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1	Letter	11/11/2004	Interview and Telephone Conversation with David Moss regarding the Pug Mill and Vertical Shafts adjacent to the General's Tanks at Material Disposal Area (MDA) A (w/Attachments a/s) N/A N/A N/A		
17	Letter	11/12/2004	Telephone Conversation with David Moss regarding the date the Vertical Shafts adjacent to the General's Tanks at Material Disposal Area (MDA) A were filled N/A N/A N/A		



10939



**Shaw Environmental, Inc.**

335 Central Park Square

Los Alamos, NM 87544

505-661-5200

FAX: 505-661-5222

November 11, 2004

Project No. 108503

Los Alamos National Laboratory  
ATTN: Ron Rager  
University Technical Representative  
TA-21 MDA A Investigation WP and HIR  
RRES-RS  
Los Alamos National Laboratory  
Los Alamos, New Mexico 87545

Interview and Telephone conversation with David Moss regarding the pug mill and vertical shafts adjacent to the General's Tanks at Material Disposal Area A (MDA A)

Dear Mr. Rager:

Shaw Environmental, Inc. conducted an interview with Mr. David Moss of Los Alamos National Laboratory (LANL), Facility & Waste Operations Division (FWO), Waste Facilities Management (WFM) on November 8, 2004 to gain a better understanding of the intended use of the pug mill and vertical shafts adjacent to the General's Tanks at MDA A.

Two attachments to this letter provide:

- Summary of interview questions and answers from November 8, 2004, and
- Summary of information discussed between David Moss and David Salazar (LANL) and provided to Jennifer Sanders of Shaw Environmental, Inc. on November 10, 2004 regarding asphalt-lining and filling of the vertical shafts.

This documentation is submitted by Shaw Environmental, Inc. to provide a record of the source of information to be added to the final MDA A Investigation Work Plan (IWP) in response to internal review comments. Of the four additional memoranda provided by Mr. David Moss and provided in Attachment 1, the following is currently cited in the Draft IWP:

Voelz, G. L., October 30, 1973. "Waste Storage Tanks," Los Alamos Scientific Laboratory memorandum to E. E. Wingfield (Chief, Operations Branch, AEC-LAAO) from George L. Voelz (Health Division Leader), Los Alamos, New Mexico. (Voelz 1973, 00483)

If you have any questions regarding this submittal or need additional information, please contact me at 505-661-5242 or Devon Jercinovic at 505-262-8902.

Respectfully Submitted,

Shaw Environmental, Inc.

A handwritten signature in cursive script that reads "Jennifer Sanders for".

Kate Herrell  
Project Manager

cc: Scott den Baars, Shaw-Los Alamos  
Devon Jercinovic, Shaw-Albuquerque  
Central Files, Shaw-Los Alamos

## Attachment 1

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**Date:** November 8, 2004 14:25 MST

**Participants:** David Moss (Los Alamos National Laboratory) and Jennifer Sanders (Shaw Environmental, Inc.)

**Subject:** Interview to Discuss Vertical Shafts Adjacent to General's Tanks and Disposal of Pug Mill Rinsate

*Question 1:* Two vertical shafts adjacent to the General's tanks were constructed December 3, 1975. The currently known, planned uses for the two 4-ft-diameter vertical shafts (~65 feet deep) include (Warren 1976):

- Disposal of non-retrievable cement paste.
- Processing of wash water and associated solids generated when cleaning the transfer hose after operation of a pug mill.

It was noted in a telephone conversation with Jeff Sanders of Shaw Environmental, Inc. that the vertical shafts were never used. Were there any additional uses intended for vertical shafts?

*Response 1:* David Moss stated that the two planned uses for the 4-foot diameter vertical shafts adjacent to the General's tanks were 1) disposal of non-retrievable cement paste, and 2) processing of wash water and associated solids generated when cleaning the transfer hose after operation of a pug mill. He stated that he confirmed with David Salazar that the vertical shafts were never used.

*Question 2:* Why were the intended uses cited in the 1976 report abandoned?

