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## INDUSTRIAL HYGIENE RADON REPORT

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### South High School and Howard Street Charter School RADON TESTING SAMPLE REPORT

Report to: Vonnie B. Good, EHS Salem Keizer School District

By: Kathy Ellis, Senior Industrial Hygiene Consultant

Reviewed By: DeEtta Burrows, MSPH, CIH – Wise Steps, Inc.

On-site: November 19–22, 2013

Report: December 2, 2013

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#### **PURPOSE**

Radon monitoring was done to measure the background levels in all classrooms, offices and staff work rooms that are in contact with the ground or below ground level. Howard Street Charter School is housed within the South High School Building, so the testing for this school is included in the report.

#### **CONCLUSION and RECOMMENDATION**

The classrooms and rooms associated with Howard Street Charter School had low to no detectable levels of radon.

In South High School, testing in Classroom 118 identified a radon level of 4.4 pCi/l. The presence of this radon level may be related to the radiator pipe tunnel located below these rooms.

It is recommended that this room in South High School be retested. Also, the tunnel should be tested to determine if this is the pathway of radon gas entering the classroom. Check with Maintenance and Facilities HVAC technicians to make sure the supply air vents or dampers within the ductwork have not been closed and are supplying recommended levels of outside air.

#### **TESTING**

Radon Air-Chek short-term test devices were used in each location by placing the device 5-6 feet above the floor, where it is not in direct contact with airflow from the ventilation system, windows or exterior doors. Staff were requested to keep windows closed during the testing.

These short-term devices work by trapping room air inside the grains of charcoal within the devices, meaning that live radon gas is being captured. The analysis is performed by measuring the radiation emitted from the charcoal, which is proportional to the amount of radon that was present in the room air.

The testing occurred from Tuesday November 19 to Friday November 22, 2013 during normal and routine operation of the school.

### **BACKGROUND ON RADON**

Radon is a gas that occurs in nature, seeping up from the earth. It is odorless, colorless and tasteless. Radon comes from the natural breakdown, or radioactive decay, from Uranium 238. The half-life of an individual element is relatively short. Within two weeks, about 90% of a given amount of radon gas will be gone. However, the actual health concern is for the radon decay products, called radon progeny, which carry a small static charge that allows their attachment to water vapor, dust and smoke particles in the air.

The Radon progeny can become lodged in the lung tissue when they are inhaled, and it is these particles' further radiation decay that is associated with potential lung cancer effects.

Radon can seep into buildings or schools through cracks in slab floors or porous cinderblock. It can enter around loose-fitting drainage pipes or through sump pumps. Pressure differential between the building and the soil surrounding the foundation can draw soil gases into the building.

The US EPA has set an Action Level of 4.0 pCi/L. At or above this level of radon, the EPA recommends that corrective measures should be taken to reduce the exposure to radon gas. These actions include:

Step 1 If your result is 4.0 pCi/L or higher, take a follow-up test (Step 2) to be sure.

Step 2. Follow up with either a long-term test or a second short-term test

### **CONTROL OF RADON LEVELS IN SCHOOLS**

The major control mechanism for lowering radon levels within school buildings is the use of dilution ventilation, if the amount of outside air delivered into a building increases, the radon levels should decrease.

### **SAMPLE RESULTS**

Only one test location was above the EPA's Action Level of 4.0 picoCuries per liter (pCi/l). That location was Classroom 118 with a radon level of 4.4 pCi/l. There was one other location with slightly elevated radon levels, the office in Classroom 117 with a radon level of 2.4 pCi/l.

