

-----Original Message-----

From: Hays, David C Jr CIV USARMY CENWK (USA) <David.C.Hays@usace.army.mil>

Sent: Wednesday, April 01, 2020 7:23 AM

To: Clements, Julie A CIV (USA) <Julie.A.Clements@usace.army.mil>; Walker, Stuart <Walker.Stuart@epa.gov>

Subject: RE: Draft for Army Corps review -- radon intrusion into buildings calculator

Good morning, for comment 12; I wanted to add that I realize you need the equation the way it is for the units to work out. Just not sure if the GW AF has the slab AF as part of it?

-----Original Message-----

From: Hays, David C Jr CIV USARMY CENWK (USA)

Sent: Tuesday, March 31, 2020 11:51 PM

To: Clements, Julie A CIV (USA) <Julie.A.Clements@usace.army.mil>; Walker, Stuart <Walker.Stuart@epa.gov>

Cc: Filips, Michael R CIV USARMY CEHNC (USA) <Michael.R.Filips@usace.army.mil>

Subject: RE: Draft for Army Corps review -- radon intrusion into buildings calculator

Julie/Stuart, please find my comments below, Re: USACE Review of RVISL calculator. I apologize for my delay, normally would have Julie review before sending but did not in interest of getting these out today. As such, Julie may disagree or have other comments, I defer to her on any inconsistencies and apologize to you both. Please let me know of any issues, questions, or concerns. Calculator works well.

1. The calculator functioned properly. USACE ran the calculator multiple times and with many different inputs and hand checked some calculations.
2. The manual states that the Feq is not used in calculations however, Feq is included as terms in some equations and seems to be used in WL calculations? Also calculator states "Select air exchanges per hour for Feq". Suggest verifying and reconciling manual and/or calculator.
3. USACE assumes the ground water temperature and Attenuation factor for GW inputs being on the main calculator screen are required for target screening level calculations. However this may be confusing to some users as: When the "Predict indoor air concentrations, and risk, from measured media concentrations" is selected to yes: it would only appear to impact the ground water calculations. Recommend moving these GW inputs to the Site Groundwater Concentration input page and just using the defaults for screening level calculations. The Attenuation Factor Sub Slab could also be considered for moving likewise. Alternatively, explaining this in the user manual may help as well.
4. The dose output is in total mrem. For ARAR comparison it may be helpful to add a millirem per year output.
5. The test runs for resident and worker UMTRCA ARAR evaluations indicate that the former EPA guidance of 4 pCi/l and the guidance in OSWER 9285.6-20 are not protective. Likely due to equilibrium assumptions made in the guidance vs calculator, but this may be confusing and recommend this be discussed in the user manual accordingly or set up the calculator UMTRCA eval to use the same assumptions as the OSWER.
6. The state ARAR evaluation appears to function well.
7. Recognize that the default GW temperature is same as VISL but seems high as a default?
8. Appreciate the flexibility in changing input values. Recognize that the exposure factors are from the handbook and as defaults are set to provide a very conservative result (e.g. use 90th percentile exposure times and 10th percentile ACH) which is fine for screening levels but results in extremely conservative risk results. Recommend EPA provide separate default calculations for SL and Risk or explain this conservatism in the user's guide.
9. Recommend the units for the "Other" box in the ARAR comparison be specified on the calculator page (beside the box). Assume pCi/l and WL?

10. I compared the results of RVISL (air) to the BPRG calculator (air). See attached. They are within an order of magnitude so good agreement, but some isotopes report the same results and other differ. May be worth looking into why? Once RVISL approved which one would be the preferred model? May be worth explaining in both model's user guides?
11. Recommend pCi/l for air concentration input rather than pCi/m³ as that is the most common units of measure. Or Bq/m³ which personally I do not prefer.
12. The GW attenuation factor is confusing (maybe just me)? It appears at the default temp given the conversion from L to m³ (x1000) and then times the AF of 0.001 results in a prediction factor of Henry law times the pCi/l value. Given this I question if the slab attenuation factor is considered as part of the GW AF or not? Recommend that the impact of the slab AF to the predicted indoor air concentration from GW be explained in the users manual and if not accounted for in the GW AF then added to the equation to predict indoor air concentration.

