PCPG Newsletter

Communicating Key Information and Concerns to Geologists and Environmental Professionals

Issue 3 / 2023

BOARD OF DIRECTORS

General Information: PCPG Office

INSIDE THIS ISSUE...

MESSAGE FROM THE PRESIDENT

Happy Summer PCPG!

As always, I would like to thank our PCPG members, Associate Members, Board of Directors, Past Presidents and Rose Jeffries for all of their time and commitment to the organization to maintain its success. Kudos to all of you who elevate our profession every day and continue the successful and important work that we do for Pennsylvania and the geoscience community; I appreciate you all.

An update on the Barbara Dunst Memorial Fund: over the summer the PCPG Board of Directors developed a framework for the Barbara Dunst Memorial Fund. By the end of this year, PCPG will provide a schedule and more guidance to apply for reimbursement to offset costs incurred in taking the Fundamentals of Geology (FG) Exam. The guidance is currently in review by the PCPG Board of Directors and upon concurrence with the Dunst family, will be finalized and then shared publicly.

The news I have received from our membership is that regardless of one's specific Geoscience discipline, our community is busy, vibrant, and demonstrates that the work we do is very valued. I hear many stories from members and from my own experiences about the dangers of working many hours in the field, plus having abundant office workloads, and trying to keep a sustainable work-life balance. As we go forward in our work lives and careers, I would like to share a growing concern of mine that I have experienced many times - **burnout**.

Young Professionals manage critical portions of projects and field work on a day-to-day basis and are constantly on the move. But workload must match your capacity to execute the work, and everyone is different in that capacity, with different strengths. Long days in the field collecting data and documenting

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UPCOMING PCPG EVENTS

August 24, 2023
Sedimentology, Stratigraphy, and Paleontology
Webinar: 6:00-7:30 PM ET

September 12, 2023
Hydrostructural Methods in Bedrock Aquifer Characterization and Remedial Decision Making (435 mins.)
Cranberry Township, PA

February 29, 2024 - Save the Date
2024 PCPG Annual Meeting, Education Program, Networking and Barb Dunst Memorial Fund Bottle Auction
Harrisburg, PA

FOR A COMPLETE LIST OF UPCOMING EVENTS OR TO REGISTER ONLINE, CHECK OUR HOME PAGE EVENT CALENDAR, OR VISIT PCPG'S COURSES AND EVENTS WEB PAGE.

PCPG is now on Instagram!

While signed into your Instagram account, check out pcpg_rocks or search for @pcpg_rocks.
Be sure to FOLLOW us to see how easy it is to keep up to date with PCPG to see updates on educational programming, announcements, and more.

PRESIDENT'S MESSAGE *Continued from Page 1*

procedures is physically demanding and mentally challenging. If one feels chronically tired, notices a change in habits or just feels that you don't have time to rest and recover, your manager/supervisor needs to know in order to be able to help. It is okay to speak up and talk to your supervisor or appropriate manager about exploring a schedule and workload that works best for you, your family life, your clients' needs, and your employer or program. I have learned, its ok to say "No, I need a break." Young professionals have a long an important career ahead, life is not a sprint, but a marathon, so pace yourself for success.

For senior geoscientists like myself, we also deal with burnout on the management end of the spectrum. Personally, I want to be available for my staff – to encourage their work, provide the tools they need to get their job done, and address all the non-geologic administrative issues. Mental burnout and stress are damaging to your health. What I have found over the years is that in attempting to provide the resources your staff needs, provide them with new work opportunities and sound management practices also requires time off to recharge. Over my career, on occasion I have learned the hard way that working while feeling drained can lead to errors in judgement and leaving staff without direction. When one is not at their best, even with the most heartfelt efforts, it is difficult to succeed in all tasks.

One strategy that has worked for me is establishing my own set of "office hours" where I can be available for a call or to discuss a project, which is a benefit to me and my staff. In those meetings we designate a "Number One" (from Star Trek Next Generation) who is the backup Captain should I or another staff member need a break. This plan also allows for a set "Free Time" to catch up or just let go and free your mind.

As a fellow geologist and from a PCPG board that cares for all of their members, please plan to take time to enjoy a bit of life and learn to occasionally let go. 6 Causes of Burnout, and How to Avoid Them (hbr.org)

Vincent Carbone, P.G., C.P.G.

PCPG Government Affairs Refresher and Reminder

By Tom Wagner, P.G.,
Geology Manager MBU of Coterra Energy, Inc.

Professional licensure is crucial in the field of geology, ensuring that individuals possess the necessary qualifications and expertise to safeguard public health, safety, and the environment. In Pennsylvania, the state legislature plays a key role in shaping policies related to work that involve professional licensed geologists. It is essential for geologists and professionals in related fields to stay informed about legislative developments that may impact their licensure requirements and professional practice.

