

# 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 March 31, 2018, the Pennsylvania Department of Environmental Protection (DEP) reported there were 9,635 active unconventional wells in the state. Thirty-four of Pennsylvania's 67 counties had active unconventional wells, with Washington (1,608), Susquehanna (1,369) and Greene (1,202) 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 March 31, 2018, DOH received 140 ONGP-related health complaints, with Washington (37), Susquehanna (26) and Bradford (21) counties having the most health complaints.

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

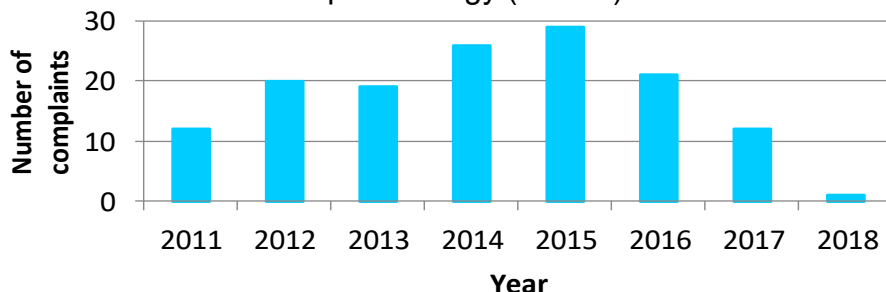


Table 1. Reason for Contact (N=140)

| Reason                               | Mar 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 <sup>a</sup> | 0        | 1        | 101              | 72.1%                 |

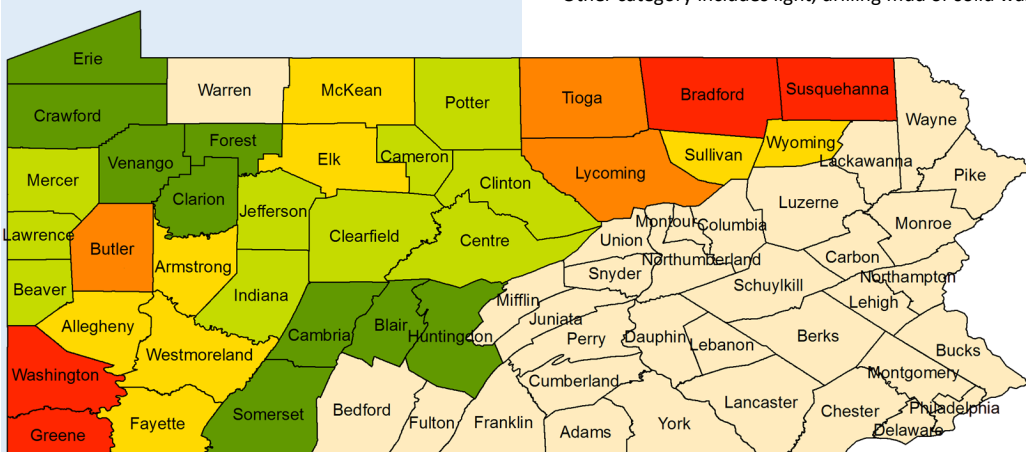
<sup>a</sup>General inquiries, news updates/alerts and information sharing cases were no longer logged in the health complaints registry effective March 2017.

Table 2. Environmental Source of Concern<sup>a</sup> (N=140)

| Source             | Mar 2018 | 2018 YTD | Total since 2011 | % of Total since 2011 |
|--------------------|----------|----------|------------------|-----------------------|
| Water              | 0        | 1        | 96               | 68.6%                 |
| Air                | 0        | 1        | 86               | 61.4%                 |
| Soil               | 0        | 0        | 21               | 15.0%                 |
| Noise              | 0        | 1        | 47               | 33.6%                 |
| Truck traffic      | 0        | 1        | 45               | 32.1%                 |
| Other <sup>b</sup> | 0        | 1        | 42               | 30.0%                 |
| Missing            | 0        | 0        | 9                | 6.4%                  |

<sup>a</sup>More than one environmental source of concern may be selected per complaint.

<sup>b</sup>Other category includes light, drilling mud or solid waste, vibrations or seismic testing, etc.



## Referrals

No cases in March 2018

## Number of wells

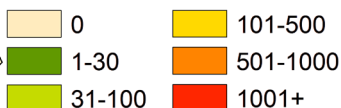


Figure 2. Active Unconventional Oil and Natural Gas Wells in Pennsylvania, as of March 31, 2018\*

