Environmental Justice Concerns regarding the expansion of the Gardner Sludge Landfill

Prepared by the Coalition For a Sustainable Alternative to Expanding Gardner's Sludge Landfill

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Gardner is a lower income city and a clear target for companies to locate their hazardous facilities. According to the recent 2020 Census, 79.8% of Gardner's population qualifies for the Environmental Justice (EJ) community designation, through the criteria of income and minority populations.[1] Steps should be taken to protect the city's residents from more environmental harm. In this case it is the City of Gardner itself that is proposing to expand the size of the existing sludge landfill by 4.2 acres. In addition to sludge generated by the city's wastewater treatment facility, this landfill expansion is being considered for the acceptance of sludge waste from outside Gardner, placing additional environmental burden from increased waste on Gardner city residents.[2] Disposing of sludge into a landfill has become an outdated way of dealing with this type of waste and holds the most environmental impact.[3] The expansion of the Sludge Landfill will negatively impact the health and well-being of city residents, disproportionately affecting the 79.8% of the city's EJ population.

Smell and particulate matter: Particulate matter can carry particles of pathogenic bacteria that can cause respiratory illness to residents downwind from the sludge landfill.[4,5] The smell itself is a nuisance which impacts both landowners and people enjoying the adjacent Cummings Conservation Area, which has hiking trails, vernal pools, and a glacial esker.[6]

Methane Production: Unlike the nearby solid waste landfill where the landfill is kept under negative pressure and the methane produced through decomposition is collected increased and turned into energy, the Gardner sludge landfill does nothing to control the methane production and it is freely released to the atmosphere through several vents in the landfill. The sludge landfill is a greenhouse gas producer, contributing to global climate change, and the plume of emissions released from the landfill could contribute to localized warming in the city of Gardner.[7] Growing the size of this sludge landfill, which may include importing sewage sludge from outside Gardner, will increase the amount of methane being produced. The lack of underground monitoring or control of methane is also a hazard. It is possible that the methane, which is highly explosive, could migrate underground and end up in someone's basement.[8]

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[1] MA EEA. 2021. 2020 Environmental Justice Populations. https://www.mass.gov/info-details/massgis-data-2020-environmental-justice-populations

[2] NEBRA. 2019. The Mass Sludge Survey 2018: wastewater solids generation and management. V1.1 p.23

[3] NEBRA. 2019.

[4] Lu, J.C.S. et al. 1983. A critical review of wastewater treatment plant sludge disposal by Landfilling. US EPA. EPA-600/S2-82-092.

[5] Odonkor, S.T. and T. Mahami. 2020. Microbial Air Quality in Neighborhoods near landfill sites: Implications for Public Health. Journal of Environmental and Public Health. 2020: 4609164.

[6] McCLure Engineering. (2021) 2020 Operations Report for Municipal Sludge Landfill Facility Gardner, MA. 310 CMR 19.130(34)(d) pp. 150-160.

[7] US EIA. 2011. Emissions of GHG in the U.S. DOE/EIA-0573(2009). https://www.eia.gov/environment/emissions/ghg_report/ghg_methane.php

[8] Williams, G.M. and N. Aitkenhead. 1991. Lessons from Loscoe: the uncontrolled migration of landfill gas. Quarterly Journal of Engineering Geology and Hydrogeology. 24: 191-207.

Climate Justice: The proposed expansion will cut down 4.2 acres of forest. Cutting down a forest and taking on methane generating waste will increase the likelihood of Gardner residents being at risk for urban heat island effects and more intense heat waves[9], which is one of the largest risks climate change poses to human health.[10] Trees and other plants naturally cool their surrounding area through evapotranspiration, which is evaporation of the water from the leaf during the process photosynthesis. Many cities are looking to add more trees to their city landscape to help protect residents from the increasing frequency of heat waves[11], yet Gardner is proposing cutting down 4.2 acres of forested land. As fossil fuel produced energy becomes more expensive, the real cost of the landfill will be transferred to the residents through their increased cooling energy costs that will come from additional localized climate warming due to methane production and tree removal.

Air Pollution: Warmer temperatures and methane also increase the generation rate of photochemical air pollutants, which are created through chemical reactions of other pollutants in the air, like Ozone.[12,13] Ozone negatively affects human health through irritating our respiratory system making us more susceptible to other air pollutants.[14] Trees are also capable of removing air pollution and can improve air quality.[15]

Water Quality: The current sludge landfill has had issues in the past with erosion from the top of the landfill.[16] The area surrounding the landfill is a wetland. Any chemicals that may be in sludge waste could find their way into the natural water system in Gardner and affect drinking water.[17] Some of the human health-harming chemicals that have been identified in the water quality samples taken from around the current sludge landfill include Nitrates, Arsenic, Chloride, Chloroform, Barium, Cadmium, Chromium, Copper, Iron, and Lead; amount and presence of these chemicals vary from sample to sample.[18]

Recreation and Access to Green Spaces: Public health scientists have identified the importance of open space and local, free opportunities for recreation and exercise to prevent obesity, cardiovascular disease, metabolic diseases, and other chronic diseases, as well as reduce stress and improve psychological health. Green spaces also create a sense of belonging and community identity by creating places for residents to be physically active and socialize with neighbors.[19] The area of the proposed

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[9] Edmondson, J.L. et al. 2016. Soil surface temperatures reveal moderation of the urban heat island effect by trees and shrubs. Scientific Reports. 6: 33708.
[10] Tong, S. et al. 2021. Urban Heat: and increasing threat to global health. The BMJ. 375:n2467.
[11] US EPA. 2021. Reduce Urban Heat Island Effect. https://www.epa.gov/green-infrastructure/reduce-urban-heat-island-effect
[12] Coates, J. et al. 2016. The influence of temperature on ozone production under varying NOx conditions. Atmospheric Chemistry and Physics. 16, 11601-11615.
[13] Isaksen, I.S.A. et al. 2014. Atmospheric Ozone and Methane in a Changing Climate. Atmosphere. 5, 518-535.
[14] Nuvolone, D. et al. 2017. The effects of ozone on human health. Environmental Science and Pollution Research. 25, 8074-8088.
[15] Nowak, D.J. et al. 2006. Air pollution removal by urban trees and shrubs in the U.S. Urban Forestry and Urban Greening. 4: 115-123.
[16] McCLure Engineering. (2021) 2020 Operations Report for Municipal Sludge Landfill Facility Gardner, MA. 310 CMR 19.130(34)(d) , p. 159
[17] Lu, J.C.S. et al. 1983. A critical review of wastewater treatment plant sludge disposal by Landfilling. US EPA. EPA-600/S2-82-092.
[18] Mclure, pp. 44-140.
[19] Rodriguez, R. 2021. Improving Urban Health through Green Space. USDA https://www.usda.gov/media/blog/2017/11/28/improving-urban-health-through-green-space

landfill expansion hosts a well-established and popular hiking trail. Not only would the expansion remove portions of the trail, but it would decrease the enjoyment of this area due to the increased noxious smells and noise.

For additional information:

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Coalition members:

MRWC, Gardner Clean Air, Athol Bird and Nature Club, Clean Water Action, Connecticut River Conservancy, MassPIRG, Mass Rivers Alliance, Mount Grace Conservation Land Trust and North County Land Trust