PCPG Newsletter

Communicating Key Information & Concerns to Geologists and Environmental Professionals

Issue 2 / 2021

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Message from the President

Because of COVID

We held PCPG's first virtual annual meeting on April 14 which was very successful with over 150 participants! The program was quite varied from slope stability to PFAS and ethics. I would like to thank the many people who helped organize and produce the meeting along with the great speakers and all of the people in attendance. See the Annual Meeting summary article later in this newsletter. Replays of some talks will be available on our website at a later date.

While preparing my presentation, I looked back at last year's PCPG activities and realized that despite COVID-19, or rather because of COVID-19, PCPG had a good year. One of our goals for 2020 was to develop new continuing education events since our Strategic Plan had identified that the membership wanted more frequency, variety, experience level, formats and convenience in our educational offerings, including webinars. The PCPG board had talked about webinars for a few years, including investigating a new digital platform, determining topics and speakers that would be engaging virtually, how to issue PDH's, who would moderate, etc. During that time, we continued to pursue tried and true in-person events.

Then, as everyone knows, COVID-19 and lockdown hit last March. As part of our mission, PCPG needed to continue providing educational opportunities so we quickly switched gears and started offering one-hour webinars in June 2020. The one-hour webinars are open to everyone but are free to PCPG members and PCPG provides PDH credit certificates to verified attendees. Our 2020 webinars were a huge success with most having over 100 attendees. The topics were quite varied and included soils, ground penetrating radar, drone technology, shale play water management, seasonal high water tables and abandoned oil & gas wells. We also had a four-hour virtual seminar on Managing Hydrogeologic Risk in December that was well attended. The experience level ranged from basic to advanced. Combining the attendance of the virtual with three in-person events, over 1,050 people participated in PCPG's 2020

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UPCOMING PCPG EVENTS

May 18, 2021

Maximize well efficiencies in both screen wells and open hole (Bedrock wells) with proper well development techniques (60 mins.)

Webinar: 1:00 - 2:00 PM EDT

June 15, 2021

Dam that Muddy Creek! Lake Arthur dam siting, design, and construction story (60 mins.)

Webinar: 1:00 - 2:00 PM EDT

June 29, 2021

Mars sample return science: Transferring geo-skills from Earth to Mars (60 mins.)

Webinar: 1:00 - 2:00 PM EDT

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.

PRESIDENT *Continued from Page 1*

educational events. That is a 59% increase when compared to 660 participants for all of our in-person education events in 2019.

The trend continued in 2021, with over 600 participants in our virtual education as of mid-April! We revamped our PG Review Course, normally a two-day in-person event, into a six-part, two and a half hour webinar series in February 2021. The in-person PG review course in early February 2020 (prior to shutdown) had 19 attendees, while the virtual 2021 series had 92 participants! We offered the full six-part series for one discounted rate but also opened each session to individual registrants for a per webinar fee. In this way, if someone wanted to just brush up on their hydrogeology or mineralogy, they could register individually for those webinars. The reviews on this series were exceptional and we hope to offer this again prior to the fall ASBOG testing date.

By attending PCPG's free virtual events since last June, one would have accumulated 10 PDH's for renewal and another 27 PDH's for our fee-based webinars all from the comfort of their home. The PCPG webinars have been a huge success and I would like to acknowledge and thank Dan Billman, P.G., PCPG Education Chair, and his committee for their efforts during the entire pandemic. New webinars are being added all the time and we are working on offering webinar replays. Check PCPG's Courses and Events page for the latest schedule and registration information. PCPG's one-hour webinars will remain free to members. Longer webinars are discounted for members, so accumulate those PDH's for this year's PG license renewal.

All in all, COVID-19, lockdown, and social distancing was difficult, but it forced PCPG to further develop our virtual programing. I know most of us are itching to get back to in-person events and socializing, but the success of our webinars has shown that virtual learning will continue to be a valuable part of our overall educational program. For more on last year's successes and our goals for 2021, see the PCPG 2021 Annual Meeting Report, available for download on our homepage.

Very Truly Yours,

Barbara J. Dunst, P.G., C.P.G.

