PACIFIC NORTHWEST CLEAN WATER ASSOCIATION
LOWER COLUMBIA SECTION

QUARTERLY E-NEWSLETTER

MESSAGE FROM THE PRESIDENT

It is a special honor and privilege to begin my term as the new LCS Chapter President along with Jeff Hart as the Vice-President. I would like to specially thank the past two presidents Dana Devin-Clarke and Joel Borchers for guiding and setting a great example for me and for others coming in future. I will strive to do my best in trying to bring our little wastewater community together.

This year we have a great group of energetic and enthusiastic members who want to make a difference! We are striving to put the extra effort to expand our social and educational activities to enrich the wastewater community. In the coming months we will:

- Continue to provide informative tours, seminars and workshops
- Promote networking of wastewater and water industry professionals,
- Maintain and improve student chapter at Portland State University and collaboration with the existing student chapter at Clackamas Community College
- Continue assisting students via sponsorships.

If you are interested in joining this group or have any ideas for tours or workshops please feel free to contact me or any LCS officer.

Bhargavi Maremanda
President of the Lower Columbia Section
(BMaremanda@carollo.com)

Inside this issue:

What is Pacific Northwest Clean Water Association (PNCWA)?

PNCWA is a professional organization for people in clean water industries in the states of Idaho, Oregon, and Washington. Members include wastewater treatment plant operators, consulting engineers, scientists, water and wastewater treatment equipment manufacturers and representatives, and students.

Mission Statement:

"Pacific Northwest Clean Water Association (PNCWA) is dedicated to preserving and enhancing the water quality in the states of Idaho, Oregon, and Washington. We promote the technical development of our members, the dissemination of information to the public and the advancement of science needed to protect the water environment."

What is Lower Columbia Section (LCS)?

The Lower Columbia Section is one region of the PNCWA encompassing Portland (OR) and surrounding areas of Northwest Oregon.

What's Going On in the Lower Columbia Section?

See what's new, find opportunities for training, and meet your officers at our website. We are always looking for people interested in getting involved. Check out the Lower Columbia Section's website and the PNCWA at http://lowercolumbia.pncwa.org.

What is the Young Professionals (YP) division?

The Young Professionals division of the PNCWA LCS is open to anyone under 35 years of age or with less than 10 years of experience in the clean water industry. LCS's YP events are held quarterly and expose rising professionals to the fundamentals of wastewater treatment technology. Industry professionals are encouraged to attend as well. Each event is designed to promote learning specific to our industry. Events range from touring municipal wastewater treatment plants, breweries or even happy hour events for networking. If you have an event you would like to suggest or to learn more about the PNCWA, please contact the YP Chair:

Hunter Bennett-Daggett (hunter.bennettdaggett@tetratech.com) .

More information on events, as well interesting news bits from around the web can be found on the group's Facebook page at www.facebook.org/LCSYP.

"A young professional is anyone under 35 years of age or anyone with less than 10 years of experience."

FACILITY TOUR: Clean Water Services Fernhill Wetlands

On August 5th, 2016, the LCS hosted a picnic and tour of the Clean Water Services Fernhill Wetlands in Forest Grove. The Fernhill Wetlands is a series of Natural Treatment Systems (NTS) designed as tertiary treatment for Clean Water Services.

The tour started with a scrumptious picnic. Attendees made their own sandwiches to go along with drinks, chips and cookies. While everyone ate, Jared Kinnear from Clean Water Services and Jeff Hart for Kennedy/Jenks gave an overview of the Fernhill NTS using a few figures and aerial maps. After the talk, a portion of the site was walked.

Fernhill is a 110 acre NTS consisting of various types of treatment wetlands. In 2012, the 2.5 acre Lower Treatment Wetland was constructed and included the Water Garden (a beautifully landscaped area with multiple waterfalls and wooden bridges). In 2014, the South Wetland were constructed consisting of 60 acres of free water surface wetlands and 30 acres of open water. The primary treatment function of the South Wetlands is temperature treatment.

FACILITY TOUR: Clean Water Services Fernhill Wetlands

Currently in construction is the Western Wetlands, which is primarily composed of a vertical flow wetland designed to reduce ammonia. Within the next 3-4 years, the Upper Wetlands will be the last component constructed rounding up the Fernhill NTS.

