

Risk Communication for Emerging Contaminants: Perfluorochemicals

American Public Health Association

Environment Section



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Emerging Contaminants

- no clear definition...some “new” awareness
 - new chemical
 - new toxicological info
 - new level of detection
 - new media
 - new pathway
- large uncertainties
- health standard lacking or changing

Risk Communication...

sometimes counter-intuitive

- People are not just empty vessels to be filled with facts.
- Need to start where they are
- Acknowledge their values, worldview, concerns
(earn your right to be heard)
- Then gradually move towards your message

Clash of Two Value Systems

People - Qualitative

- Fear the unknown
- Want to maintain control
- Protect home and family
- concerned about aspects of risk that cannot be quantified

Experts - Quantitative

- Scientific method
- Technical knowledge
- Comfortable with uncertainty/ambiguity
- Unique language

- People involved in the communication process will “...transform each message in accordance with their previous understanding of the issue, their application of values, worldviews, and personal or organizational norms as well as their own strategic intentions and goals.”

Renn, 2003

Social Amplification of Risk

Kasperson, 1986

- Risks – found in social experiences and interactions of individuals, groups, and institutions
- How does social context influence risk communication?
- Meetings, media, informal word of mouth
- Send risk signals that cause
 - Amplification – increased perception of risk
 - Attenuation – decreased perception of risk

Risk Migration...creep

Alcock and Busby, 2006

- attempts to mitigate produce new risk
- risks change as science and technology change
- change in knowledge
- may change individual's ability to mitigate risk
- more science may not provide more reassurance

Implications for Risk Communication

- anticipate change
 - new scientific developments may be perceived as past errors by public
- acknowledge uncertainty
- discuss the scientific method
 - “active area of research
- explain differences in health guidelines
- serial/spiral health education

Perfluorochemicals (PFCs)

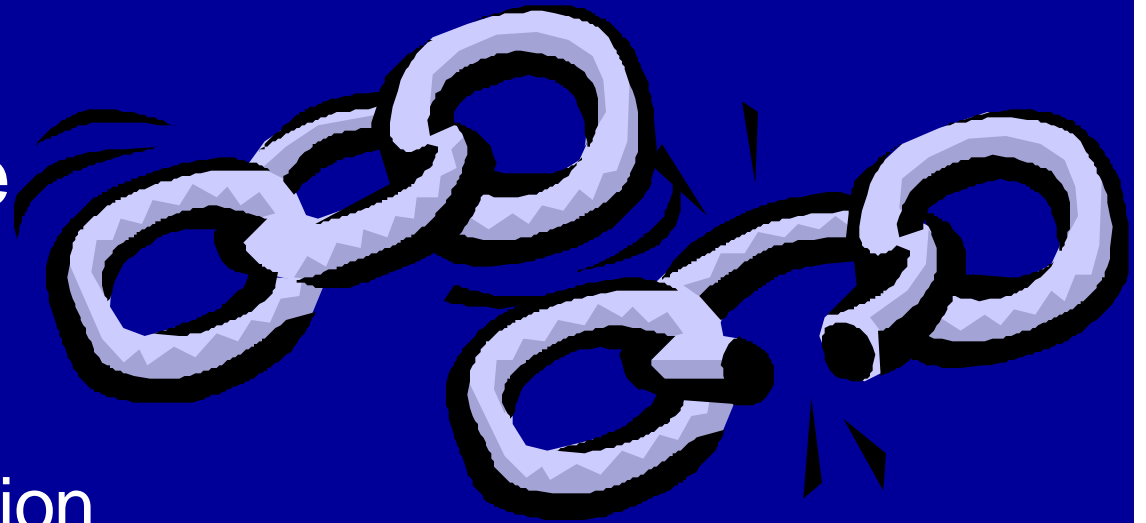
- A family of chemicals used to make products that resist heat, stains, water, oil and grease
- Many specialized industrial and commercial uses (e.g. fire fighting foam)
- Surfactants with unique chemical properties
- Mobile and persistent in the environment