Geologists and industry professionals can stay informed about legislation affecting their licensure by actively monitoring bills introduced in the House and Senate. It is essential to regularly check the state legislature's official website or subscribe to legislative alert services to receive updates on proposed bills, committee hearings, and votes of the House and Senate.

To effectively track legislation, geologists should focus on bills that specifically mention geologic licensure or regulatory bodies responsible for bills that relate to professional geologic work. Bills related to environmental regulations, resource management, or infrastructure at the surface or subsurface are a few examples. Engaging with and becoming a member of the Pennsylvania Council of Professional Geologists (PCPG), can also provide valuable insights into identifying relevant bills. Did you know that PCPG actively scans all new bills in the House and Senate each month across all regulatory bodies and tracks any bill directly and indirectly related to language of geologic licensure in Pennsylvania? PCPG maintains and provides a spreadsheet to all of its dues paying members of the bills it tracks in both the House and Senate each Session year.

Once identified, geologists can actively engage in the legislative process by contacting their elected representatives to express their support of concerns regarding specific bills. Sharing their expertise and perspectives with legislators can help shape legislation in a way that ensures the continued effectiveness and relevance of geologic licensure requirements.

Collaboration with professional associations like PCPG plays a crucial role in tracking legislative developments and advocating for the interests of geologists. By actively participating in these associations, geologists can access valuable resources, networking opportunities, and the latest information on legislative activities. By staying informed, engaging with lawmakers, and working with professional associations geologists can adapt to changing licensure requirements and ensure the highest standards of competence and professionalism in the field of geology. This in turn ultimately benefits public safety and the environment.

PCPG Members in Action

by PCPG member David Wilcots, P.G.
Senior Geologist with Sci Tek Consultants, Inc.

PCPG member David Wilcots, P.G. of Philadelphia presented a Fossils Through Time exhibit at Baltimore's STEMcx Conference and Expo 2023 on March 11, 2023. He was assisted by colleague, fellow geologist and Temple University graduate, Aaron Lawson of the Mütter Museum. Mr. Wilcots brought fossils from his collection to show to the students that ranged from 10,000 to 500 million years old.

Approximately 250 third through ninth graders attended the event. Students came from many schools in the Baltimore area, and much appreciated the opportunity to handle, feel, and experience a wide variety of fossil specimens. The more than 40 specimens were shared included fossil leaves, bones, teeth, seashells, coral, trilobites and even a life-size replica of a Tyrannosaurus tooth. There was also a life-size Tyrannosaurus footprint outline that the students could stand in.

The students thoroughly enjoyed the event and their questions were impressive – covering topics such as fossilization, geologic time periods, field equipment, research costs, paleoecology, botany, biology, taphonomy, geography, ancient climate, relationships of major taxa, and academic coursework.

PCPG Board Member David Wilcots, P.G. on the right and Aaron Lawson on the left, both Temple University graduates

CAREER CONNECTIONS ▶

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Corporate Members are now able to sponsor open positions in the firm under our Corporate Member Open Positions page.

CORPORATE MEMBER OPEN POSITIONS

The sponsorship fee is $100 for a two-month listing.
Sponsorships do not auto-renew.

For more details:

Rose Jeffries (717) 730-9745

Members In Action

by PCPG President Vincent Carbone, P.G., C.P.G. of HDR

On June 8th, 2023, PCPG and our Associate Member Parrat Wolff, completed a full day field camp for approximately 30 students and interns for Pennsylvania State System of Higher Education (PASSHE) Geology Field Experience. During the day, PCPG membership and PASSHE professors instructed students on the safety around drill rigs, how to log soils, install and construct wells, and answered questions they had on the profession, advice on their careers, and how PCPG can help them achieve their goals. Preliminary feedback is that it was a success and aligned with PCPG's continued emphasis on outreach and working with the larger community. PCPG encourages all of our members to be present with local geologist groups, educators, and professions to educate the community and provide life experiences, research, or project examples for their benefit. In the fall PCPG will be supporting many state universities with their undergraduate or graduate programs and member participation is welcome and encouraged.

Josh Ellingworth of Parratt-Wolff explains basics of air rotary drilling methods to PASSHE Field Course students and PA Geological Survey interns.

A Pennsylvania Geologist's Visit to the Coastal Town of Pacific City, Oregon

By Tom Wagner, P.G., Geology Manager MBU of Coterra Energy, Inc.

Nestled along the picturesque Oregon coast, Pacific City offers a fusion of natural wonders and artisanal delights. With its stunning geology and renowned Pelican Brewing Company, this coastal gem has become a must-visit destination for geologists and beer afficionados/foodies alike. Here, we explore the geology of Pacific City's beach, its treasures, and the pleasure of visiting the iconic Pelican Brewing Company.

