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AMERICAN CYANAMID COMPANY
PIGMENTS DIVISION
PINEY RIVER PLANT

January 26, 1965

To: Piney River Office

Att'n.: Mr. J. F. Hopkins

Copy To: Dr. W. S. Gastor - WAYNE
Mr. G. P. Ferrigni - WAYNE
Mr. G. C. Marcot - WAYNE
Mr. J. A. Schmidlein - WAYNE

Subject: Production Cost Estimate
Hydrated Yellow Iron Oxide
"Hyferox"

We have prepared a cost estimate for the production of 250 tons per month (3000 tons per year) of hydrated yellow iron oxide pigment using by-product copperas as the source of iron. The estimate indicates a cost of $6.936 per hundred pounds of pigment and requires a capital expenditure of $936,860. This estimate will apply to either the Piney River or Savannah plant. A breakdown of the equipment costs and the production costs is attached. As shown, the building will require an investment of $192,660. This building will house the process equipment, maintenance area, laboratory, production office, storage for product and loading facilities for shipment by rail or truck. The estimate of plant cost is based on our production experience gained while producing iron oxide pigments at Piney River. It uses all up-to-date equipment and controls to keep operating and maintenance costs at a minimum. It also insures uniformity and optimum quality of the product. Some savings in plant cost may be recognized during the design of the plant. The use of existing buildings if they become available before a decision is made will also reduce capital costs. The $6.936 per hundred pounds of pigment contains all normal charges against a production unit. The actual out-of-pocket cost is $4.877 per hundred pounds of pigment.

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In January 1960, Mr. R. L. Phelps who was connected at that time with our Industrial Chemical Division visited Piney River to discuss the possible production of iron oxide for use in producing their H 1-3 Catalyst. At that time we dehydrated some of our hydrated iron oxide by subjecting it to a temperature of 300°C. for approximately 30 minutes. This sample appeared to be very close to the product they were buying from C. K. Williams for $0.14 to $0.15 per pound. At that time Mr. Phelps felt that the production of H 1-3 Catalyst would require approximately 1,000,000 pounds per year. Mr. Phelps also felt that there may be other markets for iron oxide. It would be worthwhile investigating the Industrial Chemical Divisions present needs with the aim of building a plant larger than the proposed 3000 ton per year unit. Increase in capacity would require very little increase in capital expenditure and would have a very marked effect on production cost.

A flow sheet of the proposed plant is attached. Also included is the flow sheet of our 1945 plant, production cost obtained in 1945 and a letter from Mr. R. L. Phelp.

Stephen A. Lamanna

Stephen A. Lamanna

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PRODUCTION AND COST REPORT

PRODUCT: Hydrated Yellow Iron Oxide Pigment "Hyferox" PERIOD: Month

PLANT: Piney River COSTED ON: 250 TP Month

THIS IS A FINISHED PRODUCT DRY OR AS IS: 100 Lbs.

Raw Material Indicate Whether Purchased (P) or Manufactured (M)	Price per Unit	Per Unit 100 Pounds This Period	Per Unit 100 Pounds Out of Pocket
	cwt		
Anhydrous Ammonia	3.32	1.335	1.335
Diatomacious Earth	4.283	.225	.225
Soda Ash	1.975	.062	.062
Total Raw Material		1.622	1.622
Other Factory Costs: Direct Labor		1.476	1.476
Supervision		.200	.140
P/R Taxes, Ins. Etc.		.071	.069
Utilities: Steam		.592	.525
Electricity		.130	.122
Water		.028	.024
Other Services: Yard		.048	.048
Maintenance & Repairs		.600	.600
Stores & Supplies		.025	.025
Laboratory Control		.047	.047
Process Improvement		.100	-
Prop. Taxes, Insurance & Plant Protection		.156	-
Other Plant General Expense		.797	-
Depreciation		.865	-
Total Factory Cost in Bulk		5.135	3.076
Container Costs		.179	.179
Net Factory Cost in Bulk		6.936	4.877

Basis and Assumption for
this Production Cost Estimate

1. Production of 250 tons per month or 3000 tons per year of hydrated yellow iron oxide pigment using the Ammonia Process developed at Piney River.
2. Pigment recovery 95.0%.
3. No charge for the by-product ferrous sulfate (copperas). The cost of removing impurities and clarifying the copperas solution is part of the estimate.
4. Assuming the plant is built at Piney River, the copperas disolving tank used by chloride will be used by the Hyferox plant. Chloride is using the disolving tank a maximum of 3 out of 21 shifts per week.
5. All costs are based on Piney River Costs as of January, 1965. Anhydrous Ammonia cost based on cost delivered to the Savannah plant.

Ammonia	$61.20/ton
Freight (Natrium W.Va.)	5.20
Total Cost	$66.40/net ton

It is assumed that the same cost will apply to Piney River.

6. Supervision of Operation will be directed by a plant superintendent with minor supervision by the general plant foreman.
7. Estimated plant cost are based on the enclosed flow sheet.