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

Table 3. Demographic Information of Individuals in ONGP Registry with a Formal Health Complaint (N=101 formal health complaints, 222 individuals\*)

| Characteristic        | Mar 2018 | 2018 YTD | Total since 2011 | % of Total since 2011 | <b>Demographic Summary</b><br>This table summarizes the demographic and health insurance information of individuals included in the formal health complaints received for the month of March 2018, YTD 2018 and total since 2011. This does not necessarily reflect the demographic characteristics of the entire community. |
|-----------------------|----------|----------|------------------|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Female                | 0        | 1        | 116              | 52.3%                 |                                                                                                                                                                                                                                                                                                                              |
| Male                  | 0        | 1        | 102              | 45.9%                 |                                                                                                                                                                                                                                                                                                                              |
| Missing               | 0        | 0        | 4                | 1.8%                  |                                                                                                                                                                                                                                                                                                                              |
| Non-Hispanic white    | 0        | 2        | 66               | 29.7%                 |                                                                                                                                                                                                                                                                                                                              |
| Non-Hispanic black    | 0        | 0        | 0                | 0.0%                  |                                                                                                                                                                                                                                                                                                                              |
| Hispanic              | 0        | 0        | 0                | 0.0%                  |                                                                                                                                                                                                                                                                                                                              |
| Other                 | 0        | 0        | 1                | 0.0%                  |                                                                                                                                                                                                                                                                                                                              |
| Missing               | 0        | 0        | 155              | 69.8%                 |                                                                                                                                                                                                                                                                                                                              |
| 0-17 years old        | 0        | 0        | 38               | 17.1%                 |                                                                                                                                                                                                                                                                                                                              |
| 18-64 years old       | 0        | 0        | 103              | 46.4%                 |                                                                                                                                                                                                                                                                                                                              |
| 65+ years old         | 0        | 2        | 31               | 14.0%                 |                                                                                                                                                                                                                                                                                                                              |
| Missing               | 0        | 0        | 50               | 22.5%                 |                                                                                                                                                                                                                                                                                                                              |
| Any private insurance | 0        | 2        | 48               | 21.6%                 |                                                                                                                                                                                                                                                                                                                              |
| Public only insurance | 0        | 0        | 18               | 8.1%                  |                                                                                                                                                                                                                                                                                                                              |
| Uninsured             | 0        | 0        | 5                | 2.3%                  |                                                                                                                                                                                                                                                                                                                              |
| Missing               | 0        | 0        | 151              | 68.0%                 |                                                                                                                                                                                                                                                                                                                              |

\*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, 222 individuals\*)

| Symptom group                 | Mar 2018 | 2018 YTD           | Total since 2011      | % of Total since 2011 | <b>Symptom Summary</b><br>This table summarizes the symptoms reported by individuals for the month of March 2018, YTD 2018 and total since 2011. |
|-------------------------------|----------|--------------------|-----------------------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| Cardiovascular                | 0        | 0                  | 38 (10) <sup>†</sup>  | 17.1%                 |                                                                                                                                                  |
| Dermatological                | 0        | 2                  | 87                    | 39.2%                 |                                                                                                                                                  |
| Ear                           | 0        | 1                  | 29                    | 13.1%                 |                                                                                                                                                  |
| Eye                           | 0        | 2                  | 48                    | 21.6%                 |                                                                                                                                                  |
| Gastrointestinal              | 0        | 0                  | 81                    | 36.5%                 |                                                                                                                                                  |
| General systemic <sup>a</sup> | 0        | 1                  | 76                    | 34.2%                 |                                                                                                                                                  |
| Neurological                  | 0        | 1                  | 98 (3) <sup>†</sup>   | 44.1%                 |                                                                                                                                                  |
| Psychological                 | 0        | 1                  | 52 (7) <sup>†</sup>   | 23.4%                 |                                                                                                                                                  |
| Respiratory                   | 0        | 2 (1) <sup>†</sup> | 125 (19) <sup>†</sup> | 56.3%                 |                                                                                                                                                  |
| Urogenital                    | 0        | 0                  | 22 (6) <sup>†</sup>   | 9.9%                  |                                                                                                                                                  |
| Missing                       | 0        | 0                  | 36                    | 16.2%                 |                                                                                                                                                  |

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

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

<sup>†</sup>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 March 31, 2018, seven counties had more than 500 active unconventional wells (exact number of wells in parentheses):

**Washington (1,608) Susquehanna (1,369) Greene (1,202)**  
**Bradford (1,162) Lycoming (858) Tioga (725) Butler (519)**

**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         | 14          | 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 <sup>a</sup> | 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.

<sup>a</sup>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          | 8           | 3      | 12       | 0        | 1     | 0      |
| Dermatological                | 22         | 24          | 6      | 10       | 6        | 0     | 0      |
| Ear                           | 7          | 5           | 0      | 3        | 2        | 0     | 0      |
| Eye                           | 15         | 10          | 1      | 5        | 3        | 1     | 0      |
| Gastrointestinal              | 21         | 22          | 6      | 14       | 0        | 0     | 2      |
| General systemic <sup>a</sup> | 21         | 16          | 6      | 10       | 0        | 2     | 2      |
| Neurological                  | 26         | 19          | 6      | 15       | 1        | 2     | 3      |
| Psychological                 | 19         | 11          | 2      | 4        | 3        | 0     | 2      |
| Respiratory                   | 36         | 28          | 8      | 15       | 3        | 1     | 2      |
| Urogenital                    | 6          | 6           | 0      | 4        | 3        | 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).

<sup>a</sup>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](mailto:env.health.concern@pa.gov).

