Lead Lines

Eastern Pennsylvania Chapter
International Society of Explosives Engineers
www.easternpaisee.com

Volume 29 Number 3 Summer 2022

The Eastern PA ISEE welcomes requests for topics, and invites readers' letters and other contributions that relate to drilling, blasting, seismology and explosives engineering.

Prizes Awarded!
Gun Raffle!

2022 Clay Shoot & BBQ

Friday, November 4, 2022
11:30am - 5:30pm
Lehigh Valley Sporting Clays
2750 Limestone St., Coplay, PA

The event is FREE for Members or $35 for Non-Members

Sponsorship Opportunities Available!

Letter from The President

Dear Members,

On Friday, November 4, 2022 the Eastern PA Chapter will host the 6th Annual Clay Shoot & BBQ at the Lehigh Valley Sporting Clays in Coplay, PA. We are again looking forward to seeing everyone come out and participate. You will find all of the event details on page 3. Page 3 also features our generous event sponsors. As an event sponsor you will be acknowleged in the upcoming newsletter, on the website and with event signage at the Clay Shoot. Please consider sponsoring this event. Our sponsorship opportunity form is featured on page 5. And don't forget to register to participate at the shoot. Members are free, but registration is required. Form your own team of 4 or sign up and we will add you to a team. The registration form can be found on page 4.

We look forward to seeing you in November!

Best regards,

Scott

Eastern Pennsylvania Chapter Clay Shoot & BBQ

On Friday, November 4th the Eastern Pennsylvania Chapter will host it's sixth annual Clay Shoot and BBQ. Join us at 11:30am for a BBQ lunch followed by a mandatory 12:30pm safety class and 1pm start at the Lehigh Valley Sporting Clays course in Coplay, PA.

The event is FREE for members. Non-members will be charged $35 for a Chapter Membership. Registration includes a BBQ lunch, 8 station course with 50 rounds, and friendly competition. Ear protection is provided. You are encouraged to bring eye protection or purchase glasses for $10.00. Prizes will be awarded for the top three shooters as well as Lewis class shooter placements. We will also be raffling off a Mossberg Silver Reserve 20 gauge over/under shotgun.

If you are interested in registering, please complete the attached form on page 4. We also have station sponsorship opportunities available.

Thank you to Our Sponsors!

BBQ Sponsor: Austin Powder Co.

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Gun Raffle Sponsor: Rocky Rift Consulting

Station Sponsors & Raffle Prize Donations:

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Become a Station Sponsor Today!

Eastern Pennsylvania Chapter Clay Shoot & BBQ

Friday, November 4, 2022

FREE for Members

$35 for Non-Members

11:30am - 5:30pm

Lehigh Valley Sporting Clays

2750 Limestone St., Coplay, PA

Name_____

Company_____

Address_____

Phone_____ Fax_____

Email _____

Deadline to register is Friday, October 28, 2022

Your registration includes a BBQ lunch, 8 station course with 50 rounds and a golf cart per team of 4. Ear protection is provided. You are encouraged to bring eye protection or purchase glasses for $10.00.

You can bring your own gun and ammo (7.5-9 lead shot only).

Prizes will be awarded!

The event is FREE for Members.

Non-Members will be charged $35 for a Chapter Membership.

Non-members - please complete the membership form on page 21 and this registration form to sign-up.

Send to:

Eastern PA Chapter I.S.E.E.
Ethan Huff
c/o Vibra-Tech Engineers, Inc.
109 East First Street, Hazleton, PA 18201
ethanh@vibratechinc.com

Eastern Pennsylvania Chapter Clay Shoot & BBQ

Sponsorship Commitment Form

☐ **Clay Shoot Station Sponsor for $250**

Your company logo will appear on station sign

Contact Person _____

Company_____

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Please complete this form and email/fax it to Ethan Huff
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Jackson Joins ISEE as Director of Membership

Cynthia Jackson joined ISEE as Director of Membership and brings over 15 years of association management from a diverse group of individual and trade based organizations. Her background includes Chapter and Membership mangement and governance. Cynthia has an MBA from Regis University, a BS in Business Administration from the University of Denver as well as Certificates in the Principles of Financial Management and Principles of Marketing, both from ASAE, formerly known as the American Society of Association Executives.

