MATANUSKA-SUSITNA BOROUGH
WASTEWATER & SEPTAGE ADVISORY BOARD

Mike Campfield, Chair
Helen Munoz
Thomas Stoelting

Archie Giddings, Vice Chair
Chris Nall

Gina Jorgensen
Ronald Phillips

AGENDA

REGULAR MEETING
MSB Assembly Chambers
350 E. Dahlia Ave
Palmer, AK 99645

Thursday, August 10, 2017
2:00 p.m.

I. CALL TO ORDER

II. ROLL CALL AND DETERMINATION OF QUORUM

III. APPROVAL OF AGENDA

IV. PLEDGE OF ALLEGIANCE

V. AUDIENCE INTRODUCTIONS

VI. APPROVAL OF MINUTES OF PRECEDING MEETING
- A. May 19, 2017 (regular meeting)

VII. PRESENTATION
- A. Ryan Moyers, HDR – Biosolids

VIII. AUDIENCE PARTICIPATION (*Three minutes per person*)

IX. AGENCY AND STAFF REPORTS
- A. City of Wasilla – Mr. Archie Giddings, P.E., Public Works Director
- B. City of Palmer – Mr. Nate Wallace, City Manager
- C. City of Houston – Ms. Gina Jorgensen, City Council Member
- D. Anchorage Water & Wastewater Utility – Mr. Will O'Malley, P.E., Project Mgmt. Supervisor
- E. Matanuska-Susitna Borough – Mr. Mike Campfield, P.E., Environmental Engineer
- F. State of Alaska, DEC- Mr. Oran Woolley, Wastewater Engineering Associate

X. UNFINISHED BUSINESS

XI. NEW BUSINESS

XII. INFORMATIONAL HANDOUTS AND COMMUNICATIONS

A. MSB Assembly Ordinance 17-029 – Prohibiting Biosolids
B. Documents received from James Skinner at our last WSAB meeting re: biosolids

XIII. COMMENTS FROM THE BOARD

XIV. NEXT MEETING
A. November 9, 2017

XV. ADJOURNMENT

I. CALL TO ORDER

The regular meeting of the Matanuska-Susitna Borough Wastewater and Septage Advisory Board was held on Friday, May 19, 2017, at the MSB Assembly Chambers, 350 E. Dahlia Avenue, Palmer, Alaska. The meeting was called to order at 2:03 p.m. Acting Chairman, Mr. Mike Campfield, chaired the meeting.

II. ROLL CALL AND DETERMINATION OF A QUOROM

Wastewater and Septage Advisory Board members present and establishing a quorum were:

Mike Campfield, P.E.
Archie Giddings, P.E.
Gina Jorgensen
Chris Nall
Ronald Phillips

Wastewater and Septage Advisory Board members absent and excused were:

Helen Munoz
Thomas Stoelting

Staff and Agency Representatives in attendance were:

Debbie Passmore, Board Administrative Support
Alex Strawn, MSB Development Services Manager
Assembly Member Jim Sykes

III. APPROVAL OF AGENDA

Today's agenda was reviewed by the Board and approved by all.

IV. PLEDGE OF ALLEGIANCE

The Pledge of Allegiance was led by Ron Phillips.

V. AUDIENCE INTRODUCTIONS

Will O'Malley, AWWU
James Skinner
Gabriel St. Pierre, PDC

VI. NOMINATION & ELECTION

A. CHAIR

a. Mr. Archie Giddings nominated Mr. Mike Campfield, P.E.; seconded by Ms. Gina Jorgensen. No other nominations were received.

VOTE: no objections and Mr. Mike Campfield, P.E. is the elected Chair.

B. VICE CHAIR

a. Mr. Archie Giddings volunteered as Vice Chair; seconded by Ms. Gina Jorgensen. No other nominations were received.

VOTE: no objections and Mr. Archie Giddings is the elected Vice Chair.

VII. APPROVAL OF MINUTES OF PRECEDING MEETING

A. Minutes for the February 9, 2017 meeting were reviewed by the Board.

MOTION: Mr. Archie Giddings moved to accept; Mr. Ron Phillips seconded.
VOTE: The minutes were approved without objection.

VIII. PRESENTATIONS

A. Alex Strawn, MSB Development Services Manager
   i. Planning Commission Ordinance No. 17-029 prohibiting the land application of Biosolids within the Borough.

IX. AUDIENCE PARTICIPATION (*Three minutes per person*)

James Skinner is a member of the Ag Board but today is speaking as a private citizen. Spoke on how natural biosolids are and that they are part of the cycle of life. Every country in the world is using biosolids to help grow crops, as is every state in the United States, including Alaska. We are lucky that we can use these because there is very little that can be grown or manufactured in Alaska. Spoke on how we are exposed daily to toxins. We have not had one test of biosolids in this Borough except what he got from AWWU. He said he'll give Mike Campfield some of the information that he has, including links to audio that explain how it's done in other communities. Suggests that we do some research before we make any definite decisions on what we are going to do with this. Also, right now a farmer has to go to Alaska Mill & Feed to get fertilizer to the tune of about $100,000 a year for his farm and that's for only three months out of the year. In California, they pay farmers a bit to take the biosolids to sell to people for their gardens, including on their food. This has been going on for at least 55 years and he didn't get sick when he was there. For the farmers' sake, they need a break instead of penalizing them; at least give them the choice to be able to buy it if they want it.

