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SPECIAL RE-REVIEW
FINAL DETERMINATION
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August 31, 1951

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By Authority of DA

May 1973

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PROPOSED COMBINATION OF NEUTRALIZED CONCENTRATION
BUILDING WASTES WITH NEUTRALIZED 5-6 and SECOND
CYCLE WASTES.

Since it is understood that the tanks now handling the Concentration Building wastes will soon be full, an investigation has been started on the effects of combining these neutralized wastes with neutralized 5-6 and Second Cycle wastes. The results presented below are preliminary and further work may be desirable to confirm the data. However, since the need for information on this problem is urgent and since the author will be on vacation for two weeks, these available data are presented at this time.

SUMMARY

Addition of neutralized Concentration Building waste to the supernatant from combined, neutralized 5-6 and Second Cycle wastes (simulating addition of the Concentration Building waste to the second tank of the 110-112 cascade) appears to have little effect on the total beta activity in the final supernatant or on the total volume of sludge to be expected from the three wastes.

EXPERIMENTAL

Actual plant solutions were used throughout these experiments. Assumed ratio of production rates for the three wastes concerned was 1:0.63:0.24 for 5-6:2nd cycle:Concentration Building wastes, respectively. Combination of the wastes was in these ratios. The included table shows the beta activity remaining in the supernatants after combination of the wastes according to several schemes, neutralization and removal of the resulting solids by settling. Experiment C indicates that the total beta activity present in the final supernatant when neutralized Concentration Building waste is mixed with supernatant from combined, neutralized 5-6 and Second Cycle waste is equal to or less than that present in the supernatants when settled separately as is now the case.

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Experiment D simulates the situation which will exist when the 110 tank is completely full of sludge and mixing of all three neutralized wastes occurs in the 111 tank. Again, no decrease in the overall beta decontamination appears likely as a result of the mixing.

Plutonium analyses have been carried out for these experiments but counting of the resulting discs has been delayed by difficulties with the counters available. These difficulties have been resolved and values for the plutonium content of these streams should be available by September 10.

When a mixture of one volume of neutralized 5-6 waste and 0.63 volumes of neutralized Second Cycle waste was allowed to settle for sixteen hours, the sludge volume was 27 per cent of the total waste volume. Similarly, the sludge volume in neutralized Concentration Building waste after sixteen hours of settling was 26 per cent of the total waste volume. A mixture composed of 1, 0.63 and 0.94 volumes of neutralized 5-6, Second Cycle and Concentration Building wastes, respectively, had a sludge volume 15 per cent of the total waste volume after 16 hours settling. Further experimentation is required to confirm this apparent decrease in sludge volume obtained on mixing all three wastes as compared to that obtained by separate settling. At any rate, it appears unlikely that the combination of the neutralized wastes will cause any increase in the total sludge volume.

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BETA ACTIVITY CONTENT OF SUPERNATANTS FROM MIXTURES OF NEUTRALIZED 5-6, 2nd CYCLE AND CONCENTRATION BUILDING WASTES

Experiment	Conditions	c/p/ml
A	1 volume 5-6 ⁽¹⁾ waste (as received, pH 10) and 0.63 volumes 2nd cycle waste ⁽²⁾ neutralized to pH 7.	2700
B	Concentration Building waste ⁽³⁾ neutralized to pH 10.	115
C	1.63 volumes supernatant from A and 0.94 volumes neutralized (pH 10) Concentration Building waste slurry. Stirred. Settled overnight.	1400
D	1 volume 5-6 made 0.04 M in NaOH (plant practice), 0.63 volumes 2nd cycle waste neutralized to pH 7, and 0.94 volumes Concentration Building waste neutralized to pH 10. Mixture stirred and settled.	1400
E	Calculated expected activity in final supernatants (C and D) based on A and B.	1780

1. Sampled 8-4-51 through 8-10-51, B Canyon.
2. 18-4 from Run T-01-5-D-26, 19-3 from Run T-01-6-DR51.
3. E-3 and F-8 from Run B-11-07-H31, D-4 from Run B-11-07-H32, A-4 from Run B-11-08-H1.

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