First Quarter 2021 Photo Contest

By Emily Glick, P.G.,
PCPG Photo Contest Committee

The First Quarter Photo Contest, which ended March 5th, was themed, *Geology in Pennsylvania*. After having a record breaking 17 photo entries in the Fourth Quarter 2020 Photo Contest, we only received two entries for the First Quarter 2021 Photo Contest. That is pretty amazing, considering that most of us actually LIVE in Pennsylvania!

Congratulations to Tom Beatty, current President at ACA Engineering in Pittsburgh for his unbelievable photo of Ticklish Rock in Sullivan County (Photo 1) and to Kim Schollenberger, a retired Chief Master Sergeant and current Kutztown University geology major for his very interesting photo of potholes at Falmouth, PA along the Susquehanna River (Photo 2).

Both photos highlight the effects of weathering. Ticklish Rock is a block of sandstone that is part of the Catskill Formation (Devonian age) located in a fairly remote area, the coordinates are 41.351, -76.648. The precarious rock has long been of interest in Pennsylvania, one of the earlier documents on it can be found in the 1937 Pennsylvania Department of Internal Affairs Monthly Bulletin 7. The outcrop is on the rim of the Allegheny Ridge; an excellent example of differential weathering.

The potholes and sculpted rock in Falmouth, PA also receive their fair share of buzz. They were discovered at the base of

Ticklish Rock in Sullivan County, Pennsylvania
Submitted by Tom Beatty (ACA Engineering)

Potholes and sculpted rocks in Falmouth, Pennsylvania
Submitted by Kim Schollenberger, Chief Master Sergeant-Retired

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PHOTO CONTEST *Continued from Page 3*

the Conewago Falls in 1947 when the Susquehanna River level was low. Surprisingly, this is one of the most expansive pothole fields uncovered in the United States. The Conewago potholes and the sculpted rocks found here are composed of diabase formed 200 million years ago. The igneous rock can withstand the weathering from the water, slowly creating the large smooth boulders, but the hard quartz-sand blasting away with tornado like force did a lot of the carving work, creating a truly unique example of erosion and weathering.

Many thanks go out to Tom and Kim for giving us a glimpse of these amazing geologic formations located close to home! Their winning photos will be posted to our Photo Contest and we will be sending a PCPG sticker as our token of appreciation.

We decided to make the Second Quarter 2021 photo contest theme WIDE OPEN to encourage more participation. The theme is "Geology from around the World." We have generated a new photo submission form to help keep things more organized from the get-go. Winning photos will not only be selected because of a stunning image or skilled photography, but we will also be looking for the story behind the rock. We encourage those who submit photos to describe what it is that we are looking at, and also share a sentence or two about yourself. Please email photos and submission forms to PCPG Board Member Kurt Friehauf, PhD, P.G., with the subject line: PCPG Photo Contest. The Second Quarter Photo Contest will end on Friday, June 18.

Note that by submitting a photo you are giving PCPG permission to use the photo in the PCPG Newsletter, PCPG website, or other PCPG media (proper credit will be given).

PCPG Photo Committee: Kurt Friehauf, PhD, P.G., Emily Glick, P.G., Russell Losco, P.G., Jackie Reichl, P.G.

PCPG Annual Meeting 2021

By Leslie Tintle, PCPG Member

The annual meeting looked a little bit different this year, with about 150 people registered to attend the first ever virtual annual meeting. Despite not being able to join together in the same room, the meeting was a huge success! It provided valuable opportunities for PCPG members and stakeholders to learn about updates on relevant legal and regulatory changes in our industries, education on geology and related technical advances, a welcomed reprieve from our everyday office work, and last but not least, PHDs needed for PGs to maintain their licenses. In case you missed the virtual meeting, please read on for a summary of this year's talks.

