DATE: February 18, 1966

TO: Dr. C. P. Stanford

cc: Messrs. R. W. Johnson
R. R. Allen

Calumet & Hecla EXECUTIVE OFFICES

MS-002
Box 558
Folder 12

SUBJECT: Some Considerations for our Future in the Agricultural and Industrial Chemicals Business

Review

In addition to our supplying of copper oxides, carbonates, and hydrates to the industrial complexes involved in marine paints, ceramics, Petro-Chemical catalysts, and other applications; we are furnishing the agricultural trade with copper oxides for trace mineral additives in fertilizer and animal feeds, and furnishing other copper chemical (tri basic copper sulfate, copper oxychloride sulfate, nuetral copper dust base) for fungicide.

Present developments involve the possibilities of our production of Cuprous oxide for marine paints; a copper dithocarbonate fungicide; a "water" soluble copper concentrate for "immediate need" sprays; and a copper algicide.

Limitations of our Present Product and Marketing

1. Few of our chemicals are in the form of final use
   a) industrials require further process before end use

   b) agriculturals require a dispersement media for fertilizer and feeds and require a mixture formula of other products (sulfer-DDT etc.) prior to fungicidinal use.

2. Distance from our raw materials source

3. Distance from our markets

4. Little marketing follow-up to testing programs

5. Dependency on very few customers for the total volume

6. The specific end market is unknown (who, why, what price)

7. Location of the sales office at Calumet handicaps travel

8. Ineffectual and incomplete advertising brochures and media distribution

9. Lack of product "Glamour"

10. Lack of essentially related products

Program for Improvement in Product and Marketing

In preparation for a more encompassing line of products leading eventually to a "Chemicals" Division of Calumet & Hecla, Inc. we might:

1. Establish a Chemical Marketing Section in Chicago, perhaps housing at the corporate office with complete marketing autonomy.

a) Assume control of all Chemical Marketing

b) Remain under the Calumet Divisional command

2. Create a broader market base for our chemicals by

a) Determining the end user, his use demands, and the competitive situation

1) Reply card contest in our agricultural product bags

2) Assign a man to work closely with Traylor Chemical to determine his market and operational advantage

b) Soliciting the large fertilizer manufacturers, coops, area "mixers," and animal feed producer

1) Determine potentials for copper and related trace minerals

2) Create a mailing list and establish the credit responsibility

c) Expand our industrial market

3. Create a "Glamour" image for our products

a) Redesign bags and rename the products

b) Revise all brochures for appearance, name, and completeness of technical information and usage recommendations

4. Ascertain possible related products and extensions of our present line during marketing solicitations

5. Ascertain the prospects of a complete and ready mixed product

6. Inaugurate a detailed freight cost study of the product to market

a) Possible gimick on advantages of shipping form

b) Prospects of "2 way" freight hauls

c) Contract carriers

7. Coordinate marketing and testing programs to assure follow-up of and product availability to new areas of tests

8. Examine the prospects for total trace mineral mixes based on purchased materials

a) Test market the "full" mix

1) Form a contest on a package "Test Plot" success trial

2) Grass roots promotion in the test are with mixer and/or coop

b) If successful determine feasibility and priority for becoming basic in the additional trace minerals

9. Plan a research program toward the goals desired

10. Begin an analysis of the raw material source points for all materials ultimately desired

a) Freight considerators

b) Availability considerators

11. Detail a search into the necessary equipment to accomplish the planned goal

a) Costs (capacities-expansion needs)

b) Productivity desired

c) Physical facility and location

12. Chemicals Division Creation

The assignment of all chemical sales to a new office would allow the development of the prospective Chemical Division to proceed toward reality and at the same time improve our current profitability and market vulnerability.

