

# Bill as Introduced

HB 1685 - AS INTRODUCED

2010 SESSION

10-2935

06/04

HOUSE BILL            **1685**

AN ACT                relative to testing the water quality of private water supply wells.

SPONSORS:            Rep. Spang, Straf 7

COMMITTEE:           Commerce and Consumer Affairs

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ANALYSIS

This bill requires water quality testing for private water supply wells.

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Explanation:        Matter added to current law appears in ***bold italics***.  
                         Matter removed from current law appears ~~[in brackets and struckthrough.]~~  
                         Matter which is either (a) all new or (b) repealed and reenacted appears in regular type.

STATE OF NEW HAMPSHIRE

*In the Year of Our Lord Two Thousand Ten*

AN ACT relative to testing the water quality of private water supply wells.

*Be it Enacted by the Senate and House of Representatives in General Court convened:*

1 1 New Chapter; Private Well Water Quality Testing. Amend RSA by inserting after chapter  
2 485-E the following new chapter:

3 CHAPTER 485-F

4 PRIVATE WELL WATER QUALITY TESTING

5 485-F:1 Purpose. The purpose of this chapter is to protect public health by informing owners of  
6 private water supply wells and buyers of properties using private water supply wells, of the quality of  
7 water provided by said wells with reference to health-based standards, and to aid the scientific  
8 community in understanding the occurrence and distribution of natural contaminants in groundwater  
9 by providing a means for well owners to share well testing data with the geological survey.

10 485-F:2 Definitions. In this chapter:

11 I. "Accredited laboratory" means a laboratory accredited pursuant to RSA 485:44.

12 II. "Commissioner" means the commissioner of the department of environmental services.

13 III. "Department" means the department of environmental services.

14 IV. "Geological survey" means the New Hampshire geological survey.

15 V. "Hydrofracture" means a well development technique utilizing a high pressure pump and  
16 one or more inflatable or mechanical packers to flush out or expand fractures within a well, used to  
17 potentially increase the yield of a well.

18 VI. "Parameters of concern" means arsenic, bacteria (total coliform and E. coli), chloride,  
19 copper (stagnant and flushed), fluoride, gross alpha, hardness, iron, lead (stagnant and flushed),  
20 manganese, nitrate, nitrite, pH, radon, sodium, and uranium.

21 VII. "Private well" means a drinking water well that serves a dwelling unit and is not  
22 regulated as part of a public water system as defined in RSA 485:1-a, XV.

23 VIII. "Pump installer" has the meaning given in RSA 482-B:2, IV.

24 485-F:3 Testing of New, Deepened, and Hydrofracture Wells.

25 I. Upon completion of a new private well or upon deepening or hydrofracturing of an existing  
26 private well, the pump installer shall:

27 (a) Sample the untreated water produced by such well.

28 (b) Have the sample analyzed for parameters of concern, with the exception of stagnant  
29 copper and lead, by an accredited laboratory.

30 (c) Provide the results of such analysis to the well owner using a form developed by the  
31 department in consultation with the water well board.

1 II. The well owner shall acknowledge receipt of the results of such analysis by signing the  
2 form required under paragraph I(c) and returning it to the pump installer.

3 485-F:4 Testing of Wells Prior to Transfer of Real Estate.

4 I. Prior to the execution of a purchase and sale agreement for any developed  
5 property using a private well, the seller of the property shall, at the seller's expense:

6 (a) Sample the untreated water produced by such well.

7 (b) Have the sample analyzed for parameters of concern by an accredited laboratory.

8 (c) Provide the results of such analysis to the buyer using a form developed by the  
9 department in consultation with the water well board.

10 II. The buyer shall sign said form certifying that the seller has complied with the  
11 requirements of this section and return a signed copy to the seller.

12 III. If, within 3 years before the execution of a purchase and sale agreement, a private well  
13 has been tested pursuant to this chapter, the seller may provide the results of such test to the buyer  
14 to satisfy the requirements of this section.

15 IV. A buyer may relieve the seller of all of the requirements of this section by completing  
16 and signing a form provided by the department for this purpose. Such form shall inform the buyer of  
17 the department's recommendations regarding private well testing, and the buyer's signature on such  
18 form shall indicate that the buyer is aware of said recommendations.

19 485-F:5 Administrative Fines; Appeals.

20 I. The commissioner, after notice and hearing pursuant to RSA 541-A, may impose an  
21 administrative fine not to exceed \$10,000 for each offense upon any person who knowingly:

22 (a) Violates any provision of this chapter or any rule or order adopted or issued under  
23 this chapter.

24 (b) Makes any material false statement in any document required to be filed or  
25 maintained under this chapter.

26 II. Rehearings and appeals from a decision of the commissioner under this section shall be in  
27 accordance with RSA 541.

28 III. Any administrative fine imposed under this section shall not preclude the imposition of  
29 further penalties under this chapter. The commissioner may assess additional fines upon any person  
30 who has received written notification from the department regarding violations of the provisions of  
31 this chapter or rules adopted pursuant to this chapter, if the violations have not been mitigated  
32 within 30 days of receipt of notification.

33 IV. Notwithstanding the provisions of RSA 21-O:7, IV, any enforcement action taken by the  
34 department or the commissioner against any licensed pump installer pursuant to this chapter may  
35 be appealed to the water well board pursuant to RSA 482-B:16. Any enforcement action taken by the  
36 department or the commissioner against any other person pursuant to this chapter may be appealed  
37 to the water council pursuant to RSA 21-O:7, IV.

1        485-F:6 Private Well Testing and Notification Form. Forms developed by the department for  
2 the purposes of this chapter shall include the following information:

3            I. The name, mailing address, and phone number of the pump installer, if the testing is  
4 under RSA 485-F:3, or the seller if the testing is under RSA 485-F:4.

5            II.(a) The name and address of the owner of the well.

6            (b) The address of the property where the well is located in a format consistent with the  
7 state's emergency 911 system.

8            (c) The map and lot numbers if available.

9            (d) The well identification number assigned by the department, if available.

10          III. In the case of new, deepened, or hydrofracture wells under 485-F:3, the final well yield  
11 measured according to rules adopted by the water well board under RSA 482-B:4.

12          IV. The location where the sample was taken, for example the well, a pressure tank, or  
13 kitchen faucet.

14          V. The name, license number, if applicable, and whether the sample collector is the owner,  
15 pump installer, owner's agent, or other.

16          VI. The name, address, phone number, and identification number of the laboratory where  
17 the specimen was tested.

18          VII. Analytical results for each parameter of concern, using units specified on the form.

19          VIII. Explanation of analytical results relevant to drinking water standards, and  
20 explanation of well yield results relative to recommended minimum well yield for new and deepened  
21 wells, provided by the department.

22          IX. A statement by the laboratory agreeing to provide the following information in an  
23 electronic spreadsheet format to the geological survey within one year if so instructed in writing by  
24 the well owner or home buyer:

25            (a) Well location information.

26            (b) Well identification number assigned by the department, if available.

27            (c) Analytical results for each parameter of concern, using units specified by the  
28 department.

29        485-F:7 Voluntary Sharing of Data for Scientific Purposes.

30            I. Forms provided by the department for the purposes of this chapter shall include space for  
31 the well owner or home buyer to voluntarily instruct the testing laboratory to release the data listed  
32 in 485-F:6, IX to the geological survey for scientific purposes.

33            II. An accredited laboratory that accepts samples for analysis pursuant to this chapter shall  
34 agree to use forms provided by the department to provide information to the geological survey if so  
35 instructed in writing by the well owner or home buyer pursuant to 485-F:6, IX.

36        485-F:8 Rulemaking. The commissioner shall adopt rules in consultation with the water well  
37 board, pursuant to RSA 541-A, relative to:

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1 I. The content and structure of all forms to be issued by the department, including  
2 information and other materials to be submitted with the forms.

3 II. Methodology for sampling water from private wells.

4 III. Handling of samples until delivered to the accredited laboratory.

5 IV. Methods and procedures to be followed by accredited laboratories to handle and analyze  
6 samples.

7 V. A schedule of administrative fines which may be imposed under this chapter.

8 VI. Procedures for notice and hearing prior to the imposition of an administrative fine.

9 VII. Use and sharing of private well data received by the geological survey pursuant to this  
10 chapter.

11 2 Effective Date.

12 I. The provisions of RSA 485-F:6, IX and RSA 485-F:7 as inserted by section 1 of this act  
13 shall take effect 2 years after its passage.

14 II. The remainder of this act shall take effect one year after its passage.

# Amendments

Amendment to HB 1685

*NOT ADOPTED*

1 Amend RSA 485-F:2, VI as inserted by section 1 of the bill by replacing it with the following:

2

3 VI. "Parameters of concern" means arsenic, bacteria (total coliform and E. coli), chloride,  
4 copper (stagnant and flushed), fluoride, hardness, iron, lead (stagnant and flushed), manganese,  
5 nitrate, nitrite, pH, radon, sodium, and uranium.

6

7 Amend RSA 485-F:3, I(c) as inserted by section 1 of the bill by replacing it with the following:

8

9 (c) Provide the results of such analysis to the well owner using a form that meets  
10 minimum standards developed by the department in consultation with the water well board.

11

12 Amend RSA 485-F:4, I(c) as inserted by section 1 of the bill by replacing it with the following:

13

14 (c) Provide the results of such analysis to the buyer using a form that meets minimum  
15 standards developed by the department in consultation with the water well board.

16

17 Amend the introductory paragraph of RSA 485-F:6 as inserted by section 1 of the bill by replacing it  
18 with the following:

19

20 485-F:6 Private Well Testing and Notification Form. For the purposes of this chapter, an  
21 accredited laboratory may use one or more forms which together shall include the following  
22 information:

23

24 Amend RSA 485-F:8 as inserted by section 1 of the bill by replacing it with the following:

25

26 485-F:8 Rulemaking. The commissioner shall adopt rules in consultation with the water well  
27 board, pursuant to RSA 541-A, relative to:

28

29 I. The content and structure of all forms to be issued by the department, including  
information and other materials to be submitted with the forms.

30

31 II. Minimum standards for forms to be used by accredited laboratories in connection with  
the provisions of this chapter.

32

III. Methodology for sampling water from private wells.





- 1 IV. Handling of samples until delivered to the accredited laboratory.
- 2 V. Methods and procedures to be followed by accredited laboratories to handle and analyze
- 3 samples.
- 4 VI. A schedule of administrative fines which may be imposed under this chapter.
- 5 VII. Procedures for notice and hearing prior to the imposition of an administrative fine.
- 6 VIII. Use and sharing of private well data received by the geological survey pursuant to this
- 7 chapter.

8  
9 Amend the bill by inserting after section 1 the following and renumbering the original section 2 to  
10 read as 3:

11  
12 2 Definitions. Amend RSA 485-F:2, VI to read as follows:

13 VI. "Parameters of concern" means arsenic, bacteria (total coliform and E. coli), chloride,  
14 copper (stagnant and flushed), fluoride, *gross alpha*, hardness, iron, lead (stagnant and flushed),  
15 manganese, nitrate, nitrite, pH, radon, sodium, and uranium.

16  
17 Amend the bill by replacing section 3 with the following:

18  
19 3 Effective Date.

20 I. RSA 485-F:6, IX and RSA 485-F:7 as inserted by section 1 of this act shall take effect 2  
21 years after its passage.

22 II. Section 2 of this act shall take effect 3 years after its passage.

23 III. The remainder of this act shall take effect one year after its passage.

# Speakers



# Hearing Minutes

HOUSE COMMITTEE ON COMMERCE AND CONSUMER AFFAIRS

PUBLIC HEARING ON HB 1685

**BILL TITLE:** relative to testing the water quality of private water supply wells.

**DATE:**

**LOB ROOM:** 302      **Time Public Hearing Called to Order:** 1:20 pm

**Time Adjourned:** 2:50 pm

(please circle if present)

**Committee Members:** Reps. Butler, DeStefano, Kopka, McEachern, Hammond, Nord, Winters, Meader, Gidge, Schlachman, Keans, D. Eaton, Hunt, Quandt, Belanger, O. Flanders, R. Holden, Dowling, Headd, Nevins and Palfrey

**Bill Sponsors:** Rep. Spang

TESTIMONY

\* Use asterisk if written testimony and/or amendments are submitted.

**Rep. Judith Spang, sponsor** – Is co-chair of the Groundwater Commission. Many private wells have contaminated water. Testing will help with research; best time is at the time of change of ownership. Amendment offered; technical.

**Rep Sandra Keans** – Cost of test?

A: Range depending on whom.

**Rep Patricia Dowling** – Water test costs around \$75, many people have it done, banks won't give mortgage for bad H2O. Does this add a layer of bureaucracy to sale of home?

A: Data recording is optional, but there will need to be forms. Is it opt-in or opt-out.

**\*Paul Susca, NH DES** – State lab test is \$165, private labs \$185-\$300. Person receiving test info can opt-in to reporting to NH Geological Survey. It is possible to opt-out of testing. Realtors and home builders didn't support mandating testing even on water quality board. Bill recommended by the Academy of Pediatrics. About 20% of private wells are contaminated (100,000 people or 77K wells); arsenic, radon and others. Many people doing tests right now aren't covering all needed contaminants.

**Q: Rep. Keans** – How many used to be a public water supply?

A: 15 units or more.

**Q: Rep. Dowling** – Are community wells testing for all these contaminants like radon?

A: Yes, testing, but no standards.

