November 13, 2019

Delaware River Basin Commission
P.O. Box 7360
West Trenton, New Jersey 08628

Re: COMMENT on Delaware River Basin Commission Docket No. D-1988-052-5; Discharge to a Tributary of Special Protection Waters, Grand Central Sanitary Landfill, Inc. , Leachate Treatment Plant, Plainfield Township, Northampton County, Pennsylvania

This comment is submitted by Delaware Riverkeeper Network on behalf of our approximately 23,000 members throughout the Delaware River Watershed including residents of Northampton County, Plainfield Township and Pen Argyl, PA. We request that additional parameters be added to the permit for the discharge of effluent from the Grand Central Sanitary Landfill (GCSL) leachate treatment plant.

Request to Add PFOA and PFOS Monitoring, Reporting and Treatment Requirements to this Docket

Delaware Riverkeeper Network advocates that a suite of PFAS compounds, specifically including PFOA and PFOS, be added to the permit requirements under this DRBC Docket with effluent limitations, monitoring and reporting requirements. Sampling could be done to find which PFAS compounds are present and the permit parameters designed around those that are present. Since PFOA and PFOS are the most prevalently found in the regions' contaminated drinking water, surface water and groundwater, the suite should definitely include these compounds.

GCSL regularly receives sludge and other municipal waste from sewage treatment plants and municipal trash collection facilities for disposal in the facility. Highly toxic compounds known as per- and polyfluoroalkyl substances (PFAS), including specific Perfluorinated Compounds (PFC) Perfluorooctanoic Acid (PFOA) and perfluorooctane sulfonate (PFOS), have been found at extremely high levels in drinking water, groundwater wells and in surface water in regions in Pennsylvania. These regions may send sewage treatment facility sludge or other PFAS-contaminated materials to the GCSL. In addition to sewage sludge, contaminated cartridges, soil and other waste from PFAS treatment and handling has been identified as a disposal problem that could lead to some PFAS-contaminated waste coming into the GCSL. (See: https://www.theintell.com/news/20190802/waste-containing-pfas-chemicals-poses-conundrums) If these contaminants are disposed in the landfill, they could make their way into the leachate collected for discharge through the leachate treatment system.

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Scientific papers and reports are available that identify some of the known contaminants in sludge. A study published in 2011 analyzed perfluorinated chemicals (PFCs) in land-applied biosolids coming from a sewage treatment plant in Decatur, Alabama. Local farmers had applied it to agricultural fields in Lawrence, Morgan, and Limestone counties in Alabama. (Lindstrom, A.B. Strynar, M.J., Delinsky, A.D., Nakayama, S.F., McMillan, L., Lieblo, E.L., Neill, M., & Thomas, L. (2011), "Application of WWTP Biosolids and Resulting Perfluorinated Compound Contamination of Surface and Well Water in Decatur, Alabama, USA. *Environ. Sci. Technol.*, 2011", 45 (19), pp 8015–8021. Retrieved from https://pubs.acs.org/doi/abs/10.1021/es1039425)

Another study in Wisconsin issued in January 2019 has found that PFAS compounds can escape from treatment plants through the processed wastewater that is deposited into public waters and the treated sludge spread onto farm fields or otherwise disposed. Modern sewage treatment processes eliminate many hazards, but PFAS compounds are not rendered harmless by those processes. According to the report, PFAS also has been found at higher levels in biosolids, which, until recently, was spread on about 100 acres of farm fields annually in this Wisconsin region. There are no laws in Wisconsin against spreading the chemical on farm fields. However, DNR asked the wastewater plant to voluntarily stop spreading. (Verburg, S. (2019). The Wisconsin case shows how sewage plants spread unregulated toxins across landscapes. *Wisconsin State Journal*, January 27, 2019. Retrieved from https://madison.com/wsj/news/local/govt-and-politics/wisconsin-case-shows-how-sewage-plants-spread-unregulated-toxins-across/article_e9e50bb6-85b8-5377-95ab-736541129386.html).

