

AMERICAN INSTITUTE OF PROFESSIONAL GEOLOGISTS

Northeast Section **NEWSLETTER** *Winter 2021*

As published on 2/16/21

***Angelo Tagliacozzo Memorial Geological Scholarship
35th Year Retrospective ([Pg. 22](#))
By Dennis McGrath***

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Mine Collapse
Backstory & Final
Resolution
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**Iguazu Falls:
One Geologist's
Perspective
By Mike Greenman
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Bill Poupis

516-616-6026 EXT 105

wpoupis@aquiferdrilling.com

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Jay Boland

M: 413-329-7525

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AIPG NORTHEAST SECTION NEWSLETTER

WINTER 2021

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NEWSLETTER EDITORS

Kim Burger
Roux Environmental Engineering
and Geology, D.P.C.
209 Shafter Street
Islandia, NY 11749
631-780-2956 (Cell)
kburger@rouxinc.com

Brandon Tufano
Integral Consulting, Inc.
285 Century Place, Suite 190
Louisville, CO 80027
570-702-9992 (Cell)
btufano@integral-corp.co



PUBLISHER & ADVERTISING MANAGER

Dick Young
Consulting Geologists, LLC
179 Intervale Road
Parsippany, NJ 07054
973-335-2289 (Office)
973-335-9799 (Fax)
ryoungnj@aol.com

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2021 NEAIPG EXECUTIVE COMMITTEE AND SUBCOMMITTEES

PRESIDENT

Jennifer Rhee, MEM-2805
HDR Inc.
1 International Blvd, Floor 10
Mahwah, NJ 07495
Work: (201)-335-9336
Cell: (845)-664-5218
jennifer.rhee@hdrinc.com

PRESIDENT ELECT

Kelly A. Weyer, CPG-11826
Clean Globe Environmental LLC
PO BOX 1895, New City, NY 10956
Office: 1-888-454-5923, Ext. 700
kweyer@cg-env.com

PAST PRESIDENT

Michael G. Grifasi, CPG-11489
FPM Remediations, Inc.
181 Kenwood Ave
Oneida, NY 13421
Office: (315) 336-7721 X215
Fax: (917) 336-7722
Cell: (917) 767-2662
Email: m.grifasi@fpm-remediations.com

SECRETARY

Adelina E Prentice, MEM-3075
FPM Remediations Inc.
181 Kenwood Ave
Oneida, NY 13421
Work: 315-336-7721 ext 228
Fax: (315) 336-7722
Email: a.prentice@fpm-remediations.com

TREASURER

Robert P. Blauvelt, CPG-06508
GEI Consultants
300 Broadacres Dr, Suite 100
Bloomfield, NJ 07003
Office: (973) 873-7127
Cell: (973) 803-0167
Fax: (973) 509-9625
rblauvelt@geiconsultants.com

MEMBERS

Christopher Brown, CPG-10599
PVE, LLC
108 W 39th Street, Suite 501
New York, NY 10018
Office: (646) 602-4999
Cell: (914) 475-2650
E-mail: cbrown@pve-llc.com

Jessica McEachern, CPG-11869
37 Spencer Street W
Farmingdale, NY 11735
Office: (516) 694-5212
E-mail: geode78@verizon.net

Member at Large

Jeffrey J. Frederick, PG, CPG
Associate Vice President
WSP USA
500 Summit Lake Drive, Ste 450
Valhalla, NY 10595
Phone: +1 914 801 9206
Mobile: +1 541 517 8774
Email: jeffrey.frederick@wsp.com

Laurie Scheuing, CPG-09898
46 Homestead Rd
Saratoga Springs, NY 12866-5808
Office: (518) 695-9445
E-mail: lescheuing@aol.com

Luanne Whitbeck, CPG-07923
P.O. Box 637
Singerlands, NY 12159
Office: (518) 475-1008
E-mail: Luanne.whitbeck@gmail.com

Mitchell T Ward
FPM Remediations Inc.
181 Kenwood Ave
Oneida, NY 13421
Work: 315-336-7721 ext 230
Email: m.ward@fpm-remediations.com

SCREENING BOARD CHAIRMAN

Charles A. Rich, CPG-04433
CA Rich Consultants, Inc.
17 Dupont Street
Plainview, NY 11803-1602
Office: (516) 576-8844 Fax: (516) 576-0093
E-mail: crich@carichinc.com

NEWSLETTER EDITORS

Brandon Tufano, MEM-2954
Integral Consulting Inc.
285 Century Place, Suite 190
Louisville, CO 80027
Cell: (570) 702-9992
E-mail: btufano@integral-corp.com

Kim Burger
Roux Environmental Engineering and Geology, D.P.C.
209 Shafter Street
Islandia, New York
Cell: (631) 780-2956
kburger@rouxinc.com

DIRECTORY OF MEMBERS EDITOR

Curtis A. Kraemer, CPG-06019
111 Van Cedarfield Road
Colchester, CT 06415
Office: 860-861-4644
email: curtkraemer@comcast.net

PUBLISHER & ADVERTISING MANAGER

Richard H. Young, CPG-03356
Consulting Geologists, LLC
179 Intervale Road
Parsippany, NJ 07054
Office: 973-335-2289
Fax: 973-335-9799
E-mail: ryoungnj@aol.com

WEBMASTER

Michael G. Grifasi, CPG-11489
FPM Remediations, Inc.
181 Kenwood Ave
Oneida, NY 13421
Office: (315) 336-7721 X215
Fax: (917) 336-7722
Cell: (917) 767-2662
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Section Directory: Curt Kraemer, Editor, Dick Young, Publisher

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2021 EXECUTIVE COMMITTEE MEETING SCHEDULE:

January 11th

March 8th

May 12th (Spring Meeting, TBA)

July 12th

September 13th

October 13th (Fall Meeting, TBA)

December 6th

**Meetings are
typically held from
4:00 to 6:00 pm via
teleconference.**

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Presidential Ramblings WINTER 2021

Welcome President Jennifer Rhee!

Greetings, Northeast Section, and Happy New Year! I want to introduce myself to the membership as the newest President of the Northeast AIPG Section. My name is Jennifer Rhee and I am very excited to begin my two-year tenure following the amazing leadership of our Past President, Michael Grafasi. Thank you, Michael, for helping me make a smooth transition into the new role, and for all the

(Ramblings continued on page 20)



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The Retsof Salt Mine Collapse Backstory & Final Resolution

By Samuel W. Gowan (CPG-07284, Alpha Geoscience) & John M. Nadeau (CPG-11181, Alpha Geoscience)

We prepared this article in response to the interest generated by John's October 28, 2020 virtual presentation. John's presentation focused on the remediation of brine being forced out of the collapsed mine into the overlying aquifers. The presentation stimulated many great questions about historical events that led to the eventual closure of the 107-year-old, 10-square-mile mine that lies quietly beneath the towns of Leicester, Geneseo, and York, Livingston County, New York. Perhaps this article can add a little more background to the history.

The Retsof mine was started by a group of investors headed by William Foster in 1885. ("Retsof" is Foster spelled backward.) The International Salt Company was formed in 1901 and became the owner of the Retsof Mine. Akzo Nobel Salt (Akzo) purchased the mine in 1968, and it was long after this that Sam and John started consulting for the mine.

Sam started consulting on a controversial incinerator ash disposal project at the mine while at Dunn Geoscience in 1991. The plan was to use the abandoned workings to store incinerator ash pumped back into the mine as a cementitious, flowable fill. This project was handled separately from the mining operation, and in fact, was viewed with suspicion by the miners and concern by the citizens. We were kept away from the mining operations and were generally not familiar with salt mining at that time. We focused on the geology and hydrogeology of the mine and surrounding area and were drawn into an understanding of the mining process due to a need to resolve a major leak in the adjacent Sterling Salt Mine for the disposal permit.