**Q: Rep. Dowling – How long does a test take?**

**A:** DES lab cheaper; long time private labs more expensive, but quicker.

**Q:** Does this bill shift burden of testing from buyer to seller?

**A:** Yes.

**Q:** How many people does this effect?

**A:** People don't always know.

**Q: Chairman Edward Butler – What about beryllium?**

**A:** That was an example of a regional contaminant, but not a required test.

**Q:** This doesn't require notification to DES?

**A:** It is voluntary.

**Q: Rep. Donna Schlachman – Why is gross alpha different in the amendment?**

**A:** Very little ability to test yet, so phased in.

**Bart Cushing, Cushing & Sons, Culligan of Keene** – Opposes the bill. 3<sup>rd</sup> generation well driller. He has been part of the DES work groups and NH water well drillers. The water well drillers' suggestions are not part of the bill. The usual test is not the test in the bill, bills test is more strict. Tests for lead and copper which relate to pipes, not water. More extensive testing is very expensive. Concerns about owner signing off on test. Administrative fine is unreasonable (\$10,0900). Participants in the group not necessarily representative of public at large. No hard data to support DES's numbers of contaminated wells.

**Q: Rep. Dowling – What will the water test cost be if bill passes?**

**A:** Now it's \$80, could be as high as \$335. before labor and mark-up.

**Joanne Dolbear of Wakefield, NH** – She is losing her home because her well is contaminated with uranium and radon. \$10K water system and enviro-septic system. This has led to health issues for their family. She thinks its important so DES can get info they need.

**Q: Rep. Dowling - Is your well dug or drilled and was the H2O tested before you bought it?**

**A:** No, just usual bacteria test, we discovered it because her husband had high levels of uranium in system.

**Lynne Merrill, NH Assn. Of Realtors** – Oppose the new mandate before purchase and sale. Realtors educate buyers and sellers on H2O quality and advise testing. Better to have buyers do testing to protect chain of custody. No agreed upon standards for radon. Reason there aren't guidelines on radon is because public wells would need remediation. Unfair to require private wells if public wells are exempt. Foreclosed properties make implementation a problem. Hard to get done by banks. Sometimes hard for seller to afford.

**Rep. Paul McEachern** – What does water quality test mean and what percentage of people test for radon?

A: Quality defined by buyer, FA or home inspector. Unknown how many people test radon.

**Jack Munn, Southern NH Planning Commission** – Member of DES private well working group. Planning commissions are active in promoting water testing for community planning purposes. Data will help communities get data to protect drinking water supplies.

**Q: Repl. Schlachman** – Why is reporting voluntary and was there a discussion of seller vs. buyer?

A: Discussion was around point of sale vs. certificate of occupancy.

**Q: Were there realtors in your group?**

A: Not entirely sure.

**Q; Chairman Butler** –Why so many more contaminants than usual?

A: Because we need the information to learn how these affect the water supply over time.

**Q; Rep. Dowling** – More onerous than public supply testing...why?

A: As planners, we aren't the ones to make that decision. These tests meet planning needs; we didn't worry about commercial requirements.

**Q: Rep. DeStefano** – Why seller, all other tests are on buyer?

A: Buyer vs. seller wasn't recommended by us; up to you.

**Bud Hancock of Hopkinton, NH representing self** – Wonderful water from 1983 to 1999. Discovered arsenic in water supply. Bought reverse osmosis water filtration system which fixed the problem. Arsenic should be part of standard water quality test. Fines seem exorbitant. Buyer should be responsible. Illness from arsenic and radon are insidious.

**Bernard Lucey of Concord, representing self** – Recent retiree from DES, in the field for 37 years. Problem is that current tests are not comprehensive enough. Very important to test for arsenic, gross alpha, uranium for health concerns. The question is how many people need to miss health risks. He thinks 1%. Most people think recommended tests cover what they need, don't realize current tests are incomplete. List in bill is nearly comprehensive but leaves out some things because tests are expensive or risk is so small. For 10 years they have tried to get people to do this voluntarily.

**Q: Rep. Dowling** – Are all of these items tested in community systems?

A; We did, but stopped because there is no guideline for radon. Others are tested in public systems.

**Q: Rep, McEachern** – Why not test radium?

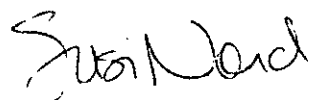
A: Too expensive, too infrequent and can be intuited from other tests.

**Q: Why require test for radon if no standard?**

**A: Because the risk is so high.**

**Burt Cushing of Cushing & Sons Culligan of Keene – Don't forget radon is also in air. Also the bill will cost a lot.**

**Respectfully Submitted:**

A handwritten signature in cursive script that reads "Susi Nord". The signature is written in black ink and is positioned below the "Respectfully Submitted:" text.

**Susi Nord, Acting Clerk**



HOUSE COMMITTEE ON COMMERCE AND CONSUMER AFFAIRS

PUBLIC HEARING ON HB 1685

**BILL TITLE:** relative to testing the water quality of private water supply wells.

**DATE:** 1-21-10

**LOB ROOM:** 302

**Time Public Hearing Called to Order:** 1:20

**Time Adjourned:** 2:50

(please circle if present)

**Committee Members:** Reps. Butler, DeStefano, Kopka, McEachern, Hammond, Nord, Winters, Meader, Gidge, Schlachman, D. Eaton, Hunt, Quandt, Belanger, D. Flanders, R. Holden, Dowling, Headd, Nevins and Palfrey.

Kearns

**Bill Sponsors:** Rep. Spang

TESTIMONY

\* Use asterisk if written testimony and/or amendments are submitted.

- Rep. Spang is co-chair of the Groundwater Commission
- many private wells have contaminated water
- testing will help with research
- best time is at time of change of ownership
- amendment offered - technical

? Kearns - cost of test?

JS: range depending on who

? Dowling - water test costs around \$75, many people have it done, banks won't give mortgage for bad H<sub>2</sub>O. Does this add a layer of bureaucracy to sale of home.

JS: Data recording is optional, but there will need to be forms. Is it opt-in or opt-out

#B 1185

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- Mr. Susca from DES with written testimony.

- State lab test = \$165, priv. labs \$185-300
  - person receiving test info can opt-in to reporting to NH Geological Survey
  - it is possible to opt-out of testing
  - Realtors & Home Builders didn't support mandating testing even on water quality board.
  - Bill recommended by Academy of Pediatrics
  - About 20% of private wells are contaminated (100,000 people or 77K wells)  
[arsenic, radon & others]
  - many people doing tests right now aren't covering all needed contaminants
- ? S. Keans - ~~How many users take a lead test~~ <sup>How many users take a</sup> Public Water Supply  
Susca - 15 units or more
- ? Dawling - Are Community wells testing for all these contaminants - like radon  
Susca - Yes testing, but no standards
- ? Dawling - How long does a test take?  
Susca - DES lab cheaper, but long time private labs more expensive, but quicker
- ? Dawling - Does this bill shift burden of testing from buyer to seller  
Susca - Yes
- ? Dawling - How many people does this affect  
Susca - People don't always know

? Butler - What about barium

Susca - that was an example of a regional contaminant, but not a required test

? Butler - This doesn't require notification to DES?

Susca - It is voluntary

? Schlachman - Why is gross alpha different in the amendment.

Susca - very little ability to test yet, so phased in

Bart Cushing - Cushing + Sons, Culligan of Keene  
3rd generation well driller

- he has been part of the DES

work groups + NH water well drillers

- The water well drillers' suggestions are not part of the bill.

- The usual test is not the test in the bill, bill's test is more strict

- Tests for lead + copper which relate to pipes, not water.

- more extensive testing is very expensive

- concerns about owner signing off on test

- administrative fine is unreasonable (\$10,000)

- Participants in the group not necessarily representative of public at large

- No hard data to support DES ~~vs~~ of wells. <sup>contaminated</sup>

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? Dowling - what will the water test cost  
be if bill passes?

BC - Now its \$80, could be as high as \$335  
before labor & mark-up.

Joanne Dolken

- She is losing her home because her well is contaminated with Uranium & radon
- \$10K water system & enviro-septic system
- This has led to health issues for their family.
- She thinks its important so DES can get info they need

? Dowling - Is your well dug or drilled & was the H<sub>2</sub>O tested before you bought it?

JD: No, just usual bacteria test, we discovered it because her husband had high % of Uranium in system

Lynne Merrick - NH Association of Realtors

- oppose new mandate before purchase and sale
- Realtors educate buyers & sellers on H<sub>2</sub>O quality & advise testing
- Better to have buyers do testing to protect chain of custody.
- No agreed upon standards for radon

☞ Lynne Merrill - continued

- Reason there aren't guidelines on radon is because public wells would need remediation. Unfair to require private wells if public wells are exempt.
- Foreclosed properties make implementation a problem. Hard to get done by Banks.
- Sometimes hard for sellers to afford

? P. McEachern - What does water quality test mean & what % of people test 4 radon?

LM - quality defined by buyer, FHA or home inspector. Unknown how many people test radon

Jack Munn - S. NH Planning Commission

- member of DES private well working group.
- Planning Commissions are active in promoting water testing for community planning purposes
- Data will help communities get data to protect drinking water supplies

? Schlachman - Why is reporting voluntary & was there a discussion of seller v. buyer.

Jm: Discussion was around point of sale vs certificate of occupancy

? Schlachman: Were there realtors in your group?

Jm: Not entirely sure

? Butler: Why so many more contaminants than usual?

Jm: Because we need the info to learn how these affect the water supply over time.

? Dowling: More onerous than public supply testing - why?

Jm: As planners, we aren't the ones to make that decision. These tests meet planning needs, we didn't worry about commercial requirements.

? DiStefano: Why seller, all other tests are on buyer?

Jm: Buyer vs Seller wasn't recommended by us - up to you

Bud Hancock - Hopkinton

- Wonderful water from 1983 - 1999
- Discovered arsenic in water supply
- Bought reverse osmosis water filtration system which fixed the problem.
- Arsenic should be part of standard water quality test.
- Fines seem exorbitant
- Buyer should be responsible

→ illness from arsenic & radon are insidious

## Bernard Lucey

- recent retiree from DES, in the field for 37 years
- Problem is that current tests are not comprehensive enough
- very important to test for arsenic, gross alpha, uranium for health concerns
- the question is how many people need to miss health risks? He thinks 1%.
- most people think recommended tests cover what they need, don't realize current tests are incomplete.
- list in bill is nearly comprehensive but leaves out some things because tests are expensive or risk is so small.
- For 10 years they have tried to get people to do this voluntarily.

? Dowling - Are all of those items tested in Community systems?

BL: We did, but stopped because there is no guidelines for radon. Others are tested in public systems.

? McEachern - Why not test radium?

BL: Too expensive, too infrequent & can be intuided from other tests

? McEachern - Why require test for radon if no standard?

BL: Because the risk is so high.

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But Cushing - Don't forget radon  
is also in air.

- Also the bills will cost a lot.



# Sub-Committee Actions

HOUSE COMMITTEE ON COMMERCE AND CONSUMER AFFAIRS

SUBCOMMITTEE WORK SESSION ON HB 1685{Type BILL NO.}

**BILL TITLE:** relative to testing the water quality of private water supply wells.

**DATE:** 2-2-10

**Subcommittee Members:** Reps. Hammond, DeStefano, Dowling

**Comments and Recommendations:**

**Amendments:**

Sponsor: Rep. OLS Document #:

Sponsor: Rep. OLS Document #:

Sponsor: Rep. OLS Document #:

**Motions:** OTP, OTP/A, ITL, Retained (Please circle one.)

Moved by Rep.

Seconded by Rep.

Vote:

**Motions:** OTP, OTP/A, ITL, Retained (Please circle one.)

Moved by Rep. DEStefano

Seconded by Rep. Dowling

Vote: 3-0

Respectfully submitted,

Rep. Jill Shaffer Hammond  
Subcommittee Chairman/Clerk

HOUSE COMMITTEE ON COMMERCE AND CONSUMER AFFAIRS

SUBCOMMITTEE WORK SESSION ON HB 1685

**BILL TITLE:** relative to testing the water quality of private water supply wells.

**DATE:** 2-2-10

**Subcommittee Members:** Reps. HAMMOND, DESTEFANO,  
DOWLING

**Comments and Recommendations:**

**Amendments:**

Sponsor: Rep.

OLS Document #:

Sponsor: Rep.

OLS Document #:

Sponsor: Rep.

OLS Document #:

**Motions:** OTP, OTP/A, ITL, Retained (Please circle one.)

Moved by Rep. DESTEFANO

Seconded by Rep. DOWLING

Vote: 3-0

**Motions:** OTP, OTP/A, ITL, Retained (Please circle one.)

Moved by Rep.

Seconded by Rep.

Vote:

Respectfully submitted,

Rep. {Type NAME}  
Subcommittee Chairman/Clerk

JILL SHAFFER HAMMOND

Jill Shaffer Hammond

ROCKINGHAM  
  
PLANNING  
COMMISSION

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[email@rpc-nh.org](mailto:email@rpc-nh.org) • [www.rpc-nh.org](http://www.rpc-nh.org)

February 1, 2010

Representative Edward Butler, Chair  
Commerce and Consumer Affairs Committee  
Legislative Office Building, Room 301  
Concord, NH 03301

**RE: Support for HB-1685**

Dear Chairman Butler and Members of the Committee:

I am writing to convey the support of the Rockingham Planning Commission for House Bill 1685. Should this legislation be successful it will require testing of private wells as part of a real estate transfer. We believe this accomplishes two things that are important to the well being of the residents of the State of New Hampshire.

First, and for the first time, this bill makes water quality a high priority for all real estate transfers. At the present time there is no requirement that any information on the adequacy of groundwater be a part of the real estate transfer process. I can think of no single item more central to the viability of a piece of property than a potable water source. This bill will insure that all parties to a real estate transfer will have full knowledge as to the viability of the onsite water supply. By incorporating a manageable set of "parameters of concern" (those items that must be tested for) the bill has been sensitive to the need to keep the cost for this well testing at a reasonable level. I believe that testing for the limited constituents indicated in the bill would cost a property owner less than \$300 at a private laboratory.

Second, the bill allows for the voluntary reporting of the well testing results to the New Hampshire Geological Survey (NHGS). The information that will be supplied to the NHGS through this process will provide a greater volume of detailed, high quality scientific information about the State's groundwater resource than has ever been gathered to date

Finally, I would like to note that I am member of the SB155 Commission to Study Issues Relative to Groundwater Withdrawal, representing the NH Association of Regional Planning

Rockingham Planning Commission

Page 2 of 2

Commissions. At the meeting of November 9, 2009 the Groundwater Study Commission voted 10-4 to support the legislation. On behalf of the Commission I hope your Committee will support HB 1685. Please feel free to contact me should you have any questions about our position.