*Response 2:* The reason the vertical shafts adjacent to the General's tanks were never used was described by David Moss as follows:

The original plan was to pump supernatant out of the General's tanks and fill them with cement that was mixed with liquid waste using a pug mill. The pug mill was an adapted commercial dough mixer designed for a bakery. The General's tanks were pumped and the liquid waste was transferred to TA-21-257. But, instead of using the General's tanks for the cement/liquid waste mixed with the pug mill, the cement/liquid waste was transferred to corrugated metal pipes (CMPs) located in Area T using a fire hose and screw pump. The pug mill was then rinsed with water at the end of the operation and the rinsate was transferred to vertical shafts in Area T.

Because the pug mill waste was never transferred to the General's tanks as planned, the vertical shafts adjacent to the General's tanks never received pug mill rinse water. The reason the shafts were not used was geographical. That is, they were located adjacent to the General's tanks, while the disposal operations (mixing and transfer with the pug mill) were being conducted in Area T. There was one pug mill used, which was a fixed structure. Typically, retrievables went into CMPs and rinsate went into vertical shafts. The shafts that received this rinse water are still located at Area T, but the CMPs have been removed. Carmen Rodriguez is currently compiling information

regarding operations at Area T and may be able to provide additional information (665-6770).

*Question 3:* Why were the shafts eventually filled without being used?

*Response 3:* David Moss is unsure whether the vertical shafts were actually filled and will confirm with David Salazar.

*Question 4:* Based on a 1976 report (Warren), there were also plans to coat the shafts with asphalt. Why was this action not completed?

*Response 4:* David Moss will ask David Salazar about the plans to coat the shafts with asphalt. He noted that, at the time, coating the shafts with asphalt was considered an acceptable method to contain waste. He will ask David Salazar if the shafts were coated with asphalt.

*Question 5:* In telephone conversation with Jeff Sanders of Shaw Environmental, Inc. it was noted that the pug mill on-site was used to pump the General's tanks (containing Pu-239/240 and Am-241). Was the transfer hose rinsate from decontamination ever transferred to the vertical shafts? If not, what was the alternative location(s) for discharge of decontamination water?

*Response 5:* See response to Question 2.

*Question 6:* How many pug mills were used at this location and were they stationary (i.e., with building numbers) or mobile?

*Response 6:* See response to Question 2. There was one pug mill used, which was a fixed structure.

*Question 7:* Was the decision to fill the shafts documented? When was this action completed?

*Response 7:* See response to Question 3. David Moss will ask David Salazar if the shafts were filled.

*Question 8:* What was the process used to fill the shafts? (i.e., were they simply filled with concrete or were any other actions completed)?

*Response 8:* If the shafts were filled, the method would have been to drive in a concrete truck and fill them.

*Question 9:* Were any wastes mixed with the concrete when the shafts were grouted (e.g., at MDA T)?

*Response 9:* No waste would have been added if the tanks were filled as described in Response 8.

David Moss also provided the following documents (attached to this record):

- Memorandum (March 12, 1976) from P.E. McGinnis, H-7, MS 518 to Margaret Anne Rogers, H-8, MS 737, Subject: General's Tanks Waste.

- Memorandum, (October 30, 1973), from George L. Voelz, MD, Health Division Leader to E.E. Wingfield, Chief, Operations Branch AEC-LAAO, Subject: Waste Storage Tanks.
- Memorandum (December 6, 1971) from W.B. Gibson, CMB-11 to W.J. Maraman, CMB-11, Subject: General's Tanks – Memo from Dean D. Meyer, December 3, 1971.
- Memorandum (December 3, 1971) from Dean D. Meyer, Group Leader H-1 to W.J. Maraman, Group Leader, CMB-11, Subject: General's Tanks.
- Emelity report (pages 167 and 168), LA-UR-96-1283.
- Photograph of actual pug mill used to mix cement and liquid waste.
- Photo of vertical shafts at Area T where rinsate was placed.
- Photo of CMPs at Area T that received cement/liquid waste from pug mill.

