# GARDNER SLUDGE LANDFILL EXPANSION

808 West Street,
Gardner, MA 01440
EEA# 16643

***Draft Environmental Impact Report (DEIR)***

**Proponent:**
City of Gardner,
Massachusetts

**Prepared By:**
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0231568.03
January 2025

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## APPENDICES

# ACRONYMS

| | |
|---|---|
| BMP | Best Management Practices |
| CFR | Code of Federal Regulations |
| DEIR | Draft Environmental Impact Report |
| DWPC | Massachusetts Department of Environmental Protection, Division of Water Pollution Control |
| EPA | U.S. Environmental Protection Agency |
| FCSWMD | Franklin County Solid Waste Management District |
| GHGs | Greenhouse Gases |
| HELP | Hydrologic Evaluation of Landfill Performance |
| GWPS | Groundwater Protection System |
| LandGEM | Landfill Gas Emissions Model |
| MassDEP | Massachusetts Department of Environmental Protection |
| MEPA | Massachusetts Environmental Policy Act |
| MGL | Massachusetts General Law |
| NHESP | Natural Heritage and Endangered Species Program |
| NOAA | National Oceanic and Atmospheric Administration |
| NPDES | National Pollutant Discharge Elimination System |
| PIP | Public Involvement Plan |
| PFAS | per- and polyfluoroalkyl substances |
| SWPPP | Stormwater Pollution Prevention Plan |
| TMDL | Total Maximum Daily Load |
| TSS | Total Suspended Solids |
| ULSD | Ultra Low Sulfur Diesel |
| USACE | Army Corps of Engineers |
| USGS | U.S. Geological Survey |
| WWTF | Wastewater Treatment Facility |

# 1. PROJECT DESCRIPTION AND PERMITTING

## 1.1 Introduction

The purpose of the Massachusetts Environmental Policy Act (MEPA) and 301 CMR 11.00 is to "provide meaningful opportunities for public review of the potential environmental impacts of Projects for which Agency Action is required, and to assist each Agency in using all feasible means to avoid Damage to the Environment or, to the extent Damage to the Environment cannot be avoided, to minimize and mitigate Damage to the Environment to the maximum extent practicable (301 CMR 11.01(1)(a)." The Agencies that would be acting on the Project include the Massachusetts Department of Environmental Protection (MassDEP) and the U.S. Environmental Protection Agency (EPA (see **Section 1.15**). MEPA review is an "administrative process that is intended to involve any interested Agency or Person as well as the Proponent and each Participating Agency (301 CMR 11.01(1)(b))." The Proponent for the Project is the City of Gardner (City).

The City is proposing to increase the capacity of their Sludge Landfill through the Sludge Landfill Expansion Project (Project), which is required to maintain adequate wastewater treatment services within the City (see **Figure 1-1)**. Consistent with MEPA regulations at 301 CMR 11.07(3), this Draft Environmental Impact Report (DEIR) provides a "reasonably complete and stand-alone description and analysis of the Project and its alternatives, and an assessment of its potential environmental and public health impacts and mitigation measures." This DEIR demonstrates that the City would avoid, minimize, and mitigate Damage to the Environment to the maximum extent practicable.

## 1.2 MEPA Process

The Project requires Agency Actions and meets the MEPA Environmental Notification Form review threshold at 301 CMR 11.03(5)(b)(5)(a), New Capacity or Expansion in Capacity for combustion or disposal of any amount of sewage sludge, sludge ash, grit, screenings, or other sewage sludge residual materials, requiring the Project to undergo MEPA review. The Project also requires an Approval of Wastewater Treatment Residual Landfill (WP33) and a Superseding Order of Conditions from MassDEP and other approvals described further in **Section 1.15,** such as a National Pollutant Discharge Elimination System (NPDES) Stormwater General Permit from the EPA. The Project would be financed by the City and has not sought financial assistance from an Agency. As defined by MEPA Regulations, MEPA jurisdiction extends to aspects of the Project that are within the subject matter of any required or potentially required Agency Action that may cause Damage to the Environment.

Pursuant to 301 CMR 11.01, the City initiated the MEPA process by filing the Environmental Notification Form with the MEPA Secretary of the Executive Office of Energy and Environmental Affairs on December 12, 2022. The Energy and Environmental Affairs Secretary issued a certificate on the Environmental Notification Form (EEA Number 16643) on February 10, 2023, requiring that the City prepare a DEIR pursuant to MEPA; M.G.L. c. 30, ss. 61-62L and Section 11.06 and 11.11 of the MEPA Regulations (301 CMR 11.00). Through the MEPA process, the City has maintained communications with the MEPA Office, MassDEP, the Massachusetts Department of Public Heath, and the City of Templeton, refining the Project design to respond to comments, and performing technical analyses to prepare this DEIR.

Bridge St

West St

Bridge St

West St

Wildwood Cemetery

Solar Farm

Former Solid Waste Landfill

Saint John's Cemetery

Notre Dame Rd

St Johns Rd

ner St

Otter River

Sludge Landfill

Cummings Conservation Area

Notre Dame Cemetery

INSET

Albany

Nashua

Lowell

Gardner, MA

Boston

Worcester

Springfield

Plymouth

Hartford

Providence

New Bedford

Waterbury

RHODE ISLAND

## Project Location

City of Gardner, MA
Gardner Sludge Landfill Expansion

**Worcester County, MA**

*Legend*

Project Area

Project Site

N

0 50 100 200 300 400 500 Feet

Woodard & Curran

Project #: 0231568.03
Map Created: July 2024



**Figure 1-1**

## 1.3 Background

Sludge, defined as "Sewage sludge" is solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works (40 Code of Federal Regulations (CFR) 503.9(w))." Sewage sludge includes, but is not limited to, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment processes; and a material derived from sewage sludge. Sewage sludge does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screenings generated during preliminary treatment of domestic sewage in a treatment works (40 CFR 503.9(w)).

Sludge is a natural byproduct of the wastewater treatment process requiring disposal. The City's Wastewater Treatment Facility (WWTF), located on Plant Road in the adjacent Town of Templeton, MA, serves approximately 20,000 City residents (about 95 percent of the City's population), 1,680 Town of Ashburnham residents (about 25 percent of the Town's population), and 150 East Templeton residents (about two percent of the Town's population). Sludge or wastewater treatment residuals are generated during the primary and secondary treatment stages at the WWTF and require the City to have a place to dispose of this solid material. The City's Sludge Landfill is a lined facility dedicated to the disposal of the City's WWTF sludge removed during both the primary and secondary stages of the City's wastewater treatment process.

The City's Sludge Landfill was originally site-assigned, which is a process that determines if a piece of land is appropriate for a solid waste management facility, as a 37.65-acre site in August 1986 by the Department of Environmental Quality Engineering at its current location in the Project Area (see **Section 1.6** for definition of Project Area).[1] While the larger parcel was site-assigned, the sludge disposal needs at the time only required the City to develop approximately 9.7-acres to create the Sludge Landfill. Developing the site as needed has allowed the City to be flexible to changing regulations and best available technologies to protect human health and the environment. The current lined area of the landfill occupies approximately 7.3 acres and has been in operation since November 1990. Originally approved with a volumetric capacity of approximately 140,000 cubic yards, this volume provided a life expectancy of approximately 25 years at a maximum generation rate of 80 to 100 cubic yards per week (4,160 to 5,200 cubic yards per year). The landfill was later vertically expanded through a permit application and authorization to construct issued from MassDEP on February 3, 2016. With this vertical expansion, the capacity of the landfill was increased by 107,000 cubic yards and the lifespan was extended.

Sludge is thickened at the WWTF using gravity thickeners and a centrifuge. In 2019 as part of a WWTF improvement project, the original belt press dewatering process equipment was replaced with centrifuge dewatering process equipment. Conversion from belt press dewatering to centrifuge dewatering has improved the average dewatered sludge cake total solids content from a range of 19 percent to 23 percent with the belt press to a range of 25 percent to 30 percent with the centrifuge. Wet sludge requires addition of sand so that it is workable on the landfill. The drier sludge cake requires addition of less sand. Currently, the dewatering and hauling of the sludge cake occurs four days a week with two truckloads per day. Sludge is transported from the WWTF in Templeton to the landfill. At the landfill, the sludge is mixed with sand,

[1] Note the current MassDEP Residuals Management Program policy on the Design and Operation of Sludge Landfills states that such sludge-only disposal facilities are not subject to the site assignment requirements of Chapter 111, Section 150A (MassDEP Residuals Management Program. (1983) *Policy on the Design and Operation of Sludge Landfills*. Retrieved from https://www.mass.gov/doc/sludge-landfills-design-operation/download).

dirt, and gravel to allow it to be easily spread and covered. The change to centrifuge dewatering has increased the expected lifespan of the landfill. It is now anticipated that capacity of the landfill would be reached between 2027 and 2030.[2]

### 1.3.1 Existing Sludge Landfill Facilities

The City, through a contracted operator (Veolia), has been operating the existing wastewater sludge landfill since November 1990. In addition to the disposal area, the facility includes a leachate collection system, equipment garage, equipment, pump station, force main, former chemical addition building (currently not in use), retention basins and run-off controls, access roads, borrow pit, and gas venting system. These facilities are described further below and shown in site photographs in **Figure 1-2**

#### 1.3.1.1 Leachate Collection System

The existing sludge landfill base liner is composed of 0.06-inch-thick high-density polyethylene geomembrane barrier overlain by 18 inches of filter sand. Currently, there is no leak detection system in place for the existing landfill. The sludge landfill is divided into five zones separated from one another by berms 4 feet tall by 24 feet wide. Each zone is pitched towards a low point in the center of the zone. The low points in each zone are hydraulically connected to a leachate pipe along the midpoint of the landfill. The five zones are subdivided into 24 individual cells that have been filled in a sequential order. Perforated pipes positioned in the filter sand layer over the liner barrier collect the leachate water and convey it to a manhole at the low outlet end of the existing landfill. From this collection manhole the leachate flows via a gravity sewer to the leachate pump station.

#### 1.3.1.2 Equipment Garage

The equipment garage is a 40-foot by 43-foot prefabricated metal building that houses the bulldozer, the front-end loader and any additional equipment and spare parts (see **Figure 1-2, Photo 1**). The garage provides an area to protect the equipment from inclement weather and vandalism, in addition to providing a suitable location to perform maintenance on the equipment. The garage is equipped with two 12-foot wide by 14-foot-tall garage doors in the front of the building. Each quadrant of the garage floor is drained by 8-foot trench drains. The drains ultimately discharge into the leachate sewer system via the manhole and sediment trap directly outside the equipment garage.

#### 1.3.1.3 Equipment

At the WWTF, sludge is conveyed from the centrifuge and dropped directly into a 13-cubic-yard dump truck (see **Figure 1-2**). A loader is used at the sludge landfill and the borrow pit for excavating and loading the dump truck with the cover material, moving sludge, and for general site maintenance and work, as needed. Sludge and cover material can be spread and compacted at the landfill with the loader or track dozer (see **Figure 1-2, Photo 3)**.

[2] Lifespan projection is updated based on annual reporting. As of July 2024, the capacity of the landfill is anticipated to be reached between 2027 and 2030.


## Site Photographs

City of Gardner, MA
Gardner Sludge Landfill Expansion

**Worcester County, MA**

*Legend*

- Project Area
- Project Site
- (#) Photo Number Location and Photo Direction

0 50 100 200 300 400 500 Feet

N

Woodard & Curran

Project #: 0231568.03
Map Created: July 2024



**Figure 1-2**

Photo Number: 1 | View Direction: North | Date: July 11, 2024
Description: View of Equipment Garage.

Photo Number: 2 | View Direction: Southeast | Date: July 11, 2024
Description: Dump Truck.

Photo Number: 3 | View Direction: Northwest | Date: July 11, 2024
Description: Track Dozer.

Photo Number: 4 | View Direction: West | Date: July 11, 2024
Description: Chemical Feed Building.

Photo Number: 5 | View Direction: South | Date: July 11, 2024
Description: Access Road.

Photo Number: 6 | View Direction: Southwest | Date: July 11, 2024
Description: View of Borrow Pit.

| Photo Number: 7 | View Direction: Northeast<br>Description: Gas Venting System. | Date: July 11, 2024 |
|---|---|---|

Photo Number(s): 8-12 | View Direction: West/Southwest | Date: July 11, 2024
Description: Panoramic View of Existing Sludge Landfill.

Photo Number(s): 13-17 | View Direction: West/Southwest | Date: July 11, 2024
Description: Panoramic View of Existing Sludge Landfill.

#### 1.3.1.4 Leachate Pump Station

A subsurface pump station for the removal of leachate from both the sludge landfill and the adjacent municipal solid waste landfill is located along the access road northeast of the existing sludge landfill. The station is a prefabricated steel chamber equipped with two 5-horsepower pumps, sump pump, dehumidifier, and vent blower. Adjacent is a separate concrete wet well structure. This pump station is at the end of its useful life and a project to upgrade this pump station is planned as part of the City's capital plan. The upgrades to this pump station would include two 25-horsepower pumps with capacity to accommodate the sludge landfill expansion project. Construction of the pump station upgrade project is anticipated to start in 2025 and be completed in 2026.

#### 1.3.1.5 Force Main

An approximately one-mile-long 4-inch polyvinyl chloride (PVC) force main extends from the leachate pump station and discharges into the City's sewer collection system. The force main extends north along the access road to West Street, then runs along West Street past the former chemical feed building and continues along West Street to a manhole located approximately 900 feet west of the junction of Ryan Street and West Street. From this point, leachate flow continues by gravity via the City's existing sewer lines to the WWTF.

#### 1.3.1.6 Chemical Addition Building (former)

A building that was previously used for chemical additions to mitigate odor concerns is located immediately inside the main gate of the municipal solid waste landfill along West Street (see **Figure 1-2, Photo 4**). The 20-foot by 20-foot building is made of concrete blocks and is equipped with two 500-gallon tanks (one for hydrogen peroxide and one for sodium hydroxide). Each tank is equipped with its own chemical feed pump. An 8-foot-deep by 6-foot-diameter chemical feed manhole located outside the building contains a 4-inch static mixer with extension that connects the chemical feed lines from the chemical addition building to the 4-inch PVC force main. This building and associated tanks and facilities are no longer in use after it was determined that the treatment process was ineffective at reducing odor concerns.

#### 1.3.1.7 Retention Basins and Run-off Controls

Two retention basins located at the eastern end of the landfill on each side of the access road near the equipment building serve as sedimentation basins and surface water run-off control for the landfill.

#### 1.3.1.8 Access Roads

The existing sludge landfill is accessed by a gravel road that begins at West Street near the Wildwood Cemetery entrance and runs along the west side of the municipal solid waste landfill past the pump station and ends at the eastern edge of the sludge landfill. The gravel road transitions to a partially vegetated dirt road that extends from the northwest corner of the sludge landfill a short distance to the borrow pit from which daily cover will be excavated and continues around the perimeter of the existing sludge landfill (see **Figure 1-2, Photo 5**).

#### 1.3.1.9 Borrow Pit

Borrow used for daily cover during the operations of the sludge landfill is located on top of the landfill to reduce time moving material to the top. Borrow for the borrow pit is obtained from local sources and predominately consists of sand and gravel (see **Figure 1-2, Photo 6** ).

#### 1.3.1.10 Gas Venting System

Landfill gas (primarily methane and carbon dioxide) generated from the decomposition of the sludge is vented to the atmosphere via the 4-inch perforated leachate pipes and the solid PVC riser pipes (gas vent pipes) that are connected to the perforated leachate pipes at both ends of each zone and extended eight feet vertically above the top of the liner system (see **Figure 1-2, Photo 7** ).

### 1.4 Document Organization

In accordance with MEPA Regulation 301 CMR 11.07(6)(e), this DEIR has been prepared to include a detailed description and analysis of the nature and location of the Project including its type, size, and proposed use; the objectives and anticipated benefits of the Project; a description of the physical characteristics of the Project and its surroundings, illustrated with a location map and site plan; and an approximate cost and timing of construction for the Project (see **Chapter 4, "Landfill Design and Construction"** for further description).

Additionally, as detailed by the Certificate of the Energy and Environmental Affairs Secretary on the Environmental Notification Form (MEPA Certificate), the scope of this chapter includes the identification of changes to the Project since the filing of the Environmental Notification Form; identifies and describes Project state, federal, and local permitting and review requirements and an update on the status of each pending action; a description and analysis of applicable statutory and regulatory standards and requirements, a discussion of the Project's consistency with those standards and requirements, including the need for a Landfill Closure Permit from MassDEP and addresses relevant regulatory standards; and clarifies the applicability of Article 97, which is the Massachusetts Constitutional amendment that ensures public lands dedicated to open space, conservation, and natural resources cannot be used for other purposes.

The structure of this DEIR follows the scope provided in the February 10, 2023 MEPA Certificate as follows:

1. Project Description and Permitting
2. Alternatives Analysis
3. Environmental Justice
4. Landfill Design and Construction
5. Groundwater
6. Stormwater
7. Air Quality
8. Climate Change
9. Construction Period

10. Mitigation and Draft Section 61 Findings
11. Response to Comments
12. Circulation

The City has used the review and comments (by agencies or interested persons) on the Environmental Notification Form as an opportunity to improve the planning and design of the Project.

## 1.5 Project Site

The Project Site is immediately West of the existing 9.7-acre Sludge Landfill and includes undeveloped City-owned property that is forested (see **Figure 1-1** and **Figure 1-4a)**. The Project Site is zoned Rural Residential (RR2). Municipal uses, defined by City Code Chapter 675 Zoning as "Facilities owned or operated by the City" are permitted within the RR2 zone.[3] Although no formal easement has been found on record, the Esker Ridge Trail, as identified on the City of Gardner Parks, Open Space & Trails GIS Web App, traverses the Project Site (see **Figure 1-3)**.[4]

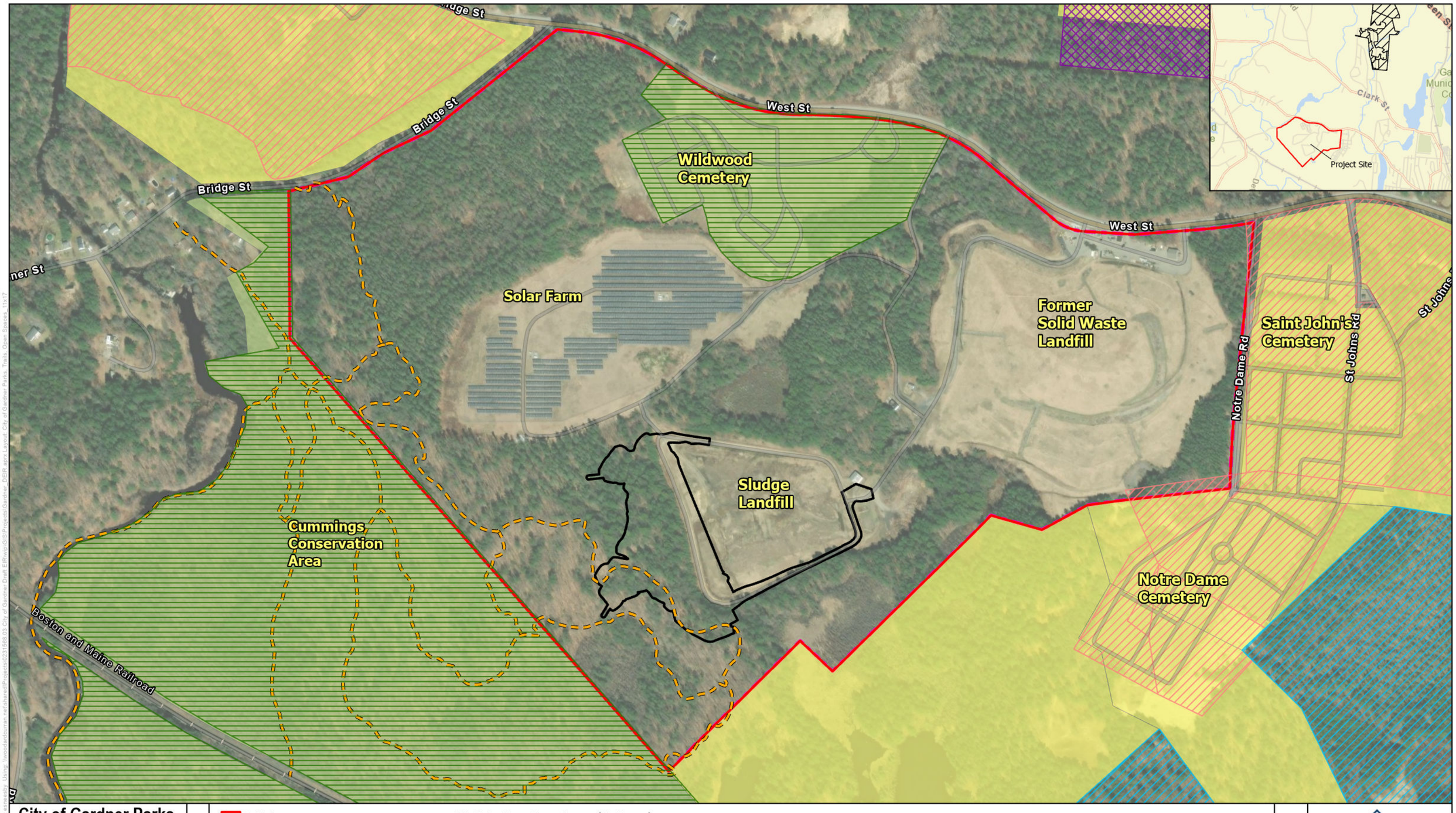
With the Project, the existing sludge landfill site would be expanded to incorporate the 8.75-acre footprint of the sludge landfill expansion. The Project Site footprint would include the proposed groundwater protection system (GWPS) and disposal area, new leachate pumping system, force main, 12-foot-wide perimeter gravel access road and a stormwater management system consisting of a perimeter swale, bioretention area at the north end of the site and infiltration basins to the west and south (see drawings in **Appendix A** of this DEIR, page 338).

## 1.6 Project Area

The Project Area is a 186-acre City-owned parcel, located at 850 West Street in the City of Gardner. It is a large irregularly shaped lot bounded by Bridge Street to the northwest, West Street (MA 68) to the north, Notre Dame Road and a privately-owned parcel to the southeast, and by another City-owned parcel, the Cummings Conservation Area (approximately 78.5 acres), to the southwest (see **Figure 1-2**). The Project Area includes multiple City uses including the approximately 15.5-acre Wildwood Cemetery, approximately 15.5-acre solar farm, the approximately 32.5-acre former solid waste landfill (closed in 2005), the approximately 1.9-acre current residential solid waste transfer station, and the City's existing 9.7-acre municipal wastewater sludge landfill. The Project Area also includes approximately 111 acres of undeveloped land that is forested. This forested land contains four defined tree groupings, called stands, which are distinguishable from one another in the species, age, and general composition of the trees which populate them (see **Figure 1-4a**)**.** Hemlock and white pine are the predominant species in Stand One; the project site is located in Stand Two, which consists primarily of white pine (61 percent of total stock) and mixed hardwoods (including red oak, red maple, beech, birch, aspen, white ash, hemlock, and red pine); Stand Three contains primarily of gray birch and white pine saplings; and Stand Five is a mixed stand of white pine, red maple, mixed oaks, aspen, birch, and hemlock saplings. Stand Four occurs elsewhere in the Wildwood Forest but not in the project area. Similar to the Project Site, the Project Area is zoned Rural Residential (RR2) with a West Street Solar Overlay and some areas within the Floodplain Overlay.

[3] City of Gardner, MA. *Zoning Map.* Retrieved from https://gardner.maps.arcgis.com/home/index.html.

[4]City of Gardner, MA. *Parks, Open Space & Trails.* Retrieved from https://gardner.maps.arcgis.com/home/index.html.




# City of Gardner Parks, Trails, and Open Space

City of Gardner, MA
Gardner Sludge Landfill Expansion

**Worcester County, MA**

*Legend*

- Project Area
- Project Site
- Trails

**City of Gardner Open Space Ownership Records**

- Municipal
- Private

**MA State Open Space Ownership Records**

- Land Trust
- Municipal
- Private Non-Profit
- Private
- MA Open Space Legal Interest

0 50 100 200 300 400 500 Feet

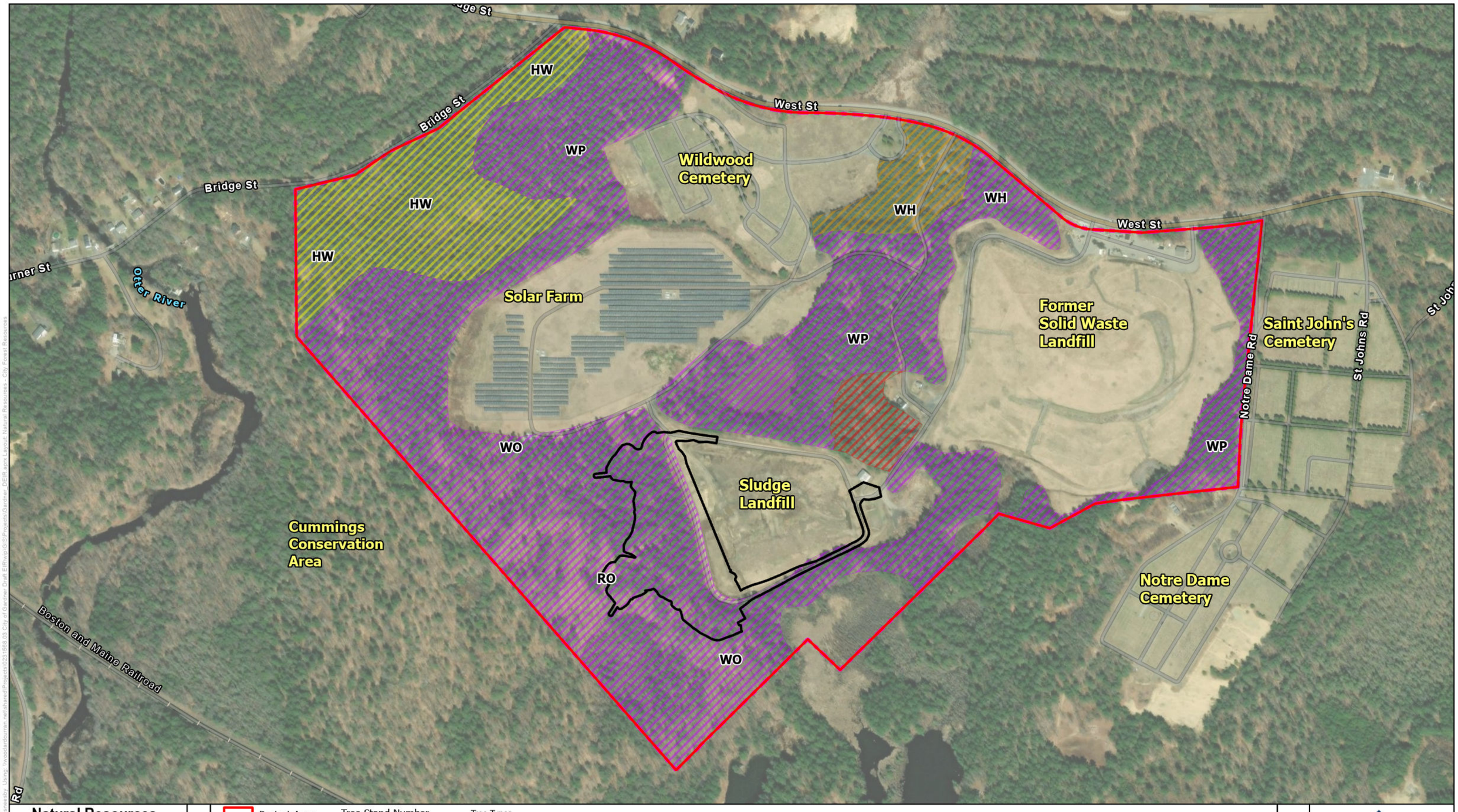
N

Woodard & Curran

Project #: 0231568.03
Map Created: July 2024



**Figure 1-3**




**Natural Resources - City Forest Resources**

City of Gardner, MA
Gardner Sludge Landfill Expansion
**Worcester County, MA**

*Legend*

- Project Area
- Project Site

Tree Stand Number
- Stand 1
- Stand 2
- Stand 3
- Stand 5

Tree Types
WO = White Oak
RO = Red Oak
WP = White Pine
WH = White Pine Hardwood
HW = Hemlock White Pine

0 50 100 200 300 400 500 Feet

N

Woodard & Curran

Project #: 0231568.03
Map Created: July 2024



**Figure 1-4a**

Wetlands in the Project Area were delineated in 2021 by DiPrete Engineering, and occur southeast, north, and west of the Project Site within the Project Area. Freshwater emergent wetlands are located north and south of the Project Site, and four forested/shrub freshwater wetlands are located south, east, and northwest of the Project Site (see **Figure 1-4b** and **Figure 1-4c**). According to the MassDEP Vernal Pools database, there are two certified vernal pools within the Project Area. One is located approximately 103 feet to the east and the other approximately 102 feet to the south of the Project Site (see **Figure 1-4d**). The Project avoids impacts to nearby vegetated wetlands and vernal pools by 100 feet or more (see **Chapter 6, "Stormwater"**).

## 1.7 Surrounding Area

The Project Area is bordered by St. John's Cemetery (44 acres) and Notre Dame Cemetery (27.9 acres) to the east; a privately-owned parcel to the southeast; the Cummings Otter River Conservation Area (78.5 acres) to the southwest; Bridge Street and Saint Joseph's Cemetery (36 acres) to the west; and West Street (MA Route 68) to the north. Across West Street, there is a 146-acre privately-owned parcel with a solar farm (see **Figure 1-5a** and **Figure 1-5b**).

Notable natural resources within the surrounding area include: the Otter River, Hilchey Pond, and Bailey Brook. The Otter River is located approximately 1,450 feet south of the Project Site and 1,060-feet south of the Project Area and flows northwesterly. Bailey Brook is approximately 1,780 feet northeast of the Project Site and approximately 30 feet from the Project Area. Additionally, Hilchey Pond is located approximately 360 feet northeast of the Project Area. There is also a certified vernal pool located approximately 190 feet to the west of the Project Area.

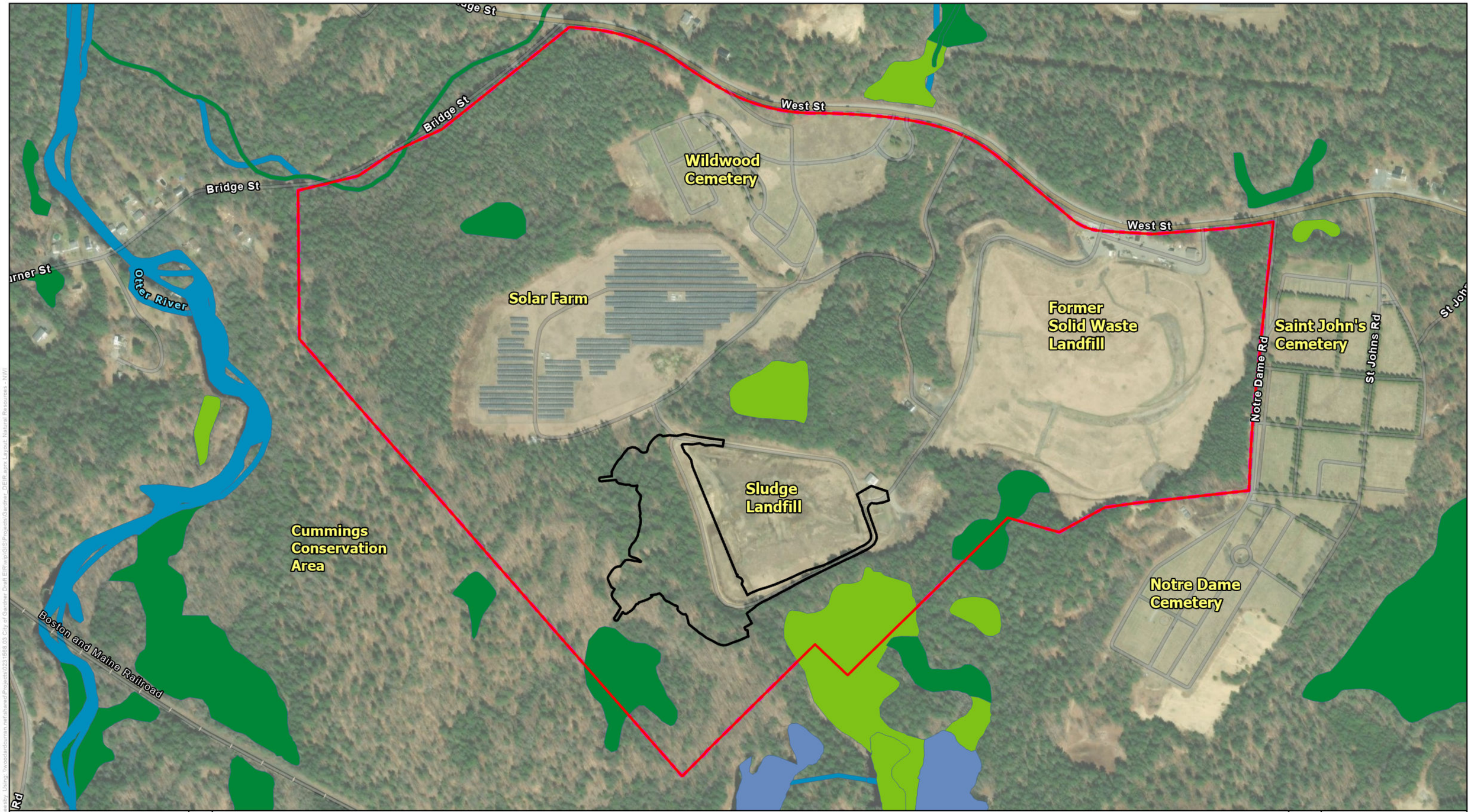
## 1.8 Purpose and Need

The receipt and disposal of sludge at the landfill is a critical component of municipal wastewater treatment infrastructure that prevents raw sewage from contaminating local waters. The existing Sludge Landfill is anticipated to reach capacity between 2027 and 2030. Therefore, the aim of the Project is to increase the capacity of the Sludge Landfill to continue to accept sewage sludge from the City's WWTF.

