

Community-engaged Investigation of Environmental Exposure from 2023 Train Derailment at East Palestine, OH

Oindrila Ghosh, Carla Ng, James Fabisiak, Juliane
Beier, Maureen Lichtveld

University of Pittsburgh



University of
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INTRODUCTION

On Feb. 3, 2023, a freight train carrying vinyl chloride and other volatile chemicals derailed in East Palestine, OH, contaminating local air, soil, and water.

A vent-and-burn operation and likely use of fluorochemical firefighting foam created a complex mix of vinyl chloride (VC), dioxins, PFAS, and other Volatile Organic Compounds (VOCs).

Regulators reported no ambient air exceedances, but residents still report odors and health symptoms and view a proposed \$310 million monitoring-focused settlement with the rail company as inadequate.



NIEHS Response

https://www.niehs.nih.gov/research/programs/east_palestine

February 2024

September 2025



CASE
WESTERN
RESERVE
UNIVERSITY

1. **Healthy Futures Research Study: Linking Somatic Mutation Rate With Baseline Exposure in East Palestine**

PI: Frederick Ray Schumacher, Ph.D.



2. **Responding to Air Pollution in Disasters (RAPID) Air Sampling and Symptom Monitoring in East Palestine, OH**

PI: Natalie Johnson, Ph.D.



UC San Diego

3. **Uncovering the Short-Term Public Health Impact of Toxin Release in East Palestine, Ohio: Outcomes and Effect Modifiers**

PI: Beatrice Golomb, M.D., Ph.D.



4. **East Palestine Train Derailment Health Tracking Study**

PI: Erin Haynes, Dr.P.H

5. **Profiling the Post-Accident Exposome in East Palestine**

PI: Peng Gao, Ph.D.

6. **East Palestine Community-Engaged Environmental Exposure, Health Data, and Biospecimen Bank**

PI: Juliane Beier, Ph.D.; Maureen Lichtveld, M.D., M.P.H.



The University of Kentucky will coordinate and execute the primary objectives outlined by community feedback.

PI: Erin Haynes, Dr.P.H.



The University of Pittsburgh will study liver and thyroid function as part of the research team.

PI: Juliane Beier, Ph.D.



Yale University will evaluate water quality through state-of-the-science hydrological modeling.

PI: Nicole Deziel, Ph.D. and Michelle Bell, Ph.D.



Components of this Study



Environmental Health

Carla Ng, PhD

Oindrila Ghosh, PhD

James Fabisiak, PhD

Xuening Tang

Firoz Abdoel Wahid, MD, PhD, MPH



1. Community- engaged environmental data collection from participant homes (air, water, soil)
2. Characterization of presence and distribution of VOC/SVOCs and PFAS.



Biomedical Health

Juliane Beier, PhD

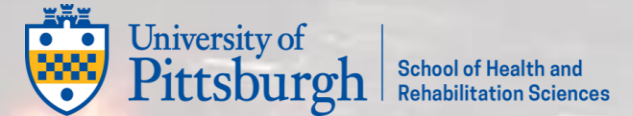
Olisa Okonkwo

Maureen Lichtveld, MD, MPH

Firoz Abdoel Wahid, MD, PhD,



1. Collection and biomarker analysis of blood for liver injury (Pitt/UPMC).
2. Collection of urine for analysis of VC and other contaminants (Pitt).
3. Measurement of liver stiffness (hardness) and fatty changes in liver using an ultrasound device called a Fibroscan.



Pediatric/ Psychosocial Health

Laura Dietz, PhD

Helen S. Farnham



1. Survey parents of children (0–18) about their concerns and observed changes in their children’s health and development after the derailment.

Building the Team

Community Advisory Board (CAB)

Erika Kinkead
Linda Ludwig
Don Carson
Beth McTrusty
Andris Balputris
Darla McElroy
Bonnie Sansenbauer
Susan DellaVolle



Community Based Researchers (CbRs)

