76137

ENVIRONMENTAL RESTORATION PROJECT

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(10) 4/137

LA-UR-05-1102

Los Alamos
NATIONAL LABORATORY

memorandum

Chemical Science and Technology
Responsible Chemistry for America

Environmental Restoration Project/CST-18
Los Alamos, New Mexico 87545

To/MS: Carl Newton, ESS-1, MS E525
From/MS: William C. Francis, CST-18, MS E525 W.C.F.
Phone/FAX: 7-6080/5-4632
Symbol: ER-WCF-96-17
Date: November 27, 1996

MATERIAL DISPOSALS AREA (MDA) U. RESEARCH ON OIL FROM THE PRECIPITRON TO THE PITS.

The TA-21 Operable Unit RFI Work Plan For Environmental Restoration, May 1991, Page 16-198 has the following paragraph under 16.6.1.1 Site History: "There were early problems with the pits; they did not function properly, and it was reported that the oil washing from the precipitron is lying on the top of the ground. This (oil) is very definitely contaminated to a high degree (Drager 1946).

The precipitron oil referred to in the 1946 Drager memorandum was oil that was used in the Electromatic Filters installed in the Filter Building, TA-21-153. These were the first filters that air exhausted from building, TA-21-152 passed through. There was a backup system of dry filters installed behind the Electromatic Filters.

Building TA-21-153 was constructed in 1945 by the R. E. McKee Construction Company. It was used until 1970 and the building was demolished in 1978.

Enclosed are drawings Eng-C2216, C2275, C2306, and C2342; The Herbert W. Drager letter and the report on the Decommissioning of building TA-21-153.

Evidently the contaminated oil got to the seepage pit MDA-U through the floor drains. I have no idea what function the oil had in the operation of the Electromatic Filters. I have talked to Jerome Dummer and N. Krikorian about the oil used in the Electromatic Filters and they have no knowledge of the function that the oil had in the filtering process.

Distribution: (w/enc)
Garry Allen, CST-18, MS E525

June 11, 1946

E. R. Jette

Herbert W. Drager

Preliminary Survey of Sewer System

As was arranged by your office, James Tribby and myself made a check of the project sewer system with Mr. McCall, sanitary engineer of the Zia Company, on Wednesday, June 5. We first stopped at the exits of the Tech Area acid sewer which empties north, northwest of the school area. The waste water from the sewer empties onto a flat section of ground near the edge of Pueblo Canyon. The refuse from the sewer has destroyed vegetation in the immediate area near the end of the sewer pipe and Tribby was able to detect, with instruments, the presence of a considerable amount of contamination.

Tank No 2?

The outlet to the Tech Area sanitary sewer, which also serves a small portion of the residential section across from the Tech Area, empties about 25 feet from the Tech Area acid sewer. There was also evidence of contamination at this outlet but the vegetation was not destroyed. The stream from the acid sewer and the sanitary sewer join down the side of Pueblo Canyon and then takes off in an uncertain direction. Neither of the two outlets or the stream is marked with warning signs.

Our second stop was at the site of the residential sanitary sewer north, northwest of T-218. The outlet of this sewer had detectable traces of contamination but the septic tanks appeared to be cold. However, it was difficult to make any measurement with the instruments we had with us because of the splashing water. The fact that the septic tank refuse did not show signs of contamination is easily explained by the density of the refuse.

00-039

Tank No. 5

Our check route took us to Los Alamos Canyon where we made a third stop at three small sewer outlets south of "Z" building. Two of the three sewers were inactive at the time we checked them and the third showed signs of relatively little use. We were unable to accurately determine the presence of contaminated materials, but the foliage surrounding the sewer outlets is richer than would be found if caustic or harmful materials were emptied from the pipes.

The area south of the old D building laundry hutments was our fourth stop, but no instrument checks were made because the ground is known to be contaminated at that point.

