

WASHINGTON STATE'S INNOVATIVE GRANT:
COMMUNITY SUPPORT RADON ACTION TEAM FOR SCHOOLS

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ABSTRACT

In February, 1990, the Environmental Protection Agency awarded the Washington State Department of Health \$100,000 from the State Indoor Radon Grants Program to fund an innovative project titled, "Community Support Radon Action Team for Schools." The Department of Health contributed an additional \$34,000 to the project and organized a team of public and private sector experts. The goal of the team was to write a manual of cooperative and cost-effective approaches school administrators could use to assess and mitigate radon exposure in schools.

The team of federal, state and local experts from the fields of health, education, energy, building science and codes, safety, administration, communication, and radon testing, diagnostics and mitigation, chose to write and evaluate the manual with the cooperation of a school district in northeastern Washington.

The manual includes chapters on administrator's overview, radon facts, radon awareness, radon and liability, strategic planning, public informational materials, school radon testing, building inspection and radon diagnostics, radon mitigation, long-term radon management, and case studies. These chapters and the experience gained in their application in the school district will be discussed.

INTRODUCTION

Despite the identification of elevated radon exposure levels (100 pCi/L) in some buildings in Washington State's five northeastern counties, very few residences, schools or public and commercial buildings have been tested or mitigated. Within the Core Radon Program, the Department of Health (DOH), the State's lead agency responsible for a radon program, has insufficient resources to help school districts that want to tackle their radon problems but lack the funds, organization, staff and technical expertise.

DOH with its State Radon Task Force encourages state agencies, local governing bodies and other organizations to work cooperatively to reduce the public health risk from radon. In discussions with personnel in the school community, government agencies and the private radon industry, DOH found a manual was needed to help schools resolve radon issues. Since a variety of relevant expertise was present in Washington State, a team approach to developing the manual had merit. EPA agreed and awarded funding for DOH's innovative project, "Community Support Radon Action Team."

THE RADON ACTION TEAM

The Community Support Radon Action Team, a group of public and private sector experts, met ten times from March, 1990 to February, 1991 and numerous times in small working groups to develop the **School Radon Action Manual**. The team was composed of health, radon and building science experts from DOH, Region 10 EPA, the Washington Energy Extension Service (WEES), the Spokane County Health District (SCHD) and the City of Spokane Building Services Department (SBSD). Also, Faytek, Inc., Quality Conservation and Thomas J. Gerard & Associates, Inc. from the private sector provided expertise on radon testing, diagnostics and mitigation, and HVAC (heating, ventilation and air conditioning) systems, respectively.

In addition, the school community was represented on the team by a manager of state school facilities from the Office of the State Superintendent of Public Instruction (OSPI); a writer and a safety coordinator from the Education Service District 101 (ESD 101, one of nine regional agencies in Washington providing administrative and instructional support to local school districts); an administrator experienced in school radon testing from Spokane School District 81 (SSD); and an administrator, a public information officer, a supervisor of school maintenance and an HVAC specialist from Central Valley School District 356 (CVSD). The Northwest Regional Foundation (NRF, a private, non-profit

corporation committed to facilitating change in communities) provided a facilitator to help this group of people work as a team to write the manual and evaluate its application in the CVSD. Finally, as a legal consultant, a Washington State Assistant Attorney General (OAG) contributed his expertise about liability.

THE TEAM PROCESS

In initial meetings, team members discussed the project goal, participants' self-interests, the process of radon problem solving in a school community, manual contents, working group assignments and site selections for the case studies in CVSD. The major goal of the team was to compile educational, problem solving and organizational resources in the **School Radon Action Manual**. The manual was designed to help school personnel communicate with their school community about radon and use internal resources as well as the private sector to cost-effectively assess and remediate for radon in their schools.

Radon Action Team members represented a wide variety of expertise and self-interests. Health professionals focussed on the need to communicate the health effects of radon exposure accurately and effectively to the public. School administrators desired to test, diagnose and mitigate for radon in a cost-effective manner while informing and involving their communities. Radon testing professionals demanded a scientific approach that complied with EPA interim protocols. Building science professionals concentrated on each building as an integrated system that demanded careful, logical problem solving techniques as radon and other indoor air quality problems were tackled. Team members decided to cooperatively pool their knowledge and concerns in the manual development realizing they had differences in perspectives and opinions which would be debated during the writing process.

