RESOLUTION #18-03

A RESOLUTION OF THE TREASURE COAST REGIONAL PLANNING COUNCIL SUPPORTING COLLABORATION WITH THE FLORIDA REGIONAL COUNCILS ASSOCIATION, FLORIDA ASSOCIATION OF COUNTIES, FLORIDA LEAGUE OF CITIES, FLORIDA SMALL COUNTY COALITION, FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION, FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES, AND OTHER PARTNERS TO INCREASE AWARENESS OF BIOSOLIDS MANAGEMENT ISSUES IN FLORIDA, PRIORITIZE THE REDUCTION AND EVENTUAL ELIMINATION OF THE LAND APPLICATION OF HUMAN WASTEWATER BIOSOLIDS, AND ESTABLISH A PILOT PROJECTS PROGRAM FOR FUNDING NEW STATE OF THE ART WASTEWATER TECHNOLOGIES TO IMPROVE RECOVERY AND AFFORD MORE EFFICIENT USE OF HUMAN WASTEWATER BIOSOLIDS

WHEREAS, the Treasure Coast Regional Planning Council's (TCRPC) geographical area is comprised of Indian River, Martin, St. Lucie, and Palm Beach counties and the 52 Municipalities contained therein; and

WHEREAS, the TCRPC is a multi-purpose regional governmental entity with policy responsibility in the areas of affordable housing, economic development, emergency preparedness, energy, regional health, natural resources and regional transportation, and

WHEREAS, it is time to work together as a region and state to increase awareness of current and future biosolids management issues, examine potential water quality impacts from our current practices, and explore new wastewater treatment technologies to improve biosolids resource recovery and management options; and

WHEREAS, the TCRPC wishes to collaborate with Florida Regional Councils Association, Florida Association of Counties, Florida League of Cities, Florida Small County Coalition, Florida Department of Environmental Protection, Florida Department of Agriculture and Consumer Services, and other partners to accomplish these objectives and rethink 21st Century human wastewater management practices for Florida.

NOW, THEREFORE, BE IT RESOLVED THE TREASURE COAST REGIONAL PLANNING COUNCIL ENCOURAGES THAT:

1. The State of Florida and its local governments prioritize the reduction and eventual elimination of the land application of human wastewater biosolids; and
2. The State of Florida establish a Pilot Projects Program for funding local utilities to implement new state of the art wastewater treatment technologies to improve recovery and afford more efficient use of human wastewater biosolids resources.

DULY ADOPTED by the Treasure Coast Regional Planning Council this 20th of July, 2018.

Reece J. Parrish
Chair

Michael J. Busha
Executive Director

TREASURE COAST REGIONAL PLANNING COUNCIL

MEMORANDUM

To: Council Members AGENDA ITEM 6

From: Staff

Date: July 20, 2018 Council Meeting

Subject: Management Alternatives for Human Wastewater Biosolids -- Resolution

Introduction

One of the by-products or residuals of the wastewater treatment process is called biosolids or the wet sludge that is left behind after initial processing, which is then collected for further treatment and processing. In Florida, biosolids are either land-applied as a soil amendment to improve agricultural productivity or disposed of in landfills. Either way it is an important source of water, energy, nitrogen, and phosphorous resources that some suggest could be recovered and used more efficiently. There is also concern statewide that excess nutrients from land application of human waste biosolids reach surface waters as a result of rainfall runoff and continue to increase the occurrence of chronic harmful algal blooms (HABs). The purpose of this item and the attached resolution is to inform Council's member counties, municipalities, and their associations about this regional issue and potential solutions.

Background

Today, Florida's central sewer wastewater treatment facilities produce approximately 340,000 dry tons of biosolids. Approximately 100,000 dry tons of biosolids qualify as Class B biosolids, which are treated sewage sludge meeting U.S. Environmental Protection Agency (EPA) guidelines for land application as fertilizer with restrictions, and are allowed to have detectable levels of pathogens. Another 100,000 dry tons of biosolids are deposited in various landfills throughout the state. The final 140,000 dry tons of biosolids are further processed, dried, and composted with material from the landscape industry to produce approximately 200,000 tons of Class AA biosolids, which can then be distributed and marketed as fertilizer. This class of biosolids is unregulated and land-applied mainly on pasture and, to a lesser extent, citrus.

