To: Keith Harrison
from [illegible]

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CONSTRUCTION PRODUCTS DIVISION

W. R. Grace & Co.

1970 LONG RANGE PLAN

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EXHIBIT 131

CONSTRUCTION PRODUCTS DIVISION

1970 LONG RANGE PLAN

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V. ONE YEAR OBJECTIVES AND ACTION PROGRAMS - WORK PLANS

1. ACCOMPLISHMENTS VERSUS 1969 OBJECTIVES

A. Zonolite:

C. 1. SECURE CONTROL BY PURCHASING OR LEASING OF VERMICULITE

D. DEPOSITS IN SOUTH CAROLINA.

E. Rock Pr Target Date: April

Progress:

Our evaluation indicated that the reserves would support only a very small mill operation, which would not be capable of generating an adequate return on investment.

We are focusing our efforts on evaluating the deposits in Virginia.

2. DESIGN MILL FACILITY TO UTILIZE VERMICULITE IN SOUTH CAROLINA.

A. Division

Targe' Date: March, dependent upon success of No. 1.

B.

Progre .

Cancelled.

3. FURTHER EXPLORE VERMICULITE OCCURRENCES IN NORTH CAROLINA AND VIRGINIA.

Target Date: April

Progress:

Drilling conducted in Virginia during June through September has given preliminary indication that this

deposit may warrant commercial development. Considerable testing and analysis must be done before making a final assessment. We may have to conduct further exploratory drilling next summer before determining whether this area should be commercially developed or abandoned.

Target Date: April

4. IMPROVE PROCESSING METHODS AT LIBBY.

Target Date: September

Progress:

We have found a new reagent system which is much more selective than anything used to date for flotation separation of vermiculite from the gangue material.

We are piloting new processing methods and circuits, which we expect to have firmed up to be able to start to engineer revisions to the plant by the end of 1969.

5. ATTEMPT TO MARKET A FIRE RESISTANT COMPOSITE CONTAINING A HIGH PERCENTAGE OF VERMICULITE DEVELOPED TO THE PILOT STAGE BY WRC.

Target Date: April

Progress:

We were unable to interest anyone in this project because comparable type materials can and are being made at lower cost using low density Perlite.

6. FURTHER DEVELOP PROGRAM FOR MARKETING DRI-PAC PERLITE-ASPHALT ROOF DECK SYSTEM.

Target Date: December

Progress:

We are progressing on schedule. We have obtained nine applicators as of October.

7. EXTEND THE TEST MARKETING PROGRAM ON REDI-EARTH TO ADDITIONAL AREAS.

Target Date: September

Progress:

We had inconclusive results and plan a new approach using cooperative advertising in 1970.

8. CLOSE THE SPOKANE, WASHINGTON AND THE PORTLAND, OREGON PLANTS AND REPLACE WITH ONE CENTRAL FACILITY.

Target Date: December

Progress:

Project delayed until 1971.

9. CONSTRUCT A NEW POLYSTYRENE PLANT AND NEW VERMICULITE WAREHOUSE IN ATLANTA.

Target Date: August.

Progress:

We extended the lease on the present polystyrene facility until August, 1970 and will construct new plant in 1970. This project was delayed pending the development of a manufacturing plan for the Southeastern part of the U.S.

10. CONSTRUCT NEW PLANT IN ELLWOOD CITY, PENNSYLVANIA.

Target Date: June

Progress:

was accomplished July 10, 1969.

11. CLOSE MODESTO AND CONSOLIDATE WITH SOUTH GATE, CALIFORNIA.

Target Date: April

Progress:

The consolidation was accomplished in February, 1969.

12. CONSOLIDATE TWO PLANTS IN BOCA RATON AND ONE IN HIALEAH INTO ONE LOCATION IN SOUTH FLORIDA.

Target Date: December

Progress:

Rescheduled for 1970. This project was delayed pending the development of a manufacturing plan for the South-east part of the U.S.

13. ORGANIZE AND STAFF A RESEARCH AND DEVELOPMENT PROGRAM.

Target Date: June

Progress:

Two research professionals have been assigned to Zonolite at Cambridge. Further emphasis on Zonolite research will be given by the former CID research group, which now serves the entire Construction Products Division.