Sincerely,



Glenn Greenwood

Assistant Director,

Rockingham Planning Commission

cc: Peter Griffin, Chair, Rockingham Planning Commission  
Steve Buckley, Esq., Chair, New Hampshire Association of Regional Planning  
Commissions

# Private Well Testing Disclosure

2/1/2010 DES DRAFT

*The New Hampshire Department of Environmental Services recommends that anyone considering buying a home that uses a private well for drinking water have the water tested for ALL common contaminants before purchasing the property.*

**DES Recommends Testing  
for ALL of these  
Parameters**

**Chemical Tests**

Arsenic  
Bacteria  
Chloride  
Copper  
Fluoride  
Hardness  
Iron  
Lead  
Manganese  
Nitrate/Nitrite  
pH  
Sodium  
Volatile Organic Compounds  
including MtBE

**Radiological Tests**

Radon  
Uranium  
Analytical Gross Alpha

It is very common for private wells in New Hampshire to contain unhealthy levels of natural contaminants such as arsenic and radon, even in areas where there is no human activity. Before purchasing a home that uses a private well, the home buyer should be aware of the health risks associated with using the well water and should look into the cost of installing and maintaining an appropriate treatment system. In homes that already have treatment systems, DES recommends that the treated water be tested to ensure that ALL common contaminants are below levels that pose a health risk.

In New Hampshire there are no statewide requirements for testing of private wells in connection with real estate transactions, although some lenders require limited testing [and state law will require testing of newly deepened, and hydrofractured wells beginning in 2011]. The testing required by your mortgage lender, if any, may or may not include ALL contaminants that are common in New Hampshire wells (particularly arsenic and radon, the most common contaminants in New Hampshire).

The testing parameters above is meant to include health-related contaminants that occur in a significant percentage of private wells in New Hampshire, plus a few parameters that affect the usability of water, may be indicators of sewage contamination, or affect the choice of treatment methods. These tests can be performed by a number of private laboratories or by the DES Laboratory. Prices and turnaround times may vary significantly from one laboratory to another. DES recommends that all testing be done by a NELAP-certified laboratory.

A new state law (RSA 485-F) requires the SELLER to provide this disclosure form to you *and* it requires you to sign this form to indicate that you have read it, **BEFORE YOU SIGN A PURCHASE AND SALE AGREEMENT**. The purpose of the law is to protect public health by making home buyers aware of the potential health risks associated with using untreated or inadequately treated water from private wells.

*By signing this form, the BUYER acknowledges receipt of a copy of this form.*

\_\_\_\_\_  
BUYER Signature

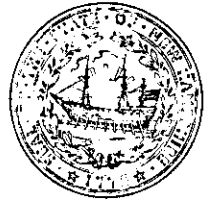
\_\_\_\_\_  
BUYER Name

\_\_\_\_\_  
Date signed

# Testimony



The State of New Hampshire  
**DEPARTMENT OF ENVIRONMENTAL SERVICES**



**Thomas S. Burack, Commissioner**

January 21, 2010

The Honorable Edward Butler, Chairman  
Commerce and Consumer Affairs Committee  
Room 302, LOB  
Concord, NH 03301

**RE: House Bill 1685, Relative to testing the water quality of private water supply wells**

Dear Chairman Butler:

Thank you for the opportunity to comment on HB 1685. The goal of this bill is to improve public health protection by increasing awareness of water quality in private water supply wells such as those that serve individual residences in New Hampshire. This is proposed to be accomplished by mandating certain water quality testing for private water supply wells when real estate is sold, new wells are drilled, or existing wells are improved such as by hydrofracturing or drilling.

In New Hampshire, for reasons discussed in detail below, there is a well-recognized need for improved knowledge of water quality in residential wells by those who live in the households served by these wells and who consume the water. To further consider this problem, in 2007, a Private Well Working Group was formed by DES to study this issue as part of DES's drinking water strategy. As formed, the group had over 20 members from diverse organizations. After consideration of this issue, based on a majority vote, the group recommended in a report to the Groundwater Commission dated September 16, 2009 that legislation be proposed to require testing of private water supply wells. In October 2009, the majority of the Groundwater Commission voted to endorse this concept. HB 1685 has been proposed as the result of this process.

HB 1685 requires testing of new private wells as well as existing wells during the transfer of real estate or when improvements occur such as deepening or hydrofracturing, unless the buyer opts out. The cost for the proposed water quality analysis is estimated at between \$165 and \$300 per well. The responsibility for enforcement of this program is proposed to be placed with DES. DES would specifically be required to adopt rules regarding forms to be used and technical matters such as sample taking, handling, and analysis. DES would also be responsible for enforcement when violations are reported. DES would work with pump installers, real estate agents, laboratories, and mortgage lenders to ensure that all parties are aware of their responsibilities. HB 1685 specifically makes data reporting to the state optional but the well owner or home buyer may voluntarily elect to have the information shared with the New Hampshire Geological Survey for scientific purposes. DES anticipates that some additional staff effort would be required. However, most of this program would be implemented by shifting staff resources already being used for our education and outreach efforts to private well owners to the new responsibilities. We also expect that program staff supported by federal Safe Drinking Water Act (SDWA) funds could continue to be used for this expanded purpose. The United States Environmental Protection Agency (USEPA) has determined that private well

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water quality is a significant national public health issue and, therefore, allows SDWA funds to be used for this purpose. Therefore, there would be no cost to the general fund.

At the national level, private water supply well water quality is recognized as a public health issue by both federal agencies, such as the USEPA and the United States Public Health Service, and medical professionals that requires further attention. For example, attached is a recent policy statement entitled "Drinking Water from Private Wells and Risks to Children" from the American Academy of Pediatrics. This statement, which was published in PEDIATRICS magazine in June 2009, explains the issues and makes recommendations to pediatricians and others, including government agencies to improve children's health protection. HB 1685 is consistent with a specific recommendation for governments in this policy that water testing and reporting be required during real estate transactions.

Approximately 40 percent of New Hampshire residents (approximately 525,000 people) rely on private residential water supply wells for their water supply at home, and this percentage is growing. Many of these households have residential water supply wells that have not been tested for the entire suite of naturally occurring contaminants that can pose a health risk and that we know to be present in a significant percentage of wells as a result of New Hampshire's geology. Specifically:

- The United States Geological Survey and DES estimate that around 20 percent of all private wells in the state (approximately 47,000 of the state's 235,000 private wells) contain arsenic concentrations above the federal health-based limit of 10 ug/L that applies to public water systems. And, in some areas, up to 50% of the wells exceed this limit.
- About 33 percent of private residential wells (77,550 wells) exceed the proposed federal limit for radon in water of 4,000 pCi/L. Radon from water supplies is released to indoor air adding to radon drawn into homes from the soil to cause elevated levels of radon in the living spaces in many homes. Radon in indoor air is second only to smoking as a leading cause of lung cancer.
- Uranium and other radionuclides are also found in private residential wells but less frequently than arsenic and radon. The estimated percentages of wells in New Hampshire that exceed the federal health-based standards for these radionuclides are seven percent for uranium (16,000 wells), four for radium (9,400 wells), and four for gross alpha (9,400 wells).
- Approximately two percent of New Hampshire wells (4,700 wells) have fluoride exceeding the health-based limit of 4 mg/L.
- Beryllium occurs naturally in some of the state's bedrock. It is found in wells primarily in the Mt. Washington Valley area and exceeds the federal limit (4 ug/L) in approximately seven percent of wells in that area.


The Honorable Edward Butler, Chairman  
HB 1685  
January 21, 2010  
Page 3 of 3

Without knowledge of the concentrations of these natural contaminants in water supply wells, homeowners are unable to make informed decisions about consuming water from these wells and whether additional treatment is necessary.

DES suggests three changes to the bill as introduced. First, while the bill's testing requirements would take effect one year after the bill's passage, DES suggests that the inclusion of gross alpha among the "contaminants of concern" be phased in a year or two later, to enable the state's private laboratories to develop the capacity and the accreditation to perform this analysis, which is currently available at fewer than a handful of in-state laboratories. Second, the bill's language regarding the use of forms to be developed by DES for the reporting of analytical data should be clarified to enable laboratories to report results in a variety of formats if minimum standards for clarity and readability are met. DES also believes that serious consideration should be given to a requirement that volatile organic chemicals including gasoline contaminants such as methyl-tertiary butyl ether (MtBE) since these also can be present in groundwater at significant levels; we also recognize that this would increase the cost for testing.

If you have any questions or need additional information, please do not hesitate to call Sarah Pillsbury at 271-1168 or me at 271-3449.

Sincerely,

  
Thomas S. Burack  
Commissioner

cc: Representative Spang

Enclosure



## POLICY STATEMENT

# Drinking Water From Private Wells and Risks to Children

Organizational Principles to Guide and  
Define the Child Health Care System and/or  
Improve the Health of All Children

Committee on Environmental Health and Committee on Infectious Diseases

**ABSTRACT**

Drinking water for approximately one sixth of US households is obtained from private wells. These wells can become contaminated by pollutant chemicals or pathogenic organisms and cause illness. Although the US Environmental Protection Agency and all states offer guidance for construction, maintenance, and testing of private wells, there is little regulation. With few exceptions, well owners are responsible for their own wells. Children may also drink well water at child care or when traveling. Illness resulting from children's ingestion of contaminated water can be severe. This policy statement provides recommendations for inspection, testing, and remediation for wells providing drinking water for children. *Pediatrics* 2009;123:1599–1605

[www.pediatrics.org/cgi/doi/10.1542/peds.2009-0751](http://www.pediatrics.org/cgi/doi/10.1542/peds.2009-0751)

doi:10.1542/peds.2009-0751

All policy statements from the American Academy of Pediatrics automatically expire 5 years after publication unless reaffirmed, revised, or retired at or before that time

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**Key Words**

water, drinking water, well, well water, private well, groundwater, nitrate, waterborne disease

**Abbreviation**

EPA—Environmental Protection Agency  
PEDIATRICS (ISSN Numbers: Print, 0031-4005,  
Online, 1098-4275). Copyright © 2009 by the  
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**INTRODUCTION**

Approximately 15% to 20% of households in the United States obtain their water from private wells.<sup>1</sup> Private wells are not subject to federal regulations of the US Environmental Protection Agency (EPA) or those of the Navajo Nation (which has its own EPA) and are minimally regulated by states. Coliform contamination of home private wells in Iowa in the 1990s was as high as 27%.<sup>2</sup> According to the Centers for Disease Control and Prevention, there were 31 waterborne disease outbreaks reported in the United States in 2005–2006, the latest years for which data are published.<sup>3</sup> Twenty of the outbreaks were from drinking water, of those, 8 were groundwater sources, usually private wells. Those caused illness in 458 people. The etiology of 5 of the outbreaks is known: 1 was *Campylobacter*, 3 were norovirus, and 1 was Hepatitis A. Waterborne illness is undoubtedly underrecognized and underreported.

**GROUNDWATER AND WELLS**

Groundwater is water below the topsoil and above impervious bedrock. When groundwater collects in and saturates relatively porous fractured bedrock and soil, it is said to be in an aquifer. The water table is a depth below which the soil and fractured bedrock (ie, the aquifer) is saturated with water. The water table can vary from season to season and year to year. For a well to produce water reliably, it must be deep enough so that water can be pumped from the aquifer under virtually all weather conditions. Aquifers are recharged from above by precipitation and runoff.

**WELL TYPES**

Dug wells usually are shallow holes, 10 to 30 ft deep, lined with rock, brick, tile, or concrete, with a pump in a nearby pump house or in the dwelling. Dug wells usually are relics on older home sites. They are easy to contaminate and unreliable in most of the United States.

For driven wells, pipe is driven through gravel or sandy soil. These wells also tend to be shallow, usually approximately 50 ft deep; the pump is installed at the top of the well or in the dwelling. Driven wells are still relatively easy to contaminate because of their shallowness but can be installed rapidly and inexpensively if the geologic conditions are right. Dug wells and driven wells are often the water source at camps or vacation homes.

Drilled wells are 100 to 400 ft deep and reach bedrock. Most drilled wells have an electric submersible pump at the bottom. Because the water has been filtered by soil on the way down and is relatively safe from contamination while in the aquifer, water from these deeper wells is less likely to be contaminated.

**TABLE 1 Relevant Chemicals in Well Water**

Chemical	Source	Effects
Nitrates	Sewage Fertilizer	Methemoglobinemia Possible promoter of carcinogenesis
Volatile organics and pesticides	Dry-cleaning agents, gasoline, etc Often a source cannot be identified	Compound-specific effects
Lead	Leached from the brass in a submersible pump, from solder, or from old lead pipes	Impairs neurocognitive development
Arsenic	Occurs in specific rock formations (eg, the "slate belt" in the southeastern United States, Nevada, Alaska, and other areas in the western United States)	Acutely toxic carcinogenic (bladder, skin, and lung) in humans
Chromium VI	Used in the electroplating and other industries	Toxic and carcinogenic in laboratory animals
Radon	Naturally occurring radioactive gas	Carcinogenic (lung) in humans
Fluoride	Naturally in water in a few parts of the United States	Accepted preventive for dental caries, supplement if low concentrations Too much can cause dental fluorosis
Uranium	Naturally occurring in western mountains in the United States and in areas that have granite outcrops in the eastern United States	High dose is acutely toxic A source of ionizing radiation, which causes cancer
Methyl tertiary butyl ether	Partially oxidized hydrocarbon fuel additive used to oxygenate gasoline	Carcinogenic in laboratory animals
Perchlorate	Oxidizing agent used in rocket fuels, fireworks, and airbag inflators, among other applications Can occur naturally	Inhibits synthesis of thyroid hormone

**COMPOSITION OF WELL WATER**

**Chemicals**

The chemical composition of well water varies with region, underlying geologic formation, and environmental contamination and can be harmful, beneficial, or merely undesirable. For example, some fluoride is desirable in drinking water, whereas iron is undesirable. Many other chemicals, some of them potentially toxic, can contaminate well water, with their presence or absence attributable to naturally occurring geologic factors or dispersion from industry, farms, or business (Table 1). The presence of nitrates is particularly problematic for infants.<sup>4</sup> The most commonly occurring pollutant chemicals are volatile organics and pesticides, which may be identifiable in more than one third of US wells,<sup>5</sup> albeit mostly at concentrations below federal public water standards.

