



THE DOW CHEMICAL COMPANY

ROCKY FLATS DIVISION
P O BOX 888
GOLDEN COLORADO 80401

July 25, 1968

Copy to
Mathews 12/17/68
also to L W Meyers 1/20/69
(AIC-RF)

J Seastone

PLUTONIUM SURFACE CONTAMINATION, 903 AREA

Health Physics has completed a survey of the plutonium contamination present on the surface of the 903 area. The following describes the techniques used, conditions in the area during the survey, survey results, and the Health Physics recommendation for corrective action.

A grid system was established which extended approximately 25 feet outside of the fenced area in all directions. Wooden stakes were placed at intervals of 25 feet along each grid line and the maximum level of contamination within 1 foot of each stake was determined. Significant levels of contamination were noted on the east and south boundaries of the grid system so the system was extended an additional 125 feet in these directions to more accurately determine the size and shape of the significantly contaminated area.

Vegetation is very sparse inside of the fenced area and the levels of contamination were determined for the most part on bare soil. Vegetation outside of the fenced area is relatively heavy and although attempts were made to reach the soil the levels of contamination are in many cases influenced downward due to a greater distance and vegetation between the probe and the soil. All of the surveys were taken during periods when the temperature ranged from 75 to 95 degrees Fahrenheit. There had been no significant rain fall during the previous week to ten days.

The results of the survey are displayed on the attached diagram. Information used in converting the survey results to micrograms per square meter was obtained from the "Emergency Radiation Monitoring Team Training Manual" prepared by Reynolds Electrical and Engineering Company, Incorporated (REECO), Mercury, Nevada, for use in Operation "Hot Spot". The conversion factors are for "fresh fallout".

The contamination in the 903 area is not "fresh fallout". Within the fenced area and 1 spot estimated at from 100 to 300 micrograms per square meter south of the fenced area, the contamination is due to leaking drums. The contamination was carried into the soil by a liquid. The soil conditions in this area do not permit accurate penetration determinations, but a spot survey in the southwest section indicated 60 micrograms per square meter at a depth of 8 inches with no indication of having reached the limit of penetration.

ADMIN RECORD

REVIEWED FOR CLASSIFICATION

By R B Hoffman

Date 7/11/90

REVIEWED FOR CLASSIFICATION/UCM

By George H. Setbol

Date 7/3/90

73011

A-DUO-000001

The effects of wind, rain, snow, and work in the fenced area, including purposely covering high level contamination with clean soil and gravel, have not been determined, but it is known that these factors result in the survey indicating less plutonium than the actual amount present. Inside of the fenced area the actual amount of plutonium present may be as much as 1,000 times more than is indicated by the survey results.

The contamination in the remaining area outside of the fence is due to wind and ground water runoff from the fenced area. No attempts have been made to determine the depth of penetration in this area, but it is reasonable to assume that the penetration is not more than 1 or 2 inches deep and that the actual amount of plutonium present is not more than 100 times greater than the amount indicated by the survey results.

X The survey results must, therefore, be considered as relative rather than absolute numbers. To establish absolute values would require an extensive soil sampling program. This was considered too time consuming, too expensive and not necessary in order to consider the solutions to the problem.

In considering the solutions to the problem, one can refer to the REECO training manual and the "ALO Radiological Assistance Plan". To quote from the REECO training manual:

"The most desirable objective for decontamination would be to remove all traces of contamination, at least to 1 or 2 micrograms per square meter. However, in many, perhaps most, cases this will not be possible. Therefore, suggested maximum levels for determining decontamination and relative hazards in Pu²³⁹ areas are as follows:

<u>MEASUREMENT</u>	<u>HAZARD POTENTIAL</u>
Greater than 3500 micrograms per square meter	Extremely hazardous
Greater than 1000 micrograms per square meter	Some hazard - decontaminate
Less than 1000 micrograms per square meter	Little hazard - decontaminate if in public interest "

