How can you grow lush, beautiful orchids like this?

Why, with perlite, of course!

For decades, Dr. Wally Thomas, an orchid hybridist in British Columbia, Canada, grew award-winning orchids using the perlite reservoir technique with intermediate-size perlite. He wrote extensively about his success growing orchids with this method. To learn more about Dr. Thomas, who passed away earlier this year at the age of 92, and his work with orchids and perlite, go to page 6.
2013 Board of Directors for the Perlite Institute

OFFICERS

PRESIDENT
Linda Chirico
Carolina Perlite Company, Inc.
P.O. Box 158
Gold Hill, NC 28071
Phone: (704) 279-2325
Fax: (704) 279-8818
lchirico@carolina.rr.com

VICE PRESIDENT
Matt Goecker
EP Minerals LLC
9785 Gateway Drive
Suite 1000
Reno, NV 89509
Phone: (775) 824-7658
Fax: (775) 824-7676
matt.goecker@epminerals.com

TREASURER
Keith Hoople
Midwest Perlite, Inc.
4280 West Parkway Blvd.
Appleton, WI 54913
Phone: (920) 731-2671
Fax: (920) 731-2600
keith@midwestperlite.com

PAST PRESIDENT / ADVISOR
Kathryn Louis
Sun Gro Horticulture Canada, Ltd.
15831 NE Eighth St., #100
Bellevue WA 98008
Phone: (425) 433-0170
Fax: (253) 484-2715
kathrynl@sungro.com

DIRECTORS

Sebastien Caspard
Imerys Performance & Filtration Minerals
154 Rue de l’Universite
Paris 75007
France
Phone: (33) 633 50 82 17
sebastien.caspard@imerys.com

Mike Hess
Idaho Minerals LLC
P.O. Box 162
Malad City ID 83252
Phone: (208) 766-4777 or (800) 767-4701
Fax: (208) 766-4776
mikeh@hesspumice.com

René van der Mark
Pull Rhenen b.v.
Postbus 15
Utrechtsestraatweg 222
Rhenen 3911 TX, Netherlands
Phone: (31) 318-471001
Fax: (31) 318-472088
rmark@pullrhenen.nl

Matthew Malaghan
Australian Perlite Pty Limited
18-22 McPherson St.
Banksmeadow
Sydney NSW 2019
Australia
Phone: 61 2 9316 0054
Fax: 61 2 9316 0050
matthew.malaghan@perlite.co.nz

Jerry Mishler
Supreme Perlite
4600 N. Suttle Road
Portland, OR 97217
Phone: (503) 286-4333
Fax: (503) 286-1068
jerry@perlite.com

Rick Willis
Silbrico Corporation
6300 River Road
Hodgkins IL 60525-4257
Phone: (708) 354-3350
Fax: (708) 354-6698
rwillis@silbrico.com
Greetings, everyone. Since publication of our last newsletter, we are pleased to welcome a new member to the Perlite Institute:

World Perlite Tellioglo Perlite and Mineral Mining Construction Company – Kocarli, Turkey

We look forward to seeing them at future Perlite Institute meetings.

The Board of Directors met April 9 and 10 in Reno, Nev., to conduct strategic planning as well as ongoing Perlite Institute business. Several members also joined us for the session and tour of EP Minerals’ perlite and DE plants in Lovelock, Nev., as well as its nearby perlite mine. On behalf of the Perlite Institute, I would like to extend our thanks to Matt Goecker and his colleagues at EP Minerals for their tremendous hospitality and a spectacular tour of their perlite operations.

The Communications Committee is nearing completion of our Perlite Loose-Fill Insulation brochure, but we are still in search of good photos of this application. If anyone has photos to share, please send them to the Perlite Institute office.

Our annual meeting to be held in Sydney, Australia, Sept. 29 through Oct. 2, is fast approaching. Registration information has been sent out, speakers have been booked, and the Sir Stamford Hotel in “The Rocks” district of Sydney awaits our arrival. Hope to see you all there!
Each year, the Institute’s Board of Directors meets to strategically plan for the future of the organization. During this exercise, the board identifies strengths, weaknesses, opportunities and threats to the organization and develops measurable goals for the organization to work toward through committee activities.

This year, the board met in Reno, Nev., in April. By the end of the planning session, those present had developed and prioritized the following goals for the organization:

1. Use technology for educational delivery by Dec. 31, 2014 (Meetings Committee)
2. Net seven new members by Dec. 31, 2014 (Membership Committee)
3. Develop analysis on competitive products (i.e., insulation, stormwater management and sludge coagulants) by Dec. 31, 2014 (Research Committee)
4. Continue to update website for reach and relevance by Dec. 31, 2014 (Communications Committee)
5. Maintain 95 percent of current members by Feb. 28, 2014 (Membership Committee)
6. Develop a model for the PI to research new products by Dec. 31, 2014 (Research Committee)
7. Increase member participation in committee work by March 31, 2014 (Membership Committee)
8. Continue to research and use blogs and social media sites by Dec. 31, 2014 (Communications Committee)
9. Develop five new and update four outdated product guides by June 30, 2014 (Communications Committee)
10. Continue grant process by Dec. 31, 2014 (Research Committee)
11. Continue providing newsletter and promote articles received by Dec. 31, 2014 (Communications Committee)
12. Review existing standards and research codes and regulations affecting the industry by Dec. 31, 2014 (Research Committee)
13. Use spokesperson to represent the Perlite industry through various venues by Dec. 31, 2014 (Chuck Vogelsang and Board)

Continued on page 5
continue to research and share patents and regulations affecting the industry and develop a process to analyze the information by Dec. 31, 2014 (Ken Wiener and Board).

These goals require active committees to oversee the projects and activities that will be developed to address the goals. The board agreed upon the following committee structure for 2014:

- Meetings Committee
- Membership Committee
- Research Committee
- Communications Committee
- Long-Range Planning Committee

While board members will continue to chair and serve on the various committees, it is imperative to the success of this plan that members of the Institute get involved in committee work. We need volunteers! The time commitment might require several conference calls throughout the year to solicit your ideas and opinions, and those calls typically take one to two hours depending upon the agenda items. Most importantly, we need members to provide ideas during these meetings.

My challenge to every member is this: Give two hours each quarter to your professional association. Your input will have a lasting effect on the success and future of the Perlite Institute. Perhaps you have an employee who would benefit from networking with other members on a conference call. Ask him or her to serve! You only get back from your membership in the Perlite Institute what you put into the organization. The more you put in, the more you will get back. Trust me when I say you will benefit from this experience and may actually enjoy getting involved!

