

E&M Engineers and Surveyors, PC

Fall 2007

Springville, New York 14141
(716) 592-2851

Bradford, Pennsylvania 16701
(814) 362-5546

www.emengineers.com

Pond Health

By: Jeffrey C. Bahret, P.E.

It has been a very dry and hot summer season here in the Western New York and Northwestern Pennsylvania. I'm sure you have also noted the poor water conditions our area ponds are in. Today more than ever, people are beginning to realize that clean water is becoming a natural resource that demands more than our casual attention. There are many parts of our country that must use effluent water (secondary waste water discharge) for irrigation due to the prohibitive cost and availability of clean water. In order to help preserve this natural resource of our area ponds and lakes, it is necessary to incorporate a water quality management plan.



Management must focus on improving poor water quality. It is not sufficient to merely alleviate the

symptoms of poor water quality such as algae, discoloration, or foul odor. Effective management must cure the true causes of these symptoms. Such as:

- Stagnant water (inadequate fresh influent)
- High water temperature
- Polluted incoming water supply
- Fertilizer and organic waste run off
- Insufficient amount of dissolved oxygen in water
- Bottom sludge and nutrient build-up

There are two basic approaches to pond management: Chemical treatment and aeration/circulation. In addition to being cost prohibitive, the chemical treatment process must be continually applied and can be harmful to plants and wildlife. A chemical treatment approach only alleviates the symptoms of poor pond water quality. Eventually problems will re-occur.

Aeration stimulates the natural water clean-up process by transferring oxygen from the atmosphere into the body of water. Aerators pump water into the air, creating spray droplets. The droplets absorb oxygen as they travel through the air and transfer this oxygen to the pond in the form of dissolved oxygen. The addition of dissolved oxygen allows aerobic bacteria to respire more efficiently, thereby enhancing the bio-degrading process.

Circulation of aerated water is critical to water quality management. It is important to circulate the aerated water throughout the pond in order to effectively control water quality. Algae blooms

flourish in warm stagnant environments. Circulation not only stirs the water but will mix the cooler bottom water with the warmer surface waters. This process will prevent thermal stratifications and algae growth. A secondary benefit of the aerator spray and circulation action is that it discourages mosquitos and other insects from using the water surface as a breeding area.



Aeration and circulation represents a simple solution to an increasing environmental problem. Proper sizing and placement of a circulating aerator is the key for effective pond management.

How Do You Develop Land If It Contains Wetlands?

By: Allan Vanderpoel, P.E.

One year ago, I wrote on the definition of a wetland, so you would have an idea of what type of lands are termed “wetland”. Especially in Pennsylvania, wetlands are far more common than most people suspect, and the only way to document their location is to have an expert do a wetland delineation. In New York by contrast, the wetlands have been mapped, and are more easily located. So what do you do if you have a parcel of land in Pennsylvania that you would like to develop over the next few years?

The first step is to hire a wetland expert to do the field delineation. This will tell you what you have on your land in terms of wetland size. Can you skip

this step, and just build? Not if you need a DEP permit, as every permit application will open the question of wetlands. It is better to do this as early as possible, to avoid a last minute time hassle with any building project.

The first issue to face is the type of wetland that is encountered. The two choices in Pennsylvania are “exceptional value” and “other”. An exceptional value wetland is one that serves as habitat for threatened or endangered species, or one that is located in or along the flood plain of a trout stream, or exceptional value stream. The trout stream connection includes many local streams, and has far reaching effects. And now for the bad news; an exceptional value wetland for all practical purposes is “off limits.” Remember that the exceptional value is a definition, and not necessarily the pristine condition that the image suggests. It has to do with the location along a trout stream.

Moving ahead, provided that your wetlands are defined as “other”, the next issue is size. If the wetland is less than 0.05 acres (2,000 square feet), it may be considered deminimus. While a wetland encroachment application is still required, the consequences are that no remediation is necessary.

If the wetland is not deminimus, the wetland encroachment permit will require that certain requirements are met. One of the requirements is that alternatives must be explored that would lessen the impacts on the wetlands. Reshaping the proposed development to avoid the wetlands as much as possible is the most obvious. But another alternative that must be considered is to use an area not presently owned, and “which could reasonably be obtained, utilized, expanded or managed to fulfill the basic purpose of the proposed project.” So, if an adjacent parcel is available, and would impact less wetland, that may be the alternative required. There are other requirements that also must be met, requiring a written justification.

As a last step in the wetland process, a wetland replacement must be established, typically at a 1:1 or 2:1 ratio. The function and value of the replacement area must be the same as the impacted wetland. This entire process is part of the DEP Joint Permit.