Sludge placement in the landfill is anticipated to continue at the current rate based on population projections remaining constant for the next twenty years. There are no plans to expand the sewerage collection system that contributes to the sludge landfill, and there are no intentions to import sludge from other sources. Similar to the existing sludge landfill, inspections and monitoring of the landfill expansion will be performed in accordance with applicable regulations to control odor, dust, and vectors; however, with the Project, measures would be included to improve leachate collection, manage stormwater, and reduce erosion as compared to existing conditions.

The City has been operating and consistently improving their WWTF to manage the waste stream generated from the citizens of the City of Gardner, Town of Ashburnham, and East Templeton. The operation of the WWTF has allowed the City to improve the conditions in the Otter River. One of the end products of the wastewater treatment plant is sewage sludge, and the City is responsible for managing this waste. The City has been and continues to explore options that are feasible, permittable, and provide a cost-effective option. In evaluating options, which are detailed in **Chapter 2, "Alternatives Analysis"** of this DEIR, the City is responsible for providing the service of managing the City's wastewater in a manner that works to

maintain a reasonable cost, especially in light of the fact that portions of the City are within state-designated "Environmental Justice" block groups with the criteria "Income (see **Chapter 3, "Environmental Justice**")."




**Natural Resources - NWI Wetlands**

City of Gardner, MA
Gardner Sludge Landfill Expansion
**Worcester County, MA**

*Legend*

- Project Area
- Project Site

National Wetlands Inventory

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Riverine

0 50 100 200 300 400 500 Feet

N

Woodard & Curran

Project #: 0231568.03
Map Created: July 2024



**Figure 1-4b**

Bridge St
West St
Wildwood Cemetery
Bridge St
West St
Solar Farm
Former Solid Waste Landfill
Saint John's Cemetery
Notre Dame Rd
St Johns Rd
St John
Otter River
Sludge Landfill
Cummings Conservation Area
Notre Dame Cemetery
Boston and Maine Railroad
Rd

# Natural Resources - MassDEP Wetlands

City of Gardner, MA
Gardner Sludge Landfill Expansion

**Worcester County, MA**

Legend

- Project Area
- Project Site

MassDEP Wetlands Inventory

- Bog
- Deep Marsh
- Open Water
- Shallow Marsh Meadow or Fen
- Shrub Swamp
- Wooded Swamp Coniferous
- Wooded Swamp Deciduous
- Wooded Swamp Mixed Trees

0 50 100 200 300 400 500 Feet

N

Woodard & Curran

Project #: 0231568.03
Map Created: July 2024



**Figure 1-4c**


# Vernal Pool Locations

City of Gardner, MA
Gardner Sludge Landfill Expansion

**Worcester County, MA**

*Legend*

- Project Area
- Project Site
- MassDEP Mapped Vernal Pools (6/15/2020)
- MassDEP Mapped Vernal Pool No-Disturb Buffer - 100 ft.
- NHESP Certified Vernal Pools

0 50 100 200 300 Feet

N

Woodard & Curran

Project #: 0231568.03
Map Created: July 2024



**Figure 1-4d**

# Surrounding Area - Aerial

City of Gardner, MA
Gardner Sludge Landfill Expansion

**Worcester County, MA**

*Legend*

- Project Area
- Project Site
- Surrounding Area (1 mile)

0 250 500 1,000 1,500 2,000 2,500 Feet

N

Woodard & Curran

Project #: 0231568.03
Map Created: July 2024

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources: MassGIS**

**Figure 1-5a**

# Surrounding Area - Land Use

City of Gardner, MA
Gardner Sludge Landfill Expansion

**Worcester County, MA**

## Legend

- Project Area
- Project Site
- Surrounding Area (1 mile)
- City of Gardner Boundary

Land Use Category

- Commercial
- Industrial
- Open Space and Outdoor Recreation
- Public Institutions and Facilities
- Residential
- Right of Way
- Transportation and Utility
- Private - Undeveloped
- Water
- Mixed Use
- Vacant

0 250 500 1,000 1,500 2,000 2,500 Feet

N

Woodard & Curran

Project #: 0231568.03
Map Created: July 2024



**Figure 1-5b**

## 1.9 Proposed Project

As described in the Environmental Notification Form, the City is proposing the Project, which would construct an 8.75-acre expansion to the existing sludge landfill located at 850 West Street, Gardner (H32-16-4; Route 68) as shown in **Figure 1-1** and the Project drawings included in **Appendix A** of this DEIR, page 338 (Project). The Project will include three cells and increase the capacity of the landfill by approximately 276,500 cubic yards, which is conservatively projected to accommodate the City's sludge production for at least seventeen years or until 2044. The Project is immediately to the west of the existing landfill and will allow for continued sludge landfill operations as an extension of the western face.

The Project meets all applicable design standards and requirements of MassDEP's residuals and biosolids program and has been designed to conform to the EPA Resource Conservation and Recovery Act standards of 40 CFR Part 257 – Criteria for Classification of Solid Waste Disposal Facilities and Practices. As such, 310 CMR 19:00 Solid Waste Facility Regulations were consulted for the Project landfill design standards. The design of the landfill would ultimately be reviewed, revised if necessary, and approved by MassDEP through the WP34 permit approval process.

Construction of the Project involves the removal of vegetation and forested area, then removing up to 20 feet of soil and regrading the Project Site to establish a sub-base. The subbase will be a minimum of 4 feet above the seasonal high groundwater elevation. See **Chapter 4, "Landfill Design and Construction"** for further details regarding design and construction.

The Project would leave the remaining 102.2 acres of the Project Area undeveloped.

### 1.9.1 Groundwater Protection System

The Project would be constructed with a double composite (a type of material where two layers of different composite materials are combined together) groundwater protection system (GWPS) with leak detection meeting the 310 CMR 19.110 standards for a solid waste landfill. As defined by 310 CMR 19.006, a GWPS is an engineered system that may include without limitation, liners, and barrier structures; leachate collection, storage, and disposal systems; drainage systems and/or other technologies intended to prevent the migration of leachate into and contamination of the groundwater. The GWPS would occupy a footprint of approximately 4.3 acres immediately to the west of the existing landfill and would be constructed on top of the subbase to act as a barrier to separate the applied sludge and any generated leachate from the groundwater resources beneath it. The GWPS will consist of the following components, which will be installed in the order below (from the bottom of the liner in contact with the subbase to the top of the liner in contact with sludge/leachate):

1. Low Permeability Layer - a low permeability layer will cover the subbase with one-foot of compacted low hydraulic conductivity soil, a geosynthetic clay liner, and a high-density polyethylene geomembrane;

2. Leak Detection and Secondary Leachate Collection System - a leak detection and secondary leachate collection system would be installed over the low permeability layer;

3. Primary Low Permeability Layer - a primary low permeability layer with a geosynthetic clay liner and high-density polyethylene geomembrane would be installed to cover the leak detection and secondary leachate collection system;

4. Primary Leachate Collection System - a primary leachate collection system would be installed over the primary low permeability layer; and

5. A one-foot layer of sandy soil material and stone would be installed over the primary leachate collection system to protect the underlying components of the GWPS. Once operational, sludge would be placed on top of this layer.

The GWPS will overlap the entire slope of the existing landfill to create a continuous impermeable barrier at the interface between the existing landfill and the expansion.

See **Chapter 5, "Groundwater,"** for the groundwater impact analysis and how the Project would ensure the protection of groundwater resources.

### 1.9.2 Leachate Collection and Conveyance System

Similar to existing conditions, leachate produced by the Project would be directed to the City's existing sewerage collection system. As defined by Federal Regulation 40 CFR 257.2, leachate is a liquid that has passed through or emerged from solid waste and contains soluble, suspended, or miscible materials removed from such waste. A 15,000-square-foot portion at the southernmost and lowest end of Cell One would be used as a detention area to which leachate from the remainder of Cell One and Cells Two and Three would be directed. Leachate would be pumped out of the landfill and into the existing leachate conveyance system. From there, the leachate pump station delivers it to a gravity sewer main in West Street where it can flow to the existing WWTF for treatment. The leachate collection and conveyance system for the Project was designed to accommodate precipitation that would become leachate under worst case extreme storm conditions (see **Chapter 8, "Climate Change"** for further discussion of associated impacts).

### 1.9.3 Stormwater Management System

To manage clean rainwater that falls onto unused cells, the Project would include a bioretention pond and two infiltration basins.

### 1.9.4 Gas Management

Passive venting is proposed to manage the small amount of gas produced by sludge decomposition.

### 1.9.5 Operations

The Project would include three cells that are proposed to be constructed at the same time and then filled sequentially. The Project was designed to accommodate a cap after it has reached capacity. See **Chapter 4, "Landfill Design and Construction"** for further description of the Project's proposed operational sequencing and eventual closure.

## 1.10 Changes to the Project since the Environmental Notification Form

Revisions to the landfill design will be made during MassDEP permitting and final design. With respect to landfill design, a revision would be made to replace the 10-foot overlap with a hydraulic separation liner to achieve the requirements of MassDEP's Residuals Management Program, relevant guidance documents (i.e., Residuals Guidance Document No. 90-1 and Solid/Hazard Waste Policy #12), and MassDEP Solid Waste Management Regulations 310 CMR 19.110(5)(c); a landfill gas monitoring system will be included in nearby

structures (i.e., leachate pump station) to ensure landfill gas is not migrating away from the landfill toward on-site structures; and the design of infiltration basin #2 would be revisited to accommodate additional storage volume as necessary. Furthermore, final cover placement will be designed when portions of the existing landfill are at final grade, which will occur after disposal operations move into the expansion area.

## 1.11 Project Cost

The Project is estimated to cost approximately $12 million for construction of the Project. The estimate includes the cost of landfill expansion in 2024 Dollars (USD), which is estimated to be $6.7 million, cost associated with the partial closure of the landfill, which is estimated to be $2.9 million, and cost associated with the full closure in 2044, which is estimated to be $2.4 million. This estimate is considered a complete construction cost and includes the capital costs for purchasing material; labor associated with construction and inspection; and administrative, quality assurance, construction permits, and contingency costs. This estimate is also considered conservative and does not include a provision for the sale of timber on the Project Site or the use of approximately 19,500 cubic yards of surplus soil material, which could be stockpiled and used as daily cover (estimate includes a price to export this soil), which could result in cost savings. The two primary benefits to expanding the City of Gardner's current landfill are its low cost to implement compared to the Project's alternatives and stabilizing the cost for disposal of the City's sludge for sewer ratepayers.

## 1.12 Construction Schedule

Construction of the Project is expected to commence in April of calendar year 2026 and be completed in calendar year 2028. The duration of construction is conservatively expected to be 22 months (See **Chapter 4, "Landfill Design and Construction"**).

## 1.13 Regional and Regulatory Context

### 1.13.1 Regional Context

The three primary means of sludge disposal used in the New England region are landfilling, incineration, and land application (beneficial reuse). The state of Massachusetts was reported in 2024 to have approximately 127 Water Resource Recovery Facilities in the state, with approximately 14 percent of the state's sewage sludge being disposed of by landfills or monofils (including both in state and out of state facilities, with significant contributions from landfills in Vermont, New Hampshire, and New York); 37 percent being incinerated (a method primarily used by facilities in Massachusetts, Rhode Island, and Connecticut, with Upper Blackstone Clean Water and the Lynn WWTF as significant contributors); 39 percent by land application, which includes composting, thermal drying, and alkaline stabilization, with the largest facilities of these methods being the Massachusetts Water Resources Authority Biosolids Processing Facility and the Greater Lawrence Sanitary District; and 10 percent by other methods (e.g., hauling to a cogeneration facility in Quebec).[5]

[5] Bone, C., Brower, B., Tenney, R., Caceci, J., Labbe, T., King, L., Nekowitsch, J., Sierra, N., Baskin, K. M., Wood, J., Smith, C. M., Galambos, N., Langley, L., Towns, K., Boyer, D., Burke-Wells, J., & Nowak, M. (2024). *PFAS and Residuals Technology and Management Study, Part 1 Technical Memorandum: Current and Near-Term Management of Massachusetts Wastewater Sludge*. Massachusetts Department of Environmental Protection.

Sludge generally refers to the suspended and dissolved solids removed from sewage/wastewater during the treatment process. Raw sludge is approximately 2 to 3 percent solids and 97 to 98 percent water before it is thickened and/or dewatered. Dewatering can be accomplished by a variety of means and to a variety of extents, and the dryer a sludge becomes prior to landfilling, the less added amendment (sand) needs to be mixed into the landfill with the sludge. When some amount of this sand can be spared from use, a significant amount of money and space can be saved, and the lifespan of the landfill is extended. In 2019, the replacement of the City's belt filter press with a centrifuge was determined to be the best option for upgrades to the WWTF. Centrifuge dewatering is generally capable of producing sludge at 20 to 35 percent solids (compared to 25 percent solids with the belt filter press).[6]

It is also worth noting the differences between the use and disposal of sludge and biosolids. When sludge is treated further to attain quality standards sufficient for its beneficial reuse, it generally becomes known as a "biosolid," at which point the waste product is subject to a different set of standards and regulations.

The sludge and biosolids disposal market is markedly interconnected, and sludge or biosolids generated in one state are frequently disposed of in another. Thus, it is important to view the regional market as a whole, rather than considering state-by-state or location-by-location conditions. The New England Biosolids and Residuals Association 2018 survey on wastewater solids management in the state of Massachusetts reported, for example, that almost all of those wastewater solids that were generated in the state and being sent to landfills, were sent to landfills out of the state. This was confirmed by MassDEP's 2024 report, entitled "PFAS and Residuals Technology and Management Study, Part 1." MassDEP's 2024 report highlights the diversity of sludge management strategies in Massachusetts, which helps mitigate the risk of relying on a single disposal method. However, it also notes the challenges and potential disruptions in each method, particularly with evolving regulations and capacity limitations. Currently, Massachusetts does not have a Master Plan addressing the treatment, storage, and handling of wastewater residuals, whether it be landfilling, incineration, or land application. The Massachusetts 2030 Solid Waste Master Plan (October 2021) focuses on the challenges of municipal waste management and does not mention the management of wastewater treatment residuals. As witnessed in MassDEP's PFAS and Residuals Technology and Management Study, Part 1, "options for managing sludge in the entire New England region are shrinking, and challenges faced by Gardner to manage wastewater treatment residuals are representative of the region as a whole. Landfills are credited as providing an important option in the event that other disposal methods run into issues, and when landfills close, market demands lead to increased disposal fees, and sludge waste is hauled to greater and greater distances.

Deficiencies in the region's sewage sludge sewage management systems result in a need for additional disposal capacity that is both cost-effective and reliable. Long- and short-term solutions are sought, and concerns surrounding per- and polyfluoroalkyl substances (PFAS) as well as shutdowns of landfills, incinerators, and land application options have disrupted typical systems. There is interest in having a regional biosolids facility in New England that could bolster the development of new technologies supporting the water utility sector and water resource recovery facilities. Organizations in the industry like the New England Interstate Water Pollution Control Commission, the New England Water Environment Association, and New England Biosolids and Residuals Association have recognized the potential benefits of a regional facility, as well as the challenges that could come from such an effort. While they can be

[6] Metcalf & Eddy Inc., Tchobanoglous, G., Burton, F. L., Tsuchihashi, R., & Stensel, H. D. (2013). *Wastewater engineering: Treatment and resource recovery* (5th ed.). McGraw-Hill Professional.

technically feasible, developing regional facilities can be expensive and could face public resistance. Questions remain regarding which community(ies) would host the facility, who might own and operate such a facility, and who would pay for such a facility. Current efforts for regional facilities are not far enough along to be feasible for the near-term sludge disposal needs that the City faces.

A study released in 2020 from New England Biosolids and Residuals Association cited that New England municipalities encountered a median 37 percent year-over-year contract price increase in sludge and biosolids disposal fees. Associations like New England Biosolids and Residuals Association and New England Interstate Water Pollution Control Commission frequently share biosolids disposal contract values for regional municipalities during renegotiation. As of 2023, in surveying those associations, the median contract tipping fee (the fee for disposal of solid waste) rose significantly, to an estimated $150 per wet ton. However, there are some significant outliers to these trends. In at least one case in western Massachusetts within the past three years, a municipality was charged more than $300 per wet ton to dispose of sludge outside of their normal hauling schedule. In addition, disposal contract renewal terms have broadly moved from 5-year renewals to 1- or 2-year contract terms. Veolia estimated a cost range of $175 to $225 per wet ton for off-site hauling of Gardner's sludge. This data points to significant instability in the sludge and biosolids disposal market, with strong upward trends in tipping fees likely to continue for the foreseeable future.

### 1.13.2 Regulatory Context

MassDEP's Residuals Management Program oversees wastewater treatment sludge and biosolids and regulates construction and modification of residuals landfills.

Standards for the use or disposal of sewage sludge are promulgated in Federal Regulation 40 CFR Part 503 – Subpart C – Surface Disposal, which establishes standards, consisting of general requirements, pollutant limits, management practices, operational standards, frequency of monitoring, recordkeeping, and reporting for the final use or disposal of sewage sludge. These requirements apply to sewage sludge placed on a surface disposal site, such as the Project. However, with respect to design and operation, MassDEP's residuals and biosolids program has issued a policy memorandum stating that the design and operation of sludge landfills on sites owned by municipal wastewater treatment facilities shall conform to the EPA Resource Conservation and Recovery Act standards of 40 CFR Part 257. As such, 310 CMR 19:00 Solid Waste Facility Regulations were consulted for the Project landfill design and operational standards.

The landfilling of wastewater treatment sludge is governed by MassDEP policy and guidance documents. The following policy and guidance documents were consulted in the development of the Project:

- **Residuals Guidance Document No. 90 – 1, Guidelines for Hydrogeologic Evaluations** for proposed landfill sites defines the geology of the site, groundwater flow paths and rates, design characteristics of the landfill liner, and the location of all proposed groundwater protection and monitoring systems.
- **Residuals Guidance Document No. 90 – 2, Residuals Landfill Plan Submittal List** lists application submittal requirements for plan approval (see Permits and Approvals section below).

- **Sludge Disposal Redundancy Requirements** include requirements for backup facilities for wastewater treatment plants that may not be able to dispose of sludge throughout their design life (20 years).
  - For sludge only landfills, such as the Project, generally no backup facility will be required for landfills that have adequate capacity to accommodate sludge during the design life of the wastewater treatment facility. If the landfill capacity is not sufficient for 20 years, the treatment facility shall be required to have an approved backup disposal solution method in place six months prior to the closure of the primary landfill. Such backup may be either a long-term solution or an interim one pending development of a long-term resolution.
- **MassDEP Division of Water Pollution Control (DWPC) Wastewater Residuals Guidance Document No. 89 - 2 – Closure/Post Closure Care Requirements** includes procedures and certifications required for closing a residuals landfill.
- **Solid/Hazardous Waste Policy #12 - Sludge Landfills Design & Operation** includes parameters for the environmentally safe design and operation of sludge landfills.

## 1.14 Public Policy

### 1.14.1 Article 97 Land Disposition Policy Consistency Analysis

Article 97 of the Public Lands Preservation Act was enacted to ensure no net loss of protected open space and establishes a right to a clean environment including its natural, scenic, historical, and aesthetic qualities for the citizens of the commonwealth. This legislation applies to areas identified by Massachusetts State Open Space Ownership Records and Open Space Legal Interest Areas. As illustrated in **Figure 1-3**, the Project Area is outside of the City of Gardner Open Space Ownership Record area as well as Massachusetts State Open Space Ownership Records and Open Space Legal Interest Areas. Therefore, the Project is consistent with Article 97's Land Disposition Policy.

### 1.14.2 Gardner Community Development Plan

Gardner's 2006 Community Development Plan was created in response to Executive Order 418, which mandated that all Massachusetts communities create a Community Development Plan to address four elements: housing, open space and resource protection, economic development, and transportation. The open space and resource protection element recognizes the Open Space and Recreation Plan as a guiding document for issues related to open space, and the 2015 update of the Open Space and Recreation Plan acknowledges the sludge landfill's possible horizontal expansion. Thus, the Project is consistent with this element of the Community Development Plan. A 2023 update of the Open Space and Recreation Plan has been drafted but not finalized, and the update recognizes the sludge landfill's planned expansion to extend the useful life of the landfill. The Project supports the plan's economic development and open space and resource protection elements by limiting the amount of new space required for sludge disposal by making the best use of existing properties and infrastructure, and by following federal, state, and local policies for the protection of open space and resources.

### 1.14.3 Wildwood Forest Management Plan

The Wildwood Forest Management Plan was developed in 2012 and establishes goals and practices for the Project Area, which is under the ownership of the City. The plan's goals include those for water quality,

habitat, and species protection, but of notable importance is that these goals exist in the context of timber harvesting. Management of the forest according to the plan has the primary purpose of maximizing long-term profits from future timber resources following silvicultural principles with a focus on environmental protection. This plan expired in 2021. The City may pursue an update to this plan to include the harvest of timber removed in the Project Site footprint, an action that is consistent with the original plan, which states "the proposed areas [for timber harvesting] may change based on priority, markets and landowner goals for the property."

### 1.14.4 ResilientMass/2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan

The ResilientMass Plan, also known as the Massachusetts State Hazard Mitigation and Climate Adaptation Plan was adopted by the Commonwealth of Massachusetts in 2023. Developed by the Executive Office of Energy and Environmental Affairs, the Massachusetts Emergency Management Agency, and other state agencies, the plan lays out state goals and strategies that support climate adaptation, climate resilience, and hazard mitigation. Prioritized projects per the climate adaptation plan address risks from the five identified priority impacts as well as from high-consequence vulnerabilities. The City has developed the Project to address hazards outlined in the plan related to flooding from precipitation and hurricanes, and to promote state efforts to update, repair, and replace critical infrastructure.

In compliance with the State Hazard Mitigation and Climate Adaptation Plan, risks associated with the Project have been assessed and addressed in its design. The Project's stormwater management systems address hazards associated with storms, hurricanes, and flooding events (see **Chapter 6, "Stormwater,"** and **Chapter 8, "Climate Change**"). **Chapter 4, "Landfill Design and Construction"** additionally provides an evaluation of the landfill's hydrologic performance under average and peak weather projections.

## 1.15 Permits and Approvals

This section lists the applicable state, federal, and local permits and review requirements for the Project and provides the status of associated pending actions.

### 1.15.1 Local

#### 1.15.1.1 Wetlands Protection Act

Within the City of Gardner, a Wetlands Protection Act permit is required prior to altering any protected resource area or buffer zone of a protected resource. A portion of the proposed work is located within the buffers to a Bordering Vegetated Wetland. The Gardner Conservation Commission held a joint Public Hearing under Ch. 131, § 40, Wetlands Protection Act and the City of Gardner Wetlands Protection Ordinance on a Notice of Intent filed by the City for the expansion of the Sludge Landfill on July 25, 2022. At the request of the Conservation Commission, the consultant firm Tighe & Bond received the City's Notice of Intent application dated June 23, 2022 and conducted a Peer Review. A Peer Review Memorandum was issued October 19, 2022, which requested a groundwater mounding analysis and assessment of potential impacts of groundwater mounding from new stormwater basins on vernal pools; clarity on the location of the erosion control barriers; included a recommendation to require permanent monumentation of the 100-foot buffer to certified vernal pools; included a recommendation to use 100 percent jute or coconut fiber erosion control products; concurred with the Project's compliance with the Massachusetts Stormwater

Standards 1, 2, 4, 7-10; included a recommendation to require additional subsurface explorations within the limits of each infiltration component under Standard 3; requested consideration if the landfill constitutes a land use with higher potential pollutant load and if additional stormwater pollution measures are required under Standard 5; requested a determination if additional research into the Smith/Rodecki Water Supply Land is required under Standard 6; included a recommendation to the Commission to require adequate cover for outlet pipe at infiltration basin one; included a request to revise HydroCAD models to correct an error in area; provide a justification for the multiplier used to size the horizontal overflow grate as part of the outlet control structure; requested that reasoning be provided for using a lower infiltration rate for the bioretention basin; and included a recommendation to require an intermediate condition watershed map. Subsequently a response to the Peer Review was issued on November 1, 2022, and an Order of Conditions was received from MassDEP Bureau of Resource Protection on November 14, 2022. The Order of Conditions states the Project, as proposed, is approved subject to conditions which are necessary in accordance with the performance standards set forth in the wetlands regulations. The Order was appealed by an abutter on December 1, 2022. MassDEP conducted a site visit on April 3, 2023, to gather additional information for the appeal before issuing a Superseding Order of Conditions. It is the intent of MassDEP to issue a Superseding Order of Conditions with a review of this DEIR, which can affirm, modify, or overturn the local decision. The Superseding Order of Conditions takes precedence over the local Order of Conditions, ensuring that state-level standards and regulations are met. This process helps maintain consistent application of the Wetlands Protection Act across Massachusetts while allowing for state-level oversight.

### 1.15.2 State

The following State environmental approvals have been identified. The agency that would issue the Project's approval is MassDEP. As a Participating Agency under the MEPA regulations, MassDEP will wait for the conclusion of the MEPA process before determining whether to issue approvals "to maximize consistency between Agency Actions, and to facilitate coordination of all environmental and development review and permitting processes of the Commonwealth (301 CMR 11.01(1)(c))."

#### 1.15.2.1 Massachusetts Department of Environmental Protection

##### 1.15.2.1.1 WP33 - Approval of Wastewater Treatment Residual Landfills

Under MassDEP Bureau of Resource Protection Residuals Management Program, an Approval of Wastewater Treatment Residual Landfills is required for the Project. Legislative authority for this approval is stated in Massachusetts General Laws (MGL), Chapter 21, sections 27 and 43(2); Chapter 83, sections 6 and 7; and Chapter 111, sections 17. A WP33 application for Approval of a Wastewater Treatment Residuals Landfill was prepared and submitted to MassDEP by the City of Gardner (the Applicant) in January of 2022 to obtain authorization for construction and operation of the Project. The application materials are available to the Department for review in accordance with protocols, the design will be modified per any recommendations received from the review, and then, if approved, a permit would be granted for construction and operation. As stated above, MassDEP awaits the conclusion of the MEPA process before completing review and considering whether to issue approval.

##### 1.15.2.1.2 257 CMR 2.00: Certification of Operators of Wastewater Treatment Facilities

257 CMR 2.00 establishes a process for the evaluation and certification of operators of wastewater treatment facilities. Persons desiring to be certified operators of wastewater treatment facilities must file an application

and pass the examination prepared by the Board of Certification of Operators of Wastewater Treatment Facilities established in M.G.L. c. 21, § 34A. The existing landfill facility is operated by Veolia, a certified wastewater treatment facility operator. Veolia is anticipated to act as the operator of the facility expansion area.

#### 1.15.2.1.3 310 CMR 7.00: Air Pollution Control

The Massachusetts Air Pollution Control regulations are set forth in 310 CMR 7.00. The plan approval requirements in Section 7.02(1) state:

- (b) "*A plan approval is required prior to any construction, substantial reconstruction, alteration, or subsequent operation of a facility that may emit contaminants to the ambient air*."
- (d) "*For the air contaminant GHGs [Greenhouse Gases], the potential to emit shall be determined based on tons per year $CO_2e$ [$CO_2$ equivalents], and 310 CMR 7.02 shall be applicable to GHGs only if construction, substantial reconstruction or alteration of a facility or emission unit results in an increase in potential emissions equal to or greater than 75,000 tons per year $CO_2e$*."

The primary emissions from landfills are methane and carbon dioxide, both of which are GHGs. Plan approval is not required for the Project because the GHG emissions are well below 75,000 tons per year $CO_2e$.

Odor is an air contaminant and the regulations state that emissions may not cause or contribute to a condition of air pollution that includes an odor nuisance. See **Chapter 7, "Air Quality**."

#### 1.15.2.1.4 314 CMR 7.00: Sewer System Extension and Connection Permit Program

MassDEP regulates extensions and connections of sewer systems in accordance with 314 CMR 7.00 to ensure proper operation of Massachusetts wastewater treatment facilities and sewer systems. The Project includes the installation of a new pump station associated with the leachate management system. Leachate will be pumped from the new landfill expansion area to the existing leachate conveyance system. From there, it will be pumped to a gravity sewer main in West Street where it can flow to the existing WWTF for treatment. The existing leachate pump station will be upgraded as a separate project prior to commencement of the landfill expansion.

#### 1.15.2.1.5 314 CMR 12.00: Operation, Maintenance and Pretreatment Standards for Wastewater Treatment Works and Indirect Discharges

MassDEP establishes standards and pretreatment requirements to ensure the proper operation and maintenance of wastewater treatment works and the protection and enhancement of water resources within the Commonwealth. This regulation applies to the WWTF and not the Project.

#### 1.15.2.1.6 314 CMR 3.00: Surface Water Discharge Permit Program

MassDEP regulates surface water discharge through a permitting program that runs parallel to the NPDES program, which is run solely by the EPA as of June 20, 2020. Both the MassDEP Surface Water Discharge program and the NPDES program regulate point sources that discharge pollutants to surface waters. Most

surface water discharges only require submission of a Notice of Intent to EPA, but some activities require submittals to MassDEP.

Leachate will be pumped from the landfill expansion area to the existing leachate conveyance system. From there, it will be pumped to a gravity sewer main in West Street where it can flow to the existing Gardner WWTF. The Gardner WWTF is authorized to discharge in accordance with effluent limitations, monitoring requirements, and other conditions set forth under the NPDES program. All stormwater runoff from new impervious areas will be directed to two (2) infiltration basins and one (1) bioretention pond. Pretreatment of stormwater runoff will be provided by deep sump catch basins installed at the low point of each grass-lined swale draining to the basins and pond.

#### 1.15.2.1.7 314 CMR 4.00: Surface Water Quality Standards

Massachusetts Surface Water Quality Standards (314 Code of Massachusetts Regulations (CMR) 4.00), are enforced by the Commonwealth of Massachusetts. Any revisions to state water quality standards must be approved by the EPA for the revised standards to be federally enforceable under the Clean Water Act. MassDEP may limit or prohibit discharges of pollutants to surface waters to protect, maintain, or attain surface water quality standards. Effluent limitations for individual projects are established by the discharge permit in accordance with 314 CMR 3.00: Surface Water Discharge Permit Program. MassDEP may also develop and enforce compliance with Total Maximum Daily Loads (TMDLs) and TMDL implementation plans.

Project operation would include environmental monitoring with sampling and analysis performed three times per year to assess potential effects on groundwater and nearby surface waters. All stormwater runoff from new impervious areas will be directed to two (2) infiltration basins and one (1) bioretention pond. Pretreatment of stormwater runoff will be provided by deep sump catch basins installed at the low point of each grass-lined swale draining to the basins and pond.

#### 1.15.2.1.8 314 CMR 5.00: Groundwater Discharge Permit Program

314 CMR 5.00 establishes a Groundwater Discharge Permit Program that allows MassDEP to regulate the discharge of pollutants to groundwater. The Project does not include the discharge of pollutants to groundwater. Leachate captured by the landfill's GWPS will be pumped from the landfill expansion area to the existing leachate conveyance system. From there, it will be pumped to a gravity sewer main in West Street where it can flow to the existing Gardner WWTF.

#### 1.15.2.1.9 314 CMR 1.00 – 6.00 BRP WP 34 Approval of Closure Plans for Wastewater Residual Landfills

MassDEP requires approval of closure plans for wastewater residual landfills prior to closure activities. This approval is required for any individual, business, or organization that owns and/or operates a site where sludge and other wastewater treatment facility residuals have been or will be disposed of. The review and approval ensure that a proper monitoring plan is in place and minimizes the risk of contamination reaching groundwater and/or surface water from potential leachate migration.

A WP 34 Approval of Closure Plans for Wastewater Residual Landfills will be required prior to closure activities at the landfill. The City has not yet applied for this approval. The City of Gardner anticipates submitting a partial Closure Plan for areas no longer receiving sludge within the existing landfill prior to the

closure of these areas upon moving operations into the expanded landfill. A full Closure Plan is anticipated to be submitted in approximately 2044. This timing is consistent with the requirement that a Closure Plan approval should be applied for at least six (6) months prior to any proposed closure activities. The application should include all required site maps, ownership information, site receptors, and local surface and groundwater resource information.

### 1.15.3 Federal

#### 1.15.3.1 EPA Region 1

##### 1.15.3.1.1 National Pollutant Discharge Elimination System Construction General Permit for Stormwater Discharges from Construction Activities

In accordance with the Clean Water Act, 33 U.S.C. §1251 et. seq., the NPDES Construction General Permit authorizes the discharge of stormwater from construction activities that meet the requirements of the permit. The EPA is the permitting authority for NPDES permits in the Commonwealth of Massachusetts. NPDES permits are typically co-issued by EPA and MassDEP. Some circumstances require a Notice of Intent submittal to both MassDEP and EPA. This project does not discharge to Outstanding Resource Waters and does not include any of the other scenarios requiring submittal to both MassDEP and EPA.