Twelve people attended the tour and there was great feedback. The food selection, presentation, and walk was a nice change of pace for most folks. As LCS, we strive to provide tours of this magnitude in the future.

FERNHILL DESIGNTEAM

Lower Columbia Section Scholarship Program

The Lower Columbia Section of the PNCWA has been providing scholarships to Water and Environmental Technology (WET) students at Clackamas Community College since 2004. Since 2012, scholarships have valued $500.

WET provides career technical classes combined with real world field experiences. Course work emphasizes fundamental aspects of drinking water distribution, drinking water treatment, wastewater collection and wastewater treatment. The program also offers 240 hours of industry cooperative work experience, laboratory methods in environmental chemistry, aquatic microbiology, and preparation for the provisional operator certification exams.

The scholarships are genuinely appreciated by students and help them attain an Education That Works! The LCS has received many thanks from students that greatly appreciate the donation that help them take steps to becoming employees in the water and waster industry.

Lower Columbia Section PNCWA

Clackamas Community College

WASTEWATER MATH CHALLENGE:

Recently, the LCS started giving away a $20 Starbucks gift card to a selected participant of the Wastewater Math Challenge who answered all the Math Challenge questions correctly. The gift card winner from last quarter's Challenge is John Lewis! For Solutions to last quarter's challenge is on Page 12

The Rules:

- Submit your solutions to JeffHart@KennedyJenks.com
- Participants with the correct solutions will be put in a hat
- One participant with the correct answers will be drawn from the hat, that person will **win the $20 gift card to Starbucks**

Motor Horsepower (MHP) is the power going to a motor.

Brake Horsepower (BHP) is the power output of the motor and is determined by the amount of power going to the motor (MHP) and the efficiency of the motor.

1) If 25 MHP is going to the motor and the motor output is 22 BHP, when is the efficiency of the motor?

Water Horsepower (WHP) is the power output of the pump and is determined by the power output of the motor (BHP).

2) If the horsepower output of the motor (BHP) is 18 and the pump is 78% efficient, what is the WHP?

Sometimes the efficiency of the motor and pump are given as a single value. This value is called the Wire-to-Water efficiency.

3) If a 20 HP of power is being delivered to a motor and the wire-to-water efficiency is 65%, what would the water horsepower be?

Let's put it all together now.

4) A pump must pump 2000 gpm against a total head of 20 feet. What horsepower is required for this work?

5) A pump must pump against a total dynamic head of 50 ft at a flow rate of 1300 gpm. What is the WHP requirement for this pumping application?

6) 40 HP is supplied to a motor. Calculate the WHP knowing that the motor is 92% efficient and the pump is 85% efficient.

Featuring:

- Golf Tournament benefiting Water for People and PNCWA Scholarship Fund
- Preconference Workshops
- Operations Challenge
- Facility Tours including Deschutes Brewery

Pacific Northwest Young Professional Summit

Save the Date!

Second Annual Pacific Northwest Young Professional Summit will be on November 4th, 2016, and will be in Puyallup, Washington at the Washington State University (WSU) Puyallup Research & Extension Center.

The PNCWA Young Professionals and PNWS-AWWA Young Professionals are both hard at work to plan the second half-day summit. The goal of the event is to provide leadership, personal and career development training for attendees. Networking opportunities will include Q&A sessions for students and YPs to chat with industry professionals in small groups. All are welcome – mentors are encouraged to attend and share their knowledge. Registration information will be available soon!

American Water Works Association
Pacific Northwest Section

PACIFIC NORTHWEST CLEAN WATER ASSOC.
1935

SUPPORTERS OF PNCWA-LOWER COLUMBIA SECTION

Thanks to these sponsors!

The Lower Columbia Section strives to provide educational opportunities for those in the field of wastewater treatment. We work to do that by offering social events, scholarships, workshops and promoting plant tours around the area. None of this would be possible without the generous support of our sponsors.

On behalf of the entire Lower Columbia Section of the Pacific Northwest Clean Water Association, we would like to thank:

Carollo Engineering

JBI Water & Wastewater

Kennedy/Jenks Consultants

Murray, Smith & Associates

MWH

ADVERTISING OPPORTUNITIES ARE NOW AVAILABLE!

