MONSANTO COMPANY

APPROPRIATION REQUEST

To: Mr. E.J. Bock
President

October 19, 1970

Messrs.
J.M. Depp (4
P.J. Dowd (2
J.S. Kerley (3
L.F. Steinbach (2
T.K. Smith, Jr. (1

TITLE: CONTROL, RECLAMATION, AND DISPOSAL OF AROCLOR WASTES
(Functional Fluids Business Group)

NEW FIXED CAPITAL REQUESTED: $ 590,000

DIVISION: Organic Chemicals PLANT: W.G. Krummrich & Anniston

REQUEST NO: CEA 2415 FORECAST NO. 3019

FIRST LISTED IN THE CONSTRUCTION FORECAST: 7/1/70

I - SUMMARY

Monsanto has announced a program intended to eliminate entry of PCB's (polychlorinated biphenyl) into the environment. To close the loop on closed system applications of Aroclor, such as electrical equipment and heat transfer systems, we need the capability to reclaim or destroy spent or contaminated fluid. This project provides for modification of Krummrich Plant Aroclor manufacturing facilities for reclamation of used fluid, installation of an incinerator at Krummrich for disposal of unreclaimable fluid and still residue, and improvements to manufacturing facilities at both Anniston and Krummrich to further reduce losses.

The reclamation system will consist of an existing still and filter system with piping modified to isolate reclaiming operations from virgin production. Customers will be credited for returned material at a price which will result in a lower cost for reclaimed fluid than for new product.

Used material which cannot be reclaimed will be incinerated. Vendor tests have demonstrated complete destruction of PCB's

I - SUMMARY (Cont'd)

under controlled operating conditions. A scrubber will remove HCl from the flue gas. Customers will be charged a fee for incineration which will at a minimum cover operating cost. Still residue from the Aroclor manufacturing operation will also be incinerated. Substantial excess incineration capacity will be available for disposal of other problem wastes.

This project provides for paving, trenches, curbs, and sewers in storage and loading areas, so that leaks and spills, if any, do not enter ground waters or by-pass the catch basins.

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

The Group Vice-President has reviewed this project and recommends approval. This is a non-earnings project required for continuation of the Aroclor business.

H. L. Minckler

Recommended by H. L. Minckler
General Manager

II - PREMISES

Since liquid Aroclors have been reported by some researchers to be harmful to wild life and persistent in the environment, they are being withdrawn from "open system" applications. However, as to the applications where Aroclor safety and electric stability are irreplaceable, we believe and have indicated to regulatory agencies, concerned legislators, and the public that "closed system" applications pose no threat to the ecology. In order to fully implement the program, we must have a working system for disposal of fluid drained from dismantled transformers, or otherwise contaminated or unusable materials. The key premise of this project is that customers can be motivated to return such materials for reclamation or disposal, given an economical and practical way to do so.

Another important premise is that reclaimed Aroclor can be marketed as Therminol or electrical fluid.

Central Engineering has based its process design and capital estimate on the data given in the Preliminary Scope Report dated August 6, 1970. Sufficient information was available for preparation of a reliable estimate.

The Project Scope was based on actual incineration tests at the John Zink test facilities during 1970.

III - ALTERNATE COURSES

1. Haul Returned Aroclor To Toxic Landfill

   Rejected because of possible adverse public reaction despite technical feasibility. Also, the landfill presently in use for W.G. Krummrich Plant will be full in 4 to 5 years and State approval to open another one is unlikely.

2. Abandon The Entire Aroclor Business

   This has been explored with the Corporate Management Committee in arriving at our present PCB strategy and was rejected because the electrical industry has no viable alternate.

3. Contract Incineration

   No suitable facilities were found at the right location and price.

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IV - MARKET

We cannot predict how much material will actually be returned by customers, but have estimated it will be 10% of sales or 6 M pounds/year. About half will be reclaimable. A fee of 3¢/pound for incineration (freight prepaid) has been quoted, subject to adjustment after operating cost has been demonstrated.

V - TECHNOLOGY

Aroclors and Still Residue (Montar) incineration tests were run at John Zink test facilities at Tulsa, Oklahoma. Stack gas analyses were performed by Organic Research personnel. Test results showed that temperatures of 2000°F and above are adequate to achieve destruction of the material. The project will provide blending facilities to assure uniform feed from each storage tank to the incinerator and operating temperatures to 2800°F can be realized. Thus, the risk of not achieving destruction is considered minimal. Because of the high temperatures at which the incinerator operates, handling corrosive vapors and liquids plus solids in the Montar, materials of construction are limited and their capabilities are being stretched. Materials of construction outside the incinerator fire box have been reviewed thoroughly, resulting in material changes from standard vendor design in the quench tube and venturi. A similar facility operated for 2½ years by another firm is performing reasonably well with approximately 85% on-stream time.

Solids (lime) in Montar will reduce life of the incinerator refractory at temperatures above 2200°F. Since the Montar was adequately destroyed in a test at this tempemature, life reduction of the refractory should be minimal during operation.

