Dear Neighbors:

In today’s competitive world, companies must evolve in response to technological advancement and increased global competition. At Hemlock Semiconductor Operations, we are focused on hiring, developing and retaining talent with skills in science, technology, engineering and math (STEM) to stay successful.

STEM skills are required within Manufacturing to maintain safe and reliable operations, and within Science & Technology to improve efficiency and quality to maintain our competitive advantage. More importantly, STEM is foundational to two of the largest and fastest growing segments in the Great Lakes Bay Region: manufacturing and healthcare.

Many different STEM careers are available at Hemlock Semiconductor. These are not exclusive to engineers and, in fact, most of our workforce requires STEM skills to operate and maintain the plant. Unlike engineering jobs, these high-paying skilled trade roles do not require a bachelor’s degree and are typically filled by local candidates. However, we and other companies in the region have become increasingly concerned about the future pipeline of skilled trade workers, as there are not enough workers to meet growing demand.

Today, that gap is being closed through a greater focus in both the private and public sectors on promoting and investing in skilled trades education, training and programs.

Armed with STEM skills, these workers can become respected specialists who are well-equipped to solve problems and deliver solutions at the front lines of manufacturing. Increasingly, we are seeing hybrid skilled trade roles emerge as our processes become more automated. One example is in the area of robotics, which requires the integration of machine, instrumentation and computing knowledge to run and maintain this equipment.

Hemlock Semiconductor promotes skilled trades education in many ways, such as offering mentorship programs for students interested in skilled trades careers, building awareness at community events and donating to skilled trades classes for basic tools and equipment (see the article on page 2).

– Continued on back page
LED Project Drives BIG Changes

The Energy Management (EM) program at Hemlock Semiconductor Operations is sharply focused on reducing energy use to promote sustainability and cost savings. One key initiative is an LED lighting project to improve energy efficiency while reducing light pollution.

Better and Safer

Because Hemlock Semiconductor uses a significant amount of electricity to light up around-the-clock operations, the EM team saw an opportunity to upgrade traditional lights and bulbs.

“LED was selected as it is not only more cost effective and reliable with a longer bulb lifetime, but also provides higher quality ‘white’ lighting for improved visibility and safety in the manufacturing process areas,” said Harry Mika, EM program leader.

To date, the LED project has replaced over 19,000 fixtures and bulbs across the site; by the end of 2019, 32,000 fixtures and bulbs will have been replaced. This is expected to reduce the site’s annual power requirement by 11,705,000 kWh, which is equivalent to the power used by 660 residential homes in our area.

Less Light Pollution

According to Dan Plowdrey, LED project leader, LED lights also benefit neighbors by reducing nighttime light pollution. With LED, 85 percent of the outdoor lights can stay off until required for process activities.

“After the entire LED project is implemented, our neighbors should see a reduction of lights running from 12 hours non-stop to less than two hours as needed,” Dan said. “LED technology can do this without compromising a safe work environment because it provides instantaneous lighting, unlike the current, outdated lighting which requires 15 minutes to become fully illuminated.”

Energy Impact

The LED project team is using a phased implementation approach to strategically replace traditional light fixtures and bulbs with LED technology in key process areas around the site. The project, which started in late 2017 and should be completed by the end of 2019, has already allowed some areas of the site to reduce lighting requirements by 10 percent.

The LED project reflects Hemlock Semiconductor’s continued partnership with Consumers Energy to improve the sustainability of the area’s energy grid. Consumers Energy provides rebates to companies and residential customers for energy reduction efforts. For more information on what projects could be eligible, please see https://www.consumersenergy.com/residential/save-money-and-energy.

HSC Donation Puts Tools into Students’ Hands

Thanks to a donation of hand tools and a mobile tool chest from Hemlock Semiconductor Operations, skilled trades students at Merrill Schools now have the capability to keep equipment running, minimize breakdowns and focus more of their time on class projects.

