



BIOSOLIDS

MESSAGING BOOK



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Executive Summary

This messaging book is intended to serve as a guide to help WEF staff, members, and water utilities educate the public, stakeholders, media and other external parties about biosolids.

This messaging book is a resource for communicating about biosolids in ways that are factual, science-based, and easily understandable by the lay person. This includes responding to, or proactively pursuing media placements, drafting speeches or remarks for use at any events or meetings with external audiences (especially those open to the public), and creating content to be posted online or on social media channels.

These messages serve as an overall umbrella that can be adapted to a suit a variety of purposes, including but not limited to: FAQs, talking points, elevator speeches, boilerplate language, fact sheets, brochures, and website language.

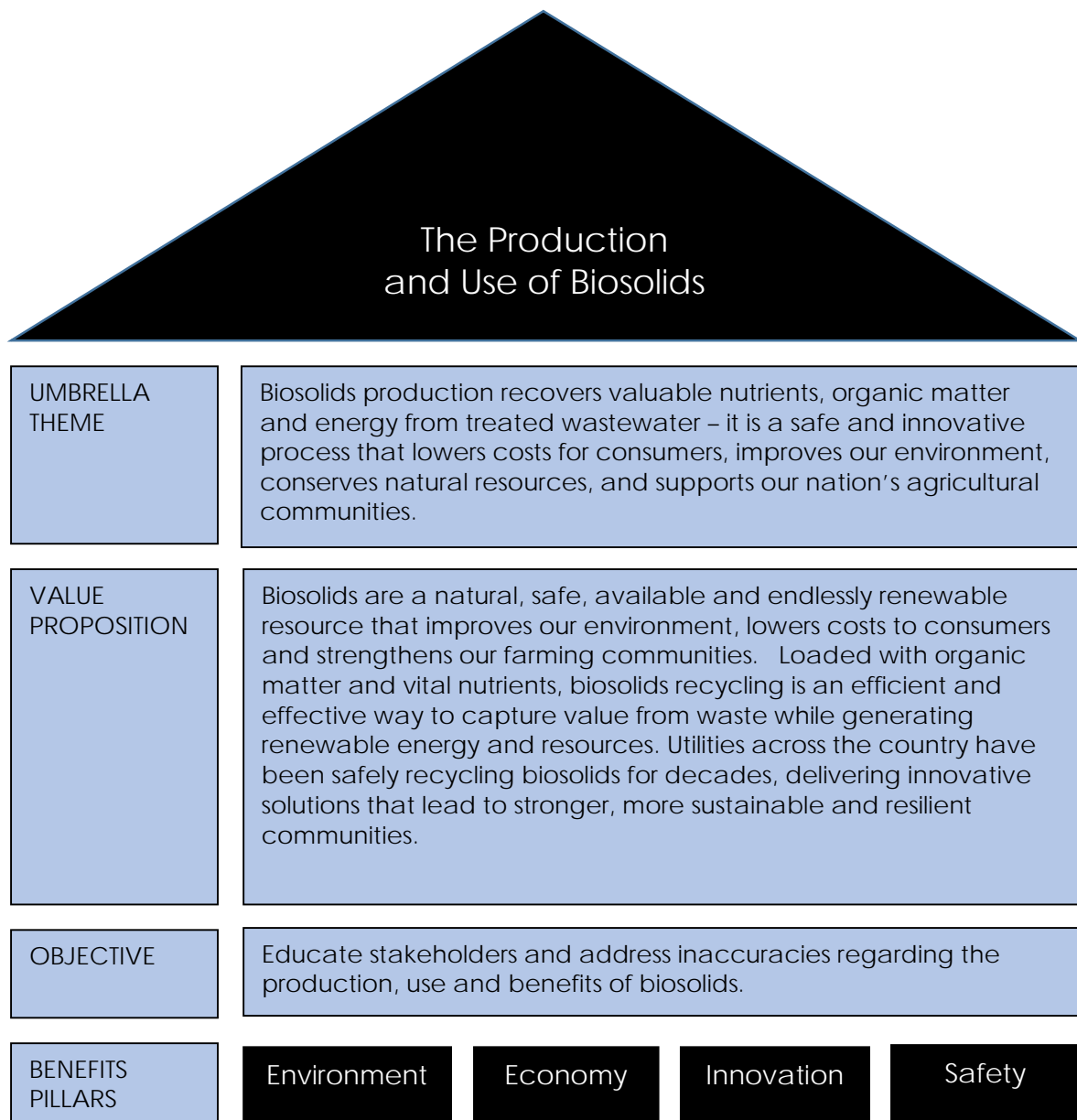
This messaging book is not intended, however, to include all messaging that can be used to address utility-specific issues or local opposition. Rather, it is intended to serve as the foundation for how we explain the proven benefits of biosolids and resource recovery in general. It will be critical that WEF members and other biosolids stakeholders coordinate closely with the community for further guidance on how best to adapt these messages as part of a broader localized communications strategy. Consideration should be given to relevant audiences, geography, and the nature of any potential opposition a biosolids program may be facing.