Many commercial sources will measure water hardness and concentrations of iron and manganese. Calcium and magnesium carbonate make water hard. Hard water is not toxic, but it may require treatment to prevent precipitation from clogging pipes and causing other problems, such as coating electric hot water heater elements and causing them to burn out. Manganese and iron can appear as rust-colored to black flecks and can stain clothing, plumbing, and fixtures. So-called iron and manganese bacteria can grow in such water and form visible black slimy colonies of microorganisms, sometime clogging pipes and faucets.

**Microorganisms**

Microorganisms, including bacteria, viruses, fungi, and parasites, can contaminate the ground water that supplies wells (Table 2). The major source of these organisms is fecal material from animals and humans. Analyzing well water at its point of use for "total coliforms"

is the commonest way of detecting fecal contamination of the water. Where available, testing for fecal coliforms and/or *Escherichia coli* may be performed as a combined assay with total coliforms and used for the annual bacterial testing. The absence of coliforms is good but not absolute evidence that significant fecal contamination is not present. Samples that contain any coliforms should be retested to determine if they are fecal coliforms; specimens that test positive should be examined for the presence of *E coli* or other pathogens.

Much of the information describing the pathogens that can be present in well water has been obtained from investigations of waterborne outbreaks. In the United States, most waterborne outbreaks are associated with noncommunity water systems, chiefly private or communal wells.<sup>3</sup>

**MITIGATION**

**Bacterial**

If test results confirm bacterial contamination, the water system must be treated. The first approach is to inspect the well to make sure that there are no structural defects that may have fostered the contamination. "Shock chlorination," using concentrations of chlorine that are 100

**TABLE 2 Pathogenic Microorganisms Found in Well Water**

Bacteria	Viruses	Parasites
<i>Escherichia coli</i> , including O157:H7	Norovirus, sapovirus	<i>Giardia intestinalis</i>
<i>Salmonella</i> species	Rotavirus	<i>Cryptosporidium</i>
<i>Shigella</i> species	Enteroviruses	<i>Cyclospora</i>
<i>Campylobacter jejuni</i>	Hepatitis A and E	Microsporidia
<i>Yersinia enterocolitica</i>		<i>Isoospora</i>
<i>Mycobacterium avium-intracellulare</i>		<i>Naegleria fowleri</i>

to 400 times the amount found in municipal water supplies, should be performed initially. This can be performed by the homeowner using household bleach (many Web sites [eg, [www.water-research.net/shockwelldisinfection.htm](http://www.water-research.net/shockwelldisinfection.htm)] have instructions), but consultation with the health department or other experienced individuals is advisable before the first time.

Most other treatment measures require the service of a trained home water-treatment professional. If bacterial contamination persists despite efforts at continuous disinfection, natural or structural factors may be present that may not be under the control of the well owner. This may require that the well be closed and a new well be drilled. A certified well contractor should fill or seal the contaminated well.

### Chemical

Chemical contaminants are approached by investigating the possibility that the contamination exists on the homeowner's or on an adjacent homeowner's property, such as from agricultural application of nitrogen-containing fertilizers, pesticide application, or fuel tanks. If the water supply cannot be remediated further and the well is still contaminated or the chemicals in question are naturally occurring, then it is possible to filter out or treat for virtually any chemical or biological contaminant.<sup>6</sup> However, treatment can become complex and/or expensive and can require meticulous or professional maintenance.

Because there are no standards for private wells for many contaminants of concern, those seeking a specific concentration to indicate potability have little choice but to apply the same standards that municipalities do under the Safe Drinking Water Act amendments of 1996 (Pub L No. 104-182 [for the current list of drinking water contaminants, see [www.epa.gov/safewater/mcl.html](http://www.epa.gov/safewater/mcl.html)]). Municipalities regard water that is persistently above these federal standards as not potable. Nonetheless, well owners or home occupants are under no obligation to apply this same standard to their well water.

## RECOMMENDATIONS FOR PEDIATRICIANS

1. Pediatricians should ask whether a family drinks water from a private well at home, on vacation, when traveling, in child care, or other locations where they might drink water. This is particularly important for families with an infant. Families with children of high school age or younger should follow the algorithm in Appendix 1. A description of the tests and some rationale for their use is provided as follows.

### Routine Testing

#### A. Purchase of a New Home With a Well

The builder should provide the results of coliform, nitrate, inorganic (total dissolved solids, iron, magnesium, calcium, chloride), fluoride, radon, and lead testing. If the well was shock-chlorinated after drilling, it should be retested for coliforms after some period of time as rec-

ommended by the local health department or agricultural extension agent. Have the builder or agent provide a site plan with the well, its water lines, and the septic tank and field.

#### B. Purchase/Rental/Lease of an Existing Home With a Well

Recommend including the well and septic field in any general inspection. If this cannot be performed, families should arrange for well inspection and testing as described in 1A and have the septic tank located and inspected to determine if it needs to be pumped. If there are filters, softeners, or other devices in the water-supply lines, determine from the seller or landlord what they are treating.

#### C. Vacation Homes, Camps, etc

A vacation home or camp with a shallow well and no other water source should be tested each season, if possible. If not, consider bottled water for infants or anyone with a compromised immune system. For a short stay, it may be safer and more convenient to use bottled water for drinking and cooking for everyone. Boiling water and filtration systems on the tap can reduce the risk of acquiring microorganisms from the untested well water. Boiling water means that the water must be brought to a full boil for 1 to 3 minutes, but recommendations vary and local advice should be sought. Filtration will allow viruses and possibly some *Giardia* cysts through.

Test kits are available for coliforms and nitrate, but it is difficult for the consumer to judge the accuracy and quality control for each product. Thus, for families with an infant, for whom it is crucial to know that the nitrate concentration is below 10 mg/L, home testing is inadvisable.

#### D. Child Care and School

Child care in rural and suburban areas can be in a setting where the water comes from a private well. Parents should inquire about the child care center's water source if they have any doubt. If the water comes from a well, parents should ask whether the well has been regularly and recently tested for nitrate and coliforms and what the results were. If recent results are not available, infants should be given bottled water until the well is shown not to have excessive nitrate concentrations.

#### E. Scheduled Testing

Every spring, the well should be examined to make sure that there are no mechanical problems. Well water should be tested annually for coliforms and nitrates. Testing more than once per year may be warranted in the following special situations: (1) someone in the household is pregnant or nursing; (2) there are unexplained illnesses in the household; (3) neighbors find a dangerous contaminant in their well water; (4) there is a change in the odor or taste of the well water; (5) there is a chemical spill in proximity of the well; or (6) there was a significant repair or replacement in the well. Routine testing for *Giardia* and *Cryptosporidium* organisms is not recommended because of the technical difficulty

(filtering very large volumes of water) and expense. However, in the following situations, it may be prudent to test for these parasites: (1) members of family have developed gastrointestinal disease attributable to *Giardia* and/or *Cryptosporidium* species; (2) the well is at the bottom of a hill and/or is shallow (vulnerable to runoff); or (3) the well is in a rural area where animals graze. The risk factors for *E coli* O157:H7 are similar to those for *Giardia* and *Cryptosporidium* species. So when these situations exist, vigilance should be maintained for *E coli* O157:H7 contamination and/or clinical symptoms. Much information about potential for contamination is local lore, so national sources of information about drinking water, such as the EPA Web site, repeatedly advise contact with local experts. Thus, the time of annual testing for nitrates and coliforms is a reminder to check with the health department about any water-quality problems that have emerged.

### Occasional Testing

#### *F. New Infant*

A new infant or a child younger than 1 year in the home should prompt testing if the yearly test has indicated any fluctuation in nitrate concentrations or has never been performed. Even a breastfed infant may need water at some time, and boiling does not remove and can concentrate nitrate.

#### *G. Damage or Disturbance to the Well*

If a new submersible pump is installed or the well integrity is compromised, such as by a falling tree, a vehicle collision, a flood, or a cut to the water line during landscaping, the well should be tested and, if necessary, shock-chlorinated.

#### *H. Sentinel Illnesses*

Every episode of gastroenteritis does not require well testing or an investigation of the cause of the illness. However, if multiple individuals become ill with gastroenteritis, if the gastroenteritis is recurrent, or if a pathogen causing the gastroenteritis is a bacteria or parasite that may have been present in the well water as a result of fecal contamination, then well testing for pathogens is indicated. Any occurrence of methemoglobinemia in an infant consuming well water requires testing the well water for nitrate. An elevated blood lead concentration in a child living in a home built after 1978, or a persistently elevated blood lead concentration, requires testing for lead in well water. At some point in the evaluation of unusual or cryptogenic illness, the possibility of contaminated well water should be considered. For a list of symptoms associated with various well contaminants, see the work by Wagenet et al<sup>6</sup>

2. Fluoride is an accepted preventive for dental caries, and if a child's drinking water contains little or none, then supplements (available as drops or chewable tablets) are necessary. The American Academy of Pediatrics recommends no fluoride supplementation before 6 months of age; from 6 months to 3 years of age,

children (including those who are breastfed) require fluoride supplementation if the water has a fluoride concentration of less than 0.3 ppm. Supplementation from 3 to 16 years of age is recommended where drinking water fluoride concentrations are less than 0.6 ppm.<sup>7</sup> To avoid dental fluorosis, water with fluoride concentrations greater than 2 ppm should not be consumed by children younger than 9 years.

3. Become familiar with well water considerations in your area. Advocate for water safety practices that will protect the health of children.

### RECOMMENDATIONS TO GOVERNMENT

1. Local governments should provide access to information about local groundwater conditions. Recommendations for testing should be easily available with a telephone call or a Web-page visit. If water contamination becomes a public health issue, then multiple means of alerting and informing the public should be considered. In areas where agricultural land is being developed, paved, or put to any new use, local governments should consider mailing or using some other active means of getting their policies and recommendations concerning well testing to homes with permitted wells and the possibility of being affected by the new use.
2. Tests determined to be necessary for the safety and health of the families drinking well water should be convenient and, if possible, free or inexpensive (see Appendix 2 for current costs).
3. Community wells that serve just enough households to be regulated are sometimes exempted from testing that is required of larger systems. Although this may be appropriate, it should not be routine, and adequate local data should justify any exemption.
4. For housing that has drinking water supplied by a private well, states should require testing for coliforms, nitrate, fluoride, and any contaminant of local concern when a dwelling is sold, and the results should be made available to the buyer before closing.

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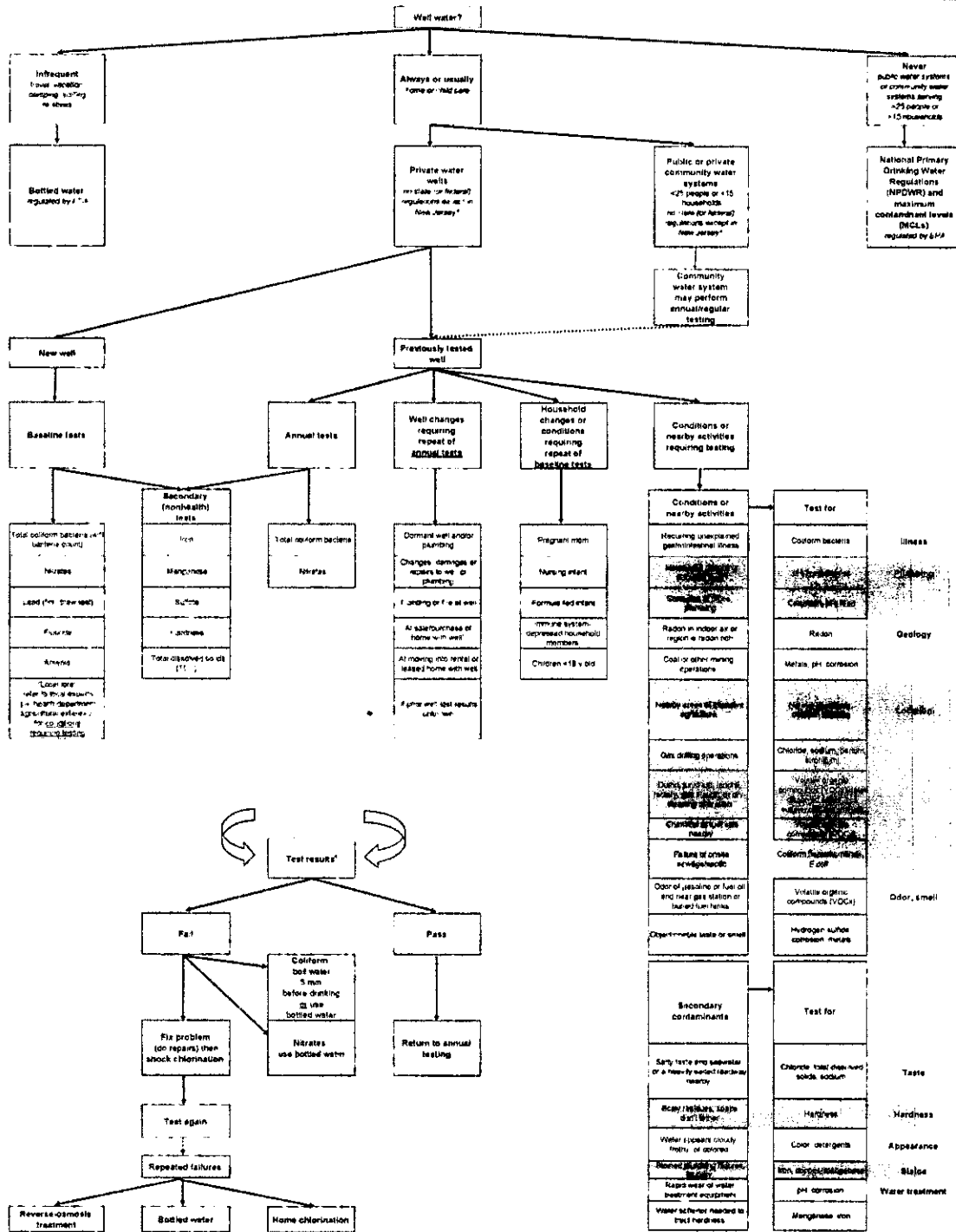
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**REFERENCES**