“When equipment in our skilled trades class broke down, such as a vertical milling machine or hydraulic iron worker sheer, we often had to wait for it to get fixed because we didn’t have the tools in the classroom to make the repairs ourselves,” said Chris Wall, career and technical education coordinator and welding instructor. “Through the generosity of this donation, students are now better equipped to maintain the equipment and explore career pathways in skilled trades.”

According to Chris, the donation of the mobile tool chest and tools such as socket and wrench sets, enables:

- **A shorter response time to major breakdowns.** When replacement parts arrive, they can be installed faster by students. This reduces downtime while improving the learning student’s experience. It also saves time for the school’s maintenance personnel.

- **Improved efficiency and safety.** The ability to wheel tools around in a tool chest is faster and safer, keeps the tools in one place and frees up time to learn.

- **A proactive preventive maintenance program.** Students can engage in a preventative maintenance program in which they are trained to proactively prevent or fix
Award Ceremony Held for 2018 Community Calendar Art Contest

In early November, 14 winners and 20 finalists of the ninth annual Community Calendar Art Contest were recognized at a special award ceremony for photography they entered under the theme, “Great Lakes Bay Beauty: Pure Nature.” The contest asked high school students from Saginaw, Bay City and Midland to showcase the natural wonders of our region through photography or other digital art.

The ceremony was hosted by Brooke Beebe, vice president of External Affairs for Hemlock Semiconductor Operations, with support from leaders on the contest judging committee. Together, they presented awards to approximately 65 educators, students and parents. Winners and honorable mentions were each awarded a Barnes & Noble gift card and community calendar, and winners also had their artwork framed. The Saginaw Arts & Science Academy also received a $1,000 check for the “best-of-the-best” submissions, which is to be used for activities related to science and art.

“We are always amazed at the creativity and quality of the work submitted by area students, who should be proud of their achievement,” Brooke said. “This calendar, in particular, helps us all appreciate the natural beauty of our region. When you read the student interpretations of their work, it’s clear that they have quite a passion for enjoying and protecting our environment too.”

Take a minute to enjoy the 2019 Community Calendar enclosed with this issue of the Community Connection, and hang it on your wall. Note that:

- The front cover, inside cover and each month feature winning photography and student interpretations of their work. The first page shares more details about the calendar.
- Each month also includes interesting facts about how Hemlock Semiconductor is not only helping to beautify our region, but is committed to making it safer too.
- The Community Safety Information section at the back of the calendar provides important safety details and tips.

Thanks again to everyone who participated in this effort.

Merrill School donation (left to right): Tara Mager, Merrill Schools Superintendent; Drew Collins, Hemlock Semiconductor Finishing ECO; Dan Lyscas, Hemlock Semiconductor Finishing Day Technician; Chris Wall, Merrill Schools Skilled Trades teacher, Terry Robinson, Hemlock Semiconductor Finishing Team Leader

problems before they become an issue. Planned shut-down maintenance events are scheduled, just as they are in the real world of industry.

- **Support for two key educational programs**: Many students are getting first-time experience with common hand tools, preparing them for the American Welding Society’s Schools Excelling through National Skill Standards Education program for limited Level 1 welding certification, and the C.O.R.E. safety curriculum through the National Center for Construction Education and Research. In both programs, the use of hand tool safety, identification, use, care and maintenance are covered.

- **In-class assembly of additional equipment**: If the school is able to add new equipment to its skilled trades program, students will be able to assemble the equipment on site, again saving time and money while expanding the learning experience.

According to Drew Collins, finishing equipment care operator at Hemlock Semiconductor, “The company is glad to have the opportunity to help put the tools for success in these student’s hand,” he said. “We are committed to supporting skilled trades and consider it vital to the future of manufacturing success.”


33 Students Attend Engineering Scholars Program

In keeping with Hemlock Semiconductor Operations’ commitment to science, math, engineering and technology (STEM), company contributions enabled 33 students from 15 area high schools to attend a week-long Michigan Technological University (MTU) Engineering Scholars Program (ESP) in July. “These scholarships tie into the State of Michigan's aggressive Marshall Plan for driving STEM education, which includes providing students with out-of-classroom career mentoring,” said Terry Robinson, Semi-Finishing team leader.