Cynthia's main responsibilities include ISEE Membership and Chapter relationships. Cynthia has had the opportunity to attend her first Chapter/Membership Committee meeting as well as the Board of Directors Mid-Year Meeting.

Cynthia can be reached at jackson@isee.org.

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AUGUST 1997

COYOTE TUNNEL BLASTING

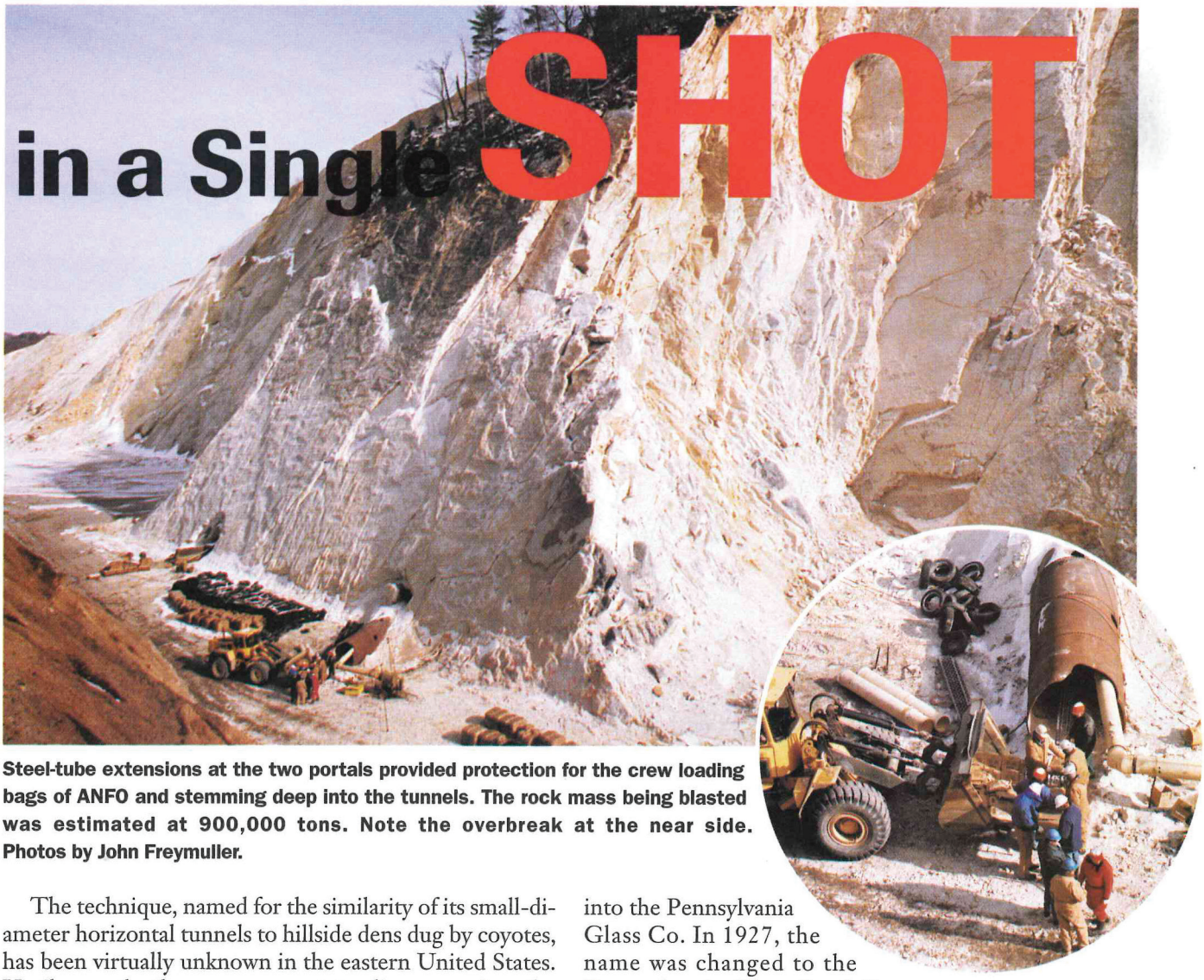
900,000 TONS in a Single SHOT

900,000 TONS of Rock

Decades ago, coyote tunnel blasting was common in the western United States as a means of producing large quantities of rock for highway construction, dam projects and harbor improvements. Coyote blasts involve fairly large rock masses, heavily concentrated explosive charges and a substantial financial investment. Only certain geologic formations with selected mining systems can accommodate coyote tunnel blasting. Unlike standard bench blasting, it produces a highly irregular face as a result of overbreak and uneven collapse of top strata, with somewhat larger fragmentation throughout the muck pile.

by Les Van Alstyne Jr.

in a Single SHOT



Steel-tube extensions at the two portals provided protection for the crew loading bags of ANFO and stemming deep into the tunnels. The rock mass being blasted was estimated at 900,000 tons. Note the overbreak at the near side. Photos by John Freymuller.

The technique, named for the similarity of its small-diameter horizontal tunnels to hillside dens dug by coyotes, has been virtually unknown in the eastern United States. Until recently, there was one outstanding exception: the Mapleton, Pa., pit and plant of U.S. Silica. In January, a 75-year reliance upon coyote tunnel blasting ended with the last and largest coyote tunnel shot ever fired at this location. The shot brought down an estimated 900,000 tons of Oriskany Sandstone—enough raw stone to meet most of the 1997 requirement for silica rock at the plant. Henceforth, rock will be produced by bench blasting, which is already in progress.

U. S. Silica has its headquarters in Berkeley Springs, W.V., where the company operates a silica rock quarry, mining the same formation as the Mapleton plant. The second largest producer of silica, U. S. Silica has plants in 12 states. Its product's end uses include optical and flat glass manufacturing, containers, housewares, furnace refractories and electronics.