The Sterling Mine was started in 1907 by the sinking of the "B" shaft, which was originally named Barbara after the owner's daughter. The simplification to "B" was unfortunate due to a loss of historical knowledge at the mine and rumors of an "A" shaft. The "A" shaft never existed, but the rumors led to more than one investigation to find the phantom shaft. The "B" shaft leaked from the beginning at 7 gallons per minute (gpm). Some of this leakage was pumped out and the rest drained to the salt horizon where dissolution undermined the shaft; fractured the surrounding rock; and created a large, multi-acre, surface depression. The leak gradually increased from the initial 7 gpm to more than 385 gpm by the early 1990's.

(Retsof article continued on page 13)



Sam Gowan inspecting the Geology of the Retsof Bed (B6 of the Vernon Formation) in 1994. Rotated dolostone inclusions in the Retsof Bed when it was a preferential shear zone (Decollement).

The Sterling Mine was interesting from a mine stability perspective because it was originally independent from the Retsof Mine, and the Sterling Mine relied on a different mine design. The Sterling Mine was composed of large pillars with small yielding pillars that gradually compress and shed the overburden load to large buttress pillars. This was a very stable configuration that allowed the Sterling Mine to extend beneath the Genesee River Valley where more than 600 feet of the original 1,100 feet of rock had been scoured away by glaciation and backfilled with unconsolidated glacial and fluvial sediments.

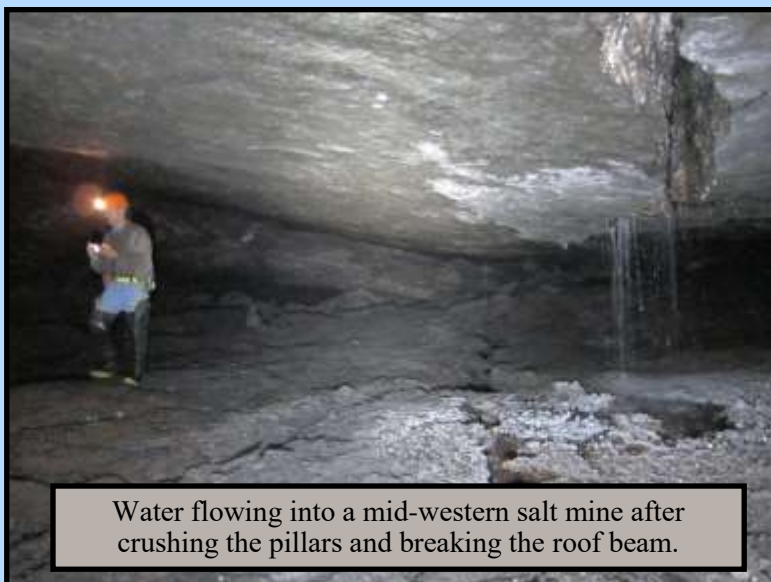
The Sterling Mine had become uneconomic by 1901 and was purchased by the International Salt Company in 1901 and was shut down in 1923. It was connected to the Retsof Mine in 1958 by two horizontal drifts so that the "B" and "C" shafts could be used for ventilation and escape for the Retsof Mine. This connection subsequently (many years later) exposed the incinerator ash disposal concept to the concern for ground water circulating through the ash backfill. We were actively considering various approaches to resolve the leaking "B" shaft issue when the Retsof Mine collapse occurred on March 12, 1994 and abruptly ended the proposed ash project. The collapse was associated with a magnitude 3.6 earthquake that was recorded across the country.

Akzo immediately started investigating and attempting to shore up the mine by pumping cement into the collapsed panels. Alpha Geoscience (Sam left Dunn

(Retsof article continued from page 13)

Geoscience to join Alpha in 1992) had minimal involvement at the mine immediately after the collapse until May when Akzo asked Sam and another consultant from Canada to provide independent opinions of methods, costs, and probabilities of success to save the mine. Sam considered grouting to be the most viable option, but he estimated it would cost \$600 million and would have a low chance of success. This and the opinions of others led to a decision to abandon the Retsof Mine, develop and permit a new mine nearby (Hampton Corners Mine now owned and operated by American Rock Salt Company), and file a \$270 million insurance claim for the loss of the Retsof Mine.

Akzo pulled together an expert team of mining engineers to sleuth out the cause of the collapse for the insurance claim. Alpha was initially not directly part of this team due to being geologists and having limited salt mining experience at that time. However, it soon became apparent that geology was very important, and Alpha had the most knowledge of those related aspects of the Mine. The expert engineering team was led by Dr. Hamish Miller from the University of Missouri at Rolla. It was his opinion, based on closure data (mine roof to floor convergence) and the inflow of nearly saturated brine at the time of the collapse, that fluid pressure close to the mine roof was the cause. He asked Alpha to investigate the hydrogeologic evidence to assess the validity of this theory.



Water flowing into a mid-western salt mine after crushing the pillars and breaking the roof beam.

It became apparent after Alpha's investigation that there was a pressurized brine pocket 160 feet above the collapsed panels. It was also apparent that the yielding pillar design is not as effective as large rigid pillars in supporting the roof where there is a hydrostatic load close to the mine.

(Retsof article continued on page 16)



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(Retsof article continued from page 14)

The rumors floating around the community and amongst some technical circles immediately after the collapse were that Akzo had adopted the smaller pillars so that they could extract more salt per unit area. This seemed plausible to many due to the winter of 1993 and 1994 being harsher than average, and the mine had to operate 24-hours-a-day, 7-days-a-week, for several months to keep up with salt demand. However, the actual reason for switching to the new mining method was the result of a roof fall that killed two miners in 1990.

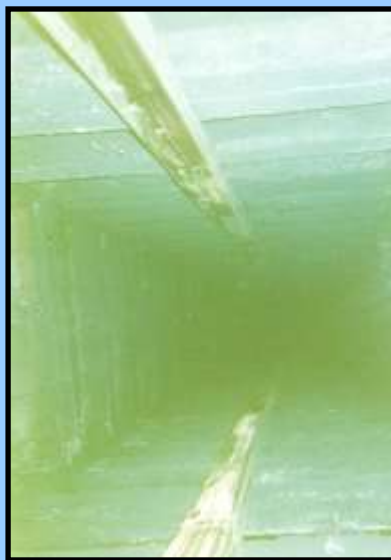
The condition that ultimately led to the deaths in 1990 was the result of a change in mining practices that occurred in the mid-1930's when donkeys were replaced by mechanized mining. Prior to the 1930's, mining relied on small yielding pillars, which tended to result in safe mine openings. In fact, we are still able to enter portions of the mine with small pillars that were excavated in the early 1900's. These old pillars were nominally 20 feet square. Mining was switched to larger pillars (60 to 80 feet square or rectangular) in the 1930's for efficiency reasons when the methods became more mechanized. The older portions of the mine that included small pillars were located west of the Genesee Valley beneath the uplands. Mining progressed beneath the Genesee Valley in the 1960's where roof falls and floor heaves became more common. Conditions got worse as they progressed southward below the deeply scoured glacial valley until the fatal roof



Rotated dolostone surrounded by recrystallized salt in the Retsof Mine B6 Salt Bed. The B6 formed a decollement that allowed thousands of feet of lateral displacement relative to the roof and floor rock.