Opening Remarks and PCPG Year in Review

Barb Dunst, P.G., PCPG President, kicked off the meeting extending a warm welcome and introduction of the newest, elected board members as well as the other members of the board. She discussed all of the good things that came out of 2020 amidst the pandemic: increased educational offerings due to virtual platform, increased participation in virtual meetings, the hope for an in-person Annual Meeting Part II, and the introduction of podcasts. The main items on the 2021 Action Plan are: development of a new website and online community with engaging content and an increased social media presence, further development of continuing education and podcasts, focused efforts on the Future Workforce, and increasing public perception of the PCPG and community of geologists.

Technical Program

Dr. Paul Ziemkiewicz, Director of Water Research Institute (West Virginia University), began the technical program with a very interesting presentation on the recovery of Rare Earth Elements (REE) from coal mine drainage. There is a global demand for REE within a very small market with high value products, in general heavy REE are more valuable than light REE. He discussed the importance of the relationship between pH of acid mine drainage and the amount of REE's present within it. Acid Mine Drainage treatment generally includes a pumping station removing water out of the mine into controlled mine pools. The pH of the water is increased by removing calcium hydroxides or oxides. This reduced ferrous iron water generates ferrous hydroxide (blue-looking material) and in order to stabilize this water a mixer aerator is used turning the water orange and precipitating out the REEs. A practical application of REE is the use of them to create the magnets found within our cell phones.

Dr. Jacqueline Stephen, College of Professional Advancement (Mercer University), shared advice and guidance about cultivating a diverse, ethical, and inclusive professional environment. Diversity is even more critical now amidst the global pandemic. As everything has transitioned over to the virtual platform, a unique and special opportunity has presented itself: the ability to include members of other countries and continents more readily. We learned that diversity, equity, ethics, and inclusion are all interrelated processes. Diversity is all about understanding the variety and differences amongst the different generations of people within our organizations and workplaces. Dr. Stephen's talk helped us reflect, as an organization, about strengthening our diversity and inclusion of all people within the STEM field.

"Geology is fantastic."

David Crotsley, P.G., Senior Geologist (HDR, Inc.), said it best when concluding his presentation: "Geology is fantastic." He discussed a structural geology case study about a rock slope investigation along US 340 in Harpers Ferry, West Virginia. This area is a high traffic corridor during local commuter and truck traffic and is a seasonal tourism spot making this investigation crucial to protect people from rockslide hazards. A detailed investigation was conducted through various techniques such as a literature review, aerial mapping, point-cloud mapping, road level investigations, upper slope investigation through rappelling, Rockfall Simulation (CSRP), and kinematic and global analyses to inform the remediation technique. Remediation techniques included an attenuator barrier, rockfall barrier, rockfall drape, pinned mesh, rock bolts, scaling; all treatments require significant clearing. A more detailed summary is provided in this newsletter as well.

Mike Maddigan, Environmental Group Manager, Land Recycling Program (PADEP), provided a brief summary of progress being made to revise Chapter 250 Final-Form Rulemaking. Some of these changes include adding MDLs, updating limits related to PQLs, clarification of language in public participation and report submittals, changes to the MSC tables, and proposed updates to the soil lead calculation models. Final publication is expected in a few months after the Environmental Quality Board approval.

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ANNUAL MEETING *Continued from Page 5*

Frank Nemec, P.G., Bureau of Environmental Cleanup & Brownfields (PADEP), presented on surface water impacts from diffuse flow of contaminated water through the use of SWLOAD5B spreadsheet. The prior program used to make this assessment was the Pennsylvania Toxics Single Discharge (PENTOXSD) program, recently the Toxic Management Spreadsheet (TMS 2020) has been developed to replace PENTOXSD, which is being discontinued in 2021. TMS was created for completing reasonable potential analyses and determining water quality based on effluent limitations for discharges of toxic pollutants. This tool combines the functionality of PADEP's toxic screen analysis and PENTOXSD.

Brie Sterling, Environmental Chemist 2, ECB Program (PADEP), discussed the various components included within the PADEP's Risk Assessment Report review process. Screening of contaminants of concern, receptor evaluation, pathway evaluation, and evaluation of exposure factors are all based on the current and potential future land use (both residential and non-residential). The toxicity factor provides a numerical measure of how bad a chemical is and if it is carcinogenic and/or systemic. Including a section on Risk Management is not necessary; uncertainty and its implications needs to be discussed within the actual report. All written responses sent to the PADEP need to be included within the final report.