Permit coverage is required for stormwater discharge from any construction activity disturbing one (1) acre or more of land. The Project would disturb 8.75 acres of land in total. Therefore, authorization under the Construction General Permit will be required prior to construction activities. Construction activities include clearing, grading, excavating, and any other construction activities that could generate pollutants. The Construction General Permit addresses the minimum federal effluent limitation guidelines found in 40 CFR 450.21. Under the Construction General Permit, the project will comply with erosion and sediment control, water quality, site inspection, and other applicable requirements. A Stormwater Pollution Prevention Plan (SWPPP) for the project will be developed and submitted with the Notice of Intent and kept up to date throughout the coverage of the Construction General Permit.

##### 1.15.3.1.2 National Pollutant Discharge Elimination System Multi-Sector General Permit

The EPA regulates stormwater discharges associated with certain industrial activities through the issuance of a NPDES Multi-Sector General Permit. Land dedicated to the disposal of sewage sludge is considered an industrial facility that is required to obtain this permit coverage. The requirements for coverage under an industrial stormwater permit include the development of a written SWPPP, implementation of control measures, and submittal of a Notice of Intent. The SWPPP is a written assessment of potential sources of pollutants in stormwater runoff and control measures that are implemented by the facility to minimize the discharge of these pollutants in runoff from the site. These control measures include site-specific best management practices (BMPs), maintenance plans, inspections, employee training, and reporting. The procedures detailed in the SWPPP must be implemented by the facility and updated as necessary, with a copy of the SWPPP kept on-site. The industrial stormwater permit also requires the collection of visual, analytical, and/or compliance monitoring data to determine the effectiveness of implemented BMPs.[7]

[7] U.S. Environmental Protection Agency. (2006). *Sector T: Treatment Works*. EPA-833-F-06-035. Retrieved from https://www.epa.gov/sites/default/files/2015-10/documents/sector_t_treatmentworks.pdf

### 1.15.3.2 USACE New England District

The Project does not include work or structures in, over or under navigable waters of the United States, or the discharge of dredged or fill material into waters of the United States. Therefore, the Project does not require Clean Water Act Section 10 or Section 404 permitting by the U.S. Army Corp of Engineers (USACE).

# 2. ALTERNATIVE ANALYSIS

## 2.1 Introduction

In accordance with Massachusetts Environmental Policy Act (MEPA) Regulation 301 CMR 11.07(6)(f), this chapter provides:

- "a description and analysis of alternatives to the Project including all feasible alternatives, but not limited to those indicated in the Environmental Notification Form Scope;
- a description of the alternative of not undertaking the Project (i.e., the no-build alternative) for the purpose of establishing a future baseline in relation to which the Project and its alternatives can be described and analyzed and its potential environmental impacts and mitigation measures can be assessed;
- an analysis of the feasible alternatives in light of the objectives of the Proponent and the mission of any Participating Agency, including relevant statutes, regulations, executive orders and other policy directives, and any applicable Federal, municipal or regional plan formally adopted by an Agency or any Federal, municipal, or regional governmental entity;
- an analysis of principal differences among the feasible alternatives under consideration, particularly regarding potential environmental impacts; and
- a brief discussion of any alternatives no longer under consideration including the reasons for no longer considering these alternatives."

As indicated in the MEPA Certificate Scope, this chapter provides a supplemental alternatives analysis that provides additional details available concerning a proposed anerobic digester in Fitchburg, MA; reviews an alternative involving trucking sludge to the proposed anerobic digester in Fitchburg (also known as the Fitchburg Biosolids Management Facility) if it were to be available for sludge disposal (no-build alternative); and evaluates the potential environmental impacts and impacts on environmental justice populations. In response to comments made on the Environmental Notification Form, this chapter also evaluates an alternative to build a hydrothermal carbonization facility. Also provided in this chapter is a history and background on alternatives previously studied and provides more detail as to why alternatives studied in 2016 or studied in the Environmental Notification Form were dismissed.

The two alternatives to the Project described and analyzed in this chapter include the following:

- **Alternative 1: Landfill Closure and Off-Site Hauling (no build alternative).** Under this alternative, the existing landfill would be closed once capacity is reached and sludge would be hauled from the Gardner WWTF to locations outside of Gardner for disposal thereafter. This option includes an evaluation of off-site disposal at the planned Fitchburg Biosolids Management Facility.
- **Alternative 2: Hydrothermal Carbonization.** Under this alternative, modifications would be made to the Gardner WWTF or the Project Site to process sludge and other organic materials such as food waste or septic waste using hydrothermal carbonization technology and facilitate a regional biosolids processing facility in the City of Gardner.

## 2.2 Alternatives Analysis Background

Prior to 1990, wastewater residuals (sludge) from the City's WWTF used to be disposed of in the City's municipal solid waste landfill. The municipal solid waste landfill was closed in 1999. As described in **Chapter 1, "Project Description and Permitting,"** the current sludge only landfill has been in operation since November 1990.

### 2.2.1 Sludge Disposal Site Evaluation and Management Program (1983)[8]

A site evaluation was conducted in 1983 for the siting of the existing sludge landfill. The objective of this study was to find an environmentally acceptable and economically feasible site for the disposal of the City's wastewater residuals (sludge). The site evaluation included a review of planning studies and geological reports regarding natural resources in the Town, and discussions with City officials. The study area included parcels within the City of Gardner as well as city-owned parcels within the Town of Templeton. The criteria used to eliminate sites from further evaluation included:

1. the need for a vacant property with sufficient space to host the sludge landfill for 20 years;
2. access for trucks and other sludge disposal facility equipment;
3. a location where existing zoning and land use would not be in conflict with a sludge disposal facility; and
4. proximity to the WWTF, located on Plant Road in the adjacent Town of Templeton, to minimize the distance for the trucking of sludge and the need for extensive sewer infrastructure connections to direct leachate back to the WWTF from the sludge disposal site.

There were advantages to selecting a site already in City-ownership, including the avoidance of costs and additional time spent on an acquisition process. The following three sites were identified for further evaluation:

- The sand filter bed site (Town of Templeton Parcel #: 6-12-16.6, 16.3, and 16.2), which is City owned property in the Town of Templeton;
- The Gardner Municipal Airport (Parcel #: 5-12-30), located at 499 Airport Road, which is City owned property in the Town of Templeton; and
- The current location of the existing sludge landfill (Parcel H32-16-4), located at 850 West Street, which is City owned property within the City of Gardner.

The advantages of all three sites were that they were all under City-ownership, had sufficient space, provided access for trucks and other sludge disposal facility equipment, and were near the WWTF, which would result in shorter hauling distances from the WWTF.

At the time, the most desirable location for siting the sludge landfill was the sand filter bed site as it was adjacent to the WWTF. Due to its proximity, this location would have minimized the need for trucking and

[8] Public Hearing for Industrial Pretreatment Program and Sludge Disposal Site Evaluation and Management Program. October 5, 1983.

additional leachate conveyance infrastructure more than the other sites. Costs for developing the sludge landfill at this location would have been $190,000 (1983 USD).

The Gardner Municipal Airport is located approximately 1.9 miles from the Gardner WWTF. This location had sufficient space and accessibility for trucks and disposal equipment. Costs for developing the sludge landfill at this location would have been $545,000 (1983 USD).

The current location of the existing sludge landfill is located approximately 2.4 miles from the Gardner WWTF. The site met all the criteria for further evaluation above. Costs for developing the sludge landfill at this location were estimated to be $380,000 (1983 USD).

On December 8, 1983, the City of Gardner was informed that the Town of Templeton held a Special Town Meeting, and it was voted unanimously by those registered voters present, not to allow the City of Gardner to use any land in the Town of Templeton as a sludge landfill. This effectively eliminated the sand filter bed site (and any other City of Gardner owned property in the Town of Templeton) from further evaluation, including the Gardner Municipal Airport. Ultimately, the current location of the existing sludge landfill was advanced, permitted, and developed.

### 2.2.2 Project Site Evaluation

Similar to the 1983 study, alternative locations for the disposal of the City's sewage sludge were considered in support of the Project's purpose and need. In the decision-making process, criteria considered for the Project's location included property ownership, land use and zoning, permitting, space constraints, availability of existing infrastructure and site development costs, and overall cost-effectiveness (see **Figure 2-1)**.

For the property-ownership criteria, properties not owned by the City were excluded from further consideration. While it may have been possible for the City to purchase new land for the project, using existing city-owned property results in cost-savings and avoids the potentially lengthy process of negotiating, purchasing, and obtaining necessary approvals for acquiring land. For the land use and zoning criteria, further excluded from consideration were land zoned commercial (COM1 and COM2), single family residential (SFR1), and General Residential (GR3). Land zoned for industrial use (IND1 and IND2) may have provided an appropriately zoned area for the Project; however, lot size, proximity to residential and commercial zones, and availability were factors contributing to the elimination of industrial zoned land. Additionally, floodplain and water protection overlay zones were avoided. The majority of the City is zoned Rural Residential (RR2), which provides ample space for uses such as sewage sludge disposal.

A site would have to meet the requirements of the necessary permits and approvals to construct and operate a sludge landfill. Sites that would not meet permit requirements were excluded from further consideration. Factors that would present permitting issues included proximity to wetlands, water bodies, and floodplains; geology and soil conditions; and human health and safety concerns. For the space constraints criteria, the Project is expected to require 8.75 acres of land. Therefore, the site would need to be large enough to accommodate the size of the landfill expansion. Two other sites shown on **Figure 2-1** met these evaluation criteria – a site along State Route 40 (Parcel #W37-23-1) and a site along Mill Street (Parcel #R12-1-4A). However, these parcels were excluded due to their proximity to commercial and residential uses as well as their distance from the Gardner WWTF.

With respect to the availability of existing infrastructure, the existing sludge landfill already has infrastructure necessary to manage sewage sludge (i.e., leachate pump station, access road, equipment

storage building). Using and expanding existing infrastructure, including transportation systems such as access roads and waste hauling routes minimizes costs and environmental impact compared to developing a new site. The overall cost-effectiveness of site development was considered to protect ratepayers from cost increases.

Project Site

Gardner WWTF

Parcel W37-23-1

Parcel R12-1-4A

Winchendon State Forest

Lake Wampanoag

Gardner Municipal Golf Course

Mount Wachusett Community College

Dunn State Park

Gardner

South Ashburnham

Pitcherville

Gardner Rd

Winchendon Rd

Green St

Center St

Clark St

West St

Elm St

W Broadway

George W Stanton Hwy

W Main St

State Route 2

State Route 140

State Rd W

E Broadway

Timpany Blvd

Hubbardston Brook

Underwood Rd

Pitcherville Rd

Minott Rd

Knower Rd

Ellis Rd

Whitney St

Westminster State Forest

# Project Site Evaluation

City of Gardner, MA
Gardner Sludge Landfill Expansion
**Worcester County, MA**

Legend

- Project Area
- City of Gardner Owned Parcels

Excluded Parcels

- Excluded (<8.75 acres)
- Excluded (Zoning)
- In Active Use

- Groundwater Protection Overlay District (O2)
- Surface Water Protection Overlay District (O6)
- Flood Plain Overlay
- Municipal Open Space
- Gardner Parcels

0 0.25 0.5 1 Miles

N

Woodard & Curran

Project #: 0231568.03
Map Created: November 2024



**Figure 2-1**

For these reasons, the Project Site was chosen for the Project as it is located on land currently owned by the City, specifically zoned and permitted for such use, and already has infrastructure in place to accommodate the Project. Expanding the existing sludge landfill at its proposed location eliminates the need to duplicate infrastructure that already exists at the current location, and thus reduces the total necessary development footprint.

### 2.2.3 Alternatives Previously Considered

#### 2.2.3.1 Wastewater Treatment Plan Upgrades Sludge Disposal Evaluation & Gardner Sludge Disposal – Alternatives Analysis (2016)

In May 2015, the City initiated an evaluation of alternatives to the existing sludge landfill and dewatering technology upgrades to the WWTF. This evaluation was subsequently refined over a 17-month period (May 2015-September 2016). Concurrently with this evaluation, the City sought approval from MassDEP for a vertical expansion of the existing sludge landfill. A presentation was given to Gardner's City Council on September 19, 2016 by CDR Macguire, Inc., which provided a history of wastewater treatment in the City, reviewed recent activities, and provided an overview of the dewatering technology evaluation and the options for disposing sludge.[9] It was reported at this meeting that the City received approval from MassDEP pursuant to MGL Chapter 21, Sections 27(12) and 34; and 314 CMR 3.00 and 12.00, for a vertical expansion through a BRP WP44 permit application on February 3, 2016, contingent upon an odor control analysis and modifications. Modifications to reduce odors included changes to operations that no longer allowed sludge to sit uncovered over the weekend and use of an increased cover ratio with additional cover added during weather events. Ultimately, MassDEP concurred with the implementation of these measures.

With the vertical expansion, the capacity of the landfill was increased by 107,000 cubic yards and the lifespan was extended. Also, in 2019, the original belt press dewatering process equipment at the Gardner WWTF was replaced with centrifuge dewatering process equipment. Conversion from belt press dewatering to centrifuge dewatering has improved the average dewatered sludge cake total solids content from a range of 19 percent to 23 percent with the belt press to a range of 25 percent to 30 percent with the centrifuge. The implementation of this technology has also extended the lifespan of the landfill.

As part of the 2016 alternative analysis, cost and non-cost impacts were investigated. Cost factors included future costs, fuel prices, electrical costs, trucking costs, odors, design costs, construction costs, the cost of land, needed infrastructure improvements, equipment purchases, and operation and maintenance costs. Contract negotiations with disposal sites, other municipalities and trucking companies were also conducted for this analysis. For the cost evaluation, the following was assumed:

- the term of borrowing for the evaluation would be 20 years;
- the interest rate would be 4 percent;
- the WWTF would not expand and would produce sludge at a consistent rate for the life of the term;
- the current landfill accepts approximately 400 cubic yards of material every month (at 22 percent solids), which results in approximately 1,500 dry tons per year;

[9] City of Gardner. (September 19, 2016). *Informal Meeting of September 19, 2016, Meeting Minutes*.

- engineering, permitting, and construction oversight for each alternative is 25 percent;
- for a conservative analysis, a 25 percent contingency was included;
- operation and maintenance of equipment is equal to 4 percent of capital costs;
- costs for sludge cake, and incineration were prorated to increase over the term of the evaluation at 4 percent; and

- power generated using gas from anaerobic digestion was valued at $0.15 per kilowatt hour.

The non-cost factors evaluated included traffic and odor impacts. The four alternatives or "options" analyzed were the following:

1. Continue dewatering and landfilling
2. Composting
3. Anaerobic digestion
4. Offsite disposal

These alternatives were evaluated on two sites – the available land adjacent to the existing sludge landfill and the Gardner WWTF in Templeton.

**Option 1 - Continue Dewatering and Landfilling** would be a continuation of the current methods, which would require the expansion of the sludge landfill (the Project). Generally, this option would require comparatively minor infrastructure improvements as the Project Area is already in use as a landfill and no new equipment would be needed. The costs for this option include the development of the plans for the expansion (design costs), sitework, installation of a liner, an extension of the existing leachate collection system and mixing material (materials and construction costs), electrical and replacements costs. Operational costs would remain as in existing conditions and would generate eight truck trips per week. For this option, it was assumed that a portion of the in-situ material would be used for daily cover and final cover material for the closing of the existing sludge landfill. Costs for this option were estimated to be approximately $7,500,000 (2016 USD). The cost impact to the sewer rate payer would be approximately $17 per quarter (2016 USD).

**Option 2 - Composting** would involve gravity thickening and dewatering of the sludge prior to conversion to compost. To make compost, the dewatered sludge would be mixed with an amendment (typically wood chips) and stored for decomposition. To facilitate the complete conversion of material to compost and ensure a consistent process, the mixed piles of amended sludge are placed over a pumped air distribution system. For composting, best practice dictates the process be performed under a covering as protection from rain is key. Three acres of space would be needed for this option, which could be sited at either the Project Site or the Gardner WWTF. To facilitate composting at the Gardner WWTF, a concrete platform would be constructed, likely over the existing sand filter beds. To facilitate composting at the Project Site, tree removal and grading would be necessary.

In evaluating the composting option, the viability of the use, sale, or distribution of the finished product (i.e., compost) is a factor. Massachusetts regulations 310 CMR 32.00, regulate limits on the use of compost based on type.

- Type I Sludge may be used, sold, or distributed or offered for use, sale, or distribution on any site without further approval, and may be used for growing any vegetation (310 CMR 32.10(1)).
- Type II Sludge and septage may be used, sold, or distributed or offered for use, sale, or distribution on a site only with prior approval from MassDEP, and may be used for growing any vegetation (310 CMR 32.10(2)).
- Type III Sludge and septage may be used, sold, or distributed or offered for use, sale, or distribution for land application on a site only with prior approval from MassDEP, and may be used for growing any vegetation not including direct food chain crops, land application to a site must be recorded in the registry of deeds in the chain of title for such site (310 CMR 32.10(3)).

Tests conducted on sludge from the Gardner WWTF indicate the sludge could be Type II or Type III as the boron content of the sludge is 329 mg/kg, which is above the maximum allowable concentration for water soluble boron (300 ppm) per Table 32.12.(2)(a) in 310 CMR 32.00. If approval was obtained from MassDEP for use, sale, or distribution, there would be additional trucking associated with the use, sale, or distribution of the compost.

**Option 3 - Anaerobic Digestion** uses gravity thickened (not dewatered) sludge and introduces it to an anaerobic (no oxygen) environment inside a reaction chamber that allows certain bacteria to break down the organic matter and destroy the pathogens in the sludge. Food waste can also be added to enhance the process. Changes in food waste disposal regulations support the development of this type of operation. Depending on the characteristics of the sludge and other feedstock added to the process, various amounts of gas containing methane are produced that can be used for energy production (and cost recovery). One of the inherent downsides to anaerobic digestion is that waste biproducts are still produced, requiring disposal.

The 2016 alternatives analysis also studied the planned Fitchburg Biosolids Management Facility proposal, first to determine the feasibility of its replication in Gardner and second to evaluate a potential collaboration by contributing Gardner's sludge to that system. The planned Fitchburg Biosolids Management Facility would have used Fitchburg's sludge, paper mill waste, food waste, and sludge from surrounding communities. In addition to sludge disposal, one of the main goals of the planned Fitchburg Biosolids Management Facility at the time was to generate energy from the facilities' anaerobic digestion system. It was proposed that the planned Fitchburg Biosolids Management Facility would generate 1.5 megawatts of energy. The report entitled Organics to Energy Feasibility Study (February 2016) developed for the Fitchburg Biosolids Management Facility, stated that the "development of a large-scale (1.5 MW) anaerobic digestion project appears economically viable and further development is warranted." Energy generation was a key component of the viability of this planned project for a rate of return on investment. The report states that the initial investment, or preliminary project cost, would be approximately $23,700,00 (2016 USD) with a total project cost of $270 million. Fitchburg's situation was unique in that many of the facilities necessary for the process are already built. Their West Treatment Plant was recently decommissioned, providing available space with some existing structures that could house some of the equipment needed, which significantly reduced their capital costs. The intent of the Fitchburg facility was to fund construction and operation of their project through tipping fees, energy production, and tax credits, as well as State and Federal grants that were being pursued to fund the project. Approximately 30 truck trips would be necessary to supply the Fitchburg Biosolids Management Facility with material to feed the anaerobic digestion system both within and outside of Fitchburg. Of those 30 trips, it is anticipated that approximately 10 truck trips a

week would be required to deliver liquid sludge from Gardner to Fitchburg. If the City were to participate in the Fitchburg Biosolids Management Facility project, it would cost approximately $623,780 (2016 USD) per year.

If instead, Gardner were to develop an anaerobic digestion system, its viability would similarly depend on the addition of food waste. The City has 17 viable sources of food waste that generate 3.31 tons of food waste per day. Based on a mixing ratio of food waste to sludge of 1:5 and the average production of 13.3 tons per day of sludge, the new anaerobic digestion system would require 2.9 tons of food waste per day, which is approximately 88 percent of the food waste generated in the City. A major factor in the viability of the anaerobic digestion system is the ability to receive a consistent quality of material (food waste and sludge) for feedstock. To allow for the delivery of consistent amounts of material, it is anticipated that storage would be required for both sludge and food waste. Without a sufficient supply of waste, this alternative would not be practical.

For Gardner, this option would require a significant infrastructure investment (i.e., new structures, gravity thickener, reaction chamber, tanks for processing, mixing, and storage), staff training, and additional staff for the collection of community food waste. An anaerobic digestion facility could be sited at the Gardner WWTF or the Project Site, but it would be more cost effective to locate it at the Gardner WWTF where the sludge is generated and would be thickened and to facilitate the return of liquid waste. Siting the anaerobic digestion system at the Project Site would involve tree removal and grading, developing a portion of the available space, construction of the infrastructure, and hauling of the thickened sludge to the digester and liquid back to the Gardner WWTF. The anaerobic digestion facility could be accommodated at the Gardner WWTF; however, the WWTF is located in the Town of Templeton, where the power grid is owned and operated by the Templeton Power Utility. There are no incentive programs for contributing to Templeton's power grid, thereby reducing this option's viability. It is anticipated that 10 truck trips per week would be required to service the anaerobic digestion facility. With option 3, odors are expected to be similar to existing conditions. Ultimately, disposal of a biproduct would still be necessary, which would postpone, not eliminate, the need for a sludge landfill expansion, or this option would include off-site hauling.

This option would cost the City of Gardner approximately $680,000 (2016 USD) annually. This cost includes engineering, equipment, personnel, and operational expenses. However, site improvements and land development are required for the system, which was estimated to cost approximately $2,325,000 (2016 USD). Similar to Fitchburg, the viability of this option in Gardner would likely depend on the availability of tax credits, some of which are no longer available, and the pursuit of state and federal grant funding.

**Option 4 - Off-site Disposal** would include closing the existing sludge landfill, hiring a trucking contractor, and hauling sludge to another disposal facility. In general, this option would include minor infrastructure but would be subject to volatile haul pricing and rising fuel costs, regulatory changes, disposal site availability, and contract terms. Initially, this option evaluated hauling liquid sludge by a private hauler or hauling sludge cake by a private hauler. However, with the centrifuge upgrade at the Gardner WWTF, an approximately $2,000,000 investment made by the City, hauling liquid sludge is no longer necessary.

Costs for this option were estimated to be approximately $12,800,000 (2016 USD). The cost impact to the sewer rate payer would be approximately $29 per quarter (2016 USD).

The use of a private hauler eliminates the disposal of sludge at the city-owned landfill, but entails unpredictability due to potential contract issues, fuel costs, and available capacity at the private disposal

site. The hauling of sludge cake requires approximately four truck trips per week, depending on the size of the truck, making it potentially more efficient than hauling to the city-owned landfill, which generates eight trips per week.

#### 2.2.3.2 Environmental Notification Form Considered Alternatives

The following nine alternatives were considered in the Project's Environmental Notification Form:

**Alternative 1 – No Action** The no action alternative was dismissed because it does not address handling the sludge produced by the treatment plant. It was therefore rejected without further evaluation.

**Alternative 2 – Eliminate Sludge Generation** The sludge is produced by processes that treat sewage before clean water is released to the environment. Eliminating the generation of sludge could be achieved by either discontinuing the operation of the wastewater treatment plant or discharging untreated wastewater to the Otter River. Either action would result in multiple environmental regulatory violations and were therefore rejected as nonviable without further evaluation.

**Alternative 3 – Land Application** would apply wastewater sludge to land parcels used for animal grazing or crops.

**Alternative 4 – Construct a Composting Facility** would construct a composting facility on the Project Site or at another location. This alternative is similar to Option 2, discussed above.

**Alternative 5 – Modify the WWTP to Add Anaerobic Digestion** would construct an anaerobic digestion system at the Gardner WWTF. This alternative is similar to Option 3, discussed above.

**Alternative 6 – Construct an Incinerator** would construct an incinerator at the Gardner WWTF or Project Site.

**Alternative 7 – Construct a Pyrolysis or Gasification Facility** Pyrolysis and gasification were evaluated jointly because of their similarities. These are very expensive cutting-edge technologies to transform sludge into gas emissions and char. Both processes operate at extremely high temperatures – pyrolysis without oxygen, gasification with very low levels of oxygen. Although the ability of these processes to eliminate PFAS is promising, it has not been proven. No pyrolysis or gasification facilities have been permitted in Massachusetts. Hydrothermal carbonization is a similar technology and has been advanced for further consideration in this chapter.

**Alternative 8 – Construct a New Sludge Landfill Elsewhere in the City** would construct a new sludge landfill in the City of Gardner at a location other than the Project Site. This alternative is similar to the Project Site Evaluation, discussed above (see **Section 2.2.2**).

**Alternative 9 – Contracted Hauling and Disposal** would close the existing sludge landfill and contract with a private hauler for disposal of the City's sludge outside of Gardner. For this alternative, the City would engage the services of a private hauler to truck the sludge to a disposal facility. The City conducted an evaluation in 2016 by collecting data from multiple WWTFs throughout the northeast that were using private haulers for sludge removal. All the contracts that had been initiated within the previous two years had a duration of two to five years. Longer-term disposal contracts are not available because of the volatility in pricing. The preference of private haulers to only offer short duration contract periods is primarily driven by the uncertainty in the limited availability of disposal options and because of regulatory changes. The uncertainty about fuel costs also contributes to the preference for short-duration contracts. This alternative has been advanced for further consideration in this chapter.

## 2.3 Alternatives Considered but Dismissed

All of the above alternatives were dismissed (see **Table 2-1**) except for:

- Option 1 (Continue dewatering and landfilling), which is being further considered as the Project;
- Option 4 (Off-site disposal)/Environmental Notification Form Alternative 9 (contracted hauling and disposal), which is being further considered as Alternative 1: Landfill Closure and Off-Site Hauling (no build alternative); and
- Environmental Notification Form Alternative 7 (Construct a Pyrolysis or Gasification Facility), which is similar to and being further considered as Alternative Two: Hydrothermal Carbonization.

**TABLE 2-1: ALTERNATIVES CONSIDERED**

| 2016 Alternatives | ENF Alternatives | DEIR Alternatives |
|---|---|---|
| N/A | Alternative 1 - No Action | dismissed |
| N/A | Alternative 2 - Eliminate Sludge Generation | dismissed |
| Continue dewatering and landfilling (Option 1) | the Project | **the Project** |
| Composting (Option 2) | Alternative 3 - Land Application | dismissed |
| | Alternative 4 - Construct a Compost Facility | dismissed |
| Anaerobic Digestion (Option 3) | Alternative 5 - Modify the WWTP to Add Anaerobic Digestion | dismissed |
| N/A | Alternative 6 - Construct an Incinerator | dismissed |
| N/A | Alternative 7 - Construct a Pyrolysis or Gasification Facility | **Alternative 2: Hydrothermal Carbonization** |
| N/A | Alternative 8 - Construct a New Sludge Landfill Elsewhere in the City | dismissed |
| Off-site Disposal (Option 4) | Alternative 9 - Contracted Hauling and Disposal | **Alternative 1: Landfill Closure and Off-Site Hauling (no build alternative)** |

Similar options or alternatives have been grouped together to discuss why these alternatives have been dismissed, below.

Environmental Notification Form Alternative 1 (no action) and 2 (eliminate sludge generation) were dismissed because they do not address sludge disposal. Taking no action is not a legal option.

For Option 2 (Composting) and Environmental Notification Form Alternatives 3 (Land Application) and 4 (Construct a Compost Facility), these alternatives were dismissed due to the concerns around PFAS in sewage sludge. Regionally, land application of compost is under scrutiny and in some locations, such as

Maine, bans are being enacted.[10] Although land application has not been banned in Massachusetts, more stringent testing requirements have been adopted and limitations are currently being considered. Pursuing this option would incur costs associated with testing and also introduces a risk to Gardner if a ban is enacted in Massachusetts, in that effort (time and money) would be spent developing a compost facility, only to have to decommission it. Secondarily, composting is known to generate odors and also attracts vectors such as birds, flies and rodents. Costs associated with controlling odors and managing vectors are high. This alternative would also require new equipment (i.e., a pumped air distribution system) and training for staff. Additionally, some trucking would be involved if compost was approved by MassDEP for use, sale, or distribution and therefore traffic generated. This option is assumed to generate similar traffic to option 1, which would generate eight truck trips per week. For these reasons, these alternatives have been dismissed.

Option 3 (Anaerobic Digestion) and Environmental Notification Form Alternative 5 (Modify the WWTP to Add Anaerobic Digestion) were dismissed due to high capital and operational costs. The reliance on the availability of food waste is a risk to the systems' viability and there remains the need to dispose of the solids because the anaerobic digestion process does not eliminate the solids; it merely reduces the volume by approximately 50 percent. Therefore, some form of solids disposal is required as part of the anaerobic digestion alternative and either the Project would still be required, or the City would incur additional costs to haul solids off site. For these reasons, these alternatives have been dismissed.

Environmental Notification Form Alternative 6 (Construction an Incinerator) was dismissed as it requires large expenditure to construct and operate. According to The High Cost of Waste Incineration, it is reported that waste-to-energy incineration in the U.S. can range from $600-$830 million dollars per ton per year.[11] The high cost is due in part to additional sludge drying processes that would be required prior to incineration. According to MassDEP's Current and Near-Term Management of Massachusetts Wastewater Sludge (June 2024), the major drivers affecting incineration systems include regulatory requirements, costs of maintaining incinerators, costs of hauling to landfills, and limited disposal options. The current regulatory requirements that are influencing the continuation of incineration at existing facilities in the region include PFAS and GHG emission legislation, as well as general air permitting legislation, including Title V permits. Additionally, future changes from EPA or state legislators could prove challenging for these facilities.[12] Senate Bill 2053 from the Massachusetts Legislature, currently before the Senate Ways and Means, is proposing a moratorium on "prohibiting the procurement of PFAS-emitting structures or activities and shall not grant approval to any person required to file an environmental notification form proposing a new use or structure or modification of an existing use or structure where said proposal would generate emissions containing perfluoroalkyl and polyfluoroalkyl substance (PFAS)."[13] New air quality standards (40 Code of Federal Regulation (CFR) Part 60, Subpart LLLL – New Performance Standards for Sewage Sludge Incinerators), have affected incinerators in the region, as they have required existing facilities to upgrade. Due to the high cost of development, PFAS concerns, and stringent air quality standards, this alternative has been dismissed.

[10] Maine State Chamber of Commerce. (June 9, 2022). *PFAS Legislation Signed into Law by Governor Janet Mills*. Accessed at: https://www.mainechamber.org/mscc-blog/pfas-legislation-signed-into-law-by-governor-janet-mills

[11] https://www.no-burn.org/wp-content/uploads/The-High-Cost-of-Waste-Incineration-March-30.pdf

[12] MassDEP (June 28, 2024). *Current and Near-Term Management of Massachusetts Wastewater Sludge*. Accessed at: https://www.mass.gov/doc/pfas-and-residuals-technology-and-management-study-part-1-technical-memorandum/download

[13] https://malegislature.gov/Bills/193/S2053

For reasons analyzed above under **Section 2.2.2**, "Project Site Evaluation," Environmental Notification Form Alternative 8 (construct a new sludge landfill elsewhere in the City) was dismissed.

Further consideration of two alternatives – Alternative 1: Landfill Closure and Off-Site Hauling and Alternative 2: Hydrothermal Carbonization - is provided below and summarized in **Table 2-2**.

## 2.4 Alternative 1: Landfill Closure and Off-Site Hauling (no build alternative)

Under this alternative, the remaining capacity of the existing sludge landfill would be used until approximately 2030, the sludge landfill would not be expanded, and a landfill closure plan would be developed and executed. The City would then haul the sewage sludge from their WWTF to another receiving facility outside of the City of Gardner. According to MassDEP's PFAS and Residuals Technology and Management Study, Part 1, "in 2023, sludge was hauled from 1 to 424 miles for further processing or disposal, with an average hauling distance of 96 miles."

Hauling the sewage sludge to another receiving facility would require consideration of the following factors:

- Logistics of contracting with a private hauler, which involves variable contract term limits and stringent hauling requirements.
- Disposal fees.
- Location of the receiving facilities, which involves driving distance and driving time, associated vehicle and GHG emissions, drivers pay, and hauling routes (e.g., potentially through state-designated environmental justice communities).
- Available capacity of nearby receiving facilities (e.g., how much capacity and for how long)

The benefits of this alternative include no additional capital costs to the City (e.g., acquisition of new equipment, hiring and/or training staff, construction costs, planning and design costs, or lengthy and complex permitting and environmental review processes and costs). Additionally, with the closure of the existing sludge landfill in 2030, this alternative would result in a reduction in localized odors associated with sludge operations. Odors associated with the transport of sludge would still occur under this alternative.

The disadvantages of this alternative include significant cost uncertainties associated with the waste hauling market. The City would be subject to contracting with a private hauler and thus contracting rates and terms. Current trends in sludge disposal have introduced substantially upward-trending instability in disposal fees as confirmed by MassDEP's recent PFAS and Residuals Technology and Management Study, Part 1. Additionally, there is significant uncertainty about the future of the sludge market. The closure of one disposal location is likely to increase hauling prices across the market as regional disposal capacity is further restricted.

The MassDEP PFAS and Residuals Technology and Management Study, Part 1 states: "for hauling to an incineration facility, like Buffalo, NY or Woonsocket, RI, for sludge that contains over 4.2 percent solids, these facilities charge $386 per dry ton for the first 50 dry tons, then $323 per dry ton for additional sludge. For cake, the hauling and tip fee cost reported by 24 POTWs in the survey was $118-$203/wet-ton (average:

$153/wet-ton). These values are similar to the cost of landfilling cake, which ranges from $115-$205/wet ton."

