MEETING MINUTES

PRINCE WILLIAM COUNTY SOLID WASTE ADVISORY GROUP (SWAG)

March 9, 2023

ATTENDANCE

SWAG Members:

Present: Richard "Buck" Arvin, Mark Bonner, Tiziana Bottino, Ned Greene, Will Linter, Lynn Meadows, Jane Wyman

Absent: Virginia Douglas, James Gestrich, Harry Glasgow, Keisha Strand

Solid Waste Division Staff: Roscoe Coles, Monica Gorman, Trent Magill

Guests: None

OPENING

Ms. Gorman called the meeting of the Solid Waste Advisory Group to order at 7:03 p.m. via Microsoft Teams.

AGENDA TOPICS

INTRODUCTIONS

Ms. Gorman welcomed everyone to the meeting via Microsoft Teams. No guests or visitors were present.

APPOINTMENTS

None

PUBLIC COMMENTS

None

APPROVAL OF THE MINUTES

A quorum was present. The draft minutes of the January 12, 2023, SWAG meeting were approved.

OPERATIONAL UPDATES

Landfill Operations

Ms. Gorman introduced the new Landfill Operations Manager, Roscoe Coles.

The new HHW vendor, Clean Harbors, resumed service at the landfill on February 8. The vendor had a few late start times initially, but they seem to have everything worked out at this point. The public collection hours remain the same, Wednesday and Saturday, from 10:00 a.m. to 5:00 p.m.

A Public Information Session about the Renewable Natural Gas facility was held on February 21. The session was hosted by the County and our vendor, Opal Fuels, on February 21 to provide the public with information about the facility and the proposed natural gas line from the landfill to a Washington Gas main distribution line. About 20 members of the public attended the session.

Balls Ford Road Operations

Ms. Gorman stated that the increase in organic material coming to the compost facility continues. This February was much higher than the same month last year. Fairfax County has been delivering leaves to the facility and still has a backlog of material, so we anticipate they will continue these deliveries into March and possibly April.

Between the compost facility and the mulch yard at the landfill, Freestate Farms has processed over 50,000 tons of organics during the first eight months of this fiscal year. The total for last fiscal year was less than this amount.

Recycling/Diversion Programs

Ms. Gorman reported that the County's yard waste diversion program started up again on March 1. Freestate Farms estimates that the yard waste program resulted in an additional 6,500 tons to the compost facility last year.

Upcoming events, which Deborah mentioned in January, include: Compost Awareness Day on May 6 at Balls Ford Road Facility from 10:00 a.m. to 1:00 p.m.; and paper shredding at Pfitzner Stadium parking lot on May 20 from 9:00 a.m. to 1:00 p.m.

Ms. Bottino asked about the glass recycling program, and Ms. Gorman responded that a new contract for glass was awarded last summer.

Ms. Gorman mentioned that the County will need a recyclable material contract to process the recyclables collected at the landfill, compost facility, and drop-off sites. Other jurisdictions in Northern Virginia are paying upwards of $100 per ton for processing recyclables.

Mr. Bonner stated that glass can be recycled into sand and asked if we have considered looking at that as an option. Ms. Gorman said that we could purchase the equipment to process glass, but there is no use for that material at the landfill. Currently, the County has a vendor, CAP Glass, that collects the glass and recycles the material at no cost.

PROJECT UPDATES

2023 SWAG Work Plan

Ms. Gorman presented the draft 2023 Work Plan that the SWAG reviewed at the January meeting. No members requested additional changes, so staff finalized the Work Plan (attached). The SWAG had no further comments or questions on the 2023 Work Plan.

Adopted Solid Waste Management Plan (SWMP)

Ms. Gorman reported that the Towns of Dumfries and Haymarket have sent their SWMP approval letters to staff for inclusion in the plan submittal to the Virginia Department of Environmental Quality (DEQ). Staff is still waiting on approval letters from the Towns of Occoquan and Quantico.

Division Staffing

Ms. Gorman reported that since the SWAG met in January, the Division has had two announced retirements and no new hires.

Recruitment efforts are ongoing for the Landfill Administrative Specialist, Sr. Environmental Program Manager, and Scalehouse Operator. A first round of interviews is scheduled next week for an Administrative Coordinator.

Mr. Coles successfully recruited three new Maintenance and Operations Workers, and those candidates are in the final stages of the recruitment process.