Bahia grass pastures in Florida can generally produce satisfactorily without total Phosphorous (TP) fertilization, and every crop in Florida can be grown economically without the use of biosolids as fertilizer. Biosolids provide an inefficient form of fertilization that provides only a fraction (less than 40%) of plant available nitrogen that can result in both total Nitrogen (TN) and TP over fertilization, which may negatively affect surface and other coastal waters. Of additional concern are compounds found in human wastewater biosolids which may include: hormones; steroids; bacteria; viruses; polychlorinated biphenyls (PCBs); pharmaceuticals; antibodies; polybrominated diphenyl ethers (PBDE fire retardants); polyfluoroalkyl substances

(PFAS) like Teflon, polishes, waxes, paints, and household cleaning products; organics; metals; and artificial sweeteners. Although these materials are applied in a manner that may not be harmful to humans according to EPA guidelines, their accumulated secondary impacts are not entirely known.

Both Class B biosolids and Class AA biosolid fertilizers contain approximately 5.5 % TN and 2.2% TP. Therefore, land application of 300,000 dry tons of Class AA and Class B biosolids deposits over 33 million pounds of TN and 13.2 million pounds of TP on agricultural lands each year. Peer reviewed studies, such as those related to the Lake Okeechobee drainage basins, estimate that +/- 12% of both TN and TP imports will find their way to surface waters. This basin currently receives over 1,000 dry tons of TP from Class AA biosolids, which could amount to 120 dry tons or 240,000 pounds of TP to surface waters. Large areas within Florida such as the basins draining into Lake Okeechobee already exhibit enough legacy phosphorus to last for the next 25 to 60 years. While the practice of land-applying Class B biosolids was recently banned in the Lake Okeechobee, Caloosahatchee, St. Lucie River and Everglades watersheds, the St. Johns River Upper Basin received nearly 74,000 tons of Class B biosolids in 2016, or approximately 74% of the Class B biosolids produced in Florida, in its watershed.

Analysis

Agricultural crops can be grown profitably without land applying this inefficient nutrient source. There are alternative technologies that should be considered such as: pyrolysis; vapor recompression distillation; boiler technology electric generation; and supercritical water oxidation to improve recovery of resources and sustainable management of biosolids (see Attachment A).

Recently, the Florida Department of Environmental Protection announced the formation of a statewide Biosolids Technical Advisory Committee to: 1) establish a better scientific understanding of potential nutrient impacts of the land application of biosolids; and 2) evaluate current biosolids management practices and potential opportunities for enhancements to better protect Florida's water resources (see Attachment B).

Conclusion

Florida's population continues to grow at historic rates. Today, the Treasure Coast Region's estimated 1.6 million people on public sewer generate about 87,000 dry tons of biosolids each year. In 30 or 40 years from now that total could increase by 50 percent. With this in mind, the region is encouraged to begin a serious conversation among local elected officials, utility directors, the agriculture industry, and others about what the future of biosolids management should look like in 30 years. Is it the same as we are doing now, or is it something completely different, using new technology to create more strategic, sustainable, and valuable reuse products? All of this starts with increasing awareness about the current status of: 1) how we manage biosolids in Florida; 2) our progress in meeting water quality goals established through approved Basin Management Action Plans and other measures; and 3) new technology aimed at improving biosolids resource recovery and water quality.

Recommendation

Council should approve Resolution No. 18-03 and authorize its distribution to local government associations and involved state agencies.

Attachments

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DULY ADOPTED by the Treasure Coast Regional Planning Council this 20th of July, 2018.

Reece J. Parrish	Michael J. Busha
Chair	Executive Director

Executive Summary

Treasure Coast Regional Planning Council
Regional Biosolids Symposium
Charting the Future of
Biosolids Management
June 08, 2018

On Friday June 08, 2018 the Treasure Coast Regional Planning Council and the Indian River Lagoon National Estuaries Program sponsored a "Regional Biosolids Symposium" at the Indian River State College Chastain Campus, Wolf High-Technology Center in Stuart Florida.

With 170 people in attendance, Martin County Commissioner Doug Smith welcomed everyone and put forth a purpose and challenge for the attendees to listen to one another and find a better, more sustainable path forward on how we manage and reuse our biosolids resources.

Henry Dean, St. Johns County Commissioner and former Executive Director for both the St. Johns River Water Management District and the South Florida Water Management District provided opening remarks encouraging that with open minds and cooperative efforts, we can solve any problem.

