AERZEN: Positive Displacement and Turbo Blowers

AMT: Small Utility Pumps, Sump Pumps

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ANOXKALDNES: IFAS and MBBR Systems for BNR, ENR and Plant Expansion Applications


AQUARIUS: Fine and Coarse Bubble Aeration Systems, Fixed Biofilm System (FBS), Advanced Biological Systems

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ENVIRONETICS: Floating Baffles and Covers, Clearwell Baffles

FONTAINE-AQUANOX: Stainless Steel Slide Gates, Stop Logs

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G.E.T. INDUSTRIES: GrindHog™ Comminutors

GORMAN RUPP: Wastewater Pumping Stations, Sewage and Sludge Pumps, Water Booster Stations, Submersible Pumps, Engine Driven Pumps

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## Conference at a Glance

### Sunday, June 4
- 9:00am-3:00pm: Golf Tournament
- 3:00-5:00pm: Registration Open

### Monday, June 5
- 7:30am-5:30pm: Registration Open
- 7:45-8:45am: Continental Breakfast in Exhibit Hall
- 7:45am-5:30pm: Exhibit Hall Open
- 8:45-8:50am: Vendor Presentations*
- 8:50-11:45am: Morning Technical Programs
  - Biosolids - *Aloeswood Room*
  - Collection Systems - *Nile Room*
  - Engineering - *Orange Room*
  - Utility Management - *Ironwood Room*
- 10:15-10:45am: Break Refreshments in Exhibit Hall
- 11:45am-1:00pm: Complimentary Lunch in Exhibit Hall
- 12:30-1:00pm: Annual Business Meeting - *Zambezi Room* with Dessert & Coffee
- 1:00-3:30pm: PWO Plant Tour - *meet at Convention Center entrance at 12:30pm*
- 1:00-1:05pm: Vendor Presentations*
- 1:05-4:30pm: Afternoon Technical Programs
  - Biosolids - *Aloeswood Room*
  - Collection Systems - *Nile Room*
  - Engineering - *Orange Room*
  - Utility Management - *Ironwood Room*
- 2:30-3:30pm: Break Refreshments in Exhibit Hall
- 4:30-5:30pm: President's Reception in Exhibit Hall
- 6:00-7:30pm: PWEA Awards Ceremony - *River Patio*
- 7:30-9:00pm: PWEA Annual Dinner - *Zambezi Room*

* See Vendor Presentation schedule on page 23

### Tuesday, June 6
- 7:00-8:30am: Continental Breakfast in Exhibit Hall
- 7:00am-5:30pm: Registration Open
- 7:00am-5:30pm: Exhibit Hall Open
- 8:00-8:05am: Vendor Presentations*
- 8:05-11:30am: Morning Technical Programs
  - Collection Systems - *Nile Room*
  - Engineering - *Orange Room*
  - Industrial Pretreatment - *Aloeswood Room*
  - Stormwater - *Ironwood Room*
- 8:00-11:30am: Students & Young Professionals Program - *Rosewood Room*
- 9:30-10:30am: Break Refreshments in Exhibit Hall
- 11:30am-1:00pm: Complimentary Lunch in Exhibit Hall
- 1:00-1:05pm: Vendor Presentations*
- 1:05-4:30pm: Afternoon Technical Programs
  - Collection Systems - *Nile Room*
  - Construction - *Orange Room*
  - Finance - *Ironwood Room*
  - Industrial Pretreatment - *Aloeswood Room*
- 1:00-4:30pm: Student Research Program & Poster Contest - *Rosewood Room*
- 2:30-3:30pm: Break Refreshments in Exhibit Hall
- 4:30-5:30pm: Beer & Pretzels Reception in Exhibit Hall
- 6:00-9:00pm: “Raise Your Glass” - A Wine Tasting Event - *Zambezi Room*

### Wednesday, June 7
- 7:00-8:30am: Continental Breakfast
- 7:00am-12:00pm: Registration Open
- 8:00-11:00am: Morning Technical Programs
  - Professional Wastewater Operations - *Rosewood Room*
  - Water Sustainability & Reuse - *Ironwood Room*
- 9:30-10:00am: Break Refreshments
- 11:30am: Conference Concludes

### Workshops
These workshops are approved for additional PA DEP contact hours. You must have a ticket to attend. Limited tickets are available on-site.

#### Monday, June 5
- 8:00am-5:30pm: Activated Sludge Refresher Course (Day 1) - *Ebony Room*
- 8:45am-12:00pm: Permit Required Confined Space Awareness/Excavation and Trenching Awareness - *Rosewood Room*
- 9:00am-4:30pm: Industrial Inspections 360 - *Sagewood Room*

#### Tuesday, June 6
- 8:00-11:45am: Laboratory Ethics - *Empress Room*
- 8:00am-4:30pm: Wastewater Professionals Guide to Online Process Instrumentation for Biological Nutrient Removal Activated Sludge Monitoring - *Sagewood Room*
- 8:00am-5:30pm: Activated Sludge Refresher Course (Day 2) - *Ebony Room*

#### Wednesday, June 7
- 8:00am-12:00pm: Responsibilities of Clean Water Professionals - *Sagewood Room*
H.D.P.E. Man-hole Inserts

SPECIFICATIONS:
• The dish is made of ultra-high density polyethylene copolymer material that meets ASTM specifications designation D 1248, Class A, Category 5, Type 111 with a minimum impact brittleness temperature of -180°F. The thickness shall be uniform to .187 or greater. This material is composed of MARLEX HXM 50100…extra high molecular weight Hexene copolymer.
• The lift strap is made of 1 inch wide woven polypropylene web and is attached to the bowl of the dish by a wide head stainless steel 3/16” rivet and a stainless steel ¾” backup SS washer. All cut edges are seared to insure against unraveling.
• Ventilation is provided by a 1/8” vent hole and/or a valve, vent hole located on the side wall of the bowl, valve threaded into the side-bottom of the insert. The hole or valve allows maximum release of 5 gallons of water per 24 hours and is not effected by debris that might collect in the bottom of the dish. Sewer gas is vented at one P.S.I. or less.  
• The gasket is made of closed cell neoprene and is attached by a pressure sensitive adhesive to the weight bearing surface of the dish.

Stainless Steel Man-hole Inserts

SPECIFICATIONS:
• INSERT- The manhole insert is manufactured of 16 gauge 304 or 316 Stainless Steel. Tile insert shall have a bowl size large enough to receive the design of the underside of the manhole lid. The bowl size shall also be designed to allow easy removal from the manhole frame. The insert shall have a load test greater than 3000 pounds.  
• GASKET- The gasket is made of closed cell neoprene and is attached by a pressure sensitive adhesive to the weight bearing surface of the dish.
• HANDLE- The handle, cable terminal, and cable eye end are manufactured from stainless steel. The handle is manufactured from 3/16” plastic coated stainless steel cable and is attached with a #66 stainless steel rivet and a 1” diameter SS washer. The cable is braided in a manner which resists cutting with bolt cutters.
• TETHER- Tile tether is manufactured from 3/16” braided stainless steel and is attached to the insert using #66 stainless steel rivet. The cable terminal end and eye are manufactured from stainless steel.  
• RELIEF VALVE- The gas relief valve is designed to, release at a pressure of .5 to 1.5 PSI and release less than 5 gallons of water in 24 hours. The valve is threaded and screwed into a hole drilled in the bottom of the insert. The valve is made from material that is inert against Sulfuric Acid, Hydrogen Sulfide and other substances found in the sanitary sewer systems.

H.D.P.E. or A.B.S. Valve Box Inserts

SPECIFICATIONS:
• The valve box insert is made of ultra-high density polyethylene copolymer material that meets ASTM specifications designation D 1248, Class A, Category 5, Type 111 with a minimum impact brittleness temperature of -180°F. The thickness shall be uniform to .187 or greater. This material is composed of MARLEX HXM 50100…extra high molecular weight Hexene copolymer or can also be made with acrylonitrile butadiene styrene or A.B.S. plastic.
• The lift strap is made of 1 inch wide woven polypropylene web and is attached to the bowl of the dish by a wide head stainless steel 3/16” rivet and a stainless steel ¾” backup SS washer. All cut edges are seared to insure against unraveling.
A MESSAGE FROM...

PWEA President and the Conference Committee Chair

On behalf of the PWEA Board of Directors and the 2017 Conference Committee, we welcome you to PWEA's 89th Annual Technical Conference and Exhibition (PennTec 2017).

This year's Conference Program includes a wide range of topics related to water quality. In addition to the Conference technical sessions, we are also presenting workshops which have been approved by the PA DEP for additional contact hours for water and/or wastewater operator licenses. By attending these workshops, you could earn up to 15.5 DEP contact hours, or up to 18.5 Professional Development Hours, in just a few days!

A very important part of the Conference is the vendor exhibition. By visiting the exhibits, you will gain insight into new and innovative solutions and discover new products and equipment that will help you do your job in a more efficient and safer manner. We encourage you to talk to the vendors about what is most important to you.

The Conference includes networking opportunities for you to meet and interact with your colleagues. The President's Reception will be on Monday evening. The Annual PWEA Dinner and Awards Ceremony will be held on Monday night. The Beer & Pretzels Reception and the "Raise Your Glass" Wine Tasting Event are on Tuesday.

We believe this year's PennTec Conference will provide everything you need under one roof—education, vendor contacts, and networking. Welcome!
Founded in 1915 to serve the water/wastewater field, Whitman, Requardt and Associates, LLP continues to specialize in the planning, design and construction management of water and wastewater projects. To learn more about our capabilities, please visit

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The Pennsylvania Water Environment Association would like to welcome Students & Young Professionals (SYPs) to PennTec 2017. The SYP Committee is happy to see you at PennTec.