X. AGENCY AND STAFF REPORTS

A. City of Wasilla – Mr. Archie Giddings, P.E., Public Works Director

We finally are making some progress in Wasilla. We bought 80 acres to try to utilize the wetlands for disposal and treatment. We got bogged down for about a year on our hydrology analysis and we finally got that nailed down. We had a meeting this week with DEC to permit a pilot project. As early as 2018, we could be piping some of our treated lagoon effluent over a 30-acre wetland and test to see how it is for nitrate removal. Obviously we're going to have to test to prove up a lot of other things – we do have drinking water wells in the area - but what the ground water modeling shows that the hydraulic loading is much better spreading it out than what we currently do under our drain fields. Just that by itself, even if we have to treat it to a much higher level, the disposal aspects of it are fantastic. We'll possibly have a pilot study in 2018 which would mean we'd basically be constructing an outfall and fencing area and having consultants crawl all over it, monitoring background and monitoring monthly – all kinds of parameters.

B. City of Palmer – Mr. Chris Nall, City Manager

I can give you a quick update on our Wastewater Treatment Facility. We do have a contract for the installation of the wastewater treatment facility – the NBBR system. We will have the first pre-construction meeting on Tuesday with that contractor and our engineer firm and our granting agency, which is USDA. Once that's done, we hope to have a groundbreaking within the next couple of weeks. Then we still will have initial operational capability by the end of July of next summer.

C. City of Houston – Ms. Gina Jorgenson, City Council Member

We now have a Three Bears and a gas station in Houston! Just opened on Wednesday and it's pretty awesome so come out and see us.

D. Anchorage Water & Wastewater Utility – Mr. Will O'Malley, Project Manager

AWWU is working on their two Septage Receiving Station upgrades: Turpin and King Street. We just sent an RFP to Purchasing to select a designer to facilitate the upgrades to both receiving stations. Hope to have the design contract in September, then have the design done and start construction towards the end of summer 2018.

Addressing the rate increases question that Ron had during our last WSAB meeting. Will researched and found that the rate increase was across the board for all of AWWU's sewer customers, not just septage haulers. Everyone got a 9.5% rate increase. That was because of some of the recent projects we've done at the wastewater treatment plants and the increased operations costs. Water rates didn't get an increase.

Mr. Will O'Malley: Has a question for the WSAB. Did we select somebody yet for our facility?

Mr. Mike Campfield, P.E.: yes, we had two RFP's that we put out and we have just recently selected both. The first was for the design (Clark Engineering out of Minnesota), the second was for technical advice and construction management (HDR). Those contracts are just in the finishing touches and will be finalized soon.

Mr. Will O'Malley: When do you hope to start construction on the facility?

Mr. Mike Campfield, P.E.: probably in 2019 but maybe 2018. We still need to get a permit for a new discharge.

Mr. Will O'Malley: Are you doing a phased approach to the construction or will we do the whole thing?

Mr. Mike Campfield, P.E.: We plan to build the whole thing basically at once. It was advertised as possibly phased because of the uncertain growth projections and the volumes of treatment. We don't want to overbuild it and not have the number of customers to pay for it. We'll see what the new data shows; so far the data AWWU recently sent us seems like it's grown over the last couple of years – 100,000 gallons more of septage just at Turpin Street. That's probably mostly coming from the Valley and that makes sense since we've seen a continued population growth in the Valley over the last couple of years although it's slower than it was 10 years ago.

Mr. Will O'Malley: Do the Valley haulers do business in Anchorage, Eagle River or Peters Creek? If so, that could skew the results.

Mr. Mike Campfield, P.E.: When we get with Clark Engineers, they're going to do a capacity analysis using the numbers that you've provided and talking with the haulers to make sure that we don't overbuild the thing.

Mr. Will O'Malley: We might give you some data that has the time and date of when they dump so we can get the peak days and weeks that they mostly dump so we can get the distribution of when they're dumping.

Mr. Mike Campfield, P.E.: Okay, yeah.

Mr. Will O'Malley: So it sounds like maybe 2020 that will be online?

Mr. Mike Campfield, P.E.: That's what we're hoping for. Maybe earlier if we're lucky but that's a pretty realistic date.

Mr. Mike Campfield, P.E.: The rates went into effect in 2017?

Mr. Will O'Malley: Yes.

Mr. Mike Campfield, P.E.: The number that always gets tossed around is $0.08 cents per gallon.

Mr. O'Malley: Well I think it was about $22.50 every 1,000 gallons and now it's like $24.75 every 1,000 gallons.

Mr. Ron Phillips: I think mine is $87 for 3,400 gallons.

Mr. O'Malley: Okay, so right now it's about $24.50 every 1,000 gallons. So, basically it went up 9.5%.

Mr. Mike Campfield, P.E.: Okay, well thank you very much.

E. Matanuska-Susitna Borough – Mr. Mike Campfield, P.E., Environmental Engineer

We'll have our kickoff meeting in June with the designers from Clark Engineering and the technical advisers from HDR.

XI. UNFINISHED BUSINESS

None

XII. NEW BUSINESS

A. WSAB Resolution 17-01, requesting that the Assembly take no action on the proposed moratorium on soil application of biosolids until after the preliminary engineering plans for the proposed Septage & Leachate Treatment and Disposal Facility are complete and the WSAB has had an opportunity to review them and provide its recommendation to the Assembly.

MOTION: Mr. Archie Giddings moved to adopt; Mr. Ron Phillips seconded.

DISCUSSION: Seems to be that food and feed are the concerns, wherever consumption takes place.

