



Testing, Mitigation, System Design
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Radon Survey Analysis Job# 19-C119R

for

Central Point School District Crater High School

c/o Dale Giovannetti

property located at

655 N 3rd St

Central Point OR 97502

January 24, 2020



STATE OF OREGON
CERTIFIED
EMERGING SMALL BUSINESS

ESB#10782

Introduction

The following report documents a study of radon levels for the property located at 655 N 3rd St Central Point OR 97502. The goal of this study is to determine indoor radon levels for all areas in contact with the ground. Testing was performed per Oregon Health Authority School Testing Protocols.

Analysis assumes that the buildings tested were maintained under “closed-building” conditions (windows closed and exterior doors shut immediately after entering and exiting), as well as normal indoor temperatures, for the duration of the testing period. The H-VAC system for each building was set to normal occupied settings for the entirety of the testing period.

Conclusions and Recommendations

Test was a “Short-Term” test, with minimum duration of 60 hours. See the chart below of areas in buildings that were tested, and the corresponding levels found. All current test results are provided in Table 1. Maps of the test levels are provided in Appendix A. Note that all one-hundred and seventy-three (173) locations tested had results below the USEPA Action Level of 4.0 pCi/L. Four test locations were missing at pickup.

No mitigation action is recommended at this time. While the USEPA recommends buildings be fixed if the radon level is 4.0 pCi/L or more, because there is no known safe level of exposure to radon, the US EPA also suggests individuals consider fixing buildings for radon levels between 2.0 pCi/L and 4.0 pCi/L.

This report represents the average radon concentration for the period that testing was and at the specific location(s) within the building. The concentration of radon gas in indoor air can vary widely; it fluctuates daily, seasonally, and with weather conditions. Indoor radon levels may be affected by barometric pressure, strong winds, rain-soaked ground, snow cover, heating and A/C systems, building construction, open windows, and the like. For further confirmation of average, long-term radon levels, it is suggested that long-term, Alpha-Track type radon testing be performed.

NOTE: It is recommended that any building indicating low radon values be retested at least every 5 years. In areas where mitigation has been performed, it is recommended to test using long-term testing at least every 2 years.

Radon Level Measurements

The building tested was assumed occupied during testing. The measurement technique used (208) AirChek activated charcoal kits.

Test Start Date: 12/17/2019

Test End Date: 12/20/2019

Measurements of radon levels were made in the following areas:

Table 1: Results

Room	Floor	Kit ID #	Test Start Time	Test End Time	Result (pCi/L)
359	1	9336001	01:04 PM	09:41 AM	0.3
602	1	Duplicate Avg*	02:05 PM	10:03 AM	0.5
604 shirt	1	9336011	01:52 PM	09:57 AM	0.3
601	1	9336012	02:02 PM	10:01 AM	0.3
Student services classroom	1	9336013	01:46 PM	09:55 AM	0.3
604	1	9336019	01:50 PM	09:57 AM	0.3
603 office	1	Duplicate Avg*	01:56 PM	09:58 AM	0.3
601 b	1	9336023	02:03 PM	10:02 AM	0.5
300 supply	1	9336035	12:57 PM	09:37 AM	0.3
355	1	9336036	01:01 PM	09:39 AM	0.5
602 b	1	9336037	02:03 PM	10:02 AM	0.3
359b	1	9336039	01:06 PM	09:41 AM	0.3
604 office	1	9336040	01:49 PM	09:56 AM	0.6
301	1	9336045	12:46 PM	09:34 AM	0.8
302 b	1	9336046	12:47 PM	09:33 AM	0.5
302c	1	9336047	12:48 PM	09:35 AM	0.7
351	1	9336048	12:51 PM	09:35 AM	0.3
302	1	9336049	12:43 PM	09:32 AM	0.3
303	1	9336050	12:49 PM	09:35 AM	0.3
302 office	1	9336051	12:44 PM	09:33 AM	0.3
352	1	9336053	12:54 PM	09:36 AM	0.3
300 lobby	1	9336054	12:56 PM	09:37 AM	0.3
300 ged test	1	9336055	12:55 PM	09:36 AM	0.3
357	1	9336056	01:03 PM	09:39 AM	0.3
Wtp office 300	1	Duplicate Avg*	12:59 PM	09:38 AM	0.5
800 b office	1	9336060	02:22 PM	10:08 AM	0.3
800 b	1	9336061	02:21 PM	10:07 AM	0.3
Ne cafeteria	1	9336062	01:41 PM	09:54 AM	0.3
206a	1	9336063	12:36 PM	09:29 AM	0.3
207	1	9336064	12:37 PM	09:29 AM	0.8