For this evaluation, it is assumed that sludge generated at the Gardner WWTF would be hauled off site at a price of $160 per wet ton, which is the average hauling cost reported in MassDEP's recent PFAS and Residuals Technology and Management Study, Part 1. At $160 per wet ton, sludge disposal under this alternative would cost approximately $528,000 annually. Over the 17-year lifetime of the Project, this results in a cost of approximately $9 million. Note that this calculation is an approximation that does not account for the significant instability in the current sludge disposal market, nor does it account for inflation. Thus, it is likely that the cost is substantially underestimated. Another cost of this alternative would be the closure of the existing landfill, which is estimated to be approximately $4 million. Altogether, the cost of this alternative is estimated to be approximately $13 million.[14]

### 2.4.1 Fitchburg Biosolids Management Facility

This alternative considers use of the planned Fitchburg Biosolids Management Facility as the specific off-site disposal location for Gardner's sludge. The planned Fitchburg Biosolids Management Facility project is intended to be a private public partnership; however, at the time of this writing, a private partner has not been identified. The planned Fitchburg Biosolids Management Facility project, if constructed, would reuse the site of the nearby City of Fitchburg WWTF former West Plant to become a regional biosolids facility. The Fitchburg Biosolids Management Facility project, if funded, permitted, and built, could receive sludge generated at the City of Gardner WWTF for further treatment and disposal.

Currently, the project is in its infancy, with significant uncertainty about the project moving forward. In 2023, the planned Fitchburg Biosolids Management Facility had a projected schedule of three years that included environmental review, permitting, design and construction, with the intent of being operational by 2027; however, at the time of this writing, environmental review has not commenced. If a private partner was identified and environmental review commenced in 2025, the facility might be operational in 2028 at the earliest. If contracts are in place to accept Gardner's sludge prior to operation, this alternative might conceivably be available before the existing landfill reaches capacity. However, lacking financial backing, there is uncertainty around this project's advancement. There is also uncertainty around the timeframe of the environmental review and permitting process, which could take longer than anticipated. This high degree of uncertainty surrounding the planned Fitchburg Biosolids Management Facility makes this a high-risk alternative for sludge disposal for the City of Gardner.

The planned Fitchburg Biosolids Management Facility Fitchburg is not the only regional pursuit that has occurred in Massachusetts and has faced similar feasibility issues. As described in MassDEP's PFAS and Residuals Technology and Management Study, Part 1:

> *"[Publicy owned treatment works] POTW-to-POTW hauling practices and conversations with industry professionals clearly indicate that some POTWs serve as de facto regional management facilities by managing liquid sludge from smaller facilities. Although The Mass Sludge Survey 2018 discussed several potential projects for regional facilities and POTW operators and other industry professionals demonstrate clear interest in development of regional facilities, increased regionalization of sludge management within Massachusetts has not materialized. [Franklin County Solid Waste Management District] FCSWMD serves*

[14] Assumes closure costs $450,000 per acre applied to existing 8.75 acre sludge landfill.

*as an informative case study: As reported in The Mass Sludge Survey 2018 and confirmed by ongoing conversations with industry professionals, Greenfield envisioned installing a municipally owned anaerobic digester that would serve as a regional sludge outlet and began the project in earnest. Unfortunately, other nearby towns were not willing or able to contribute capital to the project, given that they would have no ownership of the completed facility. These municipalities also could or would not commit to long-term contracts with Greenfield's proposed anaerobic digestion facility given the volatile sludge management market and evolving regulatory environment. Without the financial and contractual support of would-be customer communities, Greenfield's anaerobic digestion project could not proceed. It is likely these small communities were simply unable to take on the financial or contractual risk that would be required to support the project."*

## 2.5 Alternative 2: Hydrothermal Carbonization

Under this alternative, modifications would be made to the Gardner WWTF or the Project Site to process sludge and other organic materials such as food waste or septic waste using hydrothermal carbonization technology and facilitate a regional biosolids processing facility in the City of Gardner. It is assumed that hydrothermal carbonization would require approximately 5 acres and that this could be accommodated at either the Gardner WWTF or the Project Site. Similar to anaerobic digestion, this alternative still produces a byproduct that requires sale (if there is a market), a waste-to-energy system that connects to the electrical or gas grid, or disposal.

Hydrothermal carbonization treats sludge using moderate heat (180-250°C) and pressure to generate a carbon-dense material called hydrochar. Hydrochar is a solid that tends to repel or fail to mix with water (hydrophobic), is significantly easier to dewater than sludge, and yields stabilized and dried material, averaging 50 percent to 60 percent total solids. This resulting material can be further treated, by drying, pelletizing, and gasification, for conversion to a hydrocarbon-dense liquid fuel referred to as syngas. In a separate process, this syngas is finally converted to energy using a generator engine that is fueled by syngas, combusted in a boiler for heat, or processed into renewable natural gas.

### 2.5.1 Gardner, MA Hydrothermal Carbonization Feasibility Study[15]

In 2023, SoMax Hydrothermal Carbonization, Inc. prepared a feasibility study analyzing the potential for processing the sludge generated by the City of Gardner using their technology. This study included a technical evaluation of the City's wastewater sludge to determine if its composition would support the hydrothermal carbonization process, evaluated the economics of an upgrade at the Gardner WWTF, and assigned a value to the hydrochar biproduct that was generated. The technical evaluation of the City's wastewater determined that the composition of the City's sludge, alone, would not support the hydrothermal carbonization process and that the addition of other carbon-rich material, such as the City's food waste would be required. In evaluating the financial feasibility and return on investment of implementing the hydrothermal carbonization system, SoMax estimated that the main factor that would be required to make the hydrothermal carbonization system economical would be to import a significant volume of additional carbon-rich material to increase the volume and vary the composition of the wastewater sludge generated at the Gardner WWTF. This would require the Gardner WWTF to become a regional waste acceptance facility, taking in wastewater sludge and food waste from elsewhere. Per the

[15] SoMax Hydrothermal Carbonization, Inc. (2023). *Gardner, MA HTC Feasibility Study*.

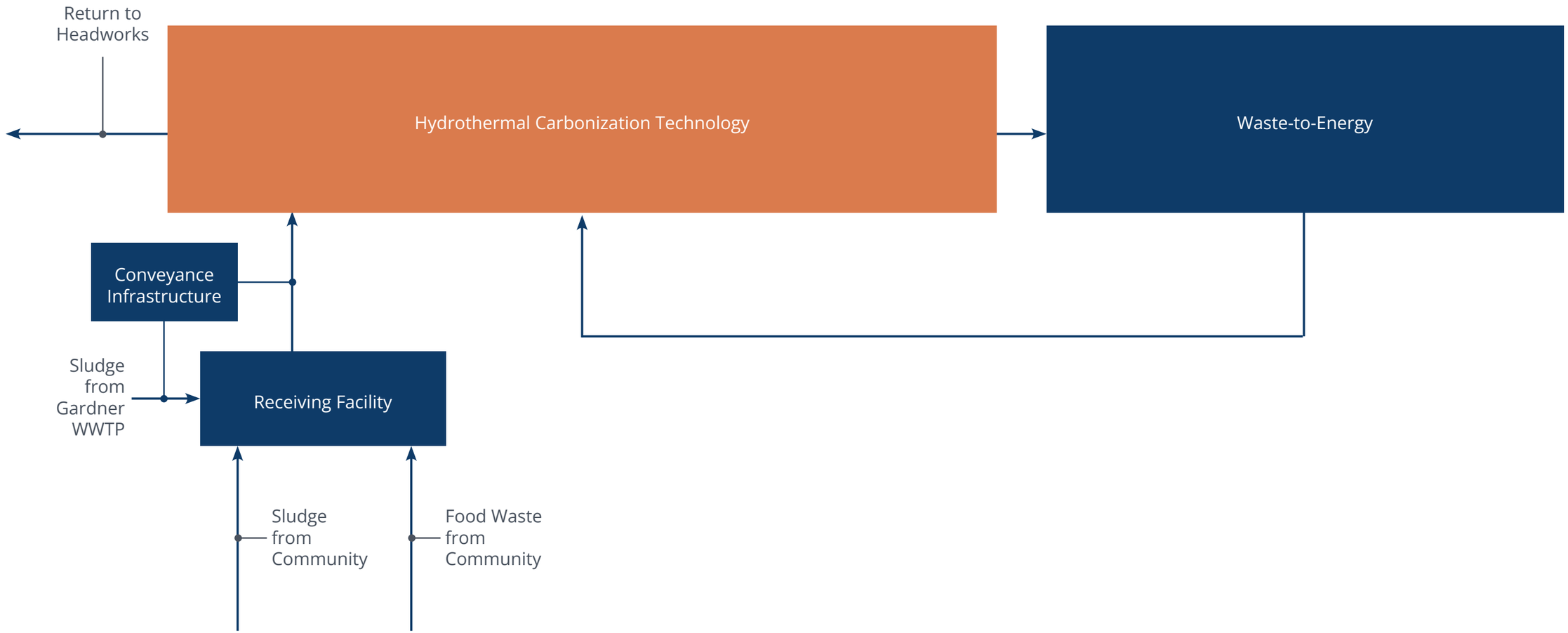
SoMax report, "[only] through additional hauled waste [including food waste and sewage sludge] can Gardner become a net energy producer." In addition, the SoMax report concluded that a significant investment in capital equipment would be needed to operate hydrothermal carbonization at the Gardner WWTF. As stated in the SoMax report, in 2021, Gardner generated 3,339.8 wet tons with an average percent total solid of 28 percent. The hydrothermal carbonization process has a target feedstock of 15 percent total solid, and processes approximately 15,000 (14,864) wet tons annually at 7 gallons per minute. With this capacity, the City would have to accept hauled waste to fill the excess capacity at approximately 4.45 times the current volume.

As described in the study, capital costs do not scale linearly with the amount of material passing through a system (throughput), and a smaller system would not only fail to meet the City's goal of energy generation but would be less cost efficient and would not allow the City to benefit financially from acceptance of hauled waste. For these reasons, modeling a system with City-only sludge was not developed.

### 2.5.2 Cost

The SoMax Study estimated the cost of the hydrothermal carbonization system to be approximately $9.9 million; however, it appears that this cost estimate did not include other components that would be necessary to implement this alternative, such as a receiving facility, and potentially also did not consider additional conveyance infrastructure, odor control systems, a gas treatment system, a turbine/generator to turn the syngas into energy and associated infrastructure to connect the delivery of that energy to the electrical or gas grid. **Figure 2-2** illustrates the schematic components both included and excluded from the SoMax cost estimate. There would also be costs associated with the operational shift to hydrothermal carbonization (i.e., staff and training), the cost of the engineering required to design the upgrade, permitting, and the cost to construct the system, all of which were also not included in the SoMax Study. For comparison, the SoMax equipment capital cost alone accounts for 130 percent of the installed budgetary cost of the landfill expansion, not including the waste-to-energy component. Costs for these excluded components are difficult to estimate. The cost to build a receiving facility in Massachusetts that processes approximately 15,000 wet tons annually can vary based on several factors, including the technology used, site-specific conditions, and additional infrastructure requirements. However, based on industry estimates, a smaller facility of this capacity might cost between $5 to $10 million.

Due to the significant planning and design as well as the identification of funding sources that remain to be developed for hydrothermal carbonization, this alternative likely would not be a feasible option to meet Gardner's 2027 disposal needs. However, given the desire for a regional facility, efforts, in collaboration with the State, should continue to be explored, for a longer-term solution to the City's, and the region's sludge disposal needs and electricity generation goals. Nonetheless, this alternative was conceptually evaluated in the alternatives analysis below for its potential environmental impacts in comparison to the Project.




**Hydrothermal Carbonization Technology Process Flow**

City of Gardner, MA
Gardner Sludge Landfill Expansion

**Worcester County, MA**

*Legend*

SoMax Study - Included Components

SoMax Study - Excluded Components

Note: This graphic is based on information provided in the SoMax study. This is our understanding of the components included/excluded in the SoMax proposal to the City of Gardner.

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Woodard & Curran

Project #: 0231568.03

**Figure 2-2**

## 2.6 Alternatives Analysis

### 2.6.1 Project Purpose and Need

As stated in **Chapter 1, "Project Description and Permitting,"** the City has been and continues to explore options that are feasible, permittable, and provide a cost-effective option for the City's wastewater treatment and sludge disposal process. The purpose and need for the Project is to:

- Provide the service of managing the City's wastewater in a manner that works to maintain a reasonable cost to sewer rate payers;
- Prevent raw sewage from contaminating local waters;
- Find a feasible, permittable, and cost-effective option for the disposal of the City's wastewater residuals (sludge);
- Implement a solution that meets 2027 disposal needs; and
- Avoid the importation of sludge from other sources and converting the City of Gardner's WWTF into a regional receiving facility

The project, as proposed, would meet all of these objectives, and would fulfill the purpose and need for sludge disposal.

#### 2.6.1.1 Alternative 1: Landfill Closure and Off-Site Hauling

This alternative would meet the City's objectives of preventing raw sewage from contaminating local waters, be feasible, would meet 2027 disposal needs, and avoids conversion to a regional receiving facility. This alternative would also not require permitting and avoids associated costs. However, this alternative would not work to maintain a reasonable cost to sewer rate payers and be a less cost-effective option for the disposal of the City's sludge.

#### 2.6.1.2 Alternative 2: Hydrothermal Carbonization

To meet the objective of exploring options that are feasible, permittable, and provide a cost-effective option to the City's wastewater treatment and residual disposal process, a hydrothermal carbonization feasibility study was conducted. This study was undertaken to act as a guide for the City of Gardner decision makers when assessing the potential for implementing hydrothermal carbonization at the WWTF as a sustainable long-term solution to replace the current practice of landfilling and the expansion of the municipal sludge landfill. Secondarily, this feasibility study was conducted to advance the City's goal of energy production. Exploration of options to advance the City's goal of energy production are outside the scope of this environmental review.

Without diversified funding sources such as grants or a public private partnership, Alternative Two would increase the cost to sewer rate payers, does not provide a solution that meets Gardner's 2027 disposal needs, and does not avoid the importation of sludge and food waste from other sources that would convert Gardner's WWTF into a regional receiving facility. This alternative does not meet the Project's purpose and need.

### 2.6.2 Land

With the Project, additional consideration and review under MEPA Regulation 301 CMR 11.03(1)(b) is not necessary as it would not include the direct alteration of 25 or more acres of land; create five or more acres of impervious area (the area of lined landfill is 4.3 acres); involve the disposition of or change in use of land or an interest in land subject to Article 97 (see **Section 1.10** and **Figure 1-3**); convert land in active agricultural use; involve the release of an interest in land held for conservation, preservation or agricultural or watershed preservation purposes; or require approvals associated with urban redevelopment projects or urban renewal plans. Therefore, impacts to land, as defined by MEPA Regulations, are not expected to occur with the Project.

A review of potential impacts under this technical analysis area is provided for Project alternatives below.

#### 2.6.2.1 Alternative 1: Landfill Closure and Off-Site Hauling

Under this alternative, land disturbance would not occur in the City of Gardner. Land disturbance of a developed site would occur with the redevelopment of Fitchburg's WWTF former West Plant and would need to be studied under that project's environmental review.

#### 2.6.2.2 Alternative 2: Hydrothermal Carbonization

Based on a hydrothermal carbonization system in Phoenixville, Pennsylvania, it is assumed that approximately five acres of land is required for this alternative. However, it is unlikely that all five acres would be impervious. Similar to the Project, impacts to land, as defined in the MEPA Regulations, are not anticipated to occur under this alternative at the Gardner WWTF.

### 2.6.3 Rare Species

The MEPA regulation 301 CMR 11.03(2)(b) requires additional consideration and review for projects that would meet or exceed review thresholds related to rare species or habitat that include the alteration of designated significant habitat; or if a Project involves greater than two acres of disturbance of designated priority habitat, as defined in 321 CMR 10.02, that results in a take of a state-listed endangered or threatened species or species of special concern.

Alteration of Significant Habitat would include the "change of the physical or biological condition of a designated Significant Habitat in any way that detrimentally affects the capacity of the Significant Habitat to support a population of Endangered or Threatened species… (321 CMR 10.01)." Activities conducted within Significant Habitat are considered alterations if they fall under any of the categories listed in 321 CMR 10.63(1), including the "discharge, storage, or disposal of solid waste, rubbish, stormwater, wastewater, toxic or hazardous substances, petroleum-based products, dredged materials, or fill (321 CMR 10.63(1)(e))." Take of state-listed species in these areas would mean to "harass, harm, pursue, hunt, shoot, hound, kill, trap, capture, collect, process, disrupt the nesting, breeding, feeding or migratory activity or attempt to engage in any such conduct, or to assist such conduct, and in reference to plants, means to collect, pick, kill, transplant, cut or process or attempt to engage or to assist in any such conduct. Disruption of nesting, breeding, feeding or migratory activity may result from, but is not limited to, the modification, degradation or destruction of Habitat" (321 CMR 10.01).

With the Project, additional consideration and review under MEPA Regulation 301 CMR 11.03(2)(b) is not necessary as it would not include the alteration of designated significant habitat or disturb designated priority habitat. The Project includes a westerly expansion of the sludge landfill to undeveloped areas

adjacent to the existing landfill. There are three certified vernal pools included in the Natural Heritage Atlas of the Natural Heritage and Endangered Species Program mapped adjacent to (approximately 100 feet west at its closest point) the Project Site, which may provide habitat to rare or state-listed species. The Project Site does not include areas considered to be priority habitat or areas of significant habitat. Furthermore, impacts to vernal pool habitat and buffers are avoided with the Project. Therefore, impacts to rare species or habitats are not anticipated to occur with the Project.

A review of potential impacts under this technical analysis area is provided for Project alternatives below.

#### 2.6.3.1 Alternative 1: Landfill Closure and Off-Site Hauling

Under the landfill closure and off-site hauling alternative, it is assumed that sludge would be hauled from the Gardner WWTF and be disposed of at an existing site, already developed elsewhere. As it would be an already developed receiving facility, it is assumed that alteration of designated significant habitat or disturbance of designated priority habitat would not occur. Therefore, similar to the Project, impacts to rare species or habitat are not anticipated to occur under this alternative.

If the planned Fitchburg Biosolids Management Facility was developed and available, a preliminary review of the Natural Heritage and Endangered Species Program layers of the Natural Heritage Atlas depict no priority habitat areas and no designated areas of significant habitat in or around Fitchburg's WWTF former West Plant. However, with the redevelopment of Fitchburg's WWTF former West Plant, potential impacts to rare species or habitat would need to be studied under that project's environmental review.

#### 2.6.3.2 Alternative 2: Hydrothermal Carbonization

For development of the hydrothermal carbonization alternative at the Gardner WWTF, a preliminary review of the Natural Heritage and Endangered Species Program layers of the Natural Heritage Atlas was performed. Similar to the Project, priority habitat (PH 1726) is mapped adjacent to (approximately 1,000 feet west) of the WWTF near Gardner Road, however this area is not located within the Gardner WWTF property and would likely not be impacted by development at this site. Additionally, the floodplain of the Otter River is located immediately east of the Gardner WWTF. As this alternative would require approximately 5 acres, development of the hydrothermal carbonization system would likely need to be designed to avoid impacts to adjacent sensitive resources that may provide habitat for rare species. In a review of aerial photographs, the site would likely accommodate the hydrothermal carbonization system to the southeast and southwest of the existing WWTF with minimal tree removal and expansion of the existing footprint. However, as this alternative does not have specific site plans available for review, potential impacts to rare species or habitat cannot be fully ascertained.

### 2.6.4 Wetlands, Waterways, and Tidelands

With the Project, additional consideration and review under MEPA Regulation 301 CMR 11.03(3)(b) is necessary as it would trigger the regulatory thresholds for the alteration of 5,000 or more square feet of bordering vegetated wetlands. The Project requires an Order of Conditions under the Wetlands Protection Act (Notice of Intent submitted on June 23, 2022, File No. CE 160-0654) as approximately 24,343 square feet of the proposed work is located within the buffers to a Bordering Vegetated Wetland. An Order of Conditions was received from MassDEP Bureau of Resource Protection on November 14, 2022 (see **Section 6.6.2**). As the Order of Conditions was appealed, a superseding Order of Conditions will be issued. It is the intent of MassDEP to issue a Superseding Order of Conditions with a review of this DEIR. Therefore, the Project is anticipated to impact approximately 24,343 square feet of Bordering Vegetated Wetland buffer

area; however, these impacts would be mitigated through implementing measures as outlined in the Order of Conditions.

A review of potential impacts under this technical analysis area is provided for Project alternatives below.

#### 2.6.4.1 Alternative 1: Landfill Closure and Off-Site Hauling

Under the landfill closure and off-site hauling alternative, it is assumed that sludge would be hauled from the Gardner WWTF and be disposed of at an existing site, already developed elsewhere. As it would be an already developed receiving facility, it is assumed that permits would not be required for the alteration of wetlands, waterways, and tidelands. Therefore, impacts to wetlands, waterways, and tidelands are not anticipated to occur under this alternative.

If the planned Fitchburg Biosolids Management Facility was developed and available, a preliminary review of MassMapper depicts wetlands, open waters, and streams on-site. The development of the planned Fitchburg Biosolids Management Facility would likely require permits to address the potential for impacts to wetlands, waterways, and tidelands, depending on final design. Ultimately, with the redevelopment of Fitchburg's WWTF former West Plant, potential impacts to wetlands, waterways, and tidelands would need to be studied under that project's environmental review.

#### 2.6.4.2 Alternative 2: Hydrothermal Carbonization

For development of the hydrothermal carbonization alternative at the Gardner WWTF, a preliminary review of MassMapper revealed a large floodplain and wetland complex associated with the Otter River on-site. Additionally, wetlands are mapped to the south of the facility with a potential stream or channel that hydrologically connects to the Otter River. As this alternative would require approximately 5 acres, development of the hydrothermal carbonization system would likely need to be designed to avoid impacts to adjacent sensitive resources. In a review of aerial photographs, the site would likely accommodate the hydrothermal carbonization system to the southeast and southwest of the existing WWTF with minimal expansion of the existing developed footprint. However, as this alternative does not have specific site plans available for review, potential impacts to wetlands, waterways, and tidelands cannot be fully ascertained.

### 2.6.5 Wastewater

With the Project, additional consideration and review under MEPA Regulation 301 CMR 11.03(5)(b) is necessary as it involves the expansion in capacity for the disposal of sewage sludge. This DEIR provides the required additional consideration and review with respect to other technical analysis areas. With respect to wastewater, the Project would provide the City with a critical infrastructure facility and is considered to be a beneficial effect of the Project.

A review of potential impacts under this technical analysis area is provided for Project alternatives below.

#### 2.6.5.1 Alternative 1: Landfill Closure and Off-Site Hauling

Under the landfill closure and off-site hauling alternative, it is assumed that capacity at the existing sludge landfill would be reached between 2027 and 2030, and the sludge landfill would close. Thereafter, sludge would be hauled from the Gardner WWTF and be disposed of at an existing site, already developed elsewhere. With respect to wastewater infrastructure in the City of Gardner, this would be considered a significant adverse impact as it would eliminate the ability of the City to manage and dispose of their own

sludge and subject the City to a volatile hauling market. This would negatively affect the City's sewer rate payers. Furthermore, this alternative would not only impact the City's wastewater infrastructure but place a burden on the already stressed regional disposal infrastructure given that capacity of receiving facilities is diminishing and few, if any, are opening in other locations. This is already resulting in haulers having to travel farther and farther distances to dispose of sludge. As discussed above, Maine has enacted a ban on the land application of sludge, which has caused immense pressure on the few landfills available, resulting in sludge being exported to Canada.

If the planned Fitchburg Biosolids Management Facility was developed and available, an analysis of impacts to wastewater infrastructure would be required and would need to be studied under that project's environmental review. With respect to wastewater, the planned Fitchburg Biosolids Management Facility would provide critical infrastructure and would be considered a beneficial effect for the region. However, this would remain a significant adverse impact to Gardner's wastewater infrastructure and continue to result in disposal price volatility risk for the City.

#### 2.6.5.2 Alternative 2: Hydrothermal Carbonization

Similar to the Project, hydrothermal carbonization would provide the City with a critical infrastructure facility and would be considered a beneficial effect.

### 2.6.6 Transportation

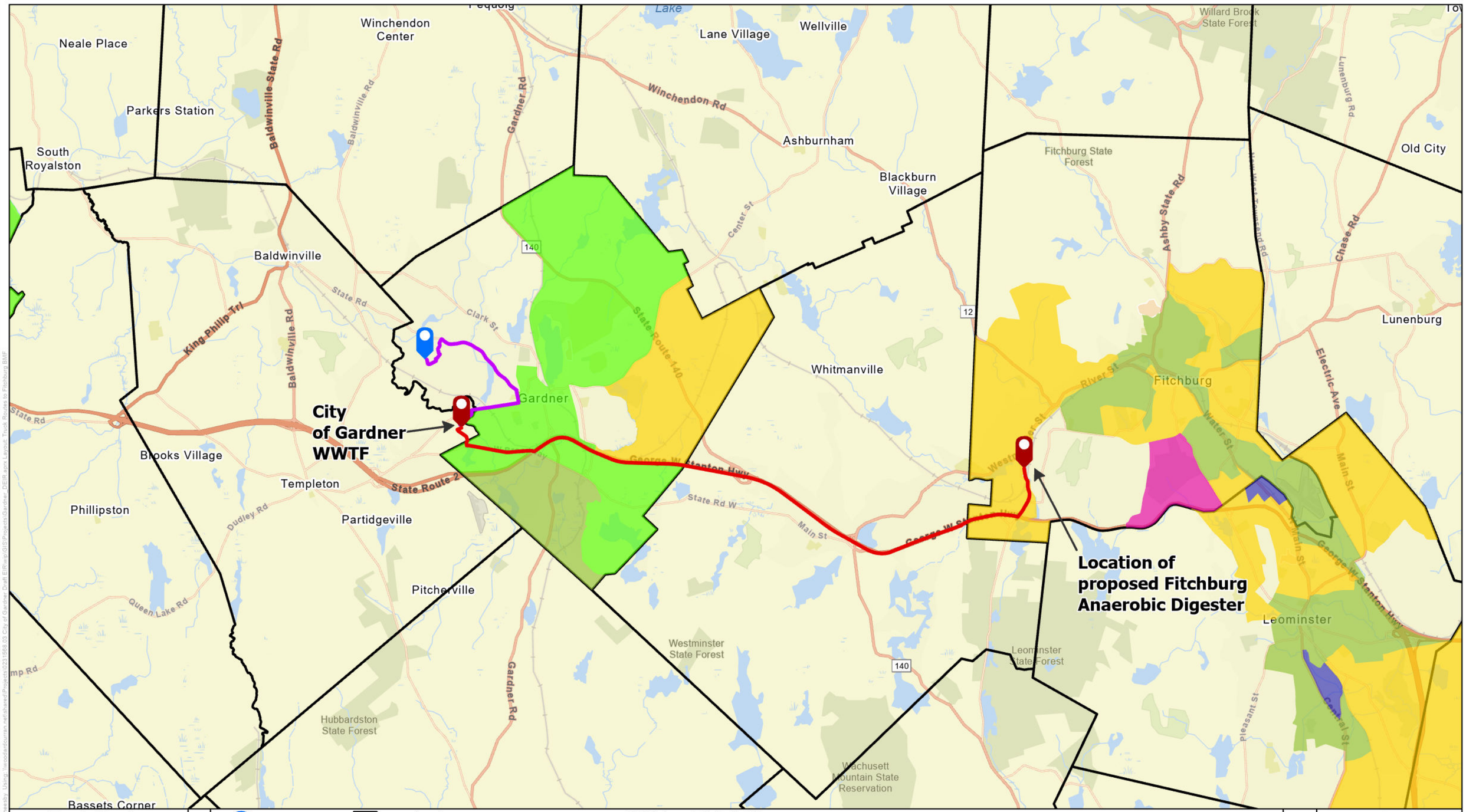
With the Project, additional consideration and review under MEPA Regulation 301 CMR 11.03(6)(b) is not necessary as it would not generate new average daily trips. The Project is not anticipated to introduce new operational traffic to Gardner and traffic would remain as in existing conditions. Similar to existing conditions, the landfill expansion would generate approximately eight truck trips per week. As described in further detail in **Chapter 9 "Construction Period,"** the maximum construction-related traffic increments would not materially affect traffic in the City of Gardner and the Project is not expected to result in any significant adverse traffic impacts during construction.

A review of potential impacts under this technical analysis area is provided for Project alternatives below.

#### 2.6.6.1 Alternative 1: Landfill Closure and Off-Site Hauling

**Figure 2-3** shows a comparative truck route hauling sludge generated at the City of Gardner WWTF to the Gardner Landfill and the planned Fitchburg Biosolids Management Facility, respectively. The truck route to the proposed Fitchburg Biosolids Management Facility has two main comparative weaknesses to the truck route to the Project Area. The route to the planned Fitchburg Biosolids Management Facility is 11.6 miles longer than to the Project Area, resulting in more particulate matter, nitrogen oxides, carbon monoxide, hazardous air pollutants, odors, and GHG emissions associated with this additional trucking. Second, the route to the planned Fitchburg Biosolids Management Facility would cross three more state-designated environmental justice areas.

Thus, the proposed Fitchburg facility would result in a greater adverse traffic impact to communities in both Gardner and Fitchburg; however, itself does not constitute a significant adverse traffic impact.




**Truck Routes to Fitchburg BMF**

City of Gardner, MA
Gardner Sludge Landfill Expansion

**Worcester County, MA**

*Legend*

- Gardner Landfill
- Alternative Locations
- Municipal Boundaries
- Proposed truck route from Gardner WWTF to Gardner Landfill
- Gardner WWTF to Fitchburg Anaerobic Digester Haul Route

2020 Environmental Justice Block Groups

- Minority
- Income
- Minority and Income
- Minority and English isolation
- Minority, Income and English isolation

0 0.5 1 2 Miles

N

Woodard & Curran

Project #: 0231568.03
Map Created: July 2024



**Figure 2-3**

#### 2.6.6.2 Alternative 2: Hydrothermal Carbonization

Relative to the Project, this alternative involves additional trucking associated with transporting regional sludge and food waste into Gardner. Depending on whether the biproduct of hydrothermal carbonization was used on-site as fuel or sold, additional trucking would be associated with hauling the biproduct off-site.

For the development of the hydrothermal carbonization alternative at the Gardner WWTF, the local trucking of sludge from the Gardner WWTF to the Project Site would be eliminated; however, it is estimated that approximately 8-12 truck trips would be generated through Gardner carrying regional sludge and food waste. Therefore, this alternative has the potential to generate the same or slightly more (approximately 4) truck trips than the Project. Comparatively, this alternative has the potential to result in greater traffic impacts than the Project; however, would not result in a significant adverse traffic impact.

### 2.6.7 Energy

With the Project, additional consideration and review under MEPA Regulation 301 CMR 11.03(7)(b) is not necessary as it would not involve energy generation or related energy infrastructure. As one or more alternatives have the potential to trigger further review under 301 CMR 11.03(7)(b) for energy, a review of potential energy impacts is provided below.

#### 2.6.7.1 Alternative 1: Landfill Closure and Off-Site Hauling

Under this alternative, similar to the Project, no energy generation would occur.

#### 2.6.7.2 Alternative 2: Hydrothermal Carbonization

The SoMax Study stated that energy production would result in net electrical energy generation of 53.5 MWh/6.11 kW and 2,366 MWh net thermal energy annually. Under this alternative, there would be the construction of a new electric generating facility; however, it would not exceed the MEPA threshold of 25 or more MW for analysis. As stated in the SoMax Study, the Project would be consistent with the City's goal of energy generation.

For the development of the hydrothermal carbonization alternative at the Gardner WWTF, connection would be made to the Templeton electrical or gas network, which would not fulfill the City's goal of energy generation.

### 2.6.8 Air Quality and Odor

With the Project, additional consideration and review under MEPA Regulation 301 CMR 11.03(8)(b) is not necessary as it would not construct a new stationary source or modify an existing stationary source. Odors are anticipated to improve over existing conditions with changes in operational practices (see **Chapter 7, "Air Quality"**) and the partial closure of portions of the existing landfill (see **Chapter 4, "Landfill Design and Construction"**). As one or more alternatives have the potential to trigger further review under 301 CMR 11.03(8)(b) for air quality, a review of potential air quality impacts is provided below.

#### 2.6.8.1 Alternative 1: Landfill Closure and Off-Site Hauling

Under the landfill closure and off-site hauling alternative, it is assumed that sludge would be hauled from the Gardner WWTF and be disposed of at an existing site, already developed elsewhere or the planned

Fitchburg Biosolids Management Facility. Relative to the Project, this option would result in the same number of trucks hauling the sludge a longer distance from the WWTF to other locations or the planned Fitchburg Biosolids Management Facility. The longer trucking distance would result in increased emissions of particulate matter, nitrogen oxides, carbon monoxide, hazardous air pollutants, and GHGs. The increase in emissions is directly proportional to the increase in trucking distance. If the trucking distance doubled the air emissions would double. Depending on the location of the disposal site, the route may travel through environmental justice communities, comparatively increasing air pollution impacts.

With this alternative, localized odor associated with the existing sludge landfill would be eliminated. Some odor associated with trucking would remain.

