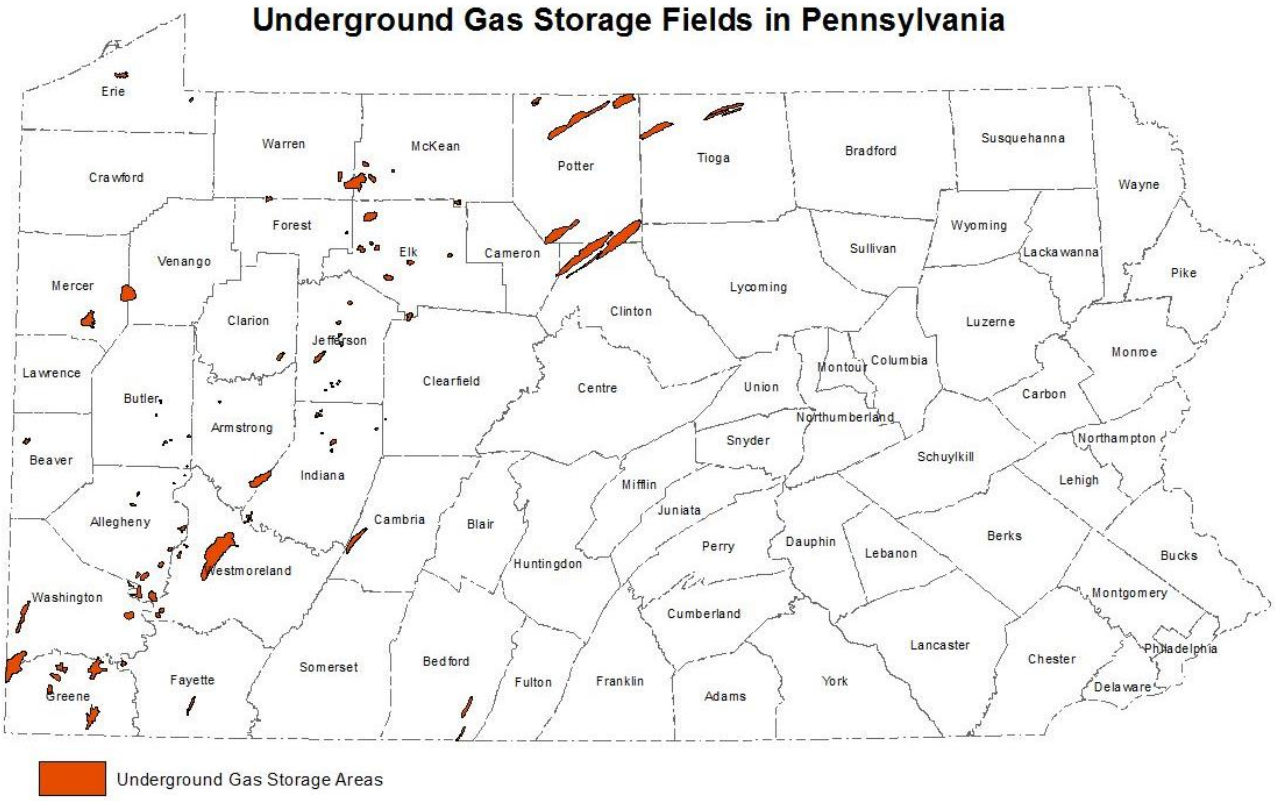
pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Underground Gas Storage Fields in Pennsylvania



Currently, the Pennsylvania Department of Environmental Protection's (DEP) database contains approximately 60 active and 20 inactive or abandoned underground gas storage (UGS) fields in 25 counties in Pennsylvania. All of the Pennsylvania UGS fields are contained within depleted hydrocarbon reservoirs (host rocks, typically sandstones, in which the economic oil and/or natural gas has been removed). As such, these locations coincide with historical oil and gas production, which is predominantly in the western half of Pennsylvania.

A successful UGS field is a rock unit whose geological and engineering characteristics provide for the acceptance and retention of injected natural gas. At a minimum, the rock unit must possess 1) the correct porosity and permeability to allow for the storage and flow of gas; and 2) a geologic trap (or "seal") to prevent the escape of injected gas. UGS fields are located at depths of 2,000 to 8,000 feet beneath the ground surface, depending on the specific rock formation targeted. For more information concerning the geology of UGS fields, please refer to Educational Series 8, *Oil and Gas in Pennsylvania*, by the Pennsylvania Department of Conservation and Natural Resources, Bureau of Topographic and Geologic Survey.

