

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 Sept. 30, 2022, the Pennsylvania Department of Environmental Protection (DEP) reported there were 12,182 active unconventional wells in the state. Thirty-five of Pennsylvania’s 67 counties had active unconventional wells, with Susquehanna (1,921), Washington (1,920), and Greene (1,527) counties having the greatest numbers of active unconventional wells.*

ONGP Health Registry

In response to growing concerns about UONGD, the Pennsylvania Department of Health (DOH) developed a confidential health registry to better track and respond to public health complaints related to ONGP.

As of Sept. 30, 2022, DOH received 193 ONGP-related health complaints, with Washington (46), Susquehanna (41), and Bradford (23) counties having the most health complaints. Three complaints were received in Quarter 3 2022.

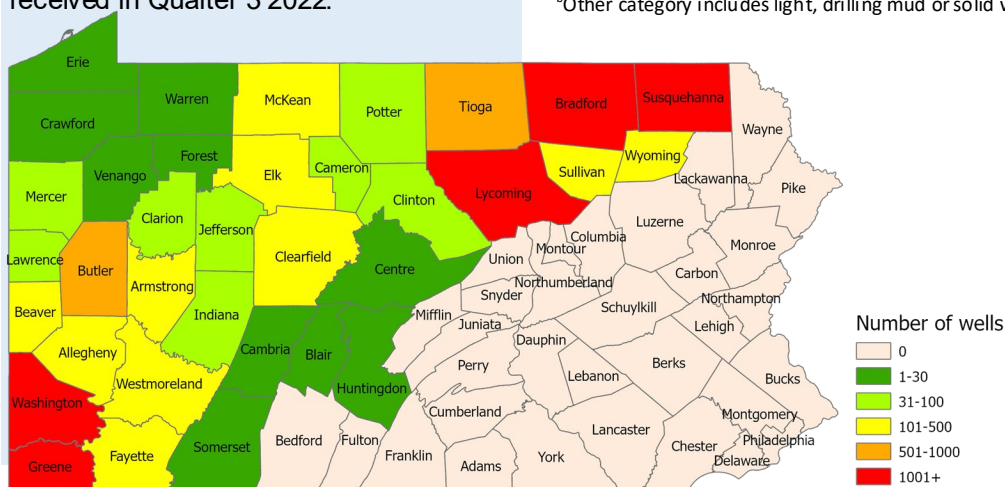


Figure 2. Active Unconventional Oil and Natural Gas Wells in Pennsylvania

*Based on the number of active wells from DEP Spud Data Report, Wells Drilled by County, 9/30/2022

Figure 1. Total Health Complaints Logged by DOH Division of Environmental Health Epidemiology Since 2011 (N=193)

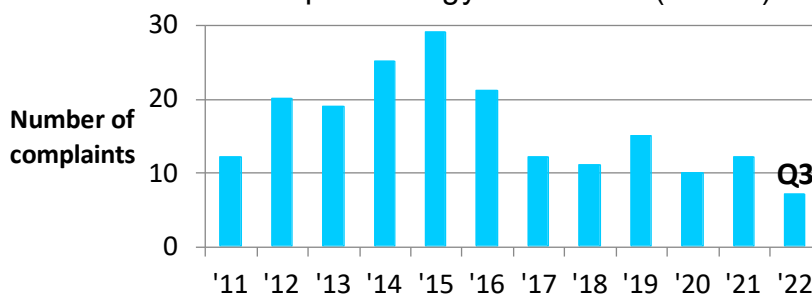


Table 1. Reason for Contact (N=193)

Reason	Q3 2022	2022 YTD	Total since 2011	% of total since 2011
General inquiry	0	0	24	12.4%
News update/alert	0	0	3	1.6%
Information sharing	0	0	12	6.2%
Formal health complaint ^a	3	7	154	79.8%

^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=193)

Source	Q3 2022	2022 YTD	Total since 2011	% of total since 2011
Water	2	6	139	72.0%
Air	2	2	108	56.0%
Soil	0	0	34	17.6%
Noise	0	0	59	30.6%
Truck traffic	1	1	54	28.0%
Other ^b	1	1	53	27.5%
Missing	0	0	9	4.7%

^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

Thirty three percent of Q3 2022 health complaints were referred by DEP.

Sixty six percent of Q3 2022 health complaints contacted DOH directly.

Table 3. Demographic Information of Individuals in ONGP Registry With a Formal Health Complaint (N=154 formal health complaints, 309 individuals*)

Characteristic	Q3 2022	2022 YTD	Total since 2011	% of total since 2011
Female	3	6	164	53.1%
Male	0	2	141	45.6%
Missing	0	0	4	1.3%
Non-Hispanic white	3	8	152	49.2%
Non-Hispanic black	0	0	0	0.0%
Hispanic	0	0	0	0.0%
Other	0	0	5	1.6%
Missing	0	0	152	49.2%
0-17 years old	0	0	47	15.2%
18-64 years old	2	4	153	49.5%
65+ years old	1	4	60	19.4%
Missing	0	0	49	15.9%
Any private insurance	3	5	109	35.3%
Public only insurance	0	3	38	12.3%
Uninsured	0	0	8	2.6%
Missing	0	0	154	49.8%

Demographic Summary

This table summarizes the demographic and health insurance information of individuals included in the formal health complaints received for Q3 2022, YTD 2022, and total since 2011. This does not necessarily reflect the demographic characteristics of the entire community.

