

EXPLORING HEALTH IMPACTS OF SHALE GAS DEVELOPMENT ON CHILDREN

FREE PROGRAM FOR HEALTH PROFESSIONALS

Registration in advance preferred, walk-ins welcome. Dinner is included.

JUNE 6, 2018 6:00-9:00 PM

**Allegheny County Medical Society
713 Ridge Ave, Pittsburgh, PA 15212**



Ned Ketyer, MD, FAAP

Pediatric Alliance, PC
Editor, *The PediaBlog*
AAP Council on Environmental Health
SWPA Environmental Health Project (Consultant)
Physicians for Social Responsibility PA (Board)
Climate Reality Leadership Corps

Larysa Dyrszka, MD

Former Director of Pediatrics, Holy Name Hospital, NJ
Physicians for Social Responsibility NY (Executive Board)
Concerned Health Professionals of New York

Peggy Slota, DNP, RN, FAAN

Director, DNP Graduate Studies; Associate Professor
Georgetown University
MACCHE Council of Advisors
Climate Reality Leadership Corps
Franklin Park Environmental Advisory Council
Women for a Healthy Environment Board Member

Irena Gorski, MPH

PhD Student, Department of Environmental Health &
Engineering
Johns Hopkins Bloomberg School of Public Health
APHA Environment Section Councilor

FRACKING AND HEALTH

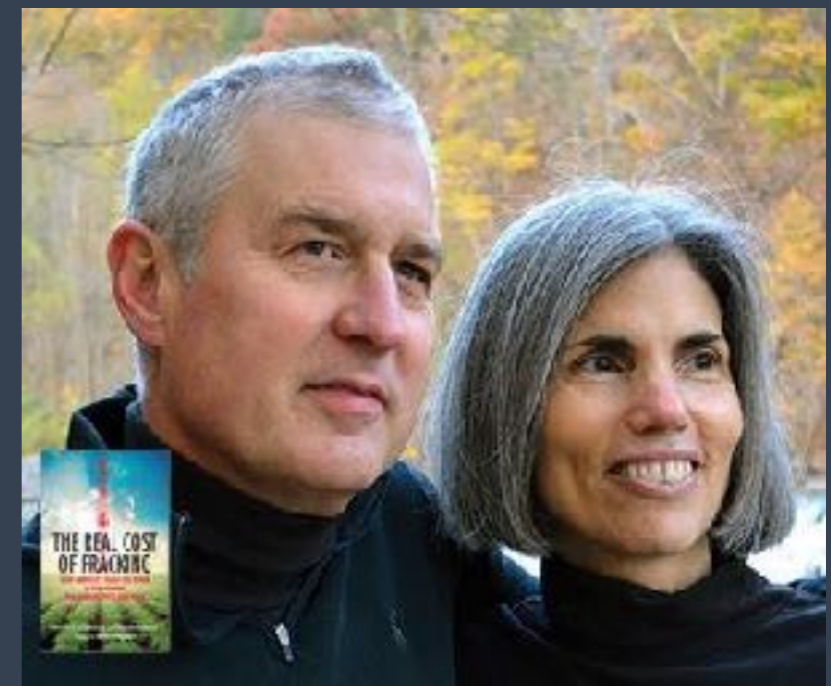
POLICY AND PRACTICE IN NEW YORK

Larysa Dyrszka MD
June 6, 2018



People and animals around gas exploration and production sites were getting sick, lighting their water on fire and watching their water turn brown

<https://pennsylvaniaallianceforcleanwaterandair.wordpress.com/the-list/>



<http://lesstonepublishorperish.blogspot.com/>

[Impacts of Gas Drilling on Human and Animal Health](#)

THE SCIENCE ON SHALE GAS DEVELOPMENT

A Survey of the Environmental Public Health Literature

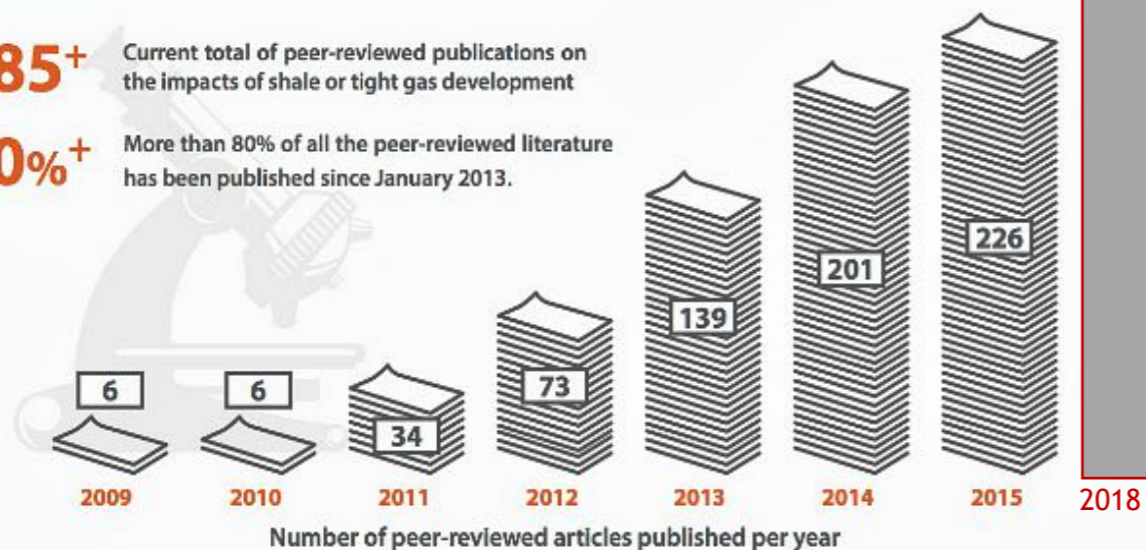
The scientific community is **only beginning to understand** the impacts of shale and tight gas development on human health and the environment. Many data gaps remain, but **numerous hazards and risks have been identified.**

685+

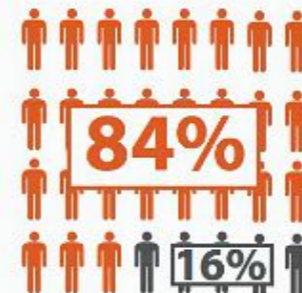
Current total of peer-reviewed publications on the impacts of shale or tight gas development

80%+

More than 80% of all the peer-reviewed literature has been published since January 2013.