Pacific City's beach showcases a fascinating geological landscape. The prominent landmark of the area is Haystack Rock, a towering sea stack that stands at a remarkable height of 235 feet (72 meters). Composed primarily of basalt, Haystack Rock is a remnant of basalt that flowed over land into the coastal water's tens of millions of years ago and becoming buried withing marine sediments. The basalt and marine sediments were then uplifted over geologic time from continental margin tectonic forces, and the softer marine sediments were eroded away leaving behind the more resistant basalt rock forming the ever-prominent Haystack Rock.

The beach itself is characterized by fine-grained sand that spans several miles. The sand's origin can be traced back to the erosion and weathering of the local coastal mountains and rivers, which gradually deposited sediments onto the shoreline.

One of the striking features of Pacific City's beach is the presence of dynamic dunes. Small dunes mark the general beach landscape but on the northern end of the beach are large dunes competing for height with Haystack Rock. One such dune is 240 feet high where beach visitors strive to climb and conquer as did the author of this article with his family while visiting. You get a great view of Pacific City high atop the dune, explore its unique features, and it is wildly fun to run/ski your way back down in the soft sand.

A visit to Pacific City would not be complete without experiencing the award-winning Pelican Brewing Company. The brewery boasts a warm and inviting ambiance, with large windows offering panoramic vistas of the stunning shoreline where you can watch surfers, kiteboarders, Haystack Rock, and the large dunes within walking distance to the north. Tackling the climb up the Dune is a great way to burn off some of those extra calories and energy which is what we did or you could tackle the climb first and quench your thirst and appetite with a stop at the brewery after as well.

Guests of the brewery can indulge in a variety of brews, from refreshing IPAs and crisp lagers to rich stouts and seasonal specialties. In addition to the delectable beer selection, Pelican Brewing Company offers a divers menu featuring Pacific Northwest-inspired cuisine. Whether is savoring fresh seafood, artisanal pizzas, or mouthwatering burgers, visitors are sure to find something to delight their taste buds.

Pacific City, Oregon, captivates visitors with its mesmerizing geological formations and the opportunity to savor exceptional craft beers at Pelican Brewing Company. From the towering Haystack Rock to the ever-shifting dunes, the beach presents a scenic backdrop for exploration and relaxation. Combine this with the flavorsome brews and delectable food offerings at Pelican Brewing Company, and you have a perfect recipe for an unforgettable coastal getaway. Whether you are an outdoor enthusiast, a beer lover, or simply seeking a tranquil escape, Pacific City is a great choice if you ever get the chance to make it to the Oregon coast.

Photo by member Tom Wagner, P.G. at dune top of the Dune looking toward the town of Pacific City, Oregon and Pelican Brewing Company.

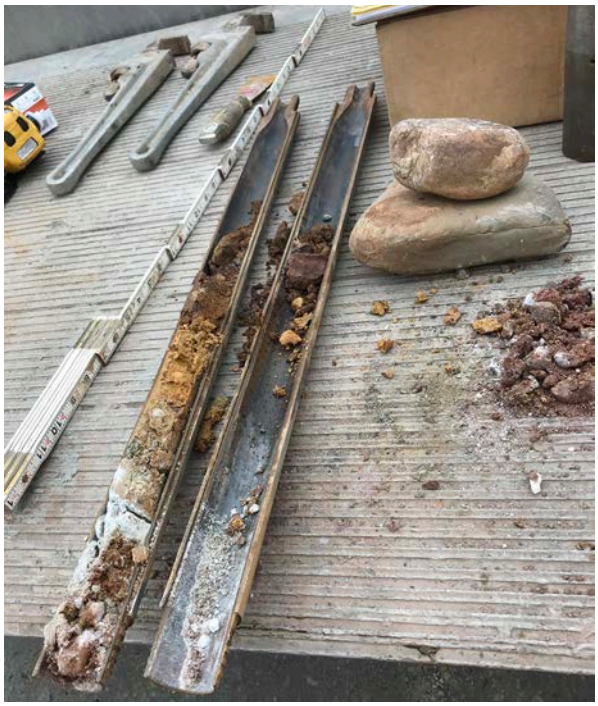
What does a Professional Geologist do for a

Visit our
What Does a Professional Geologist Do web page for more in this series.

PA ENVIRONMENTAL CLEANUP SITE

A Professional Geologist (PG) works on environmental cleanup project sites to characterize the geology/hydrogeology, delineate the extent of contamination, evaluate remedial actions, and guide the project through the regulatory process.

- The PG investigates the "Who, What, Where, When, How" at a cleanup site. What was released? When did it happen? How was it released? Where has contamination moved/migrated? Who/what does it affect? How can it be remediated, if needed?
- PGs collect information about a project site not only through field work, but through desktop review and research activities. PGs may review prior environmental reports, records on prior site use, release activities and ownership, or aerial photographs over various years, topographic maps and geologic publications.
- Activities that should be prepared by or performed under the direct supervision of a PG include but are not limited to: Investigations and assessments of groundwater contamination; preparation of sampling and analysis plans; design, analysis and interpretation of aquifer test data; preparation of boring and well logs; creation of geologic cross sections and fence diagrams; and preparation of groundwater contour and isopach maps.
- PGs go into the field to better understand the geology and hydrogeology of a project site. Field activities include borehole logging (classification of soil and bedrock structure and lithology), aquifer testing, collection of field parameters, and identification of potential pathways for contaminant migration to potential receptors.