(Retsof article continued on page 17)

View up the 1,100 ft B Shaft of the Sterling Mine showing the cage guides.
This was an escape shaft for the Retsof Mine.



fall occurred. The federal Mine Safety and Health Administration (MSHA) investigated and directed Akzo to address the safety issue. It was determined that the issue was due to the larger pillars being too stiff to shorten (deform or compress) from the overburden load. This stiffness caused "pillar punch," which is a transfer stress related deformation (strain) into the open rooms. This deformation manifests as roof falls and floor heave. The use of smaller pillars bordered by much larger abutment pillars (several hundred feet long by a few tens of feet wide) allows the roof to sag gently over small pillars that shorten (deform). The roof sag (relaxation) expands vertically until a structural arch forms in the overlying rock. This arch transfers the overburden load to the large abutment pillars. The effective result is the near elimination of roof falls and floor heave, as long as there are no geologic anomalies, such as pressurized fluid, in the relaxed strata between the arch support and the mine.

Akzo undertook a yielding pillar panel (ypp) test beneath the valley in an area of existing large pillars by splitting the pillars and monitoring mine closure (roof to floor convergence). The test resulted in normal closure as indicated by a rate that was initially very high (30 to 50 inches per year (in/yr)) and decreased asymptotically toward 0.25 to 0.5 in/yr.

The test was followed by mining two production panels in the headings below the Genesee Valley in 1993. The closure in these two panels started high (30 to 80 in/yr) but did not decrease. In fact, the convergence accelerated in both panels in February 1994 to rates that approached 300 in/yr in one of the panels. The collapse was associated with an earthquake with a magnitude of 3.6 and an inrush of nearly 100 percent saturated brine that freshened after a few days. The anomalous pressure surcharge, followed by a significant reduction in closure in the adjacent panel, as brine flowed into the collapsed panel, led to the reasonable conclusion that excess fluid pressure had built up above the panels, and this pressure was at least partially relieved when the first panel broke. The big question at that time was whether there was any evidence of the occurrence of pressurized fluid close to the mine prior to the collapse. This was the question that Alpha was asked to address.

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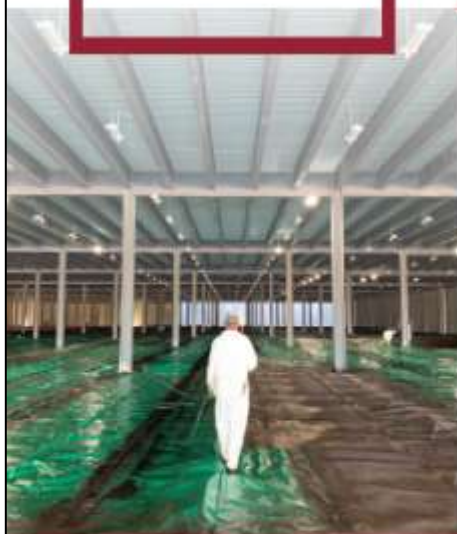
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(Retsof article continued from page 17)

We were fortunate to find that Livingston County, New York was the worldwide leader in salt production from around 1885 to 1920. The New York State Museum documented this very well and, in fact, published a report by I. P. Bishop in 1886 that documented the geology and hydrogeology of brine wells north of the Retsof Mine and also at the south end (Phoenix Dairy Well). The Phoenix Well was approximately 2,100 feet west of the collapse. Mr. Bishop's notes, for which he got paid \$1.00/page of publication (hence the extensive number of pages), provided, in detail, the geology and the location of pressurized brine pockets in the strata. We were able to use this in conjunction with a 1987 investigation of the Phoenix Dairy Well by the International Salt Company to determine that there were, in fact, two pre-existing, pressurized brine pools in Unit D of the Syracuse Formation, approximately 160 feet above the salt bed that was being mined at Retsof.

Brine collected near the bottom of the "B" Shaft and pumped to the surface up the "C" Shaft.



We were able to use downhole geophysical logs from post-collapse investigative holes to define the lateral extent of

the brine pool above the mine collapse area. The finding of the pressurized brine pocket provided a geologic defect; however, the occurrence of the earthquake at the time of the collapse raised the specter of the earthquake exclusion in the insurance policy. According to Robert Fakundiny and William Kelly of the New York State Museum, it was apparent from the earthquake's seismic signal, which was recorded as far west as Denver, CO, that it was a shallow event related to mining and not a natural earthquake. Many thought it was the mine roof hitting the floor, but the mining engineers doubted that the crumbling small pillars would have generated the sharp signal that was recorded. Hamish Miller theorized that the brine broke into the mine prior to the earthquake. When the brine entered the mine, it resulted

(Retsof article continued on page 29)

(Ramblings continued from page 11)

guidance provided along the way.

I have been a geologist in the consulting world for over eleven years now and work predominantly in the New York/New Jersey area. I have always had a passion for learning and originally was focused on becoming a secondary earth science educator when I fell in love with geology at my alma mater SUNY Cortland. While focused on the education program, I became particularly interested in the Quaternary period “soft rock processes” of geomorphology. I started undergraduate research in climatology and dendrochronology with my advisor and ended up switching my major to geology the same semester. I luckily landed a job out of college as a field grunt at a small consulting firm and have enjoyed all the fun and challenges of being a geologist ever since.

In my free time, I enjoy the outdoors, whether it's hiking, camping, or even running around with my toddler in the backyard. Since the pandemic, we haven't traveled much, but I am looking forward to exploring the red rocks in the Southwest with my family when this is all over.

I am excited to take on the new role in the ExCom, and wanted to thank everyone for being supportive and helpful. I am very excited to start 2021 with a positive outlook for the Section, the Angelo Tagliacozzo Memorial Geological Scholarship fund, and the upcoming meetings we have planned.

Stay safe
and healthy,
Jennifer



(End)

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Angelo Tagliacozzo Memorial Geological Scholarship 35th Year Retrospective

By Dennis McGrath

Part 1: Historical Summary

This year marks the 35th anniversary of the Angelo Tagliacozzo Memorial Geological Scholarship Trust Fund. In recognition of that milestone event and starting with this issue of the Newsletter, we plan to publish a series of articles in each of the next three 2021 newsletters. Each article will highlight various aspects or achievements of the scholarship program. This first article is a brief historical summary of the scholarship program. Subsequent articles are planned and may include a profile of Angelo Tagliacozzo, where the money donated has come from, what we hope to achieve in the future, and positive impacts of the scholarship on the recipients.

For some of you reading this article, the subject matter may be information you have heard before or know firsthand, but for many others, I suspect you may be hearing it for the first time. Regardless, I hope that everyone will find something of interest. We welcome comments and/or questions.

The Angelo Tagliacozzo Memorial Geological Scholarship Trust Fund was established in 1987 as a Perpetual Trust Fund (PTF). This meant that every dollar contributed to the PTF would remain in the fund forever. The intent here was to grow the PTF to a point where the fund could ultimately become self-sustaining by making awards using profit/capital appreciation generated from the contributions received. To help achieve that goal, scholarships have historically been funded using money provided by the NE Section. Up until very recently, the NE Section was financially able to cover on an annual basis, the full amount of the scholarship award pool. As the award pool has increased, however, it has become impossible for the Section to continue that practice. Fortunately, the scholarship fund has now grown to a point where it has been able to contribute up to half of the award pool using the profit/capital appreciation realized on an annual basis without touching any of the donated funds, thereby maintaining the permanency of the contributed funds.

Traditionally, scholarship applications have been solicited in the Fall and awards have been made in the Spring. This has meant that the entire application and award process spans the academic year or two calendar years. Consequently, the application process has been tracked and recorded that way. Some of the details (e.g., student names and colleges) during the early years have been lost, but based on the records that still exist, we have been able to piece together most of the early history.

