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File name: Target-ERID # for Domino.txt
Version: 1.0
Document Type: RPF Record
Description: FINAL CONDITION REPORT, BUILDING 2, DPW, TA-21, BACKLOG, DPWEST PLUTONIUM FACILITY

Document Details:

Title: ERID-105809 1) FINAL CONDITION REPORT, BUILDING 2, DPW, TA-21
ERID Number.StartPage: ERID-105809
Office of Record: WES-DO
Date Received: 05/18/2009
Official Use Only: N
Page Count: 12
Record Type: Report
Document Date: 01/01/2000
To:(Addressees - Organization) N/A
From:(Senders - Organization) H-1 HEALTH PHYSICS GROUP
Other Document Number(s): N/A
TA: TA-21
PRS Number(s):

* Denotes Fields that are mandatory.

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FINAL CONDITION REPORT

Building 2, DPW, TA-21

Prepared by: H-1 Health Physics Group

CONTENTS

	Page
INTRODUCTION	1
I. Final Condition Report Information	2- 6
II. Site and Building Drawings and Photographs	7-55
III. Miscellaneous Utility and Acid Well Drawings	56-67

FINAL CONDITION REPORT
BUILDING 2, DPW, TA-21

INTRODUCTION

This report was prepared to provide future occupants and support service personnel information concerning the status of Building 2 following completion of decontamination work that was performed from 1978 to 1981. Beginning in 1978 all CMB-11 plutonium operations at DP West were transferred to a new Plutonium Facility at TA-55. It should be noted that rooms 206 and 224 were sealed off from the rest of Building 2 prior to 1978 and were being occupied by Groups CNC-4 (206) and CMB-8 (224). When crafts were preparing to seal the entrance to the perimeter tunnel in Room 224, plutonium contamination was released into Room 224, and by an exhaust fan, circulated contamination into Room 206. The tunnel entrance was sealed with concrete and the rooms were decontaminated to guideline levels and released back to previous occupants.

The remaining Building 2 areas occupied by CMB-11 were decontaminated to allow reuse for Laboratory experimental activities. The decontamination project involved the removal of all plutonium contaminated process systems and inside utility support services, the decontamination of outside concrete pads, and the removal of a large area of concrete, black top, and soil. The empty rooms were decontaminated to conditions noted in this report. The remaining room walls and ceilings were painted a bright orange and a new sheet linoleum was layed on all room floor surfaces.

General health physics controls are also noted in this report. However, occupants and service personnel must get specific information from the Health Physics personnel stationed at DP West since conditions and requirements will change with time.

I. FINAL CONDITION INFORMATION

General Conditions

Building 2 DPW, TA-21 was used for processing ^{239}Pu and ^{241}Pu wastes from 1946 through 1977. During the years there were failures of the containment systems, which resulted in plutonium contamination of systems and building structures. During the DPW Decontamination Project which was accomplished from 1978-1981, effort was made to reduce the surface contamination to levels below the guidelines established in "Management Plan for TA-21, DP-West, Group CMB-11, Plutonium Facility." The guideline levels are, surface alpha activity 2000 dpm/100 cm^2 , 400 dis/min swipeable, beta-gamma and neutron activity 0.25 mrem/h. At completion of the decontamination phase, the beta-gamma and neutron levels were met, however, there were a few surface areas where the alpha activity exceeded the guidelines. These areas are noted in the following discussion. Details concerning the extent and nature of the DPW Decontamination Project are documented in report LA-9513-MS.

After all plutonium equipment items and utility services were removed from Building 2; the ceilings and walls were monitored to locate the spots of highest activity, these spots were cleaned with a commercially available household cleaner and rag swabs. This included the overhead lights and sprinkler system. The initial work was done by the Laboratory special decontamination crew to reduce the levels to a point where there was less chance of the material being spread to other areas. The later stages of a more thorough cleaning of surfaces having a low level of contamination was done by laborers and janitors under the direct supervision of health physics technicians. The walls and ceiling were also scanned with a phoswich detector to locate any high levels of contamination that had been painted over or cancelled in voids or were hidden by metal strips or pipes. When such spots were located, the paint was removed by a commercially available paint remover. If the spots

were on plaster walls and decontamination was not practical because of porous surface and very high levels of contamination, sections of the walls were removed. By removing sections of walls, the insulation behind the plaster could also be monitored and removed where necessary. The walls were replaced after decontamination was completed. A scabblor unit was used to remove layers of material and reduce the contamination level on contaminated concrete surfaces.