November 26, 2013

**\*\* LABORATORY ANALYSIS REPORT \*\***

Radon test result report for:  
**SK**  
**SOUTH HS**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
4601961	100C	2013-11-19 @ 3:00 pm	2013-11-22 @ 3:00 pm	< 0.3	2013-11-26
4601963	100D	2013-11-19 @ 3:00 pm	2013-11-22 @ 3:00 pm	0.8	2013-11-26
4601964	100E	2013-11-19 @ 3:00 pm	2013-11-22 @ 3:00 pm	< 0.3	2013-11-26
4601965	100F SRO	2013-11-19 @ 3:00 pm	2013-11-22 @ 3:00 pm	0.9	2013-11-26
4601966	100G	2013-11-19 @ 3:00 pm	2013-11-22 @ 3:00 pm	0.5	2013-11-26
4601967	100H ATTEND1	2013-11-19 @ 4:00 pm	2013-11-22 @ 3:00 pm	0.6	2013-11-26
4601970	106	2013-11-19 @ 4:00 pm	2013-11-22 @ 3:00 pm	< 0.3	2013-11-26
4601972	107	2013-11-19 @ 4:00 pm	2013-11-22 @ 3:00 pm	< 0.3	2013-11-26
4601974	108	2013-11-19 @ 4:00 pm	2013-11-22 @ 3:00 pm	0.5	2013-11-26
4601975	109	2013-11-19 @ 4:00 pm	2013-11-22 @ 3:00 pm	< 0.3	2013-11-26
4601976	110	2013-11-19 @ 4:00 pm	2013-11-22 @ 3:00 pm	0.6	2013-11-26
4601977	111	2013-11-19 @ 4:00 pm	2013-11-22 @ 3:00 pm	< 0.3	2013-11-26
4601978	111 OFFICE	2013-11-19 @ 4:00 pm	2013-11-22 @ 3:00 pm	< 0.3	2013-11-26
4601979	112	2013-11-19 @ 4:00 pm	2013-11-22 @ 3:00 pm	< 0.3	2013-11-26
4601980	112 OFFICE	2013-11-19 @ 4:00 pm	2013-11-22 @ 3:00 pm	0.7	2013-11-26
4601983	113	2013-11-19 @ 4:00 pm	2013-11-22 @ 3:00 pm	< 0.3	2013-11-26
4601982	113 INTERIOR OFF	2013-11-19 @ 4:00 pm	2013-11-22 @ 3:00 pm	< 0.3	2013-11-26
4601985	113 WINDOW OFF	2013-11-19 @ 4:00 pm	2013-11-22 @ 3:00 pm	0.8	2013-11-26
4601986	116	2013-11-19 @ 4:00 pm	2013-11-22 @ 3:00 pm	0.8	2013-11-26
4601989	117	2013-11-19 @ 4:00 pm	2013-11-22 @ 3:00 pm	1.1	2013-11-26
4601990	117 OFFICE	2013-11-19 @ 4:00 pm	2013-11-22 @ 3:00 pm	2.4	2013-11-26
4601991	118	2013-11-19 @ 4:00 pm	2013-11-22 @ 3:00 pm	4.4	2013-11-26
4601981	128	2013-11-19 @ 4:00 pm	2013-11-22 @ 3:00 pm	< 0.3	2013-11-26
4601973	132	2013-11-19 @ 4:00 pm	2013-11-22 @ 3:00 pm	< 0.3	2013-11-26
4601971	133	2013-11-19 @ 4:00 pm	2013-11-22 @ 3:00 pm	0.6	2013-11-26
4601969	134	2013-11-19 @ 4:00 pm	2013-11-22 @ 3:00 pm	0.6	2013-11-26
4601948	160	2013-11-19 @ 3:00 pm	2013-11-22 @ 3:00 pm	1.3	2013-11-26
4601949	161	2013-11-19 @ 3:00 pm	2013-11-22 @ 3:00 pm	0.9	2013-11-26
4601950	161F	2013-11-19 @ 3:00 pm	2013-11-22 @ 3:00 pm	0.8	2013-11-26
4601953	163	2013-11-19 @ 3:00 pm	2013-11-22 @ 3:00 pm	0.8	2013-11-26
4601951	163L	2013-11-19 @ 3:00 pm	2013-11-22 @ 3:00 pm	< 0.3	2013-11-26
4601952	163M	2013-11-19 @ 3:00 pm	2013-11-22 @ 3:00 pm	0.8	2013-11-26
4601958	18A	2013-11-19 @ 3:00 pm	2013-11-22 @ 3:00 pm	< 0.3	2013-11-26
4601959	21	2013-11-19 @ 3:00 pm	2013-11-22 @ 3:00 pm	1.4	2013-11-26
4601968	ATTENDANCE 2	2013-11-19 @ 4:00 pm	2013-11-22 @ 3:00 pm	< 0.3	2013-11-26
4601944	B4	2013-11-19 @ 3:00 pm	2013-11-22 @ 3:00 pm	< 0.3	2013-11-26
4601943	B8	2013-11-19 @ 3:00 pm	2013-11-22 @ 3:00 pm	1.2	2013-11-26

Air Chek, Inc. 1936 Butler Bridge Rd, Mills River, NC 28759-3892 Phone: (828) 684-0893 Fax: (828) 684-8498

November 26, 2013

**\*\* LABORATORY ANALYSIS REPORT \*\***

Radon test result report for:  
**SK**  
**SOUTH/HOWARD**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
4601945	B2	2013-11-19 @ 3:00 pm	2013-11-22 @ 3:00 pm	< 0.3	2013-11-26
4601946	B3	2013-11-19 @ 3:00 pm	2013-11-22 @ 3:00 pm	0.5	2013-11-26

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