

IV. RETRIEVAL AND HOT CELL OPERATIONS

1. SINGLE BARREL EXCAVATIONS

Table III summarizes available information from the burial ground records for the three single barrels that were to be retrieved for the AEC. The records show that the three barrels were located in Pits 10 and 11 at specified distances from the northwest corner monuments of the pits. Only one of the three barrels (No. 771-7285) was found.

TABLE III

RECORDED SINGLE BARREL LOCATIONS

Date Shipped/ Date Buried	Shipment Identification	Container Identification	Pit/Location
1/22/69-9/30/69	ATMX SN69-145-B-1	771-3431	10/590-600'E & 40-50'S NW cor
5/20/70-5/27/70	Trlr SN-70-134-B	771-7285	11/80-83'E & 15-95'S NW cor
6/?/70-6/10/70	Trlr SN70-21-B	771-16500	11/125-130'E & 10-95'S NW cor

Container No. 771-7285 was found close to the area designated by the burial ground records. Retrieval of this container was relatively straight-forward. The top soil was removed with a backhoe, and the barrels in the pit were lifted out, using a chain-hook lifting device and crane. The other two containers (771-3431 and 771-16500) were not located because of circumstances involving their burial.

Inclement weather forced a large backlog of containers (5000) to be stored above ground during the winter of 1970. Container No. 771-16500 was part of this backlog. As conditions and weather permitted, this backlog of barrels was moved into Pit 11, which resulted in the load containing Barrel No. 771-16500 to become scattered. Although 30 of the barrels of the load of 152 barrels were located as indicated by the records, the remaining barrels (including 771-16500) were not located.

The load containing Barrel No. 771-3431 in Pit 10 was put in an area of the burial ground where the containers were "dumped." The lack of identifying tags and difficulty of excavating in a "dumped" area made it impossible to locate this special barrel or the load containing it during the time available for this work.

1.1 Single Barrel No. 771-7285

Barrel No. 771-7285 was found about 72 ft east and 45 ft south of

the Pit 11 northwest monument. This barrel was found at a depth of about 10 ft below the top of the barrel stack during the excavations which took place from September 8 through September 14, 1971.

Figure 10 is a diagram of the excavation site. The location specified by the burial ground records was surveyed and marked as indicated in the figure. Soil samples were collected and analyzed to determine the concentration of Pu that could be expected prior to excavation operations. No significant contamination ($>1 \times 10^{-6}$ Ci Pu/g soil) was found.

Table IV is a summary of Pu analyses of the soil samples that were collected prior to the beginning of digging. The excavation began at the northern end of the surveyed area, proceeded south, and was continued by moving first to the east and then to the west until waste containers in the load containing Barrel No. 771-7285 were found.

The barrel was surveyed externally by a GM instrument to determine potential radiation hazards. Initially, the maximum beta-gamma reading obtained with the barrel in an upright position was 80 mR/hr on contact at a point 6 to 9 in. from the bottom of the barrel. The barrel was tipped for bagging in plastic, and a piece of heavy material therein--probably metal--shifted position noticeably. A re-survey showed that the beta-gamma activity was 150 mR/hr maximum on contact at the mid-plane of the barrel. After bagging, the barrel was placed in a marked waste dumpster at the burial ground.

TABLE IV

RESULTS OF SOIL SAMPLE ANALYSES FOR BARREL NO. 771-7285

Sample No.	Date Collected	Location[a]	Activity $\mu\text{Ci Pu/g soil}$
IV-CS-1	9-2-71	Pit 11, 82 ft E, 10 ft S of NW Monument, 8 ft deep	6.76×10^{-7}
IV-CS-2	9-2-71	Pit 11, 82 ft E, 30 ft S of NW Monument, 3-1/2 ft deep	6.83×10^{-7}
IV-CS-3	9-2-71	Pit 11, 82 ft E, 50 ft S of NW Monument, 3 ft deep	$<3 \times 10^{-7}$ [b]
IV-CS-4	9-2-71	Pit 11, 82 ft E, 60 ft S of NW Monument, 2 1/4 ft deep	3.07×10^{-7}
IV-CS-5	9-2-71	Pit 11, 82 ft E, 90 ft S of NW Monument, 3 ft deep	$<3 \times 10^{-7}$

[a] Samples taken above the barrels before excavation started.