In fact, many vigorous discussions did take place over the course of the year. One often debated question was: How much testing, diagnostics and mitigation work can school personnel accurately and cost-effectively accomplish before they call in the private sector for help? A second question was: How can a school district communicate about radon to its community which often wants problems immediately solved, while the district trains its staff, hires consultants, requests bids, raises funding and plans to remediate radon problems as they are discovered over several years of testing and diagnostics? Team members decided they could provide accurate and concise guidance on such things as radon testing options, building inspection and radon diagnostics, and public informational materials. They concluded, however, that ultimately it would be school administrators with an intimate knowledge of their communities and resources who would answer these questions.

SCHOOL RADON ACTION MANUAL

The **School Radon Action Manual** contains sections designed for school district administrators, public information officers, building managers and maintenance personnel. The manual organization follows a school radon action process (illustrated in Figure 1) recommended by the team. A list of the sections with a summary of their contents follows:

The **"Administrators' Overview"** includes what radon is, where radon is found, what the health risks are and when radon was recognized as a health hazard. Other topics are how radon enters a building, how it is measured, how radon concentrations are reduced and who can perform the radon testing and mitigation. In this section, the team recommends that school district staff involved in radon testing, building diagnostics or mitigation attend an EPA endorsed training course. Also, it is recommended that school district consultants show that they have successfully participated in EPA's Radon Measurement Proficiency Program, or employ individuals who have passed EPA's National Radon Contractor Proficiency Program.

"Radon Facts" gives greater detail on radon discovery, radon and radon progeny, the health effects of radon, the health risk to children and comparisons of school to home exposures.

"Risk Awareness" deals with assessing risk, the nature of radon risk, 4 pCi/L as an action level, the Indoor Radon Abatement Act, the health risk to children and smokers, challenges to EPA's risk estimates, getting to ALARA (As-Low-As-Reasonably-Achievable), managing and communicating radon risk and the risk awareness process.

"Radon and Liability" concludes that health hazards presented by radon and indoor pollution in schools and public buildings may be substantially reduced by technical analysis of the problem and a careful administrative response from management. Failure to initiate the analysis and respond to the problem presents the risk of liability for any school or public institution. Suggestions for a program that schools can develop to deal with radon and other indoor air quality problems are given.

"Strategic Planning" deals with how a school district may develop a plan for dealing with radon in its buildings. Topics covered include prerequisites for planning, action steps, timelines and financing. Formulation of a radon action team is recommended.

"Public Informational Materials" includes internal and external communications strategies utilized by the Central Valley School District as it dealt with radon in its schools. It includes

