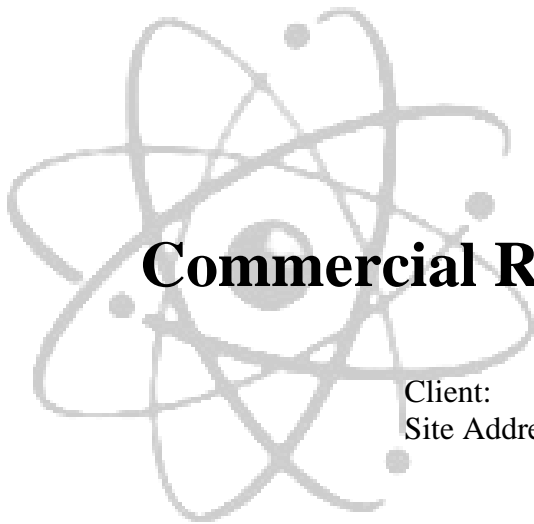


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## **Commercial Radon Survey Report**

Client: Community Consolidated School District 181  
Site Address: Prospect School  
130 N Prospect  
Clarendon Hills, IL 60514  
Survey Date: April 23, 2012 to April 25, 2012

**Initial Test**

RDS-R-002

Prepared by: Kirsten Schmidt  
IL Professional Radon License RNI2006204  
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Client: C.C.S.D. 181  
Site Address: Prospect School, 130 N Prospect,  
Clarendon Hills, IL  
Survey Date: 4/23/12 to 4/25/12

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## Basics of Radon and Radon Health Impacts

Radon is recognized by the United States Environmental Protection Agency (USEPA) as well as the scientific and medical communities as a Class A carcinogen, accounting for 15,000 – 22,000 lung cancer deaths annually. Exposure to radon gas is the leading cause of lung cancer among non-smokers.

Radon is a cancer-causing, naturally occurring, radioactive gas which comes from our soil. It can't be seen, smelled or tasted. The only way to know if the level of radon gas in your building exceeds the recommended action level of 4.0 pCi/L is to test. The Department of Nuclear Safety in Illinois requires those testing for radon in commercial buildings, schools and multi-family housing communities, as well as individual residences, to be licensed.

The amount of radon in the soil depends on soil chemistry, which naturally varies. Radon levels in the soil can range from a few hundred to several thousands of pCi/L (pico Curies per liter of air). The amount of radon that escapes from the soil and enters the building depends on the weather, soil porosity, soil moisture, and the suction within the building.

### **Radon is the leading cause of lung cancer among non-smokers.**

- There is no safe level of radon exposure. Any exposure causes some risk of developing cancer. In two 1999 reports, the National Academy of Sciences (NAS) concluded after an exhaustive review that radon is the second leading cause of lung cancer. Only cigarette smoking poses a greater risk. The NAS estimates that 15,000 to 22,000 Americans die every year from radon-related lung cancer. That's 10% of all lung cancer deaths annually.
- The alpha radiation from radon and its decay products cause damage to the sensitive lung tissue. Most of the radiation dose is not actually from radon itself, but rather from radon's chain of short-lived decay products that are inhaled and lodge in the airways of the lungs. These radionuclides decay quickly, producing other radionuclides that continue damaging the lung tissue. Those particles that are retained long enough release radiation and damage the surrounding lung tissue. It is this damage that can lead to lung cancer.

### **What other health risks are related to radon exposure?**

- No other respiratory ailments are linked to radon exposure
- There are preliminary studies that are looking at the link between radon exposure and the development of Parkinson's and Alzheimer's disease. These are early studies. For more information on this issue, please visit our website and read the press release.



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## **Scope of Work Performed:**

At the request of Jim Prusa, Facilities Coordinator for District 181, RDS performed radon testing at Prospect School, located at 130 N Prospect, Clarendon Hills, Illinois. This scope of work included a 2 day (short-term) radon test in all classrooms, offices, and common use spaces of the subject building.

A total of 51 passive devices were deployed. Of the 51 passive devices deployed, 42 were single measurements, 6 were duplicates and 3 were blanks.