Colin R Wade, Environmental Protection Specialist, HSCA Group (PADEP) and Lisa Strobridge, P.G., Bureau of Environmental Cleanup & Brownfields (PADEP), presented on a DEP case study: The Ridge Run PFAS HSCA. PFAS (PFOA and PFOS) are being investigated by the DEP under the Hazardous Sites Cleanup Act (HSCA). A single instance of a fire on site resulted in overall shallow soil impacts and infiltration into the subsurface via rain events resulting in distributed mass in shallow overburden and in surface water. When the fire occurred, firefighting foam was utilized to mitigate the hazard and resulted in PFAS contamination. The important take-home message was for all of us to be aware of the persistence and impact of a one-time release.

The annual meeting concluded with a discussion of upcoming events to mark on everyone's calendars. Check out the renewed PCPG website over the coming months as it is undergoing updates, and look ahead to attending upcoming webinars, listening to podcasts, and last but definitely not least, in-person networking events (hopefully taking place in 2021- fingers crossed!).

PCPG Supports Geoscience Students

By Vincent Carbone, P.G., PCPG Outreach Services Committee Chair

When PCPG recently finished their strategic plan, one thing was abundantly clear, we needed to work with students to understand what geologists do, promote our profession and educate students of all ages on the importance of geoscience to the broader community. At each level of education, PCPG is monitoring geoscience education in Pennsylvania and has developed programs to assist young earth scientists learn geology and the professional application of geology into their college years. PCPG is well positioned and is expanding our abilities to service students throughout the state. Some of our initiatives include:

- New Pennsylvania K-12 Science Standards – Over the last year, the Department of Education has been writing and revamping their K-12 Science Standards. PCPG is monitoring and providing comment to advocate that Earth Science is given the weight it deserves. The standards provide greater flexibility and importance for outside organizations to assist student education and PCPG is positioning to be a key organization to promote Geology for future generations.
- K-12 Education Outreach – PCPG has supported Earth Science Education in the classroom. Whether it be a "Science Night," or "Science Fair," or a geology, earth science, or environmental science discussions, PCPG has provided in person or virtual discussion on the broader field of geology or a related specific topic. Elementary school children are enthralled with rocks and minerals. They often bring bags of their shiny outdoor finds for us to tell them what they are. PCPG has provided rock, mineral and fossil displays that provide great interest to elementary school kids. At the intermediate and middle school level, PCPG has supported Young Women in Science programs providing female geologists to speak to young women about what they do as geologists. We have spoken at high school venues, can provide supervised field trips, and class discussion on what a geologist does or work with the curriculum to provide an expert on a specific earth science topic.
- College Undergraduate Outreach – PCPG has performed many college and university trips to talk directly to undergraduate students about geology careers, expectations upon graduation and help them navigate their options in decisions on graduate school and professional licensure. Recently, we have developed student programs during our annual meetings to focus on topics of interest to students such as finding a job or pursuing higher graduate education. For both, we have created programs to develop soft skills such as how to better communicate, interview skills, and resume feedback. More programs are coming as we flesh out a career skills educational program that students can complete and use for applications for a job or higher education.
- College Job Fairs – This year PCPG attended our first virtual job fair. Using a virtual booth, PCPG professionals spoke directly in group chat about their careers. Excellent questions were fielded by several students about job acquisition, consulting, graduate study programs, and overall questions on their professional and educational pursuits. PCPG provided our experience, gave professional opinions, and helped direct students to achieve their goals.
- Scholarships – PCPG provides scholarship opportunities to undergraduate students. PCPG promotes undergraduate research by inviting geology students to present the topics at our annual meeting. Every year we provide a stipend to the short list of students invited to attend the annual meeting. Following presentations to our judge panel, the top two research projects are provided a scholarship of up to $1,500 dollars.

PCPG continues to enhance our capabilities to students and looks forward to greater service to our great schools and universities of Pennsylvania. If you know of a school or university and would like to inquire about geoscience presentation or discussion please reach out to Vincent Carbone, P.G., Outreach Services Committee Chair by phoning (610) 972-8223, or by emailing Vincent.carbone@hdrinc.com.