Another report examined PFAS contaminants in landfill and wastewater leachates and in wastewater treatment. Issued by the Michigan PFAS Science Advisory Board, the report found:

> "When PFAS-containing products reach the end of their usefulness, the remainder commonly ends up in landfills, where constituents may leach from the landfill. The leachate from such point sources may be treated on-site or at a wastewater treatment plant, but the effectiveness of these processes in reducing PFAS levels or sequestering them remains in doubt (Benskin et al. 2012)." Page 24
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> Preferential accumulation of longer chain PFAS into biosolids has been reported (Sinclair and Kannan 2006), but PFAS are often released in wastewater treatment plant discharges. Levels of one PFAS compound (PFOA) discharged into effluent waters by six wastewater treatment plants in New York were on the order of 100 ppt, comparable to the 70 ppt EPA advisory level (Sinclair and Kannan 2006). Page 25
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> ("Scientific Evidence and Recommendations for Managing PFAS Contamination in Michigan", Michigan PFAS Science Advisory Panel, Report developed for the Michigan PFAS Action Response Team (MPART), Lansing, MI, December 7, 2018.)

PFOA and PFOS have been found above the Environmental Protection Agency's health advisory levels of 70 ppt in public wells in Bucks and Montgomery Counties and were among the ten highest sampling results in the nation in the EPA-required sampling done between 2013 and 2015. (https://www.epa.gov/sites/production/files/2015-09/ucmr-3-occurrence-data.zip) Sampling done since then has shown a much wider contamination across Pennsylvania, including in southeastern Pennsylvania which may send sludge and other PFAS waste to GCSL. Between 70,000 and 100,000 residents and at least two

dozen communities in Bucks and Montgomery Counties have discovered their water was contaminated by PFAS, primarily Perfluorooctanoic acid (PFOA) and Perfluorooctane sulfonate (PFOS).

In a recent blood study discussed by the PA Department of Health in December, people who live around the military bases in Bucks and Montgomery Counties were found to have elevated levels of PFOA, PFOS, Perfluorohexanesulfonic acid (PFHxS) and perfluorononanoic acid (PFNA). Additionally, sewage sludge and PFAS waste imported to GCSL may also originate in New Jersey, which has among the greatest levels of PFAS contamination of any state (most prevalent are PFOA, PFOS, and PFNA). (Post GB, et al, "Occurrence of perfluorinated compounds in raw water from New Jersey public drinking water systems", 2013, retrieved from https://www.ncbi.nlm.nih.gov/pubmed/24187954).

These chemicals pose severe threats to human health and the environment. The scientific literature and the data gleaned from health studies show that PFAS are linked to serious disease, including cancers, and detrimental human health conditions. Fetuses, infants, and children are the most vulnerable populations due to negative developmental impacts, which also affects pregnant women, women of childbearing age and women who are breastfeeding. Chief among the bodies of data and findings available for PFOA are those from the court-ordered C8 Health Panel and the C8 Health Project in West Virginia, related to the DuPont facility there. Among the conclusions of this multi-year study of human subjects, their blood and scientific reports, it was found that PFOA is correlated with Kidney Cancer, Testicular Cancer, Thyroid Disease, High Cholesterol, Pregnancy-Induced Hypertension/Preeclampsia, and Ulcerative Colitis. (http://www.c8sciencepanel.org/newsletter10.html) In other published studies, probable links were found to decreased birth weight and decreased response to vaccines. A report reviewing all of the studies on low birth weight concluded that PFOA does reduce human birth weight. (http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4181929/pdf/ehp.1307893.pdf)

PFAS don't break down in the environment (dubbed "forever chemicals"), are ubiquitous throughout the planet, and, when ingested, build up in people's blood, increasing the risk of developing adverse health effects. To protect public health and fish, fishlife and benthic life it is essential that permitting for this landfill leachate discharge require sampling, long term monitoring, and treatment for PFAS and that discharge limits be established to prevent its release to Little Bushkill Creek and its unnamed tributary.