B. Construction Materials Division:

1. INCREASE EMPHASIS ON DEALER SALES OF SERVICISED AND HORN PRODUCT LINES.

Target Date: Continuing

Progress:

We now have three hundred combined dealers and distributors for our Horn and Servicised lines. This program will continue in 1970.

2. ACCELERATE THE SEALANTS PROGRAM.

Target Date: Continuing

Progress:

Sealants sales through September were 20 percent ahead of the same period of 1968. However, prices have deteriorated causing a reduction in gross margins and we have withdrawn the acrylic type sealant because of product failures.

3. PLACE HEAVY EMPHASIS ON BITUTHENE MOISTURE BARRIER.

Target Date: 1st Quarter

Progress:

Current estimated sales of Bituthene in 1969 are 52 percent over budget and 380 percent over 1968. We have met the 1969 objectives.

4. CONTINUE TO EMPHASIZE GROWTH IN DAREX ADMIXTURES.

Target Date: December

Progress:

We have purchased E. W. Zimmerman, one of the remaining Darex distributors. We plan to acquire J-W and A. H. Harris before mid-1970 to complete this program.

We now have three hundred certified dealers and distributors. Field tests of two new Darex admixture formulations were not successful. These products have been returned to the laboratory for further development work. We will not make our December target date on them.

5. INCREASE SPECIFICATION EFFORT IN KEY CITIES AND WORK ON TARGET ACCOUNT LARGE JOB PROGRAM.

Target Date: 1st Quarter

Progress:

We have added personnel in key cities but have been only moderately successful in gaining increased specification effort. We have changed our marketing program from emphasis on direct sales to sales through dealers and distributors for the Horn and Servicised product lines.

6. IMPROVE THE MARKETING, ADVERTISING, PROMOTIONAL AND PRODUCT MANAGEMENT EFFORTS.

Target Date: Continuing

Progress:

We are continuing to phase out the low volume, marginally profitable products, especially in the Horn line, and

have focused the attention of product managers on the key products. Our advertising and promotional effort has been concentrated on Bituthene.

7. INTRODUCE TWO NEW ROCK PROCESSING CHEMICALS PRODUCTS.

Target Dates: 1st and 2nd Quarters

Progress:

We introduced DDA-7 in June. This was three months after the target date because of difficulty in obtaining ASTM acceptance. We have not yet introduced Hydrophobe, the second new product, because field tests to date have not yet confirmed the optimum formulation. We are continuing to work on this and expect that we will introduce a commercial product by the end of the year.

8. HOLD MAXIMUM RPC MARKET SHARE.

Target Date: Continuing

Progress:

Following the introduction of DDA-7, we have begun to regain customers that had been lost to competition and are holding other customers that were questionable.

9. BEGIN SELF-MANUFACTURE OF BITUTHENE.

Target Date: 4th Quarter

Progress:

We deferred this project to resolve plant location, formulation and equipment design questions.

10. IMPROVE CHICAGO PLANT OPERATION.

Target Date: Continuing

Progress:

An experienced plant manager was hired September 1. Two college graduates were added to the supervisory group and regular training meetings have been conducted with the entire supervisory group. We have improved our ability to meet promised shipping dates, but have not yet resolved this problem entirely. We have focused almost 90 percent of the Chicago laboratory effort on quality efforts and have made good progress with the outgoing quality level of sealants, PVC waterstops and rubber products. Before the end of the year, we will have completed or started cost reduction projects in the PVC, rubber, cutting and warehouse fabrication departments.

11. REDUCE INVENTORY LEVELS.

Target Date: 1st Quarter and Continuing

Progress:

We revieved the product line to eliminate slow moving items and were able to sell off some of this obsolete inventory. However, there is still a considerable quantity of obsolete or slow moving inventory on hand. We did not accomplish other planned actions because management attention was redirected to other problems which must be solved before an effective inventory policy can be specified.

12. IMPROVE THE DIVISIONAL TOTAL DISTRIBUTION POLICY.

Target Date: 4th Quarter

Progress:

We did not hire an outside consultant as planned last year because we decided first to make changes in the product line and in the marketing organization. These and other changes will accomplish this objective without the need for an outside consultant.