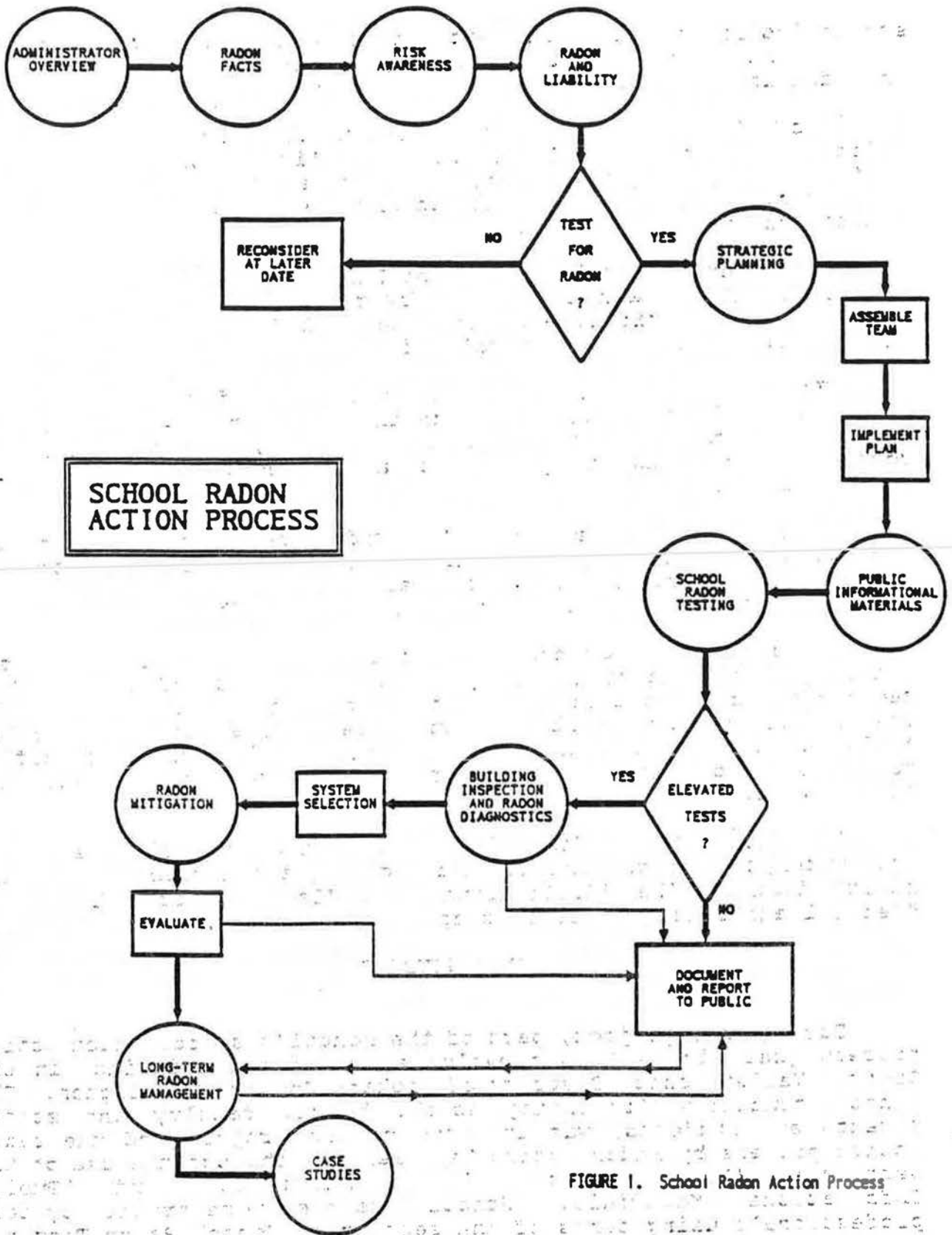


FIGURE 1. School Radon Action Process

strategies for communicating with staff, administrators, students, parents and the news media. Sample press releases and letters are included in this section.

"School Radon Testing" deals with testing school buildings for radon. It provides information on qualifications necessary to perform testing, school district requirements, testing procedures and forms, testing methods with advantages and disadvantages, and evaluation of testing results.

"Building Inspection and Radon Diagnostics" describes how to inspect buildings and perform or oversee diagnostic testing for radon entry locations. It includes checklists for review of testing data and for mechanical and structural inspections.

"Radon Mitigation" provides strategies for mitigation if elevated levels of radon are found in a building. Topics include radon entry, causes of pressure differentials, variations in radon concentrations between rooms, mitigation techniques and dealing with contractors.

"Long-term Radon Management" provides the basics for continual monitoring of indoor air quality, including radon, for the district. Topics include team design, program design, public policy guidelines and documentation.

"Case Studies" documents the application of the manual in six schools in the Central Valley School District (CVSD). This section describes the radon action process that CVSD employed with the manual and team members' expertise. Based on this limited application of the manual in one school district, the team offers suggestions to other school districts about what worked and what didn't work.

The "Glossary" defines key terms school district personnel must understand to communicate meaningfully about radon as a public health issue. The "Bibliography," a "Team Members' List" and "Federal and State Contacts" complete the manual.

CASE STUDIES

During this project, part of the manual's school radon action process (see Figure 1) was evaluated using six buildings in the Central Valley School District of Spokane County, Washington. The school community (including school board, faculty and staff, parents and students) was informed of the project and the radon action process by Radon Action Team members through the use of the sections: "Radon Facts," "Risk Awareness," and "Public Informational Materials." School personnel were trained by team professionals using parts of the sections: "School Radon Testing"

and "Building Inspection and Radon Diagnostics." The manual sections, "Administrator's Overview," "Radon and Liability," "Strategic Planning," "Radon Mitigation," and "Long-Term Radon Management" were still being developed during this time so they were not evaluated in this school district.

Selected for evaluation of the educational, communications, testing and diagnostics processes were three elementary schools, a junior high school, a high school and an administration building. Team members made presentations about the project and the school radon action process at meetings of the school board, administrators, faculty, staff, Parent Teacher Association (PTA) and press. Four junior high science instructors wrote model radon awareness curriculum which they taught and are refining for distribution next summer. Literature on radon was displayed and made available to staff and the public in the building reception areas. Letters were sent home to parents, and articles published in the newspapers. A spirit of openness and cooperation was nurtured by the radon action team and the school administrators.