The potential for someone to place biosolids say next to residential or a school, that would be a problem because there's no regulations like a land use permit necessary right now but that's probably a good idea. In Fairbanks there was a lawsuit that took years to resolve because of this. There would be value in making a land use permit part of the process. We have had some information from HDR in the past regarding biosolids, at some of our Board meetings about three or four years ago, and at that time that sounded like a promising option for a way to make something positive with our wastewater treatment. I know that they are producing Class A biosolids in at least two communities that I've personally visited (Fairbanks and Kodiak), spread biosolids. Not sure what they do in Anchorage. Anchorage incinerates and they are looking at _____. Like pyrolysis? Yes, something like that. Okay, so there are some other options out there besides land application and these things will be considered in our upcoming study by Clark and HDR

that will give us some guidance on how we should proceed with the disposal or reuse of the biosolids.

Mr. Ron Phillips: Technically, biosolids are cow manure, correct? So if this ordinance passes, a farmer couldn't use that, is that right?

Mr. Mike Campfield, P.E.: Believes that biosolids are only sludge from a wastewater treatment process.

Mr. Ron Phillips: Well, I would change your definition in your amendment to say "sludge from a treatment facility" because you're going to bite some farmers and I understand "Alaska Grown" has quite a market and everything else and I don't think that technically, you know, if you want to push the button calling something biosolids – that is manure. That needs to be addressed.

Mr. Mike Campfield, P.E.: Believes that biosolids and manure are two separate things and I know that some people throw around – even when referring to sludge – you know, that is actually different than just human feces. Some people throw around the term "putting feces on fields" as if that's what biosolids is but it's not that at all. I think there's a lot of education that still needs to happen here at the Borough. We don't have any wastewater treatment facilities so we really don't know about it and that's why … I look forward to working with the engineers who do have a lot of experience and hearing their side of the story.

Mr. Ron Phillips: I all in favor of our proposition to hold the Borough off for just a little bit.

Mr. Archie Giddings: I would like to share a couple of examples that might help the audience. In Wasilla, we have two different kinds of sludge or biosolids. When you clean a lagoon, that's a sludge; that's an odor problem and you can't put that sludge anywhere without a State permit. That's a very different kind of animal. Now we take septic pumpings, we put it in a digester and we put those in drying beds and dry it up for a year, that's some pretty safe stuff to put on a field of grass. It's not necessarily for consumption without testing for heavy metals or any other chemicals in it. It doesn't leave our sight so anything at the proposed Borough facility is going to be treated before anything is done with it. You certainly want to dewater it as much as you can and once you do that, the odor problem starts getting knocked down and then it's a much more easy product to deal with. We're using a lot of broad terms here but we're not going to apply anything anywhere on anything but it needs to be dissected down a little bit.

VOTE: all in favor and Resolution 17-01 passes.

XIII. INFORMATIONAL HANDOUTS AND COMMUNICATIONS

A. Letter from the MSB to Mr. Eugene Haberman
B. Updated WSAB contact list

XIV. COMMENTS FROM THE BOARD

Ms. Gina Jorgensen: I'm good. Enjoy your summer.

Mr. Ron Phillips: I think the definition of biosolids needs to be stated as Archie so well provided for us.

Mr. Archie Giddings: Congratulations to Mike.

Mr. Chris Nall: It was shorter than I thought it would be. Thanks for the welcome. I look forward to working with everyone.

Mr. Mike Campfield, P.E.: Yeah, I want to thank everybody for coming today and sharing with us this information. I think as a Board and as a Borough this is an issue that we need to study a lot further. Knowing that it's an issue of concern, you know, this whole episode has heighted our awareness of the issue and that's a good thing. I want to thank Alex for coming and everyone else. We'll see you guys the next time in August. This meeting is adjourned.

XV. NEXT MEETING

A. Thursday, August 10, 2017, 2:00 p.m. in the MSB Assembly Chambers

XIV. ADJOURNMENT

With no further business at hand, the meeting was adjourned at 2:55 pm.

_____
Mr. Mike Campfield, P.E. Chair

ATTEST:

_____
Debbie Passmore, Board Administrative Support

CODE ORDINANCE

Sponsored by: Assemblymember Sykes
Referred to Planning Commission: 03/21/17
Introduced: 06/06/17
Public Hearing: 06/20/17
Amended: 06/20/17
Adopted: 06/20/17

MATANUSKA-SUSITNA BOROUGH
ORDINANCE SERIAL NO. 17-029

AN ORDINANCE OF THE MATANUSKA-SUSITNA BOROUGH ASSEMBLY ADOPTING MSB CHAPTER 8.07 LAND APPLICATION OF BIOSOLIDS, PROHIBITING THE LAND APPLICATION OF BIOSOLIDS WITHIN THE BOROUGH.

BE IT ENACTED:

Section 1. Classification. This ordinance is of a general and permanent nature and shall become a part of the Borough Code.

Section 2. Adoption of Chapter. MSB 8.07 is hereby adopted as follows:

8.07.005 DEFINITIONS

8.07.010 INTENT

8.07.020 APPLICABILITY

8.07.030 BIOSOLIDS PROHIBITED

8.07.040 NONCONFORMING USES

8.07.050 VIOLATIONS, ENFORCEMENTS, AND PENALTIES

8.07.005 Definitions

(A) For the purpose of this chapter, the following definitions shall apply unless the context clearly indicates or requires a different meaning:

- "Biosolids" means solid, semi-solid, or liquid

residue generated during treatment of domestic sewage in a treatment works; "biosolids" includes domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment processes; and a material derived from biosolids. Biosolids, as used in this chapter, excludes biosolids products that are in a bag or container packaged for routine retail sales through regular retail outlets which are primarily used for residential purposes in limited quantities.