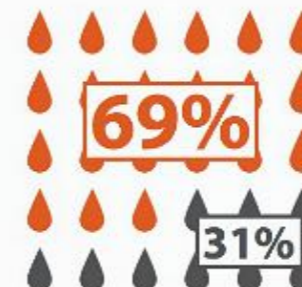
HEALTH



26 studies contain findings that indicate **public health hazards, elevated risks, or adverse health outcomes**

5 studies contain findings that indicate no significant public health hazards, elevated risks, or adverse health outcomes

WATER QUALITY



40 studies contain findings that indicate **potential, positive association, or actual evidence of water contamination**

18 studies contain findings that indicate minimal potential, no association or rare incidence of water contamination

AIR QUALITY



40 studies contain findings that indicate **elevated air pollutant emissions and/or atmospheric concentration.**

6 studies contain findings that indicate no significantly elevated air pollutant emissions and/or atmospheric concentration

<http://journals.plos.org/plosone/article?id=info:doi/10.1371/journal.pone.0154164>

SOURCE: "Toward an Understanding of the Environmental and Public Health Impacts of Unconventional Natural Gas Development: A Categorical Assessment of the Peer-Reviewed Scientific Literature, 2009-2015", PLOS ONE. 2016.: <<http://dx.plos.org/10.1371/journal.pone.0154164>>

ATTRIBUTIONS: Infographic by Yoonseo Cha. Some vector images in this infographic are based on free vector stocks available at following sources: <http://www.vecteezy.com/>; <http://www.freevector.com/>; Icons made by Freepik from <http://www.flaticon.com>



<https://www.psehealthyenergy.org/our-work/shale-gas-research-library/>



Concerned Health Professionals of NY



American Academy of Pediatrics, District II, New York State
Dedicated to the Health of All Children

Contact:

June 7, 2010

Elie Ward,
Director of Policy & Advocacy
eward@aap.net
518-441-4544

Memo of Support

A. 10490/S. 7592

An act to establish a moratorium on conducting hydraulic fracturing for extraction of natural gas or oil in New York State until 120 days after the Environmental Protection Agency issues a report on the effects of hydraulic fracturing on water quality, air quality and other public health impacts.

The American Academy of Pediatrics, District II, NYS, representing more than 5,000 pediatricians and the millions of children we care for across the state, strongly supports A10910/S7592.

This legislation provides an opportunity for the EPA to study the potential public health impacts of hydraulic fracturing, and for New York State's leaders to have that information before it makes any decision about permitting hydraulic fracturing in our state.

AAP, District II, NYS membership is concerned about the potential negative impacts on water, air, soil contamination, increased traffic and possible spills of contaminated materials in areas where many children and families live. Allowing time for the EPA study will allow our state leaders to move forward on this issue fully informed about whether hydraulic fracturing is a good public policy for our state.

We urge the legislature to pass this legislation now, imposing the moratorium to provide the time to for our state leaders to have the latest EPA data to inform our decisions going forward.

Health professionals formed Concerned Health Professionals of New York and continued to write letters to NY's Health Commissioner and Governor, joined by health and environmental orgs, and maintained a presence in Albany to educate policymakers.



Since Governor Cuomo's Inauguration in January 2010, hundreds of health professionals and organizations from across the state of New York have called on his administration to conduct an independent, comprehensive Health Impact Assessment. The letters can be found at <http://concernedhealthny.org/letters-to-governor-cuomo/>



- October 14, 2015
- May 29, 2014
- February 27, 2013
- October 4, 2012
- March 16, 2012
- December 12, 2011
- October 5, 2011
- March 26, 2011
- February 28, 2011

The Honorable Andrew M. Cuomo
Governor of New York State
NYS State Capitol Building
Albany, NY 12224

Health Commissioner Howard A. Zucker
New York State Department of Health
Corning Tower
Empire State Plaza,
Albany, NY 12237

Dear Governor Cuomo and Health Commissioner Zucker,

The first COMPENDIUM OF SCIENTIFIC, MEDICAL, AND MEDIA FINDINGS DEMONSTRATING RISKS AND HARMS OF FRACKING (UNCONVENTIONAL GAS AND OIL

MEDICAL SOCIETY OF THE STATE OF NEW YORK

99 WASHINGTON AVENUE, SUITE 408, ALBANY, NY 12210
518-465-8085 • Fax: 518-465-0976 • E-mail: albany@mssny.org



Medical Society of the State of New York

High Volume Hydraulic Fracturing

New York State physicians have expressed concern about potential short term and long term health consequences of hydraulic fracturing. MSSNY's Preventive Medicine and Family Health Committee (PMFHC) was charged with studying the subject and forming MSSNY policy on hydraulic fracturing.

The MSSNY Council adopted a policy on December 9, 2010 (Position Statement # 90.992) to "support a moratorium on natural gas extraction using high volume hydraulic fracturing in New York State until valid scientific information is available to evaluate the process for its potential effects on human health and the environment.

Following the publication of the *Draft Supplemental Generic Environmental Impact Statement (draft SGEIS)* by the Department of Environmental Conservation (DEC) in September 2011, MSSNY responded to the request for comments on November 22, 2011. This letter reiterated MSSNY's concerns about human health consequences and the impact on the environment. In addition, MSSNY recommended ongoing monitoring and analysis, including a Health Impact Assessment which should be conducted by the New York State Department of Health or a different, non-governmental, health organization.

Hydraulic fracturing Health Impacts Assessment

The New York State Nurses Association (NYSNA), representing the interests of registered nurses and the patients they serve, strongly supports the requirement of a Health Impacts Assessment on gas exploration and production using high-volume, horizontal hydraulic fracturing, prior to the issuing of any drilling permits in New York State. The Assembly budget proposal has set aside \$100,000 for a study by a school of public health within the state university system to accomplish the assessment.

The study would include research into other states' experiences with hydraulic fracturing; estimated costs of any health impacts to the state, local governments, insurers, employers and the healthcare system; and a long-term plan for monitoring and mitigating health impacts. The purpose of this study is to inform New Yorkers of any and all potential public health impacts posed by hydraulic fracturing and to provide an analysis of those impacts. Analysis and information from this study will then be used to help facilitate informed decisions regarding actions to be taken with respect to such activities in the state.