The Mapleton plant dates back to 1894 when this site and other small sites mining the Oriskany Sandstone formation in Pennsylvania and West Virginia were combined into the Pennsylvania Glass Co. In 1927, the name was changed to the Pennsylvania Glass Sand Corp. (PGS). In the late 1980s, a merger of PGS and Ottawa Silica Co. resulted in the formation of U.S. Silica.

The Oriskany Sandstone formed during the Devonian period, about 300 million years ago. A vast inland sea deposited many layers of silica sand on the sea bottom. When the sea dried up, the silica, bound together with quartzite, lay in a narrow bed stretching from Alabama to New England. Regional thrusting and folding tilted the beds at a steep angle. Large portions were removed by erosion and glaciation. What remained are the sites presently mined for 99.9% silicon dioxide, the best source of pure silica sand in the world.

Why coyote tunnel blasting?

The Mapleton plant's reliance on coyote tunnel blasting stems from a variety of factors. The Oriskany Sandstone is not as consistent as most limestone or granite formations. Within a short distance, the composition of the rock can

The blast-sequence photos (left) were selected from the 1,800 digital frames recorded on CD-ROM using digital TV technology (provided courtesy of Ensign-Bickford Co., Simsbury, Conn.). Puffs of dust from the portals and the line of holes drilled to shear the rock mass at the floor provide initial evidence of blast detonation (left). The tunnel system nearest the camera was initiated first and shows proper horizontal movement of burden (center). As explosives in both tunnel systems detonate, the "plug" moves out from under the upper portion of the face (right). Effectivness of blast design and loading is evident by the absence of fly rock and the controlled fragmentation of the burden as it moves outward.

change from soft to very hard. When quarrying first began after the turn of the century, the conventional heavy-drilling equipment available was considered impractical. On the other hand, coyote tunnels could be easily and economically developed with small drills and readily available experienced miners without costly stripping of the steep and irregular surface. Therefore, coyote tunnel blasting was chosen as the more efficient and economical means of producing the required yearly tonnage.

