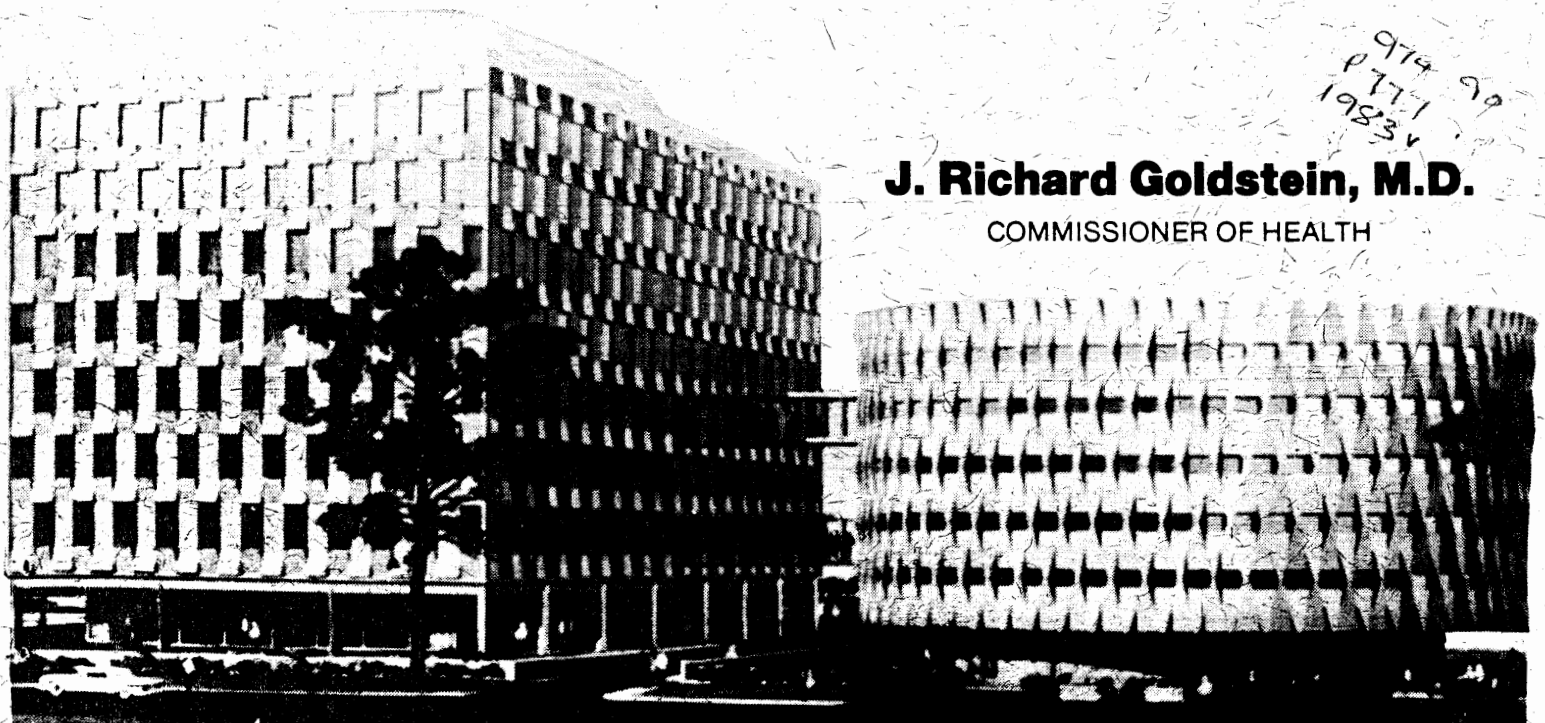


LEGISLATIVE BRIEFING ON RADIATION PROBLEM (Essex County)

December 21, 1983



History of Department of Health Involvement, Montclair - Glen Ridge Radiation Contamination

Since the Department of Environmental Protection notified the Department of Health on Monday, November 28, 1983, that there was a radiation problem in Montclair and Glen Ridge, the DOH Division of Epidemiology and Disease Control has been responding. The Health Department's role, as carried out by that division, is to assess the medical risks involved, to carry out any studies necessary to define those risks, and to inform the affected residents of the medical findings and their significance.

The following is a chronological history of the Health Department's work on this radiation emergency.

