Information Circular

Conference on the Silica Sand Resources of Minnesota and Wisconsin

October 1-3, 2012
Earle Brown Heritage Center, Brooklyn Park, MN

Sponsored by

www.d.umn.edu/prc/workshops/SSworkshop
About the Conference

Mining of high-purity silica sand rock formations has been conducted in the upper Mississippi River Valley for over a century. However, the boom in domestic oil and gas exploration over the past decade, largely spurred by increased use of hydraulic fracturing techniques, has driven a new mineral rush in Minnesota and Wisconsin for deposits of what the industry calls “Northern White Sand”. By virtue of its nearly pure quartz composition, friability, and coarse grain size, this resource is considered an ideal “frac sand” for use as a proppant in oil and gas exploration and extraction. Currently, silica sand’s use by the oil and gas industry is its second largest market by volume in the US after glassmaking (2012, Industrial Minerals Mag.).

In the face of this rush to expand current operations and develop new mines, there is an urgent need among the public, media, government regulatory agencies, and energy and mineral resource industries for credible information about this industry. This conference seeks to answer many of the questions various stakeholders have raised about the development of this resource.

- Why are these silica sand deposits located in the upper Midwest?
- How is silica sand used in oil and gas exploration and what are its other uses?
- What makes an ideal silica sand deposit?
- How are these deposits mined and the sand processed?
- What environmental safeguards are employed during mining and processing to preserve water and air quality?
- How is the material handled and transported?
- How are sand mines reclaimed?
- What regulations apply to silica sand mines and what permits are needed to develop a mine and processing plant?
- What is the local and regional economic impact of silica sand mines?

The conference is being jointly organized by the University of Minnesota Duluth’s Precambrian Research Center (PRC) and the Twin Cities section of the Society of Mining, Metallurgy, and Exploration (SME). The silica sand conference will be held in conjunction with the Midwest Groundwater Association Meeting at the Earle Brown Heritage Center in Brooklyn Park, MN (northwest of Minneapolis). A welcoming banquet highlighted by a talk on the booming domestic oil and gas industry will kick things off on Monday evening. A technical session of invited talks by experts from industry, government and academia will follow on Tuesday. Wednesday will showcase some of the classic geological occurrences of silica sand formations and will visit several mining and processing operations in western Wisconsin that highlight best practices in the industry.

Conference Schedule

**Monday, October 1 - Welcoming Banquet**
Earle Brown Heritage Center, Brooklyn Park, MN

- 5:00-8:00  **Registration Open**
- 5:30-6:30  **Reception/Cash Bar/Band**
- 6:30-8:00  **Banquet**
- 8:00-9:00  **Keynote Talk - Dr. Stephen Brand** (ConocoPhillips, VP of Technology and Development, retired)

*Talk Title* – Technological Drivers behind the Domestic Boom in Oil and Gas Exploration
Tuesday, October 2 - Technical Session on Silica Sand Resources
Earle Brown Heritage Center, Brooklyn Park, MN
Registrants will receive a bound copy of powerpoint slide notes of each presentation
7:00-10:15 Conference Registration

8:00-8:15 Introduction (Jim Miller-UMD/PRC, Louis Rudnicki-SME)

8:15-9:00 Geological Occurrences and Origins of Silica Sand Formations in the Upper Mississippi River Valley
  Presenters – Tony Runkel (Chief Geologist, Minnesota Geological Survey) and Kent Syverson (Professor, University of Wisconsin-Eau Claire)
  Emphasis – Occurrence and origins of Cambrian and Ordovician quartzose sandstone units; geologic characteristics affecting silica sand mining – faulting, cementation, geotechnical properties

9:00-9:20 Uses of Silica Sand, Part I - Silica Sand as a Proppant in HydroFrac Drilling for Oil and Gas
  Presenter – Pankaj Taneja (VP of Minerals, Schlumberger, Well Services Division)
  Emphasis - Role and ideal characteristics of silica sand as a proppant in oil and gas extraction; chemical/ceramic coatings

9:25-9:45 Uses of Silica Sand, Part II - Other Uses of Quartz Sand
  Presenter – Maureen Lynn (VP of Marketing and Sales, Fairmount Minerals)
  Emphasis - The importance of silica sand for metal-casting, water filtration, glass production, sports + recreation uses, and many different building products

9:45-10:15 Morning Break

10:15-10:45 Site Evaluations for Silica Sand Mines
  Presenter – Darrell Reed (Geologist, SEH Consultants)
  Emphasis – Field investigation techniques in assessing potential for silica sand mining

10:45-11:15 Silica Sand Mining Techniques
  Presenter – John Litsenberger (Consultant for Goodhue Co; formerly with Wisconsin Industrial Sand/Fairmount Minerals)
  Emphasis - Overburden removal and stockpiling; open pit mining; contour mining; underground mining; hydraulic dredging; noise mitigation practices

11:15-11:45 Processing, Treatment, and Storage of Silica Sand
  Presenter – Christopher Kelley (Sales Manager – Aggregate Processing, McLanahan Corporation)
  Emphasis – Crushing, grinding, washing, sorting, and other processing of sand; stockpile management

12:00-1:00 Lunch (available to all technical session registrants)
Technical Session on Silica Sand Resources (cont.)