S. N. Hartwell

ylw

Gladwin A Read Co.
1604 Chicago Ave. Evanston, Ill.
60201

Copy to Chem Feeds
" to Les Engle

COPPER OXIDE vs COPPER SULFATE

1. Dr. Harry W Titus: "Copper sulfate, or bluestone, was the first copper compound to be added to commercial mixed feeds. In the past few years, however, it has been, and is being, replaced by copper hydroxide and copper oxide." -- 9 April 1956, Terre Haute, Indiana.

2. Dr Harry W Titus: "Compounds of iron, manganese, copper and cobalt that are soluble in water are not suitable for use in mixed feeds because the ions of these four elements catalyze the oxidative destruction of the fat-soluble vitamins, A,D and E." 9 April 1956.

3. Allen T Ralston: "Copper oxide is recommended where supplementation of copper is necessary." -- Washington Beef Cattle Day 1960.

4. Drs Buescher, Griffin and Bell: "There was a greater amount of copper carbonate excreted via the urine than of copper oxide or copper sulfate. The availabilities of the three forms of inorganic copper compounds for swine were similar." -- Journal of Animal Science Vol. 20, No. 3, August 1961.

5. Dr H D Ritchie: "The use of copper sulfate in these trials gave poorer performance than copper oxide, possibly indicating toxicity." -- Journal of Animal Science, 21, 4, 1010.

6. Dr R J Bunch: "Copper oxide fed at the same level (250 ppm) also improved gains and feed efficiency to nearly the same extent. Because of the hemoglobin interference using the sulfate, it may prove preferable to use the oxide." -- FEED AGE, January 1961.

7. Drs Bunch, Speer, Hays, Hawbaker and Caton: "The feeding of copper oxide resulted in small increases in copper content of the tissues, whereas the feeding of copper sulfate resulted in marked increases in tissue copper content." -- Journal of Animal Science, November 1961.

8. John W Megown: "The water-insoluble compound, copper oxide, is the preferred source of nutritional copper." --Western Feed, June 1964.

9. Dr. Virgil W Hays: "Feed manufacturers and researchers in Great Britain have accepted 200 to 250 ppm of Cu from copper sulfate or copper oxide as a routine feed additive and are successfully using it in their swine rations." FEEDSTUFFS, April 14, 1964.

AND--in comparing costs, it is well to remember that 1 pound of BROWN COPP 75 supplies the same amount of copper as 3 pounds of copper sulfate -- currently selling at about 20¢ per pound.

* * *

MAY 1966

MS-002 Box 558 Folder 12

1916

H. E. Day
cc: LGS
LRJ
Reading File # 2

January 22, 1968

The screen sizings and chemical analysis of various C & H products that you requested are as follows:

SCREEN SIZING

	%-325 Mesh.	%-200 Mesh.
Fertilizer "50"	90.4	95.2
Fertilizer "75"	98.4	99.2
Feed "75"	97.6	----
Hi Cu_2O with chippings	97.6	----
Hi Cu_2O without chippings	98.8	----
Hi CuO with chippings	93.6	----
Hi CuO without chippings	Sample not available this month.	
N.C.D.B. "83"	98.8	----
# 1 Cupric	98.8	----

CUPRIC OXIDE (BLACK)

0.027% PBO_2

0.050% Fe

N.C.D.B.-83

Solubility 72 hours at pH 1.0 using HCL.

Total Cu----------83.17%

Cu dissolved-------30.90%

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COPPER HYDRATE

Composite sample covering one month production.

Total Cu	63.590%
OH	33.750%
Na	0.230%
NH_3	0.084%
CO_2	0.190%
SO_4	0.250%
NO_3	Nil
CL	0.020%
HNO_3 insoluble	0.006%
Ca as Ca & Mg	0.016%
Fe	0.013%
H_2O	1.200%

"B" CIRCUIT COPPER OXIDE

Cu_2O	65.27%	Cu	78.53%
CuO	25.22%		
Met. Cu	0.41%		
Insol in HNO_3	Nil		
CO_2	1.93%		
ZNO	3.66%		
PBO	0.14%		
NiO	0.13%		
Fe_2O_3	0.14%		
NH_3	0.61%		
Moisture	0.90%		
Chlorides	0.30%		
Bal Na, K, O_2			
	98.71%		

In addition spectrographic analysis indicates Ag_2O, CaO, MgO, MnO, NiO, SnO_2, Na_2O and Li_2O in trace amounts less than 0.01%.