<u>Day</u>	<u>Date</u>	<u>Event</u>
Mon.	11/28/83	Department of Environmental Protection (DEP) officials briefed Department of Health (DOH) officials on their aerial, walk-through and residential surveys showing elevated gamma radiation and radon gas exposures in two defined areas. Data were presented for 10 homes in Glen Ridge and 27 homes in Montclair built over radiation-contaminated fill (apparently placed in the 1930's). Discussion included evaluations of the levels of radon exposures, the number and specific locations of homes with levels above background, and steps which could be taken to reduce exposures to acceptable levels. Preliminary maps, exposure data and health risk estimates were distributed by DEP (See Exhibit 1).
Wed.	11/30/83	Public media reported that high radon gas levels had been identified in Montclair-Glen Ridge homes.
Thur.	12/1/83	DOH issued a press release concerning the Department's activities to date and the possible health survey and medical risk assessment activities in the two affected communities (See Exhibit 2). DOH and DEP officials met with the Mayor of Montclair and attended an emergency town council meeting to discuss current and planned activities.
Fri.	12/2/83	Dr. Koplin designated Dr. Parkin as the Chief Incident Commander and declared the investigation a Yellow Alert. (See Exhibit 3). The Division of Epidemiology and Disease Control issued a Fact Sheet on Radon for public information (See Exhibit 4).

-2-

- Sat. 12/3/83 DOH and DEP officials attended the first public meeting, held at the Montclair Town Hall, regarding the incident. Topics covered included the scope of the problem, who was investigating the incident, and what steps were being taken to reduce radon exposures.
DOH staff set up an on-scene presence in the Montclair Health Department to answer public and professional medical concerns.
- Mon. 12/5/83 Dr. Parkin wrote a memo to notify the DOH Commissioner about the Department's involvement in the Montclair-Glen Ridge problem. The memo detailed the action levels developed through meetings with state and federal agencies and radiation specialist contractors, and described the actions planned by EPA, DEP and DOH (See Exhibit 5).

DOH staff wrote a standardized health survey form to assess the lung cancer rate among current residents in the affected areas (See Exhibit 6). DOH trained its Environmental Health staff and local public health personnel to personally administer the survey to residents of each of the 37 homes monitored by DEP. Most residents were interviewed that evening, and the remainder were queried by the end of the week.
- Tues. 12/6/83 Dr. Parkin and DEP officials attended a meeting of the Montclair Town Council to provide information on current activities and to address concerns.
- Fri. 12/9/83 Dr. Parkin wrote a memo to the Commissioner describing the health survey activities, and the evaluations of additional studies that could be conducted by the Environmental Health staff (See Exhibit 7).

Dr. Parkin attended a meeting of concerned citizens of West Orange, neighboring Montclair.
- Sat. 12/10/83 DOH, DEP, and EPA officials discussed the actions taken and planned in a public meeting held at the Linden Avenue School in Glen Ridge.
- Tues. 12/13/83 Dr. Altman sent a memo to Dr. Koplin describing the preliminary results of the health survey. No excess incidence of lung cancer was found in either town or in the specific communities under study (See Exhibit 8). DOH staff began to evaluate the feasibility of an epidemiologic study of all past residents in the affected area.

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Environmental Health staff met with DEP and Montclair Health Department staff to obtain information regarding the expanded sampling program. DEP had data (available for some of the 120 additional homes being monitored) which indicated that 10-15 more residences would require health evaluations because of elevated radon exposures.

Wed. 12/14/83

The Commissioner downgraded the investigation from Yellow Alert conditions based on DOH staff's completion of emergency tasks and on the reduced public demand for immediate information and assistance (See Exhibit 9).

DOH and DEP staff met to discuss the scope of the Montclair-Glen Ridge problem, technical issues in assessing medical risks, and the determination of appropriate protective equipment for the contractors working in exposed homes.

Dr. Altman and DEP officials attended a meeting of concerned citizens in the Montclair Town Hall to address exposure and related health concerns.

List of Exhibits

<u>No.</u>	<u>Item</u>
1	DEP Document (Investigation of Contaminated Sites Resulting from the Radium Processing Industry in New Jersey) presented to DOH on 11/28/83
2	Department of Health's Press Release of 12/1/83
3	Dr. Koplin's Memo of 12/2/83 to Incident Plan Responders
4	Fact Sheet on Radon and its Daughters
5	Dr. Parkin's Memo of 12/5/83 to The Commissioner
6	Community Health Evaluation Survey - Household Health Form
7	Dr. Parkin's Memo of 12/9/83 to the Commissioner
8	Dr. Altman's Memo of 12/13/83 to Dr. Koplin
9	The Commissioner's Memo of 12/14/83 to Incident Plan Responders
10	Bibliography

EXHIBIT 1

**DEP Document (Investigation of Contaminated Sites
Resulting from the Radium Processing Industry in New Jersey)
Presented to DOH on 11/28/83.**