Rock Slide Investigation Along US 340 Near Harpers Ferry, WV

By David Crotsley, P.G., HDR, Inc., PCPG Board Member

Aerial view of the US 340 Corridor in Harpers Ferry, looking east. Study area in bottom right of photo.

US-340 is a high traffic volume, two-lane roadway (greater than 30,000 vehicles per day) that meanders along the Blue Ridge Mountains and the Shenandoah and Potomac Rivers water gap between Harpers Ferry, West Virginia, and the West Virginia – Virginia state line (Photo 1). The cut slopes and the exposed natural rock slopes of the mountain vary in elevation from 280 feet to 900 feet, which is 150 feet to greater than 600 feet above the roadway. The rock slopes exhibit varying degrees of rockfall activity that present potential hazards to the traveling public and require ongoing maintenance by the West Virginia Department of Transportation, Division of Highways (WVDOH). Because of these hazards, a design study was performed that included a geologic evaluation and rockfall remediation design for three slopes adjacent to US-340 NB between Chestnut Hill Road (CR-32) and Harpers Ferry road (VA-671). The area of Harpers Ferry relies on commercial and tourism funds, so the traffic control during construction and the impact to the viewshed of the area is of particular interest for the community.

The project area is located in the Blue Ridge Province of the South-Central Appalachian Mountains and is part of the north-east plunging Blue Ridge-South Mountain anticlinorium of Alleghenian age. The project area is primarily underlain by the Weverton Formation of the Chilhowee Group, and crosses the Owen's Creek, Maryland Heights, and Buzzard Knob members of the Weverton.

The potential for a rockfall event to reach the roadway is a function of the quality of rock and orientation of the geologic structure, slope geometry and height of the rockfall generator (source) relative to the roadway. Therefore, the slope investigations included

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ROCK SLIDE *Continued from Page 8*

roadway-level and upper-slope geologic and slope evaluations, as well as mobile and aerial LiDAR mapping. Upper-slope investigations included detouring traffic in the project area, and rappelling technicians down to the slope in order to evaluate specific locations (Photo 2). Slope investigations included global and sub-global stability evaluations at roadway-level and targeted sections of interest on the slope which were identified during field reconnaissance and by evaluation of mobile and aerial LiDAR mapping. Rockfall analyses were conducted using the Colorado Rockfall Simulation Program and the global stability analyses were performed using RocScience's Dips and RocPlane programs.

The results of the slope evaluations required various treatments to be implemented for the project due to the highly variable geometry of the slope. On slope treatments such as attenuator barriers and roadway level treatments such as rockfall fences are recommended to mitigate the rockfall potential. With the results of the global and sub-global design analyses, as well as the geotechnical design of the slope treatments, HDR has been able to provide remediation recommendations to mitigate future potentially dangerous rockfall events. The safety for vehicular traffic in the Harper's Ferry area is of utmost concern and the recommended slope treatments have been developed to prevent future rockfall events.

Ameritech Slope Constructors collecting field data while rappelling the rock slope.

State News

Licensure by Endorsement (Regulation #16A-4715)

The State Registration Board for Professional Engineers, Land Surveyors and Geologists has published a proposed regulation which will allow for Licensure by Endorsement. The public comment period for this regulation ends May 17, 2021. The regulation proposes that licensed professionals in other states be granted licensure within the Commonwealth of Pennsylvania by endorsement, for ease of workforce transition and to remain competitive with neighboring states. However, the criteria in which licensure is obtained for practice in other states would need to meet or exceed the required criteria for Pennsylvania. A comparison of licensure criteria between Pennsylvania and many of its northeastern neighbors with similar regulations in place is presented in the regulation. Additional information can be found on the Independent Regulatory Review Commission's website and comments can be submitted via pu.irrc@irrc.state.pa.us or the promulgating agency.

New PCPG Corporate Members

Please join us in welcoming our newest PCPG Corporate Members:

AECOM

StratResources Geologic Consulting, LLC

The EADS Group

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.