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**References:**

Warren, J., January 22, 1976. "Disposal Shafts at Area A and Area T," Los Alamos Scientific Laboratory memorandum H7-SW-682 to M. Wheeler and M. A. Rogers (H-8) from J. Warren (H-7), Los Alamos, New Mexico. (Warren 1976, 00508)

## Attachment 2

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**Date:** November 10, 2004 14:25 MST

**Participants:** David Moss (Los Alamos National Laboratory) and Jennifer Sanders (Shaw Environmental, Inc.)

**Subject:** Telephone Conversation between David Moss and Jennifer Sanders Regarding Vertical Shafts Adjacent to General's Tanks

In the meeting between David Moss and Jennifer Sanders on Monday, November 8, 2004 David Moss indicated he would need to ask David Salazar whether the vertical shafts at MDA A adjacent to the General's Tanks were actually filled and whether they were coated with asphalt. He stated during the meeting that he would call Jennifer Sanders with this information. This telephone conversation is the follow-up to the November 8, 2004 interview.

David Moss provided the following information:

David Moss spoke with David Salazar after the interview conducted on November 8, 2004. David Salazar stated that the vertical shafts adjacent to the General's Tanks were not asphalt-lined. In addition, David Salazar stated to David Moss that the pits were not filled with concrete and instead were filled with soil. The original plan to put concrete from the pug mill into the pits was never carried out as discussed during the November 8, 2004 interview.

Jennifer Sanders asked David Moss for the full reference for the pages he provided from the LA-UR-96-1283 report (see Attachment 1). The full reference is:

L.A. Emelity, "A history of radioactive waste management at Los Alamos" LA-UR-96-1283.

In addition, Jennifer Sanders asked David Moss if the pug mill and Area T vertical shaft/CMP photos provided on November 8, 2004 are from a specific document. David replied that they are file photos.

OFFICE MEMORANDUM

TO : Margaret Anne Rogers, H-8, MS 737

DATE: March 12, 1976

Thru : J. R. Buchholz, H-7 *JRB*  
L. A. Emelity, H-7 Alt. Group Leader *LA*

FROM : P. E. McGinnis, H-7, MS 518 *P.E.M.*

SUBJECT : GENERAL'S TANKS WASTE

SYMBOL : H7-76-PEM-162

In response to our phone conversation March 2, 1976, I have the following additional information concerning the liquid waste stored in the "General's Tanks (DPW-107 and DPW-108), Area A, TA-21:

- I. The radioactivity data for the 40,000 liters of waste already transferred from the west tank (DPW-107) Area A to TA-21-257 (Ref. Memo H7-76-PEM-86, page 2) were as follows:

Gross $\alpha$	$1.7 \times 10^6$ d/m-1	
238Pu	$1.6 \times 10^5$ d/m-1	( $4.1 \times 10^{-6}$ mg/l)
239Pu	$1.7 \times 10^6$ d/m-1	( $1.25 \times 10^{-2}$ mg/l)
241Am	$1.2 \times 10^4$ d/m-1	( $1.67 \times 10^{-6}$ mg/l)

In addition to the radionuclide content, the following  $\text{NO}_3$ -Nitrogen levels were determined:

$\text{NO}_3$  as N  $5.99 \times 10^3$  mg/l

Using this data, the following totals are estimated for the entire 185,000 liters of General's Tanks Waste and compared to both the totals estimated in the Fall of 1973 (Ref. 10/30/73 G. L. Voelz Memo to E. E. Wingfield - AEC/LAAO), and the totals projected from analyses of a grab sample taken 10/19/73.

- II. Total Radioactivity and Nitrates in 185,000 liters estimated from grab sample analysis of 40,000 liters transferred from DPW-107 to DPW-257, June 1975.

