

MONSANTO COMPANY
APPROPRIATION REQUEST

Date: April 15, 1969

To: Mr. E. J. Bock

cc: Messrs.:

J. M. Depp (4)
P. J. Dowd (2)
Finis Morgan (3)
T. K. Smith, Jr.

ORGANIC DIVISION
ANNISTON PLANT

Request No. CEA-2080

Forecast No. 854-A (Approved 10/1/68)

First Listed in Construction Program 10/1/68

Title: SOLID AROCLOR EXPANSION
(Plasticizers and General Chemicals Business Group)

This project proposes a major expansion of the Solid Aroclor facilities at the Anniston, Alabama plant. Two new 3,000 gallon chlorinators and associated storage tanks, still pots, flaking equipment and a two level structure will be provided to increase capacity from the current 11.4 M lbs./year rate to a 29.6 M lb. annual level. Upon completion in late 1969 or early 1970, this plant will enable us to supply into the mid 1970's all forecasted U.S. chlorinated polyphenyl needs and to also provide a significant share of the ex-USA demands for this type of product.

Solid aroclors, and more specifically A-5460 which accounts for 84% of the product line, is used primarily in hot melt adhesives, wax wire compounds, sealants and coatings. The family's sales volume has grown at an average rate of 16% over the last five years and this is expected to continue with export sales doubling for the period 1968-1973.

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Monsanto enjoys a unique position as the only U.S. producer of chlorinated polyphenyls although Goodyear, Reichhold, Hooker and Diamond manufacture certain competitive products. These are, however, not price/performance competitive to our Aroclor line and, hence, are not considered a serious threat.

The Solid Aroclor product line currently returns approximately 11% annually on an investment of \$1.9 M. With the proposed expansion, additional earnings of \$135 M/year will accrue in 1972. This generates an attractive 10.3% return on the total line for that year and the return will continue to increase up to 14% as the full plant capacity is used.

This project is included in the long range plans and construction program for the business group and the division.

Central Engineering has reviewed this request and comments are incorporated in those sections of the request where it has a shared responsibility.

	<u>This Project</u>	<u>This Project & Total Line</u>
New Fixed Capital Requested	\$1,100,000	\$ -
Allocated Fixed Capital	451,000	-
Working Capital	362,000	-
Gross Investment	1,913,000	3,760,000
Return on New Fixed Capital	12.3%	-
Return on Gross Investment	7.1%	10.3%
Year First Achieved	1972	-
Payout Period	5.0 years	-
Capital Turnover	0.81 times/yr.	0.91 times/yr.

Original Signed by H. L. MINCKLER

General Manager

Original Signed By Tom K. Smith, Jr.

Group Vice President

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II. PREMISES

Present Anniston facilities for solid Aroclors are inadequate to supply current and future sales requirements. Monsanto is the only U.S. manufacturer of chlorinated polyphenyls, although, there are some other competitive products. However, because of quality, price and performance advantages for our products, we can be relatively confident of the total volume forecasts.

Volume: A 10% variation in volume from project premises results in a $\pm 0.4\%$ change in return on investment. The timing of this project is such that it can be completed by February 1970, and the temporary use of the liquid Aroclor line can be eliminated. The return on investment at 80% utilization of the total new line will be an attractive 12.2%.

Prices: A 1¢/lb. change in the price or cost of our product will affect the return by $\pm 2.5\%$. Solid Aroclor pricing has been stable at 17.75¢/lb. F.O.B. Anniston for the last five years, and because of quality/performance/price advantages, we expect no adverse effects from U.S. or ex-U.S.A. competition that would cause any significant change in this stable pattern.

Capital: A 10% change (\$0.1 M) in the new fixed capital requirements affects ROI by $\pm 0.3\%$. CED has prepared a detailed scope of work, equipment lists, etc. for this project and estimates the capital accuracy to be $\pm 10\%$.

Turn-over: The total solid Aroclor line will have a turnover of 0.91 in 1972 and 1.09 at 80% of capacity.