J

June 11, 1946

E. R. Jette

Herbert W. Drager

Preliminary Survey of Sewer System .... Page 2

At our next stop, south, southeast of "Y" building we found the sewer outlet and the surrounding ground with high alpha and gamma radiation. The sewer empties out on a relatively flat piece of ground with a slight downward slope and the vegetation in the area surrounding the path of water has been destroyed and the rocks discolored by chemical actions.

The incinerator was checked next but we were unable to find signs of caustic chemicals or contamination in the noncombustible furnace refuse or in the sewer sump.

At DP laundry we found the seepage pits, for waste water, were not functioning properly and that a large amount of contaminated water was lying above the ground in the pits. This of course produces a very serious ground contamination condition when the water evaporates.

After inspecting the sewer system plans with Mr. McCall, in the afternoon, at the U. S. Engineers Office, we checked the sewer location at DP east and west area. The sanitary sewer which serves building 51 and 52 empties out onto flat ground 25 yards from the fence on the north side of the site. The water wanders over the ground forming small pools against fallen trees and debris, and then travels down a dirt road for about 200 years before it turns into the canyon proper and disappears. No effort was made to check the refuge stream for contamination but it is very reasonable to expect that the water and the ground over which the water travels is highly contaminated. The same is true of the water which empties from the east area filter house into two seepage pits. These pits, like those at the laundry, are not functioning properly and the oil washing down from the precipitrons is lying on top of the ground. This is very definitely contaminated to a high degree.

The acid sewer outlet for the west area comes out on the south end of building 2 and travels to the edge of Los Alamos Canyon. The sewer line is intercepted by some type of septic tank and vaporization chamber which we were unable to inspect because it was made of heavy timbers solidly

COPY

June 11, 1948

E. R. Jette

Herbert W. Drager

Preliminary Survey of Sewer System .... Page 3

fastened together. This line should be more thoroughly inspected on the future survey.

It is evident that most every sewer line originating in the Tech Area or at DP site is contaminated. They are poorly planned, and even more poorly used and maintained. In several instances the septic tanks are too small and in almost every instance the septic tanks are not operating properly because of improper bacterial action.

It is very desirable that water and earth samples be taken at each sewer location to determine the degree of hazard. Further, it is desirable that some type of check be made by qualified technicians to determine why the sanitary sewers are contaminated or why the acid sewer should show evidence of refuse from sanitary installations.

Mr. McCall was most helpful to Mr. Tribby and myself and he informs me that he has instructions to see this problem through to our satisfaction. I believe that the immediate future is none too soon to utilize Mr. McCall's experience and the help of others in a more clear determination of our problem and the necessary solutions.

Herbert W. Drager

HWD/lr

cc/ Graham
McCall
Tribby
file

copies made for:

Penly
Manley
Froman
Whipple

E R Jette June 11, 1946

Herbert W Drager

Preliminary Survey of Sewer System

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Herbert W/ Drager

H.D/lr
cc/ Graham
McCall
Tribby
file

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LA-9047-MS

UC-70
Issued: November 1981

The Decommissioning of TA-21-153, A ^{227}Ac Contaminated Old Filter Building

Johnny R. Harper
Raymond Garde

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Los Alamos, New Mexico 87545

THE DECOMMISSIONING OF TA-21-153, A ^{227}Ac CONTAMINATED OLD FILTER BUILDING

by

Johnny R. Harper and Raymond Garde

ABSTRACT

An exhaust air filter building contaminated with ^{227}Ac was decommissioned at the Los Alamos National Laboratory, Los Alamos, New Mexico, in 1978. The building was constructed in the late 1940s to clean exhaust air from several buildings at TA-21, DP Site. It was in service until March 1970.

The project involved preliminary decontamination, dismantling the building, and burying the debris at an on-site waste disposal/storage area.

This report presents the details on the decommissioning procedures, the health physics, the waste management, the environmenmental surveillance, and costs for the operation.

