

Oil and Natural Gas Production (ONGP) Health Concerns

ONGP in Pennsylvania

ONGP is a significant industry in Pennsylvania. The latest wave of ONGP activity in the state began in 2005 with the start of unconventional oil and natural gas development (UONGD). Unconventional wells are distinct from conventional wells due to the geologic formation being tapped. They use horizontal and vertical drilling as well as hydraulic fracturing ("fracking") to access once unavailable reservoirs of oil and natural gas.

As of Jun. 30, 2023, the Pennsylvania Department of Environmental Protection (DEP) reported there were 12,550 active unconventional wells in the state. Thirty-six of Pennsylvania's 67 counties had active unconventional wells, with Susquehanna (1,992), Washington (1,980), and Bradford (1,591) counties having the greatest numbers of active unconventional wells.*

ONGP Health Information Database

In response to growing concerns about UONGD, the Pennsylvania Department of Health (DOH) tracks public health complaints in a confidential database.

As of Jun. 30, 2023, DOH received 203 ONGP-related health complaints, with Washington (51), Susquehanna (44), and Bradford (23) counties having the most health complaints. Nine complaints were received in the first half of 2023.

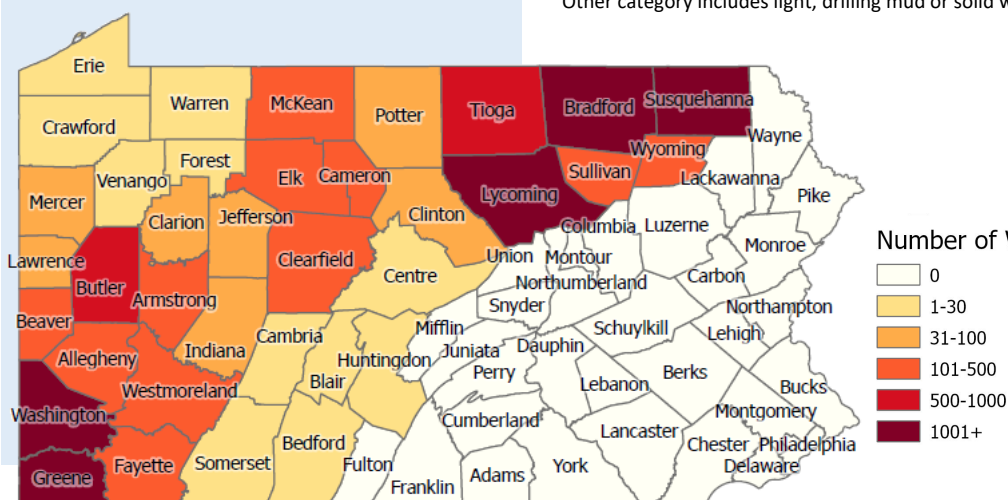


Figure 2. Active Unconventional Oil and Natural Gas Wells in Pennsylvania

*Based on the number of active wells from DEP Spud Data Report, Wells Drilled by County, 6/30/2023

Figure 1. Total Health Complaints Logged by DOH Division of Environmental Health Epidemiology Since 2011 (N=203)

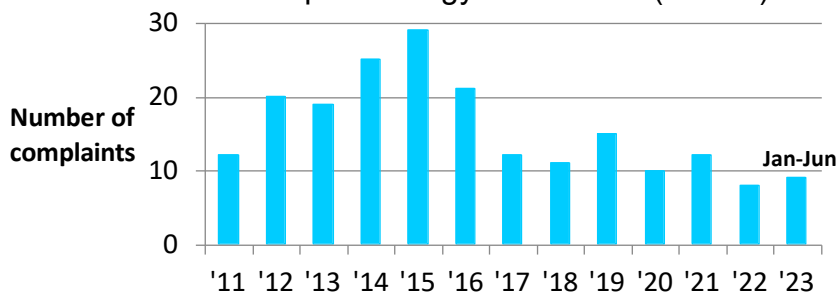


Table 1. Reason for Contact (N=203)

Reason	Jan-Jun 2023	2023 YTD	Total since 2011	% of total since 2011
General inquiry	0	0	24	11.8%
News update/alert	0	0	3	1.5%
Information sharing	0	0	12	5.9%
Formal health complaint ^a	9	9	164	80.8%

^aGeneral inquiries, news updates/alerts and information sharing cases were no longer logged in the health complaints registry effective March 2017.

