



Nancy Girard, Planning Board Chair
Tracy Tarr, Conservation Commission Chair
Town of Gilmanton
P. O. Box 550
Gilmanton, NH 03237

July 14, 2010

Dear Nancy and Tracy,

Thank you for the opportunity to provide information on biosolids management to the joint meeting of the Planning Board and Conservation Commission last Thursday. I hope it was a useful step in the Board's and Commission's information gathering processes.

I forwarded to Desiree Tumas a copy of my slide presentation, for your growing file of information on this topic. I hope it will be made available to other Town residents, along with the other information I provided in advance of the meeting.

My goal on Thursday was to provide a broad overview of how biosolids are managed across the country and in this region and then address questions and engage in discussion, to the extent time allowed. Clearly, there were more questions than time allowed, and I was glad to hear that you plan to continue the discussions on this topic. It is a complex, science-rich topic. The challenge for towns is often not having time for thorough consideration. Fortunately, you are beginning the discussions well in advance of any external time constraints or deadlines.

As you move forward, I urge you to continue to strive to balance on-going community and societal needs with the concerns of interested residents. If biosolids were some questionable widget produced by a faceless corporation for its profit, that would be one thing. But environmentally sound biosolids management is integral to clean water protection – something critical in modern society. As the late Donella Meadows aptly stated in a letter to the editor in the *Concord Monitor* more than ten years ago, when it comes to what to do with sewage sludge, “you don't get to say ‘not here’ without saying where.” We all have some responsibility to help manage it in cost-effective and environmentally sound ways. Even those of us with septic systems contribute to biosolids production, as most of our septage is delivered to treatment plants.

After years of examining this topic, I firmly believe that when biosolids recycling to soils is done in accordance with current regulations, it is protective of public health and the environment and is often the best option environmentally. There is so much research from a variety of sources and perspectives that backs up this finding. Most recently, research (e.g. Univ. of Washington, Metro Water Reclamation District of Greater Chicago, Canadian Council of Ministers of Environment) is indicating that use of biosolids on soils is often the best option with regards to greenhouse gas emissions: it adds to carbon sequestration and reduces the need for fertilizer, which has greenhouse gas impacts. Interestingly, the common alternatives to recycling organic wastes - namely landfilling or incineration - can cause significant greenhouse gas emissions.

As we heard Thursday, there are some scary allegations about biosolids. While there is widely dispersed opposition to the use of biosolids on soils, even after decades and thousands of land application events, authorities are not finding the kinds of impacts that the allegations purport. As I noted, scores of independent researchers from universities and government agencies across the country come together every ten years to review the state of the science. They are not calling for stricter regulations or cessation of land application. Two National Academy of Sciences reviews came to the same conclusion. Every U. S. state allows the beneficial use of biosolids. U. S. EPA, USDA, and U. S. FDA all accept the use of biosolids on land, in accordance with regulations. All of these independent groups reaching similar conclusions provides great reassurance that the practice of biosolids beneficial use has undergone extraordinary scrutiny and been found acceptable. And, of course, management of biosolids is a public function, decided upon by thousands of local public agencies across the nation, all of which are beholden to local citizens.

This is not to minimize the validity of the questions posed by Gilmanton residents. Reading some of the allegations out there naturally raises fears. Hopefully, however, the forum for discussion and open exchange of information you have initiated will enable people to question the various statements made about biosolids in order to develop an informed position. I appreciate the opportunity the recent meeting afforded all in attendance to question me and my input. I welcome the questions and have tried to provide additional information on some of the topics that arose during last Thursday's meeting (see attached). I urge equal questioning of all presenters and viewpoints.

If there was a common concern voiced in last week's meeting, it was that the state-required public informational meeting held by the Department of Environmental Services (DES) was not helpful. I understand that. That kind of process can be frustrating. We need to do better at meeting people where they are, providing information and answering questions. In this situation, I am committed to helping, as best I can, with further information exchange, and, most especially, addressing the concerns of neighbors. I cannot speak for RMI, but I think they are on the same page. To the extent you can provide suggestions or assistance with bringing the parties together for discussion, I would appreciate your help. What the Town of Gilmanton ultimately decides to do regarding beneficial use of biosolids is less critical to me than helping to ensure that the process to get there includes having an informed, thoughtful discussion.