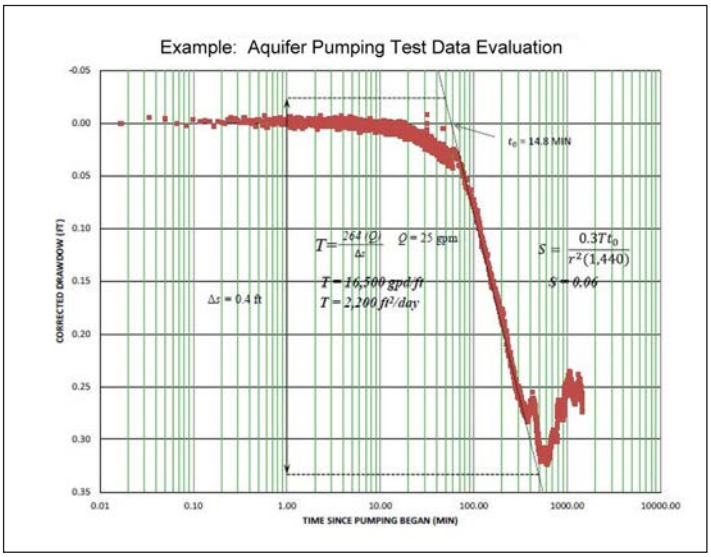
Typical split spoon sample.

- Field work by other environmental team members is often conducted under the direction of a PG. Field work may include collection of soil, groundwater, air, surface water and sediment samples for laboratory analysis of various contaminants.
- PGs may also be responsible for field oversight of specialty subcontractors, such as drillers, construction firms, and firms that do geophysical and geotechnical work, which also employ PGs.
- A PG relies on strong technical writing skills. PGs may write or review technical reports. Simple reports may include routine periodic updates (e.g., quarterly groundwater monitoring reports). Complex reports may present a comprehensive subsurface characterization of a site over time, the fate and transport of contaminants, evaluate risk to human and ecological receptors, future cleanup plans, or demonstrate attainment of regulatory requirements for closure.
- Certain reports should be reviewed and certified (stamped or sealed) by a PG if they contain any of the following: Construction details for boring logs and monitoring wells, groundwater contour maps, geologic cross-sections, stratigraphic columns and lithologic

descriptions, evaluation of soil and groundwater sampling data, aquifer test data, groundwater characterization, geophysical/geostatistical/groundwater modeling, and capture zone analysis of groundwater treatment systems.

- PGs working on cleanups sites are in both the private and public sectors. Both Department of Environmental Protection (DEP) and U.S. Environmental Protection Agency employ PGs to review work performed by environmental consultants and to oversee the project from the regulatory perspective.

- Environmental cleanup projects in PA usually involve the DEP Land Recycling Program (Act 2), Special Projects (including Brownfields – see *What Does a Professional Geologist do for PA Brownfields Development*), Hazardous Sites Cleanup Program (HSCP), Waste Management Program, Clean Water Program, Wetlands and Waterways Program, Active and Abandoned Mining Operations, or Corrective Action Program of Storage Tank sites.



The PG typically works with chemists, biologists, safety professionals, industrial hygienists, risk assessors, construction specialists, drillers, laboratory professionals, general contractors, engineers, regulatory personnel, attorneys, property owners, and the public.

Work Environment:

Both office and field tasks. Varying outdoor conditions. Field work may require the use of personal protective equipment (PPE) due to environmental hazards.

Work Schedules:

May include irregular and extended hours. Often, the number of field days becomes fewer with increased experience.

Helpful Skills & Experience:

Good communication: You will often deal with a variety of stakeholders including regulators, property owners, public, facility personnel, and contractors. Regulatory knowledge: Understand the state, federal and local regulations that govern the work. Technical writing skills: Reports you write or review may become part of the public record and must relay information in a clear and concise manner.

A strong understanding of hydrogeologic concepts is important, but you will also use your knowledge of geochemistry, geomorphology, soils, and stratigraphy.

Tools of the Trade:

Basic writing/tabulating software, modeling and analysis software, air quality meters, water gauges and meters, sampling equipment, chain of custody, appropriate PPE, GPS, and always a way to record notes and data (e.g. field book or electronic tablets).

Kids' Corner: Make Your Own Fossils!

By Leslie Tintle, Senior Project Scientist
Sanborn, Head, and Associates, Inc.

Fossils have been found in every continent and are everywhere! Can you believe that sea creature fossils have even been found on the top of Mount Everest?!