Hope these help.
Dave

-----Original Message-----

From: Filips, Michael R CIV USARMY CEHNC (USA) <Michael.R.Filips@usace.army.mil>
Sent: Thursday, March 12, 2020 8:52 AM
To: Clements, Julie A CIV (USA) <Julie.A.Clements@usace.army.mil>; Hays, David C Jr CIV USARMY CENWK (USA) <David.C.Hays@usace.army.mil>
Subject: FW: Draft for Army Corps review -- radon intrusion into buildings calculator

fyi

-----Original Message-----

From: Garufi, Katherine [mailto:Garufi.Katherine@epa.gov]
Sent: Wednesday, March 11, 2020 3:37 PM
To: Walker, Stuart <Walker.Stuart@epa.gov>; Filips, Michael R CIV USARMY CEHNC (USA) <Michael.R.Filips@usace.army.mil>
Subject: [Non-DoD Source] RE: Draft for Army Corps review -- radon intrusion into buildings calculator

Oh, my bad. Thanks.

Kate Garufi
Environmental Engineer
Office of Superfund Remediation and Technology Innovation
Cell: [REDACTED]

-----Original Message-----

From: Walker, Stuart <Walker.Stuart@epa.gov>
Sent: Wednesday, March 11, 2020 2:32 PM
To: Garufi, Katherine <Garufi.Katherine@epa.gov>; 'Filips, Michael R CIV USARMY CEHNC (USA)' <Michael.R.Filips@usace.army.mil>
Subject: RE: Draft for Army Corps review -- radon intrusion into buildings calculator

It's a model, and the link was at the bottom of my email.

Stuart Walker
Superfund Remedial program National Radiation Expert Science Policy Branch Assessment and Remediation Division
Office of Superfund Remediation and Technology Innovation W (703) 603-8748 C (202) 262-9986

-----Original Message-----

From: Garufi, Katherine <Garufi.Katherine@epa.gov>
Sent: Wednesday, March 11, 2020 9:25 AM
To: 'Filips, Michael R CIV USARMY CEHNC (USA)' <Michael.R.Filips@usace.army.mil>
Cc: Walker, Stuart <Walker.Stuart@epa.gov>
Subject: RE: Draft for Army Corps review -- radon intrusion into buildings calculator

Great, thanks.

Stuart - can you send me and Mike the documents and he can coordinate the review/

Kate Garufi
Environmental Engineer
Office of Superfund Remediation and Technology Innovation
Cell: [REDACTED]

-----Original Message-----

From: Filips, Michael R CIV USARMY CEHNC (USA) <Michael.R.Filips@usace.army.mil>
Sent: Wednesday, March 11, 2020 7:15 AM
To: Garufi, Katherine <Garufi.Katherine@epa.gov>
Cc: Walker, Stuart <Walker.Stuart@epa.gov>
Subject: RE: Draft for Army Corps review -- radon intrusion into buildings calculator

Kate,
Confirmed with Dave Hayes that they will meet the deadline.
Thanks
Mike

Michael Filips P.E.
US Army Corps of Engineers
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1616 Capitol Ave, STE. 9200
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-----Original Message-----

From: Garufi, Katherine [mailto:Garufi.Katherine@epa.gov]
Sent: Tuesday, March 10, 2020 4:49 PM
To: Filips, Michael R CIV USARMY CEHNC (USA) <Michael.R.Filips@usace.army.mil>
Cc: Walker, Stuart <Walker.Stuart@epa.gov>
Subject: [Non-DoD Source] FW: Draft for Army Corps review -- radon intrusion into buildings calculator

Mike,

See request below. Can you get back to me and let me know if the timeline can be met?

Kate Garufi

Environmental Engineer

Office of Superfund Remediation and Technology Innovation

Cell: [REDACTED]

From: Walker, Stuart <Walker.Stuart@epa.gov>
Sent: Tuesday, March 10, 2020 1:57 PM
To: Garufi, Katherine <Garufi.Katherine@epa.gov>
Subject: RE: Draft for Army Corps review -- radon intrusion into buildings calculator

Hi Kate, this email is to request review of the second draft Radon Vapor Intrusion Screening Levels (RVISL) Calculator by the ACE under your contract. I was hoping to get comments by Monday March 30.