Request to Add Radioactive Materials Radium-226 and Radium-228 Monitoring, Reporting and Treatment Requirements to this Docket

Radium is known to be contained in landfill leachate in Pennsylvania. It is also known to be contained in sewage sludge, which is part of the waste stream at GCSL. Another known source of radioactive materials is in waste solids produced by oil and gas drilling, which include cuttings and other solids. Despite the statement in the draft Docket that no gas drilling wastewater is accepted at GCSL, it is possible that solids or sludge that inadvertently contains Technically Enhanced Naturally Occurring Radioactive Materials or "TENORM" (which contains radium-226 and radium-228) can be entering the landfill. As far as DRN is aware, there is no prohibition of cuttings or solids from gas well drilling at GCSL or other landfills in Pennsylvania or within the Delaware River Basin. In fact, it is known that some solids and/or cuttings produced by gas drilling are imported into the Delaware River Basin and brought to facilities for treatment. (See: "Three facilities in the Pennsylvania portion of the Delaware River Basin already accept waste from unconventional oil and gas wells in Pennsylvania, including Berks Transfer in Reading, Berks County; Republic Environmental Systems Inc. in Hatfield, Montgomery County; and Waste Recovery Solutions in

Myerstown, Lebanon County", page 12 and "Although just a small fraction of the statewide O&G waste management picture, the waste accepted by facilities in the Delaware River Basin is significant, especially the more than 34,000 tons of drill cuttings disposed of at the Republic Environmental Systems facility. With waste haulers being willing to drive as far a Michigan to dispose of some Pennsylvania's waste, the economic pressure of finding closer destinations is likely considerable", page 13 at https://www.delawareriverkeeper.org/sites/default/files/FT-WhitePaper-DRB-2018%20%28003%29.pdf)

It is unknown if any of these TENORM-contaminated solids make their way into GCSL but it is a real threat that must be addressed in the Docket. The radiation monitors employed at landfills in Pennsylvania, including any employed at GCSL, do not detect all types of radioactive materials so cannot be completely relied upon to catch all radiation. Furthermore, it is reasonable that levels of radioactivity just below detectable levels can be brought into the landfill, accumulating over time to concentrations that result in the presence of radium-226 and radium-228 in the treated leachate. This is a likely explanation as to how TENORM accumulated to high levels in the PADEP-sampled leachate at landfills that employ radiation monitors on incoming waste. Because GCSL is not required to monitor for or treat for these materials in the permit for the leachate treatment system, these contaminants could slip through the cracks and enter the waterway.

Therefore, the potential for leachate to contain radioactive materials is present and requires investigation and action by DRBC to prevent its distribution through effluent discharge to Little Bushkill Creek and its unnamed tributary. As discussed further below, there are other sources of radioactive materials in the GCSL waste stream such as sewage sludge and hospital waste so no one source, such as TENORM, is the only possible source of radioactive materials at the GCSL, further supporting the addition of this parameter to the Docket.

The dangers associated with the distribution of radium into the environment and the human health and wildlife threats posed by exposure to radium are too great to ignore. Radium is a known cancer-causing substance and exposure to high levels of radium can lead to a higher risk of developing bone, liver and breast cancer (see: https://www.dhss.delaware.gov/dhss/dph/files/radiumfaq.pdf).

In Pennsylvania Department of Environmental Protection's (PADEP) report on Technologically Enhanced Naturally Occurring Radioactive Materials (the TENORM Report), radium was detected in all landfill leachate samples gathered for the report by PADEP's experts. Since radium-226 and radium-228 are not sampled for or removed by the GCSL leachate treatment system, these dangerous contaminants could be polluting the Little Bushkill Creek and downstream water sources without anyone knowing about it. The long life of radium-226 (half-life of 1600 years) and the fact that it can build up in the receiving sediment below an effluent outfall, elevates the severity of this pollution legacy that has the potential to contaminate the environment and deliver harmful health effects from the present through to generations to come.

