

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 by the geologic formation being tapped. They use horizontal and vertical drilling and hydraulic fracturing ("fracking") to access traditionally unavailable reservoirs of oil and natural gas.

As of Jan. 31, 2018, the Pennsylvania Department of Environmental Protection (DEP) reported there were 9,504 active unconventional wells in the state. Thirty-four of Pennsylvania's 67 counties had active unconventional wells, with Washington (1,598), Susquehanna (1,349) and Greene (1,180) 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 Jan. 31, 2018, DOH received 140 ONGP-related health complaints, with Washington (37), Susquehanna (26) and Bradford (21) counties having the most health complaints.

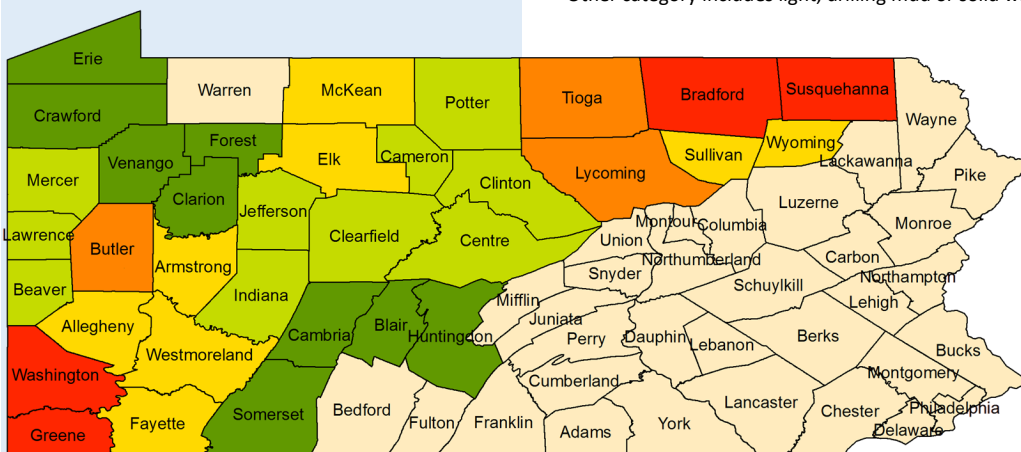


Figure 2. Active Unconventional Oil and Natural Gas Wells in Pennsylvania, as of Jan. 31, 2018*

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

Figure 1. Total Health Complaints Logged by DOH Division of Environmental Health Epidemiology (N=140)

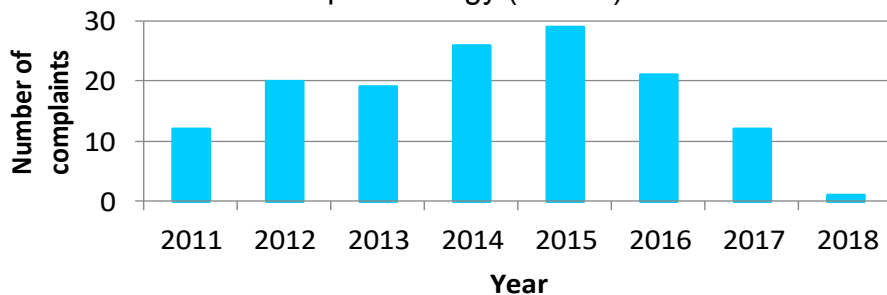


Table 1. Reason for Contact (N=140)

Reason	Jan 2018	2018 YTD	Total since 2011	% of Total since 2011
General inquiry	0	0	24	17.1%
News update/alert	0	0	3	2.1%
Information sharing	0	0	12	8.6%
Formal health complaint ^a	1	1	101	72.1%

^a General 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=140)

Source	Jan 2018	2018 YTD	Total since 2011	% of Total since 2011
Water	1	1	96	68.6%
Air	1	1	85	60.7%
Soil	0	0	21	15.0%
Noise	1	1	47	33.6%
Truck traffic	1	1	45	32.1%
Other ^b	1	1	42	30.0%
Missing	0	0	9	6.4%

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

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

Referrals

One hundred percent of health complaints received in January 2018 were self-referred.