Exposure Pathway

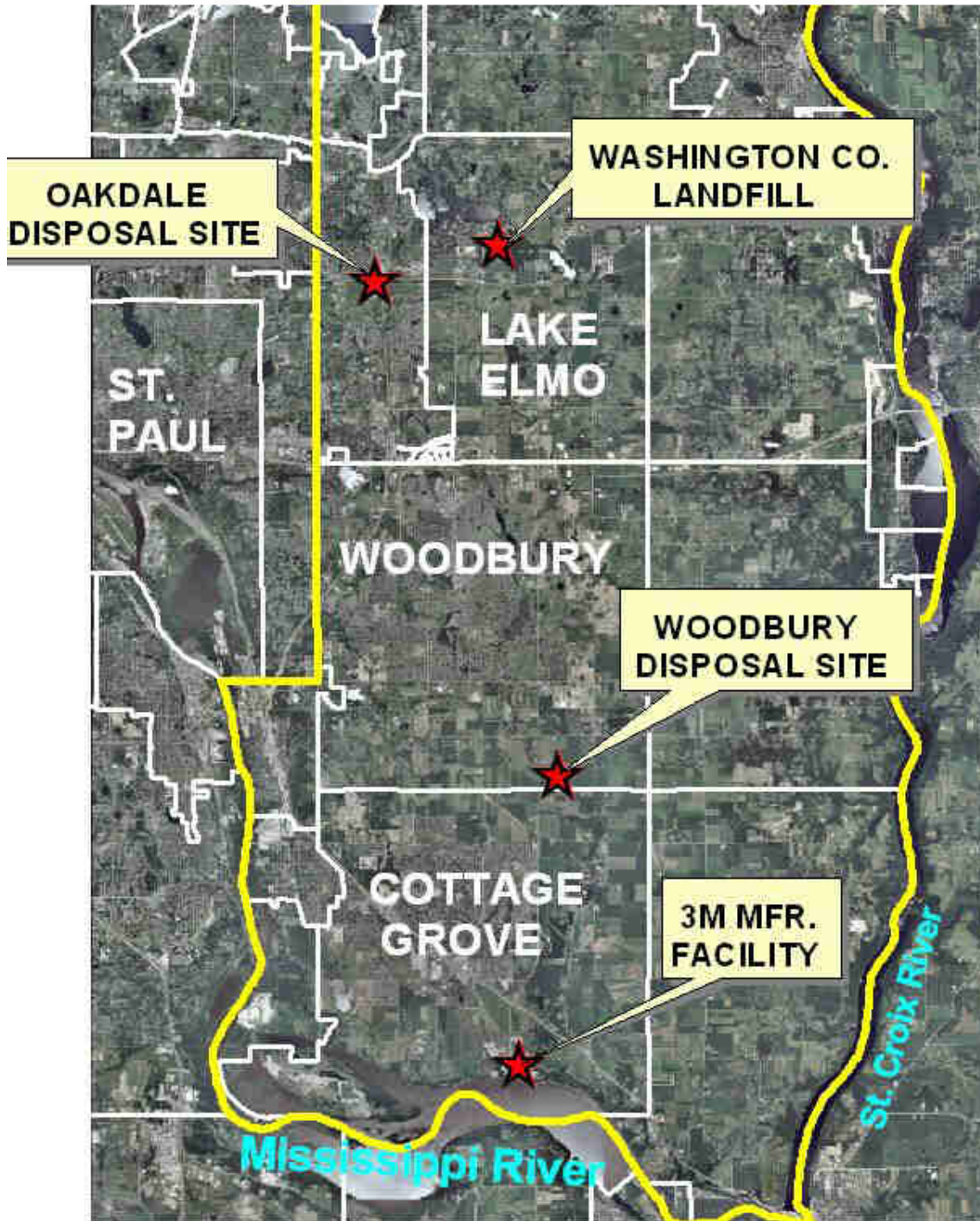
...not fully defined

- Source of Exposure
- Fate and Transport (media)
- Exposure Point
- Exposure Route
 - Ingestion
 - Inhalation
 - Dermal absorption
- Potentially Exposed Population



Why Are PFCs An Issue in MN?

