UNCLASSIFIED

NYO-1464

CLASSIFICATION CANCELLED

DATE FEB 27 1957

For The Atomic Energy Commission

H. F. Canale

Chief, Declassification Branch

PROGRESS REPORT

FOR

NOVEMBER, 1951

BY

J. T. PINKSTON AND KARL S. WILLSON

DECEMBER 1, 1951

THE HARSHAW CHEMICAL COMPANY
CLEVELAND, OHIO

CONTRACT W-7405 ENG-276

Photostat Price \$ 1.80

Microfilm Price \$ 1.80

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

ISSUED JANUARY 8, 1952

LEGAL NOTICE

This report was prepared as an account of Government sponsored work. Neither the United States, nor the Commission, nor any person acting on behalf of the Commission:

A. Makes any warranty or representation, express or implied, with respect to the accuracy, completeness, or usefulness of the information contained in this report, or that the use of any information, apparatus, method, or process disclosed in this report may not infringe privately owned rights; or

B. Assumes any liabilities with respect to the use of, or for damages resulting from the use of any information, apparatus, method, or process disclosed in this report.

As used in the above, "person acting on behalf of the Commission" includes any employee or contractor of the Commission to the extent that such employee or contractor prepares, handles or distributes, or provides access to, any information pursuant to his employment or contract with the Commission.

This document is
PUBLICLY RELEASABLE

J. L. Kiser
Authorizing Official

Date 5/9/67

UNCLASSIFIED

DECLASSIFIED

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency Thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

DISCLAIMER

Portions of this document may be illegible in electronic image products. Images are produced from the best available original document.

NYO-1464

PROGRESS REPORT

FOR

NOVEMBER, 1951

BY J.T.PINKSTON AND KARL S. WILLSON

(Work done by D.A.Hammond, M.F.Rejdak, J.R.Baird and K.S.Willson)

ABSTRACT

The plant for extraction of uranium using a TBP-kerosene solvent has been essentially completed during this period and has very nearly reached its rated capacity. Indications are that greater capacity can be reached when final experimental tests have been completed and a few instrumental difficulties have been overcome.

Flow rates and possible means of minimizing solvent loss are being studied.

A few tests indicate that the plant can handle poorer feeds than those for which it was designed, but that the throughput will necessarily be reduced and the cost per pound of product will be materially higher.

NYO-1464

PROGRESS REPORT

FOR

NOVEMBER, 1951

TABLE OF CONTENTS

	<u>Page</u>
I. Introduction	5
II. Survey of Problem	6
III. Experimental Tests	7
IV. Results and Conclusions	8

NYO-1464

I. Introduction

Essentially complete conversion of the plant for batch extraction of uranyl nitrate with ether to the new continuous process using TBP-kerosene solvent, and ironing out of instrumentation difficulties, has permitted further evaluation of the new process.

NYO-1464

II. Survey of the Problem

At the beginning of the month, some difficulties were still being encountered with various control instruments since conversion of the old to the new process precluded extended operations runs. Further, since the plant was to serve as its own pilot plant, it had been impracticable to attempt to work out all operational details for the instrumentation prior to its actual use. The need for maximum production also made test runs difficult at times.

With the completion of most of the equipment changes and the ironing out of instrumentation complications, it became possible near the end of the month to begin a study of the effects of various feeds, particularly weaker feed materials, and thus evaluate the probable capacity of the plant under various operating conditions.

In early operation, loss of solvent was found to be high due to spillage, carry-over to the filters following the caustic strip, and probably to other causes. Until other details had been worked out, no attempt could be made to work on the problem of establishing the points of loss of solvent, and what might be done to minimize this loss.

III. Experimental Results

During this month, completion of plant conversion to the new process, smoothing out of operational details, and adjusting of instrumentation required considerable time without developing any data of value from a research standpoint.

The means of effecting the final solvent scrub with caustic, as described in the previous report, (NYO-1463) has proved quite successful. Some attempts have been made to reduce the volume of water required but results are incomplete.

Tests with weaker feeds (200gU/l instead of the usual 300gU/l) have indicated that the plant can be operated if the TBP-concentration in the solvent is reduced sufficiently.

This reduced concentration of TBP is required in order that the solvent may be saturated with metal without requiring a flow of slurry so high as to form emulsions. Thus, for the weaker feed, 10% (by weight) TBP rather than 15% TBP was used.

In these tests, it was found as might be expected, that the OK liquor (ie the strip liquor) going to the boildown tanks was considerably weaker than when the stronger solvent and slurry were used.

Indications are that using the same solvent flow, only about half as much orange oxide will be secured from the process using the weaker materials as when stronger feeds as cited above are used.

IV. Results and Conslusions

Installation of the new extraction process using TBP-kerosene solvent has now been completed, instrumentation has been tested and found to be satisfactory, and the rated capacity of the plant has been approached.

Flow rates are being tested and there are indications that higher thruput should be possible in the extraction system.

It has been found possible to operate the process using weaker-than-normal slurries if a solvent of reduced TBP concentration is used. Costs will be greater.

The caustic treatment of the solvent before recycle appears satisfactory. Tests to determine points of loss of solvent are being scheduled.