The **SYP Committee planned the Tuesday Night Social Event** and we hope you will stick around for the “Raise Your Glass” Wine Tasting. Hors d’oeuvres and beverages will be available. Check at the PWEA Registration Desk for ticket availability.

SYPs have participated in a number of social and service events over the years and the SYP Committee will continue to build that program. The Committee has a number of events planned for 2017 and we look forward to your participation.

---

**Steve Kestel**
SYP Committee Chair

---

**STUDENTS & YOUNG PROFESSIONALS PROGRAM - ROSEWOOD ROOM**

**Tuesday, 8:00-11:30am**
**Kalahari’s Indoor Waterpark**
**Project Challenges and Facility Tour**

Kalahari Resorts & Conventions featured a 100,000 square foot indoor waterpark after Phase 1 was completed. Phase 2 of the project will be completed by the time PennTec 2017 begins and will add another 120,000 square feet of indoor waterpark space, making it the largest indoor waterpark in America. Join the Students and Young Professionals Committee as we examine the challenges associated with making a project of this magnitude come together. The General Manager of the resort and the Waterpark Director will partner with representatives from Site Specific Design to present perspectives on design and construction challenges and the day-to-day operations of the facility. After the presentation, small groups will be taken on a guided tour of the facility.

---

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EXHIBIT HALL HIGHLIGHTS

The Exhibit Hall is a very important part of the PennTec Conference. The exhibits will open on Monday at 8:00am and will close on Tuesday at 5:30pm. Visiting the vendors will be informational, educational, and it will also be fun!

**Exhibit Hall Hours**
The Exhibit Hall will be open during the following times:

<table>
<thead>
<tr>
<th>Day</th>
<th>Time</th>
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<tbody>
<tr>
<td>Monday</td>
<td>8:00am-5:30pm</td>
</tr>
<tr>
<td>Tuesday</td>
<td>7:00am-5:30pm</td>
</tr>
</tbody>
</table>

- Continental Breakfast: 8:00am-9:00am
- Morning Break: 10:30am-10:45am
- Lunch: 11:45am-1:00pm
- Afternoon Break: 2:30pm-3:30pm
- President's Reception: 4:30pm-5:30pm

Be sure to visit with the exhibitors!

**New for 2017 - Biosolids Bingo**
The PWEA Exhibits & Sponsors Committee organized this event for Monday and Tuesday during the Conference.

**How it Works:**
Conference attendees will receive a Bingo card in their registration packets, along with a list of participating exhibitor names. Each participating exhibitor will be assigned a letter/number from the Bingo cards. Attendees will need to visit the exhibitors in order to have their cards stamped.

Once the squares are stamped horizontally, vertically or on the diagonal, the attendee will then turn in the card to Booth 65 or Booth 119 before the last break of each day (Monday or Tuesday) for confirmation. Attendees must be present to win and can only turn in one card, either on Monday or on Tuesday.

Prizes will be awarded during the last Exhibit Hall receptions on Monday and on Tuesday.

**Biosolids Bingo Participants**

- ACF Environmental
- Bowen Calhoun & Assoc
- Charter Machine Co.
- Coyne Chemical Environmental Services
- CW Sales Corporation
- Entech Engineering
- Envirep/TLC
- Evoqua Water Technologies
- Flow Assessment Services
- Gannett Fleming
- GHD
- Hach
- Herbert, Rowland & Grubic
- Joos Equipment Co
- Kershner Environmental Technologies
- Keystone Engineering Group
- Maryland Biochemical Co
- Mott MacDonald
- PA One Call System
- Pennoni
- Pyrz Water Supply Co.
- quasar energy group
- Radwell International
- Reiner Pump Systems
- Riordan Materials Corporation
- RK&K
- RootX
- Spotts, Stevens and McCoy
- T&M Associates
- TC Tech
- TLC Drain & Sewer
- Tri State Environmental Svs
- Trumbull
- USP Technologies
- W C Weil Company
- Whitman Requardt & Associates
- Xylem Water Solutions

**Raffle Prizes**
Prizes will be raffled at different times throughout the Conference. Attendees registered for the conference will be given raffle tickets, and there will be marked containers placed randomly throughout the Exhibit Hall—one for each prize. Attendees may put as many of their tickets as they'd like in each marked container. You must be present to win. Exhibitor representatives are not eligible for these drawings.

**Raffle Prize Drawing Schedule:**

<table>
<thead>
<tr>
<th>Day</th>
<th>Prizes</th>
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<tr>
<td>Monday</td>
<td>Door Bell Package, Gift Card Package, Thermostat Package, Lunch, Afternoon Break, President's Reception</td>
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<tr>
<td>Tuesday</td>
<td>Gift Card Package, Morning Break, Lunch, Beer &amp; Pretzels Reception</td>
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**President's Reception**

*Monday, 4:30-5:30pm*
Don't miss the President's Reception! Enjoy complimentary beer & snacks while you network with your colleagues and the vendors.

**Beer & Pretzels Reception**

*Tuesday, 4:30-5:30pm*
We will be serving complimentary beer, root beer, and soft pretzels! Come to the Exhibit Hall to relax and visit with the vendors.
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- Brian D Fenstemaker
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  - 412-334-2985
- Paul D Alfery
  - palfery@kappe-inc.com
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- David L Kachman
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  - 301-788-7132

**Eastern Pennsylvania**
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P 717.259.5858 | F 717.737.5817 | tlcenvironmental@aol.com