Waste Conversion Technology Update

Mr. Magill gave a slide presentation on waste conversion technologies (presentation attached). Following are Mr. Magill's talking points for each slide.

Slide 1 – Title slide, "Waste Conversion Technologies"

Slide 2 – The County has a strong desire and an obligation to ensure best practices are employed at the landfill for the safety of people and the environment. As our population continues to grow and our economy remains healthy, our society generates more trash than we can beneficially manage. That is to say that we are throwing away things that may still have value in the form of chemical energy, and some items may generally be made of materials that are already needed for manufacturing processes. Waste Conversion Technologies can help us reintroduce waste as products for beneficial reuse. This mindset requires a bit of reframing the question about what waste really is.

Slide 3 – I want to briefly touch on established alternative waste disposal technologies and then dive deeper into a few emerging technologies designed to reuse waste and help landfills last longer.

Slide 4 – Generally speaking, digestive processes require intensive separation processes, mostly manual with some automation, to isolate organic fractions in MSW and can provide usable products from organics. This could be biogas, compost, or bio-oil when using high heat and pressure. Per the U.S. Environmental Protection Agency (EPA), it is difficult to know the total number of anaerobic digesters out there since they rely on survey responses. The EPA's 2018 report, highlighting 2015 data, counted 154 confirmed operational in the U.S. Typically, the facilities use a lot of liquid to help accelerate the decomposition of the waste. A landfill is not typically recognized as an anaerobic digester. Still, the exact same processes occur in a landfill, and the same gases are produced over a longer period. The U.S. has over 2,300 sites producing biogas in all 50 states: 316 anaerobic digesters on farms; 1,269 water resource recovery facilities using an anaerobic digester (~860 currently use the biogas they produce); 66 stand-alone systems that digest food waste; and, while not all of these are true anaerobic digesters, 652 landfill gas projects. Example: In 2015, the Blue Plains Sewage Treatment Plant in Washington D.C. started advanced anaerobic digestion using

thermal hydrolysis, which together produces about 10 MW (~8,000 homes) from biogas generated in these vessels. It receives over half of the organic matter produced from the wastewater treatment process, leaving the rest for Class A biosolids creation (food-grade soil amendment). Barriers: This system is designed largely for very wet/liquid feedstock, such as manure from dairies, sludge filtered from sewage water, organic fractions of municipal solid waste, food waste, yard clippings, and crop residues. Diversion of organic wastes to composting is expanding across the country. Per the U.S. Department of Agriculture (2021), there are 4,700 industrial composting facilities in the U.S. that compost yard trimmings, food scraps, biosolids, bioplastics, etc. Given the aerobic nature of the decomposition process, it would be difficult to capture heat from this process. Prince William County promotes and requires source separation of vegetative waste through the yard waste requirements, which was first started in October 2021. The County's partner, Freestate Farms, implemented advanced aerobic digestion at the Balls Ford Road Compost Facility. The facility required a high upfront cost, but yard waste is processed in about one-third the time of conventional composting, generating a safe, reusable and valuable resource for enhancing soil nutrition. Barriers: We can all compost at any scale to create a beneficial product, but before an advanced facility is constructed, it would be highly beneficial to first establish a steady source of quality (source-separated) feedstock via contracts. This process requires fairly large land space and significant financial costs in labor and equipment. An additional example of Anaerobic Digestion: a Roanoke Gas Company is seeking to partner with a western Virginia wastewater plant to capture, treat, and deliver biogas to local customers, but environmental groups have objections to how the deal is structured.

Slide 5 – Waste-to-Energy (WTE) Facilities or mass-burn incinerators were common in our region 25 years ago but are no longer easily permitted. Example: Arlington/Alexandria Covanta WTE is capable of handling 975 tons of waste each day while producing 21 megawatts (MW) of energy. This facility was determined to be the most environmentally sustainable means of disposing of waste generated by the Jurisdictions after reduction, reuse and recycling, and has had a stellar environmental record, achieving emissions well below the EPA's permitted levels. Barriers: the DEQ has not permitted additional WTE facilities; factors include NIMBY, high initial capital costs, and evolving regulations that require additional air pollution control equipment.

