

**Centers for Disease Control and Prevention,
National Center for Environmental Health (NCEH)**

Fernald Risk Assessment Project

Phase 1: Estimation of the Impact of the Former Feed Materials Production Center (FMPC) on Lung Cancer Mortality in the Surrounding Community

Q: WHAT PROMPTED THIS PROJECT?

A: *The mission of the Centers for Disease Control and Prevention (CDC) is to promote the health and quality of life of the public by preventing and controlling disease, injury and disability. In accordance with that mission, CDC has conducted its health research projects at Fernald to respond to community and congressional concerns about possible health effects from exposure to radioactive materials from the former Fernald Feed Materials Production Center (FMPC).*

Q: WHAT IS A RISK ASSESSMENT?

A: *A risk assessment is the scientific analysis and characterization of adverse effects of environmental hazards. It involves a number of steps for addressing the potential human health effects. These involve data gathering and use of mathematical models to:*

- *Identify sources and types of hazardous materials and estimate the quantities released.*
- *Analyze the potential exposure pathways, or ways in which substances could be transported through air, water or soil to locations where humans could be exposed.*
- *Assess the toxicity, or possible harmful effects, resulting from human exposure to the estimated concentrations of the substance in question.*
- *Estimate the increased risk of adverse health effects based on steps 1, 2 and 3.*

Q: WHAT IS THE GOAL OF THIS RISK ASSESSMENT PROJECT?

A: *The purpose of our risk assessment is to estimate the number of cancers and other health concerns that may have been caused by exposure to radioactive materials from the FMPC in the surrounding community. The first phase of this work deals with lung cancer mortality.*

Q: WHY DOES THIS RISK ASSESSMENT ONLY FOCUS ON LUNG CANCER?

A: *This is the first phase of our risk assessment project. We have focused on lung cancer in this initial phase because work in the Fernald Dosimetry Reconstruction Project indicated that exposure to radon contributed 70 to 90 percent of the lung dose to residents of the Fernald community. Based on the scientific literature, lung cancer is the most likely health outcome for radon exposure. We will consult with the Fernald Health Effects Subcommittee to determine what other health outcomes will be evaluated in the future.*

Q: FROM THE NUMBERS YOU HAVE, HOW MANY OF US ARE GOING TO DIE FROM LUNG CANCER BECAUSE WE LIVED NEAR THIS GOVERNMENT PLANT?

A: *Over the time period used in the report, 1951-2088, it is possible that between 25 to 309 individuals of the 40,000-53,000 people who lived near the FMPC during its years of operation may die from lung cancer associated with the FMPC radiation releases. The most likely value for the possible number of FMPC-related lung cancer deaths is 85.*

Q: WHAT DO THESE RISK NUMBERS REALLY MEAN? WILL I GET SICK OR MAYBE I SHOULD ASK, WHEN WILL I GET SICK?

A: *We can not tell if you, as an individual will die of lung cancer. Nor can we tell you, if you did develop lung cancer, that your lung cancer was caused by FMPC-related radiation exposures. We can, however, tell you that exposure to radioactive materials from the FMPC during its years of operation may have increased the number of lung cancer deaths among residents of the assessment domain by 1% to 12% percent over the number of lung cancer deaths we would have expected among residents in the absence of this exposure.*

Q: WHY ARE YOU FOCUSED SO MUCH ON RADON, WHY NOT URANIUM? AFTER ALL, THE FERNALD PLANT MILLED URANIUM.

A: *True, the FMPC milled uranium. However, in the 1950s the FMPC became a waste storage facility for radioactive waste generated at other facilities. The waste material stored at the FMPC contains radium. This material released radon and it was not until the Fernald Dosimetry Reconstruction Project that we learned that the large quantities of radon were released from the FMPC during its operating years, 1951-1988, representing a larger potential health hazard than uranium. However, we did not ignore uranium, in fact, we included ALL radionuclides estimated to have been released from the FMPC during the plant's operating years (1951-1988) in our risk estimation process.*

Q: IF A PERSON SMOKED AT THE SAME TIME THEY WERE BEING EXPOSED TO RADON RELEASED FROM THE PLANT, DID THEY INCREASE THEIR CHANCES OF GETTING LUNG CANCER MORE THAN A PERSON WHO DIDN'T SMOKE? IF YES, WHY?

A: *Yes, at any given dose of radon, a person who smokes has a higher risk of lung cancer than someone who doesn't smoke. This is due to what is called "interaction" – there is a combined effect of the two exposures.*

Q: WHO WAS AFFECTED MORE BY RADON EXPOSURE FROM THE PLANT, MALES OR FEMALES? ADULTS OR CHILDREN? IS IT THE SAME FOR NATURALLY OCCURRING RADON?

A: *First, it is important to clarify that naturally occurring radon and radon from the FMPC site are the same radionuclide, just from different sources. The results show that the estimated percentage increase in lung cancer deaths was comparable for males and females. Both childhood and adult exposures were used to develop these estimates. In the most recent evaluation of the lung cancer mortality risks associated with*

indoor exposure to naturally occurring radon, the National Academy of Sciences concluded that age at exposure did not affect the subsequent risk for radon-related lung cancer death.