- "treatment works" means facilities installed for the purpose of treating, neutralizing, stabilizing, or disposing of sewage, industrial waste, or other wastes; including but not limited to a plant, disposal field, lagoon, pumping station, constructed drainage ditch or surface water intercepting ditch, incinerator, area devoted to sanitary landfills, or other works.

8.07.010 INTENT

(A) It is recognized that the land application of biosolids poses a potential risk to public safety, and environmental quality; and may not be appropriate, even when applied in accordance with Federal and State regulations. Biosolids may contain heavy metals, pathogenic organisms, chemical pollutants, and synthetic organic compounds which likely pose a risk to public

health and the environment. Application of biosolids is an incompatible land use with almost all adjoining land uses because of the smells, dust, and other immediate undesirable effects.

(B) Land application of biosolids on agricultural farms within the Borough will negatively affect the brand and reputation of all farms within the Borough.

(C) It is the intent of this ordinance to prohibit land application of biosolids on land within the Borough.

8.07.020 Applicability

(A) This chapter applies to all private and public lands in the borough except within the incorporated city limits of Houston, Palmer, and Wasilla.

(B) Disposal of biosolids on municipal-owned land as part of a municipal treatment works is exempt from the provisions of this chapter.

8.07.030 Biosolids prohibited

(A) Land application of biosolids pursuant to 18 AAC 60.500 is prohibited.

8.070.040 Nonconforming Uses

Operations which have a validly issued state permit to apply biosolids on agricultural fields under 18 AAC 60.500 as of the date of adoption of this chapter are

allowed to continue for three years as of the date of adoption of this chapter.

8.07.050 Violations, enforcements, and penalties

(A) Except as otherwise specified in this chapter violations of this chapter are infractions.

(B) Remedies, enforcement actions, and penalties shall be consistent with the terms and provisions of MSB 1.45.

Section 3. Effective date. This ordinance shall take effect upon adoption.

ADOPTED by the Matanuska-Susitna Borough Assembly this 20 day of June, 2017.

VERN HALTER, Borough Mayor

ATTEST:

LONNIE R. McKECHNIE, CMC, Borough Clerk

(SEAL)

VOTE

YES: Sykes, Beck, Colligan, Mayfield, Doty, and Kowalke

NO: McKee

biosolids

[**bahy**-oh-sol-idz]

plural noun

1. nutrient-rich organic materials obtained from wastewater treatment and used beneficially, as for fertilizer:
   The application of biosolids to land improves soil properties and plant productivity, and reduces dependence on inorganic fertilizers.

British Dictionary definitions for biosolids

biosolids

/ˈbaɪəʊˌsɒlɪdz/

plural noun

1. semisolid or solid organic material obtained from the recycling of sewage, used esp as a fertilizer

biosolids in Science

biosolids (bī'ō-sŏl'ĭdz)
(http://content.dictionary.com/help/dictionary/ahsd/pronkey.html)
Solid or semisolid organic material obtained from treated wastewater, often used as a fertilizer or soil amendment.

from James Skinner @ 5-19-2017 mtg

http://lystek.com/about/associations/

Leaders in Biosolids & Organics Management

1 (888) 501-6508

Looking to learn more about the facts surrounding biosolids? We invite you to review a short-film style documentary entitled BIOSOLIDS: NATURALLY SUSTAINABLE from the Water Environment Association of Ontario (WEAO). This exciting and informative piece explores the use of biosolids as a safe, effective fertilizer alternative for Ontario's agricultural sector.

Lystek at the Center of MOU between Fairfield-Suisun Sewer District and the San Francisco Public Utilities Commission

Earth Day 2017 – United Nations Recognizes Wastewater as An Untapped Resource

CTV Ottawa's Live Eye Morning Show Showcases Tomlinson Waste Recovery Centre

Earth Day – UN Recognizes Wastewater as an Untapped Resource

World Water Day – Ten Reasons Why Wastewater Should Not Be "Wasted"

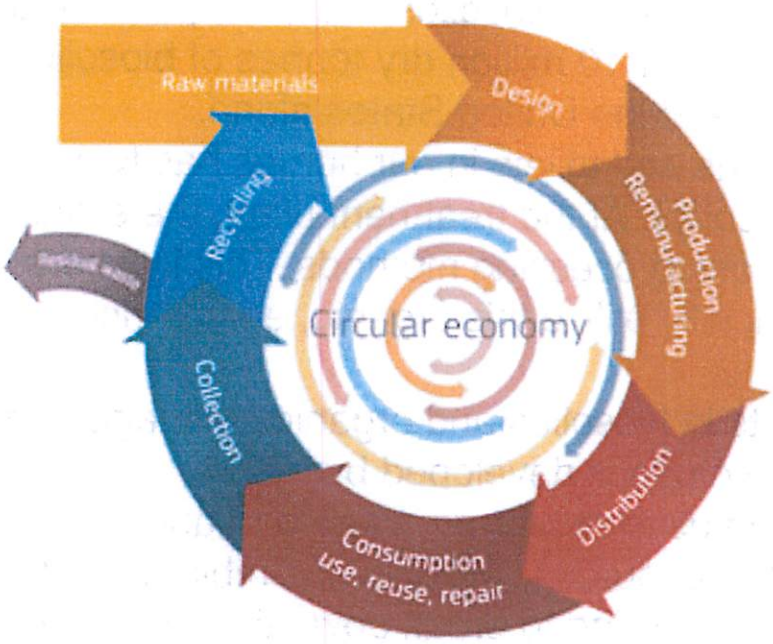
http://lystek.com/the-new-circular-economy-from-waste-to-recovery-to-revenue/

