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Health Assessment for

[REDACTED]

U.S. RADIUM-WEST ORANGE

ORANGE, ESSEX COUNTY, NEW JERSEY

JANUARY 19, 1989

Agency for Toxic Substances and Disease Registry
U.S. Public Health Service

[REDACTED]

THE ATSDR HEALTH ASSESSMENT: A NOTE OF EXPLANATION

Section 104(i)(7)(A) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, states "...the term 'health assessment' shall include preliminary assessments of potential risks to human health posed by individual sites and facilities, based on such factors as the nature and extent of contamination, the existence of potential pathways of human exposure (including ground or surface water contamination, air emissions, and food chain contamination), the size and potential susceptibility of the community within the likely pathways of exposure, the comparison of expected human exposure levels to the short-term and long-term health effects associated with identified hazardous substances and any available recommended exposure or tolerance limits for such hazardous substances, and the comparison of existing morbidity and mortality data on diseases that may be associated with the observed levels of exposure. The Administrator of ATSDR shall use appropriate data, risk assessments, risk evaluations and studies available from the Administrator of EPA."

In accordance with the CERCLA section cited, ATSDR has conducted this preliminary health assessment on the data in the site summary form. Additional health assessments may be conducted for this site as more information becomes available to ATSDR.

PRELIMINARY HEALTH ASSESSMENT
U.S. RADIUM-WEST ORANGE
ESSEX COUNTY
ORANGE, NEW JERSEY
January 19, 1989

Prepared by:
Office of Health Assessment
Agency for Toxic Substances and Disease Registry (ATSDR)

Background

The U.S. Radium-West Orange site is listed by the U.S. Environmental Protection Agency (EPA) on the National Priorities List (NPL). The two-acre site is located in the city of Orange at High and Alden Streets, which was the site of the former U.S. Radium processing facility where radium extraction, production, application, and distribution may have taken place. Other areas identified as being contaminated include adjacent vicinity properties consisting of 140 properties and 21 acres, and 20 satellite properties located throughout the Cities of Orange, East Orange, and South Orange. The original buildings on the U.S. Radium site have since been removed or incorporated into the seven buildings that exist presently. Only two of these buildings are occupied at present- a coal storage company and a auto repair station. The main site is in the middle of a dense residential area. Vicinity and satellite properties are occupied by light industries, offices, houses, grocery store, and perhaps apartments.

There is unrestricted access to these facilities by the public.

The following document was provided to ATSDR for review: Final Interim Report of Existing Information, October 10, 1986. This document forms the basis of this preliminary health assessment. In addition, the Center for Environmental Health and Injury Control, CDC, has reviewed and commented on the New Jersey remedial action plan and the EPA draft feasibility study on February 11 and 12, 1988.

Environmental Contamination and Physical Hazards

The principal environmental contamination at the High and Alden street site and the vicinity and satellite satellite properties consists of isotopes of radon, radon daughters, and radium-226. These isotopes pose potential hazards through inhalation and external and internal gamma and alpha radiation exposure. The three areas are characterized by highly variable levels of contamination; with some types of radiation present in some areas and not in others. Some of the alpha contamination has been demonstrated to be removable.

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The physical hazards present at this site are due to radiation.

Environmental and Human Exposure Pathways

The environmental pathways of concern are airborne particulate radiation, gamma radiation in air, radioactive materials, and surface deposits of radioactive materials. The human exposure pathways of concern are inhalation of airborne particulate radiation, direct exposure to gamma radiation, and ingestion of contaminated particulates.

Demographics

Some of the affected properties are apartments which may be occupied. Many are sites of active businesses. The main site is located in a heavy residential area; there are an estimated 50,000 people within a one-mile radius of the site. Presumably, there are sensitive segments of the public residing near these areas.

Evaluation and Discussion

Elevated levels of alpha radiation, gamma radiation, radium-226 in soils and structures, and radon and radon daughters in air are present at the high and Alden street site. Vicinity properties have elevated levels of gamma radiation and radon and radon daughters. Satellite properties have elevated levels of gamma radiation and radon and radon daughters. High and Alden street concentrations exceed exposure levels recommended for the general public (3 pCi/L for radon and 0.02 Working Level for radon progeny, radium-226 concentrations greater than 5 pCi/gm above background, and removable alpha contamination greater than 20 dpm/100 cm²). Not all satellite properties have been surveyed and the sources of contamination in neither vicinity nor satellite properties have been conclusively identified. Many of the facilities of interest are presently occupied by businesses and perhaps even used as dwellings, or are located adjacent to businesses or residences. It is our understanding that some of the more highly contaminated areas have been evacuated.

Conclusions and Recommendations

Based on the available information, this site is considered to be of public health concern, ranging from potential to imminent, depending on the individual area (High and Alden street location, and vicinity and satellite properties) in question, because of the risk to human health caused by exposure to radioactive materials via inhalation of contaminated particulate and gaseous radiation, ingestion of contaminated particulate, and external exposure to gamma radiation. We understand, but cannot conclude from the available information, that those properties having high

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levels of radioactivity and exposed people have been remediated so that exposure has been removed or reduced to acceptable levels. We would require a current appraisal of the levels of exposure and populations exposed, on a area-by-area basis, in order to assess the hazard presented by the individual areas.

Further environmental characterization and sampling of the site and impacted off-site areas during the Remedial Investigation and Feasibility Study (RI/FS) should be designed to address the environmental and human exposure pathways discussed above. When additional information and data become available, e.g., the completed RI/FS, such material will form the basis for further assessment by ATSDR at a later date.