[b] Detection limit for ICPP analytical procedure.

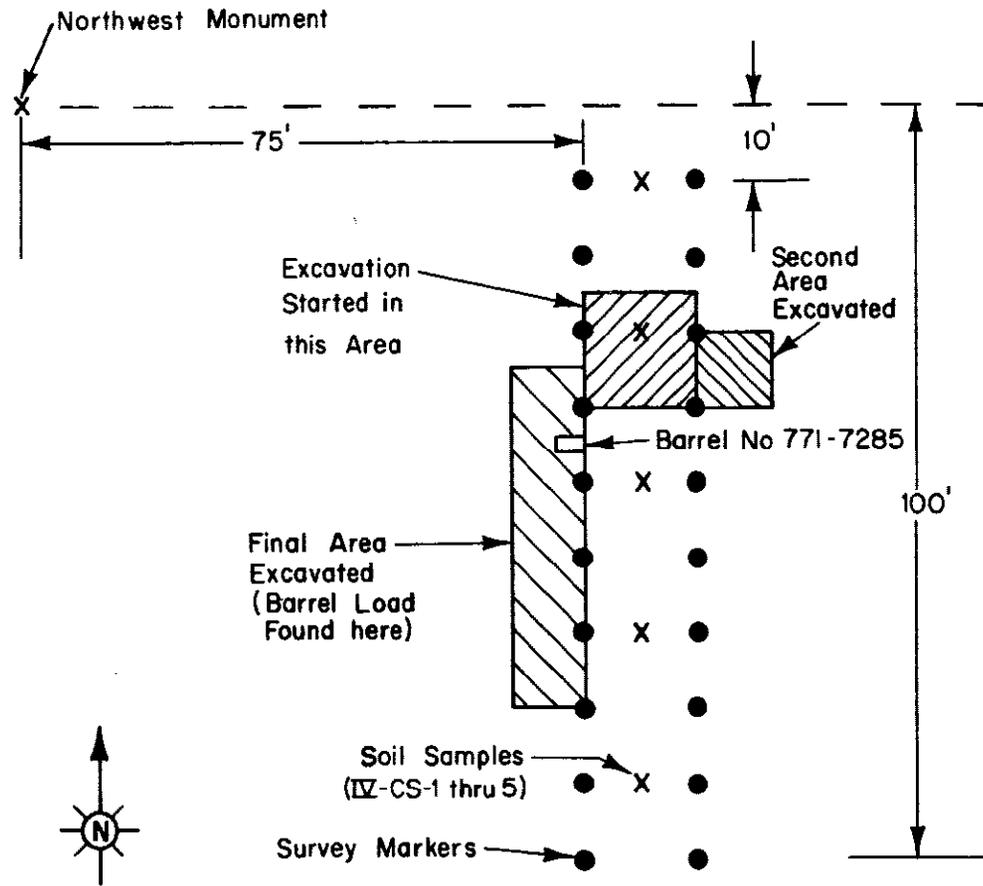


Fig. 10 Pit 11 Excavation for special Barrel No. 771-7285.

Figure 11 shows the excavation site just prior to finding Barrel No. 771-7285. Stacked barrels, such as found in this pit, presented minimal difficulties in retrieval operations. Excavation with a backhoe proved to be the best for the removal of the bulk of the dirt. However, hand-digging in the near vicinity of the barrels reduced the chances of rupturing barrels or hooking ring closures. A crane with a barrel chain-lifting device was used to remove the barrels, once they were uncovered.

Figure 12 shows a barrel which was damaged by the backhoe as the barrels were uncovered. In such situations, double bagging the ruptured container or placing the barrel in a larger 83-gal barrel minimized health physics problems. Some ring closures were also hooked by the backhoe. These incidents tended to slow work.

Identification of barrels was not difficult at this site, as 95% of the tags were intact. Figure 13 shows typical paper labels and metal tags on barrels from the first excavation site single barrels.