http://compostingcouncil.org

http://compostingcouncil.org/program-news/

THE NEW CIRCULAR ECONOMY: FROM WASTE TO RECOVERY TO REVENUE

In 2007, only 2.6 percent of the nearly 29.2 million metric tons of organic "waste" generated in North America was recovered, due to inefficient collection processes. Through heightened awareness and improved practices, progress has certainly been made since then. However, as populations continue to expand, so too does the sheer volume of residual material we have to deal with. Unfortunately, our current model is still predominantly based on a linear approach of production to consumption to disposal. This continues to contribute and stress our existence, both environmentally and economically. Many of us have taken steps to Reduce, Reuse, and Recycle in our own homes and communities including proper recycling and through other methods of waste diversion but what about on a larger scale?? Can we implement the three R's more effectively to reduce our impact on the natural environment and perhaps even benefit from it?



The Circular Economy. Photo Credit: European Commission DG Envi.

A recent publication from the Ontario Waste Management Association (OWMA) suggests that, yes we can. Implementing changes to our waste management system and modeling it more like a natural, circular ecological system is the key to unlocking many, major benefits , therebyallowing us to view "waste" as less of a problem and more of a valuable resource with vast, potential opportunity.

Strides towards a more circular economy

The list of challenges that result from a linear approach to waste management is long. The linear model results in decreased productive farmland, increased disposal costs, increased use of finite resources, increased organic waste, and increased social, environmental, and economic pressures – to name a few. However, if we can recapture a significant proportion of these materials, and effectively reuse them, some of these stressors can be alleviated.

One example of organic "waste" is biosolids – and we produce a lot of it. In fact, each year, over 10 million dry tonnes of biosolids are generated in Canada and the United States alone.
Wastewater from the drains and toilets in our homes has two components: water and solids. At the treatment plant, the solids are separated using various processing methods. This is where the opportunity to beneficially utilize this organic, energy-rich material lies.
Innovative advancements in biosolids and organics management technology, such as the solutions developed by Lystek International, are allowing us to recapture, transform and repurpose these valuable resources. Utilizing a combination of heat, alkali, and high shear mixing to break down the biological material in these materials, the patented and proven Lystek thermal hydrolysis system provides practical, affordable solutions for converting wastewater treatment plants into Resource Recovery Centres. The multi-purpose system creates an end product with multiple uses, such as the creation of a Class A quality, liquid biofertilizer product called LysteGro.
This unique material, which is ideal for use in agriculture, horticulture, sod farming, golf courses, composting (and more) is helping to close the loop and contribute to a more "circular" economy. Diversion of biosolids and organics from landfills decreases the use of chemical fertilizers, and therefore, our reliance on finite resources, such as mined phosphates. This results in a more sustainable, overall approach to the management of these materials – and the potential benefits of this innovative approach do not end there. The same, simple system can also be leveraged to reduce overall output volumes while enhancing the performance of anaerobic digesters resulting in increased biogas production for green energy. Finally, the "Lystecized" material can also be utilized as a cost effective, alternative carbon source in BNR systems.

Waste to Recovery to Revenue

Generating an organic, sustainable fertilizer is an economical solution for growers and communities. LysteGro biofertilizer can be applied using standard delivery equipment and methodologies. Its liquid format allows for it to be immediately incorporated directly into the soil for more uniform placement, faster uptake of nutrients and realization of the value found in the organic matter present in the product. Ultimately, this can help growers meet the increased demand in food production. The system is also beneficial for generators due to its low operating, energy and maintenance costs.

So, while technologies such as Lystek that can be utilized to sustainably recapture and re-use the value found in biosolids and other organics, there are still many challenges to overcome before we can truly claim we have achieved success in the goal to creating a circular economy. Some great examples of how we can get ether can be found in a recent report issued by the Ontario Waste Management Associations (OWMA). Read more about this here.

In the end, methodologies and approaches (such as the recycling of biosolids and organics) that allow us to mimic nature and implement a more sustainable system of production to resource recovery will also help to create jobs and stimulate our economy. In Ontario alone, it is estimated that a circular economy that recycles and reuses "waste" resources could support up to 13,000 new jobs and result in a subsequent rise to Ontario's GDP of $1.5 billion. By closing the loop, we can reroute these materials and create new sources of revenue to the benefit both today's communities as well as for generations to come.

Gmail

RE: Water Resuse and Biosolids

Wilder, Marty <Mwilder@cosbpw.net> Thu, May 4, 2017 at 12:07 PM
To: "onthego88bc@gmail.com" <onthego88bc@gmail.com>

From: Wilder, Marty
Sent: Thursday, April 06, 2017 4:35 PM
To: 'onthego88bc@gmail.com'
Subject: Water Resuse and Biosolids

Hi Mr. Skinner,

I recall several research papers prepared by the Monterey Regional Water Pollution Control Agency (http://www.mrwpca.org) that addressed using recycled water on crops. I am hoping they have some data on their web page here.

I believe the WateReuse Association at https://watereuse.org/ has several articles and information on pharmaceutical residuals for both water and biosolids.