- Home of 3M
- 3M chemical plant in Cottage Grove, Minnesota
- PFCs were manufactured at the plant for decades
- 4 PFC waste disposal sites are located in Washington Co., Minnesota



LOCATION OF 3M SITES IN WASHINGTON CO. MINNESOTA



City of Lake Elmo, MN



- 2005 Estimated Population: 7,966
- Mainly rural residential
- Majority of citizens rely on private wells for water
- New developments coming to affected area





City of Oakdale, MN

- 2005 Estimated Population: 27,492
- Suburban 'bedroom' community, nearly fully developed
- Vast majority of citizens on interconnected city water system
- Water mixes in the system



Our Messages

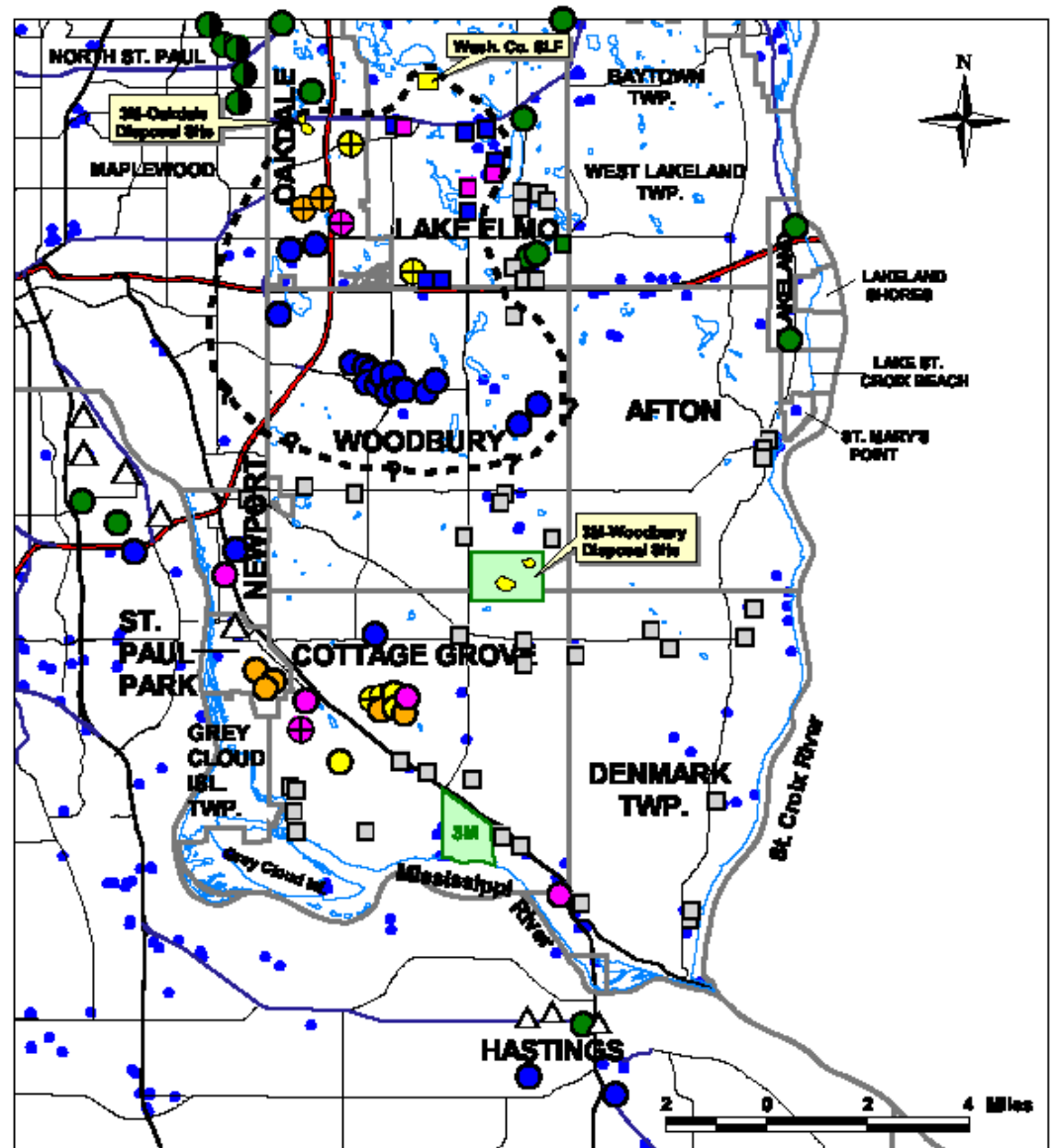
- We are taking a cautious public health approach
- This is a area of active scientific research
- As new knowledge becomes available, we will let you know.
- To reduce your exposure, point of use filters (GAC and R/O) are effective.