INVESTIGATION OF CONTAMINATED SITES RESULTING FROM
THE RADIUM PROCESSING INDUSTRY IN NEW JERSEY



STATUS OF SURVEY AS OF NOVEMBER 20, 1983

	<u>Glen Ridge</u>	<u>Montclair</u>
No. of Houses Needing Surveys	10	27+
Walk Over Gamma-Survey	All	27/27
2 Meter Grid Gamma-Survey	All	18/27
Indoor Gamma-Survey	All	18/27
Indoor Radon-Survey	All	17/27
Soil Samples (2 to 6 samples/core)	20 Cores	3 Cores

RADON AND RADON PROGENY STANDARDS

Radiation Worker Standard
(40 hours/week)

0.33 WL
or 66 pCi/l
(at 50% equilibrium)

General Public Standard
(continuous 24 hrs/day)

0.02 WL
or 3 pCi/l
(at 50% equilibrium)

Remedial Action Levels
(Uranium Mill Tailings)

< 0.03 WL
or 6 pCi/l
(at 50% equilibrium)

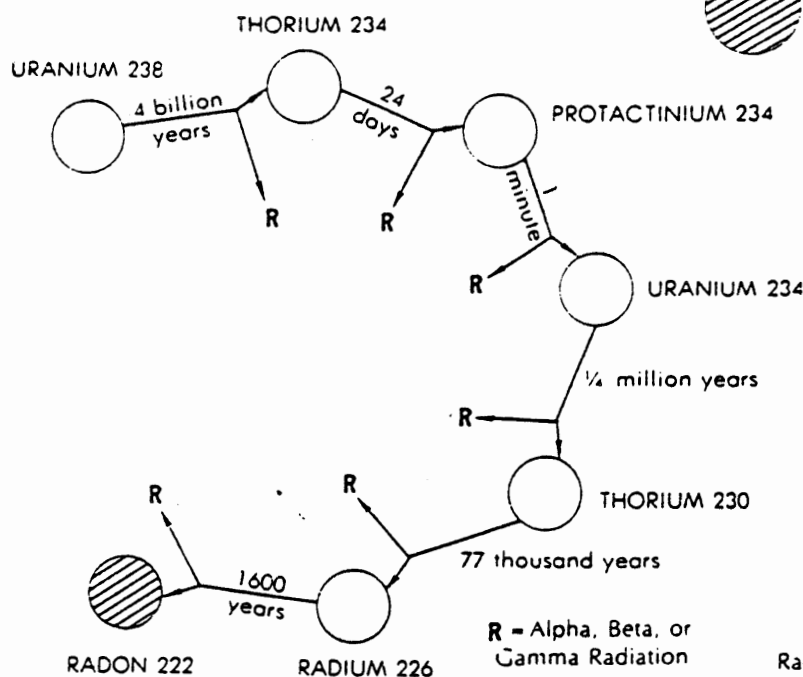
Background (Indoor) Levels

0.001 - 0.01 WL
or 0.5 - 3 pCi/l
(at 50% equilibrium)

FRACTION OF HOUSES SURVEYED WHICH EXCEED STATED LEVELS

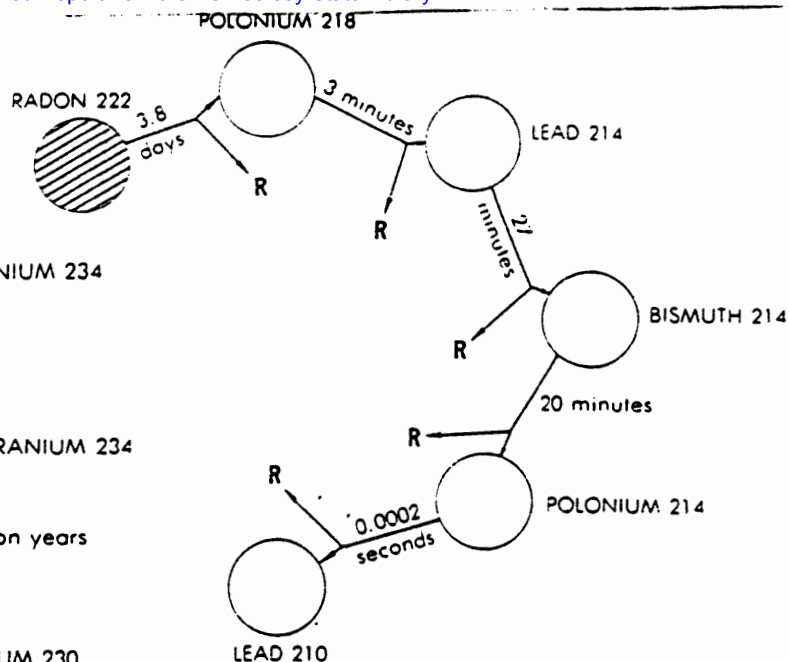
	40 hrs/wk at Radiation Worker Level 66 pCi/l 0.33 WL	75% of Cont. at Radiation Worker Level 22 pCi/l 0.11 WL	Remedial Action Level 4 pCi/l 0.02 WL	General Population Level 3 pCi/l 0.01 WL
Glen Ridge (10 houses)	2/10	3/10	6/10	7/10
Montclair (17 houses)	5/17	8/17	13/17	15/17