*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=154 formal health complaints, 309 individuals*)

Symptom group	Q3 2022	2022 YTD	Total since 2011	% of total since 2011
Cardiovascular	0	0	43 (11)†	13.9%
Dermatological	1	2	118	38.2%
Ear	0	0	36	11.7%
Eye	0	0	60	19.4%
Gastrointestinal	1	3	112	36.2%
General systemic ^a	1	1	103	33.3%
Neurological	1	2	130 (8)†	42.1%
Psychological	0	0	65 (8)†	21.0%
Respiratory	1	4	153 (22)†	49.5%
Urogenital	0	0	34 (6)†	11.0%
Missing/None	0	1	37	12.0%

Symptom Summary

This table summarizes the symptoms reported by individuals for Q3 2022, YTD 2022, and total since 2011.

*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

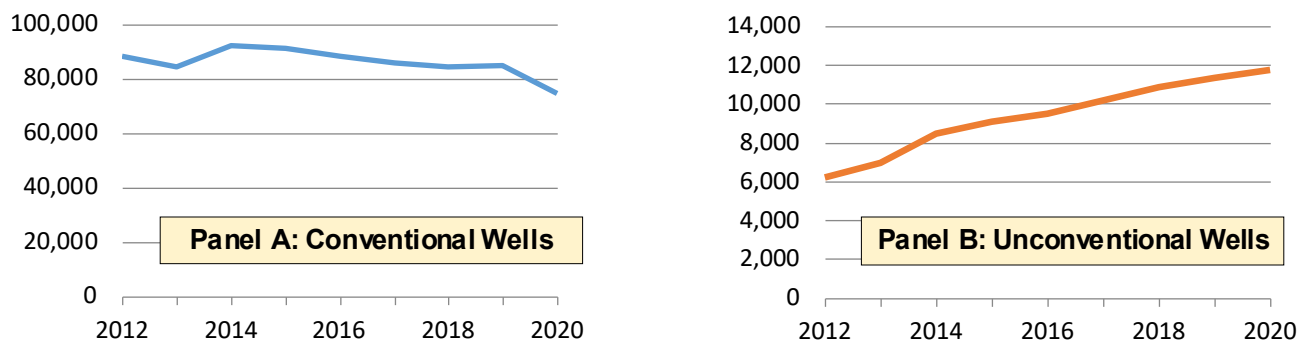
†Numbers in parentheses correspond to newly diagnosed conditions relevant to that symptom group: heart disease and/or hypertension (cardiovascular group), neurological disease (neurological), psychological disease (psychological), asthma or COPD (respiratory), kidney disease or failure (urogenital). They do not represent pre-existing conditions. Therefore, some one 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 2022 Year-to-Date Based on Formal Health Complaints (N=7 complaint, 8 individuals)

- Individuals who reported being in poor or fair health: 50%
- Individuals who reported being disabled: 25%
- Individuals who reported being diagnosed with cancer since the beginning of 2021: 25%
- Individuals who visited the doctor for their health concerns: 88%
- One (14%) of 2022 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 2020



The tables below show data for counties with more than 500 active unconventional oil and natural gas wells as of September 30, 2022.

Susquehanna (1,921) Washington (1,920) Greene (1,527)
Bradford (1,516) Lycoming (1,005) Tioga (873) Butler (629)

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

Source	Washington	Susquehanna	Greene	Bradford	Lycoming	Tioga	Butler
Water	26	36	8	21	2	7	3
Air	36	20	5	6	4	2	2
Soil	10	5	3	4	0	2	0
Noise	24	10	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: 46 (Washington), 41 (Susquehanna), 10 (Greene), 23 (Bradford), 6 (Lycoming), 7 (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	6	8	3	12	0	1	0
Dermatological	23	37	12	12	6	3	0
Ear	8	7	0	3	2	1	0
Eye	15	12	2	5	3	5	0
Gastrointestinal	23	33	6	15	0	3	2
General systemic ^a	26	19	11	11	0	4	2
Neurological	32	22	8	15	1	8	3
Psychological	23	14	3	5	3	1	2
Respiratory	43	31	13	16	4	6	2
Urogenital	6	12	3	4	3	0	1
Missing/None	16	3	3	8	0	0	1

County-specific numbers of individuals are as follows: 75 (Washington), 74 (Susquehanna), 23 (Greene), 35 (Bradford), 8 (Lycoming), 15 (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.

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.