The expansion of hydraulic fracturing is irresponsible until more research is done to ensure the safety of the water supply and the quality of the air in New York. Other states, including Pennsylvania and Wyoming, have found that hydraulic fracturing has contaminated groundwater with synthetic chemicals, some of which are known to cause genetic abnormalities and stillbirths. In a study conducted by the Environmental Protection Agency, chemicals associated with gas production and hydraulic fracturing fluids were found inside deep water wells in Wyoming (Dilouhy, 2011). Regulators in Pennsylvania also determined that gas drilling led to contaminated water and found an increased incidence of heavy metals toxicity among farm animals. (Griswald, 2011).

Citing Health Risks, Cuomo Bans Fracking in New York State



Members of New Yorkers Against Fracking celebrated the governor's decision outside his Manhattan office on Wednesday. Chang W. Lee/The New York Times

By Thomas Kaplan

A Public Health Review of
**High Volume
Hydraulic
Fracturing
for Shale Gas
Development**

December 2014

Dr Zucker's review boiled down to a simple question:
Would he want his family to live in a community where
fracking was taking place?

His answer was no.

It "would be reckless to proceed [with HVHF] in New York
until more authoritative research is done."

"We cannot afford to make a mistake," he said. "The
potential risks are too great."





MEDICAL SOCIETY OF THE STATE OF NEW YORK

May 2, 2015 - The Medical Society of the State of New York adopted a resolution, “Protecting Public Health from Natural Gas Infrastructure,” that recognizes the potential impact to human health and the environment of natural gas pipelines and calls for a governmental assessment of these risks.



AMERICAN MEDICAL ASSOCIATION

June 9, 2015 -- The American Medical Association (AMA) adopted a resolution, “Protecting Public Health from Natural Gas Infrastructure,” that states, “Our AMA recognizes the potential impact on human health associated with natural gas infrastructure and supports legislation that would require a comprehensive Health Impact Assessment regarding the health risks that may be associated with natural gas pipelines.”





**Compendium of Scientific, Medical, and Media Findings
Demonstrating Risks and Harms of Fracking
(Unconventional Gas and Oil Extraction)**

Fifth Edition

March 2018



Fracking industry site near Groers Ferry Lake in Quitman, Arkansas in the Fayetteville Shale region. ©2014 Julie Dermansky

**> 1,300 peer-reviewed studies
& investigative reports.**

- 90% published since 2013**
- 25% published in 2017**

“There is no evidence that fracking can operate without threatening public health directly or without imperiling climate stability upon which public health depends.”

JUST RELEASED

FRACKING SCIENCE COMPENDIUM

5th edition

concernedhealthny.org/compendium/



THE EVIDENCE IS IN:

DRILLING AND FRACKING OPERATIONS ARE HARMING OUR HEALTH

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PSR



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THE EVIDENCE IS IN: FRACKING WASTE CONTAMINATES RIVERS AND AQUIFERS



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(See footnotes 141, 144-47, 163, 177, 206, 210, 214)

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DOWNLOAD at: concernedhealthny.org/compendium/



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PSR 15

THE EVIDENCE IS IN: ABANDONED WELLS LEAK METHANE AND ALLOW FRACKING FLUID TO MIGRATE, PLACING CLIMATE AND GROUNDWATER AT RISK.



Photo Credit: New York State Dept. of Environmental Conservation

(See footnotes 612-665)



THE EVIDENCE IS IN:

**FRACK SAND MINING POSES POTENTIAL
EXPOSURE RISKS TO SILICA DUST, A
KNOWN CAUSE OF SILICOSIS AND LUNG
CANCER**

Save the Hills Alliance

(See footnotes 797-813)

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17

THE EVIDENCE IS IN:


FRACKING THREATENS SOIL AND FOOD PRODUCTION



(See footnotes 667-698)

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THE EVIDENCE IS IN:

FLOODING EXACERBATES THE RISKS OF FRACKING, AND FRACKING EXACERBATES THE RISKS OF FLOODING

(See footnotes 647-665)

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19

THE EVIDENCE IS IN:
EARTHQUAKES ARE A PROVEN CONSEQUENCE OF FRACKING-RELATED ACTIVITIES WHICH REGULATIONS CANNOT FIX



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(See footnotes 499-606)



