

Date: February 7, 2020

**Alliance Imaging
Mobile Van #54**

Annual Exposure Assessment For Exposures Received to "Members of the General Public"

The annual exposure evaluation was completed through a series of ambient exposure surveys, inverse square calculations and estimated occupancy times. Following this examination, it was concluded the annual exposure limit of 100 mrem had not been exceeded by this licensee. Please refer to the following for details:

Patient Injected Activity @ Time of Survey = 13.0 mCi F-18

Ambient Exposure Surveys completed with Victoreen, Model 451B Ion Chamber

Orange cones are placed at 2 meters around the mobile van to establish a security border.

Members of the General Public are required to maintain a minimum distance of 2 meters from the mobile van.

<u>Survey Location(s)</u>	
<u>Location</u>	<u>Ambient Exposure Reading</u>
1. 6 inches from PET Patient (PET Resting Chair)	20.20 mR/hr
2. 1 meter from PET Patient (PET Resting Chair)	4.82 mR/hr
3. 1 meter from PET Patient (PET Resting Chair)	4.82 mR/hr
4. 1 meter from PET Patient (PET Resting Chair)	4.80 mR/hr
5. 1.5 meters from PET Patient (Imaging Table)	2.27 mR/hr
6. 1.5 meters from PET Patient (Imaging Table)	2.25 mR/hr
7. 1.5 meters from PET Patient (Imaging Table)	2.30 mR/hr
8. 1.0 meter from Outside Wall of PET Van, South Side (PET Resting Chair)	0.51 mR/hr
9. 2.0 meters from Outside Wall of PET Van, South Side (PET Resting Chair)	0.25 mR/hr
10. 1.0 meter from Outside Wall of PET Van, East Side (PET Resting Chair)	0.44 mR/hr
11. 2.0 meters from Outside Wall of PET Van, East Side (PET Resting Chair)	0.14 mR/hr
12. 1.0 meter from Outside Wall of PET Van, North Side (PET Resting Chair)	0.20 mR/hr
13. 2.0 meters from Outside Wall of PET Van, North Side (PET Resting Chair)	0.11 mR/hr
14. 1.0 meter from Outside Wall of PET Van, North Side (Imaging Room)	0.22 mR/hr
15. 2.0 meters from Outside Wall of PET Van, North Side (Imaging Room)	0.09 mR/hr
16. 1.0 meter from Outside Wall of PET Van, West Side (Imaging Room)	0.14 mR/hr
17. 2.0 meters from Outside Wall of PET Van, West Side (Imaging Room)	0.03 mR/hr
18. 1.0 meter from Outside Wall of PET Van, South Side (Imaging Room)	0.18 mR/hr
19. 2.0 meters from Outside Wall of PET Van, South Side (Imaging Room)	0.06 mR/hr

Assumptions:

1. Member of the General Public - Standing Outside the Mobile Van @ approximately 2 meters from the van and a Maximum Occupancy of 3.00 hours/year).
2. Distance From Radioactive Patient to Members of the General Public (2.00 meters(6.00 ft). Ambient exposure dose rate from exposure emitted from the radioactive patient @ an average of 6.00 ft = 0.25 mR/hr. Patient exposure @ 6 inches = 20.20 mR/hr - PET Patient lying in recliner in the PET quiet area of the mobile van.
3. Van Operating with PET patients and radioactive materials approximately 260 days/year. Hours of Operation: 8 hours/day.
4. Ambient exposure dose rates measured utilizing a Victoreen 451B Ion Chamber.

