To: Schultheisz, Daniel[Schultheisz.Daniel@epa.gov]; Edwards, Jonathan[Edwards.Jonathan@epa.gov]; Johnson, Barnes[Johnson.Barnes@epa.gov]; Dietrich, Debbie[Dietrich.Debbie@epa.gov]; Reyes, Juan[Reyes.Juan@epa.gov]; Grevatt, Peter[Grevatt.Peter@epa.gov]
Cc: Flynn, Mike[Flynn.Mike@epa.gov]; DeCair, Sara[DeCair.Sara@epa.gov]; Veal, Lee[Veal.Lee@epa.gov]; Perrin, Alan[Perrin.Alan@epa.gov]; Nanko, Lisa[Nanko.Lisa@epa.gov]; Christ, Lisa[Christ.Lisa@epa.gov]; Walker, Stuart[Walker.Stuart@epa.gov]
From: Tulis, Dana
Sent: Fri 4/19/2013 6:44:16 PM
Subject: RE: Short-Turnaround Time: EPA Comments on Draft NCRP Document
EPA Comments on NCRP SC 5-1oem.doc.docx

Attaching OEM comments. Thanks.

From: Schultheisz, Daniel
Sent: Friday, April 19, 2013 10:54 AM
To: Edwards, Jonathan; Johnson, Barnes; Dietrich, Debbie; Reyes, Juan; Tulis, Dana; Grevatt, Peter
Cc: Flynn, Mike; DeCair, Sara; Veal, Lee; Perrin, Alan; Nanko, Lisa; Christ, Lisa; Walker, Stuart
Subject: RE: Short-Turnaround Time: EPA Comments on Draft NCRP Document

Attached are the consolidated comments that we propose to send to NCRP at the end of the day Friday. We intend to send the comments via email from Mike Flynn. For the most part, comments were incorporated as provided, particularly for specific text edits. In some cases, some editing was done for consistency or if thought to improve clarity. Please take a look to see if you have any concerns with the way your comments are represented. I ask that you let me know of any corrections that need to be made by 3 pm, if possible.

Thank you all for your review of the document on such short notice. We have certainly identified a number of issues that will need to be addressed.

Dan Schultheisz

U.S. Environmental Protection Agency

Office of Radiation and Indoor Air

Radiation Protection Division
(202) 343-9349

From: Edwards, Jonathan
Sent: Wednesday, April 10, 2013 12:27 PM

To: Johnson, Barnes; Dietrich, Debbie; Reyes, Juan; Tulis, Dana; Grevatt, Peter
Cc: Schultheisz, Daniel; Flynn, Mike; DeCair, Sara; Veal, Lee; Perrin, Alan
Subject: Short-Turnaround Time: EPA Comments on Draft NCRP Document
Importance: High

Dear Folks---

As you know, the National Council on Radiation Protection and Measurements (NCRP) recently posted a draft report for public comment. This report, "Decision-Making for Late-Phase Recovery from Nuclear or Radiological Incidents," touches on a number of areas for which EPA would bear some responsibility in the aftermath of a radiological incident, including a nuclear power plant accident, a radiological dispersal device (RDD), or an improvised nuclear device (IND). The Department of Homeland Security is the primary sponsor of this document.

EPA management has decided that it would be appropriate for the Agency to submit formal comments on this draft of the document. This doesn't leave much time, as NCRP has requested comments by April 15, which extends the original deadline of April 4. NCRP indicates that it will accept Agency comments if they are a few days late. Therefore, I am asking that your office provide any comments to Dan Schultheisz by Monday, April 15. ORIA will prepare a consolidated response for submittal to NCRP.

The document is lengthy at nearly 600 pages including appendices and will need to be tightened up and more clearly focused. At this point, you may prefer to focus on overarching comments on content, approach, or organization, rather than preparing detailed editorial comments. However, please feel free to suggest editorial revisions if so desired, particularly if they will help improve accuracy or clarity. The document is available at http://www.ncrponline.org/ (look under "Documents in Review").

Please let me know if you have questions. Thanks. --Jon

To: Andrew.Wallo@eh.doe.gov[Andrew.Wallo@eh.doe.gov]; Ansari, Armin (CDC/CCEHIP/NCEH)[asa4@CDC.GOV]; Carlos.Corredor@Hq.Doe.Gov[Carlos.Corredor@Hq.Doe.Gov]; Christ, Lisa[Christ.Lisa@epa.gov]; Darrell Liles[liles.darrell@epa.gov]; Dawson, Helen[Dawson.Helen@epa.gov]; Edward.Regnier@hq.doe.gov[Edward.Regnier@hq.doe.gov]; Ferris.John@dol.gov[Ferris.John@dol.gov]; Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]; Hudson, Scott[Hudson.Scott@epa.gov]; Jensen, JohnT[John.Jensen@dm.usda.gov]; john.mackinney@dhs.gov[john.mackinney@dhs.gov]; kzirbel@endyna.com[kzirbel@endyna.com]; lodwick.jeffrey@dol.gov[lodwick.jeffrey@dol.gov]; Major James Ross[james.ross@dtra.mil]; Manuel.Aponte@osd.mil[Manuel.Aponte@osd.mil]; Miller, Charles W. (CDC/CCEHIP/NCEH)[cym3@CDC.GOV]; Noska, Mike (FDA)[michael.noska@fda.hhs.gov]; Patricia.Milligan@nrc.gov[Patricia.Milligan@nrc.gov]; Quinn, Vanessa[Vanessa.Quinn@dhs.gov]; ricardo.a.reyes@us.army.mil[ricardo.a.reyes@us.army.mil]; Schumann, Jean[Schumann.Jean@epa.gov]; siddhanti@endyna.com[siddhanti@endyna.com]; Terry Kraus[tdkraus@sandia.gov]; Veal, Lee[Veal.Lee@epa.gov]; Walker, Stuart[Walker.Stuart@epa.gov]; william.cunningham@nist.gov[william.cunningham@nist.gov]
Cc: Veal, Lee[Veal.Lee@epa.gov]
From: DeCair, Sara
Sent: Fri 4/5/2013 9:01:00 PM
Subject: PAG Manual is out!!
PAGFactSheet4-5-2013-FINAL.pdf

PAGs Subcommittee,

EPA has just released the "Protective Action Guides and Planning Guidance for Radiological Incidents" (PAG Manual). The proposal will be published officially in the Federal Register in the coming week or so, and we've put a copy on our website if you'd like to see it sooner. (http://www.epa.gov/radiation/rert/pags.html)

Attached is a fact sheet that might be useful for you and your colleagues. We will be taking comment on the guide for 90 days from the date of publication in the Federal Register, so please plan to roll up your sleeves and get busy adjudicating those later this summer.

Thank you!

Sara

Sara D. DeCair, Health Physicist

EPA's Center for Radiological Emergency Management

202-343-9108

To: Christ, Lisa[Christ.Lisa@epa.gov]
From: Oshida, Phil
Sent: Fri 4/5/2013 7:24:03 PM
Subject: Good desk statement -- RE: PAGs Manual - revised Qs and As

From: Christ, Lisa
Sent: Friday, April 05, 2013 3:21 PM
To: Lopez-Carbo, Maria
Cc: Oshida, Phil; Burneson, Eric
Subject: RE: PAGs Manual - revised Qs and As

Here's a desk statement I think will work – let me know if you have comments or other recommendations.

From: Lopez-Carbo, Maria
Sent: Friday, April 05, 2013 3:14 PM
To: Christ, Lisa
Subject: Re: PAGs Manual - revised Qs and As

Thanks Lisa.

From: Christ, Lisa
Sent: Friday, April 05, 2013 3:10:01 PM
To: Lopez-Carbo, Maria
Subject: FW: PAGs Manual - revised Qs and As

Hi Maria,

I've just heard that ORIA is planning to post the draft PAG Manual on the web for public comment today. We are likely to get some questions on the drinking water PAG (or lack of). Attached is an internal Q&A that we have reviewed and okayed. There was only one very small dw edit which OGWDW was fine with. I will prepare a short desk statement that can be used with the Q&A in case it's needed. Let me know what else may be needed.

Lisa

From: Tulis, Dana
Sent: Thursday, April 04, 2013 6:06 PM
To: Dietrich, Debbie; Johnson, Barnes; Flynn, Mike; Grevatt, Peter; Lynch, Mary-Kay; Rudzinski, Suzanne; Schmidt, Lorie; Michaud, John; Devlin, Betsy; Stahle, Susan
Cc: Duncan, Anna; Millett, John; Edwards, Jonathan; Veal, Lee; DeCair, Sara; Christ, Lisa; Elliott, Ross; McMichael, Nate; Woolford, James; Clark, Becki; Dawson, Helen; Walker, Stuart
Subject: RE: PAGs Manual - revised Qs and As

Here are my comments, on top of the rest, we do have some differences we may need to chat on.

From: Dietrich, Debbie
Sent: Thursday, April 04, 2013 5:03 PM
To: Dietrich, Debbie; Johnson, Barnes; Flynn, Mike; Tulis, Dana; Grevatt, Peter; Lynch, Mary-Kay; Rudzinski, Suzanne; Schmidt, Lorie; Michaud, John; Devlin, Betsy; Stahle, Susan
Cc: Duncan, Anna; Millett, John; Edwards, Jonathan; Veal, Lee; DeCair, Sara; Christ, Lisa; Elliott, Ross; McMichael, Nate; Woolford, James; Clark, Becki; Dawson, Helen; Walker, Stuart
Subject: RE: PAGs Manual - revised Qs and As

I seem to be following in Barnes' footsteps – forgot the attachment.

Debbie Dietrich

Assistant Administrator for Homeland Security

USEPA

1200 Pennsylvania Avenue, NW

Washington, DC 20460

Phone: 202-564-6743

FAX: 202-564-0026

HSDN: deborah.dietrich@dhs.sgov.gov

From: Dietrich, Debbie
Sent: Thursday, April 04, 2013 4:52 PM
To: Johnson, Barnes; Flynn, Mike; Tulis, Dana; Grevatt, Peter; Lynch, Mary-Kay; Rudzinski, Suzanne; Schmidt, Lorie; Michaud, John; Devlin, Betsy; Stahle, Susan
Cc: Duncan, Anna; Millett, John; Edwards, Jonathan; Veal, Lee; DeCair, Sara; Christ, Lisa; Elliott, Ross; McMichael, Nate; Woolford, James; Clark, Becki; Dawson, Helen; Walker, Stuart
Subject: RE: PAGs Manual - revised Qs and As

Mike, I added my comments (purple) to Barnes'. Let me know if you have any questions.

Debbie Dietrich

Assistant Administrator for Homeland Security

USEPA

1200 Pennsylvania Avenue, NW

Washington, DC 20460

Phone: 202-564-6743

FAX: 202-564-0026

HSDN: deborah.dietrich@dhs.sgov.gov

From: Johnson, Barnes
Sent: Thursday, April 04, 2013 2:50 PM
To: Johnson, Barnes; Flynn, Mike; Dietrich, Debbie; Tulis, Dana; Grevatt, Peter; Lynch, Mary-Kay; Rudzinski, Suzanne; Schmidt, Lorie; Michaud, John; Devlin, Betsy; Stahle, Susan
Cc: Duncan, Anna; Millett, John; Edwards, Jonathan; Veal, Lee; DeCair, Sara; Christ, Lisa; Elliott, Ross; McMichael, Nate; Woolford, James; Clark, Becki; Dawson, Helen; Walker, Stuart
Subject: RE: PAGs Manual - revised Qs and As

Forgot the attachment

Barnes Johnson

USEPA | Superfund | Tel 703-347-8758 | johnson.barnes@epa.gov

From: Johnson, Barnes
Sent: Thursday, April 04, 2013 2:49 PM
To: Flynn, Mike; Dietrich, Debbie; Tulis, Dana; Grevatt, Peter; Lynch, Mary-Kay; Rudzinski, Suzanne; Schmidt, Lorie; Michaud, John; Devlin, Betsy; Stahle, Susan
Cc: Duncan, Anna; Millett, John; Edwards, Jonathan; Veal, Lee; DeCair, Sara; Christ, Lisa; Elliott, Ross; McMichael, Nate; Woolford, James; Clark, Becki; Dawson, Helen; Walker, Stuart
Subject: RE: PAGs Manual - revised Qs and As

Mike/Jon,

I had just a couple of suggestions. Also Peter – check out my one comment in the drinking water area – it didn't sound quite right to me and I proposed a very small edit. Otherwise this looks fine to me.

Barnes Johnson

USEPA | Superfund | Tel 703-347-8758 | johnson.barnes@epa.gov

From: Flynn, Mike
Sent: Thursday, April 04, 2013 12:05 PM
To: Dietrich, Debbie; Tulis, Dana; Johnson, Barnes; Grevatt, Peter; Lynch, Mary-Kay; Rudzinski, Suzanne; Schmidt, Lorie; Michaud, John; Devlin, Betsy; Stahle, Susan
Cc: Duncan, Anna; Millett, John; Edwards, Jonathan; Veal, Lee; DeCair, Sara; Christ, Lisa; Elliott, Ross; McMichael, Nate
Subject: PAGs Manual - revised Qs and As

All,

As a follow-up to our call yesterday, attached are revised Qs and As on the revised PAGs Manual. We've refined some of the answers, and you will note that we've added "key points" after the answers on a few of the questions to highlight the key points in the answer. Please review and let us know if you have any final comments by COB today. FYI the PAGs package was signed by Gina M a bit earlier today and it's on the way to the Administrator's office. We understand that the package may be signed later today.

FYI OAR's communications folks have been working tor refine the press materials (desk statement, etc), coordinating with your coms folks. We will send around materials when they are complete so you have them.

Call or email if you have questions.

thanks again for continuing help, Mike

From: Flynn, Mike
Sent: Wednesday, April 03, 2013 6:04 PM
To: Flynn, Mike
Subject: FW: PAG Manual - for tomorrow's conf call

Dietrich, Debbie; Tulis, Dana; Johnson, Barnes; Grevatt, Peter; Lynch, Mary-Kay; Rudzinski, Suzanne; Schmidt, Lorie; Michaud, John; Devlin, Betsy; Stahle, Susan

Duncan, Anna; Millett, John; Edwards, Jonathan; Veal, Lee; DeCair, Sara; McMichael, Nate

Mike Flynn, Director

Office of Radiation & Indoor Air

U.S. EPA

202-343-9356

From: Flynn, Mike
Sent: Tuesday, April 02, 2013 7:16 PM
To: Dietrich, Debbie; Tulis, Dana; Johnson, Barnes; Grevatt, Peter; Lynch, Mary-Kay; Rudzinski, Suzanne; Schmidt, Lorie; Michaud, John; Devlin, Betsy; Stahle, Susan
Cc: Duncan, Anna; Millett, John; Edwards, Jonathan; Veal, Lee; DeCair, Sara; McMichael, Nate

Subject: PAG Manual - for tomorrow's conf call

All,

We have a call scheduled tomorrow (Wed) at 2pm to provide you the latest on the PAG Manual and to discuss communications. Attached for our discussion is a preliminary draft of Q's and A's that we need your help on refining (and adding to). Our goal is to make sure we're all are 'on the same page' in responding to questions when the manual is released.

Some of you had conflicts and cannot make our call tomorrow – we will follow-up separately with you.

Thanks, Mike

Mike Flynn, Director

Office of Radiation & Indoor Air

U.S. EPA

202-343-9356

To: Christ, Lisa[Christ.Lisa@epa.gov]; Oshida, Phil[Oshida.Phil@epa.gov]
Cc: Schuck, Tracey[Schuck.Tracey@epa.gov]
From: Burneson, Eric
Sent: Fri 4/5/2013 6:45:54 PM
Subject: Fw: For the call at 3 pm re PAGs

Can Lisa listen in?

From: Lewis, Josh
Sent: Friday, April 05, 2013 6:42:42 PM
To: Lewis, Josh; Grevatt, Peter; Flynn, Mike; Levine, Carolyn; Edwards, Jonathan; Deitz, Randy; Tulis, Dana; Dietrich, Debbie; Johnson, Barnes
Cc: Duncan, Anna; Mackay, Cheryl; Burneson, Eric; Lopez-Carbo, Maria
Subject: For the call at 3 pm re PAGs

Appreciate folks making the time on short notice for the call. In addition to Markey's staff, we'll also have Josh Batkin from Senator Boxer's staff on the phone.

Barnes/Randy: are either of you available? Josh is likely going to have Superfund-related questions.

Josh

-----Original Message-----
From: Lewis, Josh
Sent: Friday, April 05, 2013 1:37 PM
To: Grevatt, Peter; Flynn, Mike; Levine, Carolyn; Edwards, Jonathan; Deitz, Randy; Tulis, Dana; Dietrich, Debbie; Johnson, Barnes
Cc: Duncan, Anna; Mackay, Cheryl; Burneson, Eric; Lopez-Carbo, Maria
Subject: Heads up: Possibility of PAG call with Congressman Markey's staff - TODAY at 3 pm (time may shift)

As you may all have heard by now, PAGs will be signed and posted today. I'd like to try and do a call today at 3 pm w/ Michal Freedhoff and Avenel Joseph on Markey's staff. I'm waiting on confirmation from them...once I hear back I'll send out a scheduler w/ the exact time and call in #

Josh Lewis
EPA/Office of Congressional and Intergovernmental Relations
Desk: 202 564 2095
Cell: 202 329 2291

-----Original Message-----
From: Grevatt, Peter
Sent: Thursday, April 04, 2013 6:39 PM
To: Flynn, Mike; Levine, Carolyn; Edwards, Jonathan; Deitz, Randy; Tulis, Dana; Dietrich, Debbie; Johnson, Barnes
Cc: Duncan, Anna; Lewis, Josh; Mackay, Cheryl; Burneson, Eric; Lopez-Carbo, Maria
Subject: Re: Congressman Markey staff request re: Radiation Protection Action Guides

We can have someone listen in, but we are fine to stay in the background.

From: Flynn, Mike
Sent: Thursday, April 04, 2013 6:12:34 PM
To: Levine, Carolyn; Edwards, Jonathan; Deitz, Randy; Tulis, Dana; Dietrich, Debbie; Johnson, Barnes; Grevatt, Peter

Cc: Duncan, Anna; Lewis, Josh; Mackay, Cheryl
Subject: RE: Congressman Markey staff request re: Radiation Protection Action Guides

Carolyn, We spoke with Peter Grevatt today and he said he was OK with not being involved in this briefing. (Peter - certainly chime in if I got that wrong).

Mike

Mike Flynn, Director
Office of Radiation & Indoor Air
U.S. EPA
202-343-9356

-----Original Message-----
From: Levine, Carolyn
Sent: Thursday, April 04, 2013 5:45 PM
To: Edwards, Jonathan; Deitz, Randy; Tulis, Dana; Flynn, Mike; Dietrich, Debbie; Johnson, Barnes
Cc: Duncan, Anna; Lewis, Josh; Mackay, Cheryl
Subject: RE: Congressman Markey staff request re: Radiation Protection Action Guides

Thanks everyone. We will keep you updated on scheduling. Does OW need to be included?

Carolyn Levine
Office of Congressional Affairs
U.S. EPA
(202) 564-1859

-----Original Message-----
From: Edwards, Jonathan
Sent: Thursday, April 04, 2013 5:43 PM
To: Levine, Carolyn; Deitz, Randy; Tulis, Dana; Flynn, Mike; Dietrich, Debbie; Johnson, Barnes
Cc: Duncan, Anna; Lewis, Josh; Mackay, Cheryl
Subject: RE: Congressman Markey staff request re: Radiation Protection Action Guides

Carolyn -- I'm in tomorrow and next week. Thanks, Jon

-----Original Message-----
From: Levine, Carolyn
Sent: Thursday, April 04, 2013 3:30 PM
To: Deitz, Randy; Tulis, Dana; Flynn, Mike; Dietrich, Debbie; Johnson, Barnes
Cc: Edwards, Jonathan; Duncan, Anna; Lewis, Josh; Mackay, Cheryl
Subject: RE: Congressman Markey staff request re: Radiation Protection Action Guides

Hi all,
It sounds like the PAGs will be issued very soon.
Please let me/Josh/Cheryl know availability from your office (OSRTI, OEM, ORIA, OHS) for a phone briefing with Congressman Markey's staff for Friday (if issued) or early next week.
Thanks

Carolyn Levine
Office of Congressional Affairs
U.S. EPA
(202) 564-1859

-----Original Message-----
From: Levine, Carolyn
Sent: Tuesday, April 02, 2013 12:57 PM
To: Deitz, Randy; Tulis, Dana; Flynn, Mike; Dietrich, Debbie; Johnson, Barnes
Cc: Edwards, Jonathan; Duncan, Anna
Subject: Congressman Markey staff request re: Radiation Protection Action Guides

Hi everyone,

I understand that the draft guidelines package is expected to be signed sometime this week, and that OAR may be working with OEA on a desk statement for this week? If anyone has any info. on the expected timing for either, please let me know. We cannot schedule a call in advance of releasing the draft guidelines, but given the number of offices involved, I would like to try to get folks lined up.

Carolyn Levine
Office of Congressional Affairs
U.S. EPA
(202) 564-1859

-----Original Message-----
From: Deitz, Randy
Sent: Tuesday, April 02, 2013 12:33 PM
To: Tulis, Dana; Flynn, Mike; Dietrich, Debbie; Johnson, Barnes
Cc: Edwards, Jonathan; Duncan, Anna; Levine, Carolyn
Subject: RE: Radiation Protection Action Guides

Yes Dana, OCIR has reached out to both OAR and OSWER offices to participate in a conference call with House Energy and Commerce Committee minority/Rep. Markey staff to discuss PAGs status.

-----Original Message-----
From: Tulis, Dana
Sent: Tuesday, April 02, 2013 11:51 AM
To: Flynn, Mike; Dietrich, Debbie; Johnson, Barnes
Cc: Edwards, Jonathan; Duncan, Anna; Deitz, Randy; Levine, Carolyn
Subject: RE: Radiation Protection Action Guides

Please let us know, I can be available from the OEM perspective. Thanks

-----Original Message-----
From: Flynn, Mike
Sent: Tuesday, April 02, 2013 11:42 AM
To: Dietrich, Debbie; Tulis, Dana; Johnson, Barnes
Cc: Edwards, Jonathan; Duncan, Anna
Subject: FW: Radiation Protection Action Guides

Debbie/Dana/Barnes,
Heads up- we got a request late yesterday from Markey's staff for a PAG update. We haven't gotten back to OCIR yet - we'll be in touch to coordinate.

Mike

Mike Flynn, Director

Office of Radiation & Indoor Air
U.S. EPA
202-343-9356

-----Original Message-----
From: Lubetsky, Jonathan
Sent: Monday, April 01, 2013 5:05 PM
To: Duncan, Anna
Subject: FW: Radiation Protection Action Guides

Should someone from ORIA participate? If so, who would be the right person.

From: Mackay, Cheryl
Sent: Monday, April 01, 2013 4:47 PM
To: Lubetsky, Jonathan
Subject: FW: Radiation Protection Action Guides

Hey Jonathan, Do you know who the right point of contact in ORIA would be on this? Thanks.

From: Levine, Carolyn
Sent: Monday, April 01, 2013 4:36 PM
To: Lewis, Josh; Mackay, Cheryl
Subject: FW: Radiation Protection Action Guides

Hi Josh and Cheryl,

See Avenel's request below. This might mostly be OSWER, but I know ORIA did a prior briefing on this. We should talk about how to respond. In the meantime, she asked for a call this Wednesday or Thursday. I'm checking with OSWER, but can you let me know if ORIA should participate too?

Carolyn Levine

Office of Congressional Affairs

U.S. EPA

(202) 564-1859

From: Joseph, Avenel [mailto:Avenel.Joseph@mail.house.gov]
Sent: Monday, April 01, 2013 3:53 PM
To: Levine, Carolyn
Subject: Radiation Protection Action Guides

Hi Carolyn,

I wanted to check in on this article and more generally about where things stand with the radiation cleanup standard. I think last time we talked on this was back in early 2012, could we schedule another phone briefing to get an update on where things are?

Thank you,

Avenel

http://www.nti.org/gsn/article/white-house-backs-rollback-cleanup-standards-nuclear-incidents/

Avenel Joseph, M.S., Ph.D.
Office of Representative Edward J. Markey (MA-05)
2108 Rayburn House Office Building
Washington, DC 20515
202-225-2836

Follow Rep. Markey on Face book <http://www.facebook.com/EdJMarkey> , YouTube <http://www.youtube.com/user/RepMarkey> , and Twitter <http://twitter.com/markeymemo> Sign up for Rep. Markey's e-newsletter at http://markey.house.gov/signup

To: Dietrich, Debbie[Dietrich.Debbie@epa.gov]; Johnson, Barnes[Johnson.Barnes@epa.gov]; Flynn, Mike[Flynn.Mike@epa.gov]; Grevatt, Peter[Grevatt.Peter@epa.gov]; Lynch, Mary-Kay[Lynch.Mary-Kay@epa.gov]; Rudzinski, Suzanne[rudzinski.suzanne@epa.gov]; Schmidt, Lorie[Schmidt.Lorie@epa.gov]; Michaud, John[Michaud.John@epa.gov]; Devlin, Betsy[Devlin.Betsy@epa.gov]; Stahle, Susan[Stahle.Susan@epa.gov]
Cc: Duncan, Anna[Duncan.Anna@epa.gov]; Millett, John[Millett.John@epa.gov]; Edwards, Jonathan[Edwards.Jonathan@epa.gov]; Veal, Lee[Veal.Lee@epa.gov]; DeCair, Sara[DeCair.Sara@epa.gov]; Christ, Lisa[Christ.Lisa@epa.gov]; Elliott, Ross[Elliott.Ross@epa.gov]; McMichael, Nate[McMichael.Nate@epa.gov]; Woolford, James[Woolford.James@epa.gov]; Clark, Becki[Clark.Becki@epa.gov]; Dawson, Helen[Dawson.Helen@epa.gov]; Walker, Stuart[Walker.Stuart@epa.gov]
From: Tulis, Dana
Sent: Thur 4/4/2013 10:06:11 PM
Subject: RE: PAGs Manual - revised Qs and As
Revised PAG Manual Qs and As draft 04042013 DD Comments (2)dt.doc.docx

Here are my comments, on top of the rest, we do have some differences we may need to chat on.

From: Dietrich, Debbie
Sent: Thursday, April 04, 2013 5:03 PM
To: Dietrich, Debbie; Johnson, Barnes; Flynn, Mike; Tulis, Dana; Grevatt, Peter; Lynch, Mary-Kay; Rudzinski, Suzanne; Schmidt, Lorie; Michaud, John; Devlin, Betsy; Stahle, Susan
Cc: Duncan, Anna; Millett, John; Edwards, Jonathan; Veal, Lee; DeCair, Sara; Christ, Lisa; Elliott, Ross; McMichael, Nate; Woolford, James; Clark, Becki; Dawson, Helen; Walker, Stuart
Subject: RE: PAGs Manual - revised Qs and As

I seem to be following in Barnes' footsteps – forgot the attachment.

Debbie Dietrich

Assistant Administrator for Homeland Security

USEPA

1200 Pennsylvania Avenue, NW

Washington, DC 20460

Phone: 202-564-6743

FAX: 202-564-0026

HSDN: deborah.dietrich@dhs.sgov.gov

From: Dietrich, Debbie
Sent: Thursday, April 04, 2013 4:52 PM
To: Johnson, Barnes; Flynn, Mike; Tulis, Dana; Grevatt, Peter; Lynch, Mary-Kay; Rudzinski, Suzanne; Schmidt, Lorie; Michaud, John; Devlin, Betsy; Stahle, Susan
Cc: Duncan, Anna; Millett, John; Edwards, Jonathan; Veal, Lee; DeCair, Sara; Christ, Lisa; Elliott, Ross; McMichael, Nate; Woolford, James; Clark, Becki; Dawson, Helen; Walker, Stuart
Subject: RE: PAGs Manual - revised Qs and As

Mike, I added my comments (purple) to Barnes'. Let me know if you have any questions.

Debbie Dietrich

Assistant Administrator for Homeland Security

USEPA

1200 Pennsylvania Avenue, NW

Washington, DC 20460

Phone: 202-564-6743

FAX: 202-564-0026

HSDN: deborah.dietrich@dhs.sgov.gov

From: Johnson, Barnes
Sent: Thursday, April 04, 2013 2:50 PM
To: Johnson, Barnes; Flynn, Mike; Dietrich, Debbie; Tulis, Dana; Grevatt, Peter; Lynch, Mary-Kay; Rudzinski, Suzanne; Schmidt, Lorie; Michaud, John; Devlin, Betsy; Stahle, Susan
Cc: Duncan, Anna; Millett, John; Edwards, Jonathan; Veal, Lee; DeCair, Sara; Christ, Lisa; Elliott, Ross; McMichael, Nate; Woolford, James; Clark, Becki; Dawson, Helen; Walker, Stuart
Subject: RE: PAGs Manual - revised Qs and As

Forgot the attachment

Barnes Johnson

USEPA | Superfund | Tel 703-347-8758 | johnson.barnes@epa.gov

From: Johnson, Barnes
Sent: Thursday, April 04, 2013 2:49 PM
To: Flynn, Mike; Dietrich, Debbie; Tulis, Dana; Grevatt, Peter; Lynch, Mary-Kay; Rudzinski, Suzanne; Schmidt, Lorie; Michaud, John; Devlin, Betsy; Stahle, Susan
Cc: Duncan, Anna; Millett, John; Edwards, Jonathan; Veal, Lee; DeCair, Sara; Christ, Lisa; Elliott, Ross; McMichael, Nate; Woolford, James; Clark, Becki; Dawson, Helen; Walker, Stuart
Subject: RE: PAGs Manual - revised Qs and As

Mike/Jon,

I had just a couple of suggestions. Also Peter – check out my one comment in the drinking water area – it didn't sound quite right to me and I proposed a very small edit. Otherwise this looks fine to me.

Barnes Johnson

USEPA | Superfund | Tel 703-347-8758 | johnson.barnes@epa.gov

From: Flynn, Mike
Sent: Thursday, April 04, 2013 12:05 PM
To: Dietrich, Debbie; Tulis, Dana; Johnson, Barnes; Grevatt, Peter; Lynch, Mary-Kay; Rudzinski, Suzanne; Schmidt, Lorie; Michaud, John; Devlin, Betsy; Stahle, Susan
Cc: Duncan, Anna; Millett, John; Edwards, Jonathan; Veal, Lee; DeCair, Sara; Christ, Lisa; Elliott, Ross; McMichael, Nate
Subject: PAGs Manual - revised Qs and As

All,

As a follow-up to our call yesterday, attached are revised Qs and As on the revised PAGs Manual. We've refined some of the answers, and you will note that we've added "key points" after the answers on a few of the questions to highlight the key points in the answer. Please review and let us know if you have any final comments by COB today. FYI the PAGs package was signed by Gina M a bit earlier today and it's on the way to the Administrator's office. We understand that the package may be signed later today.

FYI OAR's communications folks have been working tor refine the press materials (desk statement, etc), coordinating with your coms folks. We will send around materials when they are complete so you have them.

Call or email if you have questions.

thanks again for continuing help, Mike

From: Flynn, Mike
Sent: Wednesday, April 03, 2013 6:04 PM
To: Flynn, Mike
Subject: FW: PAG Manual - for tomorrow's conf call

Dietrich, Debbie; Tulis, Dana; Johnson, Barnes; Grevatt, Peter; Lynch, Mary-Kay; Rudzinski, Suzanne; Schmidt, Lorie; Michaud, John; Devlin, Betsy; Stahle, Susan

Duncan, Anna; Millett, John; Edwards, Jonathan; Veal, Lee; DeCair, Sara; McMichael, Nate

Mike Flynn, Director

Office of Radiation & Indoor Air

U.S. EPA

202-343-9356

From: Flynn, Mike
Sent: Tuesday, April 02, 2013 7:16 PM
To: Dietrich, Debbie; Tulis, Dana; Johnson, Barnes; Grevatt, Peter; Lynch, Mary-Kay; Rudzinski, Suzanne; Schmidt, Lorie; Michaud, John; Devlin, Betsy; Stahle, Susan
Cc: Duncan, Anna; Millett, John; Edwards, Jonathan; Veal, Lee; DeCair, Sara; McMichael, Nate
Subject: PAG Manual - for tomorrow's conf call

All,

We have a call scheduled tomorrow (Wed) at 2pm to provide you the latest on the PAG Manual and to discuss communications. Attached for our discussion is a preliminary draft of Q's and A's that we need your help on refining (and adding to). Our goal is to make sure we're all are 'on the same page' in responding to questions when the manual is released.

Some of you had conflicts and cannot make our call tomorrow – we will follow-up separately with you.

Thanks, Mike

Mike Flynn, Director

Office of Radiation & Indoor Air

U.S. EPA

202-343-9356

To: Christ, Lisa[Christ.Lisa@epa.gov]
Cc: Burneson, Eric[Burneson.Eric@epa.gov]; Lopez-Carbo, Maria[Lopez-Carbo.Maria@epa.gov]
From: Grevatt, Peter
Sent: Thur 4/4/2013 4:07:22 PM
Subject: FW: PAGs Manual - revised Qs and As
Revised PAG Manual Qs and As draft 04042013.docx

Lisa, can you please take a look at what they have for DW and let me know if we have and changes to recommend? Mike indicated that this could go forward before the end of the week, though specific timing is still uncertain. Thanks, P.G.

From: Flynn, Mike
Sent: Thursday, April 04, 2013 12:05 PM
To: Dietrich, Debbie; Tulis, Dana; Johnson, Barnes; Grevatt, Peter; Lynch, Mary-Kay; Rudzinski, Suzanne; Schmidt, Lorie; Michaud, John; Devlin, Betsy; Stahle, Susan
Cc: Duncan, Anna; Millett, John; Edwards, Jonathan; Veal, Lee; DeCair, Sara; Christ, Lisa; Elliott, Ross; McMichael, Nate
Subject: PAGs Manual - revised Qs and As

All,

As a follow-up to our call yesterday, attached are revised Qs and As on the revised PAGs Manual. We've refined some of the answers, and you will note that we've added "key points" after the answers on a few of the questions to highlight the key points in the answer. Please review and let us know if you have any final comments by COB today. FYI the PAGs package was signed by Gina M a bit earlier today and it's on the way to the Administrator's office. We understand that the package may be signed later today.

FYI OAR's communications folks have been working tor refine the press materials (desk statement, etc), coordinating with your coms folks. We will send around materials when they are complete so you have them.

Call or email if you have questions.

thanks again for continuing help, Mike

From: Flynn, Mike
Sent: Wednesday, April 03, 2013 6:04 PM
To: Flynn, Mike
Subject: FW: PAG Manual - for tomorrow's conf call

Dietrich, Debbie; Tulis, Dana; Johnson, Barnes; Grevatt, Peter; Lynch, Mary-Kay; Rudzinski, Suzanne; Schmidt, Lorie; Michaud, John; Devlin, Betsy; Stahle, Susan

Duncan, Anna; Millett, John; Edwards, Jonathan; Veal, Lee; DeCair, Sara; McMichael, Nate

Mike Flynn, Director

Office of Radiation & Indoor Air

U.S. EPA

202-343-9356

From: Flynn, Mike
Sent: Tuesday, April 02, 2013 7:16 PM
To: Dietrich, Debbie; Tulis, Dana; Johnson, Barnes; Grevatt, Peter; Lynch, Mary-Kay; Rudzinski, Suzanne; Schmidt, Lorie; Michaud, John; Devlin, Betsy; Stahle, Susan
Cc: Duncan, Anna; Millett, John; Edwards, Jonathan; Veal, Lee; DeCair, Sara; McMichael, Nate
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Some of you had conflicts and cannot make our call tomorrow – we will follow-up separately with you.

Thanks, Mike

Mike Flynn, Director

Office of Radiation & Indoor Air

U.S. EPA

202-343-9356

To: Flynn, Mike[Flynn.Mike@epa.gov]; Dietrich, Debbie[Dietrich.Debbie@epa.gov]; Tulis, Dana[Tulis.Dana@epa.gov]; Johnson, Barnes[Johnson.Barnes@epa.gov]; Lynch, Mary-Kay[Lynch.Mary-Kay@epa.gov]; Schmidt, Lorie[Schmidt.Lorie@epa.gov]
Cc: Michaud, John[Michaud.John@epa.gov]; Stahle, Susan[Stahle.Susan@epa.gov]; Edwards, Jonathan[Edwards.Jonathan@epa.gov]; Veal, Lee[Veal.Lee@epa.gov]; DeCair, Sara[DeCair.Sara@epa.gov]; Duncan, Anna[Duncan.Anna@epa.gov]; Christ, Lisa[Christ.Lisa@epa.gov]; Burneson, Eric[Burneson.Eric@epa.gov]; Oshida, Phil[Oshida.Phil@epa.gov]
From: Grevatt, Peter
Sent: Fri 3/1/2013 10:24:17 PM
Subject: Re: Revised PAG Manual

Mike: We have reviewed the revised document and for the purposes of our program, do not have any comments and/or concerns.

OMB made a few editorial changes to paragraphs related to drinking water, however, the revisions do not change the OWGDW position we previously discussed with you.

I recommend that we concur with OMB's suggested revisions related to drinking water.

From: Flynn, Mike
Sent: Thursday, February 28, 2013 9:26:10 AM
To: Dietrich, Debbie; Tulis, Dana; Johnson, Barnes; Grevatt, Peter; Lynch, Mary-Kay; Schmidt, Lorie
Cc: Michaud, John; Stahle, Susan; Edwards, Jonathan; Veal, Lee; DeCair, Sara; Duncan, Anna
Subject: Revised PAG Manual

All,

Attached is a revised version of the PAG Manual addressing OMB's latest comments. In addition to the comments we forwarded earlier this week (attached), we received a few more comments on the Waste Disposal Section which we've addressed in this latest revised manual. Please review this mark-up to identify any potential show-stoppers for your office. We will be following up with each of you shortly. We would like to get back to OMB asap so hopefully this "ship can sail" soon. Thanks for continued help, Mike

From: Flynn, Mike
Sent: Monday, February 25, 2013 12:59 PM
To: Dietrich, Debbie; Tulis, Dana; Johnson, Barnes; Grevatt, Peter; Lynch, Mary-Kay; Schmidt, Lorie
Cc: Michaud, John; Stahle, Susan; Edwards, Jonathan; Veal, Lee; DeCair, Sara; Duncan, Anna
Subject: PAG Manual

Colleagues,

Attached are comments we recently received from OMB on the Protective Action Guides revision. You'll see that the suggestions are very minor – mostly editorial. Please take a look and I'll reach out to you in the next week or so. Apparently, there are a couple more comments from OMB headed our way, so once we have those, we'll do a cleaned-up redline version for you to quickly check before we go back to OMB.

As with our last iteration this past November, this document is very "close hold." We ask that you do not distribute it at this time.

Thank you so much for your support, Mike

Mike Flynn

Director

Office of Radiation & Indoor Air

202-343-9356

To: Christ, Lisa[Christ.Lisa@epa.gov]
From: Grevatt, Peter
Sent: Fri 3/1/2013 6:27:16 PM
Subject: Re: Revised PAG Manual

Sounds good. Thanks.

From: Christ, Lisa
Sent: Friday, March 01, 2013 10:12:50 AM
To: Grevatt, Peter; Oshida, Phil; Burneson, Eric
Cc: Lopez-Carbo, Maria; Hernandez-Quinones, Samuel; Burneson, Eric
Subject: RE: Revised PAG Manual

Peter,

We have reviewed the revised document and for the purposes of our program, do not have any comments and/or concerns.

OMB made a few editorial changes to paragraphs related to drinking water, however, the revisions do not change the OWGDW position discussed with the Office of Air. OGWDW agreed to seek public comment on an approach and technical rationale for a drinking water PAG designed to help officials select protective actions under emergency conditions when exposures would occur over shorter time periods than those envisioned in the NPDWR.

I recommend that we concur with OMB's suggested revisions.

Lisa

From: Grevatt, Peter
Sent: Thursday, February 28, 2013 9:57 AM
To: Oshida, Phil; Burneson, Eric; Christ, Lisa
Cc: Lopez-Carbo, Maria
Subject: Fw: Revised PAG Manual

FYI. It will be good if we can touch base on this at the beginning of next week to go over any concerns you may want me to convey. Thanks.

From: Flynn, Mike
Sent: Thursday, February 28, 2013 9:26:10 AM
To: Dietrich, Debbie; Tulis, Dana; Johnson, Barnes; Grevatt, Peter; Lynch, Mary-Kay; Schmidt, Lorie
Cc: Michaud, John; Stahle, Susan; Edwards, Jonathan; Veal, Lee; DeCair, Sara; Duncan, Anna
Subject: Revised PAG Manual

All,

Attached is a revised version of the PAG Manual addressing OMB's latest comments. In addition to the comments we forwarded earlier this week (attached), we received a few more comments on the Waste Disposal Section which we've addressed in this latest revised manual. Please review this mark-up to identify any potential show-stoppers for your office. We will be following up with each of you shortly. We would like to get back to OMB asap so hopefully this "ship can sail" soon. Thanks for continued help, Mike

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Sent: Monday, February 25, 2013 12:59 PM
To: Dietrich, Debbie; Tulis, Dana; Johnson, Barnes; Grevatt, Peter; Lynch, Mary-Kay; Schmidt, Lorie
Cc: Michaud, John; Stahle, Susan; Edwards, Jonathan; Veal, Lee; DeCair, Sara; Duncan, Anna
Subject: PAG Manual

Colleagues,

Attached are comments we recently received from OMB on the Protective Action Guides revision. You'll see that the suggestions are very minor – mostly editorial. Please take a look and I'll reach out to you in the next week or so. Apparently, there are a couple more comments from OMB headed our way, so once we have those, we'll do a cleaned-up redline version for you to quickly check before we go back to OMB.

As with our last iteration this past November, this document is very "close hold." We ask that you do not distribute it at this time.

Thank you so much for your support, Mike

Mike Flynn

Director

Office of Radiation & Indoor Air

202-343-9356

Sent: Thur 12/29/2016 8:56:54 PM
Subject: FW: OMB Comments on Drinking Water PAG
Clean Version EPA Draft Final Drinking Water PAG (OMB 12-29-16) - OGWDW Response.docx

From: Christ, Lisa
Sent: Thursday, December 29, 2016 11:48 AM
To: Arrigoni, Holly <Arrigoni.Holly@epa.gov>
Cc: Flaharty, Stephanie <Flaharty.Stephanie@epa.gov>; Hill, Glynis <Hill.Glynis@epa.gov>; Greene, Ashley <Greene.Ashley@epa.gov>
Subject: FW: OMB Comments on Drinking Water PAG

Hi Holly,

I've attached clean versions of the document and FR notice that address OMB comments. Are you able to help get the revised documents to OP for upload into ROCIS as requested?

Thanks-

Lisa

From: Dorjets, Vlad EOP/OMB Ex. 6 - Personal Privacy
Sent: Thursday, December 29, 2016 10:55 AM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Cc: Burneson, Eric <Burneson.Eric@epa.gov>; Schwab, Margo EOP/OMB Ex. 6 - Personal Privacy; Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Ellis, Jerry <Ellis.Jerry@epa.gov>; Grevatt, Peter <Grevatt.Peter@epa.gov>
Subject: RE: OMB Comments on Drinking Water PAG

Lisa,

Thanks for making the changes to the FR. I only received a couple minor comments from interagency reviewers. They're obviously not show stoppers but seem reasonable and, hopefully, are easy to address.

Ex. 5 - Deliberative Process

I am still waiting on formal approval to conclude review but expect to get it tonight. In the meantime, and if you're fine with the two suggested edits above, please go ahead and ask OP to upload clean versions of the latest documents to ROCIS (and to let me know when they've done it).

Vlad

From: Christ, Lisa [mailto:Christ.Lisa@epa.gov]
Sent: Wednesday, December 28, 2016 4:04 PM
To: Grevatt, Peter <Grevatt.Peter@epa.gov>; Dorjets, Vlad EOP/OMB <Vladik_Dorjets@omb.eop.gov>
Cc: Burneson, Eric <Burneson.Eric@epa.gov>; Schwab, Margo EOP/OMB Ex. 6 - Personal Privacy; Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Ellis, Jerry <Ellis.Jerry@epa.gov>
Subject: RE: OMB Comments on Drinking Water PAG

Vlad and Margo,

Thank you so much for your assistance. I've attached the revised FR notice incorporating your comments (track change and clean versions). Please let me know if you have questions or concerns.

Lisa

From: Grevatt, Peter
Sent: Tuesday, December 27, 2016 1:01 PM
To: Dorjets, Vlad EOP/OMB Ex. 6 - Personal Privacy
Cc: Burneson, Eric <Burneson.Eric@epa.gov>; Schwab, Margo EOP/OMB Ex. 6 - Personal Privacy >; Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>; Ellis, Jerry <Ellis.Jerry@epa.gov>
Subject: Re: OMB Comments on Drinking Water PAG

Sounds good. Thanks again for your help Vlad.

Sent from my iPhone

On Dec 27, 2016, at 12:58 PM, Dorjets, Vlad EOP/OMB Ex. 6 - Personal Privacy wrote:

Eric,

Ex. 5 - Deliberative Process

Vlad

From: Burneson, Eric [mailto:Burneson.Eric@epa.gov]
Sent: Thursday, December 22, 2016 4:53 PM
To: Dorjets, Vlad EOP/OMB [redacted]
Cc: Schwab, Margo EOP/OMB [redacted]; Grevatt, Peter <Grevatt.Peter@epa.gov>; Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>; Ellis, Jerry <Ellis.Jerry@epa.gov>
Subject: RE: OMB Comments on Drinking Water PAG

Vlad:

[redacted]

Eric Burneson, P.E.

Director of Standards and Risk Management

Office of Ground Water and Drinking Water

U.S. Environmental Protection Agency

202 564 5250

From: Dorjets, Vlad EOP/OMB Ex. 6 - Personal Privacy
Sent: Wednesday, December 21, 2016 2:46 PM
To: Burneson, Eric <Burneson.Eric@epa.gov>
Cc: Beauvais, Joel <Beauvais.Joel@epa.gov>; Shelanski, Howard A. EOP/OMB Ex. 6 - Personal Privacy; Johnson, Katie B. B. EOP/OMB Ex. 6 - Personal Privacy; Grevatt, Peter <Grevatt.Peter@epa.gov>; Laity, Jim A. EOP/OMB Ex. 6 - Personal Privacy; Schwab, Margo EOP/OMB Ex. 6 - Personal Privacy
Subject: OMB Comments on Drinking Water PAG

Eric,

Ex. 5 - Deliberative Process

Vlad

Vlad Dorjets

Natural Resources and Environment Branch

Office of Information and Regulatory Affairs

White House Office of Management and Budget

(202) 395-7315 Ex. 6 - Personal Privacy

<EPA Draft Final Drinking Water PAG FRN (OMB Comments).docx>

To: Flaharty, Stephanie[Flaharty.Stephanie@epa.gov]
From: Christ, Lisa
Sent: Mon 1/9/2017 9:13:29 PM
Subject: FW: OGC concurrence on FRN announcing release of the drinking water PAG.
Final Drinking Water PAG FRN - OMB Comments addressed 12.29.16.docx

From: Bangser, Paul
Sent: Monday, January 09, 2017 2:07 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Cc: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Wehling, Carrie <Wehling.Carrie@epa.gov>
Subject: OGC concurrence on FRN announcing release of the drinking water PAG.

Hi Lisa,

Thank you for sending the draft FR notice announcing release of the final PAG guidance for drinking water. Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

Paul Bangser

Attorney, Office of General Counsel

U.S. Environmental Protection Agency

202-564-5479

bangser.paul@epa.gov

From: Christ, Lisa
Sent: Friday, January 06, 2017 11:59 AM
To: Bangser, Paul <bangser.paul@epa.gov>
Cc: Wehling, Carrie <Wehling.Carrie@epa.gov>
Subject: requesting OGC concurrence on FRN announcing release of the drinking water PAG.

Paul,

Ex. 5 - Deliberative Process

Thank you in advance,

Lisa

To: Flaharty, Stephanie[Flaharty.Stephanie@epa.gov]
From: Christ, Lisa
Sent: Mon 1/9/2017 2:09:43 PM
Subject: RE: Lead in DW Model
Lead Modeling Peer Review FRN 1_6_17.docx

Please check with Yvonne, she may be making changes.

From: Flaharty, Stephanie
Sent: Monday, January 09, 2017 8:03 AM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: Lead in DW Model

Lisa,

Please send me the electronic file for the lead modeling FRN.

Thanks,

Stepj

From: Christ, Lisa
Sent: Friday, January 06, 2017 1:40 PM
To: Evalenko, Sandy <Evalenko.Sandy@epa.gov>; Burneson, Eric <Burneson.Eric@epa.gov>; Flaharty, Stephanie <Flaharty.Stephanie@epa.gov>
Cc: Arrigoni, Holly <Arrigoni.Holly@epa.gov>
Subject: RE: 2 FRNs.

Sandy,

Ex. 5 - Deliberative Process

Lisa

From: Evalenko, Sandy
Sent: Friday, January 06, 2017 1:32 PM
To: Burneson, Eric <Burneson.Eric@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>; Flaharty, Stephanie <Flaharty.Stephanie@epa.gov>
Cc: Arrigoni, Holly <Arrigoni.Holly@epa.gov>
Subject: 2 FRNs.

I know that OGWDW will be sending two FRNs for Joel's signature (Final PAGs Guidance and the Proposed Modeling Approaches for Health-based benchmark for Lead and Copper). Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

If the FRNs arrive in the IO Monday, are they time sensitive? Any information you have is appreciated.

Thanks,

Sandy

To: Wadlington, Christina[Wadlington.Christina@epa.gov]; Huff, Lisa[Huff.Lisa@epa.gov]
From: Christ, Lisa
Sent: Fri 1/6/2017 4:09:33 PM
Subject: RE: Week of Jan 9th OW Rollouts

[redacted]

ROLL OUT PAGS FINAL 1.5.16 (002).docx

I found a few places where the roll out refers to the proposed PAG. Please see attached.

Thanks-

Lisa

From: Wadlington, Christina
Sent: Thursday, January 05, 2017 4:33 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>; Huff, Lisa <Huff.Lisa@epa.gov>
Subject: FW: Week of Jan 9th OW Rollouts

FYI, finals sent to OPA and OCIR in case they are helpful.

From: Dennis, Allison
Sent: Thursday, January 05, 2017 3:15 PM
To: Lynn, Tricia <lynn.tricia@epa.gov>; Jones, Enesta <Jones.Enesta@epa.gov>; Lee, Monica <Lee.Monica@epa.gov>; Borum, Denis <Borum.Denis@epa.gov>; Bowles, Jack <Bowles.Jack@epa.gov>; Klasen, Matthew <Klasen.Matthew@epa.gov>; Kaiser, Sven-Erik <Kaiser.Sven-Erik@epa.gov>
Cc: Loop, Travis <Loop.Travis@epa.gov>; Fuld, John <Fuld.John@epa.gov>; Duke, Nia <Duke.Nia@epa.gov>; Campbell, Ann <Campbell.Ann@epa.gov>; Gude, Karen <Gude.Karen@epa.gov>; Wadlington, Christina <Wadlington.Christina@epa.gov>; Lalley, Cara <Lalley.Cara@epa.gov>; Telleen, Katherine <Telleen.Katherine@epa.gov>; Orvin, Chris <Orvin.Chris@epa.gov>; Threet, Derek <Threet.Derek@epa.gov>
Subject: Week of Jan 9th OW Rollouts

All,

Ex. 5 - Deliberative Process

To: DeCair, Sara[DeCair.Sara@epa.gov]
From: Christ, Lisa
Sent: Tue 1/3/2017 6:03:20 PM
Subject: FW: DW PAG being uploaded to ROCIS today
Clean EPA Draft Final Drinking Water PAG FRN - OMB Comments addressed 12.29.16.docx
Clean Version EPA Draft Final Drinking Water PAG (OMB 12-29-16) - OGWDW Response.docx

From: Christ, Lisa
Sent: Friday, December 30, 2016 10:22 AM
To: Grevatt, Peter <Grevatt.Peter@epa.gov>; Burneson, Eric <Burneson.Eric@epa.gov>; Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Ellis, Jerry <Ellis.Jerry@epa.gov>
Subject: DW PAG being uploaded to ROCIS today

FYI

From: Arrigoni, Holly
Sent: Friday, December 30, 2016 10:17 AM
To: Muellerleile, Caryn <Muellerleile.Caryn@epa.gov>
Cc: Christ, Lisa <Christ.Lisa@epa.gov>; Flaharty, Stephanie <Flaharty.Stephanie@epa.gov>; Evalenko, Sandy <Evalenko.Sandy@epa.gov>
Subject: FW: OMB Comments on Drinking Water PAG

Here are the documents. Lisa and I made a few changes (e.g. it will be signed by Joel, not Stan),
Ex. 5 - Deliberative Process

From: Christ, Lisa
Sent: Thursday, December 29, 2016 11:48 AM
To: Arrigoni, Holly <Arrigoni.Holly@epa.gov>
Cc: Flaharty, Stephanie <Flaharty.Stephanie@epa.gov>; Hill, Glynis <Hill.Glynis@epa.gov>; Greene, Ashley <Greene.Ashley@epa.gov>
Subject: FW: OMB Comments on Drinking Water PAG

Hi Holly,

I've attached clean versions of the document and FR notice that address OMB comments. Are you able to help get the revised documents to OP for upload into ROCIS as requested?

Thanks-

Lisa

From: Dorjets, Vlad EOP/OMB Ex. 6 - Personal Privacy
Sent: Thursday, December 29, 2016 10:55 AM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Cc: Burneson, Eric <Burneson.Eric@epa.gov>; Schwab, Margo EOP/OMB Ex. 6 - Personal Privacy; Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Ellis, Jerry <Ellis.Jerry@epa.gov>; Grevatt, Peter <Grevatt.Peter@epa.gov>
Subject: RE: OMB Comments on Drinking Water PAG

Lisa,

Thanks for making the changes to the FR. I only received a couple minor comments from interagency reviewers. Ex. 5 - Deliberative Process are easy to address.

Ex. 5 - Deliberative Process

I am still waiting on formal approval to conclude review but expect to get it tonight. In the meantime, and if you're fine with the two suggested edits above, please go ahead and ask OP to upload clean versions of the latest documents to ROCIS (and to let me know when they've done it).

Vlad

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Sent: Wednesday, December 28, 2016 4:04 PM
To: Grevatt, Peter <Grevatt.Peter@epa.gov>; Dorjets, Vlad EOP/OMB
Ex. 6 - Personal Privacy
Cc: Burneson, Eric <Burneson.Eric@epa.gov>; Schwab, Margo EOP/OMB
Ex. 6 - Personal Privacy ; Hernandez-Quinones, Samuel
<Hernandez.Samuel@epa.gov>; Ellis, Jerry <Ellis.Jerry@epa.gov>
Subject: RE: OMB Comments on Drinking Water PAG

Vlad and Margo,

Thank you so much for your assistance. I've attached the revised FR notice incorporating your comments (track change and clean versions). Please let me know if you have questions or concerns.

Lisa

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Cc: Burneson, Eric <Burneson.Eric@epa.gov>; Schwab, Margo EOP/OMB
Ex. 6 - Personal Privacy ; Hernandez-Quinones, Samuel
<Hernandez.Samuel@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>; Ellis, Jerry
<Ellis.Jerry@epa.gov>
Subject: Re: OMB Comments on Drinking Water PAG

Sounds good. Thanks again for your help Vlad.

Sent from my iPhone

On Dec 27, 2016, at 12:58 PM, Dorjets, Vlad EOP/OMB Ex. 6 - Personal Privacy wrote:

Eric,

Ex. 5 - Deliberative Process

Vlad

From: Burneson, Eric [mailto:Burneson.Eric@epa.gov]
Sent: Thursday, December 22, 2016 4:53 PM
To: Dorjets, Vlad EOP/OMB <Ex. 6 - Personal Privacy
Cc: Schwab, Margo EOP/OMB Ex. 6 - Personal Privacy; Grevatt, Peter

<Grevatt.Peter@epa.gov>; Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>; Ellis, Jerry <Ellis.Jerry@epa.gov>
Subject: RE: OMB Comments on Drinking Water PAG

Vlad:

Ex. 5 - Deliberative Process

Eric Burneson, P.E.

Director of Standards and Risk Management

Office of Ground Water and Drinking Water

U.S. Environmental Protection Agency

202 564 5250

From: Dorjets, Vlad EOP/OMB Ex. 6 - Personal Privacy
Sent: Wednesday, December 21, 2016 2:46 PM
To: Burneson, Eric <Burneson.Eric@epa.gov>
Cc: Beauvais, Joel <Beauvais.Joel@epa.gov>; Shelanski, Howard A. EOP/OMB
Ex. 6 - Personal Privacy Johnson, Katie B. B. EOP/OMB
Grevatt, Peter <Grevatt.Peter@epa.gov>; Laity,
Jim A. EOP/OMB Ex. 6 - Personal Privacy Schwab, Margo EOP/OMB

Ex. 6 - Personal Privacy

Subject: OMB Comments on Drinking Water PAG

Eric,

Ex. 5 - Deliberative Process

Please don't hesitate to let me know if you have any questions about these comments or about OMB's review in general.

Vlad

Vlad Dorjets

Natural Resources and Environment Branch

Office of Information and Regulatory Affairs

White House Office of Management and Budget

(202) 395-7315 | Ex. 6 - Personal Privacy

<EPA Draft Final Drinking Water PAG FRN (OMB Comments).docx>

To: Burneson, Eric[Burneson.Eric@epa.gov]
Cc: Ellis, Jerry[Ellis.Jerry@epa.gov]; Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]; Oshida, Phil[Oshida.Phil@epa.gov]; Huff, Lisa[Huff.Lisa@epa.gov]
From: Christ, Lisa
Sent: Tue 1/3/2017 3:31:25 PM
Subject: Re: PAGs

Of course.

Sent from my iPhone

On Jan 3, 2017, at 10:17 AM, Burneson, Eric <Burneson.Eric@epa.gov> wrote:

Lisa:

Thanks for all of your work last week to assure OMB clearance of the RADs PAG document. In addition to getting the final PAG documents forward for signature, we will also need to prepare for a meeting with outside groups who are concerned about the draft PAG.

Can you please put a pre-brief document together from the material we prepared for the Roll-out. The document should include

PAG summary

Key issues raised by commenters and EPA response:

Summary of the information released in the FOIA

Eric

From: Beauvais, Joel
Sent: Tuesday, January 03, 2017 9:51 AM
To: Grevatt, Peter <Grevatt.Peter@epa.gov>; Burneson, Eric <Burneson.Eric@epa.gov>
Cc: Campbell, Ann <Campbell.Ann@epa.gov>
Subject: PAGs

Good morning – happy new year! Let's incorporate anything relevant from this into the pre-brief for meeting with the NGOs:

Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

To: Arrigoni, Holly[Arrigoni.Holly@epa.gov]
Cc: Flaharty, Stephanie[Flaharty.Stephanie@epa.gov]
From: Christ, Lisa
Sent: Thur 12/29/2016 8:00:53 PM
Subject: RE: OMB Comments on Drinking Water PAG
Clean EPA Draft Final Drinking Water PAG FRN - OMB Comments addressed 12.29.16_ha+lc.docx

Sorry – here's the attachment

From: Christ, Lisa
Sent: Thursday, December 29, 2016 3:00 PM
To: Arrigoni, Holly <Arrigoni.Holly@epa.gov>
Cc: Flaharty, Stephanie <Flaharty.Stephanie@epa.gov>
Subject: RE: OMB Comments on Drinking Water PAG

Hi Holly –

I accepted your edits. I wasn't sure where the "key words" belong. Do you mind taking a look to see if I've added them correctly?

Thanks-

Lisa

From: Arrigoni, Holly
Sent: Thursday, December 29, 2016 2:17 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Cc: Flaharty, Stephanie <Flaharty.Stephanie@epa.gov>
Subject: RE: OMB Comments on Drinking Water PAG

Here are my recommended edits. Please let me know if you have any questions or concerns.

Unfortunately it may need to wait until next week – if there's no one in today, there certainly won't be tomorrow.

From: Christ, Lisa
Sent: Thursday, December 29, 2016 11:48 AM
To: Arrigoni, Holly <Arrigoni.Holly@epa.gov>
Cc: Flaharty, Stephanie <Flaharty.Stephanie@epa.gov>; Hill, Glynis <Hill.Glynis@epa.gov>; Greene, Ashley <Greene.Ashley@epa.gov>
Subject: FW: OMB Comments on Drinking Water PAG

Hi Holly,

I've attached clean versions of the document and FR notice that address OMB comments. Are you able to help get the revised documents to OP for upload into ROCIS as requested?

Thanks-

Lisa

From: Dorjets, Vlad EOP/OMB Ex. 6 - Personal Privacy
Sent: Thursday, December 29, 2016 10:55 AM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Cc: Burneson, Eric <Burneson.Eric@epa.gov>; Schwab, Margo EOP/OMB <Margo_Schwab@omb.eop.gov>; Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Ellis, Jerry <Ellis.Jerry@epa.gov>; Grevatt, Peter <Grevatt.Peter@epa.gov>
Subject: RE: OMB Comments on Drinking Water PAG

Lisa,

Thanks for making the changes to the FR. I only received a couple minor comments from interagency reviewers. Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

Vlad

From: Christ, Lisa [mailto:Christ.Lisa@epa.gov]
Sent: Wednesday, December 28, 2016 4:04 PM
To: Grevatt, Peter <Grevatt.Peter@epa.gov>; Dorjets, Vlad EOP/OMB
Ex. 6 - Personal Privacy
Cc: Burneson, Eric <Burneson.Eric@epa.gov>; Schwab, Margo EOP/OMB
Ex. 6 - Personal Privacy >; Hernandez-Quinones, Samuel
<Hernandez.Samuel@epa.gov>; Ellis, Jerry <Ellis.Jerry@epa.gov>
Subject: RE: OMB Comments on Drinking Water PAG

Vlad and Margo,

Thank you so much for your assistance. I've attached the revised FR notice incorporating your comments (track change and clean versions). Please let me know if you have questions or concerns.

Lisa

From: Grevatt, Peter
Sent: Tuesday, December 27, 2016 1:01 PM
To: Dorjets, Vlad EOP/OMB Ex. 6 - Personal Privacy
Cc: Burneson, Eric <Burneson.Eric@epa.gov>; Schwab, Margo EOP/OMB Ex. 6 - Personal Privacy; Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>; Ellis, Jerry <Ellis.Jerry@epa.gov>
Subject: Re: OMB Comments on Drinking Water PAG

Sounds good. Thanks again for your help Vlad.

Sent from my iPhone

On Dec 27, 2016, at 12:58 PM, Dorjets, Vlad EOP/OMB Ex. 6 - Personal Privacy wrote:

Eric,

Ex. 5 - Deliberative Process

In the meantime, I have provided some comments from Margo and me on the FRN. Don't hesitate to let me know if you have any questions.

Vlad

From: Burneson, Eric [mailto:Burneson.Eric@epa.gov]
Sent: Thursday, December 22, 2016 4:53 PM
To: Dorjets, Vlad EOP/OMB [Ex. 6 - Personal Privacy]
Cc: Schwab, Margo EOP/OMB [Ex. 6 - Personal Privacy]; Grevatt, Peter <Grevatt.Peter@epa.gov>; Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>; Ellis, Jerry <Ellis.Jerry@epa.gov>
Subject: RE: OMB Comments on Drinking Water PAG

Vlad:

Ex. 5 - Deliberative Process

Eric Burneson, P.E.

Director of Standards and Risk Management

Office of Ground Water and Drinking Water

U.S. Environmental Protection Agency

202 564 5250

From: Dorjets, Vlad EOP/OMB Ex. 6 - Personal Privacy
Sent: Wednesday, December 21, 2016 2:46 PM
To: Burneson, Eric <Burneson.Eric@epa.gov>
Cc: Beauvais, Joel <Beauvais.Joel@epa.gov>; Shelanski, Howard A. EOP/OMB Ex. 6 - Personal Privacy; Johnson, Katie B. B. EOP/OMB Ex. 6 - Personal Privacy; Grevatt, Peter <Grevatt.Peter@epa.gov>; Laity, Jim A. EOP/OMB Ex. 6 - Personal Privacy; Schwab, Margo EOP/OMB Ex. 6 - Personal Privacy
Subject: OMB Comments on Drinking Water PAG

Eric,

Ex. 5 - Deliberative Process

Please don't hesitate to let me know if you have any questions about these comments or about OMB's review in general.

Vlad

Vlad Dorjets

Natural Resources and Environment Branch

Office of Information and Regulatory Affairs

White House Office of Management and Budget

(202) 395-7315 | Ex. 6 - Personal Privacy

<EPA Draft Final Drinking Water PAG FRN (OMB Comments).docx>

To: 'Diane D'Arrigo'[dianed@nirs.org]
From: Christ, Lisa
Sent: Thur 12/29/2016 2:49:12 PM
Subject: RE: Urgent: WATER PAGs clarifications
NIRS letter - DArrigo.docx

Ms. Diana D'Arrigo

NIRS

6930 Carroll Ave, Suite 340

Takoma Park, MD 20912

Dear Diane D'Arrigo,

Thank you for your letter dated December 18, 2016, expressing concern regarding the Drinking Water Protective Action Guidance (PAG) and its implementation. The purpose of EPA's Drinking Water Protective Action Guide for Radiological Incidents is to provide information to state and local officials, based on the best available science, to help inform their actions to protect public health in the event of a radiological emergency. State, local and other authorities can use the information in the PAG to inform plans and actions to protect residents from harmful effects from radiation in drinking water following a nationally significant emergency, such as a disaster at a nuclear power plant. As stated in the June 2016 proposal, EPA determined, given the drinking water contamination that occurred in Japan following the Fukushima event, that a drinking water PAG is necessary.

The Drinking Water PAG is intended for short term use only and is not intended for long-term (i.e. greater than one year) or everyday use. The proposed PAG included several references to emphasize a one-year implementation period. EPA's position on the one-year duration for the Drinking Water PAG remains unchanged. This guidance is non-regulatory and non-binding. The PAG does not affect EPA's Safe Drinking Water Act (SDWA) regulatory drinking water standards for radionuclides, which would continue to apply even in the event of an emergency. EPA expects that the responsible party for any drinking water system adversely impacted during a radiation emergency will take action to return to compliance with regulatory maximum contaminant levels as soon as practicable. If you have further questions, please contact me or your staff may call Sam Hernandez at 202-564-1735.

Sincerely,

Lisa Christ

From: Diane D'Arrigo [mailto:dianed@nirs.org]
Sent: Monday, December 19, 2016 2:37 AM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Cc: Mccarthy, Gina <McCarthy.Gina@epa.gov>; Beauvais, Joel <Beauvais.Joel@epa.gov>
Subject: Urgent: WATER PAGs clarifications

Dear Lisa Christ:

Please see the attached letter which I have compiled since our conversation last Tuesday December 13th, 2016 regarding EPA's Protective Action Guide for Drinking Water (Water PAGs) Could you please let me know ***before the Water PAG is finalized*** how the changes you told me about will be implemented***?***

You/EPA may need to change what is at OMB to *be sure that what you believe is being accomplished is actually in the PAGs.*

You told me in our phone conversation that EPA's latest Water PAGs that are at OMB were changed **specifically, so that *the Water PAGs will only apply for up to 1 year maximum* and that they will *only apply to incidents of national significance, not lesser accidents or releases.***

The 2016 PAGs finalized on Dec 1, 2016 does not say that and must be changed to reflect this in the definitions and descriptions of "incident(s)" and of the "intermediate phase."

They currently indicate that phase could be for "years" and for a wide array of lesser releases, as documented in the attached letter.

If those statements in the overall PAG document are not being altered, any contrary statement in the drinking water section would arguably be nullified by or at minimum contradicted by contrary statements elsewhere in the overall document. If the contrary statements in the main body of the PAG document are not being fixed, then will the Water PAGs specifically state that the updated definitions you described to me will apply to the Water PAGs for drinking water ***notwithstanding any other provision in the PAGs?***

The 2016 PAGs finalized on December 1, 2016 clearly state that the PAGs apply to ***"any release or potential release into the environment of radioactive materials in sufficient quantity to warrant consideration of protective actions."*** Thus they apply to many more incidents than a huge dirty bomb or nuclear power meltdown, indeed essentially any release of radioactivity for which protecting the public should be considered.

The 2016 PAGs finalized on December 1, 2016 and published on EPA's website indicate that ***the intermediate phase can be for <u>years</u>***—plural--and describe allowable doses for those years. For example, pg. 8 of the PAG states, "Intermediate phase PAGs are based on doses projected ***in the first several years.***" (Emphasis added)

In the attached version of this letter, I am providing screen shots of ***some of the places in the 2016 PAG that need to be changed if what you told me is true***. There are several places that indicate

1) the scope of the PAGs is broader than before and applies to a wide range of releases

2) the Intermediate Phase can last for multiple years.

There may be other places but these are the most obvious.

If these conflicting statements are not fixed to reflect what you told me EPA supposedly has decided to do, in response to public comments (i.e., limit the immediate phase to no more than 1 year and limit the scope of events covered to only very large events of national significance), any such language in the water section of the PAG will be at best contradicted by the statements elsewhere in the overall document. If truly EPA has decided to fix the problem, it needs to make the language consistent throughout, or at minimum, make clear that the time and scope limits for the water part of the PAG must

be in force irrespective of any language elsewhere in the PAG.

Please let us know how these changes are being made, *before* EPA signs off on the Water PAGs and it becomes too late.

The attached copy of this letter provides specific details and Screen Shots from 9 pages of the 2016 PAGs https://www.epa.gov/radiation/protective-action-guides-pags **clearly documenting the public concerns about the WATER PAGs are still present in the 2016 PAGs.**

We appreciate your efforts at responding to these major public concerns and implore you to be sure the changes are truly being implemented, or reject the Water PAGs.

Sincerely,

Diane D'Arrigo

Radioactive Waste Project Director

Nuclear Information and Resource Service

6930 Carroll Ave Suite 340

Takoma Park, MD 20912

dianed@nirs.org

202 841 8588 mobile

Cc: Gina McCarthy, Joel Beauvais

Ms. Diana D'Arrigo
NIRS
6930 Carroll Ave, Suite 340
Takoma Park, MD 20912

Dear Diane D'Arrigo,

Thank you for your letter dated December 18, 2016, expressing concern regarding the Drinking Water Protective Action Guidance (PAG) and its implementation. The purpose of EPA's Drinking Water Protective Action Guide for Radiological Incidents is to provide information to state and local officials, based on the best available science, to help inform their actions to protect public health in the event of a radiological emergency. State, local and other authorities can use the information in the PAG to inform plans and actions to protect residents from harmful effects from radiation in drinking water following a nationally significant emergency, such as a disaster at a nuclear power plant. As stated in the June 2016 proposal, EPA determined, given the drinking water contamination that occurred in Japan following the Fukushima event, that a drinking water PAG is necessary.

The Drinking Water PAG is intended for short term use only and is not intended for long-term (i.e. greater than one year) or everyday use. The proposed PAG included several references to emphasize a one-year implementation period. EPA's position on the one-year duration for the Drinking Water PAG remains unchanged. This guidance is non-regulatory and non-binding. The PAG does not affect EPA's Safe Drinking Water Act (SDWA) regulatory drinking water standards for radionuclides, which would continue to apply even in the event of an emergency. EPA expects that the responsible party for any drinking water system adversely impacted during a radiation emergency will take action to return to compliance with regulatory maximum contaminant levels as soon as practicable. If you have further questions, please contact me or your staff may call Sam Hernandez at 202-564-1735.

Sincerely,

Lisa Christ

To: Dennis, Allison[Dennis.Allison@epa.gov]; Rodgers-Jenkins, Crystal[Rodgers-Jenkins.Crystal@epa.gov]
Cc: Wadlington, Christina[Wadlington.Christina@epa.gov]
From: Christ, Lisa
Sent: Wed 12/28/2016 4:35:00 PM
Subject: RE: MEDIA INQUIRY - Inside EPA. NRIS request re: water PAGs. DDL: TODAY, 12/28 @ 2 PM

Hi Allison,

I will defer to you. The quotes I provided to Q1 came directly from the proposal published for public comment. How's this?

Ex. 5 - Deliberative Process

From: Dennis, Allison
Sent: Wednesday, December 28, 2016 11:11 AM
To: Christ, Lisa <Christ.Lisa@epa.gov>; Rodgers-Jenkins, Crystal <Rodgers-Jenkins.Crystal@epa.gov>
Cc: Wadlington, Christina <Wadlington.Christina@epa.gov>
Subject: RE: MEDIA INQUIRY - Inside EPA. NRIS request re: water PAGs. DDL: TODAY, 12/28 @ 2 PM

Ex. 5 - Deliberative Process

More information: https://www.epa.gov/radiation/protective-action-guides-pags#tab-1

From: Christ, Lisa
Sent: Wednesday, December 28, 2016 10:53 AM
To: Rodgers-Jenkins, Crystal <Rodgers-Jenkins.Crystal@epa.gov>
Cc: Wadlington, Christina <Wadlington.Christina@epa.gov>; Dennis, Allison <Dennis.Allison@epa.gov>
Subject: RE: MEDIA INQUIRY - Inside EPA. NRIS request re: water PAGs. DDL: TODAY, 12/28 @ 2 PM

Hi Allison,

Please see draft response below.

Lisa

From: Rodgers-Jenkins, Crystal
Sent: Wednesday, December 28, 2016 10:26 AM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Cc: Wadlington, Christina <Wadlington.Christina@epa.gov>; Dennis, Allison <Dennis.Allison@epa.gov>
Subject: RE: MEDIA INQUIRY - Inside EPA. NRIS request re: water PAGs. DDL: TODAY, 12/28 @ 2 PM

Hi Lisa,

Would you please draft responses to the questions below.

Thanks,

Crystal

From: Dennis, Allison
Sent: Wednesday, December 28, 2016 10:08 AM
To: Rodgers-Jenkins, Crystal <Rodgers-Jenkins.Crystal@epa.gov>
Cc: Wadlington, Christina <Wadlington.Christina@epa.gov>
Subject: FW: MEDIA INQUIRY - Inside EPA. NRIS request re: water PAGs. DDL: TODAY, 12/28 @ 2 PM

From: Lynn, Tricia
Sent: Wednesday, December 28, 2016 9:55 AM
To: Dennis, Allison <Dennis.Allison@epa.gov>
Subject: MEDIA INQUIRY - Inside EPA. NRIS request re: water PAGs. DDL: TODAY, 12/28 @ 2 PM

Deadline: TODAY, 12/28/16 @ 2 PM

Outlet: Inside EPA

Reporter: Suzanne Yohannan

suzanney@iwpnews.com

From the Reporter:

The Nuclear Information and Resource Service (NIRS) had a conversation with Lisa Christ in EPA's Office of Water about EPA's pending water protective action guidance (PAGs) for radionuclide emergencies. This is the "Water" chapter of the PAG manual that is still at OMB. According to a Dec. 18 letter from NIRS, there was a conservation between the group and Ms. Christ in which EPA gave assurances that the "water" PAGs would only apply for up to one year maximum and that they would only apply to incidents of national significance. NIRS wrote the letter asking that the PAG manual and water PAGs be specifically changed to alter that. The letter, again, is dated Dec. 18, addressed to Lisa Chirst, and was signed by Diane D'Arrigo.

Reporter Questions:

1. Could you tell me if EPA plans to follow through with the changes NIRS sought?

Ex. 5 - Deliberative Process

2. If not, what changes, if any, will be made to the PAG manual or water PAG chapter?

Ex. 5 - Deliberative Process

Tricia Lynn

Office of Public Affairs

U.S. EPA

Office: 202.564.2615

To: Wadlington, Christina[Wadlington.Christina@epa.gov]
Cc: Huff, Lisa[Huff.Lisa@epa.gov]; Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]
From: Christ, Lisa
Sent: Tue 12/20/2016 12:50:06 PM
Subject: RE: Blog for PAGS
PAGS_BLOG_v2.docx

Hi Christina,

Comments attached with Sam's help ☺

Lisa

From: Wadlington, Christina
Sent: Monday, December 19, 2016 11:22 AM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Cc: Huff, Lisa <Huff.Lisa@epa.gov>
Subject: Blog for PAGS

Morning!

When we release the PAG, they would also like to post a blog that explains what the PAG is and isn't and, if possible, address any questions that we have been receiving.

Can you please take a look and send comments by COB tomorrow? I would like to get it cleared by Peter by the end of the week.

However, if you don't foresee the PAG coming out anytime soon that, of course, would extend the deadline.

Thank you!

To: Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]
Cc: Huff, Lisa[Huff.Lisa@epa.gov]
From: Christ, Lisa
Sent: Mon 12/19/2016 4:23:11 PM
Subject: FW: Blog for PAGS
PAGS_BLOG.docx

Hi Sam,

Please provide your thoughts to me COB today.

Thanks Lisa

From: Wadlington, Christina
Sent: Monday, December 19, 2016 11:22 AM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Cc: Huff, Lisa <Huff.Lisa@epa.gov>
Subject: Blog for PAGS

Morning!

When we release the PAG, they would also like to post a blog that explains what the PAG is and isn't and, if possible, address any questions that we have been receiving.

Can you please take a look and send comments by COB tomorrow? I would like to get it cleared by Peter by the end of the week.

However, if you don't foresee the PAG coming out anytime soon that, of course, would extend the deadline.

Thank you!

To: Wadlington, Christina[Wadlington.Christina@epa.gov]; Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]
From: Christ, Lisa
Sent: Thur 12/15/2016 8:58:34 PM
Subject: RE: PAGS roll out
ROLL OUT PAGS FINAL.cw.lc.docx

Hi – I have a few edits. Let me know if you have questions/concerns.

Lisa

From: Wadlington, Christina
Sent: Thursday, December 15, 2016 2:23 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>; Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>
Subject: PAGS roll out

Are you ok with these changes to the desk statement?

To: Flaharty, Stephanie[Flaharty.Stephanie@epa.gov]
From: Christ, Lisa
Sent: Mon 12/12/2016 4:56:30 PM
Subject: RE: CMS Reassignment Request Approved - StephanieN Brown - AX-17-000-1597

Awesome

-----Original Message-----
From: Flaharty, Stephanie
Sent: Monday, December 12, 2016 9:24 AM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Cc: Burneson, Eric <Burneson.Eric@epa.gov>; Huff, Lisa <Huff.Lisa@epa.gov>
Subject: FW: CMS Reassignment Request Approved - StephanieN Brown - AX-17-000-1597

Lisa,

Reassigned to OLEM...

Thanks,
Steph

-----Original Message-----
From: cmsadmin@epa.gov [mailto:cmsadmin@epa.gov]
Sent: Monday, December 12, 2016 8:35 AM
To: Flaharty, Stephanie <Flaharty.Stephanie@epa.gov>
Subject: CMS Reassignment Request Approved - StephanieN Brown - AX-17-000-1597

Your reassignment request has been approved on 12/12/16 8:35 AM by StephanieN Brown. Please go to the CMS webpage to view the details of the control.

Summary Information -
Control Number: AX-17-000-1597
Control Subject: PAGs & US EPA Finished Drinking Water 900 Method being used on raw untreated water suspected of containing radiation
From: Borello, Chris

Note: This Email was automatically generated. Please do not attempt to respond to it. You can access this control at https://cms.epa.gov/cms. Questions or comments concerning CMS should be directed to CMS Support at 202-564-4985 or CMS Information@epa.gov.

To: DeCair, Sara[DeCair.Sara@epa.gov]; Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]; Wieder, Jessica[Wieder.Jessica@epa.gov]; Nesky, Anthony[Nesky.Tony@epa.gov]; White, Rick[White.Rick@epa.gov]; Snead, Kathryn[Snead.Kathryn@epa.gov]; Saltman, Tamara[Saltman.Tamara@epa.gov]
From: Christ, Lisa
Sent: Wed 12/7/2016 9:47:53 PM
Subject: RE: Inside EPA articles on PAGs, dated Nov. 5

Yes – the press seems very interested in this story!

From: DeCair, Sara
Sent: Wednesday, December 07, 2016 4:20 PM
To: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>; Wieder, Jessica <Wieder.Jessica@epa.gov>; Nesky, Anthony <Nesky.Tony@epa.gov>; White, Rick <White.Rick@epa.gov>; Snead, Kathryn <Snead.Kathryn@epa.gov>; Saltman, Tamara <Saltman.Tamara@epa.gov>
Subject: Inside EPA articles on PAGs, dated Nov. 5

Busy times over at Inside EPA – two articles on PAGs in one day --

From: Walker, Stuart
Sent: Wednesday, December 07, 2016 3:50 PM
To: Woolford, James <Woolford.James@epa.gov>; Stalcup, Dana <Stalcup.Dana@epa.gov>
Cc: Scozzafava, MichaelE <Scozzafava.MichaelE@epa.gov>; Fitz-James, Schatzi <Fitz-James.Schatzi@epa.gov>; Gartner, Lois <Gartner.Lois@epa.gov>
Subject: RE: PAGS

This article and link to the NY AG letter also make for interesting reading

https://insideepa.com/sites/insideepa.com/files/documents/dec2016/epa2016_2535.pdf

Daily News

New York AG Office Urges White House To Reject Water Radiation Guide

December 05, 2016

The New York attorney general's (AG) office is urging the White House to reject a proposed EPA guidance that would set protective drinking water levels for radiological emergencies far in exceedance of Safe Drinking Water Act (SDWA) limits, even as EPA Administrator Gina McCarthy is defending the pending guide and arguing its reach is limited to temporary situations.

The White House Office of Management and Budget (OMB) is reviewing a drinking water chapter slated for inclusion in EPA's protective action guides (PAGs) for radiological emergencies. The agency plans to insert the chapter into an updated PAG manual that McCarthy signed Dec. 1.

EPA chose to finalize the manual now without the drinking water chapter, but says in a notice that it still plans to finalize the drinking water guidance and intends to add it into the "Intermediate Phase" chapter of the manual and reissue the manual once complete.

The pending drinking water amendments would largely weaken acceptable radiological concentrations allowed in drinking water months or years after a radiological emergency, and dozens of environmental groups have called for the amendments' withdrawal. In addition, several environmental groups in a Nov. 30 letter appealed to McCarthy to meet once again with them to reconsider the water amendments, arguing the draft version “would upend decades of clean water protections.”

An EPA Radiation and Indoor Air Office official, Sara DeCair, told EPA's Clean Air Act Advisory Committee (CAAAC) Dec. 1 that the drinking water amendments are in line to be finalized but gave the caveat that there are no guarantees that will occur under the current administration.

Echoing some of the criticisms levied by environmentalists, the New York AG's office is appealing to OMB to scrap the drinking water guide or alternatively, to send it back to EPA to be reworked, after the agency did not respond to concerns the state raised directly to EPA officials.

While the draft guidance purports to set acceptable radiation levels in public drinking water supplies following a radiological incident, it "advances a much less protective standard for drinking water interdiction than is set forth in existing EPA guidance and in EPA regulations promulgated under [SDWA]," a Nov. 21 letter from New York Assistant AGs Joshua M. Tallent and John J. Sipos says. The

letter was sent to OMB Office of Information and Regulatory Affairs (OIRA) Administrator Howard Shelanski.

Potential Exposure

"Because it would substantially, indefinitely, and unjustifiably increase New Yorkers' exposure to radioactive contamination in drinking water in the aftermath of a potential radiological incident, the State of New York Office of the Attorney General strongly urges that OIRA either disapprove the draft guidance now under review or, in the alternative, return the guidance to the EPA for further consideration," the assistant AGs say.

A spokesman for New York Attorney General Eric Schneiderman says he cannot comment on whether the AG's office is considering the possibility of litigation over the PAGs, if EPA issues them without changes.

But McCarthy in response to a question asked during a Nov. 21 National Press Club speech she gave defended the draft water PAG, noting it is to be applied to temporary situations. She stressed that the agency is not altering its drinking water standards, and said the guide applies to a transitional period that would permit exposures temporarily that "would allow life to continue but not present a hazard to those individuals."

"[W]e are providing the best information we can in those transition days, not sending a signal that we think that those numbers should be the standard for drinking water. It clearly shouldn't be," she said at the Washington, D.C., event.

McCarthy said the guide grew out of the 2011 Fukushima, Japan, nuclear power plant accident, where she said people were left not knowing what to do in the aftermath. The larger PAG manual in which the water amendments are slated to be inserted has long been needed by states, according to McCarthy. She said "states have been driven crazy because it's been years since anyone updated [the overall PAG manual] and because they know that we have more at issue now in terms of radiation."

DeCair in slides she presented to the CAAAC indicated that the agency in response to comments revised the draft PAGs to describe "how conservative PAGs levels are" and to further stress "how environmental standards are not changing because of this guidance."

Two-Tiered Approach

In the draft water amendments, EPA proposed a two-tiered approach that would

provide more protective exposure levels for sensitive populations than the general population but would still allow radioactivity in drinking water at orders of magnitude beyond SDWA limits for radionuclides.

The amendments would deem protective action dose levels of 500 millirems/year (mrem/yr) in the first year after an incident for the general population, and 100 mrem/yr in the first year for infants, children age 15 and under, and pregnant or nursing women, according to a notice of availability for the draft drinking water PAG. The safety levels would be for emergency management officials to apply in the intermediate phase period after a radiological emergency -- which EPA has at times defined as up to one year but in other cases up to several years after an incident.

Among its criticisms of EPA's draft water PAG, the New York AG's office takes issue with the time period of exposure that citizens near a radiological incident could be subjected to.

The protective action thresholds in the water PAG are meant for use during what is called the intermediate phase of a radiological incident response, which means after the immediate release has been put under control but prior to a large-scale cleanup, the letter notes. In effect, the draft PAGs "create a variance of indeterminate duration from Safe Drinking Water Act standards," it says. This could allow emergency officials to permit citizens to be exposed to levels far exceeding SDWA limits for many months or even years after an incident, it says.

The state AG says what is especially troubling is the agency's "apparent abandonment of the organ dose-based radiation exposure measurement used in the [SDWA maximum contaminant levels (MCLs)] in favor of a measure of exposure expressed as 'committed effective dose.'" EPA in the water PAG does not explain its rationale for the shift in methodology, but due to this change, the water PAG substantially understates "the increase in radionuclide concentrations allowable under the proposed PAGs over [SDWA] levels," it says. For example, EPA would allow a 3,450-fold rise in the maximum allowable concentration of iodine-131, it says.

'Effective Dose'

In the past, EPA has rejected "effective dose" as understating cancer risk, the state AG notes. "Inexplicably, the EPA seems to have adopted PAGs that could expose the public to levels of cancer risk far in excess of what the agency itself considers the maximum acceptable risk threshold," it says.

The state AG also questions EPA's release of "derived response levels" -- the

allowable concentrations of each radionuclide in drinking water that correspond to EPA's PAG levels -- for just three of the 100 radionuclides that EPA believes may be found in drinking water systems following an incident.

The complaint echoes concerns voiced by environmentalists who have sued the agency under a Freedom of Information Act lawsuit to obtain the derived response levels for the other radionuclides. Without this data, the state and the public cannot "plausibly evaluate the protectiveness" of the agency's PAGs, the state AG says.

On the procedures side, the state AG also asks OIRA to reevaluate its apparent finding that the water PAG is not a "significant regulatory action," arguing against EPA's label that the PAGs are a nonbinding document.

"[T]he agency clearly intends and expects that federal, state, and local emergency planners will incorporate the draft PAGs into their planning protocols for use in the event of a radiological emergency," the letter says. Further, EPA's regulatory action could have significant adverse economic, agriculture, homeland security, healthcare and public health and safety impacts, it contends.

Therefore, OIRA should treat the water PAG as a significant regulatory action, subjecting it to the level of review required for such actions, it says. As part of that review, OIRA should scrutinize whether EPA has scientific justification for its claim that the water PAG is within the cancer risk range found in SDWA's MCLs, it says. -- *Suzanne Yohannan* (syohannan@iwpnews.com)

From: Woolford, James
Sent: Tuesday, December 06, 2016 8:24 AM
To: Stalcup, Dana <Stalcup.Dana@epa.gov>
Cc: Scozzafava, MichaelE <Scozzafava.MichaelE@epa.gov>; Walker, Stuart <Walker.Stuart@epa.gov>; Fitz-James, Schatzi <Fitz-James.Schatzi@epa.gov>; Gartner, Lois <Gartner.Lois@epa.gov>
Subject: PAGS

EPA Finalizes Radiological Manual With 1992 Levels Despite Updated Science

December 05, 2016

EPA has quietly released a final guide for responding to radiological incidents, expanding the guide's reach while maintaining many of the protective action levels set in 1992, despite newer scientific findings EPA has adopted for other applications that one environmentalist radiation expert says should have led the agency to set stricter levels.

EPA Administrator Gina McCarthy Dec. 1 signed a notice making available the final Protective Action Guides (PAGs) and Planning Guidance for Radiological Incidents, commonly known as the PAG Manual. The manual revises a 1992 version and sets radiological protection criteria for federal, state, local and tribal emergency response officials to use in a wide variety of incidents involving a radiological release.

The agency chose to finalize the manual now without a highly controversial drinking water chapter that is still under interagency review at the White House Office of Management & Budget (OMB). EPA in the notice says it plans to eventually add the drinking water section to the “Intermediate Phase” chapter of the manual and then reissue the PAG manual. Environmentalists and the New York’s attorney general’s office have been severely critical of the draft drinking water chapter and have urged EPA to scrap it.

The guidance outlines three radiological incident phases for which it makes protective action recommendations. These are the early phase, the intermediate phase and the late phase. In the early phase, EPA calls for sheltering-in-place or evacuating the public if radioactive levels reach between 1 and 5 roentgen equivalent man (rem) -- a conventional unit used for equivalent dose -- over a four day period following the incident. It also calls for supplementary administration of potassium iodide as a thyroid blocking agent per the latest guidance from the Food & Drug Administration if a child is subjected to 5 rem in the early phase of exposure -- hours to days.

In the intermediate phase, the PAG calls for relocating the public if the projected dose is equal to or greater than 2 rem in the first year, and 0.5 rem in the second and subsequent years. It also includes additional protective dose recommendations depending on food exposures or other circumstances.

For cleanup and waste disposal in the late phase, the manual includes brief guidance for planning the cleanup process and the disposal of radioactive waste, EPA says in a fact sheet issued with the guide.

EPA has expanded the breadth of the guidance from the 1992 version, saying the protective actions described in the manual now apply to a wide range of

incidents, although generally to those involving significant radioactive releases. These incidents include nuclear weapons complex or nuclear power plant accidents, a fire in a nuclear fuel manufacturing plant, transportation accidents involving radioactive material or terrorist acts involving a radiological dispersal device.

Questionable Authority

The environmentalist questions the need for such a guidance when the Superfund law already contains authorities to respond to releases, including emergencies. "[D]espite their rote claims to the contrary," the PAG manual undercuts the Superfund law, the source says.

The source says EPA seems "to admit the problem a bit" in a footnote, suggesting it may lack legal authority to issue the PAGs. The source points to a footnote not included in the draft PAG manual, and now repeated throughout the final that the source says effectively indicates the agency lacks the "legal basis to do any of this." In the footnote to a section on cleanup under the late phase, EPA notes that "this cleanup process does not rely on and does not affect any authority, including the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), . . . and the National Contingency Plan (NCP)."

It goes on to say: "This document expresses no view as to the availability of legal authority to implement this process in any particular situation."

EPA is stressing that the PAG manual is non-binding, and does not set legal radiation limits or supersede environmental laws or regulations.

In the notice, which in part responds to comments critical of the draft, EPA says the levels established in the manual "are intended to be used only in an emergency when radiation levels have already exceeded environmental standards and could be high enough to cause health effects unless protective actions are taken." The agency contends that PAGs are meant to prevent adverse health impacts by triggering public safety measures such as evacuation and to minimize "unnecessary exposures."

The notice continues, "The PAGs are set at a level where the health risk from radiation exposure that could be avoided with protective action outweighs the risk associated with taking the safety measures, e.g., traffic accidents, trips and falls or anxiety associated with dislocation or the separation of family members."

In response to criticism from environmental groups that the PAGs would not be stringent enough, EPA contends that "[t]here is an abundant conservatism built

into the derivation of the PAGs, and into the assumptions used to generate derived response levels, to ensure that the PAGs are appropriate emergency guides for all members of the public, including sensitive subpopulations."

Weaker Standards

But the environmentalist says EPA has effectively weakened the standards, and notes that the details in the manual contradict claims made in the notice and fact sheet.

EPA in the fact sheet says the manual "includes dose calculations based on the latest science." But the source says, "What stunned me is it's exactly the opposite."

The manual says that most of the PAGs and related actions remain unchanged from the 1992 manual. For instance in its basis for early phase PAGs, EPA references Biological Effects of Ionizing Radiation (BEIR) III, which are now out-of-date cancer and non-cancer risk estimates from exposure to low-level ionizing radiation issued by the National Academy of Sciences (NAS). The source points out that EPA has since adopted more recent NAS findings -- BEIR V and VII -- that show risks are greater than previously estimated for the same level of radiation received. Therefore, the new science shows that levels should be more stringent, the source argues.

This new document contains essentially the same levels as the 1992 document, and is based on science from the 1970s, at the same time EPA is saying it is based on new science, the source says.

Further, EPA weakened the 1992 manual by eliminating certain evacuation requirements triggered when skin and thyroid doses exceed certain levels, the source says. Also, it eliminates a PAG for the intermediate phase that called for relocation if it was projected that the population would accumulate exposure at 5 rem over a 50-year period. EPA in the manual says this was removed for simplicity. The 50-year relocation PAG "is rarely, if ever, the driver for extending a relocation area beyond that prompted by the first or second year relocation PAGs in scenarios that have been analyzed."

In addition, the manual says that "dose projections over 50 years after a radiological incident for various age groups show no significant differences for individuals exposed at 3 months of age versus adult."

The fact sheet also contradicts the manual on the time interval for the intermediate phase, with the former saying it will last weeks to months, while the

details included in the manual, including a table that specifies PAG levels, indicate this time period could last up to several years. -- *Suzanne Yohannan* (syohannan@iwpnews.com)

Related News | Toxics | Waste | Water |

196953

Jim Woolford, Director

Office of Superfund Remediation and Technology Innovation

Office of Land and Emergency Management

US Environmental Protection Agency

1200 Penn. Ave., NW

Washington, DC 20460

(Mail Code 5201-P)

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Phone: (703) 603 8960– Main Office Line

Physically located at:

Room 5622

One Potomac Yard (South)
2777 S. Crystal Dr.
Arlington, VA 22202

To: Kelly, Lynn[Kelly.Lynn@epa.gov]; Flaharty, Stephanie[Flaharty.Stephanie@epa.gov]
Cc: Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]; Miller, Kevin[Miller.Kevin@epa.gov]
From: Christ, Lisa
Sent: Mon 12/5/2016 8:32:16 PM
Subject: RE: DRAFT Answer in PEER v. EPA FOIA Litigation

Ex. 5 - Deliberative Process

From: Kelly, Lynn
Sent: Monday, December 05, 2016 3:31 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>; Flaharty, Stephanie <Flaharty.Stephanie@epa.gov>
Cc: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Miller, Kevin <Miller.Kevin@epa.gov>
Subject: RE: DRAFT Answer in PEER v. EPA FOIA Litigation

Ex. 5 - Deliberative Process

Thanks again for your review.

Lynn Kelly | US EPA | Office of General Counsel | 1200 Pennsylvania Ave., NW | WJC North, Mail Code 2377A | Washington, DC 20460 | phone: (202) 564-3266

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From: Christ, Lisa
Sent: Monday, December 05, 2016 3:22 PM
To: Kelly, Lynn <Kelly.Lynn@epa.gov>; Flaharty, Stephanie <Flaharty.Stephanie@epa.gov>
Cc: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Miller, Kevin <Miller.Kevin@epa.gov>
Subject: RE: DRAFT Answer in PEER v. EPA FOIA Litigation

Hi Lynn,

I had a few small edits. See attached.

Thanks-

Lisa

From: Kelly, Lynn
Sent: Thursday, December 01, 2016 3:13 PM
To: Flaharty, Stephanie <Flaharty.Stephanie@epa.gov>
Cc: Christ, Lisa <Christ.Lisa@epa.gov>; Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Miller, Kevin <Miller.Kevin@epa.gov>
Subject: RE: DRAFT Answer in PEER v. EPA FOIA Litigation

Ex. 5 - Deliberative Process

Please take a look at the attached revised draft so you can see what we've proposed for those paragraphs. Please let me know once you are able to review and confirm this is ok to send to the AUSA as a final draft.

Ex. 5 - Deliberative Process

As always, please let me know if you have any questions. Thanks again for everyone's input.

Lynn Kelly | US EPA | Office of General Counsel | 1200 Pennsylvania Ave., NW | WJC North, Mail Code 2377A | Washington, DC 20460 | phone: (202) 564-3266

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From: Flaharty, Stephanie
Sent: Wednesday, November 30, 2016 9:38 AM
To: Kelly, Lynn <Kelly.Lynn@epa.gov>
Cc: Christ, Lisa <Christ.Lisa@epa.gov>; Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Miller, Kevin <Miller.Kevin@epa.gov>
Subject: FW: DRAFT Answer in PEER v. EPA FOIA Litigation

Please contact me: Ex. 6 - Personal Privacy before you send our response!

From: Flaharty, Stephanie
Sent: Wednesday, November 30, 2016 9:29 AM
To: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Kelly, Lynn <Kelly.Lynn@epa.gov>
Cc: Bangser, Paul <bangser.paul@epa.gov>; Miller, Kevin <Miller.Kevin@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>
Subject: RE: DRAFT Answer in PEER v. EPA FOIA Litigation

Thanks Sam. Lynn please let me know how I can reach you to talk about our response...

Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

From: Hernandez-Quinones, Samuel
Sent: Wednesday, November 30, 2016 9:23 AM
To: Kelly, Lynn <Kelly.Lynn@epa.gov>; Flaharty, Stephanie <Flaharty.Stephanie@epa.gov>
Cc: Bangser, Paul <bangser.paul@epa.gov>; Miller, Kevin <Miller.Kevin@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>
Subject: RE: DRAFT Answer in PEER v. EPA FOIA Litigation

Hi Lynn,

here is my input for the statements listed in your email. Please give me a call and we can talk about this.

Thanks

Sam

Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

==========

Samuel Hernández Quiñones, P.E.
Environmental Engineer
Office of Water

Environmental Protection Agency
1200 Pennsylvania Ave. NW
Washington, DC 20460
202-564-1735

"USEPA Protecting Human Health and the Environment"

Ex. 5 - Deliberative Process

From: Kelly, Lynn
Sent: Tuesday, November 29, 2016 10:54 PM
To: Flaharty, Stephanie <Flaharty.Stephanie@epa.gov>; Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>
Cc: Bangser, Paul <bangser.paul@epa.gov>; Miller, Kevin <Miller.Kevin@epa.gov>
Subject: RE: DRAFT Answer in PEER v. EPA FOIA Litigation
Importance: High

Thank you Steph!

Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

Lynn Kelly | US EPA | Office of General Counsel | 1200 Pennsylvania Ave., NW | WJC North, Mail Code 2377A | Washington, DC 20460 | phone: (202) 564-3266

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From: Flaharty, Stephanie
Sent: Wednesday, November 23, 2016 6:20 AM
To: Kelly, Lynn <Kelly.Lynn@epa.gov>; Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>
Cc: Bangser, Paul <bangser.paul@epa.gov>
Subject: RE: DRAFT Answer in PEER v. EPA FOIA Litigation

Hi Kelly,

The substance of your response appears to be correct from my perspective.

Thanks,

Steph Flaharty

Sr. Reg. Mgr./CMS/FOIA Public Liaison

Office of Ground Water and Drinking Water

202.564.5072

From: Kelly, Lynn
Sent: Tuesday, November 22, 2016 3:39 PM
To: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Flaharty, Stephanie <Flaharty.Stephanie@epa.gov>
Cc: Bangser, Paul <bangser.paul@epa.gov>
Subject: DRAFT Answer in PEER v. EPA FOIA Litigation

Hi Sam and Steph,

Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

I have copied Paul Bangser from our Water Law office in OGC also as an FYI. Please let me know if you have any questions or concerns with the draft before Monday at noon EST if possible. Thank you!

Lynn Kelly | US EPA | Office of General Counsel | 1200 Pennsylvania Ave., NW | WJC North, Mail Code 2377A | Washington, DC 20460 | phone: (202) 564-3266

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To: Wadlington, Christina[Wadlington.Christina@epa.gov]; Burneson, Eric[Burneson.Eric@epa.gov]; Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]
From: Christ, Lisa
Sent: Wed 11/30/2016 6:40:36 PM
Subject: RE: Radiation PAG Statement

Thanks

From: Wadlington, Christina
Sent: Wednesday, November 30, 2016 1:20 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>; Burneson, Eric <Burneson.Eric@epa.gov>; Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>
Subject: FW: Radiation PAG Statement

FYI.

From: Dennis, Allison
Sent: Wednesday, November 30, 2016 1:16 PM
To: Fuld, John <Fuld.John@epa.gov>; Wadlington, Christina <Wadlington.Christina@epa.gov>
Cc: Loop, Travis <Loop.Travis@epa.gov>
Subject: FW: Radiation PAG Statement

FYI

From: McMichael, Nate
Sent: Wednesday, November 30, 2016 1:15 PM
To: Lynn, Tricia <lynn.tricia@epa.gov>; Lee, Monica <Lee.Monica@epa.gov>
Cc: Millett, John <Millett.John@epa.gov>; Loop, Travis <Loop.Travis@epa.gov>; Dennis, Allison <Dennis.Allison@epa.gov>; Wieder, Jessica <Wieder.Jessica@epa.gov>; Nesky, Anthony <Nesky.Tony@epa.gov>
Subject: Radiation PAG Statement

Monica and Tricia --

Wanted to give you a heads up that the radiation PAG manual will be finalized as soon as tomorrow. V

Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

Please let me know if you have any questions or need anything else.

Statement:

Ex. 5 - Deliberative Process

Nate McMichael

Office of Air and Radiation

202-564-0382 (o)

202-236-4176 (c)

To: Flaharty, Stephanie[Flaharty.Stephanie@epa.gov]
Cc: Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]
From: Christ, Lisa
Sent: Wed 11/30/2016 2:13:56 PM
Subject: RE: URGENT ATTENTION NEEDED FW: DRAFT Answer in PEER v. EPA FOIA Litigation

Hi Stephanie,

We will look at this right away. Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

Lisa

From: Flaharty, Stephanie
Sent: Wednesday, November 30, 2016 7:12 AM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Cc: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>
Subject: URGENT ATTENTION NEEDED FW: DRAFT Answer in PEER v. EPA FOIA Litigation
Importance: High

Morning Lisa,

Ex. 5 - Deliberative Process

Thanks!

Steph

From: Kelly, Lynn

Sent: Tuesday, November 29, 2016 10:54 PM
To: Flaharty, Stephanie <Flaharty.Stephanie@epa.gov>; Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>
Cc: Bangser, Paul <bangser.paul@epa.gov>; Miller, Kevin <Miller.Kevin@epa.gov>
Subject: RE: DRAFT Answer in PEER v. EPA FOIA Litigation
Importance: High

Thank you Steph!

Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

Lynn Kelly | US EPA | Office of General Counsel | 1200 Pennsylvania Ave., NW | WJC North, Mail Code 2377A | Washington, DC 20460 | phone: (202) 564-3266

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From: Flaharty, Stephanie
Sent: Wednesday, November 23, 2016 6:20 AM
To: Kelly, Lynn <Kelly.Lynn@epa.gov>; Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>
Cc: Bangser, Paul <bangser.paul@epa.gov>
Subject: RE: DRAFT Answer in PEER v. EPA FOIA Litigation

Hi Kelly,

The substance of your response appears to be correct from my perspective.

Thanks,

Steph Flaharty

Sr. Reg. Mgr./CMS/FOIA Public Liaison

Office of Ground Water and Drinking Water

202.564.5072

From: Kelly, Lynn
Sent: Tuesday, November 22, 2016 3:39 PM
To: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Flaharty, Stephanie <Flaharty.Stephanie@epa.gov>
Cc: Bangser, Paul <bangser.paul@epa.gov>
Subject: DRAFT Answer in PEER v. EPA FOIA Litigation

Hi Sam and Steph,

Ex. 5 - Deliberative Process

I have copied Paul Bangser from our Water Law office in OGC also as an FYI. Please let me know if you have any questions or concerns with the draft before Monday at noon EST if possible. Thank you!

Lynn Kelly | US EPA | Office of General Counsel | 1200 Pennsylvania Ave., NW | WJC North, Mail Code 2377A | Washington, DC 20460 | phone: (202) 564-3266

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To: Veal, Lee[Veal.Lee@epa.gov]; DeCair, Sara[DeCair.Sara@epa.gov]
From: Christ, Lisa
Sent: Mon 11/28/2016 10:52:52 PM
Subject: FW: New York Attorney General Comment Letter; EPA Proposed Drinking Water PAGs
New York Attorney General Letter re RIN 2060-ZA19.pdf

FYI only …

From: Burneson, Eric
Sent: Monday, November 28, 2016 11:59 AM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Cc: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>
Subject: FW: New York Attorney General Comment Letter; EPA Proposed Drinking Water PAGs

Lisa: Can you have the team prepare responses to these questions? I will need to get back to Joel soon.

From: Beauvais, Joel
Sent: Monday, November 28, 2016 11:53 AM
To: Grevatt, Peter <Grevatt.Peter@epa.gov>; Burneson, Eric <Burneson.Eric@epa.gov>
Subject: FW: New York Attorney General Comment Letter; EPA Proposed Drinking Water PAGs

Peter/Eric – See attached. A couple questions:

Ex. 5 - Deliberative Process

From: Joshua Tallent [mailto:Joshua.Tallent@ag.ny.gov]
Sent: Monday, November 28, 2016 10:35 AM
To: Beauvais, Joel <Beauvais.Joel@epa.gov>
Subject: New York Attorney General Comment Letter; EPA Proposed Drinking Water PAGs

Dear Deputy Assistant Administrator Beauvais:

Attached please find an electronic copy of a letter this office sent to the Office of Information and Regulatory Affairs at the Office of Management and Budget. The letter comments on the EPA's proposed Protective Action Guide for Drinking Water after a Radiological Event (81 Fed. Reg. 37,589). A paper copy of the letter will follow.

Yours truly,

Joshua Tallent

Assistant Attorney General

New York State Office of the Attorney General

The Capitol | Albany, New York 12224

(518) 776-2456

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To: Burneson, Eric[Burneson.Eric@epa.gov]
Cc: Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]
From: Christ, Lisa
Sent: Mon 11/28/2016 10:42:21 PM
Subject: RE: New York Attorney General Comment Letter; EPA Proposed Drinking Water PAGs

Q3 is addressed, the other two are not. Q3 was raised in the context of APA.

Ex. 5 - Deliberative Process

From: Burneson, Eric
Sent: Monday, November 28, 2016 5:01 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Cc: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>
Subject: FW: New York Attorney General Comment Letter; EPA Proposed Drinking Water PAGs

Thanks for your help with this. **Ex. 5 - Deliberative Process**

Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

From: Beauvais, Joel
Sent: Monday, November 28, 2016 4:36 PM
To: Burneson, Eric <Burneson.Eric@epa.gov>; Grevatt, Peter <Grevatt.Peter@epa.gov>
Subject: RE: New York Attorney General Comment Letter; EPA Proposed Drinking Water PAGs

Thanks, Eric. Makes sense. Are these issues addressed in the FRN or RTC somewhere?

From: Burneson, Eric
Sent: Monday, November 28, 2016 3:50 PM

To: Beauvais, Joel <Beauvais.Joel@epa.gov>; Grevatt, Peter <Grevatt.Peter@epa.gov>
Subject: RE: New York Attorney General Comment Letter; EPA Proposed Drinking Water PAGs

Joel:

Happy to discuss further but the following are quick responses to your questions.

Ex. 5 - Deliberative Process

Eric

From: Beauvais, Joel
Sent: Monday, November 28, 2016 11:53 AM
To: Grevatt, Peter <Grevatt.Peter@epa.gov>; Burneson, Eric <Burneson.Eric@epa.gov>
Subject: FW: New York Attorney General Comment Letter; EPA Proposed Drinking Water PAGs

Peter/Eric – See attached. A couple questions:

Ex. 5 - Deliberative Process

From: Joshua Tallent [mailto:Joshua.Tallent@ag.ny.gov]
Sent: Monday, November 28, 2016 10:35 AM
To: Beauvais, Joel <Beauvais.Joel@epa.gov>
Subject: New York Attorney General Comment Letter; EPA Proposed Drinking Water PAGs

Dear Deputy Assistant Administrator Beauvais:

Attached please find an electronic copy of a letter this office sent to the Office of Information and Regulatory Affairs at the Office of Management and Budget. The letter comments on the EPA's proposed Protective Action Guide for Drinking Water after a Radiological Event (81 Fed. Reg. 37,589). A paper copy of the letter will follow.

Yours truly,

Joshua Tallent

Assistant Attorney General

New York State Office of the Attorney General

The Capitol | Albany, New York 12224

(518) 776-2456

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To: Wadlington, Christina[Wadlington.Christina@epa.gov]; Burneson, Eric[Burneson.Eric@epa.gov]
Cc: Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]
From: Christ, Lisa
Sent: Mon 11/28/2016 7:33:57 PM
Subject: RE: Reasons for EPS's pending approval of radiation levels for drinking water far higher than current levels?

A few additions in red below

From: Wadlington, Christina
Sent: Monday, November 28, 2016 1:21 PM
To: Burneson, Eric <Burneson.Eric@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>
Cc: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>
Subject: RE: Reasons for EPS's pending approval of radiation levels for drinking water far higher than current levels?

Lisa/Eric,

Updated with Joel's comments. Request your edits and/or comments.

Ex. 5 - Deliberative Process

From: Burneson, Eric
Sent: Monday, November 28, 2016 1:09 PM

To: Wadlington, Christina <Wadlington.Christina@epa.gov>
Cc: Christ, Lisa <Christ.Lisa@epa.gov>; Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>
Subject: FW: Reasons for EPS's pending approval of radiation levels for drinking water far higher than current levels?

FYI

From: Loop, Travis
Sent: Monday, November 28, 2016 1:03 PM
To: Beauvais, Joel <Beauvais.Joel@epa.gov>
Cc: Rupp, Mark <Rupp.Mark@epa.gov>; Grevatt, Peter <Grevatt.Peter@epa.gov>; Burneson, Eric <Burneson.Eric@epa.gov>
Subject: RE: Reasons for EPS's pending approval of radiation levels for drinking water far higher than current levels?

Got it. Let me work with them on expanding the statement and run it back past you.

Travis Loop

Director of Communications
Office of Water

U.S. Environmental Protection Agency

202-870-6922

loop.travis@epa.gov

From: Beauvais, Joel
Sent: Monday, November 28, 2016 12:30 PM
To: Loop, Travis <Loop.Travis@epa.gov>
Cc: Rupp, Mark <Rupp.Mark@epa.gov>; Grevatt, Peter <Grevatt.Peter@epa.gov>; Burneson, Eric <Burneson.Eric@epa.gov>
Subject: RE: Reasons for EPS's pending approval of radiation levels for drinking water far higher than current levels?

Ex. 5 - Deliberative Process

I'll work with OGWDW on something appropriate for use in response to these kinds of incomings.

Joel

From: Loop, Travis
Sent: Monday, November 28, 2016 12:23 PM
To: Beauvais, Joel <Beauvais.Joel@epa.gov>
Cc: Rupp, Mark <Rupp.Mark@epa.gov>
Subject: RE: Reasons for EPS's pending approval of radiation levels for drinking water far higher than current levels?

Ex. 5 - Deliberative Process

https://www.epa.gov/radiation/protective-action-guides-pags#tab-1

Travis Loop

Director of Communications
Office of Water

U.S. Environmental Protection Agency

202-870-6922

loop.travis@epa.gov

From: Beauvais, Joel
Sent: Monday, November 28, 2016 12:22 PM
To: Loop, Travis <Loop.Travis@epa.gov>
Cc: Rupp, Mark <Rupp.Mark@epa.gov>
Subject: RE: Reasons for EPS's pending approval of radiation levels for drinking water far higher than current levels?

Can I see the language so I can provide directly to Judith?

From: Loop, Travis
Sent: Monday, November 28, 2016 8:04 AM
To: Beauvais, Joel <Beauvais.Joel@epa.gov>
Cc: Rupp, Mark <Rupp.Mark@epa.gov>
Subject: Re: Reasons for EPS's pending approval of radiation levels for drinking water far higher than current levels?

That language was provided to all PADs the week before last. But I will resend to R2.

Travis Loop

Communications Director for Water

U.S. Environmental Protection Agency

Phone: 202.870.6922

Follow us on Twitter @EPAwater

On Nov 28, 2016, at 7:43 AM, Beauvais, Joel <Beauvais.Joel@epa.gov> wrote:

Yep thx

On Nov 28, 2016, at 7:36 AM, Rupp, Mark <Rupp.Mark@epa.gov> wrote:

Ex. 5 - Deliberative Process

On Nov 25, 2016, at 10:37 PM, Enck, Judith <Enck.Judith@epa.gov> wrote:

Ex. 5 - Deliberative Process

Sent from my iPhone

On Nov 25, 2016, at 10:25 PM, Beauvais, Joel <Beauvais.Joel@epa.gov> wrote:

I gather you weren't able to make the WDD call on this earlier this week. I assume you've gotten the readout from Xavier but if you would like to discuss I'm happy to do so next week.

On Nov 25, 2016, at 10:20 PM, Enck, Judith <Enck.Judith@epa.gov> wrote:

Lots of incoming emails and now phone calls each day

Sent from my iPhone

Begin forwarded message:

From: Roxanne Warren <rwaa@erols.com>
Date: November 25, 2016 at 5:31:48 PM EST
To: 'judith Enck' <enck.judith@epa.gov>
Subject: Reasons for EPS's pending approval of radiation levels for drinking water far higher than current levels?

Dear Ms. Enck,

Please send me an explanation of why EPA Administrator Gina McCarthy is on the verge of approving radiation levels that are *hundreds and thousands of times higher than currently allowed* in drinking water and at cleaned up Superfund sites.

PAGs like this are mis-named "Protective" Action Guides for Drinking Water, since they *do not* protect the public from dangerous radioactivity. Rather, they protect the liability and profits of the energy company.

I would appreciate hearing from you on this subject.

Very truly yours,

Roxanne Warren, AIA

New York, NY 10025-1680

rwarchitectsv42@gmail.com

www.vision42.org

To: Greene, Ashley[Greene.Ashley@epa.gov]
From: Christ, Lisa
Sent: Tue 11/22/2016 2:02:30 PM
Subject: FW: EPA Administrator Gina McCarthy Defends Plan for Drinking Water | NBC Bay Area

FYI only

From: DeCair, Sara
Sent: Tuesday, November 22, 2016 8:44 AM
To: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>
Subject: Fw: EPA Administrator Gina McCarthy Defends Plan for Drinking Water | NBC Bay Area

Another great reflection of our message from our Administrator. And I thought Peter did an excellent job yesterday with the Regions.

S.

From: Wieder, Jessica
Sent: Tuesday, November 22, 2016 8:22 AM
To: Veal, Lee; White, Rick; Perrin, Alan; DeCair, Sara; Snead, Kathryn
Subject: Fwd: EPA Administrator Gina McCarthy Defends Plan for Drinking Water | NBC Bay Area

See below: NBC Bay Area article on the drinking water PAG.

Jessica Wieder

U.S. Environmental Protection Agency

Radiation Protection Program

202-343-9201

m: 202-420-9353

Sent from my iPho

Begin forwarded message:

From: "Jones, Enesta" <Jones.Enesta@epa.gov>
Date: November 22, 2016 at 8:00:17 AM EST
To: "Fuld, John" <Fuld.John@epa.gov>, "Loop, Travis" <Loop.Travis@epa.gov>, "Lee, Monica" <Lee.Monica@epa.gov>, "Dennis, Allison" <Dennis.Allison@epa.gov>, "Valentine, Julia" <Valentine.Julia@epa.gov>, "Lynn, Tricia" <lynn.tricia@epa.gov>, "Wieder, Jessica" <Wieder.Jessica@epa.gov>, "Millett, John" <Millett.John@epa.gov>
Subject: RE: EPA Administrator Gina McCarthy Defends Plan for Drinking Water | NBC Bay Area

Ex. 5 - Deliberative Process

Enesta Jones

U.S. EPA

Office of Media Relations

Office: 202.564.7873

Cell: 202.236.2426

"The root of all joy is gratefulness."

From: Fuld, John
Sent: Tuesday, November 22, 2016 7:59 AM
To: Jones, Enesta <Jones.Enesta@epa.gov>; Loop, Travis <Loop.Travis@epa.gov>; Lee,

Monica <Lee.Monica@epa.gov>; Dennis, Allison <Dennis.Allison@epa.gov>; Valentine, Julia <Valentine.Julia@epa.gov>; Lynn, Tricia <lynn.tricia@epa.gov>
Subject: RE: EPA Administrator Gina McCarthy Defends Plan for Drinking Water | NBC Bay Area

Ex. 5 - Deliberative Process

From: Jones, Enesta
Sent: Tuesday, November 22, 2016 7:56 AM
To: Loop, Travis <Loop.Travis@epa.gov>; Lee, Monica <Lee.Monica@epa.gov>; Fuld, John <Fuld.John@epa.gov>; Dennis, Allison <Dennis.Allison@epa.gov>; Jones, Enesta <Jones.Enesta@epa.gov>; Valentine, Julia <Valentine.Julia@epa.gov>; Lynn, Tricia <lynn.tricia@epa.gov>
Subject: EPA Administrator Gina McCarthy Defends Plan for Drinking Water | NBC Bay Area

Same outlet -- NBC (Bay Area) -- that wrote the 11/14 piece. **Monica, is that inquiry still open?**

http://www.nbcbayarea.com/investigations/Gina-McCarthy-Defends-Plan-for-Drinking-Water-402359016.html

EPA Administrator Gina McCarthy Defends Plan for Drinking Water

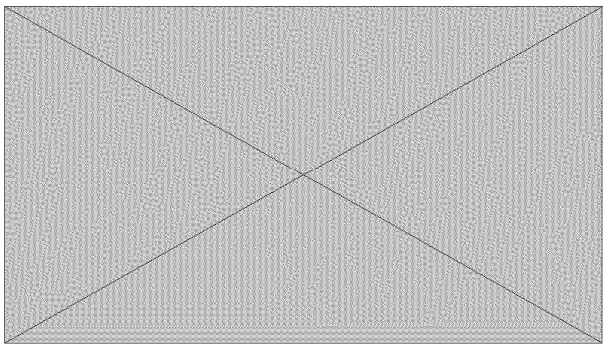
By Stephen Stock, Robert Campos, Michael Bott and Jeremy Carroll

•

Published at 7:25 PM PST on Nov 21, 2016 | Updated at 7:30 PM PST on Nov 21, 2016

The scenes from Fukushima, Japan in 2011 stunned the world. A magnitude

9.0 earthquake triggered a 33-foot high tsunami wave that wiped out the cooling system of the Daiichi nuclear plant releasing tons of harmful radioactive materials into surrounding communities and the Pacific Ocean. Addressing a crowd at the National Press Club in Washington D.C. Monday morning, EPA Administrator Gina McCarthy said the agency is trying to protect American citizens in a timely way from that kind of nuclear contamination.



EPA Administrator Gina McCarthy speaks at the National Press Club in Washington, D.C. (Nov. 21, 2016)
Photo credit: NBC Bay Area

"A lot of this information and this concern came out of Japan in the Fukushima incident. It didn't get resolved quickly. There were people that were left not knowing what to do, and we thought that it was necessary to provide this information," McCarthy said.

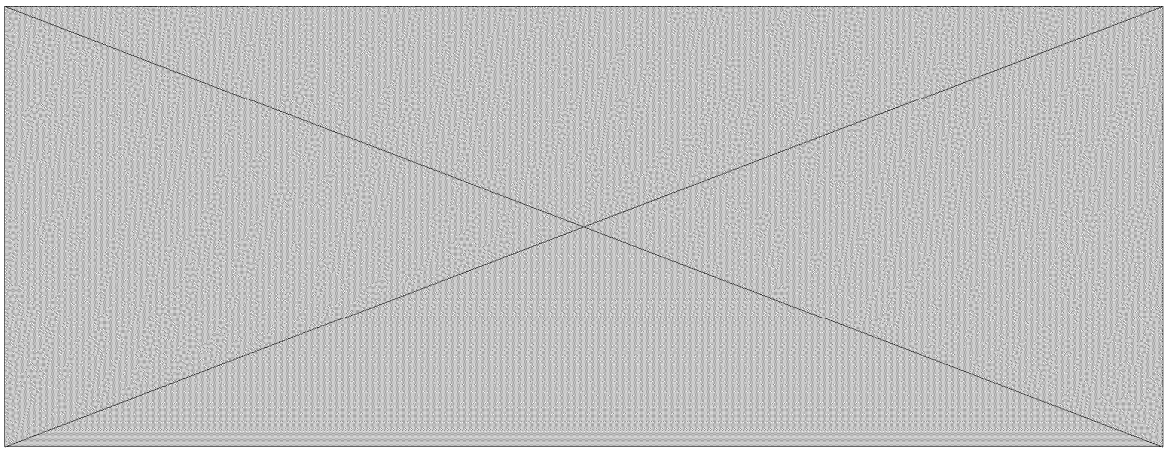
Administrator McCarthy's appearance was the first public comment directly about questions surrounding a new proposal to allow higher levels of radiation in drinking water after an NBC Bay Area investigation uncovered concerns about the proposal (click here to see original story from November 14, 2016).

The EPA administrator told the crowd that there are greater concerns over radiation today, saying, "We have more at issue right now in terms of radiation, we have the little bombs that can happen."

The EPA's answer is a Protective Action Guide (PAG), which has been in development since at least 2009. The 2009 PAG lists 107 radioactive materials. The most recent, in 2016, lists only 3. For each material, it lists a maximum level. At that level, government agencies or rescue crews must provide bottled water or evacuate residents.

The concern is over radioactive materials which are “decaying.” That means they’re emitting particles, gamma rays or electrons. This radiation can change the chemical balance of cells or change DNA, which can lead to birth defects, cancer, and in large enough doses - death.

Before the EPA released its new document, agencies relied on the Safe Drinking Water Act of 1974 for acceptable radiation levels in drinking water after emergencies.



Safe drinking water chart.

Daniel Hirsch, Director of the Program on Environmental and Nuclear Policy at UC Santa Cruz, accuses the agency of “trying to sneak this plan through.” He’s concerned that the levels in the Protective Action Guide, or “PAG” are drastically higher than the Safe Drinking Water Act.

“When I looked at the table of numbers that they were proposing and compared them to the Safe Drinking water levels, I almost fell off my chair,” said Hirsch. “I’ve never before seen someone increasing by a factor of a thousand, by 10 thousand or 100 thousand. I’ve never ever seen numbers like that and I thought at first it must be a misprint. It isn’t. They’re actually proposing increases that large.”

To view links to EPA PAGS:

- 2009
- 2013
- 2016

The EPA's chief stressed that this should not affect the water we drink every day. "I don't want anyone to think that we are changing our standards for drinking water, that is not the case," McCarthy said. She referred to an apocalyptic scenario following a nuclear disaster, saying "What we are trying to do is figure out how to actually start transitioning from a case where everybody is in their house and hunkered down, and can't drink drinking water to being able to understand what exposures - in a temporary way - would allow life to continue."

A key issue in this debate surrounds the word "temporary." How long would the higher doses of radiation be allowed in drinking water?

According to McCarthy, "We are providing the best information we can in those transition days, not sending a signal that we think that those numbers should be the standard for drinking water."

But the EPA's own manual says that these doses are for the "first and a limited number of subsequent years."

Photo credit: EPA

Hirsch thinks the plan will benefit industry and hurt consumers. "It (the PAG) is for a year to several years afterward, so it makes no sense unless you are an industry or agency that has polluted groundwater or surface water and you want to avoid having to clean it up."

Documents obtained by NBC Bay Area reveal that even the EPA's own experts are concerned about the proposed plan as far back as 2009.

Stuart Walker, National Radiation Expert at the EPA's Superfund Division wrote in an email, "My management was wondering how we are going to justify allowing consumption of potentially much higher concentrations of radiologically impacted water than we generally would during an emergency."

And, Senior Attorney in the Office of General Counsel at EPA, Charles Openchowski wrote, "This guidance would allow cleanup levels that exceed (current levels) by a factor of 100, 1000, and in two instances 7 million, and there is nothing to prevent those levels from being the final cleanup achieved."

When the EPA posted its plan for public review it received 67,404 responses.

Only about six of those were positive. Both Senator Barbara Boxer and New York's State Assistant Attorney General John Sipos (Click here to see NY Attorney General letter) have written letters asking the EPA to withdraw the proposal due to the concerns over public health. Sixty environmental groups have also written a letter, and at least one lawsuit is in the works.

- **View the environmental groups letter here.**

But despite the opposition, Administrator Gina McCarthy is intent on moving forward with the new rules. She told her listeners today, "We're doing the best we can to provide advice in a situation that we certainly hope no will ever face in the United States."