WHAT IS RADON?



FORMATION OF RADON

Radon is a naturally occurring radioactive gas found in low concentrations almost everywhere on earth. It is colorless, odorless, and chemically inert, like helium, neon, and the other so-called "noble" gases. It is fairly soluble in water.



RADON'S PROGENY

Radon is the immediate product of the radioactive decay of the element radium. However, radon is midway in a chain of radioactive transformations originating with uranium, which has such a long half-life as to have been present at the formation of the earth.

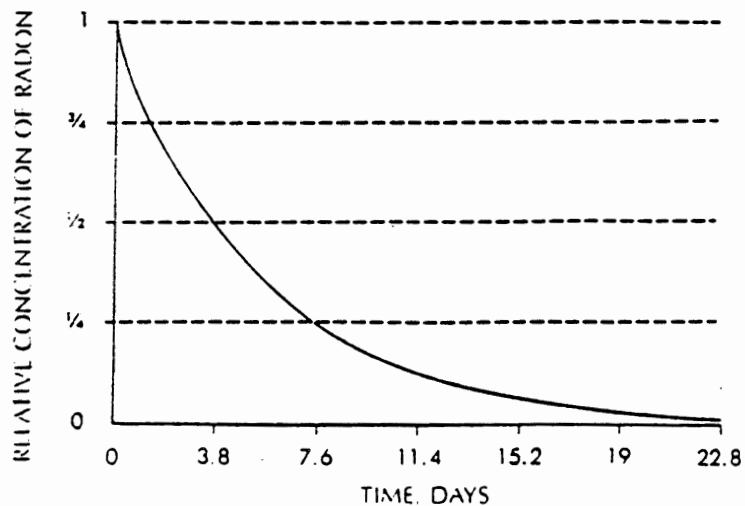
The chain of radioactive transformations does not end with radon. Indeed, it is the radioactive decay that can affect living organisms. Every atom of radon undergoes a series of transformations, emitting alpha, beta, and gamma radiation. The radioactive elements that result from the decay of radon are called "radon progeny" or, sometimes, "radon daughters". Because of these processes, when radon is present in air or water, radon progeny are also present.

For purposes of clarity, the diagrams above have been simplified with respect to the by-products of the radioactive chain. The time information on the diagrams represents "half-lives". That is, these numbers indicate how long it takes for half the atoms of each element to decay.

The half-life for radon is 3.8 days. As the graph at left shows, every 3.8 days, the concentration of radon falls by a factor of one-half.

In a normal environmental situation, the decay of radon is accompanied by the continual replenishment of fresh radon. Thus the concentration of radon in water and air in the home does not follow the pattern shown in the graph.

Concentrations of radon progeny, which have half-lives ranging from fractions of a second to tens of minutes, generally follow the concentrations of the much longer-lived radon. Such concentrations may vary from the radon concentrations, however, depending on specific removal processes.



DECAY CURVE FOR RADON

EXHIBIT 2

Department of Health's Press Release of 12/1/83

NJSDI-NEWS

NEW JERSEY STATE DEPARTMENT OF HEALTH • CN360 Trenton, N.J. 08625

Contact: 609-984-7160

Release: Dec. 1, 1983

TRENTON, NJ - "The Radon gas exposure in the towns of Montclair and Glenn Ridge, NJ is a serious matter, but has occurred over a period of many years and precipitous action is not warranted," according to Dr. Allen N. Koplin, Deputy Commissioner of Health. "We are in the process of gathering additional information on human effects."

The number of persons exposed is limited totaling probably less than 100 at present, and these individuals have had varying contact with radon ranging from inconsequential to possibly substantial.

Action required to prevent illness is primarily in the environmental sphere. Separation of those individuals with highest exposure levels from the radon is a first priority and methods for accomplishing this are being developed.