W.C. Weil Company, Greg Madia (Western Pennsylvania)
P 412.487.7140 | F 412.487.7144 | gmadia@wcweil.com
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<tr>
<th>EXHIBITOR LISTINGS</th>
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<td>BioTriad Environmental, Inc.</td>
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<td>Booth 82</td>
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<td>Boerger, LLC</td>
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<td>Bowen Calhoun &amp; Associates, Inc.</td>
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<td>Booth 65</td>
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<td>Buchart Horn, Inc.</td>
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<td>Charter Machine Co.</td>
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<td>Booth 119</td>
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<td>Coyne Chemical Environmental Services</td>
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<td>Booth 26</td>
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<td>Craig Kelman &amp; Associates</td>
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<td>CUES</td>
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<td>Booth 61</td>
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<td>CW Sales Corporation</td>
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<td>Booth 46 &amp; 47</td>
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<td>CWM Environmental</td>
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<td>Design Plastic Systems, Inc.</td>
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<td>DN Tanks</td>
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<td>Booth 16</td>
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<td>DRV Inc</td>
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<td>Duke’s Root Control, Inc.</td>
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<td>Dutchland, Inc.</td>
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<td>Engineering America</td>
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<td>F.R. Mahony &amp; Associates, Inc.</td>
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<td>Flow Assessment Services LLC</td>
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<td>Ford Hall Company</td>
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<td>G.T. Smith &amp; Assoc., Inc.</td>
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<td>Booth 105</td>
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<table>
<thead>
<tr>
<th>Company</th>
<th>Booths</th>
<th>Contact Information</th>
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<td><strong>H</strong></td>
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<tr>
<td>Hach</td>
<td>Booth 79</td>
<td>459 Longleaf Dr 18944 240-547-1128 <a href="mailto:dunziche@hach.com">dunziche@hach.com</a> <a href="http://www.hach.com">www.hach.com</a></td>
</tr>
<tr>
<td>Hazen and Sawyer</td>
<td>Booth 88</td>
<td>1 S Broad St Ste 1630 Philadelphia, PA 19107 215-592-0600 <a href="mailto:mblate@hazenandsawyer.com">mblate@hazenandsawyer.com</a> <a href="http://www.hazenandsawyer.com">www.hazenandsawyer.com</a></td>
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<tr>
<td>Herbert, Rowland &amp; Grubin Inc.</td>
<td>Booth 54</td>
<td>369 East Park Dr Harrisburg, PA 17111 717-564-1121 <a href="mailto:dspong@hrg-inc.com">dspong@hrg-inc.com</a> <a href="http://www.hrgingc.com">www.hrgingc.com</a></td>
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<td>IDEXX Laboratories, Inc.</td>
<td>Booth 91</td>
<td>One IDEXX Dr Westbrook, ME 04092 207-556-3091 <a href="mailto:water@idexx.com">water@idexx.com</a> <a href="http://www.idexx.com/water">www.idexx.com/water</a></td>
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<td>J.T. Seeley &amp; Co., Inc.</td>
<td>Booth 31</td>
<td>PO Box 702 Valley Forge, PA 19482 610-933-5420 <a href="mailto:bobb.kunzelman@jtseeley.com">bobb.kunzelman@jtseeley.com</a></td>
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<tr>
<td>Joos Equipment Co</td>
<td>Booth 25</td>
<td>PO Box 368 Paoli, PA 19301 610-644-5875 <a href="mailto:ejoo@joosequipment.com">ejoo@joosequipment.com</a> <a href="http://www.joosenequip.com">www.joosenequip.com</a></td>
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<td>Kappe Associates</td>
<td>Booth 24</td>
<td>100 Wormans Mill Ct Frederick, MD 21701 301-846-0200 <a href="mailto:ewalters@kappe-inc.com">ewalters@kappe-inc.com</a> <a href="http://www.kappe-inc.com">www.kappe-inc.com</a></td>
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<tr>
<td>Kelso Solutions</td>
<td>Booth 102</td>
<td>PO Box 743 East Berlin, PA 17316 717-932-9980 <a href="mailto:chris@kelsocompany.com">chris@kelsocompany.com</a> <a href="http://www.kelsocompany.com">www.kelsocompany.com</a></td>
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<tr>
<td>Kershner Environmental</td>
<td>Booth 101</td>
<td>Technologies 11 Easter Ct Ste M Owings Mills, PA 21117 410-581-0555 <a href="mailto:c.evans@ketcil.com">c.evans@ketcil.com</a> <a href="http://www.ketcil.com">www.ketcil.com</a></td>
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<tr>
<td>Keystone Pump &amp; Power LLC</td>
<td>Booth 49</td>
<td>1480 S Mountain Rd Dillsburg, PA 17019 717-502-8500 <a href="mailto:lisa@kpparents.com">lisa@kpparents.com</a></td>
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<td>LB Water / S3</td>
<td>Booth 12</td>
<td>540 S High St Selinsgrove, PA 18770 570-374-2355 <a href="mailto:ben.reichley@lbh2o.com">ben.reichley@lbh2o.com</a> <a href="http://www.lbh2o.com">www.lbh2o.com</a></td>
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<td>Lee Supply Co., Inc.</td>
<td>Booth 72</td>
<td>305 1st St Charleroi, PA 15022 800-353-3747 <a href="mailto:jmclevey@leesupply.com">jmclevey@leesupply.com</a> <a href="http://www.leesupply.com">www.leesupply.com</a></td>
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<td>Maryland Biochemical Co., Inc.</td>
<td>Booth 22</td>
<td>712 Tobacco Run Dr Bel Air, MD 21015 410-734-9100 <a href="mailto:emily@marylandbiochemical.com">emily@marylandbiochemical.com</a> <a href="http://www.marylandbiochemical.com">www.marylandbiochemical.com</a></td>
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<tr>
<td>Mobile Dredging &amp; Video Pipe, Inc.</td>
<td>Booth 21</td>
<td>3100 Bethel Rd Mechanicsburg, PA 15025 717-697-1242 <a href="mailto:info@mdredding.com">info@mdredding.com</a> <a href="http://www.mdredding.com">www.mdredding.com</a></td>
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<td>Rankin Associates</td>
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<td>100 Almond Mill Rd Scranton, PA 18503 570-343-6200 <a href="mailto:jballiet@gdfengineers.com">jballiet@gdfengineers.com</a> <a href="http://www.gdfengineers.com">www.gdfengineers.com</a></td>
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<td>Rambler Energy Co.</td>
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<td>Sandvik</td>
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<td>200 S Main St Souderton, PA 18964 215-721-4840 <a href="mailto:mcravard.irm@comcast.net">mcravard.irm@comcast.net</a> <a href="http://www.sandvik.com">www.sandvik.com</a></td>
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<td>T &amp; T Environmental Services Co.</td>
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<td>111 W Third St Hellertown, PA 18055 610-438-1223 <a href="mailto:jcolburn@ttcesco.com">jcolburn@ttcesco.com</a> <a href="http://www.ttcesco.com">www.ttcesco.com</a></td>
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<td><strong>Booth 69</strong></td>
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<td>No Flow In Flow-Contractor Specialties &amp; Supplies</td>
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<td>North East Technical Sales, Inc.</td>
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<td>PA One Call System, Inc.</td>
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<td>925 IrwinRun Rd</td>
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<td><strong>Booth 79</strong></td>
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<td>Perma-Liner Industries, LLC</td>
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<td><strong>Booth 36</strong></td>
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<td>Philadelphia Mixing Solutions</td>
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<td>PWEA Public Education</td>
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<td>Pyrz Water Supply Co., Inc.</td>
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<td>Radwell International, Inc.</td>
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<td><strong>Booth 74</strong></td>
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<td>Reiner Pump Systems</td>
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<td>Riordan Materials Corporation</td>
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<td>Thermal Process Systems</td>
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<td>TLC Drain &amp; Sewer</td>
<td>PO Box 327, Bridgeport, PA 19405</td>
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<td>Tri State Environmental Services LLC</td>
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<td>Trumbull</td>
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<td>U GSI Solutions</td>
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<td>USABlueBook</td>
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<td>USP Technologies</td>
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<td>Weir Specialty Pumps</td>
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<td>Xylem Dewatering Solutions, Inc.</td>
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<td>Xylem Water Solutions</td>
<td>2330 Yellow Springs Rd, Malvern, PA 19355</td>
<td>610-408-6526</td>
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<td>Whitman, Requardt &amp; Associates, LLP</td>
<td>1500 Market St, 12th flr, East Tower, Philadelphia, PA 19102</td>
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<td>From source to tap and then back to nature, we focus on the entire water cycle. Around the globe, our engineers, scientists and consultants provide safe and secure water technology and innovations that are built to anticipate and withstand the demands of a rapidly changing world.</td>
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- Stand Alone GBT
- Plate & Frame Filter Press

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- Continuous & Batch Style
- Retrofitting of Existing SBRs
- Conversion of Conventional Style Activated Sludge Design
- Extended Aeration Treatment Plants
- Tertiary Filters—Multimedia Downflow Design
- Denitrification Filters (Anoxic Style)
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- PLC—Programmable Logic Control
- VFD’s Cutler Hammer, Alan Bradley, ABB
- NEMA Starter
- IEC Starter
- SCADA Systems
- Engineering & Design

Contact Information
(724) 695-5333
(724) 695-5366
mpresutti@rammotors.com

Sequence Batch Reactor at Westmoreland
**WORKSHOP DETAILS**

You must have a ticket to attend. Seating is limited to 40 per workshop. If you did not register in advance, check at the PWEA Registration Desk for seat availability.

**Monday, 8:45am-12:00pm - Rosewood**
A Safety Committee Workshop (includes two courses)
Moderators: Lisa Cortazzo, ALCOSAN, and Joe Centrone, DELCORA
Speaker: Kelly Kramer, RETTEW

**Permit Required Confined Space Awareness**
This course is PA DEP approved for 2.0 drinking water & wastewater contact hours. Course ID 5923.

This course will introduce employees to the hazards of confined spaces and educate them on the basic hazards and requirements so they can determine if they need to attend a full course based on their work tasks. Course content includes: definition of a confined space, overview of employer requirements, overview of potential hazards, and overview of entry requirements.

**Excavation and Trenching Awareness**
This course is PA DEP approved for 1.0 drinking water & wastewater contact hours. Course ID 6428.

This course is designed to provide general information on the OSHA requirements and best practices for excavation operations. Course content includes: statistics, behavior modification, inspection items, utility location, soil mechanics, protective system options, OSHA-specific requirements, and hazard recognition.

**Monday, 9:00am-4:30pm - Sagewood**
An Industrial Pretreatment Committee Workshop

**Industrial Inspections 360**
This course is PA DEP approved for 6.0 wastewater contact hours. Course ID 7319.

Moderator: Judy Musselman, GHD

POTWs with and without EPA-approved industrial pretreatment programs conduct inspections at industries in their service areas to ensure industrial discharges will not cause pass through or interference, or affect sludge quality at the wastewater treatment plant. This workshop will discuss different types of inspections, how to prepare for an inspection, what to review during an inspection, safety concerns during an inspection and follow-up inspection activities.

**Monday & Tuesday, 8:00am-5:30pm - Ebony**
A PWO Committee Workshop

**Activated Sludge Refresher Course**
This two-day course is PA DEP approved for 16.0 wastewater contact hours. Course ID 3884. (You must attend both days to receive credit.)

Moderator: Tom Brown, PA DEP
Speakers: Jenifer Fields, PA DEP SERO, and Thomas Brown, PA DEP

This course was developed as a preparatory course for the activated sludge certification exam, as well as a refresher for certified operators. Students will be provided with a vocabulary list in order to become familiar with the material before classroom training. Training includes exam taking skills and practice, math drills, concept reinforcement, confidence building, homework, and a supportive learning environment.

**Tuesday, 8:00-11:45am - Empress**
A Laboratory Practices Committee Workshop
**Laboratory Ethics**
This course is PA DEP approved for 3.0 drinking water & wastewater contact hours. Course ID 7364.

Moderator: Linda Leopold, Environmental Service Laboratories
Speaker: Larissa Hoover, Cranberry Township

This course provides detailed information for laboratory technicians and supervisors on the topic of lab ethics, based on Chapter 252. This course is for employees who need ethics refresher training for the laboratory every 14 months. The course discusses common definitions, state requirements, consequences and prevention of unethical behavior, conflict of interest, ethics policies and agreements, data control and legal defensibility, as well as red flags and data reporting.

**Tuesday, 8:00am-4:30pm - Sagewood**
A PWO Committee Workshop

**Wastewater Professionals Guide to Online Process Instrumentation for Biological Nutrient Removal Activated Sludge Monitoring**
This course is PA DEP approved for 6.0 wastewater contact hours. Course ID 6423.

Moderator: Dean Miller, Miller Environmental
Speaker: Robert Smith, Xylem

Nutrient removal and sustainability are two of the biggest drivers in the wastewater industry today. Both demand increased automation of the activated sludge process implemented using feedback from online sensors in order to be achieved. Technology has stepped up to fill the need with a new generation of online sensors capable of monitoring at a frequency, accuracy, and reliability suitable for feedback control. However, even the best designed sensor cannot fulfill its full capabilities without proper training of the end user. Unfortunately, Operators are often left on their own to figure out how to operate and maintain these highly technical devices after the salesman or the Contractor leaves causing reduced performance and lifetime. This workshop provides participants essential information on the selection and care of online instrumentation for monitoring and control of biological nutrient removal (BNR) activated sludge. The main objective is to teach participants good practices that are essential to successful process monitoring.