A. Total Equiv. 239Pu (238Pu, 239Pu and 241Am analyses)	2.5g
B. 241Am portion expressed as 239Pu	0.0g
C. Nitrate as Nitrogen ( $5.99 \times 10^3$ mg/l)	$1.1 \times 10^6$ g

- III. Total Radioactivity and Nitrates Estimated and Reported in 1973 Memo (Voelz)

A. Total Equiv. 239Pu	230 g
B. 241Am portion expressed as 239Pu	77 g
C. Nitrate as Nitrogen ( $2.9 \times 10^4$ mg/l)	$5.4 \times 10^6$ g

Note: Voelz memo states the Nitrate level 130,mg/l as nitrates. Converting this to Nitrates as nitrogen yields the  $2.9 \times 10^4$  mg/l indicated above.

TO: Margaret Anne Rogers 2

DATE: March 12, 1976

IV. Total Radioactivity based on grab sample analysis 10/19/73

	East DPW-108 (34,000 l)	West DPW-107 (151,000 l)
A. Total Equiv. <sup>239</sup> Pu (based on gross α)	.8 g	93 g
B. <sup>241</sup> Am portion ex- pressed as <sup>239</sup> Pu	.03g	55 g
C. Nitrate as Nitrogen	(3.45 x 10 <sup>4</sup> mg/l)= 1.1 x 10 <sup>6</sup> g	(6.59 x 10 <sup>3</sup> mg/l)= 1.0 x 10 <sup>6</sup> g

V. As you can see, the correlation between 1975 analysis and 1973 estimates is not too good.

In conversation with C. W. Christenson, the difference between 1973 grab sample analysis and the 1973 memo were explained. Apparently C. W. and Voelz felt the safest approach was to use data from the General's Tanks Notebooks and data from sample analysis to determine the maximum amount of radioisotopes and nitrates possibly contained in DPW-107 and 108.

VI. Disposition of the 185,000 liters of General's Tanks Waste

- A. On June 19, 1975 40,000 liters from the west tank were transferred to TA-21-257. Shortly afterwards, the entire contents of the east tank (~34,000 liters) were transferred to the west tank. This action was taken to permit immediate utilization of the east tank for disposal of non-retrievable cement paste generated at TA-21-257.
- B. The total 40,000 liters transferred to Bldg. 257 have been treated in the waste treatment facility at Bldg. 257 (TA-21-257) and Group H-7 is waiting for approval from Group H-8 to treat the remaining 145,000 liters of General's Tanks waste. Due to the inability of the Treatment facility at Bldg. 257 to significantly remove nitrates from influent waste, a large portion of the nitrates in the 40,000 liters treated was discharged to the canyon in the plant effluent. H-8 is presently conducting a ground water environmental impact study on these nitrates.
- C. Group H-7 is anticipating chemical treatment of the remaining General's Tanks waste following H-8 approval and initiation of non-retrievable cement paste disposal in the empty General's Tank before July 1, 1976.

PEM:bh

OFFICE MEMORANDUM

TO : W. J. Maramba, CMB-11

DATE: December 6, 1971

FROM : W. B. Gibson, CMB-11

SUBJECT: General's Tanks - Memo from Dean D. Meyer, December 3, 1971

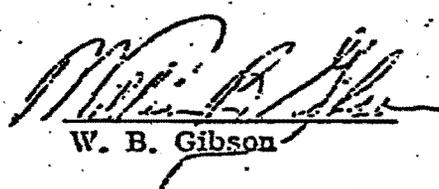
SYMBOL : CMB-11

Champion's records, which were made at the time solutions were transferred into the tanks, on the basis of radioassay (total alpha) of the individual trailer tank loads, showed a total of 344 grams into the two tanks.

Inasmuch as records at that time were kept to the nearest 0.01 grams, this is probably a reasonable figure for total alpha equivalent.

A corroborative sampling of each tank was performed about 1950 or 1951, and the results were in good enough agreement with the above that no corrections were thought to be necessary. So far as I know, no records of this sampling are still in existence, but I seem to vaguely recall that the NaOH supernatant tank had about 180 grams in 50,000 gallons, and the NH<sub>4</sub>OH tank had about 160 grams in 35,000 gallons.

How much of this is actually Pu, and how much is due to Am is open to speculation, but a reasonable guess might be about 20-30 grams of Pu, and the rest due to Am, but that is probably irrelevant, since the primary question is not how much Pu, but rather how much activity.