Most natural gas is consumed as a fuel source to heat homes and businesses, and consequently the consumer demand for natural gas peaks during the winter months. To meet this winter demand cycle, operators must build up an inventory of gas over the summer months to prepare for winter delivery. One way to accomplish this involves storing natural gas in UGS fields until it is needed.

Regulation

Regulation of UGS fields began in 1955 with the passage of the Gas Operations Well-Drilling Petroleum and Coal Mining Act. Substantive changes followed in 1985 with the passage of the Oil and Gas Act. Gas storage regulations were adopted in 1994 with some related changes following in 2011. The Oil and Gas Act was most recently amended by the 2012 Oil and Gas Act (Act 13). Act 13 maintained the original Oil and Gas Act's requirements for gas storage operations, and no new substantive provisions applicable to the operation of storage fields were included in the 2012 legislation.

Act 13 requires the exchange of important information about safety between UGS operators, owners or operators of underground coal mines, and DEP. In particular, the locations and condition of wells used in the operation of UGS fields and the locations of underground coal mines must be communicated. Gas storage operators and coal mine operators are also allowed to inspect each other's records and facilities. The statute does not apply to strip or auger mines operating from the surface and the storage of gas or liquids in caverns. Injection of gas for storage into workable coal seams is also prohibited. The 1994 regulations added additional safety requirements for gas storage operations. Regulations adopted in 2011 enhanced well construction standards for new wells drilled in operating storage fields.

By law gas storage facility operators are presently required to:

- Case and cement gas storage wells to ensure no gas can leak from them.
- Conduct monthly inspections of all gas storage wells and all wells used for observation.
- Annually inspect the gas storage reservoir and storage protective area to make sure no gas is leaking or other hazardous condition exists.
- Implement gas storage well monitoring and integrity testing programs once every five years.
- Not exceed pressures that may cause the gas to begin leaking.
- Notify DEP within 24 hours of making emergency repairs to gas storage wells and submit a written explanation of the emergency and what action was taken within five days.
- Keep records of well inspection results and pressure data, integrity testing data, and inspections of abandoned and plugged wells.
- Notify DEP 15 days before the gas storage well is plugged to prevent migration of gas or other fluids within or outside of the well.

In addition to DEP's oversight, federal regulators such as the Federal Energy Regulatory Commission and the Pipeline and Hazardous Materials Safety Administration are responsible for enforcing federal regulations pertaining to UGS fields.

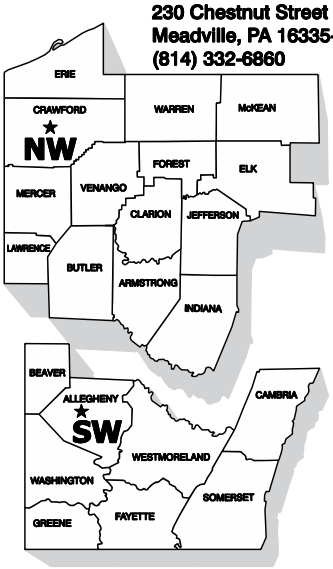
More information about underground gas storage fields is available from the DEP oil and gas district offices listed below:

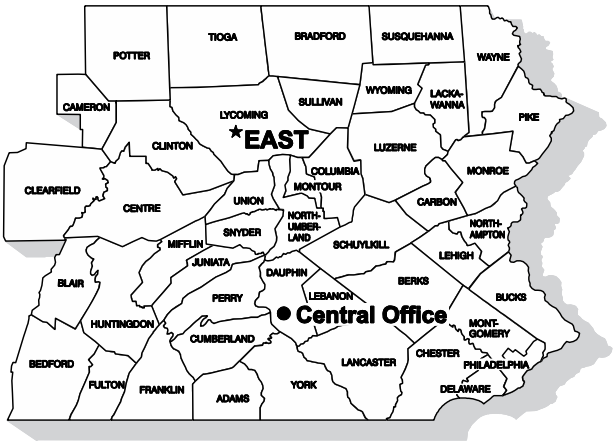
pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Oil and Gas Districts

★ Northwest Region
230 Chestnut Street
Meadville, PA 16335-3481
(814) 332-6860

★ Northcentral Region
208 West Third Street
Williamsport, PA 17701-6448
(570) 327-3636





★ Southwest Region
400 Waterfront Drive
Pittsburgh, PA 15222-4745
(412) 442-4024

● Central Office
Bureau of Oil and Gas Management
PO Box 8765
Harrisburg, PA 17105-8765
(717) 772-2199

For more information, visit www.dep.pa.gov.