autoclave capacity equal to 165 million pounds per year in three separate closed facilities at Baton Rouge. These facilities were F building, with an annual capacity of 45 million pounds, and A and E buildings, each with 60 million pound annual capacities. (REX 335B; Day, 582-84) Each of these facilities was initially closed in the mid-1960's and had its equipment drained, washed and covered with a nitrogen blanket for protection. (CX 1954Q-X; Day, 578-821) F building was reopened in 1967 and again in 1973. (Day, 580-81; REX 335B) The 1973 reopening cost \$700,000. (CX 1954Z13, Z26) In 1974-75, F building was shut down (CX 1954Z15), and reopened in 1976. (CX 1954Z21) A and E buildings remained idle and were begun to be dismantled in 1977 and 1978. (CX 1954U)

Between 1974 and 1978, the Baton Rouge capacity was decreased by 95 million pounds from 375 million to 280 million pounds because Ethyl did not install environmental equipment for F furnace. (REX 335D-G, 336D-E; CX 1954Z23-Z24) In late 1975 Ethyl estimated that that year's sales would be "roughly [19] 75% of peak sales a few years

ago" and that each industry member would have 25% excess capacity the following year, 1976. (CX 394K, Z2; Day, 591)

Ethyl's capacity to produce lead antiknock compounds was reduced from 1975 to 1978 in part because of limitations imposed on the operation of its furnaces by the Louisiana Air Control Commission and the Texas Air Control Board, and because the federal clean air standards required the installation of high energy scrubbers and tails gas burning systems. (Day, 576, 656-57; REX 335F-I; CX 1954Z3, Z5, Z21-Z24, Z27-Z28) However, through restoration and debottlenecking capacity at its Houston facility, Ethyl could have increased annual production capacity there by 75 million pounds, from 165 to 240 million pounds, at a cost of \$10 million. (CX 497E; Day, 593-98)

On July 1, 1980, Ethyl closed its Houston lead antiknock compound manufacturing plant. (Day, 622-23)

2. Du Pont

39. Du Pont had two lead antiknock compound manufacturing plants during the period 1974-1979, one located in Deepwater, New Jersey, and one in Antioch, California. Du Pont also had an antiknock compound blending facility at Beaumont, Texas. (Tunis, 40-41, 303-04; F. 2)

In 1975 Du Pont closed two plants. The first, a TML plant, with a 71 million pound annual capacity, was closed down on January 1, 1975. It could have been kept operational at a cost of \$750,000 to comply with environmental regulations. (CX 1847D, 1955P-Q) The second plant, with a 65 million pound annual capacity, was closed in April 1975 but reopened in August 1976. (CX 1847D, 1955W-Y) The second plant then was closed about a year later, in September 1977 (CX 1847E), and maintained in "standby" condition. That building was taken off standby (but kept intact) in March 1978. (CX 1955Z7-Z8) These two plants represented 25% of Du Pont's total capacity. (CX 969L) To restore one of the units to active production would cost approximately \$2 million and would take about one year. (CX 1955Z30)

Du Pont believed that demand was substantially less than the industry's installed production capacity. (Tunis, 88-89) In early 1974 Du Pont projected there would be "excess manufacturing capacity industrywide" as the market declined (CX 920H; Tunis, 91-93), and by late 1974 or early 1975, Du Pont believed there was already excess industry capacity and was concerned that it would increase because of reduced demand. (CX 924Q, 960D; Tunis, 94-95)

At the end of 1977, Du Pont had had "excess production capacity available" for "the past several years." (CX 926J, 1653A; McNally,

2139) This excess capacity continued until at least mid-1978. (CX 1113Z75) Du Pont had 100 and 80 million [20] pounds of excess operational capacity on an annualized basis for 1978 and 1979, respectively. (CX 1113Z92-Z94) As Du Pont saw demand declining it decreased its operational capacity. (Tunis, 89-90, 93; CX 922H-I, 923B, 969L, 1955K-R, W-Z) In early 1979, Du Pont announced that it would close its lead antiknock compound production facility in Antioch, California, in October 1980, an advance notice of almost twenty months. (CX 1955Z28)⁸