The deposit at Mapleton extends several miles in a north-south direction. The formation dips at an angle of approximately 62°, has an average thickness of 200 ft from the front to the back wall, and is mined at a height of 475 ft. Removing a 300-ft block of stone separating two faces was to be the final blast using coyote-tunnel techniques under the original mining permit.

After more than a year of planning and drilling, U.S. Silica successfully fired its last and largest coyote tunnel blast

A year in preparation

Planning for the blast started in the late fall of 1995 in the first of a series of meetings between Mine Superintendent Les Van Alstyne; Ted Jerman, principal blasting consultant; and David T. Logue, surveyor with Logue Surveys. Jerman, a retired DuPont explosives specialist, had designed many of the company's tunnel blasts over the previous 10 years. Logue, a former U. S. Silica employee, also was familiar with the problems to be dealt with.

Accurate surveying of the remaining rock mass was the first and one of the most critical steps in the process. Survey data by Logue Surveys was plotted to make a contour map of the area to be blasted, along with cross sections and square areas for overall volume calculations (Figure 1). Only the "neat volume" in cubic yards is considered when making coyote volume calculations. This gives all coyote tunnels a common denominator from which to work. End break, side break and back break volumes are not considered.

Various tunnel configurations were considered. The final decision was that a four-tunnel system would be required to obtain the desired powder factor and uniform explosives distribution. The four tunnel locations were then plotted and the most efficient drilling plan was developed by extending two angled entry adits into the slanted side slope, with each branching off into two parallel tunnels. Each dual-tunnel system would then have one open face to blast to.

Cubic yards and shear areas were then calculated to determine the explosives charge weight requirements and placement throughout each tunnel. To shear the large wedge of stone between the two adits, it was planned to drill 36, 3½-in.-diameter horizontal "snake" holes along the toe of the slope for firing with the main blast. These holes were between 15 and 36 ft deep.

The design goal was to maximize lift and burden movement between tunnels, keep vibration within acceptable levels, and guard against fly rock and air blast.

U.S. Silica miners Ed Wharton and Tom Varner, supervised by Kenneth Wharton, used a jackleg percussion drill and 2-in. bits to drive the horizontal coyote tunnels. About 3 to 3½ ft of advance per day was achieved using 1½- x 12-in. Tovex Minerite 2 explosives, producing a tunnel with about a 4- x 6-ft cross section.

It took 12 months to complete the 700 ft of tunnels consisting of two entrance adits, each having two branch tunnels with a wing or "T" against the highwall.

A blaster kneels on the end of an ANFO powder column, which formed a continuous explosive column in each tunnel. Powder factor was controlled by the height to which bags were stacked. Four lengths of reinforced detonating cord were used to provide a 4x-redundant initiation system in each tunnel. Cord and non-electric shock tubes were protected by carefully placed bags. Photo by John Freymuller.

Tunnels distribute blast energy

The far-right and far-left tunnels were driven adjacent to an open face (Figure 1). The exact location of the two outer tunnels was determined by plotting a selected distance to the open face. The two inner tunnels were laid out to obtain relatively uniform distribution of explosive energy throughout the central mass of the formation.

The explosive charges were designed as a continuous column running the full length of the four tunnels

and wings, ending before the branches merged into the adits. This provided a variable distribution of explosives per linear foot of tunnel, based on the observed burdens. The unloaded portions of branches and the entire length of the adits were stemmed with a total of 16,500, 40-lb bags of silica sand to confine the explosive energy and prevent a blow-out.

The delay sequence was designed to start with the outside right tunnel, followed at predetermined millisecond delay intervals by the outside left tunnel, inner right tunnel and inner left tunnel.

Controlling powder factor

The explosive selected as the main charge was ANFO supplied in 50-lb multiwall paper bags. These were delivered to the blast site in truckloads by Hall Explosives and placed on sectional conveyors mounted on steel stands. The conveyors extended to the back of each tunnel to transport ANFO and sand bags into the tunnels. A loading crew of 25 men was stationed at 6- to 10-ft intervals to push the bags along the length of the tunnels. Loading and stemming was completed in five working days.