13. FOCUS R&D EFFORT ON HIGHEST PROFIT PRODUCT LINES.

Target Date: Continuing

Progress:

We devoted more R&D effort to Rock Products Chemicals and to Darex admixtures as scheduled.

14. FOCUS R&D EFFORT ON NEW PRODUCT DEVELOPMENT.

Target Date: Continuing

Progress:

We have begun to work on several basic new products, including products in the roofing, wall panel and concrete forming areas, as scheduled.

15. CONDUCT R&D WORK ON THE BITUTHENE PROGRAM.

Target Date: Continuing

Progress:

We have worked on formulation modifications as scheduled.

2. OBJECTIVES FOR 1970

A. Division:

1. COMPLETE TECHNICAL/ECONOMIC EVALUATIONS OF THREE SPECIFIC NEW PRODUCT OPPORTUNITIES AND BEGIN PLANS TO ENTER FIELDS WITH GOOD INDICATED RETURN ON INVESTMENT.

(a) Foam forming system for poured concrete. Conduct market study and engineering design evaluation. If favorable, design molds and begin plant installation.

Target Date: 3rd Quarter

(b) Core materials for wall panels for housing. Conduct technical/economic evaluation of vermiculite molded with binders, including the "French Board" and other binder systems. Work with HUD "Operation Breakthrough" consortium to select most favorable for development and marketing.

Target Date: 3rd Quarter

(c) Inverted insulated roofing. Conduct technical/economic evaluation of combinations of Bituthene and Dyfoam, including outdoor weathering tests during winter, spring and summer, 1969/70. Make preliminary determination of commercial feasibility.

Target Date: 3rd Quarter

2. IDENTIFY AND APPROACH ACQUISITION CANDIDATES.

Study segments of the building and construction market for profitability and fit with CPD and to identify leading companies.

Target Date: Continuing

B. Canada:

1. CONCENTRATE SALES EFFORTS ON PRODUCTS WITH BEST VOLUME AND PROFIT POTENTIAL.

Eliminate lower margin buyouts and increase specification and sales efforts on admixtures, Bituthene and rock processing chemicals.

Target Date: 2nd Quarter

C. Zonolite:

1. INCREASE VERMICULITE SUPPLY.

(a) Continue exploration in Virginia and initiate prospecting in Southern Ontario and Quebec.

(b) Install equipment at Libby to increase recovery rate.

(c) Install six D-18 furnaces in plants to improve the yield in bags obtained per ton of ore expanded.

Target Date: By end of year.

2. CONSOLIDATE MANUFACTURING AND DISTRIBUTION IN SOUTHEASTERN UNITED STATES.

Install a large-scale manufacturing plant with rail-trailer distribution terminals to serve a region now supplied by several obsolete local plants.

Target Date: 4th Quarter

3. IMPROVE AND EXPAND DYFOAM MANUFACTURING.

(a) Add a warehouse and block molding equipment at New Castle.

Target Date: 3rd Quarter

(b) Install equipment in a rental site in New England to serve the Northeastern seaboard market.

Target Date: 3rd Quarter

(c) Install a block [illegible] line for Vent Board and [illegible] Tufhide[illegible] efforts on [illegible]. Straightness and [illegible] proc[illegible] Target Date: 3rd Quarter

(d) Improve output rates of plants by operating procedure changes.

Target Date: Continuing

4. IMPROVE THE BUILDING PRODUCTS SALES ORGANIZATION.

(a) Study territory coverage and district and regional control; realign and consolidate where appropriate to achieve more efficient sales coverage of the market. Target Date: 3rd Quarter

(b) Reorganize our technical services and product manager group to improve their effectiveness and to replace the functions of the Vermiculite Institute. Appoint a Merchandise Manager.

Target Date: 2nd Quarter

5. IMPROVE THE CONCRETE PRODUCTS OPERATION.

Negotiate agreement with American Excelsior for lower cost supply at Brunswick and revamp the facilities at Terry to reduce labor.

Target Date: 3rd Quarter

D. Darex, Horn-and-Servicised:

1. REORGANIZE THE CAMBRIDGE AND FIELD ORGANIZATIONS TO FOCUS MANAGEMENT ATTENTION ON THE HIGH VOLUME, HIGH PROFIT MARGIN LINES AND ON THE PROBLEM LINES.