PLANT COST ESTIMATE

		Material	Labor	Total
1.	Buildings	$115,440	$ 77,220	$192,660
2.	Electrical	27,000	15,000	42,000
3.	Service Connections	10,000	10,000	20,000
4.	Copperas Solution Tank	9,000	3,500	12,500
5.	Copperas Purification	26,700	10,100	36,800
6.	Soda Ash Disolving Tank	1,500	1,000	2,500
7.	Precoat Filter	25,800	6,250	32,050
8.	Copperas Solution Storage	17,300	4,450	21,750
9.	Anhydrous Ammonia Storage	25,000	5,000	30,000
10.	Centrifugal Air Blower & Vacuum Pump	30,500	13,100	43,600
11.	Seed Preparation and Storage	36,900	11,250	48,150
12.	Precipitation Tanks and Storage	62,900	17,450	80,350
13.	Moore Filters	39,800	30,200	70,000
14.	P & S Filter	22,650	4,050	26,700
	P & S Dryer	49,500	16,250	65,750
15.	Grinding & Packing	22,350	7,500	29,850
16.	Thickener & Recovery Tank	30,100	11,400	41,500
17.	Accessories	19,000	5,000	24,000
		$571,740	$248,720	$820,460
	Engineering			49,250
	Equipment Service			67,150
				$936,860

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G. E. Craven

J. M. McConaghy

S. A. Lamanna

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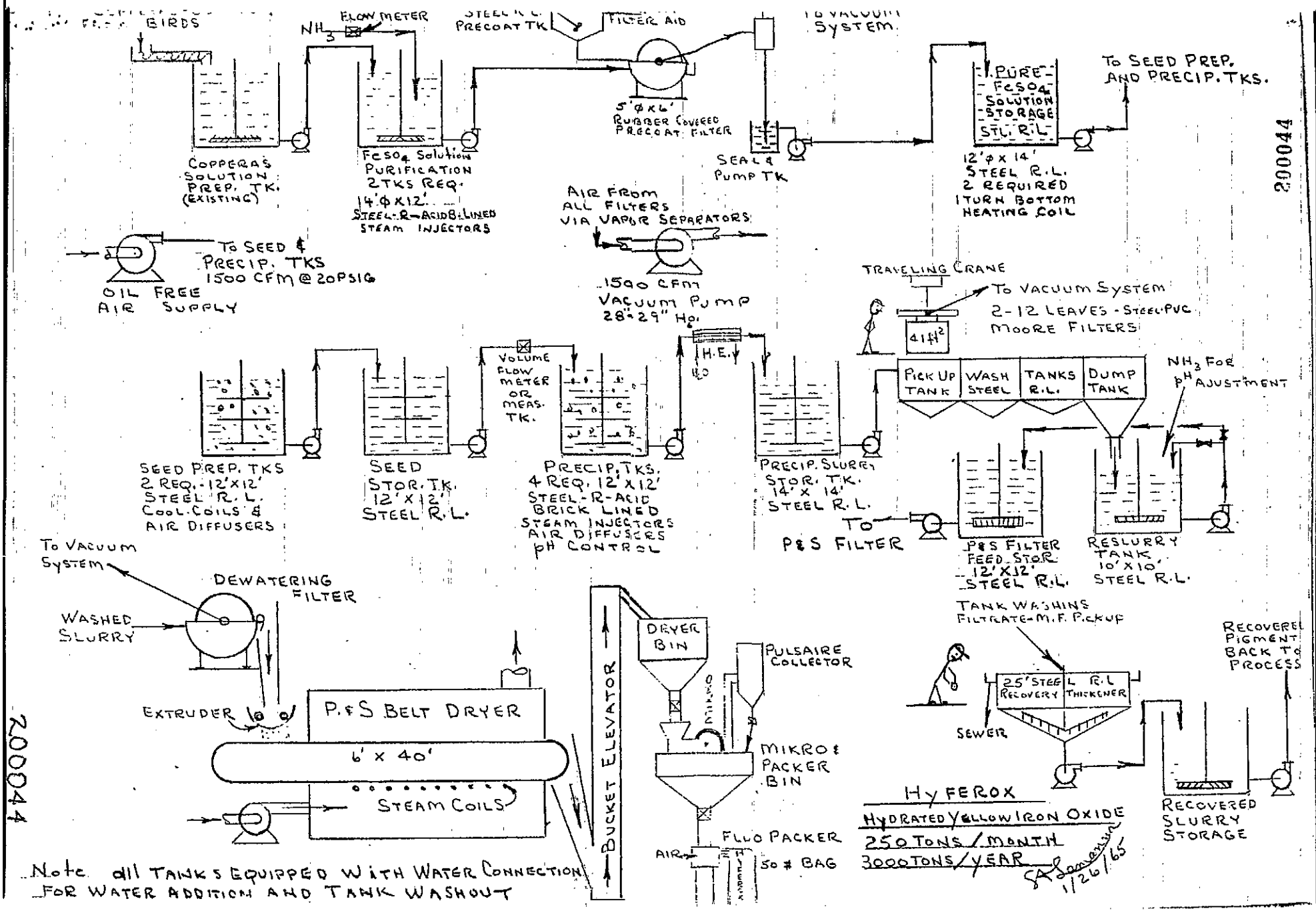

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Hyferox Production and Cost "Break Down" for 1945

Production:

The Hyferox Plant operated 327 days in 1945 producing 3,450,750 # (1725 tons) of Hyferox. The average "Per Day" production was 10,553 pounds.

Costs:/cwt of Hyferox

	Production Costs During Year		
	Average	High	Low
Raw Materials-Soda Ash-Caustic-Supercel-Paper	1.560	1.756	1.376
Productive Labor	1.097	1.263	.902
Raw Material + Productive Labor	2.657	2.951	2.278
Superintendent and Foremen	.296	.419	.197
Indirect Labor	.129	.200	.087
Maintenance and Maintenance Reserve	.775	.780	.729
Boiler	.566	.716	.463
Water	.058	.081	.034
Electricity	.134	.224	.062
Laboratory	.134	.343	.074
Engineering	.123	.254	.000
Factory General	.581	.997	.389
Other Costs	.5965	-	-
Total Cost less Raw Material and Productive Labor	3.3925	4.073	3.050
Total Cost	6.05	7.106	5.569