Manufacturing Costs: Manufacturing cost for the primary product, Aroclor 5460, is 10.15¢/lb. packaged for the present plant and 9.80¢/lb. packaged for the expanded facility at capacity operation. A 10% change is approximately 1¢/lb. and equates to a $\pm 2.5\%$ effect on ROI.

Major Raw Material Costs: Santowax R, a Biphenyl by-product is one of the major raw materials for solid Aroclors and pricing is not expected to change. Chlorine, the other major raw material, accounts for approximately 40% of the product's cost. Chlorine costs have been estimated at \$40/ton plus \$8.20/ton freight costs. A change in cost of \$5/ton would affect the ROI by $\pm 1\%$.

Net Effect: The above return estimates combine, in our opinion, to give a range of 9.5 to 11.0% on the expanded facilities. The average return should be approximately the 10.3% indicated.

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III. ALTERNATIVES

Other alternatives considered in lieu of the recommended approach were as follows:

1. Maintain status quo on capacity. This alternative would forego \$135 M of additional annual net income and would invite competition from new U. S. manufacturers and ex-USA supply sources. This is obviously not an attractive alternative.
2. The size of the expansion could be reduced from an incremental 20 M lbs. to 10 M lbs./year by eliminating one chlorinator and thereby reduce new fixed capital requirements by 25% or approximately \$250 M. This alternative would, unfortunately, only supply our requirements through early 1972 and provide absolutely no room for opportunistic business. With the profit margins Monsanto enjoys with this family of products, it is the intention of the business group to always have 25% excess, economically justified capacity always available to maintain our position in this field.

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SCHEDULE I

RETURN ON INVESTMENT AT NORMAL OPERATING LEVEL* (Dollars in Thousands)

	<u>Present Line</u>	<u>This Project</u>	<u>This Project & Total Line</u>
Annual Net Sales:			
Amount (9260M# x 16.65¢/lb.)	\$1870	\$1543	\$3413
Cost of Goods Sold	<u>1204</u>	<u>1140</u>	<u>2344</u>
Gross Profit	\$ 666	\$ 403	\$1069
SARE Expense	161	133	294
Income Charges Net	-	-	-
Federal Income Taxes (50%)	<u>252</u>	<u>135</u>	<u>387</u>
Net Income	<u>\$ 253</u>	<u>\$ 135</u>	<u>\$ 388</u>
New Property to be Installed	-	1100	1100
Allocated Property to be Utilized	<u>1410</u>	<u>451</u>	<u>1861</u>
Gross Fixed Investment	1410	1551	2961
Working Capital	<u>437</u>	<u>362</u>	<u>799</u>
Gross Investment	<u>1847</u>	<u>1913</u>	<u>3760</u>
Return on New Property	-	12.3%	- %
Return on Gross Investment	13.7	7.1%	10.3%
Capital Turnover	1.01	0.81 times/yr.	0.91 times/yr.

*Normal operating level indicated above is 67% of capacity in 1972.

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SCHEDULE II

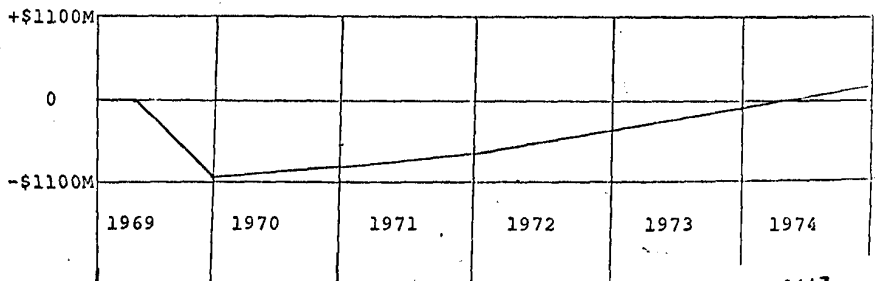
CASH FLOW STATEMENT TO PAYOUT YEAR (Dollars in Thousands)