**Wednesday, 8:00am-12:00pm - Sagewood**
A PWO Committee Workshop

**Responsibilities of Clean Water Professionals**
This course is PA DEP approved for 3.5 wastewater contact hours. Course ID 7122.

Moderator: Tom Brown, PA DEP
Speakers: Robert DiGilarmo, Thomas Brown, Anita Stabile, Robert Bauer, and Thomas Magge, all with PA DEP; and Walter Higgins, US EPA

This course will include an introduction to the Wastewater Operator Code of Ethics. Discussions will include protecting and maintaining the wastewater system; laws, rules and regulations that impact wastewater operators; and security and emergency planning for wastewater. Upon conclusion of this course, students will be able to describe the importance of good communication and establish a communication system with system owners, customers, and regulatory agencies and they will be ready to accept and carry out the responsibilities and rewards of being a Clean Water Professional.

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VENDOR PRESENTATIONS

Vendors will make brief presentations at the start of each half day technical program. Presentations will be no more than five minutes in length.

### Monday, 8:45-8:50am

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<td>Collection Systems - Nile</td>
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....and many more.
Monday Morning

Biosolids Program - Aloeswood

Moderators: Stefan Weaver, Material Matters, Inc.

8:50-9:20am – Two Stage Thermal Oxidization: A Cost-Effective, Environmentally Sound Alternative for Bioenergy Recovery from Multiple Hearth Furnaces
Speaker: Stan Chilson, PE, GHD Inc.

Delaware County Regional Water Quality Control Authority (DELCORA) operates two, 48 dry tons/day (dt/d), Multiple Hearth Furnace (MHF) based thermal oxidation systems. Facing pending EPA MACT Standards and capacity concerns DELCORAGHD developed a biosolids handling alternatives evaluation in 2011. This study reaffirmed the advantages of combustion and recommended the installation of an innovative two-stage thermal oxidation system.

9:20-9:50am – Existing Infrastructure Provides Solution for Solids Handling Improvements
Speaker: Trudy Johnston, Material Matters, Inc.

This presentation discusses the methodology, process, and rationale for the Borough of Carlisle’s biosolids processing and management evaluation. The evaluation investigated alternative treatment processes to replace the Borough’s 40 year old lime slurry stabilization process. The project objectives focused on cost, public perception, reliability, and staffing requirements with an emphasis on maximizing existing equipment and tanks.

9:50-10:20am – How to Reduce Pumping Cost
Speaker: Sami Sarrouh, PE, T&M Associates

The Milton Regional Sewer Authority recently installed a new belt dryer designed to produce Class A biosolids from the processing of dewatered waste activated and waste anaerobic sludge. This presentation will detail the dryer’s performance, costs of operation and summarize process variability including impacts of sludge feedstock type, dewatering system equipment and generator operations.

10:45-11:15am – Cross-Bores in Pennsylvania
Speaker: Michael Kyle with Lancaster Area Sewer Authority, and Eric Swartley, UGI Utilities, Inc.

The presentation will provide an understanding of cross-bores including a description of how cross-bores are developed, the risks they present, and efforts underway in Pennsylvania to enhance public safety as it relates to mitigating legacy cross bores.

11:15-11:45am – The Benefits of Sewer Lateral Inspections
Speaker: Albert Knepp, Lancaster Area Sewer Authority

This presentation will provide an on-site demonstration of sewer lateral launch capabilities of closed-circuit television inspection equipment. The presentation will discuss the need for sewer lateral inspection data as part of sewer rehabilitation programs and prior to construction of other utilities installed using trenchless methods.

Collection Systems Program - Nile

Moderators: Ed Woyden, Gannett Fleming, and Bruce Hulshizer, Herbert, Rowland & Grubic, Inc.

8:50-9:20am – Overview of Lateral and Main/ Lateral Connection Lining and Sealing Technologies
Speaker: Ted DeBoda, and Brendan Doyle, both with NASSCO

Plumbing codes often do not specify the use of trenchless technologies for sewer lateral rehabilitation as an alternative to open-cut excavation. This presentation will discuss the technical document developed by NASSCO’s Lateral Committee for advancing the acceptance of trenchless technologies for sewer lateral rehabilitation.

9:20-9:50am – Sewer Lateral Rehabilitation: Methods, Issues and Lessons Learned
Speaker: Anthony Dill, Arcadis

This presentation provides an overview of the basics of sewer lateral rehabilitation for reducing infiltration emphasizing successful sewer grouting approaches. It will also share lessons learned from lateral rehabilitation programs, documented I&I reductions, and importance of post-construction inspections.

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Engineering Program - Orange

Moderator: Justin Mendinsky, Herbert, Rowland & Grubic, Inc.

8:50-9:20am – How to Reduce Pumping Cost
Speaker: Sami Sarrouh, PE, T&M Associates

Software exists to address system optimization to reduce energy consumption. Yet, depending on the size and specifics of the water system, there may be little payback on investment. As a low-cost alternative, a number of easy-to-follow hydraulic operating procedures were developed/tested by the author. This presentation will discuss the approach.

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TECHNICAL PROGRAM DETAILS

9:20-9:50am – Practical Applications of Value Engineering in Wastewater and Drinking Water
Speaker: James J. Rhoades, Jr., PE, AVS, Alfred Benesch & Company
Value engineering (VE) is a systematic, structured approach for improving projects and processes. Presentation includes SAVE International standard methodology and its application to real-life projects. Case studies address alternative analysis and selection for various project aspects, including treatment process selection, equipment selection, building planning/programming, and operations and maintenance processes.

9:50-10:20am – Equipment Pre-Select, the Process, When and How
Speaker: Terry M. Gellner, PE, TnT Engineering LLC
Many of today’s technologies to achieve more stringent effluent limits or to optimize system operations have more differences than similarities. When should the Owner choose the technology to cost effectively implement a project and how should the technology be secured? Equipment pre-selection and procurement are methods which assist the Owner.

10:45-11:15am – Better Projects through Operator Participation
Speaker: Jerry Haimowitz, PE, GPM Associates, an Advanced Geoservices Company
Learn how to design the best possible project at the lowest possible cost through operator participation. Only by operating and repairing systems every day does one learn how they fail and how they can be improved. Examples show how to utilize operator experience into your design team.

11:15-11:45am – The Use of Micro-Tunneling Construction to Install Sanitary Sewer Main Under Challenging Site Conditions
Speaker: Mark Ambrose, PE, T&M Associates
Pocono Township faced a unique predicament when, during the installation of a gravity sewer pipeline, unsuitable, challenging geological conditions resulted in ‘humps’ in the piping—creating a ‘hydraulic bottleneck.’ In utilizing micro-tunneling construction to install a new sewer main, the problem was corrected and financial, operational and customer crises thwarted.

UTILITY MANAGEMENT PROGRAM - IRONWOOD

Moderator: Mark Pickering, GHD

8:50-9:20am – GIS Mapping on a Budget
Speaker: Britney Vazquez and Walter Higgins, both with U.S. Environmental Protection Agency
EPA Region 3’s GIS Mapping Program aims to provide water utilities FREE technical assistance with FREE online software and FREE loaner GPS handheld devices. GIS mapping is a key part of an asset management program, which helps utilities plan for rehabilitation or replacement of important components before an unexpected failure.

9:20-9:50am – Simplified Asset Management with Wireless Data Acquisition and Monitoring System
Speaker: Nick Scarpa, Nebula NJ, LLC
The benefits of automatic collection of key performance data from utility equipment will be demonstrated. Attendees will learn how elimination of manual data collection will not only greatly reduce operating costs but will also have significant impact on operational efficiency.

9:50-10:20am – Going Mobile - GIS Asset Management
Speaker: James P. Meisenbach, RETTEW
Using a mobile GIS can keep track of your underground utilities easy and accessible. The presentation will focus on those benefits using a local water company’s application as an example, and how this same process can be utilized for a wastewater system.

10:45-11:15am – Leveraging Mobile and GIS Technology to Support Asset Management and Systems Planning
Speaker: Jayson Brennen, CDM Smith
In today’s technology-driven mobile world, utility professionals are increasingly looking to obtain immediate access to critical utility information to support asset management and systems operations. During this presentation, case studies outlining how GIS and mobile-based technology tools can be used to support effective asset management will be presented and demonstrated.

11:15-11:45am – Online GIS Applications: A Low-Cost Asset Management Approach
Speaker: Alfred Guiseppe, SSM Group Inc.
This presentation will provide real-world water/wastewater system examples that use online GIS applications to transform infrastructure data into low-cost, secure, and easy-to-use asset management system. Through customized mobile web applications, field-critical data is available when needed most and accessible to operators and managers in the office or in the field.

PWO Plant Tour
Brodhead Creek Wastewater Treatment Plant
East Stroudsburg, PA
Monday, 1:00-3:30pm

As of March 2011, Brodhead Creek Regional Authority (BCRA) began ownership and operation of the former Stroudsburg sewer plant and serves the Borough of Stroudsburg, Stroud Township, Pocono Township, Hamilton Township and Tobyhanna Township (where the Kalahari Resort is located). Approximately $40 million dollars has been spent to upgrade the wastewater facility to handle growth and greatly improve the quality of water being released back into the watershed. BCRA is a non-profit entity responsible only for the operation of the wastewater plant. The municipalities served by BCRA own and operate their own collection systems (pumping stations, distribution pipes, etc.).

