Minnesota Department of Health Environmental Health Tracking and Biomonitoring Advisory Panel Meeting

FEBRUARY 8, 2022

1:00 P.M. – 3:30 P.M.

Via Microsoft Teams

Minnesota Department of Health
Environmental Health Tracking and Biomonitoring
PO Box 64882
St. Paul, MN 55164-0882
651-201-5900
health.biomonitoring@state.mn.us
www.health.state.mn.us

Contents

Agenda Overview

DATE: 02/08/2022

Welcome & Agenda

1:00pm

Chair Lisa Yost will welcome attendees to the meeting. Panel members are invited to introduce themselves. Lisa will give a brief agenda overview.

Introduction to the Meeting: Opportunities for Future PFAS Biomonitoring in Minnesota

1:10pm

MDH Biomonitoring Program Director Jessica Nelson will give an introduction to the meeting, which will focus on opportunities for PFAS Biomonitoring in Minnesota. She will review past MDH biomonitoring projects and frame the presentations and discussion for the remainder of the meeting. Panel members are invited to ask questions.

3M East Metro Settlement Plan: Overview and Update

1:30pm

Minnesota Pollution Control Agency (MPCA) staff Elizabeth Kaufenberg and Gary Krueger will give an update on the Settlement Plan developed as part of the lawsuit between the State of Minnesota and the 3M Company. Panel members are invited to ask questions.

Minnesota PFAS Blueprint Monitoring Plan: Overview

1:55pm

MPCA staff Sophie Greene will give an overview of the MPCA's PFAS Blueprint Monitoring Plan, a draft plan that lays out a path forward for PFAS monitoring at different sites in Minnesota. Jim Kelly, MDH Environmental Health, will give a short update on a new MDH initiative to test for PFAS in community water systems in Minnesota. Panel members are invited to ask questions.

Discussion: Priorities for PFAS Biomonitoring in Minnesota

Members of the public and panel members are asked to provide input and recommendations on the following questions:

- What information gaps in our state agencies' collective response to PFAS can biomonitoring help fill?

- Given funding and staff capacity constraints, what populations or exposure questions are priority areas for focus?
- What additional information should MDH consider for future biomonitoring projects?

Community/public comment

2:25pm

Members of the audience are invited to provide comments and input on the questions above.

Advisory Panel discussion

2:45pm

Panel members are invited to provide comments and input on the questions above. While we are not seeking a panel vote, MDH hopes to get recommendations from the panel on priorities for moving forward with future work.

MDH Biomonitoring, Tracking updates

3:20pm

Program updates are provided in the written Advisory Panel book. Panel members are invited to ask any questions.

Public Comments, Audience Questions, New Business

3:25pm

Motion to Adjourn

3:30pm

Opportunities for Future PFAS Biomonitoring in Minnesota

Speaker information

Liz Kaufenberg has been with MPCA for over 8 years and is the lead coordinator for the 3M Settlement. Prior to that she spent time as a Superfund project manager and water quality research scientist at the agency. She has a B.S. in environmental science from UW – River Falls and a M.S. in water resources science from UM – Twin Cities.

Gary Krueger is the Supervisor of the MPCA's East Metro Unit, which manages the implementation of projects under the PFAS Settlement with 3M. Gary has been with the MPCA's Superfund Program for 32 years, including being the project manager for the 3M PFAS disposal sites. He has a B.S. Natural Resources/Soil Science degree from UW- Madison.

Sophie Greene is the PFAS Coordinator at the Minnesota Pollution Control Agency. She began this role in 2020, and has previously worked on human health risk assessment at the Environmental Protection Agency in Washington DC. Sophie has a Master of Science degree in geology from the University of Vermont and an undergraduate degree in chemistry from Carleton College.

Background

This Advisory Panel meeting will focus on opportunities for future PFAS biomonitoring in Minnesota. PFAS, or per- and polyfluoroalkyl substances, are a large family of chemicals that have been widely used for decades in industrial processes and commercial products. PFAS are extremely stable and do not break down in the environment.

PFAS have been an issue of concern in Minnesota for many years, dating back to the early 2000s with the discovery of certain PFAS in drinking water supplies in Twin Cities east metropolitan communities (the "East Metro"). Since that time, MDH has conducted extensive PFAS water testing in both private wells and community water supplies in the East Metro and across the state, along with ongoing community engagement. MDH also issues health-based guidance values for different PFAS in drinking water; these are levels that MDH considers safe for all people to consume, including sensitive populations, for short time periods as well as up to a lifetime of exposure. More information on these activities is available online at the MDH Perfluoroalkyl Substances (PFAS) web page.

In 2008, MDH conducted its first PFAS biomonitoring project as a result of the 2007 Environmental Health Tracking and Biomonitoring state legislation. The first project was followed by two others in 2010 and 2014. These projects tested serum PFAS in the same group of longer-term East Metro residents over time to determine whether the interventions put in place in 2006 to reduce PFAS in drinking water were effective. Results of the three projects are summarized and links to Community Reports are available online at MDH's PFAS Biomonitoring in the East Metro.

MDH has not done PFAS biomonitoring since 2014 and has instead focused our limited program capacity on other biomonitoring efforts including urine mercury screening and projects in

children. With increasing activity and interest in PFAS at the state and national levels (see sections below), MDH is evaluating whether and how to re-engage in PFAS biomonitoring. MDH has a unique role as a public health agency. Our focus is public health surveillance and intervention, not research, and we have the imperative to consider equity in decisions about our program and priorities.

This meeting will describe the landscape of PFAS in Minnesota and frame key questions about opportunities for future MDH PFAS biomonitoring for public input and Advisory Panel discussion.