Eliminate the field regions and set up control at Cambridge separately over Darex admixtures, Bituthene waterproofing and Horn/Servitised building and engineering construction products.

Target Date: 1st Quarter

2. IMPROVE THE CHICAGO OPERATION.

Complete the reorganization of the manufacturing, order handling and inventory control operations.

Target Date: 2nd Quarter

E. Rock Processing Chemicals:

1. REGAIN MARKET SHARE.

Promote DDA-( ) to regain customers lost to competition and to hold existing customers.

Target Date: Continuing

2. BEGIN SALES TO NON-CEMENT MINERALS PROCESSING INDUSTRY.

Devote sales effort to introducing products based on our existing dry dispersants technology to non-cement companies processing minerals by the dry grinding process.

Target Date: One significant new customer by end of year.

3. RESEARCH PROGRAM - 1970

Both expansion/new opportunity research programs and selected sustaining research projects that are of major importance are described in this portion of the Plan. Less significant sustaining research and technical service projects are omitted, but an estimate of their cost is given in the summary of the 1970 research department budget.

A. REVIEW OF 1969 RESEARCH PROGRAM

Accomplishments:

1. Bituthene

During 1969 a pilot line was installed and used to produce small quantities of Bituthene for field testing. The line employs crumb natural rubber instead of the latex emulsion currently being used in England. The former has performance advantages over the latter and manufacturing equipment to make it is simpler. A third method for rubberizing the bitumen was dev in the laboratory, which has possible patent protection. It will provide savings in manufacturing, and has performance advantages over both the latex and crumb rubber products. Manufacturing feasibility will be evaluated on the pilot line for field testing late in 1969 and early 1970. The R&D costs of this program were approximately $34,000.

2. DDA-7

Development work was completed and the product presented to the market at mid-year. This new interground addition should

aid CPD both to recover lost business and to penetrate the Type I cement market. The R&D costs of this program during 1969 were approximately $21,000. A program aimed at development of DDA-8 was started at mid-year and will be carried over into 1970.

3. Hydrophobe

This is a new interground air entraining agent/water repellent for masonry cement which is now being field tested. Total R&D costs, including 1968, were approximately $16,000. Annual sales potential is estimated at $200,000.

4. Zonolite Products

Asbestos fiber is a health hazard during the application of Mono-Kote. Work done late in 1969 to eliminate asbestos from the product indicates that a substitute has been found which does not deter from the properties of the original Mono-Kote. Fire tests are being conducted to confirm our findings and obtain product approval.

Serious air pollution at CPD plants where Zonolite masonry fill is produced is also hazardous to health. A new coating for the expanded vermiculite was developed which both lowers the cost of the final product and eliminates the pollution problem. The use of the new coating will require changes in manufacturing equipment which will carry over into 1970.

A portion of the mined vermiculite, Type III, cannot be used in the current product line because of its extreme friability and has, therefore, been stockpiled at both of Zonolite's mining operations. During 1969 several potential new uses were uncovered for Type III vermiculite which will be further investigated in 1970.

3. Unsuccessful

Disappointments:

1. WRC Liquid Curable Polymer - Sealant and Floor Coating

Because of lack of long-term stability plus batch-to-batch inconsistency, none of the experimental polymers supplied by WRC during 1968 and 1969 could be compounded into a useful structural sealant and/or a floor coating. The R&D expenditure on this program during 1969 was approximately $10,000.

2. Room Temperature Acrylic Sealant

Efforts to overcome certain of this product's undesirable performance characteristics were not successful and the product was withdrawn from the market at mid-year. The total R&D costs in this effort during 1968 and 1969 were approximately $35,000.

3. Concrete Admixtures

In March, a patent was granted to Master Builders (Martin-Marietta) covering the use of compositions similar to those developed by CPD late in 1968. The priority given to con-

tinuation of our program resulted in a delay in the plans for developing:

(1) Admixture for specialty concretes,

(2) Polymer-treated concretes,

(3) Concrete surface sealer.

The cost of this program in 1969 was approximately $26,000.

4. Surface Retarders

Problems in manufacture and field application forced us to withdraw the newly developed (1968 to 1969) line of concrete surface retarders from the market. Total research costs for this project were $10,000.

