

## Lake Champlain Phosphorus Initiative

### Meeting of the Agricultural Innovations Group 1/15/14

This summary reflects a range of views expressed on the issues as discussed during meetings of the Agricultural Innovations Group (AgInG), they do not reflect the formal or public position of any one group of people, organization or coalition. All errors and omissions are the sole responsibility of EMC/CBI.

Attendees: 8 members, John Forcier, Tom Boucher, Sean Breen, and Alex DePillis

These notes and the presentations that were given will be posted on the Environmental Mediation Center's website: <http://www.emcenter.org/lake-champlain-phosphorus-pollution-initiative/>

- I. Review and Editing of Past Recommendations
  - Discussion of end product and final look of the report; larger concepts and bolder initiatives were seen as more appealing than smaller steps
  - Integrated approach to address water quality issues held appeal
  - The group reviewed past language of recommendations and made changes. No recommendation is in final form.
  - The group decided that a more efficient use of time would be to set aside an entire day to work on finalizing the draft recommendations.
  - February 18<sup>th</sup> has been selected for this one day set aside.
  
- II. Energy and Water Quality
  - Speakers included: Alex DePillis from the Agency of Agriculture; John Forcier from Forcier Engineering, Tom Boucher and Sean Breen from Native Energy
  - The majority of the meeting was devoted to exploration of energy issues and specifically looking at how single stage and two-stage bio-digester technologies can reduce phosphorus pollution; and discussing their potential to increase value added revenues for farms.
  - The group felt that the energy discussion should be a broader, cross sector conversation because it has the potential to integrate several water quality issues across communities.
  
- III. Alex DePillis Agency of Agriculture
  - Cow Power Initiative- manure digesters were previously in greater demand, currently there is more energy than demand
  - Pre-consumer waste liquid waste is currently being used in digesters in New England—gets trucked in and accounts for 10% of the volume in digesters. Pre-consumer waste from places like milk production and

yogurt facilities—the liquid is consistent and known and thus easier to utilize.

- Post-consumer waste creates more energy when used in the digester system but is not available for use due to regulations.
- Post-consumer waste may contain biohazards and thus prior to using the waste in any system it would need to be treated (for example, pasteurized) to reduce or eliminate the risk of contamination.
- The act of putting the material through the digester does not significantly lower the phosphorous (“P”) in the material. The majority of post-digester P is contained in the solids.
- However, the process creates a closed loop “P” system on the farm. The bio-digester uses material to make bedding and that is used in place on the farm so it’s being repurposed in situ.
- The systems generate energy for the farm and bedding and that reduces input costs for the farmer. If enough bedding is made, it will also be a byproduct that the farmer can sell to others.
- In terms of cost of energy produced when compared to solar figures in studies indicate solar costs .25 cents per KWH and digesters .10 cents per KWH.
- In order to make an impact in reducing phosphorous, a bio-digester needs to be used in conjunction with another technology. This is a two-step process, e.g. bio-conversion solutions in which the end product becomes a saleable commodity. Need to line up producers with buyers of the end product (bio plastics, etc.)

#### IV. Forcier Consulting Engineers

- John Forcier presented on farm based anaerobic digester systems. Estimates that biodigesters can reduce P by 10 to 25%.
- Systems can be utilized in any sized operation—immediate benefit is utilization of manure to create energy and heat that can be used on the farm reduces dependence on fossil fuels, lowers energy costs and will recoup the investment in the system within 5-7 years (depending on the size of the system and energy needs of the operation).
- More energy is created by using post-consumer waste but current regulatory environment makes permitting a long and expensive process.
- Act 148—prohibiting all organics from landfills—will create a need for digester systems that can process this waste since it cannot go to landfills.

- Will produce renewable energy and a liquid fertilizer byproduct that is easier to use and apply in targeted ways on the farm.
- Air quality is improved since use of a system reduces odors and results in a liquid manure that doesn't smell as much as manure from an untreated source.
- The resulting end product is a liquid manure that has more liquidity in consistency-- 3% solids versus 12% solids – absorbed into the ground easier
- Nutrients are more soluble and crop uptake is more efficient so reduces the need for chemical fertilizers
- Municipal and commercial digester systems also available to address water quality initiatives and can be combined with ag uses to provide a community-wide solution
- Creates renewable energy and provides solution for what to do with nutrients when combined with composting facilities
- More appropriate environment for the permitting and use of post-consumer waste, results in a dewatered digestate that can be added to compost at an existing composting facility

#### V. Native Energy

- Tom Boucher and Sean Breen made the presentation
- Worked on conventional single stage biodigesters and now working on two-stage biodigester processes
- Business model uses carbon offsets in a voluntary market to fund renewable energy projects
- Different energy projects—wind, hydro, solar, bio-digesters
- Confirmed benefits of single stage separation, up to 20 to 25% reduction in P
- Secondary technologies can be added to the digesters, such as a decanter centrifuge which can capture 45 to 50% of the P in the first stage liquid outflow
- Using a two stage separation system such as a decanter centrifuge could reduce total P pollution by up to 50%.
- Centrifuge technologies is well established
- Centrifuge produces “Phosphorus Cake” which can be turned into a phosphorus product such as lawn fertilizer and exported out of the Lake Champlain Basin

#### VI. VTC –Bio-digester Project

- Community project – will take manure from local farms and return to those farms the same amount of NPK
- Will not result in significant reduction of P pollution in area
- However, it will result in better management of nutrients on the land
- Each farm has to be frequently tested to ensure the nutrients returning to the farm are accurate
- The way it is returned will enable farmers to have the ability to spread the manure on fields that would otherwise be difficult to reach and therefore are not as balanced for nutrients as other fields

## VII. Wider Cross Sector Application

- What would create incentives for municipalities and ag sector to work together to utilize these technologies and provide better nutrient management, waste management and renewable energy creation?
- Is it easier to encourage farm-to-farm projects or wider community ones?
- Pre and Post Consumer waste issue needs to be addressed—more energy created with post consumer waste how to address the need for pasteurization?
- Utilization of post-consumer waste in digesters results in an agricultural operation needing to get a solid waste permit and that is an additional layer of regulation, planning and permitting--- hard to do for a farm operation
- Brings in Act 250 issues, too much for individual farming operations to take on.
- Nutrient Management Centers may be a better approach—get regional in scope, composting, post-consumer waste may be better utilized.
- Careful to balance between existing systems don't want to create issue for them but need a way to commoditize the system.
- The consistency of the manure is changed, thinner in consistency easier to inject or otherwise use in a more targeted manner.
- Some of the technologies will render the P in a cake form—that makes it much easier to transport and easier to spread.
- Can you incentivize the adoption of these technologies with specific targeted grants? Grants that require less time to get funding, less paperwork to get the grant
- Waste management overall should be in the conversation its part of making communities efficient and sustainable and ag can't do it alone and can be helpful to the community with an integrated approach.
- Manure and waste in general needs to be treated not as an end product but as a commodity to be utilized – creates needed energy, value added products.
- Goal is not to drive P to zero—not a natural thing in our environment –

- More digesters aid by energy users—reflect it in the rates charged because it creates sustainable energy from waste that otherwise ends up in landfills, community benefit, community cost is way to look at it