

# Long-term Stewardship of Residential Mitigation Systems by Radon Monitoring:

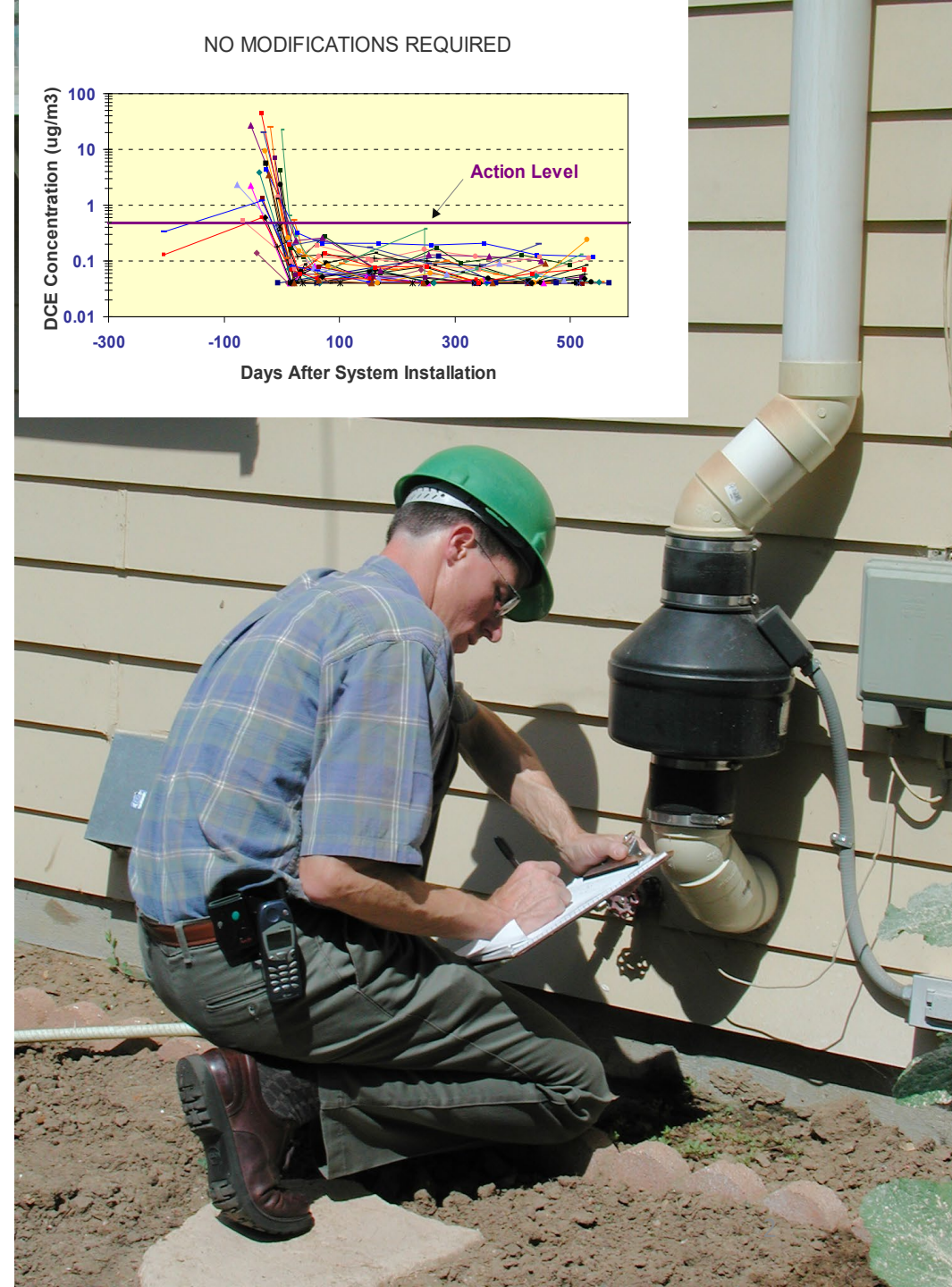
Empowering Homeowners to Help Ensure Continued Mitigation System Performance