For PADEP's TENORM study, samples of leachate were collected from 51 landfills and analyzed using gamma spectroscopy for Ra-226 and Ra-228. Nine landfills were selected based on the volume O&G waste accepted. It is unknown if GCSL was one of those tested but DRBC could find out that information from PADEP. Radium was detected above the MDC value in 34 of 51 samples. Sample results from the 42 unselected landfills showed Ra-226 results that ranged from 54.0 to 416 pCi/L with an average of 112 pCi/L. Radium-226 results from the nine selected landfills ranged from 85 pCi/L to 378 pCi/L with an

average of 106 pCi/L. Radium-228 results ranged from 2.5 to 55.0 pCi/L with an average of 11.9 pCi/L in the 42 unselected landfills. Radium-228 results from the nine selected landfills ranged from 10.0 pCi/L to 1,100 pCi/L with an average of 139 pCi/L. (Pennsylvania Department of Environmental Protection's (PADEP) "Technologically Enhanced Naturally Occurring Radioactive Materials Study Report", January 2015, page 5-1). From the report regarding landfill leachate:

> **5.2.1 Influent and Effluent Leachate**
> Nine influent and seven effluent leachate samples were collected at the nine selected landfills. All nine landfills treat leachate onsite. The samples were analyzed using gamma spectroscopy. The results of the Ra-226, Ra-228, K-40, as well as gross □ and gross □ activity levels are presented in **Table 5-4** for effluent samples and in **Table 5-5** for influent samples. Radium was detected in all of the leachate samples. Radium-226 results ranged from 67.0 to 378 pCi/L with an average of 142 pCi/L for effluent samples. Radium-228 results ranged from 3.00 to 1,100 pCi/L with an average of 178.0 pCi/L for effluent samples. Radium-226 results ranged from 48.5 to 116 pCi/L with an average of 83.4 pCi/L for influent samples. Radium-228 results ranged from 4.00 to 15.0 pCi/L with an average of 7.94 pCi/L for influent samples. The influent and effluent samples from the same facility do not represent the same leachate at different times in treatment. (PADEP, "Technologically Enhanced Naturally Occurring Radioactive Materials Study Report", January 2015, page 5-1).
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> **5.2.2 Leachate Filter Cake**
> Filter cake from three of the nine landfills was sampled and analyzed using gamma spectroscopy. The results of the Ra-226 and Ra-228 analyses are presented in **Table 5-6**. Radium was detected in all of the filter cake samples. Radium-226 results ranged from 8.73 to 53.0 pCi/g, with an average of 24.3 pCi/g. Radium-228 results ranged from 1.53 to 5.03 pCi/g, with an average of 3.85 pCi/g. (PADEP, "Technologically Enhanced Naturally Occurring Radioactive Materials Study Report", January 2015, page 5-2).
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> **5.2.3 Effluent Discharge Sediment-Impacted Soil**
> At three landfills that discharged effluent water to the environment, a sediment-impacted soil sample was collected at each of the three effluent outfalls. The gamma spectroscopy results are presented in **Table 5-7**. Radium was detected in all of the samples. Radium-226 results ranged from 2.82 to 4.46 pCi/g with an average of 3.57 pCi/g. Radium-228 results ranged from 0.979 to 2.53 pCi/g with an average of 1.65 pCi/g.
> (PADEP, "Technologically Enhanced Naturally Occurring Radioactive Materials Study Report", January 2015, page 5-2).