The only medical testing available, and it must be limited to those with obvious exposure risks, is the taking of a medical history to elicit symptoms and to determine smoking habits, and occupational risks. Also, performance of chest x-rays and pulmonary cytology tests may be suggested. X-rays are not recommended for mass use for they can inadvertently add unnecessarily to radioactive exposure.

The Department of Health will be providing a medical presence in the area and issuing fact sheets for informational purposes primarily. We will also meet with individual families who have known above-minimal exposures for purposes of providing advice and medical referral if necessary. We will be cooperating in this effort with local health department officials.

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EXHIBIT 3

Dr. Koplin's Memo of 12/2/83 to Incident Plan Responders



STATE OF NEW JERSEY
DEPARTMENT OF HEALTH
CN 360
TRENTON, 08625

J. RICHARD GOLDSTEIN, MD
COMMISSIONER

(609) 292-7837

December 2, 1983

TO: Incident Plan Responders
FROM: Dr. Koplin *DK*
SUBJECT: Radium Exposure Incident

In the absence of the Commissioner I am appointing Dr. William Parkin, State Epidemiologist, as the **CHIEF INCIDENT COMMANDER**, to coordinate the department's response to the Radium incident.

Based on the current circumstances and the fact that the situation is localized and not broad in scope, I am declaring a **YELLOW ALERT** and instructing Dr. Parkin to implement the appropriate procedures set forth in the department's Incident Plan.

Please review this plan and your respective responsibilities.

EXHIBIT 4

Fact Sheet on Radon and its Daughters

NEW JERSEY STATE DEPARTMENT OF HEALTH FACT SHEET ON RADON AND ITS DAUGHTERS

1. What are radon and its daughters (progeny)?

Radon is a radioactive gas found in low concentrations almost everywhere on earth. It is formed from the breakdown of uranium, radium and other radioactive elements. Radon has its own breakdown products (radon daughters) which emit a certain kind of radiation (alpha particles), that does not travel far.

2. How harmful are radon and its daughters?

Radon is breathed in and out quickly, so harm is minimal. When radon daughters are inhaled, however, they are deposited throughout the lungs and remain internal sources of radiation until they decay.

High radon daughter levels have caused lung cancer in uranium miners. This is the only known effect. There is no reason to suspect that pregnant women or unborn fetuses are at unusual risk. Alpha particles barely penetrate the skin so organs other than the lungs are not damaged.

3. Why has radon become an issue in Essex County?

The State Department of Environmental Protection has conducted a survey of radon levels in homes following an aerial survey that looked for excess radiation. The earlier survey identified limited areas where radioactive materials were probably dumped decades ago. These areas are in Montclair and Glen Ridge. The levels of radiation in these two towns, except for two specific areas, are within acceptable limits.

4. What levels have been found in Montclair and Glen Ridge?

Levels have been found in the living areas of a limited number of homes which exceed recommended standards for workplaces, such as uranium mines. (Scientists measure levels in picocuries-per-liter (pCi/l) and working levels (WL); here, 200 pCi/l = 1 WL. The Uranium Worker Standard is 1/3 WL, or 66 pCi/l).

Although some levels are about the same as those found in other residential surveys, some of the homes here have results above EPA's recommended remedial action level (6 pCi/l) for homes.

5. How do I know if my house is affected?

You will have already been contacted by the Department of Environmental Protection if your house is one of those already established to have high levels. Other houses will be surveyed and their occupants notified of the risks by the Department of Environmental Protection.

6. What are the risks of exposure to these levels?

Lifetime exposure to 1/2 WL is estimated to cause about 10 lung cancer cases per 100 persons; this is similar to the risk of cancer from being a heavy cigarette smoker. Shorter exposure and lower levels produce less risk.

7. Is it safe to live in or near the contaminated area?

The health risk in the affected areas is related to the radiation levels found and to duration of residency. The main concern is long-term residency or high exposure.

Living near the contaminated areas will not increase resident's risk of lung cancer above the normal level experienced by the general U.S. population. Only when the radon levels are concentrated inside a house is there a potential problem. Only if your house was built on top of the contaminated fill is there a potential problem. There is no exposure from walking or living next to a house with high levels.

8. What will be done to reduce the levels?

The emission of radon and its daughters from radium lasts for hundreds of years. You will be exposed to levels above background as long as you live over contaminated soil. Certain types of ventilation of the home can be used to decrease exposures temporarily. More permanent means of reducing exposures include: ventilating the soil directly, removing the contaminated soil from the property, sealing the basement, and if nothing else succeeds, moving out of the home may be indicated. If your home has been found to have elevated levels, the State Department of Environmental Protection will be working with you to correct the problem.