Non-DOT-approved barrels were found in this excavation. The non-DOT barrels had been used to repackage at the NRTS smaller, 30-gal barrels from earlier Rocky Flats shipments whose integrity was questionable.

Leaking sludge drums were troublesome at all of the excavation sites. Figure 14 shows white cake material that resulted from such a leaky drum in Pit 11. The material that leaked, generally, was of a low level and presented no problems, except that each leaking drum had to be checked for contamination and bagged, which slowed operations. It is believed that repackaging of leaking sludge drums will always be mandatory prior to movement.

Nearly all the barrels which were removed from this excavation showed some localized corrosion. Figure 15 shows typical examples of ring closures which were corroded. The external corrosion was not sufficient to compromise the integrity of barrels examined in Pit 11.

Table V presents some overall operational information for the work performed in the search for Barrel No. 771-7285.

TABLE V

OPERATIONAL INFORMATION FROM THE SEARCH FOR BARREL NO. 771-7285

Dates of Excavation	9/8/71 to 9/14/71
Total Number of Barrels Moved	185
Number of Hours Spent Excavating	29
Number of Barrels Without Paper Labels or Metal Tags	14
Number of Repackaged 30-gal Drums	15
Number of Barrels Punctured	6
Number of Open Barrels (loose lid)	1
Manhours Direct Labor	92

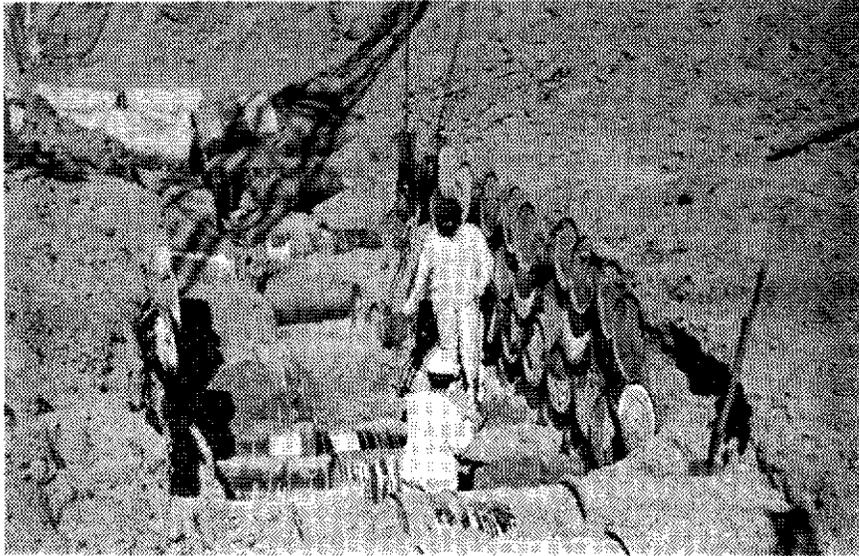


Fig. 11 Excavation site for Barrel No. 771-7285.