MOISTURE COCS

	Date	% H_2O
Lot 370	1-3-68	3.6
Lot 371	1-4-68	3.6
Lot 372	1-5-68	4.0

C. J. Bastian

CJB:amp

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Calumet & Hecla

CALUMET DIVISION

FORM 50043

RESEARCH PROJECT PROGRESS REPORT

PROJECT NO.	REPORTING PERIOD
27-20-6	1st Qtr. 1968

PROJECT TITLE
Chemical Processing - CD-1916

TECHNICAL OBJECTIVE
Process improvement to reduce costs and improve product quality.

PROJECT LEADER
L. C. Klein

PROJECT % COMPLETE	AMOUNT AUTHORIZED	% EXPENDED	REPORT AUTHORIZED BY
Continuing	$19,728	15	L. G. Stevens

PROGRESS ACHIEVED

Slight changes were made at the Tamarack Leaching Plant to adapt the equipment to the production of Cal-Cop-10. Approximately 15,000 gallons of material was produced during the last week in March. Time required for production of the material has been reduced to less than one quarter the time required to produce the material at the Lake Linden Plant, and ammonia losses have been reduced considerably. Additional savings will be made in packaging and handling the material at the Tamarack Plant.

Because of the work in disposing of the barium carbonate precipitate from the Lake Linden Leaching lead removal circuit--about six barrels a day--the possibility of reducing the amount of residue was investigated. Instead of filtering all of the precipitate formed, somewhat more than half of it has been re-introduced into the system to determine whether it would collect more lead, and the amount of barium chloride used to form this precipitate has been reduced from 500 to 250 pounds per day. It has been found that this practice is working satisfactorily with no loss in lead removing efficiency. The amount of precipitate taken from the process has been reduced to two barrels per day, and a saving of $21.00 per day is being realized from reduced reagent consumption, plus the labor saving in mixing reagents and handlingthe sludge. The possibility of selling this sludge, which contains about 10% lead, up to 5% tin, copper, and barium carbonate is being investigated.

Preliminary equipment layouts, building design, equipment lists, and inventory lists for a new chemical and leaching plant were developed during the quarter, and will be reported on during the first half of April.

A process for making COCS which derives most of its copper content from copper oxides was developed in the lab and a full scale run was made at Tamarack. The balance of the copper content in the product comes from scrap copper. The product was satisfactory, and the process is simple and straightforward. The copper oxide used was #1 Cupric but still chippings can also be used.

ACTION PLANNED NEXT PERIOD

Additional work on new chemical and leaching facility.

Technical service on manufacture and packaging of Cal-Cop-10 and as required for other chemical operations.

Complete testing of process for making COCS to thoroughly evaluate it in order to prepare a production procedure.

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Folder 5

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1922

ACTV
HED

RECEIVED AT
CALUMET DIVISION
FEB 10 1969
RESEARCH AND
DEVELOPMENT

E. Sanderson

February 6, 1969

: Break-even sales on Tamarack
Leaching Products

In order to determine break-even sales on product lines, certain facts and assumptions must be made. The basis for the break-even sales on Tamarack Leaching products is the 1969 profit plan production, cost, sales data and profit targets. Inaddition, labor was treated as a period expense.

The break-even sales pounds were predicated upon the above statements and are as follows:

Product Line	Break-even Sales Pounds
Hydrate	126,208
C.O.C.S.	430,450
T.B.C.S.	112,539
Cal-Cop 10	15,622
	684,819

G. E. Lengyel

G. E. Lengyel

GEL:gb
cc: CHS
GLC
LGS ✓
File (2)