Testing was conducted from Monday, April 23, 2012 to Wednesday, April 25, 2012. The devices used were electret ionization chambers (Eperms™) manufactured by RAD ELEC, Inc. The report includes a table that details all device measurement results. Because radon levels fluctuate hourly, daily, weekly, seasonally and yearly, these results should not be used to estimate radon levels of rooms that were not tested, or to estimate future radon levels of rooms that were tested. Changes to the building components (both structural and mechanical) can effect radon concentrations. Duplicate devices have been averaged together and demonstrate the precision of the measurements.

The testing was conducted in accordance with the Illinois Emergency Management Agency Division of Nuclear Safety (IEMA) and the United States Environmental Protection Agency (USEPA) testing protocols for commercial radon measurements, the device manufacturer's recommendations, and the RDS Quality Assurance Plan.



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## Quality Assurance Plan for this Site

### Pre-Deployment Testing Strategy

Tests will be conducted in all classrooms, offices and common use spaces in the subject building. A minimum of 1 detector will be placed every 2000 square feet in open areas. Tests will not be conducted in rooms that are not frequently occupied such as closets, storage rooms, restrooms, hallways, and stairwells unless the space is considered alterable for future regular use, or the measurement is taken for diagnostic purposes.

### Materials and Methods

RDS will use electret ionization chambers to measure radon levels in the air in the above referenced property. The test will comply with all protocols set forth by IEMA, as well as the RDS Quality Assurance Plan. Duplicate tests will be conducted for not less than 10% of the total single devices placed to measure precision. Field blanks will be deployed for not less than 5% of the total number of tests deployed to measure background gamma radiation. Spike tests will be conducted at a minimum of 3% for the total amount of devices deployed (annually) to measure accuracy. The initial voltage reading will take place not more than 24 hours prior to deployment and the final voltage of the devices will be determined within 24 hours of retrieval.

RDS will locate devices in such a way to limit unintentional interference from building occupants. A walk-through inspection of the building prior to device deployment will allow RDS to document observations regarding radon entry mechanisms and general building pressure gradients. Test results will be reported in picoCuries per liter (pCi/L) of air. The effects of the HVAC system on radon progeny will not be evaluated and working level exposure (WL) will not be calculated during this test.



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## Explanation of Device Results and Site Notes

Appendix A provides a detailed drawing showing device locations, if an appropriate and accurate drawing is provided by the client and dimensional device plotting is possible. If Appendix A is blank, please refer to the Device Placement columns provided in Appendix B (Room Use and Room Number) as an explanation of device locations.

Appendix B identifies all of the devices deployed and their reported radon levels. The results were determined using calculations supplied by the device manufacturer.

**The radon levels were BELOW the recommended action level in all locations tested.** Air exchange rates for the facility were not available at the time of testing. Air exchange rates can affect the radon concentration based on dilution of radon gas.

Notes Regarding Appendix B:

- All radon levels are expressed in picoCuries per liter (pCi/L) of air.
- The building was tested according to IEMA, and USEPA protocol in regard to device placement and analytical methods of calculating results.
- Tampering was not detected at the time the devices were retrieved, unless noted in the Comment Column.
- Devices were placed strategically to reduce accidental interference by building occupants.
- Duplicates are averaged together. It is the average of the two devices upon which decisions with regard to mitigation should be based.

## Site Notes:

1. The subject building was occupied and fully-functional during this initial short-term survey.
2. The subject building is a two-story, brick structure, built slab-on-grade.
3. Upon device retrieval, a window in room 109 was noted to be open. The results for this device are invalid.



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## Survey Summary

The radon levels found during this short-term survey were **BELOW** the USEPA and IEMA Action Level of 4.0 pCi/L.

## Recommendations

Because different ventilation systems and varying seasonal pressures can influence radon levels, it is the recommendation of this testing professional to perform another short-term survey in two years, in an alternate season, to establish a seasonal baseline. If levels continue to be below the Action Level of 4.0 pCi/L, a further recommendation will be made to test the building every five years, again, in alternating seasons.

## A Note About Long-Term Testing

The USEPA and IEMA Action Level of 4.0 pCi/L is based upon an annual average exposure. As a matter of best practice in radon measurement, a long-term test is the best way to determine occupants' annual exposure, because radon levels vary hourly, daily, weekly, seasonally and over the years. Long-term testing (lasting 90 days to one year) provides a better understanding of building radon concentrations and the risks of exposure to radon. Should you choose to engage in long-term testing, please contact us for further details.



