



Spring Creek Watershed Association Meeting
May 16th, 2017
7:30 AM to 9:30 AM
UAJA Conference Room
1576 Spring Valley Road, State College PA 16801
Minutes

1. Attendees

Bill Sharp, Dave Smith, Lexie Orr, Tim Gould, Todd Giddings, Bob Eberhart, Rob Cooper, Cory Miller, Walt Ebaugh, Judi Sittler, Ann Donovan, Michele Halsell

2. Monthly Educational Topics:

- a. What's Going on at UAJA – Cory Miller (PDF attached)
 - Treatment Capacity at UAJA is 9 million gallons per day (MGD)
 - Current flow is 5.2 MGD with production of 1 MGD of Beneficial Reuse water
 - Ozone was added to the Advanced Water Treatment System in 2016
 - Replaced Chlorine pre-treatment
 - Ozone is highly effective at reducing emergent contaminants like pharmaceuticals.
 - Solar and Battery Storage Project
 - 2.6 MW solar array will be installed on 9 acres
 - This array can completely power the expanded Beneficial Reuse Project
 - The project will begin July 2017 and will be up and running in Fall 2017
 - The battery storage system will help buffer power spikes
 - Odor Control Facility
 - \$9 million facility is in final design with construction to begin in 2018
 - De-Nitrification Filters
 - To meet Chesapeake Bay requirements, there will be a \$3.5 million project to convert existing tertiary filters to de-nitrification filters
 - This project will be in construction in 2018.
 - While this project will help meet the requirements now, with continued growth and the deadline of 2019 for PA to meet Chesapeake Bay requirements, this will probably not be enough.
 - Advanced Water Treatment



- \$4.7 million project to double the capacity of Beneficial Reuse
- Reverse osmosis has virtually no N so it helps meet Chesapeake Bay requirements.
- The project is in final design and will be under construction 2018.
- Benefits of Beneficial Reuse to Slab Cabin Run
 - Centre Hills Country Club is not using wells (350,000 GPD left in aquifer)
 - Net increase from before Beneficial Reuse - 80,000 GPD
 - Kissinger Meadow – 450,000 GPD
 - Upstream of the meadow, Slab Cabin was dry for over 140 days last year
 - Downstream of the meadow, Slab Cabin flowed year round
- Harris Township Extension of Beneficial Reuse
 - \$2 million to extend reuse water to Mountainview Country Club, Boalsburg Tech Park and Tussey Mountain (peak snow production 1.4 MGD)
 - Act 537 Plan Special Study to COG, general forum June 26, 2017
 - The project will be under construction in 2018
- Centre Region Plan – encouraging modern watershed management
 - Can we work around the old paradigm of silos?
 - Stormwater, sewer system, drinking water are all currently separate.
 - Possible model: “[One Water](#)” model of integrated water management

b. Other Discussion:

- Well Locations
 - There was general discussion on whether the locations of drinking water wells should be public knowledge. Rob Cooper noted that after 9/11, Penn State does not publicly publish locations but the locations are relatively well known. Todd Giddings mentioned that he was taking a picture of a well house and the water authority approached him, so they are working to protect their wells.
- EPA expectations must be met by 2019



- Agricultural and nonpoint source stormwater in PA are the main sources. However, because there are so many farms in PA, only large farms can be regulated.
- N Offset Options
 - septic tank removal
 - riparian restoration
 - Ag BMPs
 - floodplain restoration (land studies has done some of these)
- UAJA adds a lot of Carbon to remove N from wastewater
 - If we keep growing at the same rate, may run out of N capacity in 15 years
- EPA funding cuts will reduce our resources but will not change the law and our requirements
- Walt Ebaugh – Growth and Water (attached)

c. WRMP Follow-up Discussion – Tim Gould

- There was discussion on how the WRMP can help the SCWA and other watershed organizations. The group felt that maintaining the data so that we have continuity over time is especially important. For example, people felt it would be interesting to look at stream flow of Slab Cabin run over the last 17 years to see if there have been any significant changes. There was also interest in looking at watershed area, population and baseflow.
- WRMP Data
 - All of the data is publically available. UAJA and College Township Water Authority actively use the data.
 - While the WRMP collects the data, a lot of the interpretation of that data is left up to the users. The annual report does interpret the data, but the WRMP does not make claims that are not statistically backed.
 - If a contractor or consultant uses the WRMP data, there is a suggested donation.
- Other Discussion
 - There will be tests conducted on all water producers and beneficial reuse to look for emerging contaminants like pharmaceuticals and endocrine disrupters.