Lori Laich
Michael Hannum
Linda Ludwig
Joe DellaVolle
Susan DellaVolle



Pitt Students



Tommy Manning



Jade Heckman



Naomi L. Sanders

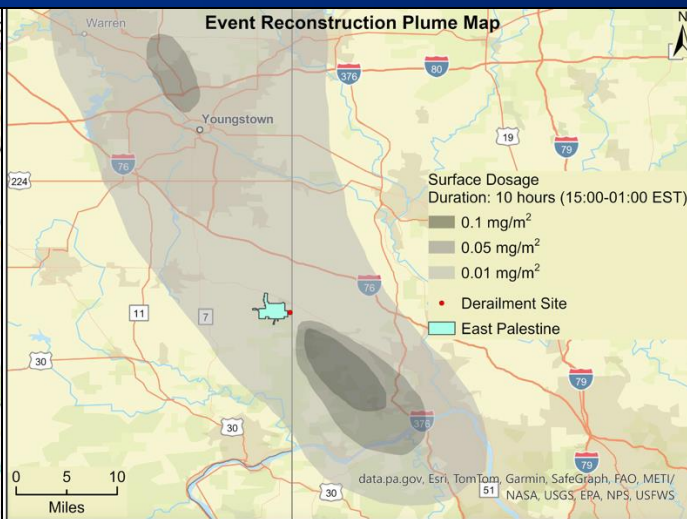
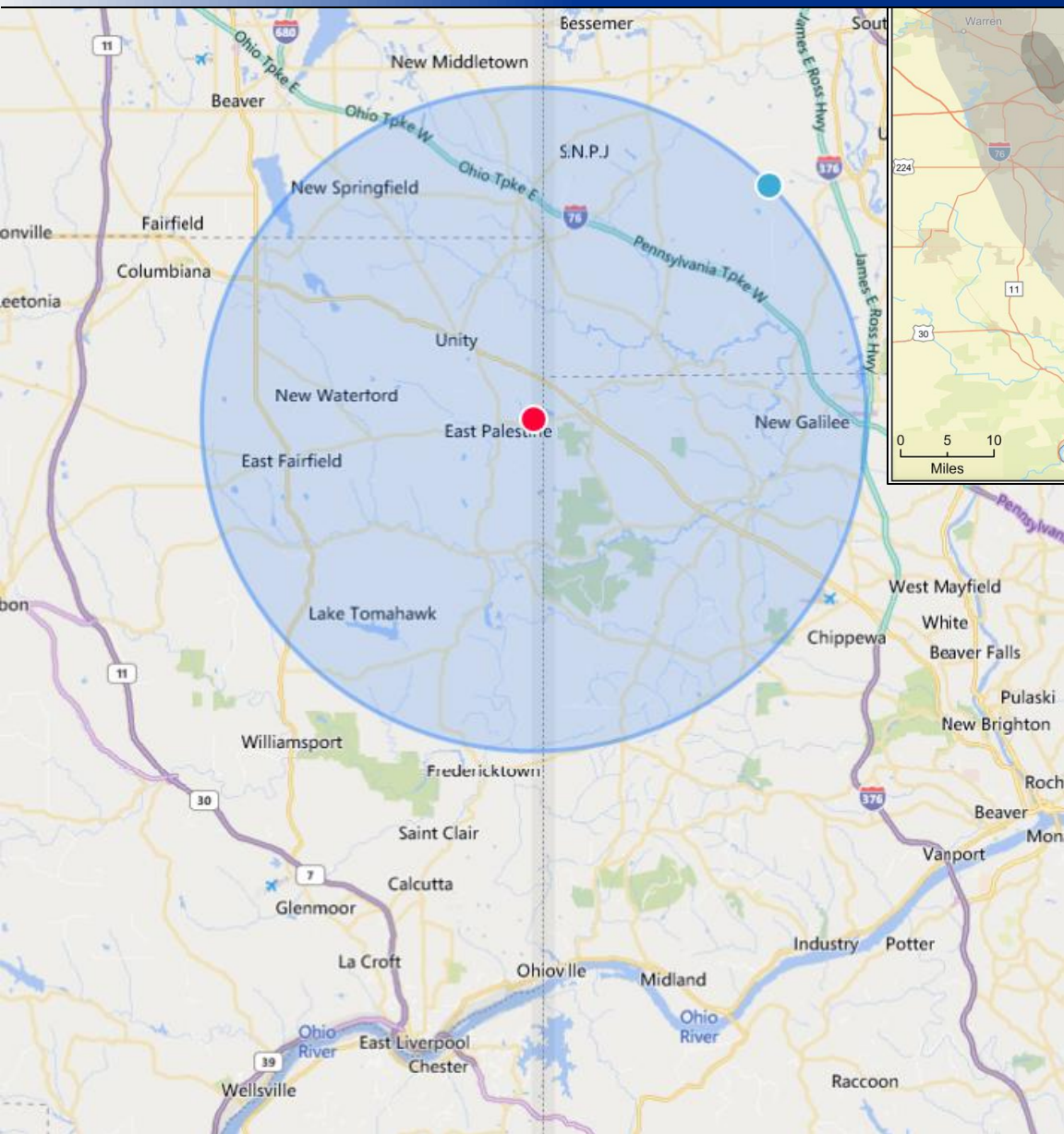