Room	Floor	Kit ID #	Test Start Time	Test End Time	Result (pCi/L)
206	1	9336065	12:35 PM	09:28 AM	0.7
201	1	9336066	12:24 PM	09:25 AM	0.7
208	1	9336067	12:40 PM	09:30 AM	0.3
204	1	Duplicate Avg*	12:30 PM	09:26 AM	0.6
205	1	9336070	12:34 PM	09:27 AM	0.3
202 a	1	9336071	12:28 PM	09:26 AM	0.3
203	1	9336072	12:28 PM	09:26 AM	0.3
204a	1	9336073	12:33 PM	09:27 AM	0.3
356	1	9336074	01:02 PM	09:39 AM	0.3
603 break	1	9336075	01:58 PM	-	Missing
800 a office	1	9336076	02:20 PM	10:08 AM	0.3
800 a classroom	1	9336077	02:18 PM	10:08 AM	0.3
358	1	9336078	01:04 PM	09:40 AM	0.3
South cafeteria	1	9336079	01:41 PM	-	Missing
Boys dressing room	1	9336080	01:20 PM	09:48 AM	0.3
202	1	9336082	12:27 PM	09:25 AM	0.6
Green room	1	9336083	01:22 PM	09:49 AM	0.3
Auditorium office	1	9336084	01:13 PM	-	Missing
Auditorium	1	9336085	01:28 PM	-	Missing
Stage	1	Duplicate Avg*	01:24 PM	09:50 AM	0.3
North cafeteria	1	9336087	01:41 PM	09:54 AM	0.3
Prop room auditorium	1	9336089	01:18 PM	10:32 AM	0.3
Kitchen office	1	Duplicate Avg*	01:34 PM	09:52 AM	0.3
Kitchen	1	9336093	01:36 PM	09:53 AM	0.3
Auditorium lobby	1	9336094	01:15 PM	09:45 AM	0.3
604 addition	1	9336095	01:53 PM	09:56 AM	0.3
Dressing room girls	1	9336096	01:19 PM	09:48 AM	0.3
603	1	9336098	01:55 PM	09:59 AM	0.3
Se cafeteria	1	9336099	01:41 PM	09:54 AM	0.3
Dish room	1	9336100	01:37 PM	09:52 AM	0.3