To get involved, send an e-mail to me at info@perlite.org. I will pass your information on to the appropriate committee chair and staff member to start the ball rolling. You will not regret this decision. Please get involved and volunteer today!

Please get involved and volunteer today!
Remembering Dr. Wally Thomas

by Steve Whysall
Photos by Mark van Manen

Editor’s Note: Dr. Wally Thomas, who had been head of haematology at the Vancouver General Hospital and an emeritus professor of medicine at the University of British Columbia, was also an orchid hybridist who sang the praises of growing orchids in perlite. He studied and wrote about his success growing orchids at Charles Island Gardens using the perlite reservoir technique. Dr. Thomas, 92, passed away in January. The following tribute to him originally ran in the Vancouver Sun. It has been edited for length and is reprinted with permission of the author.

I first met Wally in February 1992, when he was in the middle of organizing the 16th World Orchid Conference in Vancouver, the first time it had been held in North America.

I remember walking into his house in the Lighthouse Park area of West Vancouver and finding lots of tiny odontoglossum orchids being propagated in jars.

Of course, at the time, I had no idea what an odontoglossum orchid was. But Wally was a very kind and gentle and generous teacher – a wise soul who was capable of imparting knowledge with infinite grace and charm. As I remember, he always had a merry twinkle in his eyes.

For him, it all started when he brought home a few cattleya orchids, and they bloomed for him almost immediately.

“I had always wanted to have a go at orchids” he told me. “I thought they were lovely, and they represented an interesting challenge.”

Dr. Wally Thomas was an orchid hybridist who had great success growing orchids using the perlite reservoir technique.

It wasn’t long, however, before he had met and fell head over heels in love with odontoglossums.

In 2007, I worked with Wally on another story, this time about how he was helping a young teenage boy, Tom Holland (he was 15 at the time), to develop his interest in orchids, notably odontoglossums.

As well as a fine collection at his house in West

Continued on page 7
Dr. Wally Thomas 

Vancouver, Wally has another even larger collection at his island retreat off Pender Harbour on the Sunshine Coast.

I knew very little of his professional life as a doctor, although I did know that he did some very important work in immunology that resulted in producing better treatment for leukemia patients.

For me, though, I will always remember Wally for his easy smile and gentle manner and his wonderful enthusiasm for orchids.

“There is something magical about orchids,” he once told me. “When you look at them they seem so different to other flowers.”

Steve Whysall has been the garden columnist for the Vancouver Sun in British Columbia, Canada, for more than 20 years.

---

Orchids and Perlite: A Perfect Match

by Wally Thomas and Barb Thomas

For a long time, perlite has been known as a beneficial soil conditioner. Starting some 15 years ago at the West of Scotland Research Station, a hydroponic technique was developed using pure perlite for growing tomatoes. The technique really takes advantage of perlite’s excellent capillary action by using a reservoir to hold nutrient solution for the perlite to absorb.

In tomato culture studies where the perlite technique was compared to rockwool culture, researchers found the perlite to be superior and much simpler to manage. In 1988, we decided to conduct our own experiment on rockwool and perlite with our orchid collection.

For the experiment, 36 matched odontoglossum seedlings were grown in rockwool and perlite. At the end of a year, there was no significant difference in their growth as measured by weight and leaf length. The plants in perlite did seem to take off to a slightly slower start but caught up by the end of the year.

The root systems in perlite were much larger than those in rockwool, and in the ensuing years, the perlite plants did so well and were so easy to manage that we moved our entire collection from rockwool to perlite in the spring of 1992. Since doing so, we have received three Awards of Merit and six Highly Commended Certificates from the American Orchid Society.

To read the rest of this article, go to www.cvios.com/perlite_article.htm.

Excerpt from Dr. Wally Thomas’s Plant Guide: Growing Orchids in Perlite

This Plant Guide summarizes five years of outstanding success in growing orchids at Charles Island Gardens using the perlite reservoir technique with intermediate-size perlite. This method, by which all major genera of orchids can be grown, allows for a constant supply of nutrient to the plant by taking advantage of the unique capillary action of perlite.

An outstanding characteristic of this method of culture is that one cannot overwater and that there is always excellent aeration. Table 1 compares the excellent properties of perlite with those of other commonly used growing media. Additionally, perlite is a naturally occurring material. Horticultural perlite (about 1/8 inch, 3 mm in diameter) is pretreated by pouring perlite into a tub of water and fertilizer solution. The perlite is pushed into the water several times, and the floating perlite is skimmed off. This wet perlite is a wonderfully easy material with which to pot. Such pretreated perlite shows no evidence of compaction after three years.

To see Dr. Thomas’s entire guide, including the table referred to above, go to www.perlite.org/library-perlite-info/horticultural-perlite/Growing-Orchids_Perlite.pdf.
**Why Perlite Rocks**

**A look at news around the globe affecting Perlite manufacturers**

by Kenneth Wiener

---

**Smog, Dusty Roads, Fracking and Arsenic in Beer**

**CRYSTALLINE SILICA and DUST**

And, the answer is still no. There has been no action on the proposed silica exposure rules in the United States.

On the other hand, California is beginning to lead in environmental rules again. This time, it might actually make sense, especially for perlite. The California governor has proposed changes to warning label rules mandated by Proposition 65 since 1986. Proposition 65 warnings generally read as follows: “WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.” The warning is mandated unless exposure levels are deemed to be “safe.” However, there are very few levels of anything acknowledged to be safe. The changes would mandate that efforts be made to establish safe levels of exposure.

In the private sector, United States Silica has released its 2012 sustainability report, which you can download at [www.ussilicasustain.com](http://www.ussilicasustain.com). There are some interesting takeaways from this report, not the least of which is that it exists at all. A few snippets will appear throughout this column. In this section, the report announces the opening of a processing facility that is designed to resin-coat granules of sand for use as a proppant in fracking operations.

What does this process do? For a start, it does not significantly reduce the level of crystalline silica in the sand. Any attempt by an analytical laboratory will begin by grinding the material to a powder, thereby exposing uncoated material.