#### 2.6.8.2 Alternative 2: Hydrothermal Carbonization

Relative to the Project, this alternative involves additional trucking associated with transporting regional sludge and food waste into Gardner and would result in a comparative increase in mobile source emissions. In addition, this alternative would also involve the installation of several stationary sources of air emissions (e.g., dryer, gasification, engine). However, since there are no specific site plans available for review, potential impacts to air quality cannot be fully ascertained.

With this alternative, there would be localized odor associated with hydrothermal carbonization at the Gardner WWTF. Odor control systems would likely be a necessary part of this alternative.

### 2.6.9 Climate Change and Resiliency

The normal use and operation of the Project will produce GHGs in the form of methane and carbon dioxide. As discussed in the Environmental Notification Form, previous estimates of the landfill GHG annual emission rate were provided and were considered low enough to be below a threshold of management. No increase in annual GHG emission rate is anticipated relative to current landfill operations because the Project represents a continuance of existing operation and sludge handling rates (e.g., trucks per day projected to remain the same as with current disposal practices). Thus, since the Project is unlikely to result in an increase in annual GHG emissions relative to current rates at the existing landfill, the Project would not constitute an increased impact on climate change relative to the current effects of attributable GHG concentration.

The alternatives to the Project would lead to differences in overall GHG emissions relative to the Project for reasons discussed below regarding vehicle miles travelled and processes associated with the alternative projects.

#### 2.6.9.1 Alternative 1: Landfill Closure and Off-Site Hauling

Under the landfill closure and off-site hauling alternative, it is assumed that sludge would be hauled from the Gardner WWTF and be disposed of at an existing site, already developed elsewhere. Relative to the Project, this option would result in the same number of trucks hauling the sludge a longer distance from the WWTF to the existing site and the additional hauling miles would result in increased vehicle GHG emissions. Thus, with respect to GHG emissions associated with vehicle miles travelled, this alternative has a comparatively greater effect on GHG emissions than the Project. However, depending on the disposal method of the receiving facility the GHG emissions associated with vehicle miles travelled may be offset by the method of processing hauled sludge.

If the planned Fitchburg Biosolids Management Facility was developed and available, the processing of the hauled sludge from the Gardner WWTF might result in comparatively less total equivalent $CO_2$ compared to the Project. This is because the planned Fitchburg Biosolids Management Facility would combust the bioprocessed methane offgas, resulting in $CO_2$ emissions versus direct methane offgassing associated with the Project. Methane has a global warming potential of roughly 28 times that of $CO_2$ meaning that if the off-site hauling alternative uses a process such as the planned Fitchburg Biosolids Management Facility to process the hauled sludge, the hauling would result in a relative increase in GHG, but this increase may be offset by use of a sludge management process with a comparatively lower rate of GHG production (in terms of $CO_2e$). Further evaluation of the planned Fitchburg Biosolids Management Facility under that project's environmental review would be required to quantitatively determine whether methane combustion would indeed offset the increased GHG associated with additional hauling miles.

#### 2.6.9.2 Alternative 2: Hydrothermal Carbonization

Under this alternative, an upgrade to the City of Gardner WWTF would occur, which would facilitate the hydrothermal carbonization of liquid wastewater. The process treats sludge using moderate heat (180-250°C) and pressure to generate a carbon-dense material called hydrochar. The main sources of GHG emissions in the hydrothermal carbonization process could include the energy required to generate the heat and pressures (if fossil fuels used), the $CO_2$ released during chemical reactions to generate the hydrochar, emissions from feedstock handling and pre-treatment (if fossil fuel powered machinery used), the treatment of process water, and the post-processing of the hydrochar (e.g., drying). However, in general, the total GHG (in terms of $CO_2e$) emitted from the processing of the sludge would be comparatively less than the off gassing associated with the Project. Further evaluation of the new hydrothermal carbonization facility under that project's environmental review would be required to determine a quantitative estimate of the GHG emission benefit of the hydrothermal carbonization alternative versus the Project.

### 2.6.10 Environmental Justice

According to the Energy and Environmental Affairs Office of Environmental Justice and Equity, "an environmental justice population is a neighborhood where one or more of the following criteria are true:

1. the annual median household income is 65 percent or less of the statewide annual median household income
2. minorities make up 40 percent or more of the population
3. 25 percent or more of households identify as speaking English less than "very well"
4. minorities make up 25 percent or more of the population and the annual median household income of the municipality in which the neighborhood is located does not exceed 150 percent of the statewide annual median household income."

The Executive Office of Energy and Environmental Affairs uses data from the 2019 American Community Survey to identify environmental justice population areas in Massachusetts."[16]

[16] https://www.mass.gov/info-details/environmental-justice-populations-in-massachusetts#what-is-an-environmental-justice-population?-

Additional consideration of effects on communities defined by the state as an "Environmental Justice Population" is required when those populations are:

1. within one mile of a project site; or
2. within five miles of a Project that would meet or exceed MEPA review thresholds under 301 CMR 11.03(8)(a)-(b), which includes:
    a. the construction of a new stationary source with federal potential emissions[17], after construction and the imposition of required controls of 100 tons per year (tpy) of PM10, PM 2.5, CO, lead or SO2; 50 tpy of VOC or NOx; 10 tpy of any hazardous air pollutant (HAP); or 25 tpy of any combination of HAPs; or
    b. the modification of an existing stationary source resulting in a "significant net increase" in actual emissions, provided that the stationary source or facility is major for the pollutant. For purposes of this threshold, a "significant net increase" in actual emissions shall mean an increase in emissions of: 15 tpy of PM10; 10 tpy of PM 2.5; 100 tpy of CO; 40 tpy of SO2; 25 tpy of VOC or NOx; 0.6 tpy of lead; or
3. generate 150 or more new average daily trips of diesel traffic (excluding public transit trips) over a duration of one year or more.

With the Project, additional consideration and review under this analysis area is not necessary as it does not meet the above criteria. However, as directed by the MEPA Certificate Scope, a Public Involvement Plan (PIP) has been prepared to describe the measures undertaken by the City to promote public involvement in the project planning process (**Appendix B**). A screening analysis that identifies the characteristics of the state-designated Environmental Justice populations within five miles of the Project Site and the potential effects on those populations has been provided in **Chapter 3, "Environmental Justice."**

A review of potential impacts under this technical analysis area is provided for Project alternatives below.

#### 2.6.10.1 Alternative 1: Landfill Closure and Off-Site Hauling

Due to the uncertainty of the location of receiving facilities and the type of disposal method (i.e., involving a stationary source) at those receiving facilities, environmental justice impacts cannot be determined under this alternative.

As this alternative also considers off-site hauling to the planned Fitchburg Biosolids Management Facility, there is the potential that trucking of sludge would increase traffic through both the City's and other state-designated Environmental Justice communities. For Gardner, this would result in approximately four truck trips of dewatered sludge through the City's state-designated Environmental Justice communities to Fitchburg for approximately 11.2 miles, one way (see **Figure 2-3**). Additional analysis of the planned Fitchburg Biosolids Management Facility is needed to determine if that project would construct a new stationary source with federal potential emissions or generate 150 or more new average daily trips. That analysis is outside the scope of this DEIR. Further, the Fitchburg Biosolids Management Facility would be sited within a state-designated Environmental Justice community. Thus, there would be comparatively greater environmental justice impacts under this alternative.

[17] The maximum capacity of a stationary source to emit a regulated pollutant under its physical and operational design.

### 2.6.10.2 Alternative 2: Hydrothermal Carbonization

As this alternative would site a regional facility in Templeton, there is the potential that trucking, both sludge and food waste, would increase through the City's state-designated Environmental Justice communities as compared to the Project. Additionally, the regional facility would involve the construction of a new stationary source, which would require quantitative analysis to determine if it would exceed thresholds outlined in 301 CMR 11.03(8)(a). Nonetheless, there would be a comparatively greater environmental justice impact than with the Project under this alternative.

## 2.6.11 Construction

With the Project, additional consideration and review of construction impacts is provided in **Chapter 9"Construction Period"** of this DEIR. As identified in that chapter, the Project Site is located in a sparsely populated area away from potential sensitive receptors. Therefore, the construction period effects would be imperceptible. Temporary impacts that have the potential to occur during construction include noise, air quality impacts, water quality impacts, and traffic. Measures to mitigate these effects are proposed and described further in that chapter.

### 2.6.11.1 Alternative 1: Landfill Closure and Off-Site Hauling

Under this alternative, construction activity would be limited to landfill closure activities. Therefore, there would be a comparatively smaller construction impact than with the Project under this alternative.

### 2.6.11.2 Alternative 2: Hydrothermal Carbonization

Under this alternative, construction activity would occur at the WWTF. Construction impacts under this alternative would be similar to the Project.

**TABLE 2-2: SUMMARY OF ALTERNATIVES ANALYSIS**

| Technical Analysis Areas | Alternatives | | | |
|---|---|---|---|---|
| | Sludge Landfill Expansion (Project) | Alternative 1: Landfill Closure and Off-Site Hauling (no build alternative) | | Alternative 2: Hydrothermal Carbonization |
| | | Off-Site Haul (General) | Fitchburg BMF | Gardner WWTF |
| **Purpose & Need** | (++) The project as proposed would meet all objectives | (--) Would not work to maintain a reasonable cost to sewer ratepayers and be a less cost-effective option | | (--) Would not work to maintain a reasonable cost to sewer ratepayers; does not provide a solution that meets Gardner's 2027 disposal needs |
| **Cost** | $12 million | $13 million | $270 million[1] | $15-20 million |
| **Land** | (+) Impacts to land as defined by MEPA Regulations, are not expected to occur | (+) Impacts to land as defined by MEPA Regulations, are not expected to occur | Land disturbance impacts would need to be studied under Fitchburg BMF's environmental review | (+) Impacts to land as defined by MEPA Regulations, are not expected to occur |
| **Rare Species** | (+) Impacts to rare species or habitats are not expected to occur | (+) Impacts to rare species or habitats are not expected to occur | Rare species impacts would need to be studied under Fitchburg BMF's environmental review | More information needed to determine impact |
| **Wetlands, Waterways, and Tidelands** | (+) Mitigation measures proposed - with adherence to Order of Conditions, impacts to wetlands, waterways, and tidelands, are not expected to occur | (+) Impacts to wetlands, waterways, and tidelands are not expected to occur | Wetlands, waterways, and tidelands would need to be studied under Fitchburg BMF's environmental review | More information needed to determine impact |
| **Wastewater** | (++) Providing wastewater infrastructure is considered a beneficial impact | (--) Significant adverse impact to wastewater infrastructure | (-) Impact to wastewater infrastructure in Gardner | (++) Providing wastewater infrastructure is considered a beneficial impact |
| **Transportation** | (+) Impacts to transportation are not expected to occur | (+) Impacts to transportation are not expected to occur | (-) Impacts to transportation are not expected to occur (comparatively more traffic effects than the Project) | (-) Impacts to transportation are not expected to occur (comparatively more traffic effects than the Project) |
| **Energy** | (-) Project would not involve energy generation | (-) Alternative would not involve energy generation | (+) Potential to provide energy generation | (+) Potential to provide energy generation |
| **Air Quality** | (+) Impacts to air quality are not expected to occur - mitigation measures are proposed to address existing conditions | (-) Impacts to air quality are not expected to occur (comparatively more traffic-related air emissions than the Project) | (-) Impacts to air quality are not expected to occur (comparatively more traffic-related air emissions than the Project) | Impacts to air quality are not expected to occur (comparatively more traffic-related air emissions than the Project)/more information needed to determine stationary source impacts |
| **Climate Change and Resiliency** | (+) Impacts on climate change and resiliency are not expected to occur | (-) Impacts to climate change and resiliency are not expected to occur (comparatively more mobile source related GHG emissions than the Project) | (+) Impacts to climate change and resiliency are not expected to occur (comparatively more mobile source related GHG emissions than the Project; however, may be offset by facility) | (+) Impacts to climate change and resiliency are not expected to occur (comparatively more mobile source related GHG emissions than the Project; however, may be offset by facility) |
| **Environmental Justice** | (++) Impacts to environmental justice communities are not expected to occur | More information needed to determine impact | (-) Impacts to environmental justice communities are not expected to occur (comparatively more traffic-related air emissions than the Project) | (-) Impacts to environmental justice communities are not expected to occur (comparatively more traffic-related air emissions than the Project) |
| **Construction** | (+) Mitigation measures proposed - with measures to mitigate, construction impacts are not expected to occur | (+) No construction impacts | (+) No construction impacts | (+) No construction impacts |
| **Legend:** | Positive Impact / No Impact / Negative Impact / Negative Impact comparative to the Project | | | More information needed to determine impact |

Notes: [1] Represents regional costs.

# 3. ENVIRONMENTAL JUSTICE

## 3.1 Introduction

As directed by the Massachusetts Environmental Policy Act (MEPA) Certificate Scope, a Public Involvement Plan (PIP) has been prepared to describe the measures undertaken by the City to promote public involvement in the project planning process. The PIP has been designed to be consistent with MEPA and MassDEP requirements to foster engagement with the public and particularly nearby Environmental Justice populations. This chapter and the PIP (included in **Appendix B**) follow the MEPA review process and will follow the subsequent MassDEP permit application process requirements, including incorporating best practices listed in the MEPA Public Involvement Protocol for Environmental Justice Populations that the City has or intends to employ. Through the development of the PIP, the City has consulted with the Massachusetts Executive Office of Energy and Environmental Affairs Environmental Justice Director and the MEPA Office regarding community engagement strategies appropriate for the Project on October 3, 2023, March 16, 2024, and July 18, 2024.

As detailed in the PIP, a fact sheet describing the Project, using the MassDEP permitting template, has been developed. The fact sheet is currently on the City's website and will be updated as appropriate and distributed by the City to the appropriate local distribution outlets prior to the issuance of a draft permit. The PIP has been distributed to those listed on the expanded Environmental Justice Reference List (**Appendix B, Attachment 1**), which includes all Community Based Organizations, relevant tribes/Indigenous organizations (as applicable), all statewide entities, and those located in municipalities within one mile of the Project Site. Finally, a public information meeting about the Project was held on February 10, 2025 before filing the DEIR.

On March 26, 2021, the Climate Roadmap Act was signed into law, enacting a new definition of "Environmental Justice Population" for purposes of enhancing public involvement and other aspects of the MEPA review process. This definition has been incorporated into the MEPA Environmental Justice Public Involvement Protocol. An "Environmental Justice Population" now includes four categories of neighborhoods (defined by census block groups) with certain demographic characteristics based on median income level, percentage of residents who are people of color (i.e., minority), and percentage of residents who have limited English proficiency.

Section 60 of the Act provides that, "[t]o enable the public to assess the impact of proposed projects that affect their environment, health and safety through the [MEPA] project review process . . ., the secretary [of Energy and Environmental Affairs] shall provide opportunities for meaningful public involvement" by EJ [Environmental Justice] populations." On June 24, 2021, Energy and Environmental Affairs updated the 2017 Environmental Justice Policy that was previously in effect. The 2021 update (the "2021 Environmental Justice Policy"), consistent with the 2017 Environmental Justice Policy, requires that projects triggering certain MEPA Environmental Notification Form review thresholds provide opportunities for "enhanced public participation" by surrounding Environmental Justice populations, and that projects triggering certain mandatory EIR thresholds conduct an "enhanced analysis of impacts and mitigation," in addition to enhanced public participation. The MEPA thresholds to which these Environmental Justice requirements apply are those related to wastewater (301 CMR 11.03(5)), air emissions (11.03(8)), and solid and hazardous waste (11.03(9)). The MEPA Environmental Justice Public Involvement Protocol expands on, but remains consistent with, the requirements of the 2021 Environmental Justice Policy, defining what the public involvement requirements are for all MEPA projects filed after January 1, 2022. These policies and protocols have been incorporated into this DEIR and Environmental Justice discussion.

## 3.2 Identifying Characteristics of Environmental Justice Populations

As depicted on the Energy and Environmental Affairs Office of Environmental Justice and Equity environmental justice map viewer, there are 10 Block Groups identified as located in whole or in part within 5 miles of the Project Site (see **Figure 3-1**).[18] Of these Block Groups in the City of Gardner, eight are identified as an Environmental Justice population based on the income criterion, one is identified as an Environmental Justice population based on the minority criterion, and one is identified as an Environmental Justice population based on both minority and income criteria (see **Table 3-1**).

**TABLE 3-1: ENVIRONMENTAL JUSTICE CHARACTERISTICS BY BLOCK GROUP OF POPULATIONS WITHIN 5-MILES OF THE PROJECT SITE**

| Block Group | Census Tract | Population | Households | Criterion[1] | Minority Population | Median Household Income | Households with Language Isolation |
|---|---|---|---|---|---|---|---|
| 2 | 7074 | 1,196 | 586 | Income | 17% | $50,074 | 0% |
| 1 | 7075 | 2,053 | 781 | Income | 21% | $49,097 | 4% |
| 2 | 7072 | 1,125 | 595 | Income | 20% | $30,947 | 7% |
| 3 | 7073 | 1,059 | 535 | Income | 24% | $38,994 | 0% |
| 1 | 7073 | 1168 | 545 | Income | 17% | $30,972 | 4% |
| 2 | 7073 | 1,829 | 843 | Income | 18% | $36,219 | 1% |
| 2 | 7075 | 2,123 | 524 | Minority | 35% | $67,941 | 2% |
| 1 | 7072 | 995 | 364 | Income | 23% | $49,531 | 0% |
| 2 | 7071 | 2,232 | 841 | Income | 16% | $47,460 | 1% |
| 1 | 7071 | 1,853 | 764 | Minority and Income | 28% | $44,167 | 3% |

**Note:** [1]For a population to be designated under the "income," criterion, the annual median household income of a geographic area must be 65 percent or less of the statewide annual median household income. For a population to be designated under the "minority" criterion, minorities must make up 40 percent or more of the population. For a population to be designated under the "minority and income" criterion, minorities must make up 25 percent or more of the population and the annual median household income of the municipality in which the neighborhood is located does not exceed 150 percent of the statewide annual median household income.

There are no state-designated Environmental Justice Block Groups identified as located in whole or in part within one mile of the Project Site (see **Figure 3-2**).

Energy and Environmental Affairs Office of Environmental Justice and Equity 's languages spoken map does not identify languages spoken by five percent or more of the EJ population who also identify as not speaking English "very well."

[18] These data were obtained from https://www.mass.gov/info-details/massgis-data-2020-environmental-justice-populations.

# Massachusetts 2020 Environmental Justice Populations

City of Gardner, MA
Gardner Sludge Landfill Expansion
**Worcester County, MA**

*Legend*

- Project Site
- Surrounding Area (1 mile)
- Municipal Boundaries

2020 Environmental Justice Block Group Criteria

- Income
- No Environmental Justice Concerns

0 250 500 1,000 1,500 2,000 2,500 Feet

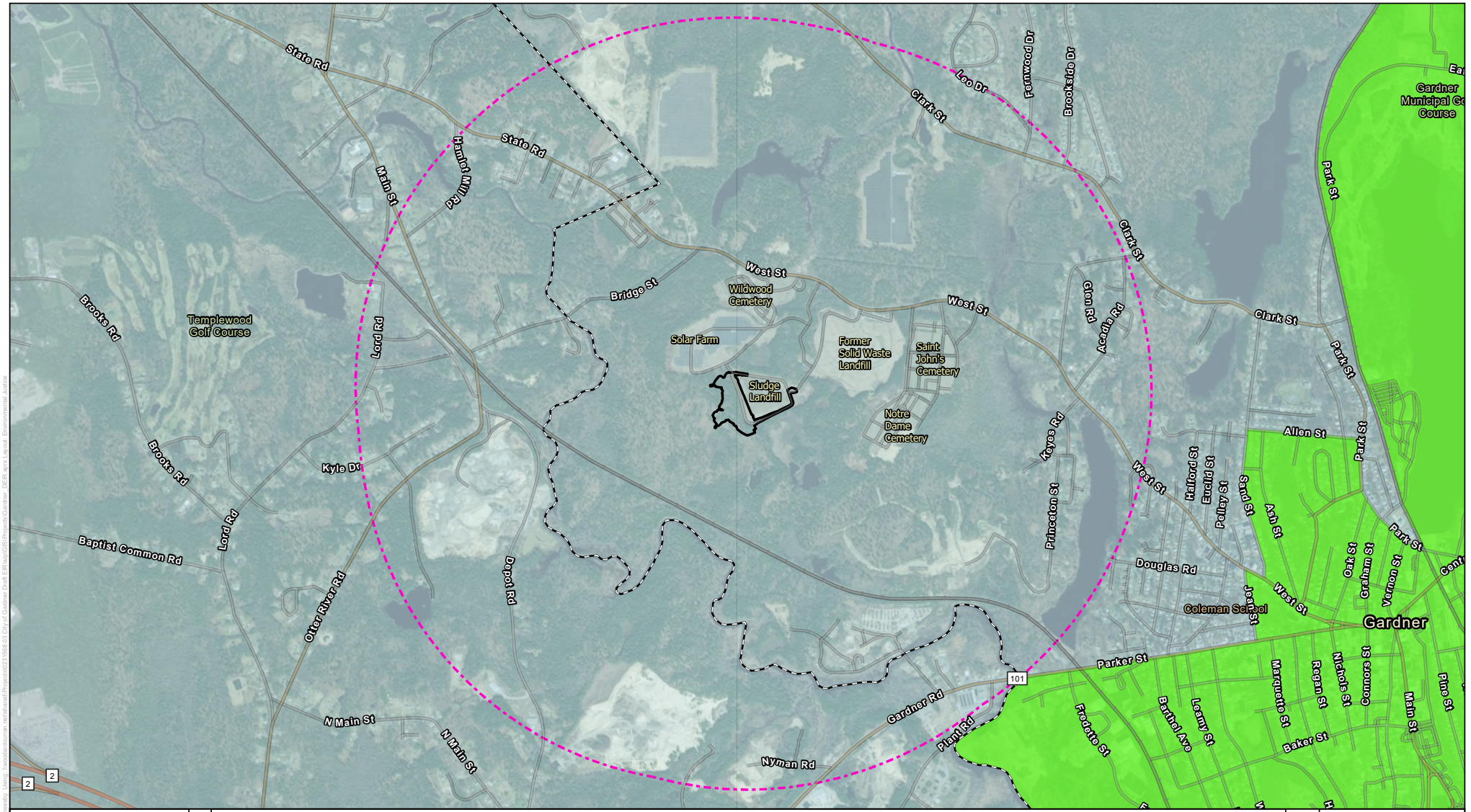
N

Woodard & Curran

Project #: 0231568.03
Map Created: July 2024

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions.
Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources:** These data were obtained from https://www.mass.gov/info-details/massgis-data-2020-environmental-justice-populations

**Figure 3-2**




**Massachusetts 2020 Environmental Justice Populations**

City of Gardner, MA
Gardner Sludge Landfill Expansion
**Worcester County, MA**

*Legend*

- Project Site
- Surrounding Area (1 mile)
- Municipal Boundaries

2020 Environmental Justice Block Group Criteria

- Income
- No Environmental Justice Concerns

0 250 500 1,000 1,500 2,000 2,500 Feet

N

Woodard & Curran

Project #: 0231568.03
Map Created: July 2024

 **Data Sources:** These data were obtained from https://www.mass.gov/info-details/massgis-data-2020-environmental-justice-populations

**Figure 3-2**

## 3.3 Potential Effects on Environmental Justice Populations

MEPA protocols require additional consideration of effects on Environmental Justice Populations when they are within one mile of a project or, when within five miles the project, would generate 150 or more new average daily trips of diesel vehicle traffic (excluding public transit trips) over a duration of one year or more (301 CMR 11.03(8)(b)). As there are no Environmental Justice populations within one mile of the Project Site (see **Figure 3-2)** and the Project does not introduce 150 average daily trips annually of diesel traffic, the Project is not reasonably likely to negatively affect Environmental Justice Populations located within the designated geographic area around the Project Site. However, due to comments received during the MEPA review process on the Environmental Notification Form, further review of the Project's effects on Environmental Justice communities has been completed. The likely effects of the Project include the following:

- **Cost.** With the Project, the cost of sanitation services is likely to remain lower and exhibit more stability than with the Project's alternatives. Lower Project and sanitation service costs will collectively benefit Environmental Justice communities by prudently investing City funds to avoid long term rate increases or capital costs that would cause a greater effect on Environmental Justice communities. Therefore, the Project would not result in an increased or disproportionate effect on Environmental Justice Populations with respect to cost of sanitation services.
- **Air.** With the Project, there would be no new stationary sources and average daily trips of diesel vehicle traffic would remain unchanged. Therefore, the Project would not result in an increased or disproportionate effect on Environmental Justice Populations with respect to air emissions.
- **Traffic.** With the Project, there would be no increase in traffic or change in traffic patterns. Therefore, the Project would not result in an increased or disproportionate effect on Environmental Justice Populations with respect to traffic.
- **Odor.** With the Project, sludge landfill operations are not proposed to increase from existing operations and landfilling would continue at the same rate and quantity. Therefore, there would be no new air quality and/or odor impact with the implementation of the Project. Odors are proposed to continue to be managed through operational practices. In existing conditions, odor complaints are made sparingly (0 to 3 times per year), are generally made in the spring and fall seasons when weather conditions exacerbate odors and are generally made more frequently in closer proximity to the existing landfill. A seasonal odor issue with limited formal complaints that are made from locations in close proximity to the existing facility does not constitute a significant adverse impact with respect to odor. However, with the Project, mitigation measures are proposed. Odor is an inherent biproduct of any wastewater/wastewater residual operation and no technology (e.g., anaerobic digestion, incineration, composting, hydrothermal carbonization) offers an odorless alternative. To mitigate odors associated with the existing landfill, the Project would implement an interim cover and cap portions of the existing landfill no longer receiving sludge. It is currently projected that this would occur in Quarter 3 of 2028 based on remaining volume (see **Chapter 4 "Landfill Design and Construction"**). Additionally, it is proposed that, with the Project, a new detailed complaint form would be implemented to ensure consistency of information collected and investigated to be included in future Annual Operations Reports. Furthermore, the Project will include a fact sheet on air quality and odors and its relationship to public health; information on the protocol for filing an odor complaint; information on sludge landfill operations and when the public is likely to experience odors from sludge handling activities; and an online survey on the City's website and advertised on the City's social media accounts. The survey will assist the City in

determining if odors are emanating from the sludge landfill (and not other potential contributors of odor in the City) and if so if they are affecting state-designated Environmental Justice populations. Survey data will be tracked and mapped, helping the City gain a better understanding of existing odor concerns, and will inform changes in operational practices and future odor reduction projects pursued by the City. Finally, the City would continue to explore technologies that reduce odors and the feasibility of their implementation on a continual basis (see **Chapter 7, "Air Quality"**). For questions regarding the City's Sludge Only Landfill or to report an odor complaint please contact VEOLIA at 978-630-8791 during normal business hours. After business hours, sludge landfill complaints can be reported by calling the non-emergency number for the Gardner Police Department dispatch at 978-632-5600 and leaving call back information and a brief description of the complaint. The complaint is forwarded to the appropriate on-call staff for follow-up. When reporting a complaint please provide the exact location and time of the complaint so VEOLIA operators can respond appropriately.

- **Land disturbance.** With the Project, approximately 8.75 acres of vacant municipal owned land that is forested would be disturbed to construct the Project. The Project Site has been considered for sludge landfill expansion and municipal use since the 1980s. While part of the Esker Ridge Trail goes beyond the Cummings Conservation Area boundaries onto the Project Site and would be removed to facilitate the Project, Environmental Justice populations would not be directly affected. Environmental Justice communities may be indirectly affected by loss of a section of trail; however, the effect is limited as the Project does not affect the Conservation Area that maintains the trails on its parcel and Environmental Justice communities would still have access to those trails. Therefore, there would be no significant adverse land disturbance effects to Environmental Justice Populations.
- **Stormwater.** With the proposed measures in place, no stormwater effects are anticipated with the Project. Therefore, there would be no adverse stormwater effects to Environmental Justice Populations (see **Chapter 6, "Stormwater"**).
- **Groundwater.** With the proposed protection measures in-place, no groundwater effects are anticipated with the Project. Therefore, there would be no adverse groundwater effects to Environmental Justice Populations (see **Chapter 5, "Groundwater"**).
- **Construction.** Within the City of Gardner, the Landfill is located in a sparsely populated area and over a half mile from the nearest built-up residential area. Construction vehicles would enter the Project Area from West Street and construction activities are expected to take place within the Project Site. Therefore, minimal to no construction related effects to rural residential areas or Environmental Justice Communities is anticipated with the Project.

## 3.4 Public Involvement Activities

Public engagement has occurred throughout the MEPA process for the Project. As outlined in the MEPA Certificate, the Draft Public Involvement Plan (see **Appendix B**) was developed to be a working document used to outline the City's approach to public engagement for the Project. In accordance with the PIP and the MEPA Certificate, a public meeting was held on February 10, 2025, and comments on the Environmental Notification Form were considered, incorporated, and responded to within the DEIR in **Chapter 11, "Response to Comments."** The PIP further describes the history of public involvement opportunities to date; explains how the public involvement process has addressed community concerns regarding the Project; describes the ongoing and planned public involvement activities going forward; outlines the roles and responsibilities of those involved in implementing the PIP; and describes how the PIP will be revised in the future to incorporate feedback from the public.

# 4. LANDFILL DESIGN AND CONSTRUCTION

## 4.1 Introduction

As indicated in the MEPA Certificate Scope, this chapter includes a discussion of the Project's landfill design and anticipated construction activities. More specifically, this chapter includes an evaluation of the Project's leachate system using the most current version of the Hydrologic Evaluation of Landfill Performance (HELP) Model (V4.0.1); and an analysis of alternative designs and construction methods for the phased construction of the expansion cells. Within this discussion, the feasibility of design and construction method alternatives, as well as inspection and maintenance procedures, are provided. This chapter also includes an analysis of capping designs, describing the feasibility of the design and how it would address leachate production/management, odors, slope stability, and stormwater management. During construction, measures to minimize erosion, siltation, and degradation of the liner are also referenced in this chapter; however, measures are described in further detail in **Chapter 9, "Construction Period."**

According to MassDEP's guidance document entitled "DWPC Wastewater Residuals Guidance Document No. 89 2, Closure/Post Closure Requirements for Residuals Landfills," the owner or operator of a landfill must submit a Closure/Post-Closure Plan for MassDEP's review and approval at least six months prior to proposed closure activities. This Closure/Post-Closure Plan must be submitted as part of a WP34 Approval of Closure Plans for Wastewater Residual Landfills application. Alternatives for capping any portion of the existing landfill where new waste has not or will not be applied within a one-year period unless the area is permitted to accept additional waste, has reached final approved elevations, or meets other criteria as stated in the Solid Waste Management regulations at 310 CMR 19.115(e)(1)(a) have been assessed. As discussed below, an interim or partial Closure Plan is currently projected to be submitted in Quarter 1 of 2028 based on remaining volume, contingent upon the availability of the landfill expansion, for the areas within the existing landfill no longer receiving sludge, with the final Closure/Post-Closure Plan anticipated to be submitted to MassDEP in Quarter 3 of 2044 for the remaining cells, including the expansion.

## 4.2 Landfill Design

As described in **Chapter 1, "Project Description,"** the landfill expansion has been designed in accordance with all applicable design standards and requirements of MassDEP's residuals and biosolids program and has been designed to conform to the EPA Resource Conservation and Recovery Act standards of 40 Code of Federal Regulations (CFR) Part 257 – Criteria for Classification of Solid Waste Disposal Facilities and Practices. As such, 310 CMR 19:00 Solid Waste Facility Regulations were consulted for the Project landfill design standards. Considering all site constraints and regulations, the current design reflects the most feasible design for a landfill expansion at this location. The design of the landfill would ultimately be reviewed, revised if necessary, and approved by MassDEP through the WP 33 permit approval process.

The components of the landfill design are a groundwater protection system (GWPS), leachate collection and conveyance system, stormwater management system, and gas management system. The GWPS would include a redundant layered liner, leak detection, and leachate collection system to separate applied sludge and any generated leachate from the groundwater sources beneath it. The GWPS will overlap the entire slope of the existing landfill to create a continuous impermeable barrier at the interface between the existing landfill and the expansion. The stormwater management system would manage clean precipitation that falls onto unused cells and would include a bioretention pond and two infiltration basins. In addition, passive venting is proposed to manage the small amount of gas produced by sludge decomposition.

Leachate produced by the Project would be directed to the City's existing sewerage collection system. A 15,000 square foot portion at the southernmost and lowest end of Cell 1 will be used as a detention area to which leachate from the remainder of Cell 1 and Cells 2 and 3 will be directed. Leachate will be pumped out of the landfill and into the existing leachate conveyance system. From there, the leachate pump station delivers leachate to the City's sewer in West Street where it can flow to the existing WWTF for treatment.

### 4.2.1 Leachate Collection and Conveyance Design and the Hydrologic Evaluation of Landfill Performance Model

The leachate management system for the Project was sized using EPA's HELP Model Version V3.07. For this DEIR, MEPA requested that the Project be modeled using the most current version of the HELP Model, V4.0.1. The Project parameters that were entered into HELP V4.0.1 matched the inputs that were used in the original HELP V3.07 model of the Project; the same inputs were used for landfill size, layer properties, landfill curve numbers, evaporative zone depth, evapotranspiration data, leaf area index, start/end of growing season, average annual wind speed, and relative humidity. The parameter that differed between the two models was weather data; the original HELP V3.07 model used weather data from Boston, Massachusetts, whereas the HELP V4.0.1 model used simulated weather data from Gardner, Massachusetts.