**THE EVIDENCE IS IN:
LIVING NEAR FRACKING SITES
RAISES the RISKS FOR
PREGNANT WOMEN**

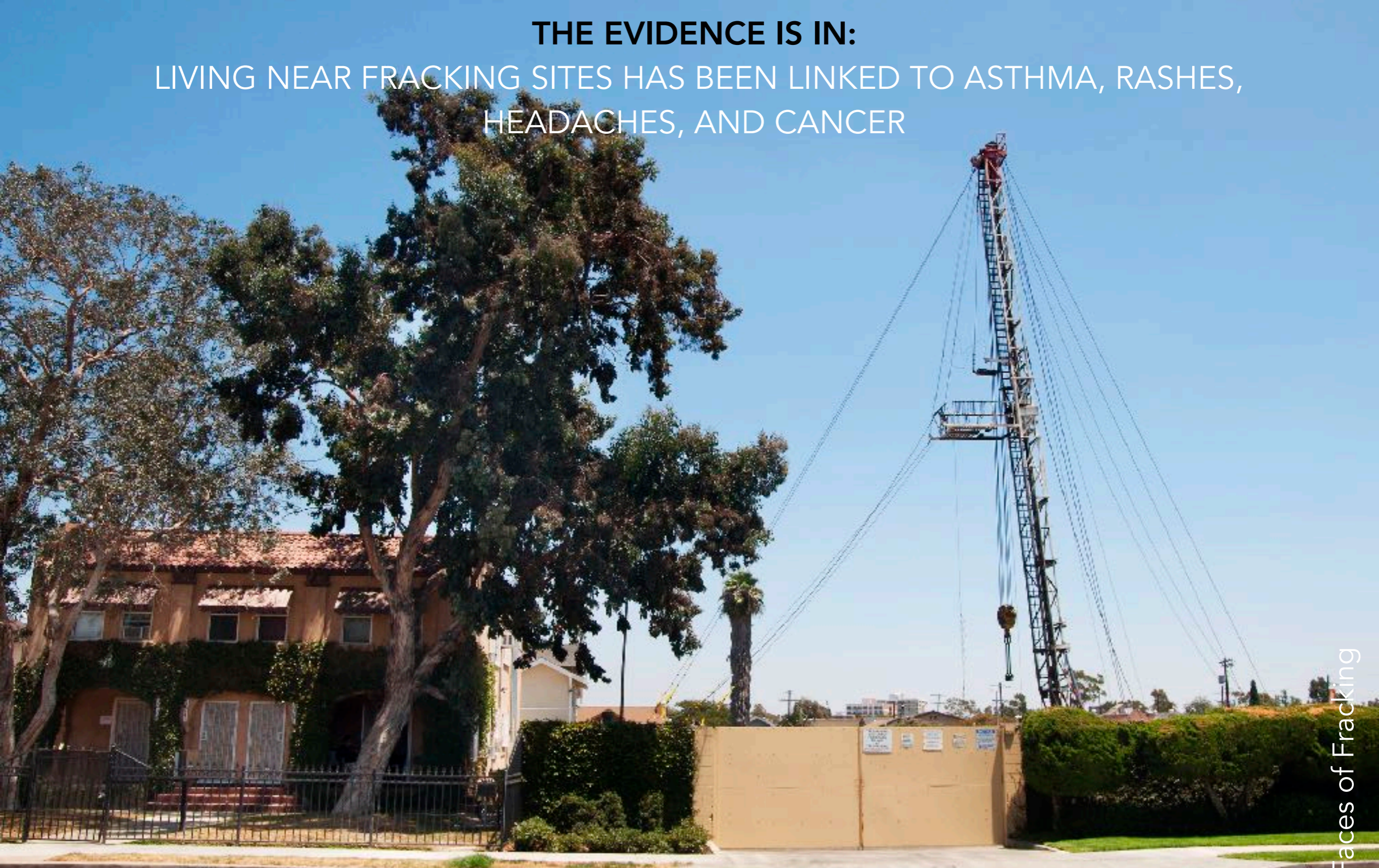


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(See footnotes 434, 436, 450, 472, 1075, 1080, 1081)



THE EVIDENCE IS IN:
LIVING NEAR FRACKING SITES HAS BEEN LINKED TO ASTHMA, RASHES,
HEADACHES, AND CANCER

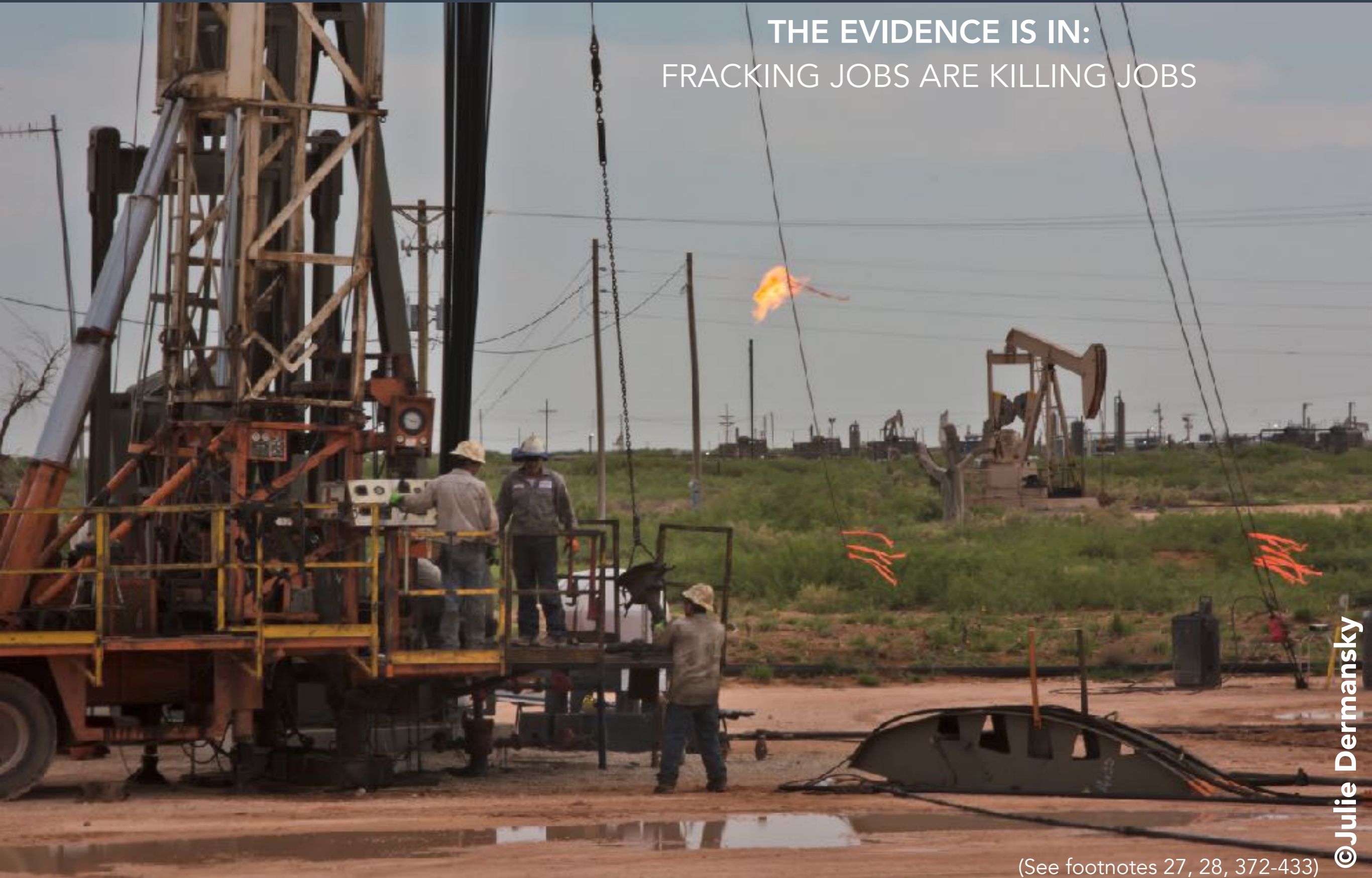


(See footnotes 438-498, 1063-1064)

©Faces of Fracking



THE EVIDENCE IS IN:
FRACKING JOBS ARE KILLING JOBS



(See footnotes 27, 28, 372-433)