  
W. B. Gibson

WBG:arn

OFFICE MEMORANDUM

TO : W. J. Maraman, Group Leader, CMB-11

DATE: Dec. 3, 1971

FROM : Dean D. Meyer, Group Leader, H-1

SUBJECT: GENERAL'S TANKS

SYMBOL : H-1-71-302

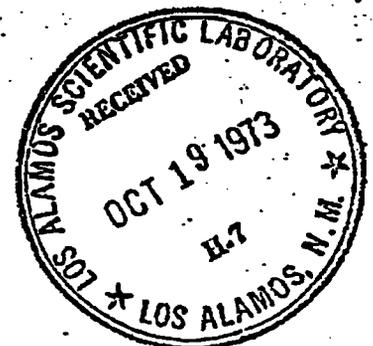
In the area between DP West and DP East, there are two tanks designated as structures TA-21-107 and TA-21-108 on the Engineering Technical Area Structure location plans. During the latter part of 1946 to an unknown date, these tanks were used to store solutions containing plutonium-239.

Sometime, these tanks will have to be removed. It will be important at that time to know approximately how much  $^{239}\text{Pu}$  is in the tanks and what was the chemical nature of the solutions stored. If possible, I would like to have this information for the records.

*Dean D. Meyer*  
Dean D. Meyer

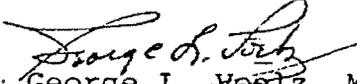
DDM/eh

cc: File



OFFICE MEMORANDUM

TO : E. E. Wingfield, Chief, Operations Br.      DATE: October 30, 1973  
AEC-LAAO

FROM :   
George L. Veeriz, M.D., Health Division Leader

SUBJECT : WASTE STORAGE TANKS

SYMBOL : H

Although there are a great number of tanks (about 50) containing radioactive wastes at LASL, we do not consider them as storage tanks but rather as process tanks since these are kept under nearly constant surveillance and are used as holding tanks rather than storage. The same is true of toxic, non-radioactive solutions.

The only storage tanks are the so-called "General's Tanks" located between DP East and DP West. These are two 50,000 gallon tanks buried about 8 ft below grade with an 8 in. slab of concrete above the tanks. These tanks were built in 1945 and the last data we have are in August 1947. The tanks have been abandoned and ignored until recently.

The amount of radioactivity (an equivalent of about 230 grams of  $^{239}\text{Pu}$  (about one-third of which is  $^{241}\text{Am}$ ) is trivial compared to the amount of radioactivity in the Hanford tanks. Furthermore, only about 0.7% of the radioactivity is in solution so that any leakage would have probably stayed very close to the tanks.

Although the surveillance of these tanks has been, to say the least, minimal in the past, there has been no leakage determinable by our present information. The volume of 40,000 gallons in one tank and 9,000 in the other as well as chemical concentrations is comparable to the record data.

It is planned to transfer this solution to Bldg. 257 for treatment. This will take some time because we will have to rely on dilution to handle the anions which are quite high, e.g.,  $\text{NO}_3^-$  at 130,000 ppm for which the MPC is 45 ppm. An anion exchange column added to Bldg. 257 would eliminate this problem.

In any event, when the tanks are emptied, it would seem advisable to leave them there. They are already in a contaminated dump area and I can't conceive of a better method of burial.

GLV/CWC/mjt

CC: Eldon Christensen, CMB-11  
C. W. Christenson, H-7

section of Pajarito Road and Pecos  
 e. directly across from TA-50, was  
 ed for the new facility. Construction  
 largely complete by 1977 when the  
 occupants transferred from DP West.  
 plutonium-processing facilities were  
 ferred into TA-55 by January 1978,  
 the americium waste problem had  
 ed from DP-257 to TA-50-1. The  
 257 pug mill operations focused on  
 remaining americium waste in storage  
 es and on nonretrievable waste. With  
 vacuum filter dewatering the plant  
 lge and with the final disposal of all  
 ercium waste at DP West, use of the  
 g mill was discontinued. The last PMR,  
 ), was conducted in April 1983. The  
 nent silo was transferred for use at  
 55 in 1984, and shortly after that the  
 g mill and appurtenances were removed.  
 1986, Area T was declared an inactive  
 disposal site, and in 1987 the surface of  
 e area was stabilized and measures were  
 en to control runoff intrusions from  
 rounding paved areas. Surface  
 abilization included covering the area  
 ith tuff from the pit excavation, then  
 lding 6-12 in. of topsoil for reseeding  
 and mulching.

