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Formerly Utilized Sites Remedial Action Program (FUSRAP)

ADMINISTRATIVE RECORD

for Maywood, New Jersey



U.S. Department of Energy



Department of Energy

Oak Ridge Operations

P.O. Box 2001

Oak Ridge, Tennessee 37831-8723

08428005

January 6, 1992

Ms. Joyce Kenefick, President
Maywood Board of Health
693 Briarcliff Avenue
Maywood, NJ 07607

Dear Ms. Kenefick:

RESULTS OF GAMMA EXPOSURE RATE SURVEYS OF FIVE STREETS IN MAYWOOD, NJ

The purpose of this letter is to transmit to you the results of gamma exposure surveys that were conducted on five streets in Maywood on November 22, 1991. As you may recall from our meeting on November 25, these surveys were conducted by the Department of Energy (DOE) as a result of a request made by U.S. Representative Robert Torricelli on behalf of some Maywood residents.

The purpose of the surveys was to determine whether or not the Maywood Interim Storage Site (MISS) is contributing significantly to background radiation in the area. Data collected during the surveys indicated gamma exposure rate measurements ranging from 7.0 to 15.9 microroentgens per hour (uR/h) (a microroentgen is a unit of radiological exposure); these values are not considered to differ significantly from the range of observable background values for Maywood, where the average background value has been recorded as 9 uR/h.

To meet the objectives of the survey, a comparison of the measured exposure rates to the distance from MISS was made. If MISS were considered to be a point source of radiation then one would expect the radiological exposure rates to decrease with distance. Upon examination of the data one can see that most of the readings range from roughly 7.5 uR/h to 9.5 uR/h on all of the streets, regardless of their proximity to MISS. The few values recorded on West Magnolia Avenue that fall outside of this range are attributed to some offsite background source. It should be noted however that the values recorded on West Magnolia Avenue are still considered to be below an exposure rate of concern (see the enclosed section on data interpretation). Based on these results DOE has determined that the gamma exposure rates along the streets that were surveyed are indistinguishable from background. Therefore, DOE sees no indication that MISS is causing elevated gamma exposure rate measurements away from the site.

As you know, additional radiological survey work is being planned for individual properties and will be conducted by DOE once a number of access agreements are received from the appropriate property owners. The results of these surveys will be sent directly to the property owner.

Ms. Joyce Kenefick

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If you have any questions pertaining to DOE's activities in Maywood, including the results of the most recent survey work please call me at (615) 576-5724.

Sincerely,


Susan M. Cange, Site Manager
Former Sites Restoration Division

Enclosure

cc: Honorable John Steuert, Mayor
Borough of Maywood
Jeff Gratz, U.S. EPA, Region II
Edgar Kaup, NJDEPE

METHODOLOGY:

Five streets were designated for inclusion in this survey. These streets, northeast of the Maywood Interim Storage Site (MISS), run parallel with the eastern boundary of the MISS. The streets surveyed, beginning with the street closest to the MISS, were: West Central Avenue, Lenox Avenue, West Magnolia Avenue, Thoma Avenue, and Taplin Avenue. West Central Avenue was surveyed from Ramapo Avenue as far as 207 West Central Avenue. The remaining four streets were surveyed from their origin at Maywood Avenue to their end point.

The area surveyed on all five streets was of sufficient size to provide exposure rate data from properties that are immediately adjacent to or in near proximity to the MISS pile as well as those properties "in line" with the pile from West Central Avenue to Taplin Avenue (which is the first street past the Maywood Town Hall/Public Library). The area surveyed did not include additional side streets between each of the streets designated for this survey.

Gamma exposure rate measurements were obtained using a pressurized ionization chamber (PIC) at 50 ft intervals along both sides of each street surveyed. This resulted in a measurement being taken in front of approximately every other residence along both sides of the street in a zigzag pattern so that no two measurements were obtained from opposing locations. The PIC instrument has a response to gamma radiation that is proportional to exposure in roentgens.

Data obtained from these measurements is provided in the attached tables.

DATA INTERPRETATION:

The average background gamma exposure rate measurement for this area is $9 \mu\text{R/h}$ (Levin 1968). It is important to note that this is an average background rate, and that actual background can vary within a range that may be higher or lower than the average for that location. The DOE limit for gamma radiation to members of the general public is 100 millirem per year (mrem/yr) above background, where 1000 microrem (μR) is equivalent to 1 mrem of total exposure. The DOE limit of 100 mrem/yr is equivalent to being subjected to an additional exposure rate of $11 \mu\text{R/h}$ above background, 24 hours per day for 365 days. As such, any measurement above $20 \mu\text{R/h}$ ($11 \mu\text{R/h}$ plus $9 \mu\text{R/h}$ background) may result in an annual exposure rate above DOE's limit.

Measurements obtained during these surveys ranged from 7.0 to $15.9 \mu\text{R/h}$ with the highest measurements being recorded at the intersections of West Magnolia Avenue/Ramapo Avenue and West Magnolia Avenue/Eccleston. Subtracting average background for the area ($9 \mu\text{R/h}$) from the highest measurement obtained ($15.9 \mu\text{R/h}$), the gamma exposure rate at this location would be

6.9 $\mu\text{R}/\text{h}$ which is less than 65 percent of the maximum sustained exposure rate of 11 $\mu\text{R}/\text{h}$ above background necessary to exceed the DOE limit of 100 mrem/yr.