The team decided to employ charcoal canisters to test the administration building and the high school and electrets to test the other four schools. In both cases, school maintenance personnel were given training from the manual in placing the detectors, retrieving them, and keeping records. Charcoal devices were sent to the manufacturer's lab for analysis while electrets were read by school personnel. Faytek, a private EPA proficient testing company, provided training and oversight throughout the whole testing process.

Elevated radon levels were found in the administration building, high school, and three elementary schools. At the writing of this paper, building inspection and radon diagnostics are in progress by both team members and school personnel. School personnel have provided information about building histories and basic building operation. They have completed some initial mitigation involving sealing cracks and adjusting HVAC systems. Most of the detailed diagnostics is being performed by radon professionals from Quality Conservation, EPA proficient contractors, and a mechanical engineer from Gerard and Associates, all team members. Quality Conservation is in the process of developing remediation plans for two elementary schools and the high school. At the end of the project, a cost analysis of testing with charcoal versus electrets and testing and diagnostics using school personnel with private sector oversight versus private sector only will be made. Due to time and funding limitations, the team's efforts will end after the three remediation plans are given to the Central Valley School District.

SUGGESTIONS FOR SCHOOL PERSONNEL

Although the work on the case studies is still in progress, some preliminary and general suggestions have emerged from the Radon Action Team's work in the Central Valley School District. This school district is to be applauded for its progressive approach to radon problem solving and its offer to share lessons learned from this project with other school districts.

Suggestions are as follows:

As a part of strategic planning, the team recommends that schools assemble a Radon Action Team which incorporates relevant expertise from both the public and private sectors. The team organized for this project provides a model for team member selection (although smaller teams are appropriate for individual school districts). It is important that regular meetings of this team be held and that progress reports be shared with and decisions supported by upper level administrators (school board members, superintendents, district level administrators, and principals) in the school district. As part of the school district's operations strategy, it is recommended that EPA testing protocols should be followed. Decision points and procedures for immediate risk interventions should be developed. Thought should be given to scheduling, and minimizing class disruptions and loss of detectors.

During the public informational process, we suggest that a public information officer or a superintendent be the primary contact for all information requests. This contact person should be a team member, well-informed about radon issues, activities in the schools and the district's strategic plan. Requests for information should be answered accurately, openly and quickly, with a timeline given for the radon action process (eg. when test results will be reported, when buildings will be fixed). A good relationship should be established with the press at the outset of the process. The contact person needs to be flexible, calm and ready to handle "incidents" with concerned individuals and groups. Staff in buildings with preexisting indoor air quality problems may show a heightened interest or sensitivity to radon testing. More communication may be needed. PTA meetings work well to inform parents and faculty. The public information officer should be accompanied by other team members who have expertise in radon health effects, testing, diagnostics and mitigation, to gain public credibility through answering a broad range of questions.

Before a school district begins the radon testing process, school personnel should evaluate the various options for testing, considering cost-effectiveness, available internal and external resources, liability issues and time constraints. These options include use of private testing firms, use of school personnel or a

combination of the two. If school personnel will be involved in performing school radon testing, the team suggests that school personnel (perhaps one or two maintenance personnel) receive EPA approved training. Also, a private, EPA proficient testing company should be employed as a consultant to oversee placement, retrieval, and recording of test results. Quality control procedures must be performed for both charcoal canisters and electrets. If school personnel read electrets, they must have training in appropriate analytical techniques. Forms and computer spreadsheets should be used from the outset to ensure accurate and complete record keeping of data. Building maps should show radon levels for each room and be color coded to make radon hotspots evident. Originals of all data should be kept in one file.

During testing, building inspection and radon diagnostics, plans and maps are required. Team members found that both architectural drawings and AHERA (asbestos) plans were sometimes inaccurate, inadequate or missing altogether. Also, the district public information officer needs to be prepared to control panic from school community members who want immediate action to lower radon levels. Radon diagnostics and mitigation take time and money to perform. Scheduling testing before a holiday such as winter break may give the district more time to perform this process.

SECOND YEAR PLANS FOR THE SCHOOL RADON ACTION MANUAL

The Washington State Department of Health (DOH) has asked EPA for second year funding to design training curriculum and materials for state and national presentations on the **School Radon Action Manual**. In addition, DOH will train instructors from the Community Support Radon Action Team who will be available for presentations to regional and national conferences of school administrators, teachers, facilities maintenance personnel, public relations staff, public health officials, and radon program and industry representatives. Finally, DOH will evaluate and revise the manual by observation of its application in two Demonstration School Districts, a small rural school district and a medium-sized suburban school district.

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