VI. SIGNIFICANT CONTRACTS

There are no significant contracts associated with this project.

VII. PATENT SITUATION

It is the opinion of the Patent Department that the reclamation and disposal of polychlorinated biphenyl waste material as proposed herein does not present any patent problem.

VIII. EARNINGS

This is a non-earnings project.

IX. CAPITAL

A. Scope Of Project

This project proposes installation of facilities at W. G. Krummrich Plant to thermally oxidize polychlorinated biphenyl waste products, to scrub gaseous hydrogen chloride and particulate combustion products to the sewer, and to discharge the balance of clean stack gases to the atmosphere. The incineration system will have a 10M lbs/year capacity. Reclamation facilities will have a capacity of about 10M lbs/year.

Major equipment items of the incineration system include a dual fuel (natural gas or oil) fired refractory-lined furnace, quench tank, venturi scrubber, and a packed tower scrubber.

Existing storage capacity will be utilized to store the waste materials prior to incineration or reclamation, and existing unloading facilities will be modified to receive the returned Aroclor from customers.

A dilution system for collecting Montars from plant operating facilities will be installed.

All necessary utilities are available at the selected incineration job site. (Phenol Fusion Area)

Funds have been provided in undeveloped design to provide facilities for removing undissolved and dissolved Aroclor from water streams. Carbon absorption studies are being conducted at the Anniston Plant. However, insufficient data is available on which to base a design.

Funds are also provided for paving, curbs, trenches, and drains in storage and loading areas at both Anniston and Krummrich Plants, and interim improvements to waste water facilities at Anniston.

IX. CAPITAL

B. Estimate

Capital	Total	Responsibility: CED	Responsibility: WOK Plant	Responsibility: Anniston Plant
Installed Machinery & Equipment	$ 590 M	$ 430 M	$ 70 M	$ 90 M
Buildings	--	--	--	--
Total Capital	$ 590 M	$ 430 M	$ 70 M	$ 90 M
Divisional Expense				
Dismantling	$ --	$ --	$ --	$ --
Repairs	7 M	7 M	--	--
Relocations & Modifications	30 M	17 M	6 M	7 M
Start-up Relocations & Modifications	7 M	7 M	--	--
Contingency	8 M	8 M	--	--
Total Division Expense	$ 52 M	$ 39 M	$ 6 M	$ 7 M
CED Expense	$ 3 M	$ 3 M	$ --	$ --

C. Project Status

Test work by both Monsanto and a vendor has been completed.

Pre-project development work is complete and pre-approval of $100M has been received to permit proceeding with engineering and committing for long-delivery equipment. The incinerator has been ordered.

IX. CAPITAL

C. Project Status (Cont'd)

Project completion is scheduled for nine months after project approval. This schedule will be improved if possible without incurring additional costs. The "undeveloped design" portion of the project, for treatment of scrubber effluent, may not be complete when the incinerator is started up.

Krummrich Plant forces plan to perform the construction of the incinerator system. Design and construction of facilities for reclamation and control of physical losses will be the responsibility of the plants.

X. LEGAL

With proper operation, no unusual legal problems are anticipated.

XI. PERSONNEL

Operating labor requirements are not fully defined, but it is expected that both the incinerator and reclamation system can be run by a man shared with existing operations.

XII. RISK EVALUATION

The major loss exposure on this project is a potential combustion chamber explosion in the incinerator with a maximum foreseeable loss of $50,000 property damage.

The foregoing paragraph is an excerpt from the Pre-Project Loss Prevention Report No. 70-38.

XIII. POLLUTION

A possibility of PCB loss from production operations will be minimal.

The sewer stream from the incinerator scrubber will contain a maximum of 770 lbs/hour of HCl and varying amounts of lime from the burning of Montar. Treatment of this stream will not be necessary. Recovery and sale of the HCl as muriatic acid was investigated, but the concentration is too low for this to be economical.

Stack gases to the atmosphere will contain a maximum of 5 lbs/hour of HCl, 50 ppm free chlorine, and 0.2 grains particulate matter per standard cubic foot. This stream will not require additional treatment.

XIV. INTERNATIONAL ASPECTS

Disposal of spent PCB materials outside the U.S. is not affected by this project.

XV. CORPORATE DISTRIBUTION REVIEW

The installation of facilities for improved manufacture at Anniston and Krummrich Plants introduces no new distribution problems.

The Aroclor reclamation program at Krummrich is requiring restudy of distribution patterns to develop the lowest distribution costs for returned contaminated Aroclors.

XVI. FINANCE

This non-earnings project is consistent with our position that "closed system" applications pose no threats to the ecology. Extending disposal service to customers assists in partially offsetting total operating costs while strengthening our marketing relationships. Since a corporate review has resulted in the decision to remain in the Aroclor business, this project is needed to help implement the current strategy.

There are no Treasury, Tax or Accounting Department problems apparent in connection with this project.