	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>
New Fixed Capital	1100	-	-	-	-	-
Project Expenses (After Taxes)	36	-	-	-	-	-
Precommercial SARE Expenses (after taxes)	-	-	-	-	-	-
Startup & Correction Expense(after taxes)	-	55	-	-	-	-
Dismantling Expenses, Net of Salvage (after taxes)	<u>9</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Total Cash Requirements	<u>1145</u>	<u>55</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Added Net Income*	-	(28)	50	110	171	182
Depreciation & Depletion	-	200	180	160	140	119
Tax Credit on Writeoffs	-	-	-	-	-	-
Investment Tax Credit**	<u>75</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Total Cash Sources	<u>75</u>	<u>172</u>	<u>230</u>	<u>270</u>	<u>311</u>	<u>301</u>
Net Cash Flow	(1070)	117	230	270	311	301
Cumulative Cash Flow	<u>(1070)</u>	<u>(953)</u>	<u>(723)</u>	<u>(453)</u>	<u>(142)</u>	<u>159</u>

* After SYD Depreciation and Taxes (50%)

** 7% of Qualified Asset Value

FIGURE I
PROJECT CUMULATIVE CASH FLOW



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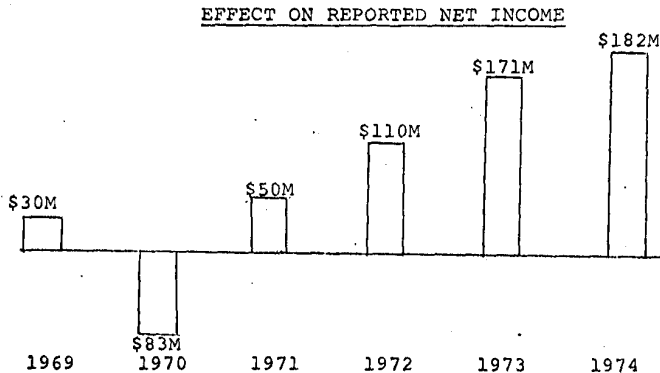
SCHEDULE III

EFFECT OF PROJECT ON REPORTED CORPORATE NET INCOME (Dollars in Thousands)

	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>
Added Net Income*	-	(28)	50	110	171	182
Expenses (After Taxes)	(45)	(55)	-	-	-	-
Retirement Loss (After Taxes)	-	-	-	-	-	-
Investment Credit**	<u>75</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Net Effect	<u>30</u>	<u>(83)</u>	<u>50</u>	<u>110</u>	<u>171</u>	<u>182</u>

* After SYD Depreciation and Taxes

* 7% of Qualified Asset Value



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IV. MARKET

Demand: The following Aroclors fall into the solid category:

Aroclor 1268
2565
5060
5442
4465
5460

Approximately 84% of the total solid Aroclor sales are made in the 5460 form.

In the past five years, Monsanto's world-wide solid Aroclor sales have increased 109% or grown at an average rate of 16% per year. At the same time, Aroclor 5460 sales have increased at approximately 17% per year. Future growth through 1973 for the entire solid family is expected to be at a 15% rate with export sales doubling over the five year period.

The market areas for solid Aroclors are as follows:

	<u>% Total Sales</u>
Distributors	32
Hot Melt Adhesives	21
Export	14
Wax Wire Compounds	12
"Lost" Wax Compounds	6
Sealants	5.5
Coatings	4.5
Flame Retardants	1
Rubber Modifiers	1
Miscellaneous	<u>4</u>
Total	100.0

The greatest growth area for 5460 over the next five years is expected to be in the hot melt adhesives field. This growth is now taking place and will accelerate after Monsanto obtains FDA approval. Export sales were relatively constant in the 1963-1966

period, but doubled from 0.7 - 1.4 M pounds for the years 1967 to 1968. We would expect future growth for 5460 adhesive use to come from the United Kingdom, Canada, Australia, and possibly Japan.

Failure to obtain FDA approval by 1970 could reduce 1.5 M pounds from our sales forecast for that year and up to 3.0 M pounds for the year 1972.