9. What tests are available to determine if I have been harmed?

There is no accepted screening test for lung cancer. Large scale studies are underway by the National Cancer Institute and other institutions to evaluate the usefulness of annual chest X-rays and microscopic examination of sputum (phlegm). The State Health Department will be discussing these tests with other medical experts and will be evaluating their usefulness in this situation.

10. What are the symptoms?

If you are developing radiation-related lung cancer, your symptoms will be the same as other lung cancer cases. Typical symptoms may include coughing blood, chronic shortness of breath, chest pains, thick sputum and a persistent cough. You should see a physician if you have these symptoms.

11. I smoke, what should I do?

You should immediately stop smoking for three reasons. First, cigarettes themselves cause lung cancer. Second, concurrent exposures to radiation and cigarettes may increase your cancer risk. Third, radon daughters attach to smoke particles in the atmosphere, and, whether you smoke or not, the effective exposure to the lungs becomes even greater. This affects all household members, including non-smokers.

EXHIBIT 5

Dr. Parkin's Memo of 12/5/83 to The Commissioner

Memo

NEW JERSEY STATE DEPARTMENT OF HEALTH

NSH

TO Dr. J. Richard Goldstein through Dr. *W. Koplin* and Dr. Altman DATE December 5, 1983

FROM Dr. William E. Parkin, *W. E. Parkin* PHONE

SUBJECT Report # 1 - Radon Contamination in Montclair and Glen Ridge

On Monday, November 28, 1983, Mr. Steven Kuhrtz, Director, Division of Environmental Quality, and Dr. Bob Tucker, Office of Science and Research, DEP presented data to Dr. Ronald Altman, Dr. William Parkin, Dr. Kenneth Rosenman, Dr. Curtis Cummings, and Dr. Rebecca Zaganiski disclosing environmental health hazards to residents of two small areas of two northern New Jersey communities - Montclair and Glen Ridge. Through a radiological screening via helicopter of a 3 x 4 mile area around the former U.S. Radium plant in Orange, DEP identified a number of gamma radiation "hot-spots". Most could be explained as the result of natural phenomena, but these two sites required additional screening. By walking the streets in these two areas with handheld gamma radiation monitors, the DEP identified 37 homes - 10 in Glen Ridge and 27 in Montclair - which were in the area of the elevated gamma readings. To date, the DEP has tested all the homes in Glen Ridge and 18 in Montclair and found elevated radon (an alpha particle emitter) levels in 18 of the homes which will require immediate or future remedial action. No untoward gamma radiation levels were found in the homes.

Following meetings between DOH, DEP, EPA, and resource individuals from the EPA, CDC, and the contractor handling the Grand Junction, Colorado clean-up, the following action levels were arrived at:

1. Levels above 1 WL (200 pCi/L at 50% E.Q.): Restrict access to these areas (namely, 2 basements).
2. Levels above 0.5 WL (100 pCi/L): Immediately initiate short-term mitigation - forced ventilation, structural repairs in basement, electrostatic precipitation - which will be accomplished within 2 weeks.
3. Levels between 0.1 and 0.5 WL (20-100 pCi/L): Initiate short-term mitigation to be completed in all homes within 2-3 months.
4. Levels above 0.02 and below 0.1 WL (5 - 19 pCi/L): Conduct long-term mitigation; no short-term mitigation required.
5. Levels below 0.02 WL (4 pCi/L or less): Background levels, no mitigation required.

On Monday, December 5, the EPA will begin retesting the homes with elevated readings and the EPA contractor will begin surveying the homes for installation of short-term mitigation devices. Monday evening, DOH and local health departments personnel will administer a health census-survey form to residents of both affected areas to determine length of residency, smoking histories, and medical histories, particularly relating to lung

- 2 -

TO: Dr. J. Richard Goldstein through Dr. Koplin and Dr. Altman
FROM: Dr. William E. Parkin

cancer. Physical examination or other medical screening are not currently planned pending a review of these forms or the identification of a meaningful test. DEP's next major activity will be to expand the testing to other homes in the area until the area of radon contamination is delineated by a ring of "clean" homes.

DOH activities have included participation in the planning meetings Thursday and Friday and the development of a fact sheet. Dr. Parkin and Mr. Kuhrtz (DEP) attended a meeting with Mayor Mary Mochary of Montclair Thursday afternoon and a subsequent emergency town council meeting that evening. On Saturday, Dr. Koplin and Dr. Parkin attended a closed meeting with the residents of both areas. On Saturday, Frank Marshall and Bob Hung established an on-scene presence in the office of the Montclair Health Department. This was done with the concurrence of the Glen Ridge Health Officer.