In 1986, the pug mill, the walls  
 nclosing it, auxiliary tanks, pump and  
 iping were removed and transferred to  
 A-54 as part of the radioactive waste lines  
 emoval project that was funded under  
 ase B of the Radioactive Liquid Waste  
 ollection Systems Improvements Project.  
 lso removed was the buried aluminum  
 pe line that originally transferred waste  
 the pits and that had been abandoned  
 place when its contents of cement paste  
 id set up.

**THE "GENERAL'S TANKS"**

The General's Tanks (Chapter 5)  
 were two 50,000-gal. cylindrical steel  
 tanks installed in the west end of Area A  
 (Fig. 9-6). The tanks stored more  
 concentrated plutonium-239/-240 wastes  
 in the hope that the plutonium-239/-240  
 could be eventually recovered. The wastes  
 also contained plutonium-241, which,  
 over the years decayed to americium-241.  
 It was estimated that the tanks contained  
 200-400 g of plutonium-239/-240.

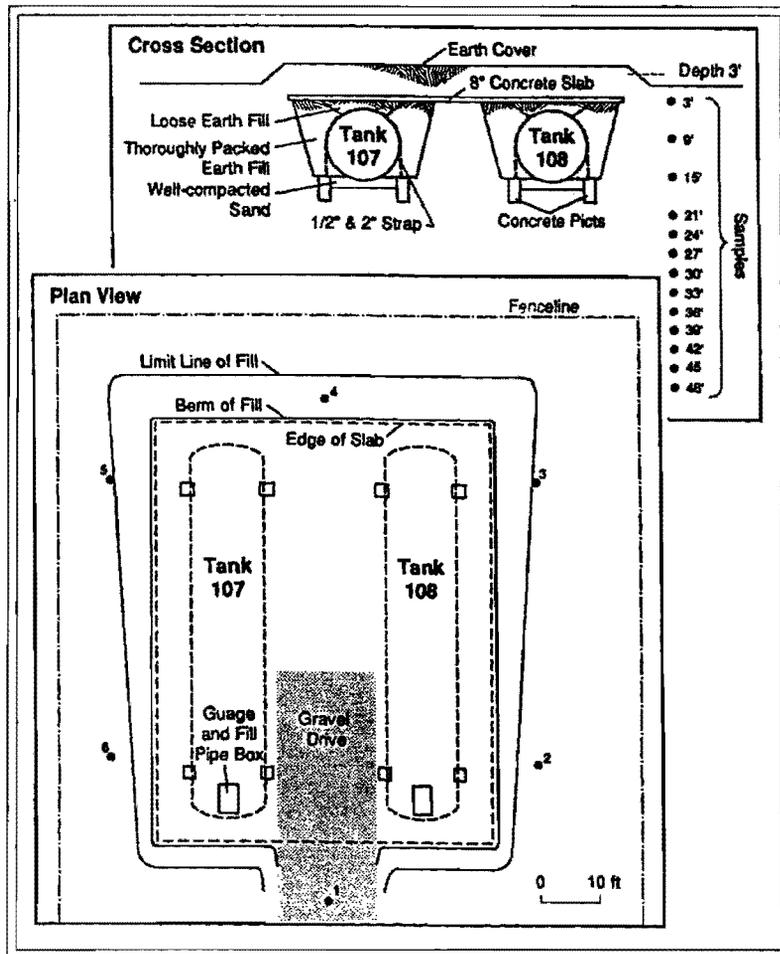


Fig 9-6. The General's Tanks, west end of Area A.