Jennifer Smith, the Director of the Southeast District, Florida Department of Environmental Protection announced the creation of its Biosolids Technical Advisory Committee to evaluate current management practices and potential opportunities for enhancements to better protect Florida's water resources.

The event included presentations by wastewater utility representatives from Palm Beach, Martin, St. Lucie, and Indian River counties and the Florida Department of Environmental Protection about standard utility practices and current challenges, programs, and regulations related to providing wastewater services cost effectively to the public and managing disposal of human waste biosolids.

Today, Florida's central sewer wastewater treatment facilities produce approximately 340,000 tons of biosolids which are the human waste effluents from central sewer wastewater treatment facilities. Approximately 100,000 dry tons of biosolids are designated as Class B biosolids which are treated sewage sludge that meets U.S. Environmental Protection Agency guidelines for land application as fertilizer, and are allowed to have detectable levels of pathogens. Another 100,000 dry tons of biosolids are deposited in various landfills throughout the state. The final 140,000 dry tons of biosolids are further processed, dried, and composted with material from the landscape industry to produce approximately 200,000 tons of Class AA biosolids. These biosolids can then be distributed and marketed as fertilizer. This class of biosolids is unregulated and land-applied mainly on pasture lands, and to a lesser extent on citrus.

Both Class B biosolids and Class AA biosolid fertilizers contain approximately 5.5% Total Nitrogen (TN) and 2.2% Total Phosphorus (TP). Therefore, the 300,000 dry tons of land-applied Class AA and Class B biosolids contribute over 33 million pounds of TN and 13.2 million pounds of TP to agricultural lands each year. While the practice of land-applying

Class B biosolids was recently banned in the Lake Okeechobee, Caloosahatchee, St. Lucie River and Everglades watersheds, the St. Johns River Upper Basin in 2016 received nearly 74,000 tons of Class B biosolids in its watershed.

A representative from the University of Florida's Institute of Food and Agricultural Services (IFAS), Maria Silveira Ph.D., Associate Professor at the University of Florida Range Cattle Research and Education Center, presented information on the fertilizer recommendations for pastures in Florida and explained the differences in P solubility and availability from various P sources and described the limitations associated with current soil testing using P as a tool to predict environmental hazards.

Presentations by Del Bottcher Ph.D., President of Soil & Water Engineering Technology, and Anthony Janicki Ph.D., President of Janicki Environmental, Inc., included information on the current conditions and probable future trends of nutrients in lakes, streams, springs and our coastal estuaries. Their conclusions were though we have made progress in reducing nutrients within our surface waters we still need to do more.

The symposium also included Edith Widder, Ph.D., CEO and Senior Scientist for the Ocean Research and Conservation Association (ORCA) who commented on some concerns related to compounds found in human wastewater biosolids which may include: hormones; steroids; bacteria; viruses; polychlorinated biphenyls (PCB); pharmaceuticals; antibodies; polybrominated diphenyl ethers (PBDE fire retardants); polyfluoroalkyl substances (PFAS) like Teflon, polishes, waxes, paints, and household cleaning products; organics, metals, and artificial sweeteners. Although these materials are applied in a manner that may not be harmful to humans according to EPA guidelines, their accumulated secondary impacts are not entirely known.

Many Florida residents are alarmed about the recent water releases from Lake Okeechobee, including the threats from the presence of blue-green algae blooms. According to Dr. Widder, blue-green algae also known as cyanobacteria, can produce toxins in surface waters that can cause problematic respiratory issues. The toxins also specifically target the liver and studies have documented liver damage and cancers from these toxins in cases from China to the Indian River Lagoon. The toxins may reduce crop production when found in irrigation water and they may actually be absorbed by the crop.

Gary Roderick an environmental consultant and former Environmental Administrator for the Southeast District Office of the Florida Department of Environmental Protection gave a comprehensive presentation on nutrient loading and the importance of and progress being made by implementing South Florida Basin Management Action Plans (BMAPs). He stressed the importance that bahia grass pastures in Florida can generally produce satisfactorily without TP fertilization and every crop in Florida can be grown economically without the use of biosolids as a fertilizer. It was indicated that biosolids provide an inefficient form of fertilization that provides only a fraction (less than 40%) of plant available nitrogen that can result in both TN and TP over fertilization, which may negatively affect surface and other coastal waters.