1:00-1:30 Water Use and Quality Controls related to Silica Sand Mining and Processing
Presenter - Scott McCurdy (Hydrogeologist, Cedar Corp-Environmental Group)
Emphasis – Role of water in mining and processing; reuse and treatment of water; mitigation of potential surface and groundwater contamination; monitoring of water quality

1:30-2:00 Air Quality Controls related to Silica Sand Mining, Processing, and Transportation
Presenter – Jeff Hedman (Engineer, Air Quality Permits Section, MN Pollution Control Agency)
Emphasis – Fugitive dust and emission sources and controls, characteristics of particulates, and air quality monitoring

2:00-2:30 Transportation Options and Issues
Presenter - Brennan Thomas (CEO, Pro Sands)
Emphasis – Transportation options for WI and MN operations, material transfer processes, mitigation of impacts on road infrastructure, noise, and congestion

2:30-3:00 Reclamation of Silica Sand Operations
Presenters - Paul Eger (Senior Engineer, Golder Associates) and Karl Everett (Senior Environmental Consultant, Golder Associates)
Emphasis – Types of reclamation plans; reclaimed site inspection and monitoring

3:00-3:30 Afternoon Break

3:30-4:00 Permitting and Regulation of Silica Sand Mining Operations in Wisconsin
Presenter – Bruce Brown (Senior Geologist, Wisconsin Geological and Natural History Survey, retired)
Emphasis – Required permits, regulatory roles of state, county and local authorities

4:00-4:40 Permitting and Regulation of Silica Sand Mining Operations in Minnesota
Presenters – Wendy Turri (Wastewater Program Manager, MN Pollution Control Agency) and Lisa Hanni (Land Use Management Director, Goodhue County, MN)
Emphasis – Required air quality and water quality permitting regulations and requirements for silica sand mining facilities in Minnesota; regulatory roles of state, county and local jurisdictions

4:40-5:10 Economic Analysis of Silica Sand Resources
Presenter - Mark Krumenacher (Senior Vice President, GZA GeoEnvironmental)
Emphasis – Economic benefits and costs to state and local communities during the life cycle of a silica sand mining and processing operation

5:15-6:00 Cocktail Reception (open to all registrants)

6:00-7:30 Buffet Dinner - Guest Speaker – TBA (much purchase dinner ticket at additional cost)

7:30-9:00 Q&A on Silica Sand Mining (presenters will be available for a final question and answer session; open to all technical session registrants).
**Wednesday, October 3 – Field Trip on Silica Sand Resources of Western Wisconsin**

All registrants will receive a field guidebook and will be provided lunch, snacks and refreshments.

7:30 AM Depart Earle Brown Heritage Center
8:30-9:00 St. Peter Sandstone exposure, River Falls (B)
9:00-10:30 Drive to New Auburn (C)
10:30-12:00 **Great Northern Sand** mine and processing plant (Wonewoc Fm)
12:00-12:15 Drive to Chippewa Falls (D)
12:15-1:30 **EOG Resources** mine and processing plant
1:30-2:30 Drive to Blair (E)
2:30-3:45 **Preferred Sands** mine and processing plant (Wonewoc Fm)
3:45-4:00 Drive to Arcadia (F)
4:00-4:45 Jordan Sandstone exposure on Hwy 93 (near Arcadia)
4:45-5:45 Drive to Eau Claire (G)
5:45-6:15 Mt Simon exposure, Eau Claire
6:15-8:00 Drive to Earle Brown Center (H)

Route for field trip on Silica Resources of Western Wisconsin.
Conference Registration

Participants have the choice of registering for any of four cost components to the conference – welcoming banquet, technical session, Tuesday evening buffet, and field trip. Students may attend the technical session at a discounted rate.

Although attendance for the technical session and dinners are unlimited, the field trip can take a maximum of 100 participants. Therefore, first preference for field trip attendance will be given to those registered for the Silica Sand Conference technical session on a first come-first served basis, contingent upon receipt of the registration form and full payment of the field trip fees. Registrants not attending the technical session will be placed on a waiting list. Any field trip slots remaining after the pre-registration deadline (September 17th) will be added from the waiting list based on their payment and registration date, regardless of technical session attendance, until the roster is full. Payments will not be processed until registrant has secured a spot on the field trip.

