Risk Communication for Per- and Polyfluoroalkyl Substances (PFAS)

1 Introduction

Communicating potential risks to human health and the environment is a vital skill to facilitate community participation and decision-making. Risk communication can be particularly challenging when dealing with science that is rapidly evolving, as in the case with PFAS. Section 14 of the Guidance Document includes more information and addresses PFAS risk communication challenges and risk communication tools with PFAS site-specific examples. Case studies that demonstrate successful risk communication planning and performance are included in Section 15.4 of the Guidance Document.

Risk communication is the process of informing people about potential hazards to their health, property, or community. It is a science-based approach for effective communication in situations of high stress, high concern or controversy (USEPA 2019 Ref#1658).

ITRC has developed a series of fact sheets that summarizes recent science and emerging technologies regarding PFAS. The information in the fact sheet is more fully described in the ***ITRC PFAS Technical and Regulatory Guidance Document (Guidance Document)*** (*https://pfas-1.itrcweb.org/*)

This fact sheet summarizes information for risk communication, including:

- Role of Risk Perception
- Risk Communication Challenges for PFAS
- Example PFAS Planning and Engagement tools

2 Role of Risk Perception: Public Stakeholders and Decision Makers

It is essential for decision makers to understand public stakeholder's and interested party (including themselves) risk perception of the hazard being discussed. Understanding the stakeholders' different perceptions of risk to the hazard(s) will assist in effectively communicating the potential risks and mitigation strategies of PFAS. Risk perception for PFAS is challenging to address because the science is rapidly evolving, the exposure is perceived as involuntary, the risk mangagement strategies are a moving target, and health impacts are greatest for the most sensitive populations.

In the context of PFAS, risk perception is heightened by uncertainties. This heightened sense of risk may result in opposition to proposed risk management strategies, such as source control (in which there is scientific uncertainty pertaining to the "safe" level of exposure, if any, without risk). A collaborative effort can be made to develop performance metrics, supplemental to cleanup standards, that evaluate how the action will lead to measurable increased protection for public health and the environment, thus leading to the development of targets or objectives (Hadley, Arulanantham, and Gandhi 2015) that offer reductions in risk. These metrics are referred to as secondary risk management performance metrics and can be used to communicate and evaluate success of a proposed PFAS risk management strategy, as well as assist with alleviating stakeholder concerns associated with uncertainty.

Perceived risk related to a hazard can be either amplified (heightened) or attenuated (diminished) relative to the current scientific understanding of risk. The type and degree of stakeholder risk perception is shaped by site-specific physical, psychological, and sociological factors. These risk perception factors contribute to the manner by which the public perceives a risk, which include voluntariness, controllability, familiarity, fairness, catastrophic potential, reversibility, equity, and effects on vulnerable populations (for example, children and pregnant women) (see ITRC Risk Communication Toolkit Table 2-2) (https://rct-1.itrcweb.org).

The underlying uncertainty feeding this risk amplification may also lead to opposition to proposed risk management strategies from some decision makers prior to establishment of the "right number" to dictate such action. When communicating with the public, it is essential to mitigate downplaying or embellishing risk due to lack of consensus on risk among decision makers. To address risk amplification challenges, it is important to build trust among the community by maintaining transparent communication of these uncertainties and variabilities early in the project life cycle.

In contrast, in a risk attenuation scenario, this diminished sense of risk results in challenges in stakeholder participation in risk mitigation activities ("Why do we need to spend money/do testing, etc., for this?"). In the context of PFAS, risk mitigation and monitoring measures include participation in blood testing, installation of a water treatment system, and use of an alternate water source. To address risk attenuation challenges, site-specific risk perception factors related to

inaction can be identified via stakeholder engagement and integrated into a communication plan (NGWA 2017; Harclerode et al. 2015; Harclerode et al. 2016 Ref# 539).