Actual placement of explosives was supervised by the explosives consultant using loading factors developed from the surveyor's plots. For the outer tunnels, the actual explosives load over each 10 lineal ft of tunnel was correlated to the average burden at that point. The inner tunnels were loaded to a higher powder factor based on rock volume with less regard for shear factors. Explosives in the inner tunnels must push up and out against the solid rock as well as against the fragmented rock remaining from tunnels fired on earlier delays. As loaded, the shot contained 165,000 lb of explosives and produced more than 900,000 tons of silica rock for an overall powder factor of 0.4 lb per cu yd, or 5.5 tons per lb.

In coyote tunnel blasting, especially in an angled face, the objective is to blast out a plug below the mass of the formation while simultaneously inducing upward compressive and outward tensile and flexural stresses. Ideally, after the plug has been shot out, gravity and the weakened condition of the upper formation will cause the rock mass to fall, accomplishing additional breakage and fragmentation.

Judged by this standard, U.S. Silica's last and largest shot was a success. There was no fly rock (defined as rock propelled beyond the blast area). Fragmentation was excellent for a coyote tunnel shot, with an estimated 50% of the muckpile having no dimension greater than 48 in. Vibration and air blast, as recorded by eight seismographs set up by Geosonics, were within the limits prescribed by Pennsylvania regulations.

Les Van Alstyne Jr. is mine superintendent at U.S. Silica's Mapleton Plant, a member of the International Society of Explosives Engineers (ISEE), and a director of ISEE's Eastern Pennsylvania Chapter.

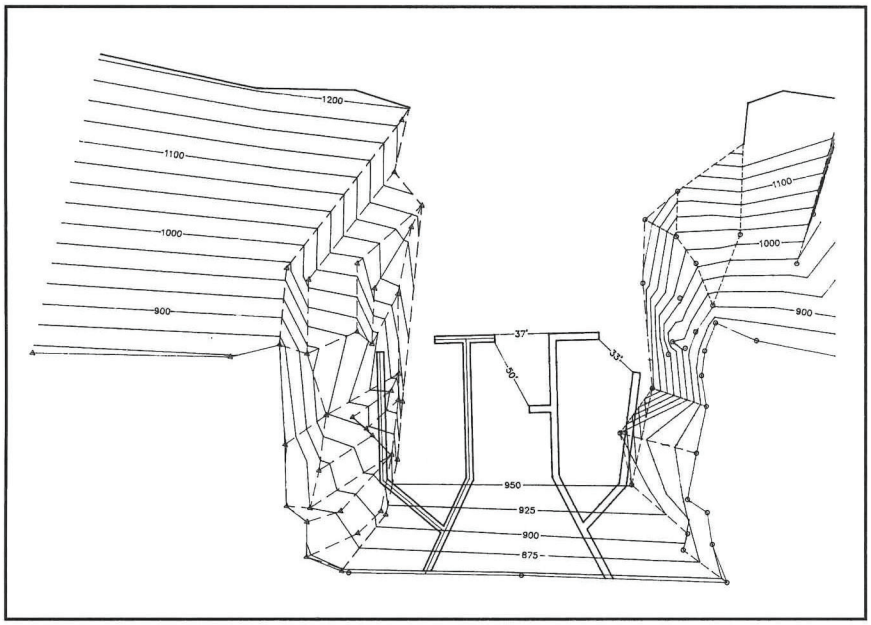


Figure 1: Plan view (courtesy of Logue Surveys, Huntingdon, Pa.) shows location of the four tunnels within the rock mass. Tunnels were initiated with individual delay periods.

Bags of stemming—16,500, 40-lb bags of silica sand—were tightly packed in the ends of tunnels and adits in order to contain blast energy within the rock mass. Photo by John Freymuller.

Catalano Named Chief of Explosives Safety

Christopher D. Catalano has been hired by the Pennsylvania Department of Environmental Protection (DEP) to fill the vacant Chief of Explosives Safety position. Chris previously served for over three years as a Blasting/Explosives Inspector in the Pottsville District Mining Office of the Pennsylvania DEP. Chris worked in various aspects of the blasting and explosives industry for over 23 before entering public service as a regulatory official.