Students were recognized and awarded their scholarships at a special reception for them and their parents at Hemlock Semiconductor in May.

<table>
<thead>
<tr>
<th>High School</th>
<th>Student</th>
<th>Grade</th>
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<tbody>
<tr>
<td>All Saints Central</td>
<td>Caroline Czyzewski</td>
<td>11</td>
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<tr>
<td>Arthur Hill</td>
<td>Zarria Atkins</td>
<td>10</td>
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<tr>
<td>Bay City Central</td>
<td>Anthony Chippi</td>
<td>10</td>
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<tr>
<td>Bay City Western</td>
<td>Victor Schoenherr</td>
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<td>Fisher Weber</td>
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<tr>
<td>Bullock Creek</td>
<td>Brendan Blasdell</td>
<td>11</td>
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<tr>
<td>Frankenmuth</td>
<td>William Braun</td>
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<tr>
<td>Freeland</td>
<td>Kaitlyn Martin</td>
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<td></td>
<td>Noah Smith</td>
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<td></td>
<td>James Wayne</td>
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<tr>
<td>Garber</td>
<td>Brandon Dinauer</td>
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<td></td>
<td>Aidan Halstead</td>
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<td></td>
<td>Ryan Hernandez</td>
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<td></td>
<td>Duncan MacConnell</td>
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<td></td>
<td>Jacob Mannikko</td>
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<tr>
<td>Hemlock</td>
<td>Isaac Killingbeck</td>
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<td>Zbynek Hlavacek</td>
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<td>Gage Slominski</td>
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<td>Phillip Spannagel</td>
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<td>H.H. Dow</td>
<td>Tristan Brewer</td>
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<td></td>
<td>Jared Poliskey</td>
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<td></td>
<td>Isabelle Rhee</td>
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<td>Merrill</td>
<td>Faith Rios</td>
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<tr>
<td>Midland</td>
<td>Corbin Fleming-Dittenber</td>
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<td>Stephen Gillman</td>
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<td></td>
<td>Carlie Servinski</td>
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<tr>
<td></td>
<td>Samuel Yoder</td>
<td>10</td>
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<tr>
<td>Saginaw Arts and Sciences Academy</td>
<td>Brendan Fosgitt</td>
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<tr>
<td></td>
<td>Sarah Syeda</td>
<td>11</td>
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<tr>
<td>Swan Valley</td>
<td>Aiden Hooverman</td>
<td>9</td>
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<tr>
<td>Valley Lutheran</td>
<td>Allison Lemanski</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Matthew Lemanski</td>
<td>10</td>
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<tr>
<td></td>
<td>Benjamin Palmreuter</td>
<td>11</td>
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</tbody>
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“MTU selects students based on specific criteria, so they should be proud to be accepted into this very competitive program,” said Rob Kain, Quality manager for Hemlock Semiconductor. “Attending ESP is quite a unique adventure, as it rotates students through nine different engineering sessions, allows them to participate in hands-on group projects in a team environment, and introduces them to other students from around the world.”

At ESP, nearly 1,250 students from 29 states and 10 countries were exposed to an array of engineering fields, including mechanical, computer, electrical, environmental, chemical, biomedical, civil, geological and materials science. Together, they worked on cool projects throughout the week, such as testing the weight strength of model bridges, creating a computer model of an object and 3D printing it, testing the earthquake-resistance strength of building models, and learning about the electrical and mechanical structures behind the human cardiopulmonary system. They also networked and learned what it’s like to live on a college campus.

According to student feedback:

• “I’ve learned how to better design, create, and engineer a better world and this is just the first step, which was definitely worth taking.”

• “ESP is an amazing program that allowed me to experience life at college and what an engineering student would go through. It was very exciting and an awesome program.”

