

AREA SURVEYS USING A LUDLUM SURVEY METER WITH A MODEL 44-3 LOW ENERGY GAMMA PROBE

Note: Applicable only to labs using ¹²⁵I

1 a. Turn on the survey meter and perform a battery check. b. If the probe has a plastic cap/cover, REMOVE it. Flip the F/S response switch to 'S' (Slow response), and hold the probe against the check-source epoxied to the side of the meter. Ensure that you can reproduce its expected reading (noted on the yellow calibration sticker), at the appropriate multiplier position. Do NOT use the survey meter if you cannot reproduce the check source reading within 10%, or if the meter is past its calibration date (also written on the calibration sticker).

AREA SURVEYS:

2. In a low-background area (away from any possible sources of radioactivity), turn the thumb switch to multiplier x0.1. Observe the reading over a 30 second interval. This is the BACKGROUND radiation reading, typically around 230 CPM (counts per minute).

3. Flip the response switch to 'F' (Fast response). Hold the probe about 1 inch from the surface you are surveying, and systematically move it to cover the entire surface. Move the probe slowly (about 1 inch per second), and avoid touching the probe on any contaminated surface. If the needle 'pegs' to the far right side at any given multiplier (eg., x0.1), proceed to the next higher scale (e.g., x1). Depress the 'reset' button to rapidly drive the meter to zero at any time. Turn on the audio to assist in detecting a radiation field. Once you have located a possible 'hot spot', flip the response switch to 'S' to get an accurate reading (read over a 30 second period). This is the GROSS reading.

5. Subtract the Background reading from the gross reading to get the NET reading in mR/h. If your survey meter reads only in CPM, use Table-1 below to convert CPM to mR/h, or vice-versa.

6. Irrespective of what radioisotopes were used, surveys results are reported in mR/h because you are measuring exposure rate (amount of ionization in a unit volume air, per unit time). Survey results exceeding twice the background reading should be considered as evidence of possible contamination, and require decontamination.

mR/h x0.1 scale	CPM*	mR/h x1 scale	CPM	mR/h x10 scale	CPM
0.01	30	0.1	300	1	3000
0.02	70	0.2	700	2	7000
0.03	100	0.3	1000	3	10000
0.04	130	0.4	1300	4	13000
0.05	170	0.5	1700	5	17000
0.06	200	0.6	2000	6	20000
0.07	230	0.7	2300	7	23000
0.08	260	0.8	2600	8	26000
0.09	300	0.9	3000	9	30000
0.10	330	1.0	3300	10	33000
0.11	360	1.1	3600	11	36000
0.12	400	1.2	4000	12	40000
0.13	430	1.3	4300	13	43000
0.14	460	1.4	4600	14	46000
0.15	500	1.5	5000	15	50000
0.16	530	1.6	5300	16	53000
0.17	560	1.7	5600	17	56000
0.18	590	1.8	5900	18	59000
0.19	630	1.9	6300	19	63000
0.20	660	2.0	6600	20	66000

EXAMPLE- ¹²⁵I work-area wiped over 100 cm².
 Bkg = 170 CPM; Gross = 330 CPM
 Net = 330 - 170 = 160 CPM
 Conversion: 160 / 0.3 = 533 DPM/100 cm²

Table-1. Conversion between mR/h and CPM for Ludlum survey meters

* Rounded off