Room	Floor	Kit ID #	Test Start Time	Test End Time	Result (pCi/L)
Gym S	1	9336370	09:52 AM	08:14 AM	0.3
Training room	1	9336371	09:16 AM	10:18 AM	1.0
Boys locker room	1	9336373	09:05 AM	10:17 AM	0.3
Team room 1	1	9336374	09:08 AM	10:16 AM	0.6
Gym NE	1	9336375	09:47 AM	08:16 AM	0.3
Mat room 2	2	9336376	09:43 AM	08:20 AM	0.6
13	1	Duplicate Avg*	11:14 AM	08:59 AM	0.3
Mat room	2	9336378	09:41 AM	08:19 AM	0.3
Therapy office 2	1	9336379	08:49 AM	08:34 AM	0.3
Girls PE coach dressing rm	1	9336380	09:25 AM	10:14 AM	1.3
Team room 2	1	9336381	09:08 AM	10:20 AM	0.3
50	1	Duplicate Avg*	08:54 AM	08:40 AM	0.4
Girls PE office	1	9336383	09:24 AM	10:13 AM	1.2
Team room 3	1	9336384	09:10 AM	10:19 AM	0.6
Sw gym	1	9336385	09:51 AM	08:15 AM	0.3
West gym	1	9336386	09:50 AM	08:18 AM	0.3
Nw gym	1	9336387	09:48 AM	08:17 AM	0.5
Nurse	1	9336388	08:45 AM	08:31 AM	0.3
Weight room SW	1	9336389	09:29 AM	10:21 AM	0.8
Boys PE coach 2	1	9336390	09:13 AM	10:19 AM	0.6
54	1	9336391	08:38 AM	08:29 AM	0.3
51	1	9336392	08:44 AM	08:31 AM	0.3
26	1	9336393	12:06 PM	09:21 AM	0.3
Coach dressing room	1	9336395	09:14 AM	10:25 AM	0.7
Gym N	1	9336398	09:53 AM	08:17 AM	0.3
Girls locker room	1	9336399	09:22 AM	10:12 AM	0.9
Girls team room 2	1	9336400	09:21 AM	10:13 AM	0.7
23 teachers room	1	9336401	11:36 AM	09:08 AM	0.3
Girls team room 1	1	9336402	09:20 AM	10:12 AM	1.1
PE coach boys 1	1	9336404	09:11 AM	10:19 AM	0.5

Room	Floor	Kit ID #	Test Start Time	Test End Time	Result (pCi/L)
25	1	9336405	12:03 PM	09:22 AM	0.5
25 b	1	9336406	12:04 PM	09:23 AM	0.7
52 office	1	9336407	08:51 AM	08:35 AM	0.3
52	1	9336408	08:52 AM	08:35 AM	0.3
23 computer	1	9336410	11:36 AM	09:09 AM	0.3
59	1	9336411	08:29 AM	08:25 AM	0.3
54 office	1	9336412	08:40 AM	08:30 AM	0.3
Athletic director	1	9336413	11:48 AM	10:30 AM	0.3
100	2	9336414	09:39 AM	08:18 AM	0.7
Track team room	1	9336415	09:06 AM	10:17 AM	0.5
Weight room NW	1	9336416	09:28 AM	10:22 AM	0.8
Therapy office	1	9336418	08:48 AM	08:32 AM	0.5
22	1	9336420	11:25 AM	09:04 AM	0.5
19	1	9336421	11:32 AM	09:07 AM	0.3
Band	1	9336423	08:25 AM	08:23 AM	0.5
60	1	9336424	08:27 AM	08:25 AM	0.3
Exam room 2	1	9336425	08:47 AM	08:33 AM	0.3
56 office	1	9336426	08:37 AM	08:28 AM	0.3
Exam room 1	1	9336428	08:46 AM	08:32 AM	0.3
55	1	9336429	08:34 AM	08:27 AM	0.3
57	1	Duplicate Avg*	08:32 AM	08:26 AM	0.5
58	1	9336431	08:30 AM	08:26 AM	0.3
Band office	1	9336432	08:24 AM	08:23 AM	0.3
56	1	9336433	08:36 AM	08:28 AM	0.3
37	1	Duplicate Avg*	10:25 AM	08:45 AM	0.3
18	1	9336435	11:27 AM	09:05 AM	0.6
Conference A	1	Duplicate Avg*	11:45 AM	09:11 AM	0.3
Laclinica counselor office	1	9336437	10:46 AM	08:50 AM	0.3
6b	1	9336438	10:41 AM	08:11 AM	0.3
44	1	9336439	10:28 AM	10:27 AM	0.3

