EPA USE OF CHARCOAL CANISTERS TO SUPPORT THE ENVIRONMENTAL JUSTICE PROGRAM

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ABSTRACT

The U.S. Environmental Protection Agency (EPA) conducts an Environmental Justice Program that promotes radon awareness, testing, and when possible mitigation assistance to minorities and low income communities. The Radiation and Indoor Environments National Laboratory (R&IE) in Las Vegas, Nevada, supports this national program by providing diffusion barrier charcoal canisters for radon testing in the communities. Individuals and organizations that receive R&IE charcoal canisters are identified by EPA Headquarters, EPA Regional Offices, and Native American Tribes. Since Fiscal Year 1998, R&IE has distributed 10,674 charcoal canisters to the participating individuals and organizations involved in the Environmental Justice Program, and has received 5,632 charcoal canisters for analysis. Communities in all EPA Regions had homes exceeding 4 Picocuries per liter of air (pCi/l), except Region 5 which did not have communities participating in this program.

INTRODUCTION

The Environmental Justice Program is administered through the Office of Radiation and Indoor Air (ORIA) Headquarters. R&IE plays an integral roll in the program by providing radon test kits (diffusion barrier charcoal canisters) and analyses at no cost to the Environmental Justice partners. The Environmental Justice Program partners currently include nonprofit organizations, national coalitions, state agencies, and Indian Nations. The Environmental Justice partners work closely with R&IE to coordinate the distribution and receipt of test kits and analysis results. Radon test kit procedures were translated into Chinese, Korean, Spanish, and Vietnamese by some of the participating organizations to preclude misunderstanding on placement of the charcoal canisters.

METHODOLOGY

Lead Staff from the Environmental Justice Program partners requested diffusion barrier charcoal canisters from the R&IE Laboratory. The representatives were responsible for distributing the charcoal canisters to the community.

The residents were responsible for deploying the charcoal canisters following established EPA protocol[1] and for sending the charcoal canisters back to the R&IE Laboratory for analysis. Results were sent from the R&IE Laboratory to the appropriate partner staff. Recommendations for resampling[2,3] were forwarded when results were greater than 4 pCi/l[4].

R&IE uses a computer-based counting system for canister measurement and analysis. This system consists of eight Sodium Iodide (NaI) detectors controlled by a Nucleus Personal Computer Analyzer card via a multiplexer-router. The software for this system has been continually upgraded using on-site programming support. Data collection, analysis, storage, and reporting are all performed by proprietary software. Daily system consistency and system background checks are performed before any measurements are made. Measurements are taken in accordance with established procedures[5].

TABLE 1 - REPORT OF ENVIRONMENTAL JUSTICE PROJECTS - ANALYSIS OF CHARCOAL CANISTERS BY REGION (FY 98 - 8/1/2000)

SUMMARY

REGION	Total	>= 4 pCi/l (%)	Avg Conc (pCi/l)	Max Conc (pCi/l)
REGION 1	299	15.7	2.9	51.7
REGION 2	992	49.3	9.6	169.4
REGION 3	1265	8.7	1.8	59.1
REGION 4	2314	4.1	0.9	72.9
REGION 6	312	23.7	2.9	27.1
REGION 7	79	38.0	5.4	39.8
REGION 8	48	43.8	5.7	32.0
REGION 9	105	21.9	3.1	23.3
REGION 10	218	8.3	1.8	64.0
GRAND TOTALS	5632	16.1	3.0	

RESULTS AND DISCUSSION

Table 1 is a results summary from various Environmental Justice partners by EPA regions. The data includes the number of canisters analyzed, results that equal or exceed the EPA recommended action level of pCi/l [2], average concentrations of radon, and the highest level of radon reported for the specific Region. The total data represents results from 5,632 charcoal canisters.

Overall, the results of the 5,632 canisters indicate 16.1 % were equal to or exceeded 4 pCi/l of radon, the highest concentration was 169.4 pCi/l and the overall average concentration of radon was 3.0 pCi/l.

Radon results were found equal to or exceeded 4 pCi/l for all the EPA Regions that participated in the program. The range varied from 4.1 % in Region 4 to 49.3% in Region 2. The lower

percentages were found in Regions 3, 4, and 10. The highest percentages were found in Regions 2, 8, and 7.

The average radon concentrations by Region varied from 0.9 in Region 4 to 9.6 pCi/l in Region 2. The lowest average radon concentrations were in Regions 3, 4, and 10. The highest concentrations were in Regions 2, 7, and 8.

SUMMARY AND CONCLUSION

The Environmental Justice Program=s use of the diffusion barrier charcoal canister provides for an efficient and effective means for short-term radon testing. This program has identified several elevated radon areas within EPA Regions 2 and 8, where nearly half of the returned charcoal canisters exceeded 4 pCi/l.

Out of 10,674 charcoal canisters distributed, R&IE has received 5,632 canisters for analysis. Several organizations requested a significant number of charcoal canisters but they have not returned them for analysis.

EPA Headquarters, Regional Office, and the sponsoring organization must have a policy in place to provide for re-testing or required mitigation. Some problems have occurred when elevated radon concentrations have been identified and no mitigation policy was in effect.

REFERENCES

1. Indoor Radon and Radon Decay Product Measurement Protocols, (EPA 520-1/89-009), Office of Radiation Programs, 1989.

2. Radon Reduction Methods, (OPA-87-010), Office of Research and Development, 1987.

3. Consumer=s Guide to Radon Reduction, (402-K92-003), Air and Radiation 6604J, 1992.

4. U.S. Environmental Protection Agency, ARadiation Protection Guidelines for Federal Agencies@ Federal Register (71-7210), May 1971.

5. NAREL Standard Operating Procedures for Radon-222 Measurement Using Diffusion Barrier Charcoal Canisters (EPA 520/5-90-032), Gray and Windham, 1990.

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