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# Need for Long-Term Stewardship of Mitigation Systems

- VOC plumes can persist for decades
  - Remediation access is limited within residential neighborhoods
  - Natural attenuation is slow
- Often a desire to keep running systems to address radon
  - Stewardship after VOC mitigation may still be needed
- However, ensuring long-term system stewardship can be challenging
  - Changes in building conditions can affect system performance
  - Systems performance could change between periodic inspections/tests
  - Continuous VOC monitoring generally not practicable at the neighborhood level





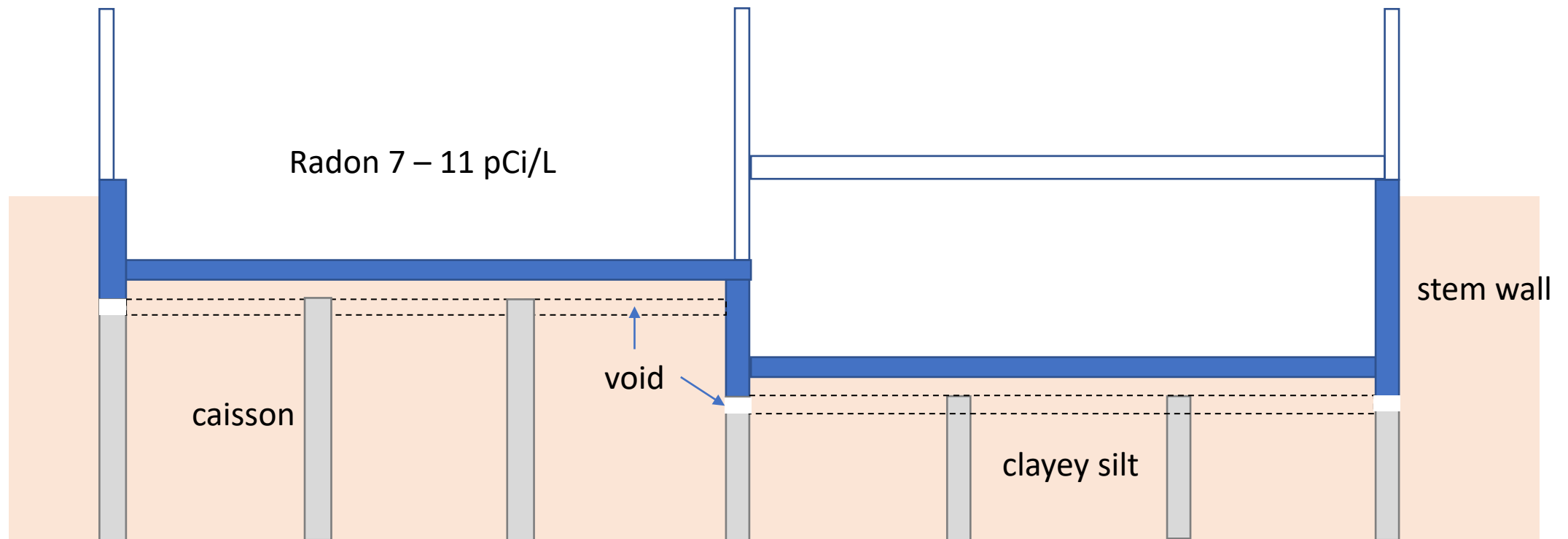
# Homeowner role

- We rely on homeowners or occupants to help us keep systems running
  - Call us when fan stops running or makes noises
  - Call us when the vacuum gauge drops
  - To let us know if major renovations/repairs occurred between inspections
- How can homeowners be better equipped to assist with long-term stewardship of their mitigation systems?