Connect with NBC Bay Area: Follow us on Social Media and download our app!

Enesta Jones

U.S. EPA

Office of Media Relations

Office: 202.564.7873

Cell: 202.236.2426

"The root of all joy is gratefulness."

To: Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]
From: Christ, Lisa
Sent: Mon 11/21/2016 7:08:06 PM
Subject: FW: DW PAGs Rollout for OAR review and input
ROLL OUT PAGS 10 19 16.docx

Most recent version

From: Wadlington, Christina
Sent: Monday, November 21, 2016 10:23 AM
To: Burneson, Eric <Burneson.Eric@epa.gov>
Cc: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: FW: DW PAGs Rollout for OAR review and input

Here's the latest that I have.

From: Dennis, Allison
Sent: Wednesday, October 19, 2016 2:07 PM
To: Wadlington, Christina <Wadlington.Christina@epa.gov>
Subject: FW: DW PAGs Rollout for OAR review and input

FYI

From: Dennis, Allison
Sent: Wednesday, October 19, 2016 1:55 PM
To: McMichael, Nate <McMichael.Nate@epa.gov>
Cc: Millett, John <Millett.John@epa.gov>
Subject: DW PAGs Rollout for OAR review and input

Before we share the attached with OPA and Joel, I wanted to see if ya'll (and ORIA) could give it a quick review? Edits welcome. Any way you can send us edits by Monday cob? Thanks! - Allison

To: Grevatt, Peter[Grevatt.Peter@epa.gov]; Burneson, Eric[Burneson.Eric@epa.gov]
Cc: Mclain, Jennifer[Mclain.Jennifer@epa.gov]; Greene, Ashley[Greene.Ashley@epa.gov]; Wadlington, Christina[Wadlington.Christina@epa.gov]
From: Christ, Lisa
Sent: Mon 11/21/2016 7:01:10 PM
Subject: RE: FRN EPA Drinking Water PAG 11-21-16
FRN EPA Drinking Water PAG 11-21-16_v2.docm

Hi Peter,

Attached is a revised clean version incorporating Joel's edit. I added a statement within his edit reemphasizing it is "guidance only" (see below). Please let me know if you need anything else.

Lisa

Ex. 5 - Deliberative Process

From: Grevatt, Peter
Sent: Monday, November 21, 2016 1:36 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>; Burneson, Eric <Burneson.Eric@epa.gov>
Cc: Mclain, Jennifer <Mclain.Jennifer@epa.gov>; Greene, Ashley <Greene.Ashley@epa.gov>; Wadlington, Christina <Wadlington.Christina@epa.gov>
Subject: FW: FRN EPA Drinking Water PAG 11-21-16

Looks like just the bottom of P. 1 and on to P.2. Please make any necessary corrections, let me take a quick scan and then send forward to Steph to move to FR when we get clearance.

From: Beauvais, Joel
Sent: Monday, November 21, 2016 12:56 PM
To: Grevatt, Peter <Grevatt.Peter@epa.gov>; Burneson, Eric <Burneson.Eric@epa.gov>

Cc: Campbell, Ann <Campbell.Ann@epa.gov>
Subject: FRN EPA Drinking Water PAG 11-21-16

Peter/Eric - My comments on the PAG FRN. I have no further comments on the RTC or other documents.

Joel

To: Burneson, Eric[Burneson.Eric@epa.gov]
Cc: Greene, Ashley[Greene.Ashley@epa.gov]; Wadlington, Christina[Wadlington.Christina@epa.gov]; Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]
From: Christ, Lisa
Sent: Mon 11/21/2016 2:19:06 PM
Subject: FW: OW Comms edits on PAGS rollout
ROLL OUT PAGS 10-4-16AD CW_lc.docx

Eric –

This is the last version I've seen.

Lisa

From: Christ, Lisa
Sent: Wednesday, October 19, 2016 11:37 AM
To: Wadlington, Christina <Wadlington.Christina@epa.gov>
Cc: Huff, Lisa <Huff.Lisa@epa.gov>
Subject: RE: OW Comms edits on PAGS rollout

Sorry, I thought I replied. There are a couple phrases that need to be carefully worded. I've made these changes before, but provided explanation this time.

From: Wadlington, Christina
Sent: Wednesday, October 19, 2016 10:47 AM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Cc: Huff, Lisa <Huff.Lisa@epa.gov>
Subject: FW: OW Comms edits on PAGS rollout

Just following up on the below. Please send back when possible.

THANKS ☺

Christina Wadlington

Communications Director

Office of Ground Water and Drinking Water

U.S. Environmental Protection Agency

Tel: 202.566.1859

Email: wadlington.christina@epa.gov

Webpage: www.epa.gov/safewater

From: Wadlington, Christina
Sent: Monday, October 17, 2016 1:56 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Cc: Huff, Lisa <Huff.Lisa@epa.gov>
Subject: FW: OW Comms edits on PAGS rollout

Lisa,

Can you take a look at the attached?

Please let me know if you have additional changes/responses.

Christina Wadlington

Communications Director

Office of Ground Water and Drinking Water

U.S. Environmental Protection Agency

Tel: 202.566.1859

Email: wadlington.christina@epa.gov

Webpage: www.epa.gov/safewater

From: Dennis, Allison
Sent: Monday, October 17, 2016 1:32 PM
To: Wadlington, Christina <Wadlington.Christina@epa.gov>
Subject: OW Comms edits on PAGS rollout

Let me know what you think. After you review/approve this version, are you ok with me sharing this with OAR (and I'll get their rollout plan for your team to review)? /Allison

To: Flaharty, Stephanie[Flaharty.Stephanie@epa.gov]
Cc: Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]; Burneson, Eric[Burneson.Eric@epa.gov]; Greene, Ashley[Greene.Ashley@epa.gov]
From: Christ, Lisa
Sent: Mon 11/21/2016 2:10:40 PM
Subject: RE: OP Inquiry re: PAGs DW draft FRN
FRN EPA Drinking Water PAG 11-21-16.docm
FRN EPA Drinking Water PAG 11-21-16-trackchange.docm

Hi Stephanie,

Peter came by with a hard copy of his one edit on page 6. See attached track change and clean versions. This is ready to move forward so OP can transmit to OMB for review. Please let me know if you need anything else.

Lisa

From: Flaharty, Stephanie
Sent: Tuesday, November 15, 2016 12:44 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Cc: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>
Subject: RE: OP Inquiry re: PAGs DW draft FRN

Hi Lisa,

I've made mostly format teaks (mark-up attached) and provided a clean version attached as well. I'll move to Peter for approval…

Thanks,

Steph

From: Christ, Lisa
Sent: Monday, November 14, 2016 1:25 PM
To: Flaharty, Stephanie <Flaharty.Stephanie@epa.gov>

Cc: Burneson, Eric <Burneson.Eric@epa.gov>; Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Bangser, Paul <bangser.paul@epa.gov>
Subject: RE: OP Inquiry re: PAGs DW draft FRN

Hi Stephanie,

Attached are two revised FRNs; a track change and a clean version that addresses OGC comments. Please let me know if you need anything else.

Thanks-

Lisa

From:
Sent: Monday, November 07, 2016 12:44 PM
To: Flaharty, Stephanie <Flaharty.Stephanie@epa.gov>
Cc: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: RE: OP Inquiry re: PAGs DW draft FRN

Lisa can you check on the status and get back to Stephanie on the FRN.

From: Flaharty, Stephanie
Sent: Monday, November 07, 2016 12:37 PM
To: Burneson, Eric <Burneson.Eric@epa.gov>
Subject: OP Inquiry re: PAGs DW draft FRN

Eric,

Nicole Owen (OP) wants to know when our draft FRN will be ready for OMB review.

Thanks,

Steph

To: Hill, Glynis[Hill.Glynis@epa.gov]; Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]
Cc: DeCair, Sara[DeCair.Sara@epa.gov]
From: Christ, Lisa
Sent: Thur 11/17/2016 6:58:17 PM
Subject: RE: Drinking Water PAG
FRN EPA Drinking Water PAG 11-15-16.sf.docm

Hi Glynis,

Our OGC took more time than we expected to review the FRN describing how comments were addressed. OGC provided comments and concurrence Monday 11/14 and it was sent to our OD Tuesday for review. I've attached what went forward to Peter. I'll check in on status and let you know.

Thanks-

Lisa

From: Hill, Glynis
Sent: Thursday, November 17, 2016 12:56 PM
To: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>
Cc: DeCair, Sara <DeCair.Sara@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>
Subject: RE: Drinking Water PAG

Did you (OW) provide OMB and response to comment information, that you can share with me as well?

Glynis Hill – Environmental Scientist | Office of the Administrator | Office of Policy | Office of Regulatory Policy & Management

(202) 564-1139 | 3512V WJC North | Mail Code 1803 | 1200 Pennsylvania Avenue, NW | Washington, DC 20460

From: Hernandez-Quinones, Samuel
Sent: Thursday, November 17, 2016 12:48 PM
To: Hill, Glynis <Hill.Glynis@epa.gov>
Cc: DeCair, Sara <DeCair.Sara@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>

Subject: RE: Drinking Water PAG

Hi Glynis,

We are still waiting for feedback from OMB on the DW PAG. MY understanding is that OMB requested input from other agencies (due 11/18).

I will let you know as soon as we hear anything.

Sam

==========

Samuel Hernández Quiñones, P.E.
Environmental Engineer
Office of Water

Environmental Protection Agency
1200 Pennsylvania Ave. NW
Washington, DC 20460
202-564-1735

"USEPA Protecting Human Health and the Environment"

From: Hill, Glynis
Sent: Thursday, November 17, 2016 12:41 PM
To: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>
Cc: DeCair, Sara <DeCair.Sara@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>
Subject: Drinking Water PAG

Good afternoon Sam:

Can you give me a brief status update on the response to comments and any correspondence with OMB? Also, please provide me with any advance draft final documents so I can get a head start on review and upper management OP briefings. Thanks in advance!

Humbly requested,

Glynis Hill – Environmental Scientist | Office of the Administrator | Office of Policy | Office of Regulatory Policy & Management

(202) 564-1139 | 3512V WJC North | Mail Code 1803 | 1200 Pennsylvania Avenue, NW | Washington, DC 20460

To: Oshida, Phil[Oshida.Phil@epa.gov]
From: Christ, Lisa
Sent: Thur 11/17/2016 3:26:08 PM
Subject: DW PAG TPs for R9 call

EPA is releasing a protective action guide (PAG) for drinking water to be used by utilities and local authorities following a nationally significant radiological incident, such as a disaster at a nuclear power plant, a radiological dispersal device or an improvised nuclear device.

•□□□□□□□ The DW PAG is **non-regulatory guidance** that authorities can use to protect residents from experiencing the harmful effects from radiation in drinking water following nationally significant radiological emergency.

•□□□□□□□ The DW PAG is two-tier:

•□□□□□□□ 500 mrem projected dose, for one year, to the general population

•□□□□□□ 100 mrem projected, for one year, to the most sensitive populations (e.g. infants, children, pregnant women and nursing women)

The purpose of the protective action for the drinking water exposure pathway is to restrict the use of contaminated water for drinking and to provide recommendations for local communities to consider in providing alternative drinking water for the affected community

The DW PAG does not affect EPA's drinking water standards for radionuclides. Therefore, affected public water systems are expected to take actions to return to compliance with drinking water standards after a radiological emergency as soon as practicable.

The drinking water PAG is an addition to the revised draft 2013 PAG Manual – *Protective Action Guides and Planning Guidance for Radiological Incidents*.

To: Burneson, Eric[Burneson.Eric@epa.gov]
From: Christ, Lisa
Sent: Wed 11/16/2016 2:11:12 PM
Subject: FW: OP Inquiry re: PAGs DW draft FRN
FRN EPA Drinking Water PAG 11-15-16.sf.docm
FRN EPA Drinking Water PAG 11-14-16_w OCG comments_clean.slf edit.docx

FYI –

We expect comment from OMB on the final DW PAG on 11/18. We don't anticipate new comments – likely similar to comment on the draft, if any. We anticipate OMC review of the FRN will go quickly.

From: Flaharty, Stephanie
Sent: Tuesday, November 15, 2016 12:44 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Cc: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>
Subject: RE: OP Inquiry re: PAGs DW draft FRN

Hi Lisa,

I've made mostly format teaks (mark-up attached) and provided a clean version attached as well. I'll move to Peter for approval…

Thanks,

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From: Christ, Lisa
Sent: Monday, November 14, 2016 1:25 PM
To: Flaharty, Stephanie <Flaharty.Stephanie@epa.gov>
Cc: Burneson, Eric <Burneson.Eric@epa.gov>; Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Bangser, Paul <bangser.paul@epa.gov>
Subject: RE: OP Inquiry re: PAGs DW draft FRN

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To: Flaharty, Stephanie <Flaharty.Stephanie@epa.gov>
Cc: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: RE: OP Inquiry re: PAGs DW draft FRN

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From: Flaharty, Stephanie
Sent: Monday, November 07, 2016 12:37 PM
To: Burneson, Eric <Burneson.Eric@epa.gov>
Subject: OP Inquiry re: PAGs DW draft FRN

Eric,

Nicole Owen (OP) wants to know when our draft FRN will be ready for OMB review.

Thanks,

Steph

To: Wadlington, Christina[Wadlington.Christina@epa.gov]; Greene, Ashley[Greene.Ashley@epa.gov]
From: Christ, Lisa
Sent: Tue 11/15/2016 10:29:10 PM
Subject: FW: NBC Bay Area Video & Article: EPA drinking water PAGs

From: Hernandez-Quinones, Samuel
Sent: Tuesday, November 15, 2016 4:06 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: FW: NBC Bay Area Video & Article: EPA drinking water PAGs
Importance: High

FYI

Sam

From: DeCair, Sara
Sent: Tuesday, November 15, 2016 2:39 PM
To: Wieder, Jessica <Wieder.Jessica@epa.gov>; White, Rick <White.Rick@epa.gov>; Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Christian, Megan <Christian.Megan@epa.gov>; Veal, Lee <Veal.Lee@epa.gov>; Perrin, Alan <Perrin.Alan@epa.gov>; Edwards, Jonathan <Edwards.Jonathan@epa.gov>; Nesky, Anthony <Nesky.Tony@epa.gov>; Boyd, Mike <Boyd.Mike@epa.gov>
Subject: NBC Bay Area Video & Article: EPA drinking water PAGs
Importance: High

All; the 6 minute video goes in to detail about concerns some have about drinking water PAGs – please watch. Lloyd from Region 4 radiation sent this on with the note below.

Please also share with your external affairs counterparts. -- Sara

From: Generette, Lloyd
Sent: Tuesday, November 15, 2016 2:22 PM
To: DeCair, Sara <DeCair.Sara@epa.gov>; Brozowski, George <brozowski.george@epa.gov>
Subject: EPA drinking water PAGs

Fyi guys, hopefully you've seen this. T

Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

http://www.nbcbayarea.com/news/local/E-P-AS-NEW-EMERGENCY-PLAN-FOR-DRINKING-WATER-CONCERNS-MANY-401206656.html

To: Flaharty, Stephanie[Flaharty.Stephanie@epa.gov]; Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]
From: Christ, Lisa
Sent: Tue 11/15/2016 2:08:00 PM
Subject: RE: OP Inquiry re: PAGs DW draft FRN

Federal Radiological Monitoring and Assessment Center

From: Flaharty, Stephanie
Sent: Tuesday, November 15, 2016 8:22 AM
To: Christ, Lisa <Christ.Lisa@epa.gov>; Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>
Subject: RE: OP Inquiry re: PAGs DW draft FRN

Please tell me what "FRMAC" stands for (page 9)?

From: Christ, Lisa
Sent: Monday, November 14, 2016 1:25 PM
To: Flaharty, Stephanie <Flaharty.Stephanie@epa.gov>
Cc: Burneson, Eric <Burneson.Eric@epa.gov>; Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Bangser, Paul <bangser.paul@epa.gov>
Subject: RE: OP Inquiry re: PAGs DW draft FRN

Hi Stephanie,

Attached are two revised FRNs; a track change and a clean version that addresses OGC comments. Please let me know if you need anything else.

Thanks-

Lisa

From:
Sent: Monday, November 07, 2016 12:44 PM

To: Flaharty, Stephanie <Flaharty.Stephanie@epa.gov>
Cc: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: RE: OP Inquiry re: PAGs DW draft FRN

Lisa can you check on the status and get back to Stephanie on the FRN.

From: Flaharty, Stephanie
Sent: Monday, November 07, 2016 12:37 PM
To: Burneson, Eric <Burneson.Eric@epa.gov>
Subject: OP Inquiry re: PAGs DW draft FRN

Eric,

Nicole Owen (OP) wants to know when our draft FRN will be ready for OMB review.

Thanks,

Steph

To: Wadlington, Christina[Wadlington.Christina@epa.gov]
Cc: Burneson, Eric[Burneson.Eric@epa.gov]
From: Christ, Lisa
Sent: Mon 11/14/2016 10:42:00 PM
Subject: RE: MEDIA INQUIRY NBC SanFran RE: PAG

Hi Christina,

Please see below. The questions seem to be about PAGs in general, but our responses are specific to the DW PAG.

Lisa

From: Wadlington, Christina
Sent: Monday, November 14, 2016 3:44 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Cc: Burneson, Eric <Burneson.Eric@epa.gov>
Subject: FW: MEDIA INQUIRY NBC SanFran RE: PAG

Lisa,

Provided for your comment and review.

Thank you.

1. How do you reassure concerned citizens who worry that after any radiological release they may be forced to drink water that has radioactive materials at concentrations that are thousands or millions of times higher than the Safe Drinking Water Act allows – and this could go on for a year or longer?

Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

2. We've obtained internal EPA emails which show that your own analysts and lawyers are concerned about this change. If they're concerned, why wouldn't the rest of us worry that we might be exposed to cancer-causing radiation as a result of these new PAGs?

Ex. 5 - Deliberative Process

3. We've talked to dozens of groups who agree that the American public is often overly concerned with radiation. Nevertheless, they say that these new PAGs are cause for serious concern. How do you allay those fears.?

Ex. 5 - Deliberative Process

From: Fuld, John
Sent: Monday, November 14, 2016 2:37 PM
To: Wadlington, Christina <Wadlington.Christina@epa.gov>
Subject: MEDIA INQUIRY NBC SanFran RE: PAG

Office of Water

Media Inquiry

Travis Loop	**John W. Fuld, Ph.D.**
Communications Director-Water	Media Relations Mgr.-Water
loop.travis@epa.gov	fuld.john@epa.gov

DATE: November 14, 2016

OUTLET: NBC, San Francisco

REPORTER: Robert Campos

TOPIC: RE: PAG

DEADLINE: **Tuesday, 2 pm**

PERTINENT INFORMATION:

Hey team – SF NBC send over more questions - Monica Lee

NOTE: This is what we sent over previously

Q: What are the PAGs, what is the purpose?

Response: The purpose of EPA's Protective Active Guide (PAG) for Radiological Incidents is to guide planning and decision-making efforts by local and state officials. It is not intended for long-term or everyday use. The proposed PAG does not affect EPA's drinking water standards for radionuclides. Therefore, affected public water systems are expected to take actions to return to compliance with drinking water standards after a radiological emergency as soon as practicable.

Q: How are the new proposed guides different from the ones proposed in 2009 and how we will ensure public safety in issuing these guides?

Response: During a radiological emergency, radioactive material could be released into the rivers, lakes, and streams used by public water suppliers. Using the best available research, EPA will release, for the first time, non-regulatory guidance that authorities can use to protect residents from experiencing the harmful effects from radiation in drinking water following nationally significant radiological emergency. EPA anticipates the release of the non-regulatory guidance by the end of the calendar year.

Note: We did not release a PAG in 2009.

Please go to the EPA website for more information:
https://www.epa.gov/radiation/protective-action-guides-pags#tab-2

QUESTION:

1. How do you reassure concerned citizens who worry that after any radiological release they may be forced to drink water that has radioactive materials at concentrations that are thousands or millions of times higher than the Safe Drinking Water Act allows – and this could go on for a year or longer?

2. We've obtained internal EPA emails which show that your own analysts and lawyers are concerned about this change. If they're concerned, why wouldn't the rest of us worry that we might be exposed to cancer-causing radiation as a result of these new PAGs?

3. We've talked to dozens of groups who agree that the American public is often overly concerned with radiation. Nevertheless, they say that these new PAGs are cause for serious concern. How do you allay those fears.?

ANSWER:

John W. Fuld, Ph.D.

Media Relations Manager-Water
Environmental Protection Agency

1200 Constitution Ave

Washington DC 20460

Office: 202-564-8847

Cell: 202-815-6408

Fuld.john@epa.gov

To: Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]
From: Christ, Lisa
Sent: Mon 11/14/2016 8:41:18 PM
Subject: FW: Comments on public comment document
Public Comments Draft DW PAG_v3 11-10-16 - Comments.docx

Hi Sam,
Please accept changes and make this a final draft. I sent the revised FRN to Stephanie since Paul provided comments on a hard copy.
Thanks-
Lisa

From: Bangser, Paul
Sent: Monday, November 14, 2016 1:06 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>; Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>
Cc: Wehling, Carrie <Wehling.Carrie@epa.gov>
Subject: Comments on public comment document

Thanks for sending this. I made two minor comments on the attached (which is the version you forwarded on 11/10). Other than that, we are OK with this draft.

Paul Bangser
Attorney, Office of General Counsel
U.S. Environmental Protection Agency
202-564-5479
bangser.paul@epa.gov

To: Flaharty, Stephanie[Flaharty.Stephanie@epa.gov]
Cc: Burneson, Eric[Burneson.Eric@epa.gov]; Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]; Bangser, Paul[bangser.paul@epa.gov]
From: Christ, Lisa
Sent: Mon 11/14/2016 6:24:34 PM
Subject: RE: OP Inquiry re: PAGs DW draft FRN
FRN EPA Drinking Water PAG 11-14-16_w OCG comments_clean.docx
FRN EPA Drinking Water PAG 11-14-16_w OCG comments.docx

Hi Stephanie,

Attached are two revised FRNs; a track change and a clean version that addresses OGC comments. Please let me know if you need anything else.

Thanks-

Lisa

From:
Sent: Monday, November 07, 2016 12:44 PM
To: Flaharty, Stephanie <Flaharty.Stephanie@epa.gov>
Cc: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: RE: OP Inquiry re: PAGs DW draft FRN

Lisa can you check on the status and get back to Stephanie on the FRN.

From: Flaharty, Stephanie
Sent: Monday, November 07, 2016 12:37 PM
To: Burneson, Eric <Burneson.Eric@epa.gov>
Subject: OP Inquiry re: PAGs DW draft FRN

Eric,

Nicole Owen (OP) wants to know when our draft FRN will be ready for OMB review.

Thanks,

Steph

To: Bangser, Paul[bangser.paul@epa.gov]
Cc: Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]; Wehling, Carrie[Wehling.Carrie@epa.gov]
From: Christ, Lisa
Sent: Thur 11/10/2016 4:22:30 PM
Subject: RE: Request for Review - DW PAG FRN
Public Comments Draft DW PAG_v3 11-10-16.docx

Hi Paul,

Attached is the revised internal response to comment document which incorporates your verbal comments. Please let me know if you need anything else to clear the FRN so we can get it to OMB for final review and sign off.

Thanks-

Lisa

From: Bangser, Paul
Sent: Monday, November 07, 2016 3:07 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Cc: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Wehling, Carrie <Wehling.Carrie@epa.gov>
Subject: RE: Request for Review - DW PAG FRN

Hi Lisa,

In my Inbox this morning I had Sam's revision of the FRN based on my comments. I will plan to look at that tomorrow. If I still have questions at that point, will you and Sam be around tomorrow to discuss?

Thanks,

Paul

From: Christ, Lisa
Sent: Monday, November 07, 2016 3:02 PM
To: Bangser, Paul <bangser.paul@epa.gov>
Subject: FW: Request for Review - DW PAG FRN

Hi Paul,

I had a vm from you last week when I was out. Did you still have a question? I've been asked for the status of your review by OP. Please let me know when you expect to complete your review as this is time sensitive.

Lisa

From: Hernandez-Quinones, Samuel
Sent: Wednesday, November 02, 2016 3:39 PM
To: Bangser, Paul <bangser.paul@epa.gov>
Cc: Wehling, Carrie <Wehling.Carrie@epa.gov>; Burneson, Eric <Burneson.Eric@epa.gov>; Huff, Lisa <Huff.Lisa@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>
Subject: RE: Request for Review - DW PAG FRN

Hi Paul,

Attached are the documents I mentioned during our call today.

Let me know if you have any questions.

Thanks

Sam

==========

Samuel Hernández Quiñones, P.E.
Environmental Engineer
Office of Water

Environmental Protection Agency
1200 Pennsylvania Ave. NW
Washington, DC 20460
202-564-1735

"USEPA Protecting Human Health and the Environment"

From: Wehling, Carrie
Sent: Tuesday, November 01, 2016 5:21 PM
To: Bangser, Paul <bangser.paul@epa.gov>
Cc: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>
Subject: FW: Request for Review - DW PAG FRN

Paul – For your review. Are you able to accommodate their schedule? Thanks.

Caroline (Carrie) Wehling

Assistant General Counsel

Water Law Office

U.S. Environmental Protection Agency

Washington DC 20004

202-564-5492

wehling.carrie@epa.gov

From: Hernandez-Quinones, Samuel
Sent: Tuesday, November 01, 2016 4:11 PM
To: Wehling, Carrie <Wehling.Carrie@epa.gov>

Cc: Bangser, Paul <bangser.paul@epa.gov>; Huff, Lisa <Huff.Lisa@epa.gov>; Burneson, Eric <Burneson.Eric@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>
Subject: Request for Review - DW PAG FRN

Hi Carrie,

We are requesting OGC review for the attached FRN regarding the final drinking water PAG. Previously you reviewed our DW input for the PAG document, and we incorporated all your suggested edits. The DW PAG write-up is currently at OMB undergoing the interagency review.

We had initially planned to fold the DW input into the overall PAG Manual, but to due unforeseen delays we are changing our approach and we now are planning to issue the DW PAG separately from the overall PAG Manual. OMB has requested that we provide a FRN to announce the availability of the Drinking Water guidance.

Please let me know if it is possible to get your feedback to us by Tomorrow, otherwise let us know when we might expect to get some feedback from OGC. I now that most likely you have other important commitments previously scheduled, so I appreciate any support you can provide.

Thank You

Sam

==========

Samuel Hernández Quiñones, P.E.
Environmental Engineer
Office of Water

Environmental Protection Agency
1200 Pennsylvania Ave. NW
Washington, DC 20460
202-564-1735

"USEPA Protecting Human Health and the Environment"

To: Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]
From: Christ, Lisa
Sent: Thur 11/10/2016 2:01:39 PM
Subject: FW: Input for Alternate FRN DW PAG
Alternate FRN EPA Drinking Water PAG 10-28-16.docx

Hi Sam,

Please let me know the status ASAP

Thanks-

Lisa

Ps-your office phone is forwarded to your cell phone

From: Burneson, Eric
Sent: Thursday, November 10, 2016 8:50 AM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: FW: Input for Alternate FRN DW PAG

What is the status of this FRN. I have to brief Joel today.

From: Hernandez-Quinones, Samuel
Sent: Monday, October 31, 2016 10:59 AM
To: Burneson, Eric <Burneson.Eric@epa.gov>
Cc: Christ, Lisa <Christ.Lisa@epa.gov>; Huff, Lisa <Huff.Lisa@epa.gov>
Subject: Input for Alternate FRN DW PAG

Hi Eric,

Attached is our input for the Alternate FRN for the DW PAG in case the DW part has to be issued separately from the overall PAG Manual.

Let me know if you have any edits or comments.

Thanks

Sam

==========

Samuel Hernández Quiñones, P.E.
Environmental Engineer
Office of Water

Environmental Protection Agency
1200 Pennsylvania Ave. NW
Washington, DC 20460
202-564-1735

"USEPA Protecting Human Health and the Environment"

To: Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]
From: Christ, Lisa
Sent: Tue 11/8/2016 1:15:41 PM
Subject: RE: OP Inquiry re: PAGs DW draft FRN

Thanks Sam for taking care of the shift in plans…I appreciate knowing things are in good hands!

From: Hernandez-Quinones, Samuel
Sent: Monday, November 07, 2016 11:37 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: RE: OP Inquiry re: PAGs DW draft FRN

Hi Lisa,

We are working on the assumption that the DW PAG will be issued separately from the overall PAG Manual.

We worked last week on drafting an updated FRN with Eric's input. I am attaching the version of the updated FRN that I sent to Paul for his review after addressing his comments on an earlier version. We really need to impress into OGC that this is a high priority document that we need cleared to transmit to OMB.

I will be available tomorrow to discuss, let me know when it is a good time for you and I will call you, otherwise feel free to call me whenever you are available.

Sam

==========

Samuel Hernández Quiñones, P.E.
Environmental Engineer
Office of Water

Environmental Protection Agency
1200 Pennsylvania Ave. NW
Washington, DC 20460
202-564-1735

"USEPA Protecting Human Health and the Environment"

From: Christ, Lisa
Sent: Monday, November 07, 2016 1:16 PM
To: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>
Subject: FW: OP Inquiry re: PAGs DW draft FRN

Hi Sam,

I'm trying to catch up on the status of the DW PAG and the FRN. I understand we're releasing separate from the overall PAG Manual. Has Paul completed his review?

Thanks-

Lisa

From: Burneson, Eric
Sent: Monday, November 07, 2016 12:44 PM
To: Flaharty, Stephanie <Flaharty.Stephanie@epa.gov>
Cc: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: RE: OP Inquiry re: PAGs DW draft FRN

Lisa can you check on the status and get back to Stephanie on the FRN.

From: Flaharty, Stephanie
Sent: Monday, November 07, 2016 12:37 PM
To: Burneson, Eric <Burneson.Eric@epa.gov>
Subject: OP Inquiry re: PAGs DW draft FRN

Eric,

Nicole Owen (OP) wants to know when our draft FRN will be ready for OMB review.

Thanks,

Steph

To: Burneson, Eric[Burneson.Eric@epa.gov]; Flaharty, Stephanie[Flaharty.Stephanie@epa.gov]
From: Christ, Lisa
Sent: Mon 11/7/2016 9:35:40 PM
Subject: RE: OP Inquiry re: PAGs DW draft FRN

Per Paul Bangser, OCG, he received revisions from Sam on his previous comments and said he'd look at it tomorrow. Hopefully he'll be prepared to sign off tomorrow.

From: Burneson, Eric
Sent: Monday, November 07, 2016 12:44 PM
To: Flaharty, Stephanie <Flaharty.Stephanie@epa.gov>
Cc: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: RE: OP Inquiry re: PAGs DW draft FRN

Lisa can you check on the status and get back to Stephanie on the FRN.

From: Flaharty, Stephanie
Sent: Monday, November 07, 2016 12:37 PM
To: Burneson, Eric <Burneson.Eric@epa.gov>
Subject: OP Inquiry re: PAGs DW draft FRN

Eric,

Nicole Owen (OP) wants to know when our draft FRN will be ready for OMB review.

Thanks,

Steph

To: Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]
From: Christ, Lisa
Sent: Mon 10/24/2016 8:53:17 PM
Subject: FW: SEPW (minority) PAGs Discussion

Hi Sam,

Giving you a heads up that SEPW wants to talk to us soon about the DW PAG.

Lisa

From: Burneson, Eric
Sent: Monday, October 24, 2016 4:49 PM
To: Greene, Ashley <Greene.Ashley@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>
Subject: RE: SEPW (minority) PAGs Discussion

I am available except for the OGWDW meeting at 3:30.

From: Greene, Ashley
Sent: Monday, October 24, 2016 4:47 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>; Burneson, Eric <Burneson.Eric@epa.gov>
Subject: RE: SEPW (minority) PAGs Discussion

The call will now be moved to next week (preferably Monday). I know Lisa is out and Peter is traveling, but they cannot do it tomorrow. Eric, can you let me know your availability between 12:30-4:30 next Monday?

Thanks,

Ashley

From: Greene, Ashley
Sent: Monday, October 24, 2016 8:55 AM
To: Christ, Lisa <christ.lisa@epa.gov>; Burneson, Eric <burneson.eric@epa.gov>
Subject: SEPW (minority) PAGs Discussion

Hi Lisa and Eric,

Just a head's up that SEPW minority staff have requested a call to discuss the drinking water PAG. I am working with OCIR on scheduling for tomorrow afternoon (likely at 4:30).

Thanks,
Ashley

****

Ashley Greene

Special Assistant

Office of Ground Water and Drinking Water

U.S. Environmental Protection Agency

Phone: (202) 566-1738

Email: greene.ashley@epa.gov

****

To: Greene, Ashley[Greene.Ashley@epa.gov]; Burneson, Eric[Burneson.Eric@epa.gov]
From: Christ, Lisa
Sent: Mon 10/24/2016 7:20:02 PM
Subject: RE: OP edits to DW PAGs Issue Paper

A couple things I want to flag:

1. OP removed the phrase below in red text. OGC changed this sentence in the DW PAG document to specifically address a concern they had. I suggest we use the same language in the roll out.

Ex. 5 - Deliberative Process

2. There is a question about adding water utilities to the list of stakeholders – I believe the water utility organizations (AWWA, NAWC, etc are covered under "industry").

Ex. 5 - Deliberative Process

From: Greene, Ashley
Sent: Monday, October 24, 2016 2:58 PM
To: Burneson, Eric <Burneson.Eric@epa.gov>
Cc: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: FW: OP edits to DW PAGs Issue Paper

Hi Eric,

Please see attached for OP's edits to the DW PAG transition issue paper. They look mostly minor, but they did flag one question in particular in the "Moving Forward" section. I think given

Ex. 5 - Deliberative Process

If you have any edits/comments on OP's edits, if you could please let me know by tomorrow.

Thanks,

Ashley

To: Burneson, Eric[Burneson.Eric@epa.gov]; Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]
From: Christ, Lisa
Sent: Mon 10/24/2016 12:31:07 PM
Subject: FRN for DWPAG
Input for FRN Re Drinking Water PAG 9-1-16.docx

Hi Eric,

Attached is the section of the PAG Manual FRN that explains how we addressed DW PAG comments.

Lisa

From: Burneson, Eric
Sent: Friday, October 21, 2016 4:45 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>; Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>
Subject: FW: OMB Comments on UCMR 4

Can one of you send me the FRN that Vlad says was omitted from ROCIS? Also let me know what you recommend we do to show that we addressed comments.

From: Burneson, Eric
Sent: Friday, October 21, 2016 4:38 PM
To: 'Dorjets, Vlad EOP/OMB' **Ex. 6 - Personal Privacy**
Subject: RE: OMB Comments on UCMR 4

Yes the Drinking Water portion of the PAG is from my group. Unfortunately I can't get my hands on the PAG document right now but I will get it sent over to you first thing on Monday.

From: Dorjets, Vlad EOP/OMB **Ex. 6 - Personal Privacy**
Sent: Friday, October 21, 2016 4:36 PM
To: Burneson, Eric <Burneson.Eric@epa.gov>
Subject: RE: OMB Comments on UCMR 4

Speaking of which, I saw the final Drinking Water PAG got submitted today. That you, right? If so, there was no FRN submitted in ROCIS. Can you please send that to me? I want to see how EPA addresses the comments it received on the proposed PAG (among other things).

From: Burneson, Eric [mailto:Burneson.Eric@epa.gov]
Sent: Friday, October 21, 2016 4:04 PM
To: Dorjets, Vlad EOP/OMB <Vladik_Dorjets@omb.eop.gov>
Subject: RE: OMB Comments on UCMR 4

Ex. 5 - Deliberative Process

Eric

From: Dorjets, Vlad EOP/OMB **Ex. 6 - Personal Privacy**
Sent: Friday, October 21, 2016 3:56 PM
To: Burneson, Eric <Burneson.Eric@epa.gov>
Cc: Carroll, Gregory <Carroll.Gregory@epa.gov>; Hautman, Dan <Hautman.Dan@epa.gov>; Farber, Glenn <Farber.Glenn@epa.gov>
Subject: RE: OMB Comments on UCMR 4

Eric,

Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

Vlad

From: Burneson, Eric [mailto:Burneson.Eric@epa.gov]
Sent: Friday, October 21, 2016 3:50 PM
To: Dorjets, Vlad EOP/OMB Ex. 6 - Personal Privacy
Cc: Carroll, Gregory <Carroll.Gregory@epa.gov>; Hautman, Dan <Hautman.Dan@epa.gov>; Farber, Glenn <Farber.Glenn@epa.gov>
Subject: RE: OMB Comments on UCMR 4

Ex. 5 - Deliberative Process

Similarly I wanted to see if you need information from us on other drinking water actions currently under OMB review including the 6 year review of National Primary Drinking Water regulations or the drinking water Protective Action Guide for Radionuclides. We are ready and willing to provide you with a briefing on these actions if it helps to facilitate your review.

Eric G. Burneson, P.E.

Director of Standards and Risk Management

Office of Ground Water and Drinking Water

U.S. Environmental Protection Agency

From: Dorjets, Vlad EOP/OMB Ex. 6 - Personal Privacy
Sent: Friday, September 30, 2016 9:25 AM
To: Burneson, Eric <Burneson.Eric@epa.gov>
Cc: Carroll, Gregory <Carroll.Gregory@epa.gov>; Hautman, Dan <Hautman.Dan@epa.gov>; Farber, Glenn <Farber.Glenn@epa.gov>
Subject: RE: OMB Comments on UCMR 4

Ex. 5 - Deliberative Process

From: Burneson, Eric [mailto:Burneson.Eric@epa.gov]
Sent: Friday, September 30, 2016 7:51 AM
To: Dorjets, Vlad EOP/OMB Ex. 6 - Personal Privacy
Cc: Carroll, Gregory <Carroll.Gregory@epa.gov>; Hautman, Dan <Hautman.Dan@epa.gov>; Farber, Glenn <Farber.Glenn@epa.gov>
Subject: Fw: OMB Comments on UCMR 4

Vald:

Ex. 5 - Deliberative Process

D. ***What is the estimated cost of this action?***

Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

From: Dorjets, Vlad EOP/OMB Ex. 6 - Personal Privacy
Sent: Thursday, September 29, 2016 6:43 PM
To: Burneson, Eric <Burneson.Eric@epa.gov>
Cc: Farber, Glenn <Farber.Glenn@epa.gov>; Carroll, Gregory <Carroll.Gregory@epa.gov>
Subject: RE: OMB Comments on UCMR 4

Eric,

Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

Vlad

From: Burneson, Eric [mailto:Burneson.Eric@epa.gov]
Sent: Friday, September 23, 2016 9:18 AM
To: Dorjets, Vlad EOP/OMB Ex. 6 - Personal Privacy
Cc: Farber, Glenn <Farber.Glenn@epa.gov>; Carroll, Gregory <Carroll.Gregory@epa.gov>
Subject: FW: OMB Comments on UCMR 4

Vlad:

Ex. 5 - Deliberative Process

Eric Burneson, P.E.

Director of Standards and Risk Management

Office of Ground Water and Drinking Water

US Environmental Protection Agency

Phone: 202-564-5250

Fax: 202 564 3760

From: Burneson, Eric
Sent: Wednesday, September 21, 2016 4:05 PM
To: Dorjets, Vlad EOP/OMB Ex. 6 - Personal Privacy; Farber, Glenn <Farber.Glenn@epa.gov>
Cc: Carroll, Gregory <Carroll.Gregory@epa.gov>
Subject: RE: OMB Comments on UCMR 4

Vlad:

Ex. 5 - Deliberative Process

Thanks for your attention to this matter.

Eric Burneson, P.E.

Director of Standards and Risk Management

Office of Ground Water and Drinking Water

US Environmental Protection Agency

Phone: 202-564-5250

Fax: 202 564 3760

From: Dorjets, Vlad EOP/OMB Ex. 6 - Personal Privacy
Sent: Tuesday, September 20, 2016 11:29 AM
To: Farber, Glenn <Farber.Glenn@epa.gov>
Cc: Carroll, Gregory <Carroll.Gregory@epa.gov>; Burneson, Eric <Burneson.Eric@epa.gov>
Subject: OMB Comments on UCMR 4

Glenn,

Ex. 5 - Deliberative Process

Let me know if you have any questions.

Vlad

To: Greene, Ashley[Greene.Ashley@epa.gov]
Cc: Huff, Lisa[Huff.Lisa@epa.gov]
From: Christ, Lisa
Sent: Mon 10/17/2016 1:54:12 PM
Subject: RE: Re-Review PAG Transition Paper
Issue Paper PAGs 10-14-16 Gude edits 10-14_lc.docx

Hi Ashley,

I revised some of the edits – see attached. Do you want me to send this forward?

Lisa

From: Greene, Ashley
Sent: Sunday, October 16, 2016 5:31 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Cc: Huff, Lisa <Huff.Lisa@epa.gov>
Subject: Re-Review PAG Transition Paper

Hi Lisa,

Ex. 5 - Deliberative Process

Sorry for another tight turnaround, but the review is due to OW COB tomorrow (Monday). I just got it last night….

Thanks,

Ashley

****

Ashley Greene

Special Assistant

Office of Ground Water and Drinking Water

U.S. Environmental Protection Agency

Phone: (202) 566-1738

Email: greene.ashley@epa.gov

****

To: Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]
From: Christ, Lisa
Sent: Mon 10/17/2016 12:19:05 PM
Subject: FW: Re-Review PAG Transition Paper
Issue Paper PAGs 10-14-16 Gude edits 10-14.docx

Hi Sam –

Ex. 5 - Deliberative Process

From: Greene, Ashley
Sent: Sunday, October 16, 2016 5:31 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Cc: Huff, Lisa <Huff.Lisa@epa.gov>
Subject: Re-Review PAG Transition Paper

Hi Lisa,

Ex. 5 - Deliberative Process

Sorry for another tight turnaround, but the review is due to OW COB tomorrow (Monday). I just got it last night….

Thanks,

Ashley

****

Ashley Greene

Special Assistant

Office of Ground Water and Drinking Water

U.S. Environmental Protection Agency

Phone: (202) 566-1738

Email: greene.ashley@epa.gov

****

To: Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]; Ellis, Jerry[Ellis.Jerry@epa.gov]
Cc: Burneson, Eric[Burneson.Eric@epa.gov]
From: Christ, Lisa
Sent: Thur 10/13/2016 8:29:23 PM
Subject: FW: PAG Manual/Water at and soon to at OMB: status update

FYI --

From: DeCair, Sara
Sent: Thursday, October 13, 2016 3:58 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Cc: Veal, Lee <Veal.Lee@epa.gov>; Perrin, Alan <Perrin.Alan@epa.gov>
Subject: PAG Manual/Water at and soon to at OMB: status update

Lisa, thanks for your message. Good to hear that OP says they only need a week with the DW piece, so we hope it'll get to OMB by Tuesday or so next week.

Ex. 5 - Deliberative Process

Do keep us up to date as these process pathways very much influence each other. Ex. 6 - Personal Privacy
Ex. 6 - Personal Privacy I'll be rooting for us to make good progress. Thanks!

Sara D. DeCair

202-343-9108

Room 1416 B in WJC West

www.epa.gov/radiation/protective-action-guides-pags

To: Burneson, Eric[Burneson.Eric@epa.gov]
From: Christ, Lisa
Sent: Tue 10/11/2016 12:16:51 PM
Subject: FW: PAGs
AL-16-001-1672.pdf
AL-16-001-1672 - Boxer - PAGs - Draft Response_V4 for ogwdw.docx

Hi Eric,

I didn't see a reply from you…do you want me to?

Lisa

From: Harris, Adrienne
Sent: Friday, October 07, 2016 12:40 PM
To: Burneson, Eric <Burneson.Eric@epa.gov>
Cc: Christ, Lisa <Christ.Lisa@epa.gov>; Greene, Ashley <Greene.Ashley@epa.gov>
Subject: FW: PAGs

Hi Eric,

Please let me know your thoughts on the latest draft of the Boxer response letter. The email chain below explains the history behind the latest version.

Adrienne O. Harris
Acting Special Assistant

Office of Ground Water and Drinking Water
U.S. Environmental Protection Agency

Washington, DC

Office Phone: 202-250-8793

From: Orvin, Chris
Sent: Friday, October 07, 2016 12:24 PM
To: Harris, Adrienne <Harris.Adrienne@epa.gov>
Cc: Burneson, Eric <Burneson.Eric@epa.gov>; Peck, Gregory <Peck.Gregory@epa.gov>; Orvin, Chris <Orvin.Chris@epa.gov>
Subject: RE: PAGs

Hey Adrienne –

Based on the discussion below, we've revised the draft response you sent yesterday. Does this work for you all?

If you have comments on this after today, please reach out to Greg directly; I will be on grand jury duty from next Tuesday until Nov 10.

Thanks,

Chris Orvin
U.S Environmental Protection Agency

Special Assistant to the Chief of Staff
Office of Water

202-564-0430

From: Grevatt, Peter
Sent: Thursday, October 06, 2016 4:16 PM
To: Brown, Tristan <Brown.Tristan@epa.gov>; Peck, Gregory <Peck.Gregory@epa.gov>
Cc: Burneson, Eric <Burneson.Eric@epa.gov>; Davis, CatherineM <Davis.CatherineM@epa.gov>; Orvin, Chris <Orvin.Chris@epa.gov>; Harris, Adrienne <Harris.Adrienne@epa.gov>
Subject: RE: PAGs

Thanks. We sent up a response earlier today, but we will defer to you if you think it is better to hold off.

From: Brown, Tristan
Sent: Thursday, October 06, 2016 4:00 PM
To: Peck, Gregory <Peck.Gregory@epa.gov>
Cc: Grevatt, Peter <Grevatt.Peter@epa.gov>; Burneson, Eric <Burneson.Eric@epa.gov>; Davis, CatherineM <Davis.CatherineM@epa.gov>; Orvin, Chris <Orvin.Chris@epa.gov>
Subject: RE: PAGs

Ex. 5 - Deliberative Process

Tristan Brown

Deputy Associate Administrator for

Congressional Affairs

U.S. Environmental Protection Agency

Office: (202) 564-4113

Email: brown.tristan@epa.gov

From: Peck, Gregory
Sent: Thursday, October 06, 2016 3:47 PM
To: Brown, Tristan <Brown.Tristan@epa.gov>
Cc: Grevatt, Peter <Grevatt.Peter@epa.gov>; Burneson, Eric <Burneson.Eric@epa.gov>; Davis, CatherineM <Davis.CatherineM@epa.gov>; Orvin, Chris <Orvin.Chris@epa.gov>
Subject: RE: PAGs

Tristan – your suggestion sounds right. We'll draft a short response focusing on our common goals and interest in getting a meeting scheduled.

We'll get a draft circulating quickly.

Best

Greg

Gregory E. Peck

Chief of Staff

Office of Water

U.S. Environmental Protection Agency

1200 Pennsylvania Avenue

Washington, D.C. 20460

202-564-5700

From: Brown, Tristan
Sent: Thursday, October 06, 2016 3:30 PM
To: Peck, Gregory <Peck.Gregory@epa.gov>
Cc: Grevatt, Peter <Grevatt.Peter@epa.gov>; Burneson, Eric <Burneson.Eric@epa.gov>; Davis, CatherineM <Davis.CatherineM@epa.gov>
Subject: PAGs

Hey Greg et al,

Just left you a vm re our response to Sen. Boxer's PAGs letter.

Our last interaction with her office was in regards to the WSJ article that came out—with their wanting another conversation… but the ball is in their court to request a specific time for that.

Ex. 5 - Deliberative Process

But happy to chat further.

Thanks

Tristan Brown

Deputy Associate Administrator for

Congressional Affairs

U.S. Environmental Protection Agency

Office: (202) 564-4113

Email: brown.tristan@epa.gov

To: Greene, Ashley[Greene.Ashley@epa.gov]
Cc: Burneson, Eric[Burneson.Eric@epa.gov]; Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]
From: Christ, Lisa
Sent: Tue 10/11/2016 12:10:42 PM
Subject: FW: Reminder: Transition Issue Paper Requests (Due Tuesday, 10/11 COB)
Issue Paper PAGs 10-5-16.docx

Hi Ashley,

Attached is the PAG issue paper. We plan to release the PAG this CY.

Thanks

Lisa

From: Harris, Adricnnc
Sent: Thursday, October 06, 2016 3:48 PM
To: Thompkins, Anita <Thompkins.Anita@epa.gov>; Burneson, Eric <Burneson.Eric@epa.gov>; Oshida, Phil <Oshida.Phil@epa.gov>; Bergman, Ronald <Bergman.Ronald@epa.gov>; Corr, Elizabeth <Corr.Elizabeth@epa.gov>
Cc: Greene, Ashley <Greene.Ashley@epa.gov>; Lopez-Carbo, Maria <Lopez-Carbo.Maria@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>
Subject: Reminder: Transition Issue Paper Requests (Due Tuesday, 10/11 COB)

A friendly reminder that the draft transition issue papers will be due to Ashley next week. For each topic please prepare a brief 1-2 page write-up of the regulatory, using the attached template by **COB October 11.**

As a reminder, the papers include:

- **Drinking Water Action Plan (IO)**
- **Drinking Water PAG (SRMD)**

Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

Adrienne O. Harris
Acting Special Assistant

Office of Ground Water and Drinking Water
U.S. Environmental Protection Agency

Washington, DC

Office Phone: 202-250-8793

To: Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]
From: Christ, Lisa
Sent: Thur 10/6/2016 9:07:10 PM
Subject: RE: Additional Transition Issue Paper Requests -- for Regulatory Information -- due 10/14

Thank you so much!

From: Hernandez-Quinones, Samuel
Sent: Wednesday, October 05, 2016 3:17 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: RE: Additional Transition Issue Paper Requests -- for Regulatory Information -- due 10/14

Hi Lisa,

Attached is my input for the Transition Issue Paper regarding the Drinking Water PAGs.

Let me know if you have any comments or would like any revisions to this.

Thanks

Sam

==========

Samuel Hernández Quiñones, P.E.
Environmental Engineer
Office of Water

Environmental Protection Agency
1200 Pennsylvania Ave. NW
Washington, DC 20460
202-564-1735

"USEPA Protecting Human Health and the Environment"

From: Christ, Lisa
Sent: Wednesday, September 28, 2016 8:19 AM
To: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>
Subject: FW: Additional Transition Issue Paper Requests -- for Regulatory Information -- due 10/14

Hi Sam,

I need your help preparing an issue paper on the PAG. Please use the attached template. Also, I've attached a lead issue paper I provided input on as an example. Please have a draft ready by COB October 5. Let me know if you have questions or concerns.

Thanks!

Lisa

From: Osegueda, Carlos
Sent: Tuesday, September 27, 2016 5:00 PM
To: Burneson, Eric <Burneson.Eric@epa.gov>; Oshida, Phil <Oshida.Phil@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>
Cc: Grevatt, Peter <Grevatt.Peter@epa.gov>; Greene, Ashley <Greene.Ashley@epa.gov>; Harris, Adrienne <Harris.Adrienne@epa.gov>
Subject: FW: Additional Transition Issue Paper Requests -- for Regulatory Information -- due 10/14

Please coordinate and respond by the due date.

From: Gude, Karen
Sent: Tuesday, September 27, 2016 3:04 PM
To: Grevatt, Peter <Grevatt.Peter@epa.gov>; Southerland, Elizabeth <Southerland.Elizabeth@epa.gov>; Sawyers, Andrew <Sawyers.Andrew@epa.gov>

Cc: Osegueda, Carlos <osegueda.carlos@epa.gov>; Lape, Jeff <lape.jeff@epa.gov>; Frace, Sheila <Frace.Sheila@epa.gov>; Greene, Ashley <Greene.Ashley@epa.gov>; Harris, Adrienne <Harris.Adrienne@epa.gov>; Conerly, Octavia <Conerly.Octavia@epa.gov>; Farris, Erika D. <Farris.Erika@epa.gov>; Beauvais, Joel <Beauvais.Joel@epa.gov>; Shapiro, Mike <Shapiro.Mike@epa.gov>; Gilinsky, Ellen <Gilinsky.Ellen@epa.gov>; Campbell, Ann <Campbell.Ann@epa.gov>; Ruf, Christine <Ruf.Christine@epa.gov>; Evalenko, Sandy <Evalenko.Sandy@epa.gov>; Arrigoni, Holly <Arrigoni.Holly@epa.gov>; Lousberg, Macara <Lousberg.Macara@epa.gov>
Subject: Additional Transition Issue Paper Requests -- for Regulatory Information -- due 10/14

Peter, Betsy, and Andrew,

Ex. 5 - Deliberative Process

If you should have any questions, please let me know.

Thank you,

Karen Gude, Special Assistant

U.S. Environmental Protection Agency

Office of Water

Phone: (202) 564-0831

From: Kenny, Shannon
Sent: Monday, September 26, 2016 6:27 PM
To: Shaw, Betsy <Shaw.Betsy@epa.gov>; Shapiro, Mike <Shapiro.Mike@epa.gov>; Breen, Barry <Breen.Barry@epa.gov>; Wise, Louise <Wise.Louise@epa.gov>
Cc: 2016OPTransitionTeam <2016OPTransitionTeam@epa.gov>; Lewis, Josh <Lewis.Josh@epa.gov>; Bergman, Shawna <Bergman.Shawna@epa.gov>; Gude, Karen <Gude.Karen@epa.gov>
Subject: Rule Information for the Transition

Betsy, Barry, Mike, and Louise,

Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

Thank you,

Shannon

Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

To: Perrin, Alan[Perrin.Alan@epa.gov]
From: Christ, Lisa
Sent: Mon 10/3/2016 9:57:30 PM
Subject: FW: DW PAG
FW: OSWER Comments on 10-02-2015 Revisions to DW PAG and FR NODA
Updated docs for ODs tomorrow
Mtg last year on DRL math - screen shot of meeting invitees/response

FYI only

From: Christ, Lisa
Sent: Monday, October 03, 2016 2:31 PM
To: Grevatt, Peter <Grevatt.Peter@epa.gov>
Cc: Burneson, Eric <Burneson.Eric@epa.gov>; DeCair, Sara <DeCair.Sara@epa.gov>; Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Ellis, Jerry <Ellis.Jerry@epa.gov>; Greene, Ashley <Greene.Ashley@epa.gov>
Subject: DW PAG

Peter,

Attached are:

•□□□□□□□ An email dated Oct 1, 2015 "Updated docs for ODs tomorrow" which contains a response to comment document and revised PAG and FRN based on comments received from OLEM

•□□□□□□□ An email dated Oct 7, 2015 "OSWER comments on 10-02-2015 …" indicating OLEM was satisfied with how we addressed comments and no show stoppers were identified.

•□□□□□□□ A screen shot of invitees for the meeting on August 18, 2015 where we walked through the DRL calculations

We reviewed the materials sent by Jim Woolford and observe the following:

Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

To: Wadlington, Christina[Wadlington.Christina@epa.gov]
Cc: Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]; Ellis, Jerry[Ellis.Jerry@epa.gov]
From: Christ, Lisa
Sent: Mon 10/3/2016 9:38:40 PM
Subject: RE: OMB Review Concluded of Drinking Water PAG
ROLL OUT PAGS 10-3-16 cw_lc.docx

Hi Christina,

See attached, I responded to the new question. Also, ideally the DW PAG will be included in the PAG Manual and everything will be released as one document. If the DW PAG gets held up (OMB review, other) we agreed to not delay the PAG Manual if it's been cleared for release. OW and OAR are working to get final versions to OMB this week so they can complete review simultaneously – fingers crossed.

Lisa

From: Wadlington, Christina
Sent: Monday, October 03, 2016 3:25 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Cc: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Ellis, Jerry <Ellis.Jerry@epa.gov>
Subject: RE: OMB Review Concluded of Drinking Water PAG

Lisa,

I was going to send this forward, but then I realized I had a few things I will need TAB's assistance on.

Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

Christina Wadlington

Communications Director

Office of Ground Water and Drinking Water

U.S. Environmental Protection Agency

Tel: 202.566.1859

Email: wadlington.christina@epa.gov

Webpage: www.epa.gov/safewater

From: Christ, Lisa
Sent: Monday, October 03, 2016 12:30 PM
To: Wadlington, Christina <Wadlington.Christina@epa.gov>
Cc: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Ellis, Jerry <Ellis.Jerry@epa.gov>
Subject: RE: OMB Review Concluded of Drinking Water PAG

Hi Christina,

Attached is a revised roll out for the final PAG. We may need to adjust if it goes out with the larger PAG Manual. Let me know if there are additional Q&As, etc needed

Lisa

From: Wadlington, Christina
Sent: Monday, October 03, 2016 8:17 AM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: RE: OMB Review Concluded of Drinking Water PAG

Christina Wadlington

Communications Director

Office of Ground Water and Drinking Water

U.S. Environmental Protection Agency

Tel: 202.566.1859

Email: wadlington.christina@epa.gov

Webpage: www.epa.gov/safewater

From: Christ, Lisa
Sent: Monday, October 03, 2016 8:15 AM
To: Wadlington, Christina <Wadlington.Christina@epa.gov>
Subject: RE: OMB Review Concluded of Drinking Water PAG

Can you send me the version with OW comments? I can work from that document for the final PAG.

From: Wadlington, Christina
Sent: Monday, October 03, 2016 8:12 AM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: RE: OMB Review Concluded of Drinking Water PAG

Yeah, I have the one that they commented on, but this for the draft PAG right? We need on for the final?

Christina Wadlington

Communications Director

Office of Ground Water and Drinking Water

U.S. Environmental Protection Agency

Tel: 202.566.1859

Email: wadlington.christina@epa.gov

Webpage: www.epa.gov/safewater

From: Christ, Lisa
Sent: Monday, October 03, 2016 8:04 AM
To: Wadlington, Christina <Wadlington.Christina@epa.gov>
Subject: FW: OMB Review Concluded of Drinking Water PAG

Hi Christina – This is the version I have. Did you get comments back from Travis or Allison? I can't find an email…

Lisa

From: Grevatt, Peter
Sent: Wednesday, May 18, 2016 7:26 PM
To: Beauvais, Joel <Beauvais.Joel@epa.gov>
Cc: Greene, Ashley <Greene.Ashley@epa.gov>; Burneson, Eric <Burneson.Eric@epa.gov>; Wadlington, Christina <Wadlington.Christina@epa.gov>; Loop, Travis

<Loop.Travis@epa.gov>; Dennis, Allison <Dennis.Allison@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>
Subject: FW: OMB Review Concluded of Drinking Water PAG

FYI. Trade press may pick up that this has cleared tomorrow. Our communications materials on this are attached. Eric and I have reviewed and we think this is in good shape. Travis and Allison, please let us know when you would like to discuss tomorrow.

From: Dorjets, Vlad Ex. 6 - Personal Privacy
Sent: Wednesday, May 18, 2016 4:33 PM
To: Grevatt, Peter <Grevatt.Peter@epa.gov>
Cc: Christ, Lisa <Christ.Lisa@epa.gov>; Greene, Ashley <Greene.Ashley@epa.gov>; Burneson, Eric <Burneson.Eric@epa.gov>; Hill, Glynis <Hill.Glynis@epa.gov>; Owens, Nicole <Owens.Nicole@epa.gov>
Subject: OMB Review Concluded of Drinking Water PAG

Peter,

Ex. 5 - Deliberative Process

Vlad

To: DeCair, Sara[DeCair.Sara@epa.gov]; Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]
From: Christ, Lisa
Sent: Mon 10/3/2016 6:18:06 PM
Subject: RE:

Yes please –

From: DeCair, Sara
Sent: Monday, October 03, 2016 1:07 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>; Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>
Subject: RE:

I will see what else I can pull together since there were 3 total responses to OSWER comments last year.

Ex. 5 - Deliberative Process

From: Christ, Lisa
Sent: Monday, October 03, 2016 1:04 PM
To: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; DeCair, Sara <DeCair.Sara@epa.gov>
Subject:

Sam and Sara – Peter is looking to respond to Jim ASAP. Below is information I pulled together, can you please help me fill in the blanks?

Peter,

Attached are:

•□□□□□□□ An email dated Oct 1, 2015 “Updated docs for ODs tomorrow” which contains a response to comment document and revised PAG and FRN based on comments received from OLEM

•□□□□□□□ An email dated Oct 7, 2015 ”OSWER comments on 10-02-2015 …” indicating OLEM was satisfied with how we addressed comments and no show stoppers were identified.

•□□□□□□□ A screen shot of invitees for the meeting on how DW PAGs were calculated

Ex. 5 - Deliberative Process

To: Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]; DeCair, Sara[DeCair.Sara@epa.gov]
From: Christ, Lisa
Sent: Mon 10/3/2016 5:03:56 PM
FW: OSWER Comments on 10-02-2015 Revisions to DW PAG and FR NODA
Updated docs for ODs tomorrow
Mtg last year on DRL math - screen shot of meeting invitees/response

Sam and Sara – Peter is looking to respond to Jim ASAP. Below is information I pulled together, can you please help me fill in the blanks?

Peter,

Attached are:

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- A screen shot of invitees for the meeting on how DW PAGs were calculated

Ex. 5 - Deliberative Process

To: Wadlington, Christina[Wadlington.Christina@epa.gov]
Cc: Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]; Ellis, Jerry[Ellis.Jerry@epa.gov]
From: Christ, Lisa
Sent: Mon 10/3/2016 4:30:22 PM
Subject: RE: OMB Review Concluded of Drinking Water PAG
ROLL OUT PAGS 10-3-16_trackchange.docx
ROLL OUT PAGS 10-3-16.docx

Hi Christina,

Attached is a revised roll out for the final PAG. We may need to adjust if it goes out with the larger PAG Manual. Let me know if there are additional Q&As, etc needed

Lisa

From: Wadlington, Christina
Sent: Monday, October 03, 2016 8:17 AM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: RE: OMB Review Concluded of Drinking Water PAG

Christina Wadlington

Communications Director

Office of Ground Water and Drinking Water

U.S. Environmental Protection Agency

Tel: 202.566.1859

Email: wadlington.christina@epa.gov

Webpage: www.epa.gov/safewater

From: Christ, Lisa
Sent: Monday, October 03, 2016 8:15 AM
To: Wadlington, Christina <Wadlington.Christina@epa.gov>
Subject: RE: OMB Review Concluded of Drinking Water PAG

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From: Wadlington, Christina
Sent: Monday, October 03, 2016 8:12 AM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: RE: OMB Review Concluded of Drinking Water PAG

Yeah, I have the one that they commented on, but this for the draft PAG right? We need on for the final?

Christina Wadlington

Communications Director

Office of Ground Water and Drinking Water

U.S. Environmental Protection Agency

Tel: 202.566.1859

Email: wadlington.christina@epa.gov

Webpage: www.epa.gov/safewater

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To: Wadlington, Christina <Wadlington.Christina@epa.gov>
Subject: FW: OMB Review Concluded of Drinking Water PAG

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To: Beauvais, Joel <Beauvais.Joel@epa.gov>
Cc: Greene, Ashley <Greene.Ashley@epa.gov>; Burneson, Eric <Burneson.Eric@epa.gov>; Wadlington, Christina <Wadlington.Christina@epa.gov>; Loop, Travis <Loop.Travis@epa.gov>; Dennis, Allison <Dennis.Allison@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>
Subject: FW: OMB Review Concluded of Drinking Water PAG

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From: Dorjets, Vlad Ex. 6 - Personal Privacy
Sent: Wednesday, May 18, 2016 4:33 PM
To: Grevatt, Peter <Grevatt.Peter@epa.gov>
Cc: Christ, Lisa <Christ.Lisa@epa.gov>; Greene, Ashley <Greene.Ashley@epa.gov>; Burneson, Eric <Burneson.Eric@epa.gov>; Hill, Glynis <Hill.Glynis@epa.gov>; Owens, Nicole <Owens.Nicole@epa.gov>
Subject: OMB Review Concluded of Drinking Water PAG

Peter,

OMB has just concluded its review of the proposed Drinking Water PAGs. Big thanks to you and your staff for addressing the comments submitted by OMB and interagency reviewers.

Vlad

From: Grevatt, Peter
Sent: Thursday, September 29, 2016 6:10 PM
To: Woolford, James <Woolford.James@epa.gov>; Cheatham, Reggie <cheatham.reggie@epa.gov>; Edwards, Jonathan <Edwards.Jonathan@epa.gov>
Cc: Burneson, Eric <Burneson.Eric@epa.gov>; Mason, Paula <Mason.Paula@epa.gov>
Subject: PAG briefing follow-up

Jim and Reggie, thanks for your participation in today's meeting. We'll provide some language changes based on your comments today and I will be happy to schedule a follow-up meeting with the two of you and Jon if he is available at the start of next week to discuss so we can quickly get this on to OMB. Paula Mason can set this up for us on my end. Please let me know who you would like her to work with on your staff. We should look for time on Monday or Tuesday of next week. Thanks again, P.G.

To: Grevatt, Peter[Grevatt.Peter@epa.gov]
Cc: Greene, Ashley[Greene.Ashley@epa.gov]; Harris, Adrienne[Harris.Adrienne@epa.gov]; Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]; Burneson, Eric[Burneson.Eric@epa.gov]
From: Christ, Lisa
Sent: Wed 9/28/2016 9:42:45 PM
Subject: FOR REVIEW: drinking water PAG chapter
Clean Draft DW PAG OGWDW 9-27.docx
Redline Draft DW PAG OGWDW 9-27_v2.docx

Hi Peter,

Attached is a redline/strikeout version of the PAG and a clean version. This incorporates public comment, OLEM comments and Eric's comments. It also removes paragraphs that are redundant with the PAG Manual. We are hoping to do the pass back with OMB as soon as you (Joel?) have reviewed the document. Let me know if you have questions or comments.

Lisa

Ps- the footnote numbering is off in the track change version but autocorrects when changes are accepted. This made me a little mental until I figured it out.

To: Harris, Adrienne[Harris.Adrienne@epa.gov]
From: Christ, Lisa
Sent: Wed 9/28/2016 7:03:13 PM
Subject: RE: Boxer PAG letter

Ex. 5 - Deliberative Process

thnx

From: Harris, Adrienne
Sent: Wednesday, September 28, 2016 9:55 AM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: RE: Boxer PAG letter

Hi Lisa,

Ex. 5 - Deliberative Process

Adrienne O. Harris
Acting Special Assistant

Office of Ground Water and Drinking Water
U.S. Environmental Protection Agency

Washington, DC

Office Phone: 202-250-8793

From: Christ, Lisa
Sent: Wednesday, September 28, 2016 9:30 AM

To: Harris, Adrienne <Harris.Adrienne@epa.gov>
Cc: Burneson, Eric <Burneson.Eric@epa.gov>; Greene, Ashley <Greene.Ashley@epa.gov>
Subject: RE: Boxer PAG letter

Hi Adrienne,

Attached are my edits. Does this need to go through Eric and Peter again for review?

Lisa

From: Harris, Adrienne
Sent: Wednesday, September 28, 2016 8:08 AM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Cc: Burneson, Eric <Burneson.Eric@epa.gov>; Greene, Ashley <Greene.Ashley@epa.gov>
Subject: FW: Boxer PAG letter

Hi Lisa,

OW has reviewed the Boxer draft response letter and is requesting the letter reflect how we share concern and be more substantive. Please find a draft attached for your review using some of the PAGs communication language.

Thanks,

Adrienne

Adrienne O. Harris
Acting Special Assistant

Office of Ground Water and Drinking Water
U.S. Environmental Protection Agency

Washington, DC

Office Phone: 202-250-8793

From: Orvin, Chris
Sent: Tuesday, September 27, 2016 9:46 AM
To: Harris, Adrienne <Harris.Adrienne@epa.gov>
Subject: Boxer PAG letter

Here is what I have.

Chris Orvin
U.S Environmental Protection Agency

Special Assistant to the Chief of Staff
Office of Water

202-564-0430

To: Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]
Cc: Burneson, Eric[Burneson.Eric@epa.gov]
From: Christ, Lisa
Sent: Tue 9/27/2016 2:31:24 PM
Subject: FW: FOR REVIEW: drinking water PAG chapter - incorporates public and internal EPA comments
RedLine Draft DW PAG OGWDW 9-22-Ver2_lc_egb.docx

Hi Sam,

Eric had two comments on pages 4 and 17 (see below). I've answered the first one, can you verify the second?

Thanks!

Lisa

Ex. 5 - Deliberative Process

From: Burneson, Eric
Sent: Monday, September 26, 2016 5:32 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: RE: FOR REVIEW: drinking water PAG chapter - incorporates public and internal EPA comments

See my two comments in the attached. Once those are addressed you can send this forward.

From: Christ, Lisa
Sent: Monday, September 26, 2016 3:28 PM
To: Burneson, Eric <Burneson.Eric@epa.gov>
Subject: FOR REVIEW: drinking water PAG chapter - incorporates public and internal EPA comments

I'll bring hard copies too.

To: Greene, Ashley[Greene.Ashley@epa.gov]; Harris, Adrienne[Harris.Adrienne@epa.gov]
Cc: Wadlington, Christina[Wadlington.Christina@epa.gov]; Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]; DeCair, Sara[DeCair.Sara@epa.gov]; Veal, Lee[Veal.Lee@epa.gov]; Hill, Glynis[Hill.Glynis@epa.gov]
From: Christ, Lisa
Sent: Mon 9/26/2016 9:16:42 PM
Subject: drinking water PAG briefing 9/29
SHQ Radiation Protective Action Guide_Administrator Brief 9_29_16_v5.pptx

All,

Attached are the presentation slides for the Administrator briefing on Thursday.

Lisa

To: Greene, Ashley[Greene.Ashley@epa.gov]
Cc: Harris, Adrienne[Harris.Adrienne@epa.gov]
From: Christ, Lisa
Sent: Mon 9/26/2016 5:59:30 PM
Subject: RE: PAGs Briefing for Thursday

Joel asked for a couple revisions to the slides. We are working in them now – they'll be ready later today.

From: Greene, Ashley
Sent: Monday, September 26, 2016 1:58 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Cc: Harris, Adrienne <Harris.Adrienne@epa.gov>
Subject: PAGs Briefing for Thursday

HI Lisa,

I didn't attend the LCR weekly on Friday where you also discussed the Administrator PAGs briefing. Was Joel good with the draft slides you all provided? Just trying to check on the status as they will be due to OW by COB tomorrow.

Thanks,

Ashley

****

Ashley Greene

Special Assistant

Office of Ground Water and Drinking Water

U.S. Environmental Protection Agency

Phone: (202) 566-1738

Email: greene.ashley@epa.gov

****

To: Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]
From: Christ, Lisa
Sent: Mon 9/26/2016 3:24:59 PM
Subject: FW: FOR REVIEW: drinking water PAG DRAFT Administrator Briefing ON 9/29
Radiation Protective Action Guide_Administrator Brief 9_29_16_v4.pptx

Hi Sam,

I need your help revising the attached slides.

Ex. 5 - Deliberative Process

Also, could you please take the redline version of the PAG chapter with all revisions; accept all changes and then do a document compare with the version that was in the docket for public comment. I would like a redline version that has all comments without attribution. Can you get that to me today?

Let me know

From: Christ, Lisa
Sent: Thursday, September 22, 2016 11:33 AM
To: Burneson, Eric <Burneson.Eric@epa.gov>; Grevatt, Peter <Grevatt.Peter@epa.gov>
Cc: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Ellis, Jerry <Ellis.Jerry@epa.gov>; Greene, Ashley <Greene.Ashley@epa.gov>
Subject: RE: FOR REVIEW: drinking water PAG DRAFT Administrator Briefing ON 9/29

Got it – I think this version will work – let me know!

From: Burneson, Eric
Sent: Thursday, September 22, 2016 10:58 AM
To: Christ, Lisa <Christ.Lisa@epa.gov>; Grevatt, Peter <Grevatt.Peter@epa.gov>

Cc: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Ellis, Jerry <Ellis.Jerry@epa.gov>; Greene, Ashley <Greene.Ashley@epa.gov>
Subject: RE: FOR REVIEW: drinking water PAG DRAFT Administrator Briefing ON 9/29

Lisa:

Ex. 5 - Deliberative Process

From: Christ, Lisa
Sent: Thursday, September 22, 2016 10:22 AM
To: Grevatt, Peter <Grevatt.Peter@epa.gov>; Burneson, Eric <Burneson.Eric@epa.gov>
Cc: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Ellis, Jerry <Ellis.Jerry@epa.gov>; Greene, Ashley <Greene.Ashley@epa.gov>
Subject: RE: FOR REVIEW: drinking water PAG DRAFT Administrator Briefing ON 9/29

Peter & Eric –

Revised slides are attached for review. I incorporated Eric's and Peter's comments. By compressing slides 9-11 to one slide, some of Peter's comments on EPA responses are in TPs.

Let me know if you'd like further revisions.

Lisa

From: Grevatt, Peter
Sent: Thursday, September 22, 2016 7:48 AM
To: Burneson, Eric <Burneson.Eric@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>
Cc: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Ellis, Jerry <Ellis.Jerry@epa.gov>; Greene, Ashley <Greene.Ashley@epa.gov>
Subject: Re: FOR REVIEW: drinking water PAG DRAFT Administrator Briefing ON 9/29

Thanks Eric and Lisa. I agree with Eric's edits and please also see my suggestions in red text in the attachment.

From: Burneson, Eric
Sent: Wednesday, September 21, 2016 6:32:17 PM
To: Christ, Lisa
Cc: Hernandez-Quinones, Samuel; Ellis, Jerry; Grevatt, Peter
Subject: RE: FOR REVIEW: drinking water PAG DRAFT Administrator Briefing ON 9/29

Ex. 5 - Deliberative Process

From: Christ, Lisa
Sent: Wednesday, September 21, 2016 5:49 PM
To: Grevatt, Peter <Grevatt.Peter@epa.gov>; Burneson, Eric <Burneson.Eric@epa.gov>
Cc: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Ellis, Jerry <Ellis.Jerry@epa.gov>
Subject: FOR REVIEW: drinking water PAG DRAFT Administrator Briefing ON 9/29

Hi Peter & Eric,

Attached for review are draft slides for the Administrator briefing next Thursday. Joel asked for a draft for this Friday's LCR weekly meeting.

Ex. 5 - Deliberative Process

Lisa

To: Greene, Ashley[Greene.Ashley@epa.gov]; Burneson, Eric[Burneson.Eric@epa.gov]; Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]
From: Christ, Lisa
Sent: Thur 9/22/2016 4:45:39 PM
Subject: RE: Hearing Prep Items
DW PAG - SEPW Hearing Factsheet - 09 22 16_SHQ_lc.docx

Here you go.

From: Greene, Ashley
Sent: Thursday, September 22, 2016 12:28 PM
To: Burneson, Eric <Burneson.Eric@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>; Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>
Subject: RE: Hearing Prep Items

Just checking in on the status of this updated document.

Thanks!

Ashley

From: Burneson, Eric
Sent: Thursday, September 22, 2016 8:32 AM
To: Christ, Lisa <Christ.Lisa@epa.gov>; Wadlington, Christina <Wadlington.Christina@epa.gov>; Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>
Cc: Greene, Ashley <Greene.Ashley@epa.gov>
Subject: RE: Hearing Prep Items

Lisa and Sam can you work these additional points into the fact sheet and send it up to Ashley.

Thanks

Eric

From: Christ, Lisa
Sent: Thursday, September 22, 2016 8:13 AM
To: Burneson, Eric <Burneson.Eric@epa.gov>; Wadlington, Christina <Wadlington.Christina@epa.gov>; Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>
Subject: RE: Hearing Prep Items

Ex. 5 - Deliberative Process

From: Burneson, Eric
Sent: Wednesday, September 21, 2016 6:15 PM
To: Wadlington, Christina <Wadlington.Christina@epa.gov>; Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>
Cc: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: RE: Hearing Prep Items

Yes that's the one I was looking for.

Ex. 5 - Deliberative Process

From: Wadlington, Christina
Sent: Wednesday, September 21, 2016 5:49 PM
To: Burneson, Eric <Burneson.Eric@epa.gov>; Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>
Cc: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: RE: Hearing Prep Items

Ex. 5 - Deliberative Process

QUESTION: Does the EPA think that it would be acceptable for the public to temporarily drink water containing radioactive contamination at up to thousands of times normal federal safety limits?

Ex. 5 - Deliberative Process

Christina Wadlington

Communications Director

Office of Ground Water and Drinking Water

U.S. Environmental Protection Agency

Tel: 202.566.1859

Email: wadlington.christina@epa.gov

Webpage: www.epa.gov/safewater

From: Burneson, Eric
Sent: Wednesday, September 21, 2016 5:30 PM
To: Wadlington, Christina <Wadlington.Christina@epa.gov>; Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>
Cc: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: RE: Hearing Prep Items

Thanks Christina:

Ex. 5 - Deliberative Process

From: Wadlington, Christina
Sent: Wednesday, September 21, 2016 5:04 PM
To: Burneson, Eric <Burneson.Eric@epa.gov>
Cc: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>
Subject: RE: Hearing Prep Items

Eric,

Sorry for the delay, attached is the sheet updated with Qs from the roll out and a few that came up a lot from the media.

Please let me know if you were thinking of others and I'm happy to pull those.

Christina Wadlington

Communications Director

Office of Ground Water and Drinking Water

U.S. Environmental Protection Agency

Tel: 202.566.1859

Email: wadlington.christina@epa.gov

Webpage: www.epa.gov/safewater

From: Burneson, Eric
Sent: Wednesday, September 21, 2016 2:28 PM
To: Wadlington, Christina <Wadlington.Christina@epa.gov>
Cc: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>
Subject: FW: Hearing Prep Items

Ex. 5 - Deliberative Process

Eric

To: Burneson, Eric[Burneson.Eric@epa.gov]; Grevatt, Peter[Grevatt.Peter@epa.gov]
Cc: Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]; Ellis, Jerry[Ellis.Jerry@epa.gov]; Greene, Ashley[Greene.Ashley@epa.gov]
From: Christ, Lisa
Sent: Thur 9/22/2016 3:32:31 PM
Subject: RE: FOR REVIEW: drinking water PAG DRAFT Administrator Briefing ON 9/29
Radiation Protective Action Guide_Administrator Brief 9_29_16_v4.pptx

Got it – I think this version will work – let me know!

From: Burneson, Eric
Sent: Thursday, September 22, 2016 10:58 AM
To: Christ, Lisa <Christ.Lisa@epa.gov>; Grevatt, Peter <Grevatt.Peter@epa.gov>
Cc: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Ellis, Jerry <Ellis.Jerry@epa.gov>; Greene, Ashley <Greene.Ashley@epa.gov>
Subject: RE: FOR REVIEW: drinking water PAG DRAFT Administrator Briefing ON 9/29

Lisa:

Ex. 5 - Deliberative Process

From: Christ, Lisa
Sent: Thursday, September 22, 2016 10:22 AM
To: Grevatt, Peter <Grevatt.Peter@epa.gov>; Burneson, Eric <Burneson.Eric@epa.gov>
Cc: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Ellis, Jerry <Ellis.Jerry@epa.gov>; Greene, Ashley <Greene.Ashley@epa.gov>
Subject: RE: FOR REVIEW: drinking water PAG DRAFT Administrator Briefing ON 9/29

Peter & Eric –

Revised slides are attached for review. I incorporated Eric's and Peter's comments. By compressing slides 9-11 to one slide, some of Peter's comments on EPA responses are in TPs.

Let me know if you'd like further revisions.

Lisa

From: Grevatt, Peter
Sent: Thursday, September 22, 2016 7:48 AM
To: Burneson, Eric <Burneson.Eric@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>
Cc: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Ellis, Jerry <Ellis.Jerry@epa.gov>; Greene, Ashley <Greene.Ashley@epa.gov>
Subject: Re: FOR REVIEW: drinking water PAG DRAFT Administrator Briefing ON 9/29

Thanks Eric and Lisa. I agree with Eric's edits and please also see my suggestions in red text in the attachment.

From: Burneson, Eric
Sent: Wednesday, September 21, 2016 6:32:17 PM
To: Christ, Lisa
Cc: Hernandez-Quinones, Samuel; Ellis, Jerry; Grevatt, Peter
Subject: RE: FOR REVIEW: drinking water PAG DRAFT Administrator Briefing ON 9/29

Lisa: Thanks for preparing the draft briefing document. I have the following comments.

Ex. 5 - Deliberative Process

From: Christ, Lisa

Sent: Wednesday, September 21, 2016 5:49 PM
To: Grevatt, Peter <Grevatt.Peter@epa.gov>; Burneson, Eric <Burneson.Eric@epa.gov>
Cc: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Ellis, Jerry <Ellis.Jerry@epa.gov>
Subject: FOR REVIEW: drinking water PAG DRAFT Administrator Briefing ON 9/29

Hi Peter & Eric,

Attached for review are draft slides for the Administrator briefing next Thursday. Joel asked for a draft for this Friday's LCR weekly meeting.

Ex. 5 - Deliberative Process

Lisa

To: DeCair, Sara[DeCair.Sara@epa.gov]; Veal, Lee[Veal.Lee@epa.gov]
From: Christ, Lisa
Sent: Wed 9/21/2016 10:13:57 PM
Subject: Fwd: FOR REVIEW: drinking water PAG DRAFT Administrator Briefing ON 9/29
Radiation Protective Action Guide_Administrator Brief 9_29_16.pptx
ATT00001.htm

Sorry. Meant to cc y'all

Sent from my iPhone

Begin forwarded message:

From: "Christ, Lisa" <Christ.Lisa@epa.gov>
Date: September 21, 2016 at 5:49:22 PM EDT
To: "Grevatt, Peter" <Grevatt.Peter@epa.gov>, "Burneson, Eric" <Burneson.Eric@epa.gov>
Cc: "Hernandez-Quinones, Samuel" <Hernandez.Samuel@epa.gov>, "Ellis, Jerry" <Ellis.Jerry@epa.gov>
Subject: FOR REVIEW: drinking water PAG DRAFT Administrator Briefing ON 9/29

Hi Peter & Eric,

Attached for review are draft slides for the Administrator briefing next Thursday. Joel asked for a draft for this Friday's LCR weekly meeting.

Ex. 5 - Deliberative Process

Lisa

To: DeCair, Sara[DeCair.Sara@epa.gov]; Veal, Lee[Veal.Lee@epa.gov]; Perrin, Alan[Perrin.Alan@epa.gov]
From: Christ, Lisa
Sent: Thur 9/15/2016 8:46:43 PM
Subject: FW: OLEM Comments on OW Draft DW PAG (August 2016)
Draft DW PAG OGWDW 8-31 (002).OLEMComments.2.docx
FDA PAG Supporting Documentation Referenced in fn 5 and fn 6.pdf

FYI

From: Grevatt, Peter
Sent: Thursday, September 15, 2016 4:32 PM
To: Burneson, Eric <Burneson.Eric@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>
Subject: FW: OLEM Comments on OW Draft DW PAG (August 2016)
Importance: High

FYI

From: Hostage, Barbara
Sent: Thursday, September 15, 2016 3:34 PM
To: Grevatt, Peter <Grevatt.Peter@epa.gov>
Cc: Woolford, James <Woolford.James@epa.gov>; Cheatham, Reggie <cheatham.reggie@epa.gov>; Clark, Becki <Clark.Becki@epa.gov>; Waltzer, Sam <Waltzer.Sam@epa.gov>; Stalcup, Dana <Stalcup.Dana@epa.gov>; Raffaele, Kathleen <raffaele.kathleen@epa.gov>; Foster, Stiven <Foster.Stiven@epa.gov>; Cogliano, Gerain <Cogliano.Gerain@epa.gov>; Scozzafava, MichaelE <Scozzafava.MichaelE@epa.gov>; Barr, Pamela <Barr.Pamela@epa.gov>
Subject: OLEM Comments on OW Draft DW PAG (August 2016)
Importance: High

Good afternoon, Peter.

OLEM appreciates the opportunity to provide OW comments on the draft DW PAG (August 2016).

You will find OLEM's comments attached.

Please let me know if you have any questions or would like to meet to discuss OLEM's comments.

In addition, and as previously requested, OLEM would like to participate in the meeting that OW has scheduled with the Administrator later this month.

Thanks again for your attention.

Barbara Hostage, Director

Policy Analysis and Regulatory Management Staff (PARMS)
Office of Program Management (OPM)
Office of Land and Emergency Management (OLEM)

EPA West Room 4130A
Phone Number: 202-566-1933
Fax Number: 202-566-1934
Mail Code: 5103T

To: Greene, Ashley[Greene.Ashley@epa.gov]; Burneson, Eric[Burneson.Eric@epa.gov]
From: Christ, Lisa
Sent: Thur 9/15/2016 1:53:54 PM
Subject: RE: Items to Review and WEFTEC Info
DW PAG - SEPW Hearing Factsheet - 09-15-16_lc.docx

A couple points of clarification – see attached.

From: Greene, Ashley
Sent: Thursday, September 15, 2016 8:48 AM
To: Burneson, Eric <Burneson.Eric@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>
Subject: FW: Items to Review and WEFTEC Info

Please let me know if you have any issues with the changes Peter made to the fact sheet.

Thanks,

Ashley

From: Grevatt, Peter
Sent: Thursday, September 15, 2016 8:46 AM
To: Greene, Ashley <Greene.Ashley@epa.gov>
Subject: RE: Items to Review and WEFTEC Info

Rad PAG fact sheet. Please make sure our PAG team is aware of the changes I have recommended.

From: Greene, Ashley
Sent: Tuesday, September 13, 2016 11:36 AM
To: Grevatt, Peter <Grevatt.Peter@epa.gov>
Subject: Items to Review and WEFTEC Info

1) Items to review (latest versions attached)

a. Legionella Comms Rollout

b. Legionella Document

c. Tiering Memo Comms Rollout

d. Joel's SEPW Testimony

e. DW PAGs SEPW Hearing factsheet

2) Take a look at Danny Gogal's email from yesterday and respond to his request for review

3) ULO Info to Joel (Anita sent you email on 9/6 at 7:53pm) – this contains draft messages from Joel to RAM as well as message to WDDs

4) WEFTEC Utility Leaders Morning Session Agenda attached – this is the session where you will be giving 5/10 minute update on OGWDW initiatives. As I mentioned, you will also be doing the Clean Water Policy session with the other ODs where you have approximately 10-15 minutes for remarks on OGWDW priorities. Let me know what specific topics you may want to cover during these sessions.

****

Ashley Greene

Special Assistant

Office of Ground Water and Drinking Water

U.S. Environmental Protection Agency

Phone: (202) 566-1738

Email: greene.ashley@epa.gov

****

To: DeCair, Sara[DeCair.Sara@epa.gov]; Veal, Lee[Veal.Lee@epa.gov]
From: Christ, Lisa
Sent: Thur 9/8/2016 7:00:49 PM
Subject: FW: Revised Drinking Water PAG chapter
Clean Draft DW PAG OGWDW 8-31.pdf
Draft DW PAG OGWDW 8-31.docx
Redline Draft DW PAG OGWDW 8-31.pdf

Hi Sara & Lee,

OLEM requested more time to review (see below) and "will strive" to provide comments by COB 9/15. They've also asked to be invited on the invitation for the Administrator briefing – which is scheduled for 9/29. We'll share comments as soon as we receive them.

Lisa

From: Grevatt, Peter
Sent: Thursday, September 01, 2016 11:12 AM
To: Burneson, Eric <Burneson.Eric@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>
Cc: Greene, Ashley <Greene.Ashley@epa.gov>
Subject: FW: Revised Drinking Water PAG chapter
Importance: High

No surprise there. Do we have an easy way to summarize the response to comments for them? I'll need to push back on the schedule. Of course they would be included in any senior level briefings.

From: Hostage, Barbara
Sent: Thursday, September 01, 2016 11:05 AM
To: Grevatt, Peter <Grevatt.Peter@epa.gov>
Cc: Woolford, James <Woolford.James@epa.gov>; Cheatham, Reggie <cheatham.reggie@epa.gov>; Clark, Becki <Clark.Becki@epa.gov>; Stalcup, Dana <Stalcup.Dana@epa.gov>; Raffaele, Kathleen <raffaele.kathleen@epa.gov>; Foster, Stiven <Foster.Stiven@epa.gov>; Cogliano, Gerain <Cogliano.Gerain@epa.gov>; Evalenko, Sandy <Evalenko.Sandy@epa.gov>; Scozzafava, MichaelE <Scozzafava.MichaelE@epa.gov>; Barr, Pamela <Barr.Pamela@epa.gov>
Subject: FW: Revised Drinking Water PAG chapter
Importance: High

Good morning, Peter.

OLEM appreciates the opportunity to review the Draft DW PAG and appreciates the need to provide comments to OW in a timely manner.

Since OLEM needs to prepare a set of coordinated comments, we will need a little bit more time, particularly given the Labor Day Holiday on Monday.

As such, OLEM will strive to send comments to OW by COB September 15th and will be happy to meet with OW to discuss those comments the following week, if needed. Please be aware, however, given the controversial nature of the document, there may be a few issues that will take additional time to resolve.

OLEM also has two requests. First, it would be helpful to see a summary of the major comments you received along with your proposed response to those comments. Second, OLEM also requests that OW include OLEM in any meetings that OW may schedule with the Administrator or the Deputy Administrator on the DW PAG.

Thank you.

Barbara Hostage, Director

Policy Analysis and Regulatory Management Staff (PARMS)
Office of Program Management (OPM)
Office of Land and Emergency Management (OLEM)

EPA West Room 4130A
Phone Number: 202-566-1933
Fax Number: 202-566-1934
Mail Code: 5103T

From: Grevatt, Peter
Sent: 8/31/2016 5:25 PM
To: Woolford, James; Cheatham, Reggie; Neugeboren, Steven
Cc: Burneson, Eric; Christ, Lisa; Beauvais, Joel; Shapiro, Mike; Edwards, Jonathan; Greene, Ashley; Perrin, Alan
Subject: Revised Drinking Water PAG chapter

Jim, Reggie and Steve,

Please see attached to this message the revised draft drinking water radiation protective action guidelines (in track changes and clean formats). These documents have been revised in response to public comments (~60,000) received during the public comment period that ended on July 25. We are still on target for releasing the final PAG document this year, and to stay on that schedule, we would greatly appreciate any comments your offices can provide by Friday, September 9. We plan to brief the Administrator later in September and we would be glad to set up a meeting to discuss any comments you have during the week of September 12.

Thanks very much for your assistance on this!

P. Grevatt

To: Grevatt, Peter[Grevatt.Peter@epa.gov]; Burneson, Eric[Burneson.Eric@epa.gov]
Cc: Greene, Ashley[Greene.Ashley@epa.gov]; Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]
From: Christ, Lisa
Sent: Thur 9/1/2016 8:48:20 PM
Subject: RE: Revised Drinking Water PAG chapter
Public Comments Draft DW PAG.v2.docx
Input for FRN Re Drinking Water PAG 9-1-16.docx

Hi Peter,

Attached is the high level comment summary we used to brief you. The responses have been revised as you suggested. Let me know if you have question or comments. I'm also attaching the draft FRN if you want to provide that as well.

Lisa

From: Grevatt, Peter
Sent: Thursday, September 01, 2016 11:12 AM
To: Burneson, Eric <Burneson.Eric@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>
Cc: Greene, Ashley <Greene.Ashley@epa.gov>
Subject: FW: Revised Drinking Water PAG chapter
Importance: High

No surprise there. Do we have an easy way to summarize the response to comments for them? I'll need to push back on the schedule. Of course they would be included in any senior level briefings.

From: Hostage, Barbara
Sent: Thursday, September 01, 2016 11:05 AM
To: Grevatt, Peter <Grevatt.Peter@epa.gov>
Cc: Woolford, James <Woolford.James@epa.gov>; Cheatham, Reggie <cheatham.reggie@epa.gov>; Clark, Becki <Clark.Becki@epa.gov>; Stalcup, Dana <Stalcup.Dana@epa.gov>; Raffaele, Kathleen <raffaele.kathleen@epa.gov>; Foster, Stiven <Foster.Stiven@epa.gov>; Cogliano, Gerain <Cogliano.Gerain@epa.gov>; Evalenko, Sandy <Evalenko.Sandy@epa.gov>; Scozzafava, MichaelE <Scozzafava.MichaelE@epa.gov>; Barr, Pamela <Barr.Pamela@epa.gov>
Subject: FW: Revised Drinking Water PAG chapter
Importance: High

Good morning, Peter.

OLEM appreciates the opportunity to review the Draft DW PAG and appreciates the need to provide comments to OW in a timely manner.

Since OLEM needs to prepare a set of coordinated comments, we will need a little bit more time, particularly given the Labor Day Holiday on Monday.

As such, OLEM will strive to send comments to OW by COB September 15th and will be happy to meet with OW to discuss those comments the following week, if needed. Please be aware, however, given the controversial nature of the document, there may be a few issues that will take additional time to resolve.

OLEM also has two requests. First, it would be helpful to see a summary of the major comments you received along with your proposed response to those comments. Second, OLEM also requests that OW include OLEM in any meetings that OW may schedule with the Administrator or the Deputy Administrator on the DW PAG.

Thank you.

Barbara Hostage, Director

Policy Analysis and Regulatory Management Staff (PARMS)
Office of Program Management (OPM)
Office of Land and Emergency Management (OLEM)

EPA West Room 4130A
Phone Number: 202-566-1933
Fax Number: 202-566-1934
Mail Code: 5103T

From: Grevatt, Peter
Sent: 8/31/2016 5:25 PM
To: Woolford, James; Cheatham, Reggie; Neugeboren, Steven
Cc: Burneson, Eric; Christ, Lisa; Beauvais, Joel; Shapiro, Mike; Edwards, Jonathan; Greene, Ashley; Perrin, Alan
Subject: Revised Drinking Water PAG chapter

Jim, Reggie and Steve,

Please see attached to this message the revised draft drinking water radiation protective action guidelines (in track changes and clean formats). These documents have been revised in response to public comments (~60,000) received during the public comment period that ended on July 25. We are still on target for releasing the final PAG document this year, and to stay on that schedule, we would greatly appreciate any comments your offices can provide by Friday, September 9. We plan to brief the Administrator later in September and we would be glad to set up a meeting to discuss any comments you have during the week of September 12.

Thanks very much for your assistance on this!

P. Grevatt

To: Grevatt, Peter[Grevatt.Peter@epa.gov]
From: Christ, Lisa
Sent: Wed 8/31/2016 8:48:13 PM
Subject: For Review: Drinking Water PAG chapter
Clean Draft DW PAG OGWDW 8-31.pdf
Draft DW PAG OGWDW 8-31.docx
Redline Draft DW PAG OGWDW 8-31.pdf

TO: Cheatham, Reggie <cheatham.reggie@epa.gov>; Woolford, James <Woolford.James@epa.gov>; Wehling, Carrie Wehling.Carrie@epa.gov; Neugeboren, Steven Neugeboren.Steven@epa.gov

CC: Bangser, Paul bangser.paul@epa.gov; Wehling, Carrie Wehling.Carrie@epa.gov

Jim, Reggie and Steve (or Carrie??),

We have been diligently working to review and address public comments (~60,000) since the comment period ended July 25. Attached for your review is the revised drinking water PAG chapter (redline/strikeout version and clean drafts). I'm asking for an expedited review; please provide comments to me by COB September 9.

The Administrator has asked that we release the drinking water PAG this year, so we plan to brief her in late September.

Peter

To: Burneson, Eric[Burneson.Eric@epa.gov]
From: Christ, Lisa
Sent: Wed 8/31/2016 8:14:57 PM
Subject: ERIC REVIEW - CMS New Assignment - Boxer, PAGs - AL-16-001-1672
16-001-1672.Boxer.PAGs.pdf
Draft Response to Sen Boxer - DW PAGs 8_31_16.docx

Hi Eric,
Attached is the incoming from Boxer and a draft response. This is due to Stephanie tomorrow- sorry for the quick turn around.
Lisa

-----Original Message-----
From: Flaharty, Stephanie
Sent: Monday, August 29, 2016 7:27 AM
To: Burneson, Eric <Burneson.Eric@epa.gov>; Oshida, Phil <Oshida.Phil@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>; Huff, Lisa <Huff.Lisa@epa.gov>
Subject: Due 9/1 - CMS New Assignment - Boxer, PAGs - AL-16-001-1672

Control AL-16-001-1672 (attached) has been assigned to your office. Attached is a draft response from OCIR.

This control is due for Peter's approval to move to Joel for signature on Sept. 1st. Let me know is you need an extension.

Control Subject: EPA'S PROPOSED PROTECTIVE ACTION GUIDES FOR DRINKING WATER
From: Boxer, Barbara

Thx.,
Steph

To: Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]
From: Christ, Lisa
Sent: Tue 8/30/2016 12:20:23 PM
Subject: FW: Review this week - Documents for Review DW PAG
Input for FRN Re Drinking Water PAG 8-29-16egb_lc pcg(00000002).docx
Draft DW PAG 8-29-16egb_lc PG.docx

Hi Sam,

Peter's comments seem pretty straight forward. Please revise the documents to incorporate all of these comments. We'll send the revised documents to Joel for review next.

Thanks!!

Lisa

From: Grevatt, Peter
Sent: Tuesday, August 30, 2016 8:15 AM
To: Greene, Ashley <Greene.Ashley@epa.gov>
Cc: Harris, Adrienne <Harris.Adrienne@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>; Burneson, Eric <Burneson.Eric@epa.gov>; Wadlington, Christina <Wadlington.Christina@epa.gov>
Subject: RE: Review this week - Documents for Review DW PAG

Please see my editorial comments on both documents attached to this message.

From: Greene, Ashley
Sent: Monday, August 29, 2016 12:20 PM
To: Grevatt, Peter <Grevatt.Peter@epa.gov>
Cc: Harris, Adrienne <Harris.Adrienne@epa.gov>
Subject: Review this week - Documents for Review DW PAG

Attached are two PAG documents for your review prior to intra-agency review by OLEM, OAR,

and OGC. The documents include:

1) Chapter on drinking water to be included in full PAG document

2) Drinking water section of full PAG FRN

Note, they are in tracked changes so you can see how public comments were addressed and exactly what sections of the drinking water proposal will be included in the overall PAG Manual.

SRMD would like to initiate intra-agency review this week.

Thanks,
Ashley

To: Greene, Ashley[Greene.Ashley@epa.gov]; Harris, Adrienne[Harris.Adrienne@epa.gov]
Cc: Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]
From: Christ, Lisa
Sent: Mon 8/29/2016 3:59:58 PM
Subject: FW: Documents for Review DW PAG
Draft DW PAG 8-29-16egb_lc.docx
Input for FRN Re Drinking Water PAG 8-29-16egb_lc.docx

The attached documents incorporate Eric's comments and are ready for Peter's review. We'd like to begin EPA intra-agency review OLEM, OAR, OGC this week if possible so we can get back to OMB quickly. Let me know if you have questions or concerns.

Lisa

From: Burneson, Eric
Sent: Monday, August 29, 2016 11:00 AM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: RE: Documents for Review DW PAG

Lisa

Attached please find my comments and suggested for the DW PAG documents. Please let me know if you have any questions or concerns. Once you have incorporated /addressed my comments these will be ready to share with Peter.

Eric

From: Christ, Lisa
Sent: Wednesday, August 24, 2016 4:31 PM
To: Burneson, Eric <Burneson.Eric@epa.gov>
Subject: FW: Documents for Review DW PAG

Hi Eric,

Attached are drafts of the drinking water chapter that will be folded into the PAG Manual and a section for the FRN describing the drinking ater PAG comments and how they've been addressed.

Lisa

From: Hernandez-Quinones, Samuel
Sent: Wednesday, August 24, 2016 3:58 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: Documents for Review DW PAG

Hi Lisa,

Attached are the files for review regarding the revisions to the DW PAG in response to public comments received on the proposal. Attached are 2 pdf files (Clean and Redline) that are very easy to read, and also a word version (this one is a bit busy since it has with tracked edits) of the DW PAG Chapter.

Also attached is the draft input for the FRN section on DW that will be incorporated into the FRN for the overall PAG Manual.

Thanks

Sam

==========

Samuel Hernández Quiñones, P.E.
Environmental Engineer
Office of Water

Environmental Protection Agency
1200 Pennsylvania Ave. NW
Washington, DC 20460
202-564-1735

"USEPA Protecting Human Health and the Environment"

To: Davis, CatherineM[Davis.CatherineM@epa.gov]
From: Christ, Lisa
Sent: Thur 8/25/2016 8:54:12 PM
Subject: RE: Sen. Boxer Letter on Proposed Drinking Water PAGs

It's not like I'm looking forward to it ☺

From: Davis, CatherineM
Sent: Thursday, August 25, 2016 4:21 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: RE: Sen. Boxer Letter on Proposed Drinking Water PAGs

That is entirely my fault. I missed the step of sending it to our correspondence folks. It will be coming your way soon. Thank you so much for circling back on this!

Cathy Davis

Office of Congressional and

Intergovernmental Relations

202-564-2703

davis.catherinem@epa.gov

Send mail to:

US Environmental Protection Agency

1200 Pennsylvania Ave, NW

MC: 1305A

Washington, DC 20460

From: Christ, Lisa
Sent: Thursday, August 25, 2016 4:07 PM
To: Davis, CatherineM <Davis.CatherineM@epa.gov>
Subject: RE: Sen. Boxer Letter on Proposed Drinking Water PAGs

Hi Cathy,

I don't think this has been controlled to us yet.

Lisa

From: Davis, CatherineM
Sent: Tuesday, July 26, 2016 8:32 AM
To: Grevatt, Peter <Grevatt.Peter@epa.gov>
Cc: Burneson, Eric <Burneson.Eric@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>; Greene, Ashley <Greene.Ashley@epa.gov>; Harris, Adrienne <Harris.Adrienne@epa.gov>
Subject: Sen. Boxer Letter on Proposed Drinking Water PAGs

Hi Peter,

Attached is a letter we received late yesterday from Sen. Boxer on EPA's proposed Protective Action Guides for drinking water. SEPW minority staff asked that EPA include this in the comments on the proposal. I'll be putting it into CMS to start the regular process for responding to Congressional correspondence, but I wanted to give you a heads up in advance of the call this afternoon.

Regards,

Cathy Davis

Office of Congressional and

Intergovernmental Relations

202-564-2703

davis.catherinem@epa.gov

Send mail to:

US Environmental Protection Agency

1200 Pennsylvania Ave, NW

MC: 1305A

Washington, DC 20460

To: Veal, Lee[Veal.Lee@epa.gov]; DeCair, Sara[DeCair.Sara@epa.gov]
From: Christ, Lisa
Sent: Thur 8/25/2016 11:51:27 AM
Subject: FW: Documents for Review DW PAG
Input for FRN Re Drinking Water PAG 8-24-16.docx
Redline Strikeout Version 8-24-16.pdf
Draft DW PAG 8-24-16.docx
Clean Version Draft DW PAG 8-24-2016.pdf

Here you go.

☺

From: Christ, Lisa
Sent: Wednesday, August 24, 2016 4:31 PM
To: Burneson, Eric <Burneson.Eric@epa.gov>
Subject: FW: Documents for Review DW PAG

Hi Eric,

Attached are drafts of the drinking water chapter that will be folded into the PAG Manual and a section for the FRN describing the drinking ater PAG comments and how they've been addressed.

Lisa

From: Hernandez-Quinones, Samuel
Sent: Wednesday, August 24, 2016 3:58 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: Documents for Review DW PAG

Hi Lisa,

Attached are the files for review regarding the revisions to the DW PAG in response to public comments received on the proposal. Attached are 2 pdf files (Clean and Redline) that are very

easy to read, and also a word version (this one is a bit busy since it has with tracked edits) of the DW PAG Chapter.

Also attached is the draft input for the FRN section on DW that will be incorporated into the FRN for the overall PAG Manual.

Thanks

Sam

==========

Samuel Hernández Quiñones, P.E.
Environmental Engineer
Office of Water

Environmental Protection Agency
1200 Pennsylvania Ave. NW
Washington, DC 20460
202-564-1735

"USEPA Protecting Human Health and the Environment"

To: Burneson, Eric[Burneson.Eric@epa.gov]
From: Christ, Lisa
Sent: Wed 8/24/2016 5:16:22 PM
Subject: RE: ERIC Quick Look: Question regarding possible PAG chart

Thanks!

From: Burneson, Eric
Sent: Wednesday, August 24, 2016 12:33 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: RE: ERIC Quick Look: Question regarding possible PAG chart

I would recommend keeping all of the text of the response in one place. Don't break up the questions or the answers.

What happens if the emergency lasts longer than a year?

Could the intermediate water contamination numbers in the proposed PAG continue to be used? If so, for how long would the EPA consider it acceptable for these intermediate guidelines to be used?

EPA established the drinking water PAG assuming the incident would last one year. In the event the radiological emergency lasts longer than one year, decision makers should re-assess the situation and recalculate the DRLs using the longer duration and re-evaluate the protective action.

It is important to note, a water system that exceeds the maximum contaminant levels for radionuclides, regardless of the circumstance, are in violation and must take action to return to compliance as soon as practicable. Water systems in violation with NPDWR must work with the primacy agency to determine a schedule and plan to return to compliance.

From: Christ, Lisa
Sent: Wednesday, August 24, 2016 12:12 PM
To: Burneson, Eric <Burneson.Eric@epa.gov>
Subject: ERIC Quick Look: Question regarding possible PAG chart

Eric,

If you have time I'd like your quick review – especially Q2. These are follow up Qs from WSJ.

Thanks-

Lisa

From: Greene, Ashley
Sent: Tuesday, August 23, 2016 4:44 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Cc: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>
Subject: FW: Question regarding possible PAG chart

Hi Lisa,

A few additional questions from WSJ on PAGs.

1) What happens if the emergency lasts longer than a year?

Ex. 5 - Deliberative Process

2) Could the intermediate water contamination numbers in the proposed PAG continue to be used?

Ex. 5 - Deliberative Process

If so, for how long would the EPA consider it acceptable for these intermediate guidelines to be

used?

Ex. 5 - Deliberative Process

Thanks,
Ashley

From: Fuld, John
Sent: Tuesday, August 23, 2016 4:23 PM
To: Greene, Ashley <Greene.Ashley@epa.gov>; Loop, Travis <Loop.Travis@epa.gov>
Subject: Fwd: Question regarding possible PAG chart

Follow ups

Thanks

Sent from my iPhone

Begin forwarded message:

From: "Harrison, Melissa" <Harrison.Melissa@epa.gov>
Date: August 23, 2016 at 4:20:29 PM EDT
To: "Fuld, John" <Fuld.John@epa.gov>
Subject: RE: Question regarding possible PAG chart

Thanks-did you also see his other follow up questions:

What happens if the emergency lasts longer than a year? Could the intermediate water contamination numbers in the proposed PAG continue to be used? If so, for how long would the EPA consider it acceptable for these intermediate guidelines to be used?

Melissa J. Harrison

Deputy Associate Administrator

Office of Public Affairs

U.S. Environmental Protection Agency

Office: (202) 564-8421

Mobile: (202) 697-0208

Harrison.Melissa@epa.gov

From: Fuld, John
Sent: Tuesday, August 23, 2016 4:05 PM
To: Harrison, Melissa <Harrison.Melissa@epa.gov>
Subject: FW: Question regarding possible PAG chart

Yes the table is accurate

From: Greene, Ashley
Sent: Tuesday, August 23, 2016 4:00 PM
To: Fuld, John <Fuld.John@epa.gov>; Wadlington, Christina <Wadlington.Christina@epa.gov>
Cc: Loop, Travis <Loop.Travis@epa.gov>
Subject: RE: Question regarding possible PAG chart

Yes, the table is accurate.

From: Fuld, John
Sent: Tuesday, August 23, 2016 12:29 PM
To: Wadlington, Christina <Wadlington.Christina@epa.gov>; Greene, Ashley <Greene.Ashley@epa.gov>
Cc: Loop, Travis <Loop.Travis@epa.gov>
Subject: FW: Question regarding possible PAG chart

Ashley,

Could you please answer the question below for clarity.

From: Lalley, Cara
Sent: Tuesday, August 23, 2016 12:24 PM
To: Fuld, John <Fuld.John@epa.gov>
Subject: RE: Question regarding possible PAG chart

Sorry- yep, it's OGWDW. It looks like it is from the protective action guide for drinking water….at first I thought it might be related to health advisories but I don't know what is in the PAG (was in the same retreat you were all morning so couldn't look!)

From: Fuld, John
Sent: Tuesday, August 23, 2016 8:09 AM
To: Lalley, Cara <Lalley.Cara@epa.gov>
Subject: FW: Question regarding possible PAG chart

Cara,

Can you look at this and confirm chart is accurate? Or should I send to Christina's group.

John W. Fuld, Ph.D.

Media Relations Manager-Water
Environmental Protection Agency

1200 Constitution Ave

Washington DC 20460

Office: 202-564-8847

Cell: 202-815-6408

Fuld.john@epa.gov

From: Harrison, Melissa
Sent: Monday, August 22, 2016 9:32 PM
To: Fuld, John <Fuld.John@epa.gov>
Subject: Fwd: Question regarding possible PAG chart

See below from WSJ. Can we confirm the chart is correct?

Melissa J. Harrison

Deputy Associate Administrator

Office of Public Affairs

U.S. Environmental Protection Agency

Office: (202) 564-8421

Mobile: (202) 697-0208

Harrison.Melissa@epa.gov

Begin forwarded message:

From: "Emshwiller, John" <john.emshwiller@wsj.com>
Date: August 22, 2016 at 7:49:53 PM EDT

To: harrison.melissa@epa.gov
Subject: Question regarding possible PAG chart

Melissa,

Story is in NY being edited and could run soon. Based on the last chart you sent back to me, I have put together this one for possible use with the story. Just wanted to make sure it looks accurate from the EPA's perspective. thanks and regards, John

	Non-emergency(1) (Annual)	Emergency(2) (Adults)	Emergency (2) (Children/pregnant women)
Sr-90/Y-90	8/60 pCi/l	7,400 pCi/l	1,000 pCi/l
Cs-137	200	16,570	6,140
I-131	3	10,350	1,310

pCi/l: picocuries per liter annually

1-assumes 70 years of exposure at annual level

2.-assumes exposure for up to one year.

Note: Sr=Strontium; Y=Yttrium; Cs=Cesium; I=Iodine

Source: U.S. Environmental Protection Agency

--

John Emshwiller

Senior Special Writer

Wall Street Journal

1901 Ave. of the Stars Suite 200

Los Angeles, Ca. 90067

w- 424-204-4817

m-213-718-0521

To: Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]
From: Christ, Lisa
Sent: Tue 8/23/2016 1:27:37 PM
Subject: RE: DW PAG chapter
Input for FRN Re Drinking Water PAG August 2016_lc.docx

Hi Sam,

I added the NEPA and cumulative risk comments and our responses since they seem significant. I'm thinking OMB may want more detail. Also, please check with Sara to see if OMB cleared the Manual. Maybe their contractor can fold in the water chapter and fix the section numbering(?) while they work on final edits.

Thanks-

Lisa

From: Hernandez-Quinones, Samuel
Sent: Monday, August 22, 2016 3:37 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: RE: DW PAG chapter

Hi Lisa,

This is my input for the FRN, specifically addressing at high level the main issues raised in the comments on the proposal. This language will be inserted in the FRN that OAR will publish for the overall PAG Manual. Let me know if the scope is appropriate.

Sam

==========

Samuel Hernández Quiñones, P.E.

Environmental Engineer
Office of Water

Environmental Protection Agency
1200 Pennsylvania Ave. NW
Washington, DC 20460
202-564-1735

"USEPA Protecting Human Health and the Environment"

From: Christ, Lisa
Sent: Monday, August 22, 2016 12:13 PM
To: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>
Subject: RE: DW PAG chapter

Got it and thanks!

From: Hernandez-Quinones, Samuel
Sent: Monday, August 22, 2016 12:11 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: RE: DW PAG chapter

Hi Lisa,

Here is the word file.

Sam

==========

Samuel Hernández Quiñones, P.E.
Environmental Engineer
Office of Water

Environmental Protection Agency
1200 Pennsylvania Ave. NW
Washington, DC 20460
202-564-1735

"USEPA Protecting Human Health and the Environment"

From: Christ, Lisa
Sent: Monday, August 22, 2016 9:53 AM
To: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>
Subject: DW PAG chapter

Hi Sam,

Please send me the revised chapter and FRN language describing how we addressed public comment. Our schedule has this going for intra-office review today for 1.5 weeks. Eric, Peter and I should review before OLEM and others though.

Thanks-

Lisa

To: Wadlington, Christina[Wadlington.Christina@epa.gov]
From: Christ, Lisa
Sent: Wed 8/17/2016 7:00:52 PM
Subject: FW: Wall Street Journal Follow-up Questions--Urgent Attention Requested

Ex. 5 - Deliberative Process

From: Hernandez-Quinones, Samuel
Sent: Wednesday, August 17, 2016 2:38 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: RE: Wall Street Journal Follow-up Questions--Urgent Attention Requested

Hi Lisa,

Ex. 5 - Deliberative Process

Q. So just to be clear, the EPA is now assuming individuals drink less water per day (0.191 to 1.564 liters/day) than the amount (2 liters/day) that was assumed in the PAG floated in January 2009 during the last days of the Bush Administration? By drinking less water than previously assumed, a person could drink water with higher levels of radionuclides and still remain under the 100mrm/500mrm ceilings contained in the 2016 PAG, correct?

Ex. 5 - Deliberative Process

From: Christ, Lisa
Sent: Wednesday, August 17, 2016 1:15 PM
To: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>
Subject: FW: Wall Street Journal Follow-up Questions--Urgent Attention Requested

Hi Sam – Please prepare responses for the follow up questions below.

Thanks!

Lisa

From: Wadlington, Christina
Sent: Wednesday, August 17, 2016 1:03 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Cc: Huff, Lisa <Huff.Lisa@epa.gov>; Burneson, Eric <Burneson.Eric@epa.gov>
Subject: FW: Wall Street Journal Follow-up Questions--Urgent Attention Requested

The story that won't stop. Thoughts?

Q. So just to be clear, the EPA is now assuming individuals drink less water per day (0.191 to 1.564 liters/day) than the amount (2 liters/day) that was assumed in the PAG floated in January 2009 during the last days of the Bush Administration? By drinking less water than previously assumed, a person could drink water with higher levels of radionuclides and still remain under the 100mrm/500mrm ceilings contained in the 2016 PAG, correct?

A. ??

Q. Does this change in drinking assumptions at least partly explain why the proposed allowable contamination levels for specific radionuclides are generally higher in the 2016 PAG than in the

2009 one? Of the four radionuclides specifically mentioned in the 2016 PAG, three---Sr-90, I-131 and Cs-137---have higher allowable contamination levels than in the 2009 draft. Only the proposed level for Yttrium appears to be lower in the 2016 PAG than in 2009.

A. **Ex. 5 - Deliberative Process**

Christina Wadlington

Communications Director

Office of Ground Water and Drinking Water

U.S. Environmental Protection Agency

Tel: 202.566.1859

Email: wadlington.christina@epa.gov

Webpage: www.epa.gov/safewater

From: Fuld, John
Sent: Wednesday, August 17, 2016 12:33 PM
To: Wadlington, Christina <Wadlington.Christina@epa.gov>
Subject: FW: Wall Street Journal Follow-up Questions--Urgent Attention Requested

Christina,

More follow up..

From: Harrison, Melissa
Sent: Wednesday, August 17, 2016 12:30 PM
To: Fuld, John <Fuld.John@epa.gov>
Subject: RE: Wall Street Journal Follow-up Questions--Urgent Attention Requested

Sorry, but I just got this back from him…

Melissa,

Thanks. This is helpful. So just to be clear, the EPA is now assuming individuals drink less water per day (0.191 to 1.564 liters/day) than the amount (2 liters/day) that was assumed in the PAG floated in January 2009 during the last days of the Bush Administration? By drinking less water than previously assumed, a person could drink water with higher levels of radionuclides and still remain under the 100mrm/500mrm ceilings contained in the 2016 PAG, correct? Does this change in drinking assumptions at least partly explain why the proposed allowable contamination levels for specific radionuclides are generally higher in the 2016 PAG than in the 2009 one? Of the four radionuclides specifically mentioned in the 2016 PAG, three---Sr-90, I-131 and Cs-137---have higher allowable contamination levels than in the 2009 draft. Only the proposed level for Yttrium appears to be lower in the 2016 PAG than in 2009.

As for my story, it is basically a look at the proposed drinking-water PAG and some of the various comments it has drawn. It is in the process of being edited. Not yet sure when it will run but possibly fairly soon.

I look forward to hearing back from you on my follow-up questions.

Thanks and best,

John

Melissa J. Harrison

Deputy Associate Administrator

Office of Public Affairs

U.S. Environmental Protection Agency

Office: (202) 564-8421

Mobile: (202) 697-0208

Harrison.Melissa@epa.gov

From: Fuld, John

Sent: Wednesday, August 17, 2016 9:33 AM
To: Harrison, Melissa <Harrison.Melissa@epa.gov>
Subject: FW: Wall Street Journal Follow-up Questions--Urgent Attention Requested

Melissa,

Here is the response to the WSJ follow up question (S).

John W. Fuld, Ph.D.

Media Relations Manager-Water
Environmental Protection Agency

1200 Constitution Ave

Washington DC 20460

Office: 202-564-8847

Cell: 202-815-6408

Fuld.john@epa.gov

From: Wadlington, Christina
Sent: Wednesday, August 17, 2016 9:19 AM
To: Loop, Travis <Loop.Travis@epa.gov>; Fuld, John <Fuld.John@epa.gov>
Cc: Dennis, Allison <Dennis.Allison@epa.gov>
Subject: RE: Wall Street Journal Follow-up Questions--Urgent Attention Requested

Question. For example, the 2016 PAG uses age specific mean drinking water ingestion rates from FGR-13, earlier calculation used 2 liters per day, the intake of the 90th% of the U.S. population. Does this mean that ,on average, the EPA is now assuming an individual takes in

less than 2 liters per day of drinking water? What is the range of "age specific mean drinking water ingestion rates" used by the EPA for the 2016 PAG?

Ex. 5 - Deliberative Process

Question. re the following numbers in the chart below accurate? I took the numbers for the column marked “Emergency” from the proposed PAG levels for non-pregnant/non-nursing adults. I took the numbers for the “Non-emergency” column from the 2002 EPA document titled “Radionuclides in Drinking Water: A Small Entity Compliance Guide.” If any of the numbers in the chart are inaccurate, please tell me what numbers would be accurate.

Ex. 5 - Deliberative Process

**

<u>EPA’s statement</u>

Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

Christina Wadlington

Communications Director

Office of Ground Water and Drinking Water

U.S. Environmental Protection Agency

Tel: 202.566.1859

Email: wadlington.christina@epa.gov

Webpage: www.epa.gov/safewater

From: Loop, Travis
Sent: Tuesday, August 16, 2016 4:27 PM
To: Wadlington, Christina <Wadlington.Christina@epa.gov>
Subject: Fwd: Wall Street Journal Follow-up Questions--Urgent Attention Requested

Can we answer this follow up from WSJ today?

Travis Loop

Communications Director for Water

U.S. Environmental Protection Agency

Phone: 202.870.6922

Follow us on Twitter @EPAwater

Begin forwarded message:

From: "Harrison, Melissa" <Harrison.Melissa@epa.gov>
Date: August 16, 2016 at 4:23:49 PM EDT
To: "Loop, Travis" <Loop.Travis@epa.gov>, "Dennis, Allison" <Dennis.Allison@epa.gov>
Subject: FW: Wall Street Journal Follow-up Questions--Urgent Attention Requested

Hey team OW-was Monica working with you on these questions from the WSJ? I know she previously responded, but he's back with the follow-ups below. If not, will you point me in the right direction? Thanks! Melissa

Melissa J. Harrison

Deputy Associate Administrator

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Harrison.Melissa@epa.gov

From: Emshwiller, John [mailto:john.emshwiller@wsj.com]
Sent: Tuesday, August 16, 2016 11:06 AM
To: Lee, Monica <Lee.Monica@epa.gov>
Cc: Harrison, Melissa <Harrison.Melissa@epa.gov>
Subject: Wall Street Journal Follow-up Questions--Urgent Attention Requested

Monica,

I wanted to make sure you saw the the additional questions I sent over the past two days (copies of which are below). My editor is working on the draft of the story, so getting any agency responses back as soon as possible would be very helpful.

Also, to elaborate on the first question regarding the EPA's change in it how it calculated an individual's daily water intake, is it accurate to say that agency has gone from setting

recommended allowable contamination levels that are based on the intake of the person at 90th percentile of consumption to a calculation basing those levels on the person at the 50th percentile of consumption? If so, wouldn't this change allow the average adult male or non-pregnant/non-nursing adult female to consume water with larger amounts of radioactive contamination than would have been the case if the 90th percentile standard had been continued? If all this accurate, why did the EPA decide to change from the 90th percentile assumption to the 50th percentile assumption?

Thanks and regards,

John

1. Emshwiller, John <john.emshwiller@wsj.com>

Aug 14 (2 days ago)

to Monica

Monica,

Part of the agency's response to my questions included this statement:

For example, the 2016 PAG uses age specific mean drinking water ingestion rates from FGR-13, earlier calculation used 2 liters per day, the intake of the 90th% of the U.S. population.

Does this mean that,on average, the EPA is now assuming an individual takes in less than 2 liters per day of drinking water? What is the range of "age specific mean drinking water ingestion rates" used by the EPA for the 2016 PAG?

Thanks and regards,

John

2. Emshwiller, John <john.emshwiller@wsj.com>

Monica,

Are the following numbers in the chart below accurate? I took the numbers for the column marked "Emergency" from the proposed PAG levels for non-pregnant/non-nursing adults. I took the numbers for the "Non-emergency" column from the 2002 EPA document titled "Radionuclides in Drinking Water: A Small Entity Compliance Guide." If any of the numbers in the chart are inaccurate, please tell me what numbers would be accurate. Thanks and Regards, John

	Non-emergency (pCi/l)	Emergency (pCi/l)
Sr-90/Y-90	68	7,400
Cs-137	200	16,570
I-131	3	10,350

--

John Emshwiller

Senior Special Writer

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To: Burneson, Eric[Burneson.Eric@epa.gov]
From: Christ, Lisa
Sent: Wed 8/17/2016 5:23:58 PM
Subject: Alan's vm

Eric –

The OMB review for the entire PAG manual is supposed to end on 8/19 (Friday). Sara mentioned they have been providing pass back responses as OMB has been providing comments. I'm not aware of any drinking water PAG comments that have come in during this last manual review by OMB. I'm waiting to hear back if water comments were received and/or OMB review is complete and/or on target to be completed this Friday.

Sam has been coordinating closely with Sara and the ORIA contractor in sorting and responding to public comments. She's provided draft responses for NEPA questions, since they received similar questions on other PAGs. I can extend the Friday invitation to ORIA folks, Jonathan, Alan, Lee and Sara if you'd like. Alternatively we could also set up a joint meeting early next week. Let me know your preference.

Of the 57,000 comments there are ~50 letters that have substantive comments to address. I'm not aware of any comments that provide a compelling reason to revise the PAG.

Lisa

To: Wadlington, Christina[Wadlington.Christina@epa.gov]
Cc: Burneson, Eric[Burneson.Eric@epa.gov]; Huff, Lisa[Huff.Lisa@epa.gov]
From: Christ, Lisa
Sent: Wed 8/10/2016 6:00:57 PM
Subject: RE: Wall Street Journal Follow-up Questions re PAG--URGENT ATTENTION REQUESTED

Yes – looks good

From: Wadlington, Christina
Sent: Wednesday, August 10, 2016 12:50 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Cc: Burneson, Eric <Burneson.Eric@epa.gov>; Huff, Lisa <Huff.Lisa@epa.gov>
Subject: RE: Wall Street Journal Follow-up Questions re PAG--URGENT ATTENTION REQUESTED

Thanks Lisa. This works for me. Here's the final. Ok to send?

The purpose of EPA's Protective Active Guide (PAG) for Radiological Incidents is to guide planning and decision-making efforts by local and state officials. It is not intended for long-term or everyday use. The proposed PAG does not affect EPA's drinking water standards for radionuclides. Therefore, affected public water systems are expected to take actions to return to compliance with drinking water standards after a radiological emergency as soon as practicable.

Unlike the 2016 PAG, the 2009 draft document was never finalized or released for public comment or publication. Since 2009, EPA modified the methodology used to calculate Derived Response Levels (DRLs). For example, the 2016 PAG uses age specific mean drinking water ingestion rates from FGR-13, earlier calculation used 2 liters per day, the intake of the 90th% of the U.S. population.

From: Christ, Lisa
Sent: Wednesday, August 10, 2016 12:46 PM
To: Wadlington, Christina <Wadlington.Christina@epa.gov>
Cc: Burneson, Eric <Burneson.Eric@epa.gov>; Huff, Lisa <Huff.Lisa@epa.gov>
Subject: RE: Wall Street Journal Follow-up Questions re PAG--URGENT ATTENTION REQUESTED

Hi Christina-

A difference I can quickly point out is changes in ingestions rates. See below.

Lisa

From: Wadlington, Christina
Sent: Wednesday, August 10, 2016 12:13 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Cc: Burneson, Eric <Burneson.Eric@epa.gov>; Huff, Lisa <Huff.Lisa@epa.gov>
Subject: FW: Wall Street Journal Follow-up Questions re PAG--URGENT ATTENTION REQUESTED

Lisa,

I talked to Monica, and she is fine with a statement similar to the below.

