Message

From: Hays, David C Jr CIV USARMY CENWK (USA) [David.C.Hays@usace.army.mil]
Sent: 2/24/2021 9:37:22 PM
To: Praskins, Wayne [Praskins.Wayne@epa.gov]
CC: Kappelman, David [Kappelman.David@epa.gov]; Walker, Stuart [Walker.Stuart@epa.gov]
Subject: FYI building screening levels from NRC calcs
Attachments: draft nureg 1757 table H-1 surface screening limits.jpg; Table 5_19 from nureg 5512 vol 3 ML082460902.pdf

Wayne, FYI: attached is the NRC screening levels for buildings as presented in their draft NUREG 1757 volume 2 rev 2. Just FYI, not suggesting they be used or even considered since based on dose (25 mrem/yr) and not risk. Of note is the resulting value for Th-232+C (6 dpm/100cm2). NRC assumes 10% removable so if someone used the Navy approach (assume wipe gross alpha equals the lowest RG * 0.1) the limit for gross alpha wipes would be 0.6 dpm/100 cm2? Have to believe people have argued against this or taken a more realistic approach. May be an error? Will see what if anything the NRC has done in this regard. FYI: The NRC/EPA MOU never settled on building contamination values like it did on soils.

From: Praskins, Wayne <Praskins.Wayne@epa.gov>
Sent: Tuesday, February 16, 2021 12:42 PM
To: Hays, David C Jr CIV USARMY CENWK (USA) <David.C.Hays@usace.army.mil>
Cc: Kappelman, David <Kappelman.David@epa.gov>
Subject: [Non-DoD Source] RE: HPNS RGs and MDCs

Dave –

Thanks! Two follow ups:

1. You mention (and we have discussed) setting a gross alpha limit based on contaminants, isotopic ratios, and equilibrium assumptions. Do you know of any examples where that's been done?
2. You mention that you have used a counting instrument's critical level to decide which wipes to send to a lab or count longer. If you do that, how would you pick the targeted critical level? Would you set it at your BPRG/release limit (accepting a MDA above the BPRG/release limit for some or most samples)?

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From: Hays, David C Jr CIV USARMY CENWK (USA) <David.C.Hays@usace.army.mil>
Sent: Friday, February 12, 2021 5:33 AM
To: Praskins, Wayne <Praskins.Wayne@epa.gov>; Kappelman, David <Kappelman.David@epa.gov>
Subject: RE: HPNS RGs and MDCs

Wayne, Good morning. The counting statistics they are referencing are correct. What they are presenting is somewhat simplistic by keeping sample and background count times the same which CDPH did not. As such they did not provide a direct apples to apples comparison to CDPH approach. The cited reference document has equations for differing background and sample count times as well. With that said, I agree a 1.2 dpm/100 cm2 limit is very difficult and would require longer count times at best. Where I see flaws in their logic is that the 1.2 BPRG is specific to Ra-226 and not a gross alpha limit. A gross alpha limit based on contaminants, isotopic ratios, and equilibrium assumptions would be higher given the site specifics. It may still require longer than 1 min count times typically used in the field.

They also should consider changing their approach to counting and to the number of wipe samples required. Other instruments could be used for gross alpha counting (reducing count times) as well as sending them to a lab. I recommend reducing the total number of wipe samples required to account for any increased count times. This can be done given consideration of the purpose of wipe sampling. As an example: we typically will just use wipe samples to verify assumptions in our risk models are appropriate. We rely on our fixed instrument readings to identify contamination and then only wipe sample the areas of known contamination. This greatly reduces the total number of wipes to count. As a conservative measure we wipe sample 10% of fixed reading locations regardless of instrument readings. Additionally, use of the fixed instrument critical level can be used as an investigation level requiring a wipe sample. The results of these wipe samples are used to confirm if the risk model assumptions for removable fraction are correct or conservative. If not, release limits may be incorrect and should be evaluated accordingly.

