

Short-Term Radon Measurement Services

Nevada Community Resource Center,
Greenhouse, and Agricultural Building

1035 15th Street; 1001 15th Street

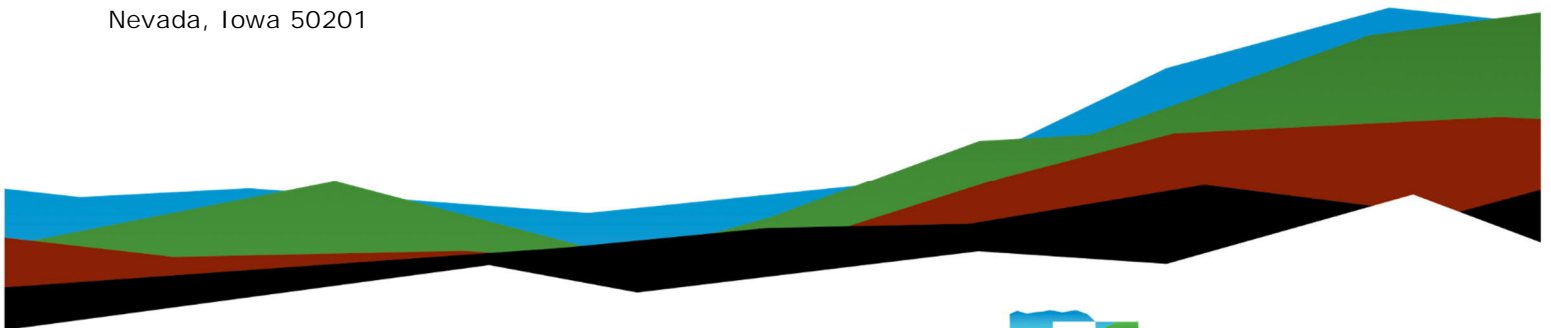
Nevada, Iowa 50201

Terracon Project No. 08237091

Prepared for:



Nevada Community School District
1035 15th Street
Nevada, Iowa 50201



Nationwide
Terracon.com

- Facilities
- Environmental
- Geotechnical
- Materials

March 15, 2024

Nevada Community School District
1035 15th Street
Nevada, Iowa 50201

Attn: Mr. Dave Kroese
P: (515) 291-4054
E: dkroese@nevada.k12.ia.us

Re: Short-Term Radon Measurement Services
Nevada Community Resource Center, Greenhouse, and Agricultural Building
1035 15th Street; 1001 15th Street
Nevada, Iowa 50201
Terracon Project No. 08237091

Dear Mr. Kroese:

Terracon Consultants, Inc. (Terracon) collected short-term radon measurements at the Nevada Community Resource Center (NCRC), Greenhouse, and Agricultural Building on behalf of the Nevada Community School District (NCSD). This measurement event was conducted in accordance with Terracon's Proposal No. P08237091 dated May 2, 2023. Terracon collected short-term radon measurements from March 4 to March 7, 2024. The objective of this work was to evaluate radon concentrations within the school in response to the new Iowa House File 2412 act requiring all Iowa public school districts to perform radon testing at each of the attendance centers by July 1, 2027.

Terracon appreciates the opportunity to provide services to you. If we can provide additional environmental, occupational health, or safety-related services, please contact us at (319) 277-4016.

Sincerely,
Terracon Consultants, Inc.

Prepared by:



Austin J. Potthoff
Project Manager

Reviewed by:



J. Rush Bowers, CIH, CSP
Senior Industrial Hygiene Consultant
Authorized Project Reviewer

Table of Contents

1.0	Field Activities	3
2.0	Radon Guidance	4
3.0	Summary of Findings	4
4.0	Recommendations	5
5.0	General Comments	5

Appendix A: Terracon Field Logs

Appendix B: AirChek Analytical Report

Appendix C: Staff Radon License

1.0 Field Activities

Radon measurements were collected from March 4 to March 7, 2024, in the Nevada Community Resource Center (NCRC), Greenhouse, and Agricultural Building for the Nevada Community School District (NCSD) in accordance with Terracon's Proposal No. P08237091 dated May 2, 2023. The work was conducted by a State of Iowa certified radon measurement specialist in accordance with Terracon's Radon Testing Quality Assurance Plan for Activated Charcoal Adsorption (QAP) and the American National Standards Institute (ANSI) / American Association of Radon Scientists and Technologies (AARST) Protocol for Conducting Measurements of Radon and Radon Decay Products in Schools and Large Buildings. Terracon's QAP is based on guidelines set forth by the United States Environmental Protection Agency (USEPA) and the Iowa Department of Public Health (IDPH). Radon measurements were collected by Mr. Austin Potthoff (certification number RNTST10075). A copy of Mr. Potthoff's certification can be found in Appendix C to this report.

Terracon informed NCSD that closed-building conditions would be required beginning 12 hours prior to the test and continuing for the duration of the test. Terracon did not observe deviations from the closed-building conditions while placing or upon retrieval of the devices.

The radon devices were placed between two feet and less than eight feet above the floor surface, a minimum of one foot from exterior walls, in areas of normal air circulation, away from air vents, and a minimum of three feet from exterior doors and windows. Heating, ventilating, and air-conditioning (HVAC) systems in the areas were set to auto and appeared to be functioning. Terracon collected 19 measurements in the buildings (one in the Greenhouse, three in the Agricultural Building, eight in the NCRC, and seven in Nevada High School) using activated charcoal devices obtained from an Iowa-certified laboratory. Terracon submitted one field blank, one lab blank, and two duplicates to the laboratory for quality control purposes. Testing included retesting of spaces in Nevada High School that had measured radon concentrations above the action level during the initial testing period January 16 to 19, 2024. Field logs summarizing the analytical results, measurement locations, blanks, and duplicates can be found in Appendix A of this report.

The activated charcoal devices used for the testing were shipped under chain-of-custody to AirChek, Inc., in Mills River, North Carolina for analysis to detect gamma rays by scintillation counting using sodium iodide detectors. AirChek, Inc. is an Iowa-certified radon laboratory (#L00009).

2.0 Radon Guidance

The following has been excerpted from the ANSI/AARST¹ Protocol for Conducting Radon Measurements in Schools and Large Buildings (MALB-2014), Section II: iv, Guidance for Building Managers and reflects guidance from the USEPA regarding recommended actions based on initial radon testing:

- 4.0 picoCuries per liter (pCi/L) or greater: If testing indicates radon concentrations equal to or greater than 4.0 pCi/L, reduce the radon to below 4.0 pCi/L in any office area, classroom, exercise facility, meeting room, dining area or other common area. The higher the radon concentration, the more quickly action should be taken to reduce the concentrations.
- Below 4.0 pCi/L: Radon concentrations below 4.0 pCi/L still pose a risk to occupants. Consider fixing the building if test results indicate radon concentrations between 2.0 and 4.0 pCi/L. Note that reducing and accurately confirming radon concentrations of about 2.0 pCi/L or below may be difficult. If test results are below the action level, confirm the low results by testing again, at least every 5 years and whenever significant changes to the building's structure or mechanical systems occur.
- Non-Residential Rooms/Enclosed Spaces: Radon concentrations should be reduced if either of these areas are occupiable with little or no modification and/or these areas serve as a source of radon into occupied areas of upper story floors that have radon concentrations equal to or greater than 4.0 pCi/L.

3.0 Summary of Findings

Analytical results indicated that all measured radon concentrations were below the EPA action level of 4.0 pCi/L. Radon concentrations ranged from less than (<) 0.3 to 3.2 pCi/L. Analytical results for devices collected for quality control purposes were found to be within control limits. These results are used to help measure precision and evaluate bias associated with radon concentration measurements. The laboratory report is attached.