Calculations:

Maximum External Exposure received by a Member of the General Public, standing two 2 meters 6.0 ft (Area of Maximum Exposure) from outside of the exterior wall of the mobile van for 3 hours/year.

$$(0.250\text{mR/hr})(3.0\text{ hrs/year})= 0.75\text{ mrem/year (PET Patient Exposure)}$$

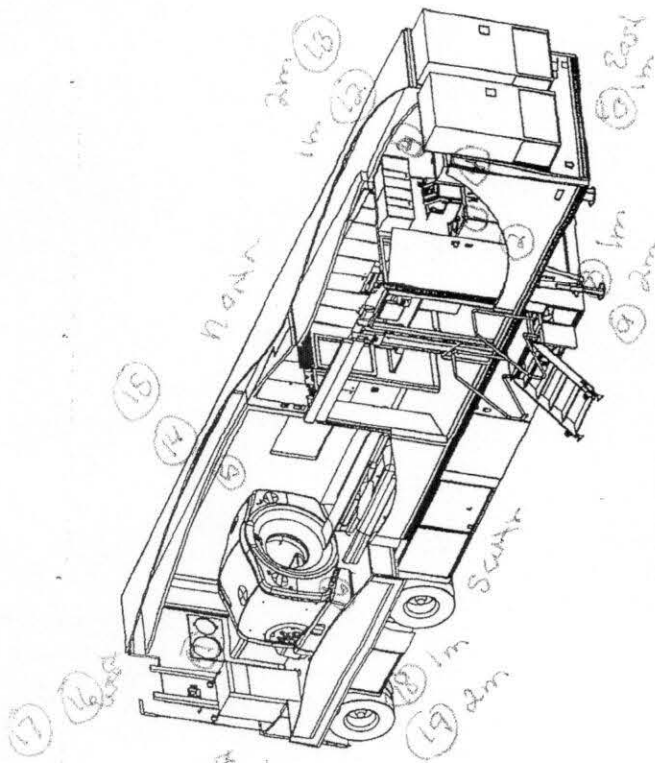
Exposure Received by a "Member of General Public" sitting 1.0 meter (3 ft) from the PET Patient resting in the PET Quiet Room, for a maximum period of 3.0 hours.

$$(4.80\text{ mR/hr})(3\text{ hrs/year}) = 14.40\text{ mrem/year}$$

Based on this analysis, a "Member of the General Public" would not exceed 100 mrem/year.

Yearly analysis completed by Michael W. Lairmoe, M.S.

Hand-drawn floor plan of a vehicle interior, oriented vertically. The plan includes several numbered callouts (1-17) and labels for specific components. Key labels include "ESCAPE WATCH", "E-STOP", "CONSOLE", "CPU", and "STOP BEHIND MONITOR". Dimensions are noted throughout the drawing, such as "2m", "1.9m", "1.347m", and "48-0". The word "South" is written vertically along the right edge of the plan. The drawing shows a detailed layout of the vehicle's interior, including seating areas, control panels, and structural elements.



ENTIRE SCAN ROOM AREA LEAD LINED FULL HEIGHT, TYP.
INCLUDES EXPANDABLE WALLS & EXPANDABLE FLOOR.

(15) 2m north

(19) 2m

UP'S
DISCOVERY ST
PEV/C

PDU

EXPANDABLE WALL

MAIN POWER PANEL BOX

STORAGE CABINET

LEAD WINDOW
1/16 LEAD EQUIVALENT

OVERHEAD STORAGE CABINETS
(OPTIONAL)

AIR CONDITIONING
FURNISHING UNIT

OPERATOR CONSOLE

CONTROL ROOM

PATIENT UPSTATE AREA

SLIDING ACCESS DOOR

PATIENT LIFT
WICKANOPY COVER
FOR TRANSIT

DOOR LINED WITH 3/32" LEAD

DOOR LINED WITH 1/16" LEAD

11'-1 5/8"

5'-1 5/8"

2'-6 1/4"

6'-0"

2'-3 13/16"

2'-3 13/16"

48'-0"

SOUTH

DATE	DESCRIPTION	AMOUNT	CHECK NO.
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Medical Coaches, Inc.
 Certified ISO 9001
 PO Box 1000, Oneida, New York 13621 USA
 Phone: 315-361-1000 Fax: 315-361-4310
 www.medicalcoaches.com