So, what does it do? Small particles, of respirable size, are likely to be bound to other, larger particles. Hence, visible dust is reduced when the sand is transported. Complaints by neighbors and the community are likely to be fewer. From a technical standpoint, though, the possibility exists of making a more spherical proppant particle by gluing smaller particles of different shapes together. The spherical shape is the shape that the fracking industry says is desired.

Additionally, the world has the problem of high levels of particulate matter in the air. This matter is designated either PM (particles smaller than about 30 microns), PM-10 (particles smaller than 10 microns) or PM-2.5 (particles smaller than 2.5 microns). The latter two are considered more dangerous, but as can be seen in the following picture, all can contribute to haze and smog.

This smoggy vista is located in New Zealand, land of pristine beauty and an ocean away from smoggy Los Angeles, Tokyo or Mexico City. Photo by Dean Kozanic, The Press

That smoggy vista is of “Chch,” better known as Christchurch to all but perhaps its inhabitants. Yes, New Zealand! Land of pristine beauty and an ocean away from smoggy Los Angeles, Tokyo or Mexico City. Pollution levels in Chch have exceeded the standard of 50 micrograms per cubic meter of air at least four times this year so far.

What causes PM formation? My answer, and the textbook answer, has been combustion processes, especially incomplete combustion such as that of sooty diesel fuel.

In the graphic on the next page, we can see that PM2.5 can form secondarily and presumably spontaneously when exposed to light from smog.
Why Perlite Rocks continued from page 8

However, when you see the following, think PM and PM-10. Coincidentally, this logging truck is also shown driving on an unsealed road in New Zealand.

This logging truck on an unsealed road in New Zealand shows why roads should be sealed either with water or some kind of acrylic emulsion. Photo by Graham Wright, the Northern Advocate

It is likely that mining equipment will also create similar dust, providing another reason to seal roads either simply with water or with some kind of acrylic emulsion. Oil emulsions may be toxic as they leach into surrounding soils and watersheds.

GLOBAL WARMING & POLITICS

One particular environmental organization, Germanwatch, publishes information yearly on climate change risks to nations and information on a so-called “performance index” based on information from each country. There doesn’t seem to be any normalization between countries, so China and the United States, ranked 52 and 53 respectively, are measured against Slovakia and Iceland, for example. The 2010 performance index is found online.

The breakdown of indicators suggests that China “talks the talk” but doesn’t “walk the walk.” On the other hand, all this information is indicative of the conflict going on behind the scenes before, during and after climate change talks. Each faction wants the “others” to take a bigger share of responsibility, claiming “fairness” concerns due to economic imbalances between developed nations and the undeveloped world.

Bloomberg News reports that the Stockholm Environment Institute wants the United States to provide almost 30 percent of the world’s cuts of carbon emissions by 2020. In comparison, they would assign China a little over 10 percent of the cuts, while the European Union’s share would be about 23 percent and India’s only 1.2 percent.

Realistically, such numbers are not going to happen unless technology improves dramatically, and even then, I’m not sure. Reducing the smog problem in Los Angeles took time, technology, money and the political will to establish and enforce vehicle emission standards. Climate change mitigation related to reducing the amount of or the rate of rise of atmospheric carbon dioxide levels will take concerted efforts and would not be without pain throughout the world.

EU LAWS: REACh, CLP

The latest EU issue requiring perlite’s attention is the question of how to establish that perlite does not leach harmful substances to the environment. Never mind that perlite gets used in soil. Never mind that perlite is used to filter consumable beverages, often acidic in nature. I have been requested to deal with their rules, so I will draft the paperwork to satisfy the requirement.

MINE SAFETY

Fracking. Love it or hate it, it’s the topic of many a town hall meeting, as communities meet to decide whether the practice should occur in their area.
Why Perlite Rocks continued from page 9

Major concerns include air and water quality degradation but also involve land use questions and earthquakes. Reading through this quarter’s patents, I found a patent assigned to Schlumberger Technology Corporation that mentions perlite as an option but does not really recommend or prefer perlite. The process protected by this patent turns low-density, low-crush strength materials into high-crush strength granules for use as proppants in fracking applications.

Why would a company want to create such granules when they can simply mine sand? Precisely because of the opposition’s issues noted above. Such granules are low in crystalline silica and low in respirable particles. They don’t have to be mined locally or regionally either, so land use issues are reduced.

That leaves issues related to contaminated material. I don’t have a very good handle on where all the water pumped down the well goes. If it comes up again, it could be a candidate for filtration and or reverse osmosis type treatment. If it stays underground, that water could contaminate local drinking water wells. And, that’s not the only contamination. Cuttings from drilling operations have to go somewhere.

In April, a truck loaded with cuttings from a Pennsylvania well set off radiation detectors as it entered a potential dump site. Gamma rays coming from radium-226 were detected, and it was determined that the material was too radioactive for that particular hazardous waste site. Radium levels were more than 80 times EPA standards. The truck was redirected back to the drilling operation and had then to be sent to a more appropriate waste facility; all in all, a highly inefficient process.

In a nod to pragmatism, a certifying agency called the Center for Sustainable Shale Development has been created. The initial purpose is to set high operational standards for companies operating in the Marcellus Shale formation that ranges from West Virginia through Pennsylvania and into New York State. Founders include energy companies, environmental groups and philanthropic organizations, even though mistrust lingers on.

Unlike the earlier reported on website www.fracfocus.org, this group would limit or prohibit the use of certain materials, such as diesel fuel, in fracking fluids, demand detailed disclosures and push faster compliance with EPA standards than required by law. Certification will include 15 standards covering water and air quality. Water standards include a requirement to reuse as much water as possible. Is this an opportunity for perlite filter aid or perlite aggregate-packed filtration columns? Members serving this geographical area are encouraged to find out soon, while companies are beginning the certification process!

Also on the subject of mine safety, the US Silica sustainability report referenced above proudly boasts the length of time that various facilities have gone without a “lost time incident.” Some of these numbers are actually very impressive. One could actually do worse than using the report as a template for one’s own sustainability report.

COMPETITION

A paper made the news this quarter regarding arsenic content of beer. The authors measured levels in German brands of beer significantly above drinking water standards. Of course, total dosage is what counts, but the point was specifically made that these brands were filtered through diatomaceous earth and that’s what caused the problem.

I was ready to suggest perlite for filtration instead; however, calculations showed that that much arsenic could not have come from DE that met Food Chemical Codex specifications. And, I found earlier articles that showed varying levels of arsenic and lead in beer with a larger sample size and brewers from the Americas, Europe and Asia. One would think that if the heavy metal content came from the filter aid, arsenic and lead levels would track. They did not, so the logical conclusion would be to look elsewhere.