Manufacturing competition for solid chlorinated bi or terphenyls exist as follows:

U.S.A.	None
United Kingdom	None
France	Ugine Kuhlmann
Italy	Caffaro (25% owned by Kuhlmann)
Germany	Bayer
Japan	Kanegafuchi

The 70% chlorinated paraffins manufactured by Diamond and ICI compete with Aroclor 5460 in the surface coatings industry. The market for chemical resistant paints is being satisfied with the superior A-5460 while 70% chlorinated paraffins have a large percentage of the non critical market.

Price: Pricing on solid Aroclors has been 17.75¢/lb. FOB Anniston for the last 5 years. Our export prices have been based on 18.5-19.25¢/lb. FAS Mobile.

Tariff protection on Aroclors under classification TS USA 403.60 is as follows:

<u>Duty Rates</u>	<u>ASP</u>	<u>FV (if ASP is lost)</u>
1967	3.5¢ + 25%	-
1968	3.0¢ + 22.5%	-
1969	2.5¢ + 20.0%	2.7¢ + 28.5%
1970	2.0¢ + 17.5%	2.3¢ + 25.0%
1971	2.0¢ + 15.0%	1.9¢ + 21.5%
1972	1.7¢ + 12.5%	1.5¢ + 18.0%

Price: (continued)

Foreign material would therefore have to land at 13.8¢/lb. CIF in 1972 to meet a domestic price of 17.75¢/lb. FOB based on ASP or 13.1¢/lb. CIF if ASP is abolished.

We expect to maintain our present pricing on Aroclor 5460 for the next 5 years except for some pressure by a few customers as their volume grows to 1 - 2 M lbs./year. To meet this, we plan to explore the possibility of shipping molten Aroclor 5460 to large hot melt adhesive customers. In the event this possibility matures, additional expenditures at the plant level may be required for storage facilities. We also hope to offer an essentially colorless Aroclor 5460 for which some hot melt customers have expressed a desire at a premium of 2 - 3¢/lb. It has been estimated that the cost of producing such a product at 3 M lbs./year would be 1¢/lb. premium.

V. TECHNOLOGY

Existing technology will continue to be utilized. Plant laboratory investigations have developed a process for decreasing color of the final product. If this is required in the future, facilities can be added to the forward part of the plant. If fractional distillation of the crude chlorinated terphenyl is required to insure FDA product approval, a part of the production can be fractionally distilled in separate facilities which can be added as a part of the refining section. Experimental work is continuing to determine if improved distillation techniques are beneficial.

The key area of technological risk is in the scale-up of the flash distillation system. A single distillation system is being designed with double the capacity of the existing unit. No serious trouble is anticipated from this scale-up.

The new facility, including the existing solid Aroclor flaker, will be used exclusively for Aroclor 5460 in order to provide a system which can pass FDA inspection.

As production increases, bagging facilities will be reviewed, and additions to the present system may be requested at that time.

VI. SIGNIFICANT CONTRACTS

No significant sales or construction contracts are now associated with this project.

VII. PATENTS

No patent problems are anticipated in connection with this project since the processes to be utilized have been used in Aroclor production for a number of years. Monsanto has or anticipates no patent position which provides us with proprietary position in the production of Aroclors.

VIII. EARNINGS

The financial data for the project has been derived in the normal fashion for expansion projects. Volume and pricing information was taken from the latest sales forecast and the manufacturing cost information for the expanded plant was developed by manufacturing. The capital estimate was supplied by CED.

This project yields additional earnings from the sales of 9.2 M pounds of solid Aroclors in 1972 that cannot be produced in the present 11.4 M lb./year plant. Even though the new facility has capacity up to 29.6 M lbs. Aroclors/year, and hence, generates considerable unused capacity charges in the early 1970 period, this project does generate an attractive 7.1% return incrementally. In addition, the total line has a substantial return on investment at 10.3%.

IX. CAPITAL

A. Scope of Project

Major facilities will include two 3,100 gallon chlorination tanks with a single 2,000 gallon charge tank supported on a hopper scale. A single 6,500 gallon intermediate storage and blow tank are provided to prepare product for distillation.

One 7,300 gallon still pot with auxiliaries and an external gas fired furnace will be provided for distillation.

A freight elevator in the present manufacturing building will replace an outmoded unit and will convey lime and rework materials to the operating level.