1. US Environmental Protection Agency. Private drinking water wells. Available at: [www.epa.gov/safewater/privatewells/index2.html](http://www.epa.gov/safewater/privatewells/index2.html). Accessed April 1, 2008
2. Kross BC, Hallberg GR, Bruner DR, Cherryholmes K, Johnson JK. The nitrate contamination of private well water in Iowa. *Am J Public Health*. 1993;83(2):270–272
3. Yoder J, Roberts V, Craun GF, et al. Surveillance for waterborne disease and outbreaks associated with drinking water and water not intended for drinking—United States, 2005–2006. *MMWR Surveill Summ*. 2008;57(SS09):39–62
4. Greer FR, Shannon M; American Academy of Pediatrics. Committee on Nutrition, Committee on Environmental Health. Infant methemoglobinemia: the role of dietary nitrate in food and water. *Pediatrics*. 2005;116(3):784–786
5. Squillace PJ, Scott JC, Moran MJ, Nolan BT, Kolpin DW. VOCs, pesticides, nitrate, and their mixtures in groundwater used for drinking water in the United States. *Environ Sci Technol*. 2002;36(9):1923–1930
6. Wagenet L, Mancí K, Sallus M. *Home Water Treatment*. Ithaca, NY: Natural Resource, Agriculture, and Engineering Service; 1995. NRAES-48
7. American Academy of Pediatrics, Committee on Nutrition. Fluoride supplementation for children: interim policy recommendations. *Pediatrics*. 1995;95(5):777

APPENDIX 1 Flowchart for Testing Well Water



<sup>a</sup> Testing at sale/purchase of home is required by law in state of New Jersey.  
<sup>b</sup> Testing at sale/purchase of homes is often required by mortgage lender/bank, VA/FHA (Veteran Affairs/Federal Housing Administration), or county health department.  
<sup>c</sup> Maximum contaminant levels from the EPA, same as those used by public water systems. FDA indicates Food and Drug Administration.



**APPENDIX 2 Well Water Tests, Recommended Frequency, and Approximate Costs**

Test	Frequency	Approximate Costs, 2006 \$
<b>Annual tests</b>	Annually	30
Total coliform bacteria		
Nitrate		
<b>Common inorganic test battery</b>		25
Fluoride		
Chloride		
Hardness		
Copper	Every 3–5 y	
Iron		
pH		
Manganese		
Uranium		
Arsenic		10
<b>FHA/VA loan for new well; additional 1-time tests</b>		10
Color		
Turbidity		
Odor	Every 3–5 y	
Sodium		
Lead (first draw) (1-time test free for FHA/VA loans)	Every 10 y for homes built before 1985	15, stand-alone lead test
<b>Additional "more thorough" 1-time tests</b>		25
Zinc		
Cadmium		
Detergents		
<b>Miscellaneous individual tests</b>		15 each
Nitrate, chloride, hardness, copper, iron, pH, manganese, color, turbidity		
Fluoride, sodium, detergents, conductivity, total solids, ammonia nitrogen		
Arsenic, barium, cadmium, chromium, lead, silver, selenium, uranium		
<b>Organic compound tests</b>		
Volatile petroleum screen (gasoline, MTBE), in water		60
Volatile petroleum screen (gasoline, MTBE), in soil		80
Diesel organics and fuel oil		140
Volatile organics screen (especially solvents, degreasers)		135
Semivolatiles organic screen (including wood preservatives)		200
Semivolatiles organic screen plus chlordane, PCBs, and toxaphene		275
PCBs		150
Chlorinated acids: herbicides screen		200
Carbamate pesticides		125
<b>Radiologic tests</b>		
Radon in water		25
Radon in air		20
Radon in air (long-term) "α track"		25
Gross α (radioactivity in water; does not test for radon)	Every 5–10 y	55
Gross β		55
Radium (if gross α > 5 pCi)		195
Radium 228 (only)		150
Gamma		50

FHA Indicates Federal Housing Administration; VA, Veteran Affairs; MTBE, methyl tertiary butyl ether; PCB, polychlorinated biphenyl.



# A Citizen's Guide To Radon



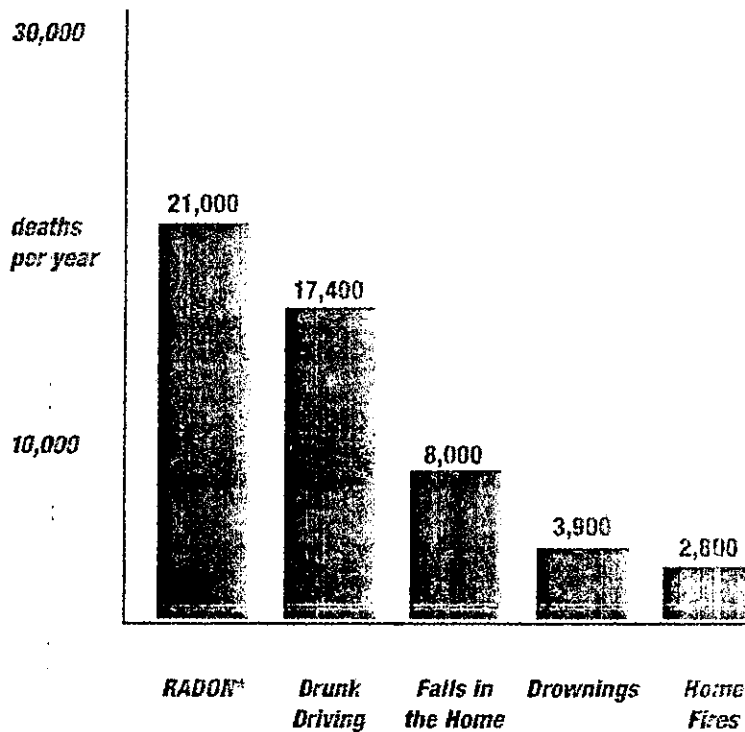
## The Guide To Protecting Yourself And Your Family From Radon



## **EPA Recommends:**

- ▼ **Test your home for radon—it's easy and inexpensive.**
- ▼ **Fix your home if your radon level is 4 picocuries per liter (pCi/L) or higher.**
- ▼ **Radon levels less than 4 pCi/L still pose a risk, and in many cases may be reduced.**

**Radon is estimated to cause thousands of lung cancer deaths in the U.S. each year.**



\*Radon is estimated to cause about 21,000 lung cancer deaths per year, according to EPA's 2003 Assessment of Risks from Radon in Homes (EPA 402-R-03-003). The numbers of deaths from other causes are taken from the Centers for Disease Control and Prevention's 1999-2001 National Center for Injury Prevention and Control Report and 2002 National Safety Council Reports.

## ***Radon is a cancer-causing, radioactive gas.***

You can't see radon. And you can't smell it or taste it. But it may be a problem in your home.

Radon is estimated to cause many thousands of deaths each year. That's because when you breathe air containing radon, you can get lung cancer. In fact, the Surgeon General has warned that radon is the second leading cause of lung cancer in the United States today. Only smoking causes more lung cancer deaths. **If you smoke and your home has high radon levels, your risk of lung cancer is especially high.**

## ***Radon can be found all over the U.S.***

Radon comes from the natural (radioactive) breakdown of uranium in soil, rock and water and gets into the air you breathe. Radon can be found all over the U.S. It can get into any type of building—homes, offices, and schools—and result in a high indoor radon level. But you and your family are most likely to get your greatest exposure at home, where you spend most of your time.

## ***You should test for radon.***

Testing is the only way to know if you and your family are at risk from radon. EPA and the Surgeon General recommend testing all homes below the third floor for radon. EPA also recommends testing in schools.

Testing is inexpensive and easy—it should only take a few minutes of your time. Millions of Americans have already tested their homes for radon (see page 5).

## ***You can fix a radon problem.***

Radon reduction systems work and they are not too costly. Some radon reduction systems can reduce radon levels in your home by up to 99%. Even very high levels can be reduced to acceptable levels.

## ***New homes can be built with radon-resistant features.***

Radon-resistant construction techniques can be effective in preventing radon entry. When installed properly and completely, these simple and inexpensive techniques can help reduce indoor radon levels in homes. In addition, installing them at the time of construction makes it easier and less expensive to reduce radon levels further if these passive techniques don't reduce radon levels to below 4 pCi/L. **Every new home should be tested after occupancy, even if it was built radon-resistant.** If radon levels are still in excess of 4 pCi/L, the passive system should be activated by having a qualified mitigator install a vent fan. For more explanation of radon resistant construction techniques, refer to EPA publication, *Building Radon Out: A Step-by-Step Guide on How to Build Radon-Resistant Homes* (see page 15).

## HOW DOES RADON GET INTO YOUR HOME?

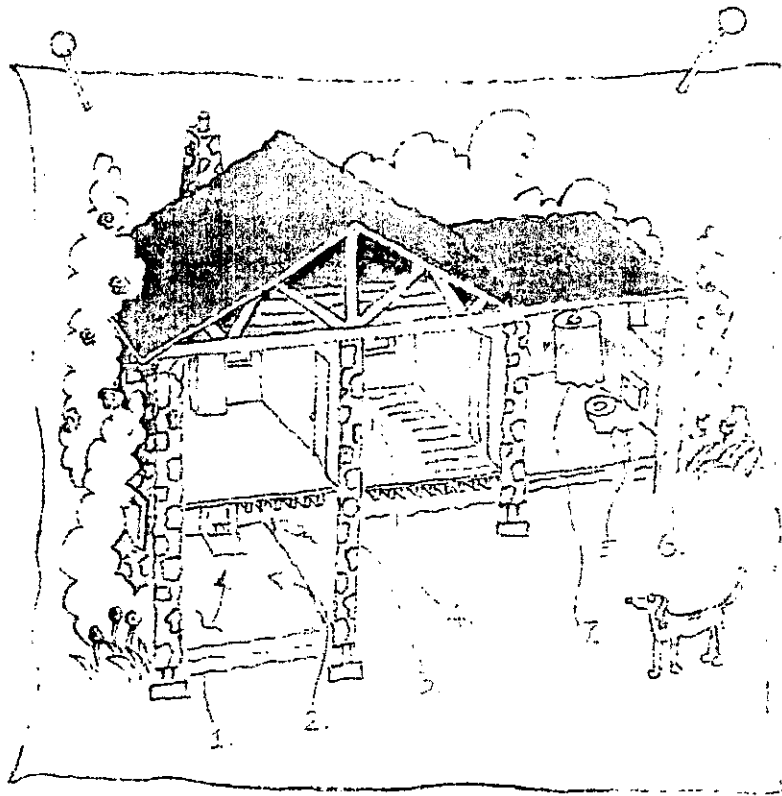
*Any home may  
have a radon  
problem.*

Radon is a radioactive gas. It comes from the natural decay of uranium that is found in nearly all soils. It typically moves up through the ground to the air above and into your home through cracks and other holes in the foundation. Your home traps radon inside, where it can build up. Any home may have a radon problem. This means new and old homes, well-sealed and drafty homes, and homes with or without basements.

Radon from soil gas is the main cause of radon problems. Sometimes radon enters the home through well water (see page 8). In a small number of homes, the building materials can give off radon, too. However, building materials rarely cause radon problems by themselves.

### **RADON GETS IN THROUGH:**

1. Cracks in solid floors.
2. Construction joints.
3. Cracks in walls.
4. Gaps in suspended floors.
5. Gaps around service pipes.
6. Cavities inside walls.
7. The water supply.



Nearly 1 out of every 15 homes in the U.S. is estimated to have elevated radon levels. Elevated levels of radon gas have been found in homes in your state. Contact your state radon office (see back cover) for general information about radon in your area. While radon problems may be more common in some areas, any home may have a problem. The only way to know about your home is to test.

Radon can also be a problem in schools and workplaces. Ask your state radon office (see back cover) about radon problems in schools, daycare and childcare facilities, and workplaces in your area (also visit [www.epa.gov/radon](http://www.epa.gov/radon)).

## **HOW TO TEST YOUR HOME**

You can't see radon, but it's not hard to find out if you have a radon problem in your home. All you need to do is test for radon. Testing is easy and should only take a few minutes of your time.

The amount of radon in the air is measured in "picocuries per liter of air," or "pCi/L." Sometimes test results are expressed in Working Levels (WL) rather than picocuries per liter (pCi/L) (4 pCi/L equals 0.016 WL). There are many kinds of low-cost "do it yourself" radon test kits you can get through the mail and in some hardware stores and other retail outlets. If you prefer, or if you are buying or selling a home, you can hire a qualified tester to do the testing for you. You should first contact your state radon office about obtaining a list of qualified testers. You can also contact a private radon proficiency program for lists of privately certified radon professionals serving your area. For links and more information, visit [www.epa.gov/radon/proficiency.html](http://www.epa.gov/radon/proficiency.html).