Table 2. Environmental Source of Concern^a (N=203)

Source	Jan-Jun 2023	2023 YTD	Total since 2011	% of total since 2011
Water	8	8	148	72.9%
Air	2	2	110	54.2%
Soil	1	1	35	17.2%
Noise	1	1	60	29.6%
Truck traffic	0	0	54	26.6%
Other ^b	0	0	53	26.1%
Missing	0	0	9	4.4%

^aMore than one environmental source of concern may be selected per complaint.

^bOther category includes light, drilling mud or solid waste, vibrations or seismic testing, etc.

Referrals

Eighty nine percent of health complaints received in the first half of 2023 were referred by DEP.

Eleven percent of health complaints received in the first half of 2023 are from individuals that contacted DOH directly.

Table 3. Demographic Information of Individuals in ONGP Registry With a Formal Health Complaint (N=164 formal health complaints, 331 individuals*)

Characteristic	Jan-Jun 2023	2023 YTD	Total since 2011	% of total since 2011	Demographic Summary This table summarizes the demographic and health insurance information of individuals included in the formal health complaints received for Q1 & Q2 2023, YTD 2023, and total since 2011. This does not necessarily reflect the demographic characteristics of the entire community.
Female	7	7	173	52.3%	
Male	8	8	152	45.9%	
Missing	2	2	6	1.8%	
Non-Hispanic white	10	10	171	51.7%	
Non-Hispanic black	0	0	0	0.0%	
Hispanic	0	0	0	0.0%	
Other	0	0	5	1.5%	
Missing	5	5	155	46.8%	
0-17 years old	2	2	52	15.9%	
18-64 years old	8	8	163	49.4%	
65+ years old	4	4	64	19.1%	
Missing	3	3	52	15.6%	
Any private insurance	7	7	120	36.3%	
Public only insurance	4	4	43	13.0%	
Uninsured	0	0	8	2.4%	
Missing	7	7	160	48.3%	

*Table excludes general inquiries, news updates and information sharing complaints. Each health complaint may pertain to more than one individual.

Race/ethnicity, age, and health insurance were not systematically collected until March 2017. Percentages within each group may not sum to 100% due to rounding.

Table 4. Health Information of Individuals in ONGP Registry With a Formal Health Complaint (N=164 formal health complaints, 331 individuals*)

Symptom group	Jan-Jun 2023	2023 YTD	Total since 2011	% of total since 2011	Symptom Summary This table summarizes the symptoms reported by individuals for Q1 & Q2 2023, YTD 2023, and total since 2011.
Cardiovascular	3 (1) [†]	3 (1) [†]	46 (12) [†]	13.9%	
Dermatological	5	5	128	38.7%	
Ear	8	8	44	13.3%	
Eye	5	5	65	19.6%	
Gastrointestinal	5	5	117	35.3%	
General systemic ^a	9	9	112	33.8%	
Neurological	6 (2) [†]	6 (2) [†]	141 (10) [†]	42.6%	
Psychological	6	6	71 (8) [†]	21.5%	
Respiratory	8	8	162 (22) [†]	48.9%	
Urogenital	3 (2) [†]	3 (2) [†]	37 (8) [†]	11.2%	
Missing/None	4	4	41	12.4%	

*Table excludes general inquiries, news updates and information sharing complaints. Each health complaint may pertain to more than one individual.

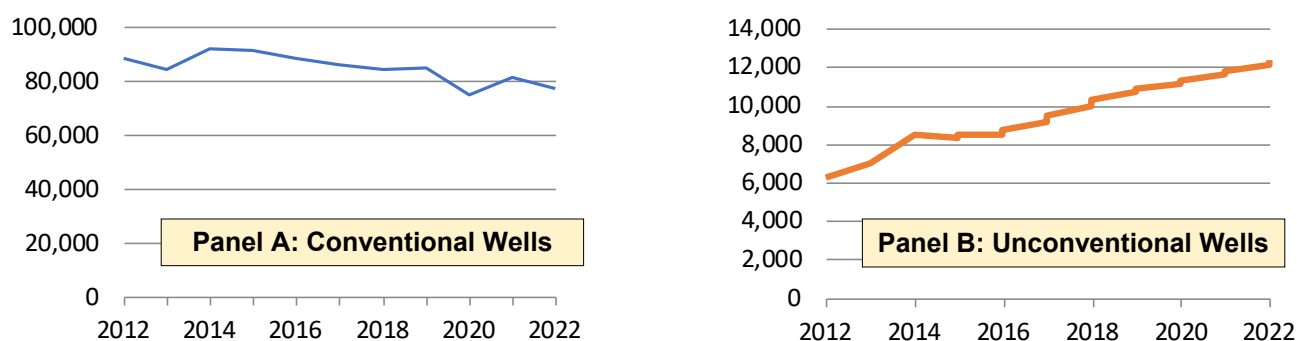
^aIncludes sleep disturbance, fatigue, fever, chills, night sweats, shaking, weight loss/gain, decreased appetite, muscle aches/cramps, joint pain, fainting, and swelling