Supplies

1. Plaster of Paris
2. Clay
3. Tinfoil
4. Small objects to fossilize (e.g. plastic bugs, insects, dinosaurs, or objects you collected like seashells from your favorite beach)
5. Baking sheet
6. Paper towels
7. One small glass bowl

Step 1: Making a Fossil Cast

1. Lay out your baking sheet
2. Using your tinfoil, crumple it up and create a small circular container, as shown in the image to the right
3. You will need a tin foil container for each fossil you plan to create
4. Next, shape your clay to fit inside of your tinfoil container. The tinfoil container should be raised up higher than the clay
5. Now its time to make your impressions in the clay - grab the objects you want to fossilize!
6. Make sure to really push your objects into the clay so that each tiny detail is transferred
7. Objects with more texture or design will make an extra detailed fossil

Figure 1: Image sourced from https://thecraftyclassroom.com/crafts/geology-crafts-for-kids/fossil-craft/

Step 2: Making Plaster Fossils

8. Grab your glass bowl, use this to mix your Plaster of Paris according to the product directions on the box. Make sure to ask your parents, teacher, siblings to help with this part!
9. Once your plaster is mixed, take a small spoon to carefully fill over top of your clay impression with the plaster mixture
    a. Adding small amounts of plaster at a time allows the plaster to fill the tiny areas in your impression. Use the back of the spoon to smooth out the top and fill in any gaps
10. Once your casts are filled with plaster it is time to wait for them to harden- this can take up to an hour.

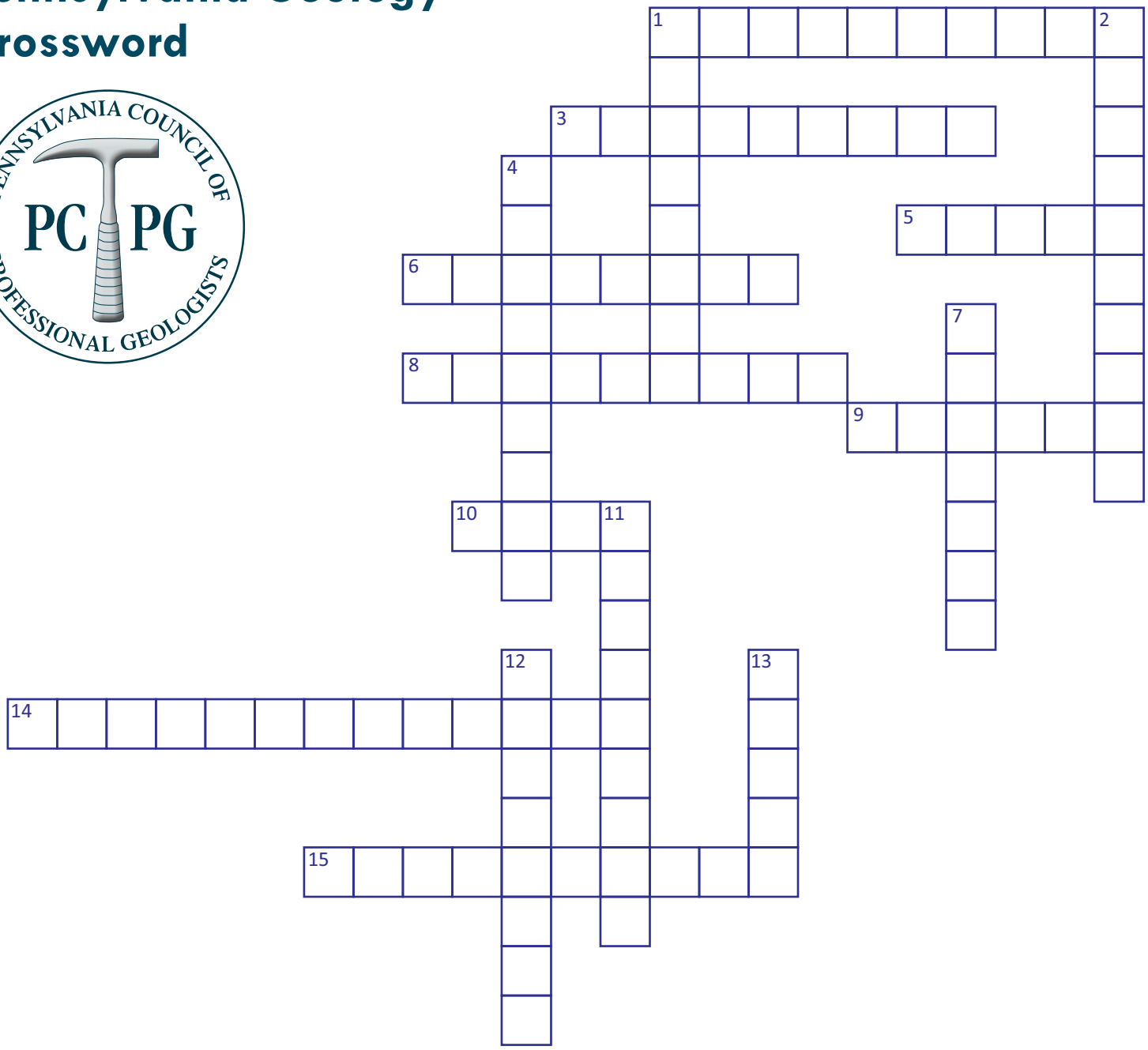
Step 3: Reveal your Fossils

11. Make sure your plaster is fully hardened. Carefully peal back the tinfoil to reveal the clay and plaster.
12. The plaster will be stuck to the clay- carefully peel these two layers apart and reveal your plaster fossil!
13. Look at how awesome your fossils turned out! Make sure to look at all the tiny details and textures.