In its "Organic Chemicals Department Annual Report" dated December 1975, Du Pont noted that its sales volume was 84 percent of its available capacity in 1974 and 94 percent in 1975. (CX 922K) In the annual report dated December 1976, Du Pont noted that it had used 89 percent of its available capacity in 1975 and 99 percent in 1976. (CX 923E)

3. PPG

40. PPG has one lead antiknock production facility at Beaumont, Texas, where it has produced lead antiknock compounds since 1961. (J. M. Robinson, 965; F. 3) PPG's maximum capacity to produce was rated at about 113 million pounds of TEL. To meet that rate, all 24 autoclaves in the West Plant and 8 autoclaves in the East Plant had to operate at maximum output and could produce TEL only. PPG could produce about 3.5 million pounds of TML by switching the two specially adapted autoclaves from TEL production to TML production; but that resulted in a direct loss of over 2 pounds of TEL capacity for every pound of TML production, and an additional loss of production for about a week from the two autoclaves being switched to TEL. As a result, PPG's maximum rated capacity to produce TEL and TML together was approximately 105 to 106 million pounds of TEL and 3.5 million pounds of TML. (Baker, 5756, 5762-66, 5829-33)

From 1974 to 1976, PPG did not have any significant excess capacity. (J. M. Robinson, 1078) From June 1976 through the first few months of 1977, PPG expected 100% production. (RPX 1341, 1345; Baker, 5829) A PPG market analysis indicated that PPG operated at 86% capacity in 1977, 100% in 1978, and 88% in 1979. (CX 1278G; Baker, 5829) Both production and capacity were reduced in 1978, and PPG terminated lead antiknock production in its 8 East Plant autoclaves in August 1978. (J. M. Robinson, 1015; Baker, 5829) In response to unexpectedly high demand toward the end of 1978, however, the East Plant was put back in operation beginning in late April 1979. Both sodium and lead were in short supply in 1979, delaying and

⁸ A copy of an article in *The Wall Street Journal* dated May 1, 1981, attached to Du Pont's Reply Brief, states that Du Pont plans to close its antiknock facilities at Antioch, California, by August 1, 1981.

raising the [21] cost of the East Plant start-up. (RPX 1429; Baker, 5775-76) The East Plant was closed permanently in December 1979. (Baker, 5776) [***]

PPG has not, since approximately 1973, authorized spending for plant modernization or improvement, except with regard to environmental protection. (Baker, 5772)

4. Nalco

41. Nalco has produced lead antiknock compounds at one facility in Freeport, Texas, since it entered the market in 1964. (Altman, Tr. 1401-02, 1477; F. 4) Its production has been limited to TML. (Altman, 1477)

In the latter part of the 1960's Nalco expanded its production capacity 50%. (Altman, 1401-02) Nalco's daily capacity during the 1970's was at least 375,000 pounds, or approximately 137 million pounds per year. (Altman, 1398-99, 1517-18; CX 1527H) Nalco's capacity and actual production were as follows:

| | <u>1974</u> | <u>1975</u> | <u>1976</u> | <u>1977</u> | <u>1978</u> | <u>1979⁹</u> |
|-----------------|-------------------|-------------------|-------------------|-------------------|-------------|-------------------------|
| Capacity | 137 | 137 | 137 | 137 | [***] | [***] |
| Production | 119 ¹⁰ | 105 ¹¹ | 118 ¹² | 122 ¹³ | [***] | [***] |
| Excess Capacity | 18 | 32 | 19 | 15 | [***] | [***][22] |

Nalco's production decreased in late 1974 and early 1975 because of a raw material shortage (methyl chloride) which resulted in lost production. (RNX 17A-B, 140A-B, 353) Nalco returned to an increased percentage of production capacity through 1977. (Altman, 1312-14, 1400) Nalco has not shut down any production facilities, although it encountered reduced production capability because of state and federal pollution requirements. (Altman, 1317, 1402)

C. Demand

1. Inelasticity of Demand

42. Price elasticity or elasticity of demand measures the responsiveness of the quantity demanded of a particular product to the change in the price of that product. If demand is elastic, revenue decreases when price increases; and if demand is inelastic, revenue increases when price increases. When revenue stays constant at higher or lower

⁹ Capacity and production figures for the first four months have been annualized.