The list of PFCs expands...

- In March 2006, the MDH Public Health Laboratory added five PFCs to the list of analytes
- Widespread detections of PFBA involve an additional 6 cities –Woodbury, Cottage Grove, St. Paul Park, Newport, South St. Paul and Hastings
- Total affected population > 170,000

Appears to be two separate areas of PFC contamination

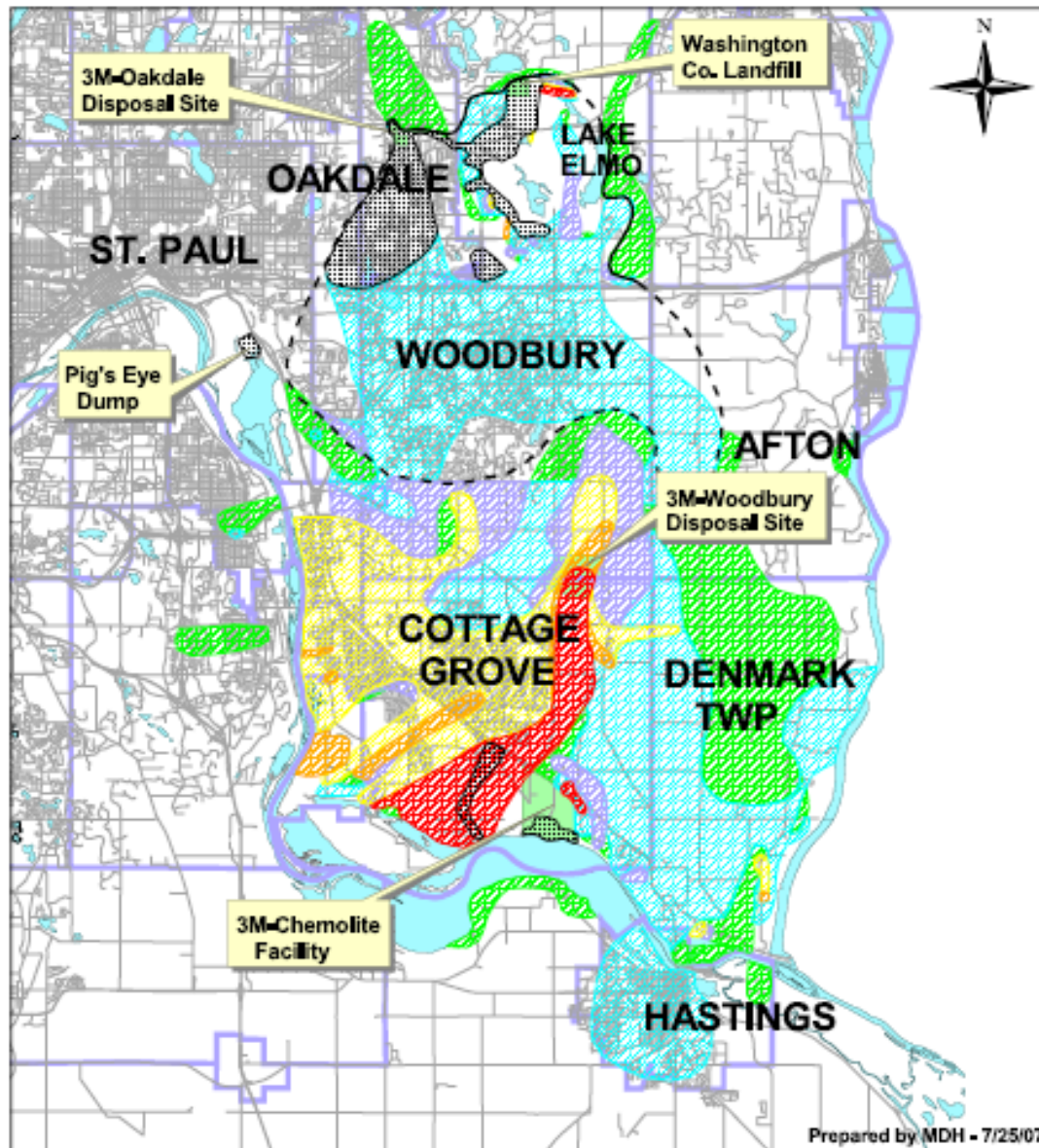
- Northern plume emerges from Oakdale and Lake Elmo sites
 - PFC concentrations decrease with distance from sources
 - Concentrations stable
 - Barely detectable in Woodbury wells
- Southern plume likely emerges from the 3M Woodbury disposal site
 - PFBA concentrations near site higher than north in Woodbury