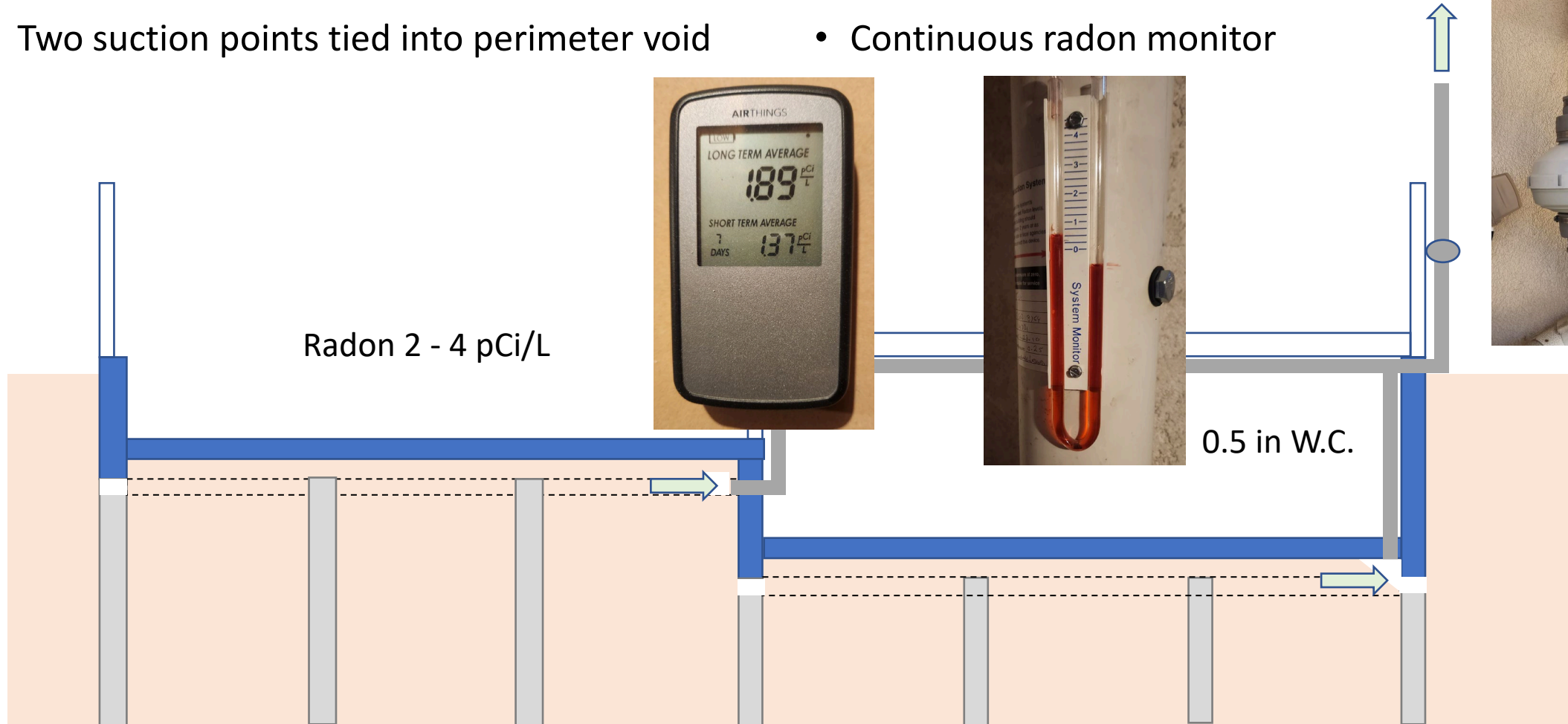
# Case History Example: Use of low-cost continuous radon detectors to monitor performance