Overview of Biosolids Messaging Process

Messaging and Communications Planning

The messages and guidance outlined in this document are based on extensive qualitative and quantitative research that reinforces the need to rapidly address concerns at the local level while amplifying broader positive themes at the national and international levels. There is clearly a need for science-based, easily understandable information about the benefits of biosolids and the importance of their effective management to a sustainable planet.

Messaging Framework



Value Proposition Matrix

DIFFERENTIATOR	PROOF POINT 1	PROOF POINT 2	KEYWORD
Biosolids are a natural and endlessly renewable and available resource	Biosolids are loaded with organic matter and vital macronutrients essential to our environment and economy.	The energy contained in wastewater and biosolids is estimated to exceed the energy needed for wastewater treatment.	Natural
The production and use of biosolids reduces waste	The wastewater treatment process produces valuable byproducts with uses ranging from fuel to soil enhancement.	Biosolids recycling helps municipalities by reducing landfill usage and extending the lifespan of limited landfill space.	Efficient
Biosolids lower greenhouse gas emissions	Applying biosolids to land has been shown to increase carbon storage in soils, reducing greenhouse gas concentrations.	Biosolids reduce the need to use chemical fertilizer, which offsets significant greenhouse gas emissions.	Sustainable
Biosolids generate renewable energy	The production of biosolids using anaerobic digestion allows utilities to capture natural biogas, reusing it as a beneficial fuel.	The use of energy generated at U.S. wastewater treatment plants could meet 12% of U.S. electricity demand.	Renewable
Biosolids are an important and growing part of creating resilient local economies	Farming communities realize significant economic benefits from applying biosolids as they are a cost-effective way to safely and effectively fertilize their crops.	Biosolids also contribute significantly to the non-farm economy by lowering costs to ratepayers.	Economical
Biosolids help maintain and beautify communities at an affordable cost	Biosolids provide a cost-effective source of organic fertilizer for home and community gardens, golf courses and municipal parks.	Biosolids are often provided free to the community, or at a greatly reduced cost compared to other similar products.	Neighborly
Biosolids improve the health of soil and increase crop yields	Studies show biosolids treatment influences grain moisture at harvest and significantly increases yields of corn.	In addition to boosting plant growth and land reclamation, biosolids have been found to promote rapid timber growth and increase protein content of forage.	Effective
Biosolids are regularly monitored to ensure compliance with all federal, state and local safeguards and regulations	Biosolids are treated to exacting safety standards set by the EPA and state regulatory agencies, and are regularly monitored by producers to ensure compliance with the highest quality standards.	Biosolids undergo a rigorous set of treatment processes to destroy harmful pathogens.	Healthy
Biosolids are a driver of innovation within and beyond the wastewater sector	Nearly 300 water and wastewater resource recovery utilities in the U.S. are recovering energy by converting their biogas to electricity.	Increasing global demand for food production means biosolids will provide needed solutions.	Pioneering

Benefits: Environment

Umbrella Message: Biosolids are a natural and endlessly renewable resource that contributes significantly to our environmental wellbeing. The production and use of biosolids creates substantial value across the environment by reducing waste, recovering natural resources, generating renewable energy, lowering greenhouse gas emissions, and improving the quality of our waterways.