(35th Anniversary continued on page 23)

(35th Anniversary continued from page 22)

The 1987-1988 academic year was the first year any awards were made. A total of \$1,300 was awarded in scholarships: two \$250 awards were made to help pay for summer field camp, and 16 awards of \$50 each were given to students at different colleges and universities in the northeast to help purchase textbooks. During the next two academic years, a total of \$1,000 was awarded - four awards of \$250 each. The year after that, the award pool was increased to \$1,750 and seven awards were made of \$250 each.

Our records do not indicate that any awards were made for the 1991-1992 academic year, but no one is sure if that was the case or if the documentation was just lost. In any case, starting the following year, the scholarship program adopted a slightly more consistent approach in setting the award pool. Over the next seven years, the award pool was established at \$3,000 and six awards of \$500 each were made. In the six years after that, the award pool was increased again, this time to \$4,000, but individual scholarships were also increased to a maximum of \$2,000.

During most of this time, the number of applications being received every year varied between 8 - 12. That number dropped off significantly between 2002 and 2004 to only three or five. The Scholarship Committee and ExCom felt that perhaps the information on our scholarship was not going to the most appropriate faculty. Our standard practice up until that time had been to simply mail an Announcement and Application Form to a list of department chairs. The department

Angelo Tagliacozzo (1936-1986)



chairs would then distribute the information on our scholarship in whatever manner they felt worked best for their departments. We came to realize that our list was outdated and that department chairs were frequently changing (sometimes

(35th Anniversary)

(35th Anniversary continued from page 23)

annually). We did always know of these changes or we found out too late. Bottom line: the information was getting lost and not always being sent to the most appropriate faculty member.

A new approach was designed. We assembled a database of every applicant, their college, and their faculty sponsor. What immediately became apparent was that some individual faculty members were repeatedly sponsoring applicants. Since these faculty members had become familiar with our scholarship program and had repeatedly demonstrated a commitment to their students by submitting letters of recommendation, we decided to make the faculty sponsors our first line of contact. Once we started to focus on the faculty who had previously written letters of recommendation for student applicants, the number of applications received annually began to climb. Since we did not have a former faculty sponsor for every geology department in the northeast, our department contacts continued to be the department chairs in those cases. AIG's annual guide of geoscience departments in the US, however, proved to be a valuable resource in keeping up to date on department chairs. Results improved dramatically!

Since the 2005-2006 academic year, the number of applications received annually have ranged from 11 – 24 and averaged 18; the number of scholarships awarded annually have ranged from 5 – 11 and averaged seven, and we have gradually, but steadily and significantly increased the award pool. Over the past five years, the award pool has ranged from

(35th Anniversary continued on page 27)



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EVENT ANNOUNCEMENT

New York State Council of Professional Geologists

CNYAPG is hosting a free virtual seminar on
February 17, 2021, 6:00-7:30pm.

Dr. John Halfman of Hobart & William Smith
College will present "Finger Lakes Water
Quality: Cyanobacteria in Our Lakes."



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(35th Anniversary continued from page 24)

\$16,000 - \$22,000 and averaged slightly over \$18,000/year. In total, over the past 35 years, a total of \$272,050 in scholarships have been awarded to 195 students at over 63 different colleges and universities in the northeast! For those on the Executive Committee and/or the Scholarship Committee that have been involved in the scholarship program over the past 35 years, we feel that we have achieved a level of success that far exceeded anything that was initially envisioned. More importantly though, we also feel that we can still do better in the future.

**For more information on the Angelo Tagliacozzo
Memorial Geological Scholarship,
please see [page 83](#) or
Contact Dennis McGrath at mcgrathdg@gmail.com**

**To support this great work and help us grow the
Perpetual Trust Fund, see [page 84](#).**

(End)

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Need an idea? Check out the News for Members section on page 56.

We cannot wait to hear about your news!



Sinkhole
above
one of the
collapsed
panels of
the
Retsof
Salt Mine
in May,
1994.

in a significant loss of fluid pressure support beneath hard dolostone layers in the Syracuse Formation, and allowed the dolostone to break under the weight of the overburden, which was dominated by the glacial valley fill sediments.

Unfortunately, Dr. Miller passed away from a heart attack while flying on a commercial airline within a couple weeks of the mediation with the insurance carrier. He was the lead expert, and he never wrote anything down, and the attorneys had not paid any attention to the details. Since the attorneys had whittled the experts down to Dr. Miller and Sam, Sam got a frantic call from the attorney to get briefed for the mediation, which was reportedly successful, though the result was not revealed as per the settlement agreement.

Not long after the mine loss was resolved, Sam and others published an article at World Salt in The Hague detailing the cause. Sam heard from a friend who told Sam that he heard from a mining engineer who attended the symposium that we made up this technical story to support the mine in its insurance claim. I assure you that is not the case, and we have since proven the hydrostatic pressure concept at two other salt mines in the mid-west where yielding pillars were used and failed under an unanticipated hydrostatic load close to the roof.

The Retsof Mine had completely flooded the 10-square-mile mine 21 months after the collapse. It was understood that brine could be squeezed out of the flooded mine and possible contaminate the valley aquifer. Alpha stayed involved with monitoring of ground water flow and quality in the valley. It became apparent in 2003 that brine was reaching the fresh water zone at the base of the valley fill sediments. The State of New York had a memorandum of understanding with Akzo committing Akzo to mitigate the valley fill aquifer if brine reached that level. The movement and control of that brine was the subject of John's presentation. The findings by both Alpha and the USGS that the brine system



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The Retsof Salt Mine Collapse Backstory & Final Resolution In Pictures



Top: Experts debating the cause of the collapse

Bottom: Area mined in the early 1900's that was still accessible close to 100 years later.



(Retsof pictures continued on page 35)

(Retsof pictures continued from page 34)



Top: Roof falls beneath the Genesee River Valley in the Retsof Salt Mine. Bottom: Another salt mine in the mid-West where water pressure has crushed the yielding pillars that are visible in the background. Only thirty inches of the original 14 feet of room height remains. Sam holding the tape and careful not to show his wife.



(End)

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(Retsof article continued from page 29)

operated by Alpha was extracting both mine-squeezed brine and pre-existing brine were a big factor in the State of New York accepting the settlement. We stressed that brine had been circulating in the base of the glacial aquifer system from the pre-existing brine pools in the Syracuse Formation for a long time prior to the presence of mining in the valley. The same processes causing the slow release and dissipation of brine from the mine will continue for many years. The squeeze rate, based on measuring mine closure from surface subsidence, has been reduced to close to 12 gpm from the 10-square-mile mine (approximately 18-billion-gallon pool of brine) and will continuously slow even more with time.



Those who were lost at the mine over its long history. The three lost in 1975 were due to an explosion in the Sterling Mine "B" Shaft.