- Single family home with elevated radon



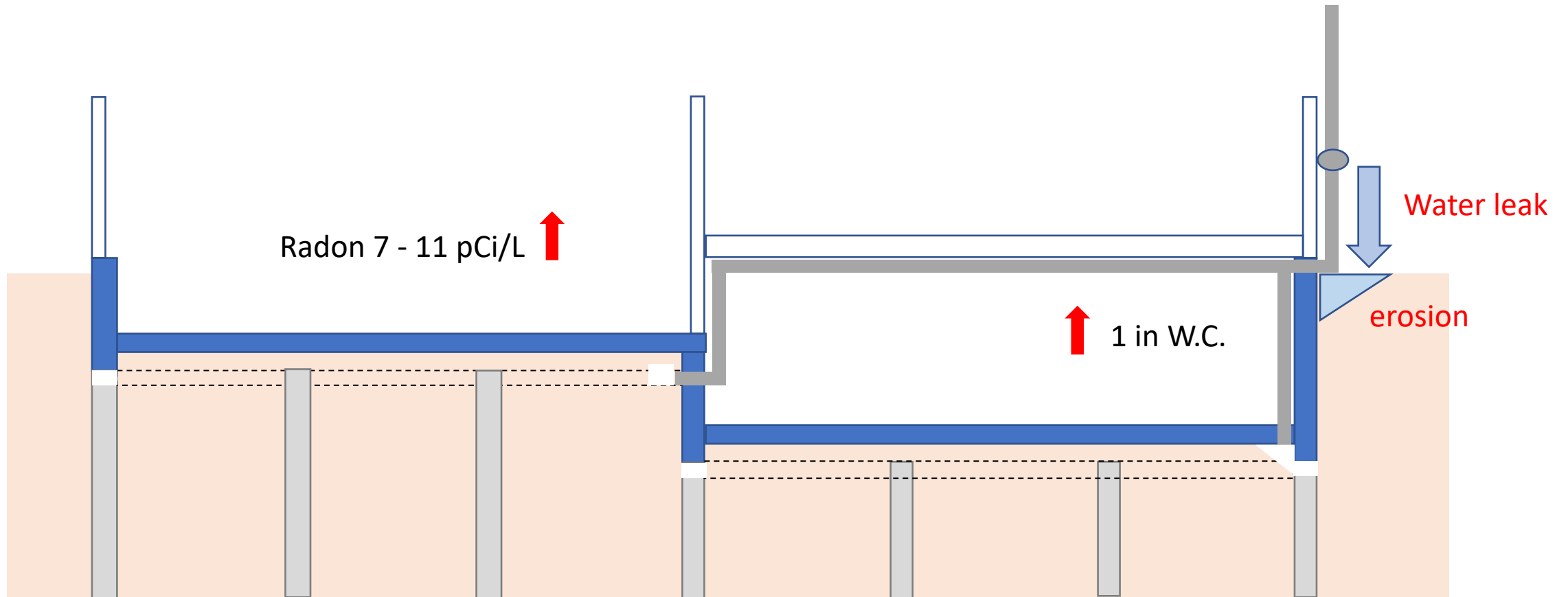
# Radon System

- Single low-vac high-flow fan
- Two suction points tied into perimeter void
- J-tube manometer
- Continuous radon monitor