Land & Water

Key Messages

- Biosolids are rich in nitrogen, phosphorus, and many other key nutrients needed to grow plants.
- Biosolids are a proven and effective natural alternative to chemical fertilizers because they do more than just replace nutrients. Rich in nutrients and organic matter, biosolids actually improve the health of the soil and allows for the slow release of key compounds like nitrogen and phosphorous.
- By recycling biosolids, we cut down on the manufacture and application of chemical fertilizers, which can cause damage to local waterways and aquatic organisms by contributing to algae growth.
- Biosolids are rich in organic matter and offer water-holding capacity, offsetting the need for irrigation.
- Biosolids are an excellent soil amendment, growing plants quickly and making sites less prone to problems like topsoil erosion and water runoff.
- The use of biosolids in large-scale reclamation projects shows significantly higher levels of positive return than could be achieved with the use of chemical fertilizers. Not only does this promote healthy plant growth and restore reclamation areas to their natural state, it also creates habitat and forage for wild animals who live on or around these sites.
- Biosolids programs are helping to transform how water resource recovery facilities operate by reducing harmful waste before it enters the system. Known as “source control,” the implementation of biosolids programs seeks to minimize potentially harmful waste upstream by working with the industrial sector to divert waste to other treatment methods before it enters the wastewater system. This innovation creates value across the supply chain and maximizes efficiencies for biosolids treatment.

Related Facts

- Approximately 45 billion gallons per day—an estimated rate of 182 gallons per person per day— of wastewater is treated and safely managed in the U.S.
- The U.S. Environmental Protection Agency estimates that approximately 7 million tons of biosolids are generated daily by the 16,500 wastewater treatment facilities nationwide.¹

¹ [State of Washington Department of Ecology](#)

- Soil and crop management best practices—including the “liberal use of biosolids”—have been found to re-sequester 60-70% of the lost soil organic carbon (SOC) from soils in the U.S. Midwest.²
- Applying highly treated organic material including biosolids and composts to agricultural land has been shown to increase carbon storage in soils and contribute significantly to the reduction of greenhouse gas emissions.³
- In addition to boosting plant growth, improving soil health, and land reclamation, biosolids have been found to promote rapid timber growth.⁴

Waste

Key Messages

- The solids extracted during the wastewater treatment process are too valuable to waste. They are loaded with organic matter and vital nutrients essential to our environment and economy. If biosolids are not captured, treated and reused, they end up in our municipal landfills.
- By treating this rich, organic matter to exacting standards, biosolids become a means to reduce our total waste while also offsetting the energy-intensive production and use of chemical fertilizers, which create their own waste streams.
- Biosolids help create a closed-loop system where a potential waste is captured, treated to exacting safety standards, and reused in environmentally beneficial ways.
- The production and use of biosolids helps municipalities by reducing landfill usage and extending the lifespan of limited landfill space.
- By treating and reusing material that would otherwise be sent to landfills, utilities are also reducing their operating costs and passing the savings on to consumers.

Related Facts

- More than 3.5 million tons of biosolids are kept out of U.S. landfills each year through treatment and reuse that benefits agriculture, forests and land restoration needs.⁵
- Landfills produce methane gas that must be collected and reused or disposed by flaring and venting. Landfills are the third largest source of methane emissions in the U.S., accounting for 20% of emissions, only behind agriculture and natural gas systems.⁶ When biosolids are diverted from landfills, they reduce methane emissions.
- Already, numerous states and municipalities are struggling to find adequate landfill space.⁷ By eliminating biosolids from the waste sent to local landfills, and turning it into beneficial uses to help grow crops and improve soil, biosolids recycling becomes an important link in a waste-reduction chain.

Air

² [The Ohio State University School of Natural Resources](#)

³ [University of South Australia Centre for Environmental Risk Assessment and Remediation](#)

⁴ [U.S. Environmental Protection Agency](#)

⁵ [North East Biosolids and Residuals Association \(NEBRA\)](#)

⁶ [U.S. Environmental Protection Agency](#)

⁷ [University of Maine Mitchell Center for Sustainability Solutions](#)