Room	Floor	Kit ID #	Test Start Time	Test End Time	Result (pCi/L)
Library	1	Duplicate Avg*	10:49 AM	08:46 AM	0.6
14	1	9336441	11:17 AM	09:00 AM	0.3
Deaf and hard of hearing	1	9336442	10:45 AM	08:49 AM	0.3
Principal CHS	1	9336443	11:52 AM	09:14 AM	0.3
9	1	Duplicate Avg*	11:02 AM	08:54 AM	0.5
Business secretary	1	9336446	11:47 AM	09:12 AM	0.3
Library office	1	9336448	10:51 AM	08:48 AM	0.3
16	1	9336449	11:11 AM	08:58 AM	0.3
Student waiting	1	9336450	11:49 AM	09:12 AM	0.3
SSC	1	9336451	11:53 AM	09:13 AM	0.3
3	1	9336452	10:36 AM	08:10 AM	0.3
Counselor	1	9336453	10:57 AM	10:16 AM	0.3
20	1	9336454	11:33 AM	09:07 AM	0.3
12	1	9336455	11:09 AM	08:57 AM	0.3
12 office	1	9336456	11:10 AM	08:56 AM	0.3
21	1	Duplicate Avg*	11:29 AM	09:06 AM	0.3
44 office	1	9336459	10:29 AM	10:27 AM	0.3
38 b	1	9336460	10:23 AM	08:44 AM	0.3
33	1	9336461	11:21 AM	09:02 AM	0.3
38 a	1	9336462	10:22 AM	08:44 AM	0.3
7	1	9336463	10:59 AM	08:52 AM	0.6
Book room	1	9336464	10:53 AM	08:47 AM	0.3
Book keeping	1	9336465	11:56 AM	09:09 AM	0.3
24	1	9336466	11:58 AM	09:20 AM	0.3
8	1	9336467	11:00 AM	08:52 AM	0.3
34	1	9336468	11:19 AM	09:02 AM	0.3
36	1	9336469	10:53 AM	08:47 AM	0.3
10	1	9336470	11:05 AM	08:53 AM	0.3
11	1	9336471	11:00 AM	08:53 AM	0.3
6a	1	9336472	10:39 AM	08:12 AM	0.3

Room	Floor	Kit ID #	Test Start Time	Test End Time	Result (pCi/L)
27	1	9336473	12:01 PM	09:21 AM	0.3
CHS lobby	1	9336474	11:55 AM	09:10 AM	0.3
17	1	9336475	11:24 AM	09:03 AM	0.3
33 kitchen	1	9336476	11:22 AM	09:02 AM	0.3
4	1	9336477	10:38 AM	08:11 AM	0.3
Staff area	1	9336478	10:42 AM	08:12 AM	0.3
28	1	9336479	12:00 PM	09:21 AM	0.3
1	1	9336481	10:33 AM	08:04 AM	0.3
2	1	Duplicate Avg*	10:35 AM	08:09 AM	0.3
Caps reception	1	9336483	10:32 AM	08:04 AM	0.3
Maintenance office	1	9336485	10:03 AM	08:37 AM	0.3
46	1	Duplicate Avg*	10:06 AM	08:39 AM	0.3
Caps lobby	1	9336487	10:30 AM	08:06 AM	0.3
39	1	9336489	10:20 AM	08:43 AM	0.3
48	1	9336490	10:08 AM	08:36 AM	0.3
Renaissance Principal	1	Duplicate Avg*	10:12 AM	08:41 AM	0.3
43	1	9336495	10:15 AM	08:42 AM	0.3
42	1	9336496	10:15 AM	08:42 AM	0.3
47	1	9336497	10:04 AM	08:37 AM	0.3
49	1	9336499	10:09 AM	08:36 AM	0.3
41	1	9336500	10:18 AM	08:43 AM	0.3

Land Lab

Room	Floor	Kit ID #	Test Start Time	Test End Time	Result (pCi/L)
Land lab a	1	Duplicate Avg*	02:34 PM	10:41 AM	1.4
Land lab b	1	9336044	02:36 PM	10:43 AM	1.1

Duplicate measurements were conducted as a means to assess the precision of the test measurements. The criteria of acceptance is that the average relative percent difference (ARPD) of the results of the two measurement results for results whose averages are greater than 4.0pCi/L, should be within 25%. The results of the collated duplicates are provided in Table 2. The applicable ARPD for this survey was not applicable and is thus in compliance.