A limited number of tickets may be available on-site. The cost is $20 per person. Bus will begin boarding at 12:30pm at the Convention Center Entrance (see diagram on page 13) and will depart at 12:45pm.
This presentation will discuss case studies in which utilities selected biosolids dryers either with or without consideration of the generated product’s characteristics. The influence of upstream processing on dryer operations and dried product’s characteristics will be presented. The process for selecting a dryer that will meet a utility’s goals will be introduced.

1:35-2:05pm – Exploring New Approaches to Measuring Biosolids Stability
Speaker: Malcolm Taylor, Penn State University, and Robin C. Brandt, PhD, PE, Material Matters, Inc.

The Oxitop® system provides an inexpensive and rapid assessment of respiratory activity. This study evaluates the potential of Oxitop® as an indicator of biosolids stability. Respiratory activity measurements are compared to observed odor thresholds to evaluate the potential of the Oxitop® system as a predictor of biosolids odor.

2:05-2:35pm – Biogas Utilization Alternatives
Speaker: Michal Blaze, Hazen and Sawyer

This project included evaluating biogas utilization alternatives such as CHP, CNG, and pipeline injection. Anaerobic digesters were evaluated under existing conditions as well as future conditions based upon population growth projections. Additionally, co-digestion of HSW based upon available capacity in the digesters and potential increases in biogas production was evaluated.

3:30-4:00pm – Screw Press for Sludge Dewatering – The Real World Experience of a New Installation
Speaker: Eric Lindhult, PE, Upper Moreland-Hatboro Joint Sewer Authority

A Schwing Screw Press was installed to replace an aging filter press. The solids content increased from ~17% to 25%. Many issues were discovered and resolved during the startup of this first of its kind system in Pennsylvania. Anticipated benefits include increase reliability, solids content, and energy savings.

4:00-4:30pm – Technical Study on Maximizing Polymer Efficiency for Improved Sludge Dewatering
Speaker: Yong Kim, PhD, UGSi Solutions, Inc.

This presentation demonstrates how good understanding of polymer science and fluid dynamics helps in designing better mixing equipment to maximize the effectiveness of polymeric flocculants. Laboratory testing and field evaluations at water and wastewater treatment plants confirmed that well-designed polymer mixing equipment alone could improve the dewatering process efficiency significantly.

1:35-2:05pm – More Connections = Less Wastewater Flows - The NBCJMA Story
Speaker: Edward L. Woyden, Gannett Fleming, Inc.

The Newtown-Bucks County Joint Municipal Authority in suburban Philadelphia has developed a flow reduction program that has resulted in over 1300 EDUs connected since 2003 with a net reduction in AADF. The Authority’s program of I/I reduction, metering, grouting and standard spec revisions is presented as an example for others.

2:05-2:35pm – From Collapse to Completion, a Case Study of an Authority’s Proactive Pipe Lining Program
Speaker: Adam N. Smith, PE, CDM Smith

After three sewer collapses in an 18-month period, the Suburban Lancaster Sewer Authority established a proactive approach to rehabilitate one-third of its sewer system using trenchless technologies. This presentation will review the overall repair program and the transition from reactive to proactive solutions in four days.

3:30-4:00pm – When Simpler Is Better: Creating an Asset Management System People Will Use
Speaker: Bryon Killian, P.E, Entech Engineering, Inc.

One of a utility’s biggest struggles is how to manage information, in particular, relevant information regarding components of their infrastructure. A simple solution that was extremely user-friendly was crafted for a Pennsylvania Sanitary Authority, making valuable, up-to-date information about all assets in the system available to everyone at the Authority.

4:00-4:30pm – It’s the Law in Massachusetts: You Must Maintain an I/I Program
Speaker: Kevin Brander, Massachusetts Department of Environmental Protection

Based on regulations amended in 2014, all communities in the State of MA must have an infiltration/inflow program by December 31, 2017. The program parameters are well defined by strategy and tactics. One of the important goals of the new regulation is to provide a means for upstream communities to share responsibility for common collection systems.

1:05-1:35pm – The University Area Joint Authority’s 18.8 MGD Big Hollow Diversion Pump Station: Project Review
Speaker: Benjamin R. Burns, Herbert, Rowland & Grubic, Inc.

The Big Hollow Pump Station was constructed to provide future flow capacity and eliminate environmental issues by removing a section of interceptor installed at ground level. The pump station incorporates a diversion pumping system with a second forcemain to pump flows around hydraulically limited segments of an interceptor.
Significant advances in UV technology have resulted in more efficient UV designs including amalgam lamps, reactor hydraulics, and bioassay testing that allows for better UV selection and predictable design. These advancements have improved the UV selection process to narrow the UV dose requirements, allowing better capital and O&M cost predictions.

3:30-4:00pm – The Water PCS Comes of Age in the 21st Century - Leveraging Advanced Technology at Loudoun Water’s Trap Rock Water Treatment Facility
Speaker: Joshua Gelman, PE, CDM Smith
This presentation will share the Process Control System (PCS) design and implementation for the new Loudoun Water TRWTF. The presentation will highlight various design concepts, through early planning and design, testing and construction, including the implementation of a dynamic 3D presentation of the new facility.

4:00-4:30pm – Aeration Retrofit for the Borough of Elizabethtown
Speaker: Nicole Bolea, Aeration Industries International, LLC
Elizabethtown’s wastewater treatment plant had chronic maintenance issues from the baffles in their oxidation ditch that were installed to facilitate consistent treatment. This spurred a simple retrofit with equipment that could aerate and mixing eliminated the baffle failure concern and maintained good process treatment throughout the entire basin.

UTILITY MANAGEMENT PROGRAM - IRONWOOD
Moderator: Jack Rae, Gannett Fleming

1:05-1:35pm – What to Know Before You Start Collecting Asset Data for GIS
Speaker: Matthew D. Cichy, PE, Herbert, Rowland & Grubic, Inc.
This presentation will identify options for who can complete the data collection, how it’s done and why, and do’s and don’ts lessons learned in completing the data collection of sanitary and storm sewer system assets for use in GIS.

1:35-2:05pm – Utilizing GIS and EQuIS to Enhance Operational Efficiency
Speakers: Raymond Lees, PE, and Brett Milburn, GISP, both with Langan Engineering & Environmental Services, Inc.
The use of GIS and enterprise data management are providing new solutions to water, wastewater and sewer providers that are increasing operational efficiencies and reducing overall capital expenditures. This presentation will focus on solutions that can be provided to the industry using these technologies through a series of case studies.

2:05-2:35pm – Asset Management Database Design and Integration
Speaker: Charlie Card, and Rich DeBell, both with EBA Engineering, Inc.
The Lancaster Area Sewer Authority (LASA) had been utilizing an asset management decision making tool implemented as an Excel spreadsheet. This project replaces the Excel spreadsheet with integrated Relational Database Management System (RDBMS) technology while preserving the same registry, condition assessment rating scales, risk framework, business logic, and associated formulae.

3:30-4:00pm – Performing a Facility Wide Asset Replacement Evaluation at Your Desk – A Simplified Approach to Capital Planning
Speaker: Jean Malafroite, Greeley and Hansen, and Samantha Burke, Philadelphia Water Dept.
Much of the equipment from wastewater treatment facilities upgraded to secondary treatment in the late 1970s/early 1980s are still in operation and approaching the end of their service life. To understand the major capital expense of replacing facility components plus system improvements, a simplified desktop analysis was performed for Philadelphia Water Department’s wastewater facilities.

4:00-4:30pm – Utilizing Simple Affordable Web-Based Technologies for the Inventory, Operations and Maintenance of your Assets
Speaker: Howard S. Hodder, Jr., MGIS, GISP, Herbert, Rowland & Grubic, Inc.
This session provides an overview of the latest web-based GIS technology (ArcGIS) and how its simplicity enables municipalities large and small to build and maintain robust databases in-house, making asset management a viable solution. A case study will highlight Lower Swatara Township Municipal Authority’s successful implementation of this technology.

TUESDAY MORNING

8:05-8:35am – Whole Digging – Excavation, Backfill and Pipe Repair
Speaker: Jerry Haimowitz, PE, GPM Associates, an Advanced Geoservices Company
For new construction and repair, learn how to dig and backfill without excess settlement, differential frost heave or future pipe and/or pavement failure. Proctor density and the cause of soil settlement are explained, along with how to avoid soil movement that can damage nearby utilities.

8:35-9:05am – Transient Events and Control to Prevent Damage to Sewage Force Mains
Speakers: Jeffrey S. Grow, PE, ENV SP, and Brian J. Rowland, EIT, ENV SP, both with RK&K
With the use of a personal computer and transient analysis software, better determinations can be made regarding the use and location of transient control methods for sewage force mains. This presentation will provide information regarding the importance of modeling of sewage pumping stations and force mains and the selection of adequate transient control.

9:05-9:35am – Using an Auxiliary Treatment Plant to Solve SSOs and CSOs
Speaker: James Cosgrove, PE, Kleinfelder, Inc.
Sanitary sewer overflows (SSOs) and Combined Sewer Overflows (CSOs) commonly occur in older urban areas during storm events. We developed and obtained regulatory approval for an auxiliary treatment facility to control and treat overflows that was shown to be the most environmentally beneficial alternative and least cost solution.
This presentation will utilize case studies to show where soil removal in stormwater BMPs. Adding a layer of amended soils can increase infiltration rates, thus reducing the effectiveness of pollutant removal. This presentation will provide lessons applicable to the design of sewer systems in similar challenging conditions.