The California State Water Quality Control Board convened a study and established the Recycled Water Policy that studied this also , see http://www.waterboards.ca.gov/water_issues/programs/water_recycling_policy/docs/rwp_revtoc.pdf

Martin Wilder

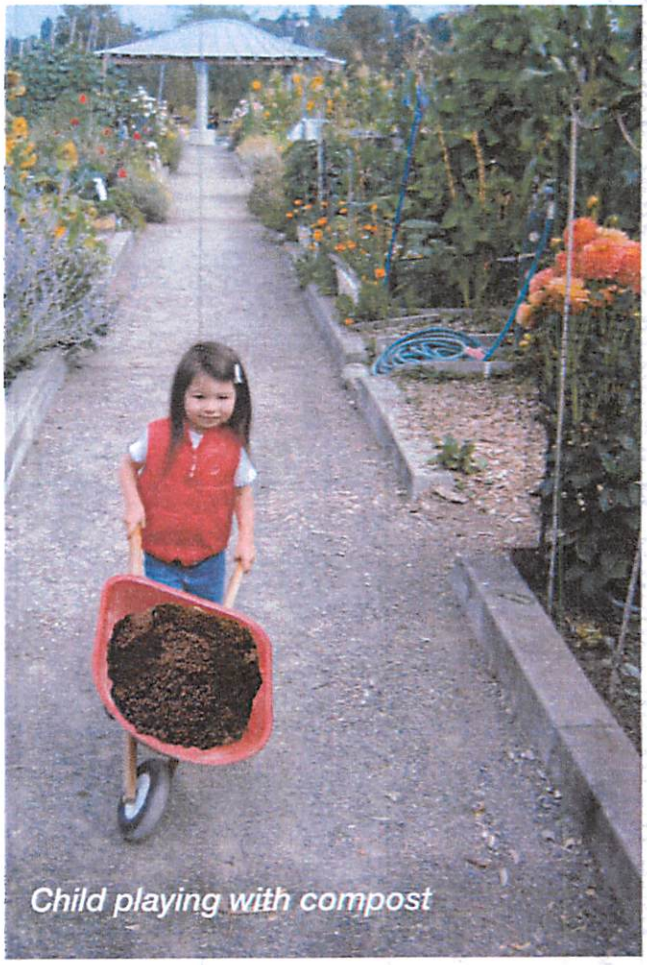
NORTHWEST BIOSOLIDS

Biosolids: Understanding the risk

Putting it into perspective - how does using biosolids or compost made with biosolids compare to chemical exposures in everyday life?

WHAT ARE BIOSOLIDS?

In the wastewater treatment process, microbes break down our waste and create a beneficial resource called biosolids. Biosolids contain nutrients and organic matter and are used as a soil conditioner and fertilizer replacement for crops and forests. Compost made with biosolids is used for gardens and landscapes.



Child playing with compost

WHY ARE BIOSOLIDS GOOD FOR THE ENVIRONMENT?

Biosolids increase plant growth, improve soil quality, and return the nutrients in our waste back to the soil in an endlessly renewable cycle that dramatically reduces our carbon footprint.

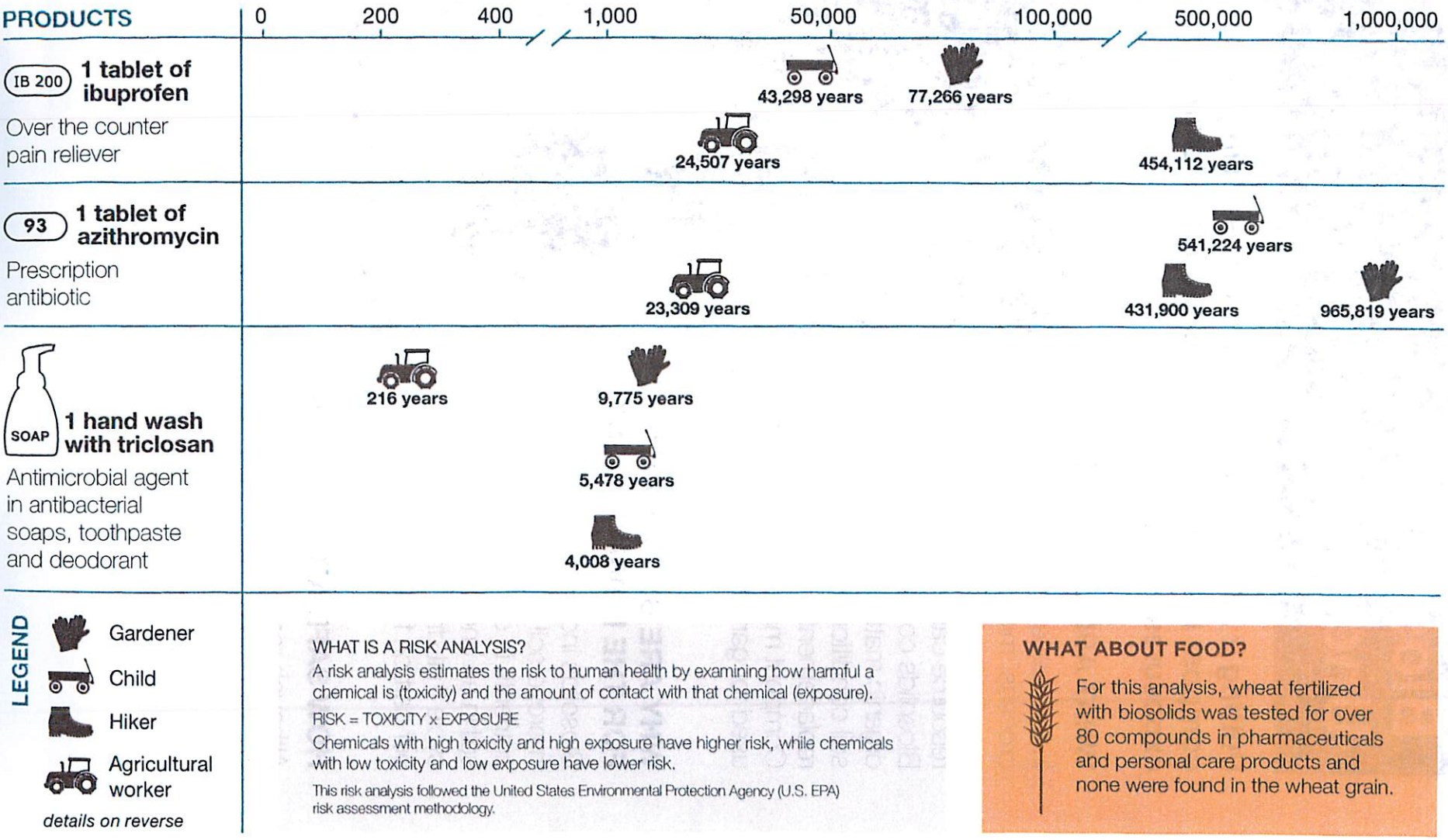
HOW SAFE ARE BIOSOLIDS?