Pre-Registration deadline is Monday, September 17th. A $50 Late Fee will be charged for registrations received after this date.

See last page of this information circular for the conference registration form.

The costs for the conference components are:

Monday Welcoming Banquet ................................................................. $33

Technical Session and Evening Q& A ............................................... $140 professional

                                      $100 student

Tuesday Evening Buffet Dinner ....................................................... $33

Field Trip.......................................................................................... $100

Technical Session Registration includes:

- Short course notebook of extended abstracts and Powerpoint lecture notes
- CD of lecture powerpoints, abstracts, and handouts
- Certificate of attendance indicating contact hours for professional development credit
- Mid-session breaks and lunch
- Admittance to cocktail reception following the topical sessions
- Admittance to evening Q&A session

Field Trip Registration includes:

- Transportation by coach bus
- Field guidebook
- Certificate of attendance indicating contact hours for professional development credit
- Morning coffee and pastries, bag lunch, afternoon snack and refreshments
Payment, Notice of Acceptance and Cancellation Policy

Payment for conference registration can be made by check or by credit card (see registration form). Upon receipt of a completed registration form and full payment, a receipt will be sent by email. If the field trip fills, registrants can request to be put on a tiered waiting list as described above and have their check or credit card information held. A full course refund will be given if notice of cancellation is received by Monday, September 24. After that date, only technical session registration costs will be fully refunded. Field trip fees will also be refunded if a substitute from the waiting list fills the slot.

Students

Students who are currently enrolled at an accredited college or university are eligible to enroll for the technical sessions at a reduced rate of $100. Depending on the level of corporate sponsorships for student support, student registrants may receive a rebate on the registration amount at the time of the meeting.

Vendors and Exhibitors

Booth and table space are available to companies, professional organizations, and government agencies on Monday (10/1) and Tuesday (10/2) to display products and services to attendees of both the Silica Sand Resources Conference and the Midwest Ground Water Conference. Booths and tables will be made available for vendors and exhibitors on a first-come first-served basis. This is a great way to get access to a very targeted audience of producers, regulators, consultants, and oil and natural gas industry professionals. You will also have exposure to participants in the Midwest Groundwater Association’s 57th Annual Conference, being held in conjunction with the Silica Sand conference. The Midwest Groundwater Association’s annual conference draws groundwater scientists, professionals, and engineers from the 14 state Upper Midwest.

Deadline for securing space is Friday, September 14th. As shown on the floorplan map below, vendor booths will be next door to the main conference hall and the focus of conference breaks and the welcoming reception and banquet the evening of October 1st.

**Exhibitor Booth - $1000**
- features an 8’ x 10’ exhibit area and a 3’x7’ skirted table
- one technical session registration

**Exhibitor Table – $600**
- features a 3’x7’ skirted table
- one technical session registration

See [website](#) to download an Exhibitor Registration Form or contact Louis Rudnicki (louisr@tillercorp.com 763-425-4191) for more information.
Sponsorships

Companies interested in generating more exposure to the hundreds of participants expected to be in attendance at the joint Silica Sand Resources and Midwest Ground Water conferences are encouraged to become a meeting sponsor. Listed on the next page are the various sponsorship opportunities, the contribution levels, and the benefits to the sponsor.

PLATINUM SPONSOR - $1,500
- Recognition and Company Logo on Conference website Main Page, Sponsor Page, Conference Proceedings and Field Trip Guidebook
- Company Logo on projector display during morning registration and breaks
- Acknowledgement and brief corporate statement at beginning of conference

GOLD SPONSOR (Keynote Speakers or Monday Reception/Band) - $1,000
- Recognition and Company Logo on Conference website Main Page, Sponsor Page and Conference Proceedings
- Company Logo on projector display during morning registration and breaks
- Acknowledgement and brief corporate statement at beginning of Keynote Address or prior to Monday's reception & live music

SILVER SPONSOR (Reception Food/Reception Bar) - $600
- Recognition and Company Logo on Conference website Sponsor Page and Conference Proceedings
- Company Logo on projector display during morning registration and breaks
- Corporate Logo and brief printed Corporate Statement on display at bars or appetizer tables

HOSPITALITY SPONSOR (Morning Coffee, Morning Break, or Afternoon Break) - $300
- Recognition and Company Logo on Conference website Sponsor Page and Conference Proceedings
- Company Logo on projector display during morning registration and breaks
- Corporate Logo and brief printed Corporate Statement on display at break tables