Key Messages

- The anaerobic digestion process transforms biosolids and allows utilities to capture natural biogas, using it as a beneficial fuel instead of using fossil fuels, which contribute to climate change.
- Once the gas is captured, it can be used for a variety of purposes including heating and electricity generation – both of which reduce costs to consumers while also reducing the need to purchase gas or other fuel to power facilities. This also means that biogas actively offsets carbon emissions from energy sources that would otherwise have to be used.
- The use of biosolids also reduces the need for chemical fertilizers, which contribute significant amounts of greenhouse gas emissions in their manufacture and use.
- Dried biosolids can be used in place of fossil fuels for industrial uses such as cement manufacturing, and also for reducing the amount of raw materials needed. Dried biosolids have approximately two-thirds the energy value of a low-grade coal, and also contain many of the same elements found in the raw materials used to produce Portland Cement. The displacement of fossil fuels in cement manufacturing also significantly reduces greenhouse gas emissions from this process.

Related Facts

- The federal Combined Heat and Power (CHP) Partnership estimates that 2.3 million metric tons of carbon dioxide emissions annually — the equivalent of 430,000 cars on the road— could be offset if existing wastewater treatment plants that employ anaerobic digestion to treat biosolids installed energy recovery facilities to recycle biosolids into biogas.⁸
- Energy generated at U.S. wastewater treatment plants could meet 12% of U.S. electricity demand, the equivalent of all annual power needs of New York City, Houston, Dallas and Chicago.⁹
- In Virginia, Alexandria Renew Enterprises beneficially reuses 100% of their biosolids and has generated close to 130 million cubic feet of renewable energy — enough gas to heat nearly 800 homes for a year — with the use of methane gas generated in the biosolids production process.¹⁰

⁸ [National Association of Clean Water Agencies \(NACWA\)](#)

⁹ [National Association of Clean Water Agencies \(NACWA\)](#)

¹⁰ [National Biosolids Partnership, Water Environment Federation](#)

Benefits: Economy

Umbrella Message: Biosolids are an important and growing part of creating resilient local economies, where resource recovery contributes to economic growth by creating jobs, reducing utility costs that benefits ratepayers, and enabling renewable energy production.

Key Messages

- Biosolids are an important and growing part of making local economies resilient and strong.
- Farming communities receive significant economic benefits from biosolids as they are a cost-effective way to safely and effectively fertilize their crops, improve the health of their soil and increase their crop yields compared to conventional chemical fertilizer. Combined, these benefits add up to real economic gains for farmers across the country.
- Communities across the country are experiencing higher costs for landfill space at the same time that additional space is becoming harder to obtain due to zoning and siting restrictions. The beneficial use of biosolids helps to extend the life of landfills by diverting it from the waste stream and turning it into economically beneficial products.
- The wastewater utility sector employs tens of thousands of people across the nation. By adopting biosolids use programs, utilities can provide additional employment in fields as diverse as engineering, science, facility maintenance and transportation.
- A key component in the production of biosolids is the generation of biogas, a natural process that occurs during the anaerobic digestion process. Biogas has numerous beneficial uses, including direct combustion to heat facilities or as a fuel source to generate electricity. The savings generated from the production and use of biogas can directly benefit ratepayers by lowering utility bills through lower operational costs.
- Communities across the country use biosolids products to help maintain and beautify their local parks, recreational facilities and golf courses. Often these products are either free to the community, or offered at a greatly reduced cost compared to other similar products, thereby providing substantial savings to America's cities and towns while enhancing public spaces.
- The development of new uses and applications of biosolids is a growing field of study. Research and development into the various uses of biosolids shows significant potential for continued growth.

Related Facts

- A four year study conducted by the University of Nebraska found that crop yields (and therefore farm income) were significantly increased after a single application of biosolids. Biosolids treatment was also found to influence grain moisture at harvest and significantly increase yields of corn.¹¹
- In Oakland, California, the East Bay Municipal Utility District's production of biogas is saving the utility and its customers approximately \$3 million annually by reducing its electric power purchases.¹²

¹¹ [University of Nebraska-Lincoln](#)

¹² [National Biosolids Partnership, Water Environment Federation](#)

- In 2014, Louisville and Jefferson County's biosolids program generated more than \$440,000 in sales.

Benefits: Innovation

Umbrella Message: Biosolids are a driver of innovation within and beyond the wastewater sector by enabling the creation of new products, developing new resource recovery techniques and contributing substantially to the knowledge and expertise of the industry as a whole.

