

Joint Briefing OW-OAR – Protective Action Guide (PAG) for Drinking Water

Purpose of this briefing:

- Present a recommendation for the Drinking Water PAG
- Discuss how we'll address the controversy associated with this proposal
- Agree on next steps toward publication for comment

What is the problem we're trying to solve?

- Drinking water is the only exposure pathway not currently addressed in the PAG Manual. At what radiation level does EPA recommend alternative drinking water resources be provided?
- Remember, a PAG is a health-based tipping point where actions are warranted to avoid a given radiation exposure.
- While highly unlikely, a large scale radiation contamination incident could impact the US, driving the need for a drinking water PAG that is pre-established and scientifically based.
- During the US response to the radiation incident at Fukushima, Japan in March 2011, rain water samples collected as part of RadNet showed concentrations of certain radionuclides above the SDWA Maximum Contaminant Levels (MCL).
- EPA experienced major difficulties conveying its message to the public that the detected levels in rain water, although greater than the MCL, were not of immediate concern to public health.
- If those same levels had been detected in drinking water, EPA may have had to issue ad-hoc guidance developed on short notice without the benefit of comprehensive analysis.

Options considered during PAG development:

- a) Do nothing. Local governments or states may develop individual PAG levels, or EPA will need to create one after an incident occurs. Experience has shown that local governments often rely on EPA advice when making decisions regarding the safe use of drinking after contamination incidents. Radiation protection decisions are almost always based on federal guidance in some form. Affected federal entities (e.g., affected military personnel) will need federal guidance.
- b) Use the SDWA MCL (4 mrem) as the level to provide an alternate source of drinking water. MCLs are not intended to inform 'do not drink' levels, in addition MCLs are based on the assumption of a 70 year exposure timeframe.
- c) Adopt DHS & FDA benchmarks: 500 mrem from water for first year after an incident (DHS covers water after a terrorist attack and FDA guide applies to food). This allows for consistency with guidance that is already in use and publicly available.
- d) Adapt above benchmarks that have long-standing acceptance, and add additional protection for pregnant women and children: 500 mrem for the general population and a lower dose level for children and pregnant women.

Recommendation:

- Based on an analysis of radiation risks to all age groups from several nuclides, we propose a two-tiered PAG as a reasonable approach considering age-based radiosensitivity.
- We recommend the drinking water PAG during the intermediate phase of a radiological response be 75 mrem projected dose in the first year for infants, children and pregnant women and 500 mrem projected dose in the first year for the general population.

The protective action:

- The protective action is to restrict the use of contaminated water for drinking purposes and to provide alternative drinking water for the affected community. Options for providing alternate drinking water could include: bottled water, altering the raw water source of a water system, interconnection between systems, or a combination of these.

Rationale:

- EPA conducted an assessment of the projected risks of excess cancer cases from exposure to radiation in drinking water at the 500 mrem level for a one year duration incident. The projected risks levels for adults at the 500 mrem level generally fall around the 0.0003 risk level for excess cancer cases.
- EPA conducted a similar assessment from exposure to contaminated drinking water for infants and children, who are more sensitive to radiation exposure, and found that the projected risk level of 0.0001 would occur at the 75 to 100 mrem dose level range.
- This recommended drinking water PAG approach is consistent with PAGs currently in place for other media. PAGs are set by balancing the risks of exposure to radiation against the logistical difficulty, costs and detriments associated with taking protective action to avoid exposure.
- According to the International Commission on Radiation Protection, emergency levels for protection of people should be selected in the lower part of the 100 to 2,000 mrem/year recommended range. Protection against all exposures, above or below the PAG level, should be balanced against detriments from the protective action itself.
- The government of Japan adopted a similarly tiered drinking water advisory when responding to the radiation incident in Fukushima.
- We determined that it is not appropriate to base emergency protective actions and response measures during short-term radiation incidents on lifetime (70 year) exposure criteria utilized to derive SDWA Maximum Contaminant Levels (MCL).
- We recognize that within the SDWA framework, water systems in violation of drinking water standards have processes available to get back into compliance within a reasonable time frame. While the SDWA framework is useful to inform actions for day-to-day normal operations, it does not provide adequate guidance for emergency responders on what levels of contamination warrant providing alternative water.
- We assume that any drinking water system adversely impacted during a radiation incident will be able to achieve compliance with MCLs within the first year after the incident.

Key considerations:

- Flexibility is emphasized. Emergency managers should make incident specific decisions that make sense for their community.
- Some PAGs lend themselves to age specificity (KI, food, water) while others are best applied to entire populations (sheltering, evacuation, and relocation). The goal is to protect everyone, including the most sensitive (children and pregnant women) while being practical with what may be limited alternative drinking water resources.
 - From a public information standpoint, the Manual may need to provide further information on the practical implementation challenges with a two tier water protection strategy. The KI simplified approach is an example of this.
- Pre-incident planning is encouraged. Pre-incident planning can help a community identify the best alternative water choices.

Stakeholder reaction:

- In response to a previous proposal, anti-nuclear and environmental groups publicized misleading comparisons of derived water PAG concentrations alongside MCL concentrations to assert that the SDWA was being weakened. This is likely to happen again.
- In addition, these groups had multiple meetings with then Assistant Administrator Gina McCarthy and Deputy Administrator Bob Perciasepe to voice their concerns about the drinking water PAG development.
- Stakeholders base their strong objections and opposition on the fact that exposure to drinking water with higher levels of radiation will likely result in an increased risk of cancer cases. The stakeholders go into detail pointing out the differences in concentration levels derived from a PAG of 500 mrem in comparison with an MCL of 4 mrem. For some radionuclides, the resulting difference in concentration could be up to several thousand times.
- During Fukushima, the Agency was pressed to develop drinking water guidance for US citizens in Japan and those using cisterns with contamination from the incident. The Agency failed to provide any guidance. Since then, both Bob and Gina have encouraged us to get this done.
- State radiation control programs, nuclear power plant response communities, and the American Water Works Association have asked EPA repeatedly for a drinking water PAG for emergencies. Comments submitted on our 2013 PAG Manual from many states, the AWWA, Health Physics Society, Nuclear Energy Institute and Conference of Radiation Control Program Directors specifically request a drinking water PAG.

Proposed next steps in the timeline:

November 2014: Joint AA-level briefing for OW and OAR (scheduled for Nov. 5)

December 2014 – January 2015: Brief multi-agency PAGs Subcommittee & get concurrence on proposal; concurrently have updated Water proposal reviewed by OSWER, OHS and OGC

February – March 2015: OW AA and OGC Review and Concurrence Process on drinking water PAG proposal and support documents

April 2015: Finalize drinking water PAG proposal *Federal Register* package

May 2015: OPEI review and facilitation

June 2015: Begin OMB 90-day review

Finalize edited FR Notice and Water proposal **(OMB release + 14 days)**

Complete *Federal Register* Workflow for Water proposal **(OMB release + 30 days)**

Public comment period **(OMB release + 90 days)**

Compile and adjudicate comments from public review **(OMB release + 120 days)**

Finalize entire PAG Manual including Water **(OMB release + 180 days = Jan 2016)**