### ***There are Two General Ways to Test for Radon:***

#### ***SHORT-TERM TESTING:***

*The quickest way to test is with short-term tests. Short-term tests remain in your home for two days to 90 days, depending on the device. "Charcoal canisters," "alpha track," "electret ion chamber," "continuous monitors," and "charcoal liquid scintillation" detectors are most commonly used for short-term testing. Because radon levels tend to vary from day to day and season to season, a short-term test is less likely than a long-term test to tell you your year-round average radon level. If you need results quickly, however, a short-term test followed by a second short-term test may be used to decide whether to fix your home (see also page 7 under Home Sales).*

#### ***LONG-TERM TESTING:***

*Long-term tests remain in your home for more than 90 days. "Alpha track" and "electret" detectors are commonly used for this type of testing. A long-term test will give you a reading that is more likely to tell you your home's year-round average radon level than a short-term test.*

### ***How To Use a Test Kit:***

Follow the instructions that come with your test kit. If you are doing a short-term test, close your windows and outside doors and keep them closed as much as possible during the test. Heating and air conditioning system fans that re-circulate air may be operated. Do not operate fans or other machines which bring in air from outside. Fans that are part of a radon-reduction system or small exhaust fans operating only for short periods of time may run during the test. If you are doing a short-term test lasting just 2 or 3 days, be sure to close your windows and outside doors at least 12 hours before beginning the test, too. You should not conduct

***Testing is easy  
and should only  
take a few  
minutes of  
your time.***

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short-term tests lasting just 2 or 3 days during unusually severe storms or periods of unusually high winds. The test kit should be placed in the lowest lived-in level of the home (for example, the basement if it is frequently used, otherwise the first floor). It should be put in a room that is used regularly (like a living room, playroom, den, or bedroom) but **not** your kitchen or bathroom. Place the kit at least 20 inches above the floor in a location where it won't be disturbed—away from drafts, high heat, high humidity, and exterior walls. Leave the kit in place for as long as the package says. Once you've finished the test, reseal the package and send it to the lab specified on the package right away for analysis. You should receive your test results within a few weeks.

### *EPA Recommends the Following Testing Steps:*

**Step 1. Take a short-term test. If your result is 4 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:**

- **For a better understanding of your year-round average radon level, take a long-term test.**
- **If you need results quickly, take a second short-term test.**

*The higher your initial short-term test result, the more certain you can be that you should take a short-term rather than a long-term follow up test. If your first short-term test result is more than twice EPA's 4 pCi/L action level, you should take a second short-term test immediately.*

**Step 3. • If you followed up with a long-term test: Fix your home if your long-term test result is 4 pCi/L or more.**

- **If you followed up with a second short-term test: The higher your short-term results, the more certain you can be that you should fix your home. Consider fixing your home if the average of your first and second test is 4 pCi/L or higher (see also page 7 under Home Sales).**



## WHAT YOUR TEST RESULTS MEAN

The average indoor radon level is estimated to be about 1.3 pCi/L, and about 0.4 pCi/L of radon is normally found in the outside air. The U.S. Congress has set a long-term goal that indoor radon levels be no more than outdoor levels. While this goal is not yet technologically achievable in all cases, most homes today *can* be reduced to 2 pCi/L or below.

Sometimes short-term tests are less definitive about whether or not your home is above 4 pCi/L. This can happen when your results are close to 4 pCi/L. For example, if the average of your two short-term test results is 4.1 pCi/L, there is about a 50% chance that your year-round average is somewhat below 4 pCi/L. However, EPA believes that any radon exposure carries some risk—no level of radon is safe. Even radon levels below 4 pCi/L pose some risk, and you can reduce your risk of lung cancer by lowering your radon level.

If your living patterns change and you begin occupying a lower level of your home (such as a basement) you should retest your home on that level.

Even if your test result is below 4 pCi/L, you may want to test again sometime in the future.

**Test your home now and save your results. If you find high radon levels, fix your home before you decide to sell it.**

### **RADON AND HOME SALES**

*More and more, home buyers and renters are asking about radon levels before they buy or rent a home. Because real estate sales happen quickly, there is often little time to deal with radon and other issues. The best thing to do is to test for radon NOW and save the results in case the buyer is interested in them. Fix a problem if it exists so it won't complicate your home sale. If you are planning to move, call your state radon office (see back page) for EPA's pamphlet "Home Buyer's and Seller's Guide to Radon," which addresses some common questions ([www.epa.gov/radon/pubs/realestate.html](http://www.epa.gov/radon/pubs/realestate.html)). You can also use the results of two short-term tests done side-by-side (four inches apart) to decide whether to fix your home.*

*During home sales:*

- *Buyers often ask if a home has been tested, and if elevated levels were reduced.*
- *Buyers frequently want tests made by someone who is not involved in the home sale. Your state radon office (see back cover) can assist you in identifying a qualified tester.*
- *Buyers might want to know the radon levels in areas of the home (like a basement they plan to finish) that the seller might not otherwise test.*

*Today many homes are built to help prevent radon from coming in. Building codes in your state or local area may require these radon-resistant construction features. If you are buying or renting a new home, ask the owner or builder if it has radon-resistant features. The EPA recommends building new homes with radon-resistant features in high radon potential (Zone 1) areas. Even if built radon-resistant, every new home should be tested for radon after occupancy. If you have a test result of 4 pCi/L or more, you can have a qualified mitigator easily add a vent fan to an existing passive system for about \$300 and further reduce the radon level in your home. For more information, refer to the EPA's Map of Radon Zones and other useful EPA documents on radon-resistant new construction (see publications on page 15), or visit [www.epa.gov/radon](http://www.epa.gov/radon).*



## RADON IN WATER

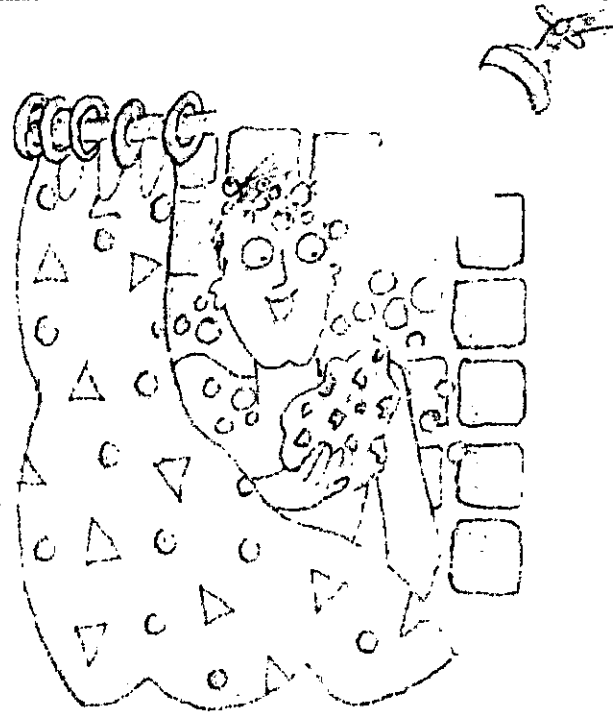
There are two main sources for the radon in your home's indoor air, the soil and the water supply. Compared to radon entering the home through water, radon entering your home through the soil is usually a much larger risk.

The radon in your water supply poses an inhalation risk and an ingestion risk. Research has shown that your risk of lung cancer from breathing radon in air is much larger than your risk of stomach cancer from swallowing water with radon in it. Most of your risk from radon in water comes from radon released into the air when water is used for showering and other household purposes.

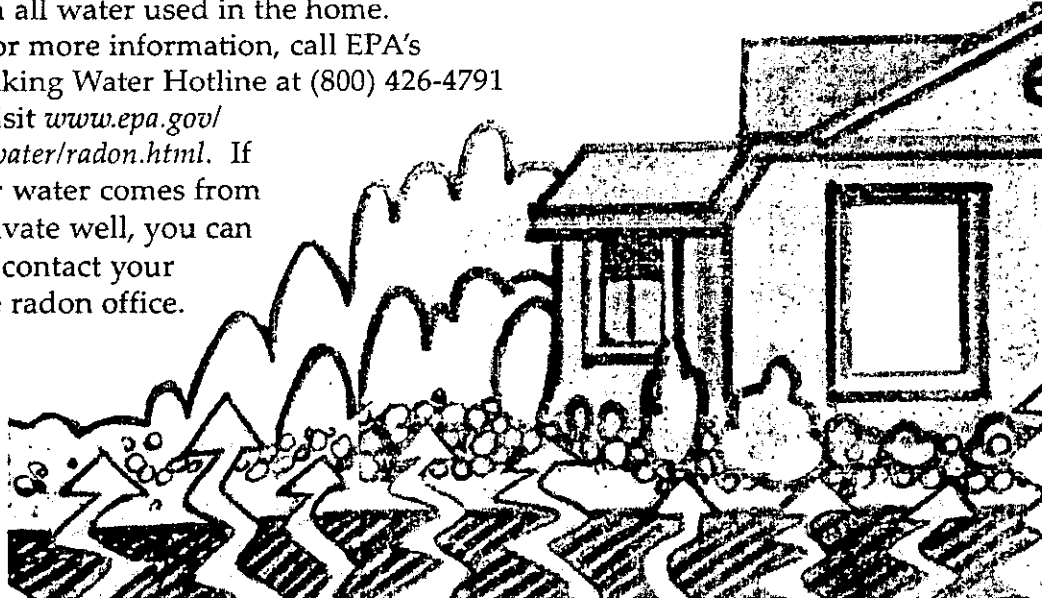
Radon in your home's water is not usually a problem when its source is surface water. A radon in water problem is more likely when its source is ground water, e.g., a private well or a public water supply system that uses ground water. If you are concerned that radon may be entering your home through the water and your water comes from a public water supply, contact your water supplier.

If you've tested your private well and have a radon in water problem, it can be fixed. Your home's water supply can be treated in two ways. Point-of-entry treatment can effectively remove radon from the water before it enters your home. Point-of-use treatment devices remove radon from your water at the tap, but only treat a small portion of the water you use and are not effective in reducing the risk from breathing radon released into the air from all water used in the home.

For more information, call EPA's Drinking Water Hotline at (800) 426-4791 or visit [www.epa.gov/safewater/radon.html](http://www.epa.gov/safewater/radon.html). If your water comes from a private well, you can also contact your state radon office.



*If you've tested the air in your home and found a radon problem, and your water comes from a well, have your water tested.*



## HOW TO LOWER THE RADON LEVEL IN YOUR HOME

Since there is no known safe level of radon, there can always be some risk. But the risk can be reduced by lowering the radon level in your home.

There are several proven methods to reduce radon in your home, but the one primarily used is a vent pipe system and fan, which pulls radon from beneath the house and vents it to the outside. This system, known as a soil suction radon reduction system, does not require major changes to your home. Sealing foundation cracks and other openings makes this kind of system more effective and cost-efficient. Similar systems can also be installed in houses with crawl spaces. Radon contractors can use other methods that may also work in your home. The right system depends on the design of your home and other factors.

Ways to reduce radon in your home are discussed in EPA's *Consumer's Guide to Radon Reduction*. You can get a copy from your state radon office, or view it online at [www.epa.gov/radon/pubs](http://www.epa.gov/radon/pubs).

The cost of reducing radon in your home depends on how your home was built and the extent of the radon problem. Most homes can be fixed for about the same cost as other common home repairs. The average house costs about \$1,200 for a contractor to fix, although this can range from about \$800 to about \$2,500. The cost is much less if a passive system was installed during construction.

### **RADON AND HOME RENOVATIONS**

*If you are planning any major structural renovation, such as converting an unfinished basement area into living space, it is especially important to test the area for radon before you begin the renovation. If your test results indicate a radon problem, radon-resistant techniques can be inexpensively included as part of the renovation. Because major renovations can change the level of radon in any home, always test again after work is completed.*



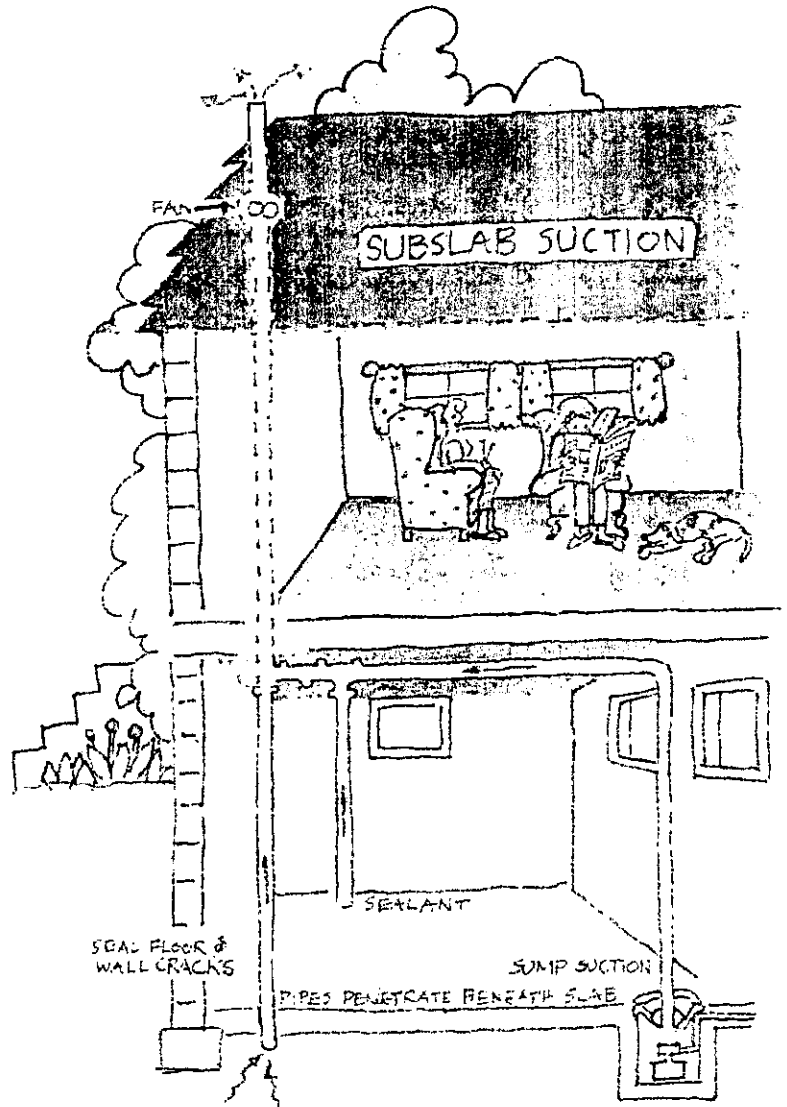
**Most homes can  
be fixed for  
about the same  
cost as other  
common home  
repairs.**

Lowering high radon levels requires technical knowledge and special skills. You should use a contractor who is trained to fix radon problems. A qualified contractor can study the radon problem in your home and help you pick the right treatment method.