¹⁰ CX 1780D. Annual production of lead-based antiknock compound fluid is calculated by dividing the annual lead alkyl produced by the percentage it represents in the finished fluid.

¹¹ CX 1779A-X.

¹² CX 1778A-X.

¹³ CX 1777A-X.

¹⁴ CX 1776A-X. [Referenced data *in camera*.]

¹⁵ CX 1775A-H. [Referenced data *in camera*.]

prices, demand is said to have unitary elasticity. (Glassman, 6255-56; Markham, 6781-82)

The demand for antiknock compounds is inelastic. (Hay, 3921, 3998, 4001; Mann, 5429; Glassman, 6257; Markham, 6782-84, 6832; Carlton, 6960) Because antiknocks are more efficient and economical than other methods of increasing the octane rating of gasoline, increases in price would have resulted in relatively small reductions in consumption. (Lockerbie, 742; Cantwell, 5205-06; RDX 332H-I; CX 1953Z279-Z80; F. 14-15) A study by Pace Engineering concluded that in 1975 lead antiknock compound prices could be increased 20% from 1974 levels without causing a reduction in consumption. (Tunis, 62-63; CX 972B) In the mid-1970's, Ethyl calculated that each 10% increase in price would result in only a 4% volume or consumption reduction. (CX 1953-Z279-Z80)

2. Decrease in Demand

43. Most automobiles manufactured since 1975 have required engines with catalytic converters which cannot burn leaded gasoline. (Tunis, 46-48; Werling, 3608) As older, lead-tolerant vehicles are retired, the market for lead-based antiknock compounds will shrink. (Werling, 3608) The following table by Du Pont indicates predicted sales of leaded gasoline for the remainder of this decade:

| | Sales of Leaded Gasoline (billion gallons) | Total Gasoline Market (billion gallons) |
|------|---|--|
| 1981 | 48.5 | 107.6 |
| 1985 | 26.3 | 103.2 |
| 1990 | 15.4 | 92.0 |

(Cantwell, 5233; CX 2007G). [23]

Present EPA lead-based antiknock compound usage regulations apply on a poolwide basis. The permissible amount of lead is a function of total amount of gasoline sold and as the unleaded volume grows, lead concentration in leaded gasoline will increase. (Werling, 3608-09; Cantwell, 5196) Domestic demand for antiknock compounds is estimated to decline to 400 million pounds for 1980 and is projected to be 300 million pounds in 1981. (Koehnle, 4628-29; CX 1219E) The market may stabilize in the 300 million pounds yearly range if heavy-duty trucks are exempt from EPA lead restrictions. (See F. 45)

During the period 1974-1979, there was some uncertainty in the demand for lead antiknocks. (Robinson, 1013-16; CX 201A, 1952Z51, Z59, 199G) In 1974 and 1975, the antiknock producers generally believed demand would decline because of EPA regulations. (CX 199A, E, 201B, 394Z2, 920I, 922J, 923C, 1928F) Demand measured in terms

of sales of fluid pounds did decline between 1976 and 1979 by approximately 24%. (CX 406R, 1931B, D; REX 324Z17). The decline between 1979 and 1980 (on an annualized basis) was approximately 42%. (REX 324Z17)

D. Government Regulations and Their Impact on the Market

44. The EPA, pursuant to the 1970 amendments to the Clean Air Act, promulgated regulations to reduce the quantity of hydrocarbon emissions from automobiles, beginning with the 1975 model year (Pub. Law 91-604 Section 6(a), 84 Stat. 1690, 42 U.S.C. 1857 f-1(a), (b) (1976)). To meet the requirements of these regulations the automobile manufacturers were required to install catalytic converters on all new cars built beginning in 1975. Such converters require the use of unleaded gasoline. The regulations required all gasoline refiners to market at least one brand of lead-free gasoline, beginning in July 1974 when 1975 model cars and light trucks were first marketed. (40 C.F.R. 80.22 (1979)) These regulations were upheld in *Amoco Oil Co. v. EPA*, 501 F.2d 722 (D.C. Cir. 1974).