Slide 6 – Today, 75 mass-burn plants in 25 states (mainly NE) consume about 34 million tons per year (tpy), or 13% of the nation's trash, down slightly from 1990. Together, they produce roughly 2.5 GW of power (typically 550 kWh/ton), nearly 1/10th of what solar produces (EHP, 2016). It is difficult to confirm how many of the WTE plants are solely for mass incineration and which ones may be burning RDF. Mass burn facilities are more popular in Europe, where land space is limited. Since there is currently no perceived land shortage in the U.S. and startup costs are so high for incinerators, the EPA views landfilling as a more viable option. The amount of ash generated by a WTE facility ranges from 15-25 percent (by weight) and 5-15 percent (by volume) of the total waste processed.

Slide 7 – Refuse-derived fuel (RFD) is best for homogenous waste-stream sources like industrial sources. RFD and Solid recovered fuel (SRF) can be used as a secondary fuel for co-combustion facilities, kilns, or constant intense heat requirements. SRF is a higher quality subset of RDF, and the output can be customized to meet requirements for specific heating needs. However, it is more costly to produce due to the higher degree of separation needed to isolate the most-combustible materials. Benefits: a European standard requires producers to detail the calorific value, chlorine

and mercury content; less reliance on fossil fuels; reduced carbon footprint and lower greenhouse gas emissions; and a constant supply of high-quality fuel at a relatively stable price. Examples: Renovare Environmental and Entsorga West Virginia, LLC (RFD). Barriers: costs associated with pre- and mid-process sorting of materials to isolate the combustible materials, particularly with SRF, and the high capital cost required to establish pre-processing plants, collection, separating, and transport to and from the plant.

Slide 8 – Emerging Conversion Technologies are generically called gasification processes with varying heat and oxygen inputs. While the EPA lumps coal gasification into its numbers, this discussion will only include gasification of waste materials. The numbers shown represent non-coal gasification plants; there are 117 gasification plants globally, including those that burn coal. Pyrolysis: low oxygen environments reduce the production of dioxins and furans. Removing impurities and contaminants from syngas is cost-prohibitive for many, leaving it to be used as a fuel source for use in a boiler, making it negligibly cleaner than modern mass-burn units. Additional expense enters the picture in the process of presorting feedstock to be more uniform. Solid residues from these processes are generally safer than residue from a mass-burn unit. These processes offer immediate recovery of metals and inert slags from the ash, leaving less to landfill. Preferred feedstock: plastics, organic material, and generally high-carbon materials. Generally, these technologies have not taken hold in the U.S. mainly because they compete with current recycling and composting efforts. Even though these technologies are or have been in practice elsewhere, they are still considered emerging because developers have not yet demonstrated performance claims on a commercial scale in the U.S. using typical trash as feedstock. It is difficult to confirm numbers of facilities in the U.S. for each category as some facilities are listed as gasification facilities but marketed as pyrolysis facilities. Pyrolysis: New Hope Energy may soon provide pyrolysis oil derived from plastics. Gasification: only at demonstration scale in the U.S., but 17 commercial-scale facilities are under development. These can have outputs, including steam, electricity, ethanol, diesel, and chemical intermediates. Plasma Arc: U.S.S. Gerald R. Ford aircraft carrier designed to treat 450 lb/hr without energy recovery. Barriers: capital costs and technical expertise to operate, the sorting process to isolate the appropriate materials is expensive, significant air pollution controls, and the energy recovered is less than the energy spent for recovery (not profitable).

Slide 9 – Plasma Arc Gasifier located in Mihama-Mikata, Japan (Hitachi Metals Ltd.); co-developed by Hitachi Metals Ltd. and Westinghouse Plasma. This plant was able to recover nearly 80% of energy input (20% net loss of energy) and provided the benefit of landfill space savings. The plant was decommissioned, reportedly due to a lack of feedstock. Technical issues caused startup problems, resulting in the loss of valuable contracts.