The main highlight of the symposium came in the afternoon when Todd O. Williams, P.E., BCEE, Principal Technologist, Residuals Resource Recovery Glohal at Jacobs, presented the importance, value and urgency of improved nutrient recovery and sustainable biosolids

management. His presentation was immediately followed by a panel on the technologies and future trends in biosolids management.

The symposium audience was given a look into the future of biosolids management. Instead of depositing biosolids into the landfill or using agricultural lands to dispose of human biosolid wastes, there are alternatives that allow for improved recovery and sustainable management. The future of biosolids management was discussed by a panel chaired by Fred Mussari, Ph.D., Vice President of Technology at BCR Solid Solutions and included three new technologies.

Although each process is different, all three processes recover useful byproducts from human biosolids and capture its stored energy, water, and nutrients.

Kobe Nagar, P.E., Senior Process Engineer, Pratt School of Engineering at Duke University, presented Supercritical Water Oxidation or SCWO, which is a process that occurs in water at temperatures and pressures above a mixture's thermodynamic critical point. Under these conditions water becomes a fluid with unique properties that can be used to quickly convert biosolids and other hazardous wastes into hot water, electricity, Co2, N2, O2, inorganic minerals and distilled water. Duke's vision for the future of SCWO technology is decentralized SCWO treatment facilities that can be housed in a standard 40 foot long container capable of servicing 6,000 people a day. Duke has developed a working industrial scale prototype (A) capable of treating the fecal waste of 1,000 people per day. A new prototype (B) is under design. Its current focus is on technology transfer and commercialization, with the establishment of a spinoff company to bring the first units to the market in 2020.

The Advanced Pyrolysis Technology system was presented by Steve Wirtel, P.E., Executive Vice President of Business Development at Kore Infrastructure. This technology is made up of individual processes that operate in series: material handling, drying, lower-temperature pyrolysis, and gas conversion into renewable natural gas, methane and hydrogen for power generation. These gases can be used to power the process, with the excess sold on the open market. The process produces a crystallized form of carbon termed "biochar." Biochar sequesters carbon in the soil and can be used as a soil supplement to provide soil structure that helps retain key nutrients and water. It does not contain nitrogen or phosphorus. The equipment used in each step is modular, mobile, and compact to enable multiple system configurations and ease in siting requirements.

Peter Janicki, P.E., of Janicki Industries and Bioenergy provided information on Vapor Recompression Distillation (VRD) and Boiler Technology Electric Generation. The combination of these two technologies are also made up of individual components and processes that can operate in series to produce electricity and fresh distilled water. TN is converted to aqueous ammonium, and the TP ends up in its elemental form in the final ash. The aqueous ammonium can be made available as a more efficient N source for fertilizer. The electricity produced provides the power needed to operate the facility with excess electricity sold back to the power grid. The TP in the reduced volume of final ash can now be transported economically to areas that are currently depleted of nutrients such as the "bread basket region" in middle North America from years of corn, wheat, and soy bean production, or the Caribbean which has seen soil nutrient depletion from years of sugar cane production and other practices.

A final "Roundtable Panel" of summit participants and elected officials was moderated by the Executive Director of the Indian River Lagoon National Estuaries Program, Duane De Freese, Ph.D., with questions also being taken from the public. The discussion and public comment centered around how best to move forward to prioritize the review of existing alternatives based on a better understanding of the performance, economics, and funding needed for constructing Pilot Projects that will eventually reduce negative nutrient impacts to surface waters. It was suggested by local elected officials on the Roundtable, that assembling a virtual panel of national experts to help local governments vet new wastewater technology proposals would be extremely helpful for them to have access to when they need it. It was also suggested that state and local governments join together in establishing a Pilot Project Implementation Program that would create Request for Proposals to encourage competitive bids on new wastewater technologies capable of achieving wastewater treatment goals and outcomes for the region.

The video/audio proceedings and PowerPoint presentation from the symposium may be found at: www.tcrpc.org/announcements/Biosolids/Summit.html

From: Florida Department of Environmental Protection [mailto:FloridaDEP@public.govdelivery.com]
Sent: Friday, June 08, 2018 4:12 PM
To: Michael Busha
Subject: DEP Announces Creation of Biosolids Technical Advisory Committee

The Florida Department of Environmental Protection is committed to protecting Florida's water and natural resources. Vital to our mission is working cooperatively with state, local and federal agencies, local communities as well as various stakeholder and interest groups that provide key input, local knowledge and additional data and information to help inform our regulatory and restoration programs.