The EPA issued general lead phasedown regulations in November 1973. The initial regulations contemplated that the permissible amounts of lead in motor gasoline would be reduced in five steps ending in January 1979 when the allowable standard would be .5 gram of lead per gallon of finished gasoline in the total gasoline pool. (38 FR 33,734 (1973)) However, there were delays in the anticipated implementation of the phasedown regulations:

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| November 28, 1973 | EPA promulgated its final regulations requiring that the amount of lead in the total gasoline pool be phased down. These regulations were to take effect on January 1, 1975, and the final step in the phasedown was to take place January 1, 1979, when [24] the pool would contain .5 gram of lead per gallon. (38 FR 33,734) |
| December 20, 1974 | The United States Court of Appeals ordered the regulations set aside, with one judge dissenting. The majority and dissenting opinions were issued January 28, 1975. (See <i>Ethyl Corp. v. EPA</i> , 541 F.2d 1, 11 (D. C. Cir. 1976) (en banc).) |
| February 20, 1975 | EPA formally suspended enforcement of the phasedown regulations as a result of the panel's decision. (40 FR 7,480) |
| March 17, 1975 | EPA's petition for rehearing en banc was granted and panel decision was vacated. (See 541 F.2d at 11.) |
| April 18, 1975 | EPA announced that it would continue suspension of the phasedown regulations pending the en banc decision. (40 FR 18,217) |
| May 20, 1975 | The case was reargued en banc. (541 F.2d 1) |
| March 19, 1976 | EPA regulations were upheld by the Court of Appeals en banc. (541 F.2d 1 (D.C. Cir. 1976)) |

Initial Decision

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- March 24, 1976 EPA lifted suspension of the phasedown regulations with regard to certain reporting requirements. General implementation continued to be suspended pending the outcome of requests for Supreme Court review. (41 FR 13,984)
- June 14, 1976 *Certiorari* was denied by the Supreme Court. (426 U.S. 941 (1976))
- July 2, 1976 EPA stated that it would put the original phasedown schedule into effect unless comments were received demonstrating that compliance would not be feasible. (41 FR 28,352-53) [25]
- September 24, 1976 EPA adopted a new schedule for implementation of phasedown regulations. On January 1, 1978, the pool average was to be .8 gram per gallon and on October 1, 1979 it was to be .5 gram. A refinery could receive a suspension of the .8 gram requirement, however, if it showed that it was making good faith efforts, such as procuring necessary equipment, to meet the October 1, 1979 deadline. (41 FR 42,675-77)
- January 1, 1978 EPA's .8 gram per gallon standard was implemented. Refiners were permitted a suspension of the .8 gram requirement if good faith effort was being made to meet the .5 gram requirement scheduled for October 1979. Refiners with over 75% of the nation's gasoline refinery capacity were granted suspensions. (44 FR 53,144)
- June 8, 1979 EPA suspended the .8 gram of lead per gallon requirement for all refiners for the period June 8, 1979 to October 1, 1979. In addition, EPA proposed delaying the October 1, 1979 effective date for the .5 gram of lead per gallon on a poolwide basis for one year because of fears of gasoline shortages. Refiners would be able to continue the general .8 gram standard (or more in certain circumstances) after October 1979 if certain requirements were met. EPA also noted that it might suspend some of the prerequisites for qualifying for the .8 gram per gallon standard. (44 FR 33,116-18)
- September 12, 1979 The regulations proposed on June 8, 1979 were adopted (44 FR 53,144). A minimum poolwide lead usage of .8 gram of lead per gallon was permitted in each of the first three quarters of 1980 when all prerequisites for qualification were suspended. (45 FR 14,854-55; 45 FR 37,195-96; [26] 45 FR 55,134-35) Certain small refiners were allowed to use up to 2.65 grams of lead per gallon. These small refiner regulations are effective through at least October 1, 1982. (42 U.S.C. 7545(g) (1)-(4) (1979); 44 FR 46,275)
- October 1, 1980 The 0.5 gram per gallon general standard went into effect. (40 C.F.R. 80.20 (1979)) Small refiners continue to receive the waivers noted above.