THE ECONOMY

The United States is facing implementation of the Affordable Care Act, colloquially known as Obamacare. Behind all the shouting about how good or terrible the law is, is the basic question: What is the cost of healthcare? The business

Continued on page 11
Why Perlite Rocks  continued from page 10

model of traditional insurance is that the doctor, hospital, lab or other entity bills the covered individual’s health insurance, and the insurance company has a negotiated set of rates with the entity for various goods and services. The insurance company does not have to share that set of rates with anyone, and the entity does not have to share its set of rates with the public. In fact, hospitals, and probably doctors and laboratories, hire consultants to artificially increase revenue by reclassifying certain procedures into more lucrative categories.

After the insurance company determines the negotiated charge, it can pay all or some, based on the details of the insurance policy. Whatever is left over, and there usually is, is the responsibility of the insured.

Estimates are that 16 percent of the U.S. economy is related to healthcare, and that percentage is on track to hit 20 percent by 2021. These costs are serious. So, how are costs calculated and how variable are they, you ask? The answers are, “Who knows?” and “Extremely,” respectively.

Medicare has published a study revealing wildly varying charges among U.S. hospitals for 100 common inpatient treatments and procedures.

One might expect costs to vary from state to state, but within a single area? Average hospital costs for knee and hip transplants in the Los Angeles area were between $32,022 and $223,373. Pneumonia treatment averages ranged from $17,000 to $70,000. That’s not for single cases where one could say that one case was easier than another. That’s the average cost for those kinds of cases at various hospitals!

Regardless of politics, such opacity in pricing, combined with the size of the economic sector, presents a challenge for all in all sectors of the economy.

GREEN BUILDINGS

To illustrate the trend of “green” construction, when I did a Google news search for the terms “green building,” I found more than 12,000 hits.

Admittedly, some will refer to a building that is the color green; however, thousands of references to “green” is an indication that the topic is real and has global impact.

In contrast, a Google news search for the terms “stormwater runoff” and “construction” found 200-plus hits. And now the bad news: the use of Google news to search for “stormwater runoff” and “perlite” got zero hits. Perhaps we, as an industry, need to promote our benefits more loudly.

Google did, however, return information on a 2008 paper published in a journal called Water Environment Research. The abstract of the paper reads:

*This paper presents the study of a mixed porous media composed of expanded perlite and a nonwoven needle-punched geotextile used to reduce the suspended solids load and concentration in urban runoff. Laboratory procedures were designed to quantify the suspended solids removal efficiency and variation in time of filtration rate. Different grain-size distributions of expanded perlite, diverse suspended solids concentrations, and different hydraulic and geometric conditions were tested to determine the most effective filter media. A dimensionless parameter, termed Global Performance Index (GPI), was developed to reach this objective. Measured data were also used to build a dimensional and a regression model to represent the performance of the filter media mathematically. The theory, derivation and performance of both models are presented and compared with an existent empirical model. The dimensional model better reproduces the observations, becoming a useful tool for the design, operation and evaluation of commercial porous media filters.*


BIOFUELS & OTHER SUSTAINABILITY ISSUES

Efforts to use methane and other biogases from wastes to create electricity have to date focused on actual waste. A national grocery chain in my area has gone a step further. The stores are collecting rotten food from their 359 area stores and bringing it all to a facility at their 59-acre regional headquarters. That alone diverts the waste from landfills and saves the energy needed to truck the 150 tons per day approximately 100 miles.

I read about this facility in the *Los Angeles Times*.
Why Perlite Rocks continued from page 11

and tried to get a tour, but the company does not allow that. The newspaper does describe the process, though. First, the food is dumped into a grinder and then sent to a pulping machine that screens out glass and metal while mixing in hot wastewater from a nearby dairy to create the sludge. That sludge is pumped into a 250,000-gallon staging tank and then fed into a 2 million-gallon silo. Bacteria are allowed to digest the organic material, while creating methane gas. The methane then feeds three turbine generators capable of producing 13 million kilowatts-hours of energy annually. If that energy were sent to the grid, it would satisfy the needs of 2,000 homes. Even though the energy is used internally within the headquarters (20 percent of needs), that amount of energy still would have been used and can be considered as providing 2,000 homes with electricity.

My interest in viewing this process was to determine the type of insulation used on the tanks and silos. According to a tank manufacturer I spoke with, perlite is not used to insulate the walls. It is possible, however, that the tops of these structures are designed to move up and down, along with the amount of material in them. If so, something such as perlite lightweight insulating concrete might be of use. Excess water is pumped out, purified and then put into the sewer for further treatment. Leftover solids qualify as organic fertilizer and are reported to be sufficient to nourish 8,000 acres.

One additional feedstock not mentioned in the newspaper is whey. Cheese factories use a lot of milk and create a lot of protein rich whey. Whey disposal creates a major problem as well.

This “closed loop” system was developed by a Boston company called Feed Resource Recovery. While it took four years to plan, build and open this facility, the timing is good. Last August, the Natural Resources Defense Council reported that 40 percent of food in the United States goes uneaten. That report may be viewed at www.nrdc.org/food/files/wasted-food-ip.pdf. In similar news, systems designed to convert dairy cow manure to energy may finally find success. A company called CH4 Power, Inc., is ready to construct a system on the property of a California dairy farmer with 1,200 cows. This will be the third such digester on the property since 1985. The 1985 system was replaced in 2002 but was shut down in 2009 due to inability to comply with air pollution requirements. The 1985 system directly cost the farmer almost $1 million, but the current system will involve a different economic model in which CH4 Power will lease the land, purchase the manure, monitor the operation and be available for repairs. More importantly, earlier efforts to get dairy farmers to install such systems also hit a nontechnical snag, as they injected the farmers into the energy business. With this model, the farmers can concentrate on the job of taking care of their cows and processing the milk.

Other companies making digesters are skeptical about the business model, the environmental permitting process and the technology. The main thing, though, for perlitters is that CH4 Power envisions concrete digester tanks. Again, these would need to be insulated, so perlite concrete or perlite loose fill could be of some use.

The 1,200 cows produce up to 90 tons of manure daily. Useful outputs from this system would include energy, fertilizer, treated reusable liquids, compost and animal bedding.