11:00-11:30am – Good Odor Treatment, Good Neighbors – Testing the Latest Wastewater Pumping Stations Technologies

Speaker: Bill Meinert, O’Brien & Gere

As part of two pumping station improvement projects, DC Water applied higher standards for odor control. The design phase included field surveys, technology screening, air dispersion modeling, and full-scale piloting of equipment. This presentation will review lessons learned from the application of new odor control standards.

TECHNICAL PROGRAM DETAILS

10:30-11:00am – Improving a Problematic Sewage Transfer System over Hilly Terrain: Lessons Learned

Speaker: Samir Sarrouh, PE, T&M Associates

For years, Pocono Township’s wastewater transfer system did not operate as intended due to hilly terrain. When there was a significant system failure, experts mobilized to stabilize the situation, and design long-term solutions. This presentation will provide lessons applicable to the design of sewer systems in similar challenging conditions.

11:00-11:30am – 2018 MS4 Permit Renewal – Permit Holders Will Have One Year To Get Two Years of Work Completed!

Speaker: Mark Harman, PG, ARRO Consulting, Inc.

The first part of the presentation will focus on procedural and governmental changes associated with the 2018 MS4 permit that need to occur and the second part of the presentation will outline the level of effort required to meet the map obligations that extend beyond the currently required MS4 map.

INDUSTRIAL PRETREATMENT PROGRAM - ALOESWOOD

Moderators: Judy Musselman, GHD Inc., and Deb Watkins, Aqua America

8:05-8:35am – Food & Beverage Industrial Wastewater Treatment through High-Rate Anaerobic MBR Technology

Speaker: Paul Greene, CDM Smith

The effectiveness, reliability and robustness of anaerobic membrane bioreactor (AnMBR) technology was evaluated as whether the AnMBR-style digester is sensitive to a broad spectrum of brewery wastes. Both submerged and pressurized membrane systems were compared and quantified for ease of operation, quality of effluent and cleaning requirements.

8:35-9:05am – Novel Solution to Hanover Foods Industrial Waste Treatment Facility Upgrade

Speaker: Mark Pickering, GHD Inc.

This presentation focuses on the technologies considered for full direct discharge and the design-build effort for the Hanover Foods IWTF which treats food processing wastewater through a contact anaerobic and lagoon treatment process prior to discharge to both the Penn Township WWTP and to the receiving stream.

9:05-9:35am – Innovative Pretreatment of High Strength Dairy Wastewater

Speaker: Ted Danforth, TSD Environomics, Inc.

This presentation will address the dairy processing facility was exceeding its limitations. The dairy wastewater was characterized and a pretreatment system designed and installed in a very fast track that did not allow for typical procurement methods. Compliance was achieved following the installation of the pretreatment facilities.

10:30-11:00am – Controlling Strength of Waste Issues and Surcharge Models

Speaker: Heath Edelman, Entech Engineering, Inc.

Municipalities often struggle with industrial customers who can be problematic for a community’s wastewater treatment system but are valuable partners in the community. This presentation explores strengths of waste issues caused by industrial users, methods for controlling high strength wastes, consideration for implementation of a surcharge program, and models commonly employed regarding surcharge rate structures.

11:00-11:30am – Insight into a Comprehensive Local Limits Analysis: Addressing Regulatory Requirements for a Large Municipal Wastewater Treatment Plant

Speaker: Lavanya Ramasubramanian, Greeley and Hansen, LLC, and Bryan Lennon, City of Wilmington, DE

An existing facility is required to reevaluate its local limits. This process involved preparing a list of pollutants of concern, sampling plan and review of existing data. This case study will discuss the process of establishing local limits and review of existing TMDLs and permit discharge limits.
Moderator: Nathan Walker, Amec Foster Wheeler

8:05-8:35am – Leveraging the ArcGIS Platform for a Complete Storm Water Inventory Solution
Speaker: P. Eric Mains, PE, Gannett Fleming, Inc.
A high quality comprehensive stormwater inventory can be collected through the use of mobile and cloud based GIS technologies. Building upon the Esri software platform, we developed a comprehensive GIS solution for the inventory, attribution, photography and quality control of all features within a municipal storm water system.

8:35-9:05am – Revisions to Pennsylvania NPDES General Permit PAG-03 for Industrial Stormwater Discharges
Speaker: James P. Cinelli, PE, BCEE, Liberty Environmental, Inc.
This presentation will outline changes in the PA DEP NPDES General Permit (PAG-03) which are aimed at improving water quality in the Commonwealth. You will learn about improved reporting, increased sampling and inspection requirements, establishing benchmark values for pollutants, examples of BMP installations, and recent PA DEP interpretations on several permit requirements.

9:05-9:35am – Using Green and Grey Infrastructure to Solve Stormwater Flooding in the Roxborough Area of Philadelphia
Speaker: Robert Serpente, PE, D&B/Guarino Engineers
This presentation will examine the costs and challenges of building parallel grey and green infrastructure for stormwater management in the Upper Roxborough section of the city of Philadelphia. This project includes the stormwater runoff analysis, alternative site evaluation, community outreach, reuse of a retired Philadelphia Water Department facility, construction challenges, and cost estimates.

10:05-10:35am – Maximizing Green Infrastructure Opportunities within Philadelphia’s Dense Urban Residential Areas
Speaker: Andrew Anderson, Hazen and Sawyer
Philadelphia Water Department is underway with efforts to implement green stormwater infrastructure to reduce combined sewer overflows and improve water quality. Area opportunity analyses serve as a key component of implementation efforts, identifying GSI options available in study areas using mapping and field observations to characterize large developed areas.

11:00-11:30am – Washington Street Green Infrastructure: A Redesign of Hoboken’s Main Thoroughfare
Speaker: Gregory Duncan, PE, LEED-AP, T&M Associates
The City of Hoboken, a CSO community, is redesigning Washington Street, one of the county’s “Top 10 Main Streets”. This will include fifteen green infrastructure facilities along this downtown corridor. Innovative elements of this program include: diversion/bypass of high flows; subgrade/hidden monitoring facilities; pretreatment of trash, oil and sediment.

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3:30-4:00pm – Flood Mitigation in the Birthplace of America: The Cohocksink Storm Flood Relief Project
Speakers: Jason Marie, PE, Mott MacDonald, and  
Nha Truong, Philadelphia Water Dept.
In order to reduce flood risk in the Northern Liberties/Kensington sections, Philadelphia Water Department is investing in a six-phase project that involves the installation of over one mile of new conduits and seven underground chambers. The capacity of the sewer system will increase from approximately 2,000 cfs to 4,000 cfs.

4:00-4:30pm – The Development of 1Mark – a Web-Based, Real-Time, XML Interface with PA1Call for Processing 1Call Tickets
Speaker: Dwight D. Hoare, PE, St. Marys Area Water Authority
Learn about 1Mark, a web-based software platform that allows every utility doing work in Pennsylvania access to PA1Call’s XML data interface for processing their 1Call tickets. A demonstration using live dig tickets will be provided to show how this new tool eases the burden of processing 1Calls.

1:05-1:35pm – The West End Trunk Line Microtunnel Project: Design and Construction Management Approaches Used to Reduce Risk to the Utility
Speakers: Jason Marie, PE, Mott MacDonald, and Gerald DeBalke, PA American Water
The design and construction management approaches used to construct a 1,050 LF segment (60-inch casing pipe, 30-inch carrier pipe) of the overall 16,200 LF West End Trunk Line Project using a MTBM reduced the risk to the utility when subsurface conditions created challenges during the mining process.

1:35-2:05pm – Designing, Constructing and Commissioning New Pretreatment Facilities in Eight Months: Use of Progressive Design-Build
Speaker: Richard G Atouikian, PE, HDR Engineering, and Jason Lemire, PE, Bowen Engineering
The genesis of this project was in response to challenging funding deadlines and the fact that the facilities were reaching the end of their useful life. These improvements will enhance operational flexibility, reduce maintenance costs and enable Aqua to continue providing reliable and cost-effective service to their customers.

2:05-2:35pm – Construction Contract Do’s and Don’ts
Speaker: Doug Muller, Eastern Environmental Contractors
This presentation will provide a construction contractor’s point of view relative to factors which can impact the success of a water or wastewater construction project. Recommendations for the development of Contract Documents and Technical Specifications, as well as suggested methods of equipment procurement, will be presented.

3:30-4:00pm – Successful Application of Horizontal Directional Drilling for a Long River Crossing
Speaker: John V. Stuliken, GHD Inc.
Horizontal Directional Drilling (HDD) is used for installing pipelines across rivers because it minimizes environmental impacts. Successful HDD application requires understanding geotechnical conditions and appropriate planning, design, and execution. A case study of a long HDD river crossing in a Chesapeake Bay tributary outlines the approach used and lessons learned.

4:00-4:30pm – How to Develop a Treatment Plant Safety Program
Speaker: Kelly Kramer, ČECO, HEM, RETTEW
Treatment plant sites can be a labyrinth of hazards. And while operators and plant personnel keep safe practices in mind, many don’t have a formalized, documented safety program. Attendees will learn why a written safety plan is necessary and the steps to create and implement such a plan.

FINANCE PROGRAM - IRONWOOD
Moderator: Adrienne Vicari, Herbert, Rowland & Grubic, Inc.

1:05-1:35pm – Selling or Leasing a Public Utility: What Drives This Trend?
Speaker: John Brosious, PMAA
The lease and sale of public utilities is on the rise. This session will discuss reasons municipalities are opting to sell public utilities, distinct advantages and disadvantages to this option and why care should be taken in considering if it’s the best long-term approach for system customers and the community at large.