Please note that there is some uncertainty associated with radon measurements. Factors that effect this uncertainty include but are not limited to, statistical variations related to seasonal weather and building operation, as well as operation of building mechanical equipment. Even during normal weather, indoor radon levels may rise and fall by a factor of two on a daily cycle; for example, from 5 pCi/L to 10 pCi/L in 24 hours. During rapidly

¹ American National Standards Institute/American Association of Radon Scientists and Technologists

changing or stormy weather, the levels may change more dramatically. Bear in mind that any radon test returns only the average of the levels present during the time of testing at the precise location of the test. Conditions during a different test period or at a different location in the building are expected to be different.

4.0 Recommendations

Additional testing should take place when one or more of the following conditions are met:

- A new addition is added;
- HVAC equipment is added, removed, replaced, operated differently or improperly maintained;
- Significant changes to the slab or foundation, such as major cracks or penetrations from natural settling, or water proofing or groundwater control efforts;
- An installed mitigation system is altered, modified, or repaired;
- A ground contact area that was not previously tested is occupied; or
- Every 5 years based on Iowa House File 2412.

5.0 General Comments

This radon measurement event was conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions in the same locale. The results, findings, and recommendations expressed in this report are based on conditions observed during our survey of the building. The information contained in this report is relevant to the date on which this survey was conducted and should not be relied upon to represent conditions at a later date. This report has been prepared on behalf of and exclusively for use by the Nevada Community School District, for specific application to their project as discussed. This report is not a bidding document. Contractors, consultants, or others reviewing this report must draw their own conclusions regarding further investigation or remediation deemed necessary. Terracon does not warrant the work of regulatory agencies, laboratories, or other third parties supplying information that may have been used in the preparation of this report. No warranty, express or implied is made.

Appendix A: Terracon Field Logs

Terracon Consultants, Inc.

Activated Charcoal Field Log and Custody Log

Building Name: Nevada Community Resource Center, Greenhouse, Ag Building
 Building Address: 1037 8th Street
 Device Placement Performed by: Austin Potthoff Device Retrieval Performed by: Austin Potthoff
 Signatures: *Austin Potthoff* *Austin Potthoff*

Test Kit #	Room #/ ID	Start Date	Start Time	Stop Date	Stop Time	Temp. (F)	Measured Value	Comments
✓ 7409357	Kit-1	3/4/24	8:15	3/7/24	8:00	70	See Results	
✓ 7409349	Act-1		8:17		8:01			
✓ 7409347	Act-2		8:20		8:02			
✓ 7409348	MR-west		8:22		8:03			
✓ 7409345	MR-east		8:24		8:04			
✓ 7409355	HW room		8:26		8:05			
✓ 7409341	Ag Building		8:45		8:15			
✓ 7409351	Welding		8:47		8:16			
✓ 7409353	Mechanical-A		8:49		8:17			
✓ 7409344	Mechanical-B		8:51		8:18			
✓ 7409350	IML-C		8:59		8:25			
✓ 7409354	IML-1		9:00		8:26			
✓ 7409358	IML-2		9:02		8:27			
✓ 7409338	IML-A		9:05		8:28			
✓ 7409346	IML-B		9:07		8:29			

Terracon Consultants, Inc.

Activated Charcoal Field Blank Log

Building Name: Nevada
Building Address: _____
Device Placement Performed by: _____ Device Retrieval Performed by: _____

Test Kit #	Room #/ ID	Start Date	Start Time	Stop Date	Stop Time	Measured Value	Comments
✓ 7409352	Kit-1	3/4/24	✓	3/7/24	✓	See Results	✓
7413861	Lab-blank	↓	✓	↓	✓	↓	✓

Appendix B: AirChek Analytical Report

March 8, 2024

**** LABORATORY ANALYSIS REPORT ****

Radon test result report for:

**NEVADA COMMUNITY SCHOOL DISTRICT
NCS D GREENHOUSE**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7409341	GREENHOUSE	2024-03-04 @ 9:00 am	2024-03-07 @ 8:00 am	0.6 ± 0.3	2024-03-08

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

March 8, 2024

**** LABORATORY ANALYSIS REPORT ****

Radon test result report for:

**NEVADA COMMUNITY SCHOOL DISTRICT
NEVADA AG BUILDING**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7409353	MECHANICAL - A	2024-03-04 @ 9:00 am	2024-03-07 @ 8:00 am	1.0 ± 0.3	2024-03-08
7409344	MECHANICAL - B	2024-03-04 @ 9:00 am	2024-03-07 @ 8:00 am	1.0 ± 0.3	2024-03-08
7409351	WELDING	2024-03-04 @ 9:00 am	2024-03-07 @ 8:00 am	0.6 ± 0.3	2024-03-08

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

March 8, 2024

**** LABORATORY ANALYSIS REPORT ****

Radon test result report for:

**NEVADA COMMUNITY SCHOOL DISTRICT
NEVADA COMMUNITY RESOURCE CENTER**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7409349	ACTIVITY AREA 1	2024-03-04 @ 8:00 am	2024-03-07 @ 8:00 am	2.4 ± 0.3	2024-03-08
7409347	ACTIVITY AREA 2	2024-03-04 @ 9:00 am	2024-03-07 @ 8:00 am	3.2 ± 0.3	2024-03-08
7409356	COMMON AREA	2024-03-04 @ 8:00 am	2024-03-07 @ 8:00 am	2.1 ± 0.3	2024-03-08
7409355	HOMEWORK ROOM	2024-03-04 @ 9:00 am	2024-03-07 @ 8:00 am	2.4 ± 0.3	2024-03-08
7409357	KITCHEN 1	2024-03-04 @ 8:00 am	2024-03-07 @ 8:00 am	2.1 ± 0.3	2024-03-08
7409352	KITCHEN 2	2024-03-04 @ 9:00 am	2024-03-07 @ 8:00 am	< 0.3	2024-03-08
7409345	MAIN ROOM - EAST	2024-03-04 @ 9:00 am	2024-03-07 @ 8:00 am	2.5 ± 0.3	2024-03-08
7409348	MAIN ROOM - WEST	2024-03-04 @ 9:00 am	2024-03-07 @ 8:00 am	2.7 ± 0.3	2024-03-08

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

March 8, 2024

**** LABORATORY ANALYSIS REPORT ****

Radon test result report for:

**NEVADA COMMUNITY SCHOOL DISTRICT
NEVADA HIGH SCHOOL**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7409354	IMC-1	2024-03-04 @ 9:00 am	2024-03-07 @ 8:00 am	1.0 ± 0.3	2024-03-08
7409358	IMC-2	2024-03-04 @ 9:00 am	2024-03-07 @ 9:00 am	1.1 ± 0.3	2024-03-08
7409338	IMC-A	2024-03-04 @ 9:00 am	2024-03-07 @ 9:00 am	1.4 ± 0.3	2024-03-08
7409346	IMC-B	2024-03-04 @ 9:00 am	2024-03-07 @ 9:00 am	1.3 ± 0.3	2024-03-08
7409350	IMC-C	2024-03-04 @ 9:00 am	2024-03-07 @ 8:00 am	1.2 ± 0.3	2024-03-08
7409328	MEDIA - MAIN	2024-03-04 @ 9:00 am	2024-03-07 @ 9:00 am	1.0 ± 0.3	2024-03-08
7413864	MEDIA A	2024-03-04 @ 9:00 am	2024-03-07 @ 9:00 am	< 0.3	2024-03-08

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

Appendix C: Staff Radon License

**Bureau of Radiological Health
Radon Measurement Specialist Certification**

Austin Potthoff

Certification #: RNTST10075

Has complied with the requirements and is hereby authorized to perform radon testing pursuant to Iowa code 136B and 641 Iowa Administrative Code Chapter 43.

Approved Testing Methods:
AT-Alpha-Track Detection
CC-Activated Charcoal Adsorption

Expiration: June 30, 2024



CEU Due Date: June 30, 2024

Radiological Health | Iowa Department of Public Health | Lucas State Office Building | Des Moines, IA 50319

Fold here to mail - Cut here to display

Austin Potthoff
785 SE WESTGATE DRIVE
WAUKEE, IA 50263
UNITED STA

Fold here to mail