Meet the Expert - Cole Prevost, Des Moines Water Works, Professional Engineer

Cole is a Professional Engineer, been with Des Moines Water Works a short time. He received his undergraduate degree at the U.S. Military Academy at West Point and then got graduate degree in Water Resources at The University of Iowa in Water Resources. This is the study of rainfall, rivers, about things like flooding. Lots of what Cole studies in college has to do with what the FIRST® LEGO® League Project is all about. He studied rain through the end uses of water.

Cole’s first job introduced him to the professional area of water with a consulting engineering firm and doing engineering for them. Working with many rural areas, which included several rural water districts, such as Xenia, in central Iowa. Cole now does a lot of in-house engineering.

The Des Moines Water Works has divisions within it where professionals do customer service where they are handling people who want new water. Facility management takes care of all the buildings and Des Moines Water Works Park. In the water production area, they do the operating of the water treatment plant and pump stations. The water distribution professionals are working with pipes and fire hydrants. In Cole’s area, the engineers work to provide solutions to infrastructure and do problem solving, design water pipelines, design pump stations, and water treatment plant component designs. Cole likes that his job is providing a service that everyone needs and feels like it is important to do work that isn’t going away due to everyone needing water.

Most suburbs get their water from Des Moines Water Works and they have three water treatment plants. Their pump station takes water at a low pressure and provides it a higher pressure. We need a certain amount of water pressure to do things like take a shower or water the grass, and these pumps take the water at the lower pressure and provide it out at a higher pressure. These pumps can range in size to real small or really big, pumping thousands of gallons a minute. They can monitor through technology how much water is needed and being used at all times. There is a water meter in the basement of a house that connects to a radio on the outside of your house, so the Water Works can pull that information to see how much water is being used at any time.

Often when there is a problem with delivering water, there is a significant loss of pressure. A leak in a small pipeline would experience a large pressure loss, whereas a leak of the same size in a large pipe, would not show as much. Leaks can be detected by sound, kind of like sonar, because a lot of the pipes are metal and when water is leaking, it actually makes a sound, but you have to know there is a leak there to use the sound. Otherwise, you are looking for a pressure loss or water coming out. This makes it tricky to monitor all those 75 million gallons of water that are typically used.

One hundred million gallons of water a day goes through the biggest plant bringing in water from the biggest source of the Raccoon River, as well as the Des Moines River and it has a thing called an infiltration gallery. This is where there are several ponds with a pipeline with little holes in it and water goes through the bottom of the pond into the pipes. (That’s actually the cleanest water they get!) Des Moines Water Works tried to use the infiltration gallery as much as possible, but it has a limited capacity to the next source is the Raccoon River followed by the Des Moines River.

Des Moines Water Works has been around a long time and started making water in the late 1800s. There are really cool old fixtures that still exist today. A cool fact is they started doing water before there
The pumps used to be run on steam power. There were old wooden pipes, and some were iron. Pipes today are now plastic or ductile iron.

Some of the biggest challenges of today that the DES MOINES Water Works are the increasing demand, since Des Moines is growing at a high rate and people need water to do just about everything with water being one of the most important resources you can have. Also, the source water for Des Moines is a low water quality. The worse the water quality the harder to make it safe to drink.

In terms of ensuring water quality Des Moines plants are set up like every other city municipality water system, except that DES MOINES has a nitrate removal facility. Nitrates are typically linked toward agricultural run off in a lot of cases. It is hard to get it out of the water and very expensive. DES MOINES Water Works is expanding their treatment of nitrates due to regulations from the EPA of allowable nitrate levels, and in certain months of the year, the water gets very close to being at those unallowable levels.

Everything that happens in the river will come through Des Moines – whatever the pollutants might be. If your team is interested in nitrate levels, you can look online at the USGS – water stream sampling site looking at many rivers/streems in Iowa. It will even make graphs for you. Find more information here: USGS Website: https://waterdata.usgs.gov/ia/nwis/rt (shows all the stream gauges in Iowa), and https://waterdata.usgs.gov/ia/nwis/uv?site_no=05484000 (this one is for the Raccoon River at Redfield, IA and it has a nitrate gauge on it).

Cole thinks the best things people can do to help the water supply is to think about where your water comes from. It doesn’t magically appear. The water in the Des Moines area rivers – they cover a large area of west and central Iowa and anything that goes on the ground or near the stream eventually makes its way into the water and that is a source of drinking water. Be careful what you dump on the ground and educate yourself on issues of water quality.

Cole has this to say about being efficient in his work to accurately run the hydraulic model for Des Moines as he works to try to get a picture of the water system is doing. “The better information you have, the better solution you can provide. If you don’t have enough information, you can over design things. Things will then run inefficiently.”

Find more information about the Des Moines Water Works here: http://www.dmww.com/education/education-resources/video/