I. INTRODUCTION

In the late 1940s a filter building was constructed at the Los Alamos National Laboratory, Los Alamos, New Mexico, to clean the exhaust air from several buildings at Technical Area (TA)-21, DP East Site. The structure, designated as TA-21-153 (Fig. 1) consisted of

a. a two-story frame and masonary building (Figs. 2 and 3) with 200 m^2 of ground floor area and 84 m^2 of second story floor area;

b. 42 lineal meters of metal duct (Fig. 4);

c. transitional plenums, filter housings with electromatic filters, (Fig. 5); and

d. two blowers and two stacks.

and 10). Only 0.3 dis/s/cm^2 of alpha activity was detected inside the blowers and stacks.

The dry filters (Fig. 11) were removed. No alpha activity was detected probably because they had been installed after the filter building was no longer in operation during a precleaning operation in 1970. Access doors were cut into the precipitator frames (which housed the dry filters) to expose the electromatic filters (Fig. 12). These filters were cut into sections and spray painted prior to removal. The maximum alpha activity detected was 12 dis/s/cm^2.

The transitional plenum was isolated from the building. Its interior sheet rock walls were stripped and placed in plastic-lined cardboard boxes (Fig. 13). The surfaces were painted. The exterior surfaces of the blower room and the transitional plenum (Fig. 14) were manually stripped of their asbestos transite siding. The remaining sheet rock walls of the transitional plenum were removed. A chain saw was used to sever the blower room (Fig. 15) and the transitional plenum from the building proper, then a front-end loader was used to collapse the structures (Figs. 16 and 17). Water was used for dust control. The ensuing rubble was loaded into plastic-lined dump trucks (Fig. 18).

For protection of the workers during the next phase, a second high efficiency filtered ventilation system with an airflow rate of 1.9 m^3/s was connected to the building (Fig. 19). The remaining electromatic filters inside the building were removed in plastic-lined cardboard boxes and barrels. The maximum alpha activity detected was 12 dis/s/cm^2 on the ground floor. No activity could be detected in the second story.

The building interior was mopped with water and spray painted (Fig. 20). Asphalt mixed with latex paint was poured into all drain lines. The floors were coated with 1.25 cm of the mixture. Examination of the building interior indicated no detectable alpha activity, and the airborne contamination was (for the first time during the operation) lower than the maximum permissible concentration values.

The building was razed with a bulldozer (Figs. 21 and 22) and a front-end loader.

Metal structures were cut into manageable pieces with torches for ease of transport. The debris was sent to the radioactive waste disposal/storage site in plastic-lined, tarpaulin-covered dump trucks (Fig. 23). Contaminated soil was removed in a similar manner.

IV. WASTE MANAGEMENT

All wastes generated by this operation were buried in shallow pits (Fig. 24) at the Laboratory's radioactive waste disposal/storage site (TA-54) located 14 km from the decommissioning site. Wastes consisting of 2 662 m^3 of building debris and 285 m^3 of contaminated soil were disposed of in this manner.

All wastes were transported to the disposal site in tarpaulin-covered dump or flat-bed trucks. Trucks, loaders, and bulldozers used to load or transport contaminated materials were monitored during the job and decontaminated as necessary. Washing with water was sufficient to remove the contamination.

V. ENVIRONMENTAL SURVEILLANCE

The Laboratory's Environmental Surveillance Group monitored the operation with its routine air sampling network[3] (Table I). Four of the nearby sampling stations were selectively examined for ^{227}Ac and its decay daughters (Table II). Filter papers from the 25 sample locations were collected weekly and analyzed after a 7-10 day decay period. No measurable elevation in gross alpha activity was detected during the period of decommissioning.

When decommissioning personnel thought the job was completed, the environmental group sampled the area for concurrence. A value of $\leq$30 pCi gross alpha/gm of soil (the detection limit of the Laboratory's ZnS gross alpha measurement system[2]) was determined to be as low as practicable (ALAP). The Laboratory's Health Division Office and the Los Alamos Area Office of the US Department of Energy concurred (Appendix).

The area was contoured and revegetated with native grasses (Fig. 25).

VI. COST

The project required 102 working days (over a 6-month period) and a total cost of $276 300. Subcontractor manpower and equipment (Table III) costs were $188 500. Laboratory costs for health physics and management were $87 800.