FIELD TRIP SPONSOR - $750
- Recognition and Company Logo on Conference website Main Page, Sponsor Page and Field Trip Guide
- Company Logo on projector display during morning registration and breaks
- Brief Corporate Statement during lunch on field trip day

See [website](#) to download an Conference Sponsorship Flier or contact Louis Rudnicki (louiser@tillercorp.com 763-425-4191) for more information.
Conference Center and Lodging Accommodations

The technical sessions and welcoming banquet will be held at the beautifully restored historic Earle Brown Heritage Center, conveniently located just minutes north of downtown Minneapolis. The EBHC is located near the junction of I-694/94 and MN Hwy 100 in Brooklyn Park (see map on next page).

As shown on the map below, a number of lodging accommodations are located within a 5-minute drive of the Earle Brown Heritage Center. Contact information for these lodgings are listed in the table on the following page. Discounted conference rates have been negotiated for blocks of rooms with several facilities. Ask for the “PRC Silica Sand Workshop” rate when making reservations.
Lodging Accommodations near the Earle Brown Heritage Center

<table>
<thead>
<tr>
<th>Facility</th>
<th>Phone</th>
<th>Web Address</th>
<th>Negotiated Rate*</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Embassy Suites</td>
<td>(763) 560-2700</td>
<td>hilton.com</td>
<td>$109</td>
</tr>
<tr>
<td>B Comfort Inn</td>
<td>(763) 560-7464</td>
<td>comfortinn.com</td>
<td>$64</td>
</tr>
<tr>
<td>C Super 8</td>
<td>(763) 566-9810</td>
<td>super8.com</td>
<td>$55 sngl, $60 dbl</td>
</tr>
<tr>
<td>D AmericInn</td>
<td>(763) 566-7500</td>
<td>americinn.com</td>
<td>($79)</td>
</tr>
<tr>
<td>E Crowne Plaza</td>
<td>(763) 489-2576</td>
<td>crowneplaza.com</td>
<td>$89</td>
</tr>
<tr>
<td>F Country Inn &amp; Suites</td>
<td>(763) 561-0900</td>
<td>countryinns.com</td>
<td>($102)</td>
</tr>
</tbody>
</table>

* Negotiated rate does not include state and local taxes (~13%); rates in parentheses are published website rates and are not guaranteed.

Midwest Ground Water Conference
The 57th Annual Midwest Ground Water Conference will be held at the Earle Brown Heritage Center concurrently with the Silica Sand Resource Conference. The MWGW conference will host two days of technical sessions on Monday, Oct. 1 and Tuesday, Oct. 2. The Monday Welcoming Banquet will be open to both MWGW and SSR conference participants. Registrants to the Silica Sand Resource conference interested in attending the Monday MWGW sessions can register at:

www.mwgwc.org

More Information

Technical Session and Field Trip

Jim Miller mille066@umn.edu
218-726-6582 (UMD office) or 218-391-5320 (cell)

Exhibitors/Vendors and General Conference

Louis Rudnicki louisr@tillercorp.com
763-425-4191 or 612-749-5799 (cell)

Registration and Lodging

Julie Anne Heinz jheinz@nrri.umn.edu
218-720-4272
Conference on the Silica Sand Resources of Minnesota and Wisconsin

Earle Brown Heritage Center
Brooklyn Park, Minnesota
October 1-3, 2012

Name: ____________________________________________________________
Affiliation: ________________________________________________________
Address: _________________________________________________________________________
City: _______________________   State/Prov: _______  Postal Code:  ___________ Country:  ____________
Day Phone: _____________________________  FAX:  _____________________________
E-Mail:  _____________________________________________

Registration Fees (in USD)

☐ $33  Welcoming Banquet (10/1)
☐ $140  Technical Session (10/2) Professional
☐ $100  Technical Session (10/2) Student       School: ____________________________
☐ $33  Tuesday Dinner Buffet (10/2)
☐ $100  Field Trip (10/3)
☐ $50  Late Fee (registration after 9/17/12)       Total: ____________

Make Payment by Check or Credit Card

☐ Enclose a check or money order made payable to “University of Minnesota Duluth”, or

☐ Charge to:  ☐ VISA  ☐ MasterCard  ☐ Other ____________________________
Card #: ____________________________ Exp: ___/_____ Name on Card: ____________________________

Fax, Email, or Mail Registration Form and Payment to:

Julie Anne Heinz
UMD Natural Resources Research Institute
5013 Miller Trunk Highway
Duluth, MN  55811   USA
Phone: (218) 720-4272;  Fax: (218) 720-4329
Email: jheinz@nrri.umn.edu

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