(End)



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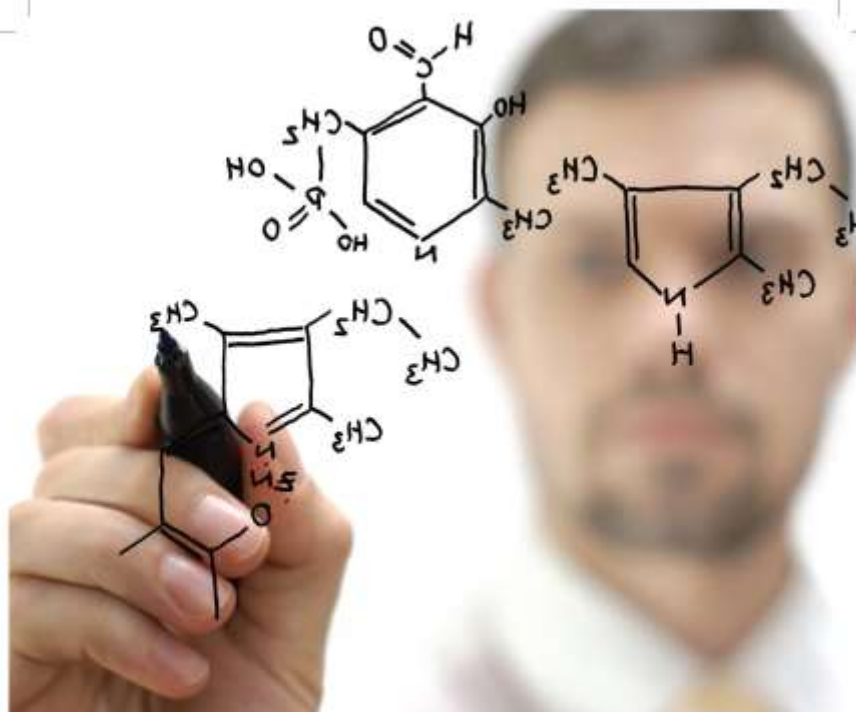
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OCTOBER 2020 MEETING MINUTES

NE SECTION – AIPG EXECUTIVE COMMITTEE MEETING THURSDAY, OCTOBER 29, 2020

Distribution:

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Jeff Frederick	Kelly Weyer	Luanne Whitbeck	Adelina Prentice
Laurie Scheuing	Chris Brown	Brandon Tufano	Dick Young
Dennis McGrath	Kim Burger		

Call to Order (4:06 PM)

Secretary's Report (Minutes)

- ♦ September 2020 – A motion was made to accept as written and seconded. Motion passes with no discussion.

Treasurer's Report

- ♦ September 2020 – The section fund is in good standing; October statement is not available yet.
- ♦ The Angelo Tagliacozzo Memorial Geological Scholarship (ATMGS) fund is down a little from the last month, and is still at a higher balance than this time last year.

Correspondence

- ♦ Scholarship-related – Reminders will be sent out soon, the deadline is approximately a month away.
- ♦ Virtual presentation – Some correspondences have been received from members and the speaker on meeting and how it went well.

Old Business

- ♦ Short Course Update – Drone Short Course (LSRP Update) – The attendance on the Fall meeting is encouraging to anticipate members signing up for the short course to receive credit. Some discussion followed on the length of the course, 4 hours vs. 2 or 2 ½ hours or breaking it up into 2 days. .
- ♦ 2020 to 2021 Scholarship – Some of the survey information has been updated. No feedback has been received from faculty so far.
- ♦ ExCom Elections – The deadline for voting has been extended approximately two weeks.

(Minutes continued on page 43)

(Minutes continued from page 42)

New Business

- ♦ October Virtual Presentation Debrief – There were approximately 30 people in attendance. The speaker gave a great presentation, and had a second person fielding responses to questions in the chat during the talk and that went very well. A survey poll has gone out to attendees to gauge responses on how the meeting went. A discussion followed on potentially having more than 2 virtual meetings, and possibly having scholarship students give presentations.
- ♦ Publications
 - ◇ Newsletter – The Holidays Newsletter will be sent out by November 9th; the content deadline for the holiday newsletter has passed. The same newsletter schedule will continue for 2021. Kurt Kramer will serve as Section Directory Editor for 2021.
 - ◇ Advertising Sales Update & Income – Renewals for advertisers are going to be sent out soon so Advertisers can decide if they want to incur cost before or after the end of the year.

A motion was made to adjourn and the motion was seconded and passed. Adjournment (4:48 PM)

(Minutes continued on page 44)



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DECEMBER 2020 MEETING MINUTES

NE SECTION – AIPG EXECUTIVE COMMITTEE MEETING MONDAY, DECEMBER 7, 2020

Distribution:

Jessica McEachern	Michael Grifasi	Bob Blauvelt	Jennifer Becker
Jeff Frederick	Kelly Weyer	Luanne Whitbeck	Adelina Prentice
Laurie Scheuing	Chris Brown	Brandon Tufano	Dick Young
Dennis McGrath	Kim Burger		

Call to Order (4:02 PM)

Secretary's Report (Minutes)

- ♦ October 2020 – A motion was made to accept as written and seconded. Motion passes with no discussion.

Treasurer's Report

- ♦ October and November 2020 - The section fund is in good standing, and showing the typical fees associated with the account.
- ♦ The Angelo Tagliacozzo Memorial Geological Scholarship (ATMGS) fund was down a little in October but back up in November, and is currently at its highest balance. A discussion followed on whether we should take any actions to take advantage of the market high and it was decided to at least wait until January to make any decisions.

Correspondence

- ♦ Scholarship-related – Applications are complete; no updates to correspondence.

Old Business

- ♦ Short Course Update – Drone Short Course – Virtual Version – The instructor has agreed to a 2 day split of the course and making it virtual, and can substitute canned footage of drone flying. The course revisions have been submitted to the board and we expect expedited turnaround.
- ♦ 2020 to 2021 Scholarship Update – The deadline has passed, and there were a total of 15 applications. The next step is to distribute to scholarship committee members in pdf. form.

(Minutes continued on page 48)

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The Executive Committee reminds all our members to support the companies that advertise in this Newsletter and generously sponsor our meetings. Their support represents a major contribution that helps the Northeast Section continue its mission to promote the profession and build the cornerstone of our Section, the *Angelo Tagliacozzo Memorial Geological Scholarship Perpetual Trust Fund*. It is our advertisers and sponsors who make our Newsletter so successful and well-distributed, reaching more than 600 members across eight states.

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(Minutes continued from page 44)

- ♦ ExCom Election (Results)
 - Kelly Weyer – President-Elect
 - Bob Blauvelt – Treasurer
 - Adelina Prentice – Secretary
 - Luanne Whitbeck – At Large
 - Jeff (Freddy) Frederick – At Large
 - Mitchell T. Ward – At Large

New Business

- ♦ Proposed Meeting Dates – 2021
 - January 11, 2021
 - March 8, 2021
 - May 12, 2021
 - July 12, 2021
 - September 13, 2021
 - October 11, 2021
 - December 6, 2021

Publications

- ♦ Newsletter – Kim and Brandon have agreed to continue to serve as Editors. Holidays Newsletter has been uploaded today. The next will be due in January, and any lines on how COVID is affecting members or any member business is welcome for submittal.
- ♦ Advertising Sales Update & Income – Invoices should be complete by end of year.

A motion was made to adjourn, which is seconded and passed.

