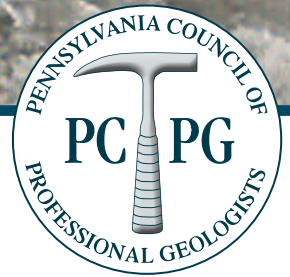


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PA BROWNFIELD DEVELOPMENT

A Professional Geologist (PG) works on brownfield development sites to protect human health and the environment during construction and future use of a property. Generally, the PG is required to sign reports proposing Act 2 liability protection with the Pennsylvania Department of Environmental Protection (PADEP) Land Recycling Program.

- A brownfield is a former industrial or commercial site where future use is affected by real or perceived contamination from various chemicals of concern (COCs) attributed to historical use of the property.
- Brownfield development has three primary goals: make contaminated sites safe for future re-use, return sites to productive use for the public or business community, and reduce sprawl and preserve green space.
- The PG serves as the technical lead to determine if COCs are present in various environmental media (soil, groundwater, surface water, sediment, and soil vapor) and evaluates if the site is safe for the intended future use of the property. This determination includes various tasks such as environmental due diligence, site characterization or remedial investigation and cleanup.
- Often a PG signs off on due diligence, which is a review of the current and historical site uses to identify source areas and potential COCs. This is called a Phase I Environmental Site Assessment (ESA). The PG investigates contaminant sources such as spills or releases from historical sources that could include tanks, industrial activities, construction, mining, and unauthorized dumps.
- If COCs are identified, the PG develops, implements, and provides a Phase II ESA. The PG collects samples to quantify the levels of COCs. The concentrations of COCs are compared to regulatory standards to determine if they can be harmful to human health and the environment. In Pennsylvania's Land Recycling (Brownfield) Program (Act 2) project, this is referred to as Site Characterization or Remedial Investigation and a PG signature along with their professional seal is required for PADEP submittals.
- As part of the remedial investigation, the PG develops a Conceptual Site Model (CSM), which identifies and delineates sources of COCs; defines the transport mechanisms of the COCs through environmental media; and evaluates the impacts to receptors such as fish, wildlife, and humans.
- The PG may oversee geophysical studies to locate infrastructure, underground storage tanks, or other subsurface structures (i.e., product lines, septic tanks, etc.) that may be sources of contamination.
- Depending on the proximity of a COC source to occupied buildings, the PG may also evaluate soil vapor which can be done outside or inside a structure.



Bell Laboratories in Allentown, PA manufactured electric components like vacuum tubes for the telecommunications industry.



Coca Cola Park Lehigh Valley Iron Pigs stadium was constructed on a portion of the former Bell Lab site. Cleanup efforts included soil contaminated from heavy metals, including arsenic, from electronic components found on a section of the property prior to stadium construction.

- Integral to the CSM is the characterization of the geologic and hydrogeologic conditions of the brownfield site. The PG may conduct hydrogeologic tests to determine flow characteristics of the aquifer and help the PG define the transport mechanisms for the COCs.
- To sample groundwater, the PG designs and installs a monitoring well network with consideration of groundwater flow direction and chemical properties of the COCs. If groundwater chemical data is in excess of regulatory standards, the PG will often complete or oversee contaminant transport modeling.
- Other data gathered during an investigation may include rainfall and climate data, historical aerial photos, regional groundwater variations, and changes to drainage pathways along with a thorough search of published and unpublished sources to get a total hydrogeologic picture.
- Based on the results of the CSM, the PG may assist in performing a risk assessment. With appropriate training, the PG will review toxicology information for exposure pathways such as ingestion, skin contact, or inhalation. Based on COC concentrations, the route, and duration of exposure, the PG may determine alternative protective measures or concentrations to protect human health or the environment.
- The PG then develops a Cleanup Plan to be implemented to make the site safe for the intended use.
- The PG often speaks at stakeholder meetings to present data on the broader redevelopment to the community. These stakeholders often include the site owner, perspective redeveloper, PADEP, municipal and county officials, and various subcontractors to integrate information obtained from the CSM into the redevelopment process.

When performing brownfield work, the PG works internally with risk assessors, chemists, geochemists, statisticians, construction specialists, engineers, soil scientists, biologists, remediation specialists, land management personnel, permitting specialists, and urban or municipal planners. The PG also works externally with regulators, attorneys, and various subcontractors.

Work Resources:

Computers, GIS, state regulator data bases, geologic and hydrogeologic modeling programs, regulatory and municipality file reviews.

Work Environment:

Office and field work. Field work may entail irregular or evening/weekend hours, visiting property owners, and working in varying outdoor conditions throughout the year.

Helpful Skills & Experience:

Research skills, landowner relations, negotiations with PADEP, ability to explain technical material to non-technical personnel, grasp of legal issues, water chemistry evaluation, and fate and transport modeling. Good management, writing, patience and communication skills are necessary for PA Brownfields Development.

Tools of the Trade:

Combustible gas indicators (CGI), photoionization detectors (PIDs), pumping equipment, flow meters, water level gauges, pH and conductivity meters, water/soil sampling equipment, and chain of custody documentation.

Training:

OSHA 40 Hour HAZWOPER, First Aid/CPR