Can you review for accuracy?

Ex. 5 - Deliberative Process

From: Fuld, John
Sent: Wednesday, August 10, 2016 11:01 AM
To: Wadlington, Christina <Wadlington.Christina@epa.gov>
Subject: FW: Wall Street Journal Follow-up Questions re PAG--URGENT ATTENTION REQUESTED

Christina,

And there is more .... **hard deadline of COB today**.

From: Lee, Monica
Sent: Wednesday, August 10, 2016 10:36 AM
To: Fuld, John <Fuld.John@epa.gov>
Cc: Dennis, Allison <Dennis.Allison@epa.gov>; Loop, Travis <Loop.Travis@epa.gov>
Subject: FW: Wall Street Journal Follow-up Questions re PAG--URGENT ATTENTION REQUESTED

Here are the additional questions – hard deadline of COB today.

From: Emshwiller, John [mailto:john.emshwiller@wsj.com]
Sent: Tuesday, August 09, 2016 11:19 PM
To: Lee, Monica <Lee.Monica@epa.gov>
Cc: Harrison, Melissa <Harrison.Melissa@epa.gov>
Subject: Wall Street Journal Follow-up Questions re PAG--URGENT ATTENTION REQUESTED

Monica,

Here are the follow-up questions I mentioned in the email earlier today. Several are essentially repeats of questions I asked days ago but never really got an answer to. The new ones, I think, can be readily responded to by the EPA.

I'd appreciate any responses the agency has by the close of business Wednesday, August 10, since I believe this story is competitive.

If you have any questions, please don't hesitate to contact me.

Thanks and regards,

John

LATEST WSJ QUESTIONS FOR EPA

1. Are the allowable radionuclide contamination levels the EPA is proposing up to thousands of times greater than the normal MCLs used by the EPA to determine acceptable risks? For example, your proposed I-131 level of 10,350 pCi/l for adults appears to more than than 3,000 times above the normal MCL of 3 pCi/L

2. Did the EPA in January 2009, during the last days of the Bush Administration, put forward a draft protective action guide for drinking water? (copy of which is attached) Did that guide contain proposed acceptable contamination levels for 110 radionuclides? Did the EPA during the early days of the Obama Administration pull that guide back for further study?

3. Did that Bush Administration PAG contain a recommendation that individuals be allowed to get a dose from drinking water of up to 500 millirems per year?

4. 2009 internal EPA documents, prepared by Stuart Walker (copies attached) and obtained through the FOIA process, criticized the 500-millirems dose level as too high. The documents also contained a chart showing that the allowable levels of contamination being proposed for some of the 110 radionuclides were so high that an individual could get a lifetime's (70 years) dose by drinking water for a period of weeks or even days. Does the EPA have any comment about these statements?

5. A January 2009 email (also attached) by an EPA attorney, Charles Openchowski, also obtained under FOIA, said the proposed PAG "would undermine our Superfund cleanup decisions as well as oversight and enforcement." Does the EPA have any comment on this statement?

6. A June 9, 2011 memo (also attached) from R.W. Borchardt, executive director for operations at the NRC, to the commissioners said the EPA had backed away from a commitment to a 500 mrem/yr standard for the drinking water PAGs. Instead, the EPA planned to defer to the SDWA limit of 4 mrem/year. The memo also said "the EPA staff has stated that it will not consider any comments on drinking water PAGs and that it considers this issue to be closed." Does this memo accurately reflect the EPA staff position at the time? If not, how is the description inaccurate?

7. The proposed PAG made public in June contains a recommendation that adults be allowed to receive up to 500 millirem per year. If the Borchard memo is accurate, what caused the EPA to change its position from the one it had in 201?

8. In the current proposal, of the three radionuclides where recommended maximum contamination levels are given---for Sr-90/Y-90; I-131 and Cs-137---are the levels for each of those higher than they were in the PAG prepared in the Bush-era PAG of 2009? If not, how many of the three are above? Why are any of the levels higher?

9. Jeff Ruch, executive director of Public Employees for Environmental Responsibility, told me that in order to get the internal EPA documents cited above, his group had to file a lawsuit after the EPA turned down its FOIA request. Is that correct? Mr. Ruch also accused the EPA of not being at all transparent on the PAG issue, saying that "We have heard of hiding the ball but this is hiding the whole basketball court." Does the EPA have any comment?

10. In its comment opposing the proposed PAG, the New York Attorney General's office said the proposal would "potentially allow millions of New York residents to ingest drinking water containing concentrations of radionuclides that are well in excess of what has been considered to pose an acceptable risk." Does the EPA have any comment?

END

--

John Emshwiller

Senior Special Writer

Wall Street Journal

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To: Wadlington, Christina[Wadlington.Christina@epa.gov]; Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]
Cc: Greene, Ashley[Greene.Ashley@epa.gov]
From: Christ, Lisa
Sent: Fri 8/5/2016 2:36:17 PM
Subject: RE: Media Inquiry: Wall Street Journal. Deadline noon tomorrow

Hi Christina,

Draft responses to the two additional questions. Let us know if you have questions or need anything else.

Lisa

Q. In the June 2016 EPA document titled "Draft Protective Action Guide (PAG) for Drinking Water", on page 18 in Table 1, the agency gives DRLs for three Sr-90/Y-90, Cs-137 and I-131. Are the numbers in that chart with radioactive decay or without radioactive decay?

Response:

Ex. 5 - Deliberative Process

Q. Earlier this year, the EPA issued an emergency administrative order in connection with the drinking-water supply of Flint, Mich. It is my understanding that this action was in part prompted by concerns that the tap water in many homes in Flint exceeded the federal action level for lead of 15 ppb. It is also my understanding that many of those exceedances were in the range of 25 ppb and most were under 150 pbb. Some critics of the EPA's drinking-water PAGs for radioactive contaminants argue that the agency felt emergency action was needed in Flint when the level of a dangerous contaminant was roughly two to ten times above an action level. However, these critics say, the EPA in the PAGs is advocating allowing people to drink water for months or more that contain radioactive contaminants at levels hundreds or even thousands of times greater than the normal action levels. These critics argue that EPA seems to be much more vigorous in its protection of the public from lead than it is in its protection of the public from radiation. I'd like to get the EPA's response to such criticisms.

Response:

Ex. 5 - Deliberative Process

From: Wadlington, Christina
Sent: Thursday, August 04, 2016 4:38 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>; Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>
Subject: Media Inquiry: Wall Street Journal. Deadline noon tomorrow

Lisa/Sam,

Provided are (2) additional follow up, questions that the reporter sent over. The last series is with Peter and I hope to get that out asap. These aren't due until tomorrow. Can you please send the responses to Ashley in the morning to give Peter time to review?

THANK YOU!

**

Q. In the June 2016 EPA document titled "Draft Protective Action Guide (PAG) for Drinking Water", on page 18 in Table 1, the agency gives DRLs for three Sr-90/Y-90, Cs-137 and I-131. Are the numbers in that chart with radioactive decay or without radioactive decay?

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Christina Wadlington

Communications Director

Office of Ground Water and Drinking Water

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Webpage: www.epa.gov/safewater

To: Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]
Cc: Wadlington, Christina[Wadlington.Christina@epa.gov]
From: Christ, Lisa
Sent: Thur 8/4/2016 7:25:28 PM
Subject: RE: PAG Media Inquiry for the WSJ. Deadline ASAP
WSJ PAG Qs.docx

Sam – Thanks!

Christina – attached is response with a couple comments from me and only small revisions to Sam's write up .

Lisa

From: Hernandez-Quinones, Samuel
Sent: Thursday, August 04, 2016 3:07 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Cc: Wadlington, Christina <Wadlington.Christina@epa.gov>
Subject: RE: PAG Media Inquiry for the WSJ. Deadline ASAP

Hi Lisa,

Here is my input. Let me know if you have any questions.

Sam

Question #1

How do the radionuclide levels, in pCi/l, of the currently proposed PAGs (which I will call the Obama PAGs) compare with the levels proposed by the EPA in the draft PAG document from the agency that surfaced in January 2009 in the last days of the Bush Administration (which I will call the Bush PAGs)? As I understand it, the Bush PAGs were pulled back during the early days of the Obama Administration and then replaced by the Obama PAGs that came out in June. In the Obama PAGs, I have only seen the proposed pCi/l numbers for three

radionuclides: Sr-90/Y-90; Cs-137; I-131. In each case, it appears that the proposed level for adults is higher than the levels proposed in the Bush PAGs. If that is the case, why have the allowable levels been raised?

Question #2

The draft Bush PAGs laid out allowable levels in water for over 100 radionuclides. I've only found the three cited above in the Obama PAGs. Can I have the Obama PAG proposed levels for the remaining 100-plus radionuclides that were in the Bush document? If I can't have them, why not? I'd also like to know why it appears that acceptable contamination levels were given out for only three radionuclides.

Response to Questions 1&2:

Ex. 5 - Deliberative Process

Question #3

I have reviewed a January 2009 internal EPA analysis that I am told was obtained under the FOIA. That analysis indicates that some of the contamination levels for the 100-plus

radionuclides in the Bush PAGs meant that a person drinking as little as one glass of water could get the same amount of radiation exposure as drinking water for 70 years under the normal MCLs. In other cases, it would take a week or month or several months to get the 70-year dose at the allowable levels being contemplated by the Bush PAGs. Since it appears the allowable levels to adults are higher in the Obama PAGs than the Bush PAGs, I'd like to talk to the EPA about whether the current proposal would allow someone to get a lifetime worth of radiation in a very short period of time. I'd also appreciate any agency comment on that 2009 internal analysis, which said that the proposed exposure levels for two radionuclides were so high, drinking the contaminated water could result in vomiting and fever.

Response to Question #3

Ex. 5 - Deliberative Process

Question #4

I have also reviewed a June 9, 2011 memo from R.W. Borchardt, executive director for operations at the NRC, to the commissioners. In that memo Mr. Borchardt said the EPA had backed away from a commitment to a 500 mrem/yr standard for the drinking water PAGs. Instead, the EPA planned to defer to the SDWA limit of 4 mrem/year. At a working-group meeting with other agencies, "the EPA staff has stated that it will not consider any comments on drinking water PAGs and that it considers this issue to be closed," he wrote. The NRC clearly objected to the EPA's plan and said would continue to support an alternative that included the 500 mrem/yr exposure standard. Does the EPA have any comment on the information in the Borchardt memo? If what Mr. Borchardt wrote is accurate, what made the EPA change its mind concerning the PAGs unveiled in June of this year, which include the 500 mrem annual exposure level?

Response to Question #4

Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

From: Wadlington, Christina
Sent: Thursday, August 04, 2016 1:51 PM
To: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>
Subject: FW: PAG Media Inquiry for the WSJ. Deadline ASAP

Christina Wadlington

Communications Director

Office of Ground Water and Drinking Water

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Email: wadlington.christina@epa.gov

Webpage: www.epa.gov/safewater

From: Wadlington, Christina
Sent: Thursday, August 04, 2016 1:39 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Cc: Huff, Lisa <Huff.Lisa@epa.gov>; Oshida, Phil <Oshida.Phil@epa.gov>
Subject: RE: PAG Media Inquiry for the WSJ. Deadline ASAP

Lisa,

I just heard your email. Provided is a bit more text to help with your review. Please submit when possible, as I understand you're tied up for a while today.

Thanks in advance.

1. How do the radionuclide levels, in pCi/l, of the currently proposed PAGs (which I will call the Obama PAGs) compare with the levels proposed by the EPA in the draft PAG document from the agency that surfaced in January 2009 in the last days of the Bush Administration (which I will call the Bush PAGs)? As I understand it, the Bush PAGs were pulled back during the early days of the Obama Administration and then replaced by the Obama PAGs that came out in June. In the Obama PAGs, I have only seen the proposed pCi/l numbers for three radionuclides: Sr-90/Y-90; Cs-137; I-131. In each case, it appears that the proposed level for adults is higher than the levels proposed in the Bush PAGs. If that is the case, why have the allowable levels been raised?

Ex. 5 - Deliberative Process

2. The draft Bush PAGs laid out allowable levels in water for over 100

radionuclides. I've only found the three cited above in the Obama PAGs. Can I have the Obama PAG proposed levels for the remaining 100-plus radionuclides that were in the Bush document? If I can't have them, why not? I'd also like to know why it appears that acceptable contamination levels were given out for only three radionuclides.

Ex. 5 - Deliberative Process

3. I have reviewed a January 2009 internal EPA analysis that I am told was obtained under the FOIA. That analysis indicates that some of the contamination levels for the 100-plus radionuclides in the Bush PAGs meant that a person drinking as little as one glass of water could get the same amount of radiation exposure as drinking water for 70 years under the normal MCLs. In other cases, it would take a week or month or several months to get the 70-year dose at the allowable levels being contemplated by the Bush PAGs. Since it appears the allowable levels to adults are higher in the Obama PAGs than the Bush PAGs, I'd like to talk to the EPA about whether the current proposal would allow someone to get a lifetime worth of radiation in a very short period of time. I'd also appreciate any agency comment on that 2009 internal analysis, which said that the proposed exposure levels for two radionuclides were so high, drinking the contaminated water could result in vomiting and fever.

Ex. 5 - Deliberative Process

4. I have also reviewed a June 9, 2011 memo from R.W. Borchardt, executive director for operations at the NRC, to the commissioners. In that memo Mr. Borchardt said the EPA had backed away from a commitment to a 500 mrem/yr standard for the drinking water PAGs. Instead, the EPA planned to defer to the SDWA limit of 4 mrem/year. At a working-group meeting with other agencies, "the EPA staff has stated that it will not consider any comments on drinking water PAGs and that it considers this issue to be closed," he wrote. The NRC clearly objected to the EPA's plan and said would continue to support an alternative that included the 500 mrem/yr exposure standard. Does the EPA have any comment on the information in the Borchardt memo? If what Mr. Borchardt wrote is accurate, what made the EPA change its mind concerning the PAGs unveiled in June of this year, which include the 500 mrem annual exposure level?

LISA: Does anyone recall this meeting? If not, I prefer to ask OPA to provide no comment.

Christina Wadlington

Communications Director

Office of Ground Water and Drinking Water

U.S. Environmental Protection Agency

Tel: 202.566.1859

Email: wadlington.christina@epa.gov

Webpage: www.epa.gov/safewater

From: Wadlington, Christina
Sent: Thursday, August 04, 2016 12:48 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Cc: Huff, Lisa <Huff.Lisa@epa.gov>; Oshida, Phil <Oshida.Phil@epa.gov>
Subject: PAG Media Inquiry for the WSJ. Deadline ASAP

Lisa, Can you assist with the below? Sorry I don't have any clue how to move on the last two.

Please note the deadline is as soon as possible.

Thank you.

1. How do the radionuclide levels, in pCi/l, of the currently proposed PAGs (which I will call the Obama PAGs) compare with the levels proposed by the EPA in the draft

PAG document from the agency that surfaced in January 2009 in the last days of the Bush Administration (which I will call the Bush PAGs)? As I understand it, the Bush PAGs were pulled back during the early days of the Obama Administration and then replaced by the Obama PAGs that came out in June. In the Obama PAGs, I have only seen the proposed pCi/l numbers for three radionuclides: Sr-90/Y-90; Cs-137; I-131. In each case, it appears that the proposed level for adults is higher than the levels proposed in the Bush PAGs. If that is the case, why have the allowable levels been raised?

Ex. 5 - Deliberative Process

2. The draft Bush PAGs laid out allowable levels in water for over 100 radionuclides. I've only found the three cited above in the Obama PAGs. Can I have the Obama PAG proposed levels for the remaining 100-plus radionuclides that were in the Bush document? If I can't have them, why not? I'd also like to know why it appears that acceptable contamination levels were given out for only three radionuclides.

Ex. 5 - Deliberative Process

3. I have reviewed a January 2009 internal EPA analysis that I am told was obtained under the FOIA. That analysis indicates that some of the contamination levels for the 100-plus radionuclides in the Bush PAGs meant that a person drinking as little as one glass of water could get the same amount of radiation exposure as drinking water for 70 years under the normal MCLs. In other cases, it would take a week or month or several months to get the 70-year dose at the allowable levels being contemplated by the Bush PAGs. Since it appears the allowable levels to adults are higher in the Obama PAGs than the Bush PAGs, I'd like to talk to the EPA about whether the current proposal would allow someone to get a lifetime worth of radiation in a very short period of time. I'd also appreciate any agency comment on that 2009 internal analysis, which said that the proposed exposure levels for two radionuclides were so high, drinking the contaminated water could result in vomiting and fever.

Response:

4. I have also reviewed a June 9, 2011 memo from R.W. Borchardt, executive director for operations at the NRC, to the commissioners. In that memo Mr. Borchardt said the EPA had backed away from a commitment to a 500 mrem/yr standard for the drinking water PAGs. Instead, the EPA planned to defer to the SDWA limit of 4 mrem/year. At a

working-group meeting with other agencies, "the EPA staff has stated that it will not consider any comments on drinking water PAGs and that it considers this issue to be closed," he wrote. The NRC clearly objected to the EPA's plan and said would continue to support an alternative that included the 500 mrem/yr exposure standard. Does the EPA have any comment on the information in the Borchardt memo? If what Mr. Borchardt wrote is accurate, what made the EPA change its mind concerning the PAGs unveiled in June of this year, which include the 500 mrem annual exposure level?

Response:

Christina Wadlington

Communications Director

Office of Ground Water and Drinking Water

U.S. Environmental Protection Agency

Tel: 202.566.1859

Email: wadlington.christina@epa.gov

Webpage: www.epa.gov/safewater

From: Fuld, John
Sent: Thursday, August 04, 2016 12:19 PM
To: Wadlington, Christina <Wadlington.Christina@epa.gov>
Subject: Media Inquiry - WSJ

From Monica:

I'll have more on his firm deadline later, but we should consider this pretty high priority" .

Office of Water

Media Inquiry

Travis Loop
Communications Director-Water
loop.travis@epa.gov

John W. Fuld, Ph.D.
Media Relations Mgr.-Water
fuld.john@epa.gov

DATE: August 4, 2016

OUTLET: WSJ

TOPIC: RE: PAGs

DEADLINE: **3:30 BUT Monica Said Top Priority**

QUESTION:

1. How do the radionuclide levels, in pCi/l, of the currently proposed PAGs (which I will call the Obama PAGs) compare with the levels proposed by the EPA in the draft PAG document from the agency that surfaced in January 2009 in the last days of the Bush Administration (which I will call the Bush PAGs)? As I understand it, the Bush PAGs were pulled back during the early days of the Obama Administration and then replaced by the Obama PAGs that came out in June. In the Obama PAGs, I have only seen the proposed pCi/l numbers for three radionuclides: Sr-90/Y-90; Cs-137; I-131. In each case, it appears that the proposed level for adults is higher than the levels proposed in the Bush PAGs. If that is the case, why have the allowable levels been raised?

2. The draft Bush PAGs laid out allowable levels in water for over 100 radionuclides. I've only found the three cited above in the Obama PAGs. Can I have the Obama PAG proposed levels for the remaining 100-plus radionuclides that were in the Bush document? If I can't have them, why not? I'd also like to know why it appears that acceptable contamination levels were given out for only three radionuclides.

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4. I have also reviewed a June 9, 2011 memo from R.W. Borchardt, executive director for operations at the NRC, to the commissioners. In that memo Mr. Borchardt said the EPA had backed away from a commitment to a 500 mrem/yr standard for the drinking water PAGs. Instead, the EPA planned to defer to the SDWA limit of 4 mrem/year. At a working-group meeting with other agencies, "the EPA staff has stated that it will not consider any comments on drinking water PAGs and that it considers this issue to be closed," he wrote. The NRC clearly objected to the EPA's plan and said would continue to support an alternative that included the 500 mrem/yr exposure standard. Does the EPA have any comment on the information in the Borchardt memo? If what Mr. Borchardt wrote is accurate, what made the EPA change its mind concerning the PAGs unveiled in June of this year, which include the 500 mrem annual exposure level?

ANSWER:

John W. Fuld, Ph.D.

Media Relations Manager-Water
Environmental Protection Agency

1200 Constitution Ave

Washington DC 20460

Office: 202-564-8847

Cell: 202-815-6408

Fuld.john@epa.gov

To: Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]
From: Christ, Lisa
Sent: Wed 8/3/2016 8:45:30 PM
Subject: PAG letter
Shapiro Incoming_AX-16-001-0672 for OW
FW: PAGS paragraph for OW
FW: More NRC language for OW

Hi Sam –

FYI for now. We can wait until it is formally controlled to us via CMS to prepare a response. Also attached is information Lee provided from previous responses.

Thanks-

Lisa

To: Christ, Lisa[Christ.Lisa@epa.gov]
From: Veal, Lee
Sent: Wed 8/3/2016 6:38:55 PM
Subject: FW: More NRC language for OW
AX-11-000-8960_FinalResponse.docx

Lisa,

The attached includes a response paragraph that we use when explaining our role versus that of NRC. This may be useful for responses.

Lee

Lee Ann B. Veal

CREM Center Director

Office of Radiation and Indoor Air

Office: 202-343-9448; Cell: 202-617-4322

www.epa.gov/radiation

From: Ferguson, Rafaela
Sent: Wednesday, August 03, 2016 2:29 PM
To: Veal, Lee <Veal.Lee@epa.gov>
Subject: More NRC language for OW

Rafaela Ferguson

Special Assistant/Regional Coordinator

Radiation Protection Division

Office of Radiation and Indoor Air

Tel: 202-343-9362

Email: ferguson.rafaela@epa.gov

Fax: 202-343-2304

To: Wadlington, Christina[Wadlington.Christina@epa.gov]
Cc: Greene, Ashley[Greene.Ashley@epa.gov]; Harris, Adrienne[Harris.Adrienne@epa.gov]
From: Christ, Lisa
Sent: Mon 8/1/2016 12:28:40 PM
Subject: FW: Talkies for Water PAG, Internal Q&A
DWPAG_Internal-QA_07292016.docx
ATT00001.htm
DWPAG_TPts_07292016.docx
ATT00002.htm

FYI only --

From: DeCair, Sara
Sent: Sunday, July 31, 2016 2:32 PM
To: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>; Veal, Lee <Veal.Lee@epa.gov>; Nesky, Anthony <Nesky.Tony@epa.gov>; Wieder, Jessica <Wieder.Jessica@epa.gov>
Cc: Perrin, Alan <Perrin.Alan@epa.gov>
Subject: Fwd: Talkies for Water PAG, Internal Q&A

For prep in case Sen. Boxer called Gina, we provided these materials for Eric Burneson to give to Peter and the AA if needed. Alan made a few changes to the Q&A so we should replace the one on the One Drive site. I can do that Tuesday.

Sara

Sent from my iPhone

Begin forwarded message:

> **From:** "Perrin, Alan" <Perrin.Alan@epa.gov>
> **Date:** July 29, 2016 at 3:39:36 PM EDT
> **To:** "DeCair, Sara" <DeCair.Sara@epa.gov>
> **Subject: RE: Talkies for Water PAG, Internal Q&A**
>
> Take a look. Lots of revs to the talkies, see what you think – I was able to get this under Jon's nose before he blew town, so includes his first blush. Q&A sheet, no real changes just formatting, header and title (more aimed toward current use as background attachment?); I'm happy to stick with prev version also if that helps w/version control or anything. Cheers.

Alan Perrin, Deputy Director
Radiation Protection Division, USEPA
ofc (202) 343-9775 | mbl (202) 279-0376

From: DeCair, Sara
Sent: Wednesday, July 27, 2016 1:44 PM
To: Perrin, Alan <Perrin.Alan@epa.gov>
Subject: Talkies for Water PAG, Internal Q&A

Thanks for checking these talking points and editing so they're more useful. I've attached the clean version Q&A too.

Sara D. DeCair

http://www.epa.gov/radiation/rert/pags.html

202-343-9108

Room 1416 B in WJC West

To: Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]
From: Christ, Lisa
Sent: Tue 7/26/2016 5:09:30 PM
Subject: FW: Sen. Boxer Letter on Proposed Drinking Water PAGs
7.25.16 Radionuclides in Drinking Water.pdf

Hi Sam,

This will eventually be controlled to us, so please begin drafting a response.

Thanks-

Lisa

From: Davis, CatherineM
Sent: Tuesday, July 26, 2016 8:32 AM
To: Grevatt, Peter <Grevatt.Peter@epa.gov>
Cc: Burneson, Eric <Burneson.Eric@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>; Greene, Ashley <Greene.Ashley@epa.gov>; Harris, Adrienne <Harris.Adrienne@epa.gov>
Subject: Sen. Boxer Letter on Proposed Drinking Water PAGs

Hi Peter,

Attached is a letter we received late yesterday from Sen. Boxer on EPA's proposed Protective Action Guides for drinking water. SEPW minority staff asked that EPA include this in the comments on the proposal. I'll be putting it into CMS to start the regular process for responding to Congressional correspondence, but I wanted to give you a heads up in advance of the call this afternoon.

Regards,

Cathy Davis

Office of Congressional and

Intergovernmental Relations

202-564-2703

davis.catherinem@epa.gov

Send mail to:

US Environmental Protection Agency

1200 Pennsylvania Ave, NW

MC: 1305A

Washington, DC 20460

To: Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]
From: Christ, Lisa
Sent: Tue 7/26/2016 12:13:32 PM
Subject: comments on the PAG sent to me
Nuclear Energy Institute Comments on EPA Docket ID Number EPAHQ-OAR-2007-0268; FRL-9947-55-OW Notice of Availability Draft Protective Action Guide for Drinking Water After a Radiological Incident: 81FR37589
EPA Docket number EPA-HQ-OAR-2007-0268
EPA–HQ–OAR–2007–0268; FRL–9947–55– OW] Notice of Availability: Draft Protective Action Guide (PAG) for Drinking Water After a Radiological Incident

Hi Sam,

I replied to a couple of these requesting they also upload comments to the docket. Can you please check to see if they're in the docket or we need to have them placed in the docket?

Thanks!

Lisa

To: Christ, Lisa[Christ.Lisa@epa.gov]
From: Leona Morgan
Sent: Tue 7/26/2016 5:59:52 AM
Subject: EPA–HQ–OAR–2007–0268; FRL–9947–55– OW] Notice of Availability: Draft Protective Action Guide (PAG) for Drinking Water After a Radiological Incident
EPA-link-not-working.pdf
ATT00001.htm
EPA-link-not-working-2.pdf
ATT00002.htm

Dear Ms. Christ,
I was planning to use the online method to submit my comment, but the link was not working. I took 2 screen shots to show this problem at 2 different times before the deadline. However, I still submitted my comments via email, but many people may have been unable to submit comments via the online link.

Please inform whomever it may concern and perhaps extend the deadline.

Thank you,

Leona Morgan
Diné No Nukes
505 879 8547

www.dinenonukes.org

To: HIATT, Jerry[jwh@nei.org]
From: Christ, Lisa
Sent: Mon 7/25/2016 8:31:33 PM
Subject: Re: Nuclear Energy Institute Comments on EPA Docket ID Number EPAHQ-OAR-2007-0268; FRL-9947-55-OW Notice of Availability Draft Protective Action Guide for Drinking Water After a Radiological Incident: 81FR37589

Dear Mr. Hiatt,
Thank you for your interest in the drinking water PAG. Please upload your comments to the EPA docket to ensure your comments are considered.
Sincerely
Lisa Christ

Sent from my iPhone

> On Jul 25, 2016, at 4:26 PM, HIATT, Jerry <jwh@nei.org> wrote:
>
> July 25, 2016
>
>
> Ms. Lisa M. Christ
> Standards and Risk Management Division
> Office of Groundwater and Drinking Water
> Mail Code 4607M
> US Environmental Protection Agency
> 1200 Pennsylvania Ave. NW.
> Washington, DC 20460
>
>
> Subject: Nuclear Energy Institute Comments on EPA Docket ID Number EPAHQ-OAR-2007-0268; FRL-9947-55-OW Notice of Availability Draft Protective Action Guide for Drinking Water After a Radiological Incident: 81FR37589
>
> Dear Ms. Christ:
> On June 10, 2016 the Environmental Protection Agency (EPA) issued a Federal Register Notice (81 FR 37589) soliciting public comments on the EPA's proposal to include an addition to the 2013 revised interim Protective Action Guides and Planning Guidance for Radiological Incidents ("2013 revised PAG Manual," hereafter). EPA is proposing a two-tier drinking water PAG to be used during the intermediate phase of radiological emergencies. The proposed two-tiered PAG is a 500 millirem (5 mSv) per year projected dose for the general population (i.e., anyone over 15 years old, except pregnant women and women who are nursing) and a 100 millirem (1 mSv) per year projected dose for children under the age of 15, pregnant women, and nursing mothers.
> The Nuclear Energy Institute (NEI)[1] appreciates the opportunity to comment on the proposed addition to the 2013 revised PAG Manual. Please note that our comments are consistent with previous comments NEI provided on behalf of the nuclear industry for the "Updates to Protective Action Guides Manual: Protective Action Guides and Planning Guidance for Radiological Incidents," 78 Federal Register 22257, April 15, 2013.
>
> Overall, NEI is pleased to note that as highlighted in our 2013 comment letter in lieu of using National Primary Drinking Water Regulations (NPDWR) standards EPA is proposing the two tier approach and more appropriate dose limits for the drinking water PAG.
> Nonetheless, while the two tier approach is an improvement NEI still recommends that the EPA consider setting a range of 2-10 rem per year for all anticipated pathways of exposure (inclusive of consumption of food or drinking water) which would greatly provide enhanced flexibility for balancing avoidance of potential radiological health risks with risks and impacts associated with disruptive protective actions. In extreme and exigent situations where the use of contaminated food or water may be

unavoidable (e.g., in the aftermath of a natural disaster or terrorist event that results in significant damage to critical infrastructure), an all-pathways approach will provide more-informed options for decision-making. In most other cases, where contaminated food and water can be effectively quarantined, the range would apply more exclusively to decision-making based on projected external exposure and inhalation of radionuclides. This recommendation is consistent with guidance from the ICRP[2]
> We thank you for the opportunity to provide industry comments on the proposed rule. If you have any questions or require additional information, please contact me.
>
> Sincerely,
>
> Jerry W. Hiatt, CHP
> Senior Project Manager
>
> Nuclear Energy Institute
> 1201 F Street NW, Suite 1100
> Washington, DC 20004
> www.nei.org<http://www.nei.org/>
>
> P: 202-739-8171
> E: jwh@nei.org<mailto:jwh@nei.org>
>
>
>
>
>
>
> _____
>
> [1]The Nuclear Energy Institute (NEI) is the organization responsible for establishing unified industry policy on matters affecting the nuclear energy industry, including the regulatory aspects of generic operational and technical issues. NEI's members include all entities licensed to operate commercial nuclear power plants in the United States, nuclear plant designers, major architect/engineering firms, fuel cycle facilities, nuclear materials licensees, and other organizations and entities involved in the nuclear energy industry.
>
> [2] International Commission on Radiological Protection (ICRP). The 2007 Recommendations of the ICRP. ICRP Publication 103, Ann. ICRP 37(2-4), Elsevier, Amsterdam (2007
>
> [http://resources.nei.org/email/NEI_Logo.jpg]<http://www.nei.org>
>
> Take The NEI Future of Energy Quiz, www.NEI.org/whynuclear<http://www.nei.org/whynuclear>
>
> FOLLOW US ON
>
> [http://resources.nei.org/email/twitter.jpg]<http://twitter.com/NEI>
[http://resources.nei.org/email/NEI_FB.jpg] <http://www.facebook.com/NuclearEnergyInstitute>
[http://resources.nei.org/email/youtube.jpg] <http://www.youtube.com/user/NEINetwork>
[http://resources.nei.org/email/flickr.jpg] <http://www.flickr.com/photos/_nei/>
>
> This electronic message transmission contains information from the Nuclear Energy Institute, Inc. The information is intended solely for the use of the addressee and its use by any other person is not authorized. If you are not the intended recipient, you have received this communication in error, and any review, use, disclosure, copying or distribution of the contents of this communication is strictly prohibited. If you have received this electronic transmission in error, please notify the sender immediately by telephone or by electronic mail and permanently delete the original message. IRS Circular 230 disclosure: To ensure compliance with requirements imposed by the IRS and other taxing authorities, we inform you

that any tax advice contained in this communication (including any attachments) is not intended or written to be used, and cannot be used, for the purpose of (i) avoiding penalties that may be imposed on any taxpayer or (ii) promoting, marketing or recommending to another party any transaction or matter addressed herein.
>
> _____
>
> Sent through www.intermedia.com
> <07-25-16_EPA_NEI Comments on Draft PAG for Drinking Water.pdf>

To: Perrin, Alan[Perrin.Alan@epa.gov]
From: Christ, Lisa
Sent: Mon 7/25/2016 1:58:31 PM
Subject: RE: PAGs timeline: On track!

It's Markey's staff

From: Perrin, Alan
Sent: Monday, July 25, 2016 9:32 AM
To: Christ, Lisa <Christ.Lisa@epa.gov>; DeCair, Sara <DeCair.Sara@epa.gov>; Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>
Cc: Veal, Lee <Veal.Lee@epa.gov>
Subject: RE: PAGs timeline: On track!

Hi Lisa, Do you know if this is a request to brief Sen. Markey, or a request to brief Markey's staff?

Alan Perrin, Deputy Director
Radiation Protection Division, USEPA
ofc (202) 343-9775 | mbl (202) 279-0376

From: Christ, Lisa
Sent: Friday, July 22, 2016 12:52 PM
To: DeCair, Sara <DeCair.Sara@epa.gov>; Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>
Cc: Veal, Lee <Veal.Lee@epa.gov>; Perrin, Alan <Perrin.Alan@epa.gov>
Subject: RE: PAGs timeline: On track!

Good news! Also, Joel has offered to help make sure intra agency review happens in a timely manner.

Bad news - I just heard that Senator Markey requested a briefing on the PAG. No other information at this point.

From: DeCair, Sara
Sent: Friday, July 22, 2016 12:41 PM
To: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>
Cc: Veal, Lee <Veal.Lee@epa.gov>; Perrin, Alan <Perrin.Alan@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>
Subject: PAGs timeline: On track!

Sam, good discussion today. We're on the same page regarding which sections will belong in the drinking water Chapter/sections in the final PAG Manual. And since we have meetings set up next week to adjudicate the public comments with support from the contractor, EnDyna, I am hopeful we can be done with those within 7 to 10 days. We'll have an internal-use only comment spreadsheet, to keep track of our thinking.

Meantime, it's wise for us both to set up briefings for our immediate management to go through these things and ask them to help with expedited intra-agency review between Aug. 15 and 25... Our leadership can be looking at the finalized water chapter, in the finalized PAG Manual, with accompanying FR package materials (FR Notice, Comms Plan, Internal Q&A, Rollout, Desk Stmt, Fact Sheet, etc.) between Aug. 5 and 15th. Take a look at the attached project plan (unchanged from previous) to see if everyone thinks we can get OAR and OW review done by Aug. 15th, or if some reviews can be concurrent.

Thanks to all for the hard work moving this forward,

Sara

To: Burneson, Eric[Burneson.Eric@epa.gov]; Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]
From: Christ, Lisa
Sent: Mon 7/25/2016 12:22:09 PM
Subject: materials for PAG briefings
Rads in drinking water 1-pager_ogwdw.docx
Drinking Water PAG OMB brief 1_13_16.docx

Attached is the recent briefing paper on the drinking water PAG. Also a one pager we prepared that includes Q&A.

Sara and Lee are aware of congressional requests for briefings, I let them know Friday.

To: 'Diane D'Arrigo'[dianed@nirs.org]
From: Christ, Lisa
Sent: Thur 7/21/2016 12:47:23 PM
Subject: RE: clarifications on commenting on the Water PAGs

Hi Diane,

In response to your questions below:

1. Comments must be postmarked by July, 25, 2016.

2. Yes, this is the correct address for hand deliveries.

3. The docket center is open Monday-Friday from 8:30 am to 4:30 pm. Please visit this website for additional information for visitors. https://www.epa.gov/dockets/epa-docket-center-reading-room

Thank you for your interest in the drinking water PAG.

Lisa

From: Diane D'Arrigo [mailto:dianed@nirs.org]
Sent: Wednesday, July 20, 2016 10:39 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: clarifications on commenting on the Water PAGs

Lisa Christ

EPA contact for Docket EPA–HQ–OAR–2007–0268

christ.lisa@epa.gov

Dear Lisa

1 Do mailed-in comments have to *be received by* Monday July 25 at 11:59 PM or can they be POSTMARKED by that date and time?

2 For hand deliveries, can you confirm that deliveries must be made to

EPA Docket Center
WJC West Building, Room 3334
1301 Constitution Avenue, NW
Washington, DC 20004

What are the business hours for that site?

3 To confirm For mail deliveries the following address is where to send

U.S. Environmental Protection Agency
EPA Docket Center
EPA–HQ–OAR–2007–0268; FRL–9947–55–OW
Mail Code 28221T
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Thank you,

Diane D'Arrigo

Nuclear Information and Resource Service

dianed@nirs.org

mobile 202 841 8588

To: 'dianed@nirs.org'[dianed@nirs.org]; 'maryo@nirs.org'[maryo@nirs.org]
Cc: Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]
From: Christ, Lisa
Sent: Wed 7/20/2016 9:42:05 PM
Subject: FW: Docket Number (EPA-HQ-OAR-2007-0268; FRL-9947-55-OW)
Response to extension request NIRS.PDF

Dear Ms. D'Arrigo and Ms. Olson,

Please find attached a response to your letter from a group of Stakeholders requesting a 120-day extension of the comment period for the EPAs Draft Protective Action Guide for Drinking Water after a radiological incident. We believe that the reasons cited by the requestors do not warrant an extension of 120-days on the public comment period. The reasons cited in the letter by the requestors to justify the extension are outside the scope of interest for comments as requested by EPA.

We believe that the 45 day comment period is adequate to provide ample opportunity to members of the public to develop their input and recommendations on the drinking water proposal.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

Lisa Christ, Chief

Targeting and Analysis Branch

Office of Ground Water and Drinking Water

USEPA

1200 Pennsylvania Ave NW
Washington, DC 20460-0001
phone: 202.564.8354
fax: 202.564-3760

Mail Code: 4607M

From: Diane D'Arrigo [mailto:dianed@nirs.org]
Sent: Friday, July 15, 2016 5:49 PM
To: Beauvais, Joel <Beauvais.Joel@epa.gov>
Cc: Diane D'Arrigo <dianed@nirs.org>
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

Subject: FW: Docket Number (EPA-HQ-OAR-2007-0268; FRL-9947-55-OW)

Joel Beauvais, Deputy Assistant Administrator

Office of Water

US Environmental Protection Agency

202 564 5700

Beauvais.joel@epa.gov

Dear Joel Beauvais:

Below and attached are requests sent last week from 60 organizations and elected officials for extension on the comment period for the EPA Water Protective Action Guides for 120 more days.

We understand you will decide on this request. We had asked to know by Friday July 15th (today) but have not heard and it is at close of business.

Please do let us know your decision.

Thank you,

Diane D'Arrigo

NIRS

301 270 6477 x 15

Mobile 202 841 8588

dianed@nirs.org

From: Mary Olson
Sent: Friday, July 08, 2016 10:09 AM
To: a-and-r-docket@epa.gov
Subject: FW: Docket Number (EPA-HQ-OAR-2007-0268; FRL-9947-55-OW)

Same attached as PDF

To: Office of Ground Water and Drinking Water (draft Radioactive Water PAGs) Docket Number **(EPA-HQ-OAR-2007-0268; FRL-9947-55-OW)**

From: Fifty-Eight Organizations and two elected officials (undersigned) via Nuclear Information and Resource Service (NIRS) Contact: Mary Olson maryo@nirs.org 828-252-8409, Diane D'Arrigo (Primary Contact after July 13) dianed@nirs.org 301-270-6477

NOTE: the co-signers to this request have been compiled as a courtesy to the Agency. We have emails from each organization requesting they be signed on this request.

RE: Request for 120 day extension to comment on EPA's Draft Protective Action Guide (PAG) for Drinking Water After a Radiological Incident, EPA-HQ-OAR-2007-0268; FRL-9947-55-OW

Dear Lisa Christ, Office of Air and Radiation, and Office of Water:

We ask that EPA extend the public comment period on the Draft Protective Action Guide (PAG) for Drinking Water After a Radiological Incident (draft Radioactive Water PAGs) for 120 days beyond the July 25th deadline.

The changes proposed in the EPA draft Radioactive Water PAGs are extremely significant. They are complicated on their own and additionally by their proposed inclusion in the Draft PAGs (2013 PAG Manual at https://www.epa.gov/radiation/protective-action-guides-pags) on which many of us commented in 2013. Commenting must be done in conjunction with the existing PAG Manual since they would be combined in practice. Since radiation's effects are multiple, additive, cumulative and synergistic, we need to consider the impacts of proposed 100 to 500 millirems/year from water (Water PAG) in light of that from food, air, etc. (PAG) and bioaccumulation.

We appreciate EPA's acknowledgement in this draft of the reality that different life stages are differently impacted by radiation. The portion of the proposal recommending different levels of radioactive water contamination for different life stages adds complexity requiring more than technical analysis and discussion to comment meaningfully, especially when developing organizational positions and responses. Practical and philosophical issues must be considered as well. It appears that the life stage sensitivity is only being addressed in the Water PAG, not the whole PAG so this must be considered and assessed as well.

Excerpts to one of the supporting documents (NCRP-174) on which the proposed Water PAG is based have just been put up on the www.regulations.gov website (in July) but not the whole document in its entirety. The excerpts were not publically available for nearly half of the current comment period. We request this report and all other information used and supporting the Water PAGs be made publicly available, free of charge and that the comment period be extended to accommodate full review.

There are some confusing legal implications that need clarification before submitting comments. The length of time for which PAG guidance would apply is not expressly limited yet assumptions are made that it will be for limited periods only. Although the Federal Register says the PAG guidance levels don't supersede the Safe Drinking Water Act levels (maximum concentration levels) does the PAG relieve the polluter from legal liability? Clarification of these questions would be helpful and certainly additional time is needed to provide meaningful comments.

We request a 120 day extension. We also respectfully ask that you decide and notify us of your decision by July 15th.

Thank you for consideration of this extension request.

Sincerely,

Timothy Judson, Executive Director

Nuclear Information and Resource Service

Takoma Park, MD

Barbara Gottlieb, Environment & Health Director

Physicians for Social Responsibility

Washington, DC

Lynn Thorp

Clean Water Action

Washington, DC

Catherine Lincoln

Committee to Bridge the Gap

Ben Lomond, CA

Ken Bossong
SUN DAY Campaign

Cindy Folkers

Takoma Park, MD

Beyond Nuclear

Takoma Park, MD

Deb Katz

Citizen Awareness Network

Rowe, MA

Dr. Gwen DuBois, President

Chesapeake Physicians for Social Responsibility

Baltimore, MD

Toni Iseeman, Mayor pro tem of Laguna Beach

Laguna Beach, CA

Pam Patterson, Mayor

San Juan Capistrano, CA

Elaine Holder, President

San Luis Obispo Mothers for Peace

San Luis Obispo, CA

Jane Williams, Executive Director

California Communities Against Toxics

Rosamond, CA

Marylia Kelley,

Tri-Valley Communities Against a Radioactive Environment

Livermore, CA

Joni Arends
Concerned Citizens for Nuclear Safety
Santa Fe, NM

Don Safer

Tennessee Environmental Coalition

Nashville, Tennessee

Becky D. Rafter, MPA, Executive Director

Georgia Women's Action for New Directions

Atlanta, GA

Dave Kraft

Nuclear Energy Information Service

Chicago, IL

Robert M. Gould, MD, President

San Francisco Bay Area Chapter

Physicians for Social Responsibility

Robert K. Musil, Ph.D., M.P.H.

President & CEO, Rachel Carson Council

Bethesda, MD

Ruth Thomas

Environmentalists Inc.

Columbus, NC

Sarah Fields

Uranium Watch

Moab, Utah

Louis A. Zeller

Blue Ridge Environmental Defense League

VA, NC, SC, TN, AL, GA

Jessica Azulay, Program Director

Alliance for a Green Economy

Syracuse, NY

Connie Kline

Ohio CARE - Citizens Against a Radioactive Environment

Cleveland, OH

Pamela Hughes

Sierra Club Niagara Group Chair

New York State, Atlantic Chapter

Bob Ciesielski, Energy Committee Chair
Sierra Club Atlantic Chapter

Albany, NY

Iris Marie Bloom
Executive Director
Protecting Our Waters

NY, NJ, PA

Jenny Lisak, Co-director

Pennsylvania Alliance for Clean Water and Air

Punxsutawney, PA

Debra Borowiecki, Co-coordinator
LAWPA - Local Authority Western PA
Murrysville, PA

Dr. Lewis Cuthbert

Alliance for a Clean Environment

Pottstown, PA. 19465

Paula Gotsch

Grandmothers, Mothers and More for Energy Safety

Normandy Beach, NJ

Priscilla Star

Coalition Against Nukes

Wainscott, NY

Barbara Warren

Citizens' Environmental Coalition

New York

Michael J. Keegan

Coalition for a Nuclear Free Great Lakes

Monroe, MI

Alice Hirt

Don't Waste Michigan

Holland, MI

Regina Minniss

Crabshell Alliance

Baltimore, Maryland

Wes Raymond - Administrator
Citizens for Alternatives to Chemical Contamination
Lake, Michigan

Lynda Schneekloth, Advocacy Chair

Western New York Environmental Alliance

Buffalo, New York

Ed Oles, President

Citizens To Preserve Ligonier Valley

Ligonier, PA

Jan Milburn, President

Westmoreland Marcellus Citizens' Group

Westmoreland County , PA

Kristen Combs

Green Party of Pennsylvania

Philadelphia, PA

Briget Shields

Marcellus Protest/Protect Our Parks Pittsburgh

Pittsburgh, PA

Gillian Graber

Protect PT

Trafford, PA

Ellen Connett

Fluoride Action Network

Canton, New York

Susan Gordon, Coordinator

Multicultural Alliance for a Safe Environment

New Mexico

Stephen Brittle

Don't Waste Arizona

Phoenix, Arizona

Greg Wingard, Executive Director

Waste Action Project

Covington, WA

Mark Haim

Mid-Missouri Peaceworks/

Missourians for Safe Energy

Columbia, Missouri

Rita M Conn

Let Laguna Vote, and, Secure Nuclear Waste

Laguna Beach, California

Michael Welch

Redwood Alliance

Arcata, CA

Gary Headrick
San Clemente Green
San Clemente, CA

Jessie Collins

Citizens' Resistance at Fermi Two (CRAFT)

MI

Faye More, Chair

Port Hope Community Health Concerns Committee

Port Hope, Ontario

Ziggy Kleinau,

Co-founder and Outreach Director (BPEG)

Binbrook, Ontario

Theresa A. McClenaghan
Executive Director and Counsel
Canadian Environmental Law Association

Ryan Metcalfe

KIMO Denmark

Toronto, ON

Kommunernes Internationale Miljøorganisation

(Local authorities environmental organisation)

Tanya Keefe

Great Lakes Environmental Alliance

Port Huron, MI

Mary Olson

Nuclear Information and Resource Service, Southeast

maryo@nirs.org

www.nirs.org

828-252-8409 / 828-242-5621 cell

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JUL 20 2016

OFFICE OF
WATER

Ms. Dianne D'Arrigo
Nuclear Information and Resource Service
6930 Carroll Street, NW, #340
Takoma Park, MD 20912

Dear Ms. D'Arrigo:

I am responding to your letter, which requests an extension of 120 days to the comment period for the proposed EPA Draft Protective Action Guide (PAG) for Drinking Water after a Radiological Incident. The U.S. Environmental Protection Agency (EPA) has provided a 45-day comment period for this action, which is scheduled to close on Monday, July 25, 2016. After reviewing the request, the EPA has concluded that the reasons cited in your letter do not warrant issuing an extension of the comment period.

Your request indicates that the extension in the comment period is needed due to the complexity of the proposal and the need to evaluate information cited in the *Federal Register* notice. You indicate that excerpts of one supporting document (NCRP-174) have only recently been posted to the Web. In addition, your letter states that comments on the drinking water proposal need to consider the impacts of the overall recommendations in the PAG manual since the effects on the public from other exposure routes are cumulative. The documents made available for public comment are 22 pages in length and they clearly list the reference documents that the agency consulted to develop the proposed PAG. In addition, the agency published the revised draft PAG manual in 2013 and the draft document has been publicly available since that time. As for your concern regarding the availability of the reference document NCRP-174, this report has been publicly available from the National Council on Radiation Protection and Measurements since 2013. However, in response to a request from a member of the public, the agency placed an authorized excerpt of the copyrighted document into the docket for those commenters who wanted to review the reference but chose not to obtain the reference from the National Council on Radiation Protection and Measurements.

You also state that there are some confusing legal implications that need clarification before submitting comments, such as whether the PAGs relieve a polluter from legal liability. EPA does not believe that this issue warrants an extension of the comment period because it is outside the scope of this draft PAG.

Lastly, you state that the proposal is not clear regarding the length of time that the drinking water PAG would apply. The agency disagrees with this statement since the proposal is clear that the recommendations for drinking water are limited to a one-year duration following a radiological incident affecting drinking water.

Internet Address (URL) ● http://www.epa.gov
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The agency therefore concludes that the 45-day comment period that we have provided allows for ample opportunity to members of the public to develop their input and recommendations on the drinking water PAG proposal.

Sincerely,

Eric Burneson
Director, Standards and Risk Management Division
Office of Ground Water and Drinking Water
Office of Water

To: 'sarah@uraniumwatch.org'[sarah@uraniumwatch.org]; Greene, Ashley[Greene.Ashley@epa.gov]; A-AND-R-DOCKET[A-AND-R-DOCKET@epa.gov]
Cc: Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]
From: Christ, Lisa
Sent: Wed 7/20/2016 9:34:21 PM
Subject: RE: Extension request for Docket Number (EPA-HQ-OAR-2007-0268; FRL-9947-55-OW)
Response to extension request Sierra Club.pdf

Dear Ms. Fields,

Attached please find a letter responding to your request for an extension of 120 days to the comment period for the proposed EPA Draft Protective Action Guide for Drinking Water after a radiological incident. EPA has provided a 45-day comment period for this action, which is scheduled to close on Monday July 25, 2016. After reviewing the request, EPA believes that the reasons cited in the letter do not justify issuing an extension of the comment period.

The documents made available for public comment are 22 pages in length and they list clearly the reference documents that the Agency consulted to develop the proposed PAG. EPA believes that the 45 day comment period we have provided allows ample opportunity to members of the public to develop their input and recommendations on the drinking water proposal.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

Lisa Christ, Chief

Targeting and Analysis Branch

Office of Ground Water and Drinking Water

USEPA

1200 Pennsylvania Ave NW
Washington, DC 20460-0001
phone: 202.564.8354
fax: 202.564-3760

Mail Code: 4607M

From: sarah@uraniumwatch.org [mailto:sarah@uraniumwatch.org]
Sent: Monday, July 18, 2016 1:33 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>; Beauvais, Joel <Beauvais.Joel@epa.gov>; Greene, Ashley <Greene.Ashley@epa.gov>; A-AND-R-DOCKET <A-AND-R-DOCKET@epa.gov>
Subject: Extension request for Docket Number (EPA-HQ-OAR-2007-0268; FRL-9947-55-OW)
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

Dear Ms. Christ,

Attached please find for your consideration Extension Request for Environmental Protection Agency (EPA) Draft Protective Action Guide (PAG) for Drinking Water After a Radiological Incident: Docket ID No. EPA-HQ-OAR-2007-0268: FRL-9947-55-OW; 81 Fed. Reg. 37589-37592 (June 10, 2016); or Draft Radioactive Water PAGs.

Sincerely,

Sarah Fields

Member, National Core Team

Sierra Club Nuclear Free Campaign

sarah@uraniumwatch.org

435-260-8384

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JUL 20 2016

OFFICE OF
WATER

SENT VIA ELECTRONIC TRANSMISSION

Ms. Susan Corbett, Chair
National Core Team
Sierra Club Nuclear Free Campaign

Dear Ms. Corbett:

I am responding to your letter, which requests an extension of 120 days to the comment period for the proposed EPA Draft Protective Action Guide (PAG) for Drinking Water after a Radiological Incident. The U.S. Environmental Protection Agency (EPA) has provided a 45-day comment period for this action, which is scheduled to close on Monday, July 25, 2016. After reviewing the request, the EPA has concluded that the reasons cited in your letter do not warrant issuing an extension of the comment period.

The documents made available for public comment are 22 pages in length. The agency therefore concludes that the 45-day comment period that we have provided allows for ample opportunity to members of the public to develop their input and recommendations on the drinking water PAG proposal.

Sincerely,

Eric Burneson
Director, Standards and Risk Management Division
Office of Ground Water and Drinking Water
Office of Water

ED_001057_00007299

To: Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]
From: Christ, Lisa
Sent: Tue 7/19/2016 7:36:00 PM
Subject: RE: Input for your response to Sierra Club
SClub_Extension request for Docket Number (EPA-HQ-OAR-2007-0268_FRL-9947-55-OW)_7-18-6.pdf

Hi Sam,

The response below is good to go – incorporates Eric's edits. Eric would like to sign the letter, so please work with Charlotte to print on letterhead for him to sign.

Thanks!

Lisa

.

From: Hernandez-Quinones, Samuel
Sent: Tuesday, July 19, 2016 2:58 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: Input for your response to Sierra Club

Lisa, this incorporates edits suggested by Paul.

Sam

Dear Ms. Corbett:

I am responding to your letter which requests an extension of 120 days to the comment period for the proposed EPA Draft Protective Action Guide for Drinking Water after a radiological incident. EPA has provided a 45-day comment period for this action, which is scheduled to close on Monday July 25, 2016. After reviewing the request, EPA believes that the reasons cited in the letter do not justify issuing an extension of the comment period.

The documents made available for public comment are 22 pages in length and they list clearly the reference documents that the Agency consulted to develop the proposed PAG. EPA believes that the 45 day comment period we have provided allows ample opportunity to members of the public to develop their input and recommendations on the drinking water proposal.

==========

Samuel Hernández Quiñones, P.E.
Environmental Engineer
Office of Water

Environmental Protection Agency
1200 Pennsylvania Ave. NW
Washington, DC 20460
202-564-1735

"USEPA Protecting Human Health and the Environment"

To: Burneson, Eric[Burneson.Eric@epa.gov]
From: Christ, Lisa
Sent: Tue 7/19/2016 7:13:35 PM
Subject: FW: Input for your response to Sierra Club - PAG extension request
SClub_Extension request for Docket Number (EPA-HQ-OAR-2007-0268; FRL-994....pdf

Hi Eric,

Sierra Club sent a letter directly to me (see attached) also requesting an extension of the comment period. I intend to direct reply back. Below is the draft response. Do you have any comments?

Lisa

From: Hernandez-Quinones, Samuel
Sent: Tuesday, July 19, 2016 2:58 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: Input for your response to Sierra Club

Lisa, this incorporates edits suggested by Paul.

Sam

Dear Ms. Corbett:

I am responding to your letter which requests an extension of 120 days to the comment period for the proposed EPA Draft Protective Action Guide for Drinking Water after a radiological incident. EPA has provided a 45-day comment period for this action, which is scheduled to close on Monday July 25, 2016. After reviewing the request, EPA believes that the reasons cited in the letter do not justify issuing an extension of the comment period.

Your request indicates that the extension in the comment period is needed due to "*numerous apparent anomalies and contradictions that should and could be identified and rectified*". However, your request does not provide information or details to point out the specific areas of the proposal where additional information is needed or where contradictions exists.

EPA believes that the 45 day comment period we have provided allows ample opportunity to members of the public to develop their input and recommendations on the drinking water proposal.

==========

Samuel Hernández Quiñones, P.E.
Environmental Engineer
Office of Water

Environmental Protection Agency
1200 Pennsylvania Ave. NW
Washington, DC 20460
202-564-1735

"USEPA Protecting Human Health and the Environment"

To: 'Cindy Folkers'[cindy@beyondnuclear.org]
From: Christ, Lisa
Sent: Tue 7/5/2016 2:19:54 PM
Subject: RE: EPA DW pags EPA-HQ-OAR-2007-0268

Confirming the excerpt has been posted and is available in the docket.

From: Cindy Folkers [mailto:cindy@beyondnuclear.org]
Sent: Friday, July 01, 2016 6:59 AM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: Re: EPA DW pags EPA-HQ-OAR-2007-0268

Thanks, Lisa, that will help.

Cindy @ Beyond Nuclear

On Thursday, June 30, 2016, Christ, Lisa <Christ.Lisa@epa.gov> wrote:

Hi Cindy,

We have prepared an excerpt with relevant information from NCRP 174 and requested it be uploaded to the docket. It is still pending upload, but I anticipate it should be in the next day or so. I will let you know when it's available in the docket, however, I'm out starting tomorrow until Tuesday. Feel free to check the docket over the next couple days for the excerpt.

Lisa

From: Cindy Folkers [mailto:cindy@beyondnuclear.org]
Sent: Monday, June 27, 2016 8:37 AM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: EPA DW pags EPA-HQ-OAR-2007-0268

Hello, Lisa,

The pag mentions deriving its limit for pregnancy using this document: NCRP report 174 (p 7 in pag doc)

Is there non-cost public access to this document? I would expect so since NCRP is a congressionally chartered research body and EPA is basing recommendations on this document which is arcane and expensive to acquire.

Please advise me where I can access this document. Since it is over 300 pages, the sooner the better since the public has only a month left for comment.

Thank you,

Cindy Folkers

Radiation and Health Hazard Specialist

Beyond Nuclear

--

Cindy Folkers
Radiation & Health Specialist
Beyond Nuclear
6930 Carroll Ave #400
Takoma Park, MD 20912
301-270-2209

--

Cindy Folkers
Radiation & Health Specialist
Beyond Nuclear
6930 Carroll Ave #400
Takoma Park, MD 20912
301-270-2209

To: Lee, Ray[Lee.Ray@epa.gov]
Cc: DeCair, Sara[DeCair.Sara@epa.gov]
From: Christ, Lisa
Sent: Thur 6/30/2016 1:31:49 PM
Subject: FW: NCRP cite request on EPA-HQ-OAR-2007-0268

Hi Ray,

Just wondering if you were able to upload the excerpt into the docket?

Thank you –

Lisa

From: DeCair, Sara
Sent: Tuesday, June 28, 2016 5:55 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Cc: Veal, Lee <Veal.Lee@epa.gov>; Nesky, Anthony <Nesky.Tony@epa.gov>
Subject: Re: NCRP cite request on EPA-HQ-OAR-2007-0268

Lisa, good news! We have permission to post an excerpt from the NCRP Report No. 174. I have the pages selected and in the morning will have a properly footer-marked permission-granted version ready for our own Ray Lee to add to the docket so the requestor and others can refer to it.

From: Christ, Lisa
Sent: Monday, June 27, 2016 8:57 AM
To: DeCair, Sara <DeCair.Sara@epa.gov>
Subject: FW: EPA DW pags EPA-HQ-OAR-2007-0268

Hi Sara,

Sam is out this week…wondering if you have access to NCRP Report 174? If so, I can place it in the docket, unless you already have it as a supporting document for the overall PAG Manual. Please let me know.

Thanks-

Lisa

From: Cindy Folkers [mailto:cindy@beyondnuclear.org]
Sent: Monday, June 27, 2016 8:37 AM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: EPA DW pags EPA-HQ-OAR-2007-0268

Hello, Lisa,

The pag mentions deriving its limit for pregnancy using this document: NCRP report 174 (p 7 in pag doc)

Is there non-cost public access to this document? I would expect so since NCRP is a congressionally chartered research body and EPA is basing recommendations on this document which is arcane and expensive to acquire.

Please advise me where I can access this document. Since it is over 300 pages, the sooner the better since the public has only a month left for comment.

Thank you,

Cindy Folkers

Radiation and Health Hazard Specialist

Beyond Nuclear

--

Cindy Folkers
Radiation & Health Specialist
Beyond Nuclear
6930 Carroll Ave #400
Takoma Park, MD 20912
301-270-2209

To: Nesky, Anthony[Nesky.Tony@epa.gov]
From: Christ, Lisa
Sent: Tue 6/28/2016 8:25:39 PM
Subject: RE: Region 7 will be directing a call to you about the DW PAGs

Hi Tony – thank you for the heads up. Lisa

From: Nesky, Anthony
Sent: Tuesday, June 28, 2016 4:16 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: Region 7 will be directing a call to you about the DW PAGs
Importance: High

Dear Lisa:

Region 7 will be directing a call to you from a member of the public about the drinking water PAG. This individual has expressed concern about the Westlake Landfill, and her concern about the drinking water PAG may be related to it.

Tony Nesky

Center for Radiation Information and Outreach

Tel: 202-343-9597

nesky.tony@epa.gov

To: DeCair, Sara[DeCair.Sara@epa.gov]
From: Christ, Lisa
Sent: Mon 6/27/2016 12:56:57 PM
Subject: FW: EPA DW pags EPA-HQ-OAR-2007-0268

Hi Sara,

Sam is out this week…wondering if you have access to NCRP Report 174? If so, I can place it in the docket, unless you already have it as a supporting document for the overall PAG Manual. Please let me know.

Thanks-

Lisa

From: Cindy Folkers [mailto:cindy@beyondnuclear.org]
Sent: Monday, June 27, 2016 8:37 AM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: EPA DW pags EPA-HQ-OAR-2007-0268

Hello, Lisa,

The pag mentions deriving its limit for pregnancy using this document: NCRP report 174 (p 7 in pag doc)

Is there non-cost public access to this document? I would expect so since NCRP is a congressionally chartered research body and EPA is basing recommendations on this document which is arcane and expensive to acquire.

Please advise me where I can access this document. Since it is over 300 pages, the sooner the better since the public has only a month left for comment.

Thank you,

Cindy Folkers

Radiation and Health Hazard Specialist

Beyond Nuclear

--

Cindy Folkers
Radiation & Health Specialist
Beyond Nuclear
6930 Carroll Ave #400
Takoma Park, MD 20912
301-270-2209

To: DeCair, Sara[DeCair.Sara@epa.gov]
From: Christ, Lisa
Sent: Thur 6/23/2016 4:17:55 PM
Subject: RE: NRC rad in waterways report pre-brief

Thanks – nice summary

From: DeCair, Sara
Sent: Tuesday, June 21, 2016 3:50 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>; Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Ellis, Jerry <Ellis.Jerry@epa.gov>; Snead, Kathryn <Snead.Kathryn@epa.gov>; Veal, Lee <Veal.Lee@epa.gov>
Subject: NRC rad in waterways report pre-brief

This afternoon Trish Milligan of the US Nuclear Regulatory Commission briefed me and colleagues from the source water protection part of OW (I didn't get names down, but noted all the names the invitation was fwded to, in the attached handwritten notes).

I took more notes than you will want, but just FYI if you are interested. NRC will be briefing this at the June 28 Federal Radiological Preparedness Coordinating Committee meeting which Lee and Kathryn are planning to attend. They'll note anything we'll want to know in preparation for the planned fall publication of their severe accident study via waterways.

Bottom line: Assuming no mitigation at the plant and no protective actions taken, doses along lakes and rivers modeled could be significant, but the Executive Summary will include discussion of how much dose reduction would be afforded by protective actions including restriction on uses of the water/fishing.

NRC will share interagency talking points prior to the publication in case those of us working on PAGs and in particular, drinking water PAGs, would get any inquiries.

Sara D. DeCair

http://www.epa.gov/radiation/rert/pags.html

202-343-9108

Room 1416 B in WJC West

To: DeCair, Sara[DeCair.Sara@epa.gov]; Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]; Ellis, Jerry[Ellis.Jerry@epa.gov]; Snead, Kathryn[Snead.Kathryn@epa.gov]; Veal, Lee[Veal.Lee@epa.gov]
From: Christ, Lisa
Sent: Tue 6/21/2016 9:07:01 PM
Subject: RE: NRC rad in waterways report pre-brief

Thanks so much. Sorry we were unable to attend

Lisa

From: DeCair, Sara
Sent: Tuesday, June 21, 2016 3:50 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>; Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Ellis, Jerry <Ellis.Jerry@epa.gov>; Snead, Kathryn <Snead.Kathryn@epa.gov>; Veal, Lee <Veal.Lee@epa.gov>
Subject: NRC rad in waterways report pre-brief

This afternoon Trish Milligan of the US Nuclear Regulatory Commission briefed me and colleagues from the source water protection part of OW (I didn't get names down, but noted all the names the invitation was fwded to, in the attached handwritten notes).

I took more notes than you will want, but just FYI if you are interested. NRC will be briefing this at the June 28 Federal Radiological Preparedness Coordinating Committee meeting which Lee and Kathryn are planning to attend. They'll note anything we'll want to know in preparation for the planned fall publication of their severe accident study via waterways.

Bottom line: Assuming no mitigation at the plant and no protective actions taken, doses along lakes and rivers modeled could be significant, but the Executive Summary will include discussion of how much dose reduction would be afforded by protective actions including restriction on uses of the water/fishing.

NRC will share interagency talking points prior to the publication in case those of us working on PAGs and in particular, drinking water PAGs, would get any inquiries.

Sara D. DeCair

http://www.epa.gov/radiation/rert/pags.html

202-343-9108

Room 1416 B in WJC West

To: Harris, Adrienne[Harris.Adrienne@epa.gov]
Cc: Osegueda, Carlos[Osegueda.Carlos@epa.gov]
From: Christ, Lisa
Sent: Mon 6/20/2016 9:08:55 PM
Subject: RE: House science hearing 1 pager on Radiation in drinking water
Rads in drinking water 1-pager_lc.docx
Drinking Water PAG OMB brief 1_13_16.docx
PAG Manual Values for Other Media 6-13-16.docx

Hi Adrienne,

Attached are revisions to the 1-pager. Let me know if you think more background is needed. I've attached a briefing or OMB and a few facts on PAG values for other media and radiation doses in everyday life that should be helpful.

Lisa

From: Harris, Adrienne
Sent: Monday, June 20, 2016 12:26 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: FW: House science hearing 1 pager on Radiation in drinking water

Hi Lisa,

As I mentioned earlier, there is a request for a 1-pager on Radiation in drinking water. Attached is a draft 1-pager adopted largely from the comms roll-out materials (attached). I also added some of the reg language on the MCLs.

Please edit the 1-pager for what messages you think are key. I kept some of the Q&A that could be an addendum to the 1-pager. Ashley will coordinate Peter and/or Eric's review of the 1-pager in Denver before we send it up.

Thanks!

Adrienne O. Harris
Acting Special Assistant

Office of Ground Water and Drinking Water
(202) 250-8793 (office)

From: Klasen, Matthew
Sent: Monday, June 20, 2016 9:43 AM
To: Orvin, Chris <Orvin.Chris@epa.gov>; Kaiser, Sven-Erik <Kaiser.Sven-Erik@epa.gov>; Peck, Gregory <Peck.Gregory@epa.gov>; Grevatt, Peter <Grevatt.Peter@epa.gov>; Davis, CatherineM <Davis.CatherineM@epa.gov>
Subject: Re: House science hearing 1 pager on Radiation in drinking water

...and, for what it's worth, I suspect this is arising from the recently released PAG for drinking water -- so hopefully we could just pull from the website or associated language there.

https://www.epa.gov/radiation/protective-action-guides-pags

-Matt

Matt Klasen
U.S Environmental Protection Agency
Office of Congressional Affairs
WJC North 3443N
202-566-0780
cell (202) 505-0787

From: Orvin, Chris
Sent: Monday, June 20, 2016 9:40 AM
To: Kaiser, Sven-Erik; Klasen, Matthew; Peck, Gregory; Grevatt, Peter; Davis, CatherineM
Subject: RE: House science hearing 1 pager on Radiation in drinking water

Thanks, Sven. We're working on it.

Chris Orvin
U.S Environmental Protection Agency

Special Assistant to the Chief of Staff (detail)
Office of Water

202-564-0430

From: Kaiser, Sven-Erik
Sent: Monday, June 20, 2016 9:31 AM
To: Klasen, Matthew <Klasen.Matthew@epa.gov>; Orvin, Chris <Orvin.Chris@epa.gov>; Peck, Gregory <Peck.Gregory@epa.gov>; Grevatt, Peter <Grevatt.Peter@epa.gov>; Davis, CatherineM <Davis.CatherineM@epa.gov>
Subject: House science hearing 1 pager on Radiation in drinking water

Heads up that we need a one pager on radiation in drinking water as soon as possible. It's for the administrators house science hearing this Weds, June 22. Please let me know if any questions. Thanks,

Sven

From: "Brown, Tristan" <Brown.Tristan@epa.gov>
Date: June 20, 2016 at 9:07:23 AM EDT
To: "Kaiser, Sven-Erik" <Kaiser.Sven-Erik@epa.gov>
Subject: Radiation in drinking water

Hey Sven,

Can you get a one-pager together—with top line notes—about radiation in drinking water?

Thank you!

Tristan Brown

Deputy Associate Administrator for

Congressional Affairs

U.S. Environmental Protection Agency

Office: (202) 564-4113

Email: brown.tristan@epa.gov

Mr. Wingard:

Thank you for your June 7, 2016 letter regarding your concerns about the proposed drinking water Protective Action Guides (PAGs). I am writing to you to provide further context and clarifications regarding the proposal.

The proposed drinking water PAG is non-regulatory guidance for emergency situations only. The PAG defines doses of radiation that should be avoided during an emergency radiological event to determine when alternative drinking water should be provided and the use of contaminated water supplies be restricted. The PAGs do not represent acceptable levels of routine exposures.

PAGs trigger safety measures to keep doses to the public as low as possible during emergency situations. EPA is proposing a two-tiered approach for drinking water to address people at the most sensitive life stage and to address the general population. The tiered approach may help officials prioritize potentially scarce water resources for those most at risk in a disaster response.

The proposed PAGs do not override National Primary Drinking Water Regulations for Radionuclides, they are guidance only in the event of a radiological emergency. The proposed PAGs are developed for up to one year of exposure. In comparison, the enforceable Maximum Contaminant Levels (MCL) for radionuclides were developed assuming 70 years of continuous exposure. The Agency determined it is not appropriate to base protective actions during short-term emergency incidents on lifetime criteria. However, EPA expects that following a radiological incident, community water systems will return to compliance with EPA's drinking water standards for radionuclides as soon as practicable.

I would also like to take advantage of this opportunity to remind you that the deadline for submitting comments on the proposed drinking water Protective Action Guide (PAG) is July 25, 2016. You can submit your comments online by visiting this website:
https://www.regulations.gov/#!docketDetail;D=EPA-HQ-OAR-2007-0268

Sincerely,

Eric Burneson, Division Director
Standards and Risk Management Division
Office of Ground Water and Drinking Water
U.S. Environmental Protection Agency

To: Burneson, Eric[Burneson.Eric@epa.gov]
Cc: Oshida, Phil[Oshida.Phil@epa.gov]
From: Christ, Lisa
Sent: Mon 6/20/2016 1:01:18 PM
Subject: FW: CMS New Assignment - Wingard - PAGs - AX-16-000-8988 Due June 22nd.
16-000-8988-WH.Wingard.DW PAG.pdf
Response to Wingard re DW PAG.docx

Hi Eric,
Attached for your signature is a reply to a letter re: the drinking water PAG. Let me know if you have questions/comments.
Lisa

-----Original Message-----
From: Flaharty, Stephanie
Sent: Thursday, June 09, 2016 2:56 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Cc: Burneson, Eric <Burneson.Eric@epa.gov>; Oshida, Phil <Oshida.Phil@epa.gov>; Huff, Lisa <Huff.Lisa@epa.gov>; Greene, Ashley <Greene.Ashley@epa.gov>
Subject: CMS New Assignment - Wingard - PAGs - AX-16-000-8988 Due June 22nd.

Hi Lisa,

Here's our first incoming on PAGs. This is a direct reply, so Peter or Eric can sign. Due June 22nd.

Summary Information -
Control Number: AX-16-000-8988-WH
Control Subject: Revised Protection Action Guides That Would Increase Exposure From Radiation in Drinking Water
From: Wingard, Greg J.

Thanks,
Steph

To: Burneson, Eric[Burneson.Eric@epa.gov]
From: Christ, Lisa
Sent: Tue 6/14/2016 11:33:27 AM
Subject: FW: PAG bullets/radiation exposure
PAG Manual Values for Other Media 6-13-16.docx

From: Christ, Lisa
Sent: Tuesday, June 14, 2016 7:33 AM
To: Grevatt, Peter <Grevatt.Peter@epa.gov>
Subject: FW: PAG bullets/radiation exposure

fyi

From: Christ, Lisa
Sent: Monday, June 13, 2016 1:43 PM
To: Grevatt, Peter <Grevatt.Peter@epa.gov>
Subject: PAG bullets/radiation exposure

Hi Peter-

Attached is a summary of EPA PAG values for other media, our method for deriving the 500 mrem/100 mrem PAG and information on everyday doses of radiation.

Let me know if you'd like additional information.

Lisa

To: Grevatt, Peter[Grevatt.Peter@epa.gov]
From: Christ, Lisa
Sent: Tue 6/14/2016 11:33:03 AM
Subject: FW: PAG bullets/radiation exposure
PAG Manual Values for Other Media 6-13-16.docx

fyi

From: Christ, Lisa
Sent: Monday, June 13, 2016 1:43 PM
To: Grevatt, Peter <Grevatt.Peter@epa.gov>
Subject: PAG bullets/radiation exposure

Hi Peter-

Attached is a summary of EPA PAG values for other media, our method for deriving the 500 mrem/100 mrem PAG and information on everyday doses of radiation.

Let me know if you'd like additional information.

Lisa

To: Greene, Ashley[Greene.Ashley@epa.gov]
From: Christ, Lisa
Sent: Fri 6/10/2016 6:07:45 PM
Subject: RE: Quick chat with Peter on PAGs around 2:30

Sure – should I include Sam?

From: Greene, Ashley
Sent: Friday, June 10, 2016 2:07 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: Quick chat with Peter on PAGs around 2:30

Hi Lisa,

Peter would like to just have a few minutes to chat with you on PAGs around 2:30 or so (I can give you a call to let you know when he becomes available).

Thanks,

Ashley

****

Ashley Greene

Special Assistant

Office of Ground Water and Drinking Water

U.S. Environmental Protection Agency

Phone: (202) 566-1738

Email: greene.ashley@epa.gov

****

To: Nesky, Anthony[Nesky.Tony@epa.gov]; Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]; Wadlington, Christina[Wadlington.Christina@epa.gov]; Ellis, Jerry[Ellis.Jerry@epa.gov]; DeCair, Sara[DeCair.Sara@epa.gov]
Cc: Veal, Lee[Veal.Lee@epa.gov]; White, Rick[White.Rick@epa.gov]
From: Christ, Lisa
Sent: Fri 6/10/2016 12:26:56 PM
Subject: RE: Request for Comment Period Extension received via Radiation Protection "Contact Us" webpage

I suggest they submit to the docket.

-----Original Message-----
From: Nesky, Anthony
Sent: Thursday, June 09, 2016 8:40 PM
To: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>; Wadlington, Christina <Wadlington.Christina@epa.gov>; Ellis, Jerry <Ellis.Jerry@epa.gov>; DeCair, Sara <DeCair.Sara@epa.gov>
Cc: Veal, Lee <Veal.Lee@epa.gov>; White, Rick <White.Rick@epa.gov>
Subject: Request for Comment Period Extension received via Radiation Protection "Contact Us" webpage

The Radiation Protection "Contact Us" webpage received the following request for an extension of the comment period. Can you accept it, or does the person need to submit it elsewhere?

Tony Nesky
Center for Radiation Information and Outreach
Tel: 202-343-9597
nesky.tony@epa.gov

-----Original Message-----
From: Radiation Questions
Sent: Thursday, June 09, 2016 8:37 PM
To: Nesky, Anthony <Nesky.Tony@epa.gov>
Subject: Request for Comment Period Extension received via Radiation Protection "Contact Us" webpage

-----Original Message-----
From: drupal_admin@epa.gov [mailto:drupal_admin@epa.gov]
Sent: Tuesday, June 07, 2016 9:05 PM
To: Radiation Questions <Radiation.Questions@epa.gov>
Subject: Contact Us - Radiation Protection

Submitted on 06/07/2016 9:05PM
Submitted values are:

Name: Marylia Kelley
Email: marylia@trivalleycares.org
Comment or Question: On what date are you planning to post the Federal Register notice re: the PAGs for radioactivity in water? For how many days after are you planning to accept public comments? If the answer is 45-days, please accept this note as a formal request from Tri-Valley CAREs in Livermore, CA for 45 days of additional time - i.e., for a total comment period of 90 days. Thank you in advance for your consideration.

To: 'Diane D'Arrigo'[dianed@nirs.org]
From: Christ, Lisa
Sent: Thur 6/9/2016 8:17:20 PM
Subject: RE: commenting on PAGs

Hi Diane D'Arrigo,

Thank you for your interest in the drinking water PAG. An announcement will be published in the Federal Register tomorrow, June 10, which contains details on how public comments may be submitted. We cannot accept comments by direct email, they must be submitted to the docket. The docket number and pertinent information will be described in the notice.

Lisa

From: Diane D'Arrigo [mailto:dianed@nirs.org]
Sent: Thursday, June 09, 2016 4:01 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: commenting on PAGs

Dear Lisa Christ

I see that you are the contact on the prepublication in the federal register for comments on Draft Protective Action Guide (PAG) for Drinking Water after a Radiological Incident.

Could you please provide a direct email address for public comments?

Thank you so much

Diane D'Arrigo

dianed@nirs.org

301 270 6477 x15

To: Nesky, Anthony[Nesky.Tony@epa.gov]; Wadlington, Christina[Wadlington.Christina@epa.gov]; Ellis, Jerry[Ellis.Jerry@epa.gov]; Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]
From: Christ, Lisa
Sent: Wed 6/8/2016 5:11:08 PM
Subject: RE: We can add a banner about the FR due date on the Radiation Protection site if you want

Hi Tony –

We have a rotating banner on our page too. Here's the link to the main page with the banner https://www.epa.gov/ground-water-and-drinking-water

The page that opens when you click the banner looks like this:

Protective Action Guides (PAGs)

Top of Form

Get email alerts about the Protective Action Guide (PAG) manualEnter email addresssign up

Bottom of Form

You will need Adobe Reader to view some of the files on this page. See EPA's About PDF page to learn more.

The Protective Action Guide (PAG) manual contains radiation *radiation*Energy given off as either particles or rays. dose guidelines that would trigger public safety measures, such as evacuation or staying indoors, to minimize or prevent radiation exposure during an emergency. EPA developed Protective Action Guides to help responders plan for radiation emergencies.

Download PAG Manuals and Resources

•□□□□□□□ Drinking Water Proposal

•□□□□□□□ PAG Manual

•□□□□□□□ Training

•□□□□□□□ Radiation Response Guidance

EPA Seeks Comment on Proposed Drinking Water

Protective Action Guide (PAG) and Planning Guidance for Radiological Incidents

During a radiological emergency, radioactive material could be released into the rivers, lakes, and streams used by public water suppliers. EPA is proposing non-regulatory guidance that authorities can use to protect residents from experiencing the harmful effects from radiation in drinking water following an emergency. EPA is seeking public comment on the proposed drinking water *Protective Action Guide (PAG) for Radiological Incidents* for up to 45 days following publication in the Federal Register.

The purpose of EPA's Protective Active Guide (PAG) for Radiological Incidents is to guide planning and decision-making efforts by local and state officials. It is not intended for long-term or everyday use. The proposed PAG does not affect EPA's drinking water standards for radionuclides. Therefore, affected public water systems are expected to take actions to return to compliance with drinking water standards after a radiological emergency as soon as practicable.

Background

EPA is proposing a two-tiered approach for drinking water to address the people at the most sensitive life stage and to address the general population The tiered approach may help officials prioritize potentially scarce water resources for those most at risk in a disaster response.

The proposed PAGs are developed for up to one year of exposure. In comparison, the Maximum Contaminant Levels (MCL) were developed assuming 70 years of continuous exposure. The PAGs are intended to 1) prevent short-term health effects, 2) balance protection with other important factors that may arise during an emergency (ensuring the actions result in more benefit than harm), and 3) reduce the potential for longer term health effects. In considering these key principles, EPA is proposing drinking water PAGs of:

- 500 mrem projected dose, for one year, to the general population.
- 100 mrem projected dose, for one year, to the most sensitive populations (e.g. infants, children, pregnant women and nursing women).

Download the "Draft Protective Action Guide (PAG) for Drinking Water" and a pre-publication copy of the Federal Register notice.

Information for consumers about the proposed drinking water PAG.

Information for public water systems on the proposed drinking water PAG.

The PAG Manual is a planning guide for emergency responders, and does not change federal, state or local environmental standards. The PAG guidelines are only for use

during a large-scale emergency, when radiation levels could be high enough to cause health effects unless public safety measures are taken.

In 2013, EPA sought public comment on a revision to the 1992 PAG manual, to update dose calculations based on current science. EPA believes that guidance based on the best available science can help local authorities save lives and minimize the impact of a radiological emergency. Comments were accepted until September 16, 2013, the comment period is now closed. View Federal Register notices and public comments in EPA's official docket (EPA-HQ-OAR-2007-0268) on Regulations.gov. EPA is assessing public comments received and plans to issue a final PAG Manual in 2016. There will then be a one-year training and adoption period to allow emergency management officials to update their response plans.

The revised PAG Manual includes lessons learned from actual radiological emergencies, including the Fukushima nuclear power plant accident. Emergency responders can use the manual for any radiation incident, such as spills of radioactive material, the detonation of a radiological dispersion device *radiological dispersion device*A mix of explosives, such as dynamite, with radioactive powder or pellets. Also known as a dirty bomb. A radiological dispersal device is not a nuclear weapon. (RDD) or “dirty bomb,” or an accident at a nuclear power plant.

Download PAG Manuals and Resources

Significant changes from the 1992 PAG Manual include:

- Applying the PAG Manual to incidents other than just nuclear power plant accidents.
- Referring users to current food guidance from the Food and Drug Administration (FDA).
- Providing guidance for potassium iodide (KI) based the latest FDA guidance.
- Providing basic planning guidance on reentry, cleanup and waste disposal.
- Incorporating late phase (cleanup) guidance from the Department of Homeland Security’s Radiological Dispersal Device/Improvised Nuclear Device Planning Guidance.

The 2013 PAG Manual provides a list of considerations for planning and initiating a cleanup process as the emergency is brought under control. The PAG Manual does not set cleanup levels. One of the recommendations in the Manual is a community involvement process for setting cleanup levels.

The Federal Emergency Management Agency's (FEMA) Emergency Management Institute has two Independent Study Courses on Radiation:

- IS-3 - Radiological Emergency Management.

- IS-301 - Radiological Emergency Response. Unit 5 of this course, "Protective Actions & Protective Action Guides" provides an excellent introduction to the use of PAGs in an emergency.

In addition to EPA's PAGs Manuals and Resources, the following radiological emergency response guidance is available:

Implementation Advice for Responders

Responders can request advice on implementing the PAGs from the Advisory Team for Environment, Food & Health. Exit

Nuclear Detonation and Radiological Dispersion Device *Radiological Dispersion Device*A mix of explosives, such as dynamite, with radioactive powder or pellets. Also known as a dirty bomb. A radiological dispersal device is not a nuclear weapon. (RDD)

- U.S. Department of Health & Human Services, Radiation Emergency Medical Management (REMM), Planning Guidance for Response to a Nuclear Detonation, Second Edition(135 pp, 2.7 MB, About PDF)
- Department of Homeland Security, Federal Emergency Management Agency (FEMA), Planning Guidance for Protection and Recovery Following Radiological Dispersal Device (RDD) and Improvised Nuclear Device (IND) Incidents (official docket on Regulations.gov)

Assessing Doses

- Federal Radiological Monitoring and Assessment (FRMAC), FRMAC Assessment Manual, Volume 1 - Overview and Methods
- Federal Radiological Monitoring and Assessment (FRMAC), FRMAC Assessment Manual, Volume 2 – Pre-assessed Default Scenarios

Potassium Iodide (KI)

- U.S. Food and Drug Administration (FDA), Guidance: Potassium Iodide as a Thyroid Blocking Agent in Radiation Emergencies(15 pp, 39.9 K, About PDF)
- U.S. Food and Drug Administration (FDA), Guidance for Industry KI in Radiation Emergencies - Questions and Answers(9 pp, 161.1 K, About PDF)
- U.S. Food and Drug Administration (FDA), Frequently Asked Questions about KI

Population Monitoring

- U.S. Centers for Disease Control and Prevention (CDC), Population Monitoring in

Radiation Emergencies: A Guide for State and Local Public Health Planners(104 pp, 4.0 MB, About PDF)

Food

- U.S. Food and Drug Administration (FDA), Accidental Radioactive Contamination of Human Food And Animal Feeds: Recommendations for State and Local agencies(59 pp, 231.4 K, About PDF)

Reentry and Return

- U.S. Department of Energy (DOE), Operational Guidelines
- U.S. Department of Energy (DOE, Preliminary Report on Operational Guidelines Developed for Use in Emergency Preparedness and Response to a Radiological Dispersal Device Incident(416 pp, 2.6 MB, About PDF)

Contact Us to ask a question, provide feedback, or report a problem.

From: Nesky, Anthony
Sent: Wednesday, June 08, 2016 11:25 AM
To: Wadlington, Christina <Wadlington.Christina@epa.gov>; Ellis, Jerry <Ellis.Jerry@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>; Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>
Subject: We can add a banner about the FR due date on the Radiation Protection site if you want

Dear Christina, Jerry, Lisa, and Sam

The Radiation Protection website has rotating banners at the top. We use it to highlight news, and we could highlight the comment due date for the proposed drinking water PAG. I'm hearing that the FR notice will come out on Friday.

The image is attached. The text would read:

Proposed Protective Action Guide (PAG) for Drinking Water

Comments due July 25, 2016

EPA is seeking public comment on a proposed Protective Action Guide (PAG) for drinking water following a radiological emergency.

Learn about the proposed PAG for Drinking Water > >

Please let us know if this is consistent with OW's communication style, and whether you want us to use it or not. It's OW's call.

Tony Nesky

Center for Radiation Information and Outreach

Tel: 202-343-9597

nesky.tony@epa.gov

From: Nesky, Anthony
Sent: Thursday, June 02, 2016 11:46 AM
To: Shogren, Angela <Shogren.Angela@epa.gov>
Cc: Thornton, Marisa <Thornton.Marisa@epa.gov>; Romero, Carmen <Romero.Carmen@epa.gov>
Subject: RE: Text for Water PAG Banner

I'm absolutely OK with it. Thanks!

Tony Nesky

Center for Radiation Information and Outreach

Tel: 202-343-9597

nesky.tony@epa.gov

From: Shogren, Angela
Sent: Thursday, June 02, 2016 11:45 AM
To: Nesky, Anthony <Nesky.Tony@epa.gov>
Cc: Thornton, Marisa <Thornton.Marisa@epa.gov>; Romero, Carmen <Romero.Carmen@epa.gov>
Subject: Re: Text for Water PAG Banner

Are you ok with my edit?

Angela Shogren

Public Affairs Specialist

Radiation Protection Division

U.S. Environmental Protection Agency Tel (202) 343-9761

Shogren.Angela@epa.gov

On Jun 2, 2016, at 11:44 AM, Nesky, Anthony <Nesky.Tony@epa.gov> wrote:

> I believe your understanding is correct, and we'll just have to wait to add the banner until we actually publish the PAG page. I'm sent the text so that I can cross something off my to-do list. I feel a little better now.
>
> Tony Nesky
>
> Center for Radiation Information and Outreach
>
> Tel: 202-343-9597
>
> nesky.tony@epa.gov
>
> **From:** Shogren, Angela
> **Sent:** Thursday, June 02, 2016 11:36 AM
> **To:** Nesky, Anthony <Nesky.Tony@epa.gov>
> **Cc:** Thornton, Marisa <Thornton.Marisa@epa.gov>; Romero, Carmen <Romero.Carmen@epa.gov>

Subject: RE: Text for Water PAG Banner

Tony,

My understanding is that these banners cannot be added to the page ahead of time, they will need to be completed as a rush job when we are ready. Please, correct me if I am wrong, Carmen or Marisa.

I have attached the image for when we are ready.

Also, we may want to tweak the language slightly to match our other banners (Tony, please approve so Marisa or Carmen will have this all set when the time comes):

Proposed Protective Action Guide (PAG) for Drinking Water
Comments due ___

EPA is seeking public comment on a Protective Action Guide (PAG) for provision of alternate drinking water supplies during a radiological emergency. ~~More~~

Learn about the proposed PAG for Drinking Water > >

Angela Shogren | Public Affairs Specialist | U.S. Environmental Protection Agency | Tel 202 343 9761 | shogren.angela@epa.gov

From: Nesky, Anthony

Sent: Thursday, June 02, 2016 11:04 AM
To: Shogren, Angela <Shogren.Angela@epa.gov>
Cc: Thornton, Marisa <Thornton.Marisa@epa.gov>; Romero, Carmen <Romero.Carmen@epa.gov>
Subject: Text for Water PAG Banner

The Water PAG proposal may come out as early as Monday, and we will need a banner on our website. I think we have the graphic already; here's the text:

Proposed Protective Action Guide (PAG) for Drinking Water
Comments due ___

EPA is seeking public comment on a Protective Action Guide (PAG) for provision of alternate drinking water supplies during a radiological emergency. More

Tony Nesky

Center for Radiation Information and Outreach

Tel: 202-343-9597

nesky.tony@epa.gov

To: Travers, David[Travers.David@epa.gov]
From: Christ, Lisa
Sent: Tue 6/7/2016 8:13:08 PM
Subject: RE: quick Q
EPA Drinking Water PAG 5-16-16_final.docx

If you're interested in reading the proposal ☺

From: Travers, David
Sent: Tuesday, June 07, 2016 4:01 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: RE: quick Q

Got it thanks

From: Christ, Lisa
Sent: Tuesday, June 07, 2016 4:00 PM
To: Travers, David <Travers.David@epa.gov>
Subject: RE: quick Q

The PAG establishes a short term dose to be avoided during a radiological emergency of100mrem children 15 and under, pregnant and nursing women; 500 mrem general pop.

From: Travers, David
Sent: Tuesday, June 07, 2016 3:52 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: quick Q

Lisa, does the new drinking water PAG establish quantitative short-term limits for exposure to specific rads? Or is more to establish a risk assessment process to define those limits? I ask just so I understand what we're about to release (or have released?).

thanks—D

David Travers, PhD

Director, Water Security Division

U.S. Environmental Protection Agency

Ph: 202-564-4638

http://www.epa.gov/waterresilience

To: Wadlington, Christina[Wadlington.Christina@epa.gov]
Cc: Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]; Huff, Lisa[Huff.Lisa@epa.gov]
From: Christ, Lisa
Sent: Tue 6/7/2016 11:19:04 AM
Subject: Re: EPA - water/radiation

Sam
The question is probably regarding the DHS water PAG. Can you work up a response after checking with ORIA?
Thank Lisa

Sent from my iPhone

On Jun 6, 2016, at 6:42 PM, Wadlington, Christina <Wadlington.Christina@epa.gov> wrote:

TAB,

Can you assist with the response?

The previous PAG Manual, entitled "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents" (EPA-400-R-92-001, May 1992), was published by the U.S. EPA in 1992. This did not include a value for drinking water. In March 2013, EPA published an updated version of the document which EPA received significant comment. The current FRN represents EPA's proposal for the drinking water portion of that 2013 PAG.

Sent from my iPhone

Sent from my iPhone

Begin forwarded message:

From: "Loop, Travis" <Loop.Travis@epa.gov>
Date: June 6, 2016 at 5:04:16 PM EDT
To: "Wadlington, Christina" <Wadlington.Christina@epa.gov>
Subject: Re: EPA - water/radiation

I sent the statement and background. But he has the specific question: "He's asking what the limit used to be. He said he's hearing that what we're proposing for comment is similar to a proposal under the Bush Administration, which was eventually

abandoned. "

How do we address that?

Travis Loop
Communications Director for Water
U.S. Environmental Protection Agency
Phone: 202.870.6922
Follow us on Twitter @EPAwater

On Jun 6, 2016, at 5:02 PM, Wadlington, Christina <Wadlington.Christina@epa.gov> wrote:

There was an older one that went out. Here's a response.

The proposed PAGs are developed for up to one year of exposure. In comparison, the Maximum Contaminant Levels (MCL) were developed assuming 70 years of continuous exposure. The PAGs are intended to 1) prevent short-term health effects, 2) balance protection with other important factors that may arise during an emergency (ensuring the actions result in more benefit than harm), and 3) reduce the potential for longer term health effects. In considering these key principles, EPA is proposing drinking water PAGs of:

- 500 mrem projected dose, for one year, to the general population.
- 100 mrem projected dose, for one year, to the most sensitive populations (e.g. infants, children, pregnant women and nursing women)

For additional information please visit:
https://www.epa.gov/radiation/protective-action-guides-pags

Sent from my iPhone

On Jun 6, 2016, at 4:57 PM, Loop, Travis <Loop.Travis@epa.gov> wrote:

Does the PAGS relate to an "old number?" Thought this was new.

Travis Loop

Communications Director for Water
U.S. Environmental Protection Agency
Phone: 202.870.6922
Follow us on Twitter @EPAwater

Begin forwarded message:

From: "Lee, Monica" <Lee.Monica@epa.gov>
Date: June 6, 2016 at 4:53:56 PM EDT
To: "Loop, Travis" <Loop.Travis@epa.gov>, "Dennis, Allison" <Dennis.Allison@epa.gov>
Subject: FW: EPA - water/radiation

Hey guys - need a quick turn around on this for AP. He's asking what the limit used to be. He said he's hearing that what we're proposing for comment is similar to a proposal under the Bush Administration, which was eventually abandoned.

Thanks

-----Original Message-----
From: Daly, Matthew [mailto:MDaly@ap.org]
Sent: Monday, June 06, 2016 4:21 PM
To: Lee, Monica <Lee.Monica@epa.gov>; Harrison, Melissa <Harrison.Melissa@epa.gov>
Cc: Conger, Nick <Conger.Nick@epa.gov>
Subject: RE: EPA - water/radiation

Thanks Monica. Can you call me?
641-9481. I have multiple questions

-----Original Message-----
From: Lee, Monica [mailto:Lee.Monica@epa.gov]
Sent: Monday, June 06, 2016 4:07 PM
To: Daly, Matthew; Harrison, Melissa
Cc: Conger, Nick
Subject: RE: EPA - water/radiation

Hey Matt - here a link to the manual on radiation dose guidelines that was released today. It's not a rule, but more of a guide for state and local official decision making and planning. It is not intended for long-term or everyday use. The proposed PAG does not affect EPA's drinking water standards for radionuclides. Let me know what questions you have.

https://www.epa.gov/radiation/protective-action-guides-pags

Thanks,

Monica Lee
Office of Public Affairs
U.S. Environmental Protection Agency
Office: 202-564-0645
Cell: 202-713-6902
lee.monica@epa.gov

-----Original Message-----
From: Daly, Matthew [mailto:MDaly@ap.org]
Sent: Monday, June 06, 2016 3:05 PM
To: Harrison, Melissa <Harrison.Melissa@epa.gov>; Lee, Monica <Lee.Monica@epa.gov>
Cc: Conger, Nick <Conger.Nick@epa.gov>
Subject: RE: EPA - water/radiation

Hi Melissa, Monica, Nick
We got a call from a source who says EPA is apparently publishing a rule that will increase the level of radiation allowed in drinking water. Supposedly the new rule is similar to a proposal the Bush administration made.
Biesecker is out today, so I am handling.
Thanks.
Matthew

Matthew Daly
Congressional Reporter
The Associated Press
202-641-9481 direct
202-365-2993 cell

To: Huff, Lisa[Huff.Lisa@epa.gov]; Ellis, Jerry[Ellis.Jerry@epa.gov]
From: Christ, Lisa
Sent: Mon 6/6/2016 2:31:50 PM
Subject: Fwd: PAG Pre-pub version

Sent from my iPhone

Begin forwarded message:

From: "Wadlington, Christina" <Wadlington.Christina@epa.gov>
Date: June 6, 2016 at 8:40:37 AM EDT
To: "Flaharty, Stephanie" <Flaharty.Stephanie@epa.gov>, "Hernandez-Quinones, Samuel" <Hernandez.Samuel@epa.gov>
Cc: "Christ, Lisa" <Christ.Lisa@epa.gov>
Subject: RE: PAG Pre-pub version

Thanks Steph,

Sam/TAB, can you please update the metadata before sending this over?

Christina Wadlington

Communications Director

Office of Ground Water and Drinking Water

U.S. Environmental Protection Agency

Tel: 202.566.1859

Email: wadlington.christina@epa.gov

From: Flaharty, Stephanie
Sent: Monday, June 06, 2016 8:39 AM
To: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>
Cc: Christ, Lisa <Christ.Lisa@epa.gov>; Burneson, Eric <Burneson.Eric@epa.gov>; Greene, Ashley <Greene.Ashley@epa.gov>; Wadlington, Christina <Wadlington.Christina@epa.gov>; Harris, Adrienne <Harris.Adrienne@epa.gov>; Grevatt, Peter <Grevatt.Peter@epa.gov>
Subject: PAG Pre-pub version
Importance: High

Good Morning Sam,

Joel signed the PAG FR notice on Friday. I've attached the pre-pub PDF for OAR posting. (We post the unsigned document). Please coordinate with OAR ***to be prepared*** to post by noon today (Christina will give us OPA's estimate of the time of the announcement so we can let OAR know).

Thanks,

Steph

From: Flaharty, Stephanie
Sent: Wednesday, June 01, 2016 10:03 AM
To: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>
Cc: Christ, Lisa <Christ.Lisa@epa.gov>; Burneson, Eric <burneson.eric@epa.gov>
Subject: FW: PAG text questions

Done.

From: Flaharty, Stephanie
Sent: Wednesday, June 01, 2016 9:52 AM
To: Sandy Evalenko <Evalenko.Sandy@epa.gov>
Cc: Arrigoni, Holly <Arrigoni.Holly@epa.gov>; Wanda Fields <Fields.Wanda@epa.gov>;

Jones-Coleman, Diane <Jones-Coleman.Diane@epa.gov>
Subject: FW: PAG text questions

Hi Sandy,

As, I mentioned yesterday, Joel has provided comments on the subject FR notice. See below for our response and his confirmation to incorporate our changes (just two sentences – see below) on pages 6 and 8.

The attached files are for Wanda or Diane to enter into CMS. I'll give the hard copy of the revised notice and the mark-up to Holly to make sure Joel gets it.

Thanks,

Steph

From: Burneson, Eric
Sent: Tuesday, May 31, 2016 6:13 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Cc: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Flaharty, Stephanie <Flaharty.Stephanie@epa.gov>
Subject: Fwd: PAG text questions

Confirmation that Joel wants those changes incorporated. Can you please make that happen for him to sign on Friday?

Sent from my iPhone

Begin forwarded message:

From: "Beauvais, Joel" <Beauvais.Joel@epa.gov>
Date: May 31, 2016 at 6:07:32 PM EDT

To: "Burneson, Eric" <Burneson.Eric@epa.gov>, "Grevatt, Peter" <Grevatt.Peter@epa.gov>
Cc: "Campbell, Ann" <Campbell.Ann@epa.gov>
Subject: RE: PAG text questions

Thanks, Eric - it would be great if we could make those tweaks and replace the copy I have, then I can sign when back in the office on Friday. On the schedule, let's plan to set a schedule and I'll connect directly with Mathy and Laura at the appropriate times to work on managing timing both of the internal process and the OMB review. I will be meeting with Gina and Laura soon on schedules for various actions, so it would be good to have that in advance of that mtg.

Joel

From: Burneson, Eric
Sent: Tuesday, May 31, 2016 6:03 PM
To: Beauvais, Joel <Beauvais.Joel@epa.gov>; Grevatt, Peter <Grevatt.Peter@epa.gov>
Subject: RE: PAG text questions

Joel: The following are responses to your questions about text in the FRN announcing the draft Drinking Water PAG.

Ex. 5 - Deliberative Process

pressing public health priorities which make it impractical.

Please let us know if you would like for us to incorporate the changes above into the FRN.

Regarding issuance of a final PAG by the end of the year, the critical factors that influence our schedule are:

Ex. 5 - Deliberative Process

Eric Burneson, P.E.

Director of Standards and Risk Management

Office of Ground Water and Drinking Water

US Environmental Protection Agency

Phone: 202-564-5250

Fax: 202 564 3760

From: Beauvais, Joel
Sent: Tuesday, May 31, 2016 1:45 PM
To: Grevatt, Peter <Grevatt.Peter@epa.gov>; Burneson, Eric <Burneson.Eric@epa.gov>
Subject: PAG text questions

Eric, Peter – I just wanted to ask about a couple sentences in the draft PAG FRN that I wasn't sure about. Not a big deal, but I couldn't tell whether these involved typos or I'm missing something . . .

Ex. 5 - Deliberative Process

P.S. The Administrator circled back to once again underscore her desire that we get this done before the end of the year, so please let me know what we need to do to make that happen.

To: Lopez-Carbo, Maria[Lopez-Carbo.Maria@epa.gov]
From: Christ, Lisa
Sent: Tue 5/31/2016 9:21:51 PM
Subject: RE: PAGs
EPA Drinking Water PAG 5-16-16_final.docx

Of course - Here's the PAG proposal. Christina is working to clear roll out materials with OPA.
Lisa

-----Original Message-----
From: Lopez-Carbo, Maria
Sent: Tuesday, May 31, 2016 4:30 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: PAGs

Hi Lisa:

Would it be possible for you to share this document before June 6? Just want to keep track of it before states and regions email post June 6.

Thanks
Maria

Sent from my iPhone

To: Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]
Cc: DeCair, Sara[DeCair.Sara@epa.gov]; Veal, Lee[Veal.Lee@epa.gov]
From: Christ, Lisa
Sent: Wed 5/25/2016 6:37:10 PM
Subject: FW: PAGS and LCR letter dates

FYI

From: Wadlington, Christina
Sent: Wednesday, May 25, 2016 2:31 PM
To: Lopez-Carbo, Maria <Lopez-Carbo.Maria@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>; Burneson, Eric <Burneson.Eric@epa.gov>; Thompkins, Anita <Thompkins.Anita@epa.gov>; Bergman, Ronald <Bergman.Ronald@epa.gov>
Cc: Greene, Ashley <Greene.Ashley@epa.gov>; Flaharty, Stephanie <Flaharty.Stephanie@epa.gov>; Harris, Adrienne <Harris.Adrienne@epa.gov>
Subject: PAGS and LCR letter dates

FYI: OPA has cleared for 6/6 PAGS & 6/7 EPA LCR response to letters

Christina Wadlington

Communications Director

Office of Ground Water and Drinking Water

U.S. Environmental Protection Agency

Tel: 202.566.1859

Email: wadlington.christina@epa.gov

To: Wadlington, Christina[Wadlington.Christina@epa.gov]; Huff, Lisa[Huff.Lisa@epa.gov]
Cc: Burneson, Eric[Burneson.Eric@epa.gov]
From: Christ, Lisa
Sent: Wed 5/25/2016 2:40:44 PM
Subject: RE: PAGS. Media Inquiry. Deadline COB today.

See below

From: Wadlington, Christina
Sent: Wednesday, May 25, 2016 9:06 AM
To: Christ, Lisa <Christ.Lisa@epa.gov>; Huff, Lisa <Huff.Lisa@epa.gov>
Cc: Burneson, Eric <Burneson.Eric@epa.gov>
Subject: PAGS. Media Inquiry. Deadline COB today.

Ladies,

Request your review of the below. While the deadline below is 1p, I requested by COB today. If that's not possible please let me know.

Q. First, could you tell me if EPA is going to release the drinking water PAG for public comment as a draft rule?

Ex. 5 - Deliberative Process

Q. Will this be separate from the final PAG manual even though it will become part of the manual?

Ex. 5 - Deliberative Process

Q. Also, can you tell me how the drinking water portion of the PAG was revised under OMB review? I believe these documents are no longer pre-decisional, given EPA's approval from OMB on the revised drinking water PAG.

Ex. 5 - Deliberative Process

Christina Wadlington

Communications Director

Office of Ground Water and Drinking Water

U.S. Environmental Protection Agency

Tel: 202.566.1859

Email: wadlington.christina@epa.gov

From: Fuld, John
Sent: Wednesday, May 25, 2016 8:58 AM
To: Wadlington, Christina <Wadlington.Christina@epa.gov>
Subject: Media Inquiry

Office of Water

Media Inquiry

Travis Loop

Communications Director-Water

loop.travis@epa.gov

John W. Fuld, Ph.D.

Media Relations Mgr.-Water

fuld.john@epa.gov

DATE: May 25, 2016

OUTLET: Inside EPA; re: PAGs

TOPIC: PAG's

DEADLINE: WE got this LATE yesterday, 1 pm (if possible?)

This is intended to be use as an internal document ONI
Not for external use

Back in December, you responded to an email from my colleague Lara Beaven who had asked about a notice that a Protective Action Guide for radiological emergencies had gone forward. You had corrected her that the Dec. notice to OMB was not the final PAG manual notice, but for a notice of availability for a proposed drinking water PAG.

I saw that last week the drinking water PAG notice had been approved by OMB, and that EPA the next day (May 19) sent over its final PAG manual without the drinking water chapter.

First, could you tell me if EPA is going to release the drinking water PAG for public comment as a draft rule? Will this be separate from the final PAG manual even though it will become part of the manual?

Also, can you tell me how the drinking water portion of the PAG was revised under OMB review? I believe these documents are no longer pre-decisional, given EPA's approval from OMB on the revised drinking water PAG.

ANSWER:

John W. Fuld, Ph.D.

Media Relations Manager-Water
Environmental Protection Agency

1200 Constitution Ave

Washington DC 20460

Office: 202-564-8847

Cell: 202-815-6408

Fuld.john@epa.gov

To: DeCair, Sara[DeCair.Sara@epa.gov]; Veal, Lee[Veal.Lee@epa.gov]; Perrin, Alan[Perrin.Alan@epa.gov]
Cc: Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]; Ellis, Jerry[Ellis.Jerry@epa.gov]; Wadlington, Christina[Wadlington.Christina@epa.gov]
From: Christ, Lisa
Sent: Wed 5/18/2016 8:43:59 PM
Subject: FW: OMB Review Concluded of Drinking Water PAG

Yeah!

From: Dorjets, Vlad **Ex. 6 - Personal Privacy**
Sent: Wednesday, May 18, 2016 4:33 PM
To: Grevatt, Peter <Grevatt.Peter@epa.gov>
Cc: Christ, Lisa <Christ.Lisa@epa.gov>; Greene, Ashley <Greene.Ashley@epa.gov>; Burneson, Eric <Burneson.Eric@epa.gov>; Hill, Glynis <Hill.Glynis@epa.gov>; Owens, Nicole <Owens.Nicole@epa.gov>
Subject: OMB Review Concluded of Drinking Water PAG

Peter,

OMB has just concluded its review of the proposed Drinking Water PAGs. Big thanks to you and your staff for addressing the comments submitted by OMB and interagency reviewers.

Vlad

To: Wadlington, Christina[Wadlington.Christina@epa.gov]; Burneson, Eric[Burneson.Eric@epa.gov]
From: Christ, Lisa
Sent: Wed 5/18/2016 5:49:50 PM
Subject: RE: FOR ERIC REVIEW: PAG Roll-Out materials

I'm comfortable with that

From: Wadlington, Christina
Sent: Wednesday, May 18, 2016 1:41 PM
To: Burneson, Eric <Burneson.Eric@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>
Subject: RE: FOR ERIC REVIEW: PAG Roll-Out materials

Does this edit work?

Ex. 5 - Deliberative Process

Christina Wadlington

Communications Director

Office of Ground Water and Drinking Water

U.S. Environmental Protection Agency

Tel: 202.566.1859

Email: wadlington.christina@epa.gov

From: Burneson, Eric
Sent: Wednesday, May 18, 2016 1:10 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>; Wadlington, Christina <Wadlington.Christina@epa.gov>
Subject: RE: FOR ERIC REVIEW: PAG Roll-Out materials

Ex. 5 - Deliberative Process

From: Christ, Lisa
Sent: Wednesday, May 18, 2016 1:07 PM
To: Wadlington, Christina <Wadlington.Christina@epa.gov>; Burneson, Eric <Burneson.Eric@epa.gov>
Subject: RE: FOR ERIC REVIEW: PAG Roll-Out materials

Ex. 5 - Deliberative Process

From: Wadlington, Christina
Sent: Wednesday, May 18, 2016 11:32 AM
To: Burneson, Eric <Burneson.Eric@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>
Subject: RE: FOR ERIC REVIEW: PAG Roll-Out materials

Thanks Eric!

Lisa, can you assist with addressing Eric's comment on this question?

Comment: Is this correct? I thought that the State and local authorities make those decisions.

Ex. 5 - Deliberative Process

Christina Wadlington

Communications Director

Office of Ground Water and Drinking Water

U.S. Environmental Protection Agency

Tel: 202.566.1859

Email: wadlington.christina@epa.gov

From: Burneson, Eric
Sent: Wednesday, May 18, 2016 10:54 AM
To: Wadlington, Christina <Wadlington.Christina@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>
Subject: RE: FOR ERIC REVIEW: PAG Roll-Out materials

I have completed my review. My edits and comments are on the sharepoint file.

From: Wadlington, Christina
Sent: Wednesday, May 18, 2016 8:25 AM
To: Christ, Lisa <Christ.Lisa@epa.gov>; Burneson, Eric <Burneson.Eric@epa.gov>
Subject: RE: FOR ERIC REVIEW: PAG Roll-Out materials

Thanks Lisa!

Eric, here is the direct link:

Ex. 5 - Deliberative Process

Please let me know when you have completed your review.

Christina Wadlington

Communications Director

Office of Ground Water and Drinking Water

U.S. Environmental Protection Agency

Tel: 202.566.1859

Email: wadlington.christina@epa.gov

From: Christ, Lisa
Sent: Wednesday, May 18, 2016 8:08 AM
To: Wadlington, Christina <Wadlington.Christina@epa.gov>; Burneson, Eric <Burneson.Eric@epa.gov>
Subject: FOR ERIC REVIEW: PAG Roll-Out materials

Hi Christina,

Ex. 5 - Deliberative Process

Lisa

From: Wadlington, Christina
Sent: Tuesday, May 17, 2016 5:14 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: Re: Revised PAG for Review

Lisa,

Can you review so we can get this to Eric by early tomorrow? Peter would like to see a draft sometime tomorrow.

Sent from my iPhone

On May 17, 2016, at 8:47 AM, Wadlington, Christina <Wadlington.Christina@epa.gov> wrote:

Thanks. I updated the roll out and collapsed the facts sheet Q&As in to it. I think this will

help with review and prevent the mess of how many documents were made for PFOA.

After all the language is approved we can then just pull out of the this and make any fact sheets/post on the web as needed? Thoughts?

Can you/whoever is relevant review? Once I get SRMD sign off, I'll forward OW for their first pass.

Ex. 5 - Deliberative Process

Christina Wadlington

Communications Director

Office of Ground Water and Drinking Water

U.S. Environmental Protection Agency

Tel: 202.566.1859

Email: wadlington.christina@epa.gov

From: Christ, Lisa
Sent: Tuesday, May 17, 2016 8:06 AM
To: Wadlington, Christina <Wadlington.Christina@epa.gov>
Subject: FW: Revised PAG for Review

From: Ellis, Jerry
Sent: Tuesday, May 17, 2016 8:04 AM

To: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: RE: Revised PAG for Review

Here are the latest. They were on the SharePoint site that ORIA set up.

Jerry L. Ellis, Jr. – Environmental Scientist

Office Phone: 202-564-2766

U.S. Environmental Protection Agency

Office of Ground Water and Drinking Water

Standards and Risk Management Division

Targeting & Analysis Branch

1200 Pennsylvania Ave. (4607M), N.W.

Washington, D.C. 20460

From: Christ, Lisa
Sent: Tuesday, May 17, 2016 7:48 AM
To: Ellis, Jerry <Ellis.Jerry@epa.gov>
Subject: FW: Revised PAG for Review

Hi Jerry – can you please send me the most recent version of the general FS, technical FS and Q&As? The version I have is dated august 2015

Lisa

From: Grevatt, Peter
Sent: Tuesday, May 17, 2016 7:36 AM

To: Burneson, Eric <Burneson.Eric@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>; Wadlington, Christina <Wadlington.Christina@epa.gov>
Subject: Fwd: Revised PAG for Review

We'll need to get on top of this part ASAP.

Sent from my iPhone

Begin forwarded message:

From: "Loop, Travis" <Loop.Travis@epa.gov>
Date: May 16, 2016 at 5:02:59 PM EDT
To: "Beauvais, Joel" <Beauvais.Joel@epa.gov>
Cc: "Grevatt, Peter" <Grevatt.Peter@epa.gov>, "Campbell, Ann" <Campbell.Ann@epa.gov>
Subject: Re: Revised PAG for Review

I haven't received roll out plan yet...

Travis Loop

Communications Director for Water

U.S. Environmental Protection Agency

Phone: 202.870.6922

Follow us on Twitter @EPAwater

On May 16, 2016, at 4:55 PM, Beauvais, Joel <Beauvais.Joel@epa.gov> wrote:

Great. Can we make sure folks, including me, are looped on likely clearance/rollout timing? Is this going to be rolled out as part of broader PAGs or separately? Are there rollout materials for this?

From: Grevatt, Peter
Sent: Monday, May 16, 2016 4:54 PM
To: Flynn, Mike <Flynn.Mike@epa.gov>; Edwards, Jonathan <Edwards.Jonathan@epa.gov>
Cc: Beauvais, Joel <Beauvais.Joel@epa.gov>
Subject: Fw: Revised PAG for Review

FYI - OMB approved DW PAG for loading to ROCIS

From: Christ, Lisa
Sent: Monday, May 16, 2016 4:44 PM
To: Nickerson, William; Owens, Nicole
Cc: Burneson, Eric; Greene, Ashley; Grevatt, Peter; Rennert, Kevin; Hernandez-Quinones, Samuel
Subject: RE: Revised PAG for Review

Hi Bill & Nicole –

Attached are the following documents for upload to ROCIS.

Ex. 5 - Deliberative Process

The proposed drinking water PAG

Let me know if you have any questions.

Lisa

From: Rennert, Kevin
Sent: Monday, May 16, 2016 4:00 PM
To: Grevatt, Peter <Grevatt.Peter@epa.gov>
Cc: Burneson, Eric <Burneson.Eric@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>; Greene, Ashley <Greene.Ashley@epa.gov>; Nickerson, William <Nickerson.William@epa.gov>; Owens, Nicole <Owens.Nicole@epa.gov>
Subject: Re: Revised PAG for Review

Please loop in Nicole Owens as well (cc'd).

On May 16, 2016, at 3:56 PM, Grevatt, Peter <Grevatt.Peter@epa.gov> wrote:

When the FRN is done, please work with Bill Nickerson and or Kevin to get the docs loaded in ROCIS. Thanks again to you and the team for your great work on this.

From: Dorjets, Vlad Ex. 6 - Personal Privacy
Sent: Monday, May 16, 2016 3:51 PM
To: Grevatt, Peter
Cc: Burneson, Eric; Greene, Ashley; Wadlington, Christina; Rennert, Kevin; Beauvais, Joel
Subject: RE: Revised PAG for Review

That's great! Once you've revised the FRN, please ask OP to upload clean versions of the updated docs to ROCIS (I have just opened it). Depending on when they are able to do that, I should be able to conclude OMB's review either tomorrow or the day after.

From: Grevatt, Peter [mailto:Grevatt.Peter@epa.gov]
Sent: Monday, May 16, 2016 3:33 PM
To: Dorjets, Vlad Ex. 6 - Personal Privacy
Cc: Burneson, Eric <Burneson.Eric@epa.gov>; Greene, Ashley <Greene.Ashley@epa.gov>; Wadlington, Christina <Wadlington.Christina@epa.gov>; Rennert, Kevin <Rennert.Kevin@epa.gov>; Beauvais, Joel <beauvais.joel@epa.gov>
Subject: Re: Revised PAG for Review

Thanks Vlad. The answer is yes on both items. The docket is already set up and we are revising the FRN now.

From: Dorjets, Vlad Ex. 6 - Personal Privacy
Sent: Monday, May 16, 2016 2:22:17 PM

To: Grevatt, Peter
Cc: Burneson, Eric; Greene, Ashley; Wadlington, Christina; Rennert, Kevin; Beauvais, Joel
Subject: RE: Revised PAG for Review

Peter,

Thanks for sending these updated documents and for your responsiveness to OMB's comment. **Ex. 5 - Deliberative Process**

Ex. 5 - Deliberative Process

I am prepared to conclude OMB's review soon after getting this last item squared away.

Vlad

From: Grevatt, Peter [mailto:Grevatt.Peter@epa.gov]
Sent: Monday, May 16, 2016 9:09 AM
To: Dorjets, Vlad <Vladik_Dorjets@omb.eop.gov>
Cc: Burneson, Eric <Burneson.Eric@epa.gov>; Greene, Ashley <Greene.Ashley@epa.gov>; Wadlington, Christina <Wadlington.Christina@epa.gov>; Rennert, Kevin <Rennert.Kevin@epa.gov>; Beauvais, Joel <beauvais.joel@epa.gov>
Subject: Revised PAG for Review

Vlad, attached please find track changes and clean versions of the PAG documents in response to the OMB comments. Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

Please let me know if you have any questions on this and when you will want to discuss. Thanks, P. Grevatt

To: Wadlington, Christina[Wadlington.Christina@epa.gov]
From: Christ, Lisa
Sent: Tue 5/17/2016 1:22:41 PM
Subject: FW: Revised PAG for Review
Draft Drinking Water PAG Desk Statement 5 7 16 egb.docx

From: Burneson, Eric
Sent: Tuesday, May 17, 2016 9:20 AM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Cc: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Ellis, Jerry <Ellis.Jerry@epa.gov>
Subject: RE: Revised PAG for Review

Attached are my recommended edits to the desk statement. Please let me know if you have questions or concerns.

From: Christ, Lisa
Sent: Monday, May 16, 2016 3:32 PM
To: Burneson, Eric <Burneson.Eric@epa.gov>
Cc: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Ellis, Jerry <Ellis.Jerry@epa.gov>
Subject: RE: Revised PAG for Review

Revised FRN with a sentence added to section D page 7. I ran this past Sara and Lee and they're okay with this modification.

Also attached the desk statement – this has gone through review previously (Peter and Mike and the communication folks in OAR) – I made one small edit.

From: Christ, Lisa
Sent: Monday, May 16, 2016 2:38 PM
To: Burneson, Eric <Burneson.Eric@epa.gov>
Cc: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Ellis, Jerry <Ellis.Jerry@epa.gov>
Subject: RE: Revised PAG for Review

Absolutely we can – a docket has already been set up. I'll work on revising the FRN now and check the comm materials to see if they need updating.

From: Burneson, Eric
Sent: Monday, May 16, 2016 2:24 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: FW: Revised PAG for Review

Can we do this? Is there a docket?

From: Dorjets, Vlad **Ex. 6 - Personal Privacy**
Sent: Monday, May 16, 2016 2:22 PM
To: Grevatt, Peter <Grevatt.Peter@epa.gov>
Cc: Burneson, Eric <Burneson.Eric@epa.gov>; Greene, Ashley <Greene.Ashley@epa.gov>; Wadlington, Christina <Wadlington.Christina@epa.gov>; Rennert, Kevin <Rennert.Kevin@epa.gov>; Beauvais, Joel <Beauvais.Joel@epa.gov>
Subject: RE: Revised PAG for Review

Peter,

Thanks for sending these updated documents and for your responsiveness to OMB's comment.

Ex. 5 - Deliberative Process

I am prepared to conclude OMB's review soon after getting this last item squared away.

Vlad

From: Grevatt, Peter [mailto:Grevatt.Peter@epa.gov]
Sent: Monday, May 16, 2016 9:09 AM
To: Dorjets, Vlad Ex. 6 - Personal Privacy
Cc: Burneson, Eric <Burneson.Eric@epa.gov>; Greene, Ashley <Greene.Ashley@epa.gov>; Wadlington, Christina <Wadlington.Christina@epa.gov>; Rennert, Kevin <Rennert.Kevin@epa.gov>; Beauvais, Joel <beauvais.joel@epa.gov>
Subject: Revised PAG for Review

Vlad, attached please find track changes and clean versions of the PAG documents in response to the OMB comments. Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

Please let me know if you have any questions on this and when you will want to discuss.
Thanks, P. Grevatt

To: Wadlington, Christina[Wadlington.Christina@epa.gov]
From: Christ, Lisa
Sent: Tue 5/17/2016 12:06:08 PM
Subject: FW: Revised PAG for Review
Technical Fact Sheet for DW PAG 8-26-15.docx
Internal Q&A on Water PAG 9-28-2015.docx
General Public Fact Sheet 8-26-15.docx
DRAFT Drinking Water PAG Comms Plan 10-9-2015.doc

From: Ellis, Jerry
Sent: Tuesday, May 17, 2016 8:04 AM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: RE: Revised PAG for Review

Here are the latest. They were on the SharePoint site that ORIA set up.

Jerry L. Ellis, Jr. – Environmental Scientist

Office Phone: 202-564-2766

U.S. Environmental Protection Agency

Office of Ground Water and Drinking Water

Standards and Risk Management Division

Targeting & Analysis Branch

1200 Pennsylvania Ave. (4607M), N.W.

Washington, D.C. 20460

From: Christ, Lisa
Sent: Tuesday, May 17, 2016 7:48 AM
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Subject: FW: Revised PAG for Review

Hi Jerry – can you please send me the most recent version of the general FS, technical FS and Q&As? The version I have is dated august 2015

Lisa

From: Grevatt, Peter
Sent: Tuesday, May 17, 2016 7:36 AM
To: Burneson, Eric <Burneson.Eric@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>; Wadlington, Christina <Wadlington.Christina@epa.gov>
Subject: Fwd: Revised PAG for Review

We'll need to get on top of this part ASAP.

Sent from my iPhone

Begin forwarded message:

> **From:** "Loop, Travis" <Loop.Travis@epa.gov>
> **Date:** May 16, 2016 at 5:02:59 PM EDT
> **To:** "Beauvais, Joel" <Beauvais.Joel@epa.gov>
> **Cc:** "Grevatt, Peter" <Grevatt.Peter@epa.gov>, "Campbell, Ann" <Campbell.Ann@epa.gov>
> **Subject: Re: Revised PAG for Review**
>
> I haven't received roll out plan yet...
>
> Travis Loop
>
> Communications Director for Water
>
> U.S. Environmental Protection Agency
>
> Phone: 202.870.6922
>
> Follow us on Twitter @EPAwater
>
> On May 16, 2016, at 4:55 PM, Beauvais, Joel <Beauvais.Joel@epa.gov> wrote:

Great. Can we make sure folks, including me, are looped on likely clearance/rollout timing? Is this going to be rolled out as part of broader PAGs or separately? Are there rollout materials for this?

From: Grevatt, Peter
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To: Flynn, Mike <Flynn.Mike@epa.gov>; Edwards, Jonathan <Edwards.Jonathan@epa.gov>
Cc: Beauvais, Joel <Beauvais.Joel@epa.gov>
Subject: Fw: Revised PAG for Review

FYI - OMB approved DW PAG for loading to ROCIS

From: Christ, Lisa
Sent: Monday, May 16, 2016 4:44 PM
To: Nickerson, William; Owens, Nicole
Cc: Burneson, Eric; Greene, Ashley; Grevatt, Peter; Rennert, Kevin; Hernandez-Quinones, Samuel
Subject: RE: Revised PAG for Review

Hi Bill & Nicole –

Attached are the following documents for upload to ROCIS.

Ex. 5 - Deliberative Process

The proposed drinking water PAG

Let me know if you have any questions.

Lisa

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Cc: Burneson, Eric <Burneson.Eric@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>; Greene, Ashley <Greene.Ashley@epa.gov>; Nickerson, William <Nickerson.William@epa.gov>; Owens, Nicole <Owens.Nicole@epa.gov>
Subject: Re: Revised PAG for Review

Please loop in Nicole Owens as well (cc'd).

On May 16, 2016, at 3:56 PM, Grevatt, Peter <Grevatt.Peter@epa.gov> wrote:

When the FRN is done, please work with Bill Nickerson and or Kevin to get the docs loaded in ROCIS. Thanks again to you and the team for your great work on this.

