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		Design Authority				3		R.B. Baker		H0-40
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1	1	Cog.Eng. A.L. Pitner	<i>R.B. Baker</i>	8/12/98	H0-40	3		K.L. Pearce		H7-20
1	1	Cog. Mgr. D.W. Bergmann	<i>D.W. Bergmann</i>	8/12/98	H0-40	3		K.H. Bergsman		X3-85
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18. A. L. Pitner <i>R.B. Baker</i> Signature of EDT Originator	19. NA Authorized Representative Date for Receiving Organization	20. <i>D.W. Bergmann</i> D. W. Bergmann Signature of Cognizant Manager	21. DOE APPROVAL (if required) Ctrl. No. ☐ Approved ☐ Approved w/comments ☐ Disapproved w/comments
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K WEST BASIN SLUDGE VOLUME ESTIMATES FOR INTEGRATED WATER TREATMENT SYSTEM

A.L. Pitner

Duke Engineering & Services Hanford, Inc., Richland, WA 99352
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Abstract: Estimates were made of the volume of sludge expected 1) from Integrated Process Strategy (IPS) processing of the fuel and 2) in the fuel storage canisters in K West Basin. These were based on visual observations of fuel element condition in the basin and laboratory measurements of canister sludge density. These estimates, made in early 1997, are reviewed and the basic assumptions used discussed.

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K WEST BASIN SLUDGE VOLUME ESTIMATES FOR
INTEGRATED WATER TREATMENT SYSTEM

January 1997

Originator:

A. L. Pitner

Peer Review:

R. B. Baker

D. J. Trimble

Purpose

An estimate was made to project the volume of sludge expected from Integrated Process Strategy (IPS) processing of the fuel and in the fuel storage canisters in K West Basin to support the Integrated Water Treatment System (ITWS). A nominal "Working Estimate" as well as an upper level "Working Bound" were developed.

Summary of Results and Conclusions

The Working Estimate of the sludge volume for ITWS design basis is 3000 liter, and the Working Bound is 6200 liter.

Assumptions

The inventory of spent fuel stored in K West Basin is comparable to that stored in K East Basin, as is the number of canisters containing the fuel. In the recent visual examination campaign conducted to inspect approximately 250 K West selected fuel assemblies, the level of damage found was comparable to that seen in similar K East fuel examinations. Thus, it is expected that the level of sludge generated during IPS processing of the K West fuel should be comparable to that estimated for the K East fuel. Accordingly, the working estimate of fuel sludge expected to be generated during IPS processing of K West fuel is 1300 liter, and the bounding estimate is 3200 liter (Reference 2).

The estimated canister sludge inventory for the K West Basin was provided in Reference 1. The best estimate derived for the as-settled volume of sludge in the K West fuel storage canisters was 1700 liter, while the upper bound estimate was 3000 liter.

Sources

- References:
- (1) Internal Memo, D. J. Trimble to D. S. Takasumi, "K West Basin Canister Sludge Inventory," dated January 26, 1997.
 - (2) Internal Memo, A. L. Pitner to D. S. Takasumi, "K East Basin Sludge Volume Estimates for Integrated Water Treatment System," dated January 23, 1997.

Calculation

The projected total sludge inventory for IWTs planning activities is the sum of the IPS fuel processing and canister sludge estimates.

Working Estimate

1300 liter (IPS) + 1700 liter (canisters) = 3000 liter

Working Bound

3200 liter (IPS) + 3000 liter (canisters) = 6200 liter