Figure 2: Image sourced from https://thecraftyclassroom.com/crafts/geology-crafts-for-kids/fossil-craft/

Fossils can sometimes look like bone – but they are not! *Fossils are made from rocks which are shaped exactly the same as the object that was originally there. The object was once buried under sediment, it then gets squished and compacted and turns into sedimentary rocks. Sedimentary rocks have been formed from things like sand, mud, and small pieces of rock.*

Pennsylvania Geology Crossword



- SEE PAGE 10 FOR CLUES -

Answers on Page 13

Credit for the development of this crossword puzzle goes to Kurt Friehauf, Ph.D., P.G., Professor of Economic Geology, Fred and Martha Hafer Scanning Electron Microscope Lab Director, Department of Physical Sciences, Kutztown University.

Pennsylvania Geology Crossword - *Clues*

Across

1. Phanerozoic geologic period for which there are almost no rocks preserved in Pennsylvania.
3. Lower Cambrian quartzite formation that lies atop the nonconformity with underlying Proterozoic metamorphic rocks and historically mined for silica. Vertical-burrow skolithos ichnofossils about the size of human fingers are relatively common in this formation and suggest deposition in a shallow marine environment as the Cambrian seas transgressed over eroded Grenville mountains.
5. Upper Ordovician age natural-gas-bearing black shale Appalachian foreland basin between the Cincinnati Arch to the west and the Acadian Mountains to the east. The Silurian Tuscarora quartz sandstone is an important marker bed for geosteering drill holes into this formation.
6. Type of continuous mining very amenable to horizontal coal strata in which a shear scrapes along the side of a mile-long "tunnel," allowing the broken coal to fall onto a conveyor belt. With each successive slice, the shear and conveyor belt migrate laterally and older parts of the "tunnel" are allowed to collapse. The Bailey Mine in Pennsylvania is one of America's biggest underground coal mines and uses this extraction method.
8. Middle Devonian natural-gas-bearing black shale deposited in the Appalachian foreland basin between the Cincinnati Arch to the west and the Acadian Mountains to the east. The Tully Limestone is an important marker bed for geosteering drill holes into this formation.
9. The fault-bounded Mesozoic Newark and Gettysburg sedimentary basins are examples of this geologic structure.
10. Upper Neogene, poorly-sorted glacial sediment common in the northwestern and northeastern part of the state, but completely absent from southern and central parts of Pennsylvania.
14. Coal deposits in Pennsylvania range in age from Mississippian to Pennsylvanian – a geologic time period often referred to by this elemental name.
15. Unlike the metamorphosed coal deposits in the central folded Appalachian mountains in eastern Pennsylvania, this type of coal is common in the western portion of the Commonwealth. These deposits were essential for making Pittsburgh the home of the Steelers.

Down

1. One of the largest iron mines in the eastern U.S., this deposit in Lebanon County formed in Paleozoic carbonate rocks near a mafic magma intrusion during the Triassic-Jurassic Central Atlantic Magmatic Province CAMP event 200 Ma.
2. Medium- to coarse-grained quartz-rich sandstone and well-rounded, quartz pebble conglomerate deposited as the molasse sequence produced by the Taconic orogeny in the Silurian Period. Also a mountain range in central New York known for recreational climbing.
4. Famous underground coal mine fire in east-central Pennsylvania that's burned since 1962.
7. Erosion-resistant, dark-colored, medium-grained, mafic igneous rock that makes the ridges at Gettysburg, forming the high ground from which the Union fought (as opposed to the muddy Triassic red shales in the valleys from which many Confederates fought).
11. Rock type characteristic of Cambrian and Ordovician strata in Pennsylvania, deposited in a shallow marine environment and critical for manufacture of cement and aggregate.
12. Magnesium-bearing mineral mined near York for refractory applications from the Cambrian Ledger Formation.
13. The 200 Ma Central Atlantic Magmatic Province (CAMP) igneous intrusions formed by injection of mafic magma between sedimentary rock layers to form **concordant** igneous rock bodies called _____.