Although research shows that biosolids are safe, there are questions about the trace amounts of chemicals from pharmaceuticals and personal care products that wind up at treatment plants. To help answer these questions and put this in perspective, a risk analysis was used to calculate how biosolids use compares to the amount of these chemicals we deliberately use or encounter in our everyday lives. The results show that risk from biosolids is very, very small.

WHAT'S THE RISK?

It would take many lifetimes of working or playing around biosolids or compost made with biosolids to equal everyday exposure to many common products.

Number of **YEARS** of contact with biosolids or compost made with biosolids required to reach the equivalent of one dose or exposure.



WHAT IS A RISK ANALYSIS?

A risk analysis estimates the risk to human health by examining how harmful a chemical is (toxicity) and the amount of contact with that chemical (exposure).

RISK = TOXICITY x EXPOSURE

Chemicals with high toxicity and high exposure have higher risk, while chemicals with low toxicity and low exposure have lower risk.

This risk analysis followed the United States Environmental Protection Agency (U.S. EPA) risk assessment methodology.

WHAT ABOUT FOOD?

For this analysis, wheat fertilized with biosolids was tested for over 80 compounds in pharmaceuticals and personal care products and none were found in the wheat grain.

WHAT WERE THE SCENARIOS USED FOR THIS RISK ANALYSIS?

	Compost made with biosolids		Biosolids	
	 **Gardener (176 pounds)**	 **Child (33 pounds)**	 **Hiker (176 pounds)**	 **Agricultural worker (176 pounds)**
Parts of body in direct contact	Head, hands, forearms, lower legs, and feet	Head, hands, forearms, lower legs, and feet	Hands and arms	Hands and arms
Amount swallowed	100 mg (4% teaspoon)	200 mg (8% teaspoon)	100 mg (4% teaspoon) & 1 liter runoff water	100 mg (4% teaspoon)
Contact frequency	52 days/ year for 20 years	52 days/ year for 6 years	12 days/ year for 20 years	220 days/ year for 25 years

The average person working or playing around biosolids or compost made with biosolids would not regularly get it all over their body, accidentally eat some of it, or drink muddy runoff water. However, this risk analysis overestimated exposure to ensure confidence in the results.

NORTHWEST BIOSOLIDS

Unearthing Sustainable Solutions

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nebra

North East Biosolids & Residuals Association

Recycled organics: Tools for sustainability.

Microconstituents /Trace Chemicals

Biosolids and other organic residuals contain traces of chemicals, sometimes called "microconstituents." Wastewater, from which biosolids are derived, may contain many natural and synthetic chemicals, some of which are toxic in high enough concentrations. These chemicals come from natural sources, households, businesses, and street drains.

Microconstituents include chemicals in pharmaceuticals & personal care products (PPCPs).

Since 2000, there has been growing concern about the potential impacts of traces of synthetic chemicals in the environment. This has been driven by the ability of scientists to measure smaller and smaller amounts - parts per billion, parts per trillion, etc. Wherever scientists have looked - in surface waters, in soils, in mammals, in the arctic – they have found traces. These traces get into the environment directly from homes and businesses and daily activities.

Are traces of synthetic chemicals in biosolids a concern for the environment?

NEBRA has long tracked this issue, to continually improve our understanding of the biosolids and residuals products we manage. So far, researchers have found some impacts of certain trace chemicals - pharmaceuticals, for example – to aquatic organisms living downstream of wastewater treatment facilities.

But there have been no significant detrimental effects shown from normal biosolids applications to soils in full-scale, field studies using actual biosolids. This is likely due to the fact that healthy soils are biologically active media that break down and/or sequester trace synthetic chemicals, reducing the potential exposure of biological organisms.

You can help protect biosolids quality. Toilets & drains are not trash cans. Learn more...

Human exposures and human health risks from microconstituents in biosolids and other residuals are likely lower than the much higher levels experienced in daily use of these chemicals. The fact is, not many people are directly exposed to biosolids. On the other hand, many of the trace chemicals people mention in biosolids are in regular use in homes and businesses; that is where human exposure occurs.

The potential risks from microconstituents in biosolids to soil biota and other environmental receptors have not been studied as much, but also appear to be low. And it makes sense for research to continue.

In the meantime, it is worth noting that soils, biosolids, and the treatments biosolids go through are effective at reducing concentrations of most microconstituents. Biosolids recycling to soils can be a solution in dealing with such chemicals, helping remove them from aquatic systems and destroying or sequestering them, as noted in this 2014 presentation, which provides advice on what biosolids managers can do to mitigate potential concerns, even as scientific understanding continues to improve.