Key Messages

- Biosolids are revolutionizing the wastewater treatment industry, transforming it into a resource recovery system able to produce valuable products and capture nutrients like phosphorous and nitrogen, while also generating energy to reduce operational costs.
- Biosolids programs demonstrate the viability and value of resource recovery, and continuous improvement in new technologies, scientific methods and research. This ongoing advancement in the field exemplifies the sector's dynamism and commitment to innovation.
- The adoption of biogas use from the biosolids production process is one of the most exciting, innovative and transformative developments in the past decade. Wastewater utilities are now able to capture biogas for a wide range of uses, including generating electricity that can be sold back into the grid to help reduce operational costs while offsetting carbon emissions.
- Biogas generation relies on highly innovative technologies that are able to harness the power of thermal hydrolysis and anaerobic digestion to efficiently produce significant quantities of this renewable resource. The technology behind the production of biogas is rapidly evolving and promises to increase yields while creating high quality products.
- Some biosolids are produced with advanced technologies (such as thermal hydrolysis and anaerobic digestion) that use extreme heat, pressure and biological processes to remove pathogens found in wastewater and ensure the resulting product meets or exceeds the same safety standards required for all fertilizers and soil products.
- America's leading academic institutions are actively researching new ways to further innovate in the biosolids sector, including quantifying the energy generation potential of biosolids; identifying less costly methods for biosolids production so even small wastewater treatment facilities can make use of their renewable resources; and creating a database that identifies all the renewable resources that can be used to further increase biogas production.
- As food demand is expected to rise with an increasing global population, demand for chemical nutrient products is also expected to increase. This represents an opportunity for innovative uses of biosolids in this field. Dried biosolids can be used in place of fossil fuels for industrial uses, such as cement manufacturing, reducing the amount of raw materials needed. Dried biosolids have approximately two-thirds the energy value of a low-grade coal, and also contain many of the same elements found in the raw materials used to produce Portland Cement. The displacement of fossil fuels in cement manufacturing also significantly reduces greenhouse gas emissions from the process.

Related Facts

- Nearly 300 water resource recovery facilities in the U.S. are recovering energy by converting their biogas to electricity, a number that is rapidly growing and providing a lower cost fuel that can replace natural gas for heating and power generation needs.
- In 2015, DC Water became the first North American utility to use an innovative thermal hydrolysis system to enhance anaerobic digestion and convert highly treated biosolids into electricity. The system is providing one-third of the plant's power, saving approximately \$10 million annually in electricity costs, and an additional \$13 million in savings on trucking expenses and chemicals.¹³
- In Oakland, California, the East Bay Municipal Utility District's production of biogas is saving the utility approximately \$3 million annually by reducing its electric power purchases.¹⁴
- According to the US EPA, USDA and Department of Energy, with proper support, more than 11,000 additional biogas systems could be deployed in the United States, which would result in an estimated \$33 billion in capital deployment for construction activity, 275,000 short-term construction jobs and 18,000 permanent jobs to build and run the digesters.¹⁵

¹³ [The Washington Post, 2015](#)

¹⁴ [National Biosolids Partnership, Water Environment Federation](#)

¹⁵ [U.S. Department of Agriculture, U.S. Environmental Protection Agency, U.S. Department of Energy](#)

Benefits: Safety

Umbrella Message: For decades, biosolids have been used safely and effectively to reduce waste, recover natural resources and improve soil conditions because they are held to exacting safety and quality standards. Biosolids are regularly monitored to ensure compliance with federal, state and local regulations. Hundreds of academic and scientific studies have shown that biosolids are a safe and responsible alternative to chemical or animal fertilizers.