TABLE II

AIR SAMPLING RESULTS FOR TA-21-153 OPERATIONS

Week Ending	Acorn Street[a] fCi/m^3	LAMPF[b] fCi/m^3	DP East STP[c] fCi/m^3	LA Airport[d] fCi/m^3
4/17/78	1.3 ± 0.4 147 ± 19	1.4 ± 0.4 150 ± 20	0.5 ± 0.2 66 ± 8	1.1 ± 0.3 148 ± 19
4/24/78	1.9 ± 0.5 190 ± 20	1.8 ± 0.5 190 ± 20	0.6 ± 0.2 86 ± 11	1.9 ± 0.5 180 ± 20
5/01/78	0.8 ± 0.3 170 ± 20	1.8 ± 0.5 190 ± 20	1.2 ± 0.4 107 ± 14	1.6 ± 0.4 160 ± 20
5/08/78	2.5 ± 0.6 52 ± 7	0.2 ± 0.4 122 ± 32	0.2 ± 0.6 440 ± 120	0.4 ± 0.4 136 ± 34
5/15/78	2.0 ± 0.5 330 ± 40	1.3 ± 0.4 180 ± 20	0.8 ± 0.3 106 ± 14	0.9 ± 0.3 147 ± 19
5/22/78	0.7 ± 0.3 147 ± 19	1.6 ± 0.4 220 ± 30	0.8 ± 0.3 170 ± 20	1.2 ± 0.4 230 ± 30
6/05/78	0.9 ± 0.5 95 ± 30	0.5 ± 0.3 35 ± 10	0.9 ± 0.4 72 ± 18	0.8 ± 0.4 180 ± 40
6/12/78	3.5 ± 0.8 260 ± 30	1.8 ± 0.5 139 ± 18	1.6 ± 0.4 113 ± 14	2.3 ± 0.5 160 ± 20
6/28/78	22 ± 0.5 35 ± 5	20 ± 0.5 160 ± 20	1.8 ± 0.4 104 ± 13	1.4 ± 0.4 87 ± 11
7/07/78	1.7 ± 0.4 47 ± 6	1.5 ± 0.9 62 ± 8	3.6 ± 0.8 150 ± 20	1.2 ± 0.3 63 ± 8
7/17/78	1.9 ± 0.5 151 ± 19	2.4 ± 0.7 180 ± 20	2.4 ± 0.6 142 ± 18	2.8 ± 0.7 180 ± 20
7/24/78	0.6 ± 0.2 40 ± 5	0.42 ± 0.19 30 ± 4	0.6 ± 0.2 25 ± 3	0.44 ± 0.17 29 ± 4
8/14/78	1.0 ± 0 45 ± 6	1.4 ± 0.4 46 ± 6	1.0 ± 0 36 ± 54	1.4 ± 0.4 43 ± 6
8/21/78	1.1 ± 0.3 48 ± 6	1.5 ± 0.4 47 ± 6	1.1 ± 0.3 31 ± 5	1.3 ± 0.3 40 ± 5
8/31/78*	20 ± 0.6 52 ± 7	1.2 ± 0.4 46 ± 6	1.6 ± 0.5 40 ± 5	1.5 ± 0.5 52 ± 7
9/05/78	5.8 ± 1.3 120 ± 15	1.2 ± 0.3 250 ± 30	4.4 ± 1.1 98 ± 13	5.1 ± 1.2 83 ± 11
9/18/78	2.4 ± 0.6 43 ± 6	3.1 ± 0.7 43 ± 5	2.0 ± 0.5 33 ± 4	3.1 ± 0.7 39 ± 5
10/31/78	2.0 ± 0.6 52 ± 7	1.2 ± 0.4 46 ± 6	1.6 ± 0.5 40 ± 5	1.5 ± 0.5 52 ± 7

*Gamma scan showed no evidence of actinium or its immediate daughters.

[a]Acorn Street is approximately 2250 m east of Decommissioning Site.

[b]LAMPF is approximately 1250 m southwest of Decommissioning Site.

[c]DP East Sewage Treatment Plant (STP) is approximately 350 m northwest of Decommissioning Site.