DEP is aware of an increased interest in better understanding the nutrient impacts of the land application of biosolids. Because the Department remains committed to using science to guide our efforts, we are creating a Biosolids Technical Advisory Committee (TAC) to evaluate current management practices and potential opportunities for enhancements to better protect Florida's water resources.

DEP is currently seeking nominations for membership on the committee, which will include agricultural interests, environmental groups, local governments, academia and research entities, representatives from large and small wastewater utilities (including the Florida Rural Water Association), biosolids haulers and the Florida Onsite Wastewater Association. The deadline for nominations is 5 p.m., July 6, 2018. Any person interested in learning more about the TAC or submitting a nomination may email BIOSOLIDS_TAC@floridadep.gov.



Prioritize Consideration of Alternatives to the Land Application of Treated Human Waste From Central Sewer Wastewater Biosolids

PROBLEM: Excess nutrients from land application of human waste from wastewater treatment effluent termed "biosolids", reach surface waters as a result of rainfall runoff and continues to increase the occurrence of chronic harmful algal blooms (HABs).

BACKGROUND: Today Florida's central sewer wastewater treatment facilities produce approximately 340,000 dry tons of biosolids. Approximately 100,000 dry tons of biosolids qualify as Class B biosolids which are treated sewage sludge meeting U.S. EPA guidelines for land application as fertilizer with restrictions and are allowed to have detectable levels of pathogens. Another 100,000 dry tons of biosolids are deposited in various landfills throughout the state. The final 140,000 dry tons of biosolids are further processed, dried, and composted with material from the landscape industry to produce approximately 200,000 tons of Class AA biosolids, which can then be distributed and marketed as fertilizer. This class of biosolid is completely unregulated and land-applied mainly on pasture and to a lesser extent citrus. However, citrus fertilized with human biosolids seldom qualify for overseas export.

Bahia grass pastures in Florida can generally produce satisfactorily without total Phosphorous (TP) fertilization, and every crop in Florida can be grown economically without the use of biosolids as a fertilizer. Biosolids provide an inefficient form of fertilization that provides only a fraction (less than 40%) of plant available nitrogen that can result in both total Nitrogen (TN) and TP over fertilization, which may negatively affect surface and other coastal waters. Of additional concern are compounds found in human wastewater biosolids which may include: hormones; steroids; bacteria; viruses; polychlorinated biphenyls (PCBs); pharmaceuticals; antibodies; polybrominated diphenyl ethers (PBDE fire retardants); polyfluoroalkyl substances (PFAS) like Teflon, polishes, waxes, paints, and household cleaning products; organics; metals; and artificial sweeteners. Although these materials are applied in a manner that may not be harmful to humans according to EPA "guidelines," their accumulated secondary impacts are not entirely known.

Both Class B biosolids and Class AA biosolid fertilizers contain approximately 5.5 % TN and 2.2% TP. Therefore, land application of 300,000 dry tons of Class AA and Class B biosolids deposits over 33 million pounds of TN and 13.2 million pounds of TP on agricultural lands each year. Peer reviewed studies, such as those related to the Lake Okeechobee drainage basins, estimate that +/- 12% of both TN and TP imports will find their way to surface waters. This basin currently receives over 1,000 dry tons of TP from Class AA biosolids which, could amount to 120 dry tons or 240,000 pounds of TP to surface waters. Large areas within Florida such as the basins draining into Lake Okeechobee already exhibit enough legacy phosphorus to last for the next 25 to 60 years. While the practice of land-applying Class B biosolids was recently banned in the Lake Okeechobee, Caloosahatchee, St. Lucie River and Everglades watersheds, the St. Johns River Upper Basin in 2016 received nearly 74,000 tons of Class B biosolids, or approximately 74% of the Class B produced in Florida, in its watershed.

SOLUTION: Agricultural crops can be grown profitably without land applying this inefficient nutrient source. There are alternative technologies that should be considered such as: pyrolysis; vapor recompression distillation; boiler technology electric generation; and supercritical water oxidation to improve recovery of resources and sustainable management of biosolids.

RECOMMENDATION: Prioritize the reduction and eventual elimination of the land application of human wastewater biosolids. Establish a "Pilot Projects Program" for funding new state of the art wastewater technologies to improve recovery and afford more efficient use of human wastewater biosolids resources.