Chris grew up in Elk County, where he was strongly influenced by his mentor, friend, school teacher, and fellow blaster, Dennis Murry. He first began an apprenticeship in 1996 at the Otto-Cupler Torpedo Company (Titusville, PA) assisting with oil and gas well blasting while attending Clarion University, after which he obtained his PA General Blasting license.

Continued on page 14

VIBRATION GEOTECHNICAL NOISE DUST ENVIRONMENTAL

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Catalano Continued

Later, while a blaster with Senex Explosives, Inc., Chris worked in Pennsylvania, Maryland, Virginia, and West Virginia in the fields of construction blasting, surface coal mining, and industrial mineral surface mining. Over the years Chris gained experience in demolition work and other non-typical explosives applications. As an ATF licensed user of explosives, Chris has also worked as a special effects coordinator and technician in the film and theater industries, having had his work appear on television, the silver screen, and live on stage. His entertainment work has included close proximity pyrotechnics, mechanical rigging, environmental simulations, large cinematic explosions, and dozens of professional fireworks displays for everything from weddings to large community events.

In addition to his employment with the Commonwealth of Pennsylvania, Chris is currently a returning student at Harrisburg Area Community College in the Physical Science (Geology) program. He holds current membership in the International Society of Explosives Engineers and the Pennsylvania Association of Environmental Professionals. He is the natural father of one little boy, the soon-to-be adoptive father of three additional little boys, and the husband of Kristie, whom he has known since childhood. Aside from being active in his local church, Chris and his family enjoy spending time together being outdoors and exploring.

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DAY	DATE	EVENT	LOCATION	DESCRIPTION
IN-PERSON SAFETY DAY CONFERENCES				
Tue	09/20	Bayfront Convention Center	Erie	The conference provides a forum for Pennsylvania stakeholders to learn about safe digging. The conference begins at 7 am. Keynote speaker Monica Rakoczy with EnterTRAINING Solutions. Numerous educational sessions throughout the day. Locate Master Tournament. Complimentary lunch.
Thu	09/22	Blair Convention Center	Altoona	
Learn more: pa1call.org/SafetyDay DEP 2 contact hours				
IN-PERSON EVENTS				
Wed	09/28	Excavator Program	Eagles Mere	Learn about excavator responsibilities under PA Act 287, as amended. Complimentary breakfast. PDH 2
Tue	10/04	Excavator Program	Drexel Hill	
Wed	10/05	Locator Program	Blairsville	Learn about facility owners and locator responsibilities under PA Act 287, as amended. Complimentary lunch. DEP 3 contact hours in 3-yr license cycle. PDH 3
Wed	10/05	Locator Program	Williamsport	
Thu	10/06	Excavator Program	York	Learn about excavator responsibilities under PA Act 287, as amended. Complimentary breakfast. PDH 2
Tue	10/11	Excavator Program	Bradford	
Wed	10/12	Designer Program	Huntingdon	Learn about designers' responsibilities under PA Act 287, as amended. Complimentary lunch. PDH 1
IN-PERSON EVENTS PARADIGM				
Tue	09/20	Paradigm	McAdoo	Presented by Paradigm-Coordinated Response Exercise and Excavator Safety Program. Brings together operators and emergency officials to assist operators with focused compliance efforts. Complimentary dinner.
Wed	09/21	Paradigm	Scranton	
Thu	09/22	Paradigm	Montrose	
Tue	09/27	Paradigm	Wysox	
Wed	09/28	Paradigm	Wellsboro	
Thu	09/29	Paradigm	Coudersport	
Tue	10/04	Paradigm	Williamsport	
Wed	10/05	Paradigm	State College	
Thu	10/06	Paradigm	Lewistown	
Tue	10/11	Paradigm	Bedford	
Wed	10/12	Paradigm	Indiana	
ONLINE TRAINING WEBINAR PROGRAMS				
Thu	09/15	PUC Online Compliance Training	Facility Owner and Locator	Online compliance training for those persons or companies instructed by the PUC to take their certified training. PDH 2
Fri	09/16		Excavator	
Fri	09/16		Project Owner and Designer	
Tue	09/27	Online Ticket Management		Learn how to utilize the online ticket management. PDF 0.5
Tue	10/11	Web Ticket Entry		Learn how to notify online instead of calling. PDF 0.5

REGISTER ONLINE: www.pa1call.org/events

Superfund Excise Tax Doubled

In August, the ISEE confirmed with the Institute of Makers of Explosives (IME) that the Superfund Excise Tax was being reinstated and being DOUBLED.