[d]LA Airport is approximately 550 m south-southwest of Decommissioning Site.

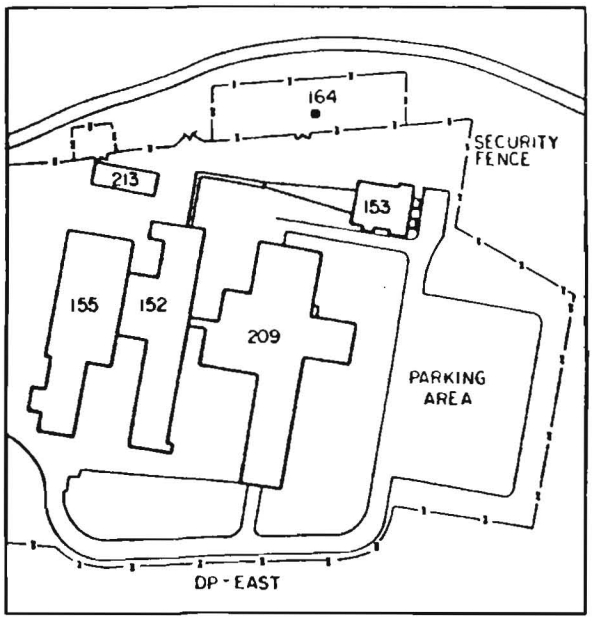

Fig. 1.
TA-21, DP East.

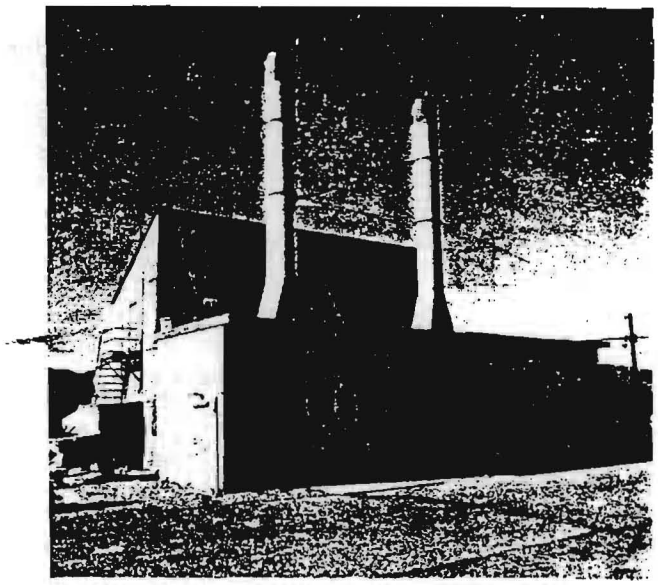

Fig. 2.
East elevation, Structure TA-21-153.

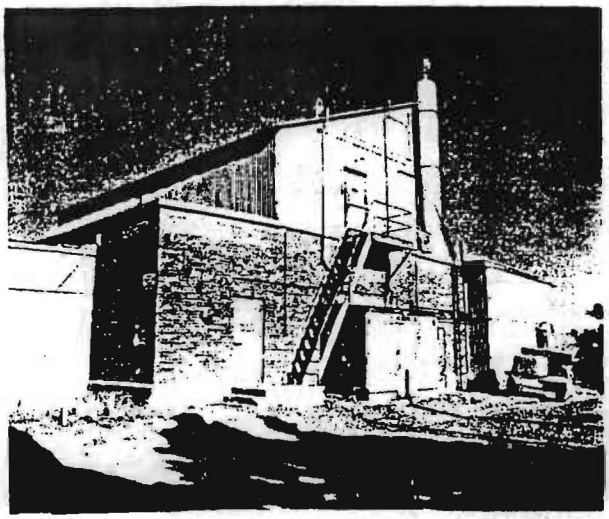

Fig. 3.
South elevation TA-21-153.

Fig. 4.
Metal duct.