OTHER REGULATORY ISSUES

Again, I encourage readers to visit www.ussilicasustain.com and download the sustainability report. The authors keep intertwining sustainability goals with “triple bottom line” thinking. That’s not a bad thing, regardless of politics.

The following issue is not strictly about regulations. It is about the use of regulations applied unevenly around the world that can ruin vacations or business travel. Along with smart phones, the world now has smart, or EMV (Europay, MasterCard and Visa) credit cards. The magnetic strip on U.S. credit cards are so last century. Without a smart card, using a credit card on the London Tube could be impossible.

These smart cards come in two varieties: Chip and PIN, and Chip and Sign. Although these are usually interchangeable, those annoying London Tube machines require a PIN! And, yet, the Chip and PIN

Continued on page 13
Mergers and Acquisitions in Australia Slow

Mergers and acquisitions involving Australian companies fell to their lowest level in nine years in the first quarter of 2013 as the nation’s mining boom slows amid declining commodity prices. The value of deals fell to $9.7 billion in the three months to March from a year earlier, according to data compiled by Bloomberg.

The Bureau of Resources and Energy Economics projected in a May 22 report that investment has peaked after A$150 billion of mines were delayed or scrapped in the past 12 months. This year, Australian mining support companies Boart Longyear LTD, Transfield Services Ltd. and UGL Ltd. said the deferral of major projects would impact earnings.

Amid this climate, Carlyle Group LP and Seven Group Holdings Ltd. scrapped the sale of Coates Hire, Australia’s largest equipment rental company, including equipment for the mining and resources market. Carlyle Group LP and Seven Group Holdings Ltd. each own 45 percent of Coates. Click here to read the article from Bloomberg.com.

Metso Oyj Set to Split, Focus on Mining and Construction

Shareholders of Metso Oyj, the Finnish maker of rock crushers and mining equipment, are scheduled to decide on Oct. 1 whether to split the company and spin off its less profitable paper, pulp and power unit.

Metso, which is splitting off paper, pulp and power into a new company called Valmet Oyj, will focus on mining, construction and automation. The sluggish global economy weighs on demand for investment goods, including machinery and equipment. About half of Metso’s 3.5 billion-euro ($4.6 billion) annual mining and construction sales come from services.

Metso’s mining, construction and automation had an operating profit margin of more than 11 percent of net sales last year, with operating profit growing to 498 million euros. Its paper, pulp and power business achieved a 4.9 percent margin, and its profit was 148 million euros. The new Metso will be less volatile due to less emphasis on large projects, said Chief Executive Officer Matti Kaehkoenen. Click here to read the article from Bloomberg.com.

South Africa’s Employees Pension Fund Plans to Invest in Funds Related in Part to Mining

South Africa’s Government Employees Pension Fund, Africa’s biggest, plans to allocate 13 billion rand ($1.3 billion) to three new funds targeted at boosting employment and economic growth. The Public Investment Corp., which manages most of the of the pension fund’s money, has committed 3 billion rand for a “priority sectors” fund, which will target employment in manufacturing, agriculture, tourism and mining. Click here to read the article from Bloomberg.com.

Freeport-McMoRan Copper & Gold Inc. Makes Bid to Reduce Vulnerability to Metal Prices

Freeport-McMoRan Copper & Gold Inc. won approval in May from shareholders of Plains Exploration & Production Co. for a $6.63 billion takeover after sweetening the bid for the largest U.S. oil and natural gas purchase announced in the past year.

A majority of Plains holders voted in favor of the takeover after the companies offered investors an additional $3 a share in the form of one-time special cash dividend plus another $1 for each share in Freeport they own after the merger closes. The Plains acquisition is part of Phoenix-based Freeport’s $9 billion bid to expand its natural resources supply base to include oil and gas production and reduce its vulnerability to metal prices. Click here to read the article from Bloomberg.com.

cards can be difficult to use when making a purchase from an e-tailer.

What’s a traveler to do? One bit of simple advice is to call your credit card company and see whether they offer a solution. These more advanced credit cards are becoming more available in the United States.

Until next time, happy expanding! Contact me at k_wiener@hotmail.com if you have any questions.
ThePerlite Papers

Innovative Uses of Perlite Explored

by Kenneth Wiener

Perlite Uses in Fish Farming, Vegetable Growing and Decontamination

This quarter, papers were published that dealt with common uses of perlite, such as lightweight concrete, phase change materials and as a minor component of green roof growing media. The selected papers presented here, though, represent more unusual applications with upward commercial potential: Fish farming, vegetable growing and decontaminating spoil.

A summary of the papers is presented below based on the nominal dates of the papers’ publication, with the “newest” first.

Perlite in Fish Farming

According to the authors of this paper, fish farmers face significant issues with water contamination from excess food and excretion products. Instead of relying on these materials to eventually sink and be dredged out of the pond or other area, these researchers began thinking about ways to make both feed pellets and fish feces actually float. That way, the water may be purified by skimming the top of the water.

Only one grade of perlite, a hydrophobic grade supplied by a German expander, was tested in this study, along with small and large cork, two grades of 3M hollow glass microspheres, foamed glass beads and a combination of vermiculite, glass microspheres and a prebiotic mix that encourages gut bacteria to produce gas. The perlite, from Damolin GmbH in Hamburg, Germany, is called Microperl mp500FH, and is reported to have a loose weight density of about 5 pcf (0.085 grams/cubic centimeter) with a size range of 32 - 250 microns. The material is said to have a silane treatment.

Results with the perlite in the diet of these rainbow trout were mixed. The bad news is that even though fewer fish experienced hindgut inflammation than on the control diet, the extent of inflammation was higher. Severe disorders were not present though, suggesting that relatively large perlite glass shards, created when pressure was applied to form the feed pellets, may have been responsible for the irritation. The article does not discuss any possible effect from the silane coating. The only lightweight additive that created floating feces was cork between 0.5 and 1.0 mm (large).

Overall, the concept was shown to be a valid one, passing at least one major test: Fish had to distinguish between floating feed pellets and floating feces, and they did. Although the researchers plan to conduct further testing using the larger gradation of cork, it would be interesting to see what smaller sized milled perlite does in this application.

Perlite and Root Vegetables

The authors of this paper claim that root vegetables, such as carrots, have not been grown hydroponically before. Their work with perlite shows that not only is it possible to do so, but that the conventional wisdom of “coarser is better” is not true, at least in this application. They tried 5 mm perlite, 1.2 mm perlite and 0.6 mm perlite. They liked the 0.6 mm perlite the best and even went beyond their three-year growing study. They actually recycled the perlite, creating 0.3 mm perlite, and grew some carrots in that as well.