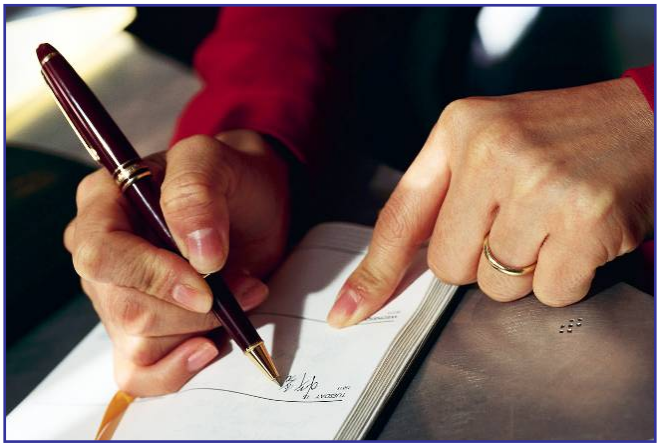
Contact Jeff Hart at JeffHart@KennedyJenks.com

for information on sponsorship and advertising.

PNCWA – Lower Columbia Section CONTACTS

	Name	Officers	E-MAIL
	**Bhargavi Maremanda**	President	BMaremanda@carollo.com
	**Jeff Hart**	Vice President	JeffHart@KennedyJenks.com
	**Jeanette DeCastro**	Secretary-Treasurer	DecastroJ@SherwoodOregon.gov
	**Joel Borch-ers**	Website Chair	BorchersJ@CleanWaterServices.org
	**Tim Munro**	Scholarship Chair	Tim.Munro@ci.mcminnville.or.us
	**Hunter Ben-nett-Daggett**	Young Professionals Committee Chair	Hunter.BennettDaggett@tetratech.com
	**Monica Stone**	Awards Chair	MAStone@olsd.net

WEF/PNCWA/LCS – Mark your Calendars!



When	Where	What	Affiliation	Contact
Fall 2016	TBD	Pump Station Tour	LCS	decastroj@sherwoodoregon.gov
Oct 16-19, 2016	Bend, OR	PNCWA Annual Conference	PNCWA	http://www.pncwa.org/pncwa2016
Nov 4th, 2016	Puyallup, WA	Pacific Northwest YP Summit	PNCWA/ AWWA	http://www.pncwa.org/studentsyoung-prof

Contact Jeff Hart at JeffHart@KennedyJenks.com to advertise your event in our newsletter.

Want to feature your project in our newsletter?

If you have an interesting project, a new process, or are just plain proud of your plant, let us know. We can organize a showcase for your project. Contact Jeff Hart and let him know that you want to show off! (JeffHart@KennedyJenks.com)

Are You Receiving this e-Newsletter in Error? Or Do Others in Your Organization Wish to Receive This Newsletter?

Either Way, PLEASE EMAIL Jeff Hart (JeffHart@KennedyJenks.com) THANKS!

PNCWA-LCS MEMBERSHIP

It has its advantages!

Are you not a member of WEF/PNCWA/LCS? Or do you know someone who needs to join?

To get a membership application, visit www.wef.org and click on "membership and careers" and then click "Join WEF"

SOLUTIONS TO WASTEWATER MATH CHALLENGE FROM LAST QUARTER

WINNER: John Lewis

Congratulations John! You will be receiving a $20 giftcard for Starbucks in the mail.

Thanks to everyone who participated.

SOLUTIONS:

1. If you have a 145 foot diameter secondary clarifier and a flow rate of 6.50 MGD of 2700 mg/L of MLSS going to the clarifier and a RAS rate of 2.5 MGD, what would be the SLR of the given clarifier?

   $$SLR = \frac{(2{,}700\ mg/L)(8.34)(6.5\ MGD + 2.5\ MGD)(1\ day/24\ hrs)}{(0.7854)(145\ ft)2} = \frac{8{,}444\ lbs/hr}{16{,}513\ ft}$$

   $SLR = 0.51\ lbs/ft^2/hr$

2. What would be the SOR of the above system?

   $$SOR = \frac{(6.50\ MGD)(1{,}000{,}000\ gpd/1\ MGD)}{(0.7854)(145\ ft)2}$$

   $SOR = 394\ gpd/ft^2$

3. What would be the WOR of the above system?

   $$WOR = \frac{(6.5\ MGD)(1{,}000{,}000\ gpd/1\ MGD)}{(3.14)(145\ lineal\ feet)}$$

   $WOR = 14{,}265\ gpd/linear\ foot$