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DAVISON CHEMICAL COMPANY
DIVISION OF W. B. GRACE & CO.
BALTIMORE · 3 · MARYLAND

CHEMICALS DIVISION
RARE EARTHS

January 12, 1960

REPLY TO:
P.O. BOX 188
POMPTON PLAINS,
NEW JERSEY
TEMPLE 5-3060

Mr. Paul B. Kleven
Inspection Division
United States Atomic Energy Commission
376 Hudson Street
New York 14, New York

Dear Mr. Kleven:

We enclose the following information requested as a result of your recent inspection of these facilities:

1. Process description.
2. Waste treatment plant operating description.
3. Plot plan indicating location of residues and waste treatment plant.
4. Thorium content of sludges stored on property.

The process description has been copied from a detailed engineering report of the company. We have indicated the number of associated tanks, presses and processing equipment in parenthesis. These coincide with the numbers of equipment itemized on the company process flow diagram given to you during your visit. In view of the nature of this description and flow diagram we have stamped it "Company Confidential" and ask that it be so treated by the Commission.

We estimate that during the past ten years approximately 750 tons of residues have been transferred to the area indicated on the enclosed plot plan.

If further information on any of the above is required, we will be pleased to cooperate.

Sincerely,

Richard M. Mandle
Richard M. Mandle
Technical Director

JNS

RMM:MCB

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PDR FOIA
AKST82-219 PDR

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DAVISON CHEMICAL COMPANY
DIV. OF W. R. GRACE & CO.
BOX 488
POMPTON PLAINS, NEW JERSEY

THORIUM CONTENT OF SLUDGES STORED ON PROPERTY

	<u>Tons Residue</u>	<u>Contained ThO₂ Pounds</u>	<u>Area</u>
Ore tailings (gangue)	230	8,200	G
Yttrium sludges	200	3,000	H
Reworked sludges	137	2,750	I
Waste treatment cake	105	1,300	J
In process silica sludge	30	2,700	H
In process thorium carbonate	31	3,100	L
In process thorium hydroxide	15	10,500	K
Refined yttrium concentrate	20	2,700	M

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WASTE TREATMENT PLANT

The waste treatment plant treats all liquid wastes issuing from the plant. The waste involved consists of wash water, floor washings and surface run-off from the adjacent plant property.

The process involves the use of an average of 35,000 gallons of water per day. All of the washes are discharged into a common 1000 gallon sump equipped with two automatically controlled force pumps which pump the waste to a retention tank. Each pump has capacity to handle the peak load and is installed so that the second pump starts in case of extreme demand or failure of the first. Signals are installed in a control house to indicate the proper function of the pumps.

The retention tank has a capacity of 50,000 gallons which provides 24 hours average retention of the wastes. In addition to the purpose of acting as a reservoir, or constant head installation, the tank provides means of diluting effluents of widely varying pH so that the automatic pH controlling equipment may function more efficiently. The incoming wastes flow through a distributing channel in the tank and effluent, after initial settling, is removed from the midpoint of the tank and flows by gravity to a mixing tank. A draw-off is provided at the bottom of the tank to pump accumulated solids to the sludge filter press.

An 8000 gallon mixing tank, equipped with a gate agitator receives effluent from the retention tank at its midpoint. a pH electrode assembly is in circuit with the mixing tank and electrically connected to a mechanically operated diaphragm valve. Two storage tanks are provided to feed either

50% sulphuric acid or 50% caustic soda solution through the automatic diaphragm valve to the mixing tank as called for by the pH controller. Again, signals are provided to indicate proper functioning of the valve and chemical supply tanks as well as a recording chart which indicates the pH of the mixing tank. The mixing tank effluent is piped to a 2000 gallon Hardinge thickener at pH 5.8-6.2.

The Hardinge thickener provides a clear overflow to a final clarification tank and adjusted to give a 20% solids underflow which is pumped to a sludge filter press in the control house.

The final clarification tank of 50,000 gallon capacity provides an average 24 hours of retention time for the effluent before discharge from the system. The main function of this tank is to provide sufficient time for post precipitation of solids after pH adjustment. A draw off is provided at the bottom of the tank to pump accumulated solids to the sludge filter press.

The sludge filter is of the plate and frame type with a capacity of 6 cubic ft. of cake. Approximately 60 cubic feet of sludges, or 3500 lbs, are removed weekly. These sludges are hauled to a dump on the property.

The system was designed to operate automatically. Twelve man hours per day are devoted to the maintenance, cleaning and control of the operation. The entire operation is under the supervision of the plant chemist who checks the performance of the equipment, and samples prepared by the shift operator.

A log is maintained which indicates satisfactory operation of the system for pH and turbidity control. Wet chemical analyses of samples of effluent meeting the turbidity standards of the Department of Health indicate

thorium levels below our limit of detection. The pH of the effluent is maintained between 5.0 and 8.0 according to the permit granted by the New Jersey State Department of Health who have approved the design and mode of operation of the system. We have found through experience that the system operates more satisfactorily at lower pH values since the precipitate formed by neutralization settles more rapidly assuring a clearer effluent.

WASTE RECOVERY
PLANT
CONSTRUCTION
OF NICKEL
PLANT