The wetland issues can be a factor that stop a development. The permitting process can take six months, and it is a real possibility that work may be denied in a wetland. The best advice is to start this process as early as possible. If a development is foreseen in the next few years, action taken now on the wetland permit will save a large amount of rushed work later on. We can help you through this process, and while you may not hear the answers you want, this initial step in a development project can be done in a systematic manner.

Tuna Cross Road Bridge Completed

By: Chris Ernst, P.E.

The construction of the Tuna Cross Road Bridge over the Tunungwant Creek in Foster Township, McKean County, Pennsylvania has been completed and the new bridge was opened to traffic in June 2007. The new bridge is a two span prestressed concrete adjacent box beam structure with a reinforced concrete deck. Each span of the new bridge is approximately 100 feet long. The abutments, piers and wingwalls are reinforced concrete that are supported on steel monotube piles. The bridge has two 9 foot wide lanes, a 5 foot wide shoulder, a 6 foot wide shoulder and a 5 feet wide sidewalk that is raised 8 inches above the adjacent roadway.



The new bridge is located where an old bridge had once been used to cross the creek. The old bridge was a two span steel truss and steel thru-girder

structure with a wood deck. The abutments and pier were concrete and the structure was a single lane bridge approximately 14 feet wide. The old bridge was closed to all traffic on April 5, 1979 and the superstructure was removed in April 1997. The abutments, pier and wingwalls remained in place until the new bridge construction began.

The design of the bridge project was completed by E&M Engineers and Surveyors, PC and their subconsultants. Wilson Consulting Group of Mechanicsburg, PA was the structural subconsultant, Skelly and Loy, Inc. of Harrisburg, PA was the environmental subconsultant and Geomechanics, Inc. of Elizabeth, PA was the geotechnical subconsultant. The design was completed using PennDOT standards and was completed under the direction of the PennDOT Engineering District 2-0 located in Clearfield, PA.

The construction of the bridge project was let for bidding in May 2006 and the low bidder for the project was Mekis Construction Corporation of Fenelton, PA with a price of \$1,942,421.53. The federal government contributed 80% of the funding for the design and construction of the bridge, the state of Pennsylvania contributed 15% and Foster Township was responsible for the remaining 5%. The Tuna Valley Trail Association also contributed to the funding of the project (as part of the Township 5% share) since the bridge will become part of their trail system. The bridge will be used to loop the existing Crook Farm Trail that runs along the west streambank of the Tunungwant Creek from Bolivar Drive to Tuna Cross Road to the trail that is scheduled to be constructed soon. This new trail will run along the east streambank from the new bridge back to Bolivar Drive.

Mekis Construction Corporation and their subcontractors began construction at the end of July 2006. The abutments, wingwalls and pier were installed and the beams were set prior to the planned winter shutdown in December 2006. Mekis started work again in March 2007 and the project was successfully finished by the scheduled completion date of June 7, 2007. The prestressed adjacent box beams were supplied by Top Roc Newcrete Products of Erie, PA and the cast-in-place concrete for the project was supplied by

Bissett Building Center of Bradford, PA. Interstate Amesite was retained by Mekis to complete the paving work for the approximately 560 feet of roadwork that was required for the bridge project. Penn Line Service, Inc. of Scottsdale, PA installed the guide rail.

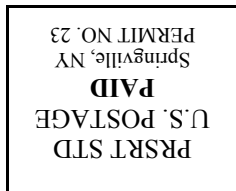
Glenn O. Hawbaker of State College, PA and Turtlepoint, PA paved the Tuna Cross Road from the limits of the bridge project to Seaward Avenue and East Main Street as part of the annual Township paving program. This work was completed on June 8 and June 11, 2007.

The design and construction of the bridge project was completed thanks to the hard work of the Foster Township Supervisors (Cary Caber, Bob Slike and Chris Wolcott), the Foster Township Secretary (Jennifer Gorrell) and the Foster Township Highway Superintendent (Joe Sweet) and his staff.

SCHOLARSHIP WINNER ANNOUNCED

E&M Engineers and Surveyors, PC is pleased to announce the winner of its annual college scholarship. The winner of the \$1,000.00 scholarship is Timothy Freyburger of Java Village. Timothy graduated from Pioneer Central School in Yorkshire and is attending Alfred State College this Fall., He will be pursuing a Bachelor's degree in Civil Engineering.

The purpose of the scholarship is to encourage High School students to pursue a career in the field of Civil Engineering or Land Surveying. E&M Engineers and Surveyors, PC has offices in Springville, NY and Bradford, PA. E&M was founded in 1946 and is committed to providing Western New York and Northern Pennsylvania with the highest quality of Civil Engineering and Land Surveying Services.



**E&M ENGINEERS AND SURVEYORS PC
482 S. CASCADE DRIVE
PO BOX 159
SPRINGVILLE, NY 14141-0159**