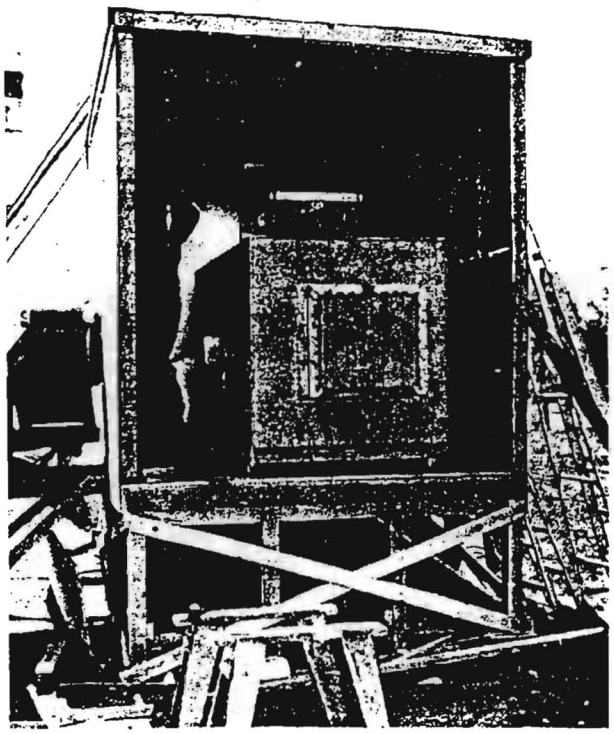

Fig. 7.
Temporary filtered exhaust system for transitional plenum.

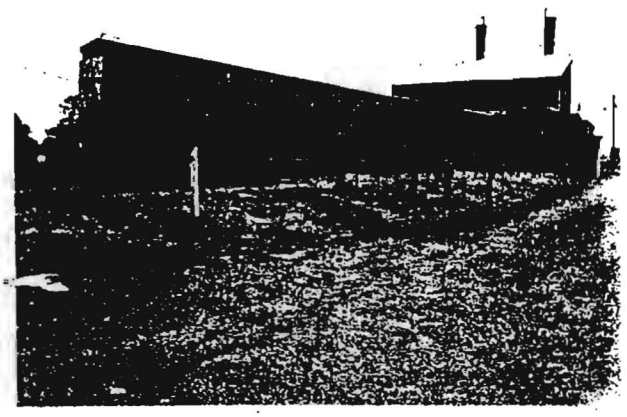

Fig. 8.
Transitional plenum after duct removal.

Fig. 9.
Removal of stack.

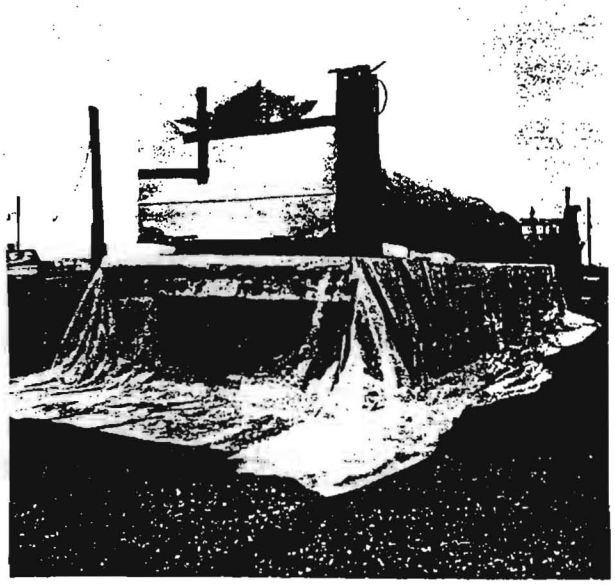

Fig. 10.
Packaging of stack.

Fig. 15.
Separation of blower room from building.