A comparison of the outputs from HELP Model V3.07 and V4.0.1 are presented in **Table 4-1** below, where the unit inches refers to inches of water.

**Table 4-1 Help Model V3.07/V4.0.1 Comparison**

| Model Result For: | HELP V3.07 | HELP V4.0.1 |
|---|---|---|
| Average Normal Monthly Temperatures | 23.3°F to 69.9°F | 28.7 °F to 75.4°F |
| Average Annual Precipitation for Years 1 through 20 | 45.93 inches | 47.04 inches |
| Average Annual Runoff for Years 1 through 20 | 10.92 inches | 8.27 inches |
| Average Annual Evapotranspiration for Years 1 through 20 | 22.50 inches | 25.59 inches |
| Peak Daily Precipitation for Years 1 through 20 | 4.34 inches | 3.31 inches |
| Peak Daily Runoff for Years 1 through 20 | 5.43 inches | 3.43 inches |
| Maximum Head on HDPE Geomembrane (Layer 4) for Years 1 through 20 | 8.43 inches | 10.60 inches |
| Peak 7 Day Leachate Generation | 11.28 inches (Days 83-89 of Year 18) | 5.61 inches (Days 28-34 of Year 17) |

Based on the weather projections simulated using the HELP V4.0.1 model, the average monthly temperatures, annual precipitation totals, and annual evapotranspiration amounts are expected to be greater than those estimated using the HELP V3.07 model. However, the HELP V4.0.1 model indicates that peak daily precipitation, peak daily runoff, and peak seven-day leachate generation values are estimated to be lower than what was estimated using the HELP V3.07 model. The peak daily runoff value generated by the HELP V3.07 model was 5.43 inches, equivalent to the National Oceanic and Atmospheric Administration

(NOAA) Atlas 14 25-year design storm event; the peak daily runoff value generated by the HELP V4.0.1 model was 3.43 inches, which is less than the 10-year design storm event. In addition, the Project's leachate storage was sized using the peak seven-day leachate generation value from the HELP V3.07 model, which is more than the value generated by the HELP V4.0.1 model. Therefore, the Project's leachate management system considers the more conservative analysis and is adequately sized to accommodate projected leachate generation rates.

For the discussion on sizing the stormwater management system, see **Chapters 6, "Stormwater,"** and **8, "Climate Change."**

### 4.2.2 Changes to Landfill Design since the Environmental Notification Form

As described in **Chapter 1, "Project Description,"** revisions to the landfill design will be made during MassDEP permitting and final design. With respect to landfill design, a revision would be made to replace the 10-foot overlap with a hydraulic separation liner to achieve the requirements of MassDEP's Residuals Management Program, relevant guidance documents (i.e., Residuals Guidance Document No. 90-1 and Solid/Hazard Waste Policy #12) and MassDEP Solid Waste Management Regulations 310 CMR 19.110(5)(c); a landfill gas monitoring system will be included in nearby structures (i.e., leachate pump station) to ensure landfill gas is not migrating away from the landfill toward on-site structures; and the design of infiltration basin #2 would be revisited to accommodate additional storage volume, as necessary. Furthermore, final cover placement will be designed when portions of the existing landfill are at final grade, which will occur after disposal operations move into the expansion area.

## 4.3 Landfill Construction

With the Project, the City would expand its existing sludge landfill operations into the Project Site, within which three new contiguous sludge disposal cells (Cells 1, 2, and 3) would be constructed. Construction of the Project would disturb 8.75 acres of land adjacent to the existing and active sludge landfill boundary, involve tree removal, and regrading by removing up to 20 feet of soil (approximately 46,500 cubic yards) to establish a sub-base. The subbase will be a minimum of four feet above the seasonal high groundwater elevation and the GWPS would be constructed on top of this subbase.

### 4.3.1 Construction Activities

Construction is allowed to occur Monday through Friday, between the hours of 7:00 AM and 6:00 PM; however, the typical construction workday is from 7:00 AM to 3:30 PM. Any work before 7:00 AM or after 6:00 PM, or on weekends, is a special circumstance that requires City approval. Typical activities during sludge landfill construction include the use of bulldozers, excavators, loaders, pick-up trucks, semi-trailers, and water trucks. Construction staging is expected to be located within the Project Area. Construction staging including equipment storage, the stockpiling of materials, and locating any dewatering operations for example, would be sited and designed to avoid any water quality and wetland impacts (see **Chapter 9, "Construction Period"**). All construction staging is anticipated to occur on site for equipment, temporary laydown, deliveries and working space. One or more appropriate staging areas will be identified in coordination with the City of Gardner as the construction schedule is finalized. It is anticipated that construction activities would not interfere with ongoing operations at the existing sludge landfill.

### 4.3.2 Preliminary Construction Schedule

Construction of the landfill expansion is anticipated to start in 2026 and be completed by 2028. **Table 4-2** provides a preliminary construction schedule for the Project, illustrating approximate timelines and durations for construction activities.

**Table 4-2 Preliminary Construction Schedule**

| Project Timeline (Year/Quarter) | Activity | Approximate Duration (months) |
|---|---|---|
| 2026 Q2 | Notice to Proceed (NTP) Issued | - |
| 2026 Q3/Q4 | Mobilization (establish erosion and sediment control measures, staging and storage areas, and initiate site clearing and preparation) | 6 months |
| 2026 Q3 – 2026 Q3 | Grading* | 12 months |
| 2026 Q3/Q4 | Construction of Access Road | 3 months |
| 2027 Q1/Q2 | Installation of Stormwater Infrastructure (bioretention ponds, infiltration basins, culverts, etc.) | 3-6 months |
| 2027 Q2/Q3 | Construction of Disposal Area (Cells 1, 2, and 3, including GWPS components, LCR piping system, liner materials, etc.) | 6 months |
| 2027 Q2/Q3 | Leachate Pumping System and Conveyance (pump station, force main, etc.) | 6 months |
| 2027 Q4 | Construction Complete | 0 months |
| 2028 Q1 | Operational | 0 months |

Note(s): *grading would take place over the course of construction

It is anticipated that the current landfill would reach capacity between 2027 and 2030. In the event capacity is reached prior to receiving permits and approvals, the City would haul sludge off site until Project construction is complete.

Ultimately, construction means and methods would be developed by the selected Contractor as long as they comply with all applicable regulations and requirements set forth by approved permits. Overlap of construction activities can be expected to occur, including detailed engineering and major equipment procurement steps, which can overlap with the early on-site construction schedule. The overall expected schedule for on-site physical construction is conservatively expected to be approximately 22 months and could be longer or shorter depending on final design and weather conditions.

## 4.4 Landfill Operations

The Project would include three cells that are proposed to be constructed at the same time and then filled sequentially, beginning with Cell 1 located at the southern end of the facility. The cells would be separated by berms covered with high-density polyethylene geomembrane liner material to prevent flow of leachate between the cells. A portion at the southernmost and lowest end of Cell 1 would be used as a detention area to which leachate from the remainder of Cell 1 and Cells 2-3 would be directed. Leachate would be

pumped from the landfill into the existing leachate conveyance system. From there, it would be pumped to a gravity sewer main in West Street where it can flow to the existing WWTF for treatment.

As shown in **Table 4-3**, the Project's operational sequence would involve the initial filling of Cell 1 in Q1 2027, which would take approximately 12 months. In Q1 2028, based on remaining volume, it is projected that a partial closure plan would be implemented for areas of the existing landfill no longer receiving sludge, lasting three months. This would be followed by interim cover and capping of portions of the existing landfill no longer receiving sludge, expected to take 6-8 months in Q3 2028. Filling of Cell 2 would commence in Q1 2028 and is projected to take 48 months (4 years), while filling of Cell 3 is scheduled for Q1 2032, with an estimated duration of 72 months (6 years). In Q1 2038, the final closure of Cell 1 would begin, also taking 72 months (6 years). The full closure plan for the entire landfill (existing and proposed) is slated for Q1 2044, with a timeline of three months, followed by its final cover and capping, expected to take 6-8 months in Q3 2044.

**Table 4-3 Operational Sequencing Plan**

| Project Timeline (Year/Quarter) | Activity | Approximate Duration (months) |
|---|---|---|
| 2027 Q1 | Cell 1 - Initial | 12 months (1 year) |
| 2028 Q1 | Closure Plan - Initial (closure of areas no longer receiving sludge within existing landfill) | 3 months |
| 2028 Q3 | Interim Cover/Capping of Existing Landfill[1] | 6-8 months |
| 2028 Q1 | Cell 2 | 48 months (4 years) |
| 2032 Q1 | Cell 3 | 72 months (6 years) |
| 2038 Q1 | Cell 1 – Final | 72 months (6 years) |
| 2044 Q1 | Full Closure Plan | 3 months |
| 2044 Q3 | Final Cover/Capping of Landfill Expansion | 6-8 months |

Note(s) [1] With interim cover/capping of the existing landfill, portions of the existing landfill that are at final grade would receive a final cover and cap and active cells would continue to be filled.

### 4.4.1 Operation and Maintenance Plan

The Operation and Maintenance Plan outlines critical procedures and protocols for managing sludge disposal, leachate and stormwater, and operational contingencies.

During the filling process, dewatered sludge is initially mixed with sand before being compacted in the landfill. Operators would manage the sludge to minimize odors and prevent leachate contamination by properly directing runoff. Unused cells would be opened and prepared for filling by adjusting a diversion structure and stormwater discharge pipe to manage precipitation runoff as leachate. Filling would continue in the original landfill until capacity is reached, then filling would proceed to Cell 1 of the expanded landfill. A section of Cell 1 would be reserved for storage of leachate to manage large precipitation events and would remain open until Cells 2 and 3 are filled. As the landfill fills, the stormwater management strategy would adapt to ensure precipitation is either treated as leachate or stormwater, depending on its contact with waste material. The Operation and Maintenance Plan addresses other essential aspects of landfill operations, including gas management, odor and dust control, vector mitigation, and contingency measures

for equipment failures or system malfunctions. These procedures ensure compliance with environmental regulations and maintain efficient landfill operation, while minimizing risks related to leachate or stormwater, gas emissions, and impacts to other environmental factors.

The Operation and Maintenance Plan describes the items to be inspected and monitored, the frequency of inspections, remedial actions, and recordkeeping requirements.

Three types of landfill inspections would be routinely performed to make sure the landfill functions as designed:

- Inspections by a professional engineer to observe landfilling operations and evaluate capacity;
- Inspections by the landfill operator to maintain the landfill systems and components in good working condition; and
- Environmental monitoring by a contracted laboratory to test groundwater and nearby surface waters for evidence of landfill contaminants.

As part of the regular inspections by the operator, unused cells would be monitored to ensure that the protective sand layer remains intact. This layer is essential for protecting the underlying GWPS materials from sunlight, which can degrade the integrity of the system. Initially, the woodchip layer on top of the GWPS would control erosion of the sand layer. Upon inspection, the operator shall replenish woodchips in areas where sand has become exposed, providing continued protection. Over time, vegetation would naturally establish on the woodchip layer, further stabilizing the surface. Once vegetation is established, the operator would mow the area at least twice annually to prevent excessive root growth, which could impact the underlying landfill systems. In the unlikely event of GWPS damage, the operator would isolate that cell from the normal operation of the landfill and make immediate plans to repair and/or replace the damage. Repairs to the synthetic membrane would be performed in accordance with the specifications approved in the design plans. These ongoing inspections and maintenance activities are crucial for the long-term functionality of the landfill and for minimizing environmental risks.

## 4.5 Alternative Designs and Construction Methods

### 4.5.1 Single vs. Phased Construction

The Project is currently proposed to be constructed in its entirety over a single construction period. In response to comments on the Environmental Notification Form, constructing the entire Project at one time would avoid damage to the liner that would reduce its effectiveness. As described above, during operations, the unused cells would be inspected to make sure the protective sand layer over the GWPS remains in place. This operational practice is key in making sure the underlying GWPS materials are not exposed to sunlight that could cause degradation.

In response to comments on the Environmental Notification Form, a two-phase construction program was considered. The option of constructing the first and second landfill cells initially with the third cell constructed approximately five years afterwards was evaluated. The second landfill cell would need to be available for filling approximately 1 year after filling commences in the first cell, so separate construction of the first and second cells was not considered practical. Environmental benefits, financial feasibility, and operational flexibility were the three main aspects of alternative construction methods that were reviewed. After evaluating the option of a two-phase construction program, a single-phase construction program was selected because it offers numerous benefits financially, environmentally, and operationally, as described in further detail below.

As seen in the following sections, with a phased construction event, it is anticipated that there would be more environmental effects (i.e., land disturbing activities), unnecessary financial burden, as well as logistical complexity. If construction is phased, there would effectively be multiple construction events, whereby construction related effects (i.e., noise, air quality, water quality, and traffic) would be repeated (see **Chapter 9, "Construction Period"**). Furthermore, the Project would be bound by requirements set forth in a WP 33 Permit and also is required to develop and adhere to a National Pollutant Discharge Elimination System (NPDES) Construction General Permit Stormwater Pollution Prevention Plan (SWPPP).

#### 4.5.1.1 Environmental Benefits

A single phased construction would minimize the overall construction duration over two or multiple phases of construction. There would be less land disturbing activities, including erosion and sedimentation from stormwater runoff, and dust, noise, and traffic effects from construction with single phased construction.

Every time the ground surface is disturbed, it creates the potential for erosion and sedimentation. Temporary stormwater control measures would be required to be assembled and dismantled in a multiple phased construction scenario. Constructing the third cell separately would require a second construction period and result in double the construction period effects. Therefore, a single phase of construction would be least disruptive to the environment and minimize the surrounding community's exposure to the nuisance effects of construction.

#### 4.5.1.2 Financial Savings

Constructing the Project under one contract is the least costly approach overall and the City has budgeted for this. In addition to the economy of scale benefits realized by the purchase of greater material quantities and the opportunity to overlap activities, a single construction phase eliminates construction costs associated with a second mobilization and the construction of temporary stormwater measures. It also avoids the cost of engineering services to design interim stormwater control systems, produce a second set of construction and bid documents, and secure corresponding permit extensions and modifications.

#### 4.5.1.3 Operational Flexibility

A single phase of construction provides flexibility in operations. All cells would be available when needed if they are constructed at one time. With a single phased construction there would be less logistical complexity, and thus less expense, as there would be no interference between landfilling vehicles and construction vehicles.

With multiple-phased construction, there would be some risk that a new cell would not be ready when needed, forcing the City to find a temporary and more costly means of sludge disposal (i.e., off-site hauling). Therefore, a schedule to design, permit, and construct additional cells would need to incorporate some amount of variability to absorb these factors that are outside the City's control.

### 4.6 Final Cover/ Capping of Landfill

Full closure of the sludge landfill expansion is proposed to occur as a single event the same time as closure of the original landfill, after filling has been completed in all landfill cells. The predicted date of closure is 2044. The Closure/Post-Closure Plan would be submitted to MassDEP at least six months prior to the proposed closure activities as stated in the DWPC Wastewater Residuals Guidance Document No. 89-2. The Closure/Post-Closure Plan submission requirements would be followed in accordance with regulatory guidance and would address the specifics of the landfill cap design and construction, the proposed post-closure use, the monitoring and maintenance requirements, and the reporting requirements.

The Project was designed to accommodate a cap after it has reached capacity. The project drawings (see **Appendix A** of this DEIR, page 338), depict the final grades prior to and after closure, assuming the final cover system is three feet thick. The top of the landfill after closure is proposed to be at elevation 1,054 feet North American Vertical Datum of 1988 (NAVD88). The landfill final cover system would consist of a gas venting layer, a low permeability layer, a drainage layer, and a vegetative support layer. The specific materials used would be selected when the final cover system is designed. The perimeter berm for the landfill expansion has been conservatively designed to accommodate up to a maximum three-foot thick final cover system, potentially consisting of at least a six-inch gas venting layer, a geomembrane (low permeability layer), a geocomposite drainage layer, and an 18-inch vegetative support layer. An alternative thinner final cover system such as ClosureTurf® could easily be accommodated. The closure design and construction would incorporate benches and down chutes to control stormwater runoff from the landfill surface and minimize erosion of the capping system. The benches and down chutes would provide a more permanent and robust solution to erosion control post closure when operators would not be on site on a daily basis to inspect and repair eroded areas.

The City currently has no plans for post-closure use of the landfill. The current intention is for it to remain a closed landfill. Monitoring and maintenance of the landfill post-closure would continue to be the City's responsibility. The City may continue to subcontract all maintenance of the landfill to the WWTF operator or elect to perform some tasks directly with its Department of Public Works staff. The specific methods used to maintain the closed landfill, including the final cover system would be described in the Closure/Post Closure Plan referenced above. The maintenance requirements will depend on the type of cover system that is installed. Natural vegetative cover surfaces would require inspection for and repair of eroded surfaces, while the inspection of synthetic cover systems (such as the ClosureTurf®) would follow the manufacturer's requirements to meet the conditions of the warranties. Under post closure conditions, the leachate produced by the landfill (from residual moisture already present in the waste and moisture released during the decomposition of organic material) would continue to be collected and conveyed in the same manner as under operating conditions. Inspection and maintenance procedures for the leachate collection system would remain unchanged from that performed under operating conditions as described in the Operations and Maintenance Plan. The pump stations would continue to be inspected and maintained by the WWTF staff along with the other pump stations in the City. Environmental monitoring and reporting of groundwater, surface water, and gas is anticipated to continue as described in the Operations and Maintenance Plan; however, this document would likely be updated prior to landfill closure. The monitoring frequency and specific parameters to be analyzed might warrant adjustment based on the results obtained over the next 17 plus years.

### 4.6.1 Capping Design Analysis

The capping procedure would involve constructing a cover system over the landfill that would be impervious to water entry. The objective is to encapsulate the landfill's content between the GWPS beneath and the waterproof cover over the top to isolate the sludge waste from the surrounding environment. Other objectives of capping design are to promote proper drainage of precipitation, limit cap erosion, and facilitate the venting of decomposition gas. The design of a cap for the Project would occur with the preparation of the Closure Plan, which is submitted with a WP34 Approval of Closure Plans for Wastewater Residual Landfills application to MassDEP.

To prepare a cap design, an experienced professional engineer would gather information and assess the landfill conditions, then prepare a design that is appropriate to the observed conditions. This design process

would include a topographic survey, geotechnical data, and an assessment of any changes to stormwater management and natural resources that may have occurred since the landfill was approved.

Two different cap designs could be implemented for landfill closure. Both caps would have similar components or layers for gas control, the barrier to water entry, and a drainage layer to remove water from above the barrier. The difference between the two designs would be the surface finish, which would either include a layer of soil to support vegetation growth, or a synthetic turf surface. The cap structure design standards are largely prescribed in landfill regulations as is the case for final cover systems on a solid waste landfill as prescribed in 310 CMR 19.112. It is anticipated that the cap design used in closure of a wastewater residuals landfill would be similar to a cap utilized for a solid waste landfill.

# 5. GROUNDWATER

## 5.1 Introduction

As directed by the MEPA Certificate Scope, this chapter analyzes the potential effects the Project may have on groundwater. To assess impacts, this chapter maps and describes the number of public and private water supply wells within 1 mile of the Project Site; maps and describes the existing monitoring wells associated with the existing sludge landfill, municipal solid waste landfill, and the proposed monitoring wells for the Project; discusses potential impacts to wells from migration of groundwater from the Project; and describes how the proposed groundwater monitoring program, including additional monitoring wells that are proposed, would detect potential impacts to wells and protect groundwater resources.

## 5.2 Previous Investigations

For the 2022 Engineering Report, based on a review of available documentation, the following previous subsurface investigations that occurred within the Project Area were identified:

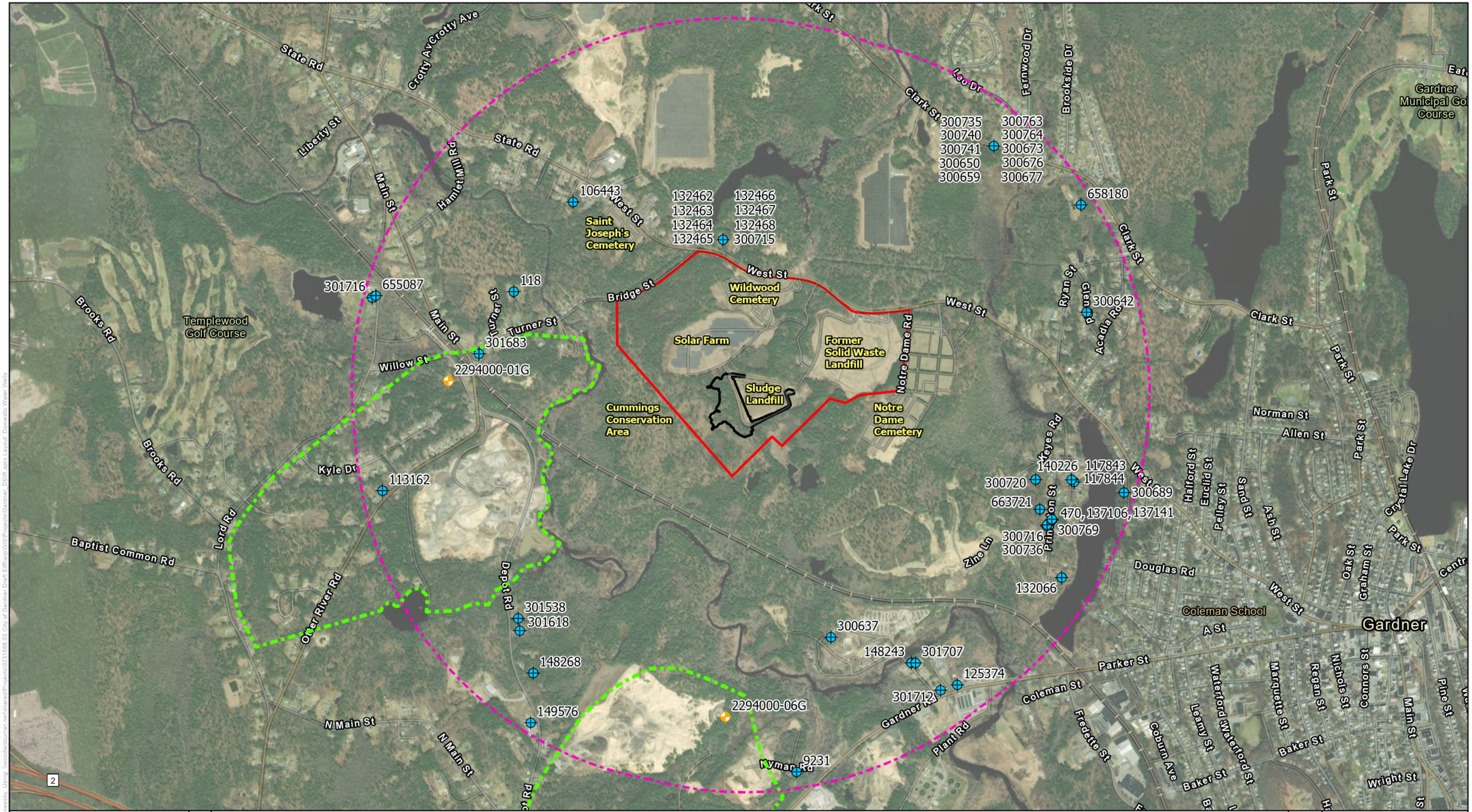
- **1984 Sanitary Landfill Investigation**. According to the 2014 CDR Maguire Geotechnical Report, a subsurface investigation associated with the nearby closed municipal solid waste landfill was conducted in 1984 by Whitman & Howard, Inc. This investigation reportedly included the installation of three shallow groundwater monitoring wells in the current proposed Project Site. Whitman & Howard submitted a report in January 1990 describing this investigation, entitled Expanded Hydrogeological Investigation at the Gardner Sanitary Landfill; however, this report was not available for review.
- **2013 Proposed Sludge Landfill Expansion Area Subsurface Characterization.** A subsurface investigation was conducted in November 2013 to characterize the proposed Project Site for design and permitting purposes (CDR Maguire, 2014).[19] This investigation included installation of seven borings (CDR-1 through CDR-7), soil and bedrock testing, and construction of five 2-inch diameter monitoring wells (located in borings CDR-1, CDR- 3, CDR-4, CDR-5, and CDR-7). The findings of this investigation are summarized in this chapter in **Section 5.3.2**.

## 5.3 Existing Conditions

### 5.3.1 Public and Private Water Supply Wells

A map of public and private water supply wells within a one-mile radius of the Project Site is included as **Figure 5-1.**

[19] CDR Maguire, 2014. "Geotechnical Report: Proposed Sludge Landfill Expansion Area Subsurface Characterization." February.




## Public and Private Water Supply Wells

City of Gardner, MA
Gardner Sludge Landfill Expansion

**Worcester County, MA**

*Legend*

- Project Area
- Project Site
- Surrounding Area (1 mile)
- Zone II Wellhead Protection Area
- Private Domestic Water Well
- Public Water Well

0 250 500 1,000 1,500 2,000 2,500 Feet

N

Woodard & Curran

Project #: 0231568.03
Map Created: August 2024



**Figure 5-1**

#### 5.3.1.1 Public Water Supplies

According to MassDEP GIS wells layer and the MassDEP Well Database, there are two public water supply wells within 1 mile of the existing sludge landfill and Project Site. These wells are listed as community groundwater wells and are located in the Town of Templeton to the west and south of the Project Site. One of Templeton's supply wells (the Otter River well) is located approximately 4,100 feet (0.78 miles) to the west of the Project Site and one (the Sawyer Street well) is located approximately 4,300 feet (0.81 miles) to the south of the Project Site. As shown on **Figure 5-1**, a portion of the Zone II Wellhead Protection Area associated with the Otter River well to the west is located within a half mile of the Site. The City's drinking water supply reservoir is Crystal Lake, located approximately 9,100 feet (1.72 miles) east of the Project Site.

#### 5.3.1.2 Private Water Supplies

Based on information provided by the City and information available online from the MassDEP Well Database, there are approximately 49 private water wells within approximately 1 mile of the Project Site. Based on the available information, the closest private drinking water well is located approximately 2,000 feet (0.38 miles) north and hydrologically upgradient from the existing sludge landfill and Project Site. The closest private water supply well, considered to be hydrologically downgradient of the Project Site, is located approximately 3,400 feet (0.64 miles) south.

### 5.3.2 Groundwater Quality

The groundwater and surface water monitoring plan creates a database of information for several different organic and inorganic parameters of interest and provides a means of detection for leakage of leachate. Sampling and analysis of groundwater and surface water is currently performed at three groundwater monitoring wells and one surface water location for the existing sludge landfill. Sampling is performed for the following indicator parameters: pH (field), Specific Conductivity, Temperature (field), Water Elevations (field), Iron, Total Phosphorous, Total Solids, Chemical Oxygen Demand, Chlorides, Ammonia, Nitrates, and Sodium as well as additional parameters of: Volatile Organics, Arsenic, Barium, Cadmium, Chromium, Lead, Silver, Mercury, and Copper. The specific parameters, sampling locations, and frequency would be described in the Project's Operations and Maintenance Plan and are performed as part of current sludge landfill operations. Groundwater quality is reported as part of the annual operations report. The 2023 Operations Report included the water quality monitoring results of the sampling conducted in March, July, and November of 2023.[20]

### 5.3.3 Regional Geology and Hydrogeology

Information regarding regional bedrock geology was obtained from the United States Geological Survey (USGS) Mineral Resources Online Spatial Data website.[21] Bedrock in the Project Area is part of the Littleton Formation, which is described as black to gray aluminous mica schist, quartzose schist, and aluminous phyllite. Bedrock to the east is part of the Paxton Formation, described as either sulfidic mica schist or undifferentiated biotite granofels, calc-silicate granofels, and sulfidic schist. Bedrock to the west is part of

[20] McClure Engineering, Inc. (2024). *2023 Operations Report: Municipal Sludge Landfill Facility, Gardner, Massachusetts*. Prepared for Gardner Water & Wastewater Veolia - Gardner WWTF.

[21] Nicholson, Suzanne W., Dicken, Connie L., Horton, John D., Foose, Michael P., Mueller, Julia A.L., and Hon, Rudi, 2006, Preliminary Integrated Geologic Map Databases for the United States: Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, Rhode Island, Vermont: U.S. Geological Survey Open-File Report 2006-1272, U.S. Geological Survey, Reston, VA. http://pubs.usgs.gov/of/2006/1272/

the Partridge Formation, described as sulfidic mica schist and subordinate amphibolite. Information regarding regional surface geology was obtained from MassDEP's online GIS mapping tool, MassMapper. Specifically, the USGS 1:24,000 Surficial Geology Layer was reviewed. The layer defines areas of exposed bedrock and boundaries between glacial till, glacial stratified deposits, and overlying early postglacial and postglacial deposits (MassGIS 2019). Surficial geology in the region is primarily coarse glacial stratified deposits with bedrock outcrops, thin till, swamp/marsh deposits, and fine glacial stratified deposits to the east. Swamp and marsh deposits are scattered throughout the area and alluvium deposits are present along the Otter River.

Based on a review of information available on MassMapper, the Project Site is located within the Millers watershed, specifically within the Otter River subwatershed. Surface water in this sub watershed drains to the Otter River and flows northward where it discharges to the Millers River, which then flows westward ultimately discharging to the Connecticut River. Groundwater is generally expected to follow a similar regional flow path, draining westward towards the Otter River. Precipitation data for 2016 through 2019 was obtained from the National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental Information for station GARDNER 1.4 SSW, located approximately 2.5 miles southeast of the Project Site. The average annual precipitation was found to be approximately 49 inches per year. Precipitation is relatively evenly distributed throughout the year, with the largest amounts of precipitation generally observed in the spring or late fall.

### 5.3.4 Project Site Geology and Hydrogeology

Geology within the landfill expansion area consists of coarse-granular stratified glacial outwash deposits on top of bedrock ranging from completely weathered to more competent (CDR Maguire, 2014). A thin post-glacial surficial subsoil stratum was also observed, consisting of forest mat ranging from 0.3 to 0.5 feet thick and subsoil ranging from 1.5 to 1.8 feet thick. The glacial outwash was primarily described as stratified fine/coarse sand and fine/coarse gravel with cobbles and occasional boulders present (CDR Maguire, 2014). The thickness of this layer ranged from 4.7 to 32 feet, with an average thickness of approximately 18 feet. Surficial bedrock observed during the 2013 investigation was described as Mica Schist with Quartz intrusions and ranged from soft and completely weathered with significant fracturing to hard and near intact with limited fracturing. Weathered bedrock was observed at the bedrock surface in four of the seven borings during the 2013 investigation. Observed depth to bedrock at the Project Site ranged from 5 to 34 feet below ground surface. Topography within the Project Site was described as steeply sloped ridges, mounds, and valleys with considerable elevation relief (i.e., more than 50 feet), which is consistent with glacially created features including kames, eskers, and kettle valleys (CDR Maguire, 2014). A pronounced esker feature is present in the vicinity of the Project Site, extending from the southeast to the northwest and occupying the southwest portion of the Project Site.

A hydrogeological evaluation was conducted for the Project in 2022, which evaluated both existing groundwater flow and potential changes due to the Project. For the evaluation, existing monitoring well locations were used, as described further below. The Project's Engineering Report includes detail related to the geologic and hydrogeologic conditions at the Project Site, the groundwater flow modeling conducted for the Project, and a discussion of how this data was considered in the sludge landfill's design and in the recommendations for operational protocols.[22] A summary of the hydrogeological evaluation of the Project Site follows.

[22] City of Gardner, Massachusetts**.** *Gardner Sludge Landfill Expansion Engineering Report*. Woodard & Curran, Inc., January 2022.

#### 5.3.4.1 Monitoring Well Locations

Groundwater monitoring wells on and in the vicinity of the existing landfill and the Project Site are shown on **Figure 5-2**. Four wells are located within the Project Site (CDR-1, CDR-2, CDR-3, and CDR-4) and three wells (CDR-5, CDR-6/6A, and CDR-7) are located just south of the Project Site. Of the seven wells, five (CDR-1, CDR-3, CDR-4, CDR-5, and CDR-7) were installed as part of the November 2013 subsurface investigation. The remaining two wells (CDR-2 and CDR-6/6A) were installed during a previous investigation conducted in 1984. CDR-1, CDR-4, and CDR-6/6A are located within the Project Site and would need to be decommissioned.

The City of Gardner currently maintains three groundwater monitoring wells in proximity to the existing sludge landfill. These monitoring wells (SL-1, SL-2, and SL-3) are located along the perimeter of the existing sludge landfill and are currently used for groundwater monitoring for the existing sludge landfill. SL-1 is located across from the entrance gate from the solar farm, which is hydraulically upgradient of the landfill. SL-2 and SL-3 are located along the southern side of the original landfill on the outside slope of the landfill, which is hydraulically downgradient of the landfill. An additional eleven monitoring wells (MW-4, MW-7, MW-13D, MW-14D, MW-14S, MW-15, MW-16, G3-90, MW-96D, MW-96R, and MW-96S) are located around the perimeter of the closed municipal solid waste landfill to the east of the existing sludge landfill.