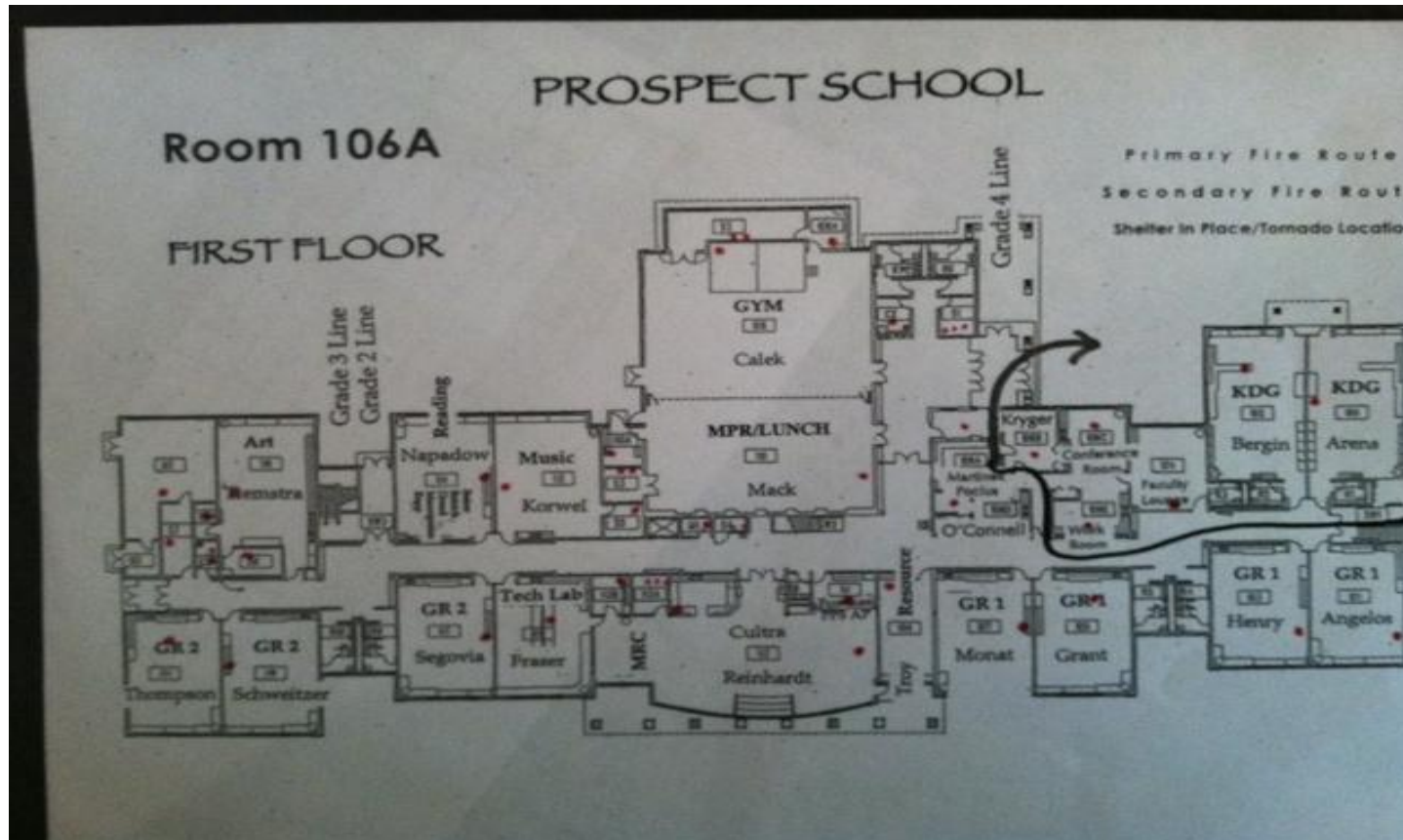
**Radon Detection Specialists** is licensed for both residential and commercial radon testing in Illinois. For more information regarding radon testing and mitigation practices in the state of Illinois, please visit the Illinois Emergency Management Agency Department of Nuclear Safety's website, [www.radon.illinois.gov](http://www.radon.illinois.gov), or call the state of Illinois Radon Program at 217-782-1325.