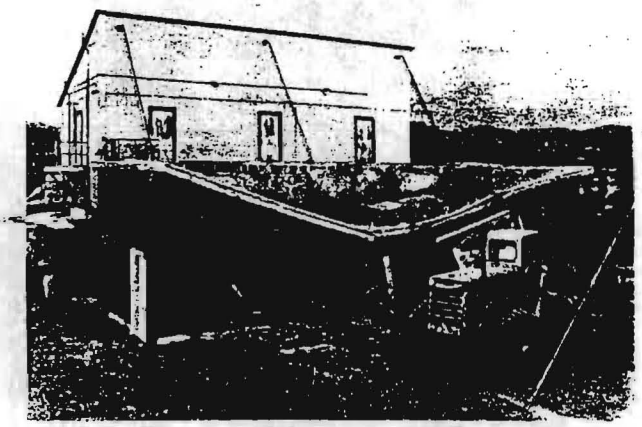

Fig. 16.
Collapsing the blower room.

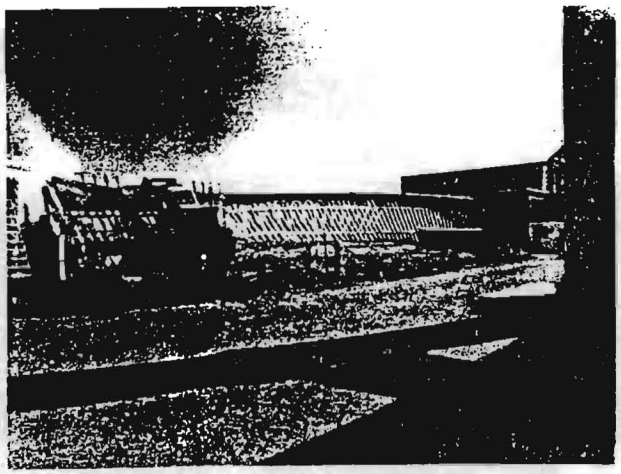

Fig. 17.
Collapsing the transitional plenum.

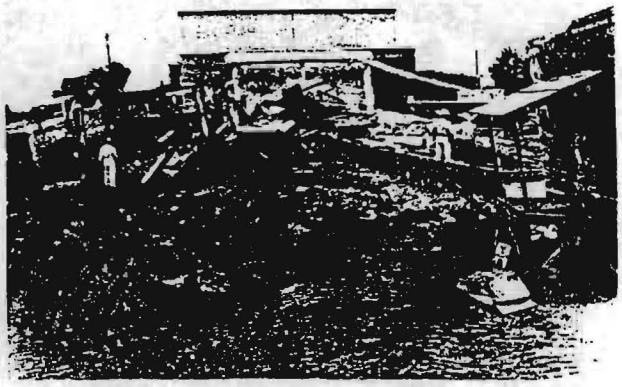

Fig. 18.
Water used for dust control.

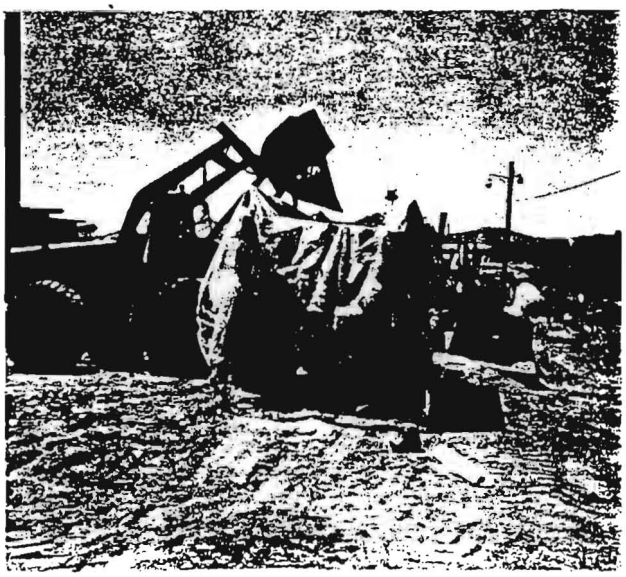

Fig. 23.
Loading of debris.