Stuart Walker

Superfund Remedial program National Radiation Expert

Science Policy Branch

Assessment and Remediation Division

Office of Superfund Remediation and Technology Innovation

W (703) 603-8748

C ([REDACTED])

From: Walker, Stuart
Sent: Friday, November 01, 2019 6:10 PM
To: Garufi, Katherine <Garufi.Katherine@epa.gov <mailto:Garufi.Katherine@epa.gov> >
Subject: Draft for Army Corps review -- radon intrusion into buildings calculator

Hi Kate, this email is to request review of the draft Radon Vapor Intrusion Screening Levels (RVISL) Calculator by the ACE under your contract. I was hoping to get comments by Friday November 22.

The RVISL calculator can be used for risk based, dose based (if a dose based standard that includes radon is used for ARAR compliance), WL or Working Levels based (for UMTRCA as an ARAR compliance) and 4 pCi/l (for state standards as an ARAR compliance).

The RVISL may be found at this URL:

BlockedBlocked<https://epa-visl.ornl.gov/radionuclides/>
<BlockedBlocked<https://gcc01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fepa-visl.ornl.gov%2Fradionuclides%2F&data=02%7C01%7CGarufi.Katherine%40epa.gov%7C793860fef106435718ba08d7c52d20c7%7C88b378b367484867acf976aacbeca6a7%7C0%7C0%7C637194669915107546&sdata=8TSqzF0jIL95gUgfoeGUekrAJLtljaqIM%2FNdnfwfd8I%3D&reserved=0>>

[REDACTED]

[REDACTED]

The RVISL is set up in a similar manner as the existing Vapor Intrusion Screening Level (VISL) calculator which may be found at:

BlockedBlocked<https://www.epa.gov/vaporintrusion/vapor-intrusion-screening-level-calculator>

I can be contacted if you have any questions at (703) 603-8748

Radionuclide pCi/l in air) (4	Total Risk RVISL	Total Risk RadBPRG	Difference
Risk for Rn-222	8.61E-02	9.90E-02	-1.29E-02
At-218	6.15E-13	6.15E-13	0.00E+00
Bi-210*	0.00E+00	0.00E+00	0.00E+00
Bi-214	3.24E-02	3.97E-02	-7.30E-03
Hg-206*	0.00E+00	0.00E+00	0.00E+00
Pb-210	0.00E+00	0.00E+00	0.00E+00
Pb-214	4.34E-02	4.89E-02	-5.50E-03
Po-210*	0.00E+00	0.00E+00	0.00E+00
Po-214	2.90E-08	3.56E-08	-6.60E-09
Po-218	8.83E-03	8.95E-03	-1.20E-04
Rn-218*	0.00E+00	0.00E+00	0.00E+00
Rn-222	1.47E-03	1.47E-03	0.00E+00
Tl-206*	0.00E+00	0.00E+00	0.00E+00
Tl-210	2.47E-07	2.59E-07	-1.20E-08
Risk for Rn-220	1.18E-01	4.05E-01	-2.86E-01
Bi-212	1.52E-02	7.02E-02	-5.50E-02
Pb-212	1.02E-01	3.33E-01	-2.31E-01
Po-212	0.00E+00	0.00E+00	0.00E+00
Po-216	6.57E-09	6.57E-09	0.00E+00
Rn-220	7.41E-04	7.41E-04	0.00E+00
Tl-208	1.18E-04	5.69E-04	-4.51E-04
Risk for Rn-219	2.22E-02	2.57E-02	-3.50E-03
Bi-211	1.64E-05	1.91E-05	-2.70E-06
Pb-211	2.22E-02	2.57E-02	-3.50E-03
Po-211	8.38E-09	9.64E-09	-1.26E-09
Po-215	7.27E-08	7.27E-08	0.00E+00
Rn-219	2.38E-05	2.38E-05	0.00E+00
Tl-207	1.51E-06	1.80E-06	-2.90E-07

* Values set to zero (0) for isotopes not in RVISL but in BPRG.