From: Dorjets, Vlad Ex. 6 - Personal Privacy
Sent: Monday, May 16, 2016 3:51 PM
To: Grevatt, Peter
Cc: Burneson, Eric; Greene, Ashley; Wadlington, Christina; Rennert, Kevin; Beauvais, Joel
Subject: RE: Revised PAG for Review

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Cc: Burneson, Eric <Burneson.Eric@epa.gov>; Greene, Ashley

<Greene.Ashley@epa.gov>; Wadlington, Christina <Wadlington.Christina@epa.gov>; Rennert, Kevin <Rennert.Kevin@epa.gov>; Beauvais, Joel <beauvais.joel@epa.gov>
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Cc: Burneson, Eric <Burneson.Eric@epa.gov>; Greene, Ashley <Greene.Ashley@epa.gov>; Wadlington, Christina <Wadlington.Christina@epa.gov>; Rennert, Kevin <Rennert.Kevin@epa.gov>; Beauvais, Joel <beauvais.joel@epa.gov>
Subject: Revised PAG for Review

Vlad, attached please find track changes and clean versions of the PAG documents in response to the OMB comments. Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

Please let me know if you have any questions on this and when you will want to discuss. Thanks, P. Grevatt

To: Nickerson, William[Nickerson.William@epa.gov]; Owens, Nicole[Owens.Nicole@epa.gov]
Cc: Burneson, Eric[Burneson.Eric@epa.gov]; Greene, Ashley[Greene.Ashley@epa.gov]; Grevatt, Peter[Grevatt.Peter@epa.gov]; Rennert, Kevin[Rennert.Kevin@epa.gov]; Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]
From: Christ, Lisa
Sent: Mon 5/16/2016 8:44:28 PM
Subject: RE: Revised PAG for Review
EPA Drinking Water PAG FR Notice 5-16-16_final.docx
EPA Drinking Water PAG 5-16-16_final.docx

Hi Bill & Nicole –

Attached are the following documents for upload to ROCIS.

Federal Register Notice (we added a sentence in section D, page 7: *The EPA has included examples of estimated costs for selected drinking water protective actions in the docket.*)

The proposed drinking water PAG

Let me know if you have any questions.

Lisa

From: Rennert, Kevin
Sent: Monday, May 16, 2016 4:00 PM
To: Grevatt, Peter <Grevatt.Peter@epa.gov>
Cc: Burneson, Eric <Burneson.Eric@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>; Greene, Ashley <Greene.Ashley@epa.gov>; Nickerson, William <Nickerson.William@epa.gov>; Owens, Nicole <Owens.Nicole@epa.gov>
Subject: Re: Revised PAG for Review

Please loop in Nicole Owens as well (cc'd).

On May 16, 2016, at 3:56 PM, Grevatt, Peter <Grevatt.Peter@epa.gov> wrote:

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To: Grevatt, Peter
Cc: Burneson, Eric; Greene, Ashley; Wadlington, Christina; Rennert, Kevin; Beauvais, Joel
Subject: RE: Revised PAG for Review

That's great! Once you've revised the FRN, please ask OP to upload clean versions of the updated docs to ROCIS (I have just opened it). Depending on when they are able to do that, I should be able to conclude OMB's review either tomorrow or the day after.

From: Grevatt, Peter [mailto:Grevatt.Peter@epa.gov]
Sent: Monday, May 16, 2016 3:33 PM
To: Dorjets, Vlad Ex. 6 - Personal Privacy
Cc: Burneson, Eric <Burneson.Eric@epa.gov>; Greene, Ashley <Greene.Ashley@epa.gov>; Wadlington, Christina <Wadlington.Christina@epa.gov>; Rennert, Kevin <Rennert.Kevin@epa.gov>; Beauvais, Joel <beauvais.joel@epa.gov>
Subject: Re: Revised PAG for Review

Thanks Vlad. The answer is yes on both items. The docket is already set up and we are revising the FRN now.

From: Dorjets, Vlad Ex. 6 - Personal Privacy
Sent: Monday, May 16, 2016 2:22:17 PM
To: Grevatt, Peter
Cc: Burneson, Eric; Greene, Ashley; Wadlington, Christina; Rennert, Kevin; Beauvais, Joel
Subject: RE: Revised PAG for Review

Peter,

Thanks for sending these updated documents and for your responsiveness to OMB's comment. Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

I am prepared to conclude OMB's review soon after getting this last item squared away.

Vlad

From: Grevatt, Peter [mailto:Grevatt.Peter@epa.gov]
Sent: Monday, May 16, 2016 9:09 AM
To: Dorjets, Vlad Ex. 6 - Personal Privacy
Cc: Burneson, Eric <Burneson.Eric@epa.gov>; Greene, Ashley <Greene.Ashley@epa.gov>; Wadlington, Christina <Wadlington.Christina@epa.gov>; Rennert, Kevin <Rennert.Kevin@epa.gov>; Beauvais, Joel <beauvais.joel@epa.gov>
Subject: Revised PAG for Review

Vlad, attached please find track changes and clean versions of the PAG documents in response to the OMB comments. Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

Please let me know if you have any questions on this and when you will want to discuss.
Thanks, P. Grevatt

To: Burneson, Eric[Burneson.Eric@epa.gov]
Cc: Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]; Ellis, Jerry[Ellis.Jerry@epa.gov]
From: Christ, Lisa
Sent: Mon 5/16/2016 7:32:19 PM
Subject: RE: Revised PAG for Review
Revised EPA Drinking Water PAG FR Notice 5-16-16_lc.docx
Draft Drinking Water PAG Desk Statement 12 11 15_LC JW_v2.docx

Revised FRN with a sentence added to section D page 7. I ran this past Sara and Lee and they're okay with this modification.

Also attached the desk statement – this has gone through review previously (Peter and Mike and the communication folks in OAR) – I made one small edit.

From: Christ, Lisa
Sent: Monday, May 16, 2016 2:38 PM
To: Burneson, Eric <Burneson.Eric@epa.gov>
Cc: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Ellis, Jerry <Ellis.Jerry@epa.gov>
Subject: RE: Revised PAG for Review

Absolutely we can – a docket has already been set up. I'll work on revising the FRN now and check the comm materials to see if they need updating.

From: Burneson, Eric
Sent: Monday, May 16, 2016 2:24 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: FW: Revised PAG for Review

Can we do this? Is there a docket?

From: Dorjets, Vlad **Ex. 6 - Personal Privacy**
Sent: Monday, May 16, 2016 2:22 PM
To: Grevatt, Peter <Grevatt.Peter@epa.gov>
Cc: Burneson, Eric <Burneson.Eric@epa.gov>; Greene, Ashley <Greene.Ashley@epa.gov>; Wadlington, Christina <Wadlington.Christina@epa.gov>; Rennert, Kevin <Rennert.Kevin@epa.gov>; Beauvais, Joel <Beauvais.Joel@epa.gov>

Subject: RE: Revised PAG for Review

Peter,

Thanks for sending these updated documents and for your responsiveness to OMB's comment.

Ex. 5 - Deliberative Process

I am prepared to conclude OMB's review soon after getting this last item squared away.

Vlad

From: Grevatt, Peter [mailto:Grevatt.Peter@epa.gov]
Sent: Monday, May 16, 2016 9:09 AM
To: Dorjets, Vlad Ex. 6 - Personal Privacy
Cc: Burneson, Eric <Burneson.Eric@epa.gov>; Greene, Ashley <Greene.Ashley@epa.gov>; Wadlington, Christina <Wadlington.Christina@epa.gov>; Rennert, Kevin <Rennert.Kevin@epa.gov>; Beauvais, Joel <beauvais.joel@epa.gov>
Subject: Revised PAG for Review

Vlad, attached please find track changes and clean versions of the PAG documents in response to the OMB comments. Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

Please let me know if you have any questions on this and when you will want to discuss.
Thanks, P. Grevatt

To: DeCair, Sara[DeCair.Sara@epa.gov]; Veal, Lee[Veal.Lee@epa.gov]
From: Christ, Lisa
Sent: Mon 5/16/2016 6:57:47 PM
Subject: RE: Revised PAG for Review
Revised EPA Drinking Water PAG FR Notice 5-16-16_lc.docx

I put a sentence referring readers to the docket for the cost estimate in section D page 7. Look okay? or do you have a suggestion for a different section?

From: DeCair, Sara
Sent: Monday, May 16, 2016 2:36 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>; Veal, Lee <Veal.Lee@epa.gov>
Subject: Re: Revised PAG for Review

Lisa, absolutely. Any and all supporting documents go there, and we can put them all up at the time of our FR Notice publication.

Sara

From: Christ, Lisa
Sent: Monday, May 16, 2016 2:33 PM
To: DeCair, Sara; Veal, Lee
Subject: FW: Revised PAG for Review

Ladies –

Confirming we can place the qualitative cost analysis in the docket [Docket ID No. EPA-HQ-OAR-2008-0268]. I can add a sentence to the FRN if you're okay with this.

Lisa

From: Burneson, Eric
Sent: Monday, May 16, 2016 2:24 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: FW: Revised PAG for Review

Can we do this? Is there a docket?

From: Dorjets, Vlad Ex. 6 - Personal Privacy
Sent: Monday, May 16, 2016 2:22 PM
To: Grevatt, Peter <Grevatt.Peter@epa.gov>
Cc: Burneson, Eric <Burneson.Eric@epa.gov>; Greene, Ashley <Greene.Ashley@epa.gov>; Wadlington, Christina <Wadlington.Christina@epa.gov>; Rennert, Kevin <Rennert.Kevin@epa.gov>; Beauvais, Joel <Beauvais.Joel@epa.gov>
Subject: RE: Revised PAG for Review

Peter,

Thanks for sending these updated documents and for your responsiveness to OMB's comment.

Ex. 5 - Deliberative Process

I am prepared to conclude OMB's review soon after getting this last item squared away.

Vlad

From: Grevatt, Peter [mailto:Grevatt.Peter@epa.gov]
Sent: Monday, May 16, 2016 9:09 AM
To: Dorjets, Vlad Ex. 6 - Personal Privacy
Cc: Burneson, Eric <Burneson.Eric@epa.gov>; Greene, Ashley <Greene.Ashley@epa.gov>;

Wadlington, Christina <Wadlington.Christina@epa.gov>; Rennert, Kevin <Rennert.Kevin@epa.gov>; Beauvais, Joel <beauvais.joel@epa.gov>
Subject: Revised PAG for Review

Vlad, attached please find track changes and clean versions of the PAG documents in response to the OMB comments.

Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

Please let me know if you have any questions on this and when you will want to discuss.
Thanks, P. Grevatt

To: Bangser, Paul[bangser.paul@epa.gov]
Cc: Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]
From: Christ, Lisa
Sent: Fri 5/13/2016 6:03:32 PM
Subject: FW: Revised PAG for Review
Revised EPA Drinking Water PAG 5-6-16_lc.docx
Revised EPA Drinking Water PAG 5-11-16_clean_lc.docx
Revised EPA Drinking Water PAG FR Notice 5-11-16_clean_lc.docx
Revised EPA Drinking Water PAG FR Notice 5-11-16_lc.docx

Hi Paul –

Just a heads up that this is likely to go back to OMB for their sign off very soon. We will be publishing the proposal for public comment as soon as OMB clears it.

Lisa

From: Grevatt, Peter
Sent: Thursday, May 12, 2016 5:20 PM
To: Beauvais, Joel <Beauvais.Joel@epa.gov>; Rennert, Kevin <Rennert.Kevin@epa.gov>
Cc: Burneson, Eric <Burneson.Eric@epa.gov>; Greene, Ashley <Greene.Ashley@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>
Subject: Revised PAG for Review

Joel and Kevin, attached please find track changes and clean versions of the PAG documents in response to the OMB comments received last week. Please note that we have incorporated OMB's input with the following qualifications:

Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

Please let me know if you have any questions on this of if you want to discuss. Thanks, P. Grevatt

To: DeCair, Sara[DeCair.Sara@epa.gov]; Hill, Glynis[Hill.Glynis@epa.gov]; Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]
From: Christ, Lisa
Sent: Thur 5/12/2016 9:34:20 PM
Subject: FW: Revised PAG for Review
Revised EPA Drinking Water PAG 5-6-16_lc.docx
Revised EPA Drinking Water PAG 5-11-16_clean_lc.docx
Revised EPA Drinking Water PAG FR Notice 5-11-16_clean_lc.docx
Revised EPA Drinking Water PAG FR Notice 5-11-16_lc.docx

FYI

From: Grevatt, Peter
Sent: Thursday, May 12, 2016 5:20 PM
To: Beauvais, Joel <Beauvais.Joel@epa.gov>; Rennert, Kevin <Rennert.Kevin@epa.gov>
Cc: Burneson, Eric <Burneson.Eric@epa.gov>; Greene, Ashley <Greene.Ashley@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>
Subject: Revised PAG for Review

Joel and Kevin, attached please find track changes and clean versions of the PAG documents in response to the OMB comments received last week.

Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

Please let me know if you have any questions on this of if you want to discuss. Thanks, P. Grevatt

To: DeCair, Sara[DeCair.Sara@epa.gov]
Cc: Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]
From: Christ, Lisa
Sent: Wed 5/11/2016 7:02:37 PM
Subject: FW: FOR ERIC's REVIEW - PAG
Revised EPA Drinking Water PAG 5-6-16_lc.docx
Revised EPA Drinking Water PAG 5-11-16_clean_lc.docx
Revised EPA Drinking Water PAG FR Notice 5-11-16_clean_lc.docx
Revised EPA Drinking Water PAG FR Notice 5-11-16_lc.docx

Hi Sara –

Eric's goal is to get the documents to Peter COB today. I don't know if Joel will want to review, since he didn't before the package went to OMB. If not, once Peter has reviewed we're ready to go back to OMB (maybe this week).

Ex. 5 - Deliberative Process

Lisa

From: Christ, Lisa
Sent: Wednesday, May 11, 2016 1:01 PM
To: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>
Cc: Hill, Glynis <Hill.Glynis@epa.gov>
Subject: FW: FOR ERIC's REVIEW - PAG

FYI

From: Christ, Lisa
Sent: Wednesday, May 11, 2016 1:01 PM
To: Burneson, Eric <Burneson.Eric@epa.gov>
Subject: FOR ERIC's REVIEW - PAG

Attached are redline/strikeout and clean versions of the proposal and the FRN.

Ex. 5 - Deliberative Process

From: Christ, Lisa
Location: EPA East Room 2227-E / Lisa's Office
Importance: Normal
Subject: Accepted: DW PAGs - OGC Review
Start Date/Time: Mon 5/9/2016 3:30:00 PM
End Date/Time: Mon 5/9/2016 4:30:00 PM

To: Bangser, Paul[bangser.paul@epa.gov]
Cc: Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]
From: Christ, Lisa
Sent: Thur 5/5/2016 6:02:02 PM
Subject: FW: OMB Comments on DW PAG Passback
EPA Drinking Water PAG FR Notice (OMB Comments 05-04-16).docx
ATT00001.htm
EPA Drinking Water PAG (OMB Comments 05-04-16).docx
ATT00002.htm

Paul –

We received comments from OMB on our response to comments (see attached). I need to respond to Peter COB today on whether or not we can address OMB's additional comments and our timeframe. I don't have concerns about OMB's suggested revisions.

Getting OMB sign-off is high priority for OGWDW and ORIA. Please let me know asap if there are red flag/show stoppers here I should tell Peter about.

thanks

Lisa

From: Grevatt, Peter
Sent: Wednesday, May 04, 2016 9:02 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Cc: Burneson, Eric <Burneson.Eric@epa.gov>; Greene, Ashley <Greene.Ashley@epa.gov>
Subject: Fwd: OMB Comments on DW PAG Passback

Please take a look. Let's see if we can get a few min to discuss tomorrow.

Sent from my iPhone

Begin forwarded message:

From: "Dorjets, Vlad" Ex. 6 - Personal Privacy
Date: May 4, 2016 at 7:26:42 PM EDT
To: "Rennert, Kevin" <Rennert.Kevin@epa.gov>
Cc: "Grevatt, Peter" <Grevatt.Peter@epa.gov>, "Burneson, Eric"

<Burneson.Eric@epa.gov>, "Laity, Jim" Ex. 6 - Personal Privacy
Subject: OMB Comments on DW PAG Passback

Kevin,

Please find attached, updated comments from OMB on the intermediate Drinking Water PAG and the related FRN. Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

Let me know if you have any questions.

Vlad

To: Wadlington, Christina[Wadlington.Christina@epa.gov]; Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]
From: Christ, Lisa
Sent: Mon 5/2/2016 2:14:28 PM
Subject: RE: PAGS

I do not have an update. Our response to comments is with OMB (recvd 4/22) for their review and sign off.

From: Wadlington, Christina
Sent: Monday, May 02, 2016 9:56 AM
To: Christ, Lisa <Christ.Lisa@epa.gov>; Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>
Subject: PAGS

Is there an update on PAGS? Just need to ensure this is correct for the Administrator Weekly.

As early as early May, pending completion of OMB review, EPA plans to release a proposed Protective Action Guide for drinking water, which would provide non-regulatory guidance for drinking water emergencies caused by radiological incidents.

Christina Wadlington

Communications Director

Office of Ground Water and Drinking Water

U.S. Environmental Protection Agency

Tel: 202.566.1859

Email: wadlington.christina@epa.gov

To: Hill, Glynis[Hill.Glynis@epa.gov]
From: Christ, Lisa
Sent: Mon 4/25/2016 2:02:14 PM
Subject: FW: Response to interagency comments on DW Radiation PAG document
Revised PAG for DW 4-21-16_v2.docx
Clean Copy - Revised PAG for DW 4-21-16.pdf
DRAFT Resonse to Comment Proposed Drinking Water PAG 4-19-16.docx
Revised FRN Drinking Water PAG 4-21-2016.docx

From: Christ, Lisa
Sent: Thursday, April 21, 2016 5:58 PM
To: Grevatt, Peter <Grevatt.Peter@epa.gov>
Cc: Burneson, Eric <Burneson.Eric@epa.gov>; Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Ellis, Jerry <Ellis.Jerry@epa.gov>
Subject: FW: Response to interagency comments on DW Radiation PAG document

Peter,

Attached are:

1) DW PAG proposal redline/strikeout

2) DW PAG proposal clean version

3) Response to comments

4) Revised FRN with additional language requested by OMB

Let me know if you need anything else.

Lisa

From: Rennert, Kevin
Sent: Thursday, April 21, 2016 2:26 PM
To: Grevatt, Peter <Grevatt.Peter@epa.gov>
Cc: Christ, Lisa <Christ.Lisa@epa.gov>; Burneson, Eric <Burneson.Eric@epa.gov>; Greene, Ashley <Greene.Ashley@epa.gov>; Flynn, Mike <Flynn.Mike@epa.gov>; McGartland, Al

<McGartland.Al@epa.gov>; Corrales, Mark <Corrales.Mark@epa.gov>
Subject: RE: Response to interagency comments on DW Radiation PAG document

Peter or Eric, if you haven't already, please transmit these to OMB through the normal channels as soon as possible. Thanks. -Kevin

From: Grevatt, Peter
Sent: Wednesday, April 20, 2016 9:25 AM
To: Beauvais, Joel <Beauvais.Joel@epa.gov>
Cc: Rennert, Kevin <Rennert.Kevin@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>; Burneson, Eric <Burneson.Eric@epa.gov>; Greene, Ashley <Greene.Ashley@epa.gov>; Flynn, Mike <Flynn.Mike@epa.gov>; McGartland, Al <McGartland.Al@epa.gov>
Subject: Re: Response to interagency comments on DW Radiation PAG document

Thanks Joel. Kevin, let Eric Burneson if you have any questions on this.

Sent from my iPhone

On Apr 20, 2016, at 8:17 AM, Beauvais, Joel <Beauvais.Joel@epa.gov> wrote:

> I won't have a chance to look until tonight but feel comfortable with it going whenever ready - don't wait for me
>
> On Apr 20, 2016, at 6:28 AM, Grevatt, Peter <Grevatt.Peter@epa.gov> wrote:
>
> > Thanks Kevin and Joel. Let us know if you have any questions on this.
> >
> > Sent from my iPhone
> >
> > On Apr 20, 2016, at 5:25 AM, Rennert, Kevin <Rennert.Kevin@epa.gov> wrote:
> >
> > > Thanks, Peter. I'll take a very quick look at this this morning and will have staff do the same, but would like to transmit this to OMB as soon as possible. Joel - are you comfortable with the content and this going back over? Kevin
> > >
> > > On Apr 19, 2016, at 10:37 PM, Grevatt, Peter <Grevatt.Peter@epa.gov> wrote:
> > >
> > > > Joel and Kevin, please see attached to this message our proposed response to interagency comments on our DW PAG document. With a big thanks to Al McGartland for all of his assistance, this includes the qualitative economic analysis that OMB requested. I think this is

ready to go back to OMB. Please let me know how you would like to proceed on process.

Thanks, P. Grevatt

<DRAFT Resonse to Comment Proposed Drinking Water PAG 4-19-16.docx>

To: Burneson, Eric[Burneson.Eric@epa.gov]
From: Christ, Lisa
Sent: Wed 4/6/2016 7:03:28 PM
Subject: RE: FOR ERIC REVIEW: PAG briefing document
EO 12866 Interagency Comments PAG_v2.docx

Hopefully this is better. We intend to bring the revised proposal redline/strikeout and clean versions to the briefing. Al thinks we have enough in our qualitative analysis to engage OMB but will have comments for us later today

From: Burneson, Eric
Sent: Wednesday, April 06, 2016 11:46 AM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: RE: FOR ERIC REVIEW: PAG briefing document

I am concerned that this document separates out the comment issues unnecessarily (frequent comments versus OMB comments) when there is lots of overlap.

It also has very little substance in the response to many of the OMB comments other than that we will do this. We need to either provide the revised PAG document with the revisions incorporated or we need to convey the substance of the edits we propose to make.

From: Christ, Lisa
Sent: Wednesday, April 06, 2016 10:36 AM
To: Burneson, Eric <Burneson.Eric@epa.gov>
Subject: FOR ERIC REVIEW: PAG briefing document

Attached for your review is the briefing document for Peter. I hope to hear from Al soon regarding the qualitative analysis.

To: Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]; Ellis, Jerry[Ellis.Jerry@epa.gov]
From: Christ, Lisa
Sent: Tue 3/29/2016 9:53:43 PM
Subject: FW: EPA Drinking Water PAGs

FYI – the direction Al and I discussed is below.

land, Al
Sent: Monday, March 21, 2016 4:12 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: Re: EPA Drinking Water PAGs

After some difficult back and forth I think it will satisfy them.

Shoot me an email with text or an invite (if you want to meet). I can seek clarification from Amanda if needed.

Sent from my iPhone

On Mar 21, 2016, at 4:00 PM, Christ, Lisa <Christ.Lisa@epa.gov> wrote:

Hi Al,

I've asked Sam on my staff to identify ways we can try to accommodate Amanda's suggestion below:

Ex. 5 - Deliberative Process

I'm meeting with Sam later this week to talk about ideas/approaches for ranking. Do you think this will satisfy Vlad/Jim?

Lisa

From: McGartland, Al
Sent: Monday, March 21, 2016 3:42 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: RE: EPA Drinking Water PAGs

Should we meet to figure what we are going to do with Amanda's suggestion? We need to get back to her. Unfortanately, I think Jim Laity talked to Amanda and thought we were doing something more than I did.

I think we should draft something that we are willing to do. I'm reading the PAG more carefully now so I won't be an idiot when we speak.

From: Christ, Lisa
Sent: Friday, February 19, 2016 3:03 PM
To: McGartland, Al <McGartland.Al@epa.gov>
Subject: FW: EPA Drinking Water PAGs
Importance: High

Hi Al,

Nice talking to you. Attached is the draft drinking water PAG provided to OMB for review. Below is Vlad's request for an EA.

Thank you for your assistance –

Lisa

From: Hill, Glynis
Sent: Friday, January 15, 2016 4:49 PM

To: DeCair, Sara <DeCair.Sara@epa.gov>; Veal, Lee <Veal.Lee@epa.gov>; Perrin, Alan <Perrin.Alan@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>; Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>
Cc: Corrales, Mark <Corrales.Mark@epa.gov>; Nickerson, William <Nickerson.William@epa.gov>
Subject: FW: EPA Drinking Water PAGs
Importance: High

Good afternoon Sam:

Congratulations on a great briefing!

Ex. 5 - Deliberative Process

Thanks in advance,

Glynis Hill – Environmental Scientist | Office of the Administrator | Office of Policy | Office of Regulatory Policy & Management

(202) 564-1139 | 3512V WJC North | Mail Code 1803 | 1200 Pennsylvania Avenue, NW | Washington, DC 20460

From: Dorjets, Vlad Ex. 6 - Personal Privacy
Sent: Friday, January 15, 2016 3:17 PM
To: Hill, Glynis <Hill.Glynis@epa.gov>
Cc: Owens, Nicole <Owens.Nicole@epa.gov>
Subject: EPA Drinking Water PAGs
Importance: High

Glynis,

Please thank the people from OW for coming in yesterday to brief us and interagency reviewers on the Drinking Water PAGs. I, for one at least, feel like I understand the issues a lot better. Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

Thanks,

Vlad

Vlad Dorjets

Natural Resources and Environment Branch

Office of Information and Regulatory Affairs

White House Office of Management and Budget

Ex. 6 - Personal Privacy

To: Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]
From: Christ, Lisa
Sent: Mon 3/21/2016 6:52:24 PM
Subject: RE: Draft Document
EO 12866 Interagency Comments PAG.docx

Hi Sam,

I started drafting a briefing paper for Peter and Joel. I think they will want to know who provided comments, a general summary of comments and how we plan to respond. We do not need to go over all the comments/questions received. I pulled some answers (in purple text) directly from the draft communication internal Q&A document for the PAG. I could use your help with responses,

Ex. 5 - Deliberative Process

Thanks-

Lisa

From: Christ, Lisa
Sent: Friday, March 18, 2016 12:25 PM
To: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>
Subject: RE: Draft Document

Hi Sam,

I finally had a chance to look through this, sorry for the delay. Attached are my thoughts on binning the comments and I added OMB's request for cost/benefit. We will want to brief Peter and maybe Joel on the comments soon. Is late March or the 1st week of April do-able?

Thanks-

Lisa

From: Hernandez-Quinones, Samuel
Sent: Monday, March 07, 2016 12:48 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: Draft Document

For todays call.

Sam

==========

Samuel Hernández Quiñones, P.E.
Environmental Engineer
Environmental Protection Agency
Office of Water
1200 Pennsylvania Ave. NW
Washington, DC 20460
202-564-1735

"USEPA Protecting Human Health and the Environment"

To: Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]
From: Christ, Lisa
Sent: Fri 3/18/2016 4:24:57 PM
Subject: RE: Draft Document
DRAFT --Binning of Comments received on the Proposed Drinking Water PAG_lc.docx

Hi Sam,

I finally had a chance to look through this, sorry for the delay. Attached are my thoughts on binning the comments and I added OMB's request for cost/benefit. We will want to brief Peter and maybe Joel on the comments soon. Is late March or the 1st week of April do-able?

Thanks-

Lisa

From: Hernandez-Quinones, Samuel
Sent: Monday, March 07, 2016 12:48 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: Draft Document

For todays call.

Sam

==========

Samuel Hernández Quiñones, P.E.
Environmental Engineer
Environmental Protection Agency
Office of Water
1200 Pennsylvania Ave. NW
Washington, DC 20460
202-564-1735

"USEPA Protecting Human Health and the Environment"

To: McGartland, Al[McGartland.Al@epa.gov]
From: Christ, Lisa
Sent: Thur 3/3/2016 6:27:45 PM
Subject: RE: Economic Analysis for OGWDW Actions

Of course. I've added Paul to the invite.

-----Original Message-----
From: McGartland, Al
Sent: Thursday, March 03, 2016 1:16 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: Re: Economic Analysis for OGWDW Actions

In going up to the hill to brief EPW staff. I may try and call you when I return. If I get out of there at a reasonable time.

Ex. 5 - Deliberative Process

Sent from my iPhone

> On Mar 3, 2016, at 1:00 PM, Christ, Lisa <Christ.Lisa@epa.gov> wrote:
>
> Purpose:
> 1) To discuss OMB's request for economic analysis for the drinking water protective action guidance (PAG).
> 2) To discuss the Reduction of Lead in Drinking Water Act economic analysis suggested by NCEE.
>

Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

>
>
> <meeting.ics>

To: Hernandez-Quinones, Samuel[Hernandez.Samuel@epa.gov]
From: Christ, Lisa
Sent: Thur 3/3/2016 5:10:13 PM
Subject: RE: do you have the rationale for not doing the EA for the PAG?

Thank you

From: Hernandez-Quinones, Samuel
Sent: Thursday, March 03, 2016 12:05 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: RE: do you have the rationale for not doing the EA for the PAG?

Yes,

Here is the language Eric forwarded to Peter a few weeks ago.

Sam

Peter:

We recently received the following request from OMB in their review of the draft Protective Action Guidance for Drinking Water

OMB request as transmitted by Mr. Vlad Dorjets, 1/15/16:

Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

==========

Samuel Hernández Quiñones, P.E.
Environmental Engineer
Environmental Protection Agency
Office of Water
1200 Pennsylvania Ave. NW
Washington, DC 20460
202-564-1735

"USEPA Protecting Human Health and the Environment"

From: Christ, Lisa
Sent: Thursday, March 03, 2016 10:58 AM
To: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>
Subject: do you have the rationale for not doing the EA for the PAG?

To: Wadlington, Christina[Wadlington.Christina@epa.gov]
From: Christ, Lisa
Sent: Tue 3/1/2016 6:50:47 PM
Subject: RE: PAGS briefing for OW weekly

OMB's 90 day review ends Friday, however we received the last bunch of comments yesterday. I don't know if OP (?) closed the loop with OMB on the ask for an EA. If we're clear to proceed w/o an EA we hope to have the PAG out for public comment in ~ 4weeks. Senior management agreement on response to comment (briefings) and review of the revised PAG in both OW and OART need to take place first

From: Wadlington, Christina
Sent: Tuesday, March 01, 2016 1:31 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: RE: PAGS briefing for OW weekly

Do we have a timeframe on the release of the guide? Is it still stuck at OMB?

Christina Wadlington

Communications Director

Office of Ground Water and Drinking Water

U.S. Environmental Protection Agency

Tel: 202.566.1859

Email: wadlington.christina@epa.gov

From: Christ, Lisa
Sent: Thursday, January 14, 2016 2:18 PM
To: Wadlington, Christina <Wadlington.Christina@epa.gov>
Subject: RE: PAGS briefing for OW weekly

Drinking Water Protective Action Guides (PAG): On January 20, OGWDW and ORIA managers and staff met with OMB and Interagency Reviewers to provide an overview of the drinking water PAG for radiological emergencies and a summary of public comments received. The drinking water PAG is non-regulatory guidance to protect the public in the event of a radiological incident that affects public drinking water supplies. The EPA intends to include the drinking water PAG when it publishes the final

"PAG Manual: Protective Action Guides And Planning Guidance for Radiological Incidents" later this year.

From: Wadlington, Christina
Sent: Thursday, January 14, 2016 12:34 PM
To: Christ, Lisa <Christ.Lisa@epa.gov>
Subject: PAGS briefing for OW weekly

Lisa,

Can you send me a quick blurb about the upcoming OMB PAGS briefing for the OW weekly.

Christina Wadlington

Communications Director

Office of Ground Water and Drinking Water

U.S. Environmental Protection Agency

Tel: 202.566.1859

Email: wadlington.christina@epa.gov

To: McGartland, Al[McGartland.Al@epa.gov]
From: Christ, Lisa
Sent: Fri 2/19/2016 8:03:18 PM
Subject: FW: EPA Drinking Water PAGs
EO12866_PAG for DW_Draft Guidance_20151119.docx

Hi Al,

Nice talking to you. Attached is the draft drinking water PAG provided to OMB for review. Below is Vlad's request for an EA.

Thank you for your assistance –

Lisa

From: Hill, Glynis
Sent: Friday, January 15, 2016 4:49 PM
To: DeCair, Sara <DeCair.Sara@epa.gov>; Veal, Lee <Veal.Lee@epa.gov>; Perrin, Alan <Perrin.Alan@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>; Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>
Cc: Corrales, Mark <Corrales.Mark@epa.gov>; Nickerson, William <Nickerson.William@epa.gov>
Subject: FW: EPA Drinking Water PAGs
Importance: High

Good afternoon Sam:

Congratulations on a great briefing!

Ex. 5 - Deliberative Process

Thanks in advance,

Glynis Hill – Environmental Scientist | Office of the Administrator | Office of Policy | Office of Regulatory Policy & Management

(202) 564-1139 | 3512V WJC North | Mail Code 1803 | 1200 Pennsylvania Avenue, NW | Washington, DC 20460

From: Dorjets, Vlad [mailto:Vladik_Dorjets@omb.eop.gov]
Sent: Friday, January 15, 2016 3:17 PM
To: Hill, Glynis <Hill.Glynis@epa.gov>
Cc: Owens, Nicole <Owens.Nicole@epa.gov>
Subject: EPA Drinking Water PAGs
Importance: High

Glynis,

Please thank the people from OW for coming in yesterday to brief us and interagency reviewers on the Drinking Water PAGs. Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

Thanks,

Vlad

Vlad Dorjets

Natural Resources and Environment Branch

Office of Information and Regulatory Affairs

White House Office of Management and Budget

Ex. 6 - Personal Privacy

To: Burneson, Eric[Burneson.Eric@epa.gov]
From: Christ, Lisa
Sent: Wed 2/10/2016 3:19:53 PM
Subject: FW: DATES: Sen. Markey Request on radioactive water PAGs

I haven't seen or heard anything more about this request. I mentioned it to Cathy Davis before vacation who said she deferred it to the OAR OCIR person. .

From: Edwards, Jonathan
Sent: Wednesday, February 10, 2016 9:17 AM
To: Burneson, Eric <Burneson.Eric@epa.gov>
Cc: Christ, Lisa <Christ.Lisa@epa.gov>; Flynn, Mike <Flynn.Mike@epa.gov>; Veal, Lee <Veal.Lee@epa.gov>; Perrin, Alan <Perrin.Alan@epa.gov>
Subject: FW: DATES: Sen. Markey Request on radioactive water PAGs

Hi Eric-- Hope everything is going ok, all things considered. I imagine you and staff are still pretty occupied with the Flint Michigan activities.

Just a note to see if there's any help on this Markey briefing and interactions with OCIR that we can be helpful with? I believe Mike Flynn is going to reach out to Peter also to check in. Have you all heard anything from OCIR on this Sen. Markey request recently? --Jon

---

From: Asher, Jonathan
Sent: Thursday, January 7, 2016 11:46 AM
To: Edwards, Jonathan; Niebling, William
Cc: Haman, Patricia
Subject: FW: Sen. Markey Request on radioactive water PAGs

Hi Jonathan,

I'm here in OCIR and am covering some of the radiation world while Josh is on detail. He recommended you as likely the best contact. I wanted to reach out on the below request for a briefing from Sen. Markey's office and see if this is something we might be able to set up and who the best person or people might be?

Let me know your thoughts, and thanks!

…also Jonathan

From: "Freedhoff, Michal (Markey)" <Michal_Freedhoff@markey.senate.gov>
To: "Distefano, Nichole" <DiStefano.Nichole@epa.gov>
Cc: "Joseph, Avenel (Markey)" <Avenel_Joseph@markey.senate.gov>
Subject: Fw: Letter from organizations opposing weakened radioactive water PAGs and requesting a meeting with OMB

Hi Nichole

We haven't worked together on this issue before, but wanted to flag it as one my boss has written to EPA about in the past and has a strong interest in. We'd like a briefing on this - in the new year is fine.

Thanks and happy holidays

Michal

Michal Ilana Freedhoff, Ph.D.
Director of Oversight and Investigations
Office of Senator Edward J. Markey (D-MA)

From: Diane D'Arrigo <dianed@nirs.org>

Sent: Tuesday, December 22, 2015 6:54 PM

To: hshelanski@omb.eop.gov; jlaity@omb.eop.gov; mechols@omb.eop.gov

Cc: mccarthy.gina@epa.gov; mccabe.janet@epa.gov; stoner.nancy@epa.gov; aastanislaus@epa.gov; Freedhoff, Michal (Markey); Poirier, Bettina (EPW); Diane D'Arrigo; McKinzie, Matthew; Allison Fisher; Catherine Thomasson; Damon Moglen; Cindy Folkers (cindy@beyondnuclear.org); Jeff Ruch (jruch@peer.org); Anna Aurilio; Deborah Brancato (dbrancato@riverkeeper.org); Wenonah Hauter (whauter@fwwatch.org); Lynn Thorp CWA; Dan Hirsch 2

Subject: Letter from organizations opposing weakened radioactive water PAGs and requesting a meeting

with OMB

RE: EPA Protective Action Guidance, Radionuclides in Water

Administrator Shelanski

Director Jim Laity

Records Management Specialist Mabel Echols:

Please find pasted below, and attached, a letter from a dozen organizations regarding a proposed weakening of radiation protection standards for drinking water, recently submitted by EPA to OMB, and our request for a meeting on the subject before OMB acts. I have also attached a 2013 letter to EPA discussing their options at that time which would increase allowable radioactivity in drinking water to levels far in excess of Safe Drinking Water Act limits.

If you would like additional information or clarification, please let me know. I look forward to coordinating a meeting in the New Year on this important matter.

Sincerely,

Diane D'Arrigo

Nuclear Information and Resource Service

dianed@nirs.org

301 270 6477 x 15

Mobile 202 841 8588

(Point of Contact for Organizations listed)

Physicians for Social Responsibility ◆ Natural Resources Defense Council

Friends of the Earth ◆Food and Water Watch

Clean Water Action ◆Public Citizen ◆Beyond Nuclear

Public Employees for Environmental Responsibility

Nuclear Information and Resource Service

Environment America ◆ Riverkeeper

Committee to Bridge the Gap

Howard Shelanski, Administrator

Office of Information and Regulatory Affairs

Office of Management and Budget

725 17th Street, NW

Washington, DC 20503

December 22, 2015

Re: Proposed Amendments to EPA Protective Action Guidance (RIN 2060-ZA19)

Dear Administrator Shelanski:

On December 5 of this year, OMB received for review from the US EPA proposed changes to its Protective Action Guides (PAGs) for responding to radiological releases. Press reports indicate that the proposals would markedly increase the levels of allowable radioactive contaminants in drinking water. We write to inform you that such an effort would be met with a firestorm of controversy, and urge that the proposals be rejected. We also request a meeting/conference call with your senior staff tasked with the review.

Currently, protective actions are to be taken when radionuclide concentrations in drinking water exceed the Maximum Contaminant Limits of the Safe Drinking Water Act. Legal constraints (anti-backsliding requirements) prohibit EPA from relaxing those limits. However, there has been a long-standing push to undermine the Safe Drinking Water Act and allow vastly higher concentrations of radioactivity in water people consume.

This action, however, was too controversial for EPA to take when it published its PAGs a couple of years ago. So EPA published the PAGs without changing the water limits, but indicated it was interested at some time in the future in considering breaching the Safe Drinking Water Act limits for PAG purposes. We presume that that is what EPA has now transmitted to OMB for approval. This could result in the public being forced to consume water with concentrations of radionuclides hundreds or even thousands of times higher than considered acceptable under the Safe Drinking Water Act.

We want to alert you that such a proposal would be extraordinarily controversial. Scores of groups opposed such possible action in the past, and we believe this would be a high visibility matter of substantial concern to legislators, the news media, and the public. People would be extremely upset when they learn that the Obama Administration is contemplating imposing consumption of water with vastly higher concentrations of radioactivity than considered acceptable under the Safe Drinking Water Act.

Furthermore, the claim that there is no significant economic impact is incorrect. Were the Administration to force this proposal through, and a radiological release contaminated water far above longstanding acceptable levels, protective actions might not be taken. People would have to consume highly radioactive water. The affected area would likely shut

down. Schools would close; businesses would be shuttered; people would move out rather than drink water with radioactivity concentrations far above what has been historically considered acceptable.

We ask you to not approve the extraordinarily controversial proposal, and we request a meeting or conference call to discuss the troubling nature of what is quietly being put forward.

Sincerely,

Daniel Hirsch, President

Committee to Bridge the Gap

Diane D'Arrigo, Director*

Radioactive Waste Project

Nuclear Information and Resource Service

Wenonah Hauter, Executive Director

Food and Water Watch

Catherine Thomasson, M.D.

Executive Director

Physicians for Social Responsibility

Damon Moglen, Senior Strategic Advisor

Friends of the Earth

Anna Aurilio, Washington DC Office Director

Environment America

Jeff Ruch, Executive Director

Public Employees for Environmental Responsibility

Matthew McKinzie, Ph.D.

Director, Nuclear Program

Natural Resources Defense Council

Lynn Thorp, National Campaigns Director

Clean Water Action

Deborah Brancato, Staff Attorney

Riverkeeper

Allison Fisher, Outreach Director

Public Citizen

Cindy Folkers, Radiation Specialist

Beyond Nuclear

* *Point of contact*: Diane D'Arrigo 301-270-6477 x 15 dianed@nirs.org

---

cc: Senator Ed Markey

Senator Barbara Boxer

EPA Administrator Gina McCarthy

Janet McCabe, EPA Assistant Administrator, Office of Air and Radiation

Nancy Stoner, EPA Assistant Administrator, Office of Water

Mathy Stanislaus, EPA Assistant Administrator, Office of Solid Waste and Emergency Response

Jim Laity, OIRA, Natural Resources & Environment Branch

Mabel Echols, OIRA, Records Management Specialist

To: DeCair, Sara[DeCair.Sara@epa.gov]
Cc: Hunt, Brian[bhunt@sandia.gov]; Laiche, Thomas P[tlaich@sandia.gov]
From: Kraus, Terrence D
Sent: Wed 3/18/2015 5:42:38 PM
Subject: RE: [EXTERNAL] Cmts due tomorrow: Water PAG proposal
Drinking Water PAG proposal Subcmte review -SNL Comments.docx

Sara,

Please find Brian's and my comments attached.

Thank you.

Terry Kraus, CHP

Nuclear Incident Response Programs

Sandia National Laboratories

(505) 284-9708

From: DeCair, Sara [mailto:DeCair.Sara@epa.gov]
Sent: Tuesday, March 17, 2015 12:46 PM
To: Amy Doll; Andrew.Wallo@eh.doe.gov; asa4@cdc.gov; ben.cacioppo@dtra.mil; Carlos.Corredor@Hq.Doe.Gov; Edward.Regnier@hq.doe.gov; John.Jensen@dm.usda.gov; john.mackinney@dhs.gov; john.madrid@dtra.mil; lee.a.nickel1@navy.mil; lodwick.jeffrey@dol.gov; michael.howe@fema.dhs.gov; Michael.Noska@fda.hhs.gov; Patricia.Milligan@nrc.gov; paul.ward@fema.dhs.gov; ricardo.a.reyes@us.army.mil; siddhanti@endyna.com; Kraus, Terrence D; Veal, Lee; Wieder, Jessica; william.cunningham@nist.gov
Cc: Hernandez-Quinones, Samuel; Christ, Lisa; Ellis, Jerry
Subject: [EXTERNAL] Cmts due tomorrow: Water PAG proposal

Hi all; just a quick reminder that we hope to hear from you by the end of the day tomorrow with your feedback on the water proposal. Please let me know right away if you have any concerns, and I look forward to seeing what you think!

Sara

From: DeCair, Sara
Sent: Tuesday, March 03, 2015 2:16 PM
To: Amy Doll; 'Andrew.Wallo@eh.doe.gov'; 'asa4@cdc.gov'; 'ben.cacioppo@dtra.mil'; 'Carlos.Corredor@Hq.Doe.Gov'; 'Edward.Regnier@hq.doe.gov'; 'John.Jensen@dm.usda.gov'; john.mackinney@dhs.gov; 'john.madrid@dtra.mil'; 'lee.a.nickel1@navy.mil'; 'lodwick.jeffrey@dol.gov'; 'michael.howe@fema.dhs.gov'; 'Michael.Noska@fda.hhs.gov'; 'Patricia.Milligan@nrc.gov'; 'paul.ward@fema.dhs.gov'; 'ricardo.a.reyes@us.army.mil'; siddhanti@endyna.com; 'tdkraus@sandia.gov'; Veal, Lee; Wieder, Jessica; 'william.cunningham@nist.gov'
Cc: Hernandez-Quinones, Samuel; Christ, Lisa; Ellis, Jerry
Subject: Water PAG proposal: review by Mar. 18th

PAGs Subcommittee;

We'd like to share a copy of our draft drinking water PAG language for your review. Since this material is still pre-decisional, we request that you do not circulate it beyond the FRPCC PAGs subcommittee. Please contact me for any further guidance, if needed. This document will serve as our Federal Register proposed language and you can see that it provides a lot of explanatory text. After we receive and address public comments, the appropriate language will be used as our Water chapter in a final PAG Manual.

We encourage you to send us feedback on content, wording, and the methods within the next two weeks. **Your comments for this round of review are due Wed., Mar. 18, 2015.**

Our contractor, EnDyna, will collect and organize your comments and we'll run an updated version past you before we complete internal EPA and legal reviews. This won't

be your last chance to provide input, though, since we will have a follow up discussion with you about the FR Notice and the Rollout Plan. Afterwards, there will be the OMB interagency review cycle with your agencies.

Thank you in advance for your thoughtful input. Please do write or call if you have any questions. Talk to you soon!

Sara

Sara D. DeCair

http://www.epa.gov/radiation/rert/pags.html

202-343-9108

new office

Room 1416 B in WJC West

To: DeCair, Sara[DeCair.Sara@epa.gov]
From: Lodwick, Jeffrey - OSHA
Sent: Wed 2/4/2015 8:50:11 PM
Subject: RE: Scheduling a mtg on PAGs, emphasis on Worker Protection sections

Sara,

Sorry, I did get your original email but I just got back from vacation today.

I am available any of those dates/times. There is a very good chance I'll be going to Dallas for an investigation for a few days within the next 3 weeks sometime. I likely will not get much lead-time on the response. Go ahead and schedule whichever of those times works best for the group and we'll just hope my field trip doesn't interfere.

Jeff

Jeffrey C Lodwick, PhD, CHP

Health Physicist

US DOL OSHA Health Response Team

8660 S Sandy Parkway

Sandy, UT 84070

(Office) 801.233.4913

(Fax) 801.233.5000

(Cell) 801.403.7615

From: DeCair, Sara [mailto:DeCair.Sara@epa.gov]
Sent: Tuesday, February 03, 2015 4:10 PM
To: Lodwick, Jeffrey - OSHA
Subject: Re: Scheduling a mtg on PAGs, emphasis on Worker Protection sections

Jeff, just checking in -- I lost email contact for a full day (it was nice) but I worry I didn't hear from you and I don't have your phone number handy.

Can you do any of the times below to cover the Worker Safety base? Thanks much!

Sara

From: DeCair, Sara
Sent: Friday, January 30, 2015 12:03 PM
To: lodwick.jeffrey@dol.gov
Subject: Scheduling a mtg on PAGs, emphasis on Worker Protection sections

Jeff,

I wanted to get your availability first before starting the scheduling process to meet with the PAGs Subcommittee on a list of several readability improvements my contractors suggested for the PAG Manual. We have this roughly final PAG Manual waiting for our new drinking water proposal, and in the meantime while water gets ready for review, I wanted to get the rest of the thing cleaned up.

I will want to schedule a one-hour webinar/call to show everyone the suggestions, discuss ones that might need some interagency buy in, and one of the key areas is worker protection. I think you'll like the readability suggestions, but I definitely don't want to discuss it at all if you are not on. Would you be able to make any of these times?

Tues. Feb. 10th, 2 pm eastern

Thurs. Feb. 12th, 11 am eastern

Wed. Feb 18th, 11 am eastern

Thanks so much for getting back to me so I can set it up. Progress!

Sara

Sara D. DeCair

http://www.epa.gov/radiation/rert/pags.html

202-343-9108

new office

Room 1416 B in WJC West

To: Wieder, Jessica[Wieder.Jessica@epa.gov]; DeCair, Sara[DeCair.Sara@epa.gov]
Cc: Veal, Lee[Veal.Lee@epa.gov]
From: Nesky, Anthony
Sent: Thur 10/30/2014 1:10:12 PM
Subject: RE: New drinking water PAG chapter for your review

I'm pretty much booked today: why don't you guys get together without me.

Tony Nesky

Center for Radiation Information and Outreach

Tel: 202-343-9597

nesky.tony@epa.gov

From: Wieder, Jessica
Sent: Thursday, October 30, 2014 8:41 AM
To: DeCair, Sara; Nesky, Anthony
Cc: Veal, Lee
Subject: RE: New drinking water PAG chapter for your review

I am free most of the day for a phone call.

Sara – Have a great RadResponder drill!!!

Jessica Wieder

U.S. EPA

Radiation Protection Program

Acting Director, Center for Radiation Information and Outreach

w: 202-343-9201

c: 202-420-9353

From: DeCair, Sara
Sent: Thursday, October 30, 2014 8:12 AM
To: Nesky, Anthony
Cc: Wieder, Jessica; Veal, Lee
Subject: Re: New drinking water PAG chapter for your review

Do you have any time free today? I am working offsite and I have several mtgs for the RR drill but would love to talk via phone...

Sent from my iPhone

On Oct 29, 2014, at 5:49 PM, "Nesky, Anthony" <Nesky.Tony@epa.gov> wrote:

> Jess and I would like to talk to you about the public messaging for this before you brief up the chain.

Tony Nesky

Center for Radiation Information and Outreach

Tel: 202-343-9597

nesky.tony@epa.gov

From: DeCair, Sara
Sent: Tuesday, October 28, 2014 1:27 PM
To: Hernandez-Quinones, Samuel; Ellis, Jerry; Christ, Lisa; Veal, Lee; Perrin, Alan; Edwards, Jonathan; Nesky, Anthony
Subject: New drinking water PAG chapter for your review

All;

This has been through Tony's editing and Alan's review in our office and is ready for review by our colleagues in Water. I left a few of the comments in for your consideration.

Please take your time to evaluate the order and content here, and if you would, provide feedback to me in the form of comments or redline/strikeout. If you let me know when you'll be done with this round of review, I can update my PAGs project plan accordingly. Thank you,

Sara

Sara D. DeCair

http://www.epa.gov/radiation/rert/pags.html

202-343-9108

new office

Room 1416 B in WJC West

To: DeCair, Sara[DeCair.Sara@epa.gov]
From: Boyd, Wesley L.
Sent: Tue 1/28/2014 1:04:07 AM
Subject: Edited Presentation (Newest)
PAGs and ICRP 60+ Implications 1-23-2014.pptx

Wes Boyd, CHP

Health Physicst/RSO

Office: (702) 784-8255

e-mail: boyd.wesley@epa.gov

New PAGs & 'New' Dosimetry

ICRP 60+ Implications

Sara DeCair, US EPA

January 2014

ED_001057_00010452

Introduction

- Introduction
- Difference between 1992 and 2013 PAGs
- KI and thyroid protective actions
- ICRP 60+
- Impact of ICRP 60+ to the PAGs
- Rationale for decisions

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Exposure Pathways

Exposure Pathways and Protective Actions

These are examples of exposure routes and various protective actions. The phases are not set timeframes and protective actions may overlap more than one phase.

POTENTIAL EXPOSURE PATHWAYS	INCIDENT PHASES	PROTECTIVE ACTIONS
1. External radiation from facility	EARLY	1. Sheltering, evacuation, control of access
2. External radiation from plume	EARLY	2. Sheltering, evacuation, control of access
3. Inhalation of activity in plume	EARLY	3. Sheltering, administration of stable iodine, evacuation, control of access
4. Contamination of skin and clothes	EARLY, INTERMEDIATE	4. Sheltering, evacuation, decontamination of persons
5. External radiation from ground deposition of activity	EARLY, INTERMEDIATE, LATE	5. Evacuation, relocation, decontamination of land and property
6. Ingestion of contaminated food, water	INTERMEDIATE, LATE	6. Food and water controls
7. Inhalation of re-suspended activity	INTERMEDIATE, LATE	7. Relocation, decontamination of land and property

EPA

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Early Phase

1992	2013
➢ Evacuation/Shelter 1-5 rem (10-50 mSv) ✓ thyroid/skin 5, 50 x higher	➢ Evacuation/Shelter 1-5 rem (10-50 mSv) ✓ (no organ dose specified)
➢ KI 25 rem (250 mSv) thyroid dose (adult)	➢ KI threshold 5 rem (50 mSv) thyroid dose (child)
➢ Worker 5, 10, 25+ rem (50, 100, 250+ mSv)	➢ Worker 5, 10, 25+ rem (50, 100, 250+ mSv)

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Intermediate Phase

1992	2013
➢ Relocate population ✓ ≥ 2 rem (20 mSv) first year (projected dose) ✓ 0.5 rem (5 mSv) any subsequent year ✓ 5 rem (50 mSv) over 50 yrs ➢ Apply dose reduction techniques ✓ < 2 rem (20 mSv)	➢ Relocate population ✓ ≥ 2 rem (20 mSv) first year (projected dose) ✓ 0.5 rem (5 mSv) any subsequent year ✓ (removed 50-year Relocation PAG) ➢ Apply dose reduction techniques ✓ < 2 rem (20 mSv)

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FDA Food PAGs

1992	2013
➢ 1982 FDA guidance ➢ NCRP 39 methodology ➢ Preventive PAG 0.5 rem (5 mSv) whole body and 1.5 rem (15 mSv) thyroid ➢ Emergency PAG 10 times higher, depends on impact ➢ Dose only, no activity levels provided	➢ 1998 FDA guide, by reference ➢ ICRP 56 & NRPB methods ➢ One set of PAGs ✓ 0.5 rem (5 mSv) whole body dose or ✓ 5 rem (50 mSv) to most exposed organ or tissue ➢ Dose and derived intervention levels (DILs) provided

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Drinking Water PAG

- National Primary Drinking Water Regulations emergency actions: Increased monitoring & notifications
- Comments sought on whether, and what value, an emergency PAG for water should be considered
- Refer to related guides from WHO, IAEA, DHS, FDA

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FRMAC Methods by Reference

- Readers are referred to FRMAC Assessment Manuals for calculations using up-to-date dosimetry.
  - ✓ Lookup tables of DCFs and DRLs not in PAG Manual
  - ✓ Updated more frequently

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Potassium Iodide (KI) Actions

- FDA recommends a multi-pronged approach:

Threshold Thyroid Radioactive Exposures and Recommended Doses of KI for Different Risk Groups				
	Predicted Thyroid exposure(cGy)	KI dose (mg)	# of 130 mg tablets	# of 65 mg tablets
Adults over 40 yrs	≥500	130	1	2
Adults over 18 through 40 yrs	≥10			
Pregnant or lactating women	≥ 5			
Adoles. over 12 through 18 yrs*				
Children over 3 through 12 yrs		65	1/2	1
Over 1 month through 3 years		32	1/4	1/2
Birth through 1 month		16	1/8	1/4

- A simplified approach:
  - ✓ Provide KI to public if 5 rem (50 mSv) child thyroid dose projected
  - ✓ This is a supplemental action where evacuation is the primary protection

ED_001057_00010452

Thyroid-based evacuation

Federal Register / Vol. 73, No. 149 / Friday, August 1, 2008 / Notices 45035

TABLE 1—PROTECTIVE ACTION GUIDES FOR RDD AND IND INCIDENTS

Phase	Protective action recommendation	Protective action guide
Early	Sheltering-in-place or evacuation of the public[a].	1 to 5 *rem* (0.01–0.05 *Sv*) projected dose.[b]
	Administration of prophylactic drugs—potassium iodide[c,e] Administration of other prophylactic or decorporation agents[d].	5 *rem* (0.05 *Sv*) projected dose to child thyroid.[c,e]
Intermediate	Relocation of the public	2 *rem* (0.02 *Sv*) projected dose first year. Subsequent years, 0.5 *rem*/y (0.005 *Sv*/y) projected dose.[b]
	Food interdiction	0.5 *rem* (0.005 *Sv*) projected dose, or 5 *rem* (0.05 *Sv*) to any individual organ or tissue in the first year, whichever is limiting.
	Drinking water interdiction	0.5 *rem* (0.005 *Sv*) projected dose in the first year.

[a] Should normally begin at 1 *rem* (0.01 *Sv*); take whichever action (or combination of actions) that results in the lowest exposure for the majority of the population. Sheltering may begin at lower levels if advantageous.

[b] Total Effective Dose Equivalent (TEDE)—the sum of the effective dose equivalent from external radiation exposure and the committed effective dose equivalent from inhaled radioactive material.

[c] Provides thyroid protection from radioactive iodine only.

[d] For other information on other radiological prophylactics and medical countermeasures, refer to *http://www.fda.gov/cder/drugprepare/default.htm, http:/www.bt.cdc.gov/radiation*, or *http://www.orau.gov/reacts.*

[e] Committed Dose Equivalent (CDE). FDA understands that a KI administration program that sets different projected thyroid radioactive dose thresholds for treatment of different population groups may be logistically impractical to implement during a radiological emergency. If emergency planners reach this conclusion, FDA recommends that KI be administered to both children and adults at the lowest intervention threshold (*i.e.*, >5 *rem* (0.05 *Sv*) projected internal thyroid dose in children) (FDA 2001).

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Sensitive Subpopulations

- Updating to ICRP 60 series
- Age- and gender-specific dose conversions
- Setting PAGs levels
- vs.
- Implementing PAG recommendations
  - ✓ Protective actions apply to whole communities
  - ✓ Conservatism built in
  - ✓ Don’t avoid less dose than intended

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Basis for PAG Levels

Appendix B, C & E quotes:

The thyroid is an exception because the very young have a relatively high uptake of radioiodine into a gland that is much smaller than the adult thyroid (see Section *BA.2.2.).* This results in a larger childhood dose and an increased risk which persists throughout life. We have examined this worst case situation. Age-specific risk coefficients for fatal thyroid cancer (See Table 6-8 of "Risk Assessment Methodology" (EP-89» are about 1.9 higher per unit dose for persons exposed at ages 0 to 9 years than for the general population. Age-dependent dose factors (see NRPB-R162 (GR-85» for inhalation of 1-131, are a factor of about 1.7 higher for 10 year olds than for adults. Therefore, the net risk of fatal thyroid cancer from a given air concentration of 1-131 is estimated to be a factor of about 3 higher for young children than for the remainder of the population. This difference is not considered large enough, given the uncertainties of exposure estimation for implementing protective actions, to warrant establishing age-dependent PAGs.

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ICRP 60+ Methodology

Inhalation Dose Coefficients: Committed Equivalent and Effective Doses per Unit Intake (Sv/Bq) for U-238 ($T_{½}$ = 4.47E+09 y).

Particulate Aerosol: AMAD = 1 µm, Absorption Type S.

Age at intake	3 Months	1 Year	5 Years	10 Years	15 Years	Adult*
f1	0.02	0.002	0.002	0.002	0.002	0.002
Adrenals	4.1E-08	2.5E-08	2.0E-08	1.6E-08	1.5E-08	1.5E-08
Bladder Wall	4.0E-08	2.3E-08	1.9E-08	1.5E-08	1.5E-08	1.5E-08
Bone Surface	1.9E-06	8.1E-07	7.5E-07	8.2E-07	9.6E-07	4.6E-07
Brain	4.0E-08	2.3E-08	1.9E-08	1.5E-08	1.5E-08	1.4E-08
Breast	4.1E-08	2.4E-08	2.0E-08	1.6E-08	1.5E-08	1.5E-08
GI-Tract						
Oesophagus	4.1E-08	2.4E-08	2.0E-08	1.6E-08	1.5E-08	1.5E-08
St Wall	4.5E-08	2.7E-08	2.1E-08	1.6E-08	1.5E-08	1.5E-08
SI Wall	5.1E-08	3.1E-08	2.3E-08	1.7E-08	1.6E-08	1.6E-08
ULI Wall	1.1E-07	7.3E-08	4.2E-08	2.9E-08	2.2E-08	2.1E-08
LLI Wall	2.4E-07	1.7E-07	8.5E-08	5.4E-08	3.7E-08	3.3E-08
Colon	1.7E-07	1.1E-07	6.0E-08	4.0E-08	2.8E-08	2.6E-08
Kidneys	7.3E-07	3.5E-07	2.5E-07	1.8E-07	1.7E-07	1.7E-07
Liver	1.7E-07	9.9E-08	7.8E-08	6.1E-08	6.0E-08	6.2E-08
Muscle	4.0E-08	2.4E-08	1.9E-08	1.5E-08	1.5E-08	1.5E-08
Ovaries	4.1E-08	2.4E-08	2.0E-08	1.6E-08	1.5E-08	1.5E-08
Pancreas	4.1E-08	2.4E-08	2.0E-08	1.6E-08	1.5E-08	1.5E-08
Red Marrow	2.2E-07	8.2E-08	6.7E-08	6.2E-08	6.3E-08	4.9E-08
Respiratory Tract						
ET Airways	1.8E-04	1.5E-04	7.4E-05	5.1E-05	3.1E-05	3.1E-05
Lungs	2.4E-04	2.1E-04	1.3E-04	8.7E-05	7.3E-05	6.7E-05
Skin	4.0E-08	2.3E-08	1.9E-08	1.5E-08	1.5E-08	1.5E-08
Spleen	4.1E-08	2.4E-08	2.0E-08	1.6E-08	1.5E-08	1.5E-08
Testes	4.3E-08	2.5E-08	2.1E-08	1.7E-08	1.5E-08	1.5E-08
Thymus	4.1E-08	2.4E-08	2.0E-08	1.6E-08	1.5E-08	1.5E-08
Thyroid	4.0E-08	2.4E-08	1.9E-08	1.5E-08	1.5E-08	1.5E-08
Uterus	4.0E-08	2.3E-08	1.9E-08	1.5E-08	1.5E-08	1.4E-08
Remainder	1.4E-07	9.0E-08	5.5E-08	4.1E-08	3.1E-08	3.1E-08
Effective Dose	2.9E-05	2.5E-05	1.6E-05	1.0E-05	8.7E-06	8.0E-06

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IAEA General Safety Guides (GSG)-2

- CRITERIA FOR USE IN PREPAREDNESS AND RESPONSE FOR A NUCLEAR OR RADIOLOGICAL EMERGENCY

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GSG-II

Generic criteria		Examples of protective actions and other response actions
External acute exposure (<10 hours)		If the dose is projected: — Take precautionary urgent protective actions immediately (even under difficult conditions) to keep doses below the generic criteria — Provide public information and warnings — Carry out urgent decontamination
$AD_{\text{Red marrow}}$[a]	1 Gy	
AD_{Fetus}	0.1 Gy	
AD_{Tissue}[b]	25 Gy at 0.5 cm	
AD_{Skin}[c]	10 Gy to 100 cm^2	
Internal exposure from acute intake (Δ = 30 days)[d]		If the dose has been received: — Perform immediate medical examination, consultation and indicated medical treatment — Carry out contamination control — Carry out immediate decorporation[f] (if applicable) — Carry out registration for long term health monitoring (medical follow-up) — Provide comprehensive psychological counselling
$AD(\Delta)_{\text{Red marrow}}$	0.2 Gy for radionuclides with $Z \geq 90$[e] 2 Gy for radionuclides with $Z \leq 89$[e]	
$AD(\Delta)_{\text{Thyroid}}$	2 Gy	
$AD(\Delta)_{\text{Lung}}$[g]	30 Gy	
$AD(\Delta)_{\text{Colon}}$	20 Gy	
$AD(\Delta)_{\text{Fetus}}$[h]	0.1 Gy	

[a] $AD_{\text{Red marrow}}$ represents the average RBE weighted absorbed dose to internal tissues or organs (e.g. red marrow, lung, small intestine, gonads, thyroid) and to the lens of the eye from exposure in a uniform field of strongly penetrating radiation.

[b] Dose delivered to 100 cm^2 at a depth of 0.5 cm under the body surface in tissue due to close contact with a radioactive source (e.g. source carried in the hand or pocket).

[c] The dose is to the 100 cm^2 dermis (skin structures at a depth of 40 mg/cm^2 (or 0.4 mm) below the body surface).

[d] $AD(\Delta)$ is the RBE weighted absorbed dose delivered over the period of time Δ by the intake (I_{Δ}) that will result in a severe deterministic effect in 5% of exposed individuals.

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GSG-II

TABLE 3. GENERIC CRITERIA FOR PROTECTIVE ACTIONS AND OTHER RESPONSE ACTIONS IN EMERGENCY EXPOSURE SITUATIONS TO REDUCE THE RISK OF STOCHASTIC EFFECTS

Generic criteria		Examples of protective actions and other response actions
Projected dose that exceeds the following generic criteria: Take urgent protective actions and other response actions		
$H_{Thyroid}$	50 mSv in the first 7 days	Iodine thyroid blocking
E	100 mSv in the first 7 days	Sheltering; evacuation; decontamination; restriction of consumption of food, milk and water; contamination control; public reassurance
H_{Fetus}	100 mSv in the first 7 days	
Projected dose that exceeds the following generic criteria: Take protective actions and other response actions early in the response		
E	100 mSv per annum	Temporary relocation; decontamination; replacement of food, milk and water; public reassurance
H_{Fetus}	100 mSv for the full period of in utero development	
Dose that has been received and that exceeds the following generic criteria: Take longer term medical actions to detect and to effectively treat radiation induced health effects		
E	100 mSv in a month	Screening based on equivalent doses to specific radiosensitive organs (as a basis for medical follow-up); counselling
H_{Fetus}	100 mSv for the full period of in utero development	Counselling to allow informed decisions to be made in individual circumstances

Note: H_T — equivalent dose in an organ or tissue T; E — effective dose.

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GSG-II

3.19. Urgent protective actions should always be introduced to avoid doses approaching levels at which, if received, severe deterministic effects could occur. It should be recognized that the doses received before implementation of the protective action could contribute to the induction of deterministic effects.

3.20. When assessing projected doses, the dose distribution should be considered together with the uncertainty in the dose distribution in the population under consideration. When exposure is being assessed for members of the public, the possibility of the presence of children and pregnant women should be considered.

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GSG-II

3.24. The generic criteria in Table 2 should be used to derive OILs for taking precautionary urgent protective actions and other response actions to prevent severe deterministic effects. For the purpose of taking actions to reduce the risk of stochastic effects, the principles of both justification and optimization require consideration of the benefit that would be achieved by the protective actions and other response actions and of the harm, in its broadest sense, that would result from them. Actions to prevent doses approaching those in Table 2 are always justified.

3.25. Table 3 provides the generic criteria that should be used to derive OILs for taking urgent and early protective actions and other response actions. The protection provided by applying these generic criteria has been optimized on a generic basis for the general population, assuming that other hazardous conditions do not prevail at the time the actions are implemented. The proposed values do not need to be adjusted to take account of any particular members of the population (e.g. children or pregnant women) because protective action taken to avert these doses will satisfy the basic principle for the whole population.

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GSG-II

5.10. The dosimetric models for developing the OILs should be established during the planning phase. These models should include a full set of parameters important for the purposes of decision making for dose assessment. For internal dose assessment and the development of corresponding OILs, the application of computer codes is necessary.

5.11. The dosimetric models and data should provide reliable assurance that all members of the public, including those that are most sensitive to radiation (e.g. pregnant women), are considered. In the development of the default operational criteria, the public needs to be assured that all groups (e.g. children playing outdoors) have been considered. Consequently, the OILs must be accompanied by a plain language explanation of the situation to which they apply (see Appendix II), the way in which they address a safety or health concern, and what their application means in terms of the risk to individuals.

5.12. These default OILs should be developed on the basis of assumptions regarding the emergency, the affected population and the prevailing conditions; these assumptions, however, may not accurately reflect the emergency in question. Consequently, Ref. [2] requires that means be established to revise the default OILs to take into account prevailing emergency conditions. However, revising the OILs during an emergency may be disruptive, and they should therefore only be revised if the situation is well understood and there are compelling reasons to do so. The public should be informed of the reasons for any change in the OILs applied in an actual emergency.

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GSG-II

people should be relocated if replacements are not available. Finally, as soon as possible the guidance in Ref. [29] should be used to determine whether the food, milk or water is suitable for international trade, and national criteria or WHO guidance [30] should be used to determine whether the food, milk or water is suitable for long term consumption after the emergency phase.

II.22. Tables 9 and 10 give OILs for assessing food, milk and water (see also Table 11). These OILs apply to radionuclides in food, milk and water destined for human consumption (they are not applicable for dried food or concentrated food). The food, milk and water OILs in Tables 9 and 10 were calculated on the basis of the following conservative assumptions:

- All of the food, milk and water are initially contaminated and are consumed throughout a full year.
- The most restrictive age dependent dose conversion factors and ingestion rates (i.e. those for infants) are used.

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GSG-II

II.27. The development of plain language explanations for the default OILs should be based on the assumption that members of the public living under normal conditions, including those who are more vulnerable to radiation exposure such as children and pregnant women, will achieve a level of protection that meets international standards, provided that during the emergency phase they:

— Do not receive a dose to any organ approaching that resulting in severe deterministic effects. The thresholds for the onset of severe deterministic effects are listed in Table 2.
— Do not receive a dose above which the risk of health effects (e.g. cancers) is sufficiently high to justify taking protective actions during an emergency (generic criterion of 100 mSv per annum, as presented in Table 3). Below this generic criterion, protective actions are not always justified and will be taken (if at all) on the basis of justified criteria developed, with interested parties, after careful consideration of the conditions, including the impact of any protective action.

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(g) It is essential that all aspects of the plan are consulted with relevant stakeholders, otherwise it will be more difficult to implement them during the response. To the extent possible, the overall protection strategy and its constituent individual protective measures should be worked through and agreed with all those potentially exposed or affected. Such an engagement will assist the emergency plans in being focused on the protection of those at greatest risk in the initial phases, and also on the progression to populations resuming 'normal' lifestyles.

(h) In the event of an emergency exposure situation, it is likely that exposure rates will vary in space and time, and that the doses received by individuals will vary, both as a result of the variations in exposure rates and as a result of differences in their physiological characteristics and behaviours. These population groups should be characterised by representative persons, as described in the Commission's advice on the representative person. In accordance with the Commission's advice on the representative person, it is important that the dose estimates reflect those likely to be received by the groups at greatest risk, but that they are not grossly pessimistic.

(i) The Commission's band of reference levels is expressed in terms of effective dose. For many emergency plans, this is an appropriate quantity in which to express the reference level. However, there are situations for which effective dose is not an appropriate quantity to express reference levels. This is the case when the type or scale of an emergency may result in doses in excess of 100 mSv effective dose (where the assumption of linearity may no longer hold), when parts of the response need to focus on individuals at risk of incurring severe deterministic injury, and when the resulting exposures are very strongly dominated by irradiation of a single organ for which very specific protective measures are optimum (e.g. releases dominated by radioiodine). For these situations, the Commission advises that consideration should be given to specifying (or providing supplementary) reference levels in terms of organ dose.

(j) In its previous advice, the Commission recommended the use of intervention

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Options for the Real Event

- The EPA PAGs have a lot of conservatism built in
- Dose assessment should continue using the adult dosimetry models
  - ✓ If additional information about a specific population subset is available (i.e. a boarding school) consult with the A-Team to get applicable recommendations

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Rationale for Using the Adult DCF

- What are the next steps???

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Conclusion

- Overview
- Difference in 1992 and 2013 PAGs
  - ✓ KI administered at 5 rem (child)
  - ✓ No 5 rem over 50 year long term requirement
- Dosimetry
  - ✓ 2013 allows for the most current dosimetry model to be implemented
- Next Steps

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The End

Thank you!

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To: DeCair, Sara[DeCair.Sara@epa.gov]
From: Boyd, Wesley L.
Sent: Tue 1/28/2014 12:33:05 AM
PAGs and ICRP 60+ Implications 1-23-2014.pptx

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New PAGs & 'New' Dosimetry

ICRP 60+ Implications

Sara DeCair, US EPA

January 2014

ED_001057_00010454

Introduction

- Introduction
- Difference between 1992 and 2013 PAGs
- KI and thyroid protective actions
- ICRP 60+
- Impact of ICRP 60+ to the PAGs
- Rationale for decisions

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Exposure Pathways

Exposure Pathways and Protective Actions

These are examples of exposure routes and various protective actions. The phases are not set timeframes and protective actions may overlap more than one phase.

POTENTIAL EXPOSURE PATHWAYS	INCIDENT PHASES	PROTECTIVE ACTIONS
1. External radiation from facility	EARLY	1. Sheltering, evacuation, control of access
2. External radiation from plume	EARLY	2. Sheltering, evacuation, control of access
3. Inhalation of activity in plume	EARLY	3. Sheltering, administration of stable iodine, evacuation, control of access
4. Contamination of skin and clothes	EARLY, INTERMEDIATE	4. Sheltering, evacuation, decontamination of persons
5. External radiation from ground deposition of activity	EARLY, INTERMEDIATE, LATE	5. Evacuation, relocation, decontamination of land and property
6. Ingestion of contaminated food, water	INTERMEDIATE, LATE	6. Food and water controls
7. Inhalation of re-suspended activity	INTERMEDIATE, LATE	7. Relocation, decontamination of land and property

EPA

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Early Phase

1992	2013
➢ Evacuation/Shelter 1-5 rem (10-50 mSv) ✓ thyroid/skin 5, 50 x higher	➢ Evacuation/Shelter 1-5 rem (10-50 mSv) ✓ (no organ dose specified)
➢ KI 25 rem (250 mSv) thyroid dose (adult)	➢ KI threshold 5 rem (50 mSv) thyroid dose (child)
➢ Worker 5, 10, 25+ rem (50, 100, 250+ mSv)	➢ Worker 5, 10, 25+ rem (50, 100, 250+ mSv)

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Intermediate Phase

1992	2013
➢ Relocate population ✓ ≥ 2 rem (20 mSv) first year (projected dose) ✓ 0.5 rem (5 mSv) any subsequent year ✓ 5 rem (50 mSv) over 50 yrs ➢ Apply dose reduction techniques ✓ < 2 rem (20 mSv)	➢ Relocate population ✓ ≥ 2 rem (20 mSv) first year (projected dose) ✓ 0.5 rem (5 mSv) any subsequent year ✓ (removed 50-year Relocation PAG) ➢ Apply dose reduction techniques ✓ < 2 rem (20 mSv)

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FDA Food PAGs

1992	2013
➢ 1982 FDA guidance ➢ NCRP 39 methodology ➢ Preventive PAG 0.5 rem (5 mSv) whole body and 1.5 rem (15 mSv) thyroid ➢ Emergency PAG 10 times higher, depends on impact ➢ Dose only, no activity levels provided	➢ 1998 FDA guide, by reference ➢ ICRP 56 & NRPB methods ➢ One set of PAGs ✓ 0.5 rem (5 mSv) whole body dose or ✓ 5 rem (50 mSv) to most exposed organ or tissue ➢ Dose and derived intervention levels (DILs) provided

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Drinking Water PAG

- National Primary Drinking Water Regulations emergency actions: Increased monitoring & notifications
- Comments sought on whether, and what value, an emergency PAG for water should be considered
- Refer to related guides from WHO, IAEA, DHS, FDA

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FRMAC Methods by Reference

- Readers are referred to FRMAC Assessment Manuals for calculations using up-to-date dosimetry.
  - ✓ Lookup tables of DCFs and DRLs not in PAG Manual
  - ✓ Updated more frequently

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Potassium Iodide (KI) Actions

- FDA recommends a multi-pronged approach:

Threshold Thyroid Radioactive Exposures and Recommended Doses of KI for Different Risk Groups				
	Predicted Thyroid exposure(cGy)	KI dose (mg)	# of 130 mg tablets	# of 65 mg tablets
Adults over 40 yrs	≥500	130	1	2
Adults over 18 through 40 yrs	≥10			
Pregnant or lactating women	≥ 5			
Adoles. over 12 through 18 yrs*				
Children over 3 through 12 yrs		65	1/2	1
Over 1 month through 3 years		32	1/4	1/2
Birth through 1 month		16	1/8	1/4

- A simplified approach:
  - ✓ Provide KI to public if 5 rem (50 mSv) child thyroid dose projected
  - ✓ This is a supplemental action where evacuation is the primary protection

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Thyroid-based evacuation

Federal Register / Vol. 73, No. 149 / Friday, August 1, 2008 / Notices 45035

TABLE 1—PROTECTIVE ACTION GUIDES FOR RDD AND IND INCIDENTS

Phase	Protective action recommendation	Protective action guide
Early	Sheltering-in-place or evacuation of the public[a].	1 to 5 *rem* (0.01–0.05 *Sv*) projected dose.[b]
	Administration of prophylactic drugs—potassium iodide[c,e] Administration of other prophylactic or decorporation agents[d].	5 *rem* (0.05 *Sv*) projected dose to child thyroid.[c,e]
Intermediate	Relocation of the public	2 *rem* (0.02 *Sv*) projected dose first year. Subsequent years, 0.5 *rem*/y (0.005 *Sv*/y) projected dose.[b]
	Food interdiction	0.5 *rem* (0.005 *Sv*) projected dose, or 5 *rem* (0.05 *Sv*) to any individual organ or tissue in the first year, whichever is limiting.
	Drinking water interdiction	0.5 *rem* (0.005 *Sv*) projected dose in the first year.

[a] Should normally begin at 1 *rem* (0.01 *Sv*); take whichever action (or combination of actions) that results in the lowest exposure for the majority of the population. Sheltering may begin at lower levels if advantageous.

[b] Total Effective Dose Equivalent (TEDE)—the sum of the effective dose equivalent from external radiation exposure and the committed effective dose equivalent from inhaled radioactive material.

[c] Provides thyroid protection from radioactive iodine only.

[d] For other information on other radiological prophylactics and medical countermeasures, refer to *http://www.fda.gov/cder/drugprepare/default.htm, http:/www.bt.cdc.gov/radiation*, or *http://www.orau.gov/reacts.*

[e] Committed Dose Equivalent (CDE). FDA understands that a KI administration program that sets different projected thyroid radioactive dose thresholds for treatment of different population groups may be logistically impractical to implement during a radiological emergency. If emergency planners reach this conclusion, FDA recommends that KI be administered to both children and adults at the lowest intervention threshold (*i.e.*, >5 *rem* (0.05 *Sv*) projected internal thyroid dose in children) (FDA 2001).

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- vs.
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Bone Surface	1.9E-06	8.1E-07	7.5E-07	8.2E-07	9.6E-07	4.6E-07
Brain	4.0E-08	2.3E-08	1.9E-08	1.5E-08	1.5E-08	1.4E-08
Breast	4.1E-08	2.4E-08	2.0E-08	1.6E-08	1.5E-08	1.5E-08
GI-Tract						
Oesophagus	4.1E-08	2.4E-08	2.0E-08	1.6E-08	1.5E-08	1.5E-08
St Wall	4.5E-08	2.7E-08	2.1E-08	1.6E-08	1.5E-08	1.5E-08
SI Wall	5.1E-08	3.1E-08	2.3E-08	1.7E-08	1.6E-08	1.6E-08
ULI Wall	1.1E-07	7.3E-08	4.2E-08	2.9E-08	2.2E-08	2.1E-08
LLI Wall	2.4E-07	1.7E-07	8.5E-08	5.4E-08	3.7E-08	3.3E-08
Colon	1.7E-07	1.1E-07	6.0E-08	4.0E-08	2.8E-08	2.6E-08
Kidneys	7.3E-07	3.5E-07	2.5E-07	1.8E-07	1.7E-07	1.7E-07
Liver	1.7E-07	9.9E-08	7.8E-08	6.1E-08	6.0E-08	6.2E-08
Muscle	4.0E-08	2.4E-08	1.9E-08	1.5E-08	1.5E-08	1.5E-08
Ovaries	4.1E-08	2.4E-08	2.0E-08	1.6E-08	1.5E-08	1.5E-08
Pancreas	4.1E-08	2.4E-08	2.0E-08	1.6E-08	1.5E-08	1.5E-08
Red Marrow	2.2E-07	8.2E-08	6.7E-08	6.2E-08	6.3E-08	4.9E-08
Respiratory Tract						
ET Airways	1.8E-04	1.5E-04	7.4E-05	5.1E-05	3.1E-05	3.1E-05
Lungs	2.4E-04	2.1E-04	1.3E-04	8.7E-05	7.3E-05	6.7E-05
Skin	4.0E-08	2.3E-08	1.9E-08	1.5E-08	1.5E-08	1.5E-08
Spleen	4.1E-08	2.4E-08	2.0E-08	1.6E-08	1.5E-08	1.5E-08
Testes	4.3E-08	2.5E-08	2.1E-08	1.7E-08	1.5E-08	1.5E-08
Thymus	4.1E-08	2.4E-08	2.0E-08	1.6E-08	1.5E-08	1.5E-08
Thyroid	4.0E-08	2.4E-08	1.9E-08	1.5E-08	1.5E-08	1.5E-08
Uterus	4.0E-08	2.3E-08	1.9E-08	1.5E-08	1.5E-08	1.4E-08
Remainder	1.4E-07	9.0E-08	5.5E-08	4.1E-08	3.1E-08	3.1E-08
Effective Dose	2.9E-05	2.5E-05	1.6E-05	1.0E-05	8.7E-06	8.0E-06

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IAEA General Safety Guides (GSG)-2

- CRITERIA FOR USE IN PREPAREDNESS AND RESPONSE FOR A NUCLEAR OR RADIOLOGICAL EMERGENCY

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GSG-II

Generic criteria		Examples of protective actions and other response actions
External acute exposure (<10 hours)		If the dose is projected: — Take precautionary urgent protective actions immediately (even under difficult conditions) to keep doses below the generic criteria — Provide public information and warnings — Carry out urgent decontamination
$AD_{\text{Red marrow}}$[a]	1 Gy	
AD_{Fetus}	0.1 Gy	
AD_{Tissue}[b]	25 Gy at 0.5 cm	
AD_{Skin}[c]	10 Gy to 100 cm^2	
Internal exposure from acute intake (Δ = 30 days)[d]		If the dose has been received: — Perform immediate medical examination, consultation and indicated medical treatment — Carry out contamination control — Carry out immediate decorporation[f] (if applicable) — Carry out registration for long term health monitoring (medical follow-up) — Provide comprehensive psychological counselling
$AD(\Delta)_{\text{Red marrow}}$	0.2 Gy for radionuclides with $Z \geq 90$[e] 2 Gy for radionuclides with $Z \leq 89$[e]	
$AD(\Delta)_{\text{Thyroid}}$	2 Gy	
$AD(\Delta)_{\text{Lung}}$[g]	30 Gy	
$AD(\Delta)_{\text{Colon}}$	20 Gy	
$AD(\Delta)_{\text{Fetus}}$[h]	0.1 Gy	

[a] $AD_{\text{Red marrow}}$ represents the average RBE weighted absorbed dose to internal tissues or organs (e.g. red marrow, lung, small intestine, gonads, thyroid) and to the lens of the eye from exposure in a uniform field of strongly penetrating radiation.

[b] Dose delivered to 100 cm^2 at a depth of 0.5 cm under the body surface in tissue due to close contact with a radioactive source (e.g. source carried in the hand or pocket).

[c] The dose is to the 100 cm^2 dermis (skin structures at a depth of 40 mg/cm^2 (or 0.4 mm) below the body surface).

[d] $AD(\Delta)$ is the RBE weighted absorbed dose delivered over the period of time Δ by the intake (I_{Δ}) that will result in a severe deterministic effect in 5% of exposed individuals.

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GSG-II

TABLE 3. GENERIC CRITERIA FOR PROTECTIVE ACTIONS AND OTHER RESPONSE ACTIONS IN EMERGENCY EXPOSURE SITUATIONS TO REDUCE THE RISK OF STOCHASTIC EFFECTS

Generic criteria		Examples of protective actions and other response actions
Projected dose that exceeds the following generic criteria: Take urgent protective actions and other response actions		
$H_{Thyroid}$	50 mSv in the first 7 days	Iodine thyroid blocking
E	100 mSv in the first 7 days	Sheltering; evacuation; decontamination; restriction of consumption of food, milk and water; contamination control; public reassurance
H_{Fetus}	100 mSv in the first 7 days	
Projected dose that exceeds the following generic criteria: Take protective actions and other response actions early in the response		
E	100 mSv per annum	Temporary relocation; decontamination; replacement of food, milk and water; public reassurance
H_{Fetus}	100 mSv for the full period of in utero development	
Dose that has been received and that exceeds the following generic criteria: Take longer term medical actions to detect and to effectively treat radiation induced health effects		
E	100 mSv in a month	Screening based on equivalent doses to specific radiosensitive organs (as a basis for medical follow-up); counselling
H_{Fetus}	100 mSv for the full period of in utero development	Counselling to allow informed decisions to be made in individual circumstances

Note: H_T — equivalent dose in an organ or tissue T; E — effective dose.

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3.19. Urgent protective actions should always be introduced to avoid doses approaching levels at which, if received, severe deterministic effects could occur. It should be recognized that the doses received before implementation of the protective action could contribute to the induction of deterministic effects.

3.20. When assessing projected doses, the dose distribution should be considered together with the uncertainty in the dose distribution in the population under consideration. When exposure is being assessed for members of the public, the possibility of the presence of children and pregnant women should be considered.

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GSG-II

3.24. The generic criteria in Table 2 should be used to derive OILs for taking precautionary urgent protective actions and other response actions to prevent severe deterministic effects. For the purpose of taking actions to reduce the risk of stochastic effects, the principles of both justification and optimization require consideration of the benefit that would be achieved by the protective actions and other response actions and of the harm, in its broadest sense, that would result from them. Actions to prevent doses approaching those in Table 2 are always justified.

3.25. Table 3 provides the generic criteria that should be used to derive OILs for taking urgent and early protective actions and other response actions. The protection provided by applying these generic criteria has been optimized on a generic basis for the general population, assuming that other hazardous conditions do not prevail at the time the actions are implemented. The proposed values do not need to be adjusted to take account of any particular members of the population (e.g. children or pregnant women) because protective action taken to avert these doses will satisfy the basic principle for the whole population.

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5.10. The dosimetric models for developing the OILs should be established during the planning phase. These models should include a full set of parameters important for the purposes of decision making for dose assessment. For internal dose assessment and the development of corresponding OILs, the application of computer codes is necessary.

5.11. The dosimetric models and data should provide reliable assurance that all members of the public, including those that are most sensitive to radiation (e.g. pregnant women), are considered. In the development of the default operational criteria, the public needs to be assured that all groups (e.g. children playing outdoors) have been considered. Consequently, the OILs must be accompanied by a plain language explanation of the situation to which they apply (see Appendix II), the way in which they address a safety or health concern, and what their application means in terms of the risk to individuals.

5.12. These default OILs should be developed on the basis of assumptions regarding the emergency, the affected population and the prevailing conditions; these assumptions, however, may not accurately reflect the emergency in question. Consequently, Ref. [2] requires that means be established to revise the default OILs to take into account prevailing emergency conditions. However, revising the OILs during an emergency may be disruptive, and they should therefore only be revised if the situation is well understood and there are compelling reasons to do so. The public should be informed of the reasons for any change in the OILs applied in an actual emergency.

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people should be relocated if replacements are not available. Finally, as soon as possible the guidance in Ref. [29] should be used to determine whether the food, milk or water is suitable for international trade, and national criteria or WHO guidance [30] should be used to determine whether the food, milk or water is suitable for long term consumption after the emergency phase.

II.22. Tables 9 and 10 give OILs for assessing food, milk and water (see also Table 11). These OILs apply to radionuclides in food, milk and water destined for human consumption (they are not applicable for dried food or concentrated food). The food, milk and water OILs in Tables 9 and 10 were calculated on the basis of the following conservative assumptions:

- All of the food, milk and water are initially contaminated and are consumed throughout a full year.
- The most restrictive age dependent dose conversion factors and ingestion rates (i.e. those for infants) are used.

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GSG-II

II.27. The development of plain language explanations for the default OILs should be based on the assumption that members of the public living under normal conditions, including those who are more vulnerable to radiation exposure such as children and pregnant women, will achieve a level of protection that meets international standards, provided that during the emergency phase they:

— Do not receive a dose to any organ approaching that resulting in severe deterministic effects. The thresholds for the onset of severe deterministic effects are listed in Table 2.
— Do not receive a dose above which the risk of health effects (e.g. cancers) is sufficiently high to justify taking protective actions during an emergency (generic criterion of 100 mSv per annum, as presented in Table 3). Below this generic criterion, protective actions are not always justified and will be taken (if at all) on the basis of justified criteria developed, with interested parties, after careful consideration of the conditions, including the impact of any protective action.

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ICRP 109

(g) It is essential that all aspects of the plan are consulted with relevant stakeholders, otherwise it will be more difficult to implement them during the response. To the extent possible, the overall protection strategy and its constituent individual protective measures should be worked through and agreed with all those potentially exposed or affected. Such an engagement will assist the emergency plans in being focused on the protection of those at greatest risk in the initial phases, and also on the progression to populations resuming 'normal' lifestyles.

(h) In the event of an emergency exposure situation, it is likely that exposure rates will vary in space and time, and that the doses received by individuals will vary, both as a result of the variations in exposure rates and as a result of differences in their physiological characteristics and behaviours. These population groups should be characterised by representative persons, as described in the Commission's advice on the representative person. In accordance with the Commission's advice on the representative person, it is important that the dose estimates reflect those likely to be received by the groups at greatest risk, but that they are not grossly pessimistic.

(i) The Commission's band of reference levels is expressed in terms of effective dose. For many emergency plans, this is an appropriate quantity in which to express the reference level. However, there are situations for which effective dose is not an appropriate quantity to express reference levels. This is the case when the type or scale of an emergency may result in doses in excess of 100 mSv effective dose (where the assumption of linearity may no longer hold), when parts of the response need to focus on individuals at risk of incurring severe deterministic injury, and when the resulting exposures are very strongly dominated by irradiation of a single organ for which very specific protective measures are optimum (e.g. releases dominated by radioiodine). For these situations, the Commission advises that consideration should be given to specifying (or providing supplementary) reference levels in terms of organ dose.

(j) In its previous advice, the Commission recommended the use of intervention

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Basis for PAG Levels

Appendix B, C & E quotes:

BA.1.4 Age Dependence of Doses
Almost all dose models are based on ICRP "Reference Man," which adopts the characteristics of male and female adults of working age. ICRP-30 dosimetric models, which use "Reference Man" as a basis, are therefore appropriate for only adult workers and do not take into account differences in dose resulting from the differences in physiological parameters between children and adults, e.g., intake rates, metabolism, and organ size. Although it is difficult to generalize for all radionuclides, in some cases these differences tend to counterbalance each other. For example, the ratio of volume of air breathed per unit time to lung mass is relatively constant with age, so that the ICRP adult model for inhaled materials provides a reasonably good estimate of the dose from a given air concentration of radioactive material throughout life.

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Options for the Real Event

- The EPA PAGs have a lot of conservatism built in
- Dose assessment should continue using the adult dosimetry models
  - ✓ If additional information about a specific population subset is available (i.e. a boarding school) consult with the A-Team to get applicable recommendations

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Rationale for Using the Adult DCF

- What are the next steps???

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Conclusion

- Overview
- Difference in 1992 and 2013 PAGs
  - ✓ KI administered at 5 rem (child)
  - ✓ No 5 rem over 50 year long term requirement
- Dosimetry
  - ✓ 2013 allows for the most current dosimetry model to be implemented
- Next Steps

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The End

Thank you!

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To: DeCair, Sara[DeCair.Sara@epa.gov]
Cc: Danielle Murray[dmurray@endyna.com]; siddhanti@endyna.com[siddhanti@endyna.com]
From: Amy Doll
Sent: Tue 11/12/2013 9:19:01 PM
Subject: Updated PAGS comment spreadsheet (Nov 12th -- V14)
EPA PAG Comments_11.12.2013v14.xlsx

Sara

Attached is the updated version of the PAGS spreadsheet, which incorporates your comments below and is ready for Thursday's meeting. Please let us know if you have any questions or additional comments.

Thanks,

Amy

From: Smita Siddhanti
Sent: Friday, November 08, 2013 3:08 PM
To: DeCair, Sara
Cc: Danielle Murray; Amy Doll
Subject: RE: Updated PAGS comment spreadsheet (Nov 7)

Sara,

Have a good week-end! I will see you next Thursday.

-Smita

From: DeCair, Sara [mailto:DeCair.Sara@epa.gov]
Sent: Friday, November 08, 2013 2:46 PM
To: Amy Doll
Cc: Smita Siddhanti; Danielle Murray
Subject: RE: Updated PAGS comment spreadsheet (Nov 7)

Good afternoon,

I have added a few more resolution items in the attached, and one red request to split a comment into two. I didn't get very far !! Let's check in via email Tuesday morning to make sure we're ready for Thursday's meeting with a new spreadsheet. Focusing on the Relocation tab should be easy since it's in such good shape. Thank you!!

Sara

From: Amy Doll [mailto:adoll@endyna.com]
Sent: Friday, November 01, 2013 4:49 PM
To: DeCair, Sara
Cc: siddhanti@endyna.com; Danielle Murray
Subject: Updated PAGS comment spreadsheet (Nov 1st -- V13)

Sara

As you requested, attached is the updated PAGS comment spreadsheet through COB today (November 1st). We'll turn over version control to you for this weekend, and if you could send it back by Monday that would be helpful. If you have any questions this weekend, please give me a call at 301-718-8133 (home phone; leave a number to call you back if I'm not home).

The Tabs with a **green** color are ready for your review and QA. Please go ahead and make your revisions/notes in these **green** Tabs as you review them.

EnDyna is still working on completing the Editorial Tab, which is marked with a **red** color. We'd appreciate if you could clearly mark any revisions/additions to this tab with either yellow highlight on the rows or some other obvious way for us to distinguish any revisions/notes you make this weekend to this **red** Tab. If we get the spreadsheet back from you on Monday, we'll get that Editorial Tab completed early next week.

One “decision rule” we used when binning the comments is whenever a comment recommended a word change or similar revision to a sentence or paragraph in the PAGS document that might affect the content/meaning of that sentence or paragraph, we binned those comments in relevant subject area so they could be considered along with other content changes. That way, you can avoid the risk of editorial changes being made later that inadvertently change the subcommittee’s intended content/meaning from resolving the subject area comments.

Because of that “decision rule” we had planned for the Editorial Tab to have comments that are just editorial (e.g., typos, inconsistencies, misspellings, style/grammar problems) along with comments on acronyms and the glossary/terms.

Thanks,

Amy

To: Boyd, Mike[Boyd.Mike@epa.gov]; DeCair, Sara[DeCair.Sara@epa.gov]
Cc: Edwards, Jonathan[Edwards.Jonathan@epa.gov]
From: Perrin, Alan
Sent: Fri 11/8/2013 4:08:05 PM
Subject: FW: A Bloomberg BNA document article on OMB holding up regulatory actions

Spoiler Alert

FYI. Both your actions rated a spot in Appendix E: Longest Reviews Completed in 2013. PAGs placed 2nd fed-wide with a 617 day review time.

~~~~~~~~~~~~~~

Alan Perrin, Deputy Director

Radiation Protection Division, USEPA

office (202) 343-9775 | bb (202) 279-0376

-----Original Message-----
From: Peake, Tom
Sent: Friday, November 08, 2013 9:56 AM
To: OAR-ORIA-RPD
Subject: FW: A Bloomberg BNA document article on OMB holding up regulatory actions

FYI--A report in line with what we've seen related to delays at OMB. The link is provided in case you find the copied article a bit difficult to read.

Tom

You have received a document from donotreply@bna.com.

The document is called "Regulatory Policy: New Draft Report Finds Political Interference in Federal Rulemaking".
~~~~~~~~~~~~~~

Access to this document requires a subscription. If you are a subscriber to Environment & Safety Resource Center, click on the link to view the document:

http://esweb.bna.com/eslw/1245/split_display.adp?fedfid=37990209&vname=dennotallissues&split=0

Report on Regulatory Reviews by White House Key Development: A report submitted for review to the Administrative Conference of the United States offers critical accounts of the rulemaking activities of the White House Office of Information and Regulatory Affairs.

What's Next: The next ACUS meeting on the document is scheduled for Nov. 14.By Stephen Lee

Nov. 5 — Senior administration officials say the government's regulatory gatekeeper is highly responsive to political concerns, routinely conducts “off the clock” informal reviews of proposed rules and demands that agencies ask permission before submitting rules for review, according to a new draft report.

“It's shocking,” Ronald White, regulatory policy director at the Center for Effective Government, told Bloomberg BNA Oct. 30. “It's outright manipulation.”

The 75-page report, submitted Oct. 29 to the Administrative Conference of the United States for review, was written by Curtis Copeland, a retired government specialist at the Congressional Research Service. Copeland drew his findings from interviews with 14 anonymous senior administration officials, representing 11 agencies, who have interacted with the Office of Information and Regulatory Affairs and experienced delays.

ACUS is an independent agency that advises federal agencies and Congress on regulatory and administrative matters.

Report to Be Marked Up

OIRA, an agency within the White House Office of Management and Budget that makes final decisions on proposed regulations, didn't respond to an interview request for this story.

Copeland's report, “Length of Rule Reviews by the Office of Information and Regulatory Affairs,” was written at the behest of ACUS.

Gretchen Jacobs, ACUS's research director, said at an ACUS meeting Oct. 29 that the report is “one of the most comprehensive treatments of OIRA review” ever written.

Two ACUS committees will review the report and mark it up. If it is approved, it will eventually go to a vote before the full conference. If that vote is successful, the report will be distributed throughout the federal government and Congress.

The next ACUS meeting on the document is scheduled for Nov. 14.

Political Sensitivity Reaches New Heights Among the report's principal allegations is that OIRA's sensitivity to electoral politics “reached new heights during 2012,” prior to the November elections.

That runs counter to OIRA's stated goal, which is to assess rules based on the public interest, regardless of their political consequences.

According to Copeland's administration sources, costly or controversial rules were delayed in the run-up to the election, and agencies “were instructed that such rules were not to be issued unless deemed absolutely necessary (e.g., a judicial deadline) or if it could be shown they were not controversial (e.g., clear net benefits).”

Sunstein Denies Role of Politics

Worker safety advocates have privately speculated that the Occupational Safety and Health Administration's silica rule was delayed for more than two years because of political considerations. However, Cass Sunstein, then the head of OIRA, has consistently denied charges that politics played a part in the agency's actions.

During a May 3 speech, for example, Sunstein said his staff would sometimes inform him about the political consequences of pending rules, to which he said he would reply, “That's sewer talk. Get your mind out of the gutter.”

But those remarks clash with the evidence Copeland uncovered. One government official said it was a “bit of a joke” among regulatory staff that the level of political sensitivity rises every Olympic year, which coincides with presidential election years.

Several of Copeland's sources said they blamed the White House, not OIRA, for delays they blamed on political influence.

Off-the-Record Conversations

OIRA also frequently has substantive discussions with agencies about rules—sometimes lasting hundreds of days—before the agencies submit their rules for formal review, according to the report.

As a result, Copeland wrote, the review times OIRA reports can be misleadingly short, and the regulatory process in reality is more secretive.

Under Executive Order 12,866, OIRA must complete its reviews within 90 days, with one 30-day extension permitted. Copeland found that the average review in 2013 lasted 140 days, more than two and a half times as long as the 52.2-day average over the previous 19 years. (As of Nov. 4, the updated average review time for 2013 was 146.) Moreover, OIRA personnel seem to feel

that they can extend their reviews “for an unlimited duration,” Copeland found.

He also found that some improvements have been made recently. He noted during the Oct. 29 ACUS meeting that in January, OIRA had on its docket 83 reviews that had lasted more than six months, but by September that number had been whittled down to 38.

New OIRA administrator Howard Shelanski, who took over in June, said during his Senate confirmation hearing that speeding up the rulemaking process would be one of his highest priorities.

Heavy Editing of Proposed Rules

In a 2001 report to Congress, OIRA said informal reviews that take place before the 90-day clock starts are “useful for agencies, since they have the opportunity to educate OIRA desk officers in a more patient way.”

Similarly, Sally Katzen, OIRA chief during the Clinton administration, told Copeland that pre-submission consultation is helpful in both drafting rules and in easing the formal review that comes later.

Three senior agency employees also said OIRA didn't informally review their draft rules.

However, some of Copeland's executive branch sources said OIRA personnel have heavily edited proposed rules during the informal review period. One source said an OIRA desk officer “would inform the agency that the delineated changes would need to be made before OIRA would allow the rule to be submitted for formal review.”

Permission to Submit

Starting in 2012, agencies have also been increasingly required to receive permission from OIRA before submitting rules for review, according to the report.

Lisa Heinzerling, a Georgetown law professor who formerly served as associate administrator of the Environmental Protection Agency's Office of Policy, made a similar claim in a June 12 draft legal paper that it has been “widely reported that OIRA has lately been in the habit of not allowing agencies to send rules for review until OIRA has cleared them for review.”

Several administration officials told Copeland that OIRA has always held pre-submission meetings to determine which rules agencies would be submitting, but beginning in 2012, the officials said they have had to meet with an OIRA desk officer before submitting each rule for formal review. Some staffers said they refer to these briefings as “Mother May I” meetings.

Significant Source of Holdups

One senior agency staffer said these pre-submission meetings are “one of the most significant holdups in the agency's rule development process,” according to the report. The same staffer said

some proposed rules have sat in her office for more than a year because OIRA would not permit her agency to submit them.

Another agency official said OIRA requires pre-submission briefings on “just about every rule the agency plans to issue,” not just those that are economically significant. Career staff at this agency who had served under multiple presidents had never previously had to receive OIRA approval before submitting every rule, the official told Copeland.

“At a minimum, such actions are not transparent, can make it difficult for agencies to plan the issuance of their proposed and final rules, and can result in an understatement of the actual length of OIRA's review process,” Copeland wrote.

Information Requests Becoming More Extensive Copeland further found evidence that OIRA reviews have been delayed because of lags in the agency's data system.

One administration staffer said such delays were “a lot more than a day or two.” Another said some rules submitted to OIRA in 2012 didn't show up in OIRA's data system as having been received for months afterward.

OIRA desk officers have also begun making more extensive requests for additional information and analysis, Copeland found, further extending the length of the review process.

One agency staffer told Copeland that several of her agency's rules sat at OIRA for more than a year, even though most of the review was completed during the first 90 days. For the next nine months at least, an OIRA officer “kept asking for more analysis of what she considered to be relatively minor issues,” as well as copies of documents that were already publicly available.

Analyses Never Before Requested

Another employee said his agency had to prepare uncertainty analyses that had never been requested in the past, and had to monetize regulatory benefits “to a level that had not been previously required—both of which required a tremendous amount of time and effort,” Copeland wrote.

Other sources told Copeland that “the kinds of questions the OIRA desk officers asked frequently appeared to be outside the scope of the rule under review.” For example, one agency official said it “often seemed that the desk officer was just curious about some aspect of the general policy,” even though it was not germane to the rule. The agency then had to spend significant time and resources to answer OIRA's questions.

One agency employee said OIRA's desk officers “would continue to ask for more analysis until someone at a high enough level in OIRA finally told them to stop.”

Questions About Significance

Copeland's sources further said OIRA has expanded its definition of what constitutes a

“significant regulatory action,” thus taking on more reviews and spreading its resources thinner, resulting in ever longer review periods.

One employee reported to Copeland that “it was now extremely different to have a rule declared non-significant.”

Robert Verchick, a law professor at Loyola University and a member scholar at the Center for Progressive Reform, has raised a similar point, telling Bloomberg BNA Oct. 26 that only 15 percent of the rules currently under review have been deemed by OIRA to be economically significant. The remaining 85 percent are being reviewed because they raise “novel policy issues.”

That ratio strongly suggests that many OIRA reviews are politically motivated, Verchick said.

Veto Power for Many Alleged

Copeland's report also found that other agencies can slow down or even stop reviews. One of his sources said that “many people want to have a say in the development of the agency's rules, rules can get stuck at any point, and no one is willing to give up influence to streamline the process.”

Anyone in the review process appears to have veto power to stop a review, Copeland wrote.

One reason for OIRA delays may be that the agency has lost staff in recent years. A source told Copeland he believed OIRA's staff to be at an all-time low. Currently, the office has 44 full-time employees.

Moreover, Verchick said most of OIRA's reviewers are either lawyers or economists, raising questions about whether they should be involved in judging the scientific decisions of agencies.

During the Oct. 29 ACUS meeting, former OIRA counsel John Cooney said the problem of short staffing is common throughout the Office of Management and Budget, OIRA's parent agency, especially as congressional budget writers have learned they can limit the president's effectiveness by withholding funding from OMB.

Recommendations for Reform

The Copeland report includes a series of recommended reforms.

OIRA should return proposed regulations to agencies if it can't complete its review within 120 days, with a letter explaining the reasons for the return, Copeland wrote. The agency should also start the clock on its reviews as soon as it receives a draft rule that represents an agency's considered opinion, give comments to agencies as soon as possible and send draft rules to all non-submitting but possibly affected agencies as soon as possible.

Congress should also authorize more funding to OIRA so it can hire more staff, Copeland wrote. As an alternative, staff from rulemaking agencies could be temporarily detailed to OIRA.

Voting Members Praise Report

The ACUS members who opened deliberations on the report Oct. 29 largely praised Copeland's work and said his findings confirmed many of their long-held beliefs.

However, ACUS member Michael Fitzpatrick, who served as OIRA's associate administrator early in the Obama administration, cautioned against placing too much trust in the causal connections made by Copeland's sources, who, because they are not privy to OIRA's inner workings, can only offer speculation.

“We should just be cautious as agency folks, maybe in entirely good faith, are searching for reasons why, all of a sudden, their rules are lingering much longer than they had experienced in the past,” Fitzpatrick said.

Drawing from his own experience and his contacts with OIRA personnel who remain at the agency, Fitzpatrick said he questioned whether there has been a broad expansion of the types of rules OIRA is reviewing, or whether interagency review has really become more complicated and involved more players.

Similarly, Jason Schwartz, legal policy director at New York University's Institute for Policy Integrity, told Bloomberg BNA Nov. 5 that problems with informal review and transparency have long been acknowledged.

Former OIRA Official Confirms Role of Politics However, Fitzpatrick did allow that a “hugely increased risk aversion and caution” in election years has overtaken OIRA.

“I experienced it before I left,” he said.

Copeland said during the meeting that he tried several times to interview OIRA personnel on the record, but was rebuffed.

Also during the meeting, ACUS member Russell Frisby, an industry lawyer with Stinson Morrison Hecker LLP, said the emphasis on getting rules out of OIRA quickly may not always be appropriate.

“Speed for its own sake is not necessarily best,” Frisby said.

Schwartz praised Shelanski's leadership and said that, despite the many problems in the rulemaking process, “It does seem like, in recent months, OIRA is making a good-faith effort to address some of these problems. We'll have to wait and see if that actually happens.”

To contact the reporter on this story: Stephen Lee in Washington at stephenlee@bna.com To contact the editor responsible for this story: Jim Stimson at jstimson@bna.com For More Information The Administrative Conference of the United States' report, “Length of Rule Reviews by the Office of Information and Regulatory Affairs,” is available at

http://op.bna.com/env.nsf/r?Open=jstn-9d6pjx.

Former EPA associate administrator Lisa Heinzerling's draft article, “Inside EPA: A Former Insider's Reflections on the Relationship Between the Obama EPA and the Obama White House,” is available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2262337.

To: DeCair, Sara[DeCair.Sara@epa.gov]
Cc: siddhanti@endyna.com[siddhanti@endyna.com]; Amy Doll[adoll@endyna.com]
From: Danielle Murray
Sent: Tue 10/22/2013 7:28:33 PM
Subject: RE: Updated Spreadsheet
EPA PAG Comments_10.22.2013v4.xlsx
Evacuation_10.22.2013.xlsx

Sara, here is the copy that should be used tomorrow for the meeting. I have also included a separate sheet of just the Evacuation tab as it may be easier to work off of this, so the other tabs are not visible. Just an option though, look forward to working with you tomorrow.

Danielle Murray

Operations and HR Analyst

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Suite 620
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dmurray@endyna.com

703-848-8842 ext.103

703-848-9001 (f)

From: DeCair, Sara [mailto:DeCair.Sara@epa.gov]
Sent: Tuesday, October 22, 2013 2:30 PM
To: Danielle Murray
Cc: Smita Siddhanti; Amy Doll
Subject: RE: Updated Spreadsheet

Cool, thanks!! I think it might just be Trish from NRC on tomorrow's 9 am call – but that's okay, we can get some work done. Can you send us a GoToMtg link to use? And should we just use the bridge line that it autogenerates instead of mine? Probably doesn't matter either way. Again – many thanks!

From: Danielle Murray [mailto:dmurray@endyna.com]
Sent: Tuesday, October 22, 2013 2:13 PM

To: DeCair, Sara
Cc: siddhanti@endyna.com; Amy Doll
Subject: Updated Spreadsheet
Importance: High

Sara,

After talking with you I have made some minor changes to the spreadsheet as you requested. I know you said that you would probably not be able to go through this today but in the morning if you find there are changes needed before the proposed 9AM meeting please do let me know and I will try to get these completed and back to you promptly.

In regards to the spreadsheet itself; the first two tabs Dosimetry and KI; the comments that were already in these tabs I have left, and then you will see the background color of the information I have added the past two days is gray. This is so you can differentiate what has been added since you last looked at this sheet. The information included in the remainder of the tabs has been vetted on our side, with a special attention to Evacuation as you requested.

Please let me know if there is anything else I can assist with. Just a reminder please make your additions to the spreadsheet easily distinguishable so that I can see what I need to incorporate.
Thanks,

Danielle Murray

Operations and HR Analyst

EnDyna, Inc.
7926 Jones Branch Drive
Suite 620
McLean, VA 22102

dmurray@endyna.com

703-848-8842 ext.103

703-848-9001 (f)

To: DeCair, Sara[DeCair.Sara@epa.gov]
Cc: siddhanti@endyna.com[siddhanti@endyna.com]; Amy Doll[adoll@endyna.com]
From: Danielle Murray
Sent: Tue 10/22/2013 6:12:50 PM
Subject: Updated Spreadsheet
EPA PAG Comments_10.22.2013v3.xlsx

Sara,

After talking with you I have made some minor changes to the spreadsheet as you requested. I know you said that you would probably not be able to go through this today but in the morning if you find there are changes needed before the proposed 9AM meeting please do let me know and I will try to get these completed and back to you promptly.

In regards to the spreadsheet itself; the first two tabs Dosimetry and KI; the comments that were already in these tabs I have left, and then you will see the background color of the information I have added the past two days is gray. This is so you can differentiate what has been added since you last looked at this sheet. The information included in the remainder of the tabs has been vetted on our side, with a special attention to Evacuation as you requested.

Please let me know if there is anything else I can assist with. Just a reminder please make your additions to the spreadsheet easily distinguishable so that I can see what I need to incorporate.
Thanks,

Danielle Murray

Operations and HR Analyst

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703-848-9001 (f)

To: DeCair, Sara[DeCair.Sara@epa.gov]
Cc: siddhanti@endyna.com[siddhanti@endyna.com]
From: Amy Doll
Sent: Mon 9/30/2013 2:34:22 PM
Subject: RE: PAG Comments
Negative Comments Only.zi
Negative Comments plus....zi
PAG Comments_Docket Numbers.zi

Sara

Here are the zip files re-named without the "p" in the extension. That has worked before for me too – let us know if you can save them, re-name them with the "p" and open them.

Amy & Smita

From: Smita Siddhanti
Sent: Monday, September 30, 2013 10:30 AM
To: DeCair, Sara (DeCair.Sara@epa.gov)
Cc: Amy Doll
Subject: FW: PAG Comments

Is there a personal email – not EPA mail – that we can send you the files again and see if that would work for the time being?

-Smita

From: DeCair, Sara [mailto:DeCair.Sara@epa.gov]
Sent: Monday, September 30, 2013 10:18 AM
To: Smita Siddhanti
Cc: Danielle Murray; Thornton, Marisa
Subject: RE: PAG Comments

Sure enough. I tried both Open and Save, both times the resulting folder says 0 bytes, 0 files. I

had the same result in the office last week (I am on home computer today on EPA email system, which might be stripping them). One workaround we used in the past was to name the zip file with a .zi extension and then send to me - want to try that?

Thanks so much!

From: Smita Siddhanti <Siddhanti@endyna.com>
Sent: Monday, September 30, 2013 9:48 AM
To: DeCair, Sara
Cc: Danielle Murray; Thornton, Marisa
Subject: RE: PAG Comments

Yes, we can certainly put this on our share point and give you access. I will find that out while you are trying to access the files at your end. Let me know how that goes. Hope you have saved the folder on your desk top as that has to happen before the files can be opened for content.

-Smita

From: DeCair, Sara [mailto:DeCair.Sara@epa.gov]
Sent: Monday, September 30, 2013 9:45 AM
To: Smita Siddhanti
Cc: Danielle Murray; Thornton, Marisa
Subject: RE: PAG Comments

Smita,

I'm getting help from my office to try and figure out if the firewall, or lack of WinZip program, or just my doing it wrong is causing these folders to only save or extract as empty when I try to unzip them.

To make future viewing by the Subcommittee members easier, is there an FTP or web location you can put this file on so I can review and then share with the group, once final?

Thanks for any help, I appreciate it!

Sara

From: Smita Siddhanti <Siddhanti@endyna.com>
Sent: Friday, September 27, 2013 4:46 PM
To: DeCair, Sara
Cc: Danielle Murray
Subject: FW: PAG Comments

Hi Sara:

As we discussed, I am sending you two zip files – one that has all comments without the negative ones and the other one with only negative comments.

There is some change in our numbering system to coincide with the docket numbers, so please call me on Monday and Danielle can explain to you how it effects your excel spreadsheet of comments that we sent you.

Have a good week-end!

-Smita

From: Danielle Murray
Sent: Friday, September 27, 2013 11:09 AM
To: Amy Doll; Smita Siddhanti
Subject: PAG Comments

Here are the three separate ZIP files and they are numbered based on the docket numbers now.

Danielle Murray

dmurray@endyna.com

703-848-8842 ext.103

MessageID: <2147217718.7430.1373679065068.JavaMail.tomcat@vweb108.salsalabs.net>
From: Helen Jones <helenjones555@gmail.com>
Sent: 07/12/2013 09:31:05 PM
Subject: Withdraw Protective Action Guides for Radionuclides (Docket ID No. EPA –HQ – OAR – 2007– 0268)

Body: Assistant Administrator McCarthy

The Honorable Gina McCarthy
Assistant Administrator for Air and Radiation and Administrator-Nominee
U.S. Environmental Protection Agency

Dear Assistant Administrator McCarthy:

I am vehemently opposed to your and President Obama's support of the National Council on Radiation Protection's disgraceful anti-public health proposal to approve a 2 Rem/year dose and do away with the current 1 in 10,000 permissible cancer incidence rates for lifetime of exposure to non-background radioactivity (i.e., from bombs, leaks and nuclear accidents). This would allow instead a shocking 1 in 23 cancer incidence rate. This is a gross failure of the Administration's solemn responsibility to protect American citizens from harm. Even the lower end of the NRCP's so-called "clean-up" standard of 100 millirems per year would cause 1 in 466 exposed persons to develop cancer after 30 years of exposure. This is a totally unacceptable cancer incidence rate that is more than 20 times worse than EPA's current Superfund clean-up standards. Suffer the little children with damaged DNA and parents dead and buried before their time, health care budgets sucked dry by widespread sickness -- and weep for Americans of all ages!

I demand that EPA withdraw the Protective Action Guides it released on April 15, 2013 for good reasons:

Allowing 1 in 6 or even more people to get cancer from radiation exposure in order to protect nuclear industry profits works against EPA's mission to "protect human health and the environment." EPA needs to make health were the driver of cleanup and recovery, not industry economics.

EPA should not be relying on advice from nuclear industry funded organizations, like the National Council on Radiation Protection and Measurements (NCRP), to establish radiation exposure levels for the public. This is an obvious conflict of interest.

EPA PAGs fail to incorporate the lessons of previous nuclear catastrophes like Chernobyl and Fukushima by ignoring increasing and migrating contamination.

EPA fails to fully account for any longer term chronic exposure sources like contaminated food; or to work with other agencies to ensure the public is fully informed of man-made radiation levels in food.

EPA fails to incorporate key applicable recommendations of the United

Nations Human Right to Health report, recently released, on the Fukushima disaster. It can happen here.

I demand the PAGs be withdrawn, rather than adjusted or amended, because of EPA's connection to NCRP, an industry-funded entity paid by EPA to advise them on these guides. This collaboration with NCRP is a conflict that will make creating independent, protective radiation standards an impossibility.

Helen Jones
Alisdale Drive
Toledo, OH 43606

The Honorable Gina McCarthy
Administrator
U.S. Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Ave., N.W.
Washington, DC 20460

US EPA Air and Radiation Docket and Information Center
Mail Code: 6102T, 1200 Pennsylvania
Ave NW, Washington, DC 20460

a-and-r-docket@epa.gov; Docket ID No. EPA-HQ-OAR-2007-0268; www.regulations.gov ;
Fax (202) 566-1741

Re: Protective Action Guides for Radionuclides (Docket ID No. EPA–HQ – OAR – 2007–0268)

Dear Administrator McCarthy:

On April 15, 2013 the Agency published in the Federal Register, a request for public comment on the proposed PAG revisions (78 FR 22257-60). Beyond Nuclear is writing to express opposition to fundamental aspects of the revised Protective Action Guides (PAGs) the purpose of which is to guide response to releases of radioactivity. We focus our comments on Chapters 3 and 4 (Intermediate and Late Phase PAGs) which overall, we conclude are wholly unprotective of human health over longer-term time spans.

The PAGs in chapters 3 and 4 are so weak and dangerous, that we demand they be withdrawn for the following reasons detailed in these comments:

- **These EPA PAGs do not comport with the United Nations Human Right to Health standards suggested in the wake of Fukushima;**
- **they are generated by entities that are funded by the nuclear industry;**
- **they fail to reflect actual nuclear power catastrophe circumstances like those plaguing Japan;**
- **they fail to fully account for any longer term chronic exposure sources like contaminated foodstuffs**

It is clear that the lesson EPA learned from Fukushima (a catastrophe which appears to be worsening by the day, more than two years later) is that a severe nuclear accident cannot be cleaned up to previously acceptable standards. Therefore, the solution is to simply redefine "dirty" as "clean" –weaken the standards.

Real-world lessons from Fukushima show that the Government of Japan, rather than relocating people, is attempting to convince families that it is safe to live in contaminated areas, playing on people's wishes that the information is true and they can resume their lives. Those who recognize that allowing their children to play in a contaminated schoolyard is dangerous are not given funding to relocate because the government says it is safe enough where they are. EPA's PAGs would allow the same fate for US victims of a nuclear catastrophe; a sad testament to an agency that states, "Our mission is to protect human health and the environment." Note that ensuring the economic viability of the nuclear

industry is not part of this mission. Yet, there is indication that EPA is using these PAGs to relax public health standards, which runs counter to their stated mission.

1) A RECENTLY ISSUED HUMAN RIGHTS REPORT SHOULD INFORM EPA PAGs

In the continuing wake of the Fukushima nuclear disaster in Japan, the Human Rights Council of the United Nations sent Special Rapporteur on the right to health (a position created in 2002) Anand Grover to assess Japan's compliance with human rights principles; specifically "the right of everyone to the enjoyment of the highest attainable standard of physical and mental health". His visit took place between November 15 and 26, 2012 with permission of the Government of Japan.

A number of the Special Rapporteur's (SR's) recommendations and conclusions would enhance protection during any attempt to keep the public from being exposed to radiation, and should apply to nuclear power and human rights compliance beyond the Fukushima catastrophe. Many aspects of the SR's report are groundbreaking and speak directly to the shortcomings of current assumptions on radiation and health not only in regard to events in Japan, but also in the context of radiation protection worldwide. Among these recommendations:

- **"...reduce the radiation dose to *less than 1mSv/year*;" (UNHR report, p 23, emphasis added)**

The EPA PAGs violate this at the very least by omission. During the intermediate phase of the PAGs, the EPA suggests that the PAG for relocation of affected people is 0.5 rem (5 mSv). This is the most protective, though still thoroughly inadequate, allowable exposure stated in the PAGs. The EPA then states that these PAGs will not be used for the late phase of cleanup but gives no specific guidance for dose level. In fact, EPA all but abandons its own recognized protection limits of 1 in 10,000 or 1 in 1 million lifetime cancers in favor of weaker, less protective standards, claiming these limits "may not be achievable after a large radiological incident." (EPA PAGs, p 69): "After the first year, the PAG for relocation is 0.5 rem (5 mSv) per year." (EPA PAGs, p 50) However, there is no assurance that after EPA's recommended late phase begins, exposure levels will be lowered from the 5 mSv per year left over from the intermediate phase; or for that matter that the exposure will be lowered from the 20 mSv allowed in the first year of exposure and leading to 1 in 6 people exposed contracting cancer. Either the 20 mSv or the 5 mSv levels are much higher than the level-- "less than 1 mSv"-- recommended by the UNHRC Special Rapporteur on health.

- **"Formulate a national plan on evacuation zones and dose limits of radiation by using current scientific evidence, based on human rights rather than on a risk-benefit analysis..." (UNHR report, p 23)**

Unfortunately, even though EPA doesn't explicitly say it, they are using risk-benefit analysis in the PAGs. EPA states in Chapter 4 "Radiation protection considerations must be addressed in concert with health, environmental, ***economic***, social, psychological, cultural, ethical, ***political***, and other considerations..."(emphasis added) and "As actual levels for areas are determined, many factors come into play in decision making, such as balancing risk reduction with other factors, background levels of radioactivity and tolerance for voluntary versus involuntary risk." These statements are clearly considering radiation exposure for the late phase in terms of "optimization," a risk-benefit concept antithetical to

the right to health and proper protection of the public, not least because it puts economic benefit on par or even above health. "Optimization" can also protect a structure where those that are at risk from nuclear power, or directly impacted by it (as in and after a radiological catastrophe) are not the ones benefiting from it.

This push for "optimization" creates a disconnect between EPA's mandate to protect public health and the desire of powerful industry proponents to downplay health danger from nuclear accidents by creating doubt where there is actually very little. This disconnect is reflected in the EPA PAGs that recognize "The most effective of these actions is relocation—the removal or continued exclusion of people (households) from contaminated areas to avoid chronic radiation exposure." (EPA PAGs, p 35) And further, EPA recognizes that "People residing in contaminated areas [beyond the relocation area] will be at some risk from radiation dose." Despite this awareness and its mission to protect health, EPA goes on to recommend a limit of relocation that is incredibly high (5 mSv per year after the first year for which the relocation level is 20 mSv). "According to the National Academy of Sciences and EPA, 20 mSv/year over a lifetime would result in a cancer in every sixth person exposed." (Citizen letter to EPA on PAGs)

Further, to get to this 5 mSv per year (0.5 rem) dose, EPA relies on people in contaminated areas to maintain certain behaviors for an extended period of time such as "spending more time than usual indoors." (EPA PAGs, p 36) However, inability to go outside has caused distress to children in Japan since the Fukushima nuclear catastrophe began: "The Special Rapporteur notes with concern that the mental and physical health of children has been especially affected by the lack of outdoor activities, safe areas to play and restrictions on activities in school." (UNHR report, p 14). Impact on adults should also be considered. In essence, EPA is allowing through the PAGs, "sheltering in place" permanently, in order to meet its ridiculously unprotective guides.

EPA is also attempting to pencil-whip the actual doses into compliance by claiming "For source terms from NPP [nuclear power plant] incidents the PAG of 2 rem (20 mSv) projected dose in the first year is expected to meet this longer-term objective through radioactive decay, weathering and normal part-time occupancy in structures." (EPA PAGs, p 45) And "Keeping below the 0.5 rem (5 mSv) PAG for "out-years"—the second year and beyond—may be achieved through natural decay of shorter half-life radioisotopes..." among other methods, like decontamination that has proven intractable in Japan. "Weathering" is another potential pitfall, as the environment contaminated by Chernobyl shows. Contamination, like cesium 137, will appear to move down through soil layers and away from growing vegetables, for example, only to be brought to the surface later through biological and environmental processes like uptake in trees and subsequent litter fall.

Additionally, attempting to change human behavior in order to meet a dose standard has failed in the past among nuclear power victims. Some native people in Scandinavia are heavily exposed to radiation because they wish to maintain their traditional diet of reindeer meat, contaminated following the Chernobyl explosion. Likewise, mushroom consumption in the Chernobyl region continues, because many people there are unwilling (whether culturally or due to necessity) to give it up. This is evidence that attempting to change behavior in the US in an effort to reduce radiation exposure may fail in certain populations.

In addition, these doses are projected, not actual. Past experience has shown a consistent unwillingness among "experts" to change projected doses, even in the face of contrary,

measureable (as opposed to modeled or assumed), evidence. This makes independent scientific assessment of nuclear catastrophes difficult and, when performed, scorned by entrenched interests who often use projected dose to cover health impacts.

- **"The Special Rapporteur urges the Government to ensure effective community participation, especially participation of vulnerable groups, in all aspects of the decision-making processes related to nuclear energy policy and the nuclear regulatory framework, including decisions regarding nuclear power plant operations, evacuation zones, radiation limits, health monitoring and compensation amounts." (UNHR report, p24)**

Governmental decision makers, like EPA, have largely ignored public concerns about nuclear power reactors. NRC is refusing to institute safety recommendations for Mark I and II reactors, the same reactor design as those that melted down and exploded at Fukushima. NRC also had refused to close Vermont Yankee, despite the wishes of the Vermont state government and the vast majority of the population that it be closed. Ironically, should a nuclear accident occur at Vermont Yankee, EPA says "…the states bear primary responsibility to identify and provide waste management options, including disposal capacity…". Therefore, EPA is recommending standards within a system that has already disregarded the will of the people. By definition, this does not meet the human right to health standard.