Areas with fixed covered surface contamination or areas which were inaccessible for survey are listed below.

- o The interior surfaces of the room air exhaust ducts are contaminated. The ducts were removed while others were left in place as they were part of the walls. The grills were removed and the internal surface were cleaned as far as could be reached. The inside of the ducts may contain alpha contamination as high as 4×10^3 dpm/100 cm².
- o The utility trenches in the floors were cleaned to no swipe, painted, and filled with concrete. Alpha activity under the concrete measured up to 10^6 dpm/100 cm² after decontamination.
- o The floors were scabbled and capped with an 8-10 cm of concrete. Prior to leveling and laying the linoleum, alpha activity remaining under the concrete cap measured up to 2×10^5 dpm/100 cm².
- o The contamination in the attic were cleaned to guideline levels and the south half was painted.
- o There was a high concentration of radioactive contamination in the tunnel, 0.5 m³ of soil was removed between Rooms 213 and 218 and packaged for disposal. No attempt was made to remove all contamination since this was beyond the scope of the decontamination operation. The remaining contamination is fixed as well

as possible by spraying with a water-based asphalt. The tunnels are sealed off from the rooms and are not available for installation of equipment or utilities. The inside surfaces of the liquid waste lines left in Rooms 204 and 211 were not checked and must be considered contaminated.

The interiors of electrical junction boxes were checked and decontaminated to guideline levels, the insides of connecting conduits was not checked and should be considered contaminated. Any modification work that requires removal or addition of electrical circuits must be done with Health Physics control.

- o A section of the outside wall located at the northeast corner of the building was found contaminated on the metal siding and concrete stub wall. After decontamination, several coats of paint were applied, alpha activity remaining on the concrete surface under the paint ranged up to 80 K dpm/100 cm².
- o The roof is suspected of containing minor amounts of radioactive contamination, which are undetected due to the rough roof surface and recovering over past years.

Survey Results

After decontamination, tests were made for airborne activity in the rooms. The airborne activity was less than 2% of the maximum permissible concentration (MPC) for radiation workers. Surveys were made for beta/gamma and neutron radiation and levels in all areas were less than the guideline criteria.

The following instruments were used for final surveys.

Alpha - All accessible surfaces of the above subject building has been monitored by Group H-1 Health Physics Technicians. The alpha

surveys were made by the direct survey method, using the portable Eberline model PAC-7 and the Ludlum model 139, and Ludlum floor monitoring instruments. Surfaces inaccessible for direct surveying were swiped with cloth or paper swipes and the activity on the swipe was measured directly with a portable alpha survey instrument. The areas directly surveyed included the floor, walls, ceiling, and remaining equipment surfaces. Any positive counts that were found by the direct survey method were swiped for loose contamination. The approximate level that can be detected by direct measurement was 1000 dpm/100 cm². Check sources were used frequently to insure instruments were functioning properly throughout surveys.

Beta-Gamma - The beta gamma radiation surveys were made using portable Ludlum model 14 and Eberline model 112-B instruments. These measurements were made at a height of approximately one meter above the floor, and walls were scanned to detect any radioactive material in the walls or leaking through from adjoining areas. Additional search and find surveys were made to locate any obscure localized spots.

The portable beta-gamma survey instruments were frequently field checked with sources to insure proper operation. The readings were taken with the shield on the probe in the open position to admit any low energy radiation. The approximate minimum level that can be detected by direct measurement with this type of instrumentation is 0.05 mR/h.

Neutron - A neutron survey using an Eberline Model PNR-4 instrument was made in all areas of the subject building. The instrument was source-checked, using a Radium Beryllium (Ra-Be) source assigned to Group H-1, to insure proper functioning during the survey. No neutrons were detected during the survey above the normal background of the instrument which is approximately 0.5 mrem/h.

TLD Survey - The final survey for beta-gamma gave no readings in excess of 0.25 mR/h. Fifty-five TLDs were placed at random spots in the rooms at a height of one meter from the floor and left for one month. Fifty-one of the TLDs read 0.00 dose, 4 TLDs read 10 mR, which is far below the 0.25 mR/h guidelines. The uncertainty associated with the TLD results is 2.0 mR.