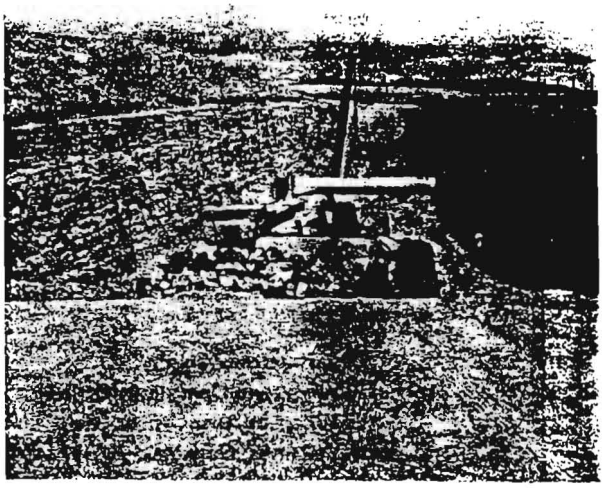

Fig. 24.
Typical burial pit at radioactive waste disposal/storage site.

Fig. 25.
Rehabilitated site.

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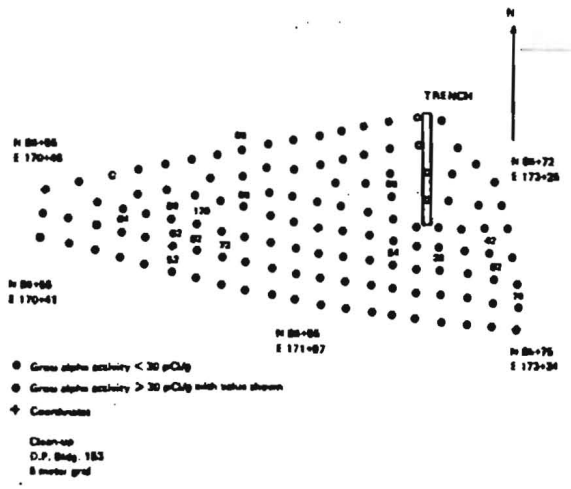

Fig. A-1.
Surface soil sampling results.

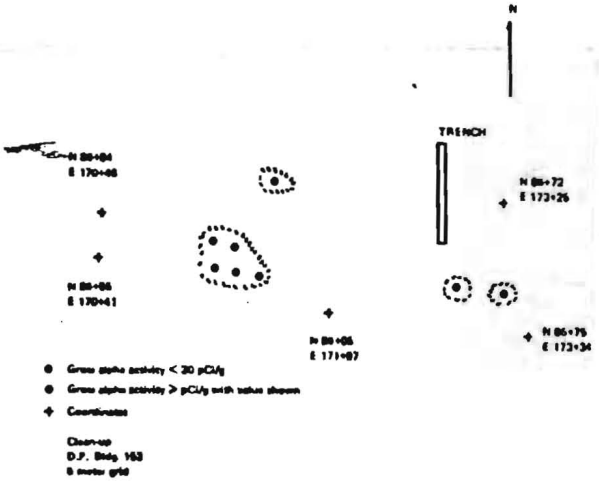

Fig. A-2.
Spot clean-up sampling results.

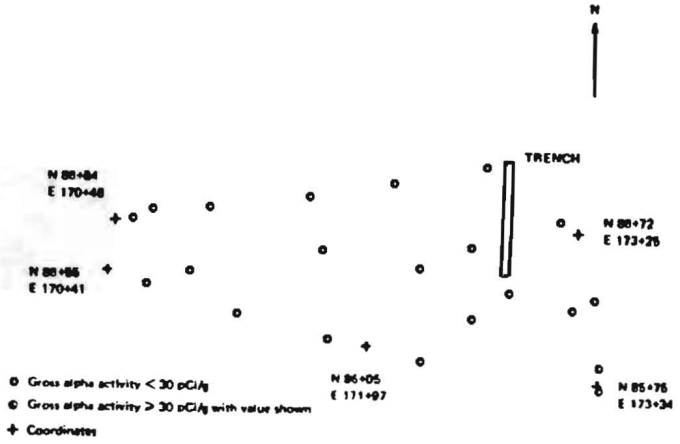

Fig. A-3.
Postcontouring sampling results.