Their conclusions were that if correctly cleaned, perlite could be reused for years.

Their concentration study of the nutrient solution issue found that in general, smaller amounts of nutrients outperformed higher levels.

Horticultural Perlite and Contaminated Spoil

Although the results of the root vegetable study could generate commercial sales, the following paper seems to offer commercial viability in the future. The 25 volume percent horticultural perlite seems to have been added to increase the surface area available for the biochar and iron to do their work. Spoil, by the way, seems to be the British

Continued on page 15
term for mine tailings or waste.

The work with iron and biochar was able to remove contamination from the spoil to the point that sunflower plants were able to grow to some degree. The pH of the soil was still acidic, well below the 6.0–8.5 that sunflowers like. A choice of plant species that thrives at lower pH levels would have been better advised, but it is still remarkable considering that nothing grew on the untreated material.

I continue to look forward to reading about and reporting on innovative thinking out there in both the literature and the real world.

References:

As of the writing of this column, President Obama’s administration has announced plans to fix the United States’ patent system. The problem that requires fixing is the use of overly broad and sometimes fraudulent patents to extort billions of dollars from companies (an estimated $29 billion in 2011, alone!) in legal settlements in lieu of lengthy and expensive lawsuits. People and companies participating in such extortion are labeled “patent trolls.” The technical term for patent trolls is nonpracticing entities, and the big error in their patents is termed “functional claiming.”

Functional claiming, for instance, could involve a use of a scanner to send documents to e-mail users or use of a “shopping cart” by an online retailer. Rather than limit the claims of a patent to the actual process, the Patent Office allowed the claim of the goal. Interestingly, the U.S. Supreme Court banned functional claiming in the 1940s for other types of patents, but the advent of patentable software, combined with an overly generous Patent Office, has enabled the return of this problem.

The Obama administration has also proposed protections for small companies and individuals. Local hotels and coffee shops that provide Wi-Fi services to customers have been troll bait. Congress has been asked to provide protection for such end users.

Thankfully, perlite has not been the subject of such broad claims, to my knowledge. As a result, the rest of this column is devoted to the usual types of topics. I have listed most of this quarter’s interesting patents involving perlite. Why most? One of the interesting ones (#8,420,578) does not consider perlite to be a preferred material. The inventors take a potentially lightweight, unexpanded mineral such as perlite, vermiculite, zeolite or even clay, mix it with a binder, add more kaolin clay, roll out granules, dry and then calcine at 1,350 degrees C for at least an hour, until finally screening out the desired -20 mesh, +40 mesh material.

What do they propose to do with the material that they’ve put through these processes? Those granules are supposed to be used as proppant in fracking operations. My guess is that this is to
reduce the chance that communities will object to the use of hazardous materials such as sand.

Three patents, all listed, involving perlite were issued to Halliburton (8,403,045, 8,434,553 and 8,440,596) on another below-ground application: oil well cements. All three specify perlite ore ground very finely, the ‘596 patent even finer than the others. It will be interesting to see whether they actually purchase perlite ore for use as a pozzolan/cost reducer/carbon footprint reducer at their locations.

A fourth Halliburton patent, as near as I can tell, involves perlite in an unusual way. People generally try to put coatings on perlite, but this patent (8,450,391) uses perlite as a coating on elastomer particles. That way, the company claims to be able to compatibilize those elastomer particles, perhaps tire crumb, with Portland cement-based concrete.

Two patents (8,445,062 and 8,445,063) assigned to Scutter Enterprises, near Saint Louis, Mo., claim to harden perlite to the point that with the addition of only a small amount of weight in the form of a metal oxide coating, a 3-foot-thick packed bed of perlite can support its own weight. This creates a different type of filter.

And I was impressed by patent #8,398,763 in which the wonderfully named company, Unstuck, LLC, has protected its invention of a mix of ingredients, including perlite. If your vehicle is stuck on an icy hill and cannot gain traction, simply sprinkle this stuff on the ground and you are good to go!

Last, but perhaps not least are two patents concerning well-known uses for perlite: filtration and soil amendment/substitute. BASF came up with a method of regenerating perlite filter aid, described in patent #8,394,279, while Mr. Zheng, in unassigned patent #8,425,819, teaches a method of creating a shaped soil medium. No loose material for him!

Even if none of the listed patents generates any sales for Perlite Institute members, they keep pushing the boundaries of perlite thinking, production and applications. Thanks for continuing this journey with me.

Report from the China Perlite Conference 2012

by Matthew Malaghan
Industrial Processors Limited, Australian Perlite Pty Limited

I was privileged to be invited to speak at the China Perlite Association Conference in Xi’an in October 2012. This was the 24th conference held by the association, and it ran over three days.

Attendance was strong with more than 200 delegates representing local perlite mining companies, expanders, machinery suppliers and perlite end-users.

As I engaged with delegates during my time at the meeting, I was interested to learn that more than 100 new expanders were commissioned in the 12 months preceding the meeting, in part due to continuing development occurring in China, but mostly to the requirement of building authorities that construction, where possible, use lightweight additives.