3 PFAS Risk Communication Challenges

As a group of compounds, PFAS poses some unique communication challenges for practitioners because it touches many of the risk factors deemed unacceptable by the public. Because there is still so much to learn, explanation and information sharing around PFAS issues and sites can become complicated making trust difficult to achieve. Section 14.2 of the Guidance Document presents a compilation of PFAS risk communication challenges categorized by the topics presented in Figure 1. A couple of examples of these challenges include:

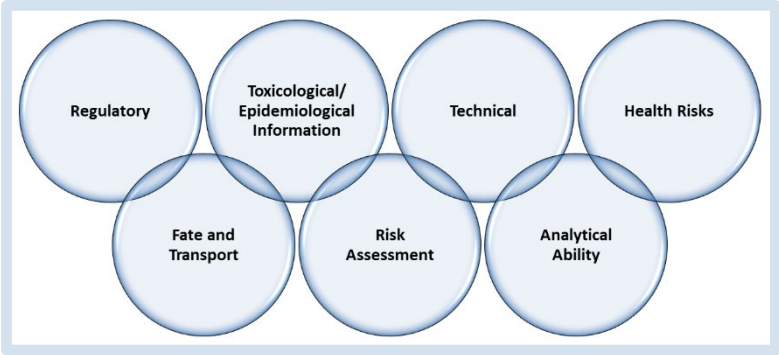

Figure 1. PFAS Risk Communication Challenges

Health Risk - A key area of challenge deals with explaining potential human and ecological health effects. Because we are communicating health risks of a large number of chemicals, when the risks are not fully known or characterized, it is critical to develop messaging that acknowledges uncertainties and a desire to be conservative and protective of health using the best available science.

Regulatory - Because Federal and state standards, guidance, and policies for PFAS are not uniform across agencies and, where available, are for only a small subset of PFAS, the public may receive mixed messages on the relative importance of and knowledge on PFAS. This in turn reduces trust in and credibility of both the agencies and the science behind the regulations.

4 PFAS-Specific Planning and Engagement Tools

So how do we apply risk communication concepts and principles to a PFAS issue?

We do it with a risk communication planning process. This risk communication planning process, was adapted from the work of NJDEP (2014) Ref#1662 which relied on the work of Caron Chess, Billie Jo Hance, and Peter Sandman, Environmental Communication Research Program, Cook College, Rutgers University, as published by the New Jersey Department of Environmental Protection. Figure 2 illustrates the communication plan process. At the center of the diagram is 'review and evaluate', representing communication as two-way, ongoing and continuous, and includes reviewing and evaluating progress. The following subsections summarize risk communication tools with PFAS-specific examples that align with the planning process steps 2 through 6. More information is included in the Risk Communication Toolkit.

Figure 2. Risk Communication Plan Process Diagram
Source: modified from NJDEP 2014. PFAS-1, Figure 14-1.

Set PFAS Risk Communication SMART Goals

Goals are general guidelines that explain what you want to achieve. Goals are brief and clear statements of outcomes to be reached within a measurable and achievable time frame.

As you develop your project goals, maintain ongoing dialogue with stakeholders and coordinate between the various parties involved. Examples of SMART goals and objectives are presented in Appendix B of the Risk Communication Toolkit.

Examples of Specific, Measurable, Attainable, Relevant, and Timely PFAS goals:
(from the Little Hocking Water Association case study, Section 15.4.1)

- By (date), the community is informed via the municipal website, flyers, and canvassing that bottled water is available as an alternate water source and used by 85% of the affected population.
- After (months), the extent of the impacted water supply is known via well testing, possible remediation options are identified and communicated to the community via a public meeting, municipal website, and newsletter.

Community Identification and Mapping Tools

Actor mapping is a tool to help guide a communication team to lay out, track, and update stakeholder roles and relationships.

Due to the persistent and recalcitrant nature of PFAS and its presence in the public drinking water supply, numerous and variant federal, state, private, and public stakeholders can be impacted. Additional information on actor mapping tools and PFAS-specific examples are included in Section 14.3.3 of the Guidance Document.

Social factors vision board is a medium for stakeholders to rate their level of importance and/or interest on applicable social factors.