In 1974, because of concern that the tanks might be leaking, H-8 drilled holes and sampled beneath the tanks, and H-7 removed the liquids from the tanks. A work order was placed to excavate a pit over each tank, break a large hole in the concrete slab over each tank, and cut a hole in the steel tops of the tanks. This work was completed in 1974. The wastes were sampled and analyzed, and on June 19, 1975, 40,000 L of the supernatant in the tanks were transferred to DP-257 for treatment. After all supernatant had been removed, it was planned to fill the tanks with cement paste from pug mill operations. To accommodate the wash water used to flush the transfer line, two 4-ft-diameter shafts were drilled in the southwest corner of Area A. The plan was to settle the rinse water for 1-2 days, then to pump the supernatant to DP-257 for treatment. Transfers of waste from the General's Tanks continued sporadically from 1975 to 1983. Because some rainwater had entered the tanks, the openings were sealed in 1985. Most of the original radioactivity remains in the residues in the bottom of the tanks.

H-8 drilled holes around the tanks in 1974 to depths of 35 ft and collected samples every 10 ft. Activities were within background levels and indicated that the tanks were not leaking. However, in a sampling campaign in 1983, holes were drilled to a 30-ft depth at 3-ft intervals at 6 locations around the tanks. Plutonium concentrations above background levels were found in most samples.

The plan to fill the tanks with cement paste from pug mill operations was never implemented.

## PROCESS IMPROVEMENTS AT DP-257

In the Preliminary Design Study Documentation and Ralph M. Parsons Co. Title I plans, all as part of the Upgrading Project, improved treatment efficiencies in DP-257 operations were planned. Considering such systems as ultrafiltration, ion exchange, mechanical and solar evaporation, LASL personnel presented a primary concept in a study report in May 1977 that included ion exchange and solar ponds. A first alternate was substituting mechanical evaporation for the ion exchange and ponds, and a second alternate provided either mechanical evaporation of ion exchange effluent or mechanical multi-effect evaporation followed by a finishing evaporator. Later, a wiped-film evaporator was proposed to process HF and HNO<sub>3</sub> wastes.