Total tonnage processed in China was difficult to
### Perlite Patents

<table>
<thead>
<tr>
<th>Patent Number(s)</th>
<th>Date Issued</th>
<th>Inventor(s)</th>
<th>Assignee</th>
<th>Topic</th>
<th>Role of Perlite</th>
<th>Perlite: Innovative/Old Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>8,394,279</td>
<td>12-Mar-13</td>
<td>Meffert, et al.</td>
<td>BASF, SE</td>
<td>Filter aid regeneration</td>
<td>Perlite filter aid</td>
<td>-----</td>
</tr>
<tr>
<td>8,398,763</td>
<td>19-Mar-13</td>
<td>Bonnizzio</td>
<td>Unstuck, LLC</td>
<td>Traction increase on ice</td>
<td>Friction enhancer</td>
<td>Improvement on highway sand</td>
</tr>
<tr>
<td>8,404,112</td>
<td>26-Mar-13</td>
<td>Gaudin</td>
<td>Industrial Insulation Group, LLC</td>
<td>Filter medium in pool filters</td>
<td>Filtration</td>
<td>Use with sand in sand filters</td>
</tr>
<tr>
<td>8,409,711</td>
<td>2-Apr-13</td>
<td>Selph, et al.</td>
<td>Grancrete, Inc.</td>
<td>Heat-resistant cement</td>
<td>Insulation, lightweight</td>
<td>Examples w/ vermiculite, but perlite is also preferred</td>
</tr>
<tr>
<td>8,425,819</td>
<td>23-Apr-13</td>
<td>Zheng</td>
<td>----</td>
<td>Soil substitute for cuttings</td>
<td>Water, air holding</td>
<td>Soil medium is shaped</td>
</tr>
<tr>
<td>8,434,553</td>
<td>7-May-13</td>
<td>Brenneis, et al.</td>
<td>Halliburton Energy Services</td>
<td>Underground cementing</td>
<td>Fine perlite ore: cost, CO2 reduction, strength</td>
<td>Strength improvement is noted at 140F</td>
</tr>
<tr>
<td>8,439,603</td>
<td>14-May-13</td>
<td>Witz, et al.</td>
<td>BHP Billiton</td>
<td>Hose improvements</td>
<td>Insulation</td>
<td>Annulus, insulated hose</td>
</tr>
<tr>
<td>8,440,296</td>
<td>14-May-13</td>
<td>Kipp, et al.</td>
<td>Ashtech Industries</td>
<td>Shear panel for construction</td>
<td>Lightweight, low cost</td>
<td>Replaces some ceramic microspheres</td>
</tr>
<tr>
<td>8,440,596</td>
<td>14-May-13</td>
<td>Brenneis, et al.</td>
<td>Halliburton Energy Systems, Inc.</td>
<td>Underground settable compositions</td>
<td>Filler, pozzolan finer than 8,403,045 or 8,434,553</td>
<td>Unexpanded preferred</td>
</tr>
<tr>
<td>8,445,062, 8,445,063</td>
<td>21-May-13</td>
<td>Scranton Jr.</td>
<td>Scutter Enterprise</td>
<td>Metal oxide composition for filtering</td>
<td>Porosity, substrate, and lightweight</td>
<td>Process hardens particles to support packed bed</td>
</tr>
</tbody>
</table>

---

**Do you have information to share with the members of the Perlite Institute?**

Do you want to write an article for the newsletter?

Contact the Editor at PerliteEditor@hotmail.com.
Technical Q&As

Q: I want to apply for ISO certification for perlite blocks. Which standards would I apply for?
A: In the past, certification for perlite blocks would have fallen under the ISO 9002 category. Now it has been consolidated into 9001. More information is available at http://the9000store.com/what-is-iso-9002.aspx. The certification requires extensive effort, and you should have the process and products well established before undertaking such an effort. The key is to say what is done and then do it in that fashion, and this requires experience in the process well beforehand. It is advantageous to work with an outside consulting firm experienced in the ISO areas in mineral and associated processing. Other areas, such as electronics and aerospace, are overly detailed and not appropriate for the construction materials industry. Because the process requires regular inspections by both interior and exterior auditors, it is a long-term commitment.

Q: We are building a straw bale house and are thinking about using perlite instead of foam under the cement slabs in the basement. What can you tell me about this use?
A: Underslab insulation with perlite can provide insulation from 3 to 25 R, depending on the quantity used. Perlite is dimensionally stable when used in the proper way. More information is available at www.perlite.org/library-perlite-info/insulation-perlite/Perlite-underslab-insulation.pdf

Q: What are the advantages of perlite blocks over AAC blocks?
A: Perlite concrete blocks are manufactured using perlite, aggregate, cement, sand, water, polyester fibers and a small quantity of air entraining agent. Aerated concrete consists of cement, water and sand with 20 percent volume of air entraining agent. The high air content (voids) in AAC blocks will reduce the strength and increase shrinkage compared to perlite concrete. Autoclaving at high temperature and pressure will improve the strength and reduce the shrinkage, but the concrete becomes more rigid and is likely to develop cracks in the long run.

Autoclaved aerated concrete can be used only for factory fabricated blocks and is not suitable for in situ concrete. Perlite concrete, on the other hand, can be used for both. Also autoclaving has high energy requirements.

Perlite concrete blocks offer better resistance to seismic forces (earthquakes), wind pressure and fire than autoclaved aerated concrete.

Q: What is the thermal conductivity of the 8-inch hollow perlite block?
A: The 8-inch lightweight block has an R factor of 2.9; if the dual core is filled with expanded perlite with a density of ~ 7, the R factor increases to 9.

Q: What expanded perlite products would be preferred for liquids/spill pickup with perlite?
A: Historically, a building-product, expanded-size material has been used for such applications. This size material flows well and isn’t very dusty when sprinkled over the spill and swept in to absorb the liquid. There are times when water is added to dedust the material as is done at times with horticultural products. Fine light perlite and FA type material have been generally much too dusty for such applications.

Want to see more? Have your own question for Chuck Vogelsang, the Perlite Institute’s technical spokesperson? Visit the Perlite Institute Facebook page at http://tinyurl.com/Perlite-Institute-Facebook or the LinkedIn Group at http://tinyurl.com/Perlite-Institute-LinkedIn or email techadvice@perlite.org.
News from the Perlite Institute

Sept. 29-Oct. 2
Join Your Fellow Perlite Institute Members at the 65th Annual Meeting in Sydney

This year’s 65th Annual Perlite Institute meeting, scheduled for Sept. 29 through Oct. 2 in Sydney, Australia, promises to be an educational and exciting event filled with workshops, speakers, tours and networking.

Our member hosts from Ausperl Pty Limited, Matthew Malaghan and Andrew Anderson, have been working closely with the Meetings and Membership Committee to bring attendees a variety of speakers and topics. Some of the topics to be explored during the conference are:

- The Usage of Perlite in the Lightweight Refractory Market
- Perlite Mining in New Zealand
- Perlite as a Replacement for Saw Dust as a Growing Media for Cucumbers
- Perlite as a Substrate for Commercial Flower Production
- An Update on Current and Future Trends for Bulk Sacks
- Handling Lightweight Powders
- Winery Applications of Perlite – with tasting included!

During the meeting, attendees will have the opportunity to tour the Ausperl Perlite facility on Tuesday, Oct. 1. Nestled in the heart of Australia’s largest city, Australian Perlite’s Banksmeadow plant uses every square inch of its floor plan to produce 30 tons per day of filter aid, horticultural and structural grades of perlite. Intricate recycle and separation techniques create a variety of grades specific to the Australian market. A modular and portable expander gives the flexibility to produce horticultural, construction and even onsite cryogenic expansion.