To quote from the "ALO Radiological Assistance Plan"

"If initial plutonium contamination is greater than 1000 micrograms per square meter decontamination should be

effected (If initial contamination is less than 1000 micrograms per square meter, the area should be decontaminated only to a value consistent with reasonable effort and cost)"

It is obvious that actions must be taken to correct the conditions in this area and that weather will continue to spread the contamination and distort the survey results Health Physics recommends that the following actions be taken, in the order listed, as soon as possible Respiratory protection, plant clothing, and monitoring will be provided as required

- 1 There are two forklift trucks in the fenced area
Crate and dispose of these forklifts as contaminated waste
- 2 Move the toxic gas storage building to a new location
- 3 Remove the fence from the south and east sides of the area
Dispose of the fence as contaminated waste
- 4 Remove the soil and rock from the spot of from 100 to 300 micrograms per square meter south of the fenced area by hand Place the soil and rock inside of the fenced area Dampen or oil the area to avoid creating dust during the removal
- 5 Bulldoze the soil and rock to a depth of from 4 to 6 inches from the contaminated areas outside of the fence to the east and south into the fenced area Dampen or oil the area to avoid creating dust during the operation

This soil and rock is to be used to start to bring the level of the fenced area up to the highest point in the fenced area The area within the fence is not to be bulldozed

This should be done with the bulldozer which Plant Services (Jack Seastone) has obtained from surplus It may become necessary to dispose of this bulldozer as contaminated waste

- 6 Remove the tanks west of Building 903 Dispose of the tanks as contaminated waste
- 7 Remove the fence in the northwest section and from the north and west sides of the area Dispose of the fences as contaminated waste

- 8 Remove the gas tank west of Building 904 and return it to the vendor
- 9 Move Buildings 903 and 904 to their new locations
- 10 Bring in additional soil and gravel to cover and complete the raising of the fenced area up to and cover the highest point in the fenced area. This cover is to extend 25 feet beyond the fenced area in all directions and is to be of a thickness and texture to serve as a base for a concrete pad

This cover can be applied by a contractor starting along the north side and grading to the south with the grader remaining on the new cover

- 11 The contractor is to pour a concrete pad over the area. The pad is to be poured in a manner which will assure that ground water will not run under it and that water from rain or snow will not penetrate it

This will insure containment of the contamination and prevent the contamination from possibly reaching the underground water

~~It is further recommended that this area be used for the storage and loading of contaminated waste. It should be fairly simple to move Building 663 to the pad, install a platform scale, and provide truck docks along the south side of the pad so that the drums and most of the crates can be loaded with a forklift. This will significantly reduce the use of the crane for loading crates and free the 600 area of the plant for other uses.~~