Number of wells

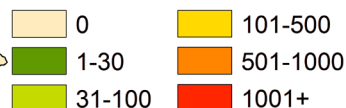


Table 3. Demographic Information of Individuals in ONGP Registry with a Formal Health Complaint (N=101 formal health complaints, 219 individuals*)

Characteristic	Jan 2018	2018 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 the month of January 2018, YTD 2018 and total since 2011. This does not necessarily reflect the demographic characteristics of the entire community.
Female	1	1	115	52.5%	
Male	1	1	100	45.7%	
Missing	0	0	4	1.8%	
Non-Hispanic white	2	2	55	25.1%	
Non-Hispanic black	0	0	0	0.0%	
Hispanic	0	0	0	0.0%	
Other	0	0	1	0.0%	
Missing	0	0	163	74.4%	
0-17 years old	0	0	38	17.4%	
18-64 years old	0	0	96	43.8%	
65+ years old	2	2	29	13.2%	
Missing	0	0	56	25.6%	
Any private insurance	2	2	44	20.1%	
Public only insurance	0	0	12	5.5%	
Uninsured	0	0	5	2.3%	
Missing	0	0	158	72.1%	

* 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=101 formal health complaints, 219 individuals*)

Symptom group	Jan 2018	2018 YTD	Total since 2011	% of Total since 2011	Symptom Summary This table summarizes the symptoms reported by individuals for the month of January 2018, YTD 2018 and total since 2011.
Cardiovascular	0	0	35 (9) [†]	16.0%	
Dermatological	2	2	87	39.7%	
Ear	1	1	24	11.0%	
Eye	2	2	45	20.5%	
Gastrointestinal	0	0	78	35.6%	
General systemic ^a	1	1	74	33.8%	
Neurological	1	1	97 (3) [†]	44.3%	
Psychological	1	1	49 (7) [†]	22.4%	
Respiratory	2 (1) [†]	2 (1) [†]	117 (18) [†]	53.4%	
Urogenital	0	0	20 (6) [†]	9.1%	
Missing	0	0	36	16.4%	

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

^a Includes 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 2018 Year-to-Date based on Formal Health Complaints (N=1 complaints, 2 individuals)

- ☐ 0% of individuals reported being in poor or fair health
- ☐ 0% of individuals reported being disabled
- ☐ 0% of individuals reported being diagnosed with cancer since 2011
- ☐ 100% of individuals visited the doctor for their health concerns
- ☐ One (100%) 2018 YTD complaint case had concerns about animal health (livestock or pets)



The following charts show data for counties that have more than 500 active unconventional oil and natural gas wells. As of Jan. 31, 2018, seven counties had more than 500 active unconventional wells (exact number of wells in parentheses):

Washington (1,598) Susquehanna (1,349) Greene (1,180)
Bradford (1,155) Lycoming (843) Tioga (723) Butler (507)

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

Source	Washington	Susquehanna	Greene	Bradford	Lycoming	Tioga	Butler
Water	22	21	4	19	1	2	3
Air	30	13	3	6	3	1	2
Soil	8	1	2	4	0	0	0
Noise	19	8	3	3	0	1	1
Truck traffic	20	8	2	3	1	1	1
Other ^a	19	8	2	4	0	0	1
Missing	3	0	0	0	1	0	0

County-specific numbers of complaint cases are as follows: 37 (Washington), 26 (Susquehanna), 4 (Greene), 21 (Bradford), 5 (Lycoming), 2 (Tioga) and 3 (Butler). More than one environmental source of concern may be selected per complaint.

^a Other 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	5	7	3	12	0	1	0
Dermatological	22	24	6	10	6	0	0
Ear	7	4	0	3	0	0	0
Eye	15	9	1	5	1	1	0
Gastrointestinal	21	22	6	14	0	0	2
General systemic ^a	21	14	6	10	0	2	2
Neurological	26	19	6	15	1	2	3
Psychological	19	11	2	4	0	0	2
Respiratory	36	27	8	15	1	1	2
Urogenital	6	6	0	4	1	0	1
Missing	16	2	3	8	0	0	1

County-specific numbers of individuals are as follows: 62 (Washington), 52 (Susquehanna), 12 (Greene), 33 (Bradford), 7 (Lycoming), 2 (Tioga) and 5 (Butler).

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

By far, the vast majority of complaints received by DOH has been related to unconventional oil and natural gas development. We have received two complaints related to conventional oil and natural gas development.

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.