In addition to the education sessions at the meeting, attendees will enjoy a harbor cruise with a welcome reception and take a tour of Sydney.

Continued on page 20
News from the Perlite Institute

Continued from page 19

and its beaches. Spouses will also embark on a special shopping excursion of their own to local shops and eateries.

Don’t miss this remarkable event down under! More information is available in the conference brochure. Registration information is available online.

Hotel Accommodations

If you haven’t done so yet, make your hotel reservations for the meeting as soon as possible to ensure a room at the host hotel, the Sir Stamford at Circular Quay.

Attendees must make their own reservations by calling +612 9252 4600 or emailing reservations@sscq.stamford.com.au. It is recommended that you call the hotel to make reservations during normal business hours of 8 a.m. and 5 p.m. AEST (Australian Eastern Standard Time). After-hours calling times are not guaranteed to have reservation staff available.

Please mention the “Perlite Institute” group name and the conference dates to take advantage of the rate of $275 for single occupancy and $283 for double occupancy that is offered during the conference dates. There is no cut-off date for reservations, but rates are subject to availability. Quoted rate is available during the conference only; however, the hotel’s reservations team will offer the rate if there is availability. Daily breakfast vouchers and taxes are included with your room rate. Check-in time is 3 p.m., and check-out time is 11 a.m.

Member Benefit Spotlight: Committee Service

All nonprofit organizations rely heavily on their members to assist with activities that are identified as important for the positive direction of the organizations. We are working to develop active committees within the Perlite Institute and would like to ask you to volunteer your time and talent to the organization.

Committees typically meet by conference call and email and call each other to communicate. The average amount of time devoted to committee involvement is two to four hours each month. The more volunteers we have on committees, the more successful we will be as an organization.

Please volunteer to serve on a Perlite Institute committee today. Just complete the Willingness to Serve form and return it to the Perlite Institute office at the address printed on the form.

Help Us Make Your Newsletter Even More Useful

Perlite Today features news on patents, mergers and acquisitions, the latest happenings in various components of the industry, and updates on the many services offered by the Perlite Institute. The quarterly e-newsletter also prints a schedule of upcoming events, trade shows and meetings as well as technical Q&As. What else would you like to see? Are we missing something? What other kinds of articles would you like to read about in Perlite Today? Do you have other suggestions on articles to improve this publication?

Please help us make Perlite Today the most relevant and useful it can be for you, our members. Email your ideas and any leads you may have for future articles to the editor, Amy, at PerliteEditor@hotmail.com. We hope to hear from you soon with your suggestions.

Good Product Photos Needed

The Communications Committee is seeking photos for brochures to be updated or revised. Photos related to the following topics are needed:

- Horticultural—numerous
- Masonry fill
- Texture
- Adsorption

Send your photos to communications@perlite.org.

During the month of June, the Perlite Institute website had 1,936 visits and 4,358 page views. Of the visits, 74 percent were new.
<table>
<thead>
<tr>
<th>Opening Date</th>
<th>Closing Date</th>
<th>Name of Show</th>
<th>Location</th>
<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>8/15/13</td>
<td>8/17/13</td>
<td>Nursery &amp; Landscape Expo</td>
<td>Dallas, TX Dallas Convention Center</td>
<td><a href="http://www.nurserylandscapeexpo.org">http://www.nurserylandscapeexpo.org</a></td>
</tr>
<tr>
<td>8/21/13</td>
<td>8/24/13</td>
<td>Plantarium</td>
<td>Boskoop, NL International Trade Centre</td>
<td><a href="http://www.plantarium.nl/Page/nctrue/ml2/index.html">http://www.plantarium.nl/Page/nctrue/ml2/index.html</a></td>
</tr>
<tr>
<td>8/22/13</td>
<td>8/24/13</td>
<td>Farwest Show</td>
<td>Portland, Ore. Oregon Convention Center</td>
<td><a href="http://www.farwestshow.com">www.farwestshow.com</a></td>
</tr>
<tr>
<td>9/10/13</td>
<td>9/12/13</td>
<td>PU China</td>
<td>Nanjing, China Nanjing International Expo Centre</td>
<td><a href="http://www.puchina.eu">www.puchina.eu</a></td>
</tr>
<tr>
<td>9/19/13</td>
<td>9/21/13</td>
<td>Landscape Show</td>
<td>Orlando, FL Orange County Convention Center</td>
<td><a href="http://www.fngla.org/thelandscapeshow/">http://www.fngla.org/thelandscapeshow/</a></td>
</tr>
<tr>
<td>9/29/13</td>
<td>10/2/13</td>
<td>Perlite Institute Annual Meeting</td>
<td>Sydney, Australia</td>
<td><a href="http://www.perlite.org">www.perlite.org</a></td>
</tr>
<tr>
<td>10/6/13</td>
<td>10/11/13</td>
<td>International Garden Centre Association Congress</td>
<td>Melbourne, Australia Various sites</td>
<td><a href="http://www.igcacongress.com">www.igcacongress.com</a></td>
</tr>
<tr>
<td>10/22/13</td>
<td>10/24/13</td>
<td>Filtech</td>
<td>Wiesbaden, Germany Rhein-Main-Hallen</td>
<td><a href="http://www.filtech.de/">http://www.filtech.de/</a></td>
</tr>
<tr>
<td>11/14/13</td>
<td>11/15/13</td>
<td>Green Industry Show</td>
<td>Edmonton, Alberta, Canada Edmonton Expo Centre</td>
<td><a href="http://www.greenindustryshow.com">www.greenindustryshow.com</a></td>
</tr>
<tr>
<td>1/21/14</td>
<td>1/24/14</td>
<td>World of Concrete</td>
<td>Las Vegas, Nev. Las Vegas Convention Center</td>
<td><a href="http://www.worldofconcrete.com">www.worldofconcrete.com</a></td>
</tr>
<tr>
<td>1/22/14</td>
<td>1/24/14</td>
<td>Tropical Plant Industry Exhibition</td>
<td>Fort Lauderdale, Fla. Convention Center</td>
<td><a href="http://www.fngla.org/TPIE/">www.fngla.org/TPIE/</a></td>
</tr>
</tbody>
</table>