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**THE EVIDENCE IS IN:
FRACKING BRINGS NOISE POLLUTION, LIGHT POLLUTION, AND STRESS**



(See footnotes 480-498)

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THE EVIDENCE IS IN:

OIL AND GAS WELLS LEAK, and
REGULATIONS CAN'T FIX IT



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(See footnotes 634-635, 637-638, 729-30)

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THE EVIDENCE IS IN:
FRACKING ACCELERATES CLIMATE CHANGE



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(See footnotes 29, 699-796, 848-850)

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THE EVIDENCE IS IN: FRACKING ATTRACTS VIOLENT CRIME AND SEX TRAFFICKING



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(See footnotes 439, 464, 465, 936, 956, 957, 960, 961, 964, 967, 970)

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THE EVIDENCE IS IN:

FRACKING IN CALIFORNIA COMPETES WITH AGRICULTURE FOR WATER



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(See footnotes 32, 144, 145, 150, 670, 675-77)

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THE EVIDENCE IS IN:
FRACKING IN FLORIDA PUTS WATER AT RISK

National Park Service

(See footnotes 33-38)

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**THE EVIDENCE IS IN:
FRACKING IS A PROVEN THREAT
TO DRINKING WATER**

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(See footnotes 141, 206, 210, and 214)

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THE EVIDENCE IS IN: AIR POLLUTION FOLLOWS FRACKING



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(See footnotes 50-135, 333, 444-45)



**THE EVIDENCE IS IN:
LNG IS A SECURITY THREAT AND SOURCE OF TOXIC POLLUTION**



Photo Credit: Dave R, Flickr creative commons

(See footnotes 909-26)



THE EVIDENCE IS IN:

**PIPELINES LEAK, CORRODE, SPILL, EXPLODE, INJURE,
KILL, AND PROMPT EVACUATIONS**



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(See footnotes 30, 816-868)

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THE EVIDENCE IS IN:
EMISSIONS FROM COMPRESSOR STATIONS ARE HIGHLY TOXIC



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(See footnotes 816-17, 823, 826-28, 830-31, 838, 857)

Health Effects Associated with Stack Chemical Emissions from NYS Natural Gas Compressor Stations: 2008-2014

A Technical Report Prepared for the Southwest
Pennsylvania Environmental Health Project

D.O. Carpenter, MD and P.N. Russo

Funded by the Park Foundation

October 12, 2017

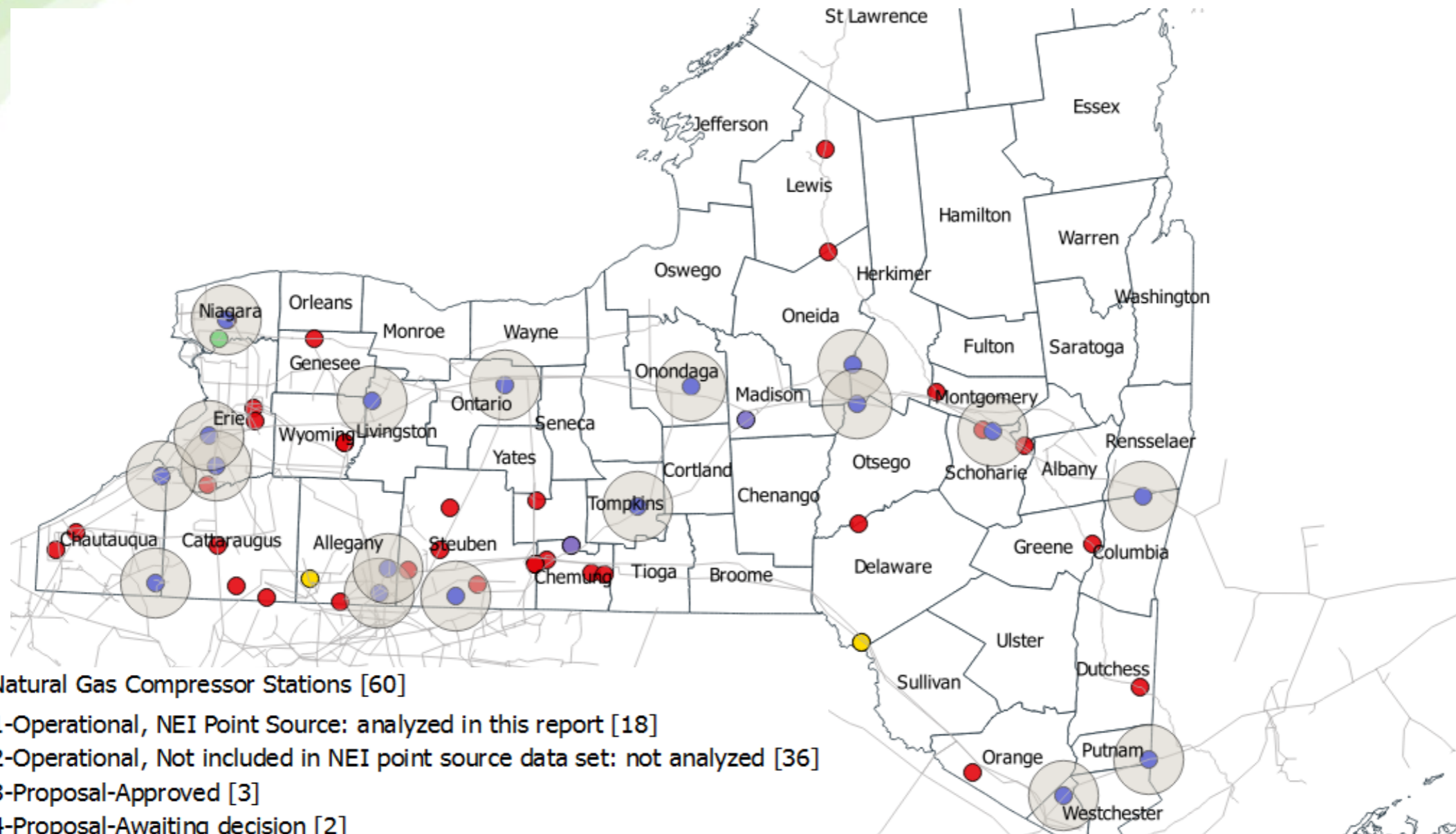
SWPA-EHP Presentation:

David Brown, ScD

Sujit Joginpally, MD, MBA, MPA, MAS

Celia Lewis, PhD

Title V Compressor Stations



NYS Natural Gas Compressor Stations [60]

- 1-Operational, NEI Point Source: analyzed in this report [18]
- 2-Operational, Not included in NEI point source data set: not analyzed [36]
- 3-Proposal-Approved [3]
- 4-Proposal-Awaiting decision [2]
- 5-Proposal-Denied [1]

56 operational natural gas compressor stations in NY State

Five major chemical emissions from New York Compressor stations

- Nitrogen oxides (45%)
- Carbon monoxide (31%)
- Formaldehyde (3%)
- PM 2.5 particulate matter (3%)
- Volatile Organic Hydrocarbons (12%) (28 compounds)

**18 of these compressor stations emitted more than 40 million pounds
of toxic pollutants between 2008-2014.**

Major Chemicals released from Title V Compressor Stations

- **NO₂**
 - Sources: cars, trucks, power plants, off road equipment and compressor stations.
 - Health effects:
 - Short term: irritate airways, can aggravate respiratory diseases, particularly asthma and may lead to coughing, wheezing or difficulty breathing.
 - Longer exposures: Development of asthma and increase susceptibility to respiratory infections.
- **CO**
 - Sources: Cars, trucks, gas stoves, compressor stations, etc.,
 - Health effects:
 - Replaces O₂ on Hemoglobin -> decrease O₂ to brain and heart
 - High levels, possibly indoors, -> dizziness, confusion, unconsciousness and death
 - Very high levels: Less likely outdoors, however elevated outdoor CO levels concerning for people with heart disease.
- **VOC's:**
 - Health effects -> Eyes, nose and throat irritation, headaches and nausea, damage to liver, kidney and CNS. Some are known to cause to cause cancer in humans.
 - Key signs or symptoms associated with exposure to VOCs include: Conjunctival irritation, nose and throat discomfort, headache, allergic skin reaction, dyspnea, decline in serum cholinesterase levels, nausea, epistaxis, fatigue and dizziness.
- **Formaldehyde:**
 - Short term health effects: levels exceeding 0.1 ppm. Watery eyes, burning sensation in eyes, nose and throat, cough, wheezing, nausea and skin irritation. EPA classified formaldehyde as a probable carcinogen at high or prolonged exposure.

70 chemicals were identified in compressor station emissions that are linked to 19 of 20 major categories of human disease.

Major Health Effects

- Respiratory problems
- Skin irritation
- Cardiovascular
- Neurological
- Anxiety, stress and sleep deprivation
- Long term health issues: Maybe Cancer

“Adding 40.2 million pounds of 70 contaminants to air already contaminated makes the air we breathe more contaminated and, by extension, increases the potential for human disease.”



FACT: One in five underground gas storage wells in the U.S. is similar in design to the well that failed at Aliso Canyon which prompted the evacuation of 8,000 families

©Earthworks

(See footnotes 31, 869-908)



THE EVIDENCE IS IN: FRACKING AND ITS INFRASTRUCTURE DISPROPORTIONATELY IMPACTS NON-WHITE AND/OR LOW-INCOME COMMUNITIES.



Photo Credit: Sarah Craig/Faces of Fracking

(See footnotes 42-49)



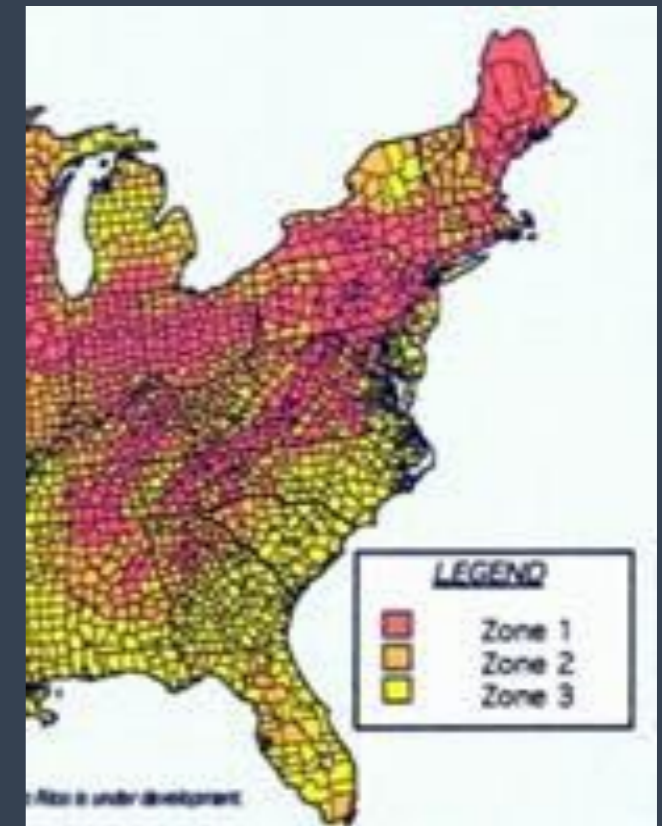
THE EVIDENCE IS IN: FRACKING RELEASES RADON, A LEADING CAUSE OF LUNG CANCER.



Photo Credit: Sarah Craig/Faces of Fracking

(See footnotes 347-371)

Exemption of Oil and Gas Exploration and Production Wastes from Federal Hazardous Waste Regulations



U.S. Env'tl. Prot. Agency, Office of Solid Waste, EPA530-K-01-004, *Exemption of Oil and Gas Exploration and Production Wastes from Federal Hazardous Waste Regulations (2002)*

[https://yosemite.epa.gov/oa/eab_web_docket.nsf/Attachments%20By%20ParentFilingId/945EF425FA4A9B4F85257E2800480C65/\\$FILE/28%20-%20RCRA%20E%26P%20Exemption.pdf](https://yosemite.epa.gov/oa/eab_web_docket.nsf/Attachments%20By%20ParentFilingId/945EF425FA4A9B4F85257E2800480C65/$FILE/28%20-%20RCRA%20E%26P%20Exemption.pdf)