• “This program teaches you how to open up yourself to new people, learn about the important roles engineers play in your life and educates you on future-college decisions.”

Hemlock Semiconductor has contributed to the MTU ESP program since 2010. To date, approximately 210 scholarships have been awarded to high school students in grades 9-12. The company continues to work closely with MTU, and is in the process of joining the university’s Talent Consortium to further enhance STEM learning experiences.
United Way Fundraising Campaign Finishes Strong

Thanks to employee contributions and a variety of fundraising activities, Hemlock Semiconductor Operations recently raised over $90,000 for United Way of the Great Lakes Bay Region to support important needs in the region.

The biggest fundraisers aside from direct employee donations included a site picnic, a golf competition, the first-annual chili cook-off contest, sales of ice cream, baked goods, cider and donuts, and an internal silent auction with donations from local businesses.

According to Van Montbriand, finishing manufacturing engineer and event co-chair, “We’re proud of the way the employees have contributed to United Way and dedicated their time to raising funds. We’d like to say ‘thanks’ to all of them for making a difference, and also to local businesses for donating to the silent auction.”

Chris Wielgus, HOST team leader and event co-chair, added that many employees also volunteer for various United Way programs and activities. “Our employees not only donate dollars, but also donate time to many United Way programs that help improve the quality of life for families and individuals in our local communities. The giving keeps on going.”

Since 1999, Hemlock Semiconductor employees have contributed approximately $1.8 million to United Way.

Employees Making an Impact through United Way

Karl Huebert, DPHOST Team Leader: “I got involved with Big Brothers Big Sisters (BBBS) in 2010 after a recommendation from a friend. I signed up, went through the volunteer screening process, and was then matched with my little brother who was from a single-parent home. He thought it would be great to have a ‘go to’ person to ask questions without being judged. We did a lot of stuff – from working on cars to doing homework, and I truly enjoyed being his mentor. He was hungry for knowledge then and now, and is currently attending college. This is one of the most impactful things I’ve ever done in my life. In 2016, when I was asked to join the Board of Directors for BBBS of the Great Lakes Bay Region, I was thrilled to help fulfill the mission of helping kids facing adversity.”

Terry Robinson, Semi-Finishing Team Leader: “I’ve supported the United Way of Midland and Saginaw Counties for 30 years through donating, running campaigns and serving on the board of the United Way of Saginaw County. I’ve seen first-hand how the power of a community coming together to donate and volunteer can improve the lives of so many! There is no question that the needs of our communities are extensive and broad. From shelter assistance, life skills coaching and literacy improvement to emergency assistance and building ramps for immobilized persons, United Way is always there to provide support, comfort and assistance. It is personally rewarding to see the difference we all can make as a community.”

Tara Crower, Process Automation Specialist: “The Midland Community Center (MCC) has been a part of my life for as long as I can remember; my mother was employed there and my parents both played in basketball and volleyball leagues. United Way is big help to the MCC, enabling it to provide programs to people of all ages. For example, a quarter of all children attending MCC summer day camps receive financial assistance, and 1,300 tax returns are completed every year for senior citizens. I worked at MCC during high school and college and was able to be a positive influence on children. Today, I am still active at MCC, volunteer for various events and gladly give to it every year through United Way.”
Hogs, Lambs and 4-H

Last August, Hemlock Semiconductor Operations again sponsored the Saginaw County Fair and purchased animals at the Junior Livestock Auction to support area youth. Three hogs and four lambs were bought from 4-H exhibitors (see table) and then, as always, the animals were donated back to them.

Participating in the livestock auction represents a year’s worth of work for 4-H youth. In addition to selecting, feeding and grooming their chosen animal, they take it to the fair for judging and sale. This experience teaches them important agricultural science, business experience and life skills that last a lifetime. Hemlock Semiconductor has been sponsoring the fair and participating in the livestock auction for several years, and may expand to other counties in the future.