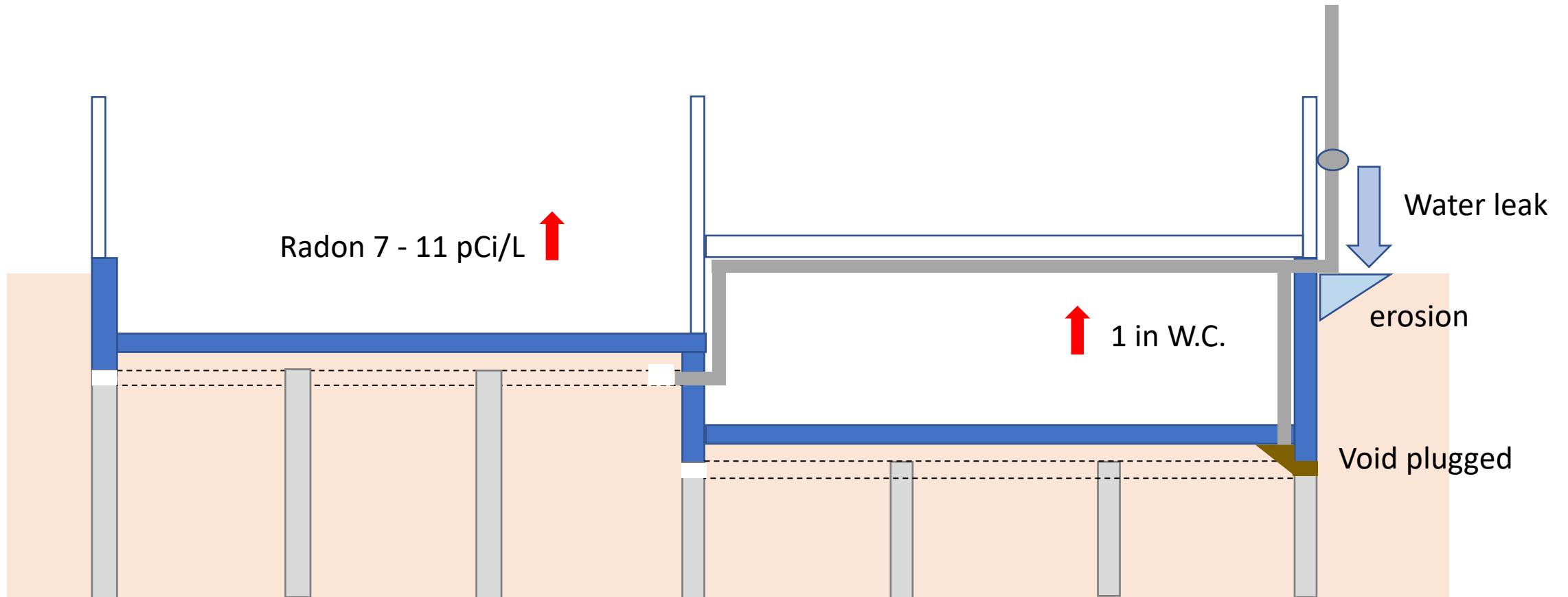
# Event 1 – lawn irrigation system leak

- Water flooded down stem wall



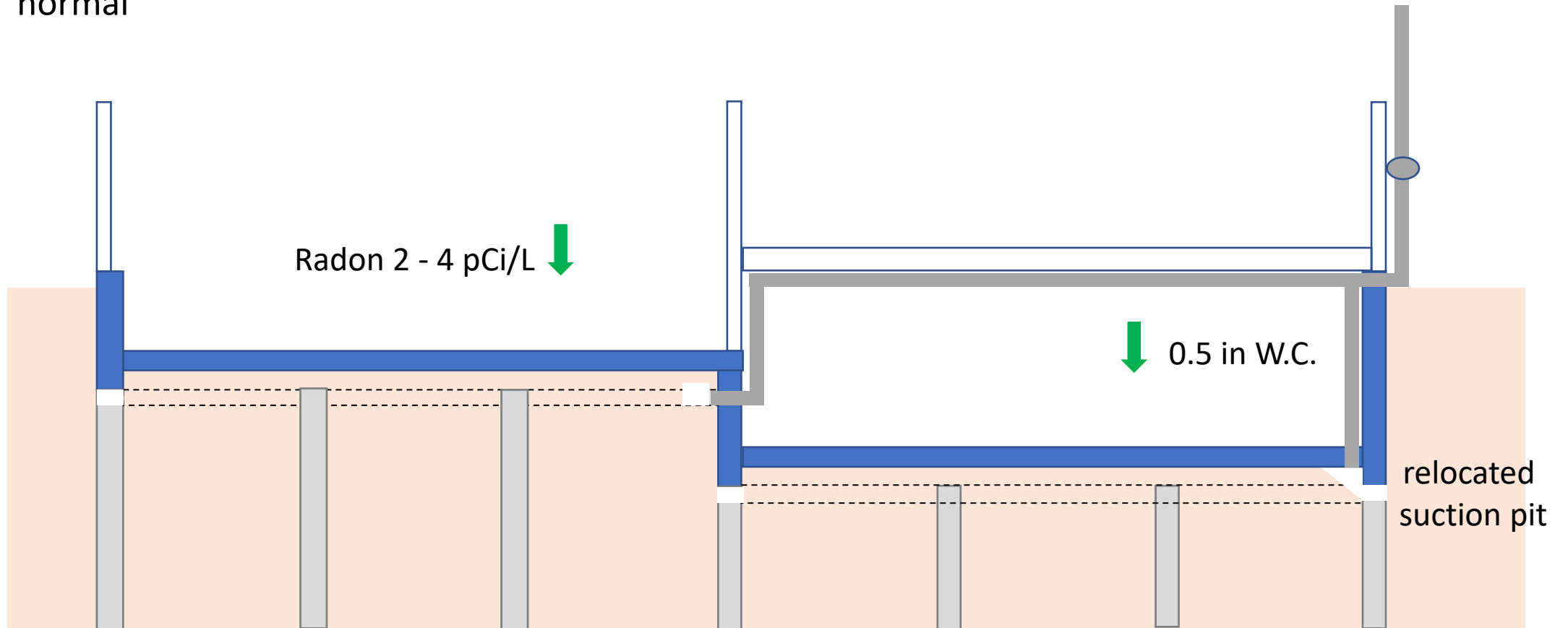
# Event 1 – lawn irrigation system leak

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# Repaired Radon System

- Relocated void pit along wall
- System vacuum and radon levels returned to normal

