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REVISED GREEN SALT MILLING, MIXING &
PACKING OPERATION.

Contract W-7405-eng-29

Photostat Price \$ 1.50

Microfilm Price \$ _____

Available from the
Office of Technical Services
Department of Commerce
Washington 25, D. C.

December 6, 1944

James C. Graham, Jr.
Plant #4

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REVISED GREEN SALT MILLING, MIXING &
PACKING OPERATION.

[REDACTED]

Contract W-7405-eng-29

INTRODUCTION

A revision and rearrangement of the Green Salt milling, mixing and packing operation was undertaken to provide a better means of mixing the material and at the same time reduce the dust concentration of the air in the working area.

The job is still in the design stages, but several other improvements have become apparent. It was found that the company would save money as a result of more saleable materials, and reduced labor costs. The new setup will also gain more storage area on both the first and second floors, and the Army will save the processing costs of the residues.

In general, the new setup is one in which the material is conveyed between the pieces of equipment and comes out at the end ready to be packed into drums and placed in finished lots. The system will be dust tight all the way through with exhaust ducts at both open ends.

Material is unloaded from the boxes either into drums or into the first hopper. From here it is conveyed to the Stokes Granulator, then through the Mikropulverizer and into another hopper. The material then is elevated to the top of the mixer and comes out into final drums ready to be labeled and stored.

DISCUSSION

As originally designed the dust system on Chemical 497 milling has proven inadequate. Dust samples were taken in this and the surrounding areas and the air was found to contain as much as ten times the safe workable concentration. Readings inside the mixing area varied from 435 to 4700 micro grams of X metal per cubic meter of air, and the variation of dust concentrations in the rest of the room ranged from 400 to 2000 micro grams per cubic meter. The accepted safe limit of dust in the air for a man working in the area eight hours is only 500 micro grams per cubic meter. The results of these studies showed a definite need for a better means of dust control in the area.

Other bad aspects of the original milling setup were that the material was scooped from drums into each mill and it was mixed by scooping from drum to drum. All of these operations resulted in a heavy loss of materials as floor sweepings and uncontrollable dust conditions. This loss of material which must be reworked as residues represents 1% of the total production of the plant or about 1650 pounds per month. It is believed that a well designed system of

conveying the material mechanically and the resulting reduction in handling should reduce the spillage losses by 1000 pounds per month. This represents an increased amount of material which the company has available for sale, and a direct savings to the Army of the cost of re-processing these goods.

By virtue of the fact that the material will be conveyed and fed into the various machines mechanically in contrast to the old method of hand feeding, the labor requirement for this process will be reduced by 25 to 35%. A total of 12 men now carry out the operations which we plan to handle with from 7 to 9 men under the revised setup.

The first step was taken to rectify the dust aspect of the problem, and the firm of Young & Bertke, dust engineers, were called in to consult with us. They presented a design to control the dust without any changes in the processing methods. The problem of a better means of mixing the Green Salt then seemed advisable and a revised design of the whole milling and mixing setup was proposed as an answer to our dust problem and also our labor situation. This revised design was worked out with the help of Stephens-Adamson Company, manufacturers of conveying equipment, to provide a mechanical and dust-proof means of handling the Green Salt from the unloading operation through the final mixing and packing into drums of the finished lots. A proposed system from Stephens-Adamson accompanies this report.

A revised floor plan was sent to Young & Bertke so they may be informed of our changes. They will in turn redesign their proposal to tie in with the contemplated system. A copy of this floor plan will also accompany this report.

We have placed our order with the Anglo-American Mill Sales Company for a MacClellan batch mixer of sufficient size to mix a complete lot of Green Salt. The rest of the setup will be furnished by the Stephens-Adamson Company with exception of the present mills and the dust system by Young & Bertke.

Acceptance of a final design for the system will depend on the amount of iron pickup of the material in a conveyor. As soon as we have received a price from the Stephens-Adamson Company, we will order one of the conveyors as a test unit. The material will be run through this unit a number of times and then analyzed for iron pickup. If the unit proves satisfactory, the rest of the system will be ordered. Young and Bertke will be notified and sent a final design so they may proceed with the installation of a dust control system.

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Installation will not be started until all materials are on hand and ready, so that the shortest possible shutdown of the plant will be required. It is believed that with careful design and care in working out the problems of installation beforehand, a shutdown of one week in the milling operation will be required. The installation will not require a shutdown of the furnaces or of the unloading and loading operation. It is believed that the time lost in the milling operation can be made up on the night shifts in a short period of time after the new system is put into operation.

It is estimated that six months may be required before the system is ready to be installed. The delay is caused by the fact that we must get one conveyor and test it before the rest of the material may be ordered.

SUMMARY

If the product purity is not affected, the new Green Salt milling and mixing setup seems to have many advantages. It should go far toward making dust control easier, cutting material losses, and saving money. It is not, however, a small change and, consequently, will be some time before the undertaking can be finished. We all realize that the dust problem is critical and the job will be pushed through in the shortest possible time after final approval has been given.

Submitted by:

James C. Graham Jr.

James C. Graham, Jr.

JCG/rr

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TECHNICAL INFORMATION REPORT

Request for

Report No.2

November 17, 1944

TO: Jim Graham

SUBJECT: A Report on the Proposed Changes in the Layout of the Green Salt Milling Operations and Its Current Status.

- SCOPE:
1. Reasons why change was thought necessary.
 - a. Dust concentrations -- information from dust sample report which Mr. Anonsen has.
 - b. Possible reduction in labor requirements.
 - c. Ease of mixing.
 - d. Reduction in material converted to residues.
 2. Steps taken to bring about change.
 - a. Contacts with Young & Bertke.
 - b. Contacts with conveyor manufacturer.
 - c. Mixer problem.
 3. Present layout.
 - a. Scale sketch showing proposed arrangement of unloading, grinding, milling, mixing and weighing equipment.
 4. Current status of all work pertaining to this problem.
 5. Detailed outline of remaining steps before job can be completed.

Date Report Due: November 30, 1944.

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