Identified factors can then be used to further develop SMART goals and key messages, develop public outreach materials, and select engagement methods. The vision boards (see Section 14.3.4 of the Guidance Document) developed are focused on a specific topic of concern and associated social factors identified from presentations by public and community stakeholders during the USEPA PFAS community meetings (https://www.epa.gov/pfas/pfas-community-engagement) held in 2018.

The overall objective of stakeholder assessment is to gain a deeper insight into stakeholder concerns and values that facilitate the development of a dialogue. Knowing the audience with whom you are speaking helps you craft targeted messages delivered through the local channels used by your community.

PFAS Key Messages

Message mapping is a helpful risk communication tool for preparing organized responses to anticipated questions or concerns by the public (Covello, Minamyer, and Clayton 2007). A more complete example can be found in Section 14.3.5 of the Guidance Document.

Message Mapping Tool

- Starts with a question
- Has three key points or facts formed into a message
- Is no more than 27 words
- Takes no longer than 9 seconds to deliver
- Provides three supporting statements linked to the three key points or facts

Examples of Key Main Messages for a PFAS Site:

Question: What are PFAS and why is the state concerned about them?

- *Main message #1:*
  - PFAS are a family of human-made chemicals found in many products used by consumers and industry. (15 words)
- *Main message #2:*
  - PFAS are emerging contaminants of concern. (6 words)
- *Main message #3:*
  - Some PFAS may adversely impact human health. (6 words)

Communication and Engagement Tools

A communication method is the means by which you communicate with your audiences.

Public health and regulatory agencies have developed several public outreach materials to inform stakeholders about PFAS, from the compounds' origins and environmental distribution to exposure pathways, associated health effects, and management strategies. Outreach tools summarized in the Guidance Document include:

Method Selection: What do you want to accomplish?

- Receive information from affected people
- Give information to affected people
- Establish dialogue with community
- Summarize or update on progress

Compilation of PFAS Fact Sheets, Frequently Asked Questions (FAQs)
and other resources developed by the Association of State and Territorial Health Officials (ASTHO) and the Environmental Council of the States (ECOS) are available:

- https://www.astho.org/topic/environmental-health/food-water-safety/pfas/
- https://www.eristates.org/projects/pfas-risk-communications-hub/

Active Centralized Information Repositories

- Michigan Department of Environmental Quality, Michigan PFAS Action Response Team (MPART): https://www.michigan.gov/pfasresponse/
- New Hampshire Department of Environmental Services (NHDES), NH PFAS Investigation: https://www4.des.state.nh.us/nh-pfas-investigation/
- Vermont Department of Environmental Conservation (VDEC), Vermont PFOA Contamination Response: https://dec.vermont.gov/pfas/pfoa

Community Education Classes to inform and support high school teachers, medical professionals, journalists, and municipal water managers.

- Bennington College's ongoing engagement with PFAS can be found at www.bennington.edu/pfoa.

The following **communication and engagement tools and PFAS-examples** were developed and provided in the ITRC Risk Communication Toolkit (https://rct-1.itrcweb.org):

- Guidance for Press Releases (Appendix E)
- Guidance for Writing Analytical Results Letters (Appendix F)
- Social Factors Vision Board (Appendix G)
- Analytical Data Package Public Information Fact Sheet (Appendix I)
- Tracking Form for Media Correspondence (Appendix J)

5 References and Acronyms

The references cited in this fact sheet and further references can be found at https://pfas-1.itrcweb.org/references/. Reference numbers are included in this fact sheet for non-unique citations in the Guidance Document reference list.

The acronyms used in this fact sheet and in the Guidance Document can be found at https://pfas-1.itrcweb.org/acronyms/.

Per- and Polyfluoroalkyl Substances (PFAS) Team Contacts

Sandra Goodrow • New Jersey Department of Environmental Protection
609-940-4164 • Sandra.Goodrow@dep.nj.gov

Kate Emma Schlosser • New Hampshire Department of Environmental Services
603-271-2910 • KateEmma.A.Schlosser@des.nh.gov

July 2022