Adjournment (5:22 PM)

(End)



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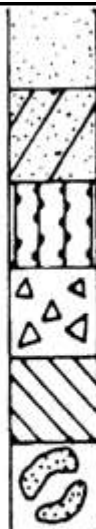
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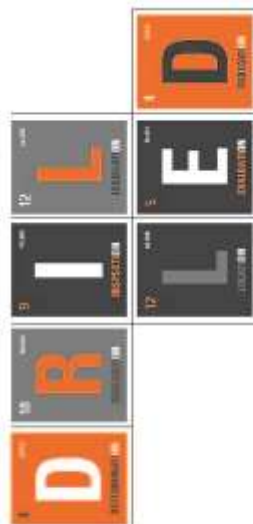
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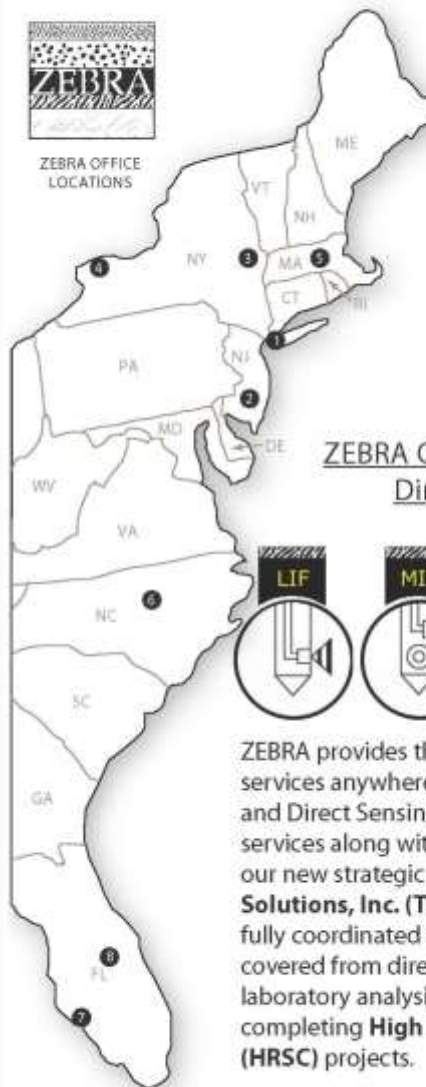
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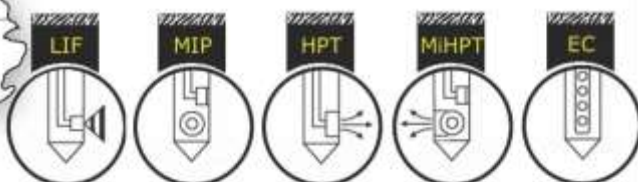
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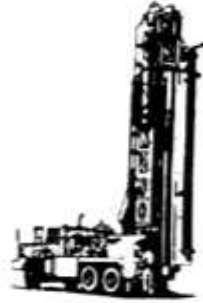
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News of Members

What have our members been doing during the pandemic?
Read on to find out!

The News of Members portion of the NE/AIPG Newsletter was a vibrant (and, often, extensive) part of each newsletter from the early 1980's, onward.

The News of Members column allows Section Members to update fellow geologists on their activities and experiences (both professional and personal). Given the expansive, 8-state area covered by the Northeast Section, and the limited opportunities to get together in person, the News of Members column fills a void and helps to maintain relationships.

Sadly, the News of Members column had languished over the last decade, given the many work/time constraints and pressures on Members.

The *good news* is we are re-invigorating the News of Members column! Read about some of the happenings of our ExCom members during this new age of quarantine and working from home.

As always, we encourage you to send **YOUR** activities, experiences, and news to our Editor for our next issue.

Dick Young	ryoungnj@aol.com
Kim Burger	kburger@rouxinc.com
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(News of Members continued on page 59)



Mitch Ward

I am employed at an environmental remediation company with job sites across the country. Fortunately, most projects I work on are considered essential, so the COVID-19 related challenges I have faced this year have consisted of adjusting procedures so that work can still be completed safely. This has included the development of safety protocols to mitigate COVID-19 risks and adapting to widespread remote working and restrictions on travel. It is encouraging to work with people confronting such an immense and unwieldy challenge.

In the spirit of hope, just prior to the pandemic, my girlfriend and I became engaged. We have been planning a small wedding for this summer, optimistic the world will soon be in better condition for us to host a party.

(End)

In Memory of Father James Skehan

A man of faith and science, James W. Skehan, SJ -- founder of Boston College's Geology Department, long-time director of the University's Weston Observatory, and a renowned geologist, who was honored for his contributions to earth science by the naming of a half-billion-year-old genus of trilobite after him -- died on Nov. 1 at the age of 97.

Father Skehan's scientific work focused on the geology of the Northeastern United States and the Avalon terrane, which extends from Belgium to the southern Appalachians. He wrote the "Roadside Geology of Massachusetts," a 400-page illustrated guide to the geological history and makeup of the Commonwealth, and followed that with "Roadside Geology of Connecticut and Rhode Island."

Father Skehan founded the Boston College Department of Geology (now Earth and Environmental Sciences) in 1958 and served as its first chairman. From 1973 to 1993, he directed Boston College's Weston

(Memorial continued on page 60)

(Memorial continued from page 59)

Observatory, a geophysical research observatory that monitors seismic activity across the globe and a frequent resource for the media in their coverage of earthquakes. He was named 1976 Teacher of the Year by the National Association of Geology Teachers.

A man of faith and science, his roles as priest and geologist were perhaps never more dramatically intertwined as when he co-organized a 1970 expedition to Surtsey, a new island that had formed off the coast of Iceland in the wake of a volcanic eruption. Funded by Boston College and NASA, the exploration provided dozens of scientists with a rich, living laboratory for observation. It also gave Father Skehan the opportunity to celebrate the first Mass ever on the island.

In 2002, Mount Holyoke College geologist/paleontologist Mark McMenamin named a new genus of trilobite, Skehanos, in Father Skehan's honor. Skehanos is a marine invertebrate that lived more than 500 million years ago and whose fossil was discovered in Quincy.

The naming of Skehanos was only one of the special ways Father Skehan was honored during his storied career. Author Sarah Andrews created a fictional Father Jim Skehan character for "In Cold Pursuit," her mystery novel set in Antarctica. In 2012, a bronze bust in Father Skehan's likeness was unveiled at the Department of Earth and Environmental Sciences on the occasion of his 89th birthday; the bust's



"If you look at a beautiful sunset, or how mountains are formed, or observe how continents move, you can view it either as science or as Gods peaking to you, or both. I do both. What I do as a scientist is no different from what I do listening to the cosmic word of God. It's nice to have both [science and faith] -- in fact, it makes everything so exhilarating. What could be more marvelous?"

(Memorial continued on page 61)

(Memorial continued from page 60)

base, from the Le Masurier Family Quarry in Chelmsford, is made from Chelmsford Granite, one of Father Skehan's favorite rocks.

In 2013, his friends and colleagues established the James W. Skehan, SJ, Graduate Research Awards to offer financial support for graduate student research in Earth and Environmental Sciences and at Weston Observatory.

Born in Houlton, Maine, Father Skehan was the oldest of seven children. His father worked for Western Union and his mother was a seamstress. The practice of their Catholic faith was an important part of family life and the rosary was regularly recited after dinner. As a teenager, he enjoyed being outside -- camping and hiking -- or participating in track and field activities. He maintained his love of the outdoors throughout most of his life. He was part of a crew that cleared trees to make way for the erection of the Weston Observatory and was often photographed with his trusty pick axe in hand.

Father Skehan entered the Society of Jesus in 1940, was ordained in 1954, and professed final vows in 1957. A noted spiritual leader, he wrote "Place Me With Your Son: Ignatian Spirituality in Everyday Life," which he used throughout the 1980s and '90s to lead 24-week group retreats based on St. Ignatius' Spiritual Exercises. He also wrote "Praying with Teilhard de Chardin," on the life and thought of French Jesuit paleontologist and philosopher Pierre Teilhard de Chardin, SJ, and contributed to the volume "The Dialogue between Science and Religion: What We Have Learned From One Another."

He earned bachelor of science and master of arts degrees from Boston College in 1946 and 1947, respectively, and graduated with a doctorate in geology from Harvard University in 1953. He then attended Weston College, where he earned a bachelor of sacred theology, master of theology, and a licentiate in sacred theology. He was awarded an honorary doctor of science degree by Boston College in 1998.