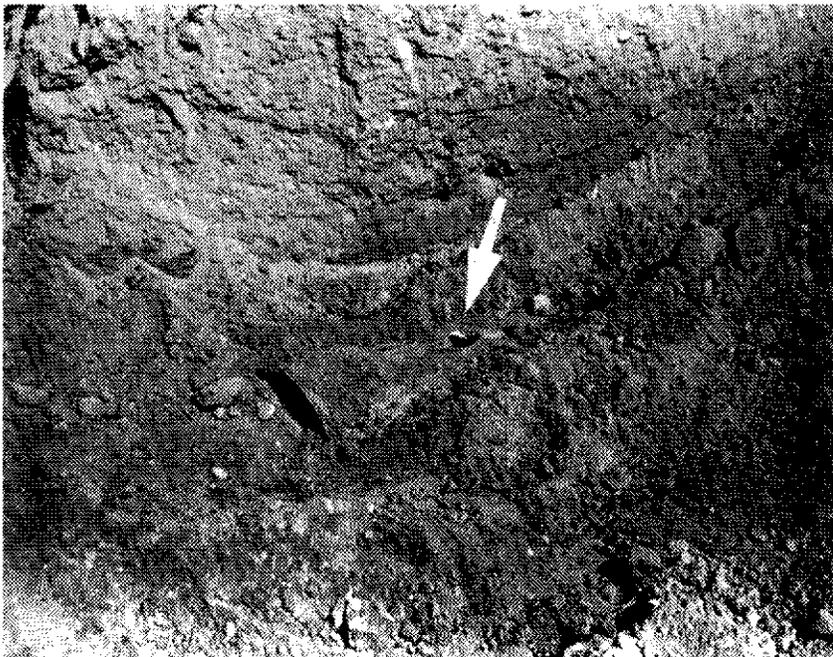


Fig. 12 Barrel damaged by the backhoe.



Fig. 13 General Barrel and Tag Condition (Pit 11).

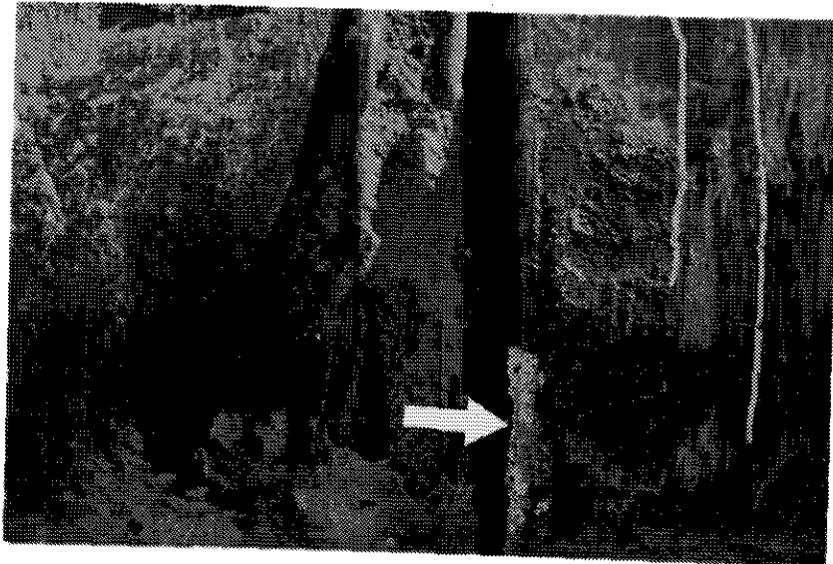
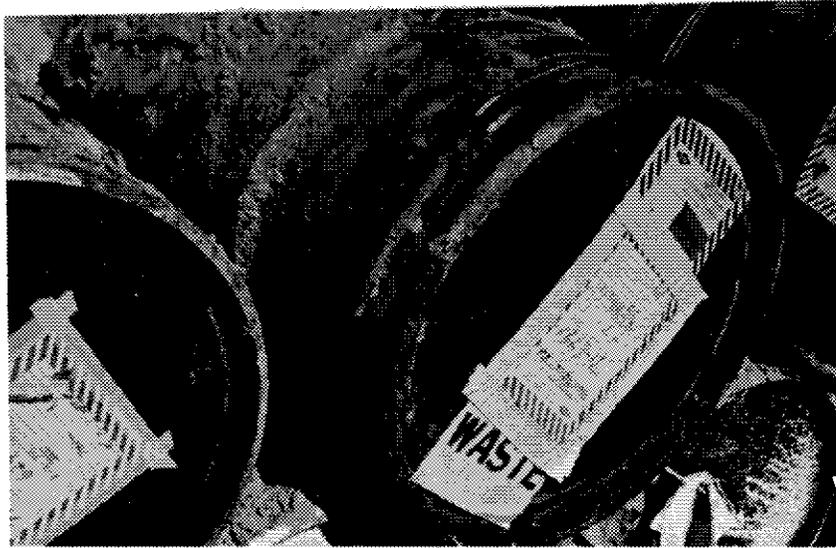


Fig. 14 "Leaky" sludge drum.



71-4671



71-4674

Fig. 15 Typical barrel corrosion.