Table 2: *Duplicate Table

Room	Kit ID#	Test Start Time	Test End Time	Result (pCi/L)	Average (pCi/L)	Avg > 3.9 pCi/L?	RPD %
57	9336430	08:32 AM	08:26 AM	0.6	0.5	No	N/A
	9336427	08:32 AM	08:26 AM	0.3			
50	9336382	08:54 AM	08:40 AM	0.5	0.4	No	N/A
	9336417	08:54 AM	08:40 AM	0.3			
Training Room	9336371	09:16 AM	10:18 AM	0.9	1.0	No	N/A
	9336372	09:17 AM	10:18 AM	1.1			
46	9336486	10:06 AM	08:39 AM	0.3	0.3	No	N/A
	9336491	10:06 AM	08:39 AM	0.3			
Renaissance Principal	9336492	10:12 AM	08:41 AM	0.3	0.3	No	N/A
	9336494	10:12 AM	08:41 AM	0.3			
37	9336434	10:25 AM	08:45 AM	0.3	0.3	No	N/A
	9336480	10:25 AM	08:45 AM	0.3			
2	9336482	10:35 AM	08:09 AM	0.3	0.3	No	N/A
	9336484	10:35 AM	08:09 AM	0.3			
Library	9336440	10:49 AM	08:46 AM	0.6	0.6	No	N/A
	9336447	10:49 AM	08:46 AM	0.5			
9	9336444	11:02 AM	08:54 AM	0.3	0.5	No	N/A
	9336458	11:02 AM	08:54 AM	0.6			
13	9336377	11:14 AM	08:59 AM	0.3	0.3	No	N/A
	9336419	11:15 AM	08:59 AM	0.3			
21	9336457	11:29 AM	09:06 AM	0.3	0.3	No	N/A
	9336488	11:29 AM	09:06 AM	0.3			
Conference A	9336436	11:45 AM	09:11 AM	0.3	0.3	No	N/A
	9336409	11:45 AM	09:11 AM	0.3			
204	9336068	12:30 PM	09:26 AM	0.6	0.6	No	N/A
	9336069	12:30 PM	09:26 AM	0.6			
WTP 300 Office	9336057	12:59 PM	09:38 AM	0.3	0.5	No	N/A
	9336058	01:00 PM	09:38 AM	0.7			

Room	Kit ID#	Test Start Time	Test End Time	Result (pCi/L)	Average (pCi/L)	Avg > 3.9 pCi/L?	RPD %
Stage	9336086	01:24 PM	09:50 AM	0.3	0.3	No	N/A
	9336088	01:24 PM	09:50 AM	0.3			
Kitchen office	9336091	01:34 PM	09:52 AM	0.3	0.3	No	N/A
	9336092	01:34 PM	09:52 AM	0.3			
603 Office	9336021	01:56 PM	09:58 AM	0.3	0.3	No	N/A
	9336022	01:56 PM	09:58 AM	0.3			
602	9336006	02:05 PM	10:03 AM	0.6	0.5	No	N/A
	9336024	02:06 PM	10:03 AM	0.3			
Land Lab A	9336043	02:34 PM	10:41 AM	1.4	1.4	No	N/A
	9336059	02:35 PM	10:41 AM	1.4			
		Average RPD for Duplicate Averages more than 3.9 pCi/L:					N/A
		In Compliance:					Yes

As a means to determine any biases in the results, detectors were deployed but not opened. At the time of test retrieval of the regular test, the devices were removed from their packaging and sent to the laboratory for blind analysis. The results of these unexposed devices are shown in Table 3. As can be seen, the laboratory reported these at the lower level of detection, indicating that no biases were introduced in handling and shipping of the devices.