3M East Metro Settlement Plan

On Feb. 20, 2018, the state of Minnesota settled its lawsuit against the 3M Company in return for a settlement of $850 million. Minnesota's attorney general sued 3M in 2010 alleging that the company's production of chemicals known as PFAS had damaged drinking water and natural resources in the Twin Cities Metropolitan Area. After legal and other expenses are paid, about $720 million will be invested in drinking water and natural resource projects in the Twin Cities east metropolitan region.

The Minnesota Pollution Control Agency and the Department of Natural Resources, Co-Trustees of the Settlement, have released plans to spend $700 million on drinking water projects for 14 impacted communities in the East Metropolitan Area. Working in partnership with work group members, along with input from citizens, stakeholders, and technical experts from each of the affected communities, the comprehensive set of projects account for every home, neighborhood, and community in the 150 square miles affected by PFAS contamination in the East Metropolitan Area.

Background information: MPCA's Minnesota 3M PFAS Settlement

Overview of Drinking Water Supply Plan: MPCA's Investing in East Metro drinking water

Minnesota PFAS Blueprint Monitoring Plan

Working together, Minnesota state agencies developed Minnesota's PFAS Blueprint to support a holistic and systematic approach to address PFAS concerns in 10 key issue areas: Measuring PFAS effectively and consistently; Understanding risks from PFAS air emissions; Quantifying PFAS risk to human health; Preventing PFAS pollution; Limiting PFAS exposure from drinking water; Limiting PFAS exposure from food; Reducing PFAS exposure from fish and game consumption; Protecting ecosystem health; Remediating PFAS contaminated sites; and Managing PFAS in waste.

The Minnesota PFAS Blueprint identifies short- and long-term opportunities, as well as legislative actions, to manage PFAS in our environment and protect families and communities. Over the coming months and years, state agencies will further develop these strategies and engage Minnesotans on how best to implement them.

Background information: MPCA's Minnesota's PFAS Blueprint

Blueprint document: Minnesota's PFAS Blueprint, February 2021 (PDF)

Additional Information

MDH Public Health Laboratory (PHL) PFAS analysis capacity

The MDH PHL Biomonitoring and Emerging Contaminants (BEC) unit has targeted liquid chromatography tandem mass spectrometry, or LC/MS/MS, methods for 14 PFAS analytes in serum and plasma and 10 PFAS analytes in milk (see table below). We are currently working to add up to 10 more analytes to our serum and plasma method. We are also working on a method for the analysis of PFAS in hair.

The MDH PHL Organics Unit has two different methods for the analysis of PFAS in water: MDH 555 and EPA 533. MDH's original method, 555, is capable of measuring 7 PFAS compounds. This method does not involve sample extraction, thus the laboratory can process more samples per week, but report limits are higher than with EPA method 533. EPA method 533 measures 26 PFAS compounds. It uses more sample volume and solid phase extraction, allowing lower report limits. Not as many samples can be processed per week, however. The PHL tests water samples collected as part of the MDH private well and community water sampling programs.

The MDH PHL has two high resolution LC/MS/MS instruments that are used for a variety of projects, including for PFAS analysis. In addition to the targeted analyses for a set list of PFAS described above, we have the potential to do suspect screening of PFAS (which is done with a combination of authentic standards and libraries) as well as true non-target analysis. Non-target analysis allows for the identification of compounds based on the mass of the parent molecule and its fragment ions. These masses are compared to robust libraries that are continuously being updated. Unlike targeted analysis, it can theoretically be used to look for every compound present in a sample. However, there are several limitations: non-target analysis can be very time consuming, will only identify compounds amenable to the extraction and ionization techniques applied, and generally still requires the analysis of a standard reference material for confident identification.

Table 1. Summary of PFAS Compounds Coverage by Method/Matrix

Analyte	Acronym	Biomonitoring Methods	MDH Method 555 (water)	EPA Method 533 (water)
Perfluorobutanoic acid	PFBA	S	X	X
Perfluoropentanoic acid	PFPeA	S	X	X
Perfluorohexanoic acid	PFHxA	S, M	X	X
Perfluoroheptanoic acid	PFHpA	S, M		X
Perfluorooctanoic acid	PFOA	S, M	X	X
Perfluorononanoic acid	PFNA	S, M		X

Perfluorodecanoic acid	PFDA	S, M		X
Perfluoroundecanoic acid	PFUnA	S, M		X
Perfluorododecanoic acid	PFDoA	S		X
Hexafluoropropylene oxide dimer acid	HFPO-DA (GenX)	D		
Perfluoro-3-methylpropanoic acid	PFMPA			X
Perfluoro-4-methoxybutanoic acid	PFMBA			X
Nonafluoro-3,6-dioxaheptanoic acid	NFDHA			X
Perfluorobutanesulfonate	PFBS	S, M	X	X
Perfluoropentanesulfonate	PFPeS			X
Perfluorohexanesulfonate	PFHxS	S, M	X	X
Perfluoroheptanesulfonate	PFHpS	S		X
Perfluorooctanesulfonate	PFOS	S, M	X	X
1H,1H,2H,2H-perfluorohexane sulfonic acid	4:2FTS	D		X
1H,1H,2H,2H-perfluorooctane sulfonic acid	6:2FTS	D		X
1H,1H,2H,2H-perfluorodecane sulfonic acid	8:2FTS	D		X
4,8-dioxa-3H-perfluorononanoic acid	ADONA	D		X
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	9Cl-PF3ONS	D		X
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	11Cl-PF3OUdS	D		X
Perfluoro(2-ethoxyethane)sulfonic acid	PFEESA			X
Perfluorooctanesulfonamide	FOSA	S, M		

N-ethyl perfluorooctanesulfonamido acetic acid	N-EtFOSAA	D		X

S = present in serum method, M = present in milk method, D = in development

University of Minnesota funding for PFAS research

The University of Minnesota has been involved in the topic of PFAS research in different ways over the years. Recently, researchers with the 10,000 Families Study received a grant from the National Cancer Institute (NCI) to investigate radon and chemicals of concern in drinking water, including PFAS, and cancer risk.

For more information on the research grant, see the University of Minnesota news release 10,000 Families Study Receives an NCI Grant.

National PFAS biomonitoring and health studies

The Centers for Disease Control and Prevention (CDC) and the Agency for Toxic Substances and Disease Registry (ATSDR) are currently funding and helping conduct PFAS exposure assessments and health studies at different sites across the U.S.

PFAS exposure assessments are being conducted in communities near current or former military bases and that are known to have had PFAS in their drinking water. The primary goal of these exposure assessments is to provide information to communities about levels of PFAS in their bodies. People in each of these communities will be randomly selected to participate in these exposure assessments. Following two pilot exposure assessments in Pennsylvania and New York, full exposure assessments are taking place in eight communities, with public release of results planned for the coming months. There are no sites in Minnesota.

For more information on sites and background, see ATSDR's PFAS Exposure Assessment Sites.

PFAS health studies are being funded by CDC/ATSDR through cooperative agreements with seven partners across the U.S. to study how drinking water that contains PFAS may harm health. The seven grantees are part of the Multi-site Study (MSS) that expands on the work that began with the Pease Study located in Portsmouth, NH. None of these sites are in Minnesota; MDH, along with partners at Washington County Public Health and Environment, unsuccessfully applied to be one of the locations of the MSS.

For more information on sites and background, see ATSDR's Health Studies.

Questions for Advisory Panel

- What information gaps in our state agencies' collective response to PFAS can biomonitoring help fill?
- Given funding and staff capacity constraints, what populations or exposure questions are priority areas for focus?
- What additional information should MDH consider for future biomonitoring projects?

Healthy Kids Minnesota Update

Program Updates

Our new biomonitoring program, Healthy Kids Minnesota, has been launched at three participating sites in the state. Together with our partners, we are systematically measuring exposures to chemicals of concern in preschool-aged kids across the state. With funding from the U.S. Centers for Disease Control and Prevention (CDC), the program has been implemented in Minneapolis and Southeast Minnesota and will rotate to other regions in a 5-year cycle to include one non-Metro and one Metro region per year.

We are working with partners to recruit children with their families' consent who come in for their already-scheduled Early Childhood Screening (ECS) visits. Partners for Healthy Kids Minnesota 2021 include:

- Minneapolis Public Schools (MPS)
- Fillmore County Public Health
- Olmsted County Public Health and Rochester Public Schools

While we reached out to the Prairie Island Indian Community, the one Tribal Nation in the Southeast region, using government-to-government channels, we were not successful at establishing a partnership. The ongoing COVID-19 situation likely played a role in this.

Other updates since the last Advisory Panel meeting in October 2021 are included below.

Ongoing Recruitment

Healthy Kids Minnesota recruiting has been ongoing since MPS ECS started recruiting in August, Fillmore County in September, and Rochester Public Schools/ Olmsted County in November. Training and recruitment at Rochester Public Schools/Olmsted County was pushed back to November due to the COVID-19 surge at that time.

As of this report, a total of 375 children have been recruited from all three Healthy Kids Minnesota 2021 sites. Here is a breakdown of the total recruitment by site:

- Minneapolis Public Schools – 298
- Fillmore County – 31
- Rochester Public Schools/ Olmsted County – 46

All recruitment will end by March 31, 2022. Participating families will receive their child's results within three to four months after the end of this phase of the program.

Monitoring Data Entry with REDCap Database

The Healthy Kids Minnesota database provides a unique opportunity to collect consistent data across Healthy Kids Minnesota sites and enhances capabilities to evaluate relationships between program measures and outcomes. ECS staff collect and enter all participant data into

REDCap. MN Biomonitoring staff continually update and improve the REDCap database to ensure we are capturing all aspects of recruitment data. ECS staff begin the process by assigning a unique participant ID. They record consent information, signatures, refusals, ineligibilities, exposure survey responses, and gift card numbers in REDCap.

MN Biomonitoring staff upload laboratory data upon receipt from the MDH Public Health Laboratory. Families with elevated urine results for mercury, arsenic, or manganese receive a call from an MDH-contracted-physician to discuss how the child is exposed to this chemical and how they can reduce the exposure. The database is designed so the system alerts the MDH-contracted physician each time laboratory results of any of these three metal entries are elevated. The physician records information gathered during a phone interview with the family in the REDCap database. MN Biomonitoring staff and the physician connect families to the appropriate services, as needed.

Continuous Quality Improvement

Using REDCap and virtual check-in meetings with our partners, MN Biomonitoring staff collect program quality indicators to assess and track recruitment and sample collection progress on an ongoing basis. The process has allowed us to identify areas where process and quality improvements were needed. MN Biomonitoring and ECS staff collaborate to work on issues that have come up to improve the quality of recruitment and sample collection protocols.

Free Private Well Testing Updates

As mentioned in the October 2021 Advisory Panel book, MDH Environmental Health and Olmsted County's Southeastern Minnesota Water Analysis Laboratory (SEMWAL) are partnering to provide free private well testing to any families approached to participate in Healthy Kids Minnesota in Fillmore and Olmsted Counties. So far, fifteen water test kits have been offered to families.

Communications/Outreach

We issued a news release about the launch of the program on November 16, 2021. We received some media attention, including a radio interview on Jazz 88 with Jessica Nelson and MPS partner Cindy Hiller. Information about Healthy Kids Minnesota was sent to all MPS families and staff. We presented information on the program at a monthly webinar for ECS staff across the state hosted by the Minnesota Department of Education, and were joined by partners from MPS and Fillmore County to talk about their experiences with the program.

Plans for Healthy Kids Minnesota 2022

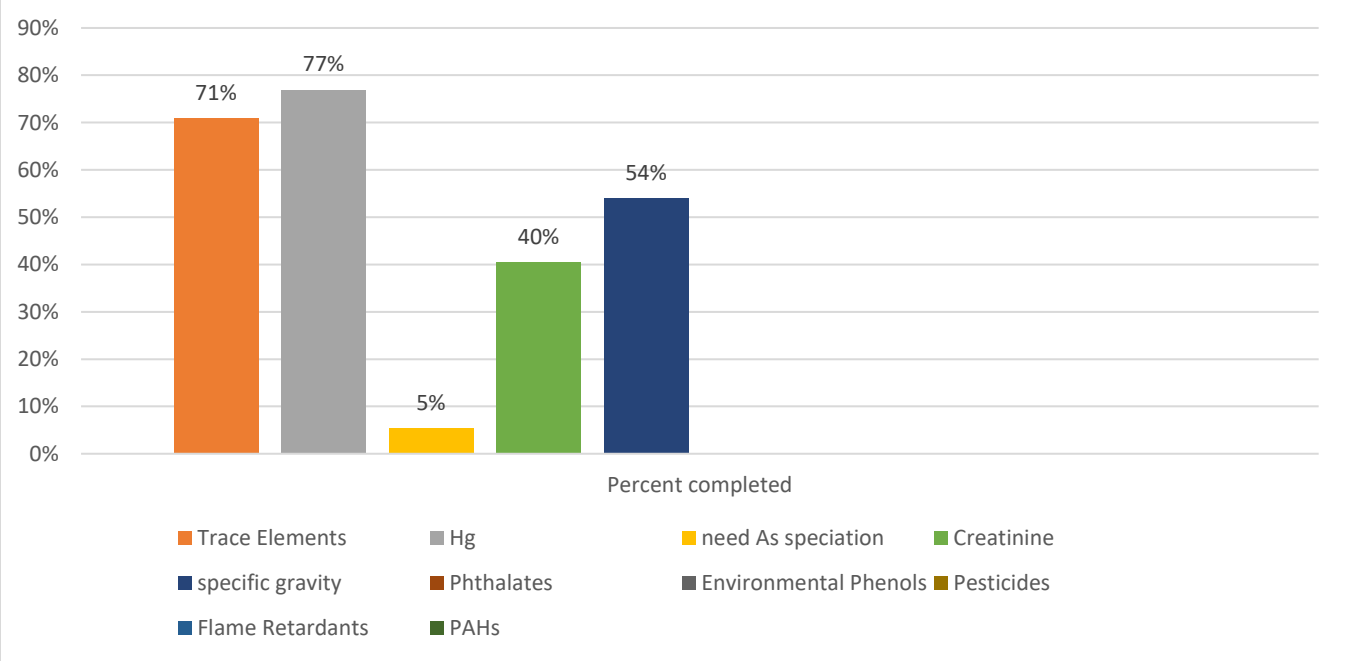
As previously stated, the program is designed to rotate regions of focus in a five-year cycle to include one non-Metro and one Metro region per year. Healthy Kids Minnesota 2022 will move to St. Paul and a seven-county region in Northeast Minnesota. Staff have conducted promising meetings with potential partners in these areas. There are three Tribal Nations in the Northeast region; we will reach out to them in February using government-to-government channels.

Laboratory Update

Validation for the phthalate and plasticizer metabolites in urine method is complete and paperwork is being reviewed. We anticipate starting to run Healthy Kids Minnesota samples for this method in March. The method for the flame retardant metabolites in urine is progressing and will likely be validated within the next month or so. Work on the new method for PAH metabolites in urine using LC/MS/MS (rather than GC/MS/MS, which we used previously for the Healthy Rural and Urban Kids Project) will likely begin this spring. A method for environmental phenols which was previously validated last year will be revalidated in the coming months to improve throughput.

282 samples have been collected and received by the PHL for Healthy Kids Minnesota. The figure below shows the percent of those samples that have been analyzed for each of the methods in the Healthy Kids Minnesota program. 71% and 77% of samples have been analyzed for mercury (Hg) and trace elements (i.e. urine metals), respectively. Samples that have total arsenic ≥ 15 ug/L are flagged for arsenic speciation. There have been 15 samples (5%) in this category so far, and arsenic speciation is close to completion on these samples. Methods for creatinine and specific gravity (both used for normalization of urine concentration) were developed over the past year and have been used to analyze 40 and 54%, respectively, of specimens in house.

Figure 1. Percentage of Completed Analyses for Healthy Kids Minnesota Samples Collected



Healthy Rural and Urban Kids Project: Communications Update

The Healthy Rural and Urban Kids Community Report summarizing project findings has been released. The Healthy Rural and Urban Kids Project measured chemicals in preschool-aged children living in Minnesota rural and urban communities in the summer of 2018.

A summary of the Healthy Rural and Urban Kids results are available now on the MDH website. The Healthy Kids 2018 Survey (PDF) is also available online.

Participant communications

Participants were mailed a copy of the Community Report on January 20, 2022. Information on the chemicals included and ways to reduce child exposure were referred to and online links provided. These directed participants to view the Healthy Rural and Urban Kids Translated Information Sheets (Hmong, Somali, Spanish, and English). These can be found at health.mn.gov/HRUKrpt.

Media communications and public awareness

- Partners were informed about summary results, served as external reviewers for the Community Report, and are helping to share information about the results with their networks and local communities.
- A news release will be distributed the week of January 31.
- Social media will be distributed the week of January 31, 2022.
- Project results were presented by Jessica Nelson at the National Biomonitoring Meeting on January 26, 2022.
- A new biomonitoring newsletter will be launched in late February and will contain a summary of the project.

Example social media post:

There are many chemicals in our environment. Responding to community concerns about exposures, the Healthy Rural and Urban Kids project focused on 21 chemicals that can be measured in urine and tell us about exposure to air pollution, metals, and pesticides. As part of their Early Childhood Screening visits, kids from neighborhoods in North Minneapolis and three counties in North-Central Minnesota whose families consented participated in the project. Learn more.

MN Tracking Updates

Portal updates recently launched

- Poverty & income
- Diabetes
- Quick Reference Guide (a list of portal topics)
- Carbon monoxide poisoning
- Adolescent immunizations
- Immunizations query (added adolescent data)
- Pesticide poisoning ED, hospitalization & poison control
- Medicaid Dental Service Use
- Radon
- Community water systems query (fixed)
- Environmental justice (new page)

Portal updates launching soon

- Childhood obesity
- Heart attack hospitalizations and ED visits
- Birth defects query
- An overhaul of County Profiles in Tableau

Section Overview: Other Information

This section contains documents that may be of interest to panel members.

- Upcoming Advisory Panel meeting dates
- Environmental Health Tracking and Biomonitoring Advisory Panel Statute
- Advisory Panel roster
- Biographical sketches of Advisory Panel members
- Biographical sketches of staff

Upcoming Advisory Panel Meeting Dates

Advisory Panel meetings in 2022:

June 14, 2022

October 11, 2022

Unless otherwise announced, these meetings will take place from 1-4 pm at

The American Lung Association of Minnesota

490 Concordia Avenue

St Paul, Minnesota

144.998 ENVIRONMENTAL HEALTH TRACKING AND BIOMONITORING ADVISORY PANEL STATUTE

Subdivision 1. **Creation.** The commissioner shall establish the Environmental Health Tracking and Biomonitoring Advisory Panel. The commissioner shall appoint, from the panel's membership, a chair. The panel shall meet as often as it deems necessary but, at a minimum, on a quarterly basis. Members of the panel shall serve without compensation but shall be reimbursed for travel and other necessary expenses incurred through performance of their duties. Members appointed by the commissioner are appointed for a three-year term and may be reappointed. Legislative appointees serve at the pleasure of the appointing authority.

Subd. 2. **Members.** (a) The commissioner shall appoint eight members, none of whom may be lobbyists registered under chapter 10A, who have backgrounds or training in designing, implementing, and interpreting health tracking and biomonitoring studies or in related fields of science, including epidemiology, biostatistics, environmental health, laboratory sciences, occupational health, industrial hygiene, toxicology, and public health, including:

(1) At least two scientists representative of each of the following:

(i) Nongovernmental organizations with a focus on environmental health, environmental justice, children's health, or on specific chronic diseases; and

(ii) Statewide business organizations; and

(2) At least one scientist who is a representative of the University of Minnesota.

(b) Two citizen panel members meeting the specific qualifications in paragraph (a) shall be appointed, one by the speaker of the house and one by the senate majority leader.

(c) In addition, one representative each shall be appointed by the commissioners of the Pollution Control Agency and the Department of Agriculture, and by the commissioner of health to represent the department's Health Promotion and Chronic Disease Division.

Subd. 3. **Duties.** The advisory panel shall make recommendations to the commissioner and the legislature on:

(1) Priorities for health tracking;

(2) Priorities for biomonitoring that are based on sound science and practice, and that will advance the state of public health in Minnesota;

(3) Specific chronic diseases to study under the environmental health tracking system;

(4) Specific environmental hazard exposures to study under the environmental health tracking system, with the agreement of at least nine of the advisory panel members;

(5) Specific communities and geographic areas on which to focus environmental health tracking and biomonitoring efforts;

(6) Specific chemicals to study under the biomonitoring program, with the agreement of at least nine of the advisory panel members; in making these recommendations, the panel may consider the following criteria:

(i) The degree of potential exposure to the public or specific subgroups, including, but not limited to, occupational;

(ii) The likelihood of a chemical being a carcinogen or toxicant based on peer-reviewed health data, the chemical structure, or the toxicology of chemically related compounds;

(iii) The limits of laboratory detection for the chemical, including the ability to detect the chemical at low enough levels that could be expected in the general population;

(iv) Exposure or potential exposure to the public or specific subgroups;

(v) The known or suspected health effects resulting from the same level of exposure based on peer-reviewed scientific studies;

(vi) The need to assess the efficacy of public health actions to reduce exposure to a chemical;

(vii) The availability of a biomonitoring analytical method with adequate accuracy, precision, sensitivity, specificity, and speed;

(viii) The availability of adequate biospecimen samples; or

(ix) Other criteria that the panel may agree to; and

(7) Other aspects of the design, implementation, and evaluation of the environmental health tracking and biomonitoring system, including, but not limited to:

(i) Identifying possible community partners and sources of additional public or private funding;

(ii) Developing outreach and educational methods and materials; and

(iii) Disseminating environmental health tracking and biomonitoring findings to the public.

Subd. 4. **Liability.** No member of the panel shall be held civilly or criminally liable for an act or omission by that person if the act or omission was in good faith and within the scope of the member's responsibilities under section 144.995 to 144.998.

Environmental Health Tracking & Biomonitoring Advisory Panel Roster as of February 2022

Jay Desai, PhD, MPH
Chronic Disease and Environmental Epidemiology
Minnesota Department of Health
85 E. 7th Place
St. Paul, MN 55164
651-201-5882
Jay.Desai@state.mn.us
MDH appointee

Kristie Ellickson, PhD
Minnesota Pollution Control Agency
Environmental Analysis & Outcomes Division
520 Layfette Road
St Paul, MN 55155-4194
651-757-2336
Kristie.ellickson@state.mn.us
MPCA appointee

Thomas Hawkinson, MS, CIH, CSP
Stantec Consulting Services Inc.
7500 Olson Memorial Highway Suite 300
Golden Valley, MN 55427
763-252-6987
tom.hawkinson@stantec.com
Statewide business organization representative

Sarah Kleinschmidt, PhD
3M Company
3M Center, 220-6W-1
St. Paul, MN 55144
651-736-5485
sekleinschmidt@mmm.com
Statewide business organization representative

Zeke J. McKinney, MD, MHI, MPH, FACOEM
HealthPartners Occupational and Environmental Medicine/Institute
Univ. of MN, School of Public Health
HealthPartners St. Paul Clinic
205 S. Wabasha St.
St. Paul, MN 55107
zeke@umn.edu
At-large representative

Jill Heins Nesvold, MS
American Lung Association of Minnesota
490 Concordia Ave
St Paul, MN 55103
651-223-9578
Jill.heins@lung.org
Nongovernmental organization representative

Ruby Nguyen, PhD
Univ. of MN, School of Public Health
Div of Epidemiology & Community Health
7525A
1300 S 2nd St, Suite 300 WBOB
Minneapolis, MN 55454
612-626-7559
nguyen@umn.edu
University of Minnesota representative

Cathy Villas-Horns, MS, PG
Minnesota Dept. of Agriculture
Pesticide & Fertilizer Management Division
625 Robert St N
St Paul, MN 55155-2538
651-201-6697
Cathy.villas-horns@state.mn.us
MDA appointee

Eileen Weber, DNP, JD, PHN, BSN, RN
Univ of MN, School of Nursing (active retiree status)
10623 Nyberg Ave S
Hastings, MN 55033
651-276-1730
Weber058@umn.edu
Nongovernmental organization representative

Lisa Yost, MPH, DABT
Ramboll Environ
Local office
479 Iglehart Ave
St Paul, MN 55101
651-470-9284
lyost@ramboll.com
National business organization representative

VACANT SEATS
At-large representative
Minnesota Senate appointee
Minnesota House of Representatives appointee

Biographical Sketches of Advisory Panel Members

Jay Desai is the Manager of the Chronic Disease and Environmental Epidemiology Section within the Division of Health Promotion and Chronic Disease at MDH. The Section includes the Environmental Epidemiology, the Minnesota Cancer Reporting System, and the Sickle Cell Data Collection program. It also includes the Long-Term Surveillance of Chronic Disease and Disabilities Annex, a program designed for response and recovery in emergency situations such as the COVID-19 epidemic. Jay received his Epidemiology doctorate from the University of Minnesota, is a chronic disease epidemiologist, and has worked in academic research and public health practice at the University of Minnesota, HealthPartners Institute, and the Minnesota Department of Health since 1993. He has a strong interest in diabetes, diabetes prevention, obesity, cardiovascular disease, chronic kidney disease, gout, cancer prevention, sickle cell disease, their underlying behavioral risk factors, and social determinants of health. He is also interested in implementation science and health equity. At MDH Jay spent 16 years as the epidemiologist for the Minnesota Diabetes Program. At HPI he worked on primary care clinical decision support; using EMR's for diabetes, cardiovascular disease, and obesity surveillance; diabetes prevention in low income individuals, and HPV vaccination in underserved communities. Jay is also a standing member of the NIH Healthcare and Health Disparities study section.

Kristie Ellickson joined the Minnesota Pollution Control Agency in 2007 after completing her PhD at Rutgers University and postdoctoral work at both Rutgers and the University of Wisconsin-Madison. Prior to her academic pursuits, she was a U.S. Peace Corps volunteer in the country of Panama. As a graduate student and postdoc she conducted research on trace metal speciation and bioavailability in a variety of environmental matrices. Her work at the MPCA includes the incorporation of cumulative risk and impact assessment principles into regulatory risk, the review of human health risk assessments for large permitted facilities, and she has been the lead investigator on an EPA community-scale air toxics grant targeting passive and active air sampling for Polycyclic Aromatic Hydrocarbons in an urban and rural environment.

Tom Hawkinson is the Senor Industrial Hygienist for Stantec Consulting Services Inc. (formerly Wenck Associates) in Golden Valley, Minnesota. He completed his MS in Public Health at the University of Minnesota, with a specialization in industrial hygiene. He is certified in the comprehensive practice of industrial hygiene and a certified safety professional. He has worked in EHS management at a number of Twin Cities based companies, conducting industrial hygiene investigations of workplace contaminants and done environmental investigations of subsurface contamination, both in the United States and Europe. He has taught statistics and mathematics at both graduate and undergraduate levels as an adjunct and is on faculty at the Midwest Center for Occupational Health and Safety, which is a NIOSH-sponsored education and resource center at the University of Minnesota's School of Public Health.

Sarah Kleinschmidt is an epidemiologist with more than 20 years of experience in population-based epidemiologic research and infectious disease clinical trials. She joined the 3M Company in 2016 and serves as an epidemiologist within the Corporate Occupational Medicine Department where she evaluates the health experience of employee groups. Prior to joining 3M, Dr. Kleinschmidt was an occupational epidemiologist for DuPont in Wilmington, DE and taught epidemiology at the University of Delaware as an Adjunct Instructor. She has also held research positions at the University of Iowa, Illinois Department of Public Health, and Southern

Illinois University School of Medicine. She earned a B.S. and M.S. in biology from the University of Illinois at Springfield, and a M.S. and Ph.D. in epidemiology from the University of Iowa with specialized training in both infectious disease and occupational epidemiology.

Zeke McKinney is a board-certified Occupational and Environmental Medicine (OEM) physician who works at the HealthPartners Clinic in St. Louis Park, MN. He is additionally board-certified in Public Health & General Preventive Medicine, Clinical Informatics, and Lifestyle Medicine. He completed all of his medical training here in Minnesota. His professional interests are in preventing work-related illness/injury, improving data-driven decision-making in clinical contexts, environmental toxicology, health equity, environmental justice, public safety medicine, managing complex impairment/disability, and increasing the health literacy of patients and communities. He practices clinical occupational and environmental medicine in the Twin Cities, and he is one of few clinicians in Minnesota who evaluates work and community-related environmental toxicologic exposures. He is the Minnesota physician contact for the Pediatric Environmental Health Specialty Units (PEHSU), a national resource for environmental medical information in partnership with ATSDR and CDC.

Jill Heins Nesvold serves as the National Director of Lung Health for the American Lung Association. Her responsibilities include program oversight and evaluation related to asthma, chronic obstructive lung disease (COPD), influenza, and quality improvement. She holds a master's degree in health management and a short-course master's degree in business administration. She has published extensively in a variety of public health areas.

Ruby Nguyen is an assistant professor at the University of Minnesota School of Public Health Division of Epidemiology & Community Health. She received her PhD in Epidemiology from Johns Hopkins University. Ruby's research focuses on maternal, child and family health; the etiology of reduced fertility; pregnancy-related morbidity, and infertility and later disease. Currently, Ruby is conducting a longitudinal study examining the role of endocrine disrupting chemicals in child development. From 2016-2017, Ruby was Co-Principal Investigator of a statewide prevalence study investigating violence against Asian women and children.

Cathy Villas Horns is the Hydrologist Supervisor of the Incident Response Unit (IRU) within the Pesticide and Fertilizer Management Unit of the Minnesota Department of Agriculture. She holds a Master of Science in Geology from the University of Delaware and a Bachelor of Science in Geology from Carleton College and is a licensed Professional Geologist in MN. The IRU oversees or conducts the investigation and cleanup of point source releases of agricultural chemicals (fertilizers and pesticides including herbicides, insecticides, fungicides, etc. as well as wood treatment chemicals) through several different programs. She has worked on complex sites with Minnesota Department of Health and MPCA staff, and continues to work with interagency committees on contaminant issues. She previously worked as a senior hydrogeologist within the IRU, and as a hydrogeologist at the Minnesota Pollution Control Agency and an environmental consulting firm.

Eileen Weber is a nurse attorney and Clinical Associate Professor Ad Honorem at the University of Minnesota School of Nursing (active retiree status). She founded the Upper Midwest Healthcare Legal Partnership Learning Collaborative. She earned her Doctor of Nursing Practice degree in Health Innovation and Leadership in 2014 from the University of Minnesota. She

earned her RN diploma from Thomas Jefferson University Hospital in Philadelphia, PA, her BSN summa cum laude from the University of Minnesota, and her JD in the founding class of the University of St. Thomas School of Law in Minneapolis. Her clinical experience and past certifications have largely been in urban critical care and emergency nursing. She has served as vice-president of the Minnesota Nurses Association, earning awards for political action and outstanding service. She represented nursing on the Minnesota Health Care Commission, was a regular editorial writer for the St. Paul Pioneer Press and an occasional op-ed contributor for the Star Tribune. She founded Friends of Grey Cloud and worked with environmental leaders at the local, regional, state and national levels to protect Lower Grey Cloud Island from harmful development and to conserve the Grey Cloud Sand Dune Prairie. She has extensive experience in legislative lobbying, community activism, and political campaign management. Her scholarly work is focused on the intersection of law, public policy, and interprofessional healthcare practice and education.

Lisa Yost is a Principal Consultant at RAMBOLL ENVIRON, an international consulting firm. She is in their Health Sciences Group, and is based in St. Paul, Minnesota. She completed her training at the University of Michigan's School of Public Health and is a board-certified toxicologist with expertise in evaluating human health risks associated with substances in soil, water, and the food chain. She has conducted or supervised risk assessments under CERCLA, RCRA, or state-led regulatory contexts involving a wide range of chemicals and exposure situations. Her areas of specialization include exposure and risk assessment, risk communication, and the toxicology of such chemicals as PCDDs and PCDFs, PCBs, pentachlorphenol (PCP), trichloroethylene (TCE), mercury, and arsenic. Lisa is a recognized expert in risk assessment and has collaborated in original research on exposure issues, including background dietary intake of inorganic arsenic. She is currently assisting in a number of projects including a complex multi-pathway risk assessment for PDDD/Fs that will integrate extensive biomonitoring data collected by the University of Michigan. She is also an Adjunct Instructor at the University of Minnesota's School of Public Health.

Biographical Sketches of Staff

Sheila Amenumey is currently the Biomonitoring Epidemiologist at MDH. Sheila collaborates with the Biomonitoring Program Director and key stakeholders leading the various biomonitoring projects including Healthy Kids Minnesota, the statewide project focused on children's environmental health. She completed her MPH in Maternal and Child Health and PhD in Water Resources Science (Water Quality Hydrology Emphasis) at the University of Minnesota. Prior to her work with the biomonitoring program, Sheila worked with the Maternal and Child Health Section at MDH. Her role as the Maternal and Child Health Epidemiologist involved leading and collaborating with external partners in conducting program evaluation across multiple federal adolescent health grants, and assisting them in monitoring program outcomes and achievement of their health and education goals for the youth they serve. Before coming to MDH, Sheila conducted water quality research at the University of Minnesota to determine the impact of agriculture on water quality.

Carin Huset has been a research scientist in the Environmental Laboratory section of the MDH Public Health Laboratory since 2007. Carin received her PhD in Chemistry from Oregon State University in 2006 where she studied the fate and transport of perfluorochemicals in aqueous waste systems. In the MDH PHL, Carin provides and coordinates laboratory expertise and information to program partners within MDH and other government entities where studies require measuring biomonitoring specimens or environmental contaminants of emerging concern. In conjunction with these studies, Carin provides biomonitoring and environmental analytical method development in support of multiple analyses.

Madison Kircher is a CSTE Applied Epidemiology fellow with the Minnesota Department of Health where she works closely with the MN Tracking and Climate & Health Programs. She received her Master of Public Health degree from the University of Wisconsin Madison in May 2020. During her graduate studies, her research focused on the relationship between trauma and substance harm with the Wisconsin Department of Health Services. Through the fellowship, she is currently working on projects related to environmental health and climate change in Minnesota.

Tess Konen graduated from the University of Michigan's School of Public Health with a master's degree in Occupational Environmental Epidemiology. She completed her thesis on the effects of heat on hospitalizations in Michigan. She worked with MN Tracking for 2 years as a CSTE Epidemiology Fellow where she was project coordinator for a follow-up study of the Northeast Minneapolis Community Vermiculite Investigation cohort. She currently is an epidemiologist working on birth defects, pesticides, and climate change, and is developing new Disaster Epidemiology tools for MDH-HPCD.

Jessica Nelson is Program Director and an epidemiologist with MN Biomonitoring. She works on design, coordination and analysis of biomonitoring projects, and has been the Principal Investigator for the Healthy Rural and Urban Kids, MN FEET and PFAS studies. Jessica received her PhD and MPH in Environmental Health from Boston University School of Public Health where her research involved the epidemiologic analysis of biomonitoring data on perfluorochemicals. Jessica was the coordinator of the Boston Consensus Conference on

Biomonitoring, a project that gathered input and recommendations on the practice and uses of biomonitoring from a group of Boston-area lay people.

Jennifer Plum is the Program Manager for MN biomonitoring, currently on a temporary leave of absence as a Supervisor in the MDH COVID response section. She studied Community Health Promotion while earning her MPH from the University of Minnesota. Prior to joining MDH in December 2019, Jennifer worked with WellShare International, Little Earth of United Tribes, and the U of M Department of Epidemiology and Community Health. She has also been a part of the Health Equity Leadership Network. Jennifer is passionate about health equity, health literacy and community engagement. She is working to connect environmental epidemiology and biomonitoring efforts to community members while coordinating biomonitoring activities.

Kathy Raleigh is an epidemiologist for MN Tracking. She completed her PhD in Environmental Health at the University of Minnesota's School of Public Health and her MPH in Environmental and Occupational Health at the University of Arizona. She has worked on a variety of environmental health projects including: pesticide exposure in children, occupational asthma, mercury exposure in women and children, and occupational exposure to PFOA. Prior to coming to MN Tracking, Kathy was working on maternal and child health projects both internationally with USAID and, more recently, at MDH. She will also be working on the coordination and collection of hospital discharge data, including heart disease and asthma surveillance projects for MN Tracking with a focus on health disparities.

Blair Sevcik is an epidemiologist with MN Tracking at the Minnesota Department of Health, where she works on the collection and statistical analysis of public health surveillance data for MN Tracking. Prior to joining MN Tracking in January 2009, she was a student worker with the MDH Asthma Program. She received her Master of Public Health degree in epidemiology from the University of Minnesota School of Public Health in December 2010.

Jessie Shmool supervises the Environmental Epidemiology Unit at MDH and is the Principal Investigator for the Environmental Public Health Tracking program. Jessie received her MPH from the Mailman School of Public Health at Columbia University and DrPH from the University of Pittsburgh, where her training and research focused on exposure assessment, GIS and spatial statistics, community-engaged research methods, and environmental health disparities. Prior epidemiology studies have examined social susceptibility to air pollution exposure in chronic disease etiology and adverse birth outcomes.

Lynn Treadwell, Minnesota Public Health Data Portal Coordinator, is an experienced digital communications leader with a solid understanding of websites and application development, social media and digital marketing communications in the health and government sectors. Lynn brings over 10 years of experience in developing optimized online user experiences and digital communications to the position. She will provide stewardship to Minnesota's public health data portal focusing on audience understanding and interactive development best practices. Lynn has an AAS in graphic design, attended the School of Journalism at University of Minnesota and has a mini-Master's in Marketing from St. Thomas University.