EPA's meager concession to allow the public to participate in the cleanup phases of its PAGs is too little, too late. EPA's position, in chapter 4, late phase PAGs, that "PAGs will not be used to guide restoration and recovery of areas impacted by a radiological incident…" supposedly allows public input: "planning activities should include developing a process to involve stakeholders in setting priorities and determining actions…" during the restoration and recovery phase. We find EPA's explanation for the malformed recommendations during the late phase extremely weak. Unless long-term recovery expectations are clearly spelled out *before* an accident, those with the most resources (power, money and access to lawmakers) will fill the chaotic void left after an accident -- to their benefit and to the detriment of the public. While real-life accident scenarios will differ, will need to be measured adequately in real-time and acted upon appropriately, certain specific parameters need to be established BEFORE an accident to attempt to ensure that the public voice is not drowned out in favor of entrenched and better-resourced industry interests. EPA has failed to accomplish this for the late phase of decontamination.

While the EPA put the PAGs out for comment, it also put them into effect, undermining confidence in a process that should be open and responsive to public concern; this according to the UN Special Rapporteur's report on the right to health, as well as plain common sense in a supposed democracy subscribing to rule of law principles.

- **"Ensure that TEPCO and other third parties are held accountable for the nuclear accident and that their liability to pay compensation or reconstruction efforts is not shifted to taxpayers."**

- **"Include cost of reconstruction and restoration of lives within the relief package;"(UNHR report, p 24)**

Although EPA PAGs do not make clear who has responsibility for financial recompense, a document from FEMA is referenced which states "For incidents involving fixed facilities, the owner/operator has primary responsibility for actions within the facility boundary and ***may*** also have responsibilities for response and recovery activities outside the facility boundary under applicable legal obligations (e.g., contractual; licensee; CERCLA). For areas surrounding a nuclear/radiological incident location, State, tribal, and local governments have primary responsibility for protecting life, property, and the environment. This does not, however, relieve nuclear/radiological facility or material owners/operators from applicable legal obligations." From: Nuclear/Radiological Index Annex (p 17)

At best this seems to offer victims of radiological exposure a lifetime of litigation since the culpability of the nuclear industry is not clearly spelled out and it is therefore unclear just who would pay for relocation. This assumes, of course, relocation is deemed necessary at all. In such a lazy regulatory regime, victims are at the mercy of a much better resourced industry that can spend millions of dollars in court NOT to compensate people. Indeed the insurance companies have already washed their hands of any liability due to nuclear accidents or detonations. So again, the taxpayer could be left paying nuclear industry's debt to society through industry-friendly laws like Price-Anderson. Fukushima costs are ranging from 137 to 500 billion dollars to date. Prince-Anderson, according to the NRC, offers a little over 12 billion dollars, 11.6 billion of which is paid by nuclear utilities only in the event of an accident, meaning the money is not in hand immediately and might never be released by industry.

Because EPA is recommending a *de facto* long-term relocation limit of 5 mSv/year, anyone living in areas contaminated at 5 mSv per year or less will not be relocated for at least a few years and probably much longer. This could be the basis for a fallacious argument that these people don't need to be compensated since officials deemed they did not need to relocate, yet they would be suffering a higher risk of cancer subsequent to the radiological release. They would be without recourse; and the industry would skate away without meeting their obligation (stated in the human rights report) to compensate people enough to restart their lives free of man-made radioactive contamination from the nuclear catastrophe--if that is what they want.

2) **EPA SHOULD NOT RELY ON INDUSTRY-FUNDED GROUPS FOR RECOMMENDATIONS**

Agencies of the federal government asked the National Council on Radiation Protection and Measurements (NCRP), an industry-funded entity, to advise them on radiation exposure levels. According to both NCRP itself (p 6), and an investigative report, NCRP was hired by DHS and EPA to produce a report on radiation exposure standards.

National Council on Radiation Protection and Measurements (NCRP) lists its corporate sponsors, including the Nuclear Energy Institute (NEI), which lobbies the US Congress and the federal executive branch agencies, on behalf of the nuclear energy industry. Obviously protecting the public from radiation exposure costs the nuclear industry money: the more strict the exposure standards, the more money it costs them. NCRP says, "Corporate sponsors provide valuable fiscal support for the National Council on Radiation Protection and Measurement's (NCRP) program…".

Clearly NCRP has done the biding of the industry that helps fund it since the recommendations coming from this PAG report could allow the cancer incidence to jump to

1 in 6 over a 70-year exposure, resulting in a horribly unprotective standard that will save the government a lot of money and make a nuclear catastrophe look less harmful than it actually is (as long as the realization that 1 in 6 people could contract cancer from these standards stays hidden). When called out regarding the weakening of standards, EPA's response was "U.S. residents are used to having 'cleanup to perfection,' but will have to abandon their 'not in my backyard' mentality in such cases.... People are going to have to put their big boy pants on and suck it up.'"

According to this same article in the Global Security Newswire (link above), "The NCRP report says the relaxation of cleanup standards is necessitated by events such as the 2011 Fukushima nuclear power plant meltdown in Japan. It says that disaster contaminated an area the size of Connecticut and, the report claims, demonstrated that remediation as thorough as what the U.S. government usually requires would not be possible." By this logic, the industry can absolve itself from cleaning up after an accident and from fairly compensating residents, because it's just too darn hard and expensive.

If we really can't clean up to a safe standard after a nuclear catastrophe, it begs the question "when does a technology become too catastrophically risky to abide?" Perhaps when regulatory agencies can't ensure an effective or economical clean up past a standard at which one in six people will get cancer.

These relationships between NCRP and federal agencies are obviously detrimental to public health. NCRP's collaboration with government agencies would result in reduced cleanup standards, allowing higher radiation exposure among the public in order to lower industry costs and rejuvenate public acceptance of nuclear reactors post Fukushima. That one in six people will contract cancer from this exposure over a 70-year lifetime, and that these PAGs disavow EPA's own safer 1 in 10,000 and 1 in 1 million standards for lifetime cancer incidence demonstrates flagrant bias toward industry financial and public relations interests, at the expense of public health, safety, and the environment.

Additionally, it appears (p 4) that the NCRP was originally asked to recommend exposures allowed after a ***terrorist*** attack that would result in a release of radiation. That NCRP seems to have changed its mandate, also calls into question why public money was spent on work that was outside of the scope of the initial charge, since the assumptions used to decide what is appropriate for very short-term emergency exposure resulting from terrorism, would not be appropriate to determine exposure over the longer term, with entrenched contamination.

3) EPA PAG PHASES DO NOT REFLECT ACTUAL ACCIDENT CIRCUMSTANCES

Chapter 3 of the EPA report recommending PAGs applicable to the intermediate phase "is defined as the period beginning after the source and releases have been brought under control and environmental measurements are available for use as a basis for decisions on protective actions and extending until these protective actions are terminated. The intermediate phase may last from weeks to months; but is assumed to last for one year for purposes of dose projection." (EPA PAG's, p 34) External exposure, and internal exposure from both inhalation and ingestion, will be accounted for and "Decisions will be made during the intermediate phase concerning whether particular areas or properties from which people have been evacuated will be decontaminated and reoccupied or the occupants relocated for an extended period." But for the entity deciding when this phase ends, a year

may not be long enough to be able to determine who needs to be permanently relocated and who is left behind since dose projections could change due to continuing radiological releases or even the movement of radioactivity through space and time. At both Chernobyl and Fukushima, the annual freeze-thaw cycle moves soluble radioactive poisons into the waterways. The flora and fauna also cause the radioactivity to move around, as does the wind. If wild fires occur, this liberates contamination in the smoke so it can move downwind. Also, it often takes long periods of time for the radioactive hot spots to be discovered, and documented.

Consider that strontium-90 in groundwater at Fukushima has increased to 30 times the legal limit since the end of last year, two plus years since the catastrophe began – releases there continue and there is serious concern that they may get worse. Clearly the phases in the PAGs, the assumptions that they make, and the resulting guidance would in no way encompass post-catastrophe reality since reliable dose projections under these conditions may not be possible for years after a catastrophe begins, if ever. This begs the question what is "emergency status" exactly and when will it end? At Fukushima two years into an ongoing accident, "control" has yet to be solidly defined as contamination continues to be released and hot spots keep popping up. Radioactive releases are ongoing despite the utility's attempts to hide them or claim ignorance, calling into question the nuclear utilities' role in providing the information that helps determine these post-catastrophe phases. At Fukushima, TEPCO has been either unable or unwilling to provide accurate monitoring, a condition which would make it impossible to make a final determination on relocation or resettlement of humans since the contamination levels could keep increasing. Under these ever-evolving conditions, the EPA should recommend relocation from all contaminated areas and these areas should be cordoned off as much as possible for the initial years after the accident. Monitoring of areas not initially affected should be maintained for generations to ensure continued protection. Any recommendation allowing humans to stay in an area should follow the more strict EPA Superfund risks of 1 in 10,000 or, better still, 1 in 1,000,000.

4) EPA SHOULD NOT MAKE PROTECTION FROM CONTAMINATED FOOD AN AFTERTHOUGHT

"Exposure from ingestion of food and water is considered independently of decisions for relocation and decontamination. In rare instances, however, where withdrawal of food or water from use would pose a health risk in itself, relocation may be an appropriate protective action against exposure via ingestion. In this case, the dose from ingestion should be considered along with the projected dose from other exposure pathways for decisions on relocation." (PAGs, p 41)

Fukushima spread radiation over some of the best farmland in Japan, including organic farmland. This radiation continues to be released into the Pacific and found in Pacific Ocean sea life, and also contaminates freshwater fish in Japan. These food sources fed not just Fukushima victims, and not just people in Japan, but also people worldwide. Korea has banned fish from Fukushima while Canada has grudgingly begun testing salmon. Additionally, the American Medical Association has passed a resolution that recommends testing seafood for anthropogenic radiation contamination. While the PAGs make recommendations for ingestion of contaminated foodstuffs in the context of *relocating nuclear accident victims*, they appear to contain *no protections* for those residing on uncontaminated land but who may be eating contaminated food that has been exported

from the contaminated regions. Yet allowing people to eat contaminated food to keep the economy of contaminated areas alive is a tactic recognized by NCRP's international brother, ICRP**:** "There may be situations where a sustainable agricultural economy is not possible without ***placing contaminated food on the market***. As such foods will be subject to market forces, this will necessitate ***an effective communication strategy to overcome the negative reactions*** from consumers ***outside*** the contaminated areas." (emphasis added). This means that those having to evacuate from nuclear power accidents aren't their only victims—everyone subjected to contaminated food is also a victim. EPA claims that it uses FDA 1998 guidelines equating to 500 mrem/year and that EPA is happy to defer to these standards.

However, in a 2011 report, International Physicians for the Prevention of Nuclear War (IPPNW), Germany, used the German acceptable limit for man-made radiation exposure of 1 mSv per year, to determine the corresponding maximum level of cesium that should be allowed in food in that country. They calculated that this 1 mSv (a limit they feel is still too high) needed to be divided between three pathways: ingestion, external exposure and inhalation, resulting in a dose from just ingestion of 0.3 mSv. Relying on an isotopic ratio for Chernobyl core contents, they used measurements of the isotope cesium-137 to extrapolate the additional isotopes in the ratio including strontium-90, plutonium-239 and iodine-131 (cesium-137 is a sentinel-indicator for the presence of these other isotopes and often does not exist without them). Based on this information, IPPNW recommends a 4 Bq/kg limit in food of cesium-137 for children in order to meet the 0.3 mSv limit for ingestion. This dose would include the biological impact from the accompanying isotopes. IPPNW's 4 Bq/kg limit comports with a limit of 5 Bq/kg Beyond Nuclear, along with other US citizens' groups, are asking the FDA to implement for everyone (a level we also feel is too high, but one that is currently measureable).

Once cesium-137 is in the body it remains concentrated in various tissues and can build up if replenished by food sources contaminated with it. This ICRP graph shows that what are considered very small amounts of cesium, when ingested routinely, can build up to unexpected levels in the body:

ICRP Publication 111

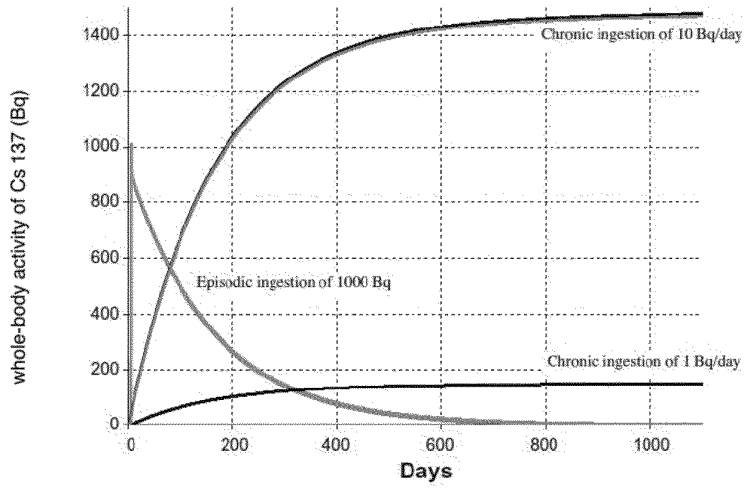

Fig. 2.2. Evolution over a pluri-annual period (1000 days) of whole-body activity (Bq) associated with an episodic intake of 1000 Bq and daily intake of 1 and 10 Bq of ^{137}Cs.

After about 3 years, ingesting 10 Bq TOTAL of cesium-137 per day will cause a build-up to over 1,400 Bq total cesium-137 in the body. For a child who weighs about 30 Kg (66 pounds) this would be about 50 Bq/kg of cesium-137. In studies of post-Chernobyl Belarus, cardiac abnormalities develop in children whose bodies contain 10-30 Bq/kg of cesium, and irreversible tissue damage develops at 50 Bq/kg. Additional pathologies at these low levels can include hormone imbalances, hypertension, angina, and diabetes.

In addition to these diseases, as cesium passes out of the body, its radioactivity starts to damage the kidneys and bladder which damages the body's ability to rid itself of cesium. This could mean the body collects cesium more quickly than this graph currently shows, which means the total body burden of cesium would be higher over time with chronic ingestion.

Since such small levels of cesium contamination in food can, over time, have very large health implications, especially for children, EPA is extremely remiss in their willingness to accept FDA standards without closer examination.

CONCLUSION

The PAGs in chapters 3 and 4 are so weak and dangerous, that we demand they be withdrawn for the following reasons:

- These EPA PAGs do not comport with the United Nations Human Right to Health standards suggested in the wake of Fukushima, ignoring recommendations to lower doses below 1 mSv/year; allowing exposure which could result in 1 in 6 people getting cancer; allowing minimal and poorly placed public participation opportunities; basing exposure standards on risk-benefit analysis, not human health

- These PAGs rely on paid input by entities that are funded by the nuclear industry; PAGs should be free of industry influence so that EPA can fulfill its mission of protecting public health
- These PAGs fail to reflect actual nuclear power catastrophe circumstances like those plaguing Japan; if health were the driver of cleanup and recovery, not industry economics, a plan for remediation could be both committed to before an accident and flexible after one, accommodating a changing situation like that at Fukushima, without being subject to the same industry interference/incompetence
- EPA's PAGs fail to fully account for any longer-term chronic exposure sources like contaminated foodstuffs; it is inexcusable to contaminate clean food by mixing it with contaminated food; it is inexcusable to not inform the public what the contamination level of their food is; the FDA limits are not adequately protective and should not be used by EPA

Rather than attempt to "adjust" these PAGs to account for our concerns, we demand the PAGs be withdrawn because of EPA's connection to NCRP, an industry-funded entity sponsored and supported by EPA to advise them on these guides. This collaboration with NCRP (who is also now advising the Centers for Disease Control, one of the agencies responsible for long-term post-catastrophe radiological management) is a conflict that will leave a lasting footprint, making the creation of independent PAGs extremely difficult.

PILGRIM WATCH COMMENT PAG MANUAL MARCH 2013 DRAFT FOR INTERIM USE AND PUBLIC COMMENT

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PILGRIM WATCH COMMENT PAG MANUAL (MARCH 2013) DRAFT FOR INTERIM USE AND PUBLIC COMMENT [Docket ID No. EPA-HQ-OAR-2007-0268]

July 9, 2013

I. INTRODUCTION

EPA's Draft PAG provides radiological protection criteria (PAGs and protective actions) for application to all incidents that would require consideration of protective actions, with the exception of nuclear war.

The PAG says that the "PAGs are not legally binding regulations or standards and do not supersede any environmental laws." However state and local responders treat the Manual as the Gospel and this should be recognized.

The Draft PAG Manual should make clear, but does not, what specific regulations or standards require beside the PAG Manual Guidance. A simple table should be included in the final document laying out side by side the PAGs and all other pertinent standards, as opposed to only footnotes providing links to those standards, as in the draft.

The PAG Manual divides into three sections: Early Phase Protective Action Guides; Intermediate Phase Protective Action Guides; and Late Phase Protective Action Guides. EPA's draft largely provides simply a broad-brushed description of radiological emergency plans at each stage; and not enough attention is given to what the plans <u>should be</u> in order to reflect lessons learned from Fukushima and to protect public health and the environment. The EPA Draft Manual guidance is inadequate in the following areas.

- Meteorological plume modeling, real-time offsite radiological air monitors, environmental sampling
- Dose Guidance
- Potassium Iodide
- Cleanup

II. METEOROLOGICAL PLUME MODELING; REAL-TIME OFFSITE RADIATION/METEOROLOGICAL AIR MONITORING STATIONS; ENVIRONMENTAL SAMPLING - EARLY, INTERMEDIATE, LATE PHASE PROTECTIVE ACTION GUIDANCE

The PAG Manual provides radiological protection criteria for application to all incidents that would require consideration of protective actions. In order to make the correct protective action call (evacuate, shelter, administration KI, interdiction of food/milk/water) and properly assess what areas require cleanup and population relocation requires:

- advanced and site-appropriate meteorological plume models;
- the availability of real -time meteorolo gical/radiological monitors located in the near and far field; and
- Timely and reliable environmental monitoring.

The PAG Draft Manual does not, as it should provide proper specific guidance in these three areas.

A. Meteorological Plume Modeling- Outdated Gaussian Model v. Advanced Variable Models

The EPA Draft PAG missed the opportunity to plainly state that advanced meteorological models[1] should be used. The draft dances around the issue but never comes straight out with a definite recommendation, as it should in the final PAG Manual.

a. Today, the out -dated straight-line Gaussian plume is used by licensees and federal/state emergency planners. It will not provide the information required to make correct protective action decisions. The Gaussian plume model assumes that a release d radioactive plume travels in a steady -state straight -line, i.e., the plume functions much like a beam from a flashlight. The choice of a straight -line Gaussian plume rather than a variable trajectory model drastically reduces, to a wedge, the size of th e area that might potentially be impacted by a release. It has been known by government and independent agencies for a long time that the assumption of a steady-state, straight -line plume is inappropriate when complex inhomogeneous wind flow

[1] See Draft PAG at, fr example pgs., 13,21,22,23,24,37,40

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patterns happen to be prevailing in the affected region – such as in hilly and mountainous terrain, along rivers that channel the plume and along wide bodies of waters where, for example, the sea breeze effect occurs.

Sea breeze : There is a misconception that the sea b reeze is generally a highly beneficial phenomenon that disperses and dilutes the plume concentration and thereby lowers the projected doses downwind from the release point. However, if the same meteorological conditions (strong solar insolation, low synoptic-scale winds) that are conducive to the formation of sea breezes at a coastal site occurred at a non coastal location, the resulting vertical thermals developing over a pollution source would carry contaminants aloft. In contrast, at a coastal site, th e sea breeze draws contaminants downward across the land and inland subjecting the population to larger doses and at greater distance.

Behavior Plumes over Water : Also Planning should, but does not, reflect understanding of the flow of air over and arou nd large bodies of water. As an example at Pilgrim, located on New England's Coastline, winds initially headed out to sea will remain tightly concentrated due to reduced turbulence over water until the winds blow the puffs back over land. [2] This can lead to hot spots of radioactivity in unexpected places – beyond 10 miles that should be instructed and prepared to take protective actions.

Meteorological Modeling: Government and Independent Studies

EPA has been a leader in advanced meteorological studies. Al so other government and independent studies support that a straight line Gaussian plume model cannot account for the effects of complex terrain on the dispersion of pollutants from a source. Therefore the final EPA PAG should make this clear – not simply ignore or skirt the issue.

[2] Zager M, Tjernstrom M, Angevine W. 2004, New England coastal boundary layer modelin g. In: AMS 16th Symposium on boundary Layers and Turbulence, August 2004, Portland, Maine. Angevine WM. Tjernstrom M, Senff CJ, White AB. 2004. Coastal Boundary layer Transport of urban pollution in New England In: 16th Symposium of boundary layers and tur bulence Portland, Maine, 13th Symposium on Turbulence and diffusion, August 2004, Portland, Maine. Angevine WM. Tjernstrom M, Zager M. 2006. Modeling of the Coastal Boundary Layer and Pollutant Transport in New England, J. of Appl. Meteorol. & Climatol. 4 5: 137-154. Scire JS, Strimaitis DG, Yamatino RJ. 2000 A User's Guide for the CALPUFF Dispersion Model (Version 5). Concord MA: Earth Tech, Inc.

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EPA

EPA recognized the need for complex models. For example: EPA's 2005 Guideline on Air Quality Models says in Section 7.2.8 *Inhomogenous Local Winds* that,

> In very rugged hilly or mountainous terrain, along coastlines, or near large land use variations, the characterization of the winds is a balance of various forces, such that the assumptions of steady-state straight line transport both in time and space are inappropriate. (Fed. Reg., 11/09/05).

EPA goes on to say that, "In special cases described, refined trajectory air quality models can be applied in a case-by-case basis for air quality estimates for such complex non-steady-state meteorological conditions." This EPA Guideline also references an EPA 2000 report, *Meteorological Monitoring Guidance for Regulatory Model Applications,* EPA-454/R-99-005, February 2000. Section 3.4 of this Guidance for coastal locations, discusses the need for multiple inland meteorological monitoring sites, with the monitored parameters dictated by the data input needs of particular air quality models.

Most important, EPA's November 2005 Modeling Guideline (Appendix A to Appendix W) lists EPA's "preferred models" and the use of straight line Gaussian plume model, called ATMOS, is not listed. Sections 6.1 and 6.2.3 discuss that the Gaussian model is not capable of modeling beyond 50 km (32 miles) and the basis for EPA to recommend CALPUFF, a non-straight line model.[3]

NRC

Since the 1970s, the USNRC too has historically documented advanced modeling technique concepts and potential need for multiple meteorological towers appropriately located in offsite communities, especially in coastal site regions. But ignored implementing its' own advice.

[3] http://www.epa.gov/scram001/guidance/guide/appw_05.pdf

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In 2009, the NRC made a presentation to the National Radiological Emergency Planning Conference;[4] and although it was focused on emergency planning, the content is equally relevant to meteorological modeling for consequence analysis. The presentation concluded that the straight-line Gaussian plume models cannot accurately predict dispersion in a complex terrain and are therefore scientifically defective for that purpose [full presentation is available at ML091050226, ML091050257, and ML091050269 (page references used here refer to the portion attached, Part 2, ML091050257). Exhibit 19

Most reactors, if not all, are located in complex terrains, including Pilgrim. In the presentation, NRC said that the "most limiting aspect" of the basic Gaussian Model, is its "inability to evaluate spatial and temporal differences in model inputs" [Slide 28]. Spatial refers to the ability to represent impacts on the plume after releases from the site e.g., plume bending to follow a river valley or sea breeze circulation. Temporal refers to the ability of the model to reflect data changes over time, e.g., change in release rate and meteorology [Slide 4].

Because the basic Gaussian model is non-spatial, it cannot account for the effect of terrain on the trajectory of the plume – that is, the plume is assumed to travel in a straight line regardless of the surrounding terrain. Therefore, it cannot, for example, "'curve' a plume around mountains or follow a river valley." NRC 2009 Presentation, Slide 33. Entergy acknowledges that within 50-miles from Pilgrim there are hills and river valleys. Further it cannot account for transport and diffusion in coastal sites subject to the sea breeze. Sea breeze also applies to any other large bodies of water. The sea breeze causes the plume to change direction caused by differences in temperature of the air above the water versus that above the land after sunrise. If the regional wind flow is light, a circulation will be established between the two air masses. At night, the land cools faster, and a reverse circulation (weak) may occur [Slide 43]. Turbulence causes the plume to be drawn to ground level [Slide 44].

The presentation goes on to say that, "Additional meteorological towers may be necessary to adequately model sea breeze sites" [Slide 40].

[4] What's in the Black Box Known as Emergency Dose Assessment (ML091050226), 2. Dispersion (ML091050257), 3. Dose Calculation (ML091050269), 2009 National Radiological Emergency Planning Conference, Stephen F. LaVie

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Significantly, the NRC 2009 Presentation then discussed the methods of more advanced models that *can* address terrain impact on plume transport, including models in which emissions from a source are released as a series of puffs, each of which can be carried separately by the wind, (NRC 2009 Presentation Slides 35, 36). This modeling method is similar to CALPUFF. Licensees are not required, however, to use these models in order to more accurately predict where the plume will travel to base either consequence analyses or protective action recommendations.

The NRC recognized as early as 1977 that complex terrain presented special problems that a model must address if the air dispersion analysis is to be accurate. [5] For example: NRC, Regulatory Guide 1.111, *Methods for Estimating Atmospheric Transport and Dispersion of Gaseous Effluents in Routine Releases from Light -Water-Cooled Reactors* (July 1977) (Draft for Comment) says that, "Geographic features such as hills, valleys, and large bodies of water *greatly* influence dispersion and airflow patterns. Surface roughness , including vegetative cover, affects the degree of turbulent mixing." (Emphasis added).

<u>This is not new information; knowledge of the inappropriateness of straight-line Gaussian plume in at complex sites goes back a long way within NRC. For example:</u>

1972: NRC Regulatory Guide 123 (Safety Guide 23) On Site Meteorological Programs 1972, states that, "at some sites, due to complex flow patterns in non -uniform terrain, additional wind and temperature instrumentation and more comprehensive programs may be necessary."

1977: NRC began to question the feasibility of using straight line Gaussian plume models for complex terrain. *See* U.S.NRC, 1977, Draft for Comment Reg. Guide 1.111 at 1c (pages 1.111 -9 to 1.111-10)

1983: In January 1983, NRC Guidance [NUREG-0737, Supplement 1 "Clarification of TMI Action Plan Requirements," January 1983 Regulatory Guide 1.97 - Application to Emergency Response Facilities; 6.1 Requirements], suggested that changes in on -site meteorological monitoring systems would be warranted if t hey have not provided a reliable indication of monitoring conditions that are representative within the 10-mile plume exposure EPZ.

[5] Ibid

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1996: The NRC acknowledged the inadequacy of simple straight -line Gaussian plume models to predict air transport and disper sion of a pollutant released from a source in a complex terrain when it issued RTM -96, *Response Technical Manual,* which contains simple methods for estimating possible consequences of various radiological accidents. In the glossary of that document, the NR C's definition of "Gaussian plume dispersion model" states that such models have important limitations, including the inability to "deal well with complex terrain." NUREG/BR-0150, Vol.1 Rev.4, Section Q; ADAMS Accession Number ML062560259,

2004: A NRC rese arch paper, *Comparison of Average Transport and Dispersion Among a Gaussian, A Two- Dimensional and a Three-Dimensional Model*, Lawrence Livermore National Laboratory, October, 2004 at 2. ("Livermore Report") had an important caveat added to the Report's summary about the scientific reliability of the use of a straight -line Gaussian model in complex terrains:

> . . . [T]his study was performed in an area with smooth or favorable terrain and persistent winds although with structure in the form of low -level noc turnal jets and severe storms. In regions with *complex terrain* , particularly if the surface wind direction changes with height, *caution should be used.* Livermore Report at 72 (Emphasis added)

2005: In December, 2005, as part of a cooperative program betwe en the governments of the United States and Russia to improve the safety of nuclear power plants designed and built by the former Soviet Union, the NRC issued a Procedures Guide for a Probabilistic Risk, related to a Russian Nuclear Power Station. The Guid e, prepared by the Brookhaven National Laboratory and NRC staff, explained that atmospheric transport of released material is carried out assuming Gaussian plume dispersion, which is "generally valid for flat terrain." However, the Guide the caveat that in "specific cases of plant location, such as, for example, a mountainous area or a valley, more detailed dispersion models may have to be considered." *Kalinin VVER -1000 Nuclear power Station Unit 1 PRA, Procedures Guide for a Probabilistic Risk Assessment,* NUREG/CR- 6572, Rev. 1 at 3 -114; excerpt attached as Exhibit 8, full report available at http://www.nrc.gov/reading-rm/doc-collections/nuregs/contract/cr6572. Exhibit 20

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2007: NRC revised their Regulatory Guide 1.23, Meteorological Monitoring Programs for Nuclear Power Plants. On page 11, the section entitled *Special Considerations for Complex Terrain Sites* says that, "At some sites, because of complex flow patterns in nonuniform terrain, additional wind and temperature instrumentation and more comprehensive programs may be necessary. For example, the representation of circulation for a hill-valley complex or a site near a large body of water may need additional measuring points to determine airflow patterns and spatial variations of atmospheric stability. Occasionally, the unique diffusion characteristics of a particular site may also warrant the use of special meteorological instrumentation and/or studies. The plant's operational meteorological monitoring program should provide an adequate basis for atmospheric transport and diffusion estimates within the plume exposure emergency planning zone [i.e., within approximately 16 kilometers" (10 miles)].[6]

These excerpts from Regulatory Guide 1.23 demonstrate that the NRC recognizes there are certain sites, such as those located in coastal areas, like Pilgrim, that multiple meteorological data input sources are needed for appropriate air dispersion modeling. Not simply one or two meteorological towers onsite. Since the straight-line Gaussian plume model is incapable of handling complex flow patterns and meteorological data input from multiple locations, Regulatory Guide 1.23 demonstrates NRC's recognition that it should not be used at any site with complex terrain.

DOE

DOE, too, recognizes the limitations of the straight-line Gaussian plume model. They say for example that Gaussian models are inherently flat-earth models, and perform best over regions of transport where there is minimal variation in terrain. Because of this, there is inherent conservatism (and simplicity) if the environs have a significant nearby buildings, tall vegetation, or grade variations not taken into account in the dispersion parameterization.[7]

[6] For example, if the comparison of the primary and supplemental meteorological systems indicates convergence in a lake breeze setting, then a "keyhole" protective action recommendation (e.g., evacuating a 2-mile radius)
[7] the MACCS2 Guidance Report June 2004 Final Report, page 3-8:3.2 Phenomenological Regimes of Applicability

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National Research Council

Tracking and Predicting The Atmospheric Dispersion of Hazardous Material Releases Implications for Homeland Security, Committee on the Atmospheric Dispersion of Hazardous Material Releases Board on Atmospheric Sciences and Climate Division on Earth and Life Studies, National Research Council of the National Academies, 2003. The report discusses how the analytical Gaussian models were used in the 1960s and tested against limited field experiments in flat terrain areas performed in earlier decades.

In the 1970s the US passed the Clean Air Act which required the use of dispersion models to estimate the air quality impacts of emissions sources for comparison to regulatory limits. This resulted in the development and testing of advanced models for applications in complex terrain settings such as in mountainous or coastal areas. In the 1980s, further advances were made with Lagrangian puff models and with Eulerian grid models. Gaussian models moved beyond the simple use of sets of dispersion coefficients to incorporate Monin-Obukhov and other boundary layer similarity measures which are the basis of contemporary EPA models used for both short range and long range transport applications. Helped enormously by advances in computer technologies, in the 1990s, significant advances were made in numerical weather prediction models and also further improve dispersion models through the incorporation of field experiment results and improved boundary layer parameterization. The decade starting with the year 2000 has seen improved resolution of meteorological models such as MM5 and the routine linkage of meteorological models with transport and dispersion models as exemplified by the real time forecasts of detailed fine grid weather conditions available to the public at Olympic events. Computational Fluid Dynamics (CFD) models which involve very fine grid numerical simulations of turbulence and fluid flow began to see applications in atmospheric dispersion studies. The next decade will see routine application of CFD techniques to complex flows associated with emergency response needs.

The nuclear industry does not show evidence of keeping up with these technological advances. For use in modeling air quality concentrations, the NRC uses straight-line Gaussian dispersion algorithms that date back to the 1960s. EPA should, but does not, advocate in the draft keeping up with these technological advances. Complex flow situations such as those associated with flow around high terrain features or that would incorporate sea breeze circulations are not

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simulated. For emergency response applications, the EPA, unlike NRC, should be advocate of advanced modeling to be installed at nuclear power plants.

Atmospheric Scientists & Meteorologists

For over three decades atmospheric sci entists and meteorologists have been identifying problems in the use of models similar to ATMOS for such settings. Example: Steven R. Hanna, Gary A. Briggs, Rayford P. Hosker, Jr., National Oceanic and Atmospheric Administration, Atmospheric Turbulence an d Diffusion Laboratory, *Handbook on Atmospheric Diffusion* (1982)).

The inability of a simple Gaussian plume model to accurately predict air transport and dispersion in complex terrains is such a basic flaw that it is discussed in a textbook for a college - level introductory course in environmental science and engineering (Steven R. Hanna, Gary A. Briggs, Rayford P. Hosker, Jr., National Oceanic and Atmospheric Administration, Atmospheric Turbulence and Diffusion Laboratory, *Handbook on Atmospheric Diffusion* (1982)). (Chapter 13 authored by William J. Moroz). In listing the assumptions that are made to develop a simple straight line Gaussian plume model, the textbook warns that:

The equation is to be used over relatively flat, homogeneous terrain. It should not be used routinely in coastal or mountainous areas, in any area where building profiles are highly irregular, or where the plume travels over warm bare soil and then over colder snow or ice covered surfaces

B. Real-Time Offsite Radiation/Meteorological Air Monitoring Stations

The EPA Final PAG needs to emphasize in clear language the need for robust real -time monitoring data to help address the question of what was emitted, over what timeframe, where it went thereafter, and what did it do or not do to the surrounding public. The importance is threefold:

(1) Fore-casting (ahead of time, as a tool for emergency planning tool for pre-planning). Where would a plume likely go under various typical weather regimes, and what and where could be the resultant concentrations/potential doses?

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(2) Now-casting (during a radiological emergency). Where is the plume actually going, and what are the resultant concentrations/potential doses - for making appropriate recommendations (i.e., evacuate or shelter in place)?

(3) Hind-casting (the post -radiological emergency timeframe) – Combining meteorological modeling with expanded meteorological/radiological data to provide for more accurate/realistic dose estimates can help with disaster recovery, clean -up, litigation resolution, and short -term acute and long-term epidemiological health studies.

Multiple Meteorological Towers Importance Recognized Since the 1970's

Since the 1970s, the USNRC has historically documented all the advanced modeling technique concepts and pote ntial need for multiple meteorological towers especially in coastal regions. NRC Regulatory Guide 123 (Safety Guide 23) On Site Meteorological Programs 1972, states that, "at some sites, due to complex flow patterns in non -uniform terrain, additional win d and temperature instrumentation and more comprehensive programs may be necessary]; and an EPA 2000 report, Meteorological Monitoring Guidance for Regulatory Model Applications, EPA-454/R-99-005, February 2000, Sec 3.4 points to the *need for multiple inla nd meteorological monitoring sites.* See also Raynor, G.S.P. Michael, and S. SethuRaman, 1979, Recommendations for Meteorological Measurement Programs and Atmospheric Diffusion Prediction Methods for Use at Coastal Nuclear Reactor Sites. NUREG/CR-0936.

C. Environmental Sampling/Monitoring

The Draft PAG recognizes that dose projections are useful for initiating protective actions in the early phase but there is uncertainty prior to confirmatory field measurements because of unknown factors affecting environmental pathways, inadequacies of modeling and uncertainty in the data for release terms. (Draft, pg., 22) However what is not acknowledged are the limits of field measurements due to lack of funds and sufficient staff to perform the field measurements in a timely manner. Also the PAG does not indicate specifics such as how deep in the soil samples should be taken nor how often the samples should be repeated in the same area to account for resuspension or aqueous discharges and runoff.

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III. PLANNING GUIDANCE AND PAGS (DRAFT, PG., 7)

Decisions regarding protective actions depend on dose response guidance. Whether the dose-response guidance is based on the best science on radiation health effects available today will determine whether the protective actions are protective of human health. Unfortunately the Draft PAGS are based on old science and out-of-date meaning the public will be harmed unnecessarily not protected.

Pilgrim Watch incorporates herein the testimony in full presented by Dr. Daniel Hirsch, Committee to Bridge the Gap, California. Highl ights of what is wrong with the PAGS and how EPA is abdicating its responsibility to protect public health include, for example:

1. EPA eliminates the existing requirements from the 1992 PAGs triggering evacuation when thyroid or skin doses exceed specified limits.
2. EPA eliminates the existing relocation limit of 5 rem cumulative dose over 50 years, saying it might conflict with their long -term cleanup approach, which in the new associated guidance from NCRP would allow cumulative 50 -year doses of 100 rem, twenty-fold higher. Even thirty years exposure at the 2 rem/year figure would, by EPA's own official risk estimates, result in an excess cancer in every eighth person exposed ; orders of magnitude higher risk than EPA has ever considered acceptable.
3. EPA incorrectly argues that relaxed long-term standard is somehow justified because the public's exposure will not be for 70 years. But this is a disingenuous argument. The core of the long-term cleanup part of the PAGs is setting a very high permissible annual dose that one would be allowed to get for a whole lifetime (indeed, the standard 70 year lifetime assumption) without the government having to cleanup at all. The one-year exposure is for the intermediate phase; the long-term phase is forever, and that is what is so troubling about relaxing long-term cleanup standards.
4. EPA says that the Safe Drinking Water Act Maximum Contaminant Limits (MCLs) may not be appropriate and propose five alternatives far more lax , and does so in footnotes. Those proposed weaker l imits would allow concentrations of radionuclides in drinking water orders of magnitude higher than considered safe by EPA under the Safe Drinking Water Act. I have attached two tables Dr. Hirsch put together comparing these levels for four key radionucli des. Their proposals are frequently as bad as the Bush water PAG

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proposal and in some cases worse. Generally, they are proposing allowing hundreds to tens of thousands of times higher concentrations of radioactivity in drinking water than EPA has historically allowed as safe under the Safe Drinking Water Act.

Obama Drinking Water PAG proposals vs. Existing EPA Safe Drinking Water Levels and Bush Administration PAG Proposal
units = Bq/L

Radionuclide	EPA Safe Drinking Water Act Maximum Contaminant Limit (MCL)	Bush Proposed Drinking Water PAG	Obama Proposed Drinking Water Page Alternative I (EPA 2013 fn 26)	Obama Proposed Drinking Water PAG Alternative II (EPA 2013 PAG fn 25)	Obama Proposed Drinking Water PAG Alternative III (EPA 2013 PAG fn 27)	Obama Proposed Drinking Water Alternative IV (EPA 2013 PAG fn 24a)	Obama Proposed Drinking Water Alternative V (EPA 2013 PAG fn 24b)
Iodine-131	0.111	314	314	3000	170	10	300
Strontium-90	0.296	246	246	200	160	10	
Cesium-137	7.4	503	503	2000	1200	10	
Plutonium-239	0.555	27	27	50	2	1	

Factors by Which Obama Drinking Water PAG Proposals Would Exceed Existing EPA Safe Drinking Water Levels

Radionuclide	Bush Proposed Drinking Water PAG	Obama Proposed Drinking Water Page Alternative I (EPA 2013 fn 26)	Obama Proposed Drinking Water PAG Alternative II (EPA 2013 PAG fn 25)	Obama Proposed Drinking Water PAG Alternative III (EPA 2013 PAG fn 27)	Obama Proposed Drinking Water Alternative IV (EPA 2013 PAG fn 24a)	Obama Proposed Drinking Water Alternative V (EPA 2013 PAG fn 24b)
Iodine-131	2829	2829	27027	1532	90	2703
Strontium-90	828	828	676	541	34	
Cesium-137	68	68	270	162	1.35	
Plutonium-239	49	49	90	3.6	1.8	

Note: Second vertical column, "Obama proposed Drinking Water Page" should read PAGs not Page

5. EPA incorporates 1998 guidance allowing extremely high contamination of food, despite internal EPA criticism of doing so which said it would produce a cancer in every fiftieth person so exposed.
6. EPA incorporates the DHS PAGs for dealing with long-term cleanup from a nuclear weapons explosion and applies it to any kind of release. The DHS PAG is based on "optimization" and contemplated permitting long-term doses as high as several rem per year. The new PAG is tied to the NCRP new guidance which would allows doses up to 2 rem per year over a lifetime (the equivalent of about 1000 extra chest X-rays every year, or 3 X-rays every day of your life from birth to death). EPA's estimate of a 70-year

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lifetime exposure at that level would be one in every six people exposed would get a cancer (the risk coefficient they use is different for exposure over a lifetime than for earlier years because of the elevated risk at younger ages

7. The associated NCRP guidance on implementing the PAGs for long term cleanup recommends radionuclide concentration levels so high that they would allow concentrations for strontium-90, for example, hundreds of thousands of times higher than the EPA's official Preliminary Remediation Goals for the same exposure scenarios. They would produce cancer risks using EPA's risk figures in the several cancers per ten people exposed, orders of magnitude outside the long-held acceptable risk range.
8. In essence, the PAGs and the documents associated with them are saying nuclear power accidents could be so widespread and produce such immense radiation levels that the government would simply abandon most cleanup obligations and force people to live with exposures so high that extremely large fractions of the exposed population would get cancer from the exposure.
9. Troubling in a different fashion, EPA buries the "bad stuff" in footnote references to a whole series of other documents so it is hard for a lay reader to see the troubling things EPA has done. EPA thereby has made the PAG manual itself essentially useless in a real accident. It was supposed to be a stand-alone, clear document that a first-responder could take off the shelf, look up a table in it, see if a radiation level exceeded a PAG and if so undertake the protective action described therein. But all of that is now removed from the PAG document. Instead, there are footnotes to URLs for numerous referenced documents, most of which are contradictory, so that the PAG does not achieve its intention that is to be useful in providing some guidance.

Furthermore, EPA is statutorily mandated to produce the PAGs and other radiation guidance for the rest of the federal family and historically has viewed DOE and NRC as not sufficiently protective in radiation matters. The PAG now abdicates EPA's responsibility to come up with guidance and instead references almost exclusively documents from DOE that EPA has historically opposed. For example, it now directs the use of DOE's Operational Guidance document which uses cleanup concentrations hundreds of thousands of times higher than EPA's official concentrations. Rather than

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use its own conversions from conce ntration to risk, EPA now defaults to DOE's models, documents, and values with which it has long disagreed as technically not defensible and not sufficiently protective. But at the end of the day, no emergency responder will have a Protective Action Guide that is useable. If it were used, however, it would allow doses to the public so far outside the range ever considered acceptable as to be deeply disturbing.

IV. EARLY PHASE PROTECTION ACTION GUIDANCE

The Draft PAG's guidance is insufficient or incorrect for: dose that triggers evacuation, discussed above; potassium iodide; omission of the importance of stockpiling 3-M face masks; and apparent confusion over the requirement for, and role of, Reception Centers.

Potassium Iodide, KI (Draft Section 2.3.4)

KI is FDA approved: It is stockpiled around the world and recommended by experts such as: the World Health Organization; the National Academies of Sciences [8] that acknowledged KI's efficacy and that it may be necessary beyond 10 -miles; American Thyroid Associati on; the International Atomic Energy Agency; President Carter's Kemeny Commission; Federation of American Physics; U.S. Public Interest Group. Although adverse reactions are possible, but rare, to those allergic to iodine; however, unlike exposures to radia tion, no long term negative effects or fatalities are on record.

Contrary to FDA and the above listed organizations, the EPA PAG improperly blows out of proportion KI's supposed contraindications, indicating a strong bias to discourage its use – politics over science. For example, EPA says that:

> Some people should not take KI . As a rule, individuals with known allergy to iodine or with pre-existing thyroid disease (e.g., Graves' disease, thyroid nodules, Hashimoto's thyroiditis) that might predispose th em to adverse reactions should avoid KI. (Draft, pg., 20)

FDA, in contrast, says that individuals with known allergy to iodine or with pre-existing thyroid disease should be treated with caution; EPA says that they "should avoid KI.

[8] *Distribution and Administration of Potassium Iodide in the Event of a Nuclear Incident*, 2004

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KI-Time Sensitive: The Draft EPA Guidance avoided to make clear[9] that because KI is time sensitive, it must be stockpiled ahead of time and taken so that it can be administered at the earliest possible time. The Final PAG needs to correct this omission.

Distance to Stockpile K I: The Draft makes no recommendation or mention of the distance from reactors that KI should be stockpiled. The Bioterrorism Act's Section 127, for example, called for stockpiling KI out to 20 miles from a reactor site. It was never implemented for purely political reasons despite the fact that NRC stockpiles KI for its employees.

The reason to provide KI in the 10 -20 mile zone is because of the possibility of inhalation during an accident of significant consequence. For example, Dr. Temeck (FDA representa tive to NRC's KI Core Group Meeting, Tempe Arizona, March 4, 1999) stated that exposure to children after Chernobyl resulted from "a combination of inhalation and ingestion."

NRC's NUREG-1633 points out that radioactive iodide can travel hundreds of mil es on the winds. An increase in cancer caused by Chernobyl was detected in Belarus, Russia and Ukraine. Notably, this increase, seen in areas more than 150 miles from the site, continues to this day and primarily affects children who were 0-14 years old at the time of the accident…the vast majority of the thyroid cancers were diagnosed among those living more than 31 miles from the site. The 2001 figures showed 11,000 thyroid cancers at 31 miles. Again, "Exposure to children after Chernobyl resulted from "a combination of inhalation and ingestion."

NRC's NUREG/CR 1433 said that for children, the following dangers might occur from the inhalation of nuclear materials after a massive core-melt atmospheric accident (like Chernobyl):

Approximate Dangers of a Core-Melt Atmospheric Accident for Children

Distance in Miles	Mean Thyroid Dose (rem) for Exposed Children Outdoors*	Probability of Thyroid Damage to Exposed Children Located Outdoors if not Protected by Stable Iodine (like KI)
1	26,000	100%
5	11,600	100%

[9] See Draft PAG, for example, at pgs19-20, 33

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10	6,400	100%
25	2,200	80%
50	760	26%
100	200	7%
150	72	2%
200	32	1%

Therefore EPA's Final PAG should advocate stockpiling KI to at least 20 miles, and that both the Federal Government [10] and states have KI stockpiles located so as to provi de KI in a timely manner to those without it.

Pilgrim Watch incorporates in full the comments on Potassium Iodide submitted on this docket by Peter Crane, Seattle Washington.

Face Masks

The PAG says that "breathing air filtered through common household it ems (e.g., folded handkerchiefs or towels) may help reduce exposures from contamination on the ground. (General Guidance for Evacuation and Sheltering in pace, pg., 17) Instead, PW recommends that the Final EPA PAG recommends stockpiling face masks in publ ic shelters, schools; and that emergency planners include face masks in their public education literature. The PAGs advice is not practical for school children and the rest of the public for that matter. Imagine a mother leaving a shelter with two small ch ildren to drive to the Reception Center for monitoring, decontamination and relocation instructions. How possibly can she drive and cover her and her children's mouths? Also, masks may be useful inside shelter locations, because shelters cannot be 100% eff ective in eliminating dose. The basic 3-M (N-95) type masks screen out >0.1 microns and are inexpensive. They come in child and adult sizes.

[10] The U.S. Strategic National Stockpile stopped purchasing KI (Washington Post, April 7, 2011)

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Reception Centers- Monitoring & Decontamination

Section 2.31 says that "A decontamination Station, with simple decontamination actions, may need to be collocated at shelters during the pre-evacuation period." The language is confusing for reactor accidents. Radiological emergency plans for nuclear reactors require Reception Centers located outside the EPZ. NUREG-0654, J-12 says that Reception Centers shall monitor 100% of the population within 12 hours. Therefore the Reception Centers must be equipped with sufficient monitors (portal and hand monitors), have capability to decontaminate as required, and provide towels and clothing or coveralls for the public to wear after decontamination. The Final PAG must make this clear.

Similarly, Radiological Emergency Workers Monitoring and Decontamination Stations must be located outside the EPZ and equipped to monitor and decontaminate.

Vehicles arriving at the Reception Centers or REWMDS also must be wiped down so as not to spread contamination to clean areas. The PAG is silent on REWMDS.

V. INTERMEDIATE PHASE (CHAPTER 3)

The Draft says that "The principal protective actions for reducing exposure of the public to deposited radioactive materials are relocation, decontamination and time limits of exposure."

A. Relocation

The Draft says that relocation should be based on 2 rem (2,000 millirem) over the first year of exposure and after the first year, the PAG relocation standard is 0.5 rem (500 millirem). (Draft, pgs., 7, 50)

The PAG **eliminates the existing relocation limit of 5 rem cumulative dose over 50 years, saying it might conflict with their long-term cleanup approach**, which in the new associated guidance from NCRP would allow cumulative 50-year doses of 100 rem, twenty-fold higher. Even thirty years exposure at the 2 rem/year figure would, by EPA's own official risk estimates, result in an excess cancer in every eighth person exposed; orders of magnitude higher risk than EPA has ever considered acceptable

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B. Decontamination & Cleanup

The key points to reduce exposure of the public in both the intermediate and late phase are not properly addressed. They include, for example:

- Meteorological modeling with expanded meteorological/radiological data to provide for more accurate/realistic dose estimates that can help with disaster recovery, clean -up (discussed in the foregoing);
- Capability to decontaminate - hosing buildings and plowi ng under fields does not decontaminate but simply moves the contamination from one place to another;
- Waste disposal, admitted to be impossible in a severe reactor accident but shifting responsibility to the state and local community is not the answer, either; and
- Updated dose estimates based on BEIR VII and geared to the most vulnerable -women and small children.
- Avoided is a discussion of what federal agency is in charge and who pays.

DECONTAMINATION/CLEANUP- NOT PROPERLY ADDRESSED

The EPA Draft never ch allenges current NRC/FEMA assumptions reflected in NRC's consequences models that:

- Underestimates both the size of the area likely to be contaminated, and the extent of contamination.
- Underestimates how long cleanup and decontamination will take.
- Ignores that forests, wetlands, and bodies of water essentially cannot be cleaned up or decontaminated and in turn runoff will re-contaminate cleaned areas.
- Ignores that the technologies needed for cleanup have not even been developed.
- Underestimates the huge vol ume of waste; and slides over the fact that there are no available disposal options.
- Ignores there is not even a clear-cut cleanup standard -guidance not regulation.
- Assumptions are based on estimates of what is required for nuclear weapon cleanup, rather than the very different problems presented by nuclear reactor accident - micron size and volume.

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- Minimizes consequences by assuming a straight -line Gaussian plume model, ignoring aqueous discharges, and ignoring that an accident can persist over many weeks and months.
- Underestimates the time that decontamination will take. Technologies to cleanup have not been developed; current cleanup methods used in Japan and assumed in US models do not work- hosing down buildings and plowing under fields. They are based on nuclear weapons cleanup that is a different from cleanup after a nuclear reactor accident. Many radionuclides, like Cs-137, have long half-lives.

The Contaminated Area

The cost of cleanup fundamentally reflects the size of the area contaminated, and the level of contamination. A year ago, the Japanese press reported that the Fukushima accident contaminated 13,000 square kilometers (an area nearly equivalent to the size of Connecticut (land area and water). The contaminated area extended in all directions and at considerable distance from the site. [11] The Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT) map showed the spread of radiation from Fukushima across 10 prefectures, including Tokyo and Kanagawa. [12] Also so far as Pilgrim Watch (hereinafter "PW") knows, no one has even attempted to calculate how much of the Pacific Ocean and connecting waters have been contaminated by aqueous discharges and those impacts on the size of the area contaminated, impact on cleanup and human health from consuming fish and seafood.

Beyond "how large an area," is the question of "how contaminated?" The level of contamination in the affected areas depends on both the size of the release at any point in time, and also on its duration. The Fukushima release has continued for months.

The basic lesson to be learned from these simple facts is that any remotely adequate consequence analysis must take into account the very real likelihood of a large level release that

[11] *Estimated 13,000 square km eligible for decontamination* Asahi.com (Asahi Shimbun), Oct 12, 2011
[12] Mainichi News, http://mdn.mainichi.jp/mdnnews/news/20111007p2a00m0na009000c.html; Gov't radiation info in English http://radioactivity.mext.go.jp/en/

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continues for a long period of time and contaminates many thousands of square miles. The EPA Draft and current NRC economic analyses unrealistically limit the duration of the radioactive release, the size of the affected area, and the radiation source.

- Duration: The Fukushima disaster persisted over many months. But the EPA Draft and NRC approved consequence code, MACCS2, limits the total duration of a radioactive releases to no more than four (4) days, if the user chooses to use four plumes occurring sequentially over a four day period.[13] A longer release such as that at Fukushima will cause offsite consequences that will increase contamination, and result in required re-decontamination, and significantly increase cleanup costs and the overall cost-benefit analyses.
- Size of Affected Area. How large an area will be contaminated, and where that area is likely to be, depends on assumptions made about the radioactive plume. Fukushima showed that the plume did not travel simply in a straight-line.[14] Fukushima also showed that releases can extend for weeks and months and thereby the plumes will travel in variable directions. Rascal also assumes a Gaussian plume in the near field and a segmented Gaussian plume in the far field. This ignores that winds are complex and variable near large water bodies, along rivers, and hilly terrain so that a much larger geographic area, in multiple directions, is impacted. EPA needs to incorporate these lessons in the final PAG.
- Non-Atmospheric Releases. Fukushima also showed that contamination is also spread by aqueous discharges. In Japan enormous quantities of contaminated water flowed into the Pacific Ocean as result of "feed and bleed" and from runoff into groundwater, streams and other water bodies from contaminants deposited by atmospheric releases on land.
- What Can't Be Cleaned-up? Lessons learned from Fukushima show that forests, water and shorelines, for example, cannot realistically be cleaned up and decontaminated. For example the Japan Times reported in September 2011[15] that

> In August, the government acknowledged difficulties in removing soil and ground cover from the forests, due mostly to the volume of radioactive waste that would be generated by the effort.

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[13] NUREG/CR-6613 Code Manual for MACCS2: Volume 1, User's Guide, 2-2
[14] Gov't radiation info in English http://radioactivity.mext.go.jp/en/
[15] Institute probing radioactive contamination of Fukushima forests, Japan Times,, Sep. 17, 2011

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"Huge volumes of soil and other (contaminated) items would be involved because the forests occupy a huge area."

The government effectively shelved any approach to decontaminating forests when it said that removing both the contaminated soil and compost materials would strip the forests of important ecological functions, including water retention.

Real world experience also shows that bodies of water, such as the Pacific, cannot be cleaned up either. Further, ocean currents may re-circulate the contamination for years contaminating and re-contaminating beaches and marine life increasing costs from a continuous need to cleanup and pay for damaged to the environment[16].

Waste Volume and Disposal

Lessons learned from Fukushima show that the Japanese Environment Ministry expects the cleanup to generate at least 100 million cubic meters (130 million cubic yards) of soil, enough to fill 80 domed baseball stadiums. [17]. The Yomiuri Press reported that disposal sites refuse to accept 140,000 tons of tainted waste. [18] Because there is no available storage for the high volume of waste and no community willing to host the disposal site,[19] waste is piling up and run-off from it contaminates and re-contaminates groundwater and property. [20] The problem cannot be solved soon because the technology is not there and cesium-137 takes 30 years to decay one half-life.[21]

The Japanese Government's clean-up budget for the next two years is $14 billion; the NRC's estimate is nowhere near that.

The Draft PAG passes disposal to the states and local communities; and it assumes that cleanup can be quickly accomplished. After Chernobyl, authorities quit trying to clean-up after 4 years.

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[16] Fukushima's radioactive sea contamination lingers, Andy Coghlan, New Scientist, Sept 30, 2011; Radioactive cesium may be brought back by Ocean in 20-30 years , Tokyo Times, 09.16.11
[17] Ibid
[18] *Daily Yomiuri* - Disposal sites refuse to accept 140,000 tons of tainted waste March 4, 2012
[19] Mainiichi Press, *Residents near Fukushima mountains face nuclear recontamination every rainfall, October 11. 2011*
[20] Ibid
[21] Ibid

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There is no excuse for ignoring waste storage, and Fukushima proved (and continues to prove) that latter is a pipe -dream. Even optimistically assuming an available radi oactive waste repository, it seems unlikely that there would be a sufficient quantity of transport containers, and many communities will quite certainly object to the millions of tons of hazardous materials being transported through them.

The EPA Draft si mply passes the buck. It acknowledges that "incidents that create large volumes of waste from a wide -scale radiological incident would likely overwhelm existing radioactive waste disposal capacity in the U.S." (Draft, pg., 69) Therefore it concludes that, "Following a nuclear incident, the states bear primary responsibility to identify and provide waste management options, including disposal capacity." (Ibid) The Draft incorrectly implies that there can be a solution. It says "safely managing and disposing of radioactive waste will require pre-planning at all levels of government and careful coordination with stakeholders at all stages of the decision-making process." (Ibid) It is time for EPA to pull "their big -boy pants up" and admit there is no solution.

Technologies for Cleanup Not Developed - Current Methods Ineffective

Cleanup methods used in Japan, and assumed in the Draft PAG, do not work. Hosing down buildings and plowing under fields does not remove contamination. It simply moves it to another place, such as the groundwater, to reappear at a later date and require more monies to either start again or bare the cost. For example, plowing will move the radiation to below the root zone for crops or reduce root uptake and food doses to the consumer of such crops. Thus, it cannot be said that the decontamination strategies identified remove the radiation from the environment. Also the fact that cesium is soluble, which means that precipitation events or fire-hosing can actually facilitate cesium binding to structural surfaces or spread it into a community's infrastructure (*e.g.*, sidewalks, gutters, drains, sewer pipes) and ecosystem (*e.g.*, groundwater, streams, lakes, reservoirs).[22] The ability of cesium and other fission products to bind to surfaces is especially pronounced for porous or rough surfaces.[23]

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[22] Chanin, D.; Murfin, W. (1996). *Site Restoration: Estimation of Attributable Costs from Plutonium-Dispersal Accidents*, SAND96-0957, DE9601166, Sandia National Laboratories. Original 300-dpi OSTI version available at: http://chaninconsulting.com/downloads/sand96-0957.pdf (10.4 MB), OCR-readable courtesy S. Aftergood, FAS, E-12.

[23] Ibid, 5-8, E-1, E-3, E-4, E-8, E-11

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A reasonable question is why the EPA, FEMA, NRC and Japanese authorities assume hosing and plowing under fields is cleanup. The likely, and unacceptable, answer is that the needed technologies for clean up have not been developed - their development is predicted to be decades down the road - and the that cost of actually removing all of the contamination too big to even think about - far more than the $14 billion budgeted through 2014 by the Japanese government. However, the fact that the cost of any real clean -up is unimaginable is no excuse for the EPA to relax standards and allow folks to stay or move back to their communities.

The Faulty Premise of the Clean-Up Model[24]

Cleanup assumptions are based on WASH-1400; and WASH -1400, that in turn, were based on clean up after a nuclear explosion. Cleanup after a nuclear bomb explosion is not comparable to clean up after a nuclear reactor accident and assuming so will underestimate the task.

Particle Size : N uclear weapon explosions result in larger -sized radionuclide particles; reactor accidents release small sized particles. Decontamination is far less effective, or even possible, for small particle sizes. Nuclear reactor releases range in size from a fracti on of a micron to a couple of microns; whereas nuclear bomb explosions fallout is much larger - particles that are ten to hundreds of microns. These small nuclear reactor releases get wedged into small cracks and crevices of buildings making clean up extrem ely difficult or impossible. Further reactors release Cs-137 that are no only small particles but soluble. Cesium particles are capable of ion exchange with sodium and potassium in materials such as concrete and migrate over time into the interior and cannot be washed off. Plutonium on the other hand is insoluble.

Mass Loading: Nuclear weapon explosions result in fallout involving large mass loading where there is a small amount of radioactive material in a large mass of dirt and demolished material. Only the bottom layer is in contact with the soil and the massive amount of debris could be shoveled, swept up with brooms or vacuums resulting in a relatively effective, quick and cheap cleanup that would not be the case with a nuclear reactors fine particulate . The Japanese are learning this the hard way, as those in Chernobyl before had discovered.

[24] Chanin, D.; Murfin, W. (1996). *Site Restoration: Estimation of Attributable Costs from Plutonium-Dispersal Accidents*, SAND96-0957, DE9601166, Sandia National Laboratories. Original 300-dpi OSTI version; NYS000241, December 21, 2011, Pre-filed written testimony of Dr. Francois J. Lemay, NYS Contention 12-C,

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Type Radiation Released : In addition, a weapon explosion results in non -penetrating radiation so that workers only require basic respiration and skin protection. This allows for cleaning up soon after the event. In contrast a reactor release involves gamma radiation and there is no gear to protect workers from gamma radiation. Therefore cleanup cannot be expedited, unless workers health shamefully and unethically i s ignored. Decontamination is less effective with the passage of time.

Clean-up Standard

How clean is clean? The cleanup standard will be determined by what seems possible - how much it will cost and what the public will accept - not, as it should, by public health considerations.

> In the United States, a range of one in a population of ten thousand to one in a population of one million excess cancer incidence outcomes is generally considered protective for both chemical and radioactive carcinogenic cont aminant exposures. The range is the regulatory standard generally used in the context of EPA superfund response actions…A similar range risk may not be practically achievable for major incidents that result in the contamination of very large areas. In maki ng decisions about cleanup goals and strategies for a particular event, decision makers must balance the desired level of exposure reduction with the extent of the measures that would be necessary to achieve it, in order to maximize overall human welfare.
>
> While it may take many years to achieve final cleanup levels, a timely return to normalcy, including re -occupancy and viable community, will require a more flexible, iterative and inclusive. (Draft, pg., 53)

Likewise, firm standards were not pre -set in Ja pan prior to the accident. Real world experience there shows that the public will not tolerate a relaxed standard, unless misled b government agencies. The public expects cleanup to reach pre -accident levels.[25] The same will be true here.

The economic cons equences of a radiological event are highly dependent on cleanup standards and cleanup costs generally increase dramatically for standards more stringent than 500 mrem/yr. This was shown true by two studies commissioned by the US Department of

[25] *In One Japanese City, Hot Spots to Avoid,* Wall Street Journal, Phred Dvorak, Sept 3, 2011

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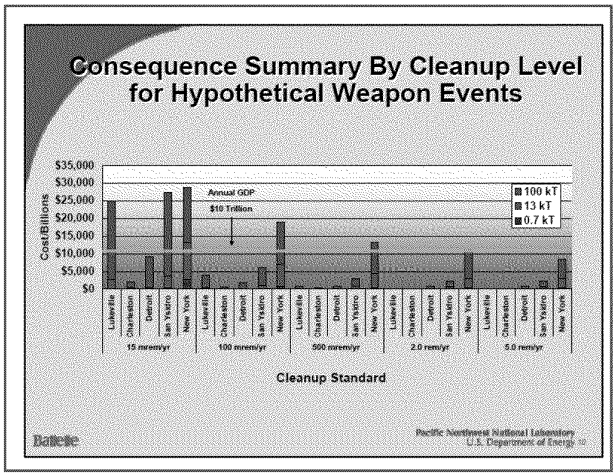
Homeland Security for the economic consequences of a Rad/Nuc attack. Although considerably more deposition would occur in reactor accident, magnifying consequences and costs, there are important lessons to be learned from these studies.

Barbara Reichmuth's study, Ec onomic Consequences of a Rad/Nuc attack: Cleanup Standards Significantly Affect Cost, 2005, [26] Table 1 Summary Unit Costs for D &D (Decontamination and Decommissioning) Building Replacement and Evacuation Costs provides estimates for different types of areas from farm or range land to high density urban areas. Reichmuth's study also points out that the economic consequences of a Rad/Nuc event are highly dependent on cleanup standards: "Cleanup costs generally increase dramatically for standards more stringent than 500 mrem/yr."



A similar study was done by Robert Luna, *Survey of Costs Arising from Potential Radionuclide Scattering Events,*[27] concluded that,

> …the expenditures needed to recover from a successful attack using an RDD type device …are likely to be significant from the standpoint of resources available to local or state governments Even a device that contaminates an area of a few hundred acres (a square kilometer) to a level that requires modest remediation is likely to

[26] Economic Consequences of a Rad/Nuc attack: Cleanup Standards Significa ntly Affect Cost Barbara Reichmuth, Steve Short, Tom Wood, Fred Rutz, Debbie Swartz, Pacific Northwest National laboratory, 2005

[27] Survey of Costs Arising From Potential Radionuclide Scattering Events, Robert Luna, Sandia National laboratories, WM2008 Conference, February 24-28, 2008, Phoenix AZ

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produce costs ranging from $1 0M to $300M or more depending on the intensity of commercialization, population density, and details of land use in the area." (Luna, Pg., 6)

In essence, the PAGs and the documents associated with them are saying nuclear power accidents could be so widesp read and produce such immense radiation levels that the government would simply abandon most cleanup obligations and force people to live with exposures so high that extremely large fractions of the exposed population would get cancer from the exposure. He re, EPA's Draft PAG totally abdicates its responsibility to protect public health and the environment, not to mention morality.

C. Drinking Water Standard

The Drinking Water Standard is discussed above, Section II.

VII. LATE PHASE (CHAPTER 4)

There is overlap be tween the intermediate and late phase. In essence, the PAGs and the documents associated with them are saying nuclear power accidents , based on real -world experience in Japan, could be so widespread and produce such immense radiation levels that the government would simply abandon current exposure limits finding them not achievable and advise people to live with exposures so high that exposed population would get cancer from the exposure, especially the most vulnerable- fetus, children, women and the sickly.

The Draft PAG acknowledges that clean -up and decontamination is an enormously expensive job, extending over decades, and the volume and toxicity of wastes from a wide -scale radiological incident is likely to overwhelm existing waste capacity in the U.S. (pgs. 60, 61, 69). Therefore they pass responsibility for the impossible task of dealing with the waste to states; although, the federal government, not the states, have responsibility for assuring the safe operations of nuclear reactors and security. The federal agencies blew it and now the states get responsibility for the "orphaned" waste.

Further the EPA Draft PAG, like NRC, fails to acknowledge that the technology for real cleanup does not exist. As explained, hosing down buildings and plowing under f ields does not clean-up or decontaminate.

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Last the section makes clear that the fundamental issues of clean up that: (1) neither the EPA, nor NRC , nor FEMA is responsible for clean-up; (2) that the cleanup standards that will determine what clean-up is required (and hence its cost) have not been defined; and (c) that no funding source has been identified. These three core points were identified in an Inside EPA investigative report in 2010- *Agencies Struggle to Craft Offsite Cleanup Plan for Nuclear Power Accidents*, by Douglas Guarino, Associate Editor. The report is available on line [28] or PW can make the report available, including emails obtained by Inside EPA by FOIA. The report says that:

> EPA, the Nuclear Regulatory Commission (NRC) and the Federal Emergency Management Agency (FEMA) are struggling to determine which agency -- and with what money and legal authority -- would oversee cleanup in the event of a large-scale accident at a nuclear power plant that disperses radiation off the reactor site and into the surrounding area.

The FOIA documents indicate that the agencies began discussions in 2009 after NRC informed the other agencies that it does not plan to take the lead in overseeing such a cleanup; and significantly that money in the Price Anderson Act, an industry-funded insurance account for nuclear accidents, would likely not be available. See the documents obtained by *Inside EPA* (Part 1 and Part 2) under the Freedom of Information Act (FOIA, Part 1, July 27, 2010 Draft White Paper, developed by Jeff Blizzard (USEPA).

Until this is resolved – who is in charge, who pays, and what are the cleanup standards- the Final PAG should not be issued.

Who's In Charge – Who Is Responsible?

The Draft PAG Manual makes clear that no federal agency is in charge (section 4.1.6) - "federal departments and agencies may coordinate"(pg., 55); "Under the NRF and NDRF, FEMA may issue mission assignments to the involved federal agencies, as appropriate" (pg., 56) "NIMS was developed specifically for emergency management and may not be the most

[28] http://environmentalnewsstand.com/Environmental-NewsStand-General/Public-Content/agencies-struggle-to-craft-offsite-cleanup-plan-for-nuclear-power-accidents/menu-id-608.html

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efficient response structure for long -term cleanup (pg., 57); "Issues that cannot be solved at the IC/UC or Unified Area Command level may be raised with the Joint Field Office (pg., 57); etc. "May" does not coordinate and take responsibility for getting the job done. Consequently without clear delegated authority, the job will drag on and not get done. The longer cleanup takes, probability is increased that resuspension will carry contaminants further afield and at the same time drive contaminants deep in the soil and groundwater.

History-Avoiding Federal Agency Responsibility

Disagreements over what government agency is in charge were documented in an investigative report by Inside EPA in 2010. It showed that:

EPA's Role: According to the Inside EPA investigative report, a July 27, 2010 white paper was never completed amid disagreements between EPA staff over what authority the agency may or may not have to clean up after a nuclear power plant accident. The paper cited Superfund as a possible source of cleanup funding – either through EPA's appropriation-driven Superfund trust fund or the agency's authority to sue parties responsible for contamination under Superfund law. But significantly EPA staff disagree on whether Superfund is applicable to clean up after a nuclear power plant accident, calling into question its viability as both a source of funding and cleanup authority.

Some at EPA contend that "special nuclear material from a nuclear incident" is exempt from the types of toxic releases governed by Superfund, according to the documents. Others suggest that such material is typically commingled with chemicals and other radioactive materials that are covered by the law, meaning EPA would be able to assert its Superfund authority to conduct a cleanup.

In internal e-mails, other EPA staff provides examples of instances where the agency has been involved with cleanups at nuclear power plant sites due to the sites being contaminated with chemicals. But Jean Schumann, a lawyer in EPA's Office of Emergency Management (OEM), criticized suggestions that the presence of chemical contaminants gives the agency the authority to clean up after a nuclear power plant incident. In one August 5 e-

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mail, Schumann argues it is uncertain whether Superfund law gives EPA such authority when radioactive substances from the accident are commingled with other contaminants. "I think there is enough uncertainty still on what the 'release' exclusion means."

NRC's role: Some federal officials previously assumed NRC had authority and would be the lead agency. However, according to the FOIA documents attached, NRC said that it was not the lead agency and tried to "pass the ball" to EPA, suggesting EPA

would be the appropriate agency to lead such an effort. But, as said above, in an August 5, 2010 email, EPA's Ms. Schumann said that it was uncertain whether Superfund Law gives EPA such authority when radioactive substances from the accident are commingled with other contaminants. In the draft white paper

FEMA's Role: While NRC and FEMA require nuclear plants to have emergency response plans, it is not clear these plans extend beyond the initial aftermath of an accident or apply to radiation dispersed over large areas, the documents say. The government's emergency response authorities under the Stafford Act, for instance, expire 60 days after an incident, the draft document notes.

U.S. President: A Presidential declaration of an emergency "leads to rather limited financial assistance being made available through FEMA" and a "potentially more useful Presidential declaration of a major disaster" appears limited to "natural events," the document said.

States Responsibility: It is apparent that because, "waste resulting from a large scale incident would likely overwhelm current disposal capacity" (pg., 60), "[f]ollowing a nuclear accident, the states bear primary responsibility to identify and provide waste management options, including disposal capacity." (pg., 69)

Stakeholder Involvement: The section talks about opportunities for stakeholder involvement (pgs., 51, 52, 54-56) but it is our understanding that EPA is the only Federal Agency that requires stakeholder involvement. Therefore if EPA has a "say" in this regard,

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cleanup will take longer; if, on the other hand, EPA remains not the responsible lead party, then meaningful involvement is not guaranteed.

Who Pays Or Where Is The Money Coming From?

Price Anderson: the industry-funded account established under the Price Anderson Act, which Congress passed in 1957 in an effort to limit the industry's liability, would likely not be available to pay for such a cleanup. The account likely could only be used to provide compensation for damages incurred as the result of an accident, such as hotel stays, lost wages and property replacement costs, the documents show, leaving federal officials unsure where the money to pay for a cleanup would come from.

Evidence – Emails Obtained by Inside EPA's FOIA Request

The following excerpt from Stuart Walker' email, EPA, says that "The insurance funds are not used to cover cleanup costs associated with the incident."

Evidence – Emails Obtained by Inside EPA's FOIA Request

The following excerpt from Stuart Walker' email, EPA, says that "The insurance funds are not used to cover cleanup costs associated with the incident."

From:	Stuart Walker/DC/USEPA/US
To:	Charles Openchowski/DC/USEPA/US@EPA
Date:	07/30/2010 06:54 PM
Subject:	Upcoming political level (AA, Administrator, maybe Obama/Biden) exercises emergency and late phase cleanup exercises on Nuclear Power Plant Incident

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Dr. Steve Landry, SOE Support Team, reviewed the draft scenario. Dr. Landry explained that the intent of the scenario is to have significant damage that exceeds the cap of the $10 billion Price-Anderson Act (PAA). Additionally, the location chosen for the scenario event should be neither "worst case" nor "best case," but somewhere in the middle.

An NRC representative stated that the PAA actually has a $12 billion cap, but that it is not really the issue. The PAA is an insurance policy for displaced persons/damage in the event of a nuclear power plant incident. Once the $12 billion has been exceeded, the U.S. Treasury will cover costs for displaced people. However, the Insurance funds are not used to cover cleanup costs associated with the incident. The NRC representative also noted that each licensee is insured for over $300 million. Whether or not D/As could recover the costs allocated towards the cleanup is an open question and would be decided by the courts, but PAA is designed to support the people affected by the accident.

The following except from the July 27, 2010 Draft White paper says that, " NRC also indicated the Price Anderson Act would be unable to pay for environmental cleanup after the nuclear power plant inci dent only for compensation for damages incurred (e.g., hotel stays, replacement costs for property and personal items, lost wages etc.

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NRC-FEMA-EPA White Paper:
Potential Authorities and/or Funding Sources for Off-site Cleanup Following a Nuclear Power Plant Incident

Background:

- The Environmental Protection Agency (EPA), the Nuclear Regulatory Commission (NRC), and the Federal Emergency Management Agency (FEMA) began a series of quarterly meetings in 2009 to discuss unresolved concerns regarding off-site environmental cleanup following a nuclear power plant incident.

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- NRC recently indicated to FEMA that they would not be taking the lead for off-site environmental cleanup after a nuclear power plant incident. NRC suggested EPA would be the appropriate agency to lead such efforts.

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- NRC also indicated the Price Anderson Act would be unable to pay for environmental cleanup after a nuclear power plant incident, only for compensation for damages incurred (e.g., hotel stays, replacement costs for property and personnel items, lost wages, etc).

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- FEMA convened a workgroup to discuss the following issues related to nuclear power plant incidents: potential Agency roles (e.g., who would lead cleanup efforts); cleanup authorities; and fund sources.

- Evaluation of language from the *Price-Anderson Act*, the *Stafford Act*, and EPA's previous policies and expectation that the *CERCLA* (Comprehensive Environmental Response, Compensation, and Liability Act) would generally not be used for response actions to address releases from NRC-licensed sites including nuclear power plants, may indicate a potential gap in authority to perform or oversee and fund off-site cleanup following a nuclear power plant incident, depending on the circumstances of the incident and the subsequent declarations of the federal government.

  Deleted: *CERCLA* (Comprehensive Environmental Response, Compensation, and Liability Act), and

- The Report to Congress from the Presidential Commission on Catastrophic Nuclear Accidents (See Attachment D)[1]: outlines a number of concerns regarding nuclear power plant incidents. The report covers the sourcing of funds under a "Major Disaster," a "Catastrophe," and how to prepare and respond to a "catastrophic disaster."
  - Current plans do not cover "long-duration accidents that have impacts over large land areas".
  - The authority of the Court to award damages does not extend to executive branch powers.

Objective:

- Provide current understanding on potential authorities and sources of funding for off-site cleanup following a nuclear power plant incident.

The next except from the July 27, 2010 Draft White paper lays out the potential cleanup authority and funding source of the Price Anderson Act. It essentially repeats what Stuart Walker, EPA, email's said in the first example, "ANI does not cover environmental cleanup costs under their primary insurance policy. It is anticipated that the secondary insurance policy will behave in a similar manner."

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Potential Cleanup Authority and/or Funding Source # 1: *Price-Anderson Act*

- Examples of Potential Circumstances Where It May Be Appropriate to Use the *Price-Anderson Act*: In addition to an accident, the nuclear power plant incident may be the result of: theft or sabotage; the transportation of nuclear fuel to a reactor site; or the storage of nuclear fuel at a reactor site.

- Possible Actions under the *Price-Anderson Act*:
  - Provide financial assistance to utilities operating nuclear power plants that have experienced an incident.
  - For individuals who have suffered damages:
    - Those who suffered bodily harm, sickness, or disease will receive financial assistance.
    - Evacuees receive property damage and loss expenses as well as living expenses.
  - Local and State governments can receive financial assistance to assist with evacuations, sheltering, and other immediate response activities.

- Funding Source for the *Price-Anderson Act*:[2]
  - Under the *Price-Anderson Act*, American Nuclear Insurers (ANI) provides nuclear power plants with financial assurance by creating insurance funding pools under both a primary and a secondary insurance policy.
  - **Primary Insurance Policy:** Each year, a premium is paid by utilities that operate nuclear power plants – this premium provides offsite private insurance of $300 million.
  - **Secondary Insurance Policy**: If an incident exceeds the $300 million, each reactor would pay a prorated share of up to $95.8 million. This secondary pool contains approximately $8.6 billion.

- Potential Gap in Covering Off-site Cleanup under the *Price-Anderson Act*:
  - These funding pools can only be accessed by a federal agency if the federal agency itself has property that has suffered damages during an incident.
  - ANI does not cover environmental cleanup costs under their primary insurance policy. While not explicitly stated, there is no expectation that the secondary insurance policy will differ in coverage from the primary insurance policy.

Obtained by InsideEPA.com

Findings:

Potential Authorities and/or Funding Sources for Off-Site Cleanup Following a Nuclear Power Plant Incident

- *Price-Anderson Act:*
  - ANI does not cover environmental cleanup costs under their primary insurance policy. It is anticipated that the secondary insurance policy will behave in a similar manner.

Further, the following except from the July 27, 2010 Draft White paper from Kathryn Snead, EPA, explains again that there is a gap in authority to perform or oversee and fund offsite cleanup and that, at bullet 3, "NRC al so indicated the Price Anderson Act would be unable to pay for environmental cleanup after a nuclear power plant incident only for compensation for

damages incurred (e.g., hotel stays, replacement costs for property and personal items, lost wages, etc.

Kathryn Snead To all, Please find attached a draft white paper o... 07/27/2010 03:51:39 PM

From: Kathryn Snead/DC/USEPA/US
To: Stuart Walker/DC/USEPA/US@EPA, Charles Openchowski/DC/USEPA/US@EPA, Jennifer Mosser/DC/USEPA/US@EPA, Susan Stahle/DC/USEPA/US@EPA, Lee Tyner/DC/USEPA/US@EPA, Jean Schumann/DC/USEPA/US@EPA
Cc: Lee Veal/DC/USEPA/US@EPA, Jeffrey Blizzard/DC/USEPA/US@EPA
Date: 07/27/2010 03:51 PM
Subject: White Paper on Off-Site Cleanup Following a Nuclear Power Plant Incident

NRC-FEMA-EPA White Paper:
Potential Authorities and/or Funding Sources for Off-site Cleanup Following a Nuclear Power Plant Incident

Background:

- The Environmental Protection Agency (EPA), the Nuclear Regulatory Commission (NRC), and the Federal Emergency Management Agency (FEMA) began a series of quarterly meetings in 2009 to discuss unresolved concerns regarding off-site environmental cleanup following a nuclear power plant incident.

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- NRC recently indicated to FEMA that they would not be taking the lead for off-site environmental cleanup after a nuclear power plant incident. NRC suggested EPA would be the appropriate agency to lead such efforts.

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- Evaluation of language from the *Price-Anderson Act*, the *Stafford Act*, and EPA's previous policies and expectation that the *CERCLA* (Comprehensive Environmental Response, Compensation, and Liability Act) would generally not be used for response actions to address releases from NRC-licensed sites including nuclear power plants, may indicate a potential gap in authority to perform or oversee and fund off-site cleanup following a nuclear power plant incident, depending on the circumstances of the incident and the subsequent declarations of the federal government.

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  - Current plans do not cover "long-duration accidents that have impacts over large land areas".
  - The authority of the Court to award damages does not extend to executive branch powers.
- The following are questions and concerns are unresolved:

InsideEPA.com

DRAFT: DO NOT CITE OR QUOTE *July 27, 2010*

Potential Cleanup Authority and/or Funding Source # 1: *Price-Anderson Act*

- Examples of Potential Circumstances Where It May Be Appropriate to Use the *Price-Anderson Act*: In addition to an accident, the nuclear power plant incident may be the result of: theft or sabotage; the transportation of nuclear fuel to a reactor site; or the storage of nuclear fuel at a reactor site.

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  - ANI does not cover environmental cleanup costs under their primary insurance policy. While not explicitly stated, there is no expectation that the secondary insurance policy will differ in coverage from the primary insurance policy.

InsideEPA.com Obtained by

The following drafts from NRC-FEMA-EPA White paper: Potential Authorities and/or Funding Sources for Off-site Cleanup Following a Nuclear Power Plant Accident, July 27, 2010, Pg., 3 repeat the same language.

- Funding Source for the *Price-Anderson Act:*[2]
  - Under the *Price-Anderson Act*, American Nuclear Insurers (ANI) provides nuclear power plants with financial assurance by creating insurance funding pools under both a primary and a secondary insurance policy.
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At 6,

Findings:

Potential Authorities and/or Funding Sources for Off-Site Cleanup Following a Nuclear Power Plant Incident

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At 17

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---- Forwarded by Elizabeth Southerland/DC/USEPA/US on 06/11/2010 12:13 PM ----

From: Stuart Walker/DC/USEPA/US
To: Elizabeth Southerland/DC/USEPA/US@EPA, Davidw Charters/ERT/R2/USEPA/US@EPA, Helen Dawson/DC/USEPA/US@EPA
Cc: Charles Openchowski/DC/USEPA/US@EPA
Date: 06/11/2010 11:57 AM
Subject: Senior management meeting needed to discuss ongoing staff meetings with NRC and FEMA to resolve responsibilities for early, intermediate, and long-term response to nuclear power plant incidents

InsideEPA.com

Hi Betsy,

See attached email from Colby Stanton that began EPA's involvement with NRC/FEMA efforts to clarify how response to a significant release (e.g., Three Mile Island, Chernobyl) from a commercial nuclear power plant (NPP) would be handled.

After 3 meetings with the other Agencies at the programmatic and general counsel staff, both Charles Openchowski and I believe that we need to have a senior level management meeting to discuss EPA's strategy for these efforts.

There are numerous issues that have arisen during these meetings since Colby's initial note, including:

1. Monies collected from nuclear industry to pay out in the event of a "nuclear incident" go to an insurance company for disbursement. It appears the monies may only go for compensating damages (e.g., cost of temporary or permanent relocation, pay for policemen, personal property replacement, etc) and not environmental cleanup.

2. There appears to not be pre-identified source of funding for environmental cleanup. NRC staff anticipates this would be handled by some type of supplemental appropriation.

3. There is a FEMA expectation that EPA would be heavily involved in the environmental response work, possibly as the lead technical agency (think OSC, RPM role). EPA has not previously been major players in NRC exercises for NPP releases.

Charles and I believe we need a senior level management meeting (OSRTI, OEM, ORIA, OGC, and OHS) to discuss:

1. What would be proper role for EPA in these types of events, including the role of each of our primary offices and respective regional counterparts.
   -- There are of resource (FTEs and $'s) implications for EPA's level of involvement both during a real event and during exercises.
   -- There are also policy implications if EPA appears to be endorsing other cleanup approaches even in a remedial contractor role for NPP events, similar to concerns raised regarding the PAGs.

2. Given the current circumstances dealing with the Gulf spill (e.g., questions about who is in charge, is the federal government in control, etc) not inhibiting our flexibility under CERCLA is a key issue. Although possibly not the first choice to take a response action during a NPP incident, EPA should not agree to language that appears to a legal interpretation that inhibits this option.

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From: Stuart Walker/DC/USEPA/US
To: Elizabeth Southerland/DC/USEPA/US@EPA, Davidw Charters/ERT/R2/USEPA/US@EPA, Helen Dawson/DC/USEPA/US@EPA
Cc: Charles Openchowski/DC/USEPA/US@EPA
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At 36,

From: Kathryn Snead/DC/USEPA/US
To: "Benowitz, Howard" <Howard.Benowitz@nrc.gov>, "Blunt, Kenyetta" <kenyetta.blunt@dhs.gov>, Sara DeCair/DC/USEPA/US@EPA, "DeFelice, Anthony" <anthony.defelice@dhs.gov>, diane.donley@dhs.gov, "Greten, Timothy" <Timothy.Greten@dhs.gov>, grace.kim@nrc.gov, "Milligan, Patricia" <Patricia.Milligan@nrc.gov>, Jennifer Mosser/DC/USEPA/US@EPA, Charles Openchowski/DC/USEPA/US@EPA, Jean Schumann/DC/USEPA/US@EPA, anneliese.simmons@nrc.gov, Susan Stahle/DC/USEPA/US@EPA, Lee Tyner/DC/USEPA/US@EPA, Stuart Walker/DC/USEPA/US@EPA, Jeffrey Blizzard/DC/USEPA/US@EPA
Cc: Lee Veal/DC/USEPA/US@EPA
Date: 05/25/2010 09:57 AM
Subject: EPA-NRC-FEMA Recovery Discussion on Nuclear Power Plant Incidents

To all,

I apologize about the short notice - my fault for taking so long to send this out:

Our next inter-agency discussion on Recovery from Nuclear Power Plant Incidents:
June 3, 2010 from 1 PM - 3 PM
Follows the FRPCC Meeting (with a break for lunch 11:30 AM - 1 PM)
Crystal City Courtyard Marriott
Blue Ridge Shenandoah Conference Room
2899 Jefferson Davis Highway
Arlington, VA 22202

A few action items that were identified during the last meeting:
- Anneliese Simmons, NRC, agreed to provide example text on the insurance exclusion language on cleanup.
- Anneliese Simmons, NRC, agreed to check on what was meant by "clearly identifiable accidents".

At 45

From: "Greten, Timothy" <Timothy.Greten@dhs.gov>
To: Stuart Walker/DC/USEPA/US@EPA, Kathryn Snead/DC/USEPA/US@EPA
Cc: Charles Openchowski/DC/USEPA/US@EPA, Colby Stanton/DC/USEPA/US@EPA, <grace.kim@nrc.gov>, "Benowitz, Howard" <Howard.Benowitz@nrc.gov>, Jean Schumann/DC/USEPA/US@EPA, Lee Tyner/DC/USEPA/US@EPA, "Milligan, Patricia" <Patricia.Milligan@nrc.gov>, Sara DeCair/DC/USEPA/US@EPA, Susan Stahle/DC/USEPA/US@EPA, "Greten, Timothy" <Timothy.Greten@dhs.gov>
Date: 11/30/2009 07:16 PM
Subject: RE: Agenda: EPA-NRC-FEMA Recovery Discussion

Potential Issue - FEMA looking for someone (e.g., EPA, Corps) to run cleanup of public property after nuclear power plant accident

Stuart Walker to: Elizabeth Southerland, Helen Dawson 12/08/2009 02:17 PM
Cc: RobinM Anderson

Betsy, this is a follow-up email about what I mentioned to you in the hall. Last week I, OEM, ORIA, and OGC staff (including Charles) met with FEMA and NRC policy and general counsel staff.

We were meeting to discuss the role of NRC, EPA, and FEMA after a catastrophic release from a nuclear power plant, and how the compensation clauses of the Price Anderson Act might come into play because of the CERCLA definition of "release" (which makes a reference to Price-Anderson in excluding some releases from CERCLA jurisdiction). In Price-Anderson, Congress in essence set up a federally-backed insurance scheme to compensate victims of a nuclear reactor accident (e.g., Three Mile Island).

I had thought that EPA was there to explain why previous policy from the removal program was incorrect in stating EPA could not respond to such releases under CERCLA authority, but rather EPA had authority but generally expected NRC to have authority over such incidents and did not expect to be involved except for possible help requested by NRC and/or state.

I was surprised to find out that NRC did not intend to be involved in the cleanup or Price-Anderson compensation decisions for contamination that was outside the fenceline of the facility. NRC said that the authority for spending the $10 billion insurance dollars that could become available when the Price Anderson Act is triggered would be lie with an Insurance Company. After those funds were gone, they thought EPA might handle the site cleanup.

NRC does not currently know if the $10 billion can only be used for compensation for damages suffered by members of the public, or if it can be used for site cleanup. Also they have not asked the insurance company if they have any plans/guidance on how they will decide to distribute the monies, whether they have contractors lined up to do the cleanup work or would they expect each affected property owner to do the cleanup after getting a claim paid, or how they will answer the question of "how clean is clean" for purposes of either cleanup or determining what is considered contaminated for the purposes of compensation.

We will be meeting together again as a group. NRC intends on finding out answers to the groups question either prior to that meeting or possibly inviting the insurance company to the next meeting.

fyi, attached is the agenda for the meeting. Below is an email from FEMA the night before the meeting that lays out some of the issues.

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The one thing I'm reasonably sure about is the cost for a major long-term cleanup would be in excess of $10bil. If either Stafford Act or Superfund are tapped for $$, the bill is going to be so high that Congress will have to appropriate funds--there is no other way this bill will be paid. And getting those funds will be a political decision negotiated the heads of EPA, FEMA/DHS, NRC, Congress, and the White House.

The first deliverable this group should put together is a memo/paper that reads as a guide through this decision making process, explaining the steps and the different decision points. I think it should shy away from trying to toss the funding burden over the fence and say "supertund must do this!" or "Stafford act must do this", and stick to a neutral explanation of what the consequences of each funding action would be (i.e. "[blank] could be funded by CERCLA--the language allows it. However, CERCLA is incredibly underfunded for something like this). A political tool-kit, if you will, that lays out options and tradeoffs.

The second deliverable would be a memo simply explaining the how of administering a long-range cleanup...that is, no matter who pays for it, it will be a join effort. Each of the agencies has a key ability they bring to the table--EPA understands environmental cleanup/remediation, NRC understands the nuclear power industry, and FEMA has longstanding relationships with state/local government, law enforcement, etc. Both in distributing funding and administering a cleanup, all of these skills would be needed (one agency doesn't have the manpower, either in skill sets or sheer numbers, to pull it off). Also, all of the agencies would essentially be robbing peter to pay paul during a cleanup--they simply don't have standby resources for this beyond a thin bench.

See all of you tomorrow morning!

Tim

The above (12/08/09) paragraph 5 -6 says that, "NRC does not currently know if the $10 billion can only be used for compensation for damages suffered by member of the public, or if it can be used for site cleanup. Also they have not asked the insurance company…how they will answer the question of 'How clean is clean' for purposes of either cleanup or determining what is considered contaminated for the purposes of compensation." By the time they wrote the July 27, 2010 Draft, they were clear that ANI only would pay for damages not cleanup, as the preceding emails show.

At 45,

From: "Greten, Timothy" <Timothy.Greten@dhs.gov>
To: Stuart Walker/DC/USEPA/US@EPA, Kathryn Snead/DC/USEPA/US@EPA
Cc: Charles Openchowski/DC/USEPA/US@EPA, Colby Stanton/DC/USEPA/US@EPA, <grace.kim@nrc.gov>, "Benowitz, Howard" <Howard.Benowitz@nrc.gov>, Jean Schumann/DC/USEPA/US@EPA, Lee Tyner/DC/USEPA/US@EPA, "Milligan, Patricia" <Patricia.Milligan@nrc.gov>, Sara DeCair/DC/USEPA/US@EPA, Susan Stahle/DC/USEPA/US@EPA, "Greten, Timothy" <Timothy.Greten@dhs.gov>
Date: 11/30/2009 07:16 PM
Subject: RE: Agenda: EPA-NRC-FEMA Recovery Discussion

Good evening!

I hope everyone had a good Thanksgiving and made it through Monday.

After reading through the agenda and other notes, I ask that we move the discussion of the Stafford Act to after both Price Anderson and CERCLA have been discussed. Both of the other funding mechanisms should be discussed before we get to the Stafford Act, as both are the appropriate funding avenues before a Stafford Act declaration is made.

That said, I also have a suggestion about what our outcome might be, based on my discussing w/Diane Donnelly today. Please also excuse me if I'm missing key nuances or information here--I might be the newest player in this game.

I'm not sure how much cleaning up after a respectably-size nuclear power plant incident would cost. $50bil? The mechanisms set up by Price Anderson have set up a $10bil pool to pay for certain expenses. After that is exhausted, and for those expenses not covered, what vehicles are available? This is covered under Superfund language...yet my understanding is Superfund is essentially broke, as industry hasn't paid in since the mid 1990s. Likewise, Stafford Act funds are not available until a declaration is issued--and then only in line with what the declaration covers.

The one thing I'm reasonably sure about is the cost for a major long-term cleanup would be in excess of $10bil. If either Stafford Act or Superfund are tapped for $$, the bill is going to be so high that Congress will have to appropriate funds--there is no other way this bill will be paid. And getting those funds will be a political decision negotiated the heads of EPA, FEMA/DHS, NRC, Congress, and the White House.

The first deliverable this group should put together is a memo/paper that reads as a guide through this decision making process, explaining the steps and the different decision points. I think it should shy away from trying to toss the funding burden over the fence and say "superfund must do this!" or "Stafford act must do this", and stick to a neutral explanation of what the consequences of each funding action would be (i.e. "[blank] could be funded by CERCLA--the language allows it. However, CERCLA is incredibly underfunded for something like this). A political tool-kit, if you will, that lays out options and tradeoffs.

The second deliverable would be a memo simply explaining the how of administering a long-range cleanup...that is, no matter who pays for it, it will be a join effort. Each of the agencies has a key ability they bring to the table--EPA understands environmental cleanup/remediation, NRC understands the nuclear power industry, and FEMA has longstanding relationships with state/local government, law enforcement, etc. Both in distributing funding and administering a cleanup, all of these skills would be needed (one agency doesn't have the manpower, either in skill sets or sheer numbers, to pull it off). Also, all of the agencies would essentially be robbing peter to pay paul during a cleanup--they simply don't have standby resources for this beyond a thin bench.

See all of you tomorrow morning!

Tim

Obtained by JeEPA.com

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See all of you tomorrow morning!

Tim

January 7, 2011

Re: Fw: Price Anderson info

Stuart Walker to: Jeff Maurer 08/11/2010 05:44 PM

Cc: Gilberto Irizarry, Kathy Jones, Lois Gartner, Randy Deitz

We haven't ever spelled this out anywhere. Nor has final cleanup levels been discussed by the FEMA, NRC, EPA workgroup looking at Price Anderson Act issues. So I don't have a clear answer, but here are some of my thoughts.

EPA has said that under CERCLA, and some other environmental laws (e.g., SDWA, CAA, AEA) that 25/100 mrem is not protective. So I don't think we would want to say we would promoting that as a cleanup level. Also, at one point during the DHS PAG (guidance for dirty bombs and nuclear weapons) development process NRC said they wanted a final cleanup level of 1 to 10 rem (that is 1,000 mrem to 10,000 mrem) and they wanted to apply those cleanup numbers to nuclear power plant meltdowns. I am not sure if NRC still feels the same way now.

In some of the AA level (OAR, OSWER, OW, OGC) which were followed up by Gina MCcarthy of OAR meeting with Lisa Jackson, it was decided we would NOT be using optimization in the ORIA PAG (Protective Action Guidelines) that would be proposed for final cleanup. We would instead be talking about using existing standards. Since this language still has too be drafted it is not certain if/how specifically CERCLA will be mentioned.

Obtained by OnSideEPA.com

Thank you for the opportunity to make comment. We sincerely hope our comment is instructive and that the final PAG will be changed to reflect our comments.

Respectfully,

Mary Lampert
Pilgrim Watch, director
148 Washington Street
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Email: mary.lampert@comcast.net

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September 16, 2013

The Honorable Gina McCarthy
Administrator
U.S. Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Ave., N.W.
Washington, DC 20460
McCarthy.gina@Epa.gov

US EPA Air and Radiation Docket and Information Center
Mail Code: 6102T, 1200 Pennsylvania Ave NW, Washington, DC 20460
a-and-r-docket@epa.gov; www.regulations.gov

Re: Protective Action Guides for Radionuclides (Docket ID No. EPA–HQ–OAR–2007–0268)

Dear Administrator McCarthy:

We write to express our concern about and opposition to key aspects of the revised Protective Action Guides (PAGs) for responding to releases of radioactivity. PAGs identify radiation doses that are to trigger actions to protect the public so as to avoid public exposures in excess of those doses. As such, the PAGs are critical for public protection; weak PAGs can significantly endanger the public.

On 15 April 2013 the Agency published in the *Federal Register* a request for public comment on the proposed PAG revisions; 78 FR 22257-60. Simultaneously, however, EPA made the new PAGs immediately effective, raising questions about whether the public comment opportunity is *pro forma* or serious.

Nonetheless, we respectfully submit this delineation of significant problems in the PAGs. Many of our organizations opposed efforts by EPA in the last days of the George W. Bush Administration to issue PAGs that would have substantially weakened radiation protections for the public by, for example, increasing dramatically the amount of radioactivity permitted in drinking water and in soil. We were gratified when the Obama Administration in its first days in office withdrew the Bush-era PAG proposal and promised a thorough review.

The current Obama PAGs now issued are in many respects as troubling as the Bush proposal, and in some particulars, even weaker in terms of public health protection. Some cosmetic changes have been made—e.g. vaguer language is used which may have the same disturbing effect. But at their core, rather than specifying protective actions to prevent public exposures, the PAGs would allow massive radiation exposures without any protective actions being recommended to limit them. We recommend the PAGs be withdrawn.

Our primary concerns are: (1) the proposal to allow, for one to several years after a release, radioactive contamination of drinking water at levels orders of magnitude above EPA's longstanding Safe Drinking Water Act (SDWA) limits, (2) language contemplating long-term cleanup standards vastly less protective than EPA's historically acceptable risk range, (3) the elimination of relocation PAGs for high thyroid and skin doses and for high projected cumulative whole body doses, (4) the recommendation to permit radioactive waste to be disposed of in unlicensed disposal sites, including regular municipal garbage dumps, (5) the inappropriate expansion of the PAGs to cover essentially all radioactive releases, from the most extraordinary (e.g. nuclear weapons explosions) to those far less consequential (e.g. transportation accidents involving relatively small amounts of radioactivity), (6) relying on PAG dose limits as high or higher than those in effect decades ago despite the fact that official estimates of cancer risks from radiation have increased significantly over that period, and (7) apparently un-reviewed retention of archaic and extremely high FDA food contamination guidelines.

Background

During the George W. Bush Administration, the Department of Homeland Security (DHS) issued PAGs for responding to the use by a terrorist group of an Improvised Nuclear Device (IND) or a "dirty bomb," a Radiological Dispersal Device (RDD). The DHS PAGs were very controversial. Many of us joined in critical comments.[1]

The DHS PAGs recommended not setting any standard for long-term cleanup but rather adopted a vague process called "optimization" in which the economic interest in not spending money on cleanup could outweigh the public health need to do so. No health-based standard would be established in advance in the PAGs, so decisions about how much to clean up would be made after the fact, selecting from various contradictory "benchmarks" from national or international advisory committees. Those entities are often heavily dominated by nuclear interests and have pressed for not requiring cleanup until doses reach extraordinary levels.

One of the benchmarks considered was *to not undertake cleanup* if the dose to the public were less than 1 rem (1000 mrem) per year (the equivalent of approximately 15,000 chest X-rays over thirty years) and *to only require cleanup over 10 rem per year* (roughly 150,000 chest X-rays over the same period), with discretion to not undertake cleanup when exposures are between those two doses.[2] According to the EPA's own current risk estimates per unit dose in its most recent "Blue Book,"[3] derived from the National Academy of Sciences' Report on the Biological

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[1] See, e.g., group comment letter of 14 April 2006 and letters to then -EPA Administrator Le avitt of 2 December 2004 and 27 January 2005, attachments found , beginning at pg. 155, at http://committeetobridgethegap.org/wp -content/uploads/2013/04/080509LetterToEPAbr5.pdf and incorporated herein by reference.

[2] The adult dose from a PA (posterior-anterior or front) view chest X-ray is typically 2 millirem.

[3] *EPA Radiogenic Cancer Risk Models and Projections for the U.S. Population,* EPA 402-R-11-001, April 2011. The Blue Book sets the excess cancer risk at an age - and sex-averaged value of 1.16×10^{-1} per Gray, with the first 30 years of life the risk being approxi mately 1.8 times higher. EPA standard practice when one doesn't consider lifetime exposure is to presume exposure over the first 30 years of life for residential scenarios and over the first 40 years for farmer scenarios.

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Effects of Ionizing Radiation (BEIR VII), 1 rem per year over the first thirty years of life would result is an excess cancer in every 17th person exposed.[4] At 10 rem/year, EPA's own estimate is that one in every 1.7 people exposed would get a cancer from the radiation.[5] Allowing such high numbers of cancers to be produced from exposure to contamination would obviously be orders of magnitude beyond risks EPA has ever considered acceptable.

The DHS PAGs also recommended allowing radioactive contamination of drinking water at levels far higher than the SDWA allows.[6] Despite the substantial public opposition, the Bush Administration adopted the DHS PAGs.

Subsequent to the issuance of the DHS PAGs, EPA attempted to extend these weakened standards from terrorist events to non-terrorist events and indeed, to all radiological releases. In the EPA proposed PAGs, "optimization" was included for long-term cleanup and actual radionuclide concentrations were put forward for drinking water. Those drinking water levels were orders of magnitude higher than EPA's Safe Drinking Water Act. For some radionuclides, EPA was proposing to allow people to drink water contaminated to such a high level that drinking a single small glass would exceed a lifetime permitted consumption under the SDWA, according to internal EPA analyses obtained under the Freedom of Information Act. [7] Independent analyses confirmed this, showing that the proposed drinking water levels were, depending on the radionuclide, hundreds, thousands, tens of thousands, and hundreds of thousands of times higher than the SDWA limits.[8]

The EPA PAGs that the outgoing Bush Administration tried to publish in its last days in office also would have adopted the deeply troubling DHS "optimization" process for long-term cleanup. Furthermore, the applicability of the PAGs would have been extended to *all* radioactive releases.

Recognizing the highly problematic aspects of these proposals by the outgoing Administration, the Obama Administration withdrew them and promised a full and careful review. We were thus hopeful that when new PAGs were released, they would be truly protective. We have been deeply disappointed.

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[4] 1 rem/year x 30 years x 2 x 1 0-3 cancers per rem during the first 30 years = 6 x 10 -2 cancers = 1 cancer per 17 people exposed.

[5] These are gender-averaged risk figures. Females are at even greater risk than males from the same levels of exposure meaning their risks are even higher than these estimates.

[6] The DHS PAGs recommended a high dose level for radiation from drinking water but did not provide specific concentrations for individual radionuclides .

[7] http://www.peer.org/news/news -releases/2010/04/05/radiation -exposure-debate-rages-inside-epa/

[8] See Hirsch and Marx, *Proposed Relaxation of EPA Drinking Water Standards for Radioactivity,* Committee to Bridge the Gap, October 2008, found as an attachment to the URL identified in footnote 1 above and incorporated herein by reference.

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1. <u>The PAGs Propose Allowing Radioactive Contamination of Drinking Water That Would Be Orders of Magnitude Higher than EPA's Longstanding Safe Drinking Water Act Limits</u>

The Bush Administration PAGs presented a table of concentrations for specific radionuclides that it proposed would be allowed without requiring treatment or alternative water sources. These concentrations were grossly higher than the levels permitted under the SDWA. The furor they provoked contributed to the Obama Administration withdrawing the proposal.

However, rather than rejecting the Bush Administration approach, the new PAGs issued by EPA adopt a similar tack—proposing abandoning the SDWA requirements and replacing them with considerably higher values. But unlike the Bush PAGs, which expressly included a table of the extreme concentrations proposed for each radionuclide, the new PAGs bury the proposed alternatives in footnotes. (Footnotes 24-27 on p. 42). The actual values for the alternatives are not even included, only citations to other works. No comparison is provided whatsoever as to how much each of these proposed alternatives would weaken the protections in the SDWA.

We have thus undertaken that missing analysis. The results are striking and are summarized in the tables below. The first shows, for four key radionuclides, the EPA Safe Drinking Water Act limits (in becquerels per liter, bq/L) compared with the alternatives now proposed by EPA in the new PAGS, as well the values previously proposed by the Bush Administration. One sees the extraordinary weakening of protections EPA now proposes.

Obama Drinking Water PAG proposals vs. Existing EPA Safe Drinking Water Levels and Bush Administration PAG Proposal
units = Bq/L

Radionuclide	EPA Safe Drinking Water Act Maximum Contaminant Limit (MCL)	Bush Proposed Drinking Water PAG	Obama Proposed Drinking Water PAG Alternative I (EPA 2013 fn 26)	Obama Proposed Drinking Water PAG Alternative II (EPA 2013 PAG fn 25)	Obama Proposed Drinking Water PAG Alternative III (EPA 2013 PAG fn 27)	Obama Proposed Drinking Water Alternative IV (EPA 2013 PAG fn 24a)	Obama Proposed Drinking Water Alternative V (EPA 2013 PAG fn 24b)
Iodine-131	0.111	314	314	3000	170	10	300
Strontium-90	0.296	246	246	200	160	10	
Cesium-137	7.4	503	503	2000	1200	10	
Plutonium-239	0.555	27	27	50	2	1	

The second table shows how many times more radioactivity would be permitted in drinking water under the various alternatives compared to the SDWA limits. The extraordinary degree to which EPA proposes increasing permissible concentrations of radionuclides in drinking water is also shown in graphs attached to this letter.

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Factors by Which Obama Drinking Water PAG Proposals Would Exceed Existing EPA Safe Drinking Water Levels

Radionuclide	Bush Proposed Drinking Water PAG	Obama Proposed Drinking Water PAG Alternative I (EPA 2013 fn 26)	Obama Proposed Drinking Water PAG Alternative II (EPA 2013 PAG fn 25)	Obama Proposed Drinking Water PAG Alternative III (EPA 2013 PAG fn 27)	Obama Proposed Drinking Water PAG Alternative IV (EPA 2013 PAG fn 24a)	Obama Proposed Drinking Water PAG Alternative V (EPA 2013 PAG fn 24b)
Iodine-131	2829	2829	27027	1532	90	2703
Strontium-90	828	828	676	541	34	
Cesium-137	68	68	270	162	1.35	
Plutonium-239	49	49	90	3.6	1.8	

It makes no sense to require people to drink water with, for example, more than 800 times the concentration of strontium-90 than the levels EPA has historically permitted, or thousands or even tens of thousands of times the permissible iodine-131 levels.[9] We oppose any weakening of drinking water standards for radioactivity. The SDWA limits should be complied with.

We note that the water PAGs are not designed for the immediate, early phase after a release, when actions to protect water supplies might arguably be difficult. Instead, the water PAGs are for the intermediate phase, after the emergency has passed, and are to be in place for one to several years after the emergency. Surely the position of EPA should be that drinking water for such a long period should be protected at levels EPA has deemed acceptable under the Safe Drinking Water Act.

Rather than proposing to force people to drink water contaminated at levels hundreds, thousands, or even tens of thousands of times higher than the EPA has historically considered acceptable under the Safe Drinking Water Act, the PAGs should instead do what they are supposed to do: provide protective action guidance for authorities on how to treat contaminated water or provide alternative drinking water supplies after the immediate emergency has passed. This is, of course, what EPA has historically done in the wake of other emergencies—arranged for treatment or alternative water supplies.

We recommend EPA abandon all efforts to set water PAGs that are weaker than the Safe Drinking Water Act limits, and instead, provide real, concrete guidance to authorities on how to safeguard water supplies so as to protect the public.

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[9] EPA has tried to defend these proposals to dramatically increase allowable radioactivity concentrations in drinking water by asserting that the SDWA limits are "based" on a 70-year lifetime exposure. That is not really true. Under SDWA, drinking water is not to contain radionuclides at concentrations above the Maximum Contaminant Limit (MCL) averaged *over a year*. (Even were that not the case, most of the new values proposed are not seventy times higher than MCLs, but hundreds or thousands of times higher). Similarly, the claim that it is appropriate to allow far higher levels of a radionuclide like I -131 because it is relatively short -lived is misdirected. Under SDWA, as indicated above, one already can average the concentration over a year. There is no need to breach the SDWA.

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2. The PAGs Propose Dramatically Relaxing EPA's Long-Term Cleanup Requirements

EPA has historically required even the nation's most contaminated sites to be cleaned up to a level deemed protective, defined as within EPA's long-held acceptable risk range, which aims for a risk level of one in a million (10^{-6} risk) but allowing no more than one in 10,000 people exposed to get cancer (a 10^{-4} risk) from that exposure. EPA has thus established Preliminary Remediation Goals (PRGs) for both radionuclides[10] and hazardous chemicals[11] and a flexible process by which, if unusual circumstances make reaching the PRGs difficult, less protective standards can be adopted so long as they are within the risk range. These risk levels have been accepted as reasonable for even huge, heavily contaminated Superfund sites (e.g. Hanford) that are half the size of a state, and thus should not be relaxed in the PAGs. The main reason for the reduction in protection is to save money and liability for industries and agencies that carry out practices that could result in large radioactive contamination, mainly the nuclear power industry and the atomic weapons fuel chain agencies and their contractors.

EPA now proposes in the PAGs that this long-followed protective approach and acceptable risk range be jettisoned and that extraordinarily higher concentrations of radionuclides be allowed to remain in soil for the long-term with no effort at cleanup. While not using the controversial term "optimization" from the Bush-era proposed PAGs, language in the PAGs could permit some to say that EPA now merely proposes optimization without calling it that. No risk-based cleanup standards for long-term cleanup would be established in the PAGs, even as a baseline, but rather a vague, undeveloped, makeshift process would be followed whereby cleanup standards would be established after the fact, based on factors other than public health. For example, the PAGs contemplate letting the desire of industry or federal agencies to not have to pay for cleaning up contamination they have created by a release override the public's need to be protected. This is unacceptable.

Just as EPA tried to relegate the proposed weakening of drinking water standards to footnotes, EPA also appears to be trying to weaken long-term cleanup standards by vague references to the DHS 2008 PAGs and by cooperating with an outside group with strong nuclear ties, the National Council on Radiation Protection and Measurements (NCRP) which recommends grossly weakened cleanup guidelines via an NCRP guidance document.

Especially troubling is the process by which EPA chose to pursue the path of weakening long-term protection of the public. For example, two EPA staffers from relevant EPA Offices[12]

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[10] http://epa-prgs.ornl.gov/radionuclides/

[11] http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/index.htm
These regional values are used nationally.

[12] John Edwards, head of the radiation protection division of the Office of Radiation and Indoor Air, and John Cardarelli from the Office of Emergency Management. EPA claims they participated with NCRP on their own but has not provided evidence that they took time off and that the activity was not approved by their superiors at EPA.

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influential in developing the EPA PAGs participated in writing the NCRP guidance document which presses EPA to weaken, to an extraordinary degree, its long-term cleanup standards. This is significant because EPA staff from other Offices attempting to retain existing radiation protection levels were not included on the NCRP team. This internal EPA conflict and the apparent conflict of interest in EPA staff participating at all in the private NCRP effort at pushing EPA to relax its cleanup goals, while representing only one side of the internal EPA debate, has been reported on in the media, pursued via Freedom of Information Act requests and a letter from Public Employees for Environmental Accountability to then-EPA Administrator Jackson[13] but EPA has failed to respond meaningfully.

The EPA PAGs DO NOT incorporate the full DHS PAGs on long-term cleanup, only a subsection dealing with general process matters about consultation (reprinted in section 4.1.6 of the EPA PAGs, pp. 55-59). The DHS PAGs sections on "optimization" and use of benchmarks for long-term cleanup are *not* included in the EPA PAGs. However, a single sentence elsewhere in the EPA PAGs (p. 4, para 4), mentions incorporation of guidance from DHS PAGs' long-term cleanup section, presumably referring to the subsection that is inserted. This poorly crafted sentence, if not clarified, can create subsequent confusion as to whether EPA is incorporating all of the DHS PAGs on long-term cleanup or only the generally innocuous section that is in fact incorporated directly. Since the DHS PAGs are explicitly based on "optimization," and the EPA PAGs are not, and since the DHS PAGs reference "benchmarks" from nuclear advocacy groups like ICRP, NCRP, and IAEA, which have pushed for "acceptable" long-term doses as high as 10 rem per year, with consequent cancer risks as high as 1 cancer per 2 people exposed, whereas the EPA PAGs do not, this potential confusion must be eliminated.

EPA should remove any implication from its PAGs that it is incorporating the DHS PAGs' "optimization" plan and contemplated use of "benchmarks." We recommend that the sentence on p. 4 be rewritten to state, "This EPA Manual substantively incorporates in Section 4.1.6 (pp.55-59) a specific subsection of the late phase cleanup guidance provided in the 2008 DHS document and refers readers to additional planning resources."

The NCRP report--which claims it is designed to provide guidance for both the DHS and EPA PAGs--recommends long-term cleanup standards of 100 to 2000 millirem per year (0.1 to 2 rem per year). That is the equivalent of 50 to 1000 chest X-rays annually, or one a week to three a day every day of one's life for decades. By EPA's own cancer risk estimates, 2 rem per year over a lifetime would result in an excess cancer in one in every six people exposed. Because of the increased risk in earlier years, EPA estimates that even just thirty years exposure from birth would result in a cancer in one in eight people exposed.[14] These risk levels are orders of magnitude higher than EPA's long-accepted risk range.

Additionally, NCRP proposes specific levels of radionuclides that should be allowed to remain in soil and not cleaned up, with people exposed for decades to that radiation without protective actions having been undertaken. Those levels are extraordinarily higher than EPA's

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[13] http://www.nti.org/gsn/article/epa -withholds-information-dirty-bomb-report-amid-cancer-concerns/; http://www.peer.org/assets/docs/epa/ 4_5_10_PEER_Radiation_ltr_to_EPA.pdf

[14] See footnote 3 above.

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Preliminary Remediation Goals (PRGs), or even the upper limit of EPA's acceptable residual contamination (one hundred times the PRG). We have attached tables and figures showing the extreme exposures these proposals would produce compared to anything EPA has ever said in the past was acceptable. For some radionuclides, the NCRP proposed "acceptable" contamination levels would be hundreds of thousands or even millions of times higher than what EPA's remediation goals are at the nation's most contaminated sites, for the same exposure scenario.

We thus oppose the long-term cleanup section of the EPA PAG as written, and any potential linkage of the EPA PAG to DHS' PAGs' "optimization" process and/or to the NCRP recommendations or those of other bodies that push for increased radiation exposures of the public.[15] EPA should stick to its longstanding principles and require cleanup to its standards for the most contaminated sites in the country, CERCLA. In extraordinary circumstances, there are already provisions whereby one can make an exception if one absolutely has to, but even then one still aims to get as close to the CERCLA risk range as possible. The PAGs as written, however, suggest a concerted attack by proponents of weakening public protections, and this should not be allowed.

3. The Elimination of Relocation PAGs for High Thyroid and Skin Doses and for High Projected Cumulative Whole Body Doses

EPA's 1992 PAGs, which the current document revises, require relocation if thyroid or skin doses over certain specified limits are predicted. Again, it is important to remember that PAGs are doses that are to be *avoided* by protective actions. The new PAGs eliminate both requirements. We believe that is inadvisable.

EPA claims it is removing the skin and thyroid relocation PAGs to "avoid confusion." This makes no sense. If predicted doses to the skin or thyroid are likely to be very large, one needs to be protecting people by getting them out of harm's way. The fact that some people in some situations may have access to potassium iodide (KI) doesn't obviate the need to relocate those who don't. And KI does nothing to protect against skin cancer; its sole use is aimed at the thyroid.

Additionally, the longstanding PAGs require protective action to assure people do not get exposed to more than 5 rem over 50 years. This has been jettisoned as well. Obviously, if some within EPA are pushing to allow long-term doses as high as 2 rem per year over many decades (60 rem over 30 years, 140 rem over a lifetime), a 5 rem cumulative cap would prevent that. That apparently is behind their desire to eliminate the lifetime cap. The cap should remain and in fact be tightened considerably (see discussion in section 6 below).

[15] We incorporate herein by reference comments submitted on the NCRP recommendations, found at http://committeetobridgethegap.org/wp -content/uploads/2013/04/ncrp -short-comments-from-multiple-groups.pdf and http://committeetobrid gethegap.org/wp-content/uploads/2013/04/CBGNIRSPSRSCFS -updated.pdf

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4. The Recommendation to Permit Radioactive Waste to Be Disposed of In Unlicensed Disposal Sites, Including Regular Municipal Garbage Dumps

Nuclear advocates have long pushed to deregulate significant portions of the radioactive waste stream and permit such wastes to be disposed of in sites neither licensed nor designed for radioactive materials, including municipal garbage dumps. This has largely been driven by a desire to cut safety corners so as to save money for industry and government.

The PAGs strongly push for elimination of the existing requirements that radioactive waste go to sites licensed and designed for radioactive waste. We oppose such an effort. Again, EPA seems intent on weakening protections. PAGs are supposed to be guides for *protective action*, not an effort to eliminate protections.

The section on waste disposal issues in Chapter 4 of the PAGs, *Guidance for the Late Phase,* appears to have been written with little or no historical knowledge about the widespread public opposition over past decades in the United States to proposals for deregulation, free release, clearance or below-regulatory-concern (BRC) designation of radioactive waste from both nuclear power and weapons facilities. The suggestion to allow nuclear waste into RCRA C and D Hazardous and Solid waste facilities is both cavalier and dangerous. Allowing the waste to go into and contaminate or poison commercial recycling has also been soundly rejected. We oppose sending nuclear waste to facilities that are not specifically licensed for radioactive materials, including but not limited to solid and hazardous landfills, incinerators, processors and recycling facilities.

Some of the reasons to keep nuclear waste out of facilities not specifically licensed for radioactive materials include inevitable leakage, the potential intermixing of radioactive materials with chelating and organic complexing agents that greatly enhance the migration of the radioactivity into groundwater and surface water, risk of fire in a landfill with both radioactive and regular wastes as is currently occurring at the West Lake landfill in Missouri, failure to consider the ability of RCRA facilities to isolate the wastes they are licensed to dispose, shorter institutional control periods, failure to inform and protect workers, and lack of detailed radiation monitoring of air, soil, and water. Recycling radioactively contaminated materials into the consumer metal supply rather than disposing of them in licensed radioactive sites is not acceptable.

EPA should have reviewed the public comments which clearly rejected their previous efforts[16] in the mid 1990's, 2001 and 2003 to allow nuclear waste into solid and hazardous facilities and into recycling to make consumer goods.

EPA gives lip-service to inclusivity in the PAGs, ignoring the reality that deregulating (or never requiring radioactive regulation) of nuclear waste from incidents and releases will

[16] 1996-1998 EPA consideration, publication and rejection of rules to legalize contaminating metal recycling with radioactive metal; 2001 66 Fed Reg 27218 May 16, 2001 to allow mixed waste to go to nuclear waste sites; 2003 ANPR 65120 68 Fed Reg 222, Nov 18, 2003 to consider "non -regulatory approaches" for radioactive waste management.

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disproportionately impact people of color and low income communities which is where the solid and hazardous waste facilities frequently are located and where new ones tend to get sited.

We encourage EPA, the other federal agencies and states to focus their efforts on *preventing* nuclear power incidents rather than pushing to relax cleanup and disposal safety requirements.

5. The Inappropriate Expansion of the PAGs to Cover Essentially All Radioactive Releases, from The Most Extraordinary (e.g. Nuclear Weapons Explosions) to Those Far Less Consequential (e.g. Small Transportation Accidents)

The DHS PAGs mixed the absolutely extraordinary event—detonation by a terrorist of a nuclear weapon in the U.S.—with vastly less consequential events involving "dirty bombs" of a range of sizes, including very small ones. It was inappropriate to suggest the same standards for such varying incidents. If a nuclear bomb explodes, all bets are off. If a small dirty bomb is detonated, normal response procedures and cleanup requirements can take care of it. By mixing the huge and the small and requiring the same lax standards, a disservice is being done.

EPA has now greatly compounded that problem by expanding its PAGs from dealing with a catastrophic release from a nuclear power plant meltdown to covering all radioactive releases, including such events as transportation accidents and incidents at radiopharmaceutical facilities.[17] Indeed, under the PAGs definition of its scope—dealing with any radioactive release for which a protective action may be required—it is hard to see what might not be covered or how CERCLA, which is EPA's longstanding statutory program for dealing with such releases would still exist, despite *pro forma* language in the PAG to the contrary.

By creating a single set of standards to address both a Fukushima-type event and a truck carrying a shipment of medical isotopes that goes off the road, one creates a useless PAG and the prospect of greatly relaxed cleanup and protection standards for many events for which there is no question that current standards and response approaches under CERCLA are fully adequate. We oppose this effort to expand the PAGs to essentially encompass every radioactive release.

6. Relying on PAG Dose Limits As High As Or Higher Than Those In Effect Decades Ago Despite the Fact That Official Estimates of Cancer Risks from Radiation Have Increased Significantly Over That Period

In addition to eliminating some important dose triggers for protective action in the older PAGs, EPA carries forward old limits that have been in place for decades, despite EPA's own official estimates of radiation risk per unit dose having markedly increased during that time. The updated official consensus is that radiation is considerably more harmful than was known when the earlier levels were established. EPA fails to improve protection based on the newer, higher

[17] EPA PAG Manual 2013, page 4 section 1.3.4 "This updated Manual applies PAGs and protective actions to an expanded range of sources of potential radiological releases, include commercial nuclear power facilities, uranium fuel cycle facilities, nuclear weapons facilities, transportation accidents, radiopharmaceutical manufacturer and users, space vehicle launch and reentry, RDDs and INDs."

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risk, and in fact allows for reduced protection instead. For example, the 1992 PAG values incorporated into the newest PAG are based on the National Academy of Sciences' BEIR III study (and in fact, go even far further back than that). But BEIR V increased those risk estimates three- or four-fold, and BEIR VII increase those an additional 35%. EPA has adopted those values in its most recent Blue Book. So, despite officially acknowledging that radiation is four or five times more dangerous than assumed when the 1992 PAGs were established, EPA now merely uses the same dose limits without any effort to tighten them by a factor of four or five.

We recommend that all parts of the PAGs that weaken or eliminate existing protections be abandoned, and all dose limits be tightened by at least the increased risk EPA now acknowledges for radiation.

7. The PAGs Incorporate Archaic and Extremely High FDA Food Contamination Guidelines, Apparently Without Updated Review

EPA simply by reference incorporates old FDA guidelines for food contamination. These food radiation exposures would be on top of doses from other exposures (e.g., inhalation, groundshine) adding significantly to cumulative doses to the public. The old FDA guidelines are based on even older guidance, and none of the dose limits have been reduced over time to reflect the increased official risk estimates discussed above.

The old FDA guidance allows—from the food pathway alone—500 millirems exposure per year. This means that the food one eats each day would produce a radiation dose equivalent of a chest X-ray every day. The FDA food guidance limits appear to have no time limit; food contaminated at these levels would be permitted to be consumed over a lifetime. At these dose levels, EPA's risk estimates indicate a lifetime risk of 4×10^{-2}, or every 25th person eating food contaminated at those levels getting a cancer from it. This is simply unacceptable, and EPA should reject any such proposed guidance. At minimum, if EPA really intends to accept such doses, it should be candid with the public and say that those "acceptable" levels, by its own estimate, would produce an excess cancer in 4% of the public. We think that would be a hard sell ethically, and EPA should thus rethink adoption of such extraordinarily lax protection levels.

SUMMARY OF RECOMMENDATIONS

We recommend the April 2013 draft PAGs be withdrawn.

We oppose any weakening of drinking water standards for radioactivity. The Safe Drinking Water Act limits should be complied with. The PAGs should do what they are supposed to do: provide protective action guidance for authorities on how to treat contaminated water or provide alternative drinking water supplies over the one to several years after the immediate emergency has passed. This is, of course, what EPA has historically done in the wake of other emergencies—arranged for treatment or alternative water supplies.

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We recommend EPA abandon all efforts to set water PAGs that are weaker than the Safe Drinking Water Act limits, and instead, provide real, concrete guidance to authorities on how to safeguard water supplies so as to protect the public to those levels or better.

The PAGs contemplate letting the desire of nuclear industry and federal agencies to not have to pay for cleaning up contamination they have created by radioactive releases override the public's need to be protected. This is unacceptable.

EPA should remove any implication from its PAGs that it is incorporating into responding to non-terrorist radiological events the Department of Homeland Security PAGs' "optimization" plan and contemplated use of "benchmarks" that would be outside EPA's historical acceptable risk range.