Table 3: Blanks

Room	Blank #	Kit ID #	Result (pCi/L)	In Compliance?
Mat Room 2	1	9336422	0.3	Yes
42	2	9336498	0.3	Yes
207	3	9336052	0.3	Yes
Land Lab B	4	9336041	0.3	Yes
Blank in transit	5	9336004	0.3	Yes
Blank in transit	6	9336003	0.3	Yes
Blank in transit	7	9336002	0.3	Yes
Blank in transit	8	9336010	0.3	Yes
Blank in transit	9	9336397	0.3	Yes
Blank in transit	10	9336394	0.3	Yes

A device was also selected from the lot of detectors that were utilized for exposure to a known radon environment at a spiking chamber (Bowser-Morner, NEHANRPP ID# 101 TC). After exposure, the device was submitted as a blind measurement to the laboratory. A comparison of the reported reading from the lab and the known concentration in the chamber is as follows:

Chamber concentration to which device was exposed:	25.5 pCi/L
Concentration reported by lab:	25.5
Relative percent difference (RPD):	0

Chamber concentration to which device was exposed:	25.5 pCi/L
Concentration reported by lab:	28
Relative percent difference (RPD):	9.3

Chamber concentration to which device was exposed:	25.5 pCi/L
Concentration reported by lab:	27.0
Relative percent difference (RPD):	5.7

Chamber concentration to which device was exposed:	25.5 pCi/L
Concentration reported by lab:	27.4
Relative percent difference (RPD):	7.2

Chamber concentration to which device was exposed:	25.5 pCi/L
Concentration reported by lab:	23.1
Relative percent difference (RPD):	9.9

Chamber concentration to which device was exposed:	25.5 pCi/L
Concentration reported by lab:	25.4
Relative percent difference (RPD):	0.4

The RPD between the reported and spiking concentration is well within normal limits.

Key:

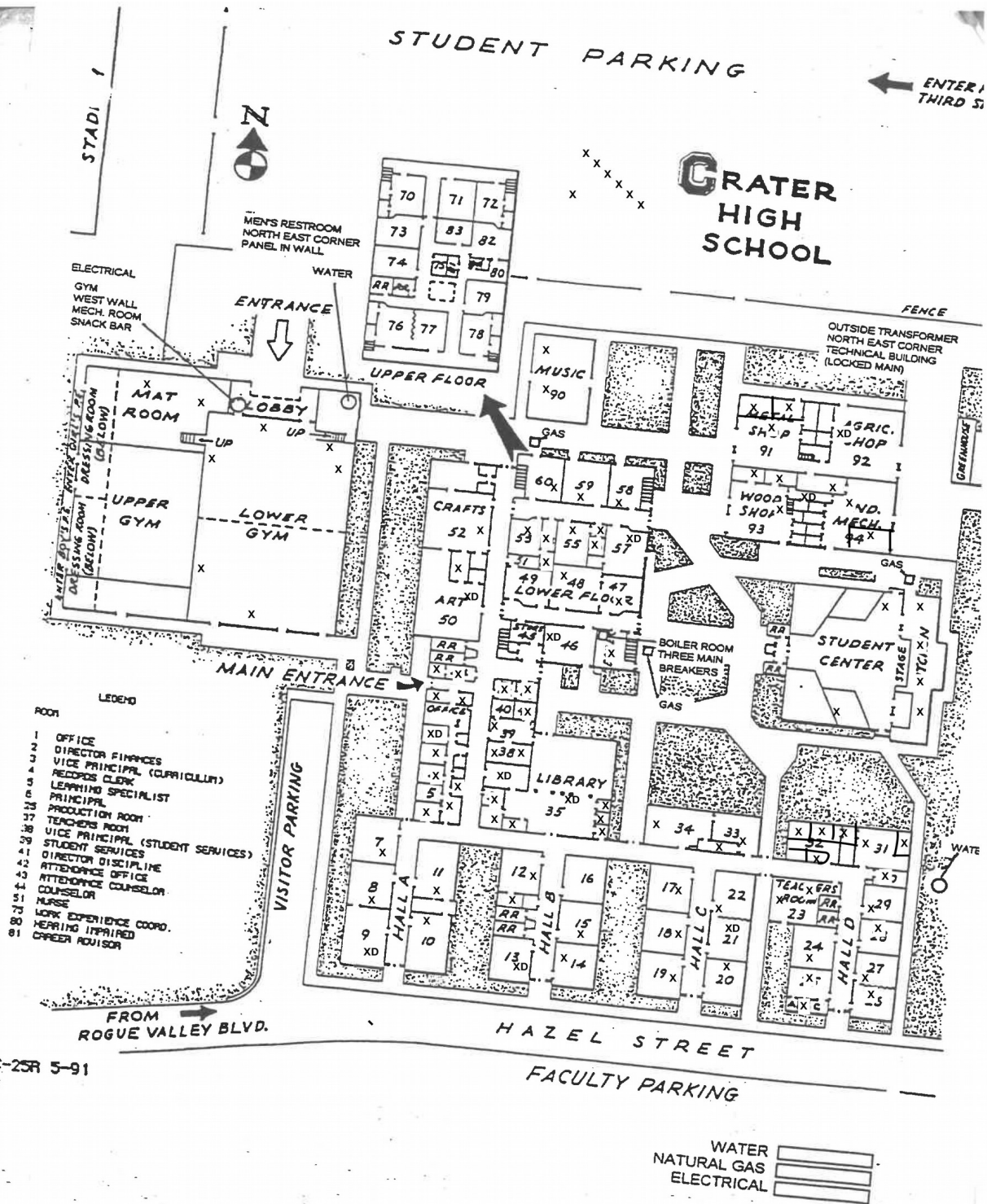
pCi/L: Picocuries per liter – units of radon concentration.