1:35-2:05pm – Using Cost-Benefit Analysis to Validate Your Decision
Speaker: Russell McIntosh, Herbert, Rowland and Grubic, Inc.
Cost-benefit analysis is a valuable tool in determining whether to sell or retain a public utility. By quantifying the benefits and costs of this substantial transaction, decision makers can validate if it is in the best interest of the municipality and more importantly the community.

2:05-2:35pm – Proactive Strategies to Retain Public Utilities and Remain Financially Secure
Speaker: Adrienne Vicari, PE, Herbert, Rowland and Grubic, Inc.
This presentation will explore tools and strategies utility leaders can implement to ensure their facilities are maintained and improved in the most cost-effective manner, helping improve the financial sustainability for long-term municipal ownership. Asset Management and Capital Improvement Planning will be discussed along with other solutions which support long term viability of infrastructure.

3:30-4:00pm – Funding Infrastructure Projects Through Government Subsidized Financing
Speakers: Brion Johnson and Rebecca Kennedy, both with PENNVEST
There is a variety of subsidized loan/grant funding options available to move infrastructure projects forward, however it is imperative to find the right fit. This portion of the Finance Session will provide the audience with an understanding of what is available and the regulations attached to specific funding sources.

4:00-4:30pm – Financing Your Infrastructure Needs Through USDA
Speaker: Susanne Gantz, USDA Rural Utility Service
An increase in USDA funding in recent years has enabled the agency to team with additional Pennsylvania local governments and authorities to strengthen water and wastewater infrastructure throughout the Commonwealth. USDA’s presentation will provide an overview of their program, availability of funds and tips for developing competitive financing applications.
1:05-1:35pm – Technology Evaluation for COD and TDS Reduction in Leachate

**Speaker: Jurek Patoczka, Matt MacDonald**

A leachate pretreatment plant needed improvements to meet its limits for COD (500 mg/L) and TDS (8,000 mg/L). Technologies investigated included MBR, NF, alternative coagulants, activated carbon, and chemical oxidation. MBR was recommended, with nanofiltration or activated carbon post-treatment needed if COD and/or TDS limits were not relaxed.

1:35-2:05pm – Application of Membrane Technology to Treat Landfill Leachate

**Speaker: Thomas G. Pullar, PE, EarthRes Group, Inc.**

Landfill leachate treatment and disposal continues to be a major challenge facing the solid waste industry. This presentation discusses the selection, design and operational considerations of membrane technology for landfill leachate treatment.

2:05-2:35pm – Treatment Alternatives for Elevated Temperature Landfill Leachates

**Speaker: Rohan Menon, Waste Management**

This presentation will discuss treatment solutions for elevated temperature landfill leachates that use innovative, conventional and/or proven treatment technologies that ultimately result in long-term cost reduction and investment payback. Elevated temperature landfill leachates typically have much higher organic, nitrogen and dissolved solids concentrations, coupled with a complex and variable matrix.

3:30-4:00pm – Bench Scale Evaluation of the Impact of Thiourea Discharges on a Wastewater Treatment Plant

**Speaker: Bradley Koley, and Matthew Gray, AECOM**

The effects of a solar panel manufacturing plant’s thiourea discharges on a wastewater treatment plant in upstate New York were evaluated in bench scale laboratory tests. Nitrification, COD removal, chlorine demand, anaerobic gas production, and thiourea biodegradation were all examined, and potential discharge limits for the manufacturing plant were developed.

4:00-4:30pm – An Innovative Geotextile and Advanced Polymer Process for Treating Selected Industrial and Municipal Waste Streams

**Speaker: Lowell V. Sieck and Craig Stevens, both with CSI Environmental, LLC**

Advances in geotextile design and advanced polymers have resulted in cost effective treatment technologies for processing industrial and municipal waste streams through significant reductions in solids requiring disposal and the recycling of liquid waste streams as applied in oil and gas, chemical, biosolids, food processing, coal ash residuals, and acid mine drainage sectors.

8:00-8:30am – RBCs to SBRs: The ABC’s of Curwensville Municipal Authority’s Chesapeake Bay WWTP Upgrade

**Speaker: Andrew Glitzer, PE, GHD Inc.**

Like many communities in the Chesapeake Bay watershed, the Curwensville Municipal Authority faced the dual challenge of meeting new nutrient limits and the replacement of aging equipment with a cost effective approach. This presentation will review the planning, design, construction, and operation and reflect on lessons learned on the upgrade process.

9:00-9:30am – Development and Implementation of Lagoon Sludge Management Plans for Compliance with NPDES Permit Requirements

**Speaker: Kelly Brenner, LO, EIT, ARRO Consulting, Inc.**

This presentation is intended to provide a basic understanding for creating and implementing a lagoon sludge management plan specific to each individual treatment plant, including establishing a lagoon sampling plan, sampling frequency, sample collection, and compliance with lagoon cleaning requirements.

10:00-10:30am – Modeling Wastewater Treatment with IViewOps3 for Complex Waste Treatment: Plant Diagnostics, Troubleshooting and Operation

**Speaker: William G. Smith, Enviros/Sci Corporation**

An evaluation of the treatment capabilities employing IViewOps3 modeling software for treatment process simulation and evaluation as well as the fate of CBOD20 through the treatment processes. A 2.5 mgd attached growth treatment plant with two stage trickling filters was incorporating long term intermittent excursions for CBOD20 effluent requirements.
10:30-11:00am – Transferring O&M Information to a Web-Based Format
Speaker: John Cannon, GHD Inc.
Operations and Maintenance information is more accessible and durable when migrated out of old paper binders and onto an online, web-based interface. This presentation will demonstrate one way that this migration can be accomplished.

WATER SUSTAINABILITY & REUSE PROGRAM - IRONWOOD
Moderators: Michele Braas, RETTEW, and Anthony Elberti, Gannett Fleming, Inc.
8:00-8:30am – Optimizing MBR Treatment Facilities with Effluent Sewer Collection Systems
Speaker: Julie Barown, Orenco Systems, Inc.
By making MBRs a more cost-competitive treatment technology, wastewater reuse becomes more feasible for small and decentralized applications. Septic Tank Effluent Pump (STEP) collection systems are ideal for MBRs since they allow downsized preliminary treatment systems, directly reduce fouling frequencies, electrical consumption and capital costs of an MBR facility.

8:30-9:00am – Regional Wastewater Effluent Solution for Irrigation Issues
Speaker: Joshua T. Fox, PE, and Edward Spayd, PE, both with Herbert, Rowland & Grubic, Inc.
This presentation will focus on an evaluation that was completed to provide Municipal WWTP effluent water to the Sunset Golf Course in Dauphin County, PA, the obstacles that needed to be overcome to achieve a successful project, and the potential implications that such a project holds for both the community through water conservation and improved water quality.

9:00-9:30am – Cranberry Highlands Golf Course: A Look Back at 15 Years of Reuse
Speaker: Chad Hanley, PE, Herbert, Rowland & Grubic, Inc.
The beneficial reuse of WWTP effluent at the Cranberry Highlands Golf has proven to be a highly successful undertaking and a model example of the benefits of water reuse. This presentation will give a brief overview of the history of the project and then focus on the successes and lessons learned over the last 15 years.

10:00-10:30am – WWTP Process Leftovers – How Much Can We Squeeze In?
Speaker: Isaac Katz, O’Brien & Gere
As part of a WWTP upgrade, a set of zero-energy goals were identified. The goal was to create as much energy, reuse and green infrastructure as possible through the parts of the process that you would normally throw away. This presentation will explore these various process leftovers.

10:30-11:00am – PA’s Nutrient Trading Program: Then and Now
Speaker: Trudy Johnston, Material Matters, Inc.
Established in 2011, Pennsylvania’s nutrient trading program has recently undergone significant changes that are expected to drastically change the nutrient trading market. This presentation evaluates the successes and downfalls of Pennsylvania’s nutrient trading program, and discusses the effects of the rule changes on the nutrient credit pricing in the future.
## RESEARCH PRESENTATIONS

### Tuesday, 1:00-4:30pm - Rosewood Room

The Research Program showcases the ongoing research activities in the field of wastewater, water quality, and environmental management relevant to Pennsylvania. Presentations will be made by this year’s Student Research Award winners.

### Student Podium & Poster Presentations

<table>
<thead>
<tr>
<th>Title</th>
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<tr>
<td>Cryptosporidium Genotypes in a Suburban River Watershed in Southeastern Pennsylvania</td>
<td>Leah Hall</td>
<td>Dr. Kristen Jellison, Lehigh University</td>
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<td>Co-digestion of Sewage Sludge and Pig Manure in Mesophilic Condition for Maximum Methane Generation</td>
<td>Xuanye Bai</td>
<td>Dr. Yen-Chih Chen, Penn State Harrisburg</td>
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<td>Analysis of Well Water Quality in Southwestern Pennsylvania at the Watershed Level, 2011-2016</td>
<td>Linnea Manley</td>
<td>Dr. John Stolz, Duquesne University</td>
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<td>Assessment on the Performances of Biosand Filters Built with Untreated River Sand and Disinfected River Sand</td>
<td>Michelle Fedun</td>
<td>Dr. Kristen Jellison, Lehigh University</td>
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<td>Modeling Nitrogen Transformations in an Ecological Wastewater Treatment System: the Potential for High-Value Protein Production from Aquatic Plant Biomass</td>
<td>Benjamin Roman</td>
<td>Dr. Rachel A. Brennann, Penn State, University Park</td>
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<td>Development of Nutrient-Rich Crystals from Wastewater for the Fortification of Compost</td>
<td>Aliza Furneaux</td>
<td>Dr. Arthur Kney, Lafayette College</td>
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<td>Simultaneous Nutrient Removal and Recovery of Phosphorus from Secondary Wastewater using a Hybrid Ion Exchange Bioreactor</td>
<td>Chelsey Shepsko</td>
<td>Dr. Arup K. SenGupta, Lehigh University</td>
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<td>A Study of Matrix Effects on the Analysis of Weak Estrogenicity with Yeast Estrogen Screen without Extraction</td>
<td>Yuxiang Shen</td>
<td>Dr. Arthur Kney and Dr. Joseph Colosi, Lafayette College</td>
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<td>Fungal Populations in Integrated Fixed-film Activated Sludge (IFAS) Biofilms and their Potential for Enhanced Removal of Trace Organic Contaminants</td>
<td>Michael J. Shreve</td>
<td>Dr. Rachel A. Brennann, Penn State, University Park</td>
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<td>Chemical Degradation of Polyacrylamide used in Hydraulic Fracturing Under Downhole Fracking Conditions</td>
<td>Boya Xiong</td>
<td>Dr. Manish Kumar, Penn State, University Park</td>
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### Student Poster Presentations

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NETWORKING EVENTS

**President’s Reception**  
*Monday, 4:30-5:30pm*  
*Exhibit Hall*

Don’t miss the President’s Reception! Enjoy complimentary beer & snacks while you network with your colleagues and the vendors.