B. 1970 RESEARCH PROGRAM

Research effort in the expansion/new opportunity area during 1970 will be focused on four major projects.

1. Bituthene

Attempts to improve its properties, simplify its manufacture and provide patent coverage will be continued in 1970. In addition, possible modifications of Bituthene for use in roofing, pipe wrapping, and low cost damp-proofing will be examined. The estimated research and development expenditure on this project during 1970 is $50,000.

2. Roofing Systems

During the second half of 1969, experimental roofing systems using Permadeck, Bituthene, Dyfoam and vermiculite concrete were erected for performance studies in 1970 and 1971. All of the systems are designed to provide both waterproofing and insulation. An expenditure of $15,000 is planned in 1970 in the system evaluation.

3. Wall Panels

During 1969, CPD joined a consortium which submitted a proposal to HUD for participation in "Operation Breakthrough". Part of CPD's participation in the consortium involves developing wall panels for use in systems built housing. The principal goal in 1970 will be to attempt to develop a board using vermiculite that would have sufficient strength to serve as the core of the wall panel. Indoor/outdoor coatings, methods of fastening and sealing of joints between the panels will also be investigated. A small expenditure ($7,000) is tentatively planned for 1970, pending determination of the acceptance by HUD of the proposal submitted by our consortium.

4. Shrinkage Control - Mortar and Concrete

Basic work at WRC in 1964 to 1967 identified the causes of shrinkage of portland cement-based mortar and concrete and established several possible avenues of approach to control shrinkage through additives. A research expenditure of $20,000 is planned for 1970 to investigate these and other approaches.

Four major research projects in the Sustaining Research category will be conducted in 1970.

1. Concrete Admixtures

The setback in early 1969 caused by the issuance of Master Builders' patent was partially overcome by a strong research effort during the repainder of the year. This program will continue to have top priority during 1970, for which an R&D expenditure of approximately $50,000 is planned.

2. Type III Vermiculite

The program initiated in 1969 aimed at finding a use for Type III vermiculite will be continued in 1970 at an expenditure level of $25,000. One use that will be evaluated and that ties in with the wall panel project involves fabrication through the use of a suitable binder into insulating fireproofing cores for wall panels.

3. Admixtures for Specialty Concretes

During 1969 concrete made from specialty cements such as Chem Comp, PCA Jet Set Cement and Alpha Regulated Set Cement gained considerable attention. CPD must have admixtures that are compatible with these cements in order to maintain its position in the concrete industry. The planned R&D expenditure for 1970 on this project is approximately $37,000.

4. Grinding Aid and Peck Set Inhibitor for Portland Cement

During the second half of 1969, work was started towards developing DDA-8, the next generation of grinding aids for portland cement. The objective is to achieve equivalent performance at reduced cost. This work will be continued in 1970 on an expenditure level of about $30,000.

C. MAJOR RESEARCH DEPARTMENT PROBLEMS

1. Research Effort Balance

Because a good part of CPD's sales is predicated on efficient technical service, a considerable portion of the research department effort is in maintenance type research projects. In the past, this has distracted from the emphasis on new opportunity research projects. Although the magnitude of this problem was reduced in 1969, measures to control it further will be taken during 1970.

D. SUMMARY OF 1970 RESEARCH BUDGET

During 1970, the Construction Products Division will spend $863,000 in its research and development program. Research and development in the Construction Products Division includes technical service and sustaining research as well as new opportunities research, and in 1970 will also include process engineering work on new products. A breakdown of planned expenditures for 1970 compared with current estimate for 1969 is shown in the following table.

R&D EXPENDITURES

	Planned 1970 ($000)	CE 1969 ($000)
Expansion/New Opportunity Research	$162	$ 95
Maintenance/Sustaining Research:		
Sustaining Research	256	262
Technical Service	375	374
Sub-Total	631	636
R&D/Process Engineering	70	-
TOTAL RESEARCH	$863	$731

All of the planned increase in the total expendiutre is in the expansion/new opportunity research projects and the assignment of process engineering time to the product development program. The new opportunities projects have been described earlier in the research plan and all have considerable new sales potential for CPD. The work by process engineering will fill a gap in the program to take new products from the initial research stage through pilot manufacturing to ultimate commercialization. The expenditure in sustaining research and technical service will not change over that of 1969.