Controls and Surveillance

Since some of the operations at DP-West, TA-21 still include work with fissionable materials, there is a remote possibility of a criticality incident. H-1 installed a criticality dosimeter in the building. The criticality alarm system must be kept operational, and the occupants must be informed of emergency procedures for the site.

All maintenance and modification work in the building and outside perimeter must be cleared with the Health Physics Group H-1 before work is started. Radiation Work Permits may be required.

The Health Physics Group H-1 will maintain a radiation monitoring program at the facility and assist occupants in the safe conduct of modifications, maintenance, and operations. If occupants do not work with radioactive materials, health physics controls such as Anti-c clothing, personnel dosimeters, and biological specimens will not be required.



Fig. 50. Metal cover, south end perimeter tunnel.
NEG #813726

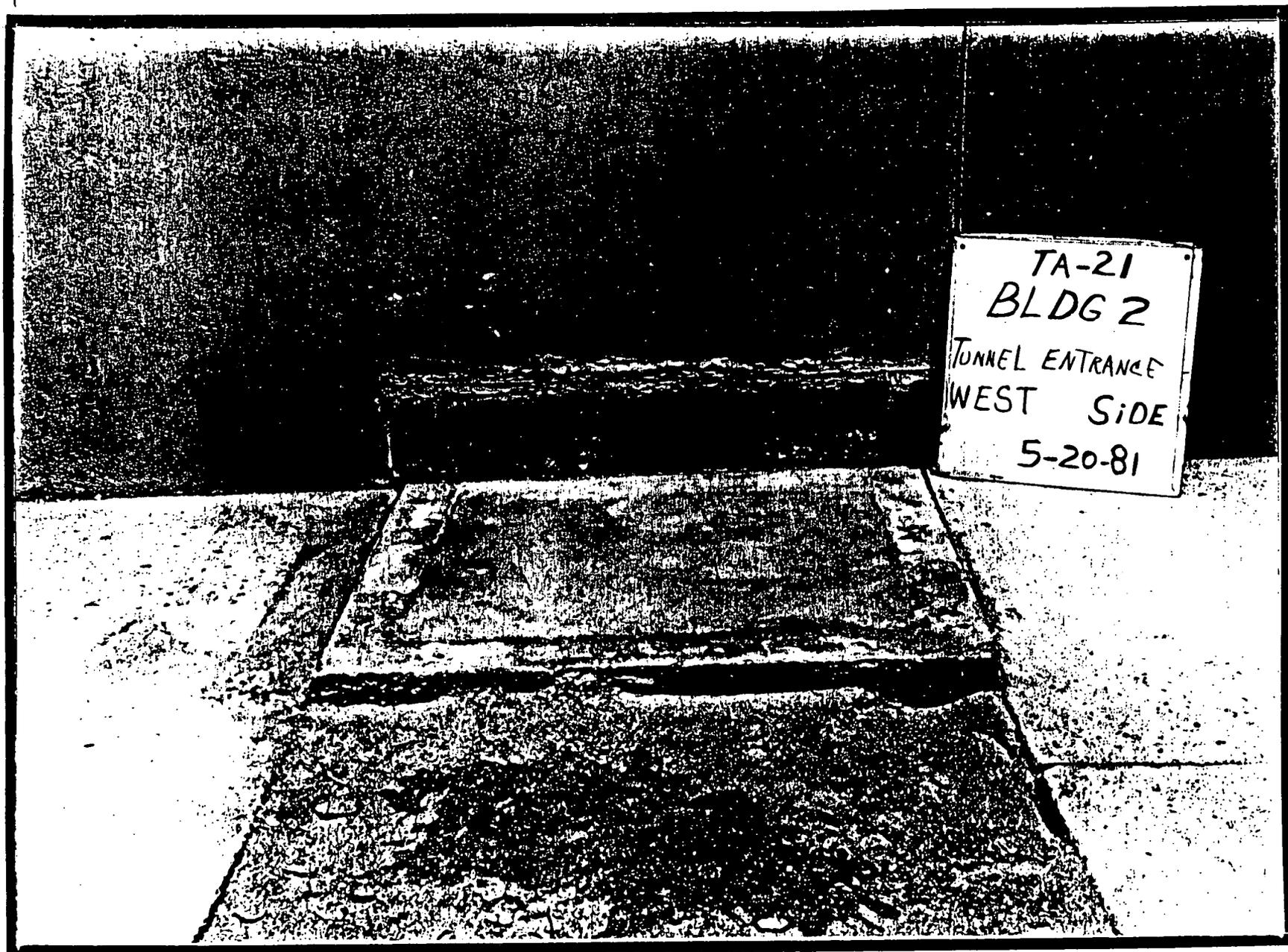


Fig. 51. Cement cover, perimeter tunnel west side of building. NEG #813727

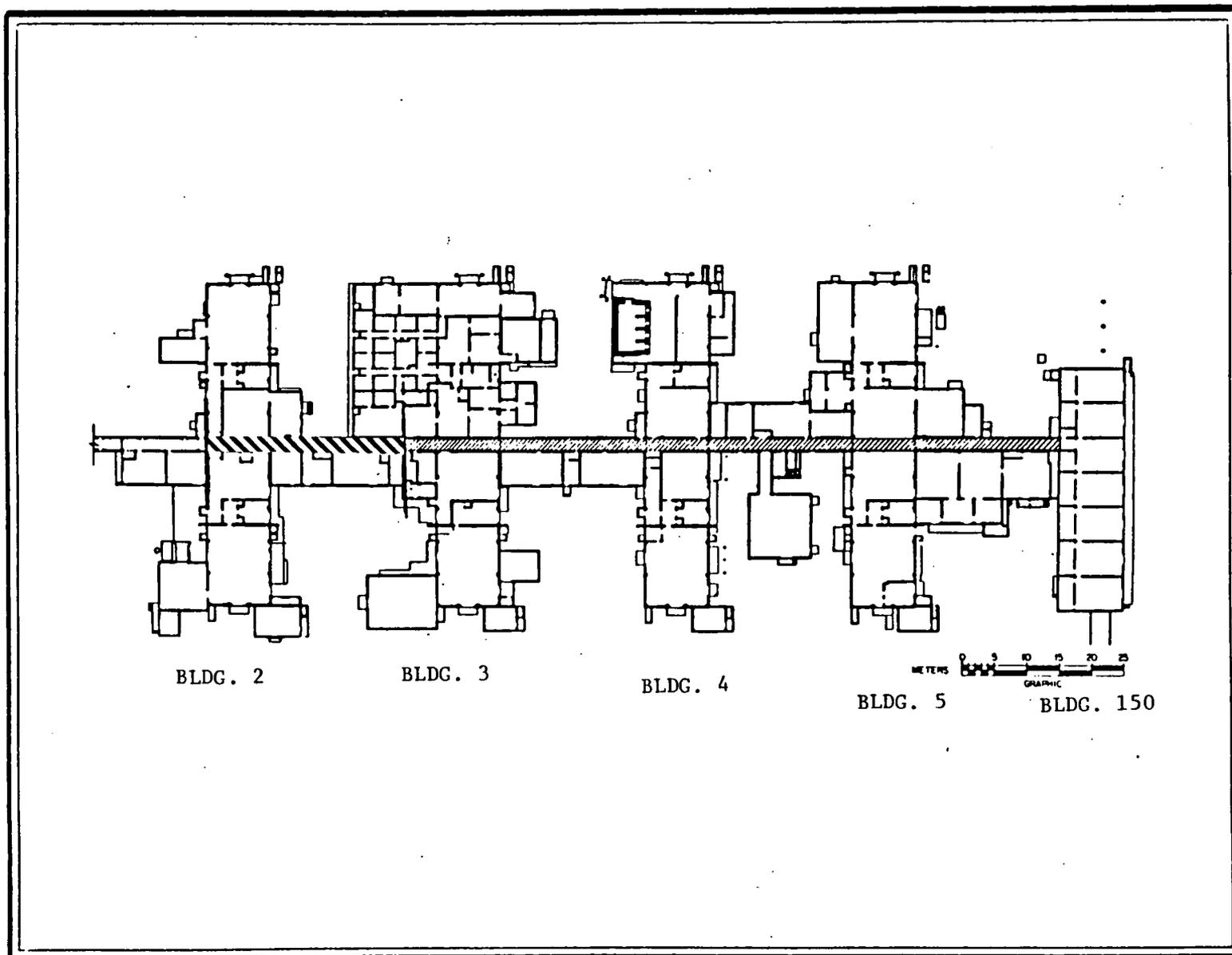


Fig. 53. Overhead utility passageway decontaminated as part of Building 2.