We oppose the long-term cleanup section of the EPA PAG as written, and the potential linkage of the EPA PAG to DHS' PAGs' "optimization" process, and to the NCRP recommendations or those of other bodies that push for increased radiation exposures of the public. EPA should stick to its longstanding principles and require cleanup to its standards for the most contaminated sites in the country, CERCLA. The PAGs as written suggest a concerted attack by proponents of weakening public protections, and this should not be allowed.

Do not remove, but instead retain and strengthen, relocation PAGs for thyroid and skin doses.

Do not remove, in fact EPA should strengthen, the longstanding PAGs that require protective action to assure people do not get exposed to more than 5 rem over 50 years.

The outdated FDA food contamination guidelines should be replaced with markedly lower permissible concentrations of radioactivity in food.

We oppose sending nuclear waste to facilities that are not specifically licensed for radioactive materials including but not limited to solid and hazardous landfills, incinerators, processors and recycling facilities. We encourage EPA, the other federal agencies and states to focus on *preventing* nuclear power incidents rather than weakening protection of the public in case of such releases.

We oppose the effort to expand the PAGs to essentially encompass every radioactive release.

We recommend that all parts of the PAGs that weaken or eliminate existing protections be abandoned, and all dose limits be tightened by at least the increased risk EPA now acknowledges for radiation.

Conclusion

Protective Action Guides are supposed to provide guidance for actions to protect the public from radiation. The current PAGs do the opposite—recommend grossly increased risks to the public without protection. We urge that the PAGs be withdrawn.

Sincerely,

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National

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Notes

As to the water PAGs, please note that EPA's Alternative 1, identified in footnote 26 of the PAG, is for the same high dose limit that was put forward in the Bush EPA PAG. EPA had previously identified in the Bush PAG radionuclide concentrations it claimed were associated with that dose, so we used here those concentrations. Secondly, Alternative 4, the first alternative in footnote 24 of the PAG, is really not a set of proposed water limits for emergencies but a set of weaker standards for normal consumption of drinking water and not really relevant to the PAG discussion. Lastly, Alternative 5, the second reference in PAG footnote 24, provides a value for only one radionuclide, iodine-131.

The NCRP's suggested long-term cleanup levels are found in NCRP SC 5-1 Draft Report, "Decision Making for Late-Phase Recovery from Nuclear or Radiological Incidents," February 25, 2013, National Council on Radiation Protection and Measurements.

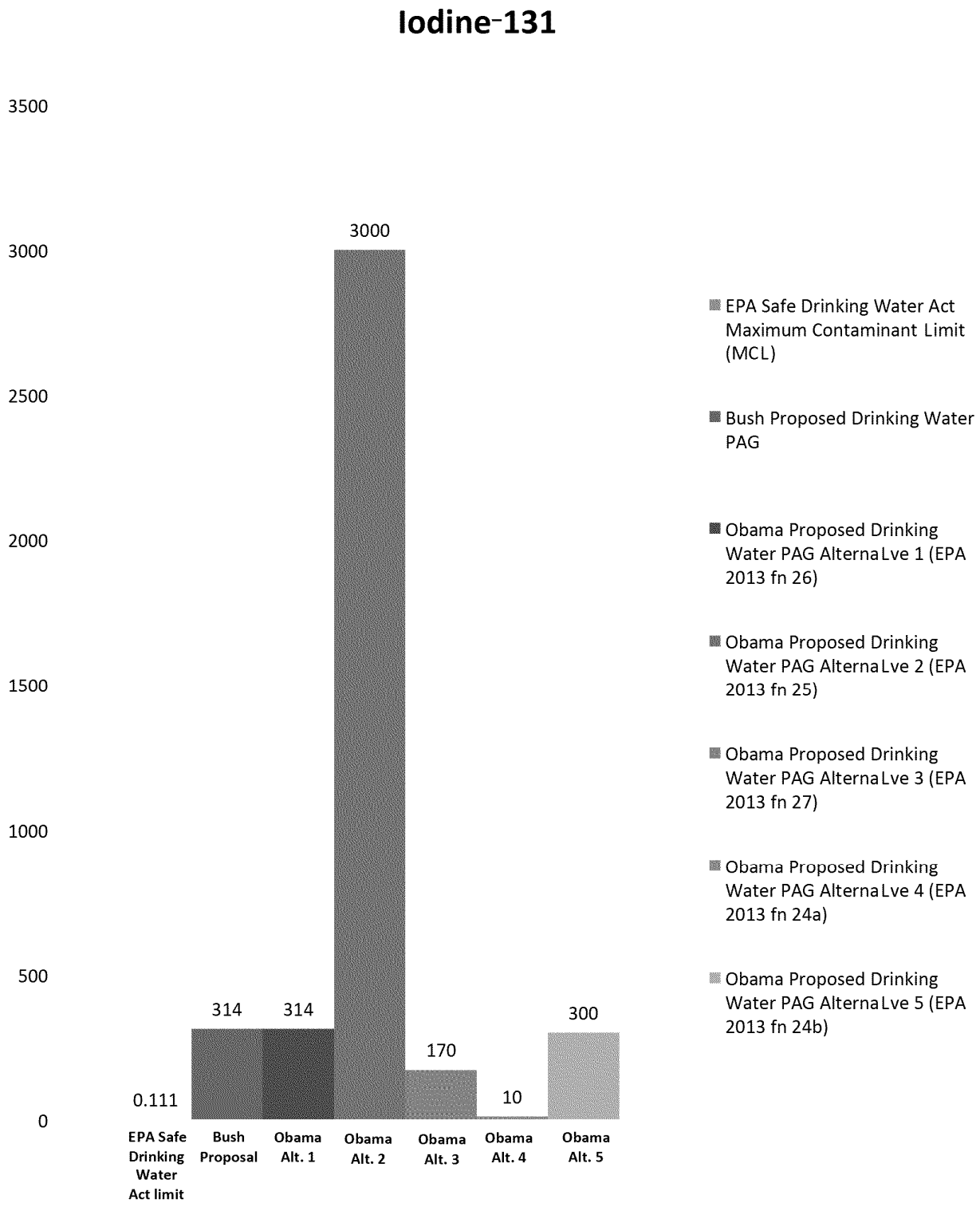
Table 6.4 of the report identifies levels of contamination below which no cleanup would occur based on a 1 mSv/yr dose, for resident farmer, urban resident, and industrial/commercial exposure pathways, and for 95th and 50th confidence intervals. The NCRP report recommends cleanup choices based on a dose range of 1 mSv/yr to 20 mSv/yr (100 mrem to 2000 mrem/yr) and indicates that one just scale up the values in Table 6.4, which are based on 1mSv/yr, to be obtain the concentrations for the 20 mSv/yr limit.

We have taken the NCRP values and compared them to EPA's Preliminary Remediation Goals (PRGs) for the same exposure scenarios—resident farmer and urban resident. We have compared the EPA PRGs to both the 50th and 95th confidence levels concentrations identified by the NCRP report.

It should be noted that EPA PRGs are the remediation goals, and that in unusual circumstances where one can't meet the goal one can fall back from them, but no more than by two orders of magnitude. In other words, EPA's remediation levels are a range of the PRG to no more than 100 times the PRG. Thus, at the upper end of the NCRP proposed acceptable risk range, for example, for a resident farmer and a 50% confidence interval, NCRP proposed plutonium-239 levels nearly 12 million times higher than EPA's PRG for the same scenario. That would be 120,000 times higher than the upper limit of EPA's risk range.

We gratefully acknowledge the work of Ryan Forster in producing the graphs.

Allowable Radionuclide Concentrations in Water Under the EPA's Safe Drinking Water Act Limits Compared with Alternatives Identified in Proposed Protective Action Guides, in Bq/L



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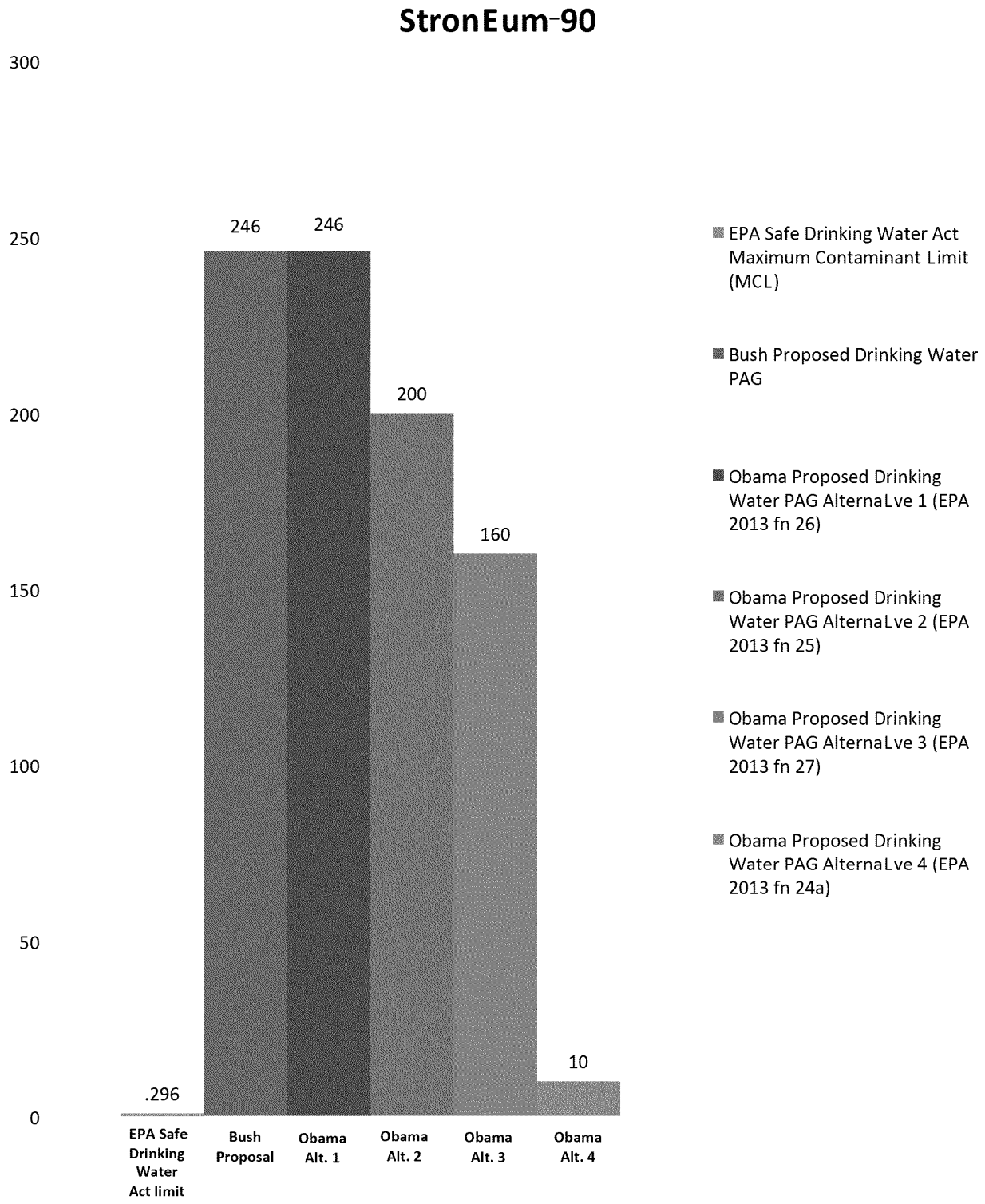
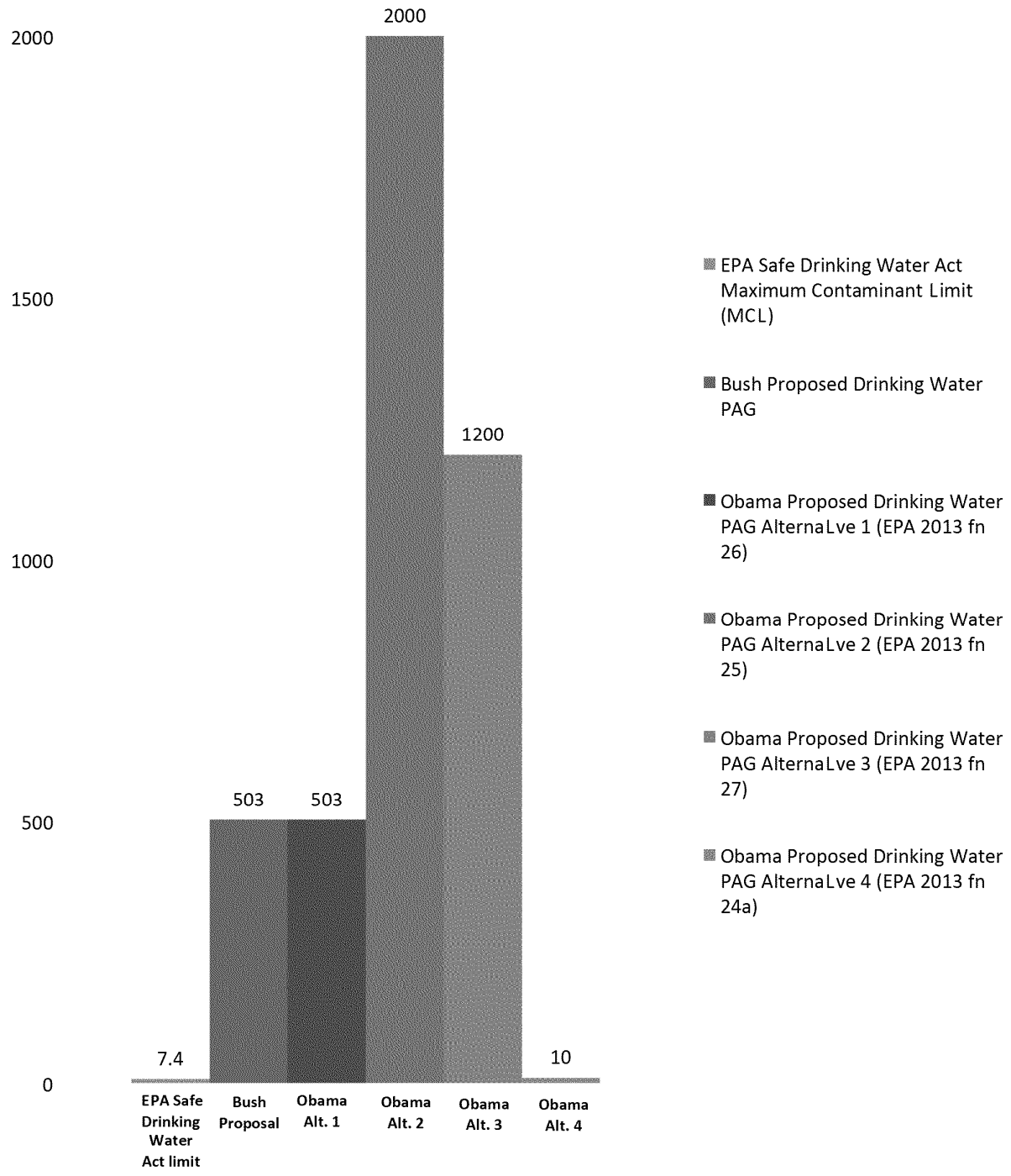


Allowable Radionuclide Concentrations in Water Under the EPA's Safe Drinking Water Act Limits Compared with Alternatives Identified in Proposed Protective Action Guides, in Bq/L

Cesium-137



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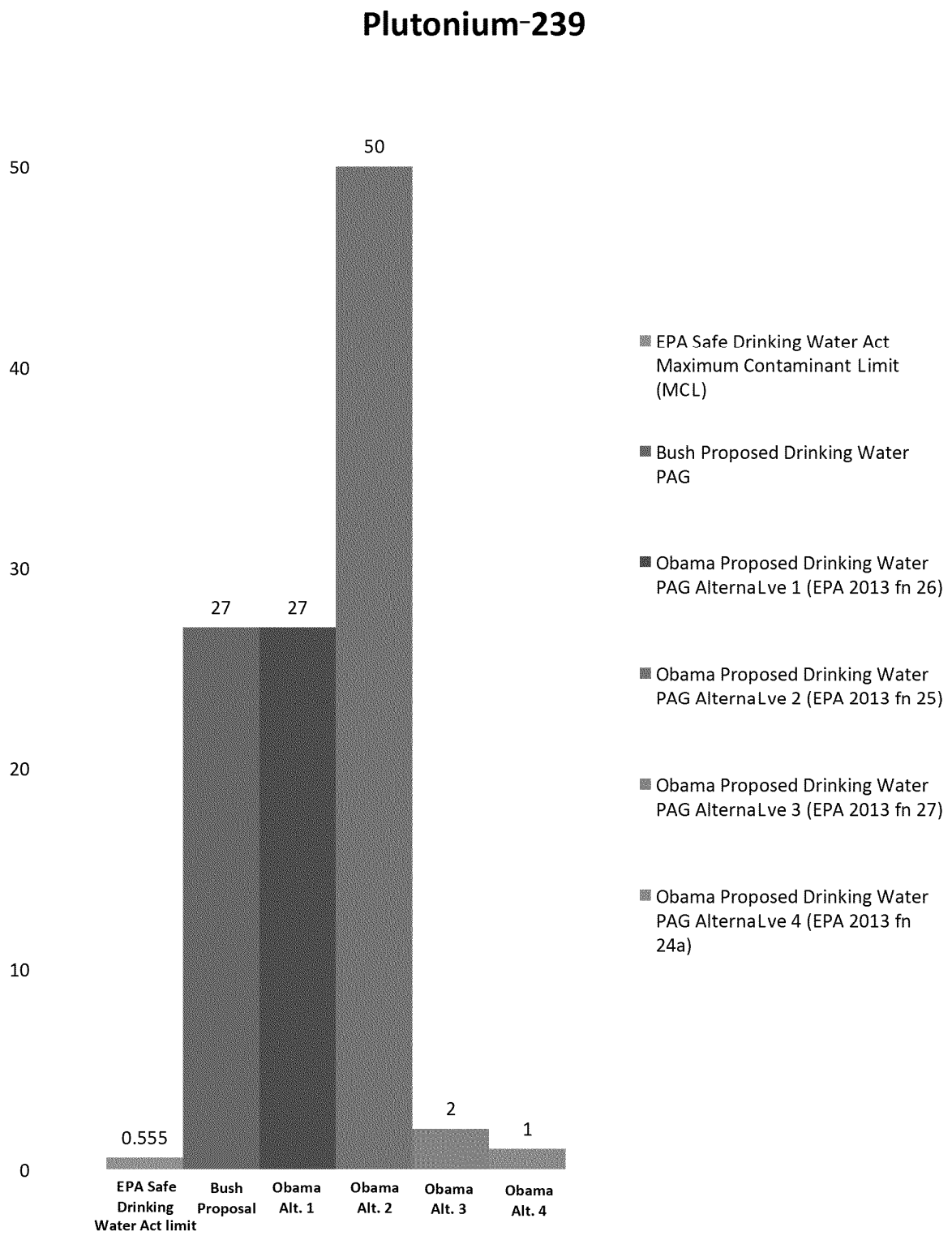
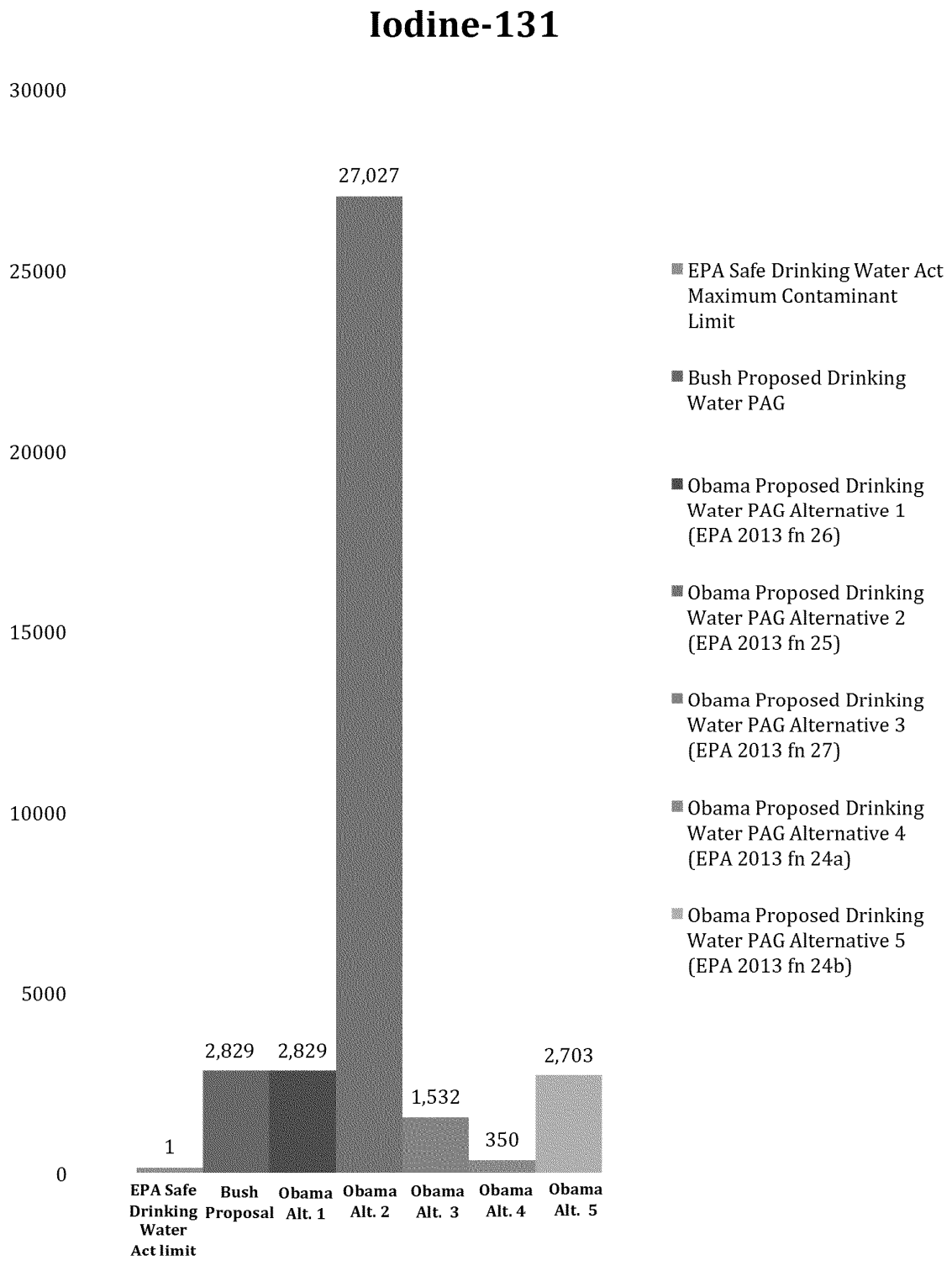


Factors by Which Radionuclide Concentrations in Drinking Water Would Exceed EPA's Safe Drinking Water Act Levels if the Alternatives Identified in 2013 Proposed Protective Actions Guides Were Adopted



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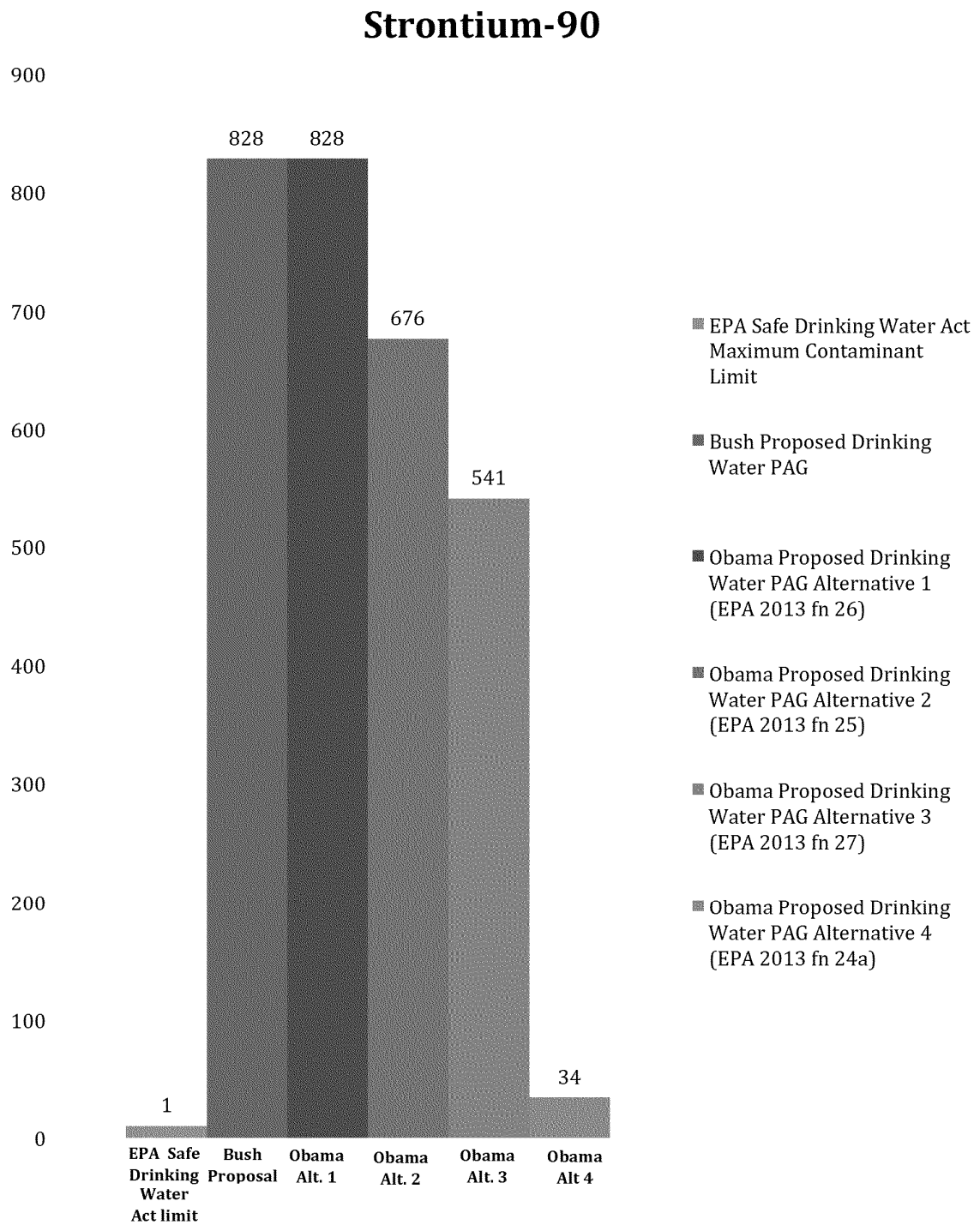

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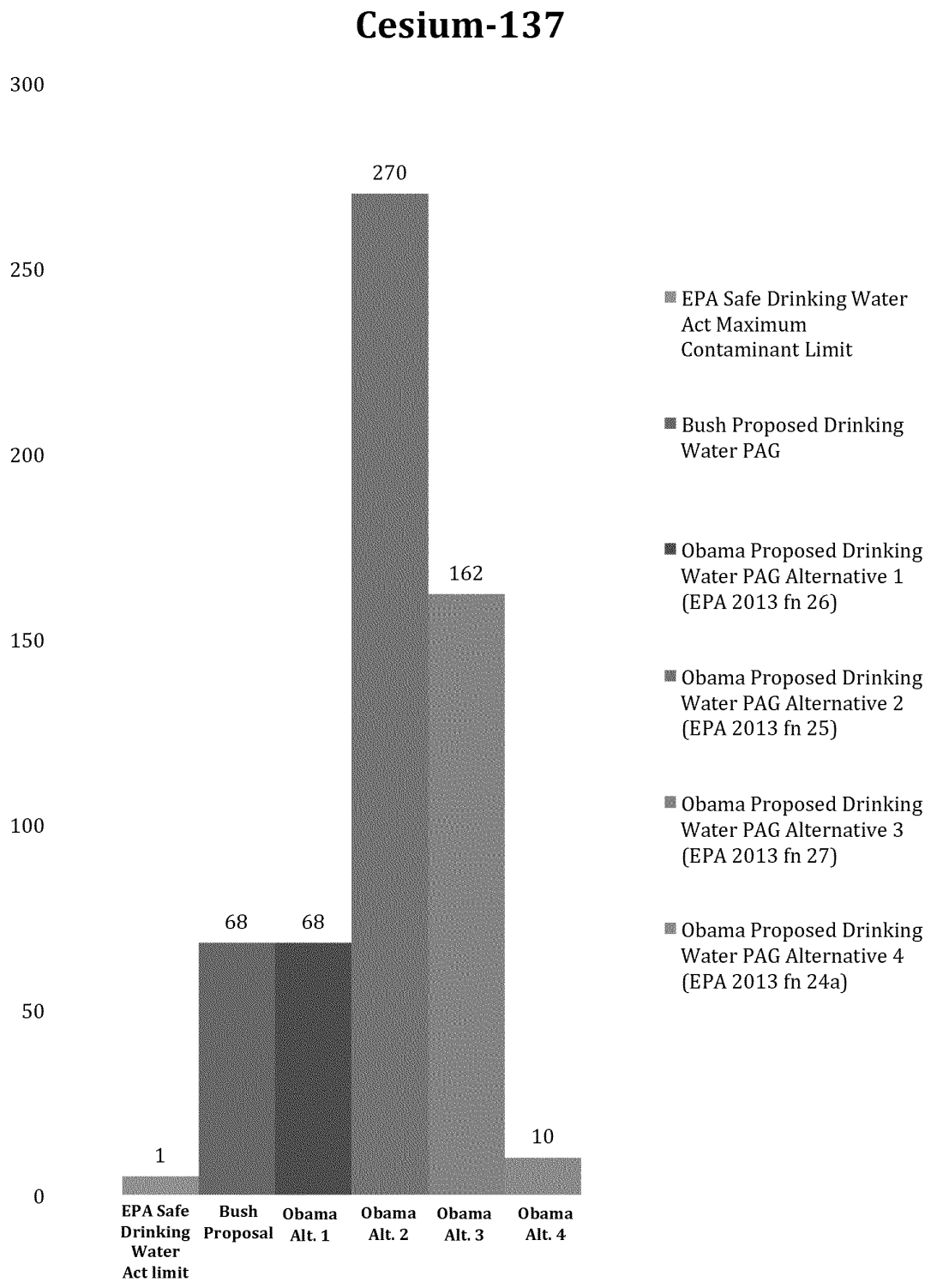

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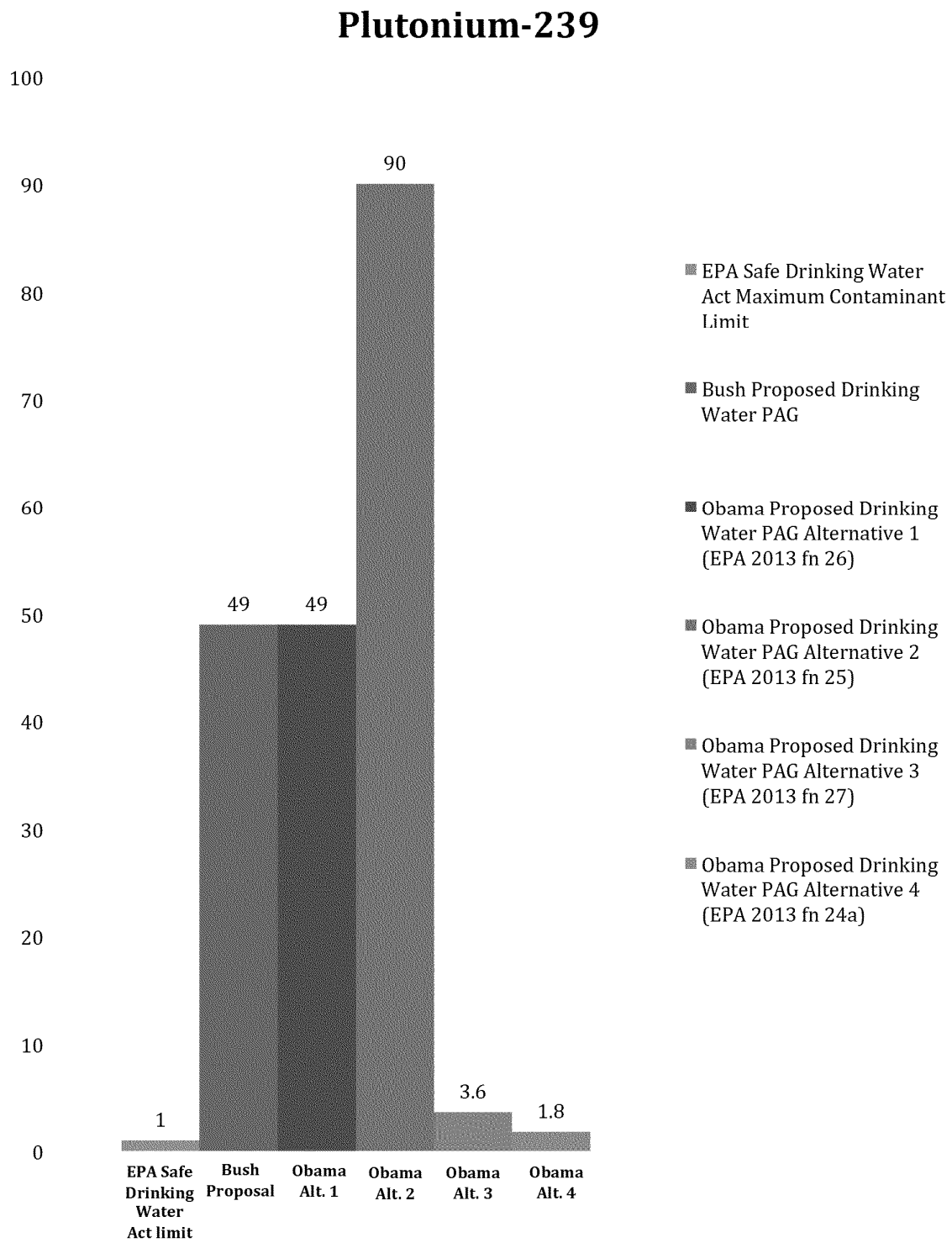


FIGURE 1a

How Many Times More Radioactivity Would be Permitted in Soil for Farmers Under NCRP Proposal Compared to EPA's Remediation Goals

(@ 95% Confidence Level)

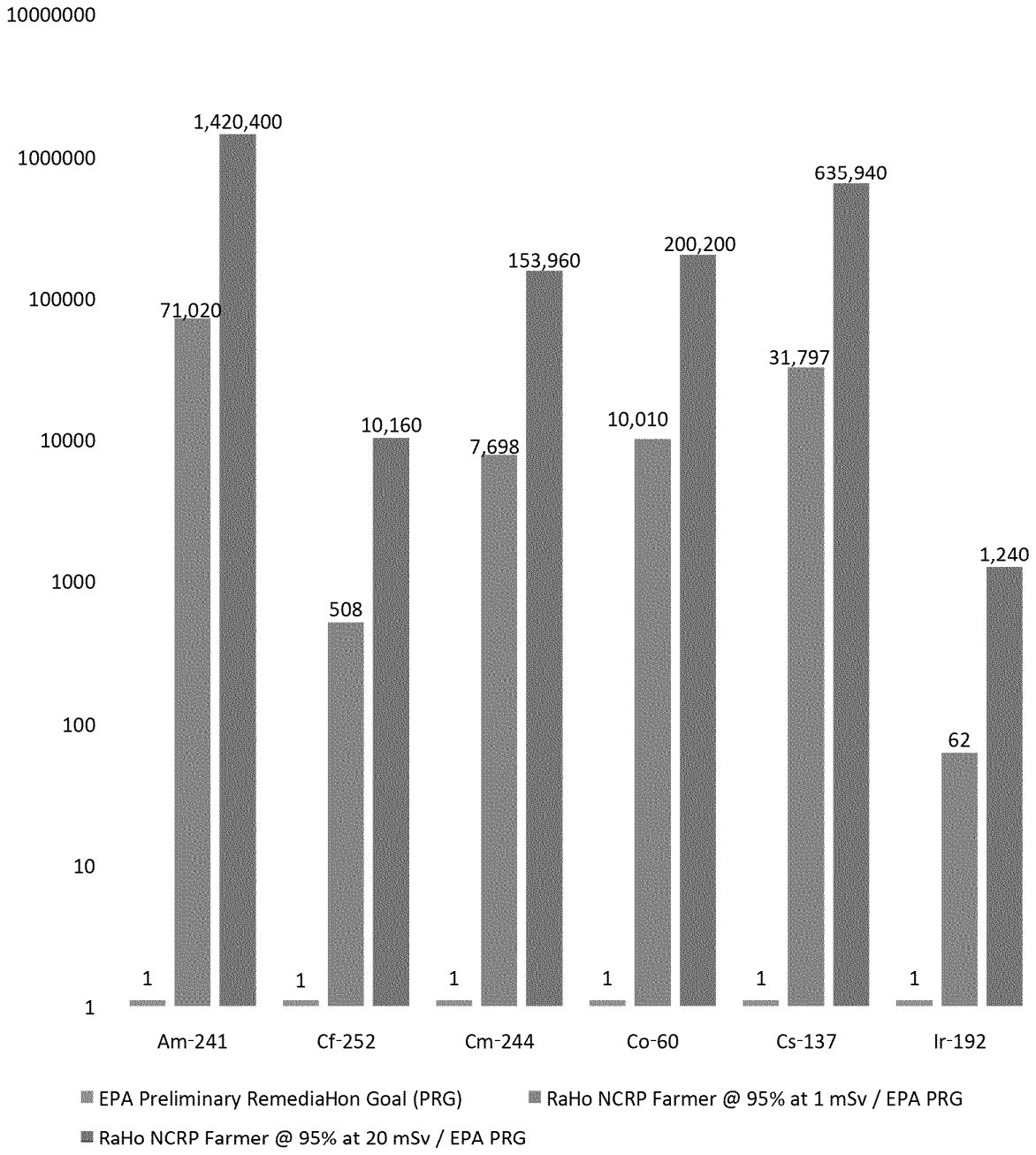


FIGURE 1b

How Many Times More Radioactivity Would be Permitted in Soil for Farmers Under NCRP Proposal Compared to EPA's Remediation Goals

(@ 95% Confidence Level)

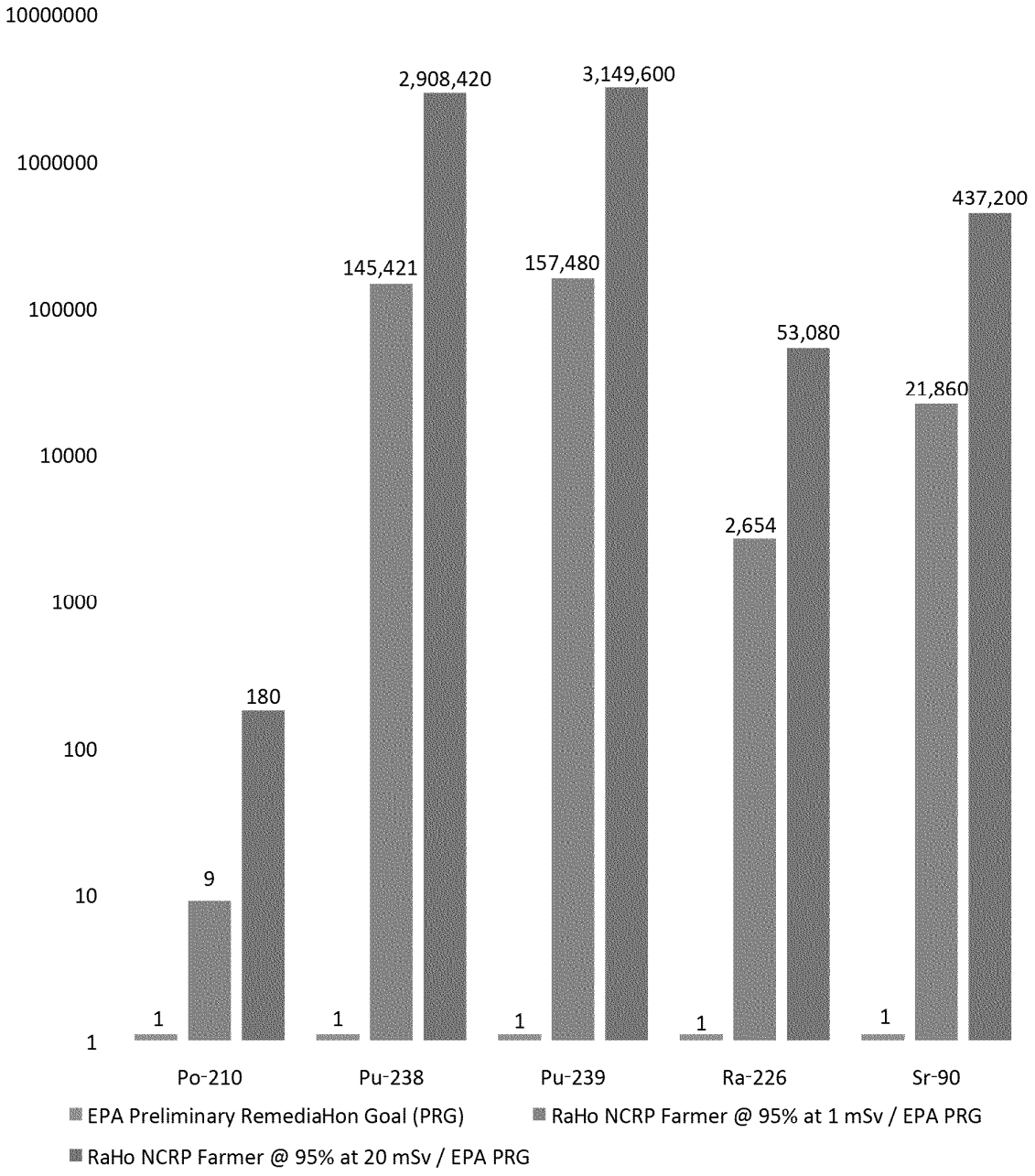


FIGURE 2a

How Many Times More Radioactivity Would be Permitted in Soil for Farmers Under NCRP Proposal Compared to EPA's Remediation Goals

(@ 50% Confidence Level)

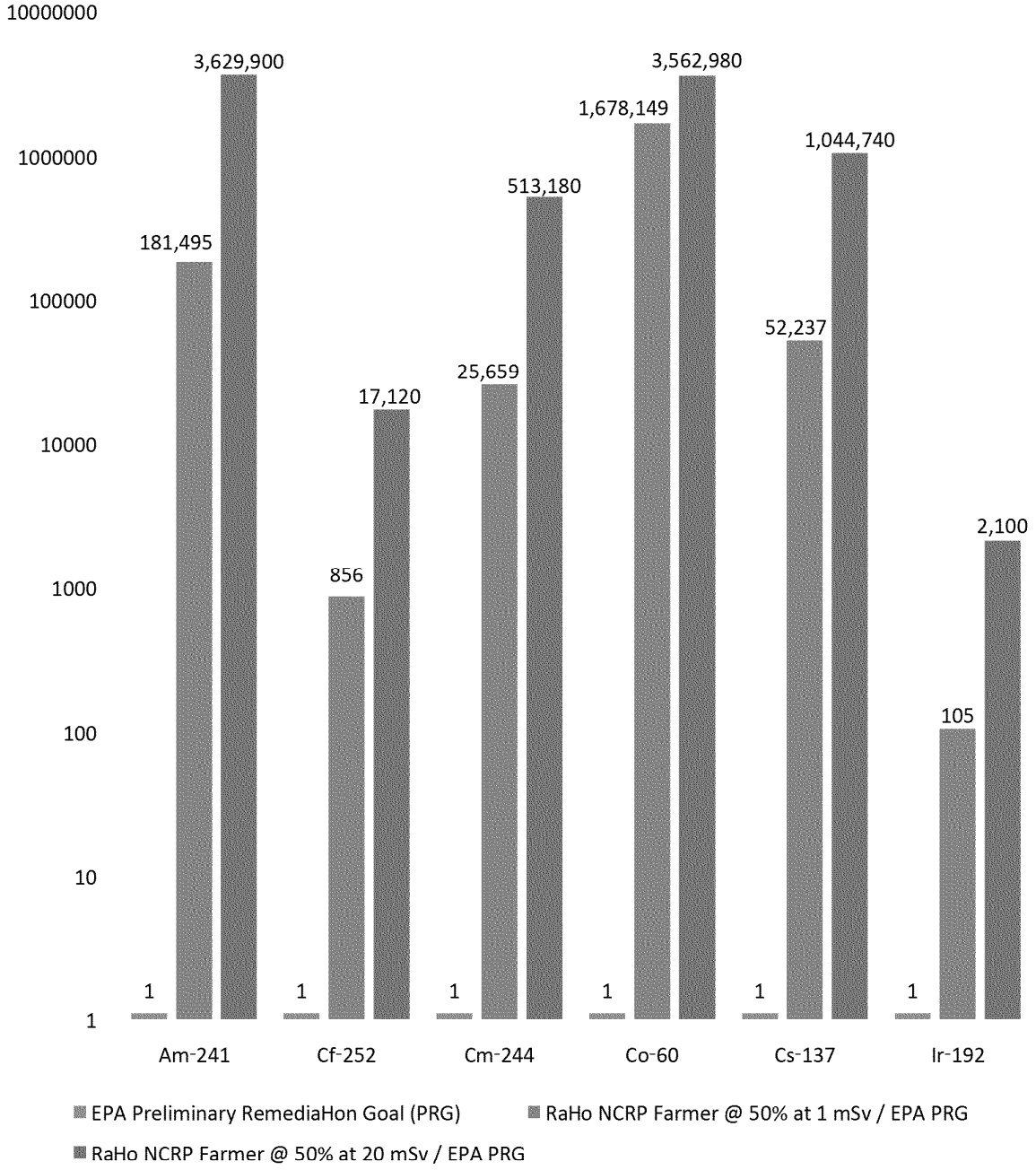


FIGURE 2b

How Many Times More Radioactivity Would be Permitted in Soil for Farmers Under NCRP Proposal Compared to EPA's Remediation Goals

(@ 50% Confidence Level)

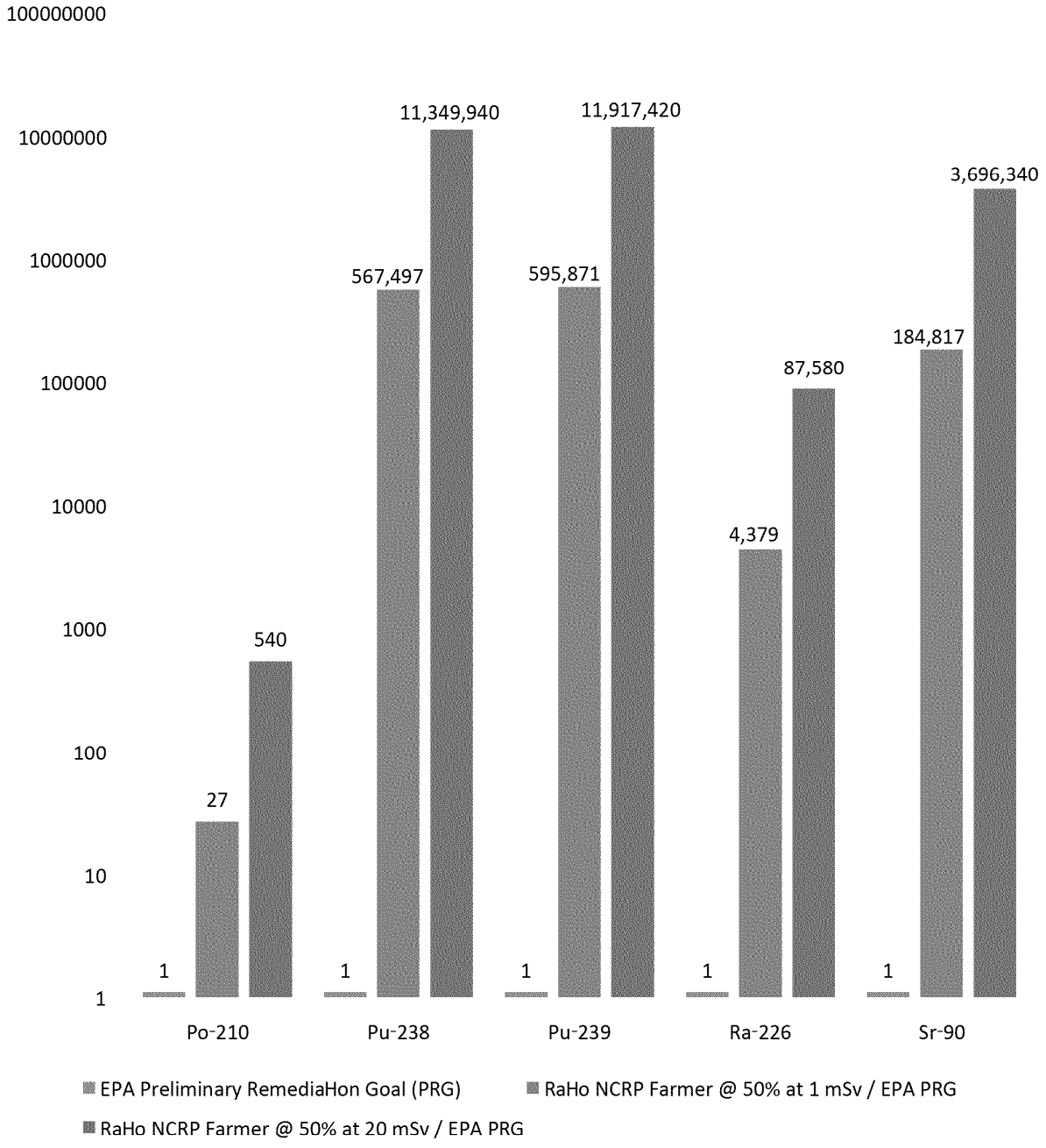


FIGURE 3a

How Many Times More Radioactivity Would be Permitted in Soil for Urban Residents Under NCRP Proposal Compared to EPA's Remediation Goals

(@ 95% Confidence Level)

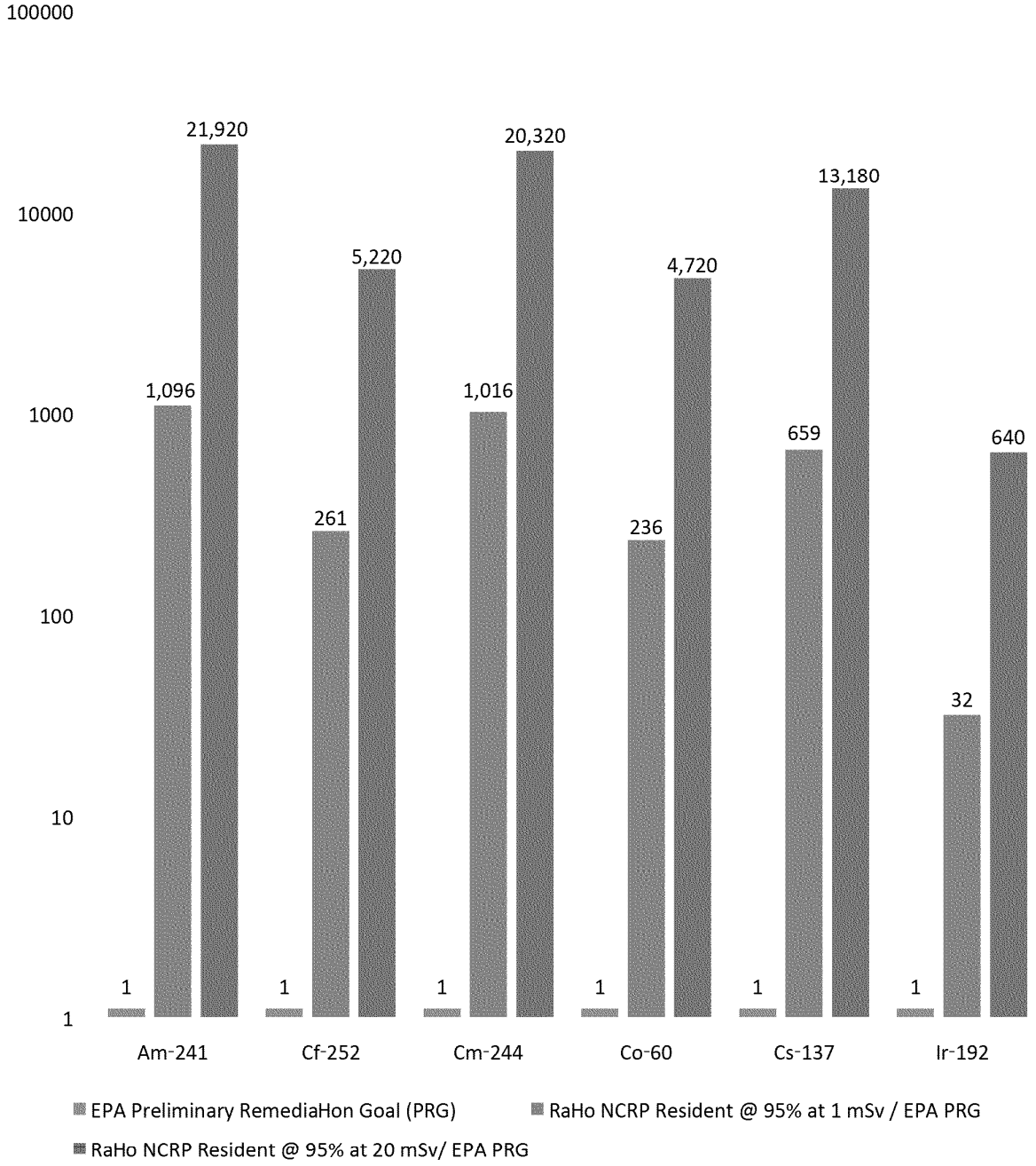


FIGURE 3b

How Many Times More Radioactivity Would be Permitted in Soil for Urban Residents Under NCRP Proposal Compared to EPA's Remediation Goals

(@ 95% Confidence Level)

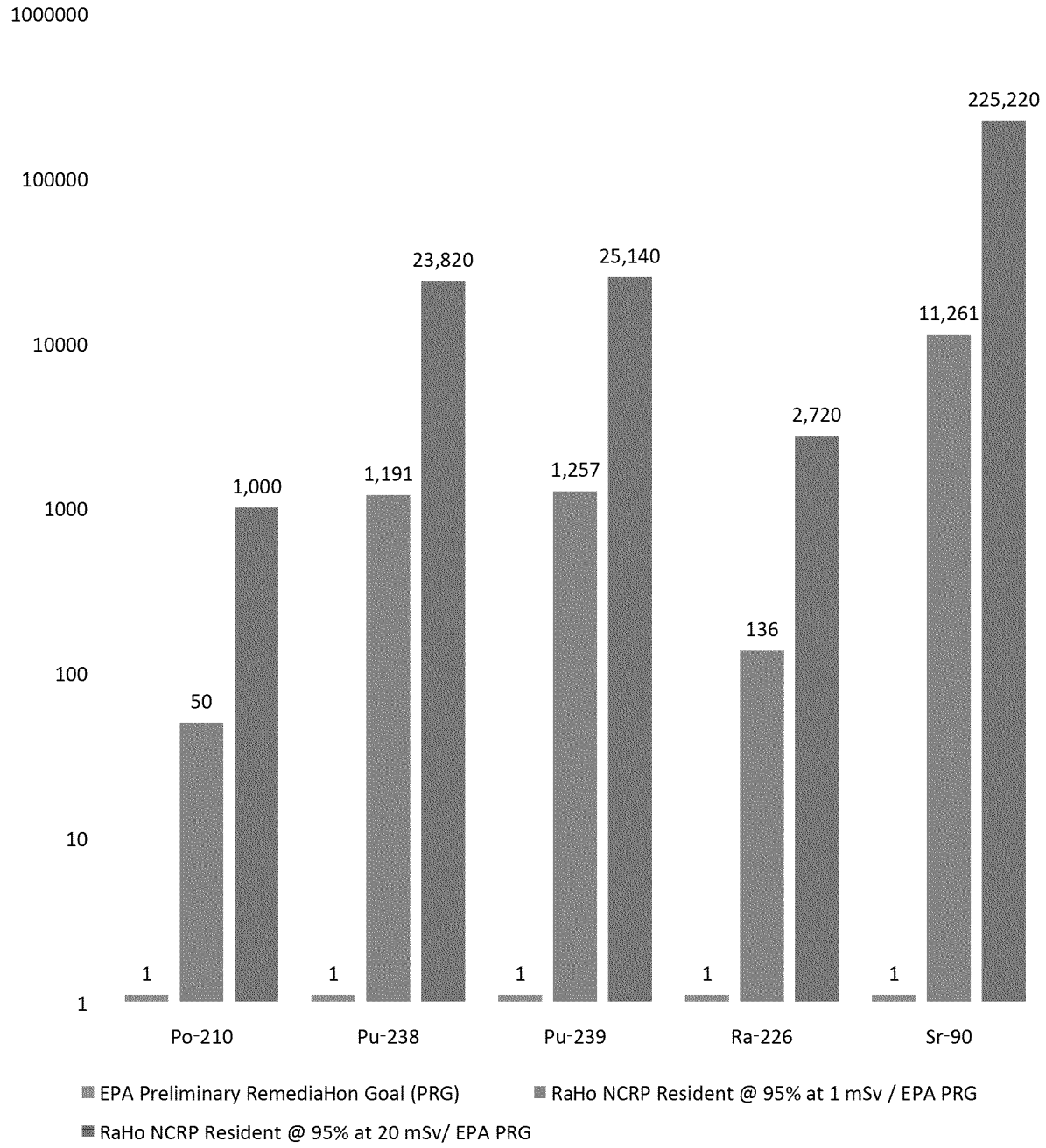


FIGURE 4a

How Many Times More Radioactivity Would be Permitted in Soil for Urban Residents Under NCRP Proposal Compared to EPA's Remediation Goals

(@ 50% Confidence Level)

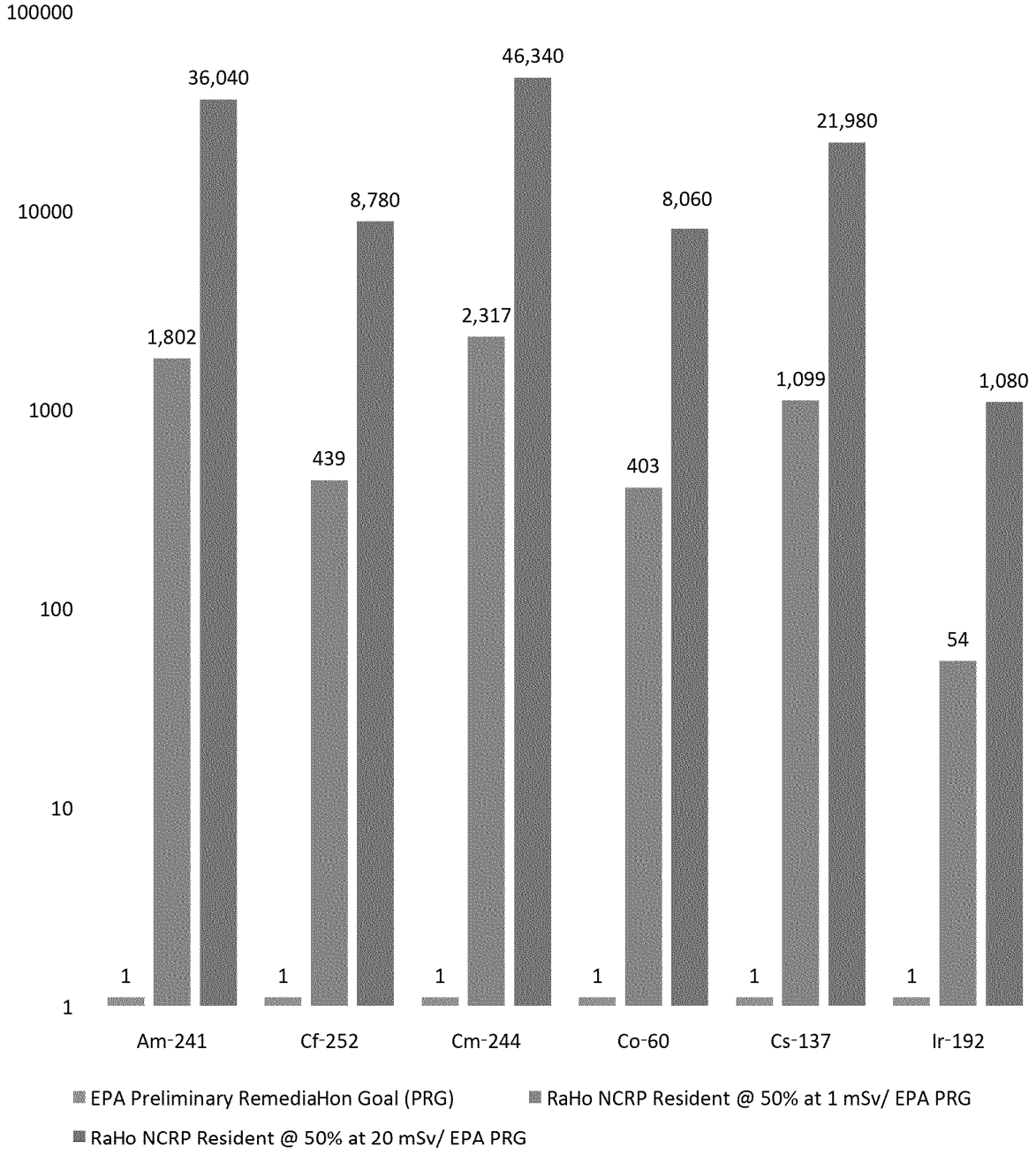


FIGURE 4b

How Many Times More Radioactivity Would be Permitted in Soil for Urban Residents Under NCRP Proposal Compared to EPA's Remediation Goals

(@ 50% Confidence Level)

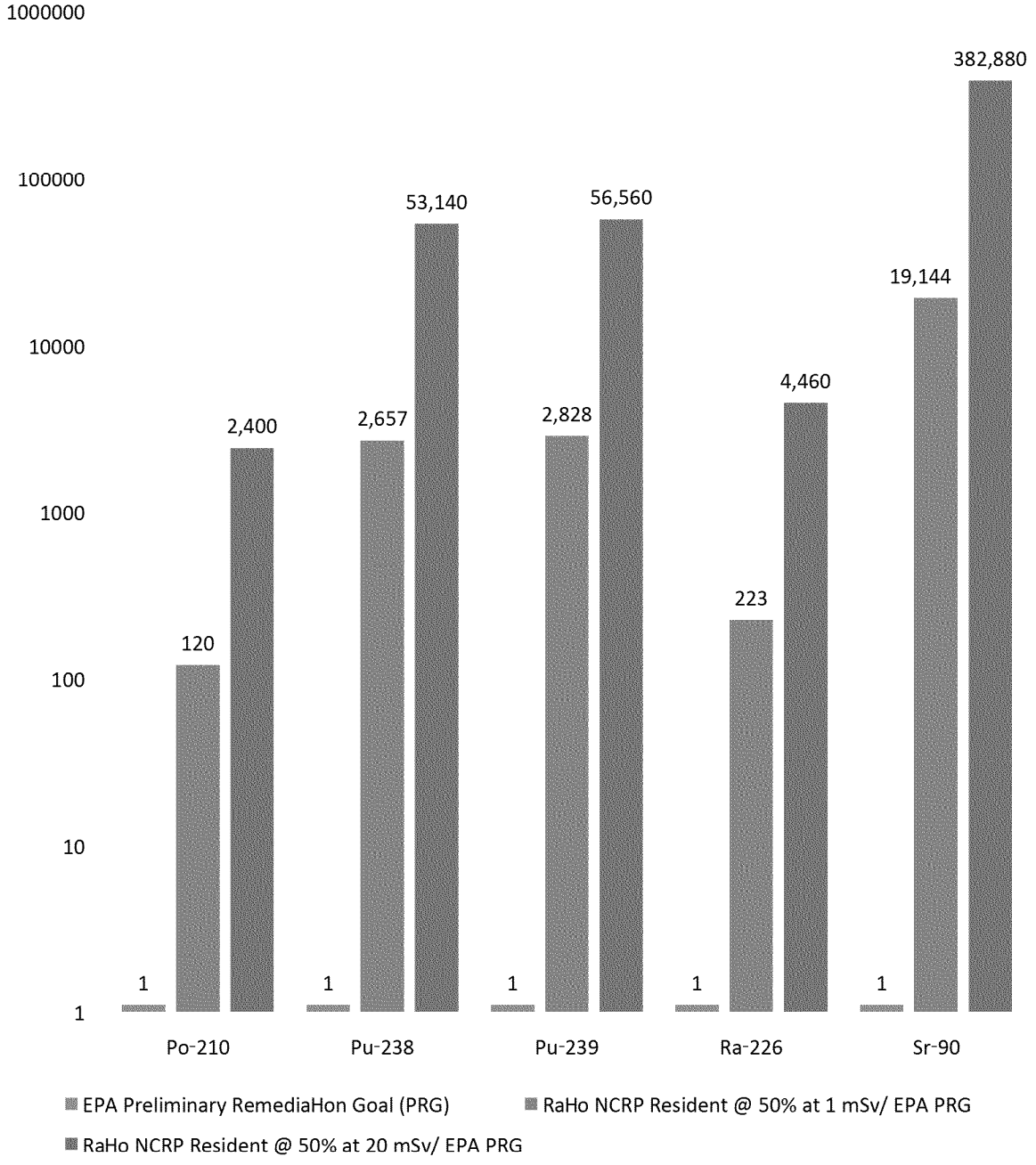


FIGURE 5a

Comparison of NCRP Proposed Permissible Concentrations of Radioactivity in Farmer's Soil in Bq/g Compared to EPA Remediation Goals

(log scale)

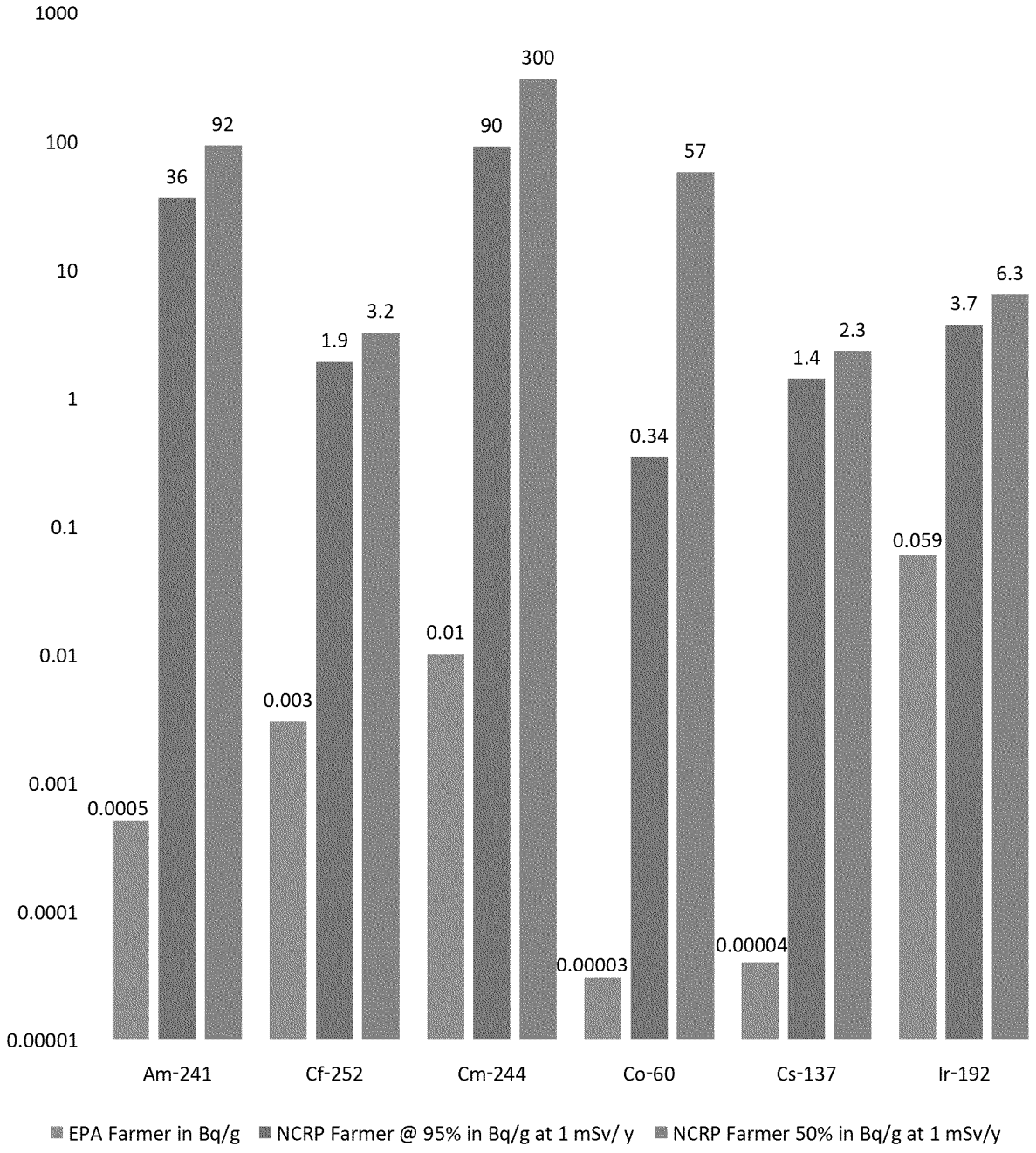


FIGURE 5b

Comparison of NCRP Proposed Permissible Concentrations of Radioactivity in Farmer's Soil in Bq/g Compared to EPA Remediation Goals

(log scale)

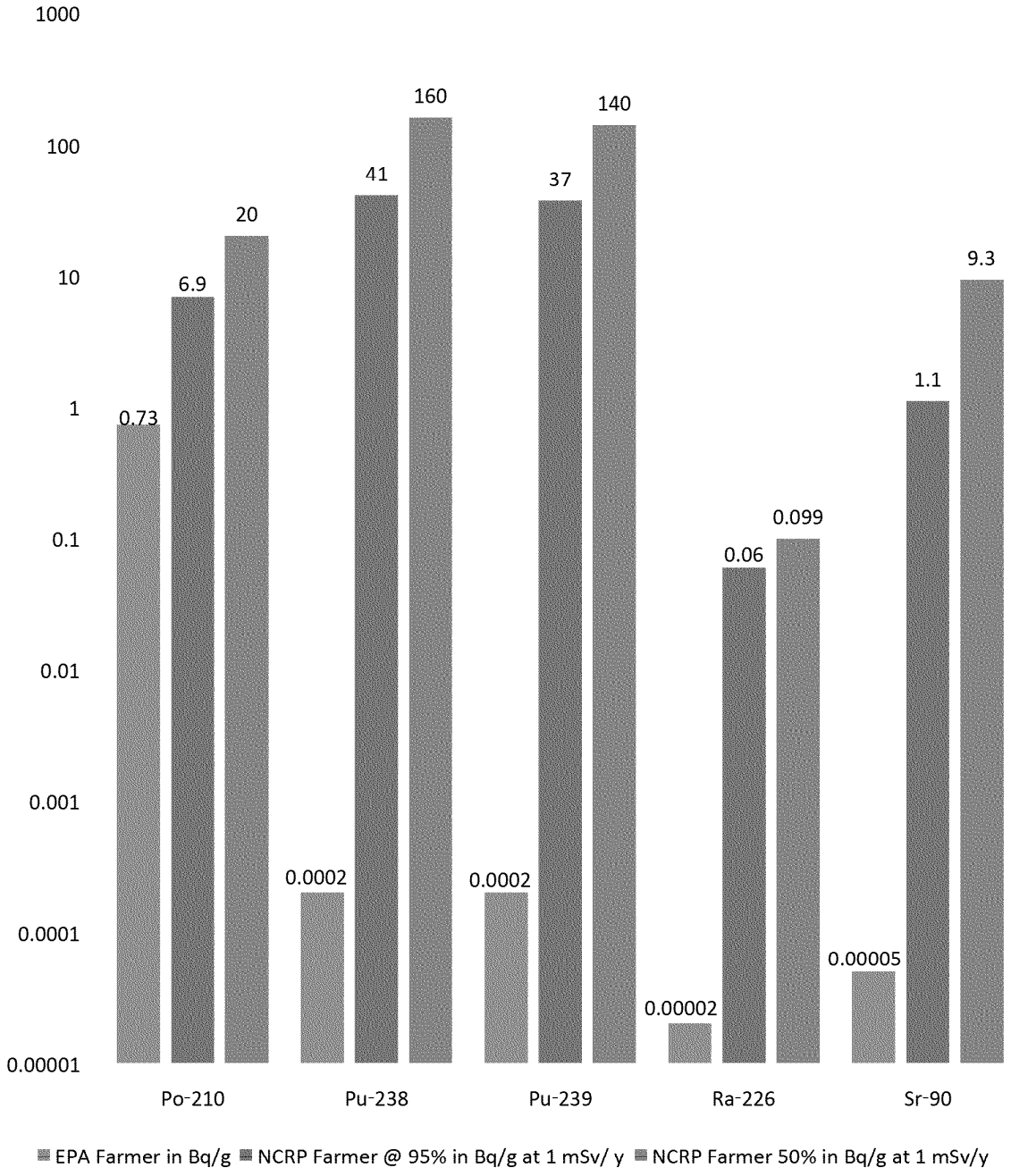


FIGURE 6a

Comparison of NCRP Proposed Permissible Concentrations of Radioactivity in Resident's Soil in Bq/g Compared to EPA Remediation Goals

(log scale)

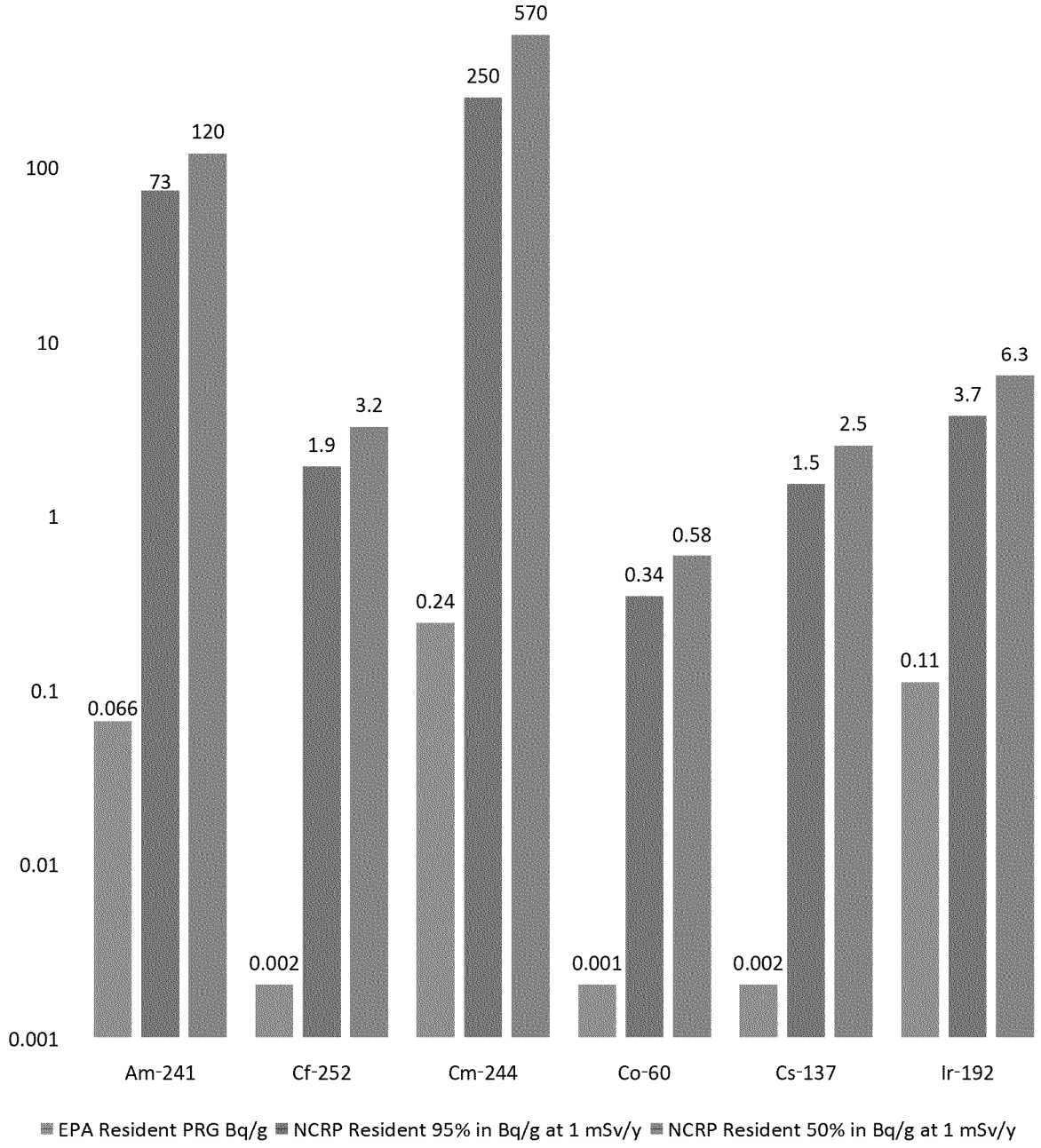
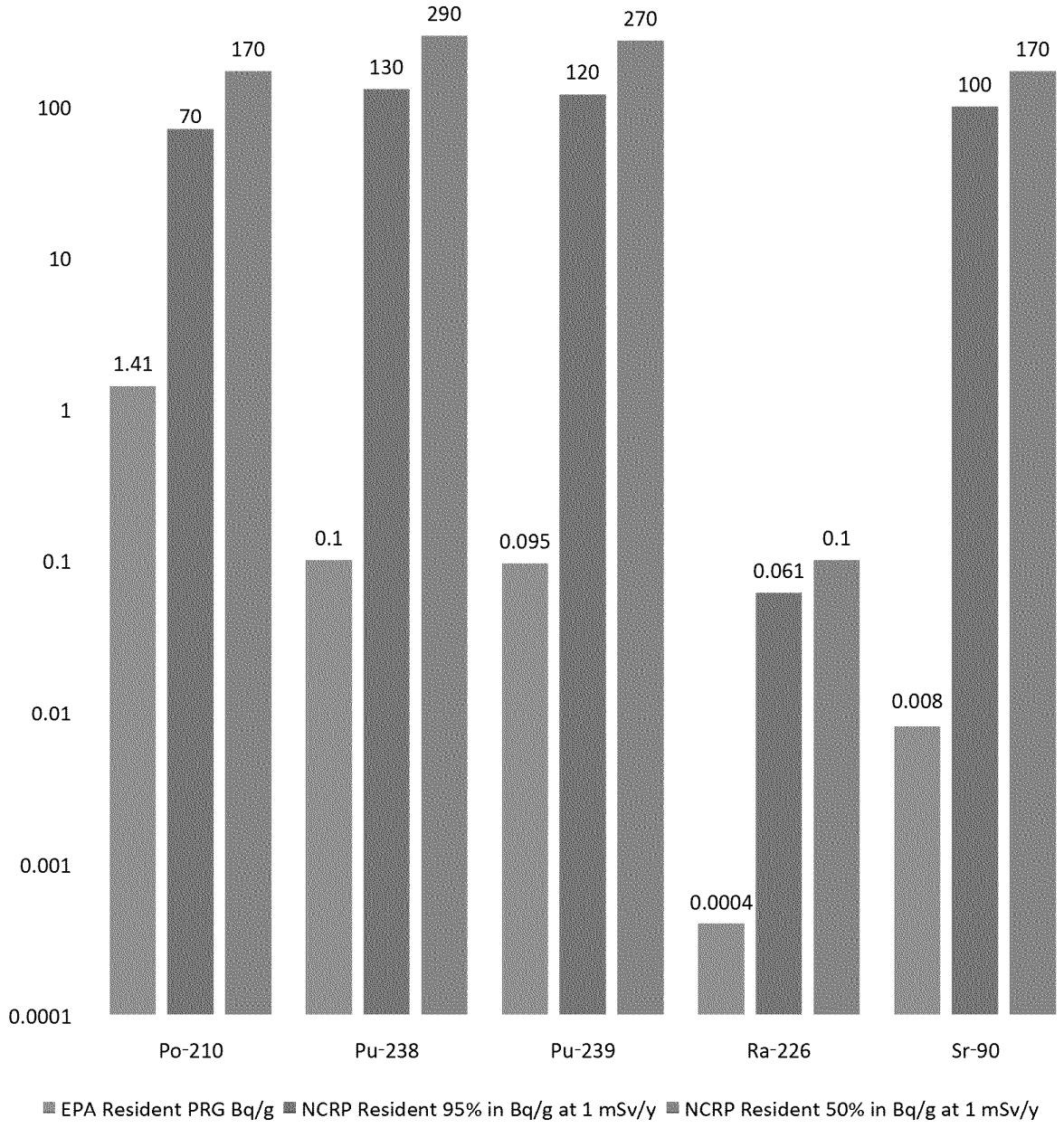


FIGURE 6b

Comparison of NCRP Proposed Permissible Concentrations of Radioactivity in Resident's Soil in Bq/g Compared to EPA Remediation Goals

(log scale)



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RE: Comments on DRAFT Protective Action Guidelines; Docket ID No. EPA-HQ-OAR-2007-0268

Dear Sara,

Attached please find my comments on the revised 2013 PAG Manual—Protective Action Guides and Planning Guidance for Radiological Incidents.

This is an impressive document that sets the foundation of our nation's radiological emergency response technical structure and the Environmental Protection Agency's continued stewardship of this doctrine is greatly appreciated.

My comments are confined to the following sections:

2.7. CONTAMINATION LIMITS AND MONITORING OF THE ENVIRONMENT AND POPULATIONS

2.8. SURFACE CONTAMINATION CONTROL

I am a Certified Health Physicist with over 20 years of experience in radiological emergency response. My comments are my own and do not represent the opinions of my employer, Lawrence Livermore National Laboratory, nor any of the organizations that I support.

Please do not hesitate to contact me if you have any questions,

Brooke Buddemeier

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Comments on 2.7. CONTAMINATION LIMITS AND MONITORING OF THE ENVIRONMENT AND POPULATIONS

Although this section is only 4 paragraphs, it has several key statements that define terms that are not consistent with the rest of the document. The second paragraph reads:

> ***"People working in the parts of the restricted areas in which their dose from the residual radioactivity would exceed 2 mrem (20 µSv) in any hour or 100 mrem (1 mSv) in a year should operate under the controlled conditions established for occupational exposure."***

With this sentence, the PAG seems to have defined a "restricted area" as being above 2 mrem/hr or 100mrem/yr without a definition of the actions that must occur within this area to protect the public or responders. Restricted to whom? For what reason?

Given that the lowest actionable level defined in the early phase is the area where an exposure could lead to **1 rem in 4 days**, this boundary would make the best actionable demarcation. Otherwise you have defined a "restricted area" that contain people who have not been provided any protective action or guidance. Presuming a steady external dose rate, 1 rem in 4 days (96 hours) would be 10.41 mrem/hr. If we round this to 10 mrem/hr, this value would be consistent with the national and internal guidance below.

This boundary is consistent with the "Hot Zone" definition of NCRP and ASTM, however I realize that different organizations define this term in different ways and a more generic "controlled" zone may be appropriate.

Controlled Area Definitions (Note: 10 mrem/h = 0.1 mSv/h = 100 µSv/h)

Agency	Zone Name	Demarcation	Numerical Value
ASTM E2601-08	Hot Zone	Hot Line	Hot line: not to exceed 10 mR/h (0.1 mSv/h) when reasonably achievable.
IAEA Manual for First Responders to a Radiological Emergency	Inner cordoned area (Hot Zone)	Safety Perimeter	Ambient dose rate of 100 µSv/h measured at 1 m above ground level or from an object; boundary of inner cordoned area.
IAEA (2003) *Method for Developing Arrangements for Response to a Nuclear or Radiological Emergency*	Inner Cordoned Area Radius (Safe Distances)	N/A	- Ambient dose readings of 100 µSv/h - 1000 Bq/cm2 gamma/beta deposition - 100 Bq/cm2 alpha deposition
CRCPD RDD Handbook (2006)	Low Radiation Zone	N/A	< 10 – 100 mR/hr within a reasonable distance of the epicenter of the blast. If there is a *large* population to be evacuated in the *low* radiation zone (< 10 - 100 mR/hr), self-decontamination at home to the extent possible may be advised.
NCRP 138	The initial alarm level is significantly higher than natural background so that		The NCRP recommends that an ambient dose rate of approximately 0.1 mSv h^{-1} is a suitable initial alarm level.

	false positive indications are avoided.		(page 98)
NCRP Commentary #19	N/A	Outer Perimeter	• 10 mR/h exposure rate (~0.1 mGy/h air-kerma rate); • 60,000 dpm/cm^2 (1,000 Bq/cm^2) for beta/gamma surface contamination; and • 6,000 dpm/cm^2 (100 Bq/cm^2) for alpha surface contamination.
NCRP 165	Hot Zone	Outer Perimeter (As defined in NCRP Commentary No. 19)	Establish the hot zone boundary if any of the following are exceeded: • 10 mR/h exposure rate (~0.1 mGy/h air-kerma rate); • 60,000 dpm/cm^2 (1,000 Bq/cm^2) for beta/gamma surface contamination; and • 6,000 dpm/cm^2 (100 Bq/cm^2) for alpha surface contamination.
The Federal Planning Guidance for Response to a Nuclear Detonation	N/A	The 0.01 R/h boundary	The area at which radiation controls should be initiated by responders.

The section's last paragraph (below) is inaccurate for reasons I detail in the next section. Specifically, ***two times (2x) the existing background*** levels is not a valid measurement for release of an object.

> ***"A contaminated item should not be released to an unrestricted area. Based on incident and locality specific considerations, it may be acceptable to release contaminated materials if the level of surface contamination is less than two times (2x) the existing background levels. As an alternative to decontamination, contaminated items (i.e., not people or animals) may be retained in the restricted area while the radiological contamination decays."***

Recommended Resolution for Section 2.7 (changes underlined)

"People working in the parts of the <u>hot zone [or controlled areas]</u> in which their dose from the residual radioactivity would exceed <u>10 mrem (100 µSv)</u> in any hour should operate under the controlled conditions established for occupational exposure."

"A contaminated item should not be released to an <u>uncontrolled</u> area. Based on incident and locality specific considerations, it may be acceptable to release contaminated materials if the level of surface contamination <u>is below acceptable release criteria</u>. As an alternative to decontamination, contaminated items (i.e., not people or animals) may be retained in the restricted area while the radiological contamination decays."

Comments on 2.8. SURFACE CONTAMINATION CONTROL

The contamination screening levels provided on pages 30-32 should be reconsidered for several reasons:

1) They are not protective of people and the environment. As written, this guidance could result in deterministic effects (e.g., acute exudative radiodermatitis) and unnecessary increased stochastic risk (e.g., skin cancer). Therefor this recommendation conflicts with the technical basis of the PAG manual.
2) The decontamination recommendations may cause more harm than benefit as the guideline to continue to attempt decontamination until below "2X Background" may result in physical harm and elevated internal uptake.
3) They are inconsistent with national and international guidelines
4) They are not scientifically derived since the concept of "2X Background" is a rule of thumb and not a measurement or traceable reference tied to a specific risk or health effect.

Although I applaud the authors for trying to find a simple solution applicable in the field, it is the purpose of this document to set technical, justified guidelines that balance the benefit of any action to the potential harm that it may cause. In this regard, the PAG should provide contamination monitoring recommendations based on the risk that contamination poses to the population, not "*derived primarily on the basis of easily measurable radiation levels using portable instruments*."

The PAG's contamination monitoring guideline should be a defendable, discrete, measureable value expressed in terms of surface contamination (e.g. Bq/m^2) or spot contamination (Bq) that can be later converted to operational procedures that are specific to the instruments and the technique used by the responders. Examples of "operationalizing" technical guidance can be found in Appendix B, "How to Perform a Radiation Survey for Contamination: Instructions for Workers," of NCRP Report No. 166 and "Handbook for Responding to a Radiological Dispersal Device. First Responders Guide—The First 12 Hours (CRCPD, 2006)"

For population monitoring, the PAG referenced CDC's 2007 (Predecisional draft) document "Population Monitoring in Radiation Emergencies: A Guide for State and Local Public Health Planners," but failed to heed the recommendation of that document

> "The initial screening criteria must focus on preventing acute health effects and must take into account the magnitude of the incident and availability of resources. The specific operational criteria provided to first responders must match the types of instruments they will be using."

Appendix C of CDC Population Monitoring guide identifies the various national and international recommendations at the time of its writing. I have summarized these recommendations below and added more recent guidance documents.

Note that the term "Screening" (as opposed to formal monitoring) is not well defined. Especially by the 2013 EPA PAG Manual which used the screening term for a variety of activities in this section.

- Defining "early screening" as when "The stations should be set up to provide simple (rapid) decontamination if needed and to evaluate whether affected people should undergo more extensive decontamination or other special care" in areas up to 5mR/hr.
- Table 2-5 defines "Emergency Screening" as twice background in areas up to 1 mR/hr.
- Table 2-6 defines "Screening Levels for People and Objects" as twice background in areas up to 0.1 mR/h

Since "2X background" is essentially based on the radiation / contamination levels at the location that measurements are being made, this resulted in 3 different "screening" levels and descriptions.

Many national guidance documents list two different monitoring levels or techniques:

- A rapid assessment level, often termed **screening**, where action is warranted to prevent adverse effects and the quickly separate people that need more immediate decontamination. Screening is often performed before decontamination and is meant for high throughput of personnel.
- A more deliberate **monitoring** level, often for post decontamination or when the number of victims is small. This monitoring is performed to look for lower levels of contamination, often taking much longer to perform.

For the purpose of this commentary, I have used the definitions above to define the categories below.

Why the guidance is <u>not protective</u>:

Without specifying an instrument efficiency and survey technique (i.e., how close and how slow) a "measurement" of "twice background" could easily miss significant contamination levels on people and objects. This is true even on the measurements made in the low background areas.

The activity of "frisking" for contamination inherently involves getting close to the surface you are checking (often within a few inches) and moving slowly over the entire surface area (2 inches per second is often used as a rule of thumb, however this could result in a 20+ minute survey for an adult using a side or end window probe). Since this is not specified, users are not likely to perform an optimal frisk.

Even when performed optimally, a moving probe <u>cannot</u> detect contamination (spot or widespread) at the same efficiency as a stationary measurement. This is especially true in an elevated background. The FEMA study sited below found that even some Pancake GM instruments could not find 1.0 µCi spot contamination (which is enough to cause acute effects) when operating in a 0.1 mR/hr background.

The ability of a person to find contamination is not only based on the detector's efficiency, but also its response time and the ability of the operator to determine the change in reading. Since an instrument type is not specified, an ion chamber (commonly used in response) could be selected which would make detection of harmful levels of difficult due to lack of audio feedback and slow response time.

Without providing amplifying information on the type of instruments to be used and the method of survey, the current screening levels used in the 2013 PAG Manual may not be able to detect contamination levels on people that could result in acute effects and increased risk of cancer, even when measurements are made in low background areas.

Why the guidance may cause more harm than benefit

In addition to potentially missing significant levels of contamination (using the wrong instrument, technique, or operating in a high background area), the "2X Background" can also result in being too sensitive when applied to a sensitive instrument held stationary over a particular spot.

This is likely to happen when contamination is discovered on a person. According to Table 2-6 of the 2013 PAG Manual, a person with detectable contamination would be sent through simple decontamination (flushing with water and wiping) and then monitored again.

Given that the location of the contamination on the body is known, the responder is likely to make a stationary, close measurement of the area with a sensitive pancake meter. Even a small amount of remaining contamination would likely resulting in another positive "2X background" reading. The person is then put through a full decontamination (washing or gentle scrubbing with soap) and monitored again.

Again, the responder is likely to make a stationary, close measurement of the area with a sensitive pancake meter, resulting in another positive "2X background" reading. These stationary, close readings can find very low levels of (< 100 dpm/cm^2) contamination that are essentially harmless to the person, but the guidance is to "***Continue to decontaminate.***"

This can result in harm as even "gentle scrubbing" if repeated several times will result in reducing the skin as a barrier, allowing the radioactive material to enter the body.

Low levels of detectable contamination are not a health risk (either acute or stochastic) and should not be managed as a medical issue requiring "special evaluation." This will deplete and distract important decontamination capabilities and medical resources from victims who have actual health risks.

Instead of "2X background," it is far better to identify a specific level of contamination that, based on calculated risk, action is warranted to avoid the exposure. An example of this calculation can be found in the FEMA document (Background information of FEMA-REP-22) which uses dose conversion factors of EPA 520/1-89-016 *Evaluation of Skin and Ingestion Exposure Pathways* to convert skin contamination to skin dose at a skin depth of 7 mg/ cm^2 to derive the threshold Minimum Detectable Level of activity on a 0.2 cm^2 spot to **avoid** acute exudative radiodermatitis. Similar calculations were done to calculate protection from skin cancer.

For both spot and widespread skin contamination, protective threshold surface contamination values were calculated for both fixed (presumed prolonged exposure) and loose (easily decontaminated, therefore shorter exposure) contamination. See the top line of table below for more information.

Examples of national and international guidance for contamination

Source	Screening Level	Monitoring or Post Decon Level	Notes
Contamination Monitoring Guidance for Portable Instruments Used for Radiological Emergency Response to Nuclear Power Plant Accidents, Federal Emergency Management Agency, FEMA-REP-22, October 2002	Acute: Spot contamination of 1.0 µCi (37 kBq) Stochastic: 0.04 µCi/cm2, (1.5 kBq/cm^2 or 90,000 dpm/cm^2) Operationally, this resulted in: 10 mR/h (CDV-718 GM); 10,000 cpm (CDV-700 Pancake); or 100,000 CPM (modern GM Pancake)	Acute: Spot contamination of 0.1 µCi (3.7 kBq) Stochastic: 0.004 µCi/cm2 (0.15 kBq/cm^2 or 9,000 dpm/cm^2) Operationally, this resulted in: 1 mR/h (CDV-718 GM) or 1,000 cpm (CDV-700 Pancake); or 10,000 CPM (modern GM Pancake)	It was presumed that the ***screening level*** referred to the limit on "loose contamination" which is presumed to stay on the person 36 hours. The (lower) ***monitoring level*** was for the limit on fixed contamination and presumed to stay on the person 2 weeks. Note: both acute (spot) and stochastic (uniform distribution) activity levels result in similar detectability for each column, noted as the operational measurements for two different types of instruments.
Key Elements of Preparing Emergency Responders for Nuclear and Radiological Terrorism, National Council on Radiation Protection and Measurements (NCRP) Commentary No. 19, December 2005	Spot contamination on the skin exceeding 1 µCi (37 kBq) have priority for decontamination.	Decontamination procedures should "strive to reduce" surface contamination to below the following limits: • *0.1* µCi *(3.7 kBq) on any one spot.* • *10,000 dpm/cm^2 (167 Bq/cm2) surface body contamination*	Note that NCRP contamination guides are numerically similar or equal to FEMA's limits, however they are stated in different ways: The ***screening level*** is defined as the level when a person becomes a priority for decontamination (i.e., action is **warranted**). The (lower) ***monitoring level*** is defined as the level that "decontamination procedures should strive to achieve"
Handbook for Responding to a RDD. First Responder's Guide— the First 12 Hours, Conference of Radiation Control Program Directors, Inc.(CRCPD), 2006	*In case of a large incident or if adequate resources are not available: GM Pancake Probe: 10,000 cpm (0.05 mR/h using a gamma detector)*	*GM Pancake Probe: With contamination levels up to 1,000 cpm, people can be instructed to go home and shower*	The CRCPD manual takes the opposite approach of defining a level below which people can *be instructed to go home and shower,* instead of defining a level above which some action should be taken.

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Manual for First Responders to a Radiological Emergency, International Atomic Energy Agency (IAEA), October 2006	0.1 mrem/h (1 µSv/h) measured at 10 cm (4 inches) from the body *>600,000 dpm/cm2 (10,000 Bq/cm2) beta/gamma contamination.* *> 60,000 dpm/cm2 (1,000 Bq/cm2) for alpha contamination.*		*"These criteria indicate the level of skin contamination which could represent a hazard from direct irradiation of the skin, from intake by inadvertent ingestion, or that could indicate that the person has already inhaled or ingested significant amounts of radioactive material."* *"The criteria were established at levels which are below those at which contaminated people would experience deterministic health effects warranting medical treatment or follow-up. The criteria were established at levels which are below those at which contaminated people would experience deterministic health effects warranting medical treatment or follow-up."*
NCRP Report No. 165: Responding to a Radiological or Nuclear Terrorism Incident: A Guide for Decision Makers (2010)	>0.1 mR h_{-1} exposure rate (~1 µGy h_{-1} air-kerma rate) at 10 cm, >600,000 dpm cm^2 (10,000 Bq cm^2) beta and gamma surface contamination, or >60,000 dpm cm^2 (1,000 Bq cm^2) for alpha surface contamination		Essentially the same screening levels as IAEA (2006): *"Decontamination (skin and clothing) should always be performed [at the Screening levels]."* *"Target levels for adequate decontamination should be in the local and regional emergency plans, but may be modified at the time of the response. These levels may be different than "any detectable level of contamination" and depending on the number of people to be monitored may make surveys with this level of detail impractical (CRCPD, 2006; NCRP, 2005)."*
NCRP Report No. 166: Population Monitoring and Radionuclide Decorporation Following a Radiological or Nuclear Incident (2010)		1,000 cpm using a *GM Pancake probe. This document estimated this contamination to be* ~670 dpm/cm^2*(see below)*	Although the 1,000 cpm value was listed as "screening," the text indicated it was a non-urgent value in alignment with the monitoring definition above: "*Persons with more than this level of contamination on their skin should be decontaminated when it is possible and appropriate to do so, and persons with less than this level of contamination may be sent home."*

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Not Scientifically Derived:

The stated technical basis is that the "screening levels are examples derived primarily on the basis of easily measurable radiation levels using portable instruments," which is not a risk derived basis. The 2013 PAG Manual should set objective guidelines based on risk, not "whatever can measured." It should be up to the implementing organizations to then determine how to use their instruments to meet the requirement, or obtain instruments that can meet the need.

An example of a more rigorous risk and dose based derivation can be found in "Contamination Monitoring Guidance for Portable Instruments Used for Radiological Emergency Response to Nuclear Power Plant Accidents, Federal Emergency Management Agency, FEMA-REP-22," October 2002 shown in the table above. The following is quoted from the document.

> **Acute Exudative Radiodermatitis threshold dose was calculated** "based on dose conversion factors in Appendix B of EPA 520/1-89-016 *Evaluation of Skin and Ingestion Exposure Pathways* (Reference 4) for the mix of radionuclides assumed to be associated with a major reactor accident, the factor to convert skin contamination to skin dose at a skin depth of 7 mg/cm^2, is about 7 rem/h per µCi/cm^2. Therefore, if the activity is concentrated in a 0.2 cm^2 area, then the threshold MDL of activity on the spot to **avoid** acute exudative radiodermatitis is **34 µCi h** (i.e., 1,200 rem on a spot / 7 rem per µCi h/cm^2 x 0.2cm^2). Dividing 34 µCi h by 36 h and 336 h of exposure yields **0.95 µCi** and **0.10 µCi** for loose and fixed contamination respectively."
>
> **Skin Cancer Risk was calculated** based on a "time-integrated concentration on the skin that would produce a dose of 10 rem. The factor to convert from time-integrated skin contamination to a dose of 10 rem is **1.4 µCi h/cm^2** (i.e., 10 rem /7 rem per µCi h/cm^2). To determine the time-integrated activity necessary to yield a dose of 10 rem to the skin of the whole body, it is necessary to multiply the time-integrated concentration per square centimeter that will yield a dose of 10 rem times the area of the skin on the whole body (about 18,000 cm^2 for an adult)… [T]he threshold level corresponding to adequate protection of the public from skin cancer under emergency conditions is a time-integrated activity of **25,200 µCi h** (i.e., 1.4 µCi h/ cm^2 x 18,000 cm^2). This is independent of the distribution of the contamination on the skin. Dividing 25,200 µCi h by 36 h and 336 h of exposure yields rounded values of **700 µCi** and **75 µCi** for loose and fixed contamination respectively. Since a portable instrument would view only a small area of skin, the threshold level in activity per unit area (µCi/ cm^2) is of interest. This is calculated by dividing the activity on the total body by the area of the skin of the total body (18000 cm^2). This yields **0.039 µCi/cm^2** and **0.0042 µCi/ cm^2** as the concentrations of concern regarding risk of cancer from loose and fixed widespread contamination respectively."

Another example of a rigorous derivation can be found in NCRP Report No. 166: Population Monitoring and Radionuclide Decorporation Following a Radiological or Nuclear Incident (2010):

"The area of a typical pancake-type detector is 15 cm^2. If the counting efficiency of the detector is 10%, then 1,000 cpm in the area beneath the detector corresponds with a total of 10,000 dpm over 15 cm^2 (~670 dpm/cm^2). Calculations performed using VARSKIN 3 (Durham, 2006) indicate that skin dose from ^{90}Sr (a high-energy beta emitter) contamination is 2.5×10^{-2} µSv/h (2.5×10^{-3} mrem/h) for 1 dpm-cm, so 670 dpm/cm^2 result in a skin dose of ~16.5 µSv h_{-1} (1.65 mrem/h). This level of exposure will produce a radiation dose of <0.5 mSv (50 mrem) to the skin even if left unwashed for 24 h and poses no physical risk to the contaminated person. Assuming more realistic counting efficiencies for high-energy beta emitters (many pancake-type GM probes are 30 to 40 % efficient for this energy of beta radiation) reduces the dose further. An action level of 1,000 cpm should remain protective of health from uptake through broken skin (*e.g.*, wounds) or through the mouth or nose. The amount of radioactivity contained in 670 dpm is ~112 Bq (~4 nCi). This level of uptake is much lower than the most limiting CDG listed in Table 3.14 of NCRP Report No. 161 [5,200 Bq (0.14 µCi) for ^{227}Ac] (NCRP, 2008a)."

Note that NCRP 166 derived surface contamination of ~670 dpm/cm^2 was to avoid a dose of 0.05 rem if the material stayed on the skin for 24 hours. Using this methodology on the 2013 PAG Manual's organ specific dose guidance of 5 rem (inferred by Table 1-1), then the skin contamination guideline would be closer to 67,000 dpm/cm^2

As a comparison, if we convert the FEMA guidance of 90,000 dpm/cm^2 (based on 10 rem skin dose over to 36 hours) to the equivalent 5 rem skin dose in 24 hours, we would get a remarkably similar 67,500 dpm/cm^2. This demonstrates consistent results despite the different calculation methods.

Emergency deposition and unconditional release of contaminated vehicles and equipment:
During the emergency phase, the IAEA emergency response guidance provided guidance for potentially contaminated equipment and vehicles may be useful, I have converted to traditional units:

Equipment or vehicle contamination criteria

For use by first responder monitor:
Ambient dose rate at 10 cm:
> 0.1 mR/h (1 µSv/h) and < 1 mR/h (10 µSv/h): use of equipment or vehicle for response activities only
> 1mR/h (10 µSv/h) and < 10 mR/h (100 µSv/h): allow use of equipment or vehicle for critical response activities only
> 10mR/h (100 µSv/h): isolate equipment or vehicle and use only with radiological assessor approval

Discussion
These criteria can only be used to assess contamination from gamma emitters and can not be used to adequately assess beta and alpha contamination which could represent a hazard from intake by inadvertent ingestion or skin dose from contamination. Therefore the response personnel using equipment that may be contaminated should always take actions to reduce intake from inadvertent ingestions (e.g. wash hands and face) and skin dose from contamination (e.g. wear gloves).

The criteria were set up on the levels to ensure that responders are protected and that critical equipment will remain available:

> 0.1 mR/h (1 µSv/h) and < 1 mR/h (10 µSv/h):
At this level there is no hazard of severe deterministic health effects from external exposure. This level was established to be consistent, assuming a 10% transfer rate, with that at which public and responders would be advised to be decontaminated in accordance with Instruction 5.
> 1mR/h (10 µSv/h) and < 10 mR/h (100 µSv/h):
Allow use of critical items. This level may be the lowest ambient dose rate that can be effectively measured near the boundary of the inner cordoned area. For gamma emitters the dose resulting from the use of items contaminated at this level will be well below that resulting in severe deterministic health effects.
> 10mR/h (100 µSv/h):
Isolate and do not use without approval of radiological assessor. This criterion is at a level that *should be* well below that resulting in severe deterministic health effects for gamma emitters. However, it was selected to ensure that severe deterministic health effects are not possible taking into account uncertainties in measurement techniques.
Generally conservative assumptions were used to establish these criteria. It is assumed that the contaminated area is almost in contact, through clothing, with a specific area of tissue for 10 hours. Experience has shown that a much lower dose would be expected in the tissue due to movement of the source relative to the tissue over the 10 hours. It is also assumed that the ambient dose rate to the tissue itself is 1000 or more times the ambient dose rate measured at 10 cm. Assumptions used in calculation will overestimate the ambient dose rate to the tissue for most contamination scenarios (e.g. if the contamination covers an area of more than about 1 cm^2).

When not in the emergency phase, acceptable guidance can be found in standards like **ANSI/HPS N13.12-1999: Surface and Volume Radioactivity Standards for Clearance. Table 1 of that standard is provided for reference.**

Table 1 Screening levels for clearance

Radionuclide Groups[a]	Screening Levels (S.I. Units)[b]	Surface Screening (Conventional Units)[b]	Volume Screening (Conventional Units)[b]
	(Bq/cm^2 or Bq/g)[c]	(dpm/100 cm^2)	(pCi/g)
Group 1 Radium, Thorium, and Transuranics: ^{210}Po, ^{210}Pb, ^{226}Ra, ^{228}Ra, ^{228}Th, ^{230}Th, ^{232}Th, ^{237}Np, ^{239}Pu, ^{240}Pu, ^{241}Am, ^{244}Cm, and associated decay chains[d], and others[a]	0.1	600	3
Group 2 Uranium and Selected High Dose Beta-Gamma Emitters: ^{22}Na, ^{54}Mn, ^{58}Co, ^{60}Co, ^{65}Zn, ^{90}Sr, ^{94}Nb, ^{106}Ru, ^{110m}Ag, ^{124}Sb, ^{134}Cs, ^{137}Cs, ^{152}Eu, ^{154}Eu, ^{192}Ir, ^{234}U, ^{235}U, ^{238}U, Natural Uranium[e], and others[a]	1	6,000	30
Group 3 General Beta-Gamma Emitters: ^{24}Na, ^{36}Cl, ^{59}Fe, ^{109}Cd, ^{131}I, ^{129}I, ^{144}Ce, ^{198}Au, ^{241}Pu, and others[a]	10	60,000	300
Group 4[f] Other Beta-Gamma Emitters: ^{3}H, ^{14}C, ^{32}P, ^{35}S, ^{45}Ca, ^{51}Cr, ^{55}Fe, ^{63}Ni, ^{89}Sr, ^{99}Tc, ^{111}In, ^{125}I, ^{147}Pm, and others[a]	100	600,000	3,000

(a) To determine the specific group for radionuclides not shown, a comparison of the effective dose factors, by exposure pathway, listed in Table A.1 of NCRP Report No. 123I (NCRP 1996) for the radionuclides in question and the radionuclides in the general groups above shall be performed and a determination of the proper group made, based on similarity of the factors.
(b) Rounded to one significant figure.
(c) The screening levels shown are used for either surface activity concentration (in units of Bq/cm^2), or volume activity concentration (in units of Bq/g). These groupings were determined based on similarity of the scenario modeling results, as described in Annex B.
(d) For decay chains, the screening levels represent the total activity (i.e., the activity of the parent plus the activity of all progeny) present.
(e) Where the Natural Uranium activity equals 48.9% from ^{238}U, plus 48.9% from ^{234}U, plus 2.25% from ^{235}U.
(f) Radionuclides were assigned to groups that were protective of 10 µSv/y (1.0 mrem/y) and were limited to 4 groups for ease of application, as discussed in Annex B.

Recommended Resolution for Section 2.8

For the reasons discussed above the "2X background" as a PAG reference value is inappropriate for a final evaluation of a person's risk, though it can be used in high background areas as an indicator of "something significant." However it should not be used as unconditional release criteria as measurements made in high background areas can hide significant contamination.

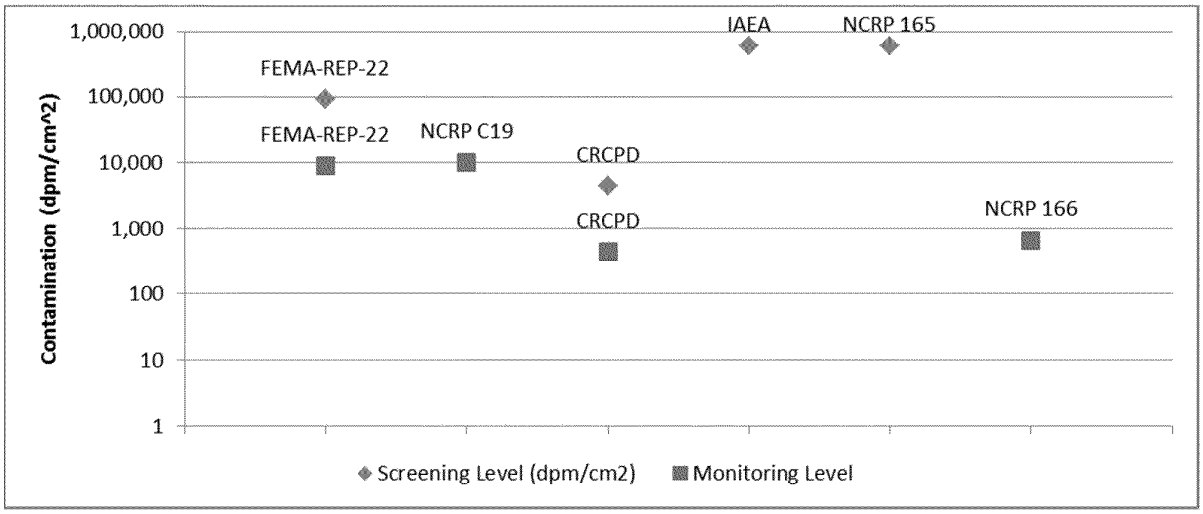
Suggested revision of paragraph #4:

***When early screening is needed after a major incident*— After plume passage, it may be necessary to establish emergency contamination monitoring stations in areas not qualifying as low background areas. Gamma exposure rates in such areas should be less than 10 millirem (100 µSv) per hour. These monitoring stations should be used only during the early phase after major atmospheric releases to monitor people emerging from possible contamination areas. The stations should be set up to provide simple (rapid) decontamination if needed and to evaluate whether affected people should undergo more extensive decontamination or other special care. Table 2-5 provides guidance on surface contamination levels for use if such centers are needed.**

Table 2-5. Recommended Surface Contamination Screening Levels for Emergency Screening of People and Objects at Screening Station in High Background Radiation Areas (0.1 mR/h to 10 mR/h Gamma Exposure Rate)

Ambient dose rate at 10 cm from surface	**Recommended Action**
<2x existing background	Forward to low background area for further screening
>2x existing background, or > 0.1 mR/h (1 µSv/h) and < 1 mR/h (10 µSv/h)	Use of equipment or vehicle for response activities only*
> 1mR/h (10 µSv/h) and < 10 mR/h (100 µSv/h)	Allow use of equipment or vehicle for critical response activities*
> 10mR/h (100 µSv/h)	Isolate equipment or vehicle and use only with RadCon approval*
>2x existing background on person	Decontamination if available then forward to low background monitoring area for further assessment.
Screening stations in such high exposure rate areas are for use only during the early phase of an incident. Screening is performed rapidly (< 5 minutes) on each person or object, often checking only likely contamination areas on the object or person.	

As noted above, there is not an accepted standard for appropriate monitoring levels. As can be seen by the chart below national and international recommendations vary by orders of magnitude. However the concept and technical bases for these standards lay the groundwork for an appropriate 2013 PAG Manual reference level.



Using the calculation method provided in FEMA-REP-22 and NCRP 166, a new table 2-6 can be constructed based on dose and risk values that align with the technical basis of the 2013 PAG Manual. To do this, the 2013 PAG Manual authors need to define:

1) What is the skin dose (organ dose) where actions are suggested or warranted?
2) What is the presumed length of exposure, particularly the presumed time before initial decontamination?

Example Revised Table Text

If, for example, the actionable skin dose is 10 rem and the assumed time to decon (without assistance) is 36 hours then the monitoring objective can be based on FEMA-REP-22 (which is guidance that is already in practice for nuclear power response).

Table 2-6. Recommended Surface Monitoring Levels for People[a] and Objects at Monitoring Stations in Low Background Radiation Areas (<0.1 mR/h Gamma Exposure Rate)

Measurement Criteria	**Recommended Action**
Equipment: dose rate at 10 cm from surface of > 0.1 mR/h (1 μSv/h) and < 1 mR/h (10 μSv/h)	Use of equipment or vehicle for response activities only*
Equipment: dose rate at 10 cm from surface of > 1mR/h (10 μSv/h) and < 10 mR/h (100 μSv/h)	Allow use of equipment or vehicle for critical response activities*
Equipment: dose rate at 10 cm from surface of > 10mR/h (100 μSv/h)	Isolate equipment or vehicle and use only with RadCon approval*
Equipment and Vehicles < 0.1 mR/h (1 μSv/h) at 10 cm from the surface.	Use appropriate release criteria (like ANSI N13.12) to determine if suitable for unconditional release.
If personnel contamination > 90,000 dpm/cm^2 , spot contamination > 2.2x10^6 dpm (1 uCi), or radiation reading >0.1 mR/h (1 μSv/h) at 20cm	Priority for decontamination, change clothing, gently wash exposure skin and hair. Resurvey after decontamination.
If personnel contamination > 9,000 dpm/cm^2, or spot contamination > 2.2x10^5 dpm (0.1 uCi).	Simple decontamination: flushing with water and wiping is an example of a simple decontamination effort. If resurvey still above measurement criteria then change clothing, gently wash exposure skin and hair. If unable to get below 10,000 dpm/cm^2 then send for special evaluation.

*Decontamination can be attempted (resurvey afterward) or equipment may be stored or disposed of as appropriate.

[a]People reporting to monitoring stations in low background radiation areas have been previously instructed to change and bag clothes, wash other exposed surfaces such as cars and their contents and then report to these centers for monitoring.

Monitoring is a more thorough assessment than screening, often using sensitive Pancake GM detector within a few inches of the surface. Specific instructions for monitoring can be found in CDC's *Population Monitoring in Radiation Emergencies: A Guide for State and Local Public Health Planners*

The highlighted text can be scaled if you use a different organ dose objective or assumed time that loose contamination is on the body.

Although contamination levels such as 9,000 dpm/cm2 or spot contamination levels of 2.2x105 dpm may appear large, they are actually quite difficult to detect while frisking (scanning the surface of an object or person). Specific minimum detection levels for various instruments for a variety of frisking speeds can be found in the Background document for FEMA-REP-22 or calculated using "Rad Pro Calculator" found on http://www.radprocalculator.com/

Note: a more restrictive release criteria will result in longer survey times:

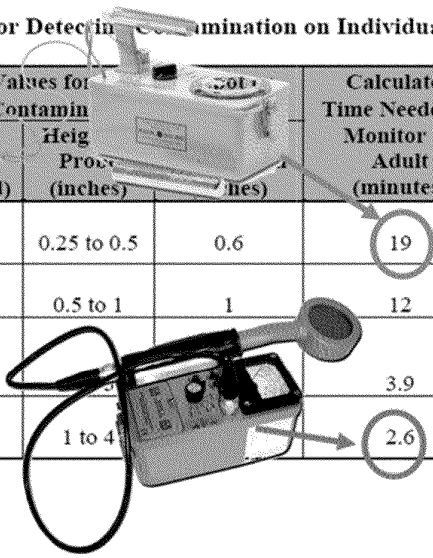
For example , in order to find 9,000 dpm/cm^2, it would take nearly 20 minutes using a common CDV-700 hotdog GM. Even with a modern Pancake GM instrument it will take 3-4 minutes per person.

Public Decon: Federal Requirements and Recommendations

FEMA REP-22 MEASUREMENT CRITERIA FOR INDIVIDUALS

Recommended Parameter Values For Detecting Contamination on Individuals[a]

Instrument/ Detector Combination	Parameter Values for Widespread Contamination			Calculated Time Needed to Monitor an Adult (minutes)
	Probe Speed (inches/second)	Height of Probe (inches)	[illegible] (inches)	
CD V-700 with side window detector[b]	4	0.25 to 0.5	0.6	19
CD V-718 with end window detector	3	0.5 to 1	1	12
All tested instruments with pancake detectors, except the Victoreen 190	6	[illegible]	[illegible]	3.9
Victoreen 190 with pancake detector[b]	6	1 to 4	[illegible]	2.6



If there are a large number of people to be monitored, this can result in a significant delay in discovery.

<u>Alliance for a Green Economy</u>
Citizens' Environmental Coalition

September 16, 2013

Air and Radiation Docket and Information Center
US EPA Mailcode 2822T
1200 Pennsylvania Ave., NW
Washington, DC 20460

Re: Docket ID No. EPA-HQ-OAR-2007-0268
Proposed guidance "PAG Manual: Protective Action Guides (PAGs) and Planning Guidance for Radiological Incidents"
Sent via email to *a-and-r-docket@epa.gov and regular mail*

These comments are being submitted on behalf of Citizens' Environmental Coalition, a NYS environmental and health organization, and the Alliance for a Green Economy representing organizations promoting a safe, clean, and sustainable energy future that is carbon-free and nuclear-free for New York State. Member organizations of the Alliance include: Citizens Awareness Network (of Central NY), Syracuse Peace Council, Peace Action of Central New York, Peace Action New York State, Center for Health, Environment & Justice, Citizens' Environmental Coalition, and Atlantic Chapter of the Sierra Club.

The new manual of so-called radiation protection guidance allows extraordinary flexibility for on-site emergency managers following "radiological incidents," such as nuclear power-plant accidents and dirty bombs. It raises permissible radiation levels in drinking water and soil. It will apply to evacuations, shelter-in-place orders, food restrictions and other actions following a wide range of "radiological emergencies." EPA had previously established levels for public health protection by requiring public exposures not to exceed cancer rates of between 1 in 10,000 and 1 in 1 million with the desired level being 1 in a million. Under this guidance EPA would be allowing a rate of 1 in 23 for a person exposed over a 30 year period. For children, the cancer rate is even more unacceptable for cancer incidence given, a single exposure could exceed a lifetime radiation dose.

The guidance also allows for a broader range of actions which could enable sending radioactive materials to ordinary landfills and applying these standards to site clean-ups, such as those managed by the Department of Energy or the Nuclear Regulatory Commission. Vulnerable populations under this proposal include workers, environmental justice communities, children and pregnant women.

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PEER, Public Employees for Environmental Responsibility, a professional organization, states there has been a multi-year internal fight within EPA over this guidance, in which there was not even access to all relevant documents for some EPA employees. The nuclear industry has been seeking a "new normal" for radiation exposure to the US population and this guidance is a clear win for the industry over public health and scientific professionals. PEER calls this new policy -- "a public health policy only Dr. Strangelove could embrace." http://www.peer.org/news/news-releases/2013/04/08/white-house-approves-radical-radiation-cleanup-rollback/

In the absence of major national efforts to correct multiple long-standing nuclear safety problems and prevent future nuclear catastrophes, it is unconscionable for this nation to instead prepare us for a much more radioactive future – orders of magnitude greater—out of a notion of "practical" necessity. This plan in fact jeopardizes the viability of future generations without their consent.

What this EPA guidance is in effect telling us is that the nation is going to continue promoting nuclear energy, despite the lack of a solution for nuclear waste, despite its costs and necessary taxpayer subsidies. Further that the nation is not willing to require safety from the nuclear industry and the various agencies involved in managing a mounting inventory of nuclear waste sites and facilities, so the only "practical" alternative is to weaken radiation standards and public health protection.

Our comments review major issues of concern to us with this Radiation Protection Guidance. Collectively these comments point to a serious failure in scientific and ethical integrity in developing this so-called Public Health Protection guidance.

Recommendations:

- EPA must discard this PAG Manual of Protective Action Guides and Planning Guidance for Radiological Incidents and abandon these efforts or start over.

- If starting over EPA should undertake a detailed environmental impact statement, including a health impact assessment. EPA should lay out a scientific process that ensures substantial public involvement, as well as that of public health professionals and researchers from universities and state agencies.

- EPA must retain all existing EPA drinking water standards and CERCLA cleanup standards.

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- EPA must strengthen standards for radiation exposure in conjunction with the newest scientific evidence, with special attention for the most vulnerable populations and total exposures. Old FDA food guidelines are not health protective.

- Prevention should be the first order priority in addressing nuclear catastrophes.

We would appreciate being kept informed of developments in this matter. Thank you for your attention.

Sincerely,

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And

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jessica@allianceforagreeneconomy.org

Attached:

Comments

EPA Presentation May 2012 (pdf)

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Comments of Citizens' Environmental Coalition and Alliance for a Green Economy

Index of Topic Areas

I Adequacy of public engagement is critical in a democracy

II Inappropriate role for the Office of Information and Regulatory Affairs at the Office of Management and Budget, in regulatory weakening, and elimination of normal process for science-based decisions at EPA.

III Scientific integrity of EPA's decision-making process and the implications of this work to all toxicological evaluations.

IV Extension of the guidance beyond immediate emergency operations and management.

V Federal Nuclear Agencies in charge of nuclear weapons, nuclear wastes or promoting nuclear power were directly involved in shaping this guidance as well as a private non-governmental group.

VI The Global Catastrophe from the Fukushima nuclear disaster

VII The failure to follow the EPA's own strategic plan related to the protection of children's health so that all actions and rulemaking evaluate the health risks to children.

VIII The absence of a detailed environmental impact analysis including a health impact assessment, further underlines the illegitimacy of the scientific process and of the guidance.

I Adequacy of public engagement is critical in a democracy.

In April of 2013, the EPA published the new PAGs in a Federal Register notice, noting that it was making them effective immediately, but was taking public comments. The public has been largely left out of the development process. In general, only those with prior knowledge of the genesis of these proposed changes would understand the significance of new "Protective Action Guidance." It sounds as if the Agency was proposing to provide additional protections to the public, instead of a dramatic weakening of radiation protections.

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There was no environmental impact statement and no health assessment to review and provide comments. There were no public forums around the country in advance of this notice. Given the public health significance of dramatic increases in “acceptable” radiation exposures and emergency planning around radiological events, public participation was essential. Public comment should not have been an afterthought.

A democracy requires a full and informed public. The public needs to fully understand the process and the proposal being undertaken. If previous standards are proposed to be weakened, the public should be fully informed, NOT told that this is merely the publication of "Protective Action Guidance."

On May 19, 2012 EPA said in a presentation in Fukushima, Japan, "The public is the most important stakeholder in any public health emergency, because people must ultimately take care of themselves." (Slide 19 of EPA presentation, attachment to these comments) It is worthwhile to note that the EPA actually identified the public as a stakeholder, but worrisome that the Agency appears to be geared to allowing people to fend for themselves.

Numerous reports from the National Academy of Sciences have dealt with the critical importance of public involvement in risk assessments. Public panels should have been convened with experts in public health and bioethics and a major amount of public interest group representation including those representing workers, environmental justice communities and children.

The National Academy of Sciences has noted that society has a significant role to play in discussions that involve issues, such as exposing large segments of the population to high doses of radiation, which is likely to result in genetic damage, birth defects, cancer and other health impacts.

The National Academy of Sciences book, ***Understanding Risk: Informing Decisions in a Democratic Society, National Research Council, Committee on Risk Characterization, Stern & Fineberg editors, 1996,*** is particularly relevant to the major problem related to the absence of meaningful public participation in these decisions. Here the NAS is talking about the importance of public participation in the deliberative process of risk characterization and analysis-- analysis that apparently did not occur for this guidance.

Direct Quotes

PARTICIPATION AND KNOWLEDGE IN RISK DECISIONS

> *In the framework we have outlined, risk characterization cannot succeed as an activity added at the end of a risk analysis, but must result from a recursive process that includes problem formulation, analysis, and deliberation. Two essential aspects of that process are appropriately broad participation by the interested and affected parties and appropriate incorporation of science.*

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Rationales for Participation
There are three compelling rationales for broad participation in risk decisions. They have been classified as ***normative, substantive, and instrumental*** *(Fiorino, 1990). The* ***normative*** *rationale derives from the principle that government should obtain the consent of the governed. Related to this principle is the idea that citizens have rights to participate meaningfully in public decision making and to be informed about the bases for government decisions. … p.23*
The ***substantive rationale*** *is that relevant wisdom is not limited to scientific specialists and public officials and that participation by diverse groups and individuals will provide essential information and insights about a risk situation. As we show in detail in Chapter 2, nonspecialists may contribute substantively to risk characterization—for example, by identifying aspects of hazards needing analysis, by raising important questions of fact that scientists have not addressed, and by offering knowledge about specific conditions that can contribute more realistic assumptions for risk analyses. Nonspecialists may also help design decision processes that allow for explicit examination, consideration, and weighing of social, ethical, and political values that cannot be addressed solely by analytic techniques, but also require broadly participatory deliberation.*
The ***instrumental*** *rationale for broad public participation is that it may decrease conflict and increase acceptance of or trust in decisions by government agencies. Mistrust is often at the root of the conflicts that arise over risk analysis in the United States……* p. 24

II Inappropriate role for the Office of Information and Regulatory Affairs at the Office of Management and Budget, in regulatory weakening, and elimination of normal process for science -based decisions at EPA.