Alyx J. Gatesman

Lessons Learned

- Students with cars
- Compensation

Study Site and Plan



Study Site

Recruit 100 homes for environmental sampling:

- 25 homes < 0.5 mile from site
- 25 homes > 0.5, < 1 mile from site
- 50 homes > 1 mile, < 8 mile from site

Ohio and Pennsylvania side
(PA side has industrial activities)

Environmental Media

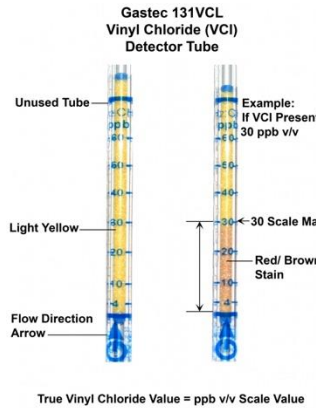
- Air
 - Participant home basements (indoor)
 - Event plume- wind direction (outdoor)
- Drinking Water
 - Municipality versus private well
- Soil
- Questionnaire (IRB approved)

Components of Environmental Monitoring

VOCs

GRAB AIR SAMPLES

- Instant read-out Gastec tubes (0.1-6 ppm)
- Tedlar bags (5L) for grab air samples



PFAS

DRINKING WATER

- First/ Second draw



PFAS/ SVOCs/VOCs

GARDEN SOIL

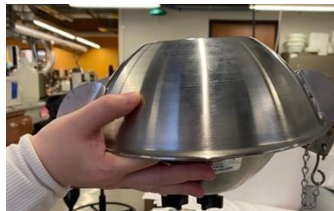
- Top 4 inches



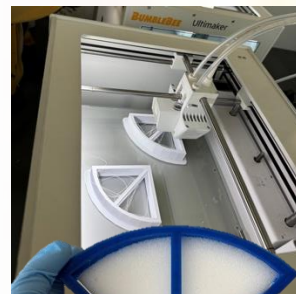
VOCs/SVOCs

PASSIVE AIR SAMPLES

- Polyurethane foam exposed for 1 month
- Outdoor- stainless steel bowls
- Indoor- 3D printed pie-holders



OUTDOOR



INDOOR

QUESTIONNAIRES



- 10 houses per week
- 2 days a week-
 - Wed (analysis on Thursday-Friday)
 - Sunday (analysis on Monday-Tuesday)
- CbR-Student pairing



Lessons Learned

- Students/ CbRs need to be protected while sampling (PPE/ pets)
- Gastec tubes of single calibration to keep things simple
- Pictures of gastec tube and temperature/ humidity readings
- Working coordination

Training (Sampling/ Analytical Methods)



East Palestine Field Sampling Items to pack:

1. 250 ml HDPE bottles (4 per hh). (Rinse bottles sequentially with DI, MeOH and DI. Pack 2 bottles in a small Ziploc bag)
2. Big cooler – Make sure ice bags/packs are well frozen and there are enough. Last



Checklist of Student Responsibilities

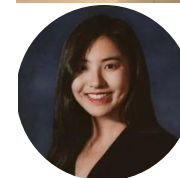
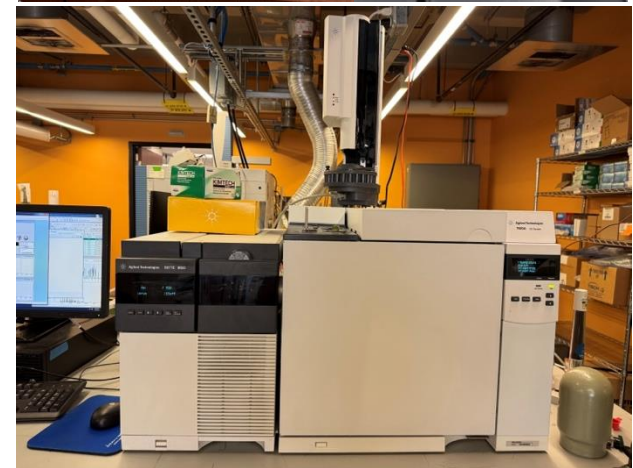
- Find the spot where indoor air samples will be collected, usually the basement. Set up the weather monitoring device.
- Take Gastec tube reading- take picture of reading- take note on questionnaire form. **Make sure Gastec tubes are inside white cooler at all times while moving between**