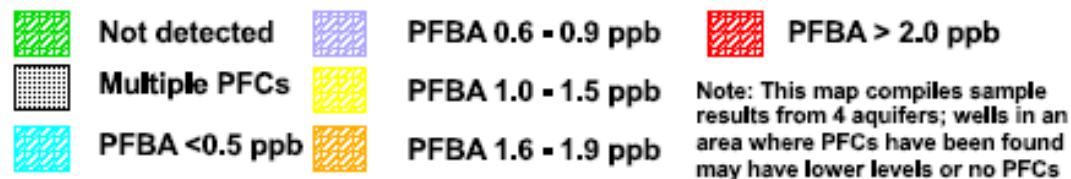
PUBLIC WELL PFBA RESULTS

SYMBOLS	PFBA Concentrations
○ City well, tested for 7 PFCs, ND or only PFBA	■ PFBA not detected
⊕ City well, tested for 7 PFCs, PFBA and other PFCs	■ PFBA: 0.2 - 0.5 ug/L
● City well, tested only for PFOA and PFOS	■ PFBA: 0.6 - 0.9 ug/L
△ City well, not used in winter	■ PFBA: 1.0 - 1.5 ug/L
□ Public, non-community well, ND or only PFBA	■ PFBA: 1.6 - 2.0 ug/L
	■ Results pending

Prepared: 1/19/07



General Distribution of PFCs in the Southeast Metro Area



MDH Guidelines (2007)

- **2007 Health Risk Limits**
 - PFOS: 0.3 ppb
 - PFOA: 0.5 ppb
 - Long-term / lifetime exposure
 - Based on slight liver and thyroid effects
- Promulgated by Aug. 2007 under new state law
- **As a cautious public health approach, MDH has applied the following guidelines for other PFCs:**
 - PFHxS, PFBS: 0.6 ppb
 - PFBA, PFHxA, PFPeA: 1.0 ppb

Summary

- The well advisory guidelines...
 - based on drinking water daily over long-term/lifetime exposure.
 - based on subtle physical changes, not a 'disease.'
 - include a factor to account for other exposures (diet, consumer products).
 - Additional factors are incorporated for health protection.
- MDH will continue to review our guidelines for PFCs.

How Are Public Health Risks Being Addressed?

- Oakdale – A granular activated carbon (GAC) filter plant was installed and began operation in October 2006.
- Lake Elmo – City water was extended to over 200 homes; those homes not on city water but exceeding the well advisory guidelines have been supplied with whole-house GAC filters.
- Other Affected Communities – Mostly PFBA , so at this time MDH is providing advice about lowering exposure until HBV is developed. Many residents are purchasing small point-of-use filters or bottled water.
- Disposal Sites – 3M and MPCA are re-assessing all of the sites and will implement additional cleanup actions to reduce or eliminate releases to the environment.

Our Methods

- Multi-agency meetings –
 - Cities
 - Minnesota Pollution Control Agency
 - Closed Landfills
 - Superfund Program
 - Washington County, Public Health and the Environment
 - 3M
 - Minnesota Department of Health
 - Site Assessment and Consultation
 - Health Risk Assessment
 - Well Management
 - Public Water Supply

Our Methods (2)

- Web information, e-mail list >700 people
- Health Education through water sampling
 - Request to sample letter
 - Home visits
 - Results letter
- Educating the media, so that they send our messages
- City newsletters, news releases, council meetings

Our Methods (3)

- “Science Fair” format for public meetings
 - 5 pm to 7 pm – Open House
 - 7 pm to 8 pm - Formal presentation
 - 8 pm to ? – more Open House
- Individual vs. community concerns
- Face to face
- Diffuses emotions/angers
- Effective education from multitude of agencies all in one place

Thank you

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