

cc: M. D. Peterson
S. McLean
C. E. Winters
P. L. Culler
I. R. Higgins

OAK RIDGE NATIONAL LABORATORY

CENTRAL FILES NUMBER

49-1-134

1611
A
20/1

Technical Division
Chemical Process
Development Section

To: P. L. Steahly Date July 1, 1968
From: W. E. Kister and I. R. Higgins

Distribution:

Classification Cancelled or Changed

Problem No. TDSI- 12

TO

By Authority of

ATG

AUG 27 1971 ~~MAXX~~ Supplement 1

Name

Title C DATE E MENT C PROBLEM

INV.
64

Title: Radiochemical Waste Solution Concentration

Object: To obtain evaporation data on the acidic radioactive waste entering the tank farm (V-12) and alkaline radioactive waste solution leaving the tank farm (V-6) (heat transfer coefficients, evaporation supernatants, form calculations, final concentrate, and operating cost) to aid in determining the optimum evaporator type.

Discussion:

With the present system of radioactive waste disposal one to seven curies of fission products are discharged into White Oak Creek each day. It is desired to reduce this activity to a minimum. With evaporation, it should be possible to reduce the activity discharged to 0.5 to 5 millicuries per day.

With an evaporator at the entrance to the tank farm, it should not be necessary to neutralize the radioactive wastes until after evaporation. Therefore, the total amount of caustic required should be lowered, thereby reducing the amount of salt to be stored. The evaporator at the tank farm unit (V-6) would serve to concentrate further the activity in the storage tanks. It is recognized that this procedure will fill the tank farm in a period of one to three years, and additional storage will be needed. Work is in progress on a chemical procedure to separate the radiochemical elements from non-radiochemical elements which should further

CLASSIFICATION CANCELLED

JG Morgan 3-14-95
ADD signature Date

This document has been approved for release
to the public by:

David R. Hamm 5/16/95
Technical Information Officer Date
ORNL Site

reduce the volume to be stored.

After a discussion of evaporators, with representatives of the Chemical Process Development, Design, and Engineering Development Sections and Operations Division, it has been agreed to install a pot evaporator at the tank farm entrance (W-12) heated by steam coils with an entrainment separator, total condenser (surface type) and a neutralizer. The need of a second evaporation or i.e. ex-change will be investigated. This equipment will be used by the Chemical Process Development Section to study heat transfer coefficients of the boiler and con-densors, entrainment, decontamination, scale, foam and corrosion. A second evaporator will be installed on the tank farm exit (W-6) for a similar study as soon as manpower is available.

The Engineering Development Section is now accumulating evaporator information from manufacturers and the literature. On the basis of this information and the test data, an optimum evaporator will be installed eventually.

Responsibilities:

F. L. Culler - Design Section

I. R. Higgins - Chemical Process Development Section

C. E. Winters, Engineering Development.