As the Town moves ahead on this topic, it may be useful to consider a recommendation of the Office of Energy and Planning: local towns can adopt DES biosolids regulations by reference, which can enhance local enforcement and oversight in partnership with DES. Some towns have chosen to augment the DES regulations by including a provision to ensure local review, in line with what Tracy suggested Thursday.

Thanks again for your time and interest in biosolids. I'm available as a resource and look forward to further discussions.

Best regards,

Ned Beecher

Enclosures

About Biosolids / Treated Sewage Sludge

Responses to Concerns Raised...

...at a Joint Meeting of the Gilmanton Planning Board & Cons. Commission

July 8, 2010

Ned Beecher, Executive Director, North East Biosolids and Residuals Assoc. (NEBRA)

Concern: *The presentation was biased in favor of biosolids use and glossed over concerns.*

Response: I regret if anyone felt I did not fully address the concerns raised. During my initial presentation, every effort was made to address the concerns most commonly raised in the time provided. During the discussion period, I attempted to answer the questions posed, but I acknowledge that due to the complexity of the underlying issues, my answers may have included more information than that which could be readily absorbed. In the notes below, I try to make sure to directly address the concerns raised at the meeting. Perhaps the reason my presentation seemed positive, is that I believe there are answers to the commonly voiced concerns. The concerns (e.g. heavy metals, pathogens, and chemicals) are legitimate, but they are the subject of historical consideration and evaluation, and have been researched for decades and addressed through regulations and best management practices. Hopefully, the additional information presented here will be helpful in advancing the discussion a bit further.

Concern: *Odors.*

Response: This is an ongoing concern, not just for biosolids management, but for manure management as well. Different biosolids have different odor qualities, depending mostly on the treatment processes they have gone through. Some Class A materials, such as well-cured composts, have little odor. Some materials, like pelletized biosolids, have little odor in their dry form, but when wetted, can generate considerable odors. In New Hampshire, the Class A biosolids from Concord, which are stabilized by adding lime to raise the pH to kill pathogens, can have a strong odor. The odor associated with the Concord WWTF by driving by on Interstate 93, however, is not the odor generated by the biosolids. The odor often detected near the WWTF is coming from the uncovered clarifiers at the treatment plant. In contrast, the anaerobically digested Class B biosolids from Franklin and Nashua have relatively little odor.

Since the odors come from the microbial decomposition of organic matter that includes nitrogen and other elements, there is a real connection between odor and the usefulness of biosolids. Those elements and the organic matter are exactly what are good for soils and plants. The challenge is to maximize the use of these attributes while controlling the odors.

Most important is this: some people do have physical and emotional responses to malodors. And it is clearly a quality-of-life issue. *Long-lasting* intense malodors are not acceptable, whether they are from biosolids, animal manures, or other sources. If persistent intense malodors are an issue, management practices should be adjusted to reduce them and/or their impacts on people. DES is very sensitive to issue of odors, particularly odors that migrate off-site from a land application area, which is why each land application permit is required to include an odor management plan prior to approval.

At the same time, no dairy farm can operate without releasing some short-term malodors, and those living in farm communities know and accept this. The best way to address malodors is at the local level, amongst neighbors working with the farmers and the biosolids managers to help develop management practices such as timing of spreading, advance notice to neighbors that spreading will occur, and maintaining odor control agents on-site, that can work for everyone.

Concern: *Why isn't groundwater monitoring required?*

Response: Research over several decades, involving many sites and many types of soils, has determined the factors that can lead to movement of contaminants from biosolids-amended soils to groundwater. The contaminant of greatest concern for groundwater is nitrogen in the form of nitrate. It occurs in biosolids at the concentrations of *percents* (parts per hundred), whereas contaminants such as heavy metals appear in parts per million. Nitrate leaching to groundwater is also a concern when a commercial fertilizer is used or when animal manures are used. However, nitrogen is one of the three macronutrients needed by plants – and this is why all these materials are applied to soils. Biosolids are the only soil amendment or fertilizer that must be applied according to the “agronomic rate,” meaning that only enough can be applied to provide the nitrogen needed to grow the crop. This federal and state requirement results in a limited application of biosolids, which protects groundwater. In addition, the state of New Hampshire requires a two-foot buffer to groundwater and bedrock (or 4 feet where biosolids are temporarily stacked in a field). And biosolids cannot be applied on wet soils or steep slopes.