Q: EXPLAIN THE RESULTS – SPECIFICALLY, WHAT DOES “THE ESTIMATED NUMBER OF LUNG CANCER DEATHS” MEAN COMPARED TO THE “PERCENTAGE INCREASE OF LUNG CANCER DEATHS”?

A: *The estimated number of lung cancer deaths is a prediction of the actual number of deaths that may be due to FMPC-related radiation exposures.*

The percentage increase is the estimated number of deaths divided by the number of lung cancer deaths that may occur in the population in the absence of FMPC exposures, multiplied by 100.

Q: WHY DIDN'T YOU GO OUT AND JUST COUNT THE NUMBER OF LUNG CANCER DEATHS THAT HAVE ALREADY OCCURRED IN THE STUDY AREA AND THEN COUNT HOW MANY PEOPLE HAVE LUNG CANCER NOW?

A: *Conducting that type of activity is not as simple as it may seem and may not give us all the information we need to estimate risk. First, the data on lung cancer deaths do not provide information on factors such as length of residence and other modifiers of lung cancer risk such as smoking. Additionally, since death certificates only contain residence at time of death, it would be very difficult to locate individuals who lived near the FMPC during the production years and moved away. Also, we could not just count the number of lung cancers among current residents because we do not know if current cases resided in the study area between 1951 and 1988. Because the risk assessment could be done more quickly, using existing data, it allows us the opportunity to respond to citizens concerns sooner.*

Q: WHAT ABOUT THE WORKERS' EXPOSURE TO RADON? SURELY IT HAD TO BE HIGHER? COMBINED WITH THEIR EXPOSURE FROM JUST LIVING NEAR THE PLANT, SHOULDN'T THEIR RISK OF DEVELOPING LUNG CANCER BE MUCH HIGHER?

A: *Our report did not consider exposures workers may have received on the job. We are working with National Institute of Occupational Safety and Health to understand the implications of this risk estimation for workers.*

Q: WHAT KIND OF MEDICAL TESTS SHOULD I TELL MY DOCTOR TO GIVE ME TO TEST FOR RADON CONTAMINATION?

A: *There aren't any medical tests that can determine whether you have been exposed to radon or radon decay products. The best approach is to test your home for naturally occurring radon.*

Q: WHAT IS THE NEXT STEP IN THE PROJECT?

A: *CDC will continue to work with the Agency for Toxic Substances and Disease Registry, the National Institute for Occupational Safety and Health, the Fernald Health Effects Subcommittee, and the*

Fernald community to prioritize work and make decisions as to additional technical work that may be needed. Estimating the risk to the community for other adverse outcomes such as kidney cancer has already been agreed upon as one of the areas of future work.

Q: HOW MUCH OF A CHANCE DO PEOPLE HAVE OF GETTING LUNG CANCER FROM NATURALLY OCCURRING RADON IN THIS AREA COMPARED TO THE CHANCES OF GETTING IT FROM PAST EXPOSURES TO RADON FROM THE FERNALD PLANT?

A: *A report has recently been released by the National Academy of Sciences (the BIER VI Report) on the effects of exposure to naturally occurring radon. The report estimates that, based on the model we used in this risk assessment, 8% to 20% of all lung cancer deaths in the United States result from indoor exposure to naturally occurring radon. If we apply these percentages to the number of background lung cancer deaths estimated to occur in the Fernald assessment population, we estimate that approximately 200 to 500 lung cancer deaths may occur in this group due to indoor exposure to natural radon. Therefore, we estimate that the number of lung cancer deaths that may result from exposure to natural radon is about 2 to 6 times greater than the number that may result from FMPC-related exposures.*

Q: IS THERE ANY DIFFERENCE IN THE LEVELS OF NATURAL RADON IN OHIO AND OTHER STATES?

A: *Ohio has a moderate to high radon potential, according to the Environmental Protection Agency's Map of Radon Zones for Ohio. This situation is similar to the states of Indiana and Illinois and due mainly to glacier activity many years ago. For more information, you should contact the Ohio Environmental Protection Agency's Ohio radon information line at 1-800-523-4439 or call the Ohio Department of Health at 614-466-0061.*

Q: WILL THE PUBLIC GET AN OPPORTUNITY TO COMMENT ON THE REPORT? WILL OUR COMMENTS REALLY MAKE A DIFFERENCE?

A: *Yes. We are asking for public review and comment on the draft Fernald Risk Assessment Report. Your review and comment will help us ensure that we have captured and addressed community health concerns and questions--in the results provided in the report and also in our planning for future work at the FMPC site. All public and scientific review and comment will be addressed in the final version of the Fernald Risk Assessment Report.*

The public review and comment period is 30 days, so all comments are due in to us by April 20, 1998. We will take your comments in any form-- in writing (by mail, facsimile or electronic mail) or by telephone. All public comment is due to Mr. Steve Adams at the Centers for Disease Control and Prevention, Mail Stop F-35, 4770 Buford Highway, NE, Atlanta, GA 30341-3714, (770) 488-7040 (telephone), (770) 488-7044 (facsimile), saa1@cdc.gov (e-mail). To get on CDC's Fernald mailing list, contact Mr. Steve Adams at the address shown at the top of this page.) Please feel free to ask questions or provide public comment on any activity we are conducting or plan to conduct in the Fernald area.