Slide 10 – Chemical recycling of plastic supports/supplements mechanical recycling and currently does not compete with it. This technology also fits into a circular economy model. Chemical recycling of plastic waste includes tech like pyrolysis, gasification, and hydrocracking. Heat breaks down the plastic into some solid, some liquid, and some gaseous products. The products are categorized from primary to quaternary. Primary Products are products that do not lose complexity and can serve the same purpose as the original material. For example, recycling PET bottles for production of more PET bottles. Secondary Products have undergone some reduction in complexity, meaning they cannot be reused for the same application, for example recycling PET bottles to PET fiber. Tertiary Products are produced via a chemical transformation. Finally, Quaternary Products are burned to

release energy. Examples: Nexus Circular LLC in Atlanta, Georgia, claims a trajectory to process 500,000 tons of plastics by 2025. Barriers: upfront capital and consistent quantity and quality of feedstock. Plastics made from raw fossil fuels are typically cheaper to produce than recycled plastics; consequently, chemical recycling is less desirable.

Slide 11 – Ideally, manufacturers will play a much larger role in minimizing the source of waste by rethinking packaging, marketing, and increasing accountability for end-of-life resource recovery of their own products. These efforts could be supplemented by consumer-level source separation programs designed to ensure products get to the right spot at their end of use (not to be confused with end of life). A circular economy is designed to circulate products and materials at their highest value. This would require consumers to be informed of the products they are using. The smaller inner circles represent the more-efficient turnaround for products. The blue is a technical loop (repair, share, reuse for lesser need, refurbish, recycle), and the green is biological (sharing or cascading value of turning something into another). The intent is cascading value from the highest use to lesser uses. Ultimately, we want to keep materials in some form of use as long as possible at their highest value. Source separation is among the most effective ways to allow existing reuse processes to remain profitable and desirable. Enhanced air pollution controls may make incineration a more attractive option for the future. In any event, the public will need to be a part of the resource acquisition channels for some industry sectors.

Slide 12 – "Questions and Comments"

Slide 13 – "List of References"

Financial Analysis Project

Ms. Gorman reminded the SWAG about previous Financial Analysis Project discussions, including the solid waste fee on the property tax bill has not changed since it was adopted in 1988. The current revenue structure cannot support new landfill construction projects. Staff recommended to the Budget Office that a fee increase be included in the FY24 budget.

On February 28, the new County Executive, Chris Shorter, presented the Proposed FY24 budget to the Board of County Supervisors. Slide 18 in that presentation included mention of the proposed increase to the solid waste fee from $70 to $75 per single-family equivalent (SFE) annually, as well as implementation of a landfill tipping fee for refuse brought in by commercial haulers of $40/ton (currently no fee per ton). The impact of a tipping fee may be that trash collection companies increase individual subscription costs for service or may ask HOAs to pay more for service. Other facilities in Northern Virginia, such as Fairfax and Loudoun Counties, all charge tipping fees, and the proposed $40/ton is below market rate. The tipping fee for commercial refuse should help encourage hauling companies to divert materials for recycling and composting. Mr. Bonner asked whether the additional revenue would go to the Solid Waste Division or to the General Fund. Ms. Gorman indicated that the Solid Waste Fund is an enterprise fund that is entirely fee supported. Solid waste revenues stay within the Solid Waste Fund and are used to fund operations and landfill cell construction costs. The solid waste fee on the tax bill would go into effect on July 1, 2023. The proposed tipping fee would go into effect on January 1, 2024. Staff is planning to ask the SWAG during the next meeting for feedback on a communication plan for the tipping fee if adopted by the Board.

The Budget Office has scheduled Public Works to present information about the solid waste fee during a March 21st Board work session. The Director, Tom Smith, will be giving that presentation. Ms. Gorman stated she will send the link to that meeting notice once the meeting documents are posted online.

At the January meeting, Mr. Arvin asked if it would be helpful to have an endorsement from the SWAG on the recommended fee changes. The Public Works Director, Tom Smith, suggested the SWAG could make and pass a motion supporting the Proposed FY24 Solid Waste Fee increase to ensure the continued operation of the County's solid waste facilities and the viability of the Solid Waste Fund. That motion would then become part of the SWAG meeting minutes that could be sent to the Budget Office. Other options include speaking at the Public Hearing on Budget Tax Rates and Fees scheduled for April 11. Board Adoption of the Budget is scheduled for April 25.

SWAG MEMBER GENERAL QUESTIONS/COMMENTS

There were no more questions or comments.

ADJOURNMENT and NEXT MEETING

The next SWAG meeting is scheduled for Thursday, May 11, 2023, at 7:00 p.m.

Ms. Gorman adjourned the meeting at 8:32 p.m.

Attachments:

- 2023 SWAG Work Plan
- Waste Conversion Technology Presentation