Kids' Geology Education

Last quarter we shared an activity to help explain sedimentary rocks in a fun and delicious way. Below you will find another tasty recipe to help our future geologists understand the formation of igneous rocks. Stay tuned for an edible metamorphic rock activity in next quarter's newsletter.

This quarter we are going to be exploring igneous rocks. One example of a common igneous rock is pumice. A fun fact about it is that pumice is usually less dense than water, so it floats. The holes within this rock can visibly be seen with our eyes. As magma is bubbling before being erupted from a volcano, a large amount of air bubbles is trapped within it. This magma is ejected out of the volcano and cools very quickly, because of this process the rock cools around these air bubbles forming tiny holes where the gas bubbles were.

Edible Igneous Rocks: Sponge Candy

Ingredients

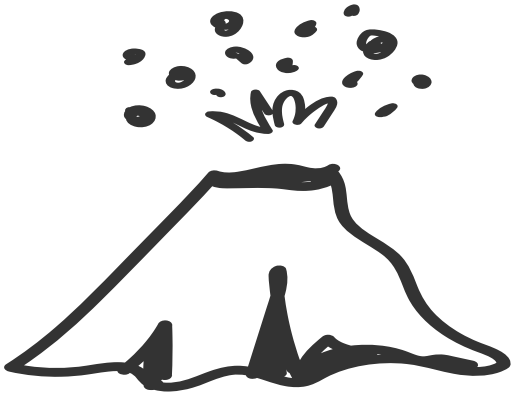
½ cup of sugar
½ cup corn syrup
½ tablespoon vinegar
½ tablespoon baking soda
1 teaspoon vanilla

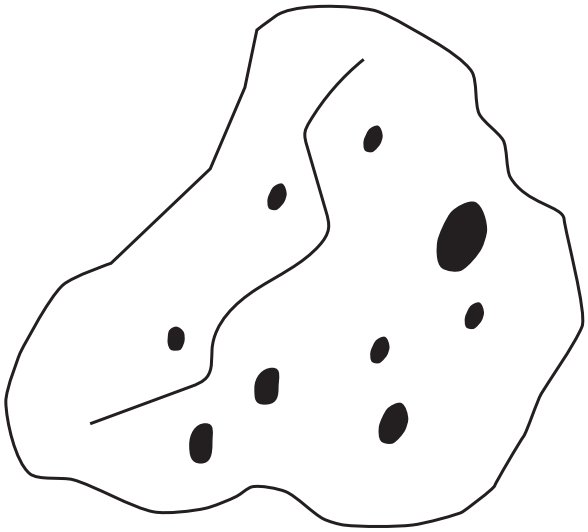
Instructions

1. Line the bottom and sides of an 8x8" square pan with parchment paper and grease with oil.
2. Add sugar, corn syrup, and vinegar to a large deep saucepan (the mixture will bubble).
3. Cook over medium heat stirring continuously until the sugar dissolves.
4. Continue cooking candy until thermometer reads 300 degrees F (this will take a while).
5. Stir occasionally, as soon as it reaches the desired temperature, remove from heat and stir in baking soda.
6. The mixture will foam.
7. Pour mixture into parchment lined pan and allow to cool completely.
8. Once hard candy has cooled, use parchment paper to pull it out of the pan.
9. Break into the candy to observe the sponge-like appearance of the candy, resembling pumice rock.
10. Last but not least, break off a piece and share your delicious creation with your family!

Fun Facts about Pumice :

- *Formed during explosive eruptions*
- *Generally light brown or gray in color*
- *Italy is the largest provider of Pumice rocks*
- *Can be used in washing jeans to give them a "worn" look*
- *It can float on water!*





DEADLINE FOR OUR NEXT NEWSLETTER IS JULY 1, 2021

For more information, contact our PCPG Newsletter Editor and Communications Committee Co-Chair - Tiffani Doerr, P.G., by eMail or telephone at 302-477-1305.

2021 PCPG ASSOCIATE AND CORPORATE MEMBER SPONSORSHIP RATE

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