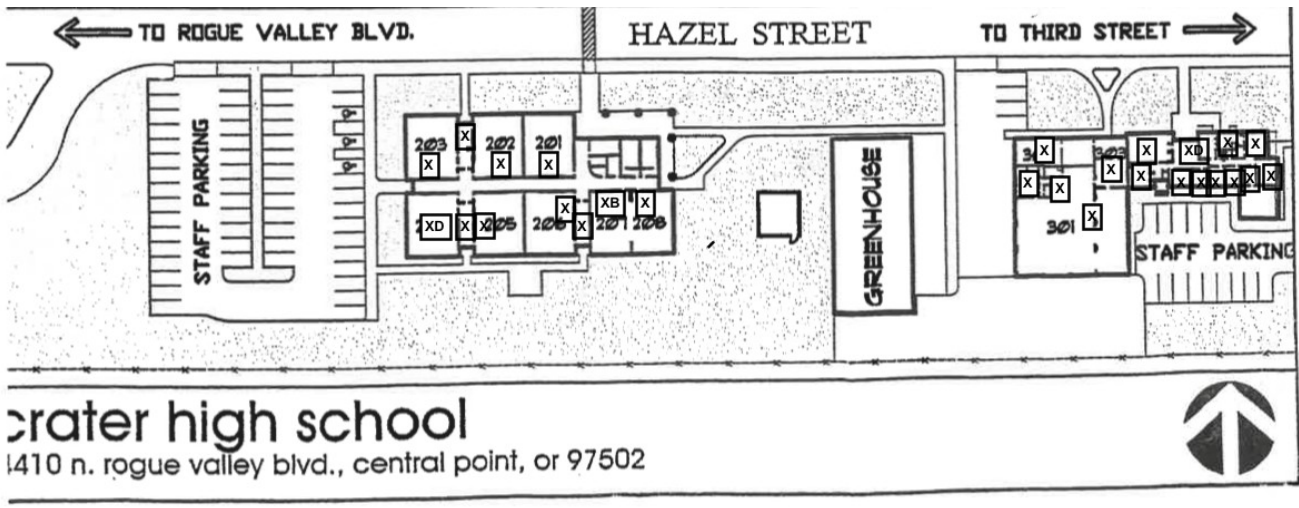
Average (Avg): Cumulative average of the entire period since the test started.

Please contact me if you have any questions.

Thank you,
Rachell Meyers
NRPP 110320 RT

Appendix A: Test Placement Map





Appendix B: Test Results Map