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## Appendix A: Site Plan Showing Device Locations



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## Appendix B: Individual Device Results Table

Electret	Device Placement			Start			Stop			Exposure Period	Radon Level	Control Measurement	Duplicate Device Avg. Radon Level	Comments
	Foundation	Room Use	Room No.	Date	Time	Volts	Date	Time	Volts	Days	(pCi/L)	Duplicate/Blank	(pCi/L)	
SFS519	Slab	Main Office	106	4/23/12	6:35 AM	241	4/25/12	9:45 AM	235	2.13	0.9			
SGC548	Slab	Principal	106B	4/23/12	6:35 AM	621	4/25/12	9:45 AM	610	2.13	1.9			
SGC504	Slab	Nurse	106D	4/23/12	6:35 AM	586	4/25/12	9:45 AM	578	2.13	1.2			
SDF231	Slab	Conference Room	106C	4/23/12	6:35 AM	218	4/25/12	9:45 AM	211	2.13	1.2			
SFS560	Slab	Work Room	106E	4/23/12	6:40 AM	421	4/25/12	9:45 AM	414	2.13	1.1			
SFS535	Slab	Lounge	104	4/23/12	6:40 AM	495	4/25/12	9:50 AM	488	2.13	1.0			
SGC461	Slab	Classroom	102	4/23/12	6:40 AM	585	4/25/12	9:50 AM	579	2.13	0.8			
SGC556	Slab	Classroom	100	4/23/12	6:40 AM	646	4/25/12	9:50 AM	641	2.13	0.5			
SFS692	Slab	Storage	C13	4/23/12	6:40 AM	403	4/25/12	9:50 AM	390	2.13	2.5			
SFS501	Slab	Storage	C13	4/23/12	6:40 AM	222	4/25/12	9:50 AM	212	2.13	2.0	Duplicate	2.3	

All radon levels are expressed in picoCuries per liter (pCi/L).  
 Results of duplicate devices are averaged to determine the radon level in that location.


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	Foundation	Room Use	Room No.	Date	Time	Volts	Date	Time	Volts	Days	(pCi/L)	Duplicate/Blank	(pCi/L)	
SFS664	Slab	Classroom	101	4/23/12	6:40 AM	345	4/25/12	9:50 AM	338	2.13	1.1			
SFS458	Slab	Classroom	103	4/23/12	6:40 AM	278	4/25/12	9:50 AM	271	2.13	1.2			
SFS463	Slab	Classroom	105	4/23/12	6:45 AM	507	4/25/12	10:30 AM	498	2.16	1.5			
SGC563	Slab	Classroom	107	4/23/12	6:45 AM	539	4/25/12	9:50 AM	531	2.13	1.3			
SFS556	Slab	Classroom	109	4/23/12	6:45 AM	358	4/25/12	9:50 AM	349	2.13	1.6			Invalid device; Please see Site Notes
SFS682	Slab	District Nurse	111	4/23/12	6:45 AM	338	4/25/12	9:55 AM	331	2.13	1.1			
SGI123	Slab	MRC East	113	4/23/12	6:45 AM	747	4/25/12	9:55 AM	743	2.13	0.3			
SGC549	Slab	MRC Circulation	113	4/23/12	6:50 AM	424	4/25/12	9:55 AM	422	2.13	-0.1			Below the Lower Limits of Detection
SGI015	Slab	MRC Office	113A	4/23/12	6:50 AM	727	4/25/12	9:55 AM	724	2.13	0.0			
SGC453	Slab	MRC Office	113A	4/23/12	6:50 AM	606	4/25/12	9:55 AM	599	2.13	1.0	0.5	Duplicate	

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	Foundation	Room Use	Room No.	Date	Time	Volts	Date	Time	Volts	Days	(pCi/L)	Duplicate/Blank	(pCi/L)	
SGH872	Slab	MRC Office	113A	4/23/12	6:50 AM	748	4/25/12	9:55 AM	748	2.13	-0.6	Blank		
SFS661	Slab	MDF	113B	4/23/12	6:50 AM	394	4/25/12	9:55 AM	387	2.13	1.1			
SFS710	Slab	Tech Lab	115	4/23/12	6:50 AM	511	4/25/12	9:55 AM	507	2.13	0.3			
SGH834	Slab	Classroom	117	4/23/12	6:50 AM	735	4/25/12	9:55 AM	728	2.13	0.9			
SDF066	Slab	Classroom	119	4/23/12	6:50 AM	354	4/25/12	10:00 AM	347	2.13	1.1			
SGH853	Slab	Classroom	121	4/23/12	6:55 AM	749	4/25/12	10:00 AM	743	2.13	0.7			
SDM742	Slab	Storage	S7	4/23/12	6:55 AM	493	4/25/12	10:00 AM	489	2.13	0.3			
SFS509	Slab	Boiler	M2	4/23/12	6:55 AM	296	4/25/12	10:00 AM	291	2.13	0.6			
SGC535	Slab	Custodian Closet	C3	4/23/12	6:55 AM	545	4/25/12	10:00 AM	539	2.13	0.8			
SGC391	Slab	Custodian Closet	C3	4/23/12	6:55 AM	456	4/25/12	10:00 AM	448	2.13	1.3	1.1	Duplicate	