3. Association Business



a. Atlas Progress Report

- The Atlas workgroup received the DEP Environmental Education Grant and will begin to receive funding in July. This funding will not only develop the Atlas website but also incorporate place-based watershed education into the State College and Penns Valley Area School Districts.
- There will be a seminar held at Penn State's Land and Water Research building May 17th at noon to introduce the Atlas to Penn State faculty and hopefully recruit contributors to the project. Michele Halsell will be facilitating the seminar.

b. Watershed Management Plan

- There will be an update on the plan at the SCWC meeting on May 17th.

4. Approval of Minutes

a. Corrections to last month's minutes:

- The Atlas seminar at PSU will be facilitated by Michele Halsell.
- The WRMP was founded in 1998.

With these corrections, the minutes were approved unanimously.

5. Partner Updates

- a. Michele Halsell – Tomorrow, May 17th at 12pm at PSU, the Atlas workgroup will hold a presentation and discussion with faculty.
- b. Lexie Orr and Judi Sittler – ClearWater Conservancy is launching its Centred Outdoors program at TU's Family Fishing Picnic at Tussey Pond June 11th from 12-4pm. We need volunteers, so please get involved if you can.
- c. Todd Giddings - Ferguson Township Planning Committee met with SCBWA staff to refine and review the Ferguson Township overlay ordinance. This sourcewater protection ordinance will put "barracuda teeth" in 29 water supply well management plans and 1 public water supply spring.
- d. Bill Sharp – Garden Starters is putting in a community garden at the Methodist Church on Houserville Road this Saturday, May 20th.

6. Next Meeting: June 20th, 2017

Meeting Adjourned at 9:30AM

From the standpoint of water, this is an unlikely place for a city of 100,000 people. Water is the resource that limits local population growth. I have a personal perspective on the relationship between growth and available water supply. I grew up here; I studied hydrogeology here; during the 1990s, I more than doubled our well water supply capacity; and I now serve on the board of the sewer authority. Herein I discuss growth I have seen, where we have obtained our water supply during my time, and the degradation of Spring Creek resulting from our water resource management methods.

I was not quite three when Father moved the family here in the spring of 1946. At the time there were 7,000 residents in the State College community, and 7,000 students at the Pennsylvania State College. I have seen population double three times in the past 70 years, once to 28,000, again to 56,000, and we are now more than 100,000 living here.

That's a doubling every 23 years, just over a 3% annual rate of growth. Were we to continue at that pace, local population would double another three times in the ensuing 70 years. That would add 900,000 new people, and population would then total 1,000,000. While this is an unlikely projection, it is in accord with the principle that "if it did happen, it can happen."

So, where's the water going to come from to support such a population? We are not downstream from anywhere. No river runs through it. We lack access to the standard municipal water system model of "put a pipe in the upstream end of town, put a pipe in the downstream end of town, build two water treatment plants," and there you are, a municipal water system.

We depend upon the Spring Creek Aquifer for our water supply. This Aquifer is comprised of the limestone and dolomite rocks that underlie Nittany Valley. These carbonate rocks dissolve in mildly acidic water, which comes from rainwater having dissolved carbon dioxide to form carbonic acid. Hence the local caves and sinkholes. Picture the Aquifer as the upper 400 feet of saturated rock, which contains 1.5% void space for the storage and transmission of water, and underlies an area of 100 square miles. The 1.5% void space within the 400-foot Aquifer thickness, contains stored water six feet deep. We have in the Spring Creek Aquifer a large water reservoir, it's just full of a lot of rock.

Recharge to replenish the Aquifer amounts to about one third of the 38 inches of average annual precipitation. The remaining two thirds either runs off or goes back into the atmosphere via evapotranspiration. About 50 per cent of recharge drains from the mountain ridges that bound the valley, some focused where streams issue from gaps in the ridges and sink upon encountering the carbonate rocks on the valley floor, and some running off the ridge slopes. Much of the remaining half of recharge is diffuse infiltration into and through the soils across the valley.