By the way, on Thursday, I said that biosolids are regulated like many other known potential environmental risks. I used the example of gas stations, noting that groundwater monitoring is not required at all gas stations. This, I said, is because research and regulations have assessed and addressed the potential risks by requiring particular management steps that greatly reduce the risk of groundwater contamination. I think this analogy is reasonable. Someone challenged this, claiming that groundwater monitoring is required at all gas stations. After the meeting, I checked again with DES and confirmed that gas stations are *not* required to have groundwater monitoring wells, and most don't.

This is not to say that groundwater monitoring is never required when using biosolids. Facilities that process biosolids, as well as any land *reclamation* sites that use biosolids, are required by DES to have groundwater monitoring wells installed. But, due to the prior research, current biosolids quality confirmation testing, reporting requirements, and oversight provided by DES site visits, groundwater monitoring is not required at agricultural land application sites.

The same combination of research and regulations address concerns about the potential for surface water contamination, obviating the need for routine surface water monitoring. For surface waters, the major concern with use of biosolids or manures is phosphorus runoff. To address this concern, regulations for biosolids require specific setbacks from water bodies and wells and limit the slope on which they can be applied.

Concern: *What about the allegations of impacts to humans and animals?*

Response: There are several allegations about the effects of biosolids on humans and/or animals. There has not yet been an instance where local independent authorities reviewing each situation have reached the conclusion that the impacts were attributable to biosolids use or exposure. A comprehensive 2003 response from U. S. EPA to the Center for Food Safety addressed the most common allegations; this document is attached.

Analytical testing is done on a regular basis in every state and provides for on-going quality confirmation. This testing has provided the ability to identify instances where biosolids have been the cause of contamination that needed attention. One example was the land application of Milwaukee Class A biosolids that were found to be above regulatory standards for PCBs. Routine testing identified the problem and the biosolids were cleaned up and properly disposed by Milwaukee. There were no resulting impacts to human health or the environment.

There are other rare incidents that are investigated by EPA and/or states, but no significant impacts have been found. Considering the thousands of land application sites across the country and the decades of experience, the record on biosolids recycling to soils is quite good.

Lastly, there is legitimate concern about intense malodors and potential health impacts: see the discussion on odors, above.

Concern: The unknowns.

Ultimately, there is one concern about biosolids that research and experience can never fully address, at least not to the extent that some people would like: the unknown. Sewage, and thus sewage sludge, can conceivably contain any and every trace chemical or substance in use today. And, it is conceivable that someone, somewhere, at some time, may dump a huge amount of something bad down the drain. That's what people imagine.

Response: First, the imagined scenario is unlikely. People don't have access to significant amounts of regulated chemicals unless they are managing them properly, in accordance with laws and regulations. So we're really talking about trace amounts of myriad chemicals that are in common use and to which people are exposed far more through direct personal use, often including ingestion.

Wastewater and biosolids management systems have significant buffering capacity, which is largely attributable to the fact that they are biological processes. Anything in toxic amounts will disrupt the treatment process and be discovered. Lesser amounts of trace chemicals of potential concern are broken down in the variety of biological and physical processes. Any remaining traces of synthetic chemicals are then decomposed in the highly biologically active soil environment. The treatment process coupled with the fact that biosolids are applied, by law, at controlled, agronomic rates, means that the parts per billion or few parts per million of undesirable contaminants end up in the soil in concentrations on the order of parts per trillion or quadrillion.

Note: 1 part per million = 1 second in ~278 hours (~11.6 days). 1 part per billion = 1 second in ~32.7 years. 1 part per trillion = 1 second in ~31,709 years.

Concern: Trace chemicals – including from pharmaceuticals and personal care products.

Response: Response: First, it is important to clarify that biosolids are mostly water plus organic matter, nutrients, and inert substances like sand. Chemicals of true potential concern appear in trace quantities, in parts per million or less – making up, in total, less than a percent.