*Memorial written by Jack Dunn, Associate Vice President for Communications at Boston College.



This close-up shot is of the model of the middle Cambrian trilobite genus that lived 505 million years ago, named for Fr. Skehan .

(End)



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DRONE COURSE



NE-AIPG is pleased to announce the availability of its online/virtual short course in the use of unmanned aerial vehicles. This two hour lecture qualifies for two technical LSRP, LSP, and PG licensure credits and is being taught by one of the leading experts in the scientific use of drone technology: Dr. Francisco J. Artigas Ph.D., the Director of New Jersey's Meadowlands Environmental Research Institute.

The use of unmanned aerial data collection devices (drones) has become a standard tool for many scientific disciplines. Depending upon their mission, drones are equipped to collect data on air quality, land use, water characteristics, and vegetation status. Drones are being and will be used to support site remediation projects in numerous ways, including accessing potential areas of environmental concern within complexes or sites that are inaccessible; the collection of baseline air emissions data from disposal sites (e.g., methane discharge from landfills) or routine monitoring of air emissions during or after remediation; and tracking of stressed vegetation, surface water runoff pathways, and thermal signatures indicative of subsurface reactions.

Drones also are being used to confirm daily cut and fill excavation limits and to establish pre- and post-surface topography at remediation sites. While many geologists have seen drones operate and use the data they generate, this course will provide a more comprehensive understanding of the mechanics of their operation, the regulatory restrictions associated with drone usage, and the type of data packages they can generate. This will allow end users to make informed decisions on when or if drone collected data would be useful and how those data will be processed.

Date: Mid-May, 2021 (TBD)

Time: 10:00 AM to 12:00 PM

Platform: Zoom or equivalent

Further details to be announced

(End)

RPI Prevails in Legal Skirmish with IET

All 18 Claims of IET's '709 Patent Held Unpatentable

Open bidding in 2017 resulted in IET losing a project in New Jersey. Instead of selecting IET, the client chose an approach that used RPI's CAT 100 technology. Mike Scalzi of IET cried foul, accused the client of infringing IET's US 7,531,709 patent because of their use of RPI's technology, and attempted to collect an egregious royalty on the project. Ultimately, IET sued the client in federal court on August 8, 2018, alleging patent infringement of its '709 patent. At this point, RPI became involved to defend its technology and the client. As part of that defense, RPI filed an Inter Parties Review in August 2019, challenging the validity of the '709 patent.

On January 15, 2021, a three-judge panel of the Patent Trial and Appeals Board (PTAB) at the U.S. Patent and Trademark Office (USPTO) found that "Petitioner [RPI] has established by a preponderance of the evidence that claims 1 – 18 of the '709 patent are unpatentable." (See final written decision) In other words, the panel found IET's flagship '709 patent to be invalid.

In a press release dated June 15, 2015, Provectus stated, "any process that removes halogenated organic contaminants from groundwater that employs an organic hydrogen donor plus ZVI (or other zero valent metal) of any shape and size may well infringe U.S. Patent No. 7,531,709". Provectus went on to detail examples of hydrogen donors (including molasses) making Provectus's position clear that injecting ZVI and molasses to dechlorinate chlorinated hydrocarbons would infringe its '709 patent.

(RPI continued on page 75)

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IGUAZU FALLS:

One Geologist's Perspective

By Mike Greenman CPG 10441



In the summer of 2019, my wife and I were on a Jewish Heritage Tour to Argentina and Chile. The tour also included the normal tourist sites in both countries. The highlight of the tour was a two day trip to Iguazu Falls.

We flew north into Iguazu from our base in Buenos Aires, Argentina. When I say summer of 2019, it was actually the South American winter. Buenos Aires was chilly, but Iguazu, closer to the equator, was a little warmer. More about the temperature later.

The falls are on the Parana River, which in the area forms the border between Argentina and Brazil, just upstream from the three-way border with Paraguay. The falls are formed by the Parana River flowing over a resistant basaltic plateau. The largest part of the falls is in Argentina and the rest is in Brazil. Above the falls the river is wide and meanders across the flat



(Iguazu Falls continued on page 73)



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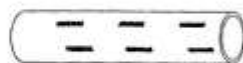
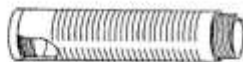
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(Iguazu Falls continued from page 67)

The basaltic plateau was formed during the Cretaceous, during the rifting caused by the breakup of the supercontinent of Pangaea. These flows locally cover approximately half a million square miles and are up to a little over a mile thick. The basalts are typically of the pahoehoe, or ropy, variety. Fracturing and faulting followed with the ensuing uplift. The local rivers tend to follow these structures. The rim of the falls is receding at the rate of a little over a tenth of an inch per year. Since its creation, the falls have receded a little over 14 miles.

Depending on the time of year and water flow, the falls consist of up to 275 distinct falls and over 600 separate cascades. Altogether, they stretch for 1.7 miles along the rim with 80% in Argentina. The falls are stepped with up to 6 steps in some places. Total height of falls is 269 feet.

The falls are located in national parks in both countries. Access to the falls is by train from the main entrance or a long hike along walking trails. There are trails that follow the rim and some in the gorge below. Several boardwalks hang over the river and some of the falls.



(Iguazu Falls continued on page 74)



The best way, however, to see the falls is by boat. Boats are jet propelled and seat about 50 people in an open arrangement. If you are familiar with the Maid of the Mist ride at Niagara Falls, this is similar, but on steroids. After a half hour ride in an open truck through the jungle to the dock area, we prepared for the trip. All of our belongings, shoes included, were put in water proof bags stowed under our seats. We donned life vests and ponchos. The first part of the trip was a high speed ascent of the rapids in which we were liberally doused with spray. After a short wait for instructions, photographs, and for other boats to clear, we made our way into and under the falls first on the Argentinian side and a second dousing on the Brazilian side. We were thoroughly drenched even with ponchos. As I mentioned earlier, this was winter, being wet and temperatures in the 50-60 degree range did not make for a comfortable ride back. The whole adventure was filmed by the guides. For a nominal fee, they delivered a flash drive to our hotel in the evening that included our ride and slide shows about the history of the falls.

Wildlife is abundant throughout. Colorful birds, such as toucans, proliferate in the treetops. Numerous coatimundis follow tourists around looking for handouts of food and invade the outdoor restaurants.

The size of the falls can only be captured by being there. Pictures, except from the air, do not do them justice.

(End)

(RPI continued from page 65)

Following the PTAB's final written decision, Mr. Scalzi, CEO of IET and one of the two named inventors on the '709 patent, contended that RPI's evidence supporting the decision was weak and regurgitated from previous challenges. In reality, the PTAB found all 18 claims unpatentable based on a new primary prior art reference (U.S. Patent 5,766,929 to Orolin) that the USPTO had not previously considered, in combination with two secondary prior art references (U.S. Patent 5,975,798 to Liskowitz and U.S. Published Appln 2002/0151602 to Vance).

In addition to the reasons for unpatentability that the PTAB set forth in its final written decision, RPI has clear and convincing evidence that Scott Noland, its president, invented the method of injecting ZVI and a carbon source (i.e., molasses) into groundwater to dechlorinate chlorinated hydrocarbons well before Mr. Scalzi's alleged invention. The picture above shows Mr. Noland on an injection trailer at a DOW Chemical site in Sarnia, Ontario, injecting ZVI and molasses in late 1998, more than four years before Mr. Scalzi filed the provisional patent application, which became the '709 patent. More than one year ago, RPI provided IET with clear and convincing documentary evidence that Mr. Noland continued to utilize the ZVI and molasses technology at multiple sites across the USA for several years, all more than one year before the priority date of the '709 patent. Thus, not only is the '709 patent invalid and unenforceable, Mr. Noland is a prior inventor of the technology claimed in the '709 Patent that IET has used to extract fees from our industry for over a decade.