Health Physics is available for further discussion of this problem as required

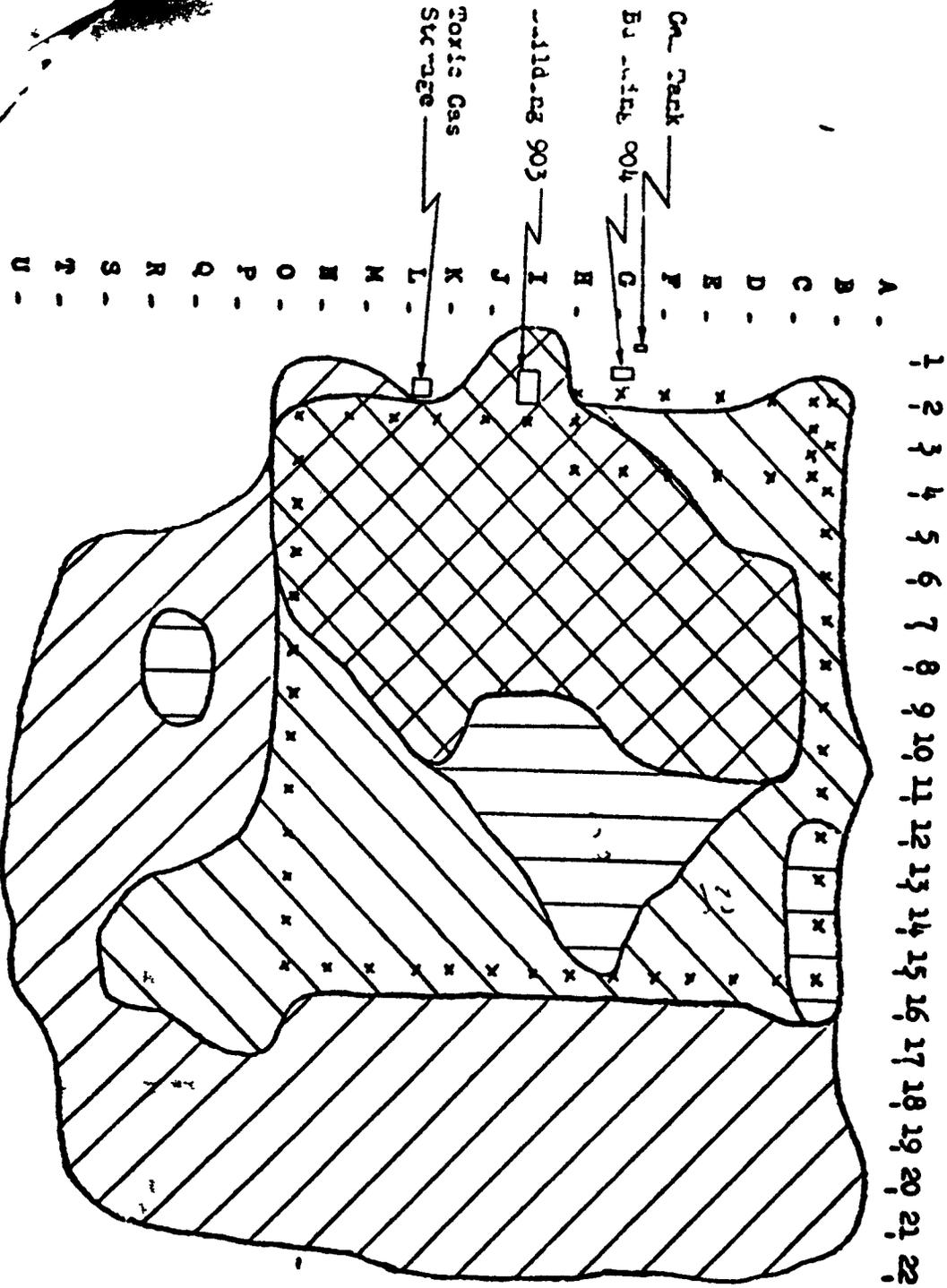
J B Owen
J B Owen
Health Physics

JBO slg
Enc

cc
D M Bassler
J G Epp
C M Love
C W Piltingsrud
E A Putzier
E J Walko

073014

PLUTONIUM SURFACE CONTAMINATION 903 AREA



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22

A -
B -
C -
D -
E -
F -
G -
H -
I -
J -
K -
L -
M -
N -
O -
P -
Q -
R -
S -
T -
U -

- KEY
- ▨ = Less than 6 ug/M²
 - ▧ = 6 to 24 ug/M²
 - ▩ = 25 to 100 ug/M²
 - = 100 to 300 ug/M²
 - = 300 to greater than 6,000 ug/M²

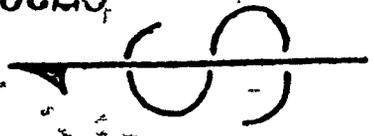
The above figures are relative rather than absolute. No correction has been made for penetration into the soil or the presence of vegetation.

Scale 1/4" = 25'

073015

100,000 →
50-100,000
20-50,000
5-20,000
1-5,000
250% TO 1K

073016



11-19-6
SURVEY B

APDEN JO