Priority pollutants and other traditional toxic chemicals in biosolids have been researched for many years. Modern science has a good general understanding of what happens to different families of chemicals in the wastewater treatment process, as well as their fate in biosolids and soils. Most decompose, given time. Those that have been found to be persistent or don't readily break down, such as PCBs and dioxins, have been more thoroughly evaluated by EPA and others. In some states, including New Hampshire, these persistent chemicals are tested for, monitored, and regulated in biosolids.

There is currently a heightened public awareness of trace chemicals from personal care products and pharmaceuticals being found in the environment, especially in surface waters. I provided a summary article on this topic with respect to biosolids in the materials provided in advance of the Gilmanton meeting. (in *Clearwaters: "PPCPs in Wastewater and Biosolids"*) The same article is available from the NEBRA website at <http://www.nebiosolids.org/index.php?page=science> (scroll down to "Current Topics of Interest").

Concern: Variability in concentrations of trace heavy metals in biosolids (as shown in biosolids test data).

Response: Tests of trace heavy metals in a particular biosolids from a particular wastewater treatment plant show relatively little variation over time, although there will be some difference from one test to another caused by the randomness created through compiling a sample from several grabs of the

biosolids or soil and some margin of error in the analytical process. But the limited variability over time is due to the fact that wastewater and biosolids treatment processes involve continuous mixing over many days, which reduces the likelihood for spikes to occur. Advances in pretreatment programs have also contributed to the removal of heavy metals or chemicals of concern prior to the wastewater even reaching the treatment plant.

Concern: *Discuss the DES regulations & permitting process.*

Response: The federal biosolids regulations (40 CFR Part 503) were designed to be self-implementing. They only address metals and pathogens, and do not require site specific permits. While New Hampshire's regulations incorporate the federal requirements, they are significantly stricter in every sense. NH regulations require testing for over 170 compounds, site permits for Class B land application sites, state issued permits for generators of Class A and B biosolids, and separate facility permits for wastewater treatment facilities. In addition, NH requires annual reporting to DES of what happens to all sewage sludge generated in the state. See the attached NH DES fact sheets:

- Sludge Quality Certification Requirements
- Permitting a Biosolids and/or Short Paper Fiber Site in New Hampshire.

Also see the DES website: <http://des.nh.gov/organization/divisions/water/wweb/index.htm>

Concern: *Is information about local biosolids applications and projects available to the public?*

Response: As part of the Class B biosolids site permitting process, applicants are required to submit two copies of the entire application directly to DES, as well as provide the Town with a copy of the complete application and provide verified notice to all abutters that the application has been submitted and that DES will be scheduling a public hearing on the application.

Records on use and disposal of all sewage sludge generated in the state are available from DES. RMI mentioned at the meeting that they will gladly provide additional information upon request.

Concern: *The National Academy of Sciences 2002 report said that biosolids are not safe.*

Response: The summary finding by the National Academy of Sciences is quoted in the power point presentation I provided. It states that "There is no documented evidence that the Part 503 regulation has failed to protect public health...." It made recommendations for research to continue and for the science to continue to be updated, which EPA, USDA, and university researchers are doing.

Concern: *The public "hearing" process by DES was not adequate or helpful. Transparency is critical.*

Response: Agreed. That kind of process can be frustrating. We need to do better at meeting people where they are, providing information and answering questions. In this situation, I am committed to helping, as best I can, with further information exchange, and, most especially, addressing the concerns of neighbors. I cannot speak for RMI, but I think they are on the same page. What the Town of Gilmanton ultimately decides to do regarding beneficial use of biosolids is less critical to me than helping to ensure that the process to get there includes having an informed, thoughtful discussion.

Managing biosolids is a busy job, with the same time pressures that many jobs have. Farmers are also incredibly busy people. Therefore, communications are sometimes not as thorough as they might be. Generally, however, the people involved in biosolids management in this region are glad to share information and are open to public input. One of NEBRA's long-standing programs has been focused on increasing the availability of information and the transparency of what our members do in managing wastewater and biosolids. NEBRA has helped push several companies and wastewater treatment facility members to adopt Environmental Management Systems (EMS) for biosolids management; four NEBRA members, including RMI, have achieved certification by the National Biosolids Partnership through an independent, third-party audit process. The EMS program requires attention to the needs of interested parties.

Concern: Orange County, California makes Class A biosolids compost. Isn't that better than Class B land application?