One consideration we also have done is use the counting instruments critical level to decide on wipes to send to a lab or to count longer. Another total count time reduction approach. Every sample is counted but only samples with counts distinguishable from background are counted longer (to meet MDC DQO).

Finally, a MARSSIM scenario B approach could be considered. Given some background levels of NORM isotopes may be present in dusts. This would be more involved.

Hope this helps:
Dave Hays

PS: With all of this said, the BPRG is very low as a result of the conservatism in the generic BPRG model used. As we have discussed, even a small change to site specific assumptions and source removal rate would increase the BPRG. The Navy seems to still be stuck on just saying the number is too low rather than trying to solve the issue.

From: Praskins, Wayne <Praskins.Wayne@epa.gov>
Sent: Thursday, February 11, 2021 7:47 PM
To: Hays, David C Jr CIV USARMY CENWK (USA) <David.C.Hays@usace.army.mil>; Kappelman, David <Kappelman.David@epa.gov>
Subject: [Non-DoD Source] HPNS RGs and MDCs

Dave and Dave –

We continue our discussion with the Navy about remediation goals for the removable fraction of any remaining radiological contamination at HPNS buildings. This afternoon we received responses to two questions about MDCs, with the Navy continuing to argue that it's impractical to measure the 1.2 dpm/100cm2 Ra-226 BPRG. I'd be interested in hearing your take on the accuracy and reasonableness of their responses. Thanks.

QUESTION #1. What are the detection limits of swipe analyzing instruments?

NAVY RESPONSE: The Parcel G Retesting Work Plan uses the Ludlum Model 3030 as a swipe counter, the same instrument that was used by CDPH at Parcel A. Count times required for various alpha MDCs using the Ludlum Model 3030P are as follows:

An MDC of 17.3 DPM/100 cm^2 requires a 1 min sample and background count time
An MDC of 3.5 DPM/100 cm^2 requires a 10 min sample and background count time
An MDC of 1.2 DPM/100 cm^2 requires a 60 min sample and background count time

Assumptions made are from the Ludlum specifications[1] as follows: background count rate of 0.3 CPM and instrument efficiency of 32% (Ra-226)

The required sample and background count times exponentially increase the lower the required MDC.

There are an estimated total of 5,500 swipes required for the Parcel G buildings, and an estimated total of 23,000 swipes required for all of the buildings at Hunters Point. Assuming a 40 hour work week for swipe processing, factoring in collection of 1 background sample for every 24 hours, would **require nearly 13 years to complete** at the 60 minute count time.

This is technically impractical, purely from the equipment detection limitations.

When measuring levels so close to zero, there will inherently be false positives caused by factors not attributable to Ra-226 contamination including: NORM in dust, instrument background fluctuations, low counting statistics, and/or equipment uncertainties. Demonstrating compliance with the proposed Ra-226 removable contamination limit of 1.2 DPM/100 cm^2 would result in an unacceptably high percentage of false positives. Statistically our goal is to achieve a 95% confidence level, which from a data standpoint, means we have confidence that the same sample would be replicated plus or minus 2 sigma from the measurement point. Contractor data from other projects at Hunters Point supports this position.
Additional MDC information may be found on *NUREG-1507 Minimum Detectable Concentrations with Typical Radiation Survey for Instruments for Various Contaminants and Field Conditions*[2]

QUESTION #2. CDPH used a 10-minute count time in their 2019 Parcel A dust sampling and achieved an MDA of 1.6 to 2.3 dpm/100cm2 with the following inputs/assumptions:

-Background Count of 30 minutes
-Background count rate of 0.26 CPM
-Sample Count Time of 10 minutes
-Instrument efficiency of 39%

NAVY RESPONSE. Using CDPH's assumptions, an MDC of 1.2 DPM/100cm^2 would be obtained using 35 minute sample and background count times. Even with an assumed increased instrument efficiency as high as CDPH's, the EPA proposed alpha removable fraction release criteria is still technically impracticable.

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