**Operator Olympics**  
*Tuesday, 4:30-5:30pm*  
*Exhibit Hall*

This is a fun activity based on some real Olympic events, but with a wastewater twist. Games may include:

- Bowling, using a ball from a pump and BOD bottles;
- Plunger Toss, tossing small plungers into a bucket;
- Golf Ball Chip, chipping golf balls into a toilet;
- Hockey, score a goal through a toilet seat; and
- Turd Toss, throw (plastic!) turds into a bucket.

Can you think of a better way to spend the afternoon?

There is no charge and pre-registration is not required. This is a competitive event and prizes will be awarded.

**PWEA Awards Ceremony Reception**  
*Monday, 6:00-7:30pm – River Patio*

Come to the Annual Awards Ceremony honoring your colleagues who have won prestigious state and national awards. This event is open to all.

Registration is not required. A cash bar will be available.

**“Raise Your Glass” with the YP Committee**  
*Tuesday, 6:00-9:00pm – Zambezi Room*

New this year! Come and join PWEA’s Young Professionals for a wine and food pairing tasting event! Participants will taste various Pennsylvania wines, and learn appropriate food-wine pairings from a PA winery owner. Participants will gain first-hand insight into how the wines are made and how winery wastewater is managed, and will also learn about the history of each wine variety.

If you are looking for a fun evening with fellow YPs and experienced professionals alike, this program will not disappoint!

Cost is $50 per person, which includes hors d’oeuvres and beverages. A limited number of tickets will be available on-site.

**PWEA Annual Dinner**  
*Monday, 7:30-9:00pm – Zambezi Room*

Network with your colleagues while enjoying a delicious meal!

Pre-registration was required for this event. On-site registration is not available for this event.

**Beer & Pretzels Reception**  
*Tuesday, 4:30-5:30pm*  
*Exhibit Hall*

We will be serving complimentary beer, root beer, and soft pretzels! Come to the Exhibit Hall to relax and visit with the vendors.

**Presidential Reception**  
*Monday, 4:30-5:30pm*  
*Exhibit Hall*

Don’t miss the President’s Reception! Enjoy complimentary beer & snacks while you network with your colleagues and the vendors.

**Operator Olympics**  
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Stefan Weaver
Jason Wert

COMMITTEE MEETING SCHEDULE

All meetings will be held in the Zambezi Room, unless otherwise noted.

Sunday, June 4
4:00pm Exhibits & Sponsors Subcommittee
   (Hotel Lounge)

Monday, June 5
7:00am Safety Committee
7:30am Biosolids Committee
8:00am Professional Wastewater Operations
   (PWO) Committee
11:30am Laboratory Practices Committee (Exhibit Hall)
2:30pm Government Affairs Committee (Exhibit Hall)

Tuesday, June 6
7:00am Collection Systems Committee
7:00am Industrial Waste Pretreatment Committee
7:00am Public Education Committee
7:00am Stormwater Committee
7:00am Training Committee
7:00am Utility Management Committee
11:30am Water Sustainability & Reuse Committee
   (Restaurant)

2017 PWEA Annual Meeting
Notice is hereby given that the Annual Business Meeting of the
Pennsylvania Water Environment Association will be held on
Monday, June 5, at 12:30pm in the Zambezi Room at the Kalahari Resort & Conference Center
To reach wastewater professionals through KWQM magazine and its targeted readership, contact Dave at your earliest convenience to discuss your company’s promotional plans.

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Do you have a topic for a technical training session you feel would benefit those involved in the water quality industry? If so, the Pennsylvania Water Environment Association (PWEA) invites you to submit your topic for the Program Committee to consider when they meet to plan the 2018 conference program.

The PWEA will issue a Call for Abstracts for the PennTec 2018 Annual Technical Conference in July 2017. Check your email and the PWEA website for specifics about the Call for Abstracts in early July. Abstracts, which should be limited to 300 words or less, should describe the subject matter in sufficient detail to allow evaluation of the proposed topic. Session presentations will be in 30 minute blocks including time for questions.

Abstract submittals will only be accepted electronically in WORD format. The abstract submittal form will be posted on the PWEA website. You will be asked to identify which of the sessions would best fit your topic. Submissions should be emailed to abstracts@pwea.org.

No travel or assistance funds are available for speakers. Speakers are responsible for all of their own transportation and lodging expenses. Registration fees for the day of the presentation will be at a discounted rate. Speaker discounted registration will be offered for the full conference.

Questions should be directed to abstracts@pwea.org.
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Continuing Education for PA DEP Operator

The PA Department of Environmental Protection (PA DEP) has approved permanent continuing education status for the PWEA Annual Conference. The Conference is being planned in accordance to the requirements of House Bill 183 (Act 11) and application has been approved to provide five (5) contact hours to eligible wastewater operators. The PWEA is a PA DEP accredited sponsor and is permitted to issue continuing education credits to water and wastewater operators.

To ensure you meet continuing education requirements, please refer to the Operator Certification 3-Year Renewal Cycle Schedule. **IMPORTANT:** Contact hours received outside of your renewal cycle will not count toward your requirements.

To comply with accreditation sponsor requirements, the PWEA will require every attendee to check in and out of each half day timeslot by presenting the contact hour tracking sheet for stamping.

Contact hour tracking sheets will be available at the Registration Area. Review this form very carefully so you are aware of all requirements. You must attend at least 2.5 hours in each half day in order to qualify for contact hours. Each half day session is worth 1.0 contact hour. Use the same contact hour tracking sheet for the entire Conference.

Completed sheets should be turned in to the PWEA registration staff during posted registration hours. You must provide a photo ID when turning in your tracking sheet. Certificates will be processed and mailed approximately one month after the Annual Conference.

In addition to the Conference contact hours, eight workshops have been approved by the PA DEP for additional credit. These workshops will run concurrently with the Conference and may have extended hours. You will receive credit for either the workshop or the Conference session, depending on what you attend during each timeslot.

Please note: You may only receive credit for attending a specific workshop once during your renewal cycle. **DEP will not count the same workshop more than once within a cycle.** Please check your records to be sure you have not previously attended one of these workshops within your current cycle.

Continuing Education for Professional Engineers

PWEA technical sessions are not pre-approved by the State Registration Board. Therefore, it is not possible to guarantee their acceptance for certification purposes. PWEA will issue attendance certificates to document your participation, provided you submit a tracking sheet. Sheets will be available in the Registration Area. PE's, LS's and Geologists earn 3 Professional Development Hours (PDH) per half day session.

Other Certification

At this time, the PWEA cannot provide continuing education certification for anyone other than PA DEP water and wastewater operators. However, Certificates of Attendance can be prepared and mailed upon request. It is your responsibility to check with your certification board to determine whether this type of certificate is acceptable.

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Not a member of PWEA? Go to www.pwea.org to join online or to download the membership application form. Members receive the PWEA member rate for the PennTec Conference and for PWEA training events.

Member benefits include the Keystone Water Quality Manager, a quarterly technical publication containing legislative updates, design/process operations articles, problem-solving case histories, and advance notice of continuing education. This valuable magazine also highlights current technology trends and issues affecting water quality.

You will also receive the monthly PWEA Job Board, listing employment opportunities in the field; and the monthly PWEA e-Newsletter, keeping you up-to-date on the latest water quality news and PWEA events.

Questions?

If you have questions about PWEA, please contact the PWEA Administrative Office at 717-642-9500 or by email at pwea@pwea.org.

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We all recognize that it is important to communicate to our customers. Many communities have newsletters and local newspapers that would welcome informational or educational articles. The PWEA Public Education Committee has been gathering newsworthy articles that can be edited and easily adapted for use within your community and is pleased to offer a communication tool for water professionals.

If you don’t have time to write an article or simply don’t like to write, visit the PWEA “Public Education Toolbox.” The Public Education Toolbox will include a selection of documents that can be downloaded in WORD format. The posted articles are not copyrighted, which allows anyone the ability to edit and adapt them to their specific use. The articles posted have been freely donated by the authors with no conditions or promises attached. Articles will include, but not be limited to, topics such as FOG, sewers, biosolids, and easements.

The Public Education Toolbox also contains informational brochures that can be downloaded, printed, and distributed to your customers.

Visit PWEA’s Home Page and click on the Education tab, then select the Public Education Tool Box link.
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