Our Aquifer reservoir is replenished at an average rate of 100 million gallons per day (mgd). It overflows at the same rate, 100 mgd, feeding seeps and springs in the stream valleys. That's why it's called Spring Creek. In fact, 86% of Spring Creek's flow is this groundwater discharge, the stream's base flow, which enables the stream to continue flowing even when it hasn't rained in several weeks.

In the 1940s we were drinking surface water taken from reservoirs in gaps along Tussey Mountain, at Galbraith Gap to supply the Boalsburg area, at Shingletown Gap for supply to State College, and from Musser Gap to supply the Penn State power plant. In the 1950s wells were drilled by the State College Borough Water Authority to augment supply from Roaring Run in

Shingletown Gap. The wells were located near Shingletown, and thus close to the pipe already running into town from there. My father could always tell when the wells kicked on in late summer to augment diminished flow in Roaring Run because his shower would become hard, the dissolved carbonate rocks of the aquifer imparting hardness to our local groundwater.

We now obtain nearly all of our water supply as groundwater pumped from our Aquifer. We return our treated waste water to Spring Creek at a point about one third of the way down the watershed, below the homes and businesses of our over 100,000 inhabitants. Both our withdrawal and our return processes degrade Spring Creek.

Our three water providers are the State College Borough Water Authority, the College Township Water Authority, and Penn State. Together they pump 10 million gallons per day supplying our water needs. This pumped water would otherwise discharge naturally from the Aquifer via seeps and springs. The result is that seep and spring flow is diminished by 10 million gallons per day due to this pumping, which is ten percent of the daily natural flux of water through the Aquifer. As a consequence, Spring Creek is drying up; at least it's headwater tributaries are drying up. Slab Cabin Run does not flow at and below the SCBWA Harter and Thomas well-fields near Shingletown unless it's raining. It has lost it's base flow of groundwater discharge. We are degrading Spring Creek by taking our water supply as we presently do.

Additionally, we all have water heaters, and the water we send to the treatment plant is twenty degrees warmer than the 52-degree groundwater that's our supply. The limit for discharge of treated waste water from the plant to Spring Creek is based not on biological oxygen demand, nor on nutrients, but on heat. It's the warm beer principle: oxygen, like carbon dioxide, is more soluble in cold water. The beer warms up, the carbon dioxide goes out of solution, the beer goes flat. The stream warms up, the oxygen goes out of solution, the fish suffocate. That's it, the reason for a 6-mgd limit on effluent discharge to the stream. This is degrading Spring Creek too.

But if we valued Spring Creek we could do things differently. I can think of two ways that we could obtain our water supply and not degrade Spring Creek. We could abandon all of the wells and take our supply from Big Spring, returning our treated waste water via an outfall to the stream somewhere below Big Spring. Or, we could make drinking water from our waste water and return it to the Aquifer via recharge wells located in the headwaters region, creating thereby a closed loop of taking water from and returning water to the Aquifer, recycling our water supply.

As it turns out, we can make drinking water from our waste water. In fact, we are doing just that. UAJA, the local sewer authority, has implemented phases one and two of a project referred to as "beneficial reuse." Tertiary treated effluent which otherwise would be released to Spring Creek is further treated using microfiltration and reverse osmosis. The result is water of very high purity. Were this water to be recycled and returned it would be the cleanest recharge our Aquifer receives. And, it's cold underground, so that would take care of the heat.

Both the Big Spring and the recycling options have limits. The first option would be limited to Big Spring's discharge of 19 mgd, less the amount Bellefonte and Coca Cola are taking, and allow population to nearly double once again, but only once. The water recycling option could seventy years hence serve a population of 1,000,000, using all of the 100-mgd natural Aquifer flux. Pumping more than that would be mining water stored within the Aquifer, which is not sustainable.

GROWTH AND WATER

Dr. Walter Ebaugh

The Centre Region Comprehensive Plan has as an objective no degradation of Spring Creek. We cannot meet that objective by continuing to do what we have been doing. We have some choices to make. It is my hope that this description of the problem will help us to make good choices.

And finally, it is we, the rate payers, who pay for this. We send money to the water provider and to the sewer provider to enable us to enjoy our high quality water system. Each household, or equivalent dwelling unit as it's known in the trade, pays \$1,044 per year. We should have an interest in how the providers are spending our money on our behalf. Which choices would you want to make?