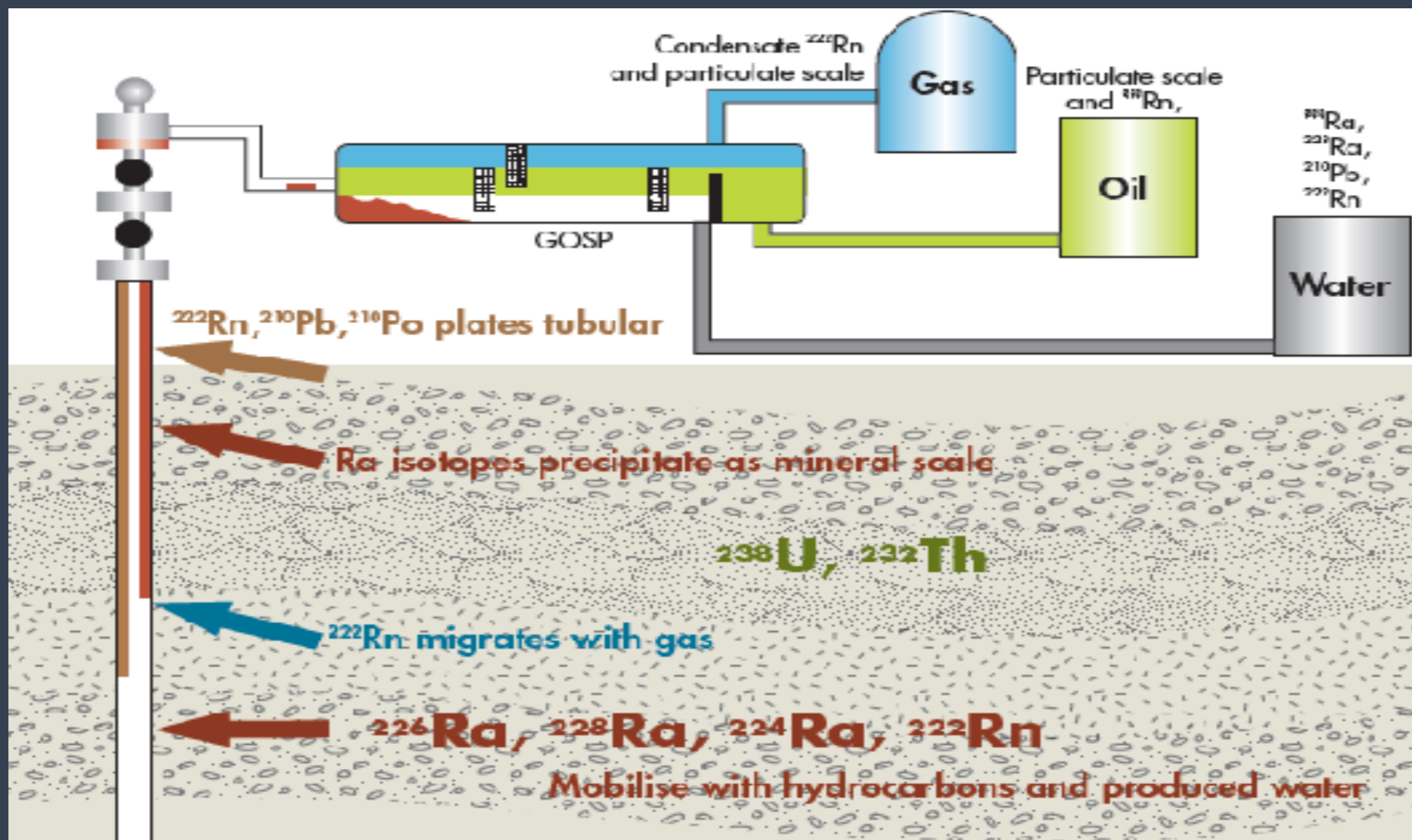


- The radioactive elements found in Marcellus shales include uranium, thorium, radium, polonium and radon.
- Federal exemption for radioactive waste exists.
- Radon travels with methane through the pipelines.
- Radium and radon levels from the Marcellus shale are significantly elevated.
- Radionuclides, the decay products of radon, such as Lead-210 and Polonium-210 can be found in pipeline scrapings as well as sludge accumulating in tank bottoms, gas/oil separators, dehydration vessels, compressor facilities, liquid natural gas (LNG) storage tanks and in waste pits.