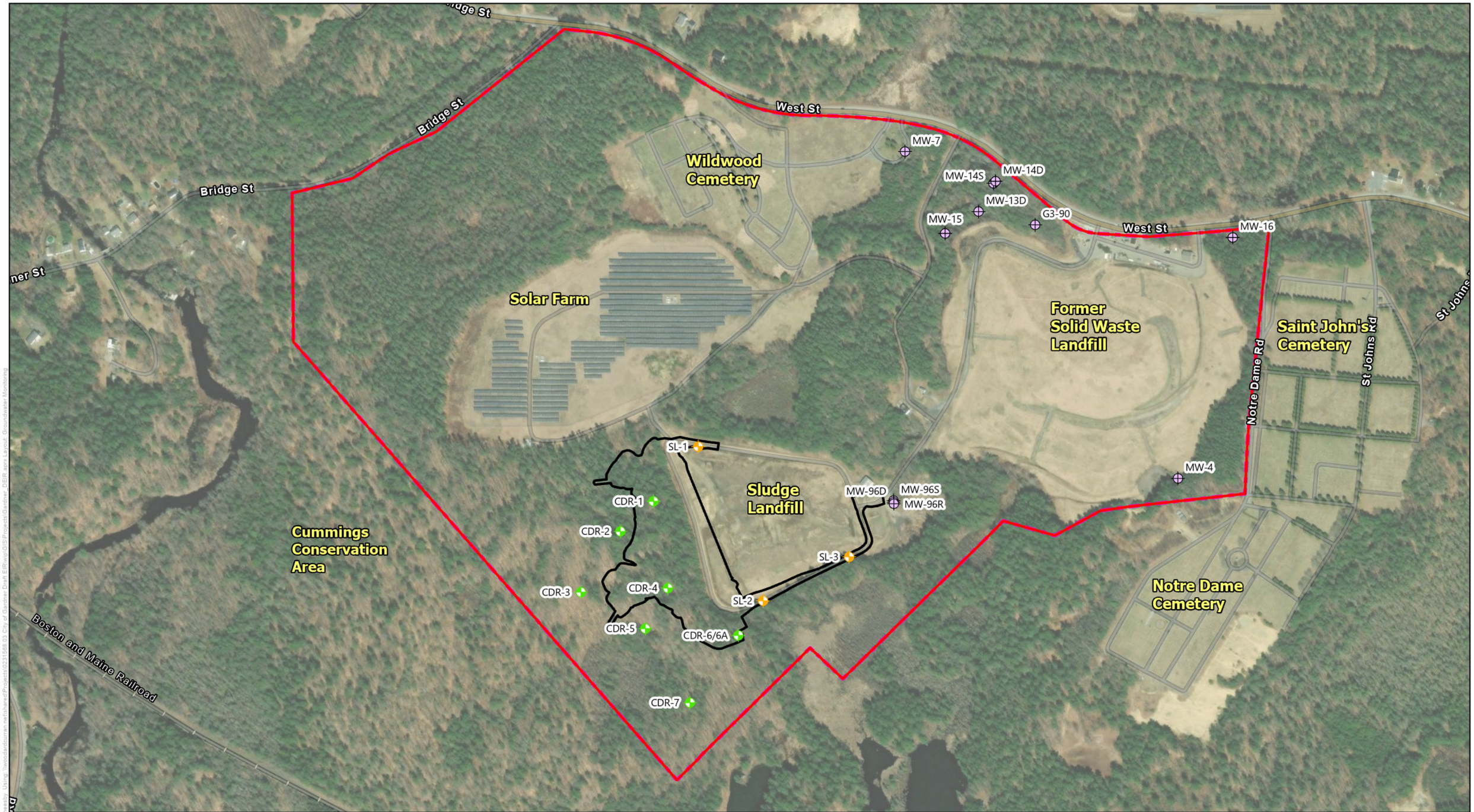
#### 5.3.4.2 Project Site Hydrogeological Properties

During the 2013 subsurface investigation conducted by CDR Maguire, 10 soil samples were collected for grain size analyses, which were performed per the Standard Test Method for Particle-Size Analysis of Soils (ASTM D 4220). Based on the results of the grain size analyses, Unified Soil Classification System designations for the subsoil were "SM" (indicative of silty sand and sand-silt mixtures) and Unified Soil Classification System designations for the glacial outwash ranged from "SP" (poorly graded sands or gravelly sands with little or no fines) to "GP" (poorly graded gravels or gravel-sand mixtures with little to no fines). The 2013 investigation also included four compression strength tests performed per ASTM D 7012 on bedrock samples. Compression strength testing for the weathered bedrock sample indicated an ultimate rock strength of 4.1 KSI, considered "soft" by the Unified Facilities Criteria standards. Testing of the more weathered samples indicated ultimate rock strengths ranging from 5.4 to 9.4 KSI, considered "soft" to "hard" by Unified Facilities Criteria standards (CDR Maguire, 2014).

A site visit was conducted on April 22, 2020, to conduct slug testing at the monitoring wells located within and in the vicinity of the Project Site (CDR-1 through CDR-7). Slug testing is used to estimate hydraulic conductivity by causing a sudden rise or fall in water level, then measuring the water level response. The purpose of performing these slug tests was to develop a range of saturated hydraulic conductivity values for overburden soils for calibration of the Project Site's groundwater-flow model.[23] Analysis revealed hydraulic conductivity ranges from approximately 16 feet per day (ft/day) to 170 ft/day, spanning about a factor of 10, which is within the literature range for clean sand and gravel. This is consistent with geologic interpretations during the installation of site monitoring wells.[24] These interpreted hydraulic conductivity results were incorporated into the development and calibration of the Project Site groundwater-flow model.

[23] Of the seven wells, six were tested; CDR-3 was dry, which is consistent with historical observations. Slug testing at monitoring wells CDR-1, CDR-4, CDR-5, and CDR-7 was performed. Of the trials conducted, three were selected for analysis. Following completion of field activities, the raw data files for each slug test was processed.

[24] Freeze, R.A., and Cherry, J.A., 1979. Groundwater: Englewood Cliffs, NJ, Prentice-Hall, 604 p.




# Monitoring Wells

City of Gardner, MA
Gardner Sludge Landfill Expansion

**Worcester County, MA**

*Legend*

- Project Area
- Project Site
- Monitoring Wells Associated With Closed Municipal Landfill
- Sludge Landfill Monitoring Wells
- Sludge Landfill Expansion Area Monitoring Wells

0 50 100 200 300 400 500 Feet

N

Woodard & Curran

Project #: 0231568.03
Map Created: August 2024





**Figure 5-2**

Groundwater levels from the wells associated with the 2013 subsurface investigation (CDR-1 through CDR-7) were measured following well installation in November 2013. Water levels were between 7 and 30 feet below ground surface, with groundwater flow direction generally to the south-southeast (CDR Maguire 2014). Based on the April 2020 measurements, groundwater flow within the Project Site appears to be generally towards the south-southeast, consistent with the groundwater flow direction observed in November 2013.

Based on groundwater elevations, the horizontal gradient in the overburden is approximately 0.04 feet/feet in the south-southeast direction. Vertical gradients within the Project Site could not be calculated due to the lack of co-located wells screened at different intervals. However, co-located wells MW-96S and MW-96D, located adjacent to the east of the existing sludge landfill, demonstrate a slight downward vertical gradient within the overburden based on water level data collected between 2008 and 2018. The average water level measured in MW-96S from 2008 to 2018 was 979.27 feet above mean sea level, whereas the average water level measured in MW-96D from 2008 to 2018 was 978.92 feet above mean sea level.

The Frimpter Method (USGS, 1981), developed specifically to assist in the evaluation of annual high-water table under the Massachusetts Title 5 regulations 310 CMR 15.103(3), was selected as the most appropriate and conservative method for calculating seasonal high-water table for the Project. Under Title 5, the Frimpter Method (USGS, 1981) is used to adjust data from on-site wells to a likely seasonal high when they may not have been monitored during a high-water period. Based on a review of site boring logs (CDR Maguire 2014) and other geologic information discussed above, the Project Site is located in a sand and gravel terrace environment. As part of the analysis for high water table, a probability of exceedance of 5 percent was selected (USGS, 1981). The continuously monitored USGS well used to adjust the on-site wells is USGS Well 423717072043101 MA-TMW 3 located in Templeton, Massachusetts, installed in 1957. The period-of-record high water depth for this well is 1.99 feet below ground surface and the recorded upper limit of the annual range of depths is 2.36 feet below ground surface. Given the available Project Site data and the low range of fluctuation observed in the Project Site dataset, the selected low probability of exceedance of 5 percent provides a conservative estimate of the projected high-water table, especially when considering the geologic setting and groundwater observations made at the Project Site.

Based on available information from MassGIS, potential receptors were identified near the Project Site. As discussed above, there are two public water wells and approximately 49 private water wells within 1 mile of the Project Site. In addition, several ponds, wetlands, and vernal pools are located within a half mile of the Project Site. Portions of the Otter River are also located within a half mile of the Project Site to the west and southwest (see **Chapter 6, "Stormwater,"** for further discussion of these resources). Surface water drains to the Otter River and flows northward where it discharges to the Millers River, which then flows westward ultimately discharging to the Connecticut River.

## 5.4 Groundwater Modeling

The above geologic and hydrogeologic information was used to build a three-dimensional finite-difference groundwater flow model for the Project. The primary objective of the groundwater flow model was to simulate groundwater conditions in the vicinity of the Project Site to support design activities. Specifically, the model was used to:

- Predict the effect of landfill expansion on groundwater flow;
- Evaluate the adequacy of the existing monitoring well network;

- Make recommendations for additional wells to be installed and other changes to the existing monitoring program; and
- Model the effects of mounding at stormwater detention basins where stormwater is to be directed.

Based on the results of the pre-construction and post-expansion model runs, the adequacy of the existing monitoring well network was evaluated. Anticipated changes to groundwater flow within the Project Site post-construction are expected to be minimal. Groundwater elevations appear slightly elevated in the Project Site compared with pre-construction modeling and the effects of the planned stormwater ponds on the water table are expected to be minimal.

With the review of existing monitoring wells and the direction of groundwater flow, one additional upgradient monitoring well, designated SL-4, was recommended to be installed to better delineate and monitor background groundwater conditions following Project implementation. SL-4 is proposed to be installed near the north entrance road at the southern edge of the solar field in the Project Area. It was also recommended that CDR-5 be used as an additional downgradient monitoring location post-expansion to assist with evaluating potential effects on groundwater from the Project.

## 5.5 Project Groundwater Protection and Operations & Maintenance

### 5.5.1 Groundwater Protection System

As described in **Chapter 1, "Project Description and Permitting,"** the Project would be constructed with a double composite groundwater protection system (GWPS) with leak detection and would be designed to meet a more rigorous standard historically reserved for solid waste landfills (310 CMR 19.110). The Project would also be designed to a higher standard than the existing sludge landfill. The Project's GWPS would function as a barrier to separate the applied sludge and any generated leachate from the groundwater sources beneath it. Thus, the project would be designed to protect groundwater resources from contamination.

The component of the GWPS that is most susceptible to degradation over time is the high-density polyethylene geomembrane, with the predominant factors affecting its lifespan being oxidative aging (temperature based) and photo-oxidative (UV exposure based) degradation. Lining systems at 20 degrees Celsius (68 degrees Fahrenheit) have been estimated to last up to 449 years, although higher temperatures may decrease service life.[25] Although the air temperatures in Gardner do exceed this range during a portion of the year, it is anticipated that ground temperatures at the depths of these liners would be less than 68 degrees. The landfill expansion's estimated time of use is approximately 17 years. At that time, the landfill would be appropriately capped with an impermeable layer, therefore removing the ability of stormwater to flow through the sludge and generate leachate and thus significantly reducing the potential for groundwater contamination.

Furthermore, before implementation, the Project's design, including the proposed GWPS would be approved by MassDEP through the permitting process to ensure all standards and requirements are met.

[25] GRI-GS20: Exposed Lifetime Prediction of Geosynthetics Using Laboratory Weathering Devices." *Geosynthetic Institute*. (2019). https://geosynthetic-institute.org/grispecs/gs20.pdf

### 5.5.2 Operations and Maintenance

During operations, the unused cells would be inspected to make sure the protective sand layer over the GWPS remains in place. This is important to make sure the underlying materials are not exposed to sunlight that could cause degradation. Initially, the woodchip layer of the GWPS would control erosion of the protective sand layer and the operator shall replenish the woodchips in areas where the protective sand has been exposed. Vegetation would establish on the woodchips over time, providing additional erosion control. Once the vegetation has been established, the operator shall mow it at least two times per year to prevent excessive root growth. If damage occurs to the GWPS, the operator would isolate that cell from the normal operation of the landfill and make immediate plans to repair and/or replace the damage. Repairs to the synthetic membrane would be performed in accordance with the specifications approved in the design plans.

With the Project, environmental monitoring and reporting of groundwater and surface waters is anticipated to continue as described in the Operations and Maintenance Plan. Existing monitoring wells SL-1, SL-2, and SL-3 and proposed monitoring wells SL-4 and CDR-5 would be monitored in accordance with applicable regulations. The results of this environmental monitoring program would continue to be analyzed by a state approved laboratory, the results of which are shared with MassDEP, Division of Water Pollution Control.

## 5.6 Impact Summary

Anticipated changes to groundwater flow within the Project Site post-construction are expected to be minimal. Groundwater elevations appear slightly elevated in the Project Site compared with pre-construction modeling and the effects of the planned stormwater ponds on the water table are expected to be minimal. With the Project, monitoring wells CDR-1, CDR-4, and CDR-6/6A would need to be decommissioned.

Based on hydrogeologic modeling, with the proposed GWPS and implementation of the monitoring and sampling plan, impacts to groundwater are not anticipated with this Project.

## 5.7 Mitigation Measures

To ensure the protection of groundwater resources, two additional monitoring wells are proposed to be installed. An additional monitoring well, designated SL-4, would be installed upgradient of the landfill near the north entrance road at the southern edge of the solar field to monitor background groundwater characteristics; and an additional downgradient monitoring location (CDR-5) is proposed to assist with evaluating potential effects on groundwater from the Project. To further protect groundwater resources, environmental monitoring and reporting would include these two additional monitoring wells.

# 6. STORMWATER

## 6.1 Introduction

As directed by the MEPA Certificate Scope, this chapter includes a discussion of how stormwater runoff would be managed during the period that the expanded landfill is being filled with sludge, clarifies whether the proposed Best Management Practices (BMPs) identified for the final capped condition would be in place, and whether any additional BMPs or conveyance systems would be necessary on a temporary basis. As described below, the Project would implement stormwater management measures during construction that would be included in the Project's Stormwater Pollution Prevention Plan (SWPPP) in accordance with its National Pollutant Discharge Elimination System (NPDES) Construction General Permit to manage stormwater during the construction period.

As described in **Chapter 1, "Project Description,"** the Project includes the development of a bioretention pond and two infiltration basins (collectively the stormwater management infrastructure) to manage clean rainwater that falls onto unused cells within the expansion area. Clean rainwater flowing off a site is referred to as stormwater and rainwater that falls onto an active sludge landfill becomes leachate. The management of stormwater on the Project Site would adjust as landfilling progresses. Initially all stormwater collected within the Project Site would be directed out of the landfill cells by gravity pipe to the bioretention pond and infiltration basins. As filling progresses and sections of the landfill rise to above the height of the perimeter berm, intermediate cover would be applied to the exterior landfill faces to prevent precipitation from contacting the sludge, thus allowing clean rainwater to continue to be directed to the stormwater management infrastructure.

Wetlands delineated in 2021 occur southeast, north, and west of the Project Site within the Project Area. Freshwater emergent wetlands are located north and south of the Project Site, and four forested/shrub freshwater wetlands are located south, east, and northwest of the Project Site (see **Figure 1-4c**). According to the MassDEP Vernal Pools database, there are two certified vernal pools within the Project Area. One is located approximately 103 feet to the east and the other approximately 102 feet to the south of the Project Site (see **Figure 1-4d)**.

## 6.2 Stormwater Management – Existing Conditions

The Project Area is located within an approximately 13.9-acre watershed containing the existing sludge landfill and its supporting infrastructure, including a stormwater pond, and approximately 8.75 acres of undeveloped woodland. Stormwater runoff from the undeveloped forested area either infiltrates into the ground surface or discharges via overland flow to the topographic depression to the west or to the wetlands to the south. The topography within this area varies considerably and consists of steeply sloped ridges, mounds, and valleys. Many of these valleys serve as naturally occurring stormwater ponds and infiltrate most, if not all, of the stormwater runoff throughout the forested area. The existing sub catchment areas are illustrated in **Figure 6-1**.

DP1
P1A
P3A
P3B
P3C
P2A
DP2
Sludge Landfill
D1
P3E
DP3
EP1

# Existing Stormwater Catchments

City of Gardner, MA
Gardner Sludge Landfill Expansion

**Worcester County, MA**

*Legend*

- Project Area
- Project Site
- Longest Flow Path
- Discharge Point
- Existing Stormwater Catchment
- Pond

N

0 50 100 200 300 Feet

Woodard & Curran

Project #: 0231568.03
Map Created: July 2024



**Figure 6 -1**

## 6.3 Design Criteria for Stormwater Management Systems

The Project's stormwater system has been designed to comply with applicable regulatory design standards, including compliance with the MassDEP Stormwater Management Standards, and future increases in precipitation based on climate conditions. A stormwater model was developed to compare the peak discharge rates under existing conditions to discharge rates in the proposed conditions.

The state of Massachusetts provides the Stormwater Handbook, which outlines ten Standards in Volume 1, Chapter 1 for stormwater infrastructure design projects. The handbook addresses the following Standards:

- prohibition on untreated stormwater conveyance discharges to wetlands or waters;
- design of stormwater management systems to manage post-development peak discharge rates;
- requirement that annual groundwater recharge rate remain equivalent to or approximate to pre-development annual recharge rates;
- design of post-development systems to remove at least 80 percent of Total Suspended Solids (TSS) with development of a long-term pollution prevention plan;
- standards for Land Uses with Higher Potential Pollutant Loads;
- standards for projects occurring within Massachusetts designated Critical Areas;
- requirements for projects categorized as redevelopment projects;
- creation of construction period pollution prevention and erosion and sedimentation control plans for use during construction phases;
- development of long-term operation and maintenance plans; and
- prohibition of illicit discharges.

All Project stormwater management infrastructure is designed in accordance with the Massachusetts Stormwater Handbook and meets the above Standards.

## 6.4 Stormwater Management – Proposed Condition

With the implementation of the Project, there would be an increase of approximately 4.3 acres of impervious area within the Project Site. Impervious surfaces prevent stormwater from infiltrating, generating surface runoff. To compensate for the loss of groundwater recharge across the Project Site, the Project would include stormwater BMPs, including a bioretention pond (BP-1), infiltration basins (IB-1 and IB-2), and stormwater conveyance and pretreatment features (see drawings in **Appendix A** of this DEIR**,** page 338). These stormwater management measures are described further below.

### 6.4.1 Bioretention Pond

The Project's stormwater management design includes the construction of a bioretention pond (BP-1) north of the proposed disposal area. The bioretention pond would consist of a soil bed planted with suitable, non-invasive vegetation. Stormwater runoff entering the bioretention pond would be filtered through a soil filter media and pea gravel before entering a perforated underdrain system and ultimately discharging from the pond through an outlet control structure. The bioretention pond has also been designed with an emergency overflow spillway to a crest elevation of 1005.50 feet.

Per the Massachusetts Stormwater Handbook, bioretention ponds shall have between 24 inches of a soil filter media layer for non-total maximum daily load discharges. The proposed bioretention pond was

designed with a 24-inch soil filter media layer because the receiving waterbodies from this site do not have total maximum daily load restrictions for nitrogen and no trees or shrubs are proposed for planting in the pond.

### 6.4.2 Infiltration Basins

The Project's stormwater management design includes the construction of two infiltration basins (IB-1 and IB-2) to the west and south of the proposed disposal area. Infiltration basins manage, treat, and gradually infiltrate stormwater runoff through the underlying soils. The water quality volume generated from stormwater runoff would infiltrate through the bottom of the basin and provide groundwater recharge. Stormwater would exit the basins in one of three ways - via exfiltration, an outlet control structure, or an emergency overflow spillway (as shown on the design drawing details; see drawings in **Appendix A** of this DEIR, page 338). During the 100-year, 24-hour design storm event, IB-1 and IB-2 would have greater than 2.0 feet of freeboard and drawdown times of 58-hours and 48-hours, respectively.

### 6.4.3 Stormwater Conveyance

The Project design includes the construction of several grass-lined swales (drainage channels), deep sump catch basins, manholes, and high-density polyethylene culvert pipes intended to convey stormwater to the bioretention pond and infiltration basins. The grass-lined swales and high-density polyethylene pipes have been designed with adequate capacity to convey stormwater runoff during the 10-year storm event. The maximum velocity of flow through each swale in the 100-year storm event ranges from 3.2 to 6.7 feet per second, and therefore check dams are proposed to reduce velocities in the swales.

The Project design includes the installation of three riprap aprons surrounding the outlets pipes discharging from the bioretention pond and infiltration basins. The aprons have been sized and designed in accordance with the Federal Highway Administration's Hydraulic Engineering Circular No. 14, Third Edition – Hydraulic Design of Energy Dissipators for Culverts and Channels and the Massachusetts Stormwater Handbook.

### 6.4.4 Stormwater Pretreatment

Pretreatment would be provided for the stormwater runoff discharging to the BP-1 and IB-1 and IB-2 in the form of deep sump catch basins installed at the low point of each grass-lined swale. Deep sump catch basins provide stormwater pretreatment by settling out sediment particles in the water prior to entering the pond or basins, which reduces maintenance needs and increases the longevity of these features.

Each deep sump catch basin is designed to remove 25 percent of the TSS in runoff prior to stormwater entering the bioretention pond and infiltration basin BMPs. The bioretention pond is designed to remove an additional 90 percent of TSS, resulting in a TSS removal of 93 percent within the bioretention pond's treatment train. The infiltration basins are designed to remove an additional 80 percent of TSS, resulting in a TTS removal of 85 percent within the infiltration basins' treatment trains.

### 6.4.5 Additional System Capacity

Massachusetts regulatory design standards require the stormwater management system to control the peak rate of run-off resulting from a 24-hour, 25-year storm and control the peak rate of run-off from the landfill resulting from a 24-hour, 100-year design storm event to the most prudent extent practicable. The hydrologic and hydraulic analysis shows that the designed stormwater management system meets the

capacity required to manage stormwater during these events.[26] Additionally, the system has capacity above the 100-year, 24-hour storm event to mitigate and control the potential impacts of future climate change and more intense storm events that may result in higher peak flow rates. If the proposed stormwater system were overwhelmed by a storm, the additional flow would overtop the individual catch basin grates, collect on the pavement, and either be collected by adjacent catch basins or sheet flow to the existing stormwater basin due to land grading.

Given that the goal of evaluating the proposed design under future climate projections is protection of critical infrastructure and assets and that the Project is sited away from critical assets; the proposed design is resilient to the current 100-year storm and 2050 25-year storm; and given the opportunity to re-assess at full closure in 2044, the stormwater management system is adequately resilient to manage current and near-term runoff projections (see **Chapter 8, "Climate Change"**).

## 6.5 Analysis of Proposed Stormwater Management System

A stormwater model was developed using HydroCAD Version 10.20, developed by HydroCAD Software Solutions, LLC, to compare the peak discharge rates from existing conditions to discharge rates under proposed conditions. The model was then used to determine the sizing, location, inlet, and outfall points of the stormwater management system to accommodate for the modelled discharge rates. Additional analysis included the establishment of Design Points for each watershed and sub-catchment to compare existing and closure condition peak discharge rates of runoff. The results of the analysis determined that there were no changes in the Design Points from existing conditions to post-construction. The model determined all stormwater management practices would maintain the necessary infiltration rate and system capacity at modelled peak discharge rates.[27]

## 6.6 Stormwater Management During Construction

The Project avoids direct impacts to vernal pools and wetlands. Impacts to state 100-foot wetland and vernal pool buffers are avoided to the maximum practicable extent, except in one area, where the Project limit of disturbance intersects the wetland buffer of Wetland D (see drawings in **Appendix A** of this DEIR, page 338). Approximately 100 linear feet of wetland buffer would be impacted. A Notice of Intent was filed with MassDEP for project impacts within a buffer zone. MassDEP issued an Order of Conditions, which allows for work within the 100-foot Wetland Resource Area Buffer Zone if conditions are met.

The stormwater infrastructure design detailed in this report and any additional future infrastructure design, such as during interim and final cover design, would incorporate the location of these natural resource features and implement BMPs to appropriately manage stormwater discharging from the Project Site.

### 6.6.1 Stormwater Pollution Prevention Plan

A SWPPP would be prepared in accordance with the EPA NPDES Construction General Permit. The SWPPP would be submitted at the time of filing, before land disturbance begins, and would outline the necessary measures to meet the requirements of Standard 8 of the Massachusetts Stormwater Handbook. The SWPPP would detail the construction activities to be incorporated to prevent stormwater contamination, control sedimentation and erosion, and maintain compliance with the Clean Water Act. The SWPPP would contain

[26] Hydrogeological Evaluation Report – Gardner Sludge Landfill Expansion, City of Gardner, Massachusetts, prepared by Woodard & Curran, Inc. for the City of Gardner, January 2022.

[27] Stormwater Management Report – Gardner Sludge Landfill Expansion, City of Gardner, Massachusetts, prepared by Woodard & Curran, Inc. for the City of Gardner, February 2024.

erosion and sediment controls applicable to the project activity as detailed in an Erosion and Sediment Control Plan. Inspection and maintenance procedures of BMPs would also be included in the SWPPP, including maintenance logs, forms, and additional erosion and sediment control measures.

### 6.6.2 Order of Conditions

MassDEP issued an Order of Conditions for the Project activity with specifications and conditions for construction activity and disturbance occurring within the Wetland Resource Area Buffer Zone. Among other requirements, the general conditions of the Order mandate that an operation and maintenance log of all inspection, repairs, maintenance, and/or replacement of the stormwater management system shall be maintained for at least a period of three years and available to MassDEP and the Conservation Commission upon request. The special conditions of the Order included both pre- and post-construction requirements for Project stormwater management. Specifications on BMP capacity, placement, and maintenance are included in these special conditions. There would be no sedimentation into wetlands or other water bodies from discharge points or surface runoff.

The order mandates that all sedimentation and erosion control devices shall be installed at the limit of work line prior to the start of any land disturbing activity. Additionally, signage delineating the limits of work shall be installed to prevent the use of heavy machinery or stockpiling outside of Project limits. During Project construction, all motorized equipment and machinery would only be allowed within the Buffer Zone while actively engaged in work in these areas and would be removed as soon as work is complete for the day. No maintenance or refueling shall be allowed within the Buffer Zone. All erosion control barriers are to consist of coconut fiber or straw laid out around the extent of the construction area. Additionally, according to the City of Garder Wetland Protection Ordinance, no storage of materials, stockpiling of soil, or any other work or disturbance shall occur within the 30-foot No-Disturbance Zone of any wetland or vernal pool.

All erosion control measures would remain in place and be repaired or replaced as needed. BMPs would not be removed until the Project is completed, the site fully stabilized, and a Certificate of Compliance has been received from the Conservation Commission. As soon as grading and/or construction is completed within the Wetland Resource Area Buffer Zone, all disturbed areas would be stabilized with seed, mulch, or erosion control blankets by November 1st of each year.

## 6.7 Impact Summary

The proposed stormwater management system includes the construction of three BMPs to accommodate the changing drainage patterns over the various stages of the landfill expansion's life cycle. These BMPs consist of two infiltration basins and one bioretention basin that would attenuate and treat stormwater, and recharge groundwater, thus offsetting the effect of the Project's impervious groundwater protection system (GWPS). Construction activity would be limited within the Wetland Resource Area Buffer Zone and all sedimentation and erosions control measures would be installed prior to the start of disturbing activity. Erosion control measures would be inspected and maintained throughout the construction period and only removed once final stabilization has been achieved. There would be no sedimentation into downgradient wetlands or water bodies from discharge points or surface runoff. The Project would comply with the conditions set forth in the Order of Conditions.

Based on hydrologic and hydraulic modelling, the proposed stormwater management design will have no significant impact to stormwater discharge from the Project Site. The proposed stormwater management system is designed with the capacity to manage 24-hour, 100-year storm events as depicted in the modelling and analysis. This capacity to control large storm events increases the resiliency of the Project to climate change and potential extreme weather conditions. The increased capacity of the Project to manage

stormwater would limit potential pollution or sedimentation of downstream water resources and prevent impacts to the surrounding natural communities. Therefore, there are no stormwater-related impacts anticipated with the Project.

# 7. AIR QUALITY

## 7.1 Introduction

As directed by the MEPA Certificate Scope, this chapter:

- includes a review of federal regulations related to landfill gas emissions from solid waste landfills, including 40 Code of Federal Regulations (CFR) Part 60, to determine whether standards for capture and control of landfill gas would trigger MassDEP air permitting;
- describes the source of all the model parameters used in the Landfill Gas Emissions Model (LandGEM) tool as they apply to sludge landfills rather than solid waste landfills;
- assesses whether it is necessary to collect landfill gas from the existing and proposed new portions of the sludge landfill and evaluates potential measures to minimize odors and greenhouse gas (GHG) emissions associated with the gas; including:
  - evaluating the feasibility of conveying those gases to the existing flare in operation at the nearby municipal solid waste landfill, which was approved by MassDEP in an Air Quality Plan Approval issued in 2005 and amended in 2008;
  - describing the differences between the landfill gas collection system for the existing sludge landfill and the former municipal solid waste landfill in the Project Area; and
  - explains the applicability of gas venting; and
- confirms daily cover is applied to the landfill.

This chapter also reviews existing information on odor, describes proposed odor control measures, and proposes additional mitigation measures.

## 7.2 Applicability of U.S. Environmental Protection Agency (EPA) Air Regulations for Municipal Solid Waste Landfills

EPA establishes air emission standards for municipal solid waste landfills under the following regulations: New Source Performance Standards for new municipal solid waste landfills (40 CFR 60 Subpart XXX), New Source Performance Standards for municipal solid waste landfills Constructed or Modified After May 30, 1991, but Before July 18, 2014 (40 CFR 60 Subpart WWW), and the National Emission Standards for Hazardous Air Pollutants for municipal solid waste landfills (40 CFR Subpart AAAA). These regulations apply to municipal solid waste landfills with a maximum design capacity greater than or equal to 2.5 million megagrams (Mg) and 2.5 million cubic meters. These regulations define "municipal solid waste landfill" as a disposal facility where household waste is placed.[28] Sludge-only landfills are therefore not considered municipal solid waste landfills and are not subject to these federal regulations. Furthermore, the total capacity of the existing sludge landfill combined with the proposed expansion is 523,500 cubic yards, which

[28] Per 40 CFR §60.751, municipal solid waste landfill means an entire disposal facility in a contiguous geographical space where household waste is placed in or on land. A municipal solid waste landfill may also receive other types of Resource Conservation and Recovery Act Subtitle D wastes (§257.2 of this title) such as commercial solid waste, nonhazardous sludge, conditionally exempt small quantity generator waste, and industrial solid waste. Portions of a municipal solid waste landfill may be separated by access roads. A municipal solid waste landfill may be publicly or privately owned. A municipal solid waste landfill may be a new municipal solid waste landfill, an existing municipal solid waste landfill, or a lateral expansion.

is well below the 2.5-million cubic meters (equivalent to 3,270,000 cubic yards) capacity threshold for the municipal solid waste landfill regulations. The Gardner Sludge Landfill is not subject to these regulations, including the requirement to operate a gas collection and control system. Because a capture and control system is not required, MassDEP air permitting for a capture and control system is also not required.

## 7.3 Source of Landfill Gas Emissions Model Parameters

The decomposition of sewage sludge produces gas consisting of primarily methane (55 percent) and carbon dioxide (45 percent). Methane and carbon dioxide are GHGs and are odorless. Trace amounts of other compounds such as hydrogen sulfide ($H_2S$), ammonia and sulfur-containing mercaptans, which are associated with the characteristic odor of sewage, are also generated.

The Gardner Sludge Landfill has not historically produced a measurable amount of gas. Landfill gas generation was estimated using the EPA's Landfill Gas Emissions Model (LandGEM), Version 3.02 using EPA default inputs for municipal solid waste landfills. There are no available default parameters specific to sludge-only landfills. The model is used as a screening tool to estimate emissions of methane, carbon dioxide, and non-methane organic compounds from municipal solid waste landfills. Emissions of non-methane organic compounds from sludge landfills are negligible because volatile organics are generally released during the wastewater treatment process. The model is based on a first-order decomposition rate equation.

The following inputs are required to estimate the annual methane generation rate:

- M = Mass of sludge landfilled per year (Megagrams, Mg)
- k = Methane generation rate ($year^{-1}$) which expresses how fast or slow the waste decomposes
- Lo = Potential methane generation capacity ($m^3/Mg$) which expresses how much methane the waste could produce until fully degraded

The mass of sludge landfilled is a measurable quantity and remains relatively consistent year-to-year. The dry solids weight of the sludge is used for modeling as the dry weight represents the organic portion capable of decomposing and generating gas. The water contained in the sludge and the added sand do not decompose to make gas. For modeling purposes, M was assumed to be 1,400 tons per year during the period 1990 to 2019, and 1,300 tons per year from 2020 to end of landfill life near 2041. These values were based on historical data and projections going forward. In 2023, the estimated amount of municipal sludge deposited at the sludge landfill totaled 1,275 tons. Therefore, the values presented in the 2022 Engineering Report remain conservative for analysis purposes.

Values for the variables Lo and k must be estimated. Estimation of the potential methane generation capacity of refuse is generally treated as a function of the moisture and organic content of the refuse. Estimation of the methane generation constant is a function of a variety of factors, including moisture, pH, temperature, other environmental factors, and landfill operating conditions. The values used for the methane generation rate and potential methane generation capacity were based on the LandGEM default values for "conventional landfills," which were considered conservative for the Project. Specifically, k = 0.04/year (for areas receiving 25 or more inches of rain per year) and Lo = 100 $m^3/Mg$ (appropriate for most municipal solid waste landfills).[29]

[29] https://www3.epa.gov/ttncatc1/dir1/landgem-v302-guide.pdf.