DRN also points out that outside of gas drilling sources of radioactive materials, there are other known sources of radioactivity in sewage sludge and waste that could be imported to the GCSL and carried through to its leachate treatment plant. Sewage flowing into a POTW can include anthropogenic materials exempt from regulatory control, such as excreta from individuals undergoing medical diagnosis or therapy, and discharges of limited quantities of radioactive materials from some licensees of the U.S. Nuclear Regulatory Commission (NRC) and NRC Agreement State licensees.

Other sources of radioactive materials that may enter sewage collection systems include stormwater runoff, groundwater, surface water, residuals from drinking water treatment plants, and waste streams from certain

industries (e.g., ceramics, electronics, optics, mining, petroleum, foundries, and pulp/paper mills). Some states have identified cases where radium from drinking water treatment residuals has been concentrated in sewage sludge. (U.S. Nuclear Regulatory Commission (2004), SCORS Assessment of Radioactivity in Sewage Sludge: Modeling to Assess Radiation Doses, Sewage Sludge Subcommittee. Retrieved from http://www.iscors.org/pdf/FinalDoseModeling.pdf)

It is essential that the presence of radium be sampled and monitored for and that it be removed from effluent discharged to Little Bushkill Creek through permit requirements. DRN advocates that monitoring, reporting and treatment requirements for radium-226 and radium-228 be added to the parameters of this Docket.

Other Contaminants

Delaware Riverkeeper Network adds that there are many other contaminants contained in sewage sludge and biosolids that may be disposed in the GCSL today, and may carry through to the effluent that is treated and discharged into the Little Bushkill Creek, degrading its water quality and the life of the stream. (See: https://www.delawareriverkeeper.org/sites/default/files/Talking%20Points%20fnl%20Hearing%208.12.pdf) DRN urges DRBC to encourage PADEP to undertake a comprehensive study of leachate constituents through broad sampling for the many contaminants that could be contained in sewage sludge and other wastes based on current scientific studies that are characterizing these wastes. It is of utmost importance that the pathway of pollution that potentially exists in the disposal of leachate from GCSL to Little Bushkill Creek be fully investigated to prevent the release of dangerous contaminants into our environment and into the Delaware River Basin.

Docket A. Description 4. Design Criteria

DRN opposes the practice of allowing reject leachate wastewater to be sprayed onto the working face of the landfill and the liners or other locations and the export of the reject wastewater to other treatment facilities unless they are equipped to treat and remove the pollutants discussed in this comment.

Docket B. Findings 2. Other

It is unclear in the draft Docket if PADEP did or did not give approval to GCSL to spray treated effluent on roads for dust control and for vehicle washing. The draft Docket states that the docket holder "withdrew" the PADEP application but states that approval was granted by PADEP. DRN strongly opposes the reuse of treated effluent from the leachate treatment facility for any purpose, including road dust suppression and vehicle washing, due to the grave potential for pollution from the contaminants discussed in this comment and other pollutants that are currently discharged under this Docket.

Docket C. Decision Other Conditions 8.

DRN strongly supports the prohibition of the treatment or pre-treatment of any hydraulic fracturing wastewater from sources in or out of the Basin.

Unnamed Tributary of Little Bushkill Creek and Little Bushkill Creek

The unnamed tributary to the Little Bushkill Creek and the Little Bushkill Creek comprise an important stream protected under Pennsylvania's Special Protection Waters (SPW) Program. It is located in State Water Plan watershed 1-F and is classified for Cold Water Fishes, Migratory Fishes; is High Quality for aquatic life, water supply and recreation. As verified in DRBC's draft Docket, the unnamed tributary to Little Bushkill Creek and Little Bushkill Creek are within the drainage area of the Lower Delaware Special

Protection Waters, protected by DRBC's designation. The anti-degradation mandate that accompanies DRBC's and PADEP's SPW programs is fundamental to the water quality for the local and regional watersheds, the related ground and surface water supplies, the stream's dependent living resources, and ultimately the Delaware River Watershed and the Wild and Scenic Delaware River.

Thank you for the opportunity to comment on this draft Docket.

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