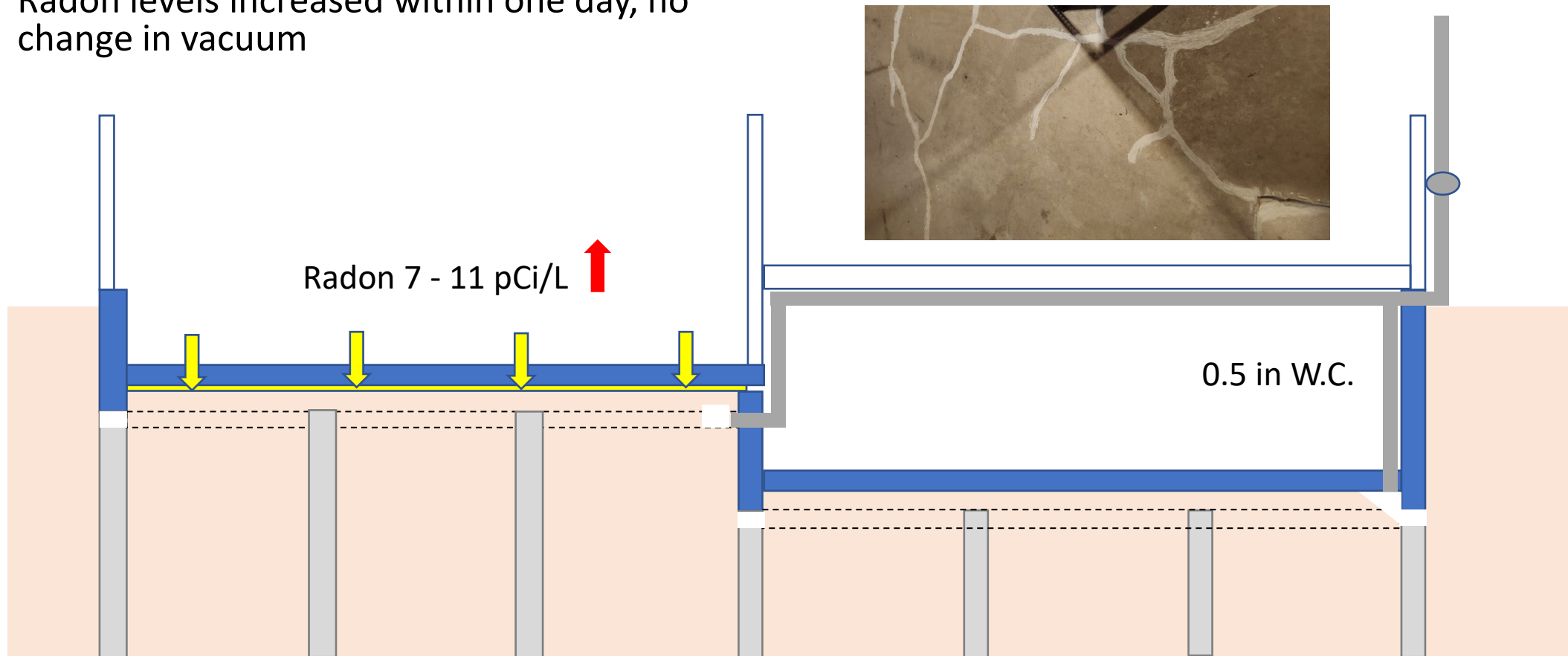




# Event 2 – polyfoam slab lift

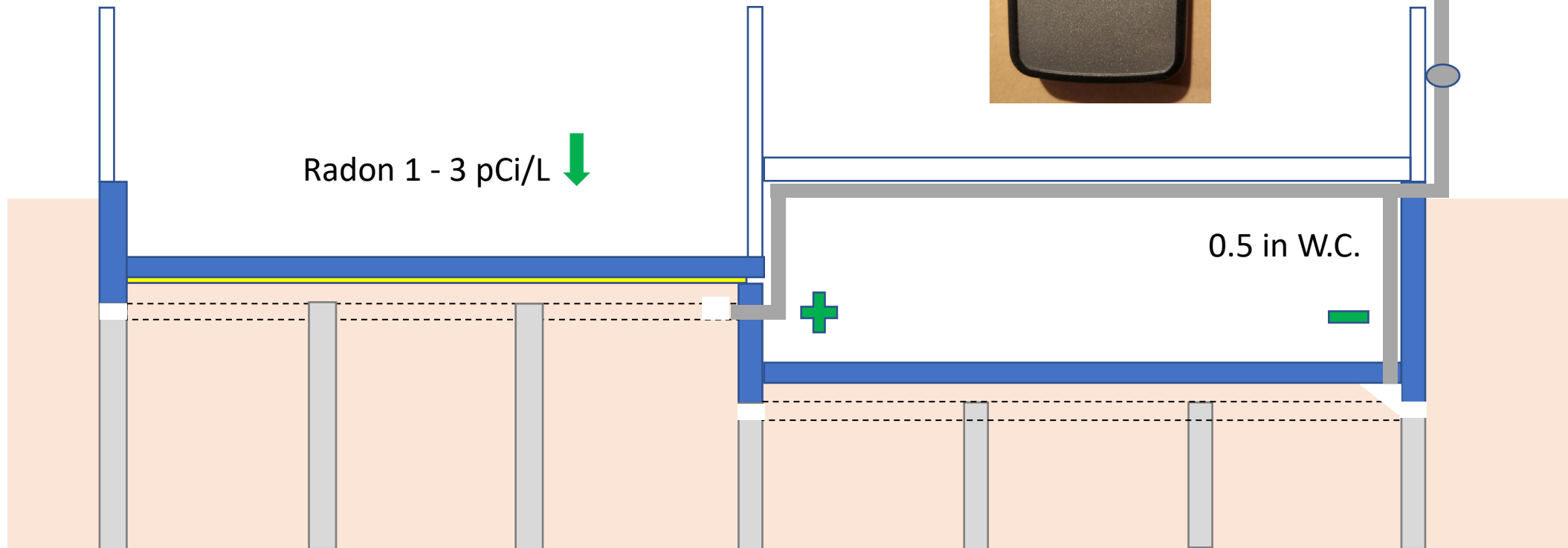
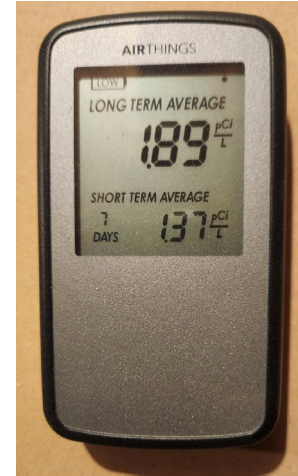
- Settlement of garden level slab repaired by polyfoam injection
- Radon levels increased within one day, no change in vacuum

- Radon monitoring indicated that substantial crack sealing had little impact on radon levels



# Rebalanced System

- Rebalanced system to decrease basement and increase garden level suction pit vacuum/flow
- Radon levels returned to normal



# Conclusions

- Simple vacuum and low-cost continuous radon monitors can allow timely warning of mitigation system problems
- Homeowner use would require some training, outreach and access to support when needed