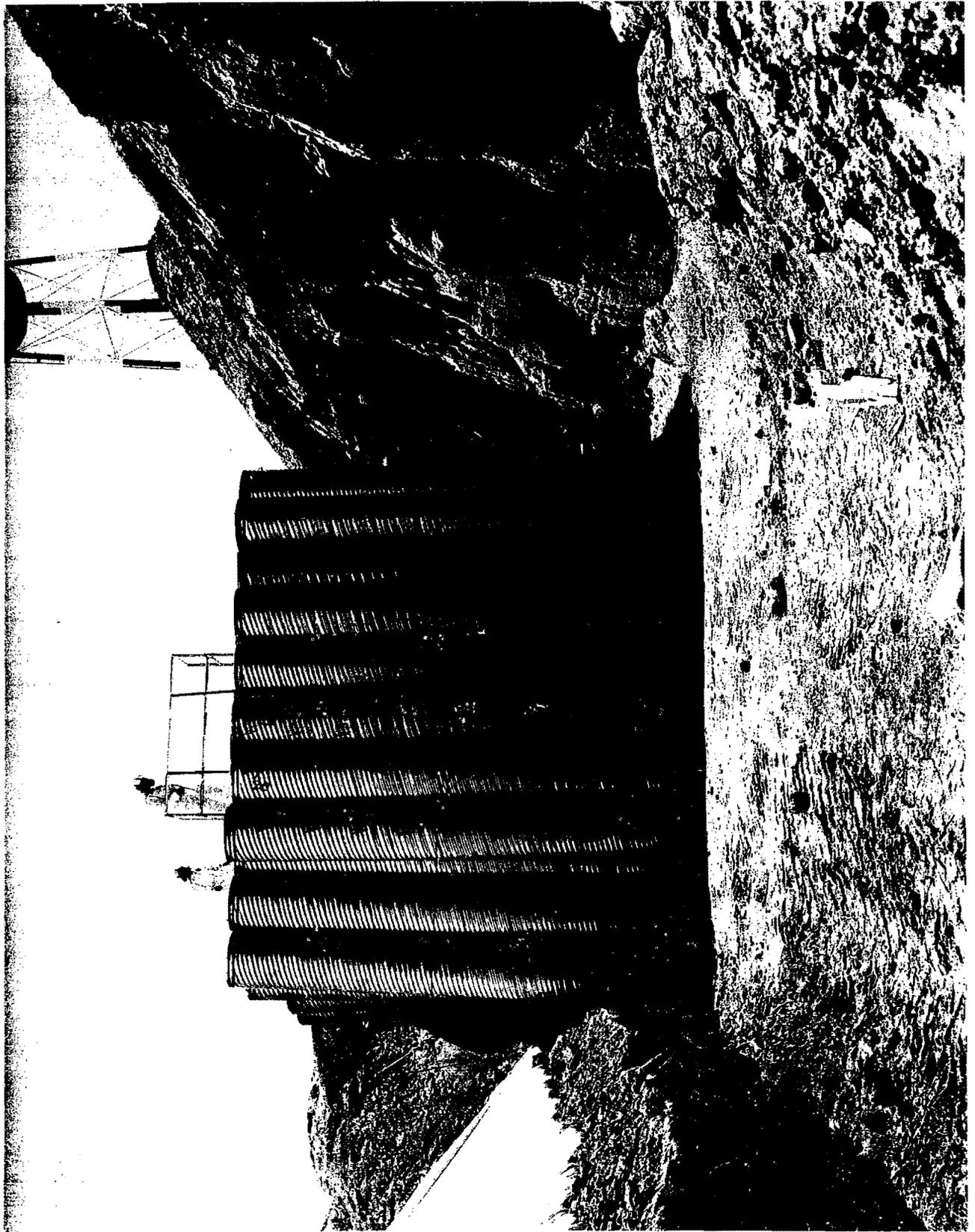
At about this time, CMB-11, the major generator of radioactive wastes at DPW, was completing a new facility at TA-55. After CMB-11 relocated, the quality and quantity of DP West wastes were estimated and a major reduction in both was assumed. Plans for process improvements at DP-257 were dropped, and it was decided to pump treated DP-257 wastes through a 3-in welded steel line to TA-50-2; improved pH control was incorporated at the DP-257 plant and the new pumping station was installed at the effluent storage tanks. TA-2 wastes would be injected into the line as it crossed that site. These decisions were incorporated into the Title II documents and became reality when construction was completed.



FIG. 22 pug mill



CN722544  
Pug Mill Run-194  
Pit 35, Aug. 11, 1972  
#4 of 9



RECEIVED NOV 12 2004

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November 12, 2004

Project No. 108503

Los Alamos National Laboratory  
ATTN: Ron Rager  
University Technical Representative  
TA-21 MDA A Investigation WP and HIR  
RRES-RS  
Los Alamos National Laboratory  
Los Alamos, New Mexico 87545

Telephone conversation with David Moss regarding the date the vertical shafts adjacent to the General's Tanks at Material Disposal Area A (MDA A) were filled

Dear Mr. Rager:

Shaw Environmental, Inc. spoke with Mr. David Moss of Los Alamos National Laboratory (LANL), Facility & Waste Operations Division (FWO), Waste Facilities Management (WFM) on November 12, 2004 to inquire about the date the vertical shafts adjacent to the General's Tanks at MDA A were filled. Mr. Moss stated that the shafts were excavated in 1975 and were filled when it was decided they would not be used. This would have been in 1977.

If you have any questions regarding this submittal or need additional information, please contact me at 505-661-5242 or Devon Jercinovic at 505-262-8902.

Respectfully Submitted,

Shaw Environmental, Inc.

A handwritten signature in cursive script that reads "Kate Herrell for". The signature is written in black ink and is positioned above the printed name and title.

Kate Herrell  
Project Manager

cc: Scott den Baars, Shaw-Los Alamos  
Devon Jercinovic, Shaw-Albuquerque  
Central Files, Shaw-Los Alamos