Road Trip! Pennsylvania Geology from Pittsburgh International Airport to the West Virginia State Line

Adopted from Katherine Schmid and Robin Anthony – Pennsylvania Geological Survey
Edited by Michele Cooney, P.G. – Pennsylvania Geological Survey
Full article available at 2023 NSS Convention – National Speleological Society (caves.org)

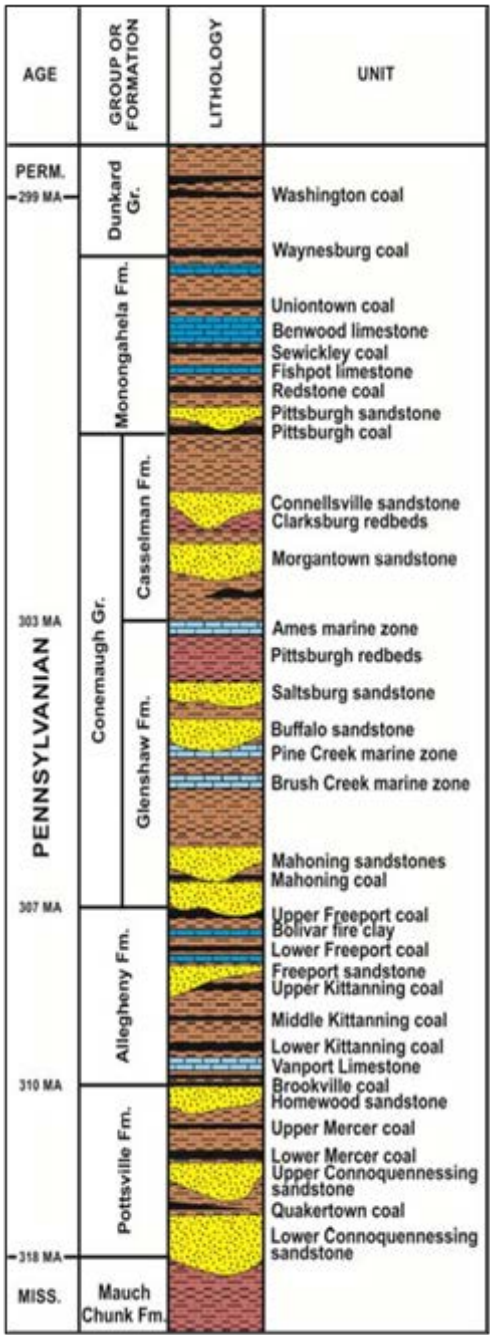


Figure 1: Stratigraphic column modified from Kollar and Harper (2019)

Traveling south from the Pittsburgh International Airport to West Virginia along interstate 79 (I-79), the terrain consists of relatively flat plateaus cut down as much as 600 feet by the various creeks and rivers. The bedrock is mostly Pennsylvanian through Permian in age and is composed of thin cyclic sequences of sandstone, shale, claystone, coal and limestone (Figure 1) deposited in ancient river environments as a result of fluctuating sea levels (Gray and others, 2012). The bedrock is mostly flat-lying and gently folded. The dominant structural trends are northeast to southwest.

I-79 mile 56: The exposure just south of the Carnegie interchange (Figure 2) is over a half mile long exposing most of the Monongahela Formation. This roadcut reveals the Benwood Limestone – the most prominent nonmarine limestone in the Appalachian basin (Kollar and Harper, 2019).

I-79 mile 54.5: Here I-79 crosses over the bypass channel of Chartiers Creek. The original channel, now a backchannel with reduced flow, lies east of here, joining the bypass channel below the east side of State Route 50. This bypass was constructed to prevent flooding of the highly meandering creek. See Barner and others (2001) for more information.

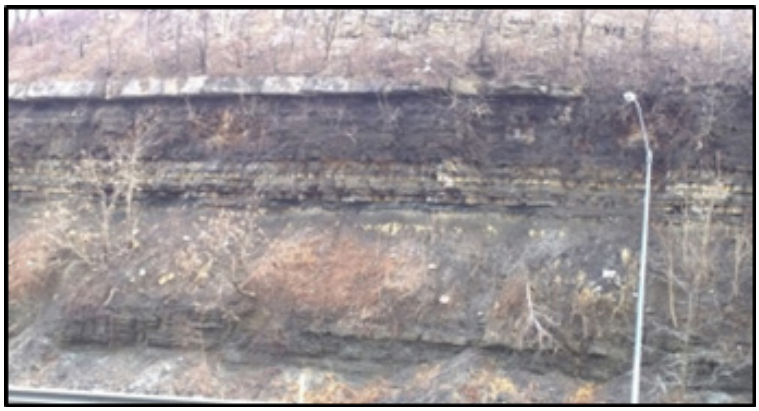


Figure 2: I-79 Carnegie Interchange roadcut exposes most of the Monongahela Formation. Note Benwood Limestone.

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GEOLOGY *Continued from Page 11*

Figure 3: Outcrop of the Upper Pennsylvanian Benwood Limestone at the Bridgeville interchange.