EXHIBIT 6

Community Health Evaluation Survey - Household Health Form

**New Jersey State Department of Health
Community Health Evaluation Survey
Household Health Form**

Consent Form

I have been informed that the New Jersey State Department of Health is conducting a survey of some households in Montclair and Glen Ridge. The survey will obtain information on health effects of radon and its daughters (progeny), and on some characteristics of each home.

I have agreed to take part in this survey and understand that

- (1) my participation is voluntary and I may refuse to answer any question(s),
- (2) my responses will be kept confidential, and
- (3) the information in this study will be summarized by the New Jersey State Department of Health, without identifying individuals, to describe the contribution of environmental factors to specific health problems.

Signature _____ Date _____
Name _____ Home Phone _____
Address _____ Witness _____

House Code (office use): _____ (1-4)
Interviewer Code: _____ (5-6)
Date (MDY): ____/____/____ (7-12)

Table 1. Household Resident Data
(yes = 1, no = 2, don't know = 8, no answer = 9)

						if over age 13												if 13 = yes		if dead	
Ques. No.						6	if 6 = yes		8	9	if 9 = yes		13	14	15	21	22				
#	Sex	Name	Age (yrs.)	Race (Code)	Resid. (yrs.)	Occupancy (mo./yr.)	Works	Usual Occupation	Cgr./Pipe	Cigarettes	Cgts./day	Total yrs.	Yrs. at house	Cancer	Type (Site)	Diagnosis (mo./yr.)	Death (mo./yr.)	State of Death			
<u>Males</u>																					
1			--	-	--	--	-		-	-	--	--	--	-		--/--	--/--	--			
2			--	-	--	--	-		-	-	--	--	--	-		--/--	--/--	--			
3			--	-	--	--	-		-	-	--	--	--	-		--/--	--/--	--			
4			--	-	--	--	-		-	-	--	--	--	-		--/--	--/--	--			
5			--	-	--	--	-		-	-	--	--	--	-		--/--	--/--	--			
<u>Females</u>																					
1			--	-	--	--	-		-	-	--	--	--	-		--/--	--/--	--			
2			--	-	--	--	-		-	-	--	--	--	-		--/--	--/--	--			
3			--	-	--	--	-		-	-	--	--	--	-		--/--	--/--	--			
4			--	-	--	--	-		-	-	--	--	--	-		--/--	--/--	--			
5			--	-	--	--	-		-	-	--	--	--	-		--/--	--/--	--			

Patient's Sex and Line No.:

Physician's Name:

Address:

Phone:

Thank you very much for your time and cooperation in this survey.

EXHIBIT 7

Dr. Parkin's Memo of 12/9/83 to The Commissioner

Memo

NEW JERSEY STATE DEPARTMENT OF HEALTH

NSI

TO Dr. J. Richard Goldstein through *RM* DATE December 9, 1983
Dr. Koplin and Dr. Altman *in*

FROM Dr. William E. Parkin PHONE

SUBJECT Report #2 - Radon Contamination in Montclair and Glen Ridge (S-632-83)

The DOH questionnaire was administered to present residents of the affected homes Monday evening, December 5. At this time all current households have been interviewed (one refusal) with the exception of one household who is out of town on vacation for several more weeks. The questionnaire was intended to derive information on length of residency, smoking history, and cancer (specifically lung). Preliminary analyses indicate that both total cancers and lung cancers reported by the current residents for both areas are at and usually below the expected levels for similar age-adjusted populations. We are now initiating our efforts to identify past residents of both areas to administer the questionnaire. This activity will be coordinated by Dr. Zaganiski and Miss Conomos of our Environmental Health Hazard Evaluation Program.

We have accessed our Cancer Registry and have failed to find evidence of a cluster of either total cancers or lung cancer to date in either area.

I will be attending a public meeting for residents of the neighboring West Orange area tonight and Dr. Altman will be attending a similar meeting in Glen Ridge tomorrow morning. While health related questions have dwindled in the last day or so for our staff on-scene at the Montclair Health Department, we will provide coverage there through Tuesday in case these meetings produce another flurry of health questions or concerns. After that an intermittent coverage should be sufficient.

Since I am to be on vacation next week, Dr. Altman will be overseeing our operations relating to this episode.

EXHIBIT 8

Dr. Altman's Memo of 12/13/83 to Dr. Koplin

Memo

NEW JERSEY STATE DEPARTMENT OF HEALTH

NSH

TO Dr. Koplin

DATE December 13, 1983

FROM Dr. Altman *Dr*

PHONE

SUBJECT Interim Report #3 (per Dr. Parkin's #1 and #2) of Activities in Montclair and Glen Ridge from November 28, 1983 to December 12, 1983, Regarding the Radon Incident

On Monday, November 28, 1983, the Department of Environmental Protection (DEP) informed the Department of Health (DOH) of elevated radon gas exposure to residents of 37 homes in Montclair and Glen Ridge. The strategy developed by the Department of Health was to inform the residents of the health risk of radon exposures, and assess the incidence of lung cancer, the only known human health effect associated with radon exposure.