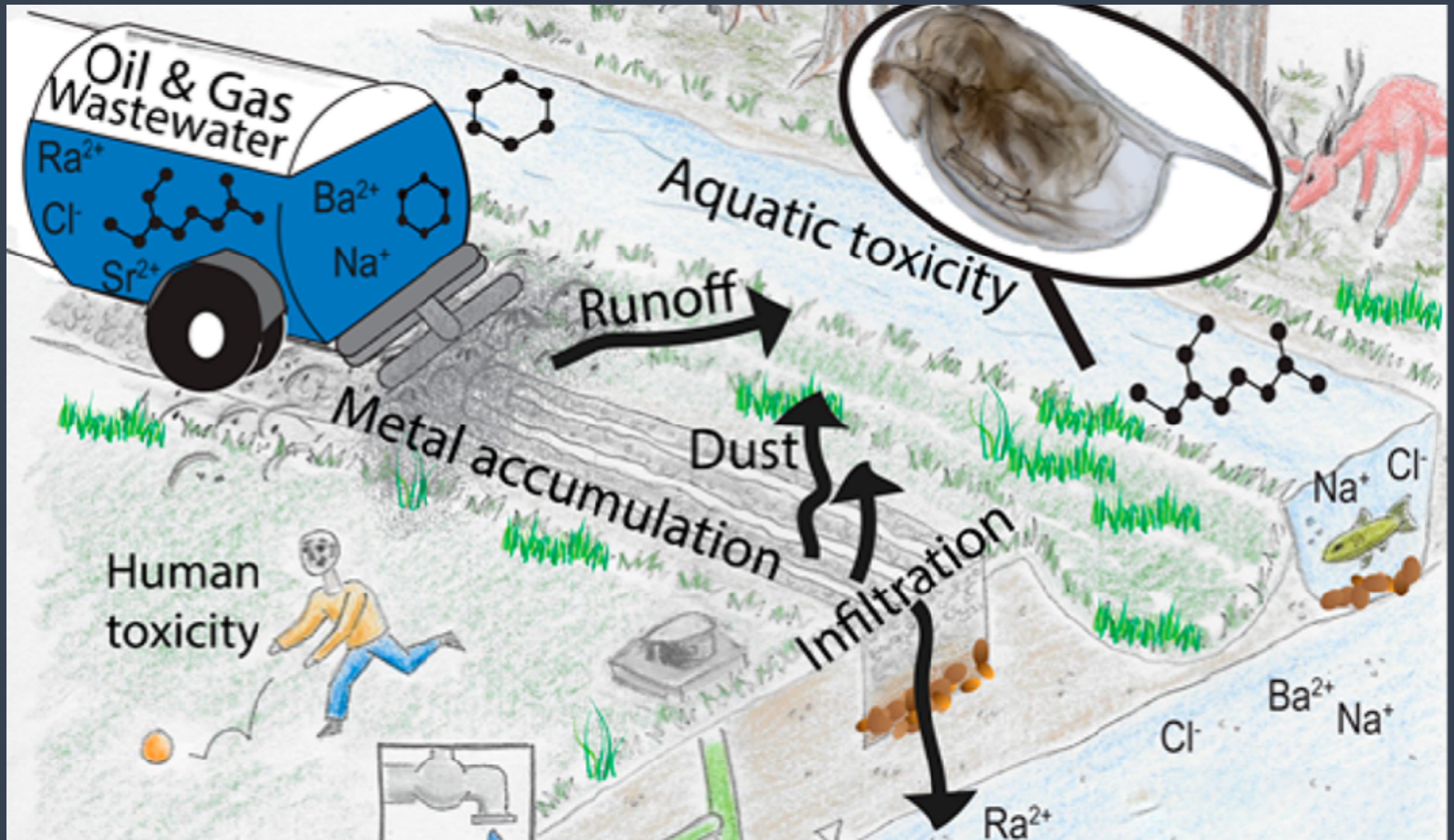


PIGS

Pipeline Inspection or Intervention
Gauge/Gizmo/Gadget



Study: "Environmental and Human Health Impacts of Spreading Oil and Gas Wastewater on Roads" shows that radium has been widely spread on Pennsylvania roadways without regulation



[DOI: 10.1021/acs.est.8b00716](https://doi.org/10.1021/acs.est.8b00716)

Environ. Sci. Technol. May 14, 2018



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PSR
45

In the United States, Vermont and New York have banned fracking, while Maryland has a moratorium in place through 2017.

Fracking was banned in France in 2011, and the ban was upheld in 2012. Bulgaria followed similarly in 2012. Germany first enacted a ban on fracking in 2012, re-affirming it in 2014. Scotland passed a ban in January of 2015.

The following countries have issued moratoriums until more is known about the environmental and health effects:

- UK
- Romania
- Denmark
- Ireland
- South Africa



OCTOBER
2016

1 **Adopted as amended**

2 **RESOLUTION 16-206**

3
4 **(Referred to Reference Committee B)**

5
6 **Subject:** **Pennsylvania Medical Society Support for a Moratorium on Fracking**
7 **Introduced by:** Michael DellaVecchia, MD, on behalf of the Philadelphia County Medical Society
8 **Author:** Walter Tsou, MD, Philadelphia County Medical Society

9
10 WHEREAS, As physicians of Pennsylvania, we care first and foremost about the health of our community
11 and believe that when an activity raises potential harm to human health, precautionary measures should
12 be taken until cause and effect relationships are fully established scientifically; and

13
14 WHEREAS, Act 13 (Impact Fee) of 2012 includes a provision that allows disclosure of proprietary chemicals
15 after a physician places a request in writing, but prohibits further disclosure of the chemicals to other
16 doctors or written into medical records, even if needed to properly care for a patient²; and

17
18 WHEREAS, Hydraulic fracturing, or fracking, is a method of oil and gas removal that involves blasting
19 between 4-6 million gallons of water, sand and chemicals under high pressure deep into the earth to break
20 up the Marcellus Shale to allow oil and gas extraction; and

21
22 WHEREAS, The Marcellus Shale covers about 60% of Pennsylvania and much of the mineral rights have
23 been leased to gas drilling companies; and

24
25 WHEREAS, The gas drilling industry has identified around 60 chemicals regularly used in fracking and
26 hundreds that could potentially be used²; and

27
28 WHEREAS, The gas drilling industry has many "proprietary" chemicals which are trade secrets so there is
29 no way to ascertain their toxicity, but fracking routinely employs numerous toxic chemicals, including
30 benzene and other volatile organic compounds³ and can also expose humans to harm from lead, arsenic,
31 and radioactivity brought back to the surface with fracking flowback fluid; and

32
33 WHEREAS, The gas industry has lobbied to exempt their industry from federal regulations of many
34 important environmental laws, including the Safe Drinking Act, the Clean Air Act, the Clean Water Act,
35 National Environmental Policy Act, Resource Conservation and Recovery Act, and CERCLA (the
36 Superfund Act) hampering any federal oversight of the industry⁴; and

37
38 WHEREAS, Many fracking chemicals and the radioactive isotopes of flowback fluid are known
39 carcinogens and evidence is mounting throughout the country that these chemicals are making their
way into aquifers and drinking water⁵, and

RESOLVED, That the Pennsylvania Medical Society urge and support a moratorium on new natural gas extraction using high-volume hydraulic fracturing in Pennsylvania; and be it further
RESOLVED, That the Pennsylvania Medical Society urge the state legislature Commonwealth of Pennsylvania to fund an independent health registry and commission research studies on the health effects of fracking.



Pennsylvania Constitution

Article I Section 27

“The people have a right to clean air, pure water, and to the preservation of the natural, scenic, historic and esthetic values of the environment.

Pennsylvania's public natural resources are the common property of all the people, including generations yet to come.

As trustee of these resources, the Commonwealth shall conserve and maintain them for the benefit of all the people.”

COMPREHENSIVE SOURCES OF HEALTH INFORMATION



PSR



- **PSE for Healthy Energy PSE STUDY CITATION DATABASE on Shale Gas & Tight Oil Development** <http://www.psehealthyenergy.org/site/view/1180#sthash.CHp8vErJ.dpuf>
- **Concerned Health Professionals of NY Compendium** <http://concernedhealthny.org/compendium/>
- **Southwest Pennsylvania Environmental Health Project**
www.environmentalhealthproject.org
724.260.5504 info@environmentalhealthproject.org
- **Physicians for Social Responsibility** www.psr.org
- **Fracktracker Alliance** www.fracktracker.org



Thank you

Lar917dy@gmail.com