<table>
<thead>
<tr>
<th>4-H Seller</th>
<th>Animal</th>
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</thead>
<tbody>
<tr>
<td>Gavin Birchmeier</td>
<td>Market Lamb</td>
</tr>
<tr>
<td>Abby Boos</td>
<td>Market Hog</td>
</tr>
<tr>
<td>Stephanie Good</td>
<td>Market Hog</td>
</tr>
<tr>
<td>Haylee Kramer</td>
<td>Champion Lamb #2</td>
</tr>
<tr>
<td>Angel Rice</td>
<td>Champion Lamb #1</td>
</tr>
<tr>
<td>Nathaniel Ruediger</td>
<td>Market Hog</td>
</tr>
<tr>
<td>Nadia Stenger</td>
<td>Market Lamb</td>
</tr>
</tbody>
</table>

STEM Festival Adds “Wow” Factor

Hemlock Semiconductor sent a team comprised of engineers, managers, skilled tradesmen and co-ops to staff four scientific modules. Together, they demonstrated:

- Molecular adhesion and cohesion using water traveling down a string.
- The heat signature humans emit using a thermal imaging camera.
- Light diffraction of lasers using prisms.
- Solar energy using a mechanical model powered by solar panels.

The solar module was a segue for introducing Hemlock Semiconductor, including how its polysilicon product is the material used to make solar cells and semiconductors, and why STEM is so important to future success.

“Many of the children were very curious about the physics they observed at each demonstration,” said Terry Robinson, Semi-Finishing team leader. “Their excitement and curiosity was fun to experience. The Great Lakes Bay Region is fortunate to have this opportunity for our kids to learn how fun science can be and how STEM correlates to the world we live in.”

What Students Are Saying

According to 2018 STEM festival event summary, students said:

“I learned about stuff I did not know and it made me want to learn more about it.”

“I didn’t know that much about engineering because I wasn’t interested in it but now I am.”

“I learned that there is much that has been discovered but there is stuff that has not been discovered...which means I can discover them.”

Approximately 5,000 children and visitors across the region visited the 2018 Dow Great Lakes Bay STEM Festival last October at Delta College, with many stopping by the “polysilicon” tables hosted by Hemlock Semiconductor Operations. This is the second year the company has participated as a sponsor and science demonstrator.

The STEM festival, which adds a big “wow” factor to science, technology engineering and math (STEM), is a two-day event that makes learning fun. The festival:

- Showcases more than 150 science demonstrations run by Michigan Technological University’s Mind Trekkers and dozens of volunteers from industry, academia and local organizations.
- Promotes interaction between STEM professionals and students, teachers and parents to increase understanding of career opportunities.
Carbon Monoxide Safety Tips

Have you ever thought about carbon monoxide (CO) and how it may affect you? CO is an odorless, colorless gas formed by the incomplete combustion of fuels. When people are exposed to it, the CO molecules will displace and reduce the oxygen in their bodies, which can lead to CO poisoning.

The Danger

According to the Centers for Disease Control and Prevention (CDC), during 2010-2015, nearly 2,250 deaths resulted from unintentional CO poisoning, with the highest numbers occurring in December, January and February. Prolonged CO poisoning can also lead to irreversible brain damage.

“To protect you and your family, remember that CO can be produced right in your home, formed when common materials burn,” said Wayne McNett, Environment, Health, Safety and Security expert, Hemlock Semiconductor. “Don’t think that CO can only come from a car running in the garage. Other sources can cause CO poisoning too, so it’s important to be alert and prevent problems.”

Those other sources include fuels like natural gas or propane that are used to run appliances such as furnaces, boilers, water heaters, clothes dryers and gas stoves or ovens. They can also include fireplaces, wood stoves, motor vehicles, grills, generators, lawn equipment or tobacco smoke.

Symptoms and Prevention

See the sidebar for important indicators of indoor CO poisoning. Because CO is colorless and odorless, the signs and symptoms are not always obvious and can be mistaken for the flu. In severe cases, CO can cause confusion, impaired judgment and loss of consciousness.