Check with your state radon office for names of qualified or state certified radon contractors in your area. You can also contact private radon proficiency programs for lists of privately certified radon professionals in your area. For more information on private radon proficiency programs, visit [www.epa.gov/radon/proficiency.html](http://www.epa.gov/radon/proficiency.html). Picking someone to fix your radon problem is much like choosing a contractor for other home repairs—you may want to get references and more than one estimate.

*If you are considering fixing your home's radon problem yourself, you should first contact your state radon office for guidance and assistance.*

You should also test your home again after it is fixed to be sure that radon levels have been reduced. Most soil suction radon reduction systems include a monitor that will indicate whether the system is operating properly. In addition, it's a good idea to retest your home every two years to be sure radon levels remain low.



*Note: This diagram is a composite view of several mitigation options. The typical mitigation system usually has only one pipe penetration through the basement floor; the pipe may also be installed on the outside of the house.*

## THE RISK OF LIVING WITH RADON

Radon gas decays into radioactive particles that can get trapped in your lungs when you breathe. As they break down further, these particles release small bursts of energy. This can damage lung tissue and lead to lung cancer over the course of your lifetime. Not everyone exposed to elevated levels of radon will develop lung cancer. And the amount of time between exposure and the onset of the disease may be many years.

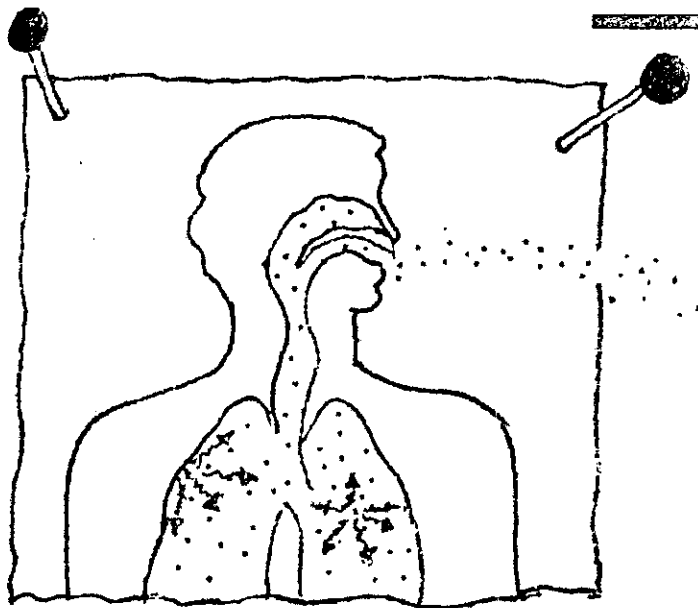
Like other environmental pollutants, there is some uncertainty about the magnitude of radon health risks. However, we know more about radon risks than risks from most other cancer-causing substances. This is because estimates of radon risks are based on studies of cancer in humans (underground miners).

Smoking combined with radon is an especially serious health risk. Stop smoking and lower your radon level to reduce your lung cancer risk.

Children have been reported to have greater risk than adults of certain types of cancer from radiation, but there are currently no conclusive data on whether children are at greater risk than adults from radon.

**Your chances of getting lung cancer from radon depend mostly on:**

- **How much radon is in your home**
- **The amount of time you spend in your home**
- **Whether you are a smoker or have ever smoked**



**Scientists are more certain about radon risks than risks from most other cancer-causing substances.**

## RADON RISK IF YOU SMOKE

Radon Level	If 1,000 people who smoked were exposed to this level over a lifetime* . . .	The risk of cancer from radon exposure compares to** . . .	WHAT TO DO: Stop Smoking and . . .
20 pCi/L	About 260 people could get lung cancer	◀ 250 times the risk of drowning	Fix your home
10 pCi/L	About 150 people could get lung cancer	◀ 200 times the risk of dying in a home fire	Fix your home
8 pCi/L	About 120 people could get lung cancer	◀ 30 times the risk of dying in a fall	Fix your home
4 pCi/L	About 62 people could get lung cancer	◀ 5 times the risk of dying in a car crash	Fix your home
2 pCi/L	About 32 people could get lung cancer	◀ 6 times the risk of dying from poison	Consider fixing between 2 and 4 pCi/L
1.3 pCi/L	About 20 people could get lung cancer	(Average indoor radon level)	(Reducing radon levels below 2 pCi/L is difficult)
0.4 pCi/L		(Average outdoor radon level)	

Note: If you are a former smoker, your risk may be lower.

## RADON RISK IF YOU'VE NEVER SMOKED

Radon Level	If 1,000 people who never smoked were exposed to this level over a lifetime* . . .	The risk of cancer from radon exposure compares to** . . .	WHAT TO DO:
20 pCi/L	About 36 people could get lung cancer	◀ 35 times the risk of drowning	Fix your home
10 pCi/L	About 18 people could get lung cancer	◀ 20 times the risk of dying in a home fire	Fix your home
8 pCi/L	About 15 people could get lung cancer	◀ 4 times the risk of dying in a fall	Fix your home
4 pCi/L	About 7 people could get lung cancer	◀ The risk of dying in a car crash	Fix your home
2 pCi/L	About 4 people could get lung cancer	◀ The risk of dying from poison	Consider fixing between 2 and 4 pCi/L
1.3 pCi/L	About 2 people could get lung cancer	(Average indoor radon level)	(Reducing radon levels below 2 pCi/L is difficult)
0.4 pCi/L		(Average outdoor radon level)	

Note: If you are a former smoker, your risk may be higher.

\*Lifetime risk of lung cancer deaths from EPA Assessment of Risks from Radon in Homes (EPA 402-R-03-003).

\*\*Comparison data calculated using the Centers for Disease Control and Prevention's 1999-2001 National Center for Injury Prevention and Control Reports.

*It's never too late to reduce your risk of lung cancer. Don't wait to test and fix a radon problem. If you are a smoker, stop smoking.*

## **RADON MYTHS**

**MYTH:** Scientists aren't sure radon really is a problem.

**FACT:** Although some scientists dispute the precise number of deaths due to radon, all major health organizations (like the Centers for Disease Control, the American Lung Association and the American Medical Association) agree with estimates that radon causes thousands of preventable lung cancer deaths every year. This is especially true among smokers, since the risk to smokers is much greater than to non-smokers.

**MYTH:** Radon testing is difficult, time consuming and expensive.

**FACT:** Radon testing is easy. You can test your home yourself or hire a qualified radon test company. Either approach takes only a small amount of time and effort.

**MYTH:** Radon test kits are not reliable and are difficult to find.

**FACT:** Reliable test kits are available from qualified radon testers and companies. Reliable testing devices are also available by phone or mail-order, and can be purchased in hardware stores and other retail outlets. Call your state radon office (see back cover or visit [www.epa.gov/radon](http://www.epa.gov/radon)) for help in identifying radon testing companies.

**MYTH:** Homes with radon problems can't be fixed.

**FACT:** There are simple solutions to radon problems in homes. Hundreds of thousands of homeowners have already fixed radon problems in their homes. Radon levels can be readily lowered for about \$800 to \$2,500 (with an average cost of \$1,200). Call your state radon office (see back cover) for help in identifying qualified mitigation contractors.

**MYTH:** Radon only affects certain kinds of homes.

**FACT:** House construction can affect radon levels. However, radon can be a problem in homes of all types: old homes, new homes, drafty homes, insulated homes, homes with basements, homes without basements. Local geology, construction materials, and how the home was built are among the factors that can affect radon levels in homes.

## A Citizen's Guide to Radon

- MYTH:** Radon is only a problem in certain parts of the country.
- FACT:** High radon levels have been found in every state. Radon problems do vary from area to area, but the only way to know your radon level is to test.
- MYTH:** A neighbor's test result is a good indication of whether your home has a problem.
- FACT:** It's not. Radon levels can vary greatly from home to home. The only way to know if your home has a radon problem is to test it.
- MYTH:** Everyone should test their water for radon.
- FACT:** Although radon gets into some homes through water, it is important to first test the air in the home for radon. If your water comes from a public water system that uses ground water, call your water supplier. If high radon levels are found and the home has a private well, call the Safe Drinking Water Hotline at (800) 426-4791 for information on testing your water.
- MYTH:** It's difficult to sell homes where radon problems have been discovered.
- FACT:** Where radon problems have been fixed, home sales have not been blocked or frustrated. The added protection is sometimes a good selling point.
- MYTH:** I've lived in my home for so long, it doesn't make sense to take action now.
- FACT:** You will reduce your risk of lung cancer when you reduce radon levels, even if you've lived with a radon problem for a long time.
- MYTH:** Short-term tests can't be used for making a decision about whether to fix your home.
- FACT:** A short-term test followed by a second short-term test\* can be used to decide whether to fix your home. However, the closer the average of your two short-term tests is to 4 pCi/L, the less certain you can be about whether your year-round average is above or below that level. Keep in mind that radon levels below 4 pCi/L still pose some risk. Radon levels can be reduced in most homes to 2 pCi/L or below.

\*If the radon test is part of a real estate transaction, the result of two short-term tests can be used in deciding whether to mitigate. For more information, see EPA's "Home Buyer's and Seller's Guide to Radon."

**FOR  
FURTHER  
INFORMATION**

**EPA Radon Web Site**  
[www.epa.gov/radon](http://www.epa.gov/radon)  
EPA radon page includes links to publications, hotlines, private proficiency programs and more.

**EPA Regional Offices**  
[www.epa.gov/iaq/whereyoulive.html](http://www.epa.gov/iaq/whereyoulive.html)  
Check the above Web site for a listing of your EPA regional office.

**Hotlines**

**1-800-805-RADON (707-7286)**  
Operated by the National Safety Council in partnership with EPA to order radon test kits.

**1-800-55RADON (557-2800)**  
Operated by the National Safety Council in partnership with EPA, for live help with radon questions.

**1-800-644-6000**  
Radon Fix-It Hotline, operated by the National Safety Council in partnership with EPA for information on how to mitigate your home.

**1-800-528-8187**  
Radon Hotline in Spanish, operators can be reached 9:00 a.m. to 5:00 p.m. to assist with information about radon, or ordering a radon test kit.

**1-800-426-4701**  
Safe Drinking Water Hotline, operated under contract to EPA. For information on testing, treatment, radon in water, and drinking water standards.

**EPA Publications**

Radon publications in print can be downloaded via the EPA radon website at [www.epa.gov/radon/pubs](http://www.epa.gov/radon/pubs)

Radon publications may be ordered through the National Service Center for Environmental Publications (NSCEP) by calling 1-800-490-9198, by visiting the NSCEP website at [www.epa.gov/ncepihom](http://www.epa.gov/ncepihom), or by e-mail at [nscep@bpsi.com](mailto:nscep@bpsi.com)





**U.S. EPA Assessment of Risks  
from Radon in Homes**

In June 2003, the EPA revised its risk estimates for radon exposure in homes. EPA estimates that about 21,000 annual lung cancer deaths are radon related. EPA also concluded that the effects of radon and cigarette smoking are synergistic, so that smokers are at higher risk from radon. EPA's revised estimates are based on the National Academy of Sciences 1998 BEIR VI (Biological Effects of Ionizing Radiation) Report which concluded that radon is the second leading cause of lung cancer after smoking.

**Surgeon General  
Health Advisory**

*"Indoor radon is the second-leading cause of lung cancer in the United States and breathing it over prolonged periods can present a significant health risk to families all over the country. It's important to know that this threat is completely preventable. Radon can be detected with a simple test and fixed through well-established venting techniques."*

January 2005

**State Radon Offices** ([www.epa.gov/iaq/wherelive.html](http://www.epa.gov/iaq/wherelive.html))

Call your state radon office for additional help with any of your radon questions. Up-to-date information on how to contact your state radon office is also available on EPA's Web site at [www.epa.gov/iaq/wherelive.html](http://www.epa.gov/iaq/wherelive.html), or call EPA's toll free Indoor Air Quality Information Clearinghouse (IAQ INFO) at (800) 438-4318 to obtain the current listing.