The model output indicates that the gas production for the entire sludge landfill (i.e., the existing landfill and the proposed expansion) would be up to 13 cubic feet per minute (CFM) until landfilling ceases at which point the landfill gas generation rate would begin to decrease. For context, municipal solid waste landfills typically produce several hundred CFM of landfill gas. A peak rate of 13 CFM is considered negligible relative to municipal solid waste landfills and is too low to warrant an active capture and control system. As noted above, sludge landfills of this size are not required to have capture and control systems.

## 7.4 Venting of Landfill Gas

Consistent with the current practice at the existing landfill, gas migration through soils is controlled by the landfill liner system. The liner restricts landfill gas from entering the subsurface. The gas would migrate to the landfill surface, following the path of least resistance and be passively released to the atmosphere. The landfill gas would passively vent throughout the year, including during the winter months as the landfill gas remains warm during colder months.

Once the landfill is closed, a cap would be installed with an impermeable barrier, and a gas venting system would be incorporated to avoid the formation of gas pockets beneath the cap. The future gas venting system would consist of a permeable sand layer beneath the geomembrane with passive vents to convey the gas to the atmosphere. Based on the type and capacity of the landfill, the landfill gas is not required to be continuously monitored.

The MEPA Certificate Scope requested an evaluation of the feasibility of conveying the gases to an existing flare at the nearby municipal solid waste landfill approved by MassDEP in Air Quality Plan Approval issued in 2005 and amended in 2008. The privately owned flare was originally permitted nearly 20 years ago and is apparently no longer in operation. There is also no active landfill gas collection system in the sludge landfill due to the low gas generation rate (only passive venting). It is therefore not feasible to connect the sludge landfill to the existing flare.

## 7.5 Greenhouse Gas Emissions

Based on the EPA regulatory default values in the LandGEM model, the peak annual landfill gas emission rate (including both methane and carbon dioxide) is estimated to be approximately 13 CFM. The peak methane emissions would be 78.1 tons of methane per year and 175.5 tons of carbon dioxide ($CO_2$) per year. Using a Global Warming Potential (GWP) of 27.2 for methane, the total emissions would be 4,851 tons per year carbon dioxide equivalent ($CO_2e$). Even using more conservative inputs (i.e., Clean Air Act Regulatory values of k= 0.05/year and Lo = 170 m3/Mg), the resulting emissions would be 8,691 tons per year of $CO_2e$. As described above, there is no regulatory requirement for a landfill of this type and size to install GHG controls. This level of emissions is considered too low to warrant an active capture and control system.

## 7.6 Odors and Odor Control Measures

### 7.6.1 Odors – Existing Conditions

Odors are a result of the proteins in wastewater residuals degrading and producing sulfur compounds such as hydrogen sulfide, methyl mercaptan, and dimethyl sulfide as well as ammonia. These compounds have relatively low odor thresholds. A chemical's odor threshold is the lowest concentration of that chemical in air that an individual can smell. Therefore, a chemical with a low odor threshold can be detected at a very low concentration, which means that a small amount can smell very strong. Odors associated with sludge handling at the existing sludge landfill can occur as sludge is handled and to a lesser extent, from the

decomposition process after the sludge has been placed in the landfill. Meteorological conditions such as wind speed and direction, relative humidity, and temperature can impact the intensity of nuisance odors.

Annual Operation Reports for the years 2018-2020 and 2022-2023 were reviewed for their cataloged odor complaints.[30] In 2018, no complaints were filed. The report noted that "the operational changes made at the sludge landfill have shown tremendous improvements in the control of odors on a consistent basis."

In 2019, three complaints were filed:

- On March 19, 2019, odors were observed at approximately 2:48 PM from a location approximately 3.35 miles east/southeast of the existing landfill. Weather conditions were clear, approximately 34°, with wind approximately 5 mph from the southeast. Ground conditions were wet from frost. Upon investigation, odor was attributed to active sludge handling activities at the landfill. It is not clear if the odors were observed from the location listed on the form or if it was the address of the individual filing the complaint.
- On May 19, 2019, odors were observed at approximately 10 AM from a location in Templeton approximately 0.57 miles north/northwest of the existing landfill. The odor complaint noted that there were normal sludge odors over the past few days (weekend). Weather conditions were sunny/partly cloudy, approximately 52°, with wind approximately 1 mph from the northwest. Upon investigation, odor was attributed to active sludge handling activities. Although not noted in the report, one possible cause of odor is sludge may have sat uncovered over the weekend.
- On May 22, 2019, odors were observed from a location approximately 0.31 miles southeast of the existing landfill. Weather conditions were sunny, approximately 50°, with wind approximately 2 mph from the north/northwest. Upon investigation, odor was attributed to recently completed sludge handling activities and exposed sludge. Corrective action was taken to add cover to the exposed sludge.

In reviewing 2019 odor complaint forms, it was observed that there is inconsistency in the formatting of the complaint forms used and more importantly the type of data collected (i.e., location of complaint and date/time of investigation).

In 2020, one complaint was filed.

- On May 19, 2020, odors were observed at approximately 9:30 AM from a location in Templeton approximately 0.77 miles north/northwest of the existing landfill. Weather conditions were clear, approximately 65°, with wind from the north/northwest. Upon investigation, odor was contributed to strong winds that likely carried residual odors from handling activities the previous day. A follow up form was filed for this complaint and odor was ranked (0 through 10, 0 being no odor). Odor at the sludge landfill gate was ranked a three and attributed to old sludge. Odor on the west side of the landfill was ranked a one and attributed to dirt from street sweepings. Odor on the top of the landfill was ranked at two. The follow up form concluded that operators who were mixing and covering the sludge found some runoff on the east side of the landfill that had an odor of old sludge. Corrective action was taken to add cover to the east slope and to hydroseed the area.

In reviewing the 2020 odor complaint, it was observed that form and data consistency was corrected and improved. Further reporting transparency was also observed as relevant correspondence was appended to the complaint forms.

[30] Reporting for years 2016-2017 and 2021 were unavailable for review.

In 2022, one complaint was filed.

- On September 2, 2022, at 3:50 PM odors were observed at the Cummings Conservation Area, adjacent to the sludge landfill, at a ranking of 4 (objectionable odors present). Upon investigation, odor was attributed to active sludge handling activities at the landfill. Weather conditions were noted to include winds from the west.

In reviewing the 2022 odor complaint, no form was used, only email correspondence was appended.

In 2023, no complaints were filed.

From the complaints filed between 2018 and 2023, it appears that odors tend to be experienced in the spring, with the exception of one complaint in the fall and when wind is mainly blowing north/northwest, with the exception of one complaint with winds blowing east/southeast.

A number of odor complaints were included in comments on the Environmental Notification Form. Commenters noted that odors are experienced at nearby open spaces (i.e., Cummings and Ebenezer Conservations Areas), cemeteries (Wildwood Cemetery, St. John, and Notre Dame Cemeteries) that are immediately adjacent to the existing sludge landfill, as well as from residences at varying distances, including those in Templeton. Some commenters note that odors are experienced or are worse in the summer months. Another commenter notes odors are "routinely" experienced during the spring, summer, and fall. One commenter notes that "winter brings some respite." A number of comments reference historical odor problems. A number of commenters note wind direction is a factor to experiencing odors ("downwind"). A number of commenters note that the current odor complaint protocol is not widely known. There is also a perception that the odor problem would increase with the Project.

Odors may continue to be generated during the handling of the sludge and, to a lesser extent, from the decomposition of the sludge after it has been placed in the landfill. Odor is an inherent biproduct of any wastewater/wastewater residual operations and no practice (i.e., anaerobic digestion, incineration, composting, hydrothermal carbonization, etc.) offers an odorless alternative. However, certain management practices can help control odors as described in the following section.

### 7.6.2 Odor Control Measures

Similar to existing conditions, the Project would entail hauling of approximately two truckloads of dewatered sludge cake per day (26.5-30.3 percent solids) approximately three miles from the Gardner WWTF to the landfill expansion. As described in the Operations and Maintenance Plan, upon arrival, the sludge would be delivered to the active cell and stabilized by mixing it with locally sourced sand at an approximate sand/sludge ratio of 3:1 by volume using a front-end loader and spread in the active area. Delivered loads would be stabilized and spread the same day, if possible. Rainy conditions might delay the management of the pile to the following day. The landfill operator would adjust operations accordingly with the goal of minimizing odors. Operations at the landfill would be analyzed and altered as existing and predicted weather dictates. Odors are generally worse when the sludge is rained on and then exposed to heat. If rain is predicted, operators would adjust times to push/spread loads to avoid sludge piles sitting for extended periods of time. Wind direction and speed would also be tracked and recorded to correlate with operational activity, odors, and odor complaints.

Odor would be controlled by applying daily cover to the landfilled sludge and keeping the sludge as dry as possible by preventing ponding. Additional cover material would be added as needed to mitigate nuisance odors. Intermediate cover would be placed on the exterior landfill side slopes as they are created so that stormwater runoff does not contact the sludge/sand mixture.

Odors would be tracked by non-landfill WWTF personnel while performing pump station rounds at the sludge landfill leachate pump stations. Non-landfill personnel record the odor readings to achieve more accurate results and avoid readings from sludge landfill personnel who may have some olfactory adaptation (temporary, normal inability to distinguish a particular odor after a prolonged exposure to that airborne compound) while working at the landfill. Odor intensity readings are based on the 5-point scale presented in **Table 7-1**. When odor complaints are logged, WWTF personnel record observations of odor in the area leading to and immediately around the sludge landfill. If odors are present and distinguishable, WWTF operators respond and attend to the area of the landfill in question.

**Table 7-1: Odor Intensity**

| Rating | Category | Description |
|---|---|---|
| **0** | No Odor | Not Detectable |
| **1** | Very Light | Odorant present that activates the sense of smell, but the characteristic may not be distinguishable |
| **2** | Light | Odorant present that activates the sense of smell and is distinguishable and definite but not necessarily objectionable in short durations but may be objectionable in longer durations |
| **3** | Moderate | Odorant present that easily activates the sense of smell, is very distinct and clearly distinguishable and may tend to be objectionable and/or irritating |
| **4** | Strong | Odorant present that would be objectionable and cause a person to attempt to avoid it completely |
| **5** | Very strong | Odorant present that is so strong it is overpowering and intolerable for any length of time |

Odor complaints can also be reported by contacting VEOLIA at 978-630-8791 during normal business hours. After business hours, sludge landfill complaints can be reported by calling the non-emergency number for the Gardner Police Department dispatch at 978-632-5600 and leaving call back information and a brief description of the complaint. The complaint is forwarded to the appropriate on-call staff for follow-up. When reporting a complaint, the exact location and time of the complaint should be provided so VEOLIA operators can respond appropriately. All odor complaints are tracked both by the City of Gardner Board of Health and by the WWTF operators. Complaints are analyzed against weather data and operational activity at the sludge landfill. Odor related data is recorded daily for wind speed, direction, temperature, time of visit, name of employee and odor ranking at each site visit.

## 7.7 Impact Summary

As described above, the Gardner Sludge Landfill is not subject to EPA air emission standards. A peak rate of 13 CFM of gas production, and peak methane (78.1 tons per year) and $CO_2$ emissions (175.5 tons of $CO_2$), are considered negligible and too low to warrant active capture and control systems.

Sludge landfill operations are not proposed to increase from existing operations and landfilling would continue at the same rate and quantity. Therefore, there would be no increase in air quality and/or odor impact with the implementation of the Project. Odors are proposed to continue to be managed through operational practices.

In existing conditions, odor complaints are made sparingly (0-3 times per year), are generally made in the spring and fall seasons when weather conditions contribute to exacerbating odors and are generally made more frequently in closer proximity to the existing landfill. A seasonal odor issue with limited formal complaints that are made from locations in close proximity to the existing facility does not constitute a significant adverse impact with respect to odor. However, with the Project, mitigation measures are proposed.

As noted above, odor is an inherent biproduct of any wastewater/wastewater residual operations and no technology (i.e., anaerobic digestion, incineration, composting, hydrothermal carbonization) offers an odorless alternative.

## 7.8 Mitigation Measures

To mitigate odors associated with the existing landfill, the Project would implement interim cover and cap the portions of the existing landfill that are no longer receiving sludge. It is currently projected that this would occur in Quarter 3 of 2028, based on remaining volume (see **Chapter 4 "Landfill Design and Construction"**). Additionally, it is proposed that, with the Project, a new detailed complaint form would be implemented to ensure consistency of information collected and investigated to be included in future Annual Operations Reports. Information such as weather conditions, temperature, wind speed from a consistent source (i.e., weather.com), the date and time the odor was experienced and for how long, would be collected and detailed investigative measures, corrective action taken, and any relevant correspondence would be appended.

Furthermore, the Project would include the following on the City's website and advertised on the City's social media accounts:

- a fact sheet on air quality and odors and its relationship to public health;
- information on the protocol for filing an odor complaint; and
- information on sludge landfill operations and when the public is likely to experience odors from sludge handling activities; and
- an online survey.

The survey would assist the City in determining if odors are emanating from the sludge landfill (and not other potential contributors of odor in the City). Survey data would be tracked and mapped, help the City gain a better understanding of existing odor concerns, and would inform changes in operational practices and future odor reduction projects pursued by the City.

Finally, the City would continue to explore technologies that reduce odors and the feasibility of their implementation on a continual basis.

# 8. CLIMATE CHANGE

## 8.1 Introduction

As directed by the MEPA Certificate Scope, this chapter assesses the impacts that climate change may have on the Project. Specifically, this chapter provides projected rainfall data for the years beyond 2050 available from the Resilient Massachusetts (ResilientMass) Climate Change Projections Dashboard to discuss the resilience of the Project's stormwater and leachate management system to future climate conditions associated with the 10- year, 25-year, and 50-year storm events. This chapter also explains how the leachate management system is designed to be resilient to a 24-hour rainfall for a 100-year storm event and how such an event compares to the recommended values provided by the ResilientMass Action Team Climate Resilience Design Standards Tool. Finally, this chapter includes an analysis of the landfill's resilience to future climate conditions and describes any potential changes to the design of the final cover and cap or proposed stormwater management system that may be necessary to maintain the long-term integrity of the landfill.

As described in **Chapter 4 "Landfill Design and Construction,"** the lifespan of the Project is anticipated to be approximately 17 years. It is assumed that the Project would be operational by 2028, which would be Operational Year One and would close in 2044, which would be Operational Year 17. Following Operational Year 17, the sludge landfill would be subject to closure/post closure design and requirements for sludge landfills for a post closure period of 30 years (DWPC Wastewater Residuals Guidance Document No. 89-2).[31] Post Closure Year One would occur in 2045, and Post Closure Year 30 would occur in 2074. Key dates relevant to the climate change discussion are the years 2050, 2070, and 2090. To assess the Project's ability to adapt to climate change, the ResilientMass Action Team Climate Resilience Design Standards Tool looks to future climate conditions. These future conditions would occur after the Project had ceased operation and post closure conditions would be present. There would be an opportunity to reassess the landfill's design at closure. Thus, allowing flexibility to adapt to changing climate conditions. The effects of climate change were considered for the year 2050 in Post Closure Year 6, the year 2070 in Post Closure Year 26, and the year 2090, which would be after the post closure period.

## 8.2 Projected Rainfall Data

The ResilientMass Climate Change Projections Dashboard[32] created by the Executive Office of Energy and Environmental Affairs in partnership with Cornell University, USGS, and Tufts University, was used to obtain rainfall projections for climate change for the years 2050, 2070, and 2090. **Table 8-1** below compares those rainfall projections with the National Oceanic and Atmospheric Administration (NOAA) Atlas 14 rainfall data used for the Project's stormwater management design.

[31] https://www.mass.gov/doc/sludge-landfills-closurepost-closure-requirements/download

[32] https://resilientma-mapcenter-mass-eoeea.hub.arcgis.com/#ClimateDashboard

**TABLE 8-1 NOAA ATLAS 14 RAINFALL DATA VS. CLIMATE CHANGE PROJECTIONS (INCHES PER 24-HOURS)**

| Storm Event | NOAA Atlas 14 Data (accessed 2021) | Resilient MA Climate Change Projections* | | |
|---|---|---|---|---|
| | Project Stormwater Design Basis | 2050 | 2070 | 2090 |
| 2-Year | 2.9 | 3.7 | 4.0 | 4.4 |
| 10-Year | 4.5 | 5.6 | 6.0 | 6.7 |
| 25-Year | 5.4 | 6.9 | 7.3 | 8.1 |
| 50-Year | 6.1 | 7.7 | 8.3 | 9.2 |
| 100-Year | 6.9 | 8.7 | 9.3 | 10.3 |
| Percentage Increase from NOAA Atlas 14 Rainfall Projections | | 24-28% | 33-38% | 49-52% |

**Note: Nearest climate model downscale location in the ResilientMass Climate Change Projection dataset is site ID 1446. Median values used. Source:* https://resilientma-mapcenter-mass-eoeea.hub.arcgis.com/#ClimateDashboard. *Accessed September 2024.*

As shown in **Table 8-1** above, rainfall totals during the 2- through 100-year storm events are projected to increase from 24 percent to 52 percent in the 2050 through 2090 future climate periods, which exceeds the current design basis for stormwater management for the Project. However, the current design is for the landfill expansion, whereas at landfill closure in 2044, final cover and capping would require further design that would consider updated climate projection data at that time. Thus, allowing the Project to be adaptable to climate change. Additionally, the landfill closure design would be encouraged to follow the ResilientMass Action Team Climate Resilience Design Standards Tool. The following sections assess stormwater and leachate management systems under future climate conditions.

## 8.3 Stormwater Management System

During the life of the Project, rainwater that falls onto unused cells is considered clean and directed to the stormwater management system, which includes bioretention pond #1 and infiltration basins #1 and #2.

The stormwater controls for the Project must be designed in accordance with 310 CMR 19.115 and the Massachusetts Stormwater Handbook using current rainfall projections. As discussed in **Chapter 6 "Stormwater,"** the proposed stormwater management design meets these required standards.

To understand how the Project's stormwater management system would handle rainfall in the future, the HydroCAD stormwater model for the closed site condition was run using the 2050 and 2090 rainfall projections. The peak discharge rates associated with the design points selected for the HydroCAD stormwater model are summarized in **Table 8-2** below for the current, 2050, and 2090 rainfall projections. The design points were selected to represent the points that clean rainfall drains from the Project Site. Design Points are typically established for each watershed and symbolize an area's ultimate stormwater discharge location. For the Project's hydraulic model, three watershed areas were identified, and therefore three Design Points were chosen. Design Point One represents runoff discharging to the area northwest of the Project Site; Design Point Two represents runoff discharging to the wetlands southwest of the Project Site; and Design Point Three represents runoff discharging to the wetlands south of the existing landfill.

**TABLE 8-2: PEAK DISCHARGE RATE COMPARISON FOR CURRENT, 2050, AND 2090 RAINFALL PROJECTIONS**

| Rainfall Projections | Peak Rate of Runoff (cfs) | | | |
|---|---|---|---|---|
| | 2-Year Storm | 10-Year Storm | 25-Year Storm | 100-Year Storm |
| **Design Point 1** | | | | |
| Current | 0.00 | 0.00 | 0.00 | 0.00 |
| 2050 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2090 | 0.00 | 0.00 | 0.00 | 1.19 |
| **Largest Increase*** | **0.00** | **0.00** | **0.00** | **1.19** |
| **Design Point 2** | | | | |
| Current | 0.00 | 0.00 | 0.00 | 0.00 |
| 2050 | 0.00 | 0.00 | 0.00 | 1.22 |
| 2090 | 0.00 | 0.00 | 0.17 | 1.32 |
| **Largest Increase*** | **0.00** | **0.00** | **0.17** | **1.32** |
| **Design Point 3** | | | | |
| Current | 24.63 | 46.88 | 58.39 | 76.43 |
| 2050 | 37.22 | 60.58 | 76.43 | 98.46 |
| 2090 | 46.03 | 73.99 | 91.11 | 118.03 |
| **Largest Increase*** | **21.40** | **27.11** | **32.72** | **41.60** |

**Note: The largest increase represents the greatest increase between peak rates of runoff for the current rainfall projections vs. either the 2050 or 2090 rainfall projections, whichever yielded higher values.*

As indicated in **Table 8-2** above, the Project's stormwater management system baseline capacity accommodates the current 100-year storm peak rate of runoff, and all future climate projections that are equivalent to or less than the current 100-year storm peak rate (e.g., 2050 25-year storm, 2090 10-year storm). Beyond the baseline capacity of the proposed system, the capacity of the stormwater management systems at Design Point 1 and Design Point 2 are resilient to an emergency overflow weir crest elevation of 1,005.5 feet and 997.50 feet, respectively. Beyond the baseline capacity of the proposed system, the capacity of infiltration basin #2 at Design Point 3 is resilient to the catch basin #3 rim elevation of 983.75; however, is not currently resilient to the emergency overflow weir with an elevation of 993.50. During final design, infiltration basin #2 would be reviewed and revised as necessary to accommodate additional storage volume.

The proposed stormwater management system would be monitored periodically throughout its lifespan and modifications would be made as necessary on an ongoing basis. At landfill closure in 2044, there would be additional opportunity for reevaluation of the entire landfill site's stormwater management system with the design of the final cover and cap. At that time, the most current climate data would be used to design additional resilience into the entire landfill sites' stormwater management system for 2050 and beyond.

The ResilientMass Action Team Climate Resilience Design Standards Tool Dashboard Output is included in **Appendix C**.

## 8.4 Leachate Management System

The Project's leachate management system would include a 15,000-square-foot portion at the southernmost and lowest end of Cell One that would be used as a detention area to which leachate from the remainder of Cell One and Cells Two and Three would be directed. Leachate would be pumped from the Project Site into the existing leachate conveyance system. From there, it would be pumped to a gravity sewer main in West Street where it can flow to the existing WWTF for treatment.

The proposed leachate management system baseline capacity accommodates the current 100-year storm precipitation rate (6.9 inches per 24 hours, (**Table 8-1**), and all future climate projections that are equivalent to or less than the current 100-year storm precipitation rate (e.g., 2050 25-year storm, 2090 10-year storm). The proposed leachate management system would be monitored periodically throughout its lifespan and modifications would be considered as necessary. At landfill closure in 2044, with the design of the final cover and cap, the leachate management system would be reconfigured as rainfall would no longer fall onto active landfill disposal area; however, would still capture leachate from residual moisture already present in the waste and moisture released during the decomposition of organic material. Therefore, as the leachate management system considers the current 100-year storm precipitation rate, and all equivalent future climate projections (2050 25-year storm, 2090 10-year storm), it is concluded that the leachate management system is adequately resilient to future climate conditions.

## 8.5 Climate Adaptation and Resiliency Conclusions

Based on the future climate projection precipitation and peak runoff data, the design of the Project's stormwater and leachate management systems incorporates measures to accommodate climate projections through its approximately 17-year operational life. The proposed design meets the current 100-year 24-hour precipitation and peak runoff rates as well as the projected 25-year storm of 2050, which is beyond the operational life of the landfill. Therefore, the Project has considered climate change impacts through its operational life and is adequately resilient to future climate conditions.

Furthermore, prior to 2050, in 2044, the landfill would be decommissioned, and a final cover and cap would be designed, which affords the opportunity to reassess and upgrade as necessary the landfill's stormwater management system using updated climate projections at that time. As stated above, the stormwater management system would be monitored periodically throughout its lifespan and modifications to ensure its continued operability would be made as necessary. Post closure monitoring would include monitoring for signs of erosion and monitoring of surface and groundwater in accordance with the regulations governing sludge landfills and measures to modify the infrastructure would be done, as necessary.

One of the goals of evaluating the Project under future climate projections is the protection of critical infrastructure and assets, and the location of the Project is sited away from the City's residences, businesses and other critical infrastructure and assets. The Project is resilient to the current 100-year storm and 2050 25-year storm and given the opportunity to re-assess the functionality of the stormwater management system at full closure in 2044, the Project is considered adequately resilient to future climate conditions.

# 9. CONSTRUCTION PERIOD

## 9.1 Introduction

As indicated in the Certificate Scope, this chapter identifies construction-period impacts and outlines proposed mitigation measures related to noise, air quality, water quality, and traffic. This chapter also discloses the number and route of construction vehicles; and describes the management of soil, including on-site stockpiling, off-site disposal, or reuse. A cut and fill analysis, including a plan of the area in which the landfill expansion would be constructed is also included in this chapter. Finally, as discussed below, this chapter confirms that the Project's selected construction Contractor would utilize Ultra Low Sulfur Diesel (ULSD) fuel and discusses the use of after-engine emission controls.

As described in **Chapter 4, "Landfill Design and Construction,"** with the Project, the City would expand its existing sludge landfill operations into the Project Site, within which three new contiguous sludge disposal cells (Cells 1, 2, and 3) would be constructed. The Project Site would alter 8.75 acres of land area adjacent to the existing and active sludge landfill boundary. This 8.75-acre area would include the proposed groundwater protection system (GWPS) and disposal area, new leachate pumping system, force main, 12-foot-wide perimeter gravel access road, and a stormwater management system consisting of a perimeter swale, bioretention area at the north end of the site, and infiltration basins to the west and south. Landfill cells within the Project Site would provide 276,500 cubic yards of new sludge disposal capacity. Existing facilities at the existing sludge landfill-including maintenance buildings, utilities (leachate collection system, pump station, and force main), retention basins and run-off controls, access roads, borrow pit, gas venting system, equipment garage, and equipment would continue to be used.

Following Project construction, sludge landfill operations in the expansion area would begin following the end of the operational phase of the existing sludge landfill, which is anticipated to reach capacity between 2027-2030. Thus, landfilling operations at the Project Site would be expected to occur between approximately 2028 and 2044.

The construction and operation of the Project is described in **Sections 4.3** and **4.4** of **Chapter 4, "Landfill Design and Construction."**

## 9.2 Construction Period Impacts

The Project Site is located in a sparsely populated area and away from potential sensitive receptors. Therefore, the construction period effects would be minimal to unnoticeable. Temporary impacts that have the potential to occur during construction include:

- Noise associated with equipment used during construction;
- Air quality impacts associated with the operation of construction equipment and with material handling activities;
- Water quality impacts associated with erosion and sedimentation from material handling activities; and
- Traffic associated with equipment delivery and construction workers.

Each of these potential temporary construction period impacts is discussed in further detail below.

### 9.2.1 Noise

Increased noise levels are an inherent consequence of construction-related activities. Construction noise impacts would be temporary and occur intermittently over the estimated 18-month construction period. Construction noise can be expected to be noticeable at the nearest sensitive receptors (Wildwood Cemetery, St. Johns Cemetery, Notre Dame Cemetery, and Cummings Conservation Area) but would be imperceptible at the nearest residential property, which is approximately 0.5 miles away from the Project Site. Given the Project's remote location surrounded by forest, construction noise is expected to be dampened by intervening topography and the surrounding vegetation. Construction activities would comply with the all-applicable noise ordinance requirements and every reasonable effort would be made to minimize the noise-related effects of construction activities. Measures to minimize noise effects would include:

- Using appropriate mufflers on all equipment and ongoing maintenance of intake and exhaust mufflers;
- Muffling enclosures on continuously running equipment;
- Replacing specific construction operations and techniques with less noise-producing ones, where feasible;
- Selecting the quietest of alternative items of equipment, where feasible;
- Scheduling equipment operations to keep average noise levels low, to synchronize the noisiest operations with times of highest ambient levels, and to maintain relatively uniform noise levels; and
- Turning off idling equipment.

### 9.2.2 Air Quality

Short-term air quality impacts from fugitive dust may be expected during certain construction activities. Plans for controlling fugitive dust during site clearing, excavation, and construction include mechanical street sweeping, wetting portions of the Project Site during periods of high wind, and careful removal of debris by covered trucks. The construction contract would provide for a number of measures to be used by the selected Contractor to reduce potential emissions and minimize impacts. These measures are expected to include:

- Using wetting agents on areas of exposed soil on a scheduled basis;
- Using covered trucks;
- Using stone aprons to clean the tires of construction vehicles entering and exiting the

Project Site;

- Minimizing spills on the construction site;
- Monitoring of construction practices to reduce unnecessary transfers;
- Minimizing mechanical disturbances of loose materials;
- Minimizing storage of debris on the construction site; and
- Periodic street and sidewalk cleaning with water to minimize dust accumulations.

The Contractor would proactively implement the above measures to minimize air quality impacts during construction.

#### 9.2.2.1 Dust Control

Any area of soil at the Project Site that is disturbed or otherwise affected during construction work shall be consistently maintained to minimize the creation and dispersion of dust. These areas may include but are not necessarily limited to active excavation areas, haul roads, active soil stockpiles and loading areas, entrances and exits to the Project Site, and adjacent public roadways. Dust and odors shall be controlled from activities including but not limited to excavation, soil loading, and vehicle traffic.

To prevent the tracking of Project Site soil into the public roadways, a stabilized construction entrance with stone aprons shall be established, such that the tires of each vehicle exiting the Project Site are free of soil and dust that could be tracked into the street or otherwise mobilized. All truck tires and equipment would be cleaned as necessary prior to leaving the Project Site. If necessary, additional measures such as a tire wash area may be necessary to achieve the performance objectives of this section. In addition, regular street sweeping shall be conducted to clean the roadways adjacent to the Project Site where fugitive soil or dust may become located.

The performance objectives for dust control would be to control dust that is measured at greater than 0.150 $mg/m^3$ above background levels at the Project Site perimeter. Alternatively, an action level would be triggered if visible dust is documented by the contracted Environmental Professional, or a community complaint is received.

As described above, the Contractor shall follow best management practices and would use standard dust-suppression methods (e.g. water misting, commercial dust suppressants) to control dust during active work or to remedy a failure of the performance objectives.

#### 9.2.2.2 Control of Equipment Emissions

Furthermore, construction equipment is subject to air emissions regulations. Standards for diesel powered heavy equipment used during construction are established by Federal Regulations 40 Code of Federal Regulations (CFR) PART 1039—Control of Emissions from New and In-use Nonroad Compression-ignition Engines. With the progression of regulations, the EPA established a Tiered emissions standard for non-road diesel engines, which was phased in between 1998 and 2012. The control of emissions from engines also involved the introduction and use of ULSD fuel, with ULSD becoming the only diesel fuel available since approximately 2010. The Project would comply with these regulations.

### 9.2.3 Water Quality

#### 9.2.3.1 Stormwater

As discussed in **Chapter 6"Stormwater,"** the Project avoids direct impacts to vernal pools and wetlands. Impacts to state 100-foot wetland and vernal pool buffers are avoided to the maximum practicable extent; however, the Project limit of disturbance intersects the wetland buffer area in one location and approximately 100 linear feet of wetland buffer would be impacted. A Notice of Intent for project impacts within a buffer zone was filed with MassDEP. MassDEP issued an Order of Conditions for the Project activity with specifications and conditions for construction within the 100-foot Wetland Resource Area Buffer Zone.

The Project would comply with the specifications and conditions for construction set forth in the Order of Conditions.

#### 9.2.3.2 Stormwater Pollution Prevention Plan

As the Project exceeds one acre of total disturbance, a Stormwater Pollution Prevention Plan (SWPPP) would be prepared in accordance with an EPA National Pollutant Discharge Elimination System (NPDES) Construction General Permit. The SWPPP would be submitted at the time of filing, before land disturbance begins, and would outline the necessary measures to meet the requirements of Standard 8 of the Massachusetts Stormwater Handbook. The SWPPP would detail the measures to be incorporated to prevent stormwater contamination, control sedimentation and erosion, and maintain compliance with the Clean Water Act. The SWPPP would also contain erosion and sediment controls specific to the project activities and detailed in a supplemental Erosion and Sediment Control Plan. Inspection and maintenance procedures for the Project's stormwater management infrastructure would also be included in the SWPPP, including maintenance logs, forms, and additional erosion and sediment control measures.

Pursuant to 40 CFR 450.21, the EPA establishes minimum NPDES effluent limitations. The City and its selected Contractor would comply with these requirements, which include:

- Design, install, and maintain effective erosion and sediment controls, and pollution prevention measures, to minimize the discharge of pollutants;
- Stabilize disturbed areas immediately when construction has ceased and would not resume for more than 14 days;
- Prohibit the dewatering discharges unless managed by appropriate controls;
- Prohibit the discharge of:
    - Wastewater from concrete washout (unless managed by appropriate control), or washout/cleanout of stucco, paint, form release oils, other wastewater materials;
    - Fuels, oils, or other pollutants used for vehicles; and
    - Soaps or solvents to wash vehicles and equipment.

Erosion and sediment controls would be installed by the selected Contractor as required by and shown on the final design drawings to prevent erosion, sedimentation, and the discharge of other pollutants during construction and other land disturbing activities. These measures would be maintained and kept in place until the disturbed areas of the Project Site have fully stabilized.

### 9.2.4 Traffic

The Project does not involve work in City streets and would not require any temporary lane closures. Therefore, no temporary roadway disruptions are anticipated with the Project.

Construction traffic is anticipated to utilize West Street (State Route 68) to access the Project Site. The Project would generate vehicle trips associated with workers traveling to and from the construction site. The average number of construction workers per day would vary depending on the stage of construction but is generally expected to be as follows:

- Mobilization is expected to average approximately 5-10 workers;

- Grading is expected to average approximately 10-20 