The origin of this proposal came not from EPA but OIRA in the last days of the Bush administration. OIRA's role in holding up regulations for extensive review has always been problematic, and in recent years it has been found to have particularly adverse impacts on health and safety regulations. Despite extensive scientific preparation, agencies such as OSHA and EPA have had their regulations delayed in some cases for as long as 3 years.

In this case, OIRA flexed its power to become the initiator of regulatory weakening by impacting radiation guidance. It has been several years since the Bush proposal was halted. Yet those intervening years have not been used to convene the usual EPA process for science-based decisions. Given the absence of supporting scientific materials, it would seem that OIRA's original proposal has remained fundamentally intact. OIRA is supposed to be a reviewer of proposed regulations for their economic implications. When OIRA is the initiator shouldn't an OIRA proposal go through the full scientific process at EPA?

If we are mistaken about the absence of a legitimate scientific process, please clarify in the final notice:

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What EPA offices were in charge of the scientific review?
What exactly was the scientific process that led to the PAG changes?
Which scientists were involved?

Given the inequitable treatment of EPA regulations in recent years and their frequent rejection by OIRA, why would EPA act now to support OIRA as a policy initiator, thus giving OIRA even more power?

III Scientific integrity of EPA's decision-making process and the implications of this work to all toxicological evaluations.

Given that we see little evidence of a careful, deliberative scientific process, and noting the absence of scientific, health, toxicological or risk assessment supporting documents, we have grave concern for the loss of scientific integrity at EPA.

None of the technical and scientific work was explained in the Federal Register notice or in the PAGs themselves, which is highly unusual. Does this mean that other agencies produced this document and EPA just added its name to the PAG manual? PEER mentions the fact that even EPA employees could not access relevant documents. Secret proceedings cannot provide an open scientific process.

According to an article in the National Journal Sept. 11, 2013, EPA has given presentations which display willingness to espouse completely unscientific viewpoints—notably "hormesis," the idea that low levels of radiation may actually be beneficial. In a follow-up to the story an EPA spokesperson claimed that the scientific community is not unified on radiation health effects. http://www.nationaljournal.com/global-security-newswire/epa-documents-raise-doubts-over-intent-of-new-nuclear-response-guide-20130911 Such statements put EPA into a class with climate change deniers and others who dismiss science findings whenever it is convenient to do so. See EPA presentation, slide 24.

Peer reviewed journal articles that debunk "Hormesis" have been submitted to the docket by scientists: Michael R. Harbut, MD, MPH, FCCP, Professor (Clinical), Internal Medicine, Director, Environmental Cancer Program, Karmanos Cancer Institute, Wayne State University, Detroit, Michigan; James Huff, Ph.D. NIEHS, Research Triangle Park, NC, Former Chief IARC Monograph Program and Associated Director for Carcinogenesis at the National Toxicology Program, NIEHS (retired); Ronald Melnick, Ph.D. NIEHS, NTP, Research Triangle Park, NC (retired) and Ronald Melnick Consulting, LLC, New Haven, Connecticut; and Kathy Burns, PhD, Sciencecorps.org, Lexington, Massachusetts.

In truth, EPA and the National Academy of Sciences have officially supported the linear no-threshold model for radiation, which is based on the scientific conclusion that there is no safe level of radiation exposure and even low doses cause harm. This LNT model is also used for many toxicological evaluations where mutagens and carcinogens are involved. As a result, this

LNT model is critically important to scientists and public health professionals in the evaluation of many toxic substances.

Such extreme carelessness with fundamental scientific foundations and an entire body of knowledge has extraordinary implications for all of the research, evaluation and chemical policy work the Agency is doing on toxic chemicals.

IV Extension of the guidance beyond immediate emergency operations and management.

The extension of the guidance to cover all radioactive releases, to cover situations well beyond severe emergencies and short time periods, to allow long term clean-up standards orders of magnitude less protective than prior standards, to allow extremely high food contamination, to substitute the PAGs for Safe Drinking Water Act limits, to eliminate appropriate guidance for relocation, and to allow radioactive waste to be sent to unlicensed disposal sites, is unacceptable.

The new acceptable dose limits are orders of magnitude higher than official cancer risk estimates, and under this guidance exposures will not be limited to short time periods, but are likely to occur over many years. This guidance did not come with a health impact assessment of cancer and birth defect risks, or an evaluation of genetic risk to future generations. No assessment was done of total exposures to situations involving multiple sources of radiation, i.e., a radioactive waste site, contaminated drinking water and a transportation accident.

V Federal Nuclear Agencies in charge of nuclear weapons, nuclear wastes or promoting nuclear power were also directly involved in shaping this guidance, as well as a private non-governmental group.

The draft report of the National Council on Radiation Protection and Measurement was used to prepare the weak EPA PAG guidance. Both the Nuclear Regulatory Commission and the Department of Energy are specifically mentioned as being involved in development of the PAGs. Both of these agencies are heavily involved in nuclear work-- nuclear power, nuclear weapons, nuclear waste and nuclear research. EPA, in the past, has been a check on this unbalanced situation, and had been a critical agency advocating for a reasonable level of public health protection.

The Nuclear Regulatory Commission acknowledged that nuclear reactors of the GE Mark I design were flawed and likely to fail in their essential "containment" function. Containment is a requirement of NRC regulations, but has been unenforced because the Agency recognized that closing Mark Is would severely impact the nuclear industry. Forty years later we have 23 Mark I Boiling Water Reactors still operating, but experiencing numerous other safety problems. Fukushima should have proven the case with the real world failure of containment of these reactors.

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Fukushima Daiichi's Unit #4 spent fuel pool is in a particularly precarious position, perched on the top of an unstable building, in a seismically active area. Should the pool topple to the ground, fire would distribute at least 10 times the radioactivity released from Chernobyl to the US and the world. Each US reactor has 4-5 times the amount of spent fuel that is in the Unit #4 reactor.

The NRC promotes nuclear energy and supports the nuclear industry. It has repeatedly failed to take meaningful regulatory action.

The Department of Energy is primarily a defense agency, based on its budget. DOE is planning to spend approximately $50 billion dollars a year over many years to refurbish our nuclear weapons. DOE also manages thousands of sites and facilities that deal with nuclear materials, nuclear waste and radioactive contamination. Unfortunately properly managing radioactive waste and contamination always receives a small percentage of the Agency's budget allocation, compared to nuclear development. Waste clean-up delays allow worsening of site conditions and the spread of contamination. This is standard operating procedure for this agency. The actual true costs of US nuclear involvement are thus never clear, because proper management of wastes are not made part of the budget.

At West Valley, NY, a former nuclear waste reprocessing site and reprocessing failure, DOE cannot seem to allocate the funds to clean-up the site more rapidly and stop the spread of radioactive contamination. The site is extremely vulnerable to erosion and radioactive wastes could be released to a creek that would carry the material to Lake Erie and the drinking water for millions of people. A strontium plume has advanced to nearby creeks. Climate change and its increasingly heavy precipitation in the Northeast will only increase the timeframe for radioactive waste releases. West Valley is just one of DOE's small, but complex sites. Yet, we know, because we work on West Valley, that DOE welcomes this weakened guidance, so it can walk away from this site and let millions of people bear the consequences.

VI The Global Catastrophe from the Fukushima nuclear disaster

The guidance refers to the Fukushima nuclear disaster as part of the rationale for a "practical" way of dealing with an extraordinary situation, and that economics must be considered.

We couldn't agree more about the extraordinary nature of the Fukushima nuclear disaster. Unfortunately policy makers have learned the wrong lessons from this nuclear disaster.

Three meltdowns, ongoing high levels of radioactive water released to the Pacific Ocean, a spent fuel pool in danger of toppling and releasing airborne radioactivity many times over the Chernobyl disaster, that will affect the West Coast in a couple of days and then the rest of the US--- this is the magnitude of disaster that must be **prevented** in the future.

The United States should be focused on Prevention as the first priority until absolutely everything has been done to prevent nuclear catastrophe in the US. Some first actions include:

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- Assembling a team of international experts to address the ongoing and worsening situation at Fukushima—in order to PREVENT more significant radioactive contamination to the ocean, atmosphere, and the globe.
- Acting to immediately close all of the Mark I GE Boiling Water Reactors in the US, given that their inadequate containment in the event of a severe accident has been known for over 40 years and Fukushima has adequately demonstrated the problem. The NRC has declined to take this action.
- Acting immediately to require reactors to begin unloading spent fuel to dry casks, restoring all pools to their original design capacity in a few years. The NRC has not taken this action.
- Assigned a multi-agency team to review all the site-specific and plant-specific hazards at each nuclear plant in the country. This would avoid using just one agency, captured by industry, to ensure the safety for millions of US citizens. NRC is the sole agency involved and very effective at protecting the nuclear industry, when it should be protecting the public.

In the absence of major national efforts to correct multiple long-standing nuclear safety problems and prevent future nuclear catastrophes, it is unconscionable for this nation to instead prepare us for a much more radioactive future – orders of magnitude greater—out of a notion of "practical" necessity. This plan in fact jeopardizes the viability of future generations without their consent.

What this EPA guidance is in effect telling us is that the nation is going to continue promoting nuclear energy, despite the lack of a solution for nuclear waste, despite its costs and necessary taxpayer subsidies. Further that the nation is not willing to require safety from the nuclear industry and the various agencies involved in managing a mounting inventory of nuclear waste sites and facilities, so the only "practical" alternative is to weaken radiation standards and public health protection.

As taxpayers we are paying for nuclear mistakes that damage our health and put our lives in danger, without our consent. Despite this unacceptable situation, a key EPA official, Paul Kudarauskas, involved in this unconscionable proposal adds insult to injury by telling us we can't live in a perfect world and we are just going to have to "suck it up."

See National Journal article at http://www.nationaljournal.com/global-security-newswire/epa-documents-raise-doubts-over-intent-of-new-nuclear-response-guide-20130911

Extraordinary circumstances like Fukushima should be strengthening efforts to prevent such disasters in the US. Instead, the US continues to subsidize the nuclear industry and rather than preventing disasters, our officials are planning to manage an increasingly radioactive future.

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VII The failure to follow the EPA's own strategic plan related to the protection of children's health so that all actions and rulemaking evaluate the health risks to children.

The following information describes EPA's established positions related to Children's Health. These positions have developed since 1995 and have been affected by high level policies, an Executive Order and legislation. This selective information is taken from a recent GAO report, GAO-13-254, related to EPA's actions concerning Children's Health.

In 1995, in response to new data regarding the potential adverse effects of environmental hazards on children, EPA established an agency-wide policy to ensure that the agency consistently and explicitly considers children in developing risk assessments, and environmental and public health standards. In 1997, EPA created the Office of Children's Health Protection (OCHP) to support the agency's efforts and formed the Children's Health Protection Advisory Committee (CHPAC) to provide advice, information, and recommendations to assist the agency in developing regulations, guidance, and policies relevant to children's health.

In roughly the same time frame as the creation of OCHP, two key legislative requirements were enacted and an executive order was signed to further protect children's health. Both the Safe Drinking Water Act Amendments of 1996 (SDWA) and the Food Quality Protection Act of 1996 (FQPA) were enacted with explicit provisions for considering children's health in the decision-making process for certain regulatory actions. SDWA, as amended, requires that EPA, in selecting a maximum contaminant level (i.e., an enforceable limit for a contaminant in drinking water), must analyze the effects on vulnerable groups, such as infants, children, pregnant women, the elderly, individuals with a history of serious illness, or other subpopulations that are identified as likely to be at greater risk. Similarly, in selecting contaminants to consider for regulation, SDWA requires EPA to consider the effects on vulnerable subgroups, such as infants, children, and pregnant women that comprise a meaningful portion of the general population but are at higher risk.

The President issued an executive order in April 1997 that established a broad policy for a concerted federal effort to address children's environmental health risks and safety risks.18 The executive order required each federal agency to (1) make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children and (2) ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks.

In February 2010, EPA's Administrator issued a memorandum reaffirming that the agency's policy is to consider the health of pregnant women, infants, and children consistently and explicitly in all activities related to human-health protection, including performing risk assessments and setting standard practices. The Administrator also directed OCHP to take the lead in ensuring that EPA programs and regions are successful in their efforts to protect children's health. OCHP's current strategic plan reiterates that the office's mission will be

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accomplished by providing leadership in identifying critical agency actions to protect children's environmental health, among other efforts.

The EPA Administrator assigned new responsibilities to OCHP in the February 2010 memorandum to EPA staff. According to the memorandum, OCHP is directed to take the lead in ensuring that program and regional offices are successful in their children's health efforts; in addition, the memo indicates that the OCHP Director will be the main point-of-contact to assist program and regional offices in making children's environmental health a priority in all agency programs and actions. OCHP staff reported that the Director now participates in senior-level meetings, including regulatory update meetings with the Deputy Administrator, quarterly meetings with regional managers, and attends senior policy meetings and program updates.

It is clear to us that infants, children and pregnant women are to be given special and high priority consideration in ALL AGENCY actions. Children are highly vulnerable to the effects of radiation. There are sex and age vulnerabilities as well with females and fetuses the most vulnerable (the younger, the more vulnerable). It is also quite clear that the President's Executive Order, Agency Policies and Agenda on children's health, and legislation related to Safe Drinking Water maximum contamination levels and children have not been used to develop the PAGs. Thus children are not adequately protected under this guidance.

VIII The absence of a detailed environmental impact analysis including a health impact assessment, further underlines the illegitimacy of the scientific process and of the guidance.

The National Environmental Policy Act lays out the rationale for conducting environmental impact analyses.

42 USC § 4331 - CONGRESSIONAL DECLARATION OF NATIONAL ENVIRONMENTAL POLICY

a) The Congress, recognizing the profound impact of man's activity on the interrelations of all components of the natural environment, particularly the profound influences of population growth, high-density urbanization, industrial expansion, resource exploitation, and new and expanding technological advances and recognizing further the critical importance of restoring and maintaining environmental quality to the overall welfare and development of man, declares that it is the continuing policy of the Federal Government, in cooperation with State and local governments, and other concerned public and private organizations, to use all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans.

(b) In order to carry out the policy set forth in this chapter, it is the continuing responsibility of the Federal Government to use all practicable means, consistent with other essential considerations of

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national policy, to improve and coordinate Federal plans, functions, programs, and resources to the end that the Nation may—

(1) fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;

(2) assure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings;

(3) attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences;

(4) preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity and variety of individual choice;

(5) achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities; and

(6) enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

Note: We have underlined particularly relevant passages.

It is obvious from these comments and those of many others that the health and environmental impacts associated with the PAGs are adverse and significant. A full environmental impact analysis and health impact assessment must examine the cumulative impacts of multiple exposure scenarios and vulnerable populations especially, infants, children, pregnant women, environmental justice community members and workers. Environmental justice communities are often where solid and hazardous waste disposal sites are located and where radioactive waste might be sent. There is also a federal Executive Order on Environmental Justice that should be used for any evaluation. Many types of workers and emergency responders, especially those who are volunteers and with limited radiation training, are at risk. As a consequence, this major change in policy should have undergone extensive detailed scientific analysis and public comment in accordance with NEPA requirements.

In the absence of such a careful analysis of the cumulative impacts of multiple exposure scenarios and vulnerable populations, public assurances about the intent of the guidance are not sufficient.

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July 4, 2013

Air and Radiation Docket and Information Center
Environmental Protection Agency
Mail Code: 6102T
1200 Pennsylvania Ave., NW
Washington, DC 20460

Attn: Docket ID No. EPA-HQ-OAR-2007-0268

To the Docket:

Introduction and Summary

I appreciate the opportunity to comment on EPA's draft PAG Manual, "Protective Action Guides And Planning Guidance For Radiological Incidents." I will limit myself to the portions of the document that relate to potassium iodide (KI).

The EPA draft has serious defects, both of omission and commission, that require correction. Regrettably, it conforms to a pattern all too familiar to those who have followed the KI issue over the past 30 years, when agencies with no special expertise in drug safety venture into this area.

On the subject of KI, EPA should simply have deferred to the Food and Drug Administration. It has expert knowledge both about drugs in general and KI in particular, having declared it "safe and effective" for use in radiological emergencies as long ago as 1978. Instead, EPA 's draft includes warnings about contraindications for using KI that conflict significantly with FDA's.

Moreover, the EPA PAGs fail to mention two of the most significant studies of the safety and effectiveness of KI: the National Academies of Science report, commissioned by Act of Congress and published in 2004, and the paper, co-authored by Drs. Janusz Nauman and Jan Wolff, that described the Polish experience in administering KI after Chernobyl. These striking omissions demand correction.

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Discussion

Potassium iodide is to my knowledge the sole aspect of American life in recent years in which the Government has made a conscious decision to weaken rather than strengthen public protection against terrorism. As the *Washington Post* reported on April 7, 2011:

> The U.S. Strategic National Stockpile stopped purchasing the best-known agent to counter radioactive iodine-induced thyroid cancer in young people, potassium iodide, about two years ago and designated the limited remaining quantities "excess," according to information provided by the U.S. Centers for Disease Control and Prevention to ProPublica. Despite this, the CDC Web site still lists potassium iodide as one of only four drugs in the stockpile specifically for use in radiation emergencies.

Why was KI removed from the Strategic National Stockpile? Apparently, the committee that maintains the stockpile felt that it had no choice, in view of the 2008 decision of the late John Marburger III, Science Advisor to President Bush, refusing to implement the 2002 law that provided for distribution of KI beyond the 10-mile radius around nuclear plants in which the Nuclear Regulatory Commission (NRC) was offering it to states.[1]

Marburger's decision, which relied on technical support from the NRC staff, failed to heed the advice of a definitive National Academies of Sciences study, commissioned by Congress and published in 2004, which had concluded that in an accident, KI might in some cases be needed beyond the 10-mile radius. Produced by a committee consisting of 13 distinguished experts from the United States and abroad, and published in book form in 2004 as *Distribution and Administration of Potassium Iodide in the Event of a Nuclear Incident*, its 248 pages constitute the definitive Government-sponsored study of the drug. (President Obama's Science Advisor, John Holdren, has so far refused to disturb his predecessor's ill-advised decision, despite pleas for reconsideration from the

[1]In the interest of full disclosure, I should mention that the rule change under which NRC agreed in 2001 to provide KI to states for populations within the 10-mile radius was in response to a petition for rulemaking filed by me in 1995. The grant of that petition was a decision of the NRC Commissioners, made over the bitter opposition of the NRC technical staff.

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American Thyroid Association, Congressman Ed Markey, and others.)[2]

The question that readers new to this subject may be asking is this: what is the basis for the opposition to KI? What is so wrong with having it available in emergencies?

Perhaps the clearest and most forthright answer came from the NRC's senior adviser for preparedness, quoted in an October 22, 2007 article in USA Today ("White House may stop plan for anti-radiation pills") as saying that the NRC "opposes broad distribution of the pills because the best way to eliminate risk is to make sure people don't eat contaminated food." The article continued:

> She also says the NRC is concerned about undermining the reputation of the nuclear industry. "It's always a concern that if you expand the distribution (of the pills), you don't have confidence in the plants," she says. "We have studies that show the safety of our plants."

Thus the need to send a message of confidence in the safety of nuclear power plants trumps preparedness for possible acts of radiological terrorism.[3] We just have to hope

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[2]If readers consulted the NAS report, they would recognize the factual problem with one statement on page 22 of the EPA document: "**Although the size of the EPZ is based on the maximum distance at which a PAG might be exceeded**, the actual boundary of an EPZ should be demarcated by features readily identifiable by people within that area." [Emphasis added.] This strongly implies that the 10-mile EPZ provided by NRC regulations is adequate to ensure that PAGs will not be exceeded. However, the NAS report was clear in saying that under some accident conditions, KI would be needed beyond the boundaries of the EPZ – a finding that the NRC staff refused to acknowledge. See the March 27, 2006, letter to NRC from HHS Secretary Michael Leavitt, sharply criticizing the NRC for mischaracterizing the findings of the NAS report in a letter to HHS, in which it had used selective quotation to create the inaccurate impression that the NAS saw no need for KI beyond the 10-mile EPZ. (See joint letter of September 26, 2007, from Professor Frank von Hippel and Peter Crane to Senator Joseph Lieberman, accessible here: http://pbadupws.nrc.gov/docs/ML0728/ML072831363.pdf) For his earnest desire to ensure better radiation protection for American children, his major concern, Secretary Leavitt was stripped of authority over KI in July 2007. That authority was transferred to the President 's Science Advisor and NRC, with the entirely foreseeable result that the statute was effectively nullified a few months later.

[3]There are easy answers to these arguments. First, KI is a supplement to other measures, not a substitute for them. We are better off having more arrows in our q uiver in an emergency than fewer. As to the notion that having KI would suggest that nuclear plants are unsafe, the same rationale would support removing life jackets and lifeboats from ferry boats, lest the public see them as implying that the boats are unsafe. The NRC position, incidentally, corresponds exactly to that expressed by NUMARC, a nuclear trade association (forerunner of today's Nuclear Energy Institute), which declared in a 1993 White Paper

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that the day never comes that KI is needed, and the nation learns that the drugs that once were in the Strategic National Stockpile were disposed of as "excess."

In an op-ed published in the *New York Times* on March 23, 2011, as the Fukushima accident was unfolding, Professor Frank von Hippel of Princeton University commented that the Nuclear Regulatory Commission had "fought relentlessly" against the stockpiling of KI. This was by no means an exaggeration. As though to prove his point, an NRC staffer was quoted in an Associated Press article of March 31, 2011, as saying that the agency was "absolutely confident" that a 10-mile radius for KI distribution was sufficient. Whether right or wrong, it was plainly premature, with the accident still in progress, for NRC to reach any such conclusion.

All too often, the NRC has used interagency consultative processes to press its deeply held policy views on other agencies, sometimes to their later regret.[4] I wish to stress in the strongest terms, however, that I have no knowledge that this occurred here.

Invariably, in the various defective Government issuances on KI, we see a suppression of pertinent and valuable information on the one hand, coupled with the introduction of erroneous and misleading information on the other. This EPA document is no exception. The most egregious omission is the absence of any discussion or citation of the National Academies of Science report on KI referred to earlier. This is as incomprehensible as if a Government agency published a document on the causes and effects of nuclear accidents without mentioning the Kemeny Commission report on Three Mile Island, or on the risks of space flight without mentioning the Rogers Commission report on the Challenger disaster.

To take another example, the best empirical data on the safety of KI when used on a

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that if KI were stockpiled, "public confidence in the technology could be affected."

[4] For example, in 2004, HHS issued draft KI guidelines, pursuant to the 2002 statute. It discovered only afterwards that what it had published was a recycled version of an NRC staff paper from 1997, SECY-97-124, which the NRC Commissioners had rejected at that time, for good reason. In the HHS notice, as in the NRC staff paper, there was no mention of Chernobyl or of the FDA "safe and effective" finding, and the reader had to get many pages into the notice to find out that the purpose of KI was to prevent cancer. A rueful HHS withdrew the guidelines and started again from scratch.

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mass scale is the Chernobyl accident, in which Polish authorities, under the direction of Dr. Janusz Nauman, gave out 18 million doses of the drug, 10 million of them to children, within a short time. The total number of persons with adverse reactions requiring hospitalization, and that only briefly, was two. Both were adult males who took the drug despite knowing that they were allergic to iodine.[5]

Dr. Nauman co-authored a paper on the Polish KI experience with Dr. Jan Wolff, an American scientist at the National Institutes of Health: Nauman J, Wolff J. "Iodide Prophylaxis in Poland After the Chernobyl Reactor Accident: Benefits and Risks." *Am J Med* 1993; 94: 524-532. It is a seminal, basic work in the field, and is cited in the FDA guidance on KI and innumerable other studies in this area. I cannot think of a single journal article or government study on KI in nuclear emergencies that does not refer to it – with the sole exception of these draft PAGs, which neither mention nor cite it.

Why the omission? Surely it is important for readers of the PAGs to know that the risks of KI administration on a mass scale, while not negligible, are extremely small.[6] As I was preparing these comments, I telephoned the EPA contact on the PAGs paper to

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[5]Dr. Nauman once told me, "We asked them why they had taken it, after they had been warned not to, and they said, 'We thought it was a matter of life and death.'"

[6]It is worth noting that in the 1990's, the NRC technical staff was deeply displeased by the Nauman-Wolff paper, since it undercut the staff's argument that the risks of KI administration were unacceptably high for the drug to be stockpiled. In a 1998 technical assessment of KI (Draft NUREG -1633, "Assessment of the Use of Potassium iodide (KI) As a Public Protective Action During Severe Reactor Accidents), the NRC staff even made a disparaging reference to the Nauman-Wolff article, saying of it, "to the extent we believe the report...." I drew attention to this slur in a paper I gave at Cambridge University in the summer of 1998, "Potassium Iodide Prophylaxis and the United States Government: A Case Study,"which can be found in book form in *Radiation and Thyroid Cancer*, published in 1999 by the European Commission, DOE, the National Cancer Institute, and Cambridge University. Criticizing this "aspersion upon two internationally renowned medical experts," I urged the Commissioners to withdraw the document and issue a "deep and contrite apology" to Drs. Nauman and Wolff. The NRC Commissioners did in fact order the report withdrawn from circulation (63 FR 55653, Oct. 16, 1998), and in an implicit apology, Dr. Nauman was invited to NRC headquarters to address the relevant staff. Twice in the next several years, the NRC staff sent revised drafts of NUREG-1633 to the Commission for approval. Both were rejected. At last the Commissioners los t patience, and by a 4-1 vote, ordered work on the project to cease. Officially, therefore, the document does not exist, except as an attachment to a rejected staff proposal. But rather than being consigned to the dumpster, as the Commissioners seem to have intended, it was given new life when it was cited with evident approval in the Marburger decision referred to earlier.

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ask the reason for the omission of the NAS study, and was informed that the authors of the draft felt that the FDA guidance from 2001 was so useful that it should be emphasized.

Leaving aside for the moment that a citation to the NAS report would hardly have detracted from whatever emphasis was given to the FDA guidance, the difficulty with this argument is that the PAGs actually **conflict** with the FDA guidance. They offer warnings about the risks of KI that are quite at odds with what the FDA said in 2001.

If we carefully compare the two, on the critical question of medical contraindications for KI use, we see subtle but extremely significant differences. First, here is the 2001 FDA guidance, at page 5:

> Short-term administration of KI at thyroid blocking doses is safe and, in general, more so in children than adults. The risks of stable iodine administration include sialadenitis (an inflammation of the salivary gland, of which no cases were reported in Poland among users after the Chernobyl accident), gastrointestinal disturbances, allergic reactions and minor rashes. In addition, persons with known iodine sensitivity should avoid KI, as should individuals with dermatitis herpetiformis and hypocomplementemic vasculitis, extremely rare conditions associated with an increased risk of iodine hypersensitivity.
>
> Thyroidal side effects of stable iodine include iodine-induced thyrotoxicosis, which is more common in older people and in iodine deficient areas but usually requires repeated doses of stable iodine. In addition, iodide goiter and hypothyroidism are potential side effects more common in iodine sufficient areas, but they require chronic high doses of stable iodine (Rubery 1990). In light of the preceding, individuals with **multinodular goiter**, Graves' disease, and autoimmune thyroiditis **should be treated with caution, especially if dosing extends beyond a few days**. The vast majority of such individuals will be adults. [Emphasis added.][7]

[7] I am grateful to Professor von Hippel for pointing out to me that the guidance on KI currently posted on the FDA website includes a line not found in the 2001 guidance: "People with nodular thyroid with heart disease should not take KI." See

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Now let us look at EPA's draft PAGs, at p. 20:

> **Some people should not take KI**. As a rule, individuals with known allergy to iodine or with pre-existing thyroid disease (e.g., Graves' disease, **thyroid nodules**, Hashimoto's thyroiditis) that might predispose them to adverse reactions should avoid KI. [Emphasis added.]

Thus there are at least two noteworthy differences. First, "multinodular goiter," in the FDA document, has been changed to "thyroid nodules." Second, instead of saying that these patients should be "treated with caution," as FDA does, EPA tells us they should "not take" and should "avoid" KI.

To fully appreciate the pernicious impact of these changes, one must know the prevalence of thyroid nodules among the American population. Here is the first paragraph of "Nonpalpable Thyroid Nodules—Managing an Epidemic," an article by Dr. Douglas S. Ross of Massachusetts General Hospital and Harvard Medical School, published in the Journal of Clinical Endocrinology & Metabolism on May 1, 2002 (vol. 87 no. 5 1938-1940):

> **Thyroid nodules are extraordinarily common**. The prevalence of palpable thyroid nodules in two non-biased population-based studies—Framingham, Massachusetts, and Whickham, England—was 4.2 and 3.2%, respectively (1, 2). In the Framingham study, the prevalence was 6.4% in women and 1.5% in men (1). The true prevalence of thyroid nodules, however, requires autopsy data. A 1955 study at the Mayo Clinic found thyroid nodules in 50.5% of 821 consecutive autopsies of patients with clinically normal thyroid glands (3). Because 7.4% of autopsies were excluded from analysis because of premortem thyroid disease, **the true prevalence is slightly higher than half the population**. Even in an unlikely group of patients to have thyroid nodules, men in the military aged 18–39 yr, the prevalence of thyroid nodules at autopsy was 13% (4). [Emphasis

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http://www.fda.gov/Drugs/EmergencyPreparedness/BioterrorismandDrugPreparedness/ucm072265.htm. However, in the population sought to be reached by a KI program – those below the age of 40, and above all children – there will presumably be very few individuals with both thyroid nodules **and** heart disease.

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added.]

Whether or not by design, the effect of these selective omissions and insertions is thus to create a document that would serve as a perfect tool for persuading state, local, and federal authorities that to stockpile and administer KI is unwise, because so large a fraction of the population would be placed at risk. And as noted earlier, there will be no references to the NAS report, or to the Polish experience with KI, that might lead anyone to realize that there may be a good case for stockpiling the drug after all.

Conclusion

During the Fukushima accident, when some on the West Coast were opportunistically peddling KI to frightened citizens at high prices, I went on television in Seattle to condemn their "irresponsible scaremongering." I thought it reprehensible of these entrepreneurs to exaggerate the benefits of KI in a situation where there was no need for anyone in the United States to be taking it. But it is every bit as reprehensible, in my view, for opponents of KI to exaggerate the risks of using the drug in potential future situations where the need for it actually **does** exist or **may** exist. One form of alarmism and disinformation is no better than the other.

Rather than drafting its own list of cautions for those taking KI, EPA should simply incorporate the FDA guidance verbatim. With respect to the omission from the draft of any mention of the NAS report and the Nauman/Wolff journal article, EPA should in its revision of the draft draw attention to these documents and discuss their findings, given their central importance to a proper understanding of the KI issue.

Fortunately, no radiological event requiring KI administration has ever occurred in this country, and we hope one never does. But we know that it **could**. That makes it incumbent on government agencies and on all of us to address these issues on the basis of sound, honest, complete information: the truth, the whole truth, and nothing but the truth. Regrettably, these guidelines in their present form do not meet that test.

Nearly 20 years ago, Senators Joseph Lieberman and Alan Simpson, a Democrat and a

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Republican, wrote to the NRC in an effort, futile at the time, to persuade that agency to support stockpiling of potassium iodide. (Letter of April 20, 1994.) In it, they pointedly reminded the NRC Commissioners of their "moral responsibility to provide the public with complete and accurate information" on the KI issue. Today, that moral responsibility rests with EPA, and I trust the agency will rise to it.

Finally, I recommend that EPA extend the comment period by an additional 60 days, to enable commenters to give the draft PAGs the careful scrutiny they plainly require.

Ms. Mary Lampert of Pilgrim Watch has advised me that she agrees with these comments and wishes to be associated with them.

Sincerely,

/s/

Peter Crane
NRC Counsel for Special Projects (retired)

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4.1.3

2013

PAG Manual

Protective Action Guides And Planning Guidance For Radiological Incidents

U.S. Environmental Protection Agency
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In the early phase, there may be little or no data on actual releases to the environment and responders may have to rely on crude estimates of airborne releases. Decision time frames are short and preparation is critical to make prudent decisions when data are lacking or insufficient.

The principal protective actions for the early phase are evacuation and sheltering-in-place. These protective actions would be taken if whole body doses are projected to exceed 1 to 5 rem (10 to 50 mSv) over four days. The decision to evacuate must weigh the anticipated radiation dose to individuals in the affected population against the feasibility of evacuating within a determined time frame and the risks associated with the evacuation itself. For example, evacuating a population of 50,000 carries with it a statistical risk of injury or death from transportation hazards or increased exposure. Evacuation also takes time. In the case of an accident at an NPP, there may be sufficient time for an orderly and relatively safe evacuation. In the case of a fire or explosion of an RDD in an urban area, evacuating a large group of people could leave them exposed to the plume and actually increase radiation dose. Sheltering-in-place may be warranted in situations where evacuation poses a greater risk of exposure or physical harm.

In addition, there are actions that are advisable, but not associated with a numerical PAG. For example, individuals should be instructed to cover airways (nose and mouth) with available filtering material when airborne radionuclides may be present. Decontamination is another protective action that may be utilized in the early phase and may include washing of contaminated individuals, removing contaminated clothing and decontaminating surfaces of critical areas and objects. Further, in areas where airborne radioactivity is present but PAGs are not exceeded, officials can consider asking people to stay indoors to the extent practicable. In such cases, individuals are not prevented from carrying out necessary tasks (e.g., seeking medical care, purchasing food). Similar to actions used in major cities on high pollution days, these measures can be effective to reduce radiation doses when prolonged releases occur, as was the case for the Fukushima accident in Japan.

In cases where significant quantities of radioiodine may have been released, administration of the radioprotectant KI should be considered as a supplementary protective action if the projected child thyroid dose exceeds 5 rem (50 mSv). This PAG is lower than the 1992 guidance. The lower dose, which FDA adopted in 2001, is for protection of children based on early studies of Chernobyl exposure data.

The choice of protective action will be based on the status of the incident site and the prognosis for worsening conditions. In the early phase, precautionary actions based on worst-case scenarios may be used before implementation of protective actions based on PAGs. For example, in the case of RDD detonation, governments may instruct affected populations to shelter in place as a precautionary action while radiation levels are being measured to determine appropriate PAG-based protective actions. Officials should plan for rapid broadcast and dissemination of protective action orders to the public.

When available, predictions of radiological conditions in the environment based on an estimate of the source or actual environmental measurements may be used. Nuclear facilities, for example, have continuous, real-time radioactive effluent monitoring capabilities to monitor radioactive material released to the environment and may have a network of off-site measurement stations.

1.4.3. Intermediate Phase Protective Action Guides and Protective Actions

Intermediate phase activities are intended to reduce or avoid dose to the public, to control worker exposures, to control the spread of radioactive contamination and to prepare for late phase cleanup operations.

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However, FDA understands that a KI administration program that sets different projected thyroid radioactive exposure thresholds for treatment of different population groups may be logistically impractical to implement during a radiological emergency. In such cases, FDA recommends that KI be administered to both children and adults at the lowest intervention threshold (i.e., >5 rem (50 mSv) projected internal thyroid exposure in children) (FDA 2002).

Note that KI is effective only against uptake of radioiodine, and is best taken prior to or just after exposure. The protective effect of a single dose of KI lasts approximately 24 hours. It should be administered daily until the risk of significant exposure to radioiodine (either by inhalation or ingestion) no longer exists.

It should be noted that adults over 40 need to take KI only in the case of a projected large internal radiation dose to the thyroid (>500 rem (5 Sv)) to prevent hypothyroidism which could lead to lifelong dependence on thyroid hormone replacement therapy. Thyroid irradiation in adults over 40 years of age is associated with an extremely low incidence of cancer (FDA 2001).

Some people should not take KI. As a rule, individuals with known allergy to iodine or with pre-existing thyroid disease (e.g., Graves' disease, thyroid nodules, Hashimoto's thyroiditis) that might predispose them to adverse reactions should avoid KI.

Pregnant women should be given KI for their own protection and for that of the fetus, as iodine (whether stable or radioactive) readily crosses the placenta. However, because of the risk of blocking fetal thyroid function with excess stable iodine, repeat dosing with KI of pregnant women should be avoided. Lactating females should be administered KI for their own protection, as for other young adults, and potentially to reduce the radioiodine content of the breast milk, but not as a means to deliver KI to infants, who should get their KI directly. As for direct administration of KI, stable iodine as a component of breast milk may also pose a risk of hypothyroidism in nursing neonates. Therefore, repeat dosing with KI should be avoided in the lactating mother, except during continuing severe contamination. If repeat dosing of the mother is necessary, the nursing neonate should be monitored.

Once the plume has passed, protective actions such as evacuation and/or sheltering-in-place and food control measures to limit exposure to radioiodine should be implemented and the administration of KI should be suspended. Food control measures include providing the public with non-contaminated food supplies while awaiting the eventual radioactive decay of contaminated food. Consumption of contaminated food may be permitted on a case-by-case basis after surveying the foodstuffs and determining the level of contamination consistent with FDA food and animal feeds guidance. As a result of radioactive decay, grain products and canned milk and vegetables from sources affected by radioactive fallout will not present a risk from radioiodine if they have been stored for weeks to months after production.

An RDD is not likely to contain radioiodine, so administration of KI would not be necessary in such incidents. The administration of other prophylactic drugs should be evaluated on a case-by-case basis depending on the nature of the event and the radioisotopes involved. For more information on radiological prophylactics and treatments, see:
http://www.fda.gov/Drugs/EmergencyPreparedness/BioterrorismandDrugPreparedness.

2.3.5. PAGs and Nuclear Facilities Emergency Planning Zones (EPZ)

Under NRC regulations, before a nuclear power reactor may be issued a license, the NRC must find that licensee, state and local emergency plans are adequate and that they can be implemented. For nuclear power reactors, there is a plume exposure EPZ within a 10 mile (16.1 km) radius of the plant and for a

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site officials.[13] Once the initial protective actions have been implemented, accident assessment should continue. Although initial assessments may be uncertain, the subsequent assessments will be less uncertain as additional information on facility condition and prognosis, effluent radiation monitor data and environmental data become available. The results of these continuing radiological assessments, including dose projections, should be used as the basis for refining the initial protective actions. In the case of transportation accidents, an RDD or IND, or other incidents that are not related to a facility, it may not be practicable to establish EALs.

Doses that may be incurred from ingestion of food and water, long-term radiation exposure (i.e., longer than four days), radiation exposure to deposited radioactive materials, or long-term inhalation of resuspended materials are chronic exposures for which neither emergency evacuation nor sheltering-in-place are appropriate protective actions. PAGs for the intermediate phase cover these exposure pathways (see Chapter 3).

2.4.2. Duration of Exposure

The projected dose for comparison to the early phase PAGs is calculated for exposure during the first four days following the anticipated (or actual) start of a release. The objective is to encompass the entire period of exposure to the plume and deposited material prior to implementation of any further, longer-term protective action such as relocation. For planning purposes, the four-day period is chosen as the duration of exposure during the early phase because it is a reasonable estimate of the time necessary to make measurements, reach decisions and prepare to implement further protective actions (such as relocation) if necessary. However, officials at the site at the time of the emergency may decide that a different time frame is more appropriate.

For example, doses incurred through ingestion pathways or long-term exposure to deposited radioactive materials take place over a longer time period. Protective actions for such exposures should be based on guidance addressed in Chapter 3.

The projected dose from each radionuclide in a plume is proportional to the time-integrated concentration of the radionuclide in the plume at each location. This concentration will depend on the rate and the duration of the release and meteorological conditions. Release rates will vary with time and this time-dependence cannot usually be predicted accurately. In the absence of more specific information, the release rate may be assumed to be constant.

Another factor affecting the estimation of projected dose is the duration of the plume at a particular location. For purposes of calculating projected dose from most pathways, exposure will start at a particular location when the plume arrives and will end when the plume is no longer present. Exposure from deposited materials will continue for an extended period as long as people are present. Other factors such as the aerodynamic diameter and solubility of particles, shape of the plume and terrain may also affect estimated dose and may be considered on a site- or source- specific basis.

Prediction of time frames for releases is difficult because of the wide range associated with the spectrum of potential incidents. Therefore, planners should consider the possible time periods between an initiating event and arrival of a plume and the duration of releases in relation to the time needed to implement competing protective actions (i.e., evacuation and sheltering-in-place). Analyses of commercial nuclear power reactors (NRC 1975) have shown that some incidents may take several days to develop to the point of a release while others may begin as early as a half hour after an initiating event. Furthermore, the

[13] Immediate protective actions based on in-plant conditions are not applicable to naval nuclear propulsion plants. See Footnote 7 for additional information. In addition, because of differences in design and operation, EALs based on in-plant conditions are not applicable to naval nuclear propulsion plants.

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		measure dose.
25 rem (250 mSv)[b]	Lifesaving or protection of large populations	Exceeding 5 rem (50 mSv) unavoidable and all appropriate actions taken to reduce dose. Monitoring available to project or measure dose.

[a] For potential doses >5 rem (50 mSv), medical monitoring programs should be considered.
[b] In the case of a very large incident, such as an IND, incident commanders may need to consider raising the property and lifesaving response worker guidelines to prevent further loss of life and massive spread of destruction.

The 25 rem (250 mSv) lifesaving response worker guidelines provide assurance that exposures will not result in detrimental deterministic health effects (i.e., prompt or acute effects). However, it could increase the risk of stochastic (chronic) effects, such as the risk of cancer. Response actions that could cause exposures in excess of the 25 rem (250 mSv) Response Worker Guideline should only be undertaken with an understanding of the potential acute effects of radiation to the exposed responder (see Table 2-3) and only when the benefits of the action clearly exceed the associated risks.

The estimated risk of fatal cancer[17] for workers exposed to 10 rem (100 mSv) is slightly less than the corresponding general population risk of 0.6 percent (6 cases per thousand exposed). Workers exposed to 25 rem (250 mSv) have an estimated risk of fatal cancer of 1.5 percent (15 cases perthousand exposed). Because of the latency period of cancer, younger workers face a larger risk of fatal cancer than older workers (for example, when exposed to 25 rem (250 mSv), 20 to 30-year-olds have a 9.1 per thousand risk of premature death, while 40 to 50-year-olds have a 5.3 per thousand risk of premature death).[18]

More specific risk determinations can be made when there is adequate information about the contaminants and the potential for human exposure. EPA's Federal Guidance Report #13 (EPA 1999) and Health Effects Assessment Summary Tables have risk factors for specific radionuclides.

Table 2-3. Acute Radiation Syndrome [a]

Feature or Illness	**Effects of Whole Body Absorbed Dose from external radiation or internal absorption, by dose range in rad**				
	0-100	100-200	200-600	600-800	>800
Nausea, Vomiting	None	5-50%	50-100%	75-100%	90-100%
Time of Onset		3-6 h	2-4 h	1-2 h	<1 h to minutes
Duration		<24 h	<24 h	<48 h	<48 h
Lymphocyte Count	Unaffected	Minimally Decreased	<1000 at 24 h	<500 at 24 h	Decreases within hours
Central Nervous	No	No Impairment	Cognitive	Cognitive	Rapid

[17] Risk per dose of a fatal cancer is assumed to be about $6x10^{-4}$ per rem ($6x10^{-5}$ per mSv). Cancer incidence is assumed to be about $8x10^{-4}$ per rem ($8x10^{-5}$ per mSv). (EPA 1999)

[18] The numerical estimate of cancer risk presented above (from Federal Guidance #13) was obtained by linear extrapolation using the nominal risk estimates based on data from human exposures at high doses and high dose rates. Other methods of extrapolation to the low-dose region could yield higher or lower numerical estimates of cancer deaths. Studies of human populations exposed at low doses are inadequate to demonstrate the actual magnitude of risk at low doses (about 0.1 Sv or 10 rem and below). There is scientific uncertainty about cancer risk in the low-dose region below the range of epidemiological observation and the possibility of no risk cannot be excluded. (EPA 1999)

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events involving fixed nuclear facilities, some evacuation reception centers or shelters will have walk-through portal monitors.

2.8.1. Priorities for Control of Contaminated Areas

The following priorities are recommended—

1. Do not delay urgent medical care for decontamination efforts or for time-consuming protection of attendants, such as donning of additional anti-contamination clothing.
2. In early phase scenarios where it might not be practical or would interfere with other life-saving and public health protection priorities, do not waste effort trying to contain contaminated wash water and be sure to notify sewage treatment plants.
3. Do not allow monitoring and decontamination to delay an ordered evacuation.
4. *When early screening is needed after a major incident*— After plume passage, it may be necessary to establish emergency contamination monitoring stations in areas not qualifying as low background areas. Gamma exposure rates in such areas should be less than 5 millirem (50 µSv) per hour. These monitoring stations should be used only during the early phase after major atmospheric releases to monitor people emerging from possible high exposure areas. The stations should be set up to provide simple (rapid) decontamination if needed and to evaluate whether affected people should undergo more extensive decontamination or other special care. Table 2-5 provides guidance on surface contamination levels for use if such centers are needed.
5. Establish monitoring and personnel decontamination (e.g., bathing) facilities at evacuation centers or other locations in low background areas (less than 0.1 millirem (1 µSv) per hour). *Encourage self-decontamination:* Encourage evacuated people who were exposed in areas where release of particulate materials would have warranted evacuation to change and bag the clothes they were wearing and store them in an area away from people and pets until authorities provide further instructions on their disposition, to wash other exposed surfaces such as cars and trucks and their contents and then report to these centers for monitoring. For more specific considerations on control of contaminated areas refer to "Population Monitoring in Radiation Emergencies: A Guide for State and Local Public Health Planners" (CDC 2007).[20] Table 2-6 provides surface contamination guidance. These screening levels are examples derived primarily on the basis of easily measurable radiation levels using portable instruments.
6. After the relocation area has been established, consider the need to set up monitoring and decontamination stations at exits from the more highly contaminated parts of the area. Low levels of contamination may be undetectable because of high background radiation levels at these locations. Monitoring should be done at lowest practical background levels. Nevertheless, these individuals should be advised to bathe and change clothes at their first opportunity—no later than within the next 24 hours. If, after decontamination, people still exceed the limits for the station, they should be sent for further decontamination or for medical or other special attention.

[20] See: http://emergency.cdc.gov/radiation/pdf/population-monitoring-guide.pdf

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Table 2-5. Recommended Surface Contamination Screening Levels for Emergency Screening of People and Objects at Monitoring Station in High Background Radiation Areas (0.1 mR/h to 1 mR/h Gamma Exposure Rate)[a]

Condition	Appropriate detection instrument reading	Recommended Action
Before Decontamination	<2x existing background	Unconditional release
	>2x existing background	Decontaminate. Equipment may be stored or disposed of as appropriate.
After Decontamination	<2x existing background	Unconditional release
	>2x existing background	Continue to decontaminate or refer to low background monitoring and decon station. Equipment may be stored for decay or disposed of as appropriate.

[b] Monitoring stations in such ~~high~~ exposure rate areas are for use only during the early phase of an incident involving major atmospheric releases ~~of particulates~~. Otherwise use Table 2-6.

Table 2-6. Recommended Surface Contamination Screening Levels for People[a] and Objects at Monitoring Stations in ~~Low~~ Background Radiation Areas (<0.1 mR/h Gamma Exposure Rate)[b]

Condition	Appropriate detection instrument reading	Recommended Action
Before decontamination	<2x existing background	Unconditional release
	>2x existing background	Decontaminate
After simple[c] decontamination effort	<2x existing background	Unconditional release
	>2x existing background	Full decontamination
After full[d] decontamination effort	<2x existing background	Unconditional release
	>2x existing background	Continue to decontaminate people Release animals and equipment
After additional full decontamination effort	<2x existing background	Unconditional full release
	>2x existing background	Send people for special evaluation Release animals and equipment

[a] People reporting to monitoring stations in low background radiation areas have been previously instructed to change and bag clothes, wash other exposed surfaces such as cars and their contents and then report to these centers for monitoring.
[b] Levels higher than 2x existing background (not to exceed the meter reading corresponding to 0.1 mR/h) may be used to speed the monitoring of evacuees in very low background areas.
[c] Flushing with water and wiping is an example of a simple decontamination effort.
[d] Washing or gentle scrubbing with soap or other mild detergent followed by flushing is an example of a full decontamination effort.

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In addition, measurements should be conducted to determine the dose reduction factors associated with simple, rapid, decontamination techniques so that these factors can be used in calculating dose to people who are not relocated. However, assumptions about these factors should not be included in calculating projected dose for decisions on relocation. Only dose reductions already accomplished can be considered.

3.4.4. Exposure Limits for People Reentering the Relocation Area

After the relocation area is established, people will need to reenter for a variety of reasons, including recovery activities, retrieval of property, security patrol, operation of vital services and, in some cases, care and feeding of farm and other animals. It may be possible to quickly decontaminate access ways to vital institutions and businesses in certain areas so that they can be occupied by adults either for living (i.e., institutions such as nursing homes and hospitals) or for employment. Clearance for occupancy of such areas will require dose reduction to meet exposure limits (EPA 1987). Dose projections should include both external exposure from deposited material and inhalation of resuspended deposited material for the duration of the planned exposure. People working in areas inside the emergency relocation area should operate under the controlled conditions established for occupational exposure (EPA 1987). The worker dose limitation does not need to include ongoing doses received from living in a contaminated area outside the relocation area. It is also not necessary to consider dose received previously from the plume or groundshine during the early phase of the radiological incident.

3.5. PROTECTIVE ACTION GUIDANCE FOR FOOD AND DRINKING WATER

Information on food and animal feeds protective action guidance is contained in FDA's "Accidental Radioactive Contamination of Human Food and Animal Feeds: Recommendations for State and Local Agencies" (FDA 1998).

EPA is not proposing a specific drinking water PAG at this time. EPA has established enforceable drinking water standards for radionuclides under the Safe Drinking Water Act (SDWA). EPA recommends that to the extent practicable, emergency measures for drinking water be based on the National Primary Drinking Water Regulations (NPDWR) for Radionuclides. The Radionuclides Rule provides states with flexibility when responding to radiological events. If a public water system exceeds the radionuclides standard it must work to get back into compliance as soon as feasible. States have the authority to determine if other corrective actions are needed (e.g. providing alternative water).

However, the Agency recognizes a short-term emergency drinking water guide may be useful for public health protection in light of the Fukushima nuclear power plant accident, which impacted some Japanese drinking water supplies. Input on the appropriateness of, and possible values for, an intermediate phase emergency drinking water PAG is being sought during the public review of this Manual.

While the NPDWR provide for a regulatory standard of 4 mrem/year (beta, photon emitters) based on life-time exposure, international organizations have developed technical approaches and methodologies that have produced a range of emergency guidelines related to drinking water (e.g., the World Health Organization[24], the International Atomic Energy Agency[25]) as have other federal agencies (e.g., the Department of Homeland Security[26], the Food and Drug Administration[27]) and non-federal organizations. EPA is seeking input on an approach and technical rationale for a drinking water PAG designed to help

[24] See: http://www.who.int/water_sanitation_health/dwq/gdwq3rev/en/ and http://www.who.int/hac/crises/jpn/faqs/en/index8.html.
[25] See: http://www-pub.iaea.org/MTCD/publications/PDF/Pub1467_web.pdf.
[26] See: http://ogcms.energy.gov/73fr45029.pdf
[27] See: http://www.fda.gov/downloads/MedicalDevices/.../UCM094513.pdf

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To: U.S. Environmental Protection Agency
Center for Radiological Emergency Management

From: California Governor's Office of Emergency Services
Radiological Preparedness Unit

Subject: PAG Comments - Docket ID No. EPA-HQ-OAR-2007-0268

The California Governor's Office of Emergency Services would like to submit the following comments on the Draft PAG Manual.

1. *General Comment:* Removing the reference material and directing the reader to myriad additional references reduces the usefulness of this document. In addition, some of the referenced reports are copyrighted materials and require a fee to access. In an emergency the ability to obtain the many referenced documents may be severely limited, causing an undue risk to the public.

   R*ECOMMENDATION:* Incorporate the information applicable for the development of radiological response plans and protective action decision making.

2. *General Comment:* Portions of the document rely heavily on acronyms. Individuals that are not familiar with these acronyms will struggle with understanding the intended message. For example: See the first paragraph under Section 3.4.2, page 40.

   RECOMMENDATION: All acronyms should be reintroduced at the beginning of each section.

3. *General Comment:* The use of website links should be avoided unless the EPA intends to update this document frequently. These links change over time as do the originating documents – keep in mind that it has been 21 years since the last PAG revision.

   RECOMMENDATION: Remove the website links. State the controlling agency and reference document name.

4. *General Comment:* The EPA PAG document changes convert the existing PAG Manual into merely a list of other agencies PAGs. Exclusion of PAGs for drinking water, agriculture, Potassium Iodide administration, and other applicable standards creates the need for agencies to adopt multiple standards and refer to multiple documents for applicable guidance.

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RECOMMENDATION: Include the applicable PAG's in the appropriate sections of the document.

5. Pages 9, 54, 69, 75, 76, and more. New terminology: Please examine your use of the terms "Reoccupancy" and "Return". The term "Return" has been used in the prior EPA PAG and in NPP emergency planning. Is there a need to differentiate between the two? Both are the return of populations to areas where the public has been ordered to leave (evacuation or relocation) and both allow for the public to return to areas with "acceptable" levels of contamination. It is reasonable to allow Return with restrictions.

   RECOMMENDATION: Pick one or provide a clear difference between them that does not confuse readers.

6. Page 15, Table 2-1, Footnote "a". The statement "Sheltering may begin at lower levels if advantageous" is unclear. Is the lower level between 1 and 5 rem? Or below 1 rem?

   RECOMMENDATION: Change the statement to say "Sheltering may begin at levels below 1 rem if advantageous".

7. Page 21, Footnote 10. The footnote expresses the opinion that since NNPP reactors are 1/5 the size of a commercial reactor and operated at only 1% power near port, then there is "no need for towns and cities to have special emergency response plans such as those required for cities near commercial NPPs"

   Commercial reactors are in the range of 1000Mw and 1/5 of that is 200Mw. NUREG 0654/FEMA REP 1 requires all commercial power plants over 50Mw to have extensive response plans and programs within the Emergency Planning Zones around the power plant, regardless of operating levels. This appears to contradict the statement that there is no need for special emergency response plans.

   RECOMMENDATION: Remove the last sentence of the footnote starting with "therefore there is no need…" Replace with "The Navy will work with affected jurisdictions to develop coordinated emergency plans for response to a Navy Nuclear Propulsion emergency."

8. Page 22, Section 2.4, Projected Dose. Referencing the FRMAC manuals for "detailed methods for estimating projected Dose…" indicates that the methods necessary to implement this document are located elsewhere. For the purposes of this draft, are we expected to review the FRMAC manual to ensure this section is correct?

   RECOMMENDATION: Include the methods for estimating projected dose in this manual.

9. Page 22, Section 2.4, Projected Dose. The last sentence in this section states "EROs are encouraged to use the most current, applicable tools and methods for implementing PAGs." Unfortunately the tools are not listed nor is there a list of the most accurate, and there is also no mention as to which is most appropriate.

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RECOMMENDATION: Remove this sentence.

10. Page 13, Section 2.1 and Page 24, Section 2.4.3. The exclusion of Dose Conversion Factors (DCF), Derived Response Levels (DRL) and calculation methodologies makes this document more of a discussion of good ideas rather that a technical standard and reference document.

    RECOMMENDATION: Include DCFs, DRL, and calculation methodologies. Update the EPA PAGs as appropriate to maintain consistency.

11. Page 25, Section 2.6. NCRP documents are listed. These documents are not freely available and may not be available in an emergency.

    RECOMMENDATION: Add applicable information from the cited NCRP documents into the PAG.

12. Pages 26 and 27, Table 2.2, Response Worker Guidelines

    RECOMMENDATION: In the final publication, do not split tables.

13. Page 30 and 32, Section 2.7 last paragraph and tables 2-5, 2-6. The term two times the existing background is used. Does this mean twice the background above background or once above background: If background is 18 cpm, then is 2x background – 18+18 =36cpm or is it 36cpm above background, which is 18 cpm, so a meter reading of 54cpm?

    Conditions in our region have backgrounds from very low to relatively high levels. At the low end, simple dirt can double the background, but 2x the background above the background would indicate a real source of radiation.

    RECOMMENDATION: Either place a numerical limit such as "100 cpm" or explain 2 x background.

14. Page 30, Section 2.7. In the last sentence, the term restricted area is used. Restricted area was removed from Figure 3-1 and is not defined anywhere.

    RECOMMENDATION: Define this term or remove it.

15. Pages 31 and 32, Section 2.8.1 (4) uses the measurement "gamma exposure rates in millirem/per hour" where in tables 2-5 and 2-6 "mR/h gamma" is used.

    RECOMMENDATION: Use consistent terms to reduce confusion; mR/h gamma.

16. Page 32, Table 2-6. The term "Simple Decontamination" should be used to clarify the screening process for people in the Recommended Action column, Before Decontamination row.

    RECOMMENDATION: Add the term Simple Decontamination

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17. Page 35, Section 3.3. The third paragraph down references the basis for the PAG value in the prior PAG manual.
    RECOMMENDATION: Insert those basis discussions in the new PAG manual.

18. Page 35, Footnote 21 cites the 1998 FDA PAGs.

    RECOMMENDATION: Insert (return) the 1998 FDA PAGs to the manual.

19. Page 35, Section 3.3. The 50 year dose PAG has been removed. It provided additional long term safety for the public. No reasoning is provided for its removal.

    RECOMMENDATION: Return the 50 year dose PAG.

20. Page 36, Table 3-1, Footnote c. Remove this footnote as it is not achievable during the ingestion or intermediate phase of the emergency. Removal of soil would require much more explanation.

    RECOMMENDATION: Remove the statement "minor removal of soil from spots where radioactive materials have concentrated".

21. Pages: 37, Section 3.3.2. New terminology: The term Restricted Zone has been replaced with Relocation Area. The terms Restricted Zone helps to clearly define an area that has a hazard (and therefore requires limitations and/or controls) and it is easily understood by the general public and non-technical responders.

    RECOMMENDATION: Use the term Restricted Zone.

22. Page 42, Section 3.5 second paragraph. Drinking water PAG. The EPA should include a drinking water PAG into this manual. Use the standard NPDWR 4mrem/year based on lifetime exposure as the standard.

    RECOMMENDATION: Include a drinking water PAG utilizing the NPDWR 4 mrem/year standard.

23. Page 51, Section 4.4.1. The transition from intermediate phase to late phase cleanup is much like the transition from emergency operations to recovery operations. There is no clear dividing line where one ends and the other begins and there is a time where these activities occur concurrently. The law designates different lead agencies as responsible for leading the response and cleanup efforts. While the priority should be the intermediate phase activities for protection of human health, considerations of long term cleanup should be made in the decision making process. This becomes important for public information, resource management, laboratory prioritization, etc. All decisions should be coordinated and decisions for cleanup should not be made independently between a response group and a cleanup group.

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RECOMMENDATION: Discuss the use of Unified Command and coordination of decision making responsibility, resources, and facilities during the transition from the Intermediate to Late Phase Cleanup.

24. Page 53, Section 4.1.3. The paragraph starting with "Community..." The discussion that recommends using a range of one in a population of then thousand to one in a population of one million excess cancer incidence outcomes is generally considered protective for both chemical and radioactive carcinogenic contaminant exposures." This should be converted into a PAG for recovery and not presented as an option.

    RECOMMENDATION: Make this discussion into a PAG for recovery.

25. Pages 55 – 59, Section 4.1.6. Why provide an example? The example is subjective, situational, and based on unrealistic assumptions. Each and every situation where wide spread contamination is present will be different.

    RECOMMENDATION: Remove the example. The concepts that support the example have been sufficiently discussed.

26. Page 59, Section 4.2. The primary decisions fall to state and local officials on waste management, however the capacity and responsibility to effect that waste management falls to the federal government. No authority exists at the state level to establish a radioactive waste facility, only federal authorities can allow legally.

    RECOMMENDATION: Following the sentence on state and local decisions add "the federal government has the responsibility to develop the capacity for large scale radioactive waste management.

27. Page 64, last bullet on the page starting with "It is anticipated..." This statement is speculative and only the federal government can approve the creation of a radioactive waste facility.

    RECOMMENDATION: Remove this bullet.

28. Consider adding the following terms to the Glossary:

    Early Phase, Intermediate Phase, Late Phase – Page 5 lists all three and gives definition so it might be appropriate to also add these to glossary.

    Cloudshine – Page 7 mentions both groundshine and cloudshine in the lower portion of Table 1-1. Groundshine is listed in the glossary but cloudshine is not.

    Shelter-in-Place – Page 7 lists shelter-in-place as a protective action recommendation and should be listed in glossary.

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29. Consider adding the following to the list of Acronyms:

Sv and rem – Listed on page 7 and throughout document.

REMM – Radiological Emergency Medical Management mentioned on page 28.

RESRAD-RDD – Mentioned on Page 46.

NDRF – National Disaster Recovery Framework mentioned on page 55.

PCB's – Mentioned on page 62.

DIL – Derived Intervention Level listed in glossary but not in acronyms list.

REM – roentgen equivalent man listed in glossary but not in acronyms list.

4.1.3

2013

PAG Manual

Protective Action Guides And Planning Guidance For Radiological Incidents

U.S. Environmental Protection Agency
Draft for Interim Use and Public Comment
March 2013

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LIMITS ON SCOPE

This guidance does not address or impact site cleanups occurring under other statutory authorities such as the United States Environmental Protection Agency's (EPA) Superfund program, the Nuclear Regulatory Commission's (NRC) decommissioning program, or other federal or state cleanup programs.

As indicated by the use of non-mandatory language such as "may," "should" and "can," this Manual only provides recommendations and does not confer any legal rights or impose any legally binding requirements upon any member of the public, states, or any other federal agency.

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CHAPTER 1 – OVERVIEW

1.1. PLANNING GUIDANCE AND PROTECTIVE ACTION GUIDES

The U.S. Environmental Protection Agency (EPA) has developed this Manual to assist public officials in planning for emergency response to radiological incidents. For purposes of this document, a radiological incident is an event or a series of events, deliberate or accidental, leading to the release or potential release into the environment of radioactive materials in sufficient quantity to warrant consideration of protective actions. This Manual provides radiological protection criteria for application to all incidents that would require consideration of protective actions, with the exception of nuclear war.

During an incident with an uncontrolled source of radiation, protection of the public from unnecessary exposure to radiation may require some form of intervention that will disrupt normal living. Such intervention is termed a protective action. Examples of protective actions include:

- evacuating an area;
- sheltering-in-place within a building or protective structure;
- administering potassium iodide (KI) as a supplemental action;
- acquiring an alternate source of drinking water;
- interdiction of food/milk.

This Manual provides recommended numerical protective action guides (PAGs) for the principal protective actions available to public officials during a radiological incident. A PAG is defined for purposes of this document as the projected dose to an individual from a release of radioactive material at which a specific protective action to reduce or avoid that dose is recommended. PAGs are guides to help officials select protective actions under emergency conditions during which exposures would occur for relatively short time periods. They are not meant to be applied as strict numeric criteria, but rather as guidelines to be considered in the context of incident-specific factors. PAGs do not establish an acceptable level of risk for normal, nonemergency conditions, nor do they represent the boundary between safe and unsafe conditions. The PAGs are not legally binding regulations or standards and do not supersede any environmental laws. For information on roles, responsibilities and authorities during emergency response and recovery, please refer to the National Response Framework: http://www.fema.gov/national-response-framework and specifically for radiological incidents, the Nuclear Radiological Incident Annex: http://www.fema.gov/pdf/about/divisions/thd/IncidentNucRad.pdf (FEMA 2008a,b).

Some protective actions are not associated with a numerical PAG. For example, the control of access to areas is a protective action implemented in concert with other protective actions; it does not have its own PAG. Any reasonable action to reduce radiation dose is encouraged even if it is not associated with a PAG, such as recommending that individuals use ad hoc respiratory protection with a handkerchief or piece of folded cloth. Or in areas where PAGs are not exceeded, but airborne radioactivity is present, people might be asked to stay indoors to the extent practicable to reduce their exposures. To further develop radiological emergency plans, brief planning guides have been provided for reentry to relocation areas, the cleanup planning process and considerations for radioactive waste disposal.

1.2. APPLICABILITY

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Protective actions may be recommended for a wide range of incidents, but generally apply to incidents involving relatively significant releases of radionuclides. Radiological incidents with potential for significant releases include:

- a fire in a major facility such as a nuclear fuel manufacturing plant;
- an accident at a federal nuclear weapons complex facility;
- an accident at a commercial nuclear power plant (NPP);
- a transportation accident involving radioactive material;
- a terrorist act involving a radiological dispersal device (RDD) or yield-producing Improvised Nuclear Device (IND).

Each type of incident would pose a unique threat to public health and should be planned for and managed accordingly. Emergency response planning for a given facility or scenario should consider:

- the radionuclides involved;
- the dynamics of the release including size and magnitude;
- the feasibility of specific protective actions;
- the timing of notification, response and protective action implementation.

The decision to advise members of the public to take a protective action during a radiological incident involves a complex judgment in which the radiological risk must be weighed against the action's inherent risks. This decision may have to be made under emergency conditions, with limited information and little time to analyze options. Advance planning reduces the complexity of the decision-making process during an incident. The planning process can identify the viability of responses to various incidents, the courses of action that can be set in motion in advance and the decisions that can only be made during an actual emergency. While many aspects of protective actions can be considered well in advance of an emergency, the situations and conditions that exist at the time of emergency must be considered if the most effective action is to be selected.

The unpredictable locations of certain radiological incidents make advance planning challenging. For example, an RDD could detonate anywhere and spread radiological contaminants over a wide variety of surfaces and terrain. Emergency planners should be prepared to apply PAGs to a wide scope of facilities and circumstances.

1.3. BACKGROUND ON THE UPDATED PAGS

This Manual updates the "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents" (EPA-400-R-92-001, May 1992), published by the U.S. EPA (EPA 1992b) (hereinafter referred to as the "1992 PAG Manual"). The guidance in this Manual was developed cooperatively with the Federal Radiological Preparedness Coordination Committee (FRPCC), with representation from the EPA; the Department of Energy (DOE); the Department of Defense (DoD); the DHS' Federal Emergency Management Agency (FEMA); the Nuclear Regulatory Commission (NRC); the Department of Health and Human Services (HHS), including the Centers for Disease Control and Prevention (CDC) and the Food and Drug Administration (FDA); the Department of Agriculture (USDA); and the Department of Labor (DOL).

1.3.1. Legal Basis

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The historical and legal basis of EPA's role in developing this guidance begins with Reorganization Plan No. 3 of 1970, in which the Administrator of EPA assumed all the functions of the Federal Radiation Council (FRC), including the charge to "…advise the President with respect to radiation matters, directly or indirectly affecting health, including guidance for all federal agencies in the formulation of radiation standards and in the establishment and execution of programs of cooperation with states" (Reorg. Plan No. 3 of 1970, sec. 2(a) (7), 6(a) (2); § 274.h of the Atomic Energy Act of 1954, as amended (AEA), codified at 42 U.S.C. § 2021(h)). Recognizing this role, FEMA directed EPA in their Radiological Emergency Planning and Preparedness Regulations to "establish Protective Action Guides (PAGs) for all aspects of radiological emergency planning in coordination with appropriate federal agencies" (44 Code of Federal Regulations (CFR) §351.22(a)). FEMA also tasked EPA with preparing "guidance for state and local governments on implementing PAGs, including recommendations on protective actions which can be taken to mitigate the potential radiation dose to the population" (44 CFR §351.22(b)). All of this information was to "be presented in the EPA Manual of Protective Action Guides and Protective Actions for Nuclear Incidents" (44 CFR §351.22(b)).

Additionally, section 2021(h) charged the Administrator with performing "such other functions as the President may assign to him [or her] by Executive Order." Executive Order 12656 states that the Administrator shall "[d]evelop, for national security emergencies, guidance on acceptable emergency levels of nuclear radiation…." (Executive Order No. 12656, sec.1601(2)). EPA's role in the development of PAGs was also recognized in the "Nuclear/Radiological Incident Annex of the National Response Framework" of June 2008.

1.3.2. Technical Basis

The FRC introduced the concept of a PAG in a series of recommendations issued in the 1960s. A key concept about PAGs is that the decision to implement protective actions should be based on the projected dose that would be avoided if the protective actions were implemented. Developers of the EPA PAGs considered the following three principles in establishing exposure levels for the PAGs—

1. Prevent acute effects.
2. Balance protection with other important factors and ensure that actions result in more benefit than harm.
3. Reduce risk of chronic effects.

These principles apply to the determination of any PAG. Principles 1 and 2 have been proposed for use by the international community as essential basies for decisions to intervene during an incident. Principle 3 has been recognized as an appropriate additional consideration (IAEA 1989). Although it is important during emergency planning to consider a range of source terms to assess the costs associated with their implementation, the PAGs are pre-determined for use in emergencies without regard to the magnitude or type of radiological release. This needs further clarification as the wording is confusing. The magnitude and type of radiological release would seem to be what drives the use of specific PAGs. Also, cost considerations may not drive the initial choice of PAGs, but could be be more relevant in the post emergency phase.

1.3.3. Changes in Scenarios since the Issuance of the 1992 PAG Manual

EPA's 1992 PAG Manual provided emergency management officials at the federal, state, tribal and local levels with the technical basis to plan responses to radiological emergencies. The 1992 PAG Manual was written to accommodate the worst release scenario deemed likely at the time – a major accident at a commercial NPP that would result in a significant off-site release of radioactive material. ("Site" and "off-site" in this Manual refer to locations where the radiological incident occurs and are not limited to facility-type incidents.) Certain characteristics typify NPPs, including: fixed locations at which an accident might occur; a known suite of radionuclides on site, the dose from which is dominated by short-

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lived radioisotopes; tight regulatory controls and requirements; skilled operational personnel who plan for

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and exercise emergency responses; state and local involvement in emergency planning; well-developed and zoned emergency evacuation plans and routes; and advance notice (generally hours to days) from deteriorating plant conditions prior to accidental release of radioactive material into the environment. Therefore, the 1992 PAG Manual provided decision-makers with radiation dose-based PAG values for various exposure pathways (such as whole body, skin dose and food ingestion) and associated protective actions that were adapted to the mix of radionuclides and operational environments associated with commercial NPPs.

In late 1991, EPA conducted a symposium titled "Implementing Protective Actions for Radiological Incidents at Other Than Nuclear Power Reactors," to evaluate PAGs for incidents other than accidents at NPPs and concluded that the PAGs could be applied to all radiological incidents (EPA 1992a). Since then, new radiological and nuclear scenarios involving terrorist use of radioactive materials have gained status in radiological emergency response planning.

In 2008, the Department of Homeland Security (DHS) published "Planning Guidance for Protection and Recovery Following Radiological Dispersal Device (RDD) and Improvised Nuclear Device (IND) Incidents" (DHS 2008). An RDD is a device or mechanism that is intended to spread radioactive material from the detonation of conventional explosives or other means. An IND is a crude, yield-producing nuclear weapon fabricated from diverted fissile material. Incidents like these may occur anywhere with little or no warning. The DHS guidance, developed cooperatively with EPA, DOE, DoD, DOL, HHS, Department of Commerce (DOC), and the NRC, affirms the applicability of existing 1992 EPA PAGs to terrorist acts, while acknowledging that the PAGs were inadequate for early response planning needs specific to an IND. To address this gap, "Planning Guidance for Response to a Nuclear Detonation" (NSS 2010) was subsequently published.

This Manual substantively incorporates late phase cleanup guidance provided in the 2008 DHS document and refers readers to additional planning resources.

1.3.4. Key Changes to PAGs in this Updated Manual

This updated Manual applies PAGs and protective actions to an expanded range of sources of potential radiological releases, including commercial nuclear power facilities, uranium fuel cycle facilities, nuclear weapons facilities, transportation accidents, radiopharmaceutical manufacturers and users, space vehicle launch and reentry, RDDs and INDs.

Dosimetry for all the PAGs was updated using the International Commission on Radiological Protection (ICRP) Publication 60 series (ICRP 1991). The PAGs in this Manual may be implemented using calculated, measurable values contained in the Federal Radiological Monitoring and Assessment Center (FRMAC) Assessment Manuals (DOE 2010a, b),[1] though using other incident-specific dose assessment methodologies is encouraged, where appropriate.

This Manual incorporates several related guidance documents published subsequent to the 1992 guidance, including FDA's 1998 update of the PAGs for interdiction of food. This Manual also incorporates FDA's 2001 decision to lower the PAG for administration of stable iodine to 5 rem (50 millisieverts (mSv)) projected child thyroid dose. Finally, this update removes the intermediate phase relocation PAG of 5 rem (50 mSv) over 50 years to avoid confusion with long-term cleanup. All other PAGs and corresponding protective actions from the 1992 PAG Manual remain unchanged.

[1] See FRMAC Assessment folder at http://www.nv.doe.gov/nationalsecurity/homelandsecurity/frmac/manuals.aspx.

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Recommended limits of exposure for emergency workers also remain unchanged from the 1992 PAG Manual. The emergency worker guides in this manual are consistent with federal and state regulations. Responsible officials should use judgment when doses may exceed regulatory limits and must advise workers of the risks Table 1-1 presents PAGs with their principal associated protective actions or planning guides.

To further develop radiological emergency plans, brief planning guides have been provided for reentry to relocation areas, a cleanup planning process and considerations for radioactive waste disposal. In this Manual, the term reentry is used for emergency workers and members of the public going into relocation areas temporarily, under controlled conditions.

1.4. RADIOLOGICAL INCIDENT PHASES AND APPLICABILITY OF PROTECTIVE ACTIONS

Emergency planners divide responses to radiological incidents into three phases of activity—

- **Early Phase** — The beginning of a radiological incident when immediate decisions for effective use of protective actions are required and must therefore be based primarily on the status of the radiological incident and the prognosis for worsening conditions. When available, predictions of radiological conditions in the environment based on the condition of the source or actual environmental measurements may be used. Protective actions based on the PAGs may be preceded by precautionary actions during the period. (Provide a definition of precautionary vs. protective actions. Samples of precautionary actions in the early phase are putting animals on stored feed, cancellation of after school activities, etc.) This phase may last from hours to days.
- **Intermediate Phase** — The period beginning after the source and releases have been brought under control (has not necessarily stopped but is no longer growing) and reliable environmental measurements are available for use as a basis for decisions on protective actions and extending until these additional protective actions are no longer needed. This phase may overlap the early phase and late phase and may last from weeks to months.
- **Late Phase** — The period beginning when recovery actions designed to reduce radiation levels in the environment to acceptable levels are commenced and ending when all recovery actions have been completed. This phase may extend from months to years. A PAG level, or dose to avoid, is not appropriate for long-term cleanup.

The phases cannot be represented by precise periods of time – and may even overlap – but to view them in terms of activities, rather than time spans, can provide a useful framework for emergency response planning.

In the early phase, sheltering-in-place and evacuation are the principal protective actions. These actions are meant to avoid inhalation of gases or particulates in an atmospheric plume and to minimize external radiation exposures. Administration of prophylactic drugs may be employed depending on the specific radionuclides released; in particular, KI, also called “stable iodine”—may be administered as a supplementary protective action in incidents involving the release of significant quantities of radioactive iodine, such as NPP incidents. Some protective actions may begin prior to the release of radioactive material when there is advance notice.

Planning considerations for reentry to relocation areas for specific tasks are suggested and basic planning guidance for late phase cleanup is provided in Chapters 3 and 4.

1.4.1. Implementation of Protective Action Guides and Protective Actions

Immediately upon becoming aware that an incident is about to occur or has occurred that may result in

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exposure of the population, responsible authorities should make a preliminary evaluation to determine the

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nature and potential magnitude of the incident. This evaluation should determine whether conditions indicate a significant possibility of a major release and, to the extent feasible, determine potential exposure pathways, populations at risk and projected doses. The incident evaluation and recommendations should then be presented to emergency response authorities for consideration and implementation.

During the early phase, the sequence of events includes—evaluation of conditions at the location of the incident, notification of responsible authorities, prediction or evaluation of potential consequences to the general public, recommendations for action and implementation of actions for the protection of the public.

In the intermediate phase, dose projections used to support decisions about protective actions may be based on measurements of environmental radioactivity and dose models. When conditions warrant relocation of populations, the collection of extensive radiological and cost-of-cleanup data will be necessary to form the decision basis for cleanup and recovery of the affected areas.

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Table 1-1. Planning Guidance and Protective Action Guides for Radiological Incidents

Phase	Protective Action Recommendation	Protective Action Guide or Planning Guide
Early (Chapter 2)	Sheltering-in-place or evacuation of the public[a]	1 to 5 rem (10 mSv to 50 mSv) projected dose/4 days[b]
	Administration of prophylactic drugs KI[c]	5 rem (50 mSv) projected child thyroid dose[d] from radioactive iodine
	Limit emergency worker exposure	5 rem (50 mSv)/year (or greater under exceptional circumstances)[e]
Intermediate (Chapter 3)	Relocation of the public	2 rem (20 mSv) projected dose first year[b] Subsequent years, 0.5 rem (5 mSv)/year projected dose
	Food interdiction[f]	0.5 rem (5 mSv)/year projected dose, or 5 rem (50 mSv)/year to any individual organ or tissue, whichever is limiting
	Limit emergency worker exposure	5 rem (50 mSv)/year[b]
	Reentry	Operational Guidelines[g] (Stay times and concentrations) for specific activities (see Section 3.7)
Late (Chapter 4)	Cleanup	Brief description of planning process
	Waste Disposal	Brief description of planning process

[a] Should begin at 1 rem (10 mSv); take whichever action (or combination of actions) that results in the lowest exposure for the majority of the population. Sheltering may begin at lower levels if advantageous.
[b] Projected dose- the sum of the effective dose from external radiation exposure (i.e., groundshine and cloudshine) and the committed effective dose from inhaled radioactive material.
[c] Provides thyroid protection from internal exposure to radioactive iodines only. For other information on radiological prophylactics and treatment, refer to http://www.fda.gov/Drugs/EmergencyPreparedness/BioterrorismandDrugPreparedness/ucm063807.htm http://www.bt.cdc.gov/radiation and www.orau.gov/reacts
[d] Thyroid equivalent dose. For more information, refer to http://www.fda.gov/Drugs/EmergencyPreparedness/BioterrorismandDrugPreparedness/ucm072265.htm.
[e] When radiation control options are not available, or, due to the magnitude of the incident, are not sufficient, doses to emergency workers above 5 rem (50 mSv) may be unavoidable and are generally approved by competent authority. For further discussion see Chapter 2, Section 2.6.
[f] For more information on food and animal feeds guidance, the complete FDA guidance may be found at http://www.fda.gov/downloads/MedicalDevices/DeviceRegulationandGuidance/GuidanceDocuments/UCM094513.pdf
[g] For extensive technical and practical implementation information please see "Preliminary Report on Operational Guidelines Developed for Use in Emergency Preparedness and Response to a Radiological Dispersal Device Incident" (DOE 2009)

Protective actions may already be designated in existing emergency response plans. Under NRC regulations, large commercial NPPs must maintain detailed radiological response plans for an emergency planning zone (EPZ) within a 10 mile (16.1 km) radius of the plant and for a separate ingestion pathway EPZ within a 50 mile (80.5 km) radius. Emergency responders should be prepared to select and implement appropriate protective actions when standing response plans are not available or applicable. This becomes especially critical in an RDD event, which could occur anywhere.

1.4.2. Early Phase Protective Action Guides and Protective Actions

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In the early phase, there may be little or no data on actual releases to the environment and responders may have to rely on crude estimates of airborne releases. Decision time frames are short and preparation is critical to make prudent decisions when data are lacking or insufficient.

The principal protective actions for the early phase are evacuation and sheltering-in-place. These protective actions would be taken if whole body doses are projected to exceed 1 to 5 rem (10 to 50 mSv) over four days. (Should the >4 days be the basis for this decision? What if the level is exceeded in day 5 or beyond?) The decision to evacuate must weigh the anticipated radiation dose to individuals in the affected population against the feasibility of evacuating within a determined time frame and the risks associated with the evacuation itself. For example, evacuating a population of 50,000 carries with it a statistical risk of injury or death from transportation hazards or increased exposure. Evacuation also takes time. In the case of an accident at an NPP, there may be sufficient time for an orderly and relatively safe evacuation. In the case of a fire or explosion of an RDD in an urban area, evacuating a large group of people could leave them exposed to the plume and actually increase radiation dose. Sheltering-in-place may be warranted in situations where evacuation poses a greater risk of exposure or physical harm.

In addition, there are actions that are advisable, but not associated with a numerical PAG. For example, individuals should be instructed to cover airways (nose and mouth) with available filtering material when airborne radionuclides may be present. Decontamination is another protective action that may be utilized in the early phase and may include washing of contaminated individuals, removing contaminated clothing and decontaminating surfaces of critical areas and objects. Further, in areas where airborne radioactivity is present but PAGs are not exceeded, officials can consider asking people to stay indoors to the extent practicable. In such cases, individuals are not prevented from carrying out necessary tasks (e.g., seeking medical care, purchasing food). Similar to actions used in major cities on high pollution days, these measures can be effective to reduce radiation doses when prolonged releases occur, as was the case for the Fukushima accident in Japan.

In cases where significant quantities of radioiodine may have been released, administration of the radioprotectant KI should be considered as a supplementary protective action if the projected child thyroid dose exceeds 5 rem (50 mSv). This PAG is lower than the 1992 guidance. The lower dose, which FDA adopted in 2001, is for protection of children based on early studies of Chernobyl exposure data.

The choice of protective action will be based on the status of the incident site and the prognosis for worsening conditions. In the early phase, precautionary actions based on worst-case scenarios may be used before implementation of protective actions based on PAGs. For example, in the case of RDD detonation, governments may instruct affected populations to shelter in place as a precautionary action (T~~t~~his may not be a good example to use of a precautionary action as "shelter in place" is on the list of protective~~ons~~ actions. However, we note that "shelter-in-place could be seen as precautionary in that it could be recommended in the case of an RDD – even with no data available. The distinction between what actions fall under the category of precautionary vs. protective may be a subjective, yet we rely on the power plants to provide initial "protective" action recommendations - which we then assess and either swiftly act on or modify. Perhaps you could use a different example such as, "goverments may instruct affected populations to take precautionary actions such as stay tuned to local media and await further instructions") while radiation levels are being measured to determine appropriate PAG-based protective actions. Officials should plan for rapid broadcast and dissemination of protective action orders to the public.

When available, predictions of radiological conditions in the environment based on an estimate of the source or actual environmental measurements may be used. Nuclear facilities, for example, have continuous, real-time radioactive effluent monitoring capabilities to monitor radioactive material released to the environment and may have a network of off-site measurement stations.

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1.4.3. Intermediate Phase Protective Action Guides and Protective Actions

Intermediate phase activities are intended to reduce or avoid dose to the public, to control worker exposures, to control the spread of radioactive contamination and to prepare for late phase cleanup operations.

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During the intermediate phase, relocation is the principal protective action against whole body external exposure from deposited material and internal exposure from inhalation of radioactive particulates. People may need to be relocated for weeks or months.

It is necessary to distinguish between evacuation and relocation. Evacuation is the urgent removal of people from an area to avoid or reduce high-level, short-term exposure from the plume or deposited activity. Relocation is the removal or continued exclusion of people (households) from contaminated areas to avoid chronic radiation exposure. Site-specific conditions may allow some groups evacuated in an emergency to return, while others may have to relocate. In other cases, some groups that were not previously evacuated may have to relocate (see Section 3.3.1 for more details).

Intermediate phase PAGs are based on doses projected in the first and a limited number of subsequent years. The PAG for relocation of the public is 2 rem (20 mSv) in the first year and 0.5 rem (5 mSv) in any subsequent year. (Note: Relocation PAGs are treated separately from food and water ingestion. That is, projection of intermediate phase doses should not include these ingestion pathways. In some instances, however, where withdrawal of food and/or water from use would, in itself, create~~create~~ a~~,~~ health risk, relocation may be an appropriate alternative protective action. In this case, the ingestion dose should be considered along with the projected dose from deposited radionuclides via other pathways, for decisions on relocation.) When projected doses are less than the relocation PAG of 2 rem (20 mSv) in the first year, focused environmental decontamination and cleanup may be able to reduce doses to populations that are not relocated. Decontamination and focused cleanup techniques can range from simple actions such as the scrubbing and flushing of surfaces with uncontaminated water to the removal and disposal of soil and contaminated debris.

Keeping projected doses below the 0.5 rem (5 mSv) PAG for ~~out~~ first year~~s~~ – the second year and beyond – may be achieved through the decay of shorter half-life radioisotopes (as in the case of an accident at an NPP), through environmental decontamination and cleanup efforts or through other means of controlling public exposures, such as limiting access to certain areas. Information on food and animal feeds
protective action guidance is contained in FDA's "Accidental Radioactive Contamination of Human Food and Animal Feeds: Recommendations for State and Local Agencies" (FDA 1998). Workers and members of the public may be allowed to re-enter relocation area for tasks related to critical infrastructure and key resources, to care for animals and to assess the condition of closed zones. Reoccupancy may be allowed under dose constraints acceptable to the community. In this Manual, the term reoccupancy refers to households and communities moving back into relocation areas where the cleanup process is still ongoing, based on radiation levels acceptable to those communities.

EPA is not proposing a specific drinking water PAG at this time. EPA has established enforceable drinking water standards for radionuclides under the Safe Drinking Water Act (SDWA). EPA recommends that, to the extent practicable, emergency measures for drinking water be based on the National Primary Drinking Water Regulations (NPDWR) for Radionuclides. The Radionuclides Rule provides states with flexibility when responding to radiological events. If a public water system exceeds the radionuclides standard it must work to get back into compliance as soon as feasible. States have the authority to determine if other corrective actions are needed (e.g. providing alternative water). Guidance on monitoring, notification and protective actions is provided in Chapter 3, along with several online resources for drinking water system operators.

However, in light the Fukushima nuclear power plant accident, in which some Japanese drinking water supplies were impacted, the Agency recognizes a short-term emergency drinking water guide may be useful for public health protection The Agency requests input on the appropriateness of, and possible values for, a drinking water PAG.
A drinking water PAG would be useful for states in both ~~pal~~planning and decision making – with

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recommendations for each phase – early, intermediate and late/clean-up phase. Also would help to distinguish between safe levels for use of different types of use beyond drinking – such as bathing, washing, etc.

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While the NPDWR provide for a regulatory standard of 4 mrem/year (beta, photon emitters) based on life-time exposure, international organizations have developed technical approaches and methodologies that have produced a range of emergency guidelines related to drinking water (e.g., the World Health Organization[2], the International Atomic Energy Agency[3]), as have other federal agencies (e.g. the Department of Homeland Security[4], the Food and Drug Administration[5]) and non-federal organizations. EPA is seeking input on an approach and technical rationale for a drinking water PAG designed to help officials select protective actions under emergency conditions when exposures would occur over shorter time periods than those envisioned in the NPDWR.

During the intermediate phase, government officials may convene to discuss late phase cleanup and site restoration strategies. All actions taken during the early and intermediate phases should be considered with respect to the impact they may have on late phase remediation, such as avoiding the use of fixatives that could hinder surface decontamination at a later date.

1.4.4. Late Phase

The late phase, as used in this Manual, is the period beginning when cleanup and recovery actions have begun and ending when all recovery actions have been completed. This phase may extend from months to years.

The late phase cleanup process, as described in this guidance, begins sometime after the commencement of the intermediate phase and proceeds independently of intermediate phase protective action activities. The transition is characterized by a change in approach, from strategies predominantly driven by urgency, to strategies aimed at both reducing longer-term exposures and improving living conditions. The late phase involves the final cleanup of areas and property at which contamination directly attributable to the incident is present. It is in the late phase that final cleanup decisions are made and final recovery efforts following a radiological incident are implemented.

Unlike the early and intermediate phases of a radiological incident, decision makers will have more time and information during the late phase to allow for better data collection, stakeholder involvement and options analysis. Community members will influence decisions such as if and when to allow people to return home to contaminated areas. There will be populations, who were not relocated or evacuated, living in contaminated areas where efforts to reduce exposures will be ongoing. Implicit in these decisions is the ability to balance health protection with the desire of the community to resume normal life. Radiation protection considerations must be addressed in concert with health, environmental, economic, social, psychological, cultural, ethical, political and other considerations. Many federal, state, and local agencies have important roles to play. It is recognized that experience from existing programs, such as the U.S. EPA's Superfund program, the U.S. NRC's process for decommissioning and decontamination to terminate a nuclear facility license and other national recommendations may be useful for designing cleanup and recovery efforts that could apply to a radiological incident. The cleanup process described in Chapter 4, however, does not rely on and does not affect any authority, including the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 U.S.C. 9601 et seq. and the National Contingency Plan (NCP), 40 CFR Part 300. For information on roles, responsibilities and authorities during emergency response and recovery please refer to the National Response Framework: http://www.fema.gov/national-response-framework and specifically for radiological incidents, the Nuclear Radiological Incident Annex: http://www.fema.gov/pdf/about/divisions/thd/IncidentNucRad.pdf (FEMA 2008a, b).

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[2] See: http://www.who.int/water_sanitation_health/dwq/gdwq3rev/en/ and http://www.who.int/hac/crises/jpn/faqs/en/index8.html
[3] See: http://www-pub.iaea.org/MTCD/publications/PDF/Pub1467_web.pdf.
[4] See: http://ogcms.energy.gov/73fr45029.pdf and the
[5] See: http://www.fda.gov/downloads/MedicalDevices/.../UCM094513.pdf.

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The late phase or cleanup process described in Chapter 4 consists of multiple steps, namely 1) characterization and stabilization, 2) development of goals and strategies and 3) implementation and reoccupancy; meaningful stakeholder involvement should be integrated *throughout* the process.

While radioactive waste handling and disposal will be an ongoing endeavor during the entire emergency response, brief planning guidance is provided in Chapter 4, the late phase. This guidance addresses both locations that may be identified by state and local officials and locations owned by the federal government, and lists criteria for evaluating their suitability for disposal, as well as actions that can be taken to facilitate their use. Legal and other considerations are also discussed. This guidance assumes that on-site disposal at a location affected by the incident, where appropriate, will be one of the locations of choice. Though recommended as the first consideration for discussion post-accident or attack, this guidance assumes that existing non-federal radioactive waste disposal capacity already available to impacted states and their regions is overwhelmed or otherwise eliminated from consideration, which drives the need to identify other disposal options or develop new disposal capacity.

We agree and would likely need federal disposal sites in a major event.

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KEY POINTS IN CHAPTER 1 – OVERVIEW

- A PAG is the projected dose to an individual from a release of radioactive material at which a specific protective action to reduce or avoid that dose is recommended. PAGs are guides to help officials select protective actions under emergency conditions when exposures would occur over relatively short time periods.
- EPA provides the PAG Manual to assist public officials with their radiological emergency response planning activities. The PAG Manual is a guidance document, not a legally binding regulation and does not affect or supersede any environmental laws. The PAG recommendations do not represent the boundary between safe and unsafe conditions.
- PAGs may be implemented to protect the public in a wide variety of radiological emergencies, including terrorist incidents and accidents involving nuclear power plants, transportation and the space program.
- PAGs are appropriate for implementation in the early and intermediate phases of radiological incidents. The early phase—lasting hours to days—is the period beginning at the projected (or actual) initiation of a release when immediate decisions for effective use of protective actions are required and must therefore be based primarily on the status of the release and the prognosis for worsening conditions. Little environmental data may be available in the early phase. The intermediate phase—lasting weeks to months—is the period beginning after the source and releases have been brought under control and environmental measurements are available for use as a basis for decisions on protective actions.
- Reentry and reoccupancy decisions will be made using incident-specific circumstances and the Operational Guidelines (DOE 2009).
- Cleanup and waste disposal decisions may be informed by planning guidance provided in Chapter 4.
- What's new in this updated Manual—
  - The PAGs in this Manual are implemented using the calculations and methods in the FRMAC Assessment Manual. Dosimetry in that Manual has been updated using the ICRP Publication 60 series (ICRP 1991).
  - EPA adopts the FDA guidance issued in 2001 that recommended lowering the projected thyroid dose at which the administration of KI is warranted as a supplementary protective action.
  - EPA adopts the 1998 FDA Food PAGs.
  - Planning guidance has been provided for reentry, late phase cleanup and waste disposal.

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CHAPTER 2 – EARLY PHASE PROTECTIVE ACTION GUIDES

2.1. INTRODUCTION

Decisions regarding protective actions for workers and the public during radiological incidents are risk management decisions and the recommendations in this Manual are provided in that context. Rapid action may be required to protect members of the public in the event of an incident involving a large release of radioactive materials into the environment. In all cases, all practical and reasonable means should be used to reduce or eliminate exposures.

This chapter presents PAGs for use in the early phase of a radiological incident. A PAG is the projected dose to an individual from a release of radioactive material at which a specific protective action should be taken to reduce or avoid that dose. The early phase begins at the actual or projected start of a release—most likely before ambient environmental and radiological data become available for quantitative risk-based actions. The exact duration of the early phase depends upon site conditions, but one should plan to project doses for four days.

Many radiological emergency scenarios would involve airborne releases, so this chapter provides guidance for estimating projected doses from exposure to an airborne plume of radioactive material and for implementing protective actions. Dose calculations for implementing the PAGs are made using the dose conversion factors (DCFs) and derived response level (DRL) methods referenced in the FRMAC Assessment Manuals (DOE 2010a, b).[6] Other calculation methods to implement PAGs may be appropriate.

2.2. EXPOSURE PATHWAYS DURING THE EARLY PHASE

During the early phase of an incident, there are three main exposure pathways from airborne releases—

- **Direct exposure** to radioactive materials in an atmospheric plume. The contents of such a plume will depend on the source of radiation involved and conditions of the incident. For example, in the case of an incident at an NPP, the plume may contain radioactive noble gases, radioiodines and radioactive particulate materials. Many of these materials emit gamma radiation that can expose people in the vicinity of the passing plume.
- **Inhalation** of radionuclides from immersion in a radioactive atmospheric plume and inhalation of ground-deposited radionuclides that are resuspended into a breathing zone. Inhaled radioactive particulates, depending on their solubility in body fluids, may remain in the lungs or move via the bloodstream to other organs, prior to elimination from the body. Some radionuclides become concentrated in a single body organ, with only small amounts going to other organs. For example, a significant fraction of inhaled radioiodines will move through the bloodstream to the thyroid gland.
- **Deposition** of radioiodine and particulates from a radioactive plume. Deposited materials can continue to emit beta and gamma radiation as "groundshine" after the plume has passed causing continued exposure to skin and internal body organs. Similarly, skin and clothes may become contaminated.

A plume may deposit materials on surfaces, posing a risk of longer-term exposures via ingestion, direct external exposure and inhalation pathways. If the release contains large quantities of radioactive iodines or particulates, the resulting long-term exposure to this "groundshine" can be more significant than

[6] See FRMAC Assessment folder at http://www.nv.doe.gov/nationalsecurity/homelandsecurity/frmac/manuals.aspx.

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external exposure from the passing plume if the exposure time to the ground contamination is long in comparison to the plume passage time. The early phase PAGs assume four days of exposure to ground contamination to address this possibility. Doses from groundshine can be readily measured by field monitoring teams dispatched at the onset of a significant radioactive release. Holding a detector probe horizontal and three feet above the contaminated surface provides a direct measurement of groundshine dose. Such assessments can confirm dose projections based upon effluent release data and the adequacy of protective actions in the early phase. More detailed analyses (e.g., isotopic) would be needed to support long-term dose projections in the intermediate phase. Doses for groundshine can be calculated during the intermediate phase (see Chapter 3). Exposure pathways that contribute less than ten percent to the total dose incurred need not be considered during the early phase.

2.2.1. The Establishment of Exposure Patterns

It is unlikely that sufficient environmental data will be available for accurate dose projections during and immediately following the early response to a radiological incident. Dose projections are needed to determine whether protective actions should be implemented in additional areas during the early phase.

For dose projections in the early phase there are two sources of data: current data from initial environmental measurements or estimates of the source term and estimated data using modeled or historical atmospheric transport data. Source term measurements, or exposure rates or concentrations measured in the plume at a few selected locations, may be used to estimate the extent of the exposed area in a variety of ways, depending on the types of data and computation methods available. The most accurate method of projecting doses is through the use of an atmospheric diffusion and transport model that has been verified for use at the site in question or for similar site conditions. A variety of computer software packages can be used to estimate dose in real time, or to extrapolate a series of previously-prepared isopleths for unit releases under various meteorological conditions. The latter can be adjusted for the estimated source magnitude or environmental measurements at a few locations during the incident. If the model projections have some semblance of consistency with environmental measurements, extrapolation to other distances and areas can be made with greater confidence. If projections using a sophisticated site-specific model are not available, a simple but crude method is to measure the plume centerline exposure rate[7] at ground level (measured at approximately 1 m height) at a known distance downwind from the release point and then to calculate exposure rates at other downwind locations by assuming that the plume centerline exposure rate is a known function of the distance from the release point.

The following relationship can be used for this calculation:

$$D_2 = D_1 (R_1/R_2)^y$$

where D_1 and D_2 are exposure rates at the centerline of the plume at distances R_1 and R_2 from the release, respectively and y is a constant that depends on atmospheric stability. For stability classes[8] A and B, y = 2; for stability classes C and D, y = 1.5; and for stability classes E and F, y = 1. Classes A and B (unstable) occur with light winds and strong sunlight and classes E and F (stable) with light winds at night. Classes C and D generally occur with winds stronger than about 10 mph. This method of extrapolation is risky because the measurements available at the reference distance may be unrepresentative, especially if the plume is aloft and has a looping behavior. In the case of an elevated

[7] The centerline exposure rate can be determined by traversing the plume at a point sufficiently far downwind that it has stabilized (usually more than one mile from the release point) while taking continuous exposure rate measurements.

[8] Pasquill stability classes categorize atmospheric turbulence into six stability classes named A, B, C, D, E and F, class A being the most unstable or most turbulence and class F the most stable or least turbulence. Pasquill, F. 1961. The Estimation of the Dispersion of Windborne Material. The Meteorological Magazine 90, No. 1063, 33-49.

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plume, the ground level concentration increases with distance from the source and then decreases, whereas any high-energy gamma radiation from the overhead cloud continuously decreases with distance. For these reasons, this method of extrapolation will perform best for surface releases or if the point of measurement for an elevated release is sufficiently distant (usually more than 1 mile) from the point of release for the plume to have expanded to ground level. The accuracy of this method will be improved by the use of measurements from many locations averaged over time.

2.3. THE PROTECTIVE ACTION GUIDES AND PROTECTIVE ACTIONS FOR THE EARLY PHASE: EVACUATION, SHELTERING-IN-PLACE AND ADMINISTRATION OF POTASSIUM IODIDE

The principal protective actions for the early phase are evacuation or sheltering-in-place. Evacuation is the urgent removal of people from an area to avoid or reduce high-level, short-term exposure from the plume or deposited activity. Sheltering-in-place is the action of staying or going indoors immediately. The administration of KI (stable iodine) to partially block the uptake of radioiodines by the thyroid is a supplemental protective action.

In addition, washing the body and changing clothing as soon as possible after significant exposure to a radioactive plume of any composition may be recommended protective actions. Changing of clothing is recommended primarily to provide protection from beta radiation from radioiodines and particulate materials deposited on the clothing.

The PAGs and corresponding protective actions for response during the early phase of an incident are summarized in Table 2-1. Evacuation or sheltering-in-place will be justified when the projected dose to an individual is 1 rem (10 mSv) projected over four days. This conclusion is based primarily on EPA's determination concerning acceptable levels of risk of health effects from radiation exposure in an emergency situation, while weighing costs and risks associated with any protective action. The basis for the PAGs for the early phase is given in Appendix C of the 1992 PAG Manual, available online as a historical reference at http://www.epa.gov/radiation/rert/pags.html.

Table 2-1. PAGs and Protective Actions for the Early Phase of a Radiological Incident

Protective Action Response	PAG (projected dose)	Comments
Sheltering-in-place or evacuation of the public[a]	1 to 5 rem (10 mSv to 50 mSv) over four days[b]	Evacuation (or, for some situations, sheltering-in-place) should be initiated when projected dose is 1 rem (10 mSv).
Supplementary administration of prophylactic drugs – KI[c]	5 rem (50 mSv) projected dose to child thyroid from exposure to iodine[d]	KI is most effective if taken prior to exposure. May require approval of state medical officials (or in accordance with established emergency plans).

[a]Should begin at 1 rem (10 mSv) except when practical or safety considerations warrant using 5 rem (50 mSv); take whichever action (or combination of actions) that results in the lowest exposure for the majority of the population. Sheltering may begin at lower levels if advantageous.
[b]Calculated dose is the projected sum of the effective dose from external radiation exposure (i.e., groundshine) and the committed effective dose from inhaled radioactive material.
[c]Provides thyroid protection from radioactive iodines only. For other information on radiological prophylactics and treatment, refer to http://www.fda.gov/Drugs/EmergencyPreparedness/BioterrorismandDrugPreparedness, http://www.emergency.cdc.gov/radiation or http://www.orau.gov/reacts.
[d]Thyroid equivalent dose (see Section 2.3.5).

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2.3.1. Evacuation vs. Sheltering-in-Place

Evacuation can be 100 percent effective in avoiding dose if completed before plume arrival. Evacuation is appropriate when its risks and secondary effects are less severe than the risk of the projected radiation dose.

Evacuation and sheltering-in-place provide different levels of dose reduction from the principal exposure pathways: direct gamma exposure and inhalation. Both sheltering and evacuation may be implemented during the same response in different areas or timeframes. Evacuation, if completed before plume arrival, can be 100 percent effective in avoiding radiation exposure. A decontamination station, with simple decontamination actions, may need to be colocated at shelters during the pre-evacuation period. This may reduce the spread of contamination and provide for greater protection during evacuation. Medical stations should also be collocated at shelters during the pre-evacuation period to ensure simple triage capabilities are met and to manage the distribution of prophylactic drugs. The effectiveness of evacuation will depend on many factors, such as how rapidly it can be implemented and the nature of the incident. For incidents where the principal source of dose is inhalation, evacuation could increase exposure if it is implemented during the passage of a short-term plume, since vehicles used to transport evacuees provide little protection against exposure (DOE 1990). Evacuation will seldom be justified at less than 1 rem (10 mSv) over the first four days.

Sheltering-in-place is a low-cost, low-risk protective action that can provide protection with an efficiency ranging from zero to almost 100 percent, depending on the type of release, the type of shelter available, the duration of the plume passage and climatic conditions. Because of these advantages, planners and decision makers may consider implementing sheltering-in-place when projected doses are below 1 rem (10 mSv) over the first four days. More guidance on the unique challenges posed by an IND can be found in the "Planning Guidance for Response to a Nuclear Detonation" (NSS 2010).[9]

Sheltering-in-place may be preferred for special populations (e.g., those who are not readily mobile) as a protective action at projected doses of up to 5 rem (50 mSv) over four days. When environmental, physical, or weather hazards impede evacuation, sheltering-in-place may be justified at projected doses up to 5 rem (50 mSv) for the general population (and up to 10 rem (100 mSv) for special populations). It is also comparatively easy to communicate with populations that have sheltered-in-place. Dose projections use a four-day exposure duration, but sheltering in place duration is intentionally not specified. Incident-specific decisions must be made to determine how long people should shelter in place.

Sheltering-in-place should be preferred to evacuation whenever it provides equal or greater protection.

Sheltering-in-place followed by informed evacuation may be most protective.

Selection of evacuation or sheltering-in-place is far from an exact science, particularly in light of time constraints that may prevent thorough analysis at the time of an incident. The selection process should be based on realistic or "best estimate" dose models and should take into account the unavoidable dose incurred during evacuation and potential failure scenarios for sheltering-in-place (e.g., a fire in the structure or leaking ventilation system).

Advance planning and exercises can facilitate the decision process. In a commercial NPP incident, early decisions should be based on information from the response plans for the EPZ and on actual conditions at the nuclear facility (see Section 2.3.5). For transportation accidents, RDDs, INDs and other incident

[9] See: http://www.epa.gov/rpdweb00/docs/er/planning-guidance-for-response-to-nuclear-detonation-2-edition-final.pdf

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scenarios for which EPZs are not practicable, best estimates of dose projections should be used for deciding on evacuation, sheltering-in-place or a combination thereof.

2.3.2. General Guidance for Evacuation and Sheltering-in-Place

The following is a summary of planning guidance for evacuation and sheltering-in-place—

- Evacuation may be the only effective protective action close to the plume source.
- Evacuation will be most effective if it is completed before arrival of the plume.
- Evacuation may increase exposure if carried out during the plume passage.
- Evacuation is also appropriate for protection from groundshine in areas with high exposure rates from deposited materials when suitable shelter is not available.
- Sheltering-in-place may be appropriate for areas not designated for immediate evacuation—
  - it may provide protection equal to or greater than evacuation for rapidly developing releases (e.g., RDDs) if followed by evacuation.
  - it positions the public to receive additional instructions.
  - Since it may be implemented rapidly, sheltering-in-place may be the protective action of choice (followed with evacuation when feasible) if rapid evacuation is impeded by:
    - severe environmental conditions, e.g., severe weather or floods;
    - uncertainty in contamination levels along routes;
    - health constraints, e.g., patients and workers in hospitals and nursing homes;
    - long mobilization times that may be associated with certain individuals, such as industrial and farm workers, or prisoners and guards;
    - physical constraints to evacuation, e.g., inadequate roads or blockage due to debris.
- If a major release of radioiodine or particulate materials occurs, inhalation dose may be a controlling criterion for protective actions—
  - Breathing air filtered through common household items (e.g., folded handkerchiefs or towels) may help reduce exposures.
  - After confirmation that the plume has passed, continued sheltering-in-place should be re-evaluated. Shelters should be opened to vent any airborne radioactivity trapped inside and people should remain sheltered until official notice about leaving high exposure areas as soon as possible to avoid exposure to deposited radioactive material.

2.3.3. Considerations for Evacuation and Sheltering In Place

Advance planning is essential to identify potential problems that may occur in an evacuation. An NRC case study cites the following aspects of planning as contributing to efficiency and effectiveness of evacuation (NRC 2005)—

- High level of cooperation among agencies.
- Use of multiple forms of emergency communications.
- Community familiarity with alerting methods, the nature of the hazard and evacuation procedures.
- Community communication.

Well-trained emergency responders.

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The NRC 2005 study included an evaluation of 50 incidents of public evacuation involving 1,000 or more people. The evacuations studied were initiated in response to natural disasters, technological hazards and malevolent acts occurring between January 1, 1990 and June 30, 2003. The report indicated that public familiarity with alerting methods and door-to-door notification were statistically significant factors for the efficiency of evacuation. The report also indicated that many communities are making improvements to response capabilities by modernizing communication systems, improving traffic flow, local education awareness and developing interagency and cross-boundary coordination plans.

Regardless of size, large or small population groups can be evacuated effectively with minimal risk of injury or death. In the NRC report, only six of the 50 cases studied involved deaths from the hazard and of those six, only one involved death from the evacuation itself (NRC 2005).

However, in 2005, not long after this report was published, the gulf coast of the United States was hit by a series of hurricanes that resulted in the evacuation of approximately 5 million people. During the evacuation that accompanied Hurricane Rita in Houston, Texas, 106 people were reported to have died as a direct result of the evacuation. It is estimated that at least two-thirds of the evacuees did not need to evacuate but did so because of poor communication, fear and poor traffic management (NRC 2008).

The emergency planning process for radiological incidents should include effective traffic management plans and communications plans, including pre-scripted messages, provisions for evacuation of special needs populations, such as children in schools and child care facilities, people in institutions and people who have impaired mobility or lack personal transportation.

The degree of protection provided by structures is affected by factors such as attenuation of gamma radiation (shielding) by structural components (the mass of walls, ceilings, etc.) and outside/inside air exchange rates (see Figure 2-1). The use of large structures, such as shopping centers, schools, churches and commercial buildings, as collection points during evacuation mobilization will generally provide greater protection against gamma radiation than use of small structures. As with evacuation, delay in taking shelter during plume passage will result in higher exposure to radiation.

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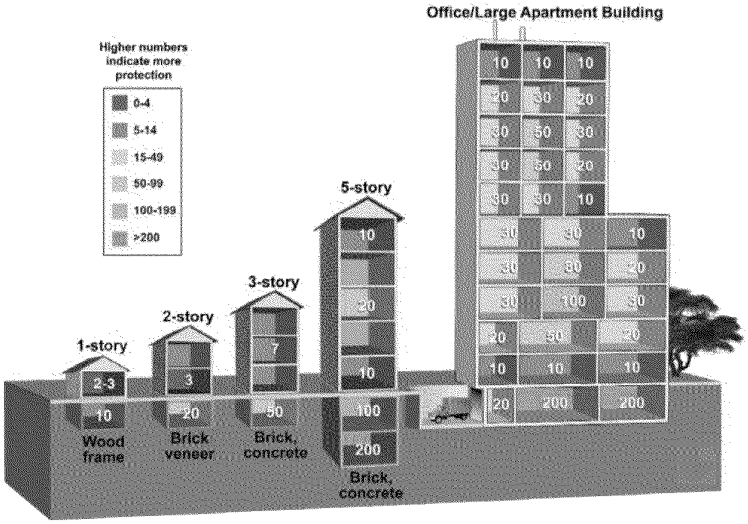
Figure 2-1: Exposure reduction from external radiation from nuclear fallout as a function of building type and location.



The numbers represent dose reduction factors. A dose reduction factor of 10 indicates that a person in that area would receive 1/10th of the dose of a person in the open. A dose reduction factor of 200 indicates that a person in that area would receive 1/200th of the dose of a person out in the open. Figure taken from *Planning Guidance for Response to a Nuclear Detonation*, *Second Edition*, National Security Staff Interagency Policy Coordination Subcommittee for Preparedness and Response to Radiological and Nuclear Threats, June 2010, courtesy of Lawrence Livermore National Laboratory. The protection factors in this figure are specific to nuclear detonation fallout, but the variations in factors throughout typical buildings may be informative for other airborne radiological releases.

2.3.4. Considerations for Potassium Iodide (KI)

FDA updated its guidance on the use of KI as a thyroid blocking agent during radiological emergencies in 2001 (FDA 2001 and FDA 2002). FDA based these dose recommendations on a review of the thyroid cancer data from the Chernobyl reactor accident of April 1986 and the experience of Poland in administering KI following the Chernobyl release (FDA 2001).

FDA recommends the following—

- Children 0-18 years of age: Administer KI when the projected radiation dose to the thyroid from exposure to radioiodine is 5 rem (50 mSv) or greater.
- Pregnant and lactating women: Administer KI when the projected radiation dose to the thyroid from exposure to radioiodine is 5 rem (50 mSv) or greater.
- Adults up to 40 years of age: Administer KI when the projected radiation dose to the thyroid from exposure to radioiodine is 10 rem (100 mSv) or greater.
- Adults over 40 years of age: Administer KI when the projected radiation dose to the thyroid from exposure to radioiodine is over 500 rem (5 Sv) in order to prevent hypothyroidism.

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However, FDA understands that a KI administration program that sets different projected thyroid radioactive exposure thresholds for treatment of different population groups may be logistically impractical to implement during a radiological emergency. In such cases, FDA recommends that KI be administered to both children and adults at the lowest intervention threshold (i.e., >5 rem (50 mSv) projected internal thyroid exposure in children) (FDA 2002). Also, in situations where available KI supply is not adequate to cover all potentially affected populations, states may consider prioritizing KI for children and pregnant women. This might include when replacement of KI stock is less than the original amount. Another consideration is that use of KI from the SNS may not be timely given the short window when KI can prevent uptake of radioiodine. Perhaps if state supplies are not adequate at the start of an event, SNS could be requested early (before any rad release) as a "precautionary" step.

Note that KI is effective only against uptake of radioiodine, and is best taken prior to or just after exposure. The protective effect of a single dose of KI lasts approximately 24 hours. It should be administered daily until the risk of significant exposure to radioiodine (either by inhalation or ingestion) no longer exists.

It should be noted that adults over 40 need to take KI only in the case of a projected large internal radiation dose to the thyroid (>500 rem (5 Sv)) to prevent hypothyroidism which could lead to lifelong dependence on thyroid hormone replacement therapy. Thyroid irradiation in adults over 40 years of age is associated with an extremely low incidence of cancer (FDA 2001).

Some people should not take KI. As a rule, individuals with known allergy to iodine or with pre-existing thyroid disease (e.g., Graves' disease, thyroid nodules, Hashimoto's thyroiditis) that might predispose them to adverse reactions should avoid KI.

Pregnant women should be given KI for their own protection and for that of the fetus, as iodine (whether stable or radioactive) readily crosses the placenta. However, because of the risk of blocking fetal thyroid function with excess stable iodine, repeat dosing with KI of pregnant women should be avoided. Lactating females should be administered KI for their own protection, as for other young adults, and potentially to reduce the radioiodine content of the breast milk, but not as a means to deliver KI to infants, who should get their KI directly. As for direct administration of KI, stable iodine as a component of breast milk may also pose a risk of hypothyroidism in nursing neonates. Therefore, repeat dosing with KI should be avoided in the lactating mother, except during continuing severe contamination. If repeat dosing of the mother is necessary, the nursing neonate should be monitored.

Once the plume has passed, protective actions such as evacuation and/or sheltering-in-place and food control measures to limit exposure to radioiodine should be implemented and the administration of KI should be suspended. Food control measures include providing the public with non-contaminated food supplies while awaiting the eventual radioactive decay of contaminated food. Consumption of contaminated food may be permitted on a case-by-case basis after surveying the foodstuffs and determining the level of contamination consistent with FDA food and animal feeds guidance. As a result of radioactive decay, grain products and canned milk and vegetables from sources affected by radioactive fallout will not present a risk from radioiodine if they have been stored for weeks to months after production.

An RDD is not likely to contain radioiodine, so administration of KI would not be necessary in such incidents. The administration of other prophylactic drugs should be evaluated on a case-by-case basis depending on the nature of the event and the radioisotopes involved. For more information on radiological prophylactics and treatments, see:
http://www.fda.gov/Drugs/EmergencyPreparedness/BioterrorismandDrugPreparedness.

2.3.5. PAGs and Nuclear Facilities Emergency Planning Zones (EPZ)

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Under NRC regulations, before a nuclear power reactor may be issued a license, the NRC must find that licensee, state and local emergency plans are adequate and that they can be implemented. For nuclear power reactors, there is a plume exposure EPZ within a 10 mile (16.1 km) radius of the plant and for a

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separate ingestion pathway EPZ within a 50 mile (80.5 km) radius. The sizes of these EPZs were developed by the NRC/EPA Task Force Report on Emergency Planning, NUREG-0396/EPA 520/1-7-016 and are based, in part, on the numerical values of the PAGs for the plume exposure and ingestion pathway EPZ. The licensee develops and maintains a detailed emergency plan for its facility while state and local authorities within the EPZ develop and maintain detailed emergency response plans for their respective jurisdictions. Guidance to these licensees, states and local agencies for developing these emergency response plans, including guidance on arrangements for implementing immediate protective actions is primarily contained in NUREG-0654/FEMA-REP-1 (NRC 1980)[10] and supplemented with other guidance issued by NRC (for licensees) and FEMA (for off-site response organizations).

Planning for incidents at other types of nuclear facilities should be developed using similar considerations. Emergency preparedness requirements for non-power reactors (e.g., test and research facilities) are provided in 10 CFR Part 50 Appendix E with supporting guidance in NRC Regulatory Guide 2.6, "Emergency Planning for Research and Test Reactors." Emergency preparedness requirements for fuel cycle and materials facilities are provided in 10 CFR Parts 30, 40, and 70 with supporting guidance in NRC Regulatory Guide 3.67, "Standard Format and Content for Emergency Plans for Fuel Cycle and Materials Facilities." Because of the relatively limited number and diverse nature of these facilities, the size of the EPZs, is determined, if needed, on a case-by-case basis for reactors with an authorized power level less than 250 MW thermal.

Within an EPZ, an area should be pre-designated for immediate response based on specified plant conditions prior to a release, or, given a release, prior to the availability of information on quantities of radioactive materials released. The shape of this area will depend on local topography, as well as political and other boundaries. Additional areas of the EPZ, particularly in the downwind direction, may require evacuation or sheltering-in-place, as determined by dose projections. The size of these areas will be based on the potential magnitude of the release and on an angular spread determined by meteorological conditions and any other relevant factors.

The pre-designated areas for immediate protective action may be reserved for use only in the most severe incidents and in cases when the facility operator cannot provide a quick estimate of projected dose based on actual releases. For lesser incidents, or if the facility operator is able to provide prompt off-site dose projections, the area for immediate protective action may be specified at the time of the incident instead of using a pre-designated area. Regardless of the basis for the initial protective action, radiological assessments need to continue through the duration of the event and if warranted, the initial protective actions extended into additional geographical areas.

Such prompt off-site dose projections may be possible when the facility operator can estimate the potential off-site dose based on information at the facility, using relationships developed during planning that relate abnormal plant conditions and meteorological conditions to potential off-site doses. After the release starts and the release rate is measurable, or when plant conditions or measurements can be used to estimate the characteristics and rate of the release, then these factors, along with atmospheric stability, wind speed and wind direction, can be used to estimate integrated concentrations of radioactive materials as a function of location downwind. Although such projections are useful for initiating protective action,

[10] Immediate protective actions based on in-plant conditions and EPZs established by NUREG-0654/FEMA-REP-1 are not applicable to naval nuclear propulsion plants. The largest naval reactors are rated at less than one-fifth of a large U.S. commercial NPP. In addition, since reactor power is directly linked to propulsion requirements, naval nuclear propulsion plants typically operate at low power when the ship is close to shore where high speeds are not required and are normally shut down when in port. Therefore, less than about 1% of the radioactivity contained in a typical commercial NPP could be released from a naval nuclear propulsion plant, limiting the possible dose to the general public and the size of the area of potential concern. Therefore, there is no need for towns and cities to have special emergency response plans such as those required for cities near commercial NPPs.

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the accuracy of these methods for estimating projected dose will be uncertain prior to confirmatory field measurements because of unknown or uncertain factors affecting environmental pathways, inadequacies of computer modeling and uncertainty in the data for release terms.

The EPZs should be large enough to cover affected urban and rural areas and accommodate the various organizations needed for emergency response.[11] Although the size of the EPZ is based on the maximum distance at which a PAG might be exceeded, the actual boundary of an EPZ should be demarcated by features readily identifiable by people within that area. Such boundaries generally include major topographical features (e.g., rivers, roads, transmission line corridors, rail rights of way) and political boundaries. The EPZ should be further subdivided, using similarly identifiable features, to facilitate implementing protective actions when the entire EPZ is not affected. Maps, showing the boundaries of the EPZ and the sub-areas and evacuation routes should be provided to the public within the EPZ on a periodic basis in a format that will likely be available if the emergency occurs (e.g., inserted sections in local phone directories, wall calendars, etc.) EPZs are not necessary at those facilities where it is not possible for PAGs to be exceeded off-site.

2.4. DOSE PROJECTIONS

The PAGs in this chapter are specified in terms of the projected whole body dose. This projected dose is the sum of the effective dose from external exposure to the plume and the committed effective dose from inhaled radionuclides. Guidance is also provided on the thyroid equivalent dose. Further references to effective or organ dose equivalent refer to these two quantities, respectively. The FRMAC Assessment Manuals (DOE 2010a, b)[12] provide detailed methods for estimating projected dose. These methods require knowledge of, or assumptions for, the intensity and duration of exposure and make use of standard assumptions on the relation, for each radioisotope, between exposure and dose. Exposure and dose projections should be based on the best estimates available. The FRMAC methods and models may be modified as necessary for specific sites for improved accuracy. Emergency response organizations are encouraged to use the most current, applicable tools and methods for implementing PAGs.

2.4.1. Dose Projection during the Early Phase

PAGs are expressed in terms of projected dose. The calculation of projected doses should be based on realistic dose models, to the extent practicable. Unavoidable dose or doses incurred before the start of the protective action being considered generally should not be included in evaluating the need for protective action. Similarly, doses that may be incurred at later times than those affected by the specific protective action should not be included. As noted earlier, the projection of doses in the early phase needs to include only those exposure pathways that contribute a significant fraction (i.e., more than 10 percent) of the dose to an individual.

In the early phase of an incident, parameters other than projected dose may provide a more appropriate basis for decisions to implement protective actions. When a facility is operating outside its design basis and a substantial release to the environment has started, or is imminent but has not yet occurred, data adequate to directly estimate the projected dose may not be available. Emergency response plans should anticipate specific conditions at the source of a potential release and the possible consequences off-site. Emergency response plans for NPPs and facilities should make use of emergency action levels (EALs), based on in-plant conditions, to trigger notification and initial protective action recommendations to off-

[11] The development of EPZs for nuclear power facilities is discussed in the NUREG 0396.
[12] See FRMAC Assessment folder at http://www.nv.doe.gov/nationalsecurity/homelandsecurity/frmac/manuals.aspx.

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site officials.[13] Once the initial protective actions have been implemented, accident assessment should continue. Although initial assessments may be uncertain, the subsequent assessments will be less uncertain as additional information on facility condition and prognosis, effluent radiation monitor data and environmental data become available. The results of these continuing radiological assessments, including dose projections, should be used as the basis for refining the initial protective actions. In the case of transportation accidents, an RDD or IND, or other incidents that are not related to a facility, it may not be practicable to establish EALs.

Doses that may be incurred from ingestion of food and water, long-term radiation exposure (i.e., longer than four days), radiation exposure to deposited radioactive materials, or long-term inhalation of resuspended materials are chronic exposures for which neither emergency evacuation nor sheltering-in-place are appropriate protective actions. PAGs for the intermediate phase cover these exposure pathways (see Chapter 3).

2.4.2. Duration of Exposure

The projected dose for comparison to the early phase PAGs is calculated for exposure during the first four days following the anticipated (or actual) start of a release. The objective is to encompass the entire period of exposure to the plume and deposited material prior to implementation of any further, longer-term protective action such as relocation. For planning purposes, the four-day period is chosen as the duration of exposure during the early phase because it is a reasonable estimate of the time necessary to make measurements, reach decisions and prepare to implement further protective actions (such as relocation) if necessary. However, officials at the site at the time of the emergency may decide that a different time frame is more appropriate.

For example, doses incurred through ingestion pathways or long-term exposure to deposited radioactive materials take place over a longer time period. Protective actions for such exposures should be based on guidance addressed in Chapter 3.

The projected dose from each radionuclide in a plume is proportional to the time-integrated concentration of the radionuclide in the plume at each location. This concentration will depend on the rate and the duration of the release and meteorological conditions. Release rates will vary with time and this time-dependence cannot usually be predicted accurately. In the absence of more specific information, the release rate may be assumed to be constant.

Another factor affecting the estimation of projected dose is the duration of the plume at a particular location. For purposes of calculating projected dose from most pathways, exposure will start at a particular location when the plume arrives and will end when the plume is no longer present. Exposure from deposited materials will continue for an extended period as long as people are present. Other factors such as the aerodynamic diameter and solubility of particles, shape of the plume and terrain may also affect estimated dose and may be considered on a site- or source- specific basis.

Prediction of time frames for releases is difficult because of the wide range associated with the spectrum of potential incidents. Therefore, planners should consider the possible time periods between an initiating event and arrival of a plume and the duration of releases in relation to the time needed to implement competing protective actions (i.e., evacuation and sheltering-in-place). Analyses of commercial nuclear power reactors (NRC 1975) have shown that some incidents may take several days to develop to the point of a release while others may begin as early as a half hour after an initiating event. Furthermore, the

[13] Immediate protective actions based on in-plant conditions are not applicable to naval nuclear propulsion plants. See Footnote 7 for additional information. In addition, because of differences in design and operation, EALs based on in-plant conditions are not applicable to naval nuclear propulsion plants.

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duration of a release may range from less than 1 hour to several days, with the major portion of the release likely occurring within the first day.

Wind speed also influences radiological exposure rates from a plume. As a general rule, air concentration is inversely related to the wind speed at the point of release. Concentrations are also affected by the turbulence of the air, which tends to increase with wind speed and sunlight and by wandering of the plume, which is greater at the lower wind speeds. This results in higher concentrations generally being associated with low winds near the source and with moderate winds at larger distances. Higher wind speed also shortens the travel time of the plume. Planning information on time frames for releases from nuclear power facilities may be found in references NRC 1978 and EPA 1978. Time frames for releases from other facilities will depend on the characteristics of the facility.

2.4.3. Derived Response Levels and Dose Conversion Factors

A Derived Response Level (DRL) is a level of radioactivity in an environmental medium that would be expected to produce a dose equal to its corresponding PAG. A Dose Conversion Factor (DCF) is any factor used to change an environmental measurement to dose in the units of concern. Depending on the exposure pathway, other factors besides the DCF may be required to convert an environmental measurement into a dose.