Checklist of CbR Responsibilities

- Fill in the questionnaire form.
 - Record humidity and temperature reading on questionnaire form after asking student samplers.
- Get signatures on consent forms. Tear off the last page and give them the rest of the doc.
- Ask if they received a Vincent Debit Card from UPitt, for compensation from any other branch of study (blood-urine collection or pediatric health survey)? If they have, ask them to show you that card (**DO NOT give a new card**) and collect following info on consent form:
 - Birthday of participant (mm/dd/yyyy)
 - Last 4 digits of the card number (front)
 - Admin number at the bottom right end (back)
- If they have not received a card OR lost their old card (from a different component of the study), give them a new card and write down the above information on the consent form. [Note:
 1. The EP health study is being conducted in 3 parts: biomedical, environmental and pediatric health survey. For each component participants get compensated. Depending on which component they do first, they get a card. For the future components, the money is loaded on the old card.
 2. For the environmental component, money is loaded on the card only after the sampling visit. Let them know that they have not been loaded yet with their compensation for the environmental component. They will be processed once we get the consent forms and samples back to the lab, so it may be a day or two before the balance shows up.
 3. Ask participants to hold on to their cards if they want to do another component of the study after this.]
- Check that students have collected air samples, water samples, soil samples and written house IDs on them.
- Check that students have pumps and weather monitoring device with them before going to next house.

Extraction and analysis of VOCs in air samples- a time-sensitive measurement.



Xuening (Selene) Tang
PhD student, Environmental and Occupational Health

Recruitment

ONLINE

East Palestine Environmental Health Study

The University of Pittsburgh is launching community-based research on the long-term impacts of the train derailment of 2023. These studies are grounded in the concerns we've heard from you, focusing on air and soil quality, physical health, and emotional well-being.

Biospecimen Sampling

- Participants will provide small blood and urine samples to check if chemicals from the train derailment might be affecting their health.
- They will answer questions about their health history and how they've been feeling since the accident.
- Compensation: \$50 per participant

Environmental Sampling

- Indoor/outdoor air, drinking water and garden soil samples will be collected from individual households within 8 miles radius of derailment, to monitor the presence of chemicals.
- Specially recruited and trained community based researchers from EP will participate in sampling along with Pitt students.
- Compensation: \$50 per participant

Pediatric Health Survey

- Parents with children ages 0-10 will be asked to complete 2 questionnaires on their concerns about children's health after the train derailment. This will help us identify needs to promote future health and development of children in EP. Special focus on families 0.1 to 1.0 miles from derailment site.
- Compensation: \$25 per participant

Register for the study here

<https://forms.office.com/010808190>

Interested to be a Community Researcher? Pitt is HIRING! Check out our other flyer and sign up for a training here!

Special Meeting: Direct event at the Public Library! May 8 & 14 June

Got questions? Reach out. Email: OIG4@pitt.edu, 866-748-7488, sc20@pitt.edu

YOUR VOICE, YOUR HEALTH, YOUR COMMUNITY.

It's not about experiments—it's about partnership. Your participation helps ensure that the results are understood, community-oriented, and capture the experiences of everyone involved. Data collected will be used to support East Palestine now and in the future. We're not here to observe from a distance—we're here because we care. Many of our researchers have ties to this region and feel a deep responsibility to listen, learn, and to continue to stand with you. Please consider joining our efforts.

HARDCOPY

University of Pittsburgh

East Palestine Train Derailment Health Studies

Support for this research study is provided by the National Institute of Environmental Health Sciences, award number 1R21 ES036032-01.

STUDY COMPONENT	YES	NO	MAYBE
Liver Health Screening			
Parents' surveys on children's health			
In-home Water Testing			
In-home Air Testing			
Outdoor Air Testing			
Garden soil			
Community-based Researcher. This involves helping us take air and water samples.			