I-79 mile 53.5-52.5: I-79 will pass over State Route 50. Here the freeway passes over a former Pittsburgh coal bed strip mine. This former strip mine extends west under parts of the Kirwan Heights exit cloverleaf. South and west of this strip mine is the speculated extent of a Pleistocene bog (beneath the Hampton Inn and other businesses). Before this peat bog was covered, a few species of plants, numerous insect remains, and the bones of a fossil mastodon were identified. The bog is approximately 23,170 years old (Kollar and Harper, 2019b).

I-79 mile 52.25: Outcrop of the Upper Pennsylvanian Benwood Limestone on both sides of the freeway at the Bridgeville interchange (Figure 3).

I-79 mile 43.1: Just before mile marker 43, I-79 passes beneath a blue bridge known as the Canon-McMIllan Alumni Bridge. Canon-McMillan High School is up the hill on the west side of the freeway. Behind it, in the valley below, is the disposal site for a former mill that processed uranium and other ores between 1911 and 1957. Madame Curie visited it in 1921, when the plant produced more radium in a year than all plants in the rest of the world combined. Historical milling operations at the site generated radioactive mill tailings, a predominantly sandy material. See Kollar and Harper (2019) for more information.

I-79 mile 0: Roadcuts at the West Virginia border show fluvial cut and fill deposits in the Morgantown Sandstone (Figure 4).

Figure 4: Outcrop of Morgantown Sandstone channel fill deposits at the Pennsylvania-West Virginia border. This Pennsylvanian age massive sandstone is in the Casselman Formation of the Conemaugh Group.

Continued on Page 13

GEOLOGY *Continued from Page 12*

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AMD (abandoned mine drainage)

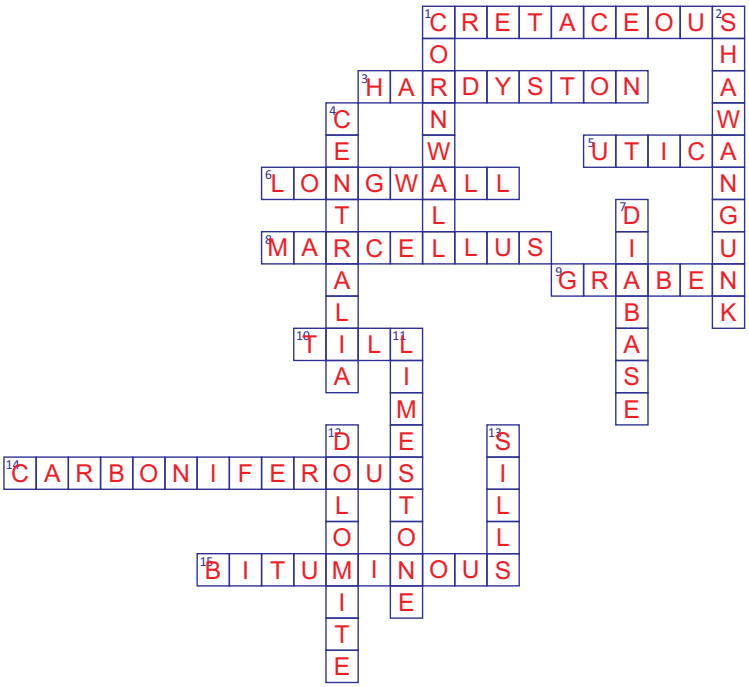
http://www.chartiersgreenway.net/amd_body.htm

https://alleghenylandtrust.org/green-space/wingfield-pines/

http://scottconservancy.org/about-us/

Pennsylvania Geology Crossword

- *Answers*



New PCPG Corporate Member

Please join us in welcoming our newest PCPG Corporate Member:

Scientific Based Solutions, LLC
Data Driven Solutions

Interested in becoming a PCPG Corporate Member? Visit our Join PCPG page, then download the Corporate Membership application. Bundling multiple Individual Memberships into a single Corporate Membership provides up to 25% discount for each professional enrolled. Telephone PCPG by dialing (717) 730-9745 for more information.

DEADLINE FOR OUR NEXT NEWSLETTER IS OCTOBER 1, 2023

- **Are you a geologist/artist?** Send us a geo-cartoon, picture of a rock/mineral painting of yours, other creative elements we can include!
- **Are you a geologist/photographer?** Send us your cool rock/rocky landscape pics!
- **Are you a geologist/academic researcher?** Send us a summary of your latest research!
- **Are you a geologist/project manager?** Send us a summary of your latest really awesome project!
- **Are you a geology student/recent grad?** Send us a summary of a class project, technical paper, field camp experience, senior thesis, etc.!
- **Are you a geologist/lawyer?** Send us a summary of the latest geology-related legal news!
- **Are you a geologist/site safety officer?** Send us reminders of how to stay safe on the job site!

Articles are suggested to be about 700 words maximum. For more information, contact our PCPG Newsletter Editor and Communications Committee Co-Chair - Vicki Pitman, P.G., by email.

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