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	Foundation	Room Use	Room No.	Date	Time	Volts	Date	Time	Volts	Days	(pCi/L)	Duplicate/Blank	(pCi/L)	
SFS615	Slab	Art	116	4/23/12	6:55 AM	267	4/25/12	10:00 AM	258	2.13	1.7			
SFS484	Slab	Kiln Room	116A	4/23/12	6:55 AM	458	4/25/12	10:00 AM	450	2.13	1.3			
SFS451	Slab	Art Storage	S6	4/23/12	6:55 AM	355	4/25/12	10:00 AM	349	2.13	0.9			
SGH710	Slab	Classroom	114	4/23/12	7:00 AM	694	4/25/12	10:00 AM	689	2.13	0.5			
SGH734	Slab	Music	112	4/23/12	7:00 AM	718	4/25/12	10:00 AM	711	2.13	0.9			
SGH651	Slab	Music Storage	S5	4/23/12	7:00 AM	747	4/25/12	10:05 AM	740	2.13	0.9			
SGC452	Slab	Elevator Equipment	M1	4/23/12	7:00 AM	649	4/25/12	10:05 AM	635	2.13	2.6			
SFS662	Slab	Storage	S4	4/23/12	7:00 AM	460	4/25/12	10:05 AM	452	2.13	1.3			
SFS496	Slab	Storage	S4	4/23/12	7:00 AM	331	4/25/12	10:05 AM	322	2.13	1.6	1.5	Duplicate	
SFS511	Slab	MPR East	110	4/23/12	7:05 AM	240	4/25/12	10:10 AM	233	2.13	1.2			

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	Foundation	Room Use	Room No.	Date	Time	Volts	Date	Time	Volts	Days	(pCi/L)	Duplicate/Blank	(pCi/L)	
SFS709	Slab	MPR Storage	S3	4/23/12	7:05 AM	367	4/25/12	10:10 AM	361	2.13	0.9			
SDF079	Slab	MPR Storage	S3	4/23/12	7:05 AM	206	4/25/12	10:10 AM	206	2.13	-0.6	Blank		
SGC460	Slab	Kitchen	110A	4/23/12	7:05 AM	579	4/25/12	10:10 AM	573	2.13	0.8			
SGC359	Slab	MPR Stage	110	4/23/12	7:10 AM	498	4/25/12	10:05 AM	494	2.12	0.3			
SGC589	Slab	MPR Storage	S2	4/23/12	7:10 AM	484	4/25/12	10:05 AM	477	2.12	1.1			
SGH716	Slab	MPR Storage	S2	4/23/12	7:10 AM	727	4/25/12	10:05 AM	721	2.12	0.7			
SGH821	Slab	Gym Office	108A	4/23/12	7:10 AM	769	4/25/12	10:05 AM	762	2.12	0.9			
SFS474	Slab	Custodial	C2	4/23/12	7:10 AM	439	4/25/12	10:05 AM	432	2.12	1.1			
SGC524	Slab	Storage	S1	4/23/12	7:15 AM	607	4/25/12	10:05 AM	598	2.12	1.5			
SGI135	Slab	Storage	S1	4/23/12	7:15 AM	740	4/25/12	10:05 AM	728	2.12	2.1	Duplicate	1.8	

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	Foundation	Room Use	Room No.	Date	Time	Volts	Date	Time	Volts	Days	(pCi/L)	Duplicate/Blank	(pCi/L)	
SGC390	Slab	Storage	S1	4/23/12	7:15 AM	598	4/25/12	10:05 AM	598	2.12	-0.6	Blank		

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