The FRMAC Assessment Manuals (DOE 2010a, b)[14] provide guidance in calculating DRLs and DCFs based on the ICRP dosimetry models (ICRP 60 series). In addition, the FRPCC encourages the use of computational tools such as DOE's Turbo FRMAC and NRC's Radiological Assessment System for Consequence Analysis (RASCAL) as well as other appropriate or more current tools to implement the PAGs.

2.5. EMERGENCY WORKER PROTECTION

These emergency worker guidelines were developed for a wide range of possible radiological scenarios, from a small transportation accident that may impact a single roadway to an IND that could potentially impact a large geographic region. Therefore, the 5, 10 and 25 rem (50, 100 and 250 mSv) guidelines (Table 2-2) should not be viewed as inflexible limits applicable to the range of early phase emergency actions covered by this guidance. Because of the range of impacts and case-specific information needed, it is impossible to develop a single turn-back dose level for all responders to use in all events, especially those that involve lifesaving operations. Indeed, with proper preparedness measures (training, personal protective equipment (PPE), etc.) most radiological emergencies addressed by this document, even lifesaving operations, may be manageable within the 5 rem (50 mSv) occupational limit. Moreover, Incident Commanders should make every effort to employ the ''as low as reasonably achievable'' (ALARA) principle after an incident. Still, in some incidents doses above the annual occupational 5 rem (50 mSv) dose limit may be unavoidable. For instance, in the case of a catastrophic incident, such as an IND, Incident Commanders may need to consider raising the lifesaving and valuable property (i.e., necessary for public welfare) emergency worker guidelines in order to prevent further loss of life and prevent the spread of massive destruction. It is essential that emergency workers have full knowledge of the associated risks prior to initiating emergency action and medical evaluation of emergency workers after such exposure.

Worker and public protection guidance and standards for normal operations are developed through risk management approaches and are implemented in federal and state regulations (e.g., 10 CFR Part 20; 10 CFR Part 835; 29 CFR Part 1910.1096). However, many factors or decision criteria in a radiological

[14] See FRMAC Assessment folder at http://www.nv.doe.gov/nationalsecurity/homelandsecurity/frmac/manuals.aspx.

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emergency differ from those in normal operations. Although there are times when implementation of standards or guidelines can cause or enhance other risks, these secondary risks can be controlled. Standards for normal operations provide a margin of safety that is greater than that in guidelines for emergency response because that margin can be provided in a manner that ensures no significant increase in public health risk or detriment to the public welfare. Currently, the development of standards and guidelines for normal operations is done in a manner that provides reasonable assurance that implementation of the standards will not cause more risk than it averts.

Response organizations need to develop plans and protocols that address radiation protection during a radiological incident and that ensure appropriate training is provided to responders and decision makers. Detailed reports on radiation risk, risk management decision making, training and public communication should be consulted in the development of plans, protocols and training materials and may be obtained from organizations such as ICRP, the National Council on Radiation Protection and Measurements (NCRP), International Atomic Energy Agency (IAEA), the American Nuclear Society (ANS) and the Health Physics Society (HPS). Detailed information on the risks of radiological emergency response and worker protection procedures can be found in the FRMAC "Radiological Emergency Response Health and Safety Manual" (DOE 2001) and the NCRP's "Management of Terrorist Events Involving Radioactive Material, Report No. 138" (NCRP 2001) and "Responding to a Radiological or Nuclear Terrorism Incident: A Guide for Decision Makers, Report No. 165" (NCRP 2010).

2.6. CONTROLLING OCCUPATIONAL EXPOSURE AND DOSES TO EMERGENCY RESPONDERS

This section provides guidance on occupational doses of radiation during an emergency response. In many radiological incidents, actual exposure of workers, including emergency responders, may be controlled to low doses when proper precautions are taken. During some emergencies, radiation exposures to responders may be unavoidable and may have the potential to exceed limits used for normal operations.

However, even in emergency conditions, every reasonable effort should be made to control doses to levels that are as low as practicable (consider NCRP 138[15] and NCRP 165[16] for recommendations that support ALARA).

2.6.1. Maintaining the ALARA Principle

To minimize the risks from exposure to ionizing radiation, employers of emergency responders should prepare emergency response plans and protocols in advance to keep worker exposures ALARA, an acronym for "as low as is reasonably achievable" means making every reasonable effort to maintain exposures to radiation as far below the dose limits in this part as is practical consistent with the purpose for which the activity is undertaken. Plans and protocols should include the following health physics and industrial hygiene practices to the maximum extent possible—

- Minimizing the time spent in the contaminated area.
- Maintaining the maximum distance from sources of radiation.
- Shielding of radiation sources.
- Tailoring of hazard controls to the work performed.
- Properly selecting and using respirators (see 29 CFR Part 1910.134) and other PPE.

[15] "Management of Terrorist Events Involving Radioactive Material, Report No. 138" (NCRP 2001).
[16] "Responding to a Radiological or Nuclear Terrorism Incident: A Guide for Decision Makers, Report No. 165" (NCRP 2010).

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__ Using prophylactic medications, where medically appropriate, that either block the uptake or reduce the retention time of radioactive material in the body.

The incident commander's staff should be prepared to identify, to the extent possible, all hazardous conditions or substances and to perform appropriate site hazard analysis. Emergency management plans should include protocols to control worker exposures, establish exposure guidelines in advance and outline procedures for worker protection. Emergency procedures should include provisions for exposure monitoring, worker training commensurate with the hazards involved in response operations and ways to control them and medical monitoring.

2.6.2. Understanding Dose and Risk Relationships

Response worker guidelines are based on cumulative dose constraint levels. These are based on an assumption that doses acquired in response to a radiological incident would be ''once in a lifetime'' doses and that future radiological exposures would be substantially lower.

Recommendations in this document provide a guideline level of 5 rem (50 mSv) for worker protection and alternative response worker guidelines (see Table 2-2) for certain activities where exposures below 5 rem (50 mSv) cannot be maintained. For most radiological incidents, radiation control measures (e.g., minimizing time, maximizing distance, using shielding) will prevent doses from reaching the 5 rem (50 mSv) occupational exposure guide while performing typical emergency response activities such as transportation, firefighting and medical treatment of contaminated victims at hospitals. However, in those situations in which victims are injured or trapped in high radiation areas or can only be reached via high radiation areas, exposure control options may be unavailable or insufficient and doses above 5 rem (50 mSv) may be unavoidable.

Decisions to take response actions that could result in doses in excess of 5 rem (50 mSv) can only be made at the time of the incident, under consideration of the actual situation. In such situations, incident commanders and other responders need to understand the risk posed by such exposures in order to make informed decisions. The Response Worker Guidelines for life and property saving activities in Table 2-2 are provided to assist such decision-making. These guidelines apply to doses incurred over the duration of an emergency and are assumed to be once in a lifetime. This is an important consideration, as the first wave of response workers may be "totalled out" dose-wise and replacement workers needed.

Emergency personnel may be exposed to increased radiation during the unique catastrophic event of an IND detonation resulting in firestorm and widespread destruction of structures. The emergency intervention needed to prevent further destruction and loss of life may result in increased exposure. Exceeding the Response Worker Guidelines in Table 2-2 may be unavoidable in responding to such events. Emergency responders undertaking a mission covered under the response worker guidelines should be informed when radiation control measures may not prevent doses from exceeding the 5 rem (50 mSv), general occupational exposure guideline and should be made fully aware of the sub-chronic and chronic risks involved, including numerical estimates of the risk of delayed health effects.

Table 2-2. Response Worker Guidelines

Guideline	Activity	Condition
5 rem (50 mSv)	All occupational exposures	All reasonably achievable actions have been taken to minimize dose.
10 rem (100 mSv)[a]	Protecting valuable property necessary for public welfare (e.g., a power plant).	Exceeding 5 rem (50 mSv) unavoidable and all appropriate actions taken to reduce dose. Monitoring available to project or

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		measure dose.
25 rem (250 mSv)[b]	Lifesaving or protection of large populations	Exceeding 5 rem (50 mSv) unavoidable and all appropriate actions taken to reduce dose. Monitoring available to project or measure dose.

[a] For potential doses >5 rem (50 mSv), medical monitoring programs should be considered.
[b] In the case of a very large incident, such as an IND, incident commanders may need to consider raising the property and lifesaving response worker guidelines to prevent further loss of life and massive spread of destruction.

The 25 rem (250 mSv) lifesaving response worker guidelines provide assurance that exposures will not result in detrimental deterministic health effects (i.e., prompt or acute effects). However, it could increase the risk of stochastic (chronic) effects, such as the risk of cancer. Response actions that could cause exposures in excess of the 25 rem (250 mSv) Response Worker Guideline should only be undertaken with an understanding of the potential acute effects of radiation to the exposed responder (see Table 2-3) and only when the benefits of the action clearly exceed the associated risks.

The estimated risk of fatal cancer[17] for workers exposed to 10 rem (100 mSv) is slightly less than the corresponding general population risk of 0.6 percent (6 cases per thousand exposed). Workers exposed to 25 rem (250 mSv) have an estimated risk of fatal cancer of 1.5 percent (15 cases per thousand exposed). Because of the latency period of cancer, younger workers face a larger risk of fatal cancer than older workers (for example, when exposed to 25 rem (250 mSv), 20 to 30-year-olds have a 9.1 per thousand risk of premature death, while 40 to 50-year-olds have a 5.3 per thousand risk of premature death).[18]

More specific risk determinations can be made when there is adequate information about the contaminants and the potential for human exposure. EPA's Federal Guidance Report #13 (EPA 1999) and Health Effects Assessment Summary Tables have risk factors for specific radionuclides.

Table 2-3. Acute Radiation Syndrome [a]

Feature or Illness	**Effects of Whole Body Absorbed Dose from external radiation or internal absorption, by dose range in rad**				
	0-100	100-200	200-600	600-800	>800
Nausea, Vomiting	None	5-50%	50-100%	75-100%	90-100%
Time of Onset		3-6 h	2-4 h	1-2 h	<1 h to minutes
Duration		<24 h	<24 h	<48 h	<48 h
Lymphocyte Count	Unaffected	Minimally Decreased	<1000 at 24 h	<500 at 24 h	Decreases within hours
Central Nervous	No	No Impairment	Cognitive	Cognitive	Rapid

[17] Risk per dose of a fatal cancer is assumed to be about $6x10^{-4}$ per rem ($6x10^{-5}$ per mSv). Cancer incidence is assumed to be about $8x10^{-4}$ per rem ($8x10^{-5}$ per mSv). (EPA 1999)

[18] The numerical estimate of cancer risk presented above (from Federal Guidance #13) was obtained by linear extrapolation using the nominal risk estimates based on data from human exposures at high doses and high dose rates. Other methods of extrapolation to the low-dose region could yield higher or lower numerical estimates of cancer deaths. Studies of human populations exposed at low doses are inadequate to demonstrate the actual magnitude of risk at low doses (about 0.1 Sv or 10 rem and below). There is scientific uncertainty about cancer risk in the low-dose region below the range of epidemiological observation and the possibility of no risk cannot be excluded. (EPA 1999)

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System Function	Impairment		impairment for 6-20 h	impairment for > 20 h	incapacitation
Mortality	None	Minimal	Low with aggressive therapy	High	Very High: Significant neurological symptoms indicate lethal dose

Source: Medical Management of Radiological Casualties, Second Edition, Armed Forces Radiobiology Research Institute. Bethesda, MD, April 2003.
[a] Percentage of people receiving whole-body doses within a few hours expected to experience acute health effects.

Prior to 5 rem (50 mSv) guideline being exceeded, workers should be provided the following—

- Site specific training, if no prior training was available, with respect to the risk associated with exposure to ionizing radiation (incident commanders and responders should consider having someone on each team with radiation safety experience).
- A thorough explanation of the latent risks associated with receiving exposures greater than 5 rem (50 mSv).

If the 5 rem (50 mSv) guideline is exceeded, workers should be provided with a medical follow-up and monitoring should be considered.

In addition, these guidelines represent dose constraint levels (e.g., when this level of dose is accumulated, the responder should not take part in the later stages of the response that may significantly increase their dose). Incident commanders and responders need a thorough understanding of the worker exposure guidelines for radiological emergency response, including the associated risks and specific worker protection procedures. The FRMAC "Radiological Emergency Response Health and Safety Manual" (FRMAC 2001) provides detailed information. Additional resources for advance planning are available on the Radiological Emergency Medical Management (REMM) web site: http://www.remm.nlm.gov/.

2.6.3. Occupational Safety Regulations for Radiological Emergency Response

The Occupational Safety and Health Act, requires employers to be responsible for the health and safety of their employees during routine and emergency operations. The primary occupational safety and health standard for emergency response is the Hazardous Waste Operations and Emergency Response (HAZWOPER) standard (29 CFR Part 1910.120).

Many U.S. states operate their own OSHA-approved state plans, which are required to be "at least as effective as" Federal OSHA standards and may impose additional or more stringent requirements.[19] Some states operate "complete" plans that cover both the private sector and state and local government employees, while others cover state and local government employees only. EPA's Worker Protection Standard (40 CFR 311) applies the HAZWOPER standard to state and local workers in states that do not have occupational health and safety plans.

In addition to the Occupational Safety and Health Act, several federal agencies (DOE, NRC and OSHA) and Agreement States issue occupational radiation safety standards (see Table 2-4). The occupational standards are not guidelines but instead are regulatory limits that cannot be exceeded except under certain

[19] For a list of state plans, see: http://www.osha.gov/dcsp/osp/index.html

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conditions. These occupational limits allow workers to receive radiation exposure during the course of performing their jobs.
Federal and state radiation safety standards recognize that it may be necessary to exceed dose limits to take critical lifesaving actions.

Table 2-4. Regulations for Worker Protection

Agency	Statutory Requirement	Title
Occupational Safety and Health Administration[1]	29 CFR 1910.120	Safety and Health-- HAZWOPER
	29 CFR 1910. 1096	Ionizing Radiation
Environmental Protection Agency[1]	40 CFR 311	Occupational Radiation Protection
Nuclear Regulatory Commission[2]	10 CFR 20	Standards for Protection Against Radiation
Department of Energy[3]	10 CFR 835	Radiation Protection Regulations

1. All states are either regulated by federal regulations or by respective state regulations. 40 CFR 311 applies the HAZWOPER standard in states that do not have their own occupational health and safety program.
2. NRC employees are covered by NRC Management Directive 10.131, ''Protection of NRC Employees Against Ionizing Radiation.'' Section VI, Guidance for Emergency Exposure Controls During Rescue and Recovery Activities, deals specifically with radiation exposure control during emergencies
3. These requirements apply to all DOE employees and contractors (except for Naval Nuclear Propulsion Program (NNPP)) who may be exposed to ionizing radiation as a result of their work for DOE, including work relating to emergency response activities. The NNPP has established requirements consistent with those contained in 10 CFR 835.

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2.7. CONTAMINATION LIMITS AND MONITORING OF THE ENVIRONMENT AND POPULATIONS

Areas under the plume can be expected to contain deposited radioactive materials if aerosols or particulate materials were released during the incident. In extreme cases, individuals and equipment may be highly contaminated and monitoring stations will be required for emergency monitoring, decontamination of individuals and medical evaluations. Equipment should be checked and decontaminated as necessary to avoid the spread of contamination to other locations. This monitoring service would be required for only a few days following plume passage until all such people have been evacuated or relocated.

People working in the parts of the restricted areas in which their dose from the residual radioactivity would exceed 2 mrem (20 µSv) in any hour or 100 mrem (1 mSv) in a year should operate under the controlled conditions established for occupational exposure.

Adults may reenter restricted areas under controlled conditions in accordance with occupational exposure standards. The need for monitoring stations should be evaluated along highways, which serve as the major evacuation or transportation routes, to control surface contamination at exits from the more highly contaminated areas. Decontamination and other measures should be implemented to maintain low-exposure rates at monitoring stations.

A contaminated item should not be released to an unrestricted area. Based on incident and locality specific considerations, it may be acceptable to release contaminated materials if the level of surface contamination is less than two times (2x) the existing background levels. As an alternative to decontamination, contaminated items (i.e., not people or animals) may be retained in the restricted area while the radiological contamination decays.

2.8. SURFACE CONTAMINATION CONTROL

Surface contamination must be controlled both before and after relocation protective actions are implemented. The principal exposure pathways for loose surface contamination on people, clothing and equipment are:

- internal doses from ingestion by direct transfer;
- internal doses from inhalation of resuspended materials;
- beta dose to skin from contaminated skin or clothing or from nearby surfaces;
- dose to the whole body from external gamma radiation;
- internal dose from absorption of contamination into wounds.

The contamination limit should be influenced by the potential for the contamination to be ingested, inhaled or transferred to other locations. Therefore, it is reasonable to establish lower limits for surfaces where contamination is loose than for surfaces where the contamination is fixed (except for skin). The expected period of exposure from fixed contamination on skin would be longer so a lower limit would be justified.

It is not practical to set contamination limits significantly lower than residual contamination levels in uncontrolled areas. Although the contamination levels recommended in this manual are accordingly set high, consideration should be given as the event progresses to using lower contamination control levels (and more sensitive monitoring instruments) once people are removed from areas causing high external doses. Such efforts will minimize cross-contamination of people located outside of the affected areas. For

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events involving fixed nuclear facilities, some evacuation reception centers or shelters will have walk-through portal monitors.

2.8.1. Priorities for Control of Contaminated Areas

The following priorities are recommended—

1. Do not delay urgent medical care for decontamination efforts or for time-consuming protection of attendants, such as donning of additional anti-contamination clothing.
2. In early phase scenarios where it might not be practical or would interfere with other life-saving and public health protection priorities, do not waste effort trying to contain contaminated wash water and be sure to notify sewage treatment plants.
3. Do not allow monitoring and decontamination to delay an ordered evacuation.
4. *When early screening is needed after a major incident* — After plume passage, it may be necessary to establish emergency contamination monitoring stations in areas not qualifying as low background areas. Gamma exposure rates in such areas should be less than 5 millirem (50 μSv) per hour. These monitoring stations should be used only during the early phase after major atmospheric releases to monitor people emerging from possible high exposure areas. The stations should be set up to provide simple (rapid) decontamination if needed and to evaluate whether affected people should undergo more extensive decontamination or other special care. Table 2-5 provides guidance on surface contamination levels for use if such centers are needed.
5. Establish monitoring and personnel decontamination (e.g., bathing) facilities at evacuation centers or other locations in low background areas (less than 0.1 millirem (1 μSv) per hour). *Encourage self-decontamination:* Encourage evacuated people who were exposed in areas where release of particulate materials would have warranted evacuation to change and bag the clothes they were wearing and store them in an area away from people and pets until authorities provide further instructions on their disposition, to wash other exposed surfaces such as cars and trucks and their contents and then report to these centers for monitoring. For more specific considerations on control of contaminated areas refer to "Population Monitoring in Radiation Emergencies: A Guide for State and Local Public Health Planners" (CDC 2007).[20] Table 2-6 provides surface contamination guidance. These screening levels are examples derived primarily on the basis of easily measurable radiation levels using portable instruments.
6. After the relocation area has been established, consider the need to set up monitoring and decontamination stations at exits from the more highly contaminated parts of the area. Low levels of contamination may be undetectable because of high background radiation levels at these locations. Monitoring should be done at lowest practical background levels. Nevertheless, these individuals should be advised to bathe and change clothes at their first opportunity—no later than within the next 24 hours. If, after decontamination, people still exceed the limits for the station, they should be sent for further decontamination or for medical or other special attention.

[20] See: http://emergency.cdc.gov/radiation/pdf/population-monitoring-guide.pdf

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Table 2-5. Recommended Surface Contamination Screening Levels for Emergency Screening of People and Objects at Monitoring Station in High Background Radiation Areas (0.1 mR/h to 1 mR/h Gamma Exposure Rate)[a]

Condition	Appropriate detection instrument reading	Recommended Action
Before Decontamination	<2x existing background	Unconditional release
	>2x existing background	Decontaminate. Equipment may be stored or disposed of as appropriate.
After Decontamination	<2x existing background	Unconditional release
	>2x existing background	Continue to decontaminate or refer to low background monitoring and decon station. Equipment may be stored for decay or disposed of as appropriate.

[b] Monitoring stations in such high exposure rate areas are for use only during the early phase of an incident involving major atmospheric releases of particulates. Otherwise use Table 2-6.

Table 2-6. Recommended Surface Contamination Screening Levels for People[a] and Objects at Monitoring Stations in Low Background Radiation Areas (<0.1 mR/h Gamma Exposure Rate)[b]

Condition	Appropriate detection instrument reading	Recommended Action
Before decontamination	<2x existing background	Unconditional release
	>2x existing background	Decontaminate
After simple[c] decontamination effort	<2x existing background	Unconditional release
	>2x existing background	Full decontamination
After full[d] decontamination effort	<2x existing background	Unconditional release
	>2x existing background	Continue to decontaminate people Release animals and equipment
After additional full decontamination effort	<2x existing background	Unconditional full release
	>2x existing background	Send people for special evaluation Release animals and equipment

[a] People reporting to monitoring stations in low background radiation areas have been previously instructed to change and bag clothes, wash other exposed surfaces such as cars and their contents and then report to these centers for monitoring.
[b] Levels higher than 2x existing background (not to exceed the meter reading corresponding to 0.1 mR/h) may be used to speed the monitoring of evacuees in very low background areas.
[c] Flushing with water and wiping is an example of a simple decontamination effort.
[d] Washing or gentle scrubbing with soap or other mild detergent followed by flushing is an example of a full decontamination effort.

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KEY POINTS IN CHAPTER 2 – EARLY PHASE

- The principal protective actions for the early phase are evacuation or sheltering-in-place. Evacuation is the urgent removal of people from an area to avoid or reduce high-level, short-term exposure from the plume or deposited activity. Sheltering-in-place refers to the use of a readily available structure that will provide protection from exposure to the plume.
- The PAG for evacuation or sheltering-in-place is a projected whole body dose of 1 to 5 rem (10 – 50 mSv) total effective dose (TED) over four days.
- Evacuation is appropriate when its risks and secondary effects are less severe than the risk of the projected radiation dose. Evacuation will be most effective in avoiding dose if completed before plume arrival.
- In general, sheltering-in-place should be preferred to evacuation whenever it provides equal or greater protection. After confirmation that the plume has passed, continued sheltering-in-place should be re-evaluated by public officials.
- The administration of KI to partially block the uptake of radioiodines by the thyroid is a supplemental protective action. The PAG for administration of KI is 5 rem (50 mSv) projected child thyroid dose. Other medical countermeasures are available, as well.
- Dose calculations for PAGs are made using the DCF and DRL calculation methods referenced in the FRMAC Assessment Manuals. Emergency response organizations are encouraged to use the most current, applicable tools and methods for implementing the PAGs.
- Response worker guidelines of 5, 10 or 25 rem (50, 100 or 250 mSv) are based on the urgency of activities and knowledge of the risks involved.

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CHAPTER 3 – INTERMEDIATE PHASE PROTECTIVE ACTION GUIDES

3.1. INTRODUCTION

This chapter presents PAGs for the intermediate phase and provides guidance for the implementation of corresponding protective actions. A PAG is the projected dose to an individual from the release of radioactive material at which a specific protective action should be taken to reduce or avoid that dose. The intermediate phase is defined as the period beginning after the source and releases have been brought under control and environmental measurements are available for use as a basis for decisions on protective actions and extending until these protective actions are terminated. The intermediate phase may last from weeks to months; but is assumed to last for one year for purposes of dose projection.

During the early phase, decisions must be made and implemented quickly by state and local officials before federal assistance is available. In contrast, many decisions and actions during the intermediate phase may be taken after federal resources are present, as described in the Nuclear/Radiological Incident Annex of the National Response Framework (FEMA 2008 a, b). Decisions will be made during the intermediate phase concerning whether particular areas or properties from which people have been evacuated will be decontaminated and reoccupied or the occupants relocated for an extended period.

This chapter provides the PAGs and corresponding protective actions for use by state and local officials in developing their radiological emergency response plans to protect the public from exposure to radiation from deposited radioactive materials. Due to the wide variety of types of radiological incidents and radionuclide releases that could occur, it is not practical to provide implementing guidance for every possible situation.

This chapter also provides guidance for translating radiological conditions in the environment into projected doses that serve as the basis for decisions to take appropriate protective actions and basic planning guidance on reentry as informed by the Operational Guidelines (DOE 2009).

3.2. EXPOSURE PATHWAYS DURING THE INTERMEDIATE PHASE

During the intermediate phase, the principal exposure pathways for the public occupying areas contaminated with deposited radioactive materials are:

- **exposure of the whole body** to external gamma radiation from deposited radioactive materials (groundshine). External gamma radiation is the expected dominant pathway for reactor accidents and incidents involving RDDs and INDs;
- **internal exposure** from the inhalation of resuspended materials;
- **internal exposure** from the ingestion of food and water.

Other potentially significant exposure pathways include exposure to beta radiation from surface contamination and direct ingestion of contaminated soil. These pathways are not expected to be controlling for NPP incidents (Aaberg 1989).

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3.3. THE PROTECTIVE ACTION GUIDES AND PROTECTIVE ACTIONS FOR THE INTERMEDIATE PHASE: RELOCATION AND DOSE REDUCTION

The principal protective actions for reducing exposure of the public to deposited radioactive materials are:

- relocation;
- decontamination;
- shielding;
- time limits on exposure;
- control of the spread of surface contamination.

The most effective of these actions is relocation—the removal or continued exclusion of people (households) from contaminated areas to avoid chronic radiation exposure. Relocation is highly disruptive and therefore only implemented when the dose is sufficiently high to warrant it. The PAG for relocation is 2 rem (20 mSv) projected over the first year of exposure. After the first year, the PAG for relocation is 0.5 rem (5 mSv) per year.

The PAG level for relocation applies to doses that can be avoided by relocation; doses already incurred prior to relocation are not included in the calculations. PAGs for protection from deposited radioactivity during the intermediate phase are summarized in Table 3-1. The basis for these values is presented in detail in Chapters 4 and 7 and Appendix E of the 1992 PAG Manual, available online as a historical reference at http://www.epa.gov/radiation/rert/pags.html. The decision to relocate will be considered on a case-by-case basis. Efforts to decontaminate and remediate the contaminated area and the shielding offered by buildings and the residency factor attributable to the building, must be considered to see if the second year PAG (0.5 rem (5 mSv) in a year) will be exceeded.

Avoiding exceedance of the relocation PAGs may not be easy for the radionuclides most likely associated with RDDs because of their longer half-lives. If these radionuclides are released, it may be necessary to relocate people in the affected areas even if exposure is less than 2 rem (20 mSv) in the first year provided decontamination and remediation measures during the first year are unsuccessful.

In most scenarios, relocation decisions will be based on doses from whole-body and internal exposure from inhalation of resuspended contamination. Food and milk ingestion dose should be considered separately with decisions based on the FDA PAGs.[21]

Other protective actions, such as simple dose reduction techniques, can be applied in areas where levels of deposited radioactivity are not high enough to warrant relocation. Dose reduction actions can range from the simple—scrubbing or flushing surfaces, removal and disposal of small spots of highly contaminated soil (e.g., from settlement of water) and spending more time than usual in lower exposure rate areas (e.g., indoors)—to the difficult and time consuming processes of removal, disposal and replacement of contaminated surfaces. The simple processes would probably be most appropriate in contaminated areas outside the relocation area. Many of these can be carried out by the residents with support from officials for monitoring and guidance on appropriate actions and disposal. The more difficult processes will be appropriate for recovery of areas where contamination is fixed (not removable) and from which the population is relocated.

[21] Accidental Radioactive Contamination of Human Food and Animal Feeds: Recommendations for State and Local Agencies, FDA 1998, available online: http://www.fda.gov/downloads/MedicalDevices/DeviceRegulationandGuidance/GuidanceDocuments/UCM094513.pdf

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Large areas may have to be restricted under these PAGs. As the land area increases, protective actions become more difficult and costly to implement, especially when the affected area is densely populated. There may be situations where full implementation of early and intermediate phase protective actions is impracticable (e.g., a release in a large city). Informed judgment must be exercised to assure priority of protection for individuals in areas having the highest exposure rates.

Table 3-1. Protective Action Guides for Exposure to Deposited Radioactivity during the Intermediate Phase of a Radiological Incident

Protective Action Recommendation	PAG (Projected Dose)[a]	Comments
Relocate the general population[b]	≥ 2 rem (20 mSv) in the first year, 0.5 rem (5 mSv)/year in the second and subsequent years	Projected dose over one year
Apply simple dose reduction techniques[c]	< 2 rem (20 mSv)	These protective actions should be taken to reduce doses to as low as practicable levels

[a]Projected dose refers to the dose that would be received in the absence of shielding from structures or the application of dose reduction techniques. These PAGs may not provide adequate protection from some long-lived radionuclides (see Section 3.7).
[b]People previously evacuated from areas outside the relocation zone defined by this PAG may return to occupy their residences. Cases involving relocation of people at high risk from such action (e.g., patients under intensive care) may be evaluated individually.
[c]Simple dose reduction techniques include scrubbing or flushing hard surfaces, minor removal of soil from spots where radioactive materials have concentrated and spending more time than usual indoors or in other low exposure rate areas.

3.3.1. The Population Affected

The PAGs for relocation are intended for use in establishing the boundary of a relocation area within an area where radioactive materials have been deposited. The relocation PAGs have been established at a level that will provide adequate protection for the general population, including higher risk groups such as children and fetuses. People residing in contaminated areas outside the relocation area will be at some risk from radiation dose. Therefore, guidance on the reduction of dose during the first year to residents outside this zone is also provided. Monitoring and simple dose reduction efforts are recommended in these areas to reduce doses to the extent practical. Such actions are unlikely to be practical where the dose reduction achieved is less than 10 percent.

Affected populations may perceive that intermediate phase protective actions are not consistent with those taken in the early phase. Early-phase decisions on sheltering-in-place and evacuation may have been implemented prior to verification of the path of the plume. Therefore, some people may have been evacuated from areas where validated doses are much lower than were projected. Others who were in the path of the plume may have been sheltered or not protected at all. During the intermediate phase of the response, dose projections may be revised based on environmental measurements. People should be relocated from areas where the projected dose exceeds the PAG for relocation without regard to prior evacuation status.

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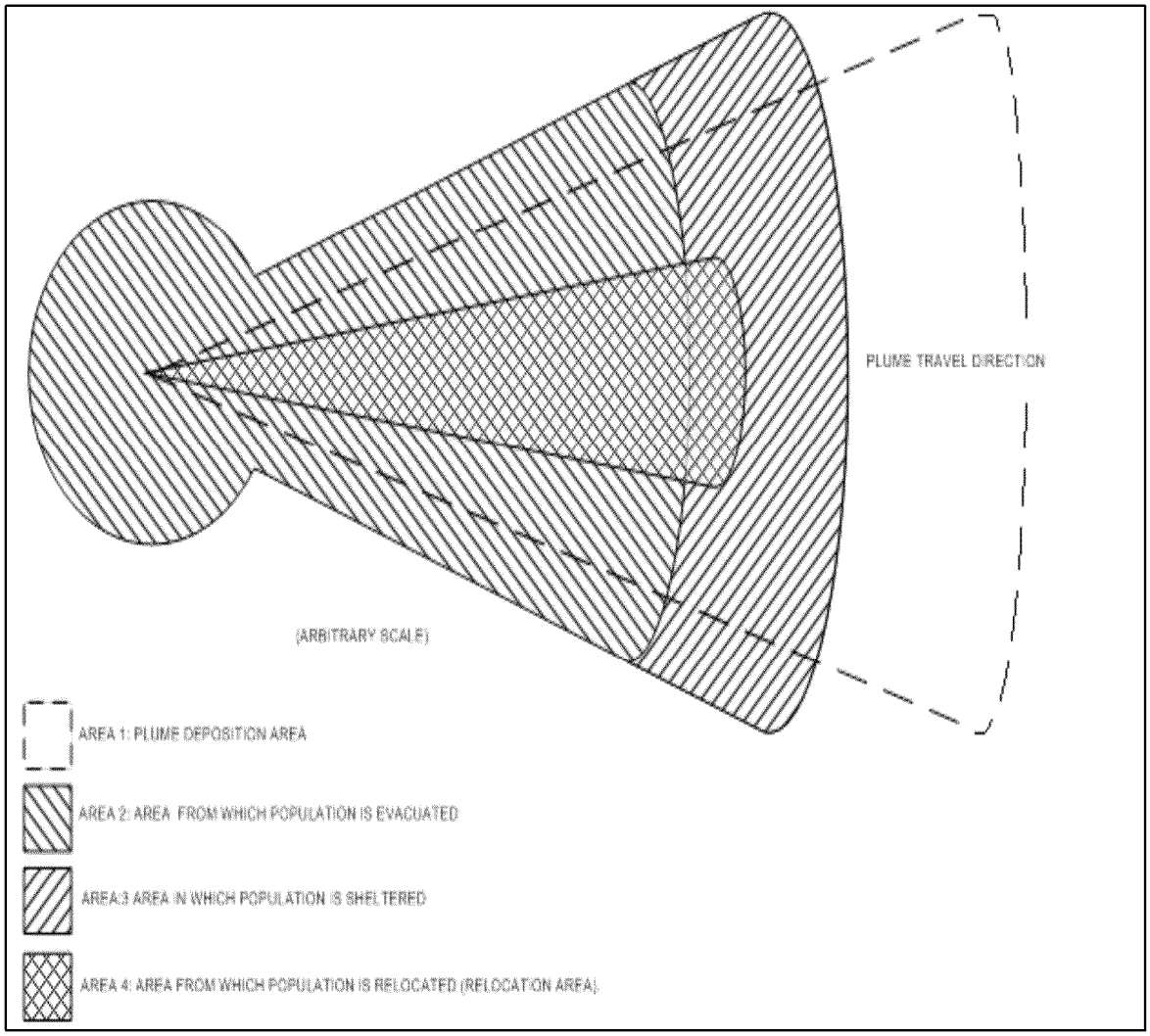

Figure 3-1. Generalized Protective Action Areas for NPP Incident

3.3.2. Areas Involved

Figure 3-1 provides a generalized example of the areas affected by different protective actions. Area 1 represents the plume deposition area. (In reality, variations in meteorological conditions would almost certainly produce a more complicated shape, but the same principles would apply.)

In situations such as an NPP accident, where early warning is given prior to a release of radioactive materials, people may already have been evacuated from Area 2 and sheltered in Area 3. People who have been evacuated from Area 2 or sheltered in Area 3 may go home if environmental monitoring verifies that their residences are outside the plume deposition area (Area 1).

Area 4 is the relocation area where projected doses are equal to or greater than the relocation PAG. People residing just outside the boundary of the relocation area may receive a dose approaching the PAG for relocation if decontamination or other dose reduction efforts are not implemented.

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Area 1, with the exception of the relocation area, represents the area of contamination that may continue to be occupied by the general public during the intermediate phase. Nevertheless, there will be contamination levels in this area that will require continued monitoring and dose reduction efforts other than relocation. Incident-specific levels below the PAGs may be used to control exposure to contamination. The relative positions of the boundaries shown in Figure 3-1 depend on areas evacuated and sheltered and the radiological and meteorological characteristics of the release. For example, Area 4 (the relocation area) could fall entirely inside Area 2 (area evacuated), so that the only people to be relocated would be those residing in Area 4 who were either missed in the evacuation process or who, because of mobility constraints for their evacuation, had remained sheltered during plume passage.

Establishing the boundary of a relocation area creates three groups of affected people—

- People who have already been evacuated from an area that is now designated as a relocation area and who now must be assigned relocation status.
- People who were not previously evacuated, but who reside inside the relocation area and should now relocate.
- People who were previously evacuated, but reside outside the relocation area and may now return home. A gradual return is recommended.

Small adjustments to the boundary of the relocation area established based on the PAG may be justified based on ease of implementation. For example, the use of a convenient natural boundary could be a logical reason for adjustment of the relocation area. However, such decisions should be supported by demonstration that exposure rates to people not relocated can be promptly reduced by methods other than relocation to meet the PAG, as well as the longer dose objectives addressed in Section 3.6.

The relocation PAG applies principally to personal residences but may impact other facilities as well. For example, it could impact work locations, hospitals and park lands as well as the use of highways and other transportation facilities. For each type of facility, the occupancy time of individuals should be taken into account to determine the criteria for using a facility or area. It might be necessary to avoid continuous use of homes in an area because radiation levels are too high. However, a factory or office building in the same area could be used because occupancy times are shorter. Similarly, a highway could be used at higher contamination levels because the exposure time of highway users would be considerably less than the time spent at home.

3.3.3. Priorities

In most cases, protective actions during the intermediate phase will be carried out over a relatively long period of time (e.g., months). Setting priorities will be important, especially when the affected area is so large that it is impractical to relocate members of the public from areas that barely exceed the relocation PAGs. The following priorities are appropriate—

- First, protect all people from doses that could cause acute health effects from all exposure pathways, including previous exposure to the plume.
- Conduct radiological surveys to verify or adjust estimates of radiological impacts.
- Recommend that affected people reduce their exposures by using simple decontamination techniques and remaining indoors.

3.4. SEQUENCE OF EVENTS

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The high-priority decisions on whether to relocate people from high exposure rate areas requires exposure rate measurements and dose analyses. Monitoring and dose assessment will be an ongoing process, with priority given to the areas with the highest exposure rates.

Following passage of the airborne plume, a number of tasks must be accomplished for the timely protection of the public. The general sequence of events is itemized below, but the time frames will overlap.

1. Determine the areas where the projected first-year dose will exceed the 2 rem (20 mSv) relocation PAG and relocate people from those areas, with priority given for people in the highest exposure rate areas.
2. Allow previously evacuated people to return as quickly as possible to areas where field gamma measurements indicate that exposure rates are near normal background levels. If there is a possibility that particles from high deposition areas could drift into the occupied areas, establish a buffer zone to restrict residential use until radiological measurements and assessments confirm that it is no longer necessary. Buffer zones are set with the understanding that conservatism is inherent in the PAGs.
3. Based on isodose-rate boundary (see Section 3.4.1), assign any evacuees who reside within the relocation area to be relocated. Evacuated people whose residence is in the area between the boundary of the plume deposition and the boundary to the relocation area may return gradually as dose projections allow.
4. Evaluate the dose reduction effectiveness of simple decontamination techniques and of sheltering-in-place in response to exposure from partial occupancy of residences and workplaces. Results of these evaluations may influence recommendations for reducing exposure rates for people who are not relocated from areas near, but outside, the relocation area.
5. Control access to and egress from the relocation area. This would be accomplished through control points at roadway accesses to the relocation area.
6. Establish monitoring and decontamination stations to support control of the relocation area.
7. Implement simple decontamination techniques in contaminated areas outside the relocation area, giving priority to areas with higher exposure rates.
8. Collect data needed to establish long-term radiation protection criteria for decontamination and dose reduction and data to determine the effectiveness of various decontamination or other dose reduction techniques.
9. Begin operations to clean up and recover contaminated property in the relocation area.
10. If not already done, evaluate whether food grown or produced within the plume deposition area need to be interdicted per the FDA PAGs and evaluate drinking water systems within the plume deposition area. Provide guidance on planting or harvesting specific agricultural products.

3.4.1. Establishment of Isodose-Rate Lines

As soon as federal or other assistance is available for aerial and ground monitoring, a concentrated effort should begin to establish isodose-rate lines on maps and identify boundaries of the relocation area. Standard maps should be developed on which all response organizations would record monitoring data. Records on monitoring and decontamination of the public and workers should also be collected.

Aerial monitoring can be used to collect data for establishing general patterns of radiation exposure rates and may form the primary basis for the development of dose lines out to the limit of aerial detectability.

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Initially during the early phase, detectability is limited to exposure rate changes of a few times natural background levels. Later during the intermediate phase, more sensitive measurements detect levels of radioactivity that are a small fraction of the natural background. Periodic air sample measurements will also be needed to verify the contribution to dose from inhalation of resuspended materials.

Gamma exposure rates measured at one meter (39 inches) will vary within a very small area because different surfaces have different deposition rates (e.g., smooth surfaces versus heavy vegetation). Rinsing or precipitation could also reduce levels in some areas and raise levels in others where runoff settles. In general, where exposure rates vary within designated areas, dose projections should be estimated using an appropriate average exposure rate.

3.4.2. Dose Projection

The FRMAC Assessment Manuals[22] provide detailed guidance for dose projection and calculating DRLs and DCFs (DOE 2010a, b). The FRMAC Assessment Manuals incorporate the ICRP dosimetry models (ICRP 60 series). In addition, the FRPCC encourages the use of computational tools such as DOE's Turbo FRMAC and NRC's RASCAL or other appropriate tools and methods to implement the PAGs.

The primary dose of interest in the intermediate phase is the sum of the effective dose from external exposure and the committed effective dose from inhalation. The exposure periods of interest are the first year and subsequent years after the incident. Other pathways should also be evaluated and their contributions considered, if significant. For example, anytime alpha-emitting radionuclides are involved, the inhalation of resuspended material must be considered. Although beta exposure will contribute to skin dose, its contribution to the overall risk of health effects from the radionuclides expected to be associated with reactor incidents should not be controlling in comparison to the whole body gamma dose (Aaberg 1989). However, the skin beta dose may be important for particulates deposited or transferred to the skin, as may be the case for an RDD that contains Strontium-90.

The dominant intermediate phase exposure pathway for incidents involving alpha-emitters (e.g. a weapons accident) is inhalation of resuspended material. For these incidents, dispersal of alpha-emitting material must be monitored carefully using proper measurement techniques. It is possible that there will be little or no associated gamma radiation or beta activity.

Calculation of the projected gamma dose from measurements will require knowledge of the principal radionuclides contributing to exposure and their relative abundances. Radiological characteristics can be compiled either through the use of portable gamma spectrometers or by radionuclide analysis of environmental samples. Several measurement locations may be required to determine whether any selective radionuclide deposition occurred as a function of meteorology, surface type, distance from the point of release, or other factors. In accordance with the Nuclear/Radiological Incident Annex to the National Response Framework, DOE, EPA and other federal agencies have the capability to assist state officials in performing environmental measurements, including determination of radiological characteristics of deposited materials (FEMA 2008 a, b).

The gamma exposure rate may decrease rapidly if deposited materials include a significant fraction of short-lived radionuclides. Therefore, the relationship between instantaneous exposure rate and projected first- and second-year annual doses will change as a function of time. These relationships must be established for the particular mix of deposited radioactive materials present at the time of the gamma exposure rate measurement. Over time, residual doses from gamma emitters will depend largely upon the

[22] See FRMAC Assessment folder at http://www.nv.doe.gov/nationalsecurity/homelandsecurity/frmac/manuals.aspx.

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half-lives of the radionuclides involved and could potentially remain significant over many years. It should be noted that natural attenuation as well as nuclear decay can affect long term dose assessments.

Projected dose considers exposure rate reduction from radioactive decay and, generally, weathering. When one also considers the anticipated effects of shielding from normal part time occupancy in homes and other structures, people who are not relocated should receive a dose substantially less than the projected dose. For commonly assumed reactor source-terms, it is estimated that 2 rem (20 mSv) projected dose in the first year will be reduced to about 1.2 rem (12 mSv) by this factor. The application of simple decontamination techniques shortly after the incident can be assumed to provide a further 30 percent or more reduction so that the maximum first year dose to people who are not relocated is expected to be less than 1 rem (10 mSv). Taking account of decay rates assumed to be associated with releases from NPP incidents (SNL 1982) and shielding from partial occupancy and weathering, a projected dose of 2 rem (20 mSv) in the first year is likely to amount to an actual dose of 0.5 rem (5 mSv) or less in the second year. The application of simple dose reduction techniques would reduce the dose further. Calculations supporting these projections are summarized in Table E-6 of the 1992 PAG Manual.[23]

Keeping below the 0.5 rem (5 mSv) PAG for "out-years"—the second year and beyond—may be achieved through natural decay of shorter half-life radioisotopes, through decontamination efforts, or through other means of controlling public exposures (such as limiting access to certain areas). In the case of an RDD, in which a longer half-life radioisotope would likely be utilized, reductions in dose may prove difficult to achieve without longer term measures (see Chapter 4).

Exposure from ingestion of food and water is considered independently of decisions for relocation and decontamination. In rare instances, however, where withdrawal of food or water from use would pose a health risk in itself, relocation may be an appropriate protective action against exposure via ingestion. In this case, the dose from ingestion should be considered along with the projected dose from other exposure pathways for decisions on relocation.

3.4.3. Projected External Gamma Dose

Projected whole body external gamma doses at 1 meter height at particular locations during the first year and second year after the incident are the parameters of interest (DOE 1988). Measurements made at 1 meter to project whole-body dose from gamma radiation should be made with instruments of the "closed window" type to avoid the detection of beta radiation. The environmental information available for calculating these doses is expected to be the current gamma exposure rate at 1 m height and the relative abundance of each radionuclide contributing significantly to that exposure rate. Calculation models are available for predicting future exposure rates as a function of time with consideration of radioactive decay and weathering.

Relocation decisions can generally be made on the basis of the first year projected dose. However, projected doses during the second year are needed for decisions on protective actions for people who are not relocated. DCFs are therefore needed to convert environmental measurements to projected dose during the first year and second year following the incident (See FRMAC Assessment Manuals). Of the many types of environmental measurements that can be made to project whole body external gamma dose, gamma exposure rate in air is the easiest to make and is the most directly linked to gamma dose rate. However, analyses of a few environmental samples (particularly, soil samples) must be coupled with the gamma exposure rate to properly project decreasing dose rates.

[23] The 1992 PAG Manual is available as a historical reference on line at: <http://www.epa.gov/radiation/rert/pags.html>

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In addition, measurements should be conducted to determine the dose reduction factors associated with simple, rapid, decontamination techniques so that these factors can be used in calculating dose to people who are not relocated. However, assumptions about these factors should not be included in calculating projected dose for decisions on relocation. Only dose reductions already accomplished can be considered.

3.4.4. Exposure Limits for People Reentering the Relocation Area

After the relocation area is established, people will need to reenter for a variety of reasons, including recovery activities, retrieval of property, security patrol, operation of vital services and, in some cases, care and feeding of farm and other animals. It may be possible to quickly decontaminate access ways to vital institutions and businesses in certain areas so that they can be occupied by adults either for living (i.e., institutions such as nursing homes and hospitals) or for employment. Clearance for occupancy of such areas will require dose reduction to meet exposure limits (EPA 1987). Dose projections should include both external exposure from deposited material and inhalation of resuspended deposited material for the duration of the planned exposure. People working in areas inside the emergency relocation area should operate under the controlled conditions established for occupational exposure (EPA 1987). The worker dose limitation does not need to include ongoing doses received from living in a contaminated area outside the relocation area. It is also not necessary to consider dose received previously from the plume or groundshine during the early phase of the radiological incident.

3.5. PROTECTIVE ACTION GUIDANCE FOR FOOD AND DRINKING WATER

Information on food and animal feeds protective action guidance is contained in FDA's "Accidental Radioactive Contamination of Human Food and Animal Feeds: Recommendations for State and Local Agencies" (FDA 1998).

EPA is not proposing a specific drinking water PAG at this time. EPA has established enforceable drinking water standards for radionuclides under the Safe Drinking Water Act (SDWA). EPA recommends that to the extent practicable, emergency measures for drinking water be based on the National Primary Drinking Water Regulations (NPDWR) for Radionuclides. The Radionuclides Rule provides states with flexibility when responding to radiological events. If a public water system exceeds the radionuclides standard it must work to get back into compliance as soon as feasible. States have the authority to determine if other corrective actions are needed (e.g. providing alternative water).

However, the Agency recognizes a short-term emergency drinking water guide may be useful for public health protection in light of the Fukushima nuclear power plant accident, which impacted some Japanese drinking water supplies. Input on the appropriateness of, and possible values for, an intermediate phase emergency drinking water PAG is being sought during the public review of this Manual.

While the NPDWR provide for a regulatory standard of 4 mrem/year (beta, photon emitters) based on life-time exposure, international organizations have developed technical approaches and methodologies that have produced a range of emergency guidelines related to drinking water (e.g., the World Health Organization[24], the International Atomic Energy Agency[25]) as have other federal agencies (e.g., the Department of Homeland Security[26], the Food and Drug Administration[27]) and non-federal organizations. EPA is seeking input on an approach and technical rationale for a drinking water PAG designed to help

[24] See: http://www.who.int/water_sanitation_health/dwq/gdwq3rev/en/ and http://www.who.int/hac/crises/jpn/faqs/en/index8.html.
[25] See: http://www-pub.iaea.org/MTCD/publications/PDF/Pub1467_web.pdf.
[26] See: http://ogcms.energy.gov/73fr45029.pdf
[27] See: http://www.fda.gov/downloads/MedicalDevices/.../UCM094513.pdf

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officials select protective actions under emergency conditions when exposures would occur over shorter time periods than those envisioned in the NPDWR.

3.5.1. Monitoring & Characterization of Contaminants

The Radionuclides Rule requires community water systems (CWS) to monitor at each entry point to the distribution system to ensure that every customer's water does not exceed the maximum contaminant levels (MCLs) for radionuclides. All CWS are required to monitor for gross alpha, radium-226/228 and uranium. In addition, CWS designated by the state as "vulnerable" or if they use waters contaminated by effluents from nuclear facilities must also conduct monitoring for beta particle and photon radioactivity.

In the event of a radiological event the state, at its own discretion, may exercise regulatory flexibility and require systems to collect samples for radionuclides, including beta particle and photon activity (40 CFR 141.26(c)). For more information about monitoring requirements for the Radionuclides Rule see the "Radionuclides Rule: A Quick Reference Guide" (EPA816-F-01-003, June 2001)[28] or "Implementation Guidance for Radionuclides" (EPA 816-F-00-002, March 2002).[29]

To determine if there is radiological contamination of drinking water sources and the extent to which such contamination is occurring, systems sampling for radionuclides must use approved EPA methods.[30]

3.5.2. Public Notification

If water sample monitoring indicates that contamination levels exceed the MCL for any radionuclide, water systems are required to issue a Tier 2 Public Notification (i.e., within 30 days).

States have the flexibility to elevate the notification if warranted to a Tier 1 Public Notification (i.e., within 24 hours) (40 CFR 141.201(a)(3) Special public notices: Occurrence of a waterborne disease outbreak or other waterborne emergency.

During a radiological event, water systems may be dealing with a number of requirements and operating procedures and may not be prepared to issue public notification. The state may issue public notification on behalf of the water system (40 CFR 141.210(a)). This would allow the state to develop and deliver a consistent message to all affected customers and also allows the system to concentrate its efforts on returning the system to operation and/or returning to compliance in the event of a radionuclides MCL violation. For more information see the Revised Public Notification Handbook (EPA 816-R-09-013, March 2010).[31]

3.5.3. Corrective Actions to Reduce Levels of Contamination

Water distribution systems all incorporate reserve and storage capacity. During the early phase of an incident it is unlikely that contamination could affect water which is directly available for consumption through distribution systems. It would take some time for radionuclides to be deposited from the plume into the supply system water source and then subsequently be distributed. During the early phase, recommendations to the public (i.e., about drinking tap water) should reflect these considerations. The public should be advised that the water is safe to drink unless otherwise informed by state officials. Some

[28] See: http://www.epa.gov/ogwdw/radionuclides/pdfs/qrg_radionuclides.pdf

[29] See: http://water.epa.gov/lawsregs/rulesregs/sdwa/radionuclides/upload/2009_04_16_radionuclides_guide_radionuclides_stateimplementation.pdf

[30] A list of EPA approved analytical methods for Radionuclides is available at: http://www.epa.gov/ogwdw/methods/pdfs/methods/methods_radionuclides.pdf

[31] See: http://water.epa.gov/lawsregs/rulesregs/sdwa/publicnotification/upload/PNrevisedPNHandbookMarch2010.pdf.

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useful and practical actions water systems can take during the intermediate phase to provide drinking water to customers are described below.

Wait for Flow-By
If radionuclides are deposited over a river, a section of the water can become contaminated and can be repeatedly contaminated as rain re-deposits radioactive particles. As this section flows down the river, this section of contaminated water is called a plume. This action calls for closing down any source intake valves along the path of the plume of contaminated water. While the intake valve is closed, no contaminated water can enter the water supply system; therefore the contaminated water is allowed to flow by the system. During this time, the system's existing storage capacity can be depended upon. If the stored water supplies could be depleted before the affected valves can be reopened, treatment of the contaminated water while using available stored water supplies should be considered. This assumes that the treatment technology will be in place or readily accessible. In the event of no other option, contaminated water could be temporarily replaced with large quantities of purchased uncontaminated water.

Treat Contaminated Water
Various treatment options exist for reducing or eliminating the contamination of drinking water by man-made radionuclides. Only a small percentage of all water systems treat specifically for radionuclides. However, typical technologies used to treat water for other contaminants can reduce the concentration of radioactivity. These technologies include coagulation/filtration, ion exchange, lime softening and reverse osmosis. Their actual removal efficiency depends on the radionuclide and the type of treatment.[32]

Activate Existing Connections to Neighboring Systems
If the water supply system is part of a larger, regional supply system, activation of existing connections to a neighboring area could be considered. Most large water systems can establish connections with other large systems for emergency purposes. As in many cases, this option may have already been considered during emergency planning. If this option is implemented, steps must be taken to ensure that the "clean" systems do not become contaminated from water backflow.

Smaller water supply systems (i.e., that serve between 10,000 and 75,000 people), or sparsely populated or rural areas, may not be connected to a neighboring system. In this case, regionalization may be a part of emergency planning to explore. This involves connecting smaller systems to larger systems, thus forming a regional water supply system. This is obviously a long-term proposition, but it does have the added advantage of reducing system vulnerability to water shortages or water quality problems other than those resulting from a radiological incident.

Establish Pipeline Connections to Closest Sources/Systems
Running a pipeline from a "clean" water supply system to various distribution centers located throughout the affected community is a routine means of providing clean water. For example, when water mains must be repaired or cleaned of debris, community water needs have been met through the assembly of temporary pipes and hoses. This is a relatively simple procedure, requiring very little construction and technical expertise. For medium- to long-term emergencies, the construction of a temporary pipeline could be cost-effective. PVC pipe, fire hoses and steel pipe have been used to provide emergency drinking water for periods of up to 2 months when service has been disrupted by earthquakes, drought, or bacterial contamination.

[32] Additional information about treatment options and compliance guidance is available at the following website: http://water.epa.gov/lawsregs/rulesregs/sdwa/radionuclides/compliancehelp.cfm.

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Import Water in Tanker Trucks
If an uncontaminated source of water is close to the affected area, it may be more efficient to arrange to transport water from that source by truck, rail, or barge to distribution centers located throughout the community. The most significant obstacle for the use of this option is the cleanliness and availability of transport vehicles. State and local laws may also affect this option.

Import Bottled Water
Importing bottled water into the affected community is another possible option. The water may come from a nearby water supply system or from a water bottling company. This option may be cost-effective during an emergency if water is needed quickly and if the length of the emergency does not merit long-term action, such as the construction of a temporary pipeline.

Ration Clean Water Supplies
Rationing uncontaminated water is also a possibility. This is particularly true if water reserves can provide each individual in the community with 1 L (0.264G, about 1 qt) of water per day until the contaminated plume has passed, the contaminated water is treated, or the water supply system has returned to normal operating conditions. If this option is chosen, it is important that efficient methods for rationing are in place. Rationing water might also be required if water treatment capabilities are limited. Consider a scheme to ration water as part of emergency planning efforts.

3.6. LONGER-TERM OBJECTIVES OF THE PROTECTIVE ACTION GUIDES FOR THE INTERMEDIATE PHASE

It is an objective of the PAGs to ensure that doses in any single year after the first will not exceed 0.5 rem (5 mSv). For source terms from NPP incidents, the PAG of 2 rem (20 mSv) projected dose in the first year is expected to meet this longer-term objective through radioactive decay, weathering and normal part-time occupancy in structures. If the release contains long-lived radionuclides, decontamination of areas outside the relocation area may be required during the first year to meet these objectives. For situations where it is impractical to meet these objectives through decontamination, relocation should be considered even if the projected first-year dose is lower than the relocation PAG.

Based on the relocation PAGs, reentry guidance can be found in the Reentry Matrix in Section 3.8, as well as in the Preliminary Report on Operational Guidelines Developed for Use in Emergency Preparedness and Response to a Radiological Dispersal Device Incident, Group C (DOE 2009). After the population has been protected in accordance with the PAGs for relocation, return for occupancy of the relocation areas should be governed on the basis of cleanup criteria and late phase cleanup activities should proceed.

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3.7. REENTRY DURING THE EARLY AND INTERMEDIATE PHASES

3.7.1. Assumptions and Definitions

The term reentry is used for emergency workers and members of the public going into radiologically contaminated areas temporarily under controlled conditions.

The incident response is divided into three activity planning phases. Early Phase begins with the incident and may last from hours to days. Intermediate Phase begins with control and characterization of the release; it may overlap early and late phase activity and last from weeks to months. Late Phase begins when recovery actions to reduce radiation in the environment begin and ends when all recovery actions are complete. The matrix below only addresses Early and Intermediate Phase activity.

3.7.2. Approach and Discussion

Interagency guidance informed this section, including—

- "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents" (EPA, 1992)[33].
- "Preliminary Report on Operational Guidelines Developed for Use in Emergency Preparedness and Response to a Radiological Dispersal Device Incident" (DOE 2009)[34].
- FRMAC Assessment Manual (Sandia National Lab, 2010)[35].

The Operational Guidelines include detailed numeric guidance, developed by a multi-agency working group as a follow-up to the RDD/IND Planning Guidance. That work focused specifically on response and recovery for an RDD event; however, that work can be expanded to include isotopes from a variety of incident types.

The Operational Guidelines are informative for this guidance, specifically the discussions about applicable dose-based limits, timeframes and pathways of exposure related to reentry tasks. Food and agriculture guides use FRMAC assessment methods as well as the Operational Guidelines for implementation. These tools allow derivation of decontamination thresholds for the early and intermediate stages of a response.

As part of the U.S. response to the Japanese Fukushima accident, scientists performed dose calculations to ensure that passengers and workers on train trips through contaminated areas do not exceed doses typically received from cosmic radiation during an international flight. DOE's Argonne National Laboratory scientists utilized the RESRAD-RDD tool and hand calculations to approximate the NPP radionuclides.

[33] PAGs Manual online at http://www.epa.gov/rpdweb00/rert/pags.html.
[34] The Operational Guidelines were developed by federal agencies and published in draft form by DOE in February 2009 with DOE reference number DOE/HS-0001; ANL/EVS/TM/09-1, on-line at http://ogcms.energy.gov/review.html.
[35] FRMAC Assessment Manual, Overview and Methods online at: http://www.nv.doe.gov/nationalsecurity/homelandsecurity/frmac/manuals.aspx.

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3.8. REENTRY MATRIX FOLLOWING A RADIOLOGICAL INCIDENT OR ACCIDENT

PHASE	ACTIVITY	SUGGESTED LEVELS	CLEANUP ACTIONS
Early Phase (first 4 days)	**Sheltering or Evacuation for the Public** **Emergency Worker Protection**	**Public**: 1,000-5,000 mrem (10-50 mSv) projected over four days (See Ch. 2). A decision to evacuate weighs anticipated dose against feasibility of evacuating within a determined time frame, along with the risks associated with the evacuation itself. **Emergency Responders**: 5,000/10,000/25,000 mrem (50/100/250 mSv) incurred over the response duration. The higher limits are based on task (e.g., protecting large populations or critical infrastructure or lifesaving). Responder doses will be tracked with dosimeters. Emergency workers have knowledge of the risks associated with radiation exposure, training to protect themselves and dosimeters to track their doses.	It is too early for organized cleanup, due to chaos of the situation and higher priorities such as life-saving activities and clearly identifying shelter and evacuation zones. Any cleanup or decontamination information should focus on personal decontamination. It is doubtful any large-scale effort could change evacuation or shelter recommendations during this period (1st 4 days). Once evacuation is completed, there are simple actions cities can implement themselves: rinsing roofs and streets, street sweeping. The objective of these efforts is to move the bulk amounts of contamination away from occupied areas or areas where reoccupation is a priority. These actions should be based on measured amounts of contamination and priority of the location. Workers may face high dose levels and will need health physics support.
Intermediate Phase (first 30 days and up to a year)	**Relocation for the Public**	**Public**: 2,000 mrem (20 mSv) projected first year, 500 mrem (5 mSv) per year projected in subsequent years (See Ch. 3). In this phase, scientists run dose calculations with RESRAD RDD or Turbo FRMAC; the user can choose sensitive age groups, or enter lower guidelines, if desired. Additionally, local decision makers can adapt the guides with incident-specific considerations and implement variations as needed.	Early cleanup efforts should focus on the removable portion of the contamination: vacuuming, washing, vegetation removal. Vacuuming has the advantage of collecting removable contamination without water or surface impact, but is limited by equipment availability and can also expose the operators to high dose levels as the vacuums collect the contamination. Washing and rinsing are simple to implement, but only move the contamination to less-populated areas and may move contamination deeper into porous surfaces. For unpaved areas, vegetation removal can effectively reduce the amount of contamination present, but is labor intensive and can produce large amount of waste. Having addressed the removable part of the contamination, later efforts can focus on fixed contamination. Paved surface

Intermediate Phase (first 30 days and up to a year)	**Reentry For Use of Critical Infrastructure** **Radiation Worker Protection**	**Public**: 2,000 mrem (20 mSv) in first year (Preliminary Report on Operational Guidelines Developed for Use in Emergency Preparedness and Response to a Radiological Dispersal Device Incident, *Operational Guidelines Group C*). Dosimeters could be considered for the public. **Radiation Worker Protection**: (dose not to exceed) 5,000 mrem (50 mSv) per year ((*Radiation Protection Guidance to Federal Agencies for Occupational Exposure*, EPA 1987). Radiation workers have knowledge of the risks associated with radiation exposure, training to protect themselves and dosimeters to track their doses. During an incident response, workers (police, waste handlers) needed in contaminated areas could be trained and given dosimeters. The guidance for Radiation Workers applies throughout the response.	removal is very effective, but requires specialized equipment and trained operators. Surface sealing is easier, but leaves the contamination in place, making it viable only in locations where the dose rates are low enough for occupation, or in low-occupancy areas. Repaving roads, lots and other paved surfaces is easy to implement, but can generate significant waste volumes. Unpaved areas can be further remediated by soil skimming (surface removal), deep plowing (turning the top foot or so of soil over) and appropriate chemical soil amendment methods like liming or chelating. As the Intermediate phase progresses, knowledge and experience increases and these methods can be re-applied, refined or customized for problem areas. Decisions about more difficult areas will benefit from professional judgment, additional analyses and application of more sophisticated technologies.
	Reentry For Use of Roads and Walkways	**Public**: 2,000 mrem (20 mSv) first year, 500 mrem (5 mSv) per year in subsequent years (*Operational Guidelines, Group E*). While the dose values here are similar to those for Use of Critical Infrastructure above, the derived concentrations measured as triggers are different because the exposure conditions are different.	
	Reentry For Access to the Relocation Zone	**Public**: 500 mrem (5 mSv) over one year for temporary access with stay times dependent on reentry tasks and site-specific conditions (*Operational Guidelines, Group D*). 'Stay time' is a term of art used in the radiation safety field. Stay times are the amount of time a person may access the contaminated area. These times vary based upon site-specific factors or incident characteristics such as indoor or outdoor work, sensitive populations and level of radioactivity. Section 7.1 of the Operational Guidelines, "Worker Access to Businesses for Essential Actions," provides tables and graphs of stay times at various limiting concentrations (see Figure 7.5 and Table 7.8). For example, if the maximum surface street	

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concentration of Cesium-137 is 3.00E+09 pCi/m^2 (1.11E+08 Bq/m^2), people limited to 500 mrem (5 mSv) should be in the contaminated area less than four 8-hour days if staying outdoors.

This may apply to individuals retrieving belongings from homes or to workers providing security patrols, or even to people reopening businesses in the area. As contamination levels are reduced during cleanup, stay times can be extended and total doses reduced.

Operational Guidelines provide stay times and concentrations for several different sets of assumptions about the exposure. Residents retrieving possessions may spend most of their time indoors, where stay times are longer than they are for outdoors tasks. Stay time recommendations can be used to guide decisions about allowing entry into the contaminated area for a limited time and dose reduction techniques like wearing dust masks, cleaning shoes and car tires upon exit and using time wisely keep radiation exposure 'ALARA' below the Operational Guideline.

Table 7.8 Scenario D2-2 Operational Guidelines for 0.5 rem Annual Dose: Residents Access to Houses (Indoor Exposure)

	Surface Street Concentration (pCi/m^2)		
Radionuclide	1 Day	4 Days	12 Days
Am-241	7.51E+07	2.86E+07	1.59E+07
Cf-252	3.50E+08	1.32E+08	7.13E+07
Cm-244	1.27E+08	4.82E+07	2.68E+07
Co-60	2.72E+09	6.87E+08	2.33E+08
Cs-137	1.14E+10	2.94E+09	1.01E+09
Ir-192	9.93E+09	2.54E+09	8.92E+08
Po-210	1.17E+09	3.86E+08	1.74E+08
Pu-238	6.56E+07	2.50E+07	1.39E+07
Pu-239	6.01E+07	2.29E+07	1.27E+07
Ra-226	6.08E+08	2.10E+08	9.97E+07
Sr-90	2.48E+10	7.70E+09	3.18E+09

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KEY POINTS IN CHAPTER 3 – INTERMEDIATE PHASE

- The principal protective actions for reducing exposure of the public to deposited radioactive materials are relocation, decontamination and time limits on exposure. The PAG for relocation is 2 rem (20 mSv) over the first year of exposure. After the first year, the PAG for relocation is 0.5 rem (5 mSv) per year.
- Boundaries of relocation areas should be established based on the relocation PAG and site-specific geographical features such as rivers, mountains or roadways.
- Exposure limits must be set for people who must enter the relocation area to perform vital services.
- Other protective actions, such as focused decontamination and time limits on exposure, are applied to people in areas where levels of deposited radioactivity are not high enough to warrant relocation.
- Protective action guidance for food is contained in FDA's "Accidental Radioactive Contamination of Human Food and Animal Feeds: Recommendations for State and Local Agencies" (FDA 1998).
- EPA has established enforceable drinking water standards for radionuclides under the SDWA. EPA recommends that to the extent practicable, emergency measures for drinking water be based on the NPDWR for radionuclides. The Radionuclides Rule provides states with flexibility when responding to radiological events. Input on the appropriateness of, and possible values for, an intermediate phase emergency drinking water PAG is being sought during the public review of this Manual.

To inform temporary reentry into relocation areas, use the Operational Guidelines (DOE 2009).

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CHAPTER 4 – GUIDANCE FOR THE LATE PHASE

4.1. CLEANUP PROCESS

This section describes the remediation cleanup process for the late phase of a nationally significant radiological incident, like a disaster at an NPP, an RDD or an IND. It should be noted that the extent and scope of contamination as a result of an NPP, RDD or IND incident may be at a much larger scale than a site or facility decommissioning or remedial cleanup. This process identifies the late phase remediation or cleanup process steps, including factors for decision makers to consider in determining final cleanup actions. For information on roles, responsibilities and authorities during emergency response and recovery please refer to the National Response Framework: http://www.fema.gov/national-response-framework and specifically for radiological incidents, the Nuclear Radiological Incident Annex: http://www.fema.gov/pdf/about/divisions/thd/IncidentNucRad.pdf (FEMA 2008a, b).

4.1.1. Transitioning from Intermediate to Late Phase Cleanup

The late phase cleanup process begins sometime after the commencement of the intermediate phase and proceeds independently of intermediate phase protective action activities. The transition is characterized by a change in approach, from strategies predominantly driven by urgency, to strategies aimed at both reducing longer-term exposures and improving living conditions. The late phase involves the final cleanup of areas and property at which contamination directly attributable to the incident is present. It is in the late phase that final cleanup decisions are made and final recovery efforts following a radiological incident are implemented.

Unlike the early and intermediate phases of a radiological incident, decision makers will have more time and information during the late phase to allow for better data collection, stakeholder involvement and options analysis. There will be opportunities to involve key stakeholders in providing sound, cost-effective cleanup recommendations. Generally, emergency phase decisions will be made directly by elected public officials, or their designees, with limited stakeholder involvement due to the need to act within a short timeframe. Longer-term decisions should be made with stakeholder involvement and can also include incident-specific technical working groups to provide expert advice to decision makers on impacts, costs and alternatives. Community members will influence decisions such as if and when to allow people to return home to contaminated areas. There will be people living in (low-level?) contaminated areas, outside the evacuation and relocation zones, where efforts to reduce exposures will be ongoing.

Because of the extremely broad range of potential impacts that may occur from NPP incidents, RDDs and INDs (e.g., light contamination of one building to widespread destruction of a major metropolitan area), a process should be used to determine acceptable cleanup and reoccupancy/relocation criteria based on the societal objectives for expected land uses and the options and approaches available. Implicit in these decisions is the ability to balance health protection with the desire of the community to resume normal life. Radiation protection considerations must be addressed in concert with health, environmental, economic, social, psychological, cultural, ethical, political, and other considerations. It is recognized that experience from existing programs, such as the U.S. EPA's Superfund program, the U.S. NRC's process for decommissioning and decontamination to terminate a nuclear facility license and other national recommendations may be useful in planning cleanup and recovery efforts.

Consistent with the "Framework for Environmental Health Risk Management," mandated by the 1990 Clean Air Act Amendments and published by the Commission on Risk Assessment and Risk Management in 1997, the late phase cleanup process consists of multiple steps, including 1) characterization and stabilization, 2) development of goals and strategies and 3) implementation and

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reoccupancy. Stakeholder involvement should be integrated throughout the process. Characterization in this phase consists of delineation, in detail, of the nature and extent of contamination in areas impacted by the incident. Stabilization is intended to reduce the spread of contamination to clean areas, airborne inhalation hazards and the volume of radioactive waste generated. Establishment of cleanup goals and strategies should consider overall community health, along with a variety of factors described further below; they are based upon anticipated land use and a variety of selection criteria. Key to these steps is the involvement and acceptance of the impacted state and local community. These steps are discussed in more detail below.[36]

4.1.2. Characterization and Stabilization

The first step in the late phase remediation or cleanup process is characterization, or the comprehensive mapping and monitoring of the distribution and level of radioactive contamination. Characterization activities are necessary in the preparation for and verification of a successful remediation or cleanup effort. The late phase characterization work is designed to define, in detail, the nature and extent of the contamination and to provide information needed to develop and evaluate cleanup alternatives.

The characterization performed in support of the late phase will be much more detailed and comprehensive than the earlier characterization work to support PAG decisions made during the early and intermediate phases. It delineates the nature of any actual threat posed to human health or the environment and defines the extent of that threat.

Stabilization techniques are designed to immobilize radioactive contamination on soils, buildings, roads and equipment. This becomes paramount in a large-scale incident where the spread of contamination can occur from natural weathering effects to human and animal interactions with the environment. Stabilization reduces chronic low-level exposures to residual radiation, airborne hazards and volumes of secondary waste. These reductions can result in significant benefits to the long-term recovery in terms of time-to-normalcy and economic recovery.

4.1.3. Goals and Strategies

After late phase characterization and stabilization activities are accomplished, areas impacted by radioactive contamination are documented and defined to the best extent possible. At this point, decision makers must establish cleanup goals and strategies for moving forward. The development of goals and strategies marks the second step in the late phase remediation or final cleanup process. As part of an ongoing iterative process, cleanup goals are informed by the feasibility of cleanup strategies and specific cleanup strategies adjust as experience is gained. That is, risk management goals may be refined as decision makers and stakeholders gain appreciation for what is feasible, what the costs and benefits are and how the process of reducing exposures and risks can improve human and ecological health.

As actual levels for areas are determined, many factors come into play in decision making, such as balancing risk reduction with other factors, background levels of radioactivity and tolerance for voluntary versus involuntary risk. Determining these levels will require consideration of a number of factors—

- The types of contamination; the technical feasibility, cost, timeliness and effectiveness of decontamination measures; and the availability and cost of options for the disposal of wastes.

[36] This cleanup process does not rely on and does not affect any authority, including the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 U.S.C. 9601 et seq. and the National Contingency Plan (NCP), 40 CFR Part 300. This document expresses no view as to the availability of legal authority to implement this process in any particular situation.

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- The size and character of the areas that are contaminated; past and projected future uses for these areas; and the preservation or destruction of places of historical, national, or regional significance.
- Site-specific natural and anthropogenic background levels of radioactivity.
- Estimates of the impacts of both contamination and options for decontamination, on human health, communities, the economy, ecosystems and ecosystem services.

Public acceptability and intergenerational equity.

Community involvement and sentiment are vital to this process. The stress from both the incident itself as well as the longer term effects of separation from home will be important factors as overall community health is considered. In the United States, a range of one in a population of ten thousand (10^{-4}) to one in a population of one million (10^{-6}) excess cancer incidence outcomes is generally considered protective for both chemical and radioactive carcinogenic contaminant exposures. This range is the regulatory standard generally used in the context of EPA Superfund response actions. The NRC's decommissioning and decontamination process outcomes are usually in or near this range as well. A similar risk range may be an appropriate goal for radiological events that affect areas of comparable size. However, such risk ranges may not be practically achievable for major incidents that result in the contamination of very large areas. In such instances, using the lower range of one in ten thousand excess cancer incidence could be considered, with clear communication with and education of the affected community regarding the predictability of such a range and comparable risks which are generally deemed to be acceptable. In making decisions about cleanup goals and strategies for a particular event, decision makers must balance the desired level of exposure reduction with the extent of the measures that would be necessary to achieve it, in order to maximize overall human welfare.

While it may take many years to achieve final cleanup levels, a timely return to normalcy, including reoccupancy and a viable community, will require a cleanup process that is flexible, iterative and inclusive. Decisions must be made on a site-specific basis and should reflect the interim risks that are reasonable and acceptable to the affected community as active remediation, radioactive decay and natural weathering move the site toward long-term cleanup goals.

Cleanup strategies are adopted as decision makers and stakeholders gain an understanding of all relevant factors. Tradeoffs between alternatives should be considered and balanced so that the best options are chosen. Local acceptance will be a key component of a fully transparent approach to long-term remediation and cleanup. Factors to consider in determining cleanup actions include evaluating:

- areas impacted (e.g., size, location relative to population);
- actions already taken during the early and intermediate phases;
- the ability of a remedy to maintain reliable protection of overall human health and the environment over time;
- assessing the relative performance of treatment technologies on the toxicity, mobility or volume of contaminants;
- the success or effectiveness of the cleanup or remediation as the cleanup progresses (contaminant removal);
- the adverse impacts on human health and the environment that may be posed in the time it takes to implement the remedy and achieve the community-based remediation goals;
- the impacts of alternative levels of clean up on the local and regional economy (e.g., job loss due to closed businesses, job creation due to decontamination and waste handling operations) and on residents' sense of place (e.g., continued limited access to one's home and community until clean up

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levels have been reached);

preservation or destruction of places of historical, national, or regional significance;

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- the technical and administrative feasibility of the remedy, including the availability of materials and services needed to implement each component of the option in question;
- the cost of each alternative, including the estimated capital and operation and maintenance costs and net present value of capital and operation and maintenance costs;
- state concurrence with the remedy;
- community support for the remedy.

This may be an iterative process. As experience is gained, adjustments may be required to achieve long-term goals.

4.1.4. Implementation and Reoccupancy

To implement cleanup actions in each community, measurable quantities associated with cleanup goals should be derived taking into account exposures from all potential pathways and through all environmental media (e.g., soil, ground water, surface water, sediment, air, animals or plants). These values typically are derived considering reasonably anticipated future land use, dietary habits and commerce patterns. If meeting acceptable levels based upon the reasonably anticipated post-incident land use is not practicable and cost-effective, decision-makers can look to more restrictive land uses through institutional and engineering controls. This approach is based on the belief that early community involvement focusing on desired post-incident uses of the property will result in expedited, cost-effective and publicly-supported cleanups. Overall community health, including stress factors from the initial event and separation from home or family is a necessary consideration.

In some situations, a site or area may reasonably be anticipated to support a range of uses, so cleanup goals may be different for different subareas of the impacted area. Although it may take years to achieve the final cleanup goals for all land uses, reoccupancy of the affected area will be possible when interim cleanup can reduce short-term exposures to acceptable levels during the time it takes to achieve the long-term goals. There may be institutional or engineering controls placed on some portions of the site to prevent excessive exposures until further active remediation, radioactive decay, or natural weathering allow the site to meet cleanup goals. An example of an institutional control might be a restriction on planting vegetable gardens to avoid ingesting radionuclides that may be taken up by the plant roots from the soil. An example of an engineering control to limit exposures might be adding a layer of pavement or cement over gamma emitting radionuclides that have become fixed in place by sorbing onto the street and sidewalks.

In complex cases such as the situation represented by a wide-area NPP, RDD or IND event, cleanup and reoccupancy are likely to occur subarea by subarea in order of priority and community assessments. Critical infrastructure is likely to have been restored to some level of functionality and further remediation of the infrastructure should be evaluated against the cleanup goal. A community-based and transparent development of priorities would follow, resulting in sequential actions, whereby areas (e.g., residential, commercial) would be remediated and reoccupied utilizing temporary cleanup levels that would be considered acceptable for an interim period of time prior to final cleanup goals being achieved. Land use may need to be changed in a subarea where it is not feasible with a combination of remediation, engineering and institutional controls to support the pre-incident land use in a manner that protects human health. In all cases, an appropriate population health monitoring program should be implemented proportionate to the potential or estimated health risk.

4.1.5. Stakeholder Involvement

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Generally, early (or emergency) phase decisions will be made directly by elected public officials, or their designees, with limited stakeholder involvement due to the need to act within a short timeframe. With additional time and an increased understanding of the situation, there will be opportunities to involve key stakeholders in providing sound, cost-effective cleanup recommendations that are protective of human health and the environment.

Affected citizens should be involved in all phases of cleanup planning and long-term remediation of their communities. Early in the process, decision makers should bring together a broad group of stakeholders, e.g., residents, local business owners, local government officials and others interested in the processes that will be required to restore their communities. The credibility of a community group is a function of its inclusiveness. It must represent all stakeholder interests to ensure it is a voice for the entire community rather than a few interested parties. Empowering individuals to assist in the process is important and effective. The affected local community will need to be involved until the site remediation activities are complete and possibly beyond that if institutional and engineering controls are placed on some subareas of the site.

4.1.6. Cleanup Process Implementation and Organization: An Example

This example, reprinted from the Planning Guidance for Protection and Recovery Following Radiological Dispersal Device (RDD) and Improvised Nuclear Device (IND) Incidents (DHS 2008), describes a hypothetical organization to integrate federal cleanup support activities with state and local governments and the public. In particular, it addresses a scenario where the federal government is expected to be the primary funding entity for cleanup and recovery activities. For some radiological scenarios, states might take the primary leadership role in cleanup and contribute significant resources toward recovery of the site. This example does not address such a scenario, although states may choose to follow a similar process.

a) Cleanup Implementation

This approach describes how federal departments and agencies may coordinate during a response with state and local government counterparts and the public, consistent with the National Response Framework (NRF) (FEMA 2008a) and the National Disaster Recovery Framework (NDRF). The approach does not attempt to provide detailed descriptions of state and local roles and expertise. It is assumed those details will be provided in state and local level planning documents that address radiological/nuclear terrorism incidents.

During the intermediate phase, site cleanup planners should begin the process described below, under the direction of the on-site incident command or unified command (IC/UC) and in close coordination with federal, state and local officials. After early and intermediate phase activities have come to conclusion and only long-term cleanup activities are ongoing, the IC/UC structure may continue to support planning and decision-making for the long-term cleanup. The IC/UC may make personnel changes and structural adaptations to suit the needs of a lengthy, multifaceted and highly visible remediation process. For example, a less formal and structured command, more focused on technical analysis and stakeholder involvement, may be preferable for site extended site cleanup than what is required under emergency circumstances.

Radiological and nuclear incidents cover a broad range of potential scenarios and impacts. This example assumes that the incident is of sufficient size to trigger a state request for federal assistance and that the federal government is the primary funding agent for site cleanup. In particular, the process described for the late phase cleanup assumes an incident of relatively large size. For smaller incidents, all of the elements in this section may not be warranted. The process should be tailored to the circumstances of the particular incident. Decision makers should recognize that for some radiological/nuclear incidents, states

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will take the primary leadership role and contribute significant resources toward cleanup of the site. This section does not address such a scenario, but states may choose to use the process described here.

b) Cleanup Activities Overview

As described earlier in the document, radiological/nuclear emergency responses are often divided roughly into three phases: (1) the early phase, when the plume is active and field data are lacking or not reliable; (2) the intermediate phase, when the plume has passed and field data are available for assessment and analysis; and (3) the late phase, when long-term issues are addressed, such as cleanup of the site. For purposes of this example, the response to a radiological or nuclear incident is divided into two separate, but interrelated and overlapping, processes. The first is comprised of the early and intermediate phases of response, which consists of the immediate and near-term on-scene actions of state, local and federal emergency responders under the IC/UC. On-scene actions include incident stabilization, lifesaving activities, dose reduction actions for members of the public and emergency responders, access control and security, emergency decontamination of persons and property, "hot spot" removal actions and resumption of basic infrastructure functions.

The second process pertains to environmental cleanup, which is initiated soon after the incident (during the intermediate phase) and continues into the late phase. The process starts with convening stakeholders and technical subject matter experts to begin identifying and evaluating options for the cleanup of the site. The environmental cleanup process overlaps the intermediate phase activities described above and should be coordinated with those activities. This process is interrelated with the ongoing intermediate phase activities and the intermediate phase protective actions continue to apply through the late phase until cleanup is complete.

Cleanup planning and discussions should begin as soon as practicable after an incident to allow for selection of key stakeholders and subject matter experts, planning, analyses, contractual processes and cleanup activities. States may choose to pre-select stakeholders for major incident recovery coordination. These activities should proceed in parallel with ongoing intermediate phase activities and coordination between these activities should be maintained. Preliminary remediation activities during the intermediate phase—such as emergency removals, decontamination, resumption of basic infrastructure function and some return to normalcy in accordance with intermediate phase PAGs—should not be delayed for the final site remediation decisions.

A process for addressing environmental cleanup is presented below. This is a flexible process in which numerous factors are considered to achieve an end result that considers local needs and desires, health risks, costs, technical feasibility and other factors. The general process outlined below provides decision makers with input from both technical experts and stakeholder representatives and also provides an opportunity for public comment. The extent and complexity of the process for an actual incident should be tailored to the needs of the specific incident; for smaller incidents, the workgroups discussed below may not be necessary.

The goals of the process described below are: 1) transparency—the basis for cleanup decisions should be available to stakeholder representatives and to the public at large; 2) inclusiveness—representative stakeholders should be involved in decision-making activities; 3) effectiveness—technical subject matter experts should analyze remediation options, consider established dose and risk benchmarks and assess various technologies in order to assist in identifying a final solution that is optimal for the incident; and 4) shared accountability—the final decision to proceed will be made jointly by federal, state and local officials.

Under the NRF and NDRF, FEMA may issue mission assignments to the involved federal agencies, as appropriate, to participate in the overall recovery process. Additional funding may be provided to

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state/local governments to perform response or recovery activities through other mechanisms. The components of the process are as follows:

c) General Management Structure

Planning for the long-term cleanup should begin during the intermediate phase and at that time, a traditional National Incident Management System (NIMS) response structure should still be in place. However, NIMS was developed specifically for emergency management and may not be the most efficient response structure for long-term cleanup. If the cleanup will extend for years, the IC/UC may decide to transition at some point to a different long-term project management structure.

Under the NRF and NIMS, incidents are managed at the lowest possible jurisdictional level. In most cases, this will be at the level of the IC/UC. The IC/UC directs on-scene tactical operations. Responding local, state and federal agencies are represented in the IC/UC and Incident Command Post in accordance with NIMS principles regarding jurisdictional authorities, functional responsibilities and resources provided. For a wide-area radiological incident, multiple Incident Command Posts (ICPs) may be established to manage the incident with an Area Command or Unified Area Command supporting the ICPs and prioritizing resources and activities among them. If the incident happens on a federal facility or involves federal materials, the representatives in the UC may change appropriately and the response will be conducted according to the applicable federal procedures.

Issues that cannot be resolved at the IC/UC or Unified Area Command level may be raised with the Joint Field Office (JFO) and JFO Unified Coordination Group for resolution. The JFO coordinates and prioritizes federal resources and when applicable, issues mission assignments to federal agencies under the Stafford Act. Issues that cannot be resolved at the JFO level may be raised to the DHS National Operations Center senior-level interagency management groups and the White House Homeland Security Council and National Security Council.

Day-to-day tactical management, planning and operations for the cleanup process will be managed at the IC/UC level, but for large-scale cleanups involving significant federal resources, it is expected that the JFO Unified Coordination Group and national level federal officials will review proposed cleanup plans and provide strategic and policy direction. The federal agency(s) with primary responsibility for site cleanup should be represented in the JFO Unified Coordination Group. The IC/UC will need to establish appropriate briefing venues as the cleanup process proceeds, including the affected mayor(s) and governor(s).

The discussion below assumes a traditional NIMS IC/UC structure; if the IC/UC transitions later to a different management structure for a longer-term cleanup, the IC/UC would need to determine the appropriate way to incorporate the workgroups described below into that structure.

This process will be managed by the IC/UC, who ultimately determines the structure and organization of the Incident Command Post, but the discussion below provides one recommended approach for managing the cleanup process within a NIMS ICS response structure. The Incident Command Post Planning Section has the lead for response planning activities, working in conjunction with other sections and would have the lead for development of the cleanup options analysis, working closely with the Operations Section. The NIMS describes the units that make up the Planning Section and allows for additional units to be added depending on site-specific needs. NIMS states that for incidents involving the need to coordinate and manage large amounts of environmental sampling and analytical data from multiple sources, an Environmental Unit may be established within the Planning Section to facilitate interagency environmental data management, monitoring, sampling, analysis, assessment and site cleanup and waste disposal planning. Radiological incidents would involve the collection of not only large amounts of radiological data, but also data related to other environmental and health and safety hazards and therefore

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would likely warrant the establishment of an Environmental Unit in the Planning Section. Planning for FRMAC radiological sampling and monitoring activities will be integrated into the Planning Section and coordinated with other Situation and Environmental Unit data management activities.

The IC/UC may assign the Environmental Unit the responsibility for coordinating the development of the cleanup options analysis. For large incidents requiring more complicated tradeoffs or the evaluation of cleanup goals with broad implications, the IC/UC may choose to establish a separate unit in the Planning Section (for example, a Cleanup Planning Unit) to coordinate the development of the cleanup options analysis. The IC/UC may then convene a technical working group and a stakeholder working group, managed by the Environmental or Cleanup Planning Unit, to analyze cleanup options and develop recommendations. The Environmental or Cleanup Planning Unit would coordinate working group processes and interactions and report the results of the cleanup options analysis and workgroup efforts to the IC/UC through the Planning Section Chief.

The development and completion of the cleanup options analysis is expected to be an iterative process and for large incidents, the cleanup will likely proceed in phases, most likely from the "outside in" toward the most contaminated areas. The extent of the analysis and process used to develop it would be tailored to the needs of the specific incident, but the following working groups may be convened by the IC/UC to assist decision makers in the cleanup options process, particularly for large or complex cleanups.

d) Technical Working Group

A technical working group should be convened as soon as practicable, ideally within days or weeks of the incident. The technical working group would be managed by the Planning Section Unit that is assigned responsibility for the cleanup options analysis. The technical working group may or may not be physically located at the ICP. The group may review data and documents, provide input electronically and meet with incident management officials. The group may also be asked to participate in meetings with the JFO Unified Coordination Group if needed.

Function: The technical working group provides multi-agency, multi-disciplinary expert input on the cleanup options analysis, including advice on technical issues, analysis of relevant regulatory requirements and guidelines, risk analyses and development of cleanup options. The technical working group would provide expert technical input to the IC/UC; it would not be a decision-making body.

Makeup: The technical working group should include selected federal, state, local and private sector subject matter experts in such fields as environmental fate and transport modeling, risk analysis, technical remediation options analysis, cost, risk and benefit analysis, health physics and radiation protection, construction remediation practices and relevant regulatory requirements. The exact selection and balance of subject matter experts is incident-specific. The Advisory Team for Environment, Food and Health is comprised of federal radiological experts in various fields that may warrant representation on the technical working group, therefore, the Team or some of its members may be incorporated into this group as appropriate.

e) Stakeholder Working Group

The stakeholder working group should be convened as soon as practicable, ideally within days or weeks of the incident. The stakeholder working group would be managed by the Planning Section Unit that is assigned responsibility for the cleanup options analysis. The IC/UC may direct the Public Information Officer (PIO) (who would coordinate with the Joint Information Center (JIC)) to work with the group, including establishing a process for the group to report out its recommendations. How and where the stakeholder working group would meet to review information and provide its input would need to be determined in conjunction with the group members. The stakeholder working group may also be asked to participate in meetings with the JFO Unified Coordination Group if needed.

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Function: The function of the stakeholder working group is to provide input to the IC/UC concerning local needs and desires for site recovery, proposed cleanup options and other recommendations. The group should present local goals for the use of the site, prioritizing current and future potential land uses and functions, such as utilities and infrastructure, light industrial, downtown business and residential land uses. The stakeholder working group would not be a decision-making body.

Makeup: The stakeholder working group should include selected federal, state and local representatives, local non-governmental representatives as well as local and regional business stakeholders. The exact selection and balance of stakeholders is incident specific.

f) Activities: Cleanup Planning and Recommendations

The IC/UC directs the management of the cleanup options analysis through the Planning Section. Technical and stakeholder working groups assist in performing analyses and developing cleanup options and provide input to the IC/UC and may be asked to participate in meetings with the JFO Unified Coordination Group. The IC/UC reviews cleanup options analysis and selects a proposed approach for site cleanup in close coordination with federal, state and local officials. Again, depending on the incident size, it may be necessary to conduct the cleanup in phases. Thus, decisions on cleanup approaches may also be made in phases. As appropriate for the magnitude of the cleanup task, the IC/UC would brief relevant federal, state and local government officials on proposed cleanup plans for approval. This may involve the office of the affected mayor and governor. At the federal level, it may involve the JFO Unified Coordination Group and higher-level officials.

g) Public Review of Decision

The IC/UC should work with the PIO and JIC to publish a summary of the process, the options analyzed and the recommendations for public comments. Public meetings should also be convened at appropriate times. Public comments should be considered and incorporated as appropriate. A reconvening of the stakeholder or technical working group may be useful for resolving particular issues.

h) Execution of Cleanup and Peer Review

Assuming a Presidential declaration of a major disaster or emergency, FEMA may issue mission assignments to the federal departments and agencies that have the capability to perform the required cleanup, remediation, or debris removal activities. Cleanup activities should commence as quickly as practicable and allow for incremental reoccupation of areas as cleanup proceeds. For significant decontamination efforts, the IC/UC may choose to employ a technical peer review advisory committee to conduct a review of the effectiveness of the cleanup. The technical peer review committee would evaluate pre- and post-decontamination sampling data, the decontamination plan and any other information key to assessing the effectiveness of the cleanup.

4.2. DISPOSAL OF LARGE VOLUMES OF RADIOLOGICAL WASTE

If a large scale radiological incident were to occur in the United States, the complexity of radiological waste disposal would depend on the magnitude of the release and the decisions related to site cleanup, both of which will determine the amount and types of waste requiring disposal. Primary responsibility for waste management decisions falls to state and local officials. If there is a limited radiological incident with relatively small waste volumes, existing licensed radioactive waste capacity is available and may be sufficient to address waste disposal. However, in a situation involving a more significant release and certainly in an event such as the 2011 incident at the Fukushima nuclear facility, the waste resulting from such an incident would likely overwhelm current disposal capacity. When waste volumes exceed existing capacity, options available for consideration include supplements to existing commercial licensed

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radioactive waste disposal facilities, such as a combination of hazardous waste landfills, solid waste landfills, DOE facilities and construction of one or more new disposal facilities. New disposal capacity could be located at the site where the radionuclide release originated, elsewhere within the contaminated area, or away from the affected area altogether.

This section provides a short introduction to the issue, a summary of the types of available disposal options, a more detailed discussion of each disposal option, including disposal capabilities and discussion of roles and responsibilities. Although not addressed explicitly in this section, the need to prepare for and conduct safe and environmentally protective storage of waste generated during remediation will also present a significant challenge, as illustrated by the challenges that Japan faced in the aftermath of the Fukushima accident. Many of the considerations for siting disposal facilities will also be applicable to storage sites.

Planners and decision-makers need to view the long-term remediation and recovery as a comprehensive process in which waste management and disposal needs are considered from the earliest stages. For example, the selected decontamination and remediation approach should involve consideration of a number of viable alternatives with regard to potential treatment and disposal options. The precise mix of treatment and disposal options employed would depend on the nature of the specific incident (e.g., location, waste volumes). The suitability of using any individual facility would depend on a number of factors, including but not limited to the toxicity, mobility and volume of radioactively-contaminated wastes (these would be evaluated as part of the characterization process), possible treatment technologies (e.g., volume reduction technologies at the incident location; thermal treatment; neutralization), cost-effectiveness and existing federal and state (and possibly local) legal requirements governing waste disposal.

4.2.1. Potential Waste Volumes and Existing Waste Disposal Options

As noted above, the complexity of radiological waste disposal decisions would depend on a number of factors, including the magnitude of the release and the decisions related to site cleanup. Consideration of these factors will determine the amount and types of waste requiring disposal. While disposal in a licensed low-level radioactive waste (LLRW) disposal facility may be the preferable first choice, there are a limited number of such facilities and not all states have access to all licensed commercial disposal facilities. If there is a limited radiological incident with relatively small waste volumes, existing capacity is available and may be sufficient to address waste disposal. However, waste resulting from a large scale incident would likely overwhelm current disposal capacity. For large waste volumes, supplements to existing commercial radioactive waste disposal facilities would need to be considered, such as a combination of hazardous waste landfills, solid waste landfills, DOE disposal facilities and potentially, the construction of a new disposal facility. Organizational and administrative issues related to federal and state government coordination and preparation are also important.

a) Waste Volume

Discussions of waste disposal options often involve comparisons of estimated waste generation and available disposal capacity. The amount of waste generated is related to the cleanup approach, as the selected approach to decontamination and remediation, as well as the long-term cleanup goals, can affect the volume of waste actually requiring disposal. The projected amounts of wastes for a large scale radiological incident may range from tens to hundreds of million cubic feet (or several million metric tons). Some of the waste may contain high radioactivity, especially at the incident's origin; however, most of the waste is expected to be only slightly contaminated, though in large quantities. The volume of contaminated soil in Japan resulting from the Fukushima incident is estimated to exceed one billion cubic feet.

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As a point of comparison, roughly 28 million cubic feet of LLRW were disposed of at licensed commercial disposal facilities during the period 2002-2011. DOE disposed of approximately twice that volume in commercial facilities during the same period, in which it was involved in significant large-scale site cleanups.[37] Thus, over that ten-year period, an average annual volume of less than ten million cubic feet was disposed of in commercial facilities. Volumes from the non-governmental sector are not expected to increase significantly until the current fleet of NPPs is decommissioned. DOE generated additional waste volumes that were disposed of at DOE sites. For example, from 2000-2010, DOE disposed of approximately 20 million cubic feet of LLRW at the Nevada National Security Site (NNSS, formerly the Nevada Test Site). As it continues site cleanups, DOE projects generation of approximately 150 million cubic feet of LLRW for the period 2010-2015, most of which will be disposed at the site of origin or other designated DOE sites.

b) Capacity Issues

Managing the large volumes of waste resulting from a wide-scale radiological incident, such as with the Fukushima accident, would likely overwhelm existing capacity in the U.S. and thus require an overall strategy employing all available types of disposal facilities and integrating federal, state, local and private sector assets. For example, consider that:

- At the beginning of 2012, less than 100 million cubic feet of disposal capacity was licensed at commercial disposal facilities. An incident could consume all remaining licensed commercial LLRW disposal capacity, which would affect waste generators in the energy, industrial, research and medical sectors for whom the capacity was originally licensed. While there may be remaining property at the facilities that could be developed, there is no guarantee that additional capacity can be licensed or that states will allow all capacity to be consumed.
- Estimated waste volumes are comparable to projected generation from the entire DOE complex over the next several years, which include large-scale cleanups. While DOE is somewhat less constrained than non-DOE disposal sites in adding additional disposal capacity at its sites, displacement of projected DOE disposal with incident-related waste has the potential to interfere with ongoing cleanup activities, leading to extended on-site storage, slower cleanups and controversial efforts to expand disposal capacity at other DOE sites. Further, there is at present no mechanism to provide access to DOE disposal sites for disposal of incident-related waste.

4.2.2. Integrated Disposal Options

An effective response to a large-scale radiological incident will involve consideration of the entire range of potential disposal options. The precise mix of disposal options employed will depend on the nature of the specific incident (e.g., location, waste volumes). The process selected to plan and conduct the long-term decontamination and remediation should identify and make provisions for using the different available disposal options. In order to provide cleanup managers the use of all potential disposal capacity there are some issues that would need to be addressed, such as waste acceptance criteria for waste sites that have not been evaluated for radioactive material disposal. However, based on an understanding of the types of waste involved and the capabilities of existing disposal facilities, a generalized discussion of the attributes of the different disposal options, with qualifiers, can be developed and are discussed below.

__ Licensed Commercial LLRW Disposal Facilities—

- Can manage most anticipated waste types within license conditions.
- Highest degree of public acceptance.
- Significant bulk disposal volume possible.

[37] Information on disposal in commercial disposal facilities provided by the Manifest Information Management System (MIMS), operated by the DOE at http://mims.apps.em.doe.gov/.

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- Access restrictions may require special approval for waste from certain states.
- Management of mixed radioactive and hazardous waste will need to ensure proper disposal and long-term groundwater monitoring.

__ Solid and Hazardous Waste Landfills—

- May offer local disposal option for expected large volumes with limited contamination.
- May offer a disposal option at hazardous waste landfills for mixed wastes (mixtures of hazardous and radiological wastes); hazardous waste landfills have specified construction and engineering requirements.
- Need to consider the location of the units in proximity to large or sensitive populations, sensitive eco-systems, and sole source aquifers.
- May require design modifications to ensure that the waste can be managed protectively over time.
- Difficulty in obtaining public acceptance, although some hazardous waste landfills have accepted waste with limited radionuclide content with state approval.
- Requires additional demonstration of suitability to ensure protectiveness for radiological material (e.g., groundwater monitoring, additional engineering controls); many solid waste landfills have not been evaluated for disposal of radioactive material and may not be suitable for radiological material.
- May require longer-term/special monitoring, as well as institutional control.

__ DOE Disposal Sites—

- Could potentially handle higher-activity waste if insufficient commercial access/capacity.
- May be suitable for some problematic waste types (e.g., whole vehicles).
- DOE disposal facilities generally accept only DOE-owned or DOE-generated waste. Disposal of non-DOE waste requires additional review and agreements involving the host state, consistent with DOE's authorities particularly where existing agreements limit DOE's waste disposal activities.

Each of these potential disposal alternatives is discussed in more detail below. There may also be some remaining wastes that might require special consideration based on factors such as level of contamination, waste form, lack of access or capacity or presence of other hazardous or toxic contaminants. These wastes could include those containing both hazardous and toxic constituents (e.g., mercury and PCBs), animal carcasses or contaminated vehicles (where dismantling the vehicle may represent a greater potential for dispersal of contaminants and exposure of workers).

a) Commercially Licensed LLRW Disposal Facilities

Given that the bulk of the waste resulting from the release of radionuclides from a nuclear facility or a deliberate action will contain radionuclides commonly contained in LLRW, licensed commercial disposal facilities would be the most appropriate and publicly acceptable option for disposal if the volumes of waste from the incident were relatively small. It would be anticipated that the waste would be mostly at the lower end of radionuclide concentrations. Thus, these facilities will be capable of handling all but the most problematic waste types, if the amounts were limited. At present, all commercial LLRW disposal facilities are licensed by states (through agreements with NRC, referred to as "Agreement States").

As described earlier, available capacity and access are significant concerns in relying on commercial LLRW disposal facilities. Further, even if a facility would be generally available to all waste generators and it is found that all but a small portion of the waste would meet that facility's disposal criteria, it is

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possible that there may be objections to accepting all waste from an incident outside the state, even if the facility's capacity was sufficient.

Access to other facilities generally unavailable to the state(s) affected by the incident might be feasible in an emergency situation under NRC regulations, but it should not be expected that large volumes of waste will be accepted under these provisions. There is also the possibility that the affected state could construct a disposal facility to provide additional capacity. Several states conducted extensive studies of their geology in anticipation of constructing disposal facilities and these studies may be of use in such situations.

b) Solid and hazardous waste landfills

Most states are authorized by the EPA under the Resource Conservation and Recovery Act (RCRA) to operate their own hazardous waste management programs in lieu of the federal Subtitle C program.[38] Management of nonhazardous solid wastes is governed by RCRA Subtitle D, which is administered largely by the states. Compared to the number of licensed LLRW disposal facilities in the U.S., there are a greater number of commercial landfills operating under Subtitle C and many more operating under Subtitle D of RCRA for disposal of hazardous and solid wastes, respectively. It would not be expected that all of these facilities (particularly those operating under Subtitle D) would be appropriate disposal options. However, some of the hazardous waste landfills have accepted some radioactive material for disposal and a few have received the necessary state approvals to do so on a routine basis. Historically, most of the radiological waste streams accepted by hazardous waste landfills contain naturally-occurring radionuclides not regulated by NRC, such as wastes from the oil and gas or other resource extraction industries, as well as water treatment residuals. However, both NRC and DOE, in coordination with state regulators and facility operators have approved disposal of radioactive waste in RCRA landfills on a case-by-case basis. Thus, there is reason to believe that one or more hazardous waste landfills could contribute to the disposal capacity for incident-related waste. The use of any particular RCRA facility for the disposal of radioactive contaminants or mixed contamination would require that the unit is well designed and managed appropriately. The uniform design and engineering requirements applicable to hazardous waste landfills would facilitate such an evaluation; by contrast, not all solid waste landfills are constructed to the same specifications. Further, the evaluation would include consideration of the waste characteristics, site characteristics, waste acceptance criteria and other facility attributes.

RCRA hazardous and solid waste landfills may also offer the advantage of disposal capacity suitable for large volumes of lightly-contaminated material (e.g., soil)[39]. In addition, these facilities are more likely to be located near the incident location, which can facilitate their use if deemed appropriate by federal, state and local officials. However, use of these facilities for disposal of radionuclides typically found in low-level radioactive waste, even if it contains very low concentrations of those radionuclides, may generate public concern if the facilities have not been previously approved for this type of disposal. Therefore, additional effort by state and local officials would be necessary to ensure the facility can manage the waste in a protective manner, including technical modification, if appropriate.

c) DOE Disposal Sites

DOE facilities could potentially be a disposal alternative that may be most appropriate for limited volumes of waste for which there is no other disposal outlet (such as high-activity waste, certain mixed wastes, or other problematic waste streams). Waste disposed at DOE sites must meet the waste acceptance criteria for those sites. DOE does not generally accept non-DOE-owned or generated waste for

[38] Alaska, Iowa, Puerto Rico, the Virgin Islands, American Samoa and the Trust Territories and Northern Marianas Islands do not have authorized RCRA programs.

[39] EPA reports that about 132 million tons of municipal solid waste were landfilled in 2009, comparable to the rate over the past two decades. The 2009 figure represents about 54% of total generation. "Municipal Solid Waste in the United States: 2009 Facts and Figures," EPA530-R-10-012, December 2010.

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disposal at its sites. In addition, DOE has significant ongoing remediation at a number of sites that will generate large volumes of waste over the coming years. Diverting DOE disposal capacity to incident-related waste may interfere with those efforts. DOE has also utilized commercial low-level radioactive disposal, primarily for bulk waste streams from cleanups and this potential disposal alternative may also be affected by a wide-scale incident.

DOE's primary disposal site serving the DOE complex is the NNSS. DOE/NNSS continues to excavate additional disposal capacity as needed and estimates that significant additional capacity could be developed at NNSS.

DOE's other designated site for complex-wide disposal is Hanford, WA; however, DOE has an agreement with the State of Washington that it will not bring waste from other sites until certain remediation milestones have been met. Overall, DOE anticipates that most of its waste generated in the coming years will be disposed at the site of generation. Sites other than NNSS and Hanford are designated for disposal of waste generated at those sites, although exceptional situations may allow for disposal of waste generated off-site and development of some additional disposal capacity. Additional disposal capacity would likely be dependent upon agreement from the state in which the facility is located.

4.2.3. Planning and Coordination Among Federal and State Entities

A number of federal and state agencies may have important roles to play in making decisions on final disposal, depending on the extent of the waste. A framework for coordination with these various federal and state agencies should be an element of the process selected for long-term decontamination and remediation.

a) <u>State Roles and Responsibilities</u>

States must be intimately involved ahead of time in planning for a large-scale radiological incident and the resulting waste disposal.

- All existing commercial LLRW disposal facilities are licensed by Agreement States.
- Many, but not all, states have formed regional compacts (as authorized by Congress) to site and operate LLRW disposal facilities; compacts control access to these sites.
- Although statutorily required[40] to provide disposal capacity for low-level waste generated within the compact boundaries (with certain exceptions), states are under no obligation to accept waste from outside their compacts. States that are not members of compacts do not have the statutory protection to prohibit disposal of out-of-compact waste.
- All DOE disposal sites are located within states, many of which have agreements regarding the extent of long-term disposal or acceptance of off-site waste; States hosting DOE disposal sites should participate in planning for the potential disposal of incident-related off-site waste at DOE sites.
- States regulate hazardous waste (when authorized by EPA) and solid waste landfills that may be used for disposal of waste with very low concentrations of radioactivity; in planning for disposal of incident-related waste, states should take into account any restrictions placed on the disposal of radionuclides in these facilities.
- It is anticipated that on-site disposal at a location affected by the incident, where appropriate, will be one location of choice and that an affected state could approve construction of a new disposal facility for that purpose.

[40] Pursuant to the Low-Level Radioactive Waste Policy Act of 1980 (LLRWPA) and the 1985 LLRWP Amendments Act of 1985.

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b) Federal Agencies

Depending on the circumstances, coordination with numerous federal agencies would be necessary. Of particular note:

- EPA is the coordinating agency for long-term remediation and cleanup, as designated by the National Response Framework (FEMA 2008a) and has federal authority for hazardous waste disposal;
- DOE is "owner" of federal sites that might be used for waste disposal;
- NRC is the federal authority for commercial LLRW disposal;
- USDA provides technical assistance for agricultural materials contaminated by the release, including animal carcasses.

4.2.4. Other Potential Options and Considerations

a) Potential Federal Actions to Increase Preparedness

__ Develop criteria under which access to DOE disposal sites is acceptable and identify issues to be resolved.

__ Facilitate agreements among regional LLRW compacts and states to address situations in which access to compact sites can be assured for all states.

__ Identify geographically strategic federal sites that can be used for staging and interim storage of large waste volumes.

__ Identify federal sites that can be characterized in advance for construction of disposal capacity for incident-related waste, should the need arise.

__ Clarify federal authorities that can be used in exceptional circumstances for acquisition of property for use as disposal or long-term storage capacity and indemnification of private sector service providers.

__ Assist state and local officials in planning for and making decisions to use local disposal options (solid and hazardous waste landfills) for waste that contains relatively low concentrations of radionuclides, including:

- developing criteria for case-by-case alternate disposal evaluations, such as those employed by NRC, EPA and DOE for limited volumes of waste;
- establishing generally applicable criteria for disposal of radionuclides in solid and hazardous waste landfills;
- supporting federal research into behavior of radionuclides and decontamination residuals in solid and hazardous waste landfills;
- providing technical assistance and streamlined regulatory review (e.g., permitting) for states to evaluate existing sites and identify new sites for incident-related waste disposal capacity; and,
- developing and disseminating tools to support planning and decision-making regarding incident-related waste management.

b) Detailed Guidance

It may be appropriate for the federal government to develop detailed guidance to address factors such as waste acceptance criteria needed for waste disposal at RCRA disposal facilities, safety evaluation of existing disposal facilities, or siting, development and regulatory approval of new disposal facilities.

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c) Adding Additional Disposal Capacity

Depending on the circumstances, it may be appropriate to create additional disposal capacity. This decision would most likely need to involve extensive discussion between the federal government and the affected state(s) where an incident occurred.

- On-site disposal. As a result of looking at the different choices, it may be advantageous to develop disposal capacity on-site (e.g., build a large disposal facility within the property boundaries where the facility causing the release is located) if the site is suitable.
- Off-site disposal. An additional option would be for a state or the federal government to build a disposal site on suitable public lands. The federal or state government could use the power of eminent domain to condemn property contaminated by a radiological incident and use it for waste disposal.

d) Site Selection Criteria

If it is determined that constructing a new disposal facility is the appropriate action, the proposed site(s) should be studied for suitability. Although the contemplated disposal actions would be taken in event of a national emergency, every effort should be made to ensure the protection of public health and the environment. Appropriate regulatory standards should be considered in developing a specific disposal plan. The disposal path and site suitability must take into account the radiological characteristics of the waste. As discussed above, some slightly radioactive materials are disposed in hazardous waste landfills if they are permitted for it. More radioactive materials are sent to sites licensed as LLRW disposal sites, though less contaminated materials are also sent to LLRW disposal sites. A small amount of waste from a radiological incident may have concentrated radioactivity, but most of the waste generated in a large scale radiological incident would likely be contaminated with low levels of radioactivity. The different radiological characteristics of the waste would have a bearing on the stringency of containment required of a waste disposal facility. All waste sites would need to have appropriate controls to protect public health and the environment for any level of radioactive contamination, but more highly radioactive materials would need more robust controls than slightly contaminated material.

e) Site Characteristics

The physical/geographic characteristics of the site and the availability of land will be important in determining the appropriateness of a potential disposal site. Sites with limited rainfall, high evapotranspiration, deep water tables and soil characteristics that limit migration of radionuclides have been found to be best suited to disposal of radioactive waste, although waste management and engineering can be applied to improve performance at sites with less favorable characteristics (e.g., controls on the waste form or level of allowable radioactivity, addition of liners, cover requirements or through construction of concrete bunkers or vaults). Other characteristics, such as location in a high risk area (e.g., flood plain or seismic zone) or sensitive ecologic area, should also be considered. A disposal cell for 1 million cubic feet of waste will occupy 1 acre or more of surface area, assuming disposal to a depth of about 30 feet. Large-scale disposal operations may also require extensive surface facilities.

f) Other Important Considerations

Additional considerations can also be applied to make finer distinctions among potentially suitable sites. These criteria include:

- proximity to the incident – it may be useful to consider sites in different regions of the country to limit transportation demands;
- proximity to residential areas or commercial districts – the potential for disposal activities to affect nearby populations or commercial activities, whether located within the site boundaries or on adjacent property, should be considered;

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__ proximity to transportation – access to timely and direct transportation that can accommodate large shipments is desirable—

- action to facilitate – construction of transportation infrastructure (e.g., direct rail lines);

__ experience in waste disposal – waste disposal sites will have infrastructure, procedures and trained personnel that can make most efficient use of the site—

- action to facilitate – development of infrastructure, training, construction of disposal cells and engineered containment (e.g., vaults or bunkers);

__ level of existing contamination – areas that are unlikely to be remediated in the near future or unlikely to be released for public use may be more acceptable for disposal.

4.2.5. Potential Federal Actions to Develop New Disposal Capacity

In addition to criteria for siting new disposal facilities, the federal government has control of a large amount of land throughout the U.S. that could be repurposed, or could offer assistance to support state governments in developing new facilities.

a) DOE Sites

DOE has decades of experience in radioactive waste management. In considering the primary selection criteria described above, DOE sites in the western U.S. generally have more favorable characteristics and readily available property compared to those in the eastern U.S. However, DOE has successfully implemented disposal at the eastern sites, often with some engineering enhancements. DOE has several categories of sites for consideration, beginning with the most suitable—

__ Active disposal or cleanup sites in the western U.S.

__ Active disposal or cleanup sites in the eastern U.S.

__ Closed sites with disposal areas.

__ Closed uranium milling sites.

__ Other long-term stewardship sites.

Considerations: Some DOE sites have agreements with states or other stakeholders regarding further disposal or cleanup activities. Current disposal sites have waste acceptance criteria by DOE policy or statute. Closed and long-term stewardship sites may not have large amounts of additional property available for disposal.

b) DoD Installations

DoD maintains some installations with large land areas, primarily in the western U.S. Many of these sites have been contaminated through extensive training or other activities. DoD likely has more sites in the eastern U.S. than does DOE. Categories of sites that could be considered suitable include:

__ bombing and firing ranges;

__ chemical weapons demilitarization and storage sites;

__ ammunition plants and arsenals;

__ surplus properties (e.g., base realignment and closure (BRAC), formerly used defense site (FUDS)).

Considerations: Section 2692 of title 10, United States Code, "Storage, Treatment and Disposal of NonDefense Toxic and Hazardous Materials," generally provides that the Secretary of Defense may not permit the use of an installation of the DoD for the storage, treatment, or disposal of any material that is a

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toxic or hazardous material and that is not owned either by the DoD or by a member of the armed forces (or by a dependent of the member) assigned to or provided military housing on the installation. Radiological waste resulting from either a nuclear accident or a terrorist attack may fall under this prohibition. The Secretary of Defense may grant exceptions to this restriction when "essential to protect the health and safety of the public from imminent danger." A determination whether or not radiological waste meets the "imminent danger" threshold would be required.

Additionally, some DoD properties, including ranges in the western U.S., are on "withdrawn" lands, which are part of the public domain supervised by the Bureau of Land Management (BLM). Withdrawn land statutes permit DoD to use the property for specific military mission needs. The use of withdrawn lands to manage radiological waste would violate those statutes.

c) Other Federal Properties

Agencies such as the Department of Interior (DOI) or USDA own large properties that could be considered suitable for disposal, many of which are in the western U.S. These properties may be administered by discrete entities within the cabinet-level departments, such as the National Park Service (NPS), BLM, or Forest Service. Some properties may be in proximity to DOE or DoD lands.

Considerations: Properties may be designated for protection or public use (e.g., wilderness areas or preserves). Many properties are also in rugged terrain with difficult access or border tribal lands.

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KEY POINTS IN CHAPTER 4 –LATE PHASE

- PAGs will not be used to guide restoration and recovery of areas impacted by a radiological incident; rather, planning activities should include developing a process to involve stakeholders in setting priorities and determining actions. Such a process should be flexible enough to adapt to a variety of situations.
- Planning considerations for worst case scenarios are provided. Smaller radiological incidents may be well addressed by existing emergency response and environmental cleanup programs at local, state, tribal and federal levels.
- Reoccupying households and businesses should be considered in balance with progress made in reducing radiation risks through decontamination, radioactive decay and managing contaminated waste.
- Exposure limits in a range of one in a population of ten thousand (10^{-4}) to one in a population of one million (10^{-6}) excess lifetime cancer incidence outcomes are generally considered protective, though this may not be achievable after a large radiological incident. In making decisions about cleanup goals and strategies for a particular event, decision makers must balance the desired level of exposure reduction with the extent of the measures that would be necessary to achieve it, in order to maximize overall human welfare.
- Incidents that create large volumes of waste from a wide-scale radiological incident would likely overwhelm existing radioactive waste disposal capacity in the U.S.
- Following a nuclear accident, the states bear primary responsibility to identify and provide waste management options, including disposal capacity; in the event of a terrorist attack, the federal government can offer a range of assistance to state governments to identify and implement waste management options.
- Safely managing and disposing of radioactive waste will require pre-planning at all levels of government and careful coordination with stakeholders at all stages of the decision-making process.

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APPENDIX B – GLOSSARY

Acute health effects: health problems caused by high radiation doses received in a short period of time. Examples of acute effects include erythema (reddening of skin), blistering, epilation (hair loss) and vomiting.

ALARA: acronym for "as low as is reasonably achievable" means making every reasonable effort to maintain exposures to radiation as far below the dose limits in this part as is practical consistent with the purpose for which the activity is undertaken.

Alpha radiation: alpha radiation comes from the ejection of alpha particles from the nuclei of some unstable atoms. An alpha particle is identical to a helium nucleus and consists of two protons and two neutrons. Alpha particles are highly energetic, but can only travel a few centimeters in air. They have low penetrating power and can be stopped by a sheet of paper. Alpha particles generally cannot even penetrate the layer of dead cells on the skin, but can pose a health risk when inhaled or ingested.

Avoided dose: The radiation dose saved by implementing a protective action. (ICRP 1991b)

Beta radiation: beta radiation comes from the emission of beta particles during radioactive decay. Beta particles are highly energetic and fast-moving. They carry a positive or negative charge and can be stopped by a layer of clothing or few millimeters of a solid material. Beta particles can penetrate the skin and cause skin burns, but tissue damage is limited by their small size. Beta particles are most hazardous when inhaled or ingested.

Committed effective dose: The sum of the committed equivalent doses following intake (inhalation or ingestion) of a radionuclide to each organ multiplied by a tissue weighting factor.

Contamination: Radionuclides on surface or in the environment as a result of an accidental release.

Concentration: Radionuclide activity per unit of mass.

Chronic effects: Health problems caused by radiation doses delivered over a long period. Examples of chronic effects include cancer and genetic mutations.

Derived Intervention Level (DIL): Concentration derived from the intervention level of dose at which introduction of protective measures should be considered. (FDA 1998)

Derived Response Level (DRL): A level of radioactivity in an environmental medium that would be expected to produce a dose equal to its corresponding Protective Action Guide.

Dose: The amount of radiation exposure a person has received, calculated considering the effectiveness of the radiation type (alpha, beta, gamma), the timeframe of the exposure and the sensitivity of the person or individual organs.

Dose conversion factor (DCF): Any factor that is used to change an environmental measurement to dose in the units of concern.

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Dose projection: A calculated future dose that an individual might receive; also the process of making these calculations

Dose reduction factor: A factor by which a decontamination technique or protective action reduces the radiation dose to a person.

Dosimetry: The system for assessing radiation doses from external radiation exposures and from intakes of radionuclides using biokinetic models and dosimetric quantities developed by the ICRP and the International Commission on Radiation Units and Measurements (ICRU).

Effective dose: The sum of organ equivalent doses weighted by ICRP organ weighting factors.

Emergency Planning Zone: A designated zone around a commercial nuclear power plant for which radiological response plans must be maintained under Nuclear Regulatory Commission regulations.

Evacuation: The urgent removal of people from an area to avoid or reduce high-level, short-term exposure, from the plume or from deposited activity. Evacuation may be a preemptive action taken in response to a facility condition rather than an actual release.

Gamma radiation: Gamma radiation comes from the emission of high-energy, weightless, chargeless photons during radioactive decay. Gamma photons are pure electromagnetic energy and highly penetrating--several inches of lead or a few feet of concrete may be required to attenuate them. External exposure to gamma rays poses a health threat to the entire body. Inhalation and ingestion of gamma emitters also poses a health threat.

Graves' disease: An autoimmune disorder that leads to the over activity of the thyroid.

Groundshine: Gamma radiation emitted from radioactive materials deposited on the ground.

Half-life: The time required for the half the atoms of a given radioisotope to transform by radioactive decay.

Hasimoto's thyroiditis: An autoimmune disorder that leads to underactive thyroid with bouts of over activity.

Isodose-rate line: A contour line that is used to connect points of equal radiation dose rates.

Latency period, cancer: The time elapsed between radiation exposure and the onset of cancer.

Microsievert: One ten-thousandth of a rem. See Rem.

Millirem: One thousandth of a rem. See Rem.

Millisievert: One thousandth of a Sievert. See Sievert.

Noble gases: A group of elemental gases that are tasteless, odorless and that do not undergo chemical reactions under natural conditions. The noble gases consist of Helium, Neon, Argon, Krypton, Xenon and Radon.

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Off-site: Areas outside the controlled border of a facility, such as a nuclear power plant. For an incident not involving a facility, this term may also be used to refer to areas impacted by contamination.

On-site: areas inside the controlled border of a facility, such as a nuclear power plant. For an incident not involving a facility, this term may refer to areas controlled during a response.

Potassium iodide: A salt of stable, nonradioactive iodine in medicine form. The administration of potassium iodine saturates the thyroid with non-radioactive iodine, so it does not absorb radioactive iodine released into the environment from a radiological incident.

Projected dose: The prediction of the dose that a population or individual could receive.

Protective actions: An activity conducted in response to an incident or potential incident to avoid or reduce radiation dose to members of the public.

Protective Action Guide (PAG): The projected dose to an individual, resulting from a radiological incident at which a specific protective action to reduce or avoid that dose is warranted.

Prophylactic: A treatment or medication designed to prevent exposure to radiation.

Rad (radiation absorbed dose): A basic unit of absorbed radiation dose. It is being replaced by the 'gray,' which is equivalent to 100 rad. One rad equals the dose delivered to an object of 100 ergs of energy, per gram of material.

Radioactive: Quality of a material that emits alpha particles, beta particles, gamma rays, or neutrons.

Radiological dispersion device (RDD): A device or mechanism that is intended to spread radioactive material from the detonation of conventional explosives or other means. An RDD is commonly known as a “dirty bomb.”

Radiopharmaceutical: A radioactive chemical used for diagnosis cure, treatment, or prevention of diseases.

Recovery: The process of reducing radiation exposure rates and concentrations of radioactive material in the environment to levels acceptable for unconditional occupancy or use.

Reentry: Workers or members of the public going into relocation or radiological contaminated areas on a temporary basis under controlled conditions.

Release: Uncontrolled distribution of radioactive material to the environment.

Relocation: The removal or continued exclusion of people (households) from contaminated areas to avoid chronic radiation exposure. Not to be confused with *evacuation*.

Reoccupancy: The return of households and communities to relocation areas during the cleanup process, at radiation levels acceptable to the community.

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Rem (roentgen equivalent man): The product of the absorbed dose in rads and a weighting factor which accounts for the effectiveness of the radiation to cause biological damage; a conventional unit for equivalent dose. One rem equals 0.01 Sv.

Release rate: The measure of the amount of radioactive dispersed per unit of time.

Return: Permanent resettlement in evacuation or relocation areas with no restrictions, based on acceptable environmental and public health conditions.

Sievert (Sv): International unit of equivalent dose.

Source term: The amount of a contaminant available in a scenario or actually released to the environment.

Total Effective Dose (TED): The sum of the effective dose (for external exposures) and the committed effective dose; also referred to in this Manual as whole body dose. See Section 2.4.

Yield-producing improvised nuclear device: A crude weapon fabricated from diverted fissile material that produces a nuclear explosion.

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APPENDIX C – LIST OF ACRONYMS

ALARA	As Low as Reasonably Achievable
ANS	American Nuclear Society
BLM	Bureau of Land Management
BRAC	Base Realignment and Closure
CDC	Centers for Disease Control and Prevention
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CWS	Community Water System
DCF	Dose Conversion Factor
DHS	Department of Homeland Security
DoD	Department of Defense
DOE	Department of Energy
DOI	Department of Interior
DOL	Department of Labor
DOT	Department of Transportation
DRL	Derived Response Level
EAL	Emergency Action Level
EPA	Environmental Protection Agency
EPZ	Emergency Planning Zone
FDA	Food and Drug Administration
FEMA	Federal Emergency Management Agency
FRC	Federal Radiation Council
FRMAC	Federal Radiological Monitoring and Assessment Center
FRPCC	Federal Radiological Preparedness Coordination Committee
FUDS	Formerly Used Defense Site
HAZWOPER	Hazardous Waste Operations and Emergency Response
HHS	Department of Health and Human Services
HPS	Health Physics Society
IAEA	International Atomic Energy Agency
ICP	Incident Command Post
ICRP	International Commission on Radiological Protection
IC/UC	Incident Command/Unified Command
IND	Improvised Nuclear Device

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JFO	Joint Field Office
JIC	Joint Information Center
KI	Potassium Iodide
LLRW	Low-level radioactive waste
LLRWPA	Low-Level Radioactive Waste Policy Act
MCL	Maximum Contaminant Level
NCP	National Contingency Plan
NCRP	National Council on Radiation Protection and Measurements
NIMS	National Incident Management System
NNPP	Naval Nuclear Propulsion Program
NNSS	Nevada National Security Site
NPDWR	National Primary Drinking Water Regulations
NPP	Nuclear Power Plant
NPS	National Park Service
NRC	Nuclear Regulatory Commission
NRF	National Response Framework
NDRF	National Disaster Recovery Framework
NSS	National Security Staff
OSHA	Occupational Safety and Health Administration
PAG	Protective Action Guide
PIO	Public Information Officer
PPE	Personal Protective Equipment
RASCAL	Radiological Assessment System for Consequence Analysis
RCRA	Resource Conservation and Recovery Act
RDD	Radiological Dispersal Device
SDWA	Safe Drinking Water Act
SNL	Sandia National Laboratories
TED	Total Effective Dose
USDA	United States Department of Agriculture

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