Leading research scientists continue to discuss this topic (September 2015)....

See...

- **NEBRA Information Update: Perfluorinated Alkyl Substances (PFAS) in Biosolids** - v.2 February 2017
- **MABA/Toffey: Update on POPs in Biosolids**, January 20, 2017
- **McCarthy and Loyo-Rozales, 2015: *Risks Associated with Application ofMunicipal Biosolids to Agricultural Lands in a Canadian Context – Literature Review*.** The most comprehensive literature review to date regarding trace organic chemicals and pathogens in biosolids.
- **Biosolids and Soil: Remarkable Media for Managing Trace Organic Chemicals of Potential Concern**, slides from a webinar presented by Ned Beecher for the NEWEA Microconstituents Committee, March 24, 2016
- **Biosolids: Understanding the Risk.** A Risk Analysis Brochure from NW Biosolids, 2016.
- **Organic Contaminants in Biosolids** - video - Dr. George O'Connor (Univ. of Florida)
- **NEBRA Information Upate: Microconstituents in Biosolids** (2011)
- **PPCPs in Wastewater & Biosolids**, *in the* ***New York Water Environment Association*** *journal Clearwaters, Fall 2008.*

One way to assess impacts of the mixture of trace chemicals in biosolids & residuals is with **bioassays**. Learn more... (photo courtesy of Puddephat/ McCarthy, Ryerson Univ.)

NEWEA Specialty Conference on Microconstituents, Oct. 2014.

- **The NEBRA office has additional information, references, and referrals.**

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Biosolids for Agriculture

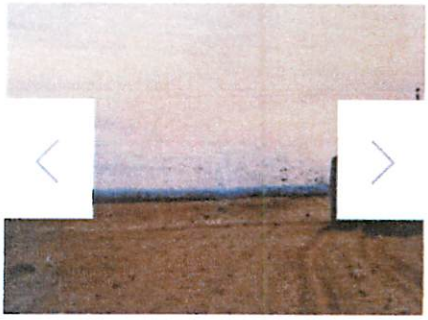
Used in bulk on farms, just like animal manures...

Most Class B biosolids are used on farms, on sites with little public contact. Examples of Class B biosolids used for agriculture are from water resource recovery facilities (WRRFs) at Essex Junction VT, Nashua NH, Franklin NH, and Lewiston-Auburn ME.

In New England and eastern Canada, Class B biosolids are commonly applied with typical manure-spreading or -injecting equipment to help fertilize fields growing feed crops for dairy animals, especially corn and grass hay. Farmers rely on biosolids as one more source of organic matter and critical nutrients, especially nitrogen, phosphorus, and micronutrients (copper, zinc, iron, calcium, magnesium, etc.)

Some Class A biosolids are managed in the same ways as Class B biosolids: in bulk, applied with manure-spreading equipment, fertilizer spreaders, or liquid injectors. Generally, site permits are not required for Class A biosolids, because pathogens are minimal. Examples of Class A biosolids managed on farms in bulk are from WRRFs in Halifax NS, Concord NH, and Guelph ON.

All biosolids should be applied at the agronomic rate and in accordance with best management practices (BMPs), ensuring the optimum application of nutrients for the crop to be grown while protecting ground and surface waters.

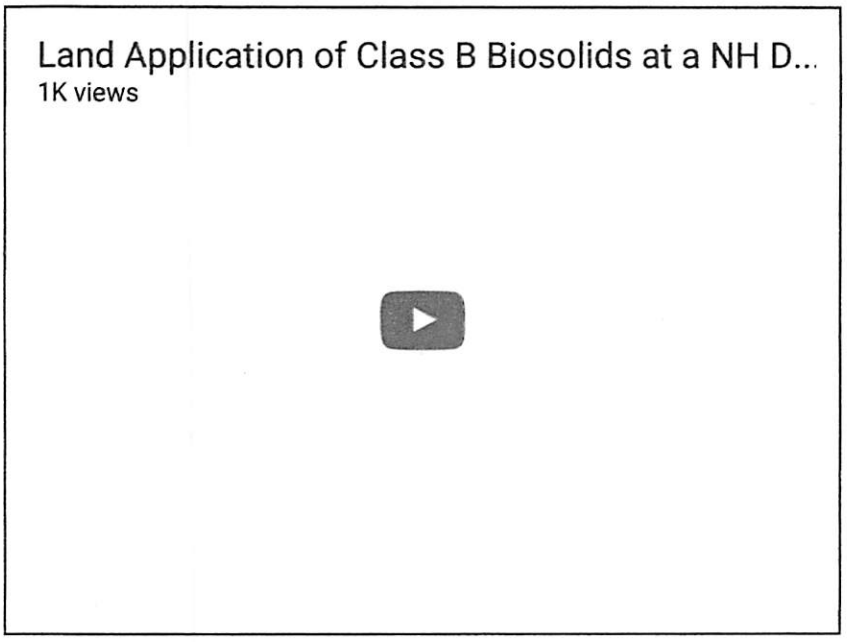


Bulk Biosolids Sources:

- **New England & NY:**
  Agresource
  Casella Organics
  Harvest Power
  quasar energy group
  Resource Management Inc.
  WeCare Organics
- **Atlantic Canada:**
  N-Viro Soil
  Transaqua
- **Ontario:** Lystek

See:

- Biosolids - A low-cost fertilizer option (*American Agriculturist*, March 2006)
- Land Application of Class B Biosolids at a NH Dairy Farm (below)



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