The United States Supreme Court has said it is in the public interest to challenge an invalid patent. See *Lear, Inc. v. Atkins*, 395 U.S. 653 (1969) (holding that even licensees can stop paying royalties and challenge the validity of a licensed patent because the public should not "be required to pay tribute to would-be monopolists without need or justification.").

Mr. Scalzi says he will appeal; this is his right. The odds weigh heavily against him. RPI noticed that IET did not provide a link to the PTAB's decision in their recent press release. Any person who is interested in, provides, or uses the technology disclosed in the '709 patent may want to read the decision and speak to a patent attorney regarding the current status of the '709 patent in light of this decision.

For more information, please contact RPI as we are happy to share any of the non-confidential filings and proceedings that have transpired over the last three years.

Kind Regards,

Bob Elliott & Scott Noland
Founders of Remediation Products, Inc.



**Scott Noland
Injecting ZVI
and Molasses
at Dow Sarnia
in 1998**

(End)



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Complex sites require complex solutions. In many situations, a single technology is not going to achieve the project objectives. AST Environmental, Inc. (AST) has a proven track record of success designing and installing affordable and effective combined remedy solutions at these sites. Please join us on Tuesday, February 23rd for the first in our new webinar series of 30 minute platform presentations where AST's Senior Remediation Engineer, Mike Mazzaresse, will focus on the technical details of a recent combined remedy success story.

Things you will learn in this free webinar:

- Understanding how high density data generated in AST's Remedial Design Characterization (RDC) process was used to develop a high-resolution quantitative conceptual site model (CSM)
- Key design elements and installation techniques for the first stage of the remedial program: an injected permeable reactive barrier (PRB) using BOS 100® and completion of an unsaturated soil mixing program
- How CAT 100 - a biologically enhanced version of BOS 100® that economically treats sites with high levels of contamination - was used in the final stage of remediation to address source area impacts

Contact Mike Mazzaresse at mmazzaresse@astenv.com for more information.

NE/AIPG 2021 PUBLICATION SCHEDULE

Winter Newsletter

January	11	Deadline (Material to Editor)
January	22	Content to Publisher
February	8	E-mail to Members

Directory of Members

February	8	Deadline (Material to Editor)
March	12	Content to Publisher
April	12	E-mail to Members

Spring Newsletter

March	19	Deadline (Material to Editor)
April	2	Content to Publisher
April	19	E-mail to Members

Indian Summer Newsletter

July	23	Deadline (Material to Editor)
August	13	Content to Publisher
September	1	E-mail to Members

Holiday Newsletter

October	8	Deadline (Material to Editor)
October	22	Content to Publisher
November	8	E-mail to Members

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(End)

Celebrating 35 Years of Scholarships!

The Angelo Tagliacozzo Memorial Geological Scholarship

The Angelo Tagliacozzo Memorial Geological Scholarship was established by the Northeast Section of the American Institute of Professional Geologists in late 1986. The first Scholarships were presented to undergraduate Geology students in 1987.

ATMGs recognizes the dedicated leadership and service which Angelo provided to NE/AIPG, to AIPG, and to the geological profession, until his untimely passing on October 11, 1986. The Scholarship furthers Angelo's goal of acquainting young geologists with AIPG and with AIPG's importance to the geological profession.

ANGELO TAGLIACOZZO (1936 - 1986)

Angelo Tagliacozzo received his doctorate in Geology from the University of Rome (Italy) in 1962. Thereafter, he worked in various positions as geologist, geophysicist, and hydrogeologist, which included assignments abroad, in the U.S., and with the United Nations. Angelo provided exemplary service to AIPG at the Section and National levels. He was a Northeast Section Executive Committee Member (1973-1982), Vice President (1977-1978), President (1979-1980), National Advisory Board Delegate (1981-1982), and Screening Board Chairman (1984-1986). Angelo's dedication to and leadership of the Northeast Section Screening Board has become the ultimate standard against which service in such a position is measured. Angelo also served as an AIPG National Executive Committeeman (1982); he was a vigorous advocate of measures to increase professionalism. Angelo was (and will be remembered as) a respected professional... and a friend.

THE SCHOLARSHIP

NE/AIPG grants Scholarships to undergraduate geology students annually. The Scholarships are designed to help with the cost of summer field courses, textbooks, and other aspects of geological education. Scholarships are awarded, both on academic achievement and on financial need, to students enrolled in recognized geology programs at colleges or universities in New England, New Jersey, & New York.

YOUR CONTRIBUTIONS

Your participation is encouraged in support of this dynamic memorial to Angelo and his recognition of the importance of AIPG to the geological profession. Contributions to the Scholarship Perpetual Trust Fund should be written to:

Angelo Tagliacozzo Memorial Geological Scholarship Trust Fund, and mailed to:

NE/AIPG Geological Scholarship Trust Fund
c/o Dennis McGrath, CPG
1133 Warburton Avenue, Apt. 211N
Yonkers, NY 10701

All Contributions are invested perpetually, with earnings thereon used solely for the Scholarship. NE/AIPG bears all costs of administration. Please ask your employer about *matching your contribution*, and *additional corporate contributions*.

For further information, contact Dennis McGrath:
mcgrathdg@gmail.com Cell: 914-424-8816

Memorandum

To: Dennis McGrath, Chairman, ATMG Scholarship, Northeast Section, AIPG

From:

Date:

Re: *I'm Taking the Pledge: **I'M IN FOR 2021!***

Dear Dennis,

Just a quick note to let you know that I'm 100% with you when it comes to achieving the Section's goal of 100% participation in support of the Scholarship Perpetual Trust Fund during 2021, the 35th Anniversary of the Scholarship! I agree with your encouragement that each and every Section Member make a contribution in accordance with their ability... and this is the one time when I don't want to be the odd person out!

I'M IN FOR 2021!

For 2021, the 35th Anniversary, I'm considering pledging... Thirty-five Bucks a Week, Thirty-five Bucks a Month, or Thirty-five Bucks for the Year!

Now, I know it could be more—and you know it could be less!—but I am committed to contributing as much as I can, so I'm not going to delay it any longer: **I'M IN FOR 2021!**

Yes, my personal budget is tight, but I figure that, somehow, I can set aside \$35 each month (aka the cost of weekly lattes) this year to give back to the profession that has given me so much. Also, I just wanted to tell you I am delighted to know that every one of those hard-earned dollars that I contribute will be INVESTED in the Scholarship Perpetual Trust Fund, so my contribution today can keep on giving, year after year!

And that makes me feel like my contribution really means something, both now and in the long term! I have thought it over, and I know how important 100% participation is for Section pride! So, Dennis, **I'M IN FOR 2021**

Professionally yours,

Times are really (GREAT / poor), so I am pledging:

____ 35 Bucks a Week (\$1820 for 2021)

____ 35 Bucks a Month (\$420 for 2021)

____ 35 Bucks a Year (\$35 for 2021)

Other: _____ (Every little bit is better than nothing!)

____ I'll make it easy on you; I have enclosed my check, made out to "*Angelo Tagliacozzo Memorial Geological Scholarship Trust Fund.*"

____ Please invoice me for my 2021 pledge by 10/31/2021. I'll pay by 12/1/2021.

Signed: _____

Name Printed: _____

Address: _____

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345 Stuyvesant Avenue, Lyndhurst, New Jersey 07071

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blauvelt@geiconsultants.com