Response: Different types of biosolids have different benefits and uses. Once a sewage sludge becomes a Class A compost, its uses are less regulated (pretty much unregulated in most states). Orange County and about 300 other facilities around the country make Class A biosolids compost and distribute and market it. These include Dover, Merrimack, and Milton, NH. (I'm currently using Merrimack biosolids compost on my home gardens.) The demand is high for such composts, and they sell for \$5 - \$40 or more per cubic yard.

But compost has low levels of nitrogen, and is therefore not of much use to farmers as a nutrient source. Class B biosolids, or the Class A biosolids that are not mixed with sawdust and not treated for as long (such as Concord's), has higher nutrient value, making it good for growing corn and grass for hay. This is what farmers in Gilmanton are interested in. The additional benefit of the nutrients from biosolids or manures is that the nutrients are released slowly, over the growing season, rather than all at once, as is the case with chemical fertilizers.

Orange County, CA still land applies a lot of Class B biosolids on farms, but they also compost some and use some to make a fuel product. Each option has its benefits and potential risks that must be managed.

Concern: Orange County found ways to make money on biosolids.

Response: At this time, no public wastewater treatment facility makes money on biosolids. While it is true that money is a significant concern to all municipalities, the "cost" has to be evaluated from several perspectives, including cost of production and cost of disposal or avoided cost of disposal. Producing Class B biosolids costs less than producing Class A biosolids. Composting can be especially expensive per cubic yard produced; however, it will bring a higher price in the current marketplace than Class B biosolids, thereby potentially reducing net expenses. In New Hampshire, while Class B biosolids are provided to farmers at no cost, the actual costs of recycling Class B biosolids are still less than the cost to landfill the same biosolids. Class A biosolids are a commodity that have value in the market place. Regardless of the commercial value, the revenue from biosolids sales never comes close to offsetting the treatment costs. Wastewater treatment and biosolids management (whether beneficial use or landfill or incineration) are paid for through sewer user fees, taxes, and septage disposal tipping fees.

When it comes to maximizing the benefits from management of sewage sludge, making biosolids for use as a soil amendment is generally considered the best option. It puts to use the nutrients and organic matter. Disposing of biosolids in landfills and incinerators wastes these resources and often comes at a higher economic cost.

Concern: They call it "biosolids" to make it sound pretty.

Response: No. All sludges are not created equal, and while all biosolids may be sludge, not all sludges are biosolids. Many sewage sludges cannot be legally land applied. While the term "biosolids" may sound nicer perhaps, the real reason that the term is necessary is because "sludge" is an inexact term used to refer to many things (including some hazardous wastes). I have known someone to confuse coal sludge with sewage sludge.

In wastewater treatment, "sludge" or "sewage sludge" refers to the solids that settle at the bottom of clarifiers. Once treated adequately to meet regulatory standards for use on land, these solids are called "biosolids." For a thorough discussion of the term "biosolids" – including how it is officially used in many jurisdictions, see www.nebiosolids.org (scroll down the left side of the page to download the document). The New Hampshire legislature has officially adopted and defined the term "biosolids."

Concern: What are other New Hampshire communities doing about biosolids?

Response: New Hampshire consists of 234 municipalities. Attached please find the most recent listing available of the municipalities that have addressed biosolids locally. Currently, about 40 towns (17%) have moratoria, bans, or severe restrictions on biosolids use. Several other communities that have adopted an ordinance (e.g. Center Harbor, Tamworth), have adopted the state regulations by reference. Some communities add a local process in addition to adopting the state regulations.

The fact is, it is easier for a town to impose a ban and not have to deal with this topic than it is to create a local review and oversight process or deal with upset citizens. But sewage sludge is not an optional thing – it has to be managed. We all have some role in its production. Public agencies are responsible for managing biosolids, and for those communities served by septic systems, NH state statute requires that local communities provide, or assure access to, a DES approved septage facility or a department approved alternative option for its residents (RSA 485-A:5-b). Biosolids management is a shared responsibility. We in the profession are tasked with providing the best environmental and cost-efficient solutions, working with public agencies, regulators, engineers, farmers, agricultural advisors, and communities.

Often, the best environmental solution is use on land. We welcome constructive public input and wish to work with communities to find solutions that suit the needs of all.