	Local-Toll	Toll-Free		Local-Toll	Toll-Free
Alabama	334-206-5391	800-582-1866	Montana	406-841-5280	800-546-0483
Alaska	907-474-7201	800-478-8324	Nebraska	402-471-0594	800-334-9491
Arizona	602-255-4845		Nevada	775-687-5394 x275	
Arkansas	501-661-2301	800-482-5400	New Hampshire	603-271-4674	800-852-3345 x4674
California	916-449-5674	800-745-7326	New Jersey	609-984-5425	800-648-0394
Colorado	303-692-3420	800-846-3986	New Mexico	505-827-1093	
Connecticut	860-509-7367		New York	518-402-7556	800-458-1158 x27556
Delaware	302-739-4731	800-464-4357	North Carolina	919-571-4141	
District of Columbia	202-535-2999		North Dakota	701-328-5188	800-252-6325
Florida	850-245-4288	800-543-8279	Ohio	614-644-2727	800-523-4439
Georgia	404-651-5120	800-745-0037	Oklahoma	405-702-5165	
Hawaii	808-586-4700		Oregon	503-731-4014 x664	
Idaho	208-332-7319	800-445-8647	Pennsylvania	717-783-3594	800-23RADON
Illinois	217-782-1325	800-325-1245	Puerto Rico	787-274-7815	
Indiana	317-233-7147	800-272-9723	Rhode Island	401-222-2438	
Iowa	515-281-4928	800-383-5992	South Carolina	803-898-3893	800-768-0362
Kansas	785-296-1560	800-693-3343	South Dakota	605-773-3151	800-438-3367
Kentucky	502-564-4856		Tennessee	615-687-7000	800-232-1139
Louisiana	225-925-7042	800-256-2494	Texas	512-834-6688	800-572-5548
Maine	207-287-5676	800-232-0842	Utah	801-536-4250	800-458-0145
Maryland (EPA Region 3)	215-814-2086		Vermont	802-865-7730	800-439-8550
Massachusetts	413-586-7525	800-RADON95	Virginia	804-786-5932	800-488-0138
Michigan	517-335-8037	800-723-6642	Washington	360-236-3253	
Minnesota	651-215-0909	800-798-9050	West Virginia	304-558-6772	800-922-1255
Mississippi	601-887-6893	800-626-7739	Wisconsin	608-267-4795	888-569-7236
Missouri	573-751-6160	800-628-9891	Wyoming	307-777-6015	800-458-5847

**Tribal Radon Program Offices**

Hopi Tribe (Arizona)	928-734-3100
Inter-Tribal Council of America	602-307-1509
Navajo Nation	928-871-7672

**Prepared for and presented at the January 21, 2010 House Commerce and Consumer Affairs Committee Hearing regarding HB 1685.**

My name is Jack Munn and I am speaking as Chief Planner with the Southern NH Planning Commission.

As a participating member on the original NH DES Private Well Working Group which provided recommendations summarized by Paul Susca in a report to the Groundwater Commission dated September 16, 2009 – I want to voice my support for this statute.

Our planning commission and now other commissions across the state are actively involved in preparing local **source water protection plans** for communities in New Hampshire.

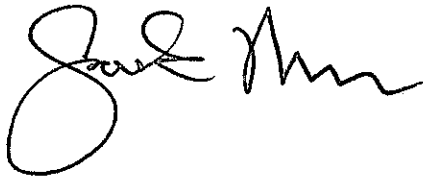
These plans identify active and potential contamination sources and are used as a basis for local measures and regulations to effectively prevent potential contamination of public water supply wells and aquifers.

This statute – particularly Section 485-F:3 Testing of New, Deepened and Hydrofracture Wells will ensure that important private well testing information is generated and shared among the environmental agencies in the state.

As this data is obtained and evaluated over time it will benefit many local community water protection efforts, including updates to these source water protection plans.

As you know there is nothing more important then protecting and ensuring that the public has clean drinking water.

Therefore, we see this statute as an important and necessary measure and first step to address the need for private well testing in the state.

A handwritten signature in black ink, appearing to read "Jack Munn". The signature is written in a cursive style with a large, looped initial "J".

**PURCHASE AND SALES AGREEMENT AND DEPOSIT RECEIPT**  
**New Hampshire Association of REALTORS® Standard Form**



10. **TAXES**, condo fees, special assessments, rents, water and sewage bills and fuel in storage shall be prorated as of time and date of closing or \_\_\_\_\_

11. **PROPERTY INCLUDED:** All Fixtures \_\_\_\_\_  
 \_\_\_\_\_

12. In compliance with the requirements of RSA 477:4-a, the following information is provided to BUYER relative to Radon Gas and Lead Paint:

**RADON GAS:** Radon gas, the product of decay of radioactive materials in rock may be found in some areas of New Hampshire. This gas may pass into a structure through the ground or through water from a deep well. Testing can establish its presence and equipment is available to remove it from the air or water.

**LEAD PAINT:** Before 1978, paint containing lead may have been used in structures. The presence of flaking lead paint can present a serious health hazard, especially to young children and pregnant women. Tests are available to determine whether lead is present.

Disclosure Required  YES  NO

**BUYER ACKNOWLEDGES PRIOR RECEIPT OF SELLER PROPERTY DISCLOSURE FORM ATTACHED HERETO AND SIGNIFIES BY INITIALING HERE:** \_\_\_\_\_

13. **DUE DILIGENCE:** The BUYER is encouraged to seek information from professionals normally engaged in the business regarding any specific issue of concern. SELLER'S AGENCY makes no warranties or representations regarding the condition, permitted use or value of the SELLER'S real or personal property. This Agreement is contingent upon the following inspections, with results being satisfactory to the BUYER:

TYPE OF INSPECTION:	YES	NO	RESULTS TO SELLER	TYPE OF INSPECTION:	YES	NO	RESULTS TO SELLER
a. General Building	<input type="checkbox"/>	<input type="checkbox"/>	within _____ days	f. Lead Paint	<input type="checkbox"/>	<input type="checkbox"/>	within _____ days
b. Sewage Disposal	<input type="checkbox"/>	<input type="checkbox"/>	within _____ days	g. Pests	<input type="checkbox"/>	<input type="checkbox"/>	within _____ days
c. Water Quality	<input type="checkbox"/>	<input type="checkbox"/>	within _____ days	h. Hazardous Waste	<input type="checkbox"/>	<input type="checkbox"/>	within _____ days
d. Radon Air Quality	<input type="checkbox"/>	<input type="checkbox"/>	within _____ days	i. _____	<input type="checkbox"/>	<input type="checkbox"/>	within _____ days
e. Radon Water Quality	<input type="checkbox"/>	<input type="checkbox"/>	within _____ days	j. _____	<input type="checkbox"/>	<input type="checkbox"/>	within _____ days

The use of days is intended to mean calendar days from the effective date of this Agreement. All inspections will be done by professionals normally engaged in the business, to be chosen and paid for by BUYER. If BUYER does not notify SELLER that the results of an inspection are unsatisfactory within the time period set forth above, the contingency is waived by BUYER. TIME IS OF THE ESSENCE. If the results of any inspection specified herein reveal significant issues or defects, which were not previously disclosed to BUYER, then:

(a) SELLER shall have the option of repairing or remedying the unsatisfactory condition(s) prior to transfer of title, so long as BUYER and SELLER both agree on the method of repair or remedy; or

(b) if SELLER is unwilling or unable to repair or remedy the unsatisfactory condition(s) or BUYER and SELLER cannot reach agreement with respect to the method of repair or remedy, then this Agreement shall be null and void, and all deposits will be returned to BUYER in accordance with the procedures required by the New Hampshire Real Estate Practice Act (N.H. RSA 331-A:13); or

(c) BUYER may terminate this Agreement in writing and all deposits will be returned to BUYER in accordance with the procedures required by the New Hampshire Real Estate Practice Act (N.H. RSA 331-A:13).

SELLER(S) INITIALS \_\_\_\_\_ / \_\_\_\_\_

BUYER(S) INITIALS \_\_\_\_\_ / \_\_\_\_\_



# For Your Protection: Get a Home Inspection

## Why a Buyer Needs a Home Inspection

A home inspection gives the buyer more detailed information about the overall condition of the home prior to purchase. In a home inspection, a qualified inspector takes an in-depth, unbiased look at your potential new home to:

- √ Evaluate the physical condition: structure, construction, and mechanical systems;
- √ Identify items that need to be repaired or replaced; and
- √ Estimate the remaining useful life of the major systems, equipment, structure, and finishes.

## Appraisals are Different from Home Inspections

An appraisal is different from a home inspection. Appraisals are for lenders; home inspections are for buyers. An appraisal is required to:

- √ Estimate the market value of a house;
- √ Make sure that the house meets FHA minimum property standards/requirements; and
- √ Make sure that the property is marketable.

## FHA Does Not Guarantee the Value or Condition of your Potential New Home

If you find problems with your new home after closing, FHA can not give or lend you money for repairs, and FHA can not buy the home back from you. That is why it is so important for you, the buyer, to get an independent home inspection. Ask a qualified home inspector to inspect your potential new home and give you the information you need to make a wise decision.

## Radon Gas Testing

The United States Environmental Protection Agency and the Surgeon General of the United States have recommended that all houses should be tested for radon. For more information on radon testing, call the toll-free National Radon Information Line at 1-800-SOS-Radon or 1-800-767-7236. As with a home inspection, if you decide to test for radon, you may do so before signing your contract, or you may do so after signing the contract as long as your contract states the sale of the home depends on your satisfaction with the results of the radon test.

## Be an Informed Buyer

It is your responsibility to be an informed buyer. Be sure that what you buy is satisfactory in every respect. You have the right to carefully examine your potential new home with a qualified home inspector. You may arrange to do so before signing your contract, or may do so after signing the contract as long as your contract states that the sale of the home depends on the inspection.



# Voting Sheets

**HOUSE COMMITTEE ON COMMERCE AND CONSUMER AFFAIRS**

**EXECUTIVE SESSION on HB 1685**

**BILL TITLE:** relative to testing the water quality of private water supply wells.

**DATE:** 2-4-10

**LOB ROOM:** 302

**Amendments:**

Sponsor: Rep. OLS Document #:

Sponsor: Rep. OLS Document #:

Sponsor: Rep. OLS Document #:

**Motions:** OTP, OTP/A, ITL, Interim Study (Please circle one.)

Moved by Rep.

Seconded by Rep.

Vote: (Please attach record of roll call vote.)

**Motions:** OTP, OTP/A, ITL, Interim Study (Please circle one.)

Moved by Rep. DeStefano

Seconded by Rep. Dowling

Vote: 15-0 (Please attach record of roll call vote.)

**CONSENT CALENDAR VOTE:** Consent or Regular (Circle One)

(Vote to place on Consent Calendar must be unanimous.)

**Statement of Intent:** Refer to Committee Report

Respectfully submitted,

Rep. James F. Headd, Clerk

HOUSE COMMITTEE ON COMMERCE AND CONSUMER AFFAIRS

EXECUTIVE SESSION on HB 1685

BILL TITLE: relative to testing the water quality of private water supply wells.

DATE: ~~1-26-10~~ 2-4-10

LOB ROOM: 302

Amendments:

Sponsor: Rep. OLS Document #:  
Sponsor: Rep. OLS Document #:  
Sponsor: Rep. OLS Document #:

Motions: OTP, OTP/A, ITL, Interim Study (Please circle one.)

Moved by Rep. *POSTERNA*

Seconded by Rep. *Powley*

Vote: *15-0* (Please attach record of roll call vote.)

Motions: OTP, OTP/A, IFL, Interim Study (Please circle one.)

Moved by Rep.

Seconded by Rep.

Vote: (Please attach record of roll call vote.)

CONSENT CALENDAR VOTE: Consent or Regular (Circle One) *15-0*

(Vote to place on Consent Calendar must be unanimous.)

Statement of Intent: Refer to Committee Report

Respectfully submitted,

Rep. James F. Headd, Clerk

COMMERCE AND CONSUMER AFFAIRS

Bill #: HB 1685 Title: Quality Ho private wells

PH Date: 1/26/10 Exec Session Date: 2-4-10

Motion: IT Amendment #: \_\_\_\_\_

MEMBER	YEAS	NAYS
Butler, Edward A, Chairman	/	
Schlachman, Donna L, V Chairman	/	
DeStefano, Stephen T	/	
Kopka, Angeline A	/	
Meador, David R	/	
McEachern, Paul	/	
Hammond, Jill Shaffer	/	
Nord, Susi	/	
Winters, Joel F	/	
Keans, Sandra B	/	
Gidge, Kenneth N	/	
Hunt, John B	/	
Quandt, Matt J	/	
Belanger, Ronald J	/	
Flanders, Donald H	/	
Holden, Rip	/	
Dowling, Patricia A	/	
Headd, James F, Clerk	/	
Nevins, Chris F	/	
Palfrey, David J	/	

15-0



# Committee Report

**CONSENT CALENDAR**

**February 10, 2010**

**HOUSE OF REPRESENTATIVES**

**REPORT OF COMMITTEE**

**The Committee on COMMERCE AND CONSUMER  
AFFAIRS to which was referred HB1685,**

**AN ACT relative to testing the water quality of private  
water supply wells. Having considered the same, report  
the same with the following Resolution: RESOLVED,  
That it is INEXPEDIENT TO LEGISLATE.**

**Rep. Stephen T DeStefano**

**FOR THE COMMITTEE**

## COMMITTEE REPORT

Committee:	COMMERCE AND CONSUMER AFFAIRS
Bill Number:	HB1685
Title:	relative to testing the water quality of private water supply wells.
Date:	February 4, 2010
Consent Calendar:	YES
Recommendation:	INEXPEDIENT TO LEGISLATE

### STATEMENT OF INTENT

This bill requires water quality testing for private water supply wells prior to the execution of a purchase and sales agreement. The cost of these tests was to be borne by the seller with a penalty of up to a \$10,000 administrative fine. The department of environmental services, the well drillers, home builders and realtors all felt that this may be better handled on the seller disclosure form or through education.

Vote 15-0.

Rep. Stephen T DeStefano  
FOR THE COMMITTEE

Original: House Clerk  
Cc: Committee Bill File

## **CONSENT CALENDAR**

### **COMMERCE AND CONSUMER AFFAIRS**

**HB1685**, relative to testing the water quality of private water supply wells. **INEXPEDIENT TO LEGISLATE.**

Rep. Stephen T DeStefano for **COMMERCE AND CONSUMER AFFAIRS**. This bill requires water quality testing for private water supply wells prior to the execution of a purchase and sales agreement. The cost of these tests was to be borne by the seller with a penalty of up to a \$10,000 administrative fine. The department of environmental services, the well drillers, home builders and realtors all felt that this may be better handled on the seller disclosure form or through education. **Vote 15-0.**

**Original: House Clerk**  
**Cc: Committee Bill File**

HB 1685 Relative to testing the water quality of private water supply wells JPL 16-0

→ This bill requires water quality testing for private water supply wells prior to the execution of a purchase and sales agreement. The cost of this tests was to be borne by the seller with a penalty of up to \$10,000.00 administrative fine.

The Dept of Environmental Services, the well drillers, home builders and Realtors all felt that this may be better handled on the seller disclosure form or through education.

OK  
EER