[†]Numbers in parentheses correspond to newly diagnosed conditions relevant to that symptom group: heart disease and/or hypertension (cardiovascular group), neurological disease (neurological), psychological disease (psychological), asthma or COPD (respiratory), kidney disease or failure (urogenital). They do not represent pre-existing conditions. Therefore, someone could report that UONGD exacerbated their asthma (noted in the respiratory count) but was diagnosed before UONGD activity started in their area (not reflected in number of parentheses).

Health Overview 2023 Year-to-Date Based on Formal Health Complaints (N=9 complaints, 17 individuals)

- ☐ Individuals who reported being in poor or fair health: 29%
- ☐ Individuals who reported being disabled: 6%
- ☐ Individuals who reported being diagnosed with cancer since the beginning of 2021: 15%
- ☐ Individuals who visited the doctor for their health concerns: 59%
- ☐ Three (33%) of 2023 YTD complaint cases had concerns about animal health (livestock or pets).

Figure 3. Total Number of Active Oil and Natural Gas Wells in Pennsylvania, 2012 to 2022



The tables below show data for counties with more than 500 active unconventional oil and natural gas wells as of June 30, 2023.

Susquehanna (1,992) Washington (1,980) Bradford (1,591)
Greene (1,529) Lycoming (1,018) Tioga (895) Butler (655)

Table 5. Environmental Source of Concern by County (All Complaints Since 2011)

Source	Washington	Susquehanna	Greene	Bradford	Lycoming	Tioga	Butler
Water	31	38	8	21	2	8	3
Air	38	20	5	6	4	2	2
Soil	11	5	3	4	0	2	0
Noise	24	11	4	4	0	1	1
Truck traffic	22	10	4	4	1	2	1
Other ^a	22	11	2	5	0	1	1
Missing	3	0	0	0	1	0	0

County-specific numbers of complaint cases are as follows: 51 (Washington), 44 (Susquehanna), 10 (Greene), 23 (Bradford), 6 (Lycoming), 8 (Tioga), and 3 (Butler). More than one environmental source of concern may be selected per complaint.

^aOther category includes light, drilling mud or solid waste, vibrations or seismic testing, etc.

Table 6. Health Symptoms by County (Individuals With a Formal Health Complaint Since 2011)

Symptom group	Washington	Susquehanna	Greene	Bradford	Lycoming	Tioga	Butler
Cardiovascular	8	8	3	12	0	1	0
Dermatological	28	42	12	12	6	3	0
Ear	14	9	0	3	2	1	0
Eye	19	12	2	5	3	5	0
Gastrointestinal	27	33	6	15	0	4	2
General systemic ^a	34	19	11	11	0	4	2
Neurological	38	27	8	15	1	8	3
Psychological	29	14	3	5	3	1	2
Respiratory	51	32	13	16	4	6	2
Urogenital	7	12	3	4	3	0	1
Missing/None	19	3	3	8	0	0	1

County-specific numbers of individuals are as follows: 87 (Washington), 82 (Susquehanna), 23 (Greene), 35 (Bradford), 8 (Lycoming), 16 (Tioga), and 5 (Butler).

^aIncludes sleep disturbance, fatigue, fever, chills, night sweats, shaking, weight loss/gain, decreased appetite, muscle aches/cramps, joint pain, fainting, and swelling. Each individual can report more than one symptom or symptom category.

By far, most oil and natural gas-related complaints received by DOH have been related to UONGD. We have received five complaints related to conventional oil and natural gas development since 2011. Symptoms are self-reported and are not clinically verified. Symptoms reported are general in nature and cannot specifically be attributed to ONGP.

Figures in this report may slightly differ from previous reports due to the potential for ongoing data collection. Please contact the Division of Environmental Health Epidemiology for more details at 717-787-3350 or env.health.concern@pa.gov.