If the MISS were contributing significantly to gamma radiation exposure rates, measurements obtained along West Central Avenue, which is the street closest to the MISS, would be expected to exceed the average background rate (9 $\mu\text{R}/\text{h}$) and sustained exposure rate (11 $\mu\text{R}/\text{h}$ above background) significantly. It should be noted that the majority of the measurements did not exceed 10 $\mu\text{R}/\text{h}$ (including average background of 9 $\mu\text{R}/\text{h}$) and that the highest measurements were at distance from the MISS suggesting a source of background radiation other than the MISS.

None of the measurements obtained in this survey were significantly above background and all were less than 20 $\mu\text{R}/\text{h}$ which would be approximately equal to DOE's limit of 100 mrem/yr for the general public. Review of this data indicates that there is no significant contribution to background gamma radiation exposure from the MISS.

GAMMA EXPOSURE RATE MEASUREMENTS

THOMA AVENUE

NOVEMBER 22, 1991

<u>Location or House Number</u>	<u>Measurement (μR/h)</u>
9	7.0
First Presbyterian Church	8.0
17	7.4
22	7.6
25	7.6
Middle of street (intersection of Thoma Avenue and Oak Street)	7.0
39	8.3
385 Oak Street (Thoma Avenue side of backyard)	8.2
45	8.4
49	7.5
50	8.3
56	9.1
Middle of street (intersection of Thoma Avenue and Poplar Street)	7.8
65	7.8
68	7.6
79	8.1
80	8.0
87	8.1
90	7.7
92	7.5
95	8.1
96	8.7
103	7.6
108	8.8
115	8.9
118	8.5
123	8.6

GAMMA EXPOSURE RATE MEASUREMENTS

TAPLIN AVENUE

NOVEMBER 22, 1991

<u>Location or House Number</u>	<u>Measurement (μR/h)</u>
491 Maywood Avenue/Corner of Taplin Avenue	9.1
Lutheran Church	9.0
491 Maywood Avenue(Taplin Avenue side of driveway)	7.5
24	7.9
Corner of Taplin Avenue and Oak Street)	7.8
34	7.6
453 Oak Street (Taplin Avenue side of backyard)	8.4
40	8.3
456 Poplar Avenue (Taplin Avenue side of backyard)	7.2
54	7.9

GAMMA EXPOSURE RATE MEASUREMENTS

WEST CENTRAL AVENUE

NOVEMBER 22, 1991

<u>Location or House Number</u>	<u>Measurement (μR/h)</u>
204	9.2
207	8.2
Corner of bridge over Westerly Brook - MISS side	8.4
187	8.5
PSE&G Substation Driveway (across from 183 West Central Avenue)	8.3
179	8.7
PSE&G Substation Driveway (across from 175 West Central Avenue)	8.5
167	7.9
PSE&G Substation (across from 161 West Central Avenue)	9.4
271 Eccleston/Corner of W. Central Avenue	9.1
146	8.9
270 Eccleston/Corner of W. Central Avenue	8.9
136	8.8
131	9.0
126 or 128 (no house number shown)	8.9
121	9.1
116	9.4
111	9.6
106	9.3
Corner of Ramapo Avenue and West Central Avenue	9.5

GAMMA EXPOSURE RATE MEASUREMENTS

LENOX AVENUE

NOVEMBER 22, 1991

<u>Location or House Number</u>	<u>Measurement (μR/h)</u>
381 Maywood Avenue/Corner of Lenox Avenue	8.1
391 Maywood Avenue/Corner of Lenox Avenue	8.1
19	8.2
20	8.5
24	8.3
Middle of street (intersection of Lenox Avenue and Oak Street)	7.3
36	8.2
373 Oak Street (Lenox Avenue side of backyard)	8.4
48	8.9
55	7.8
63	8.9
66	8.5
70	8.5
75	7.9
80 and 82	8.2
81	7.4
90	9.2
95	7.9
96	7.9
103	8.0
107 (Corner of Lenox Avenue and Wilhelm)	8.3
110	8.1
118	7.9
127	8.2
132	8.4
135	7.8
140	7.4
143	7.5
148	7.5
155	8.2
158	7.1

GAMMA EXPOSURE RATE MEASUREMENTS

WEST MAGNOLIA AVENUE

NOVEMBER 22, 1991

<u>Location or House Number</u>	<u>Measurement (μR/h)</u>
4	9.8
341 Maywood Avenue/Magnolia Avenue side	10.1
18	9.2
19	8.6
28	9.5
33	9.5
37	9.8
38	9.7
48 and 50	9.7
53	9.8
No house number shown (across from number 57)	9.9
63	9.6
66	10.2
67	10.1
Middle of street (intersection of Ramapo Avenue and W. Magnolia Avenue)	15.2
81	9.8
Backyard (across from number 85)	9.5
89	10.4
98	10.2
101	9.6
106	10.1
113	9.3
118	9.9
121	9.7
Middle of street (intersection of Eccleston and W. Magnolia Avenue)	15.9