The best way to prevent CO from harming you and your family is to put safety first. A few tips include:

- Install CO detectors on every level of your home, replacing and maintaining them per the manufacturer’s instructions.
- Properly maintain fuel-burning appliances by qualified heating contractors every year.
- Vent appliances, fireplaces and other CO sources to the outdoors.
- Use appliances as they are intended. For example, ovens are for food preparation and using one to heat a home can cause a risky CO and fire hazard.
- Never run a combustion engine inside a basement, garage or other enclosed area.
- Make sure generators are outdoors and in a safe wind direction so the fumes from the exhaust don’t blow directly back into your home through doors or windows.

“The use of a CO detector is equally as important as a smoke detector,” said Fire Chief Michael Cousins, Thomas Township Fire Department. “Every home should have one and yes, it IS that important.”

Hemlock Semiconductor takes that advice seriously. It uses CO detectors in areas with a higher exposure potential such as the kitchen and cafeteria. It also has a strict policy about the use of combustion engines in enclosed spaces, near open excavations or near/inside confined spaces. In addition, the Safety and Emergency Services team verifies CO levels in all entries to confined spaces and places portable CO detectors in areas where there may be an elevated risk due to portable heating or combustion engine operations.

Treatment

Remember to always obey the CO alarm and get outside. If a detector activates in your home or workplace, stop what you are doing and respond immediately. Fresh, outdoor air is the first treatment for CO poisoning. Remember to leave doors and windows closed upon exiting to avoid delays in getting outside; every minute counts. This also helps responders pinpoint the potential CO source, resolve the problem and get you back into your home quicker.

**Signs and Symptoms of CO Poisoning**

- Headache
- Blurred vision
- Rapid shortness of breath with little exertion
- Dizziness, fatigue and nausea with prolonged exposure
- Confusion, impaired judgment or loss of consciousness with severe exposure

**When It’s CO Poisoning and Not the Flu**

- You feel better when you are away from home.
- Everyone in the home is sick at the same time (the flu usually spreads to people consecutively).
- The family members most effected spend the most time in the house.
- Indoor pets appear ill, as well.
- You don’t have a fever or body aches, and you don’t have swollen lymph nodes that are common with the flu and some other infections.
- Symptoms appear to get worse when using fuel-burning equipment.
More than a dozen members of the American Society for Quality (ASQ) visited Hemlock Semiconductor Operations in October for a corporate overview and site tour, fulfilling their goal to learn more about the company’s quality management system and ability to consistently produce polysilicon, one of the highest purity materials in the world.

ASQ is a global community of quality experts dedicated to advancing tools, principles and practices that drive quality in the workplace.

“We were very impressed with Hemlock Semiconductor Operations and the leaders who shared its mission, vision and culture statements, which represented the site as a leader in the Great Lakes Bay community,” said Erika Carpenter, chair of ASQ Section 1004. “It is obvious why the company is a global leader in ultra-pure polysilicon and that it will remain there through continuous improvement efforts.”

Greg Striebel, a Hemlock Semiconductor Black Belt team leader and presenter, added, “It was rewarding to see ASQ members get a better idea of who we are and what we do, and for our company to better understand their organization as well,” he said. “We look forward to building on this relationship going forward.”

Approximately 70 residents in a four-mile radius of Hemlock Semiconductor attended two Neighborhood Open Houses in November.

Both events featured presentations from company leaders and a one-hour tour for those who could reserve their space in advance.

The presentations discussed what Hemlock Semiconductor manufactures, where its products are used, how it contributes to the local economy, and how it drives safety and protects the environment. These were followed by a short question-and-answer session.

In this way, neighbors are able to understand corporate activities, voice opinions and share ideas.

The bottom line is that skilled trades workers – from welders, mechanics and millwrights to electricians, plumbers and pipefitters – are in demand and integral to the future success of this region. Skilled trades offer career opportunities that can begin immediately after high school or after a few years of vocational school, and are well worth considering by area youth.

Kind regards,

Mike Grillo, Engineering & Services Manager