Health Education

By Friday, December 2, 1983, a fact sheet containing answers to 11 questions about radon and its health effects was prepared. Copies were distributed to residents of the 37 aforementioned homes and surrounding area on Saturday, December 3, 1983, and at subsequent public meetings in West Orange and Glen Ridge, on December 9 and 10, respectively. At least one, and usually two, representatives from the DOH have been on duty at the office of the Montclair Health Department to answer questions and provide information to concerned residents, officials, and the press.

Lung Cancer Incidence

The incidence of lung cancer as reported to the Cancer Registry during 1979 and 1980 was not greater than expected for the municipalities of Montclair and Glen Ridge, as a whole. The following is an analysis of reports of cancer among residents living in homes monitored by the DEP for radiation levels in Montclair and Glen Ridge. Our purpose was to evaluate whether the reported cases represent an unusual occurrence.

Through the efforts of interviewers from the State and local health departments, personal interviews were conducted in 36 households on December 5 and 6, 1983. One household subsequently withdrew its questionnaire from consideration, so the remaining 35 questionnaires were used in the analysis. The findings shown here are based on the information obtained by December 7, 1983. Additional questionnaires still have to be completed.

Of the 142 people surveyed, there were 34 black males, 39 black females, 34 white males, and 35 white females. The average years of residence was 16.5 and ranged from 1 to 58 years.

Memo

-2-

December 13, 1983

There were five different types of cancer reported by three women and two men, respectively: skin, ovarian, breast, colon, and lung. The skin cancer patient was excluded from the analysis, because there are no data available to allow us to calculate the number of skin cancers one would expect in this population. (Skin cancer is not counted in the National Cancer Survey, from which expected numbers were computed.) The ovarian and breast cancers could not be confirmed. The colon cancer was confirmed by a report to the New Jersey Cancer Registry, and the lung cancer by a death certificate. The people with cancer did not have an occupation in common. Three of the four cancer patients were cigarette smokers. The distribution of cancer did not cluster in any one year. The age of diagnosis ranged from 42 to 72, with one unknown. Therefore, no common cause is apparent for the four cancers.

The means of identifying any increase in cancer incidence rates is calculation of the ratio of the observed number of cancers to the number expected, adjusted for age and sex. The expected number is determined from the Third National Cancer Survey and is based on the assumption that the incidence rates reported therein prevail in the population surveyed. The time window of 16 years, chosen to include the time of the cancers, was from 1967 to 1983 and included the first and most recently reported cancers. The observed number of all cancers combined in both males and females was less than what was expected. Because of the instability of statistical analyses based on one cancer observed when less than one was expected, the report of one lung cancer does not indicate an epidemiologically meaningful excess.

In conclusion, for all cancer combined, there were fewer people with cancer than would have been expected in the population surveyed. For the general population, an excessive risk of lung cancer has not been demonstrated with the data that are currently available.

RA:cmc

EXHIBIT 9

The Commissioner's Memo of 12/14/83 to Incident Plan Responders



State of New Jersey

DEPARTMENT OF HEALTH

JOHN FITCH PLAZA
CN 360, TRENTON, N.J. 08625

J. RICHARD GOLDSTEIN, M.D.
COMMISSIONER

December 14, 1983

TO: Incident Plan Responders

FROM: J. Richard Goldstein, M.D.
State Commissioner of Health

SUBJECT: Radon Exposure Incident

Due to a reduced level of operations and partial completion of this Department's major involvement in the radon incident in the Montclair/Glen Ridge area, I am terminating this alert in accordance with Executive Order No. 86. Any further activities will be incorporated into the routine duties of the Emergency Response Unit and the Environmental Health Hazard Evaluation Program.

I would also like to take this opportunity to thank Dr. William Parkin, Chief Incident Commander, and the staff of the Division of Epidemiology and Disease Control for their dedication, support, and assistance during this crisis. Their professionalism is a credit not only to themselves but also this Department. Once again, congratulations for a job well done.

A handwritten signature in dark ink, appearing to read "Richard Goldstein", written over a horizontal line.

J. Richard Goldstein, M.D.
State Commissioner of Health

EXHIBIT 10

Bibliography on Radon Exposures and Lung Cancer

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