Key Messages

- Biosolids are treated to exacting safety standards set by the EPA and state regulatory agencies, and are regularly monitored by producers to ensure compliance with the highest quality standards.
- Hundreds of studies over the course of decades have shown that biosolids are a safe and natural way to improve the health of our soils.
- The National Academy of Sciences has reviewed current practices, public health concerns and regulatory standards, and has concluded that *"the use of these materials in the production of crops for human consumption when practiced in accordance with existing federal guidelines and regulations, presents negligible risk to the consumer, to crop production and to the environment."*
- Biosolids undergo a rigorous set of treatment processes that include physical, chemical and biological processes that assist in pathogen reduction.
- Biosolids generally come in two types – Class A and Class B. Class A biosolids are treated to exceptional standards, have zero detectable levels of pathogens, and are used directly as compost and on home gardens, lawns and other public spaces to promote healthy soil conditions and water retention.
- Class B biosolids are also treated to very high safety and quality standards, and are typically applied to farmland where the material is mixed with soil to help fertilize and condition the land for healthier crops. In many cases, farmers prefer Class B biosolids as they contain greater levels of plant-available nitrogen.¹⁶
- EPA's policy that promotes the beneficial use of municipal biosolids is based on years of extensive study and experience. Studies show that neither contact with biosolids nor consumption of foods grown with the organic fertilizer pose a risk to human health.¹⁷

¹⁶ [Oregon Association of Clean Water Agencies](#)

¹⁷ See, biosolidsresources.org

Related Facts

- Utilities across the country have been safely producing biosolids for decades. In Wisconsin, the Milwaukee Metropolitan Sewerage District has been running one of the nation's largest recycling programs since 1926 as a leading supplier of safe and trusted organic nitrogen fertilizers.¹⁸
- The National Biosolids Partnership (NBP) Biosolids Management Program (BMP) is a voluntary program to help public and private sector organizations improve the quality of their biosolids management programs. Over 30 organizations, representing more than 12% of the biosolids generated in the U.S., have achieved certification.
- The trace levels of metals present in some types of biosolids do not pose a threat to human health or the environment. In fact, such metals as nickel, zinc, and copper serve as nutrients that are essential for healthy plant growth – enhancing the value of biosolids as fertilizer compared to traditional chemical fertilizers.¹⁹
- The strictly controlled application of biosolids to soil, along with normal microbial activity enables physical and chemical processes occurring within the soil environment to break chemicals down into ones of lesser or no concern. For example, studies have found the presence of phthalates in biosolids at a level of no concern, 10-50 ppm; comparatively, the concentration in household dust and some plastic products range from 1,000-60,000 ppm.²⁰

¹⁸ [Milwaukee Metropolitan Sewerage District](#)

¹⁹ [Pennsylvania Biosolids Recycling Alliance](#)

²⁰ [State of Washington Department of Ecology](#)

Audience Specific Messaging

Audience	Most Relevant Benefits
General Public – Current/Potential Opponents	Safety, Environment & Economy
Regulators	Safety & Environment
Elected Officials	Economy, Safety & Environment
Agricultural Interests	Social & Economic
Industry / Internal Audiences	Innovation, Safety & Environment
Environmental Community/ NGOs	Environment & Safety

Guidance

Overall Guidance

Research shows that members of the general public as well as decision makers and influencers can learn from education about wastewater treatment, including understanding the safety and economic benefits of biosolids. Avoid overly positive or embellished language as credibility is vital. All messaging must be factual and grounded in science.

Best practices related to language include the following:

1. Clearly define the problem of wasting a valuable natural resource and the solution of effective biosolids management.
2. Refer to biosolids in neutral or positive terms as it relates to recycling, reuse and recovery of valuable nutrients and organic materials.
3. Address the stigma of the original source by referencing the transformative water and wastewater treatment process and citing the benefits natural organic matter bring compared to energy-intensive, chemical fertilizers.
4. Use consistent terminology that is clear and understandable to the general layperson.
5. Avoid overly technical jargon and instead concisely highlight the end-use consumer benefits. For example, consumers are not generally aware of the details of how anaerobic digestion works, but they can relate to the need for an alternate, lower cost fuel source.

Guidance on Language

This section includes guidance on language and messaging to use and to avoid. This guidance is based upon original research conducted to understand messaging around biosolids, as well as from an in-depth analysis of media coverage discussing biosolids.

Helpful Terms to Educate

- Reuse
- Recycling
- Recovery
- Organic Material
- Products
- Valuable Nutrients
- Wastewater treatment process
- Affordable
- Natural
- Nutrients

Inappropriate Language to Avoid

- Sludge
- Toxic
- Dumping
- Human Waste
- Poop
- Humanure
- Disposal