The tax had previously expired on Dec. 31, 1995. The reinstated tax applies to the manufacture of 42 taxable chemicals (including ammonia) and 121 taxable substances (including imported ammonium nitrate).

The below article describes how the tax will apply.
https://www.forbes.com/sites/lynnmucenskikeck/2022/07/25/superfund-excise-tax-is-catching-many-companies-by-surprise/

The IRS has also issued extensive guidance on the implementation of the tax.
https://www.irs.gov/newsroom/irs-issues-superfund-chemical-excise-taxes-faqs

Richardson Joins ISEE as Conference Coordinator

Victoria Richardson joined ISEE August 1st as the new Conference Coordinator working directly with Hiranthie Stanford to ensure the growth and continued success of the ISEE Annual Conference.

Victoria comes to ISEE from Hampton University where she served as the Assistant Academic Coordinator. Victoria assisted with managing schedules, budgets, rooms and instructional supplies for meetings and other study programs.

In her previous position, Victoria helped to restore brand awareness through various social media networks generating 50% increase in site traffic. She created digital and print event materials, website design and worked with various event apps.

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7 USEFUL TIPS

To Help You Ship Hazardous Materials Safely in Commerce

Quick e - Resource Guide

1 Classify the material

You need to determine if you are shipping a hazardous material as indicated in the 49 CFR, Parts 100-185. Specifically, you need to review the Hazardous Materials Table (HMT) found in the 49 CFR in § 172.101, and review your material's **Safety Data Sheet**.

2 Determine your HAZMAT employee training needs

- You must determine who are your hazmat employees.
- Do your HAZMAT employees need a training course?
- You must keep up-to-date records of employee training completion.
- For additional help, check out the brochure, "Guide to developing a hazmat training program."

3 Determine any registration requirements

- You must check to see if you need to register.
- If you ship a placarded quantity of hazardous material, you must be registered.

4 Select your approved packaging

The Hazardous Material Table explains how you package a HAZMAT product.

5 Mark and label your package

There are specific ways to mark and label your package depending upon their hazard class, identification (ID) number, weight and more. Be sure to follow the correct regulations when you mark and label.

6 Verify Highway Transport and placarding requirements

Are you going to provide transport or are you going to use a contract carrier. Follow the regulations to make sure you use the correct placard to communicate the hazard. You must verify if the driver's commercial driver's license (CDL) has a hazmat transportation endorsement, if required. You may need to review 49 CFR, § 177.816.

7 Prepare shipping papers

For examples of correct shipping papers, check out the Hazmat Transportation Requirements. The shipping paper's order of information is important. Extra information may be required due to the material's hazard class and quantity shipped.

FREE RESOURCES

- PHMSA regularly offers workshops on the basic sections of the 49 CFR, Parts 100-185, both face-to-face and virtually.
- PHMSA has online training modules that will satisfy some of the training requirements.
- Remember to always CHECK THE BOX!

U.S. Department of Transportation
Pipeline and Hazardous Materials Safety Administration

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- ☐ **Individual** - Chapter dues are $35.00 per year.
- ☐ **Deluxe Corporate Membership** - Dues are $250.00 for up to 10 members plus a 1/2 page ad in the quarterly newsletter ($180 value). Please list name, email address and ISEE status for all members.
- ☐ **Corporate Membership** - Dues are $150.00 for up to 5 members plus a business card ad in the quarterly newsletter ($60 value). Please list name, email address and ISEE status for all members.

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I agree to comply with the Constitution, By-Laws and Regulations of the Chapter.

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Signature of Applicant

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