A drum flaker and feed tank will be provided for Aroclor 1268 since the flaker provided on CEA 1430 is to be reserved for FDA quality material only.

A new mill for Aroclor 1268 to mate with the drum flaker is included. Funds for this mill were approved on CEA 1430, but the mill is being removed from the project by a variance since it will not be mated to the flaker provided on that job.

All tanks are carbon steel. Critical heat exchangers will have stainless tubes and tube sheets.

A new two-level steel structure 20 ft. wide by 82 ft. long with wind breakers and a concrete top deck will be provided to support process equipment.

The existing control room will be expanded to twice its present size to accomodate new instrumentation and work force.

B. Estimate

Capital

Machinery and Equipment	\$1,098,000	
Buildings	-0-	
Uninstalled Spare Equipment	2,000	
Total Capital		\$1,100,000

Divisional Expense

Dismantling	\$ 18,000	
Repairs	4,000	
Relocations and Modifications	53,000	
Start-up Modifications	15,000	
Total Division Expense		\$ 90,000

CED Expense

Central Engineering		
Start-up Expense		\$ 15,000

Scope definition for this estimate is fairly specific and was prepared by CED from a detailed scope of work, equipment list and preliminary layouts. Probable accuracy of the capital portion is $\pm 10\%$.

Expense work will include dismantling abandoned footings, a still heater, and the wall of Building 27 to clear the site

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for the new structure. Relocations and modifications are required to relocate specific items in the new control room including a large existing instrument panel and pipelines and stairways that interfere with the new structure and control room. Probable accuracy of the expense portion is $\pm 25\%$.

C. Project Status

Detailed design is underway supported by \$100 M pre-approval of H. L. Minckler, dated 12/18/68. Seventy-five percent of Process Design sheets have been completed, and five Engineering Flow Diagrams have been started. The Preliminary Model of the manufacturing area is complete, and preliminary layout drawings are finished. Steel design has been started.

The project can be completed in 10 months after approval.

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XI. FINANCE DEPARTMENT

Solid Aroclor sales are expected to grow 15% per year with the greatest growth in the hot melt adhesives field. Forecasts for this market are premised on FDA approval by 1970.

While Monsanto has no direct domestic competition in chlorinated polyphenyls, competitive products are sold by six other suppliers. The request compares these with Solid Aroclors, and it would appear that on balance the Aroclors have the edge.

Operating at only 67% of capacity, this project still shows good profitability, 7.1% ROI. The low capacity is in keeping with the policy of always maintaining a 25% excess. The total product line will show an attractive 10.3% ROI after this project.

There are no unusual treasury, accounting or tax problems apparent in connection with this request. This project is listed in the January 1, 1969 Construction Projects Program under Minor Projects for \$400 M.

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XII. PERSONNEL

Seven new manufacturing operating personnel will be required for capacity operation of the new plant. We do not foresee any difficulties in obtaining qualified personnel.

XIII. RISK EVALUATION

No new hazards are introduced by this expansion.

The maximum probable loss was considered to come from loss of the heater for the still pot as a result of explosion in the fire box. It was considered that approximately six days would be required to rebrick and repair the heater. A spare coil will be kept in stock.

It was estimated that repairs would cost about \$10 M, and the business interruption loss during this period of time would be approximately \$45 M.

XIV. POLLUTION AND TOXICITY PROBLEMS

Gaseous chlorine, a raw material, and HCl gas, a by-product, are handled routinely without contributing to air pollution at the plant.

The addition of the new chlorinators will result in a 50% increase in the maximum amount of HCl gas produced by the liquid and solid chlorinators.

Capacity of the present HCl acid absorber has not been demonstrated. It is partially loaded at present, and if additions are required to this system, a separate project will be submitted at a later date. Presently, excess HCl gas is scrubbed with water and neutralized in a central limestone pit before the wastes enter the Anniston drainage system.

XV. INTERNATIONAL ASPECTS

No unusual international aspects are foreseen for this project.

XVI. CORPORATE DISTRIBUTION REVIEW

The proposed expansion at the Anniston Plant will introduce no new or unusual problems.

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