Sign-up sheet for those expressing interest in participating in the University of Pittsburgh

PHONE

DO YOU LIVE IN EAST PALESTINE OR BEAVER COUNTY?

Your voice matters.
Join the East Palestine Health Study.
Call **866-748-7488**.



University of Pittsburgh
School of Public Health

www.publichealth.pitt.edu



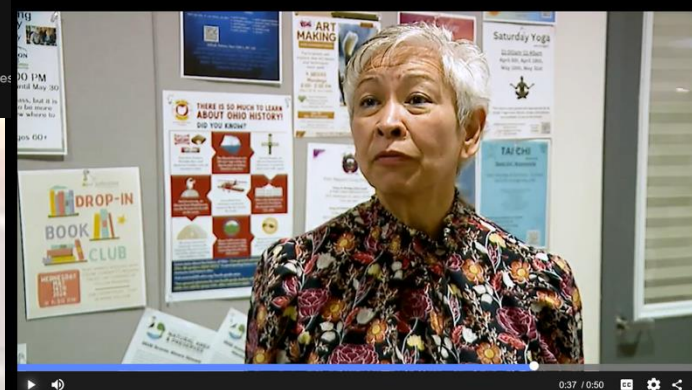
COMMUNITY EVENTS, PRESS/ MEDIA/ LOCAL PODCASTS



Claybrook Chats

University of Pittsburgh Partners with EP Community
Claybrook Chats with Barb

Barb chats with members of the train derailment health studies and how they plan on collecting and analyzing data.



Researchers meet with East Palestine residents to discuss health study

Preferred Contact Information

Name(s): 

Address:

Phone:

Preferred Email:

Please circle ALL study team members who you would feel comfortable allowing into your home to collect air and water samples:

- University of Pittsburgh Staff
- Community Based Researchers (East Palestine Community Members)

Thank you for your interest!

University of Pittsburgh

East Palestine Train Derailment Health Studies

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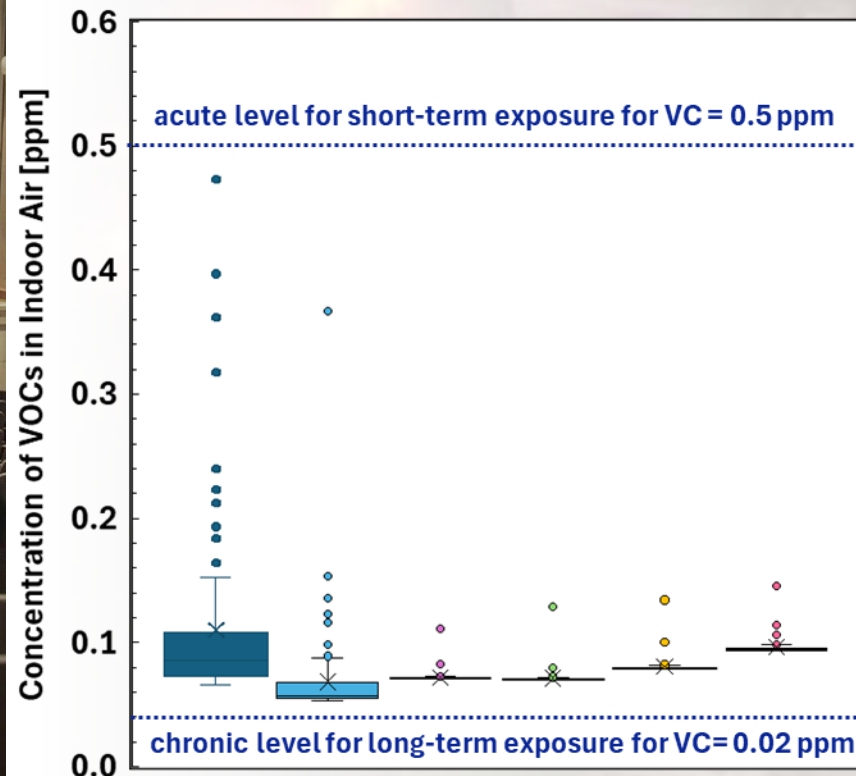
LESSONS LEARNED

- Transparency about scope of study
- Building trust (Answering who we are)

Report Back (Preliminary Results)



- Vinyl Chloride
- Toluene
- Ethylbenzene
- o-Xylene
- 1,3,5-Trimethylbenzene
- 1,2-Dibromo-3-Chloropropane



- 100 % houses have VC levels below safe levels for short-term exposure for VC = 0.5 ppm but above the chronic level for long-term exposure for VC= 0.02 ppm.
- High VC concentration homes will be re-sampled and observations cross-verified with accredited analytical lab.
- Final results will be sent to homeowners as individualized reports.
- Spilled VOCs (example: Vinyl Chloride) can move as vapor from contaminated soil and groundwater into basements (vapor intrusion). VC in basement air to assess potential long-term inhalation risk.

LESSONS LEARNED

Letting participants know that analysis takes time and drawing conclusive interpretations from exposure studies require long-term monitoring.

EAST PALESTINE, OH
FEBRUARY, 2023

FROM CRISIS TO COLLABORATION

The story of a train-wreck, chemical spill and ongoing efforts in exposure monitoring for long-term impact assessment, with the community.

I have a bad liver, my doctor said. Is that related to the exposures?

We want to answer your questions

My child has rashes, is that related to the spill?

Is the air safe to breathe?

The spinach I grew in my garden soil, is it safe to eat?

Is my drinking water safe?

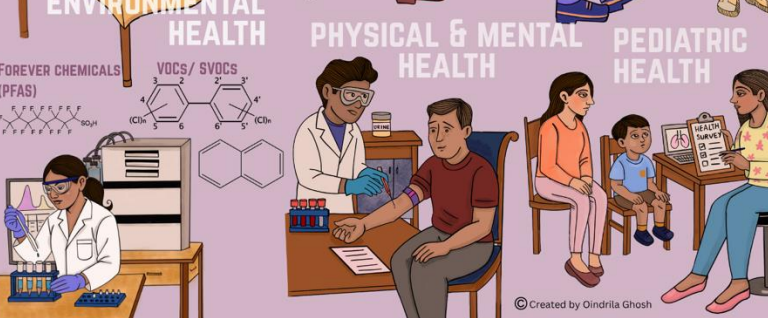
WHAT ARE THE BEST PRACTICES TO BUILD COMMUNITY TRUST?

IS OUR DATA UNBIASED?

EXPOSURES FROM THE SPILL VERSUS BACKGROUND CONTAMINATION- HOW TO TELL THE DIFFERENCE?

ARE WE ASKING THE RIGHT QUESTIONS? WHAT DID WE LEARN?

Meet and greet
Concerns
Actions



DRINKING WATER

GARDEN SOIL



© Created by Oindrila Ghosh

THANK YOU

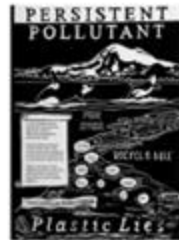
ecoartspace

novel bodies



WELCOME!

In an age of information overload and data deluge, clarity of communicating critical scientific findings is more than a necessity. The challenge is to present the essential elements of a story, to share research in a way that is accessible and engaging. This art space provides a platform for artists to share their perspectives and insights, and to connect the dots between science and the real world. We hope you will engage with different ways of communicating scientific knowledge to diverse audiences. Please see the artist statements for more information.



★ **4.14.P-We-110 - Impact of Industrial Activity From Petrochemical Plant on Environmental Health in Beaver County, PA**
Oindrila Ghosh, Fatemeh Shabani, Carla A. Ng, Helen Farnham, Jeanine Buchanich

Let's connect!



IG4@pitt.edu
LinkedIn: Oindrila Ghosh

Extra Slides

What chemicals were released ?

- **Vinyl chloride:** A flammable, colorless gas used to make hard plastic products like PVC pipes. Five tank cars of vinyl chloride were released and burned off. It is a known carcinogen linked to liver cancer.
- **Butyl acrylate:** A clear, flammable liquid used in paints, adhesives, and sealants. One tank car spilled its entire load of butyl acrylate, which was detected in nearby waterways.
- **Ethylhexyl acrylate:** A liquid used in the production of paints and plastics that can cause skin and respiratory irritation.
- **Isobutylene:** A flammable gas used to produce butyl rubber and other industrial products.
- **Ethylene glycol monobutyl ether:** A liquid used as a solvent in paints and inks that can irritate the skin, eyes, and respiratory system
- **Benzene:** Including as a solvent and in the manufacture of goods like detergents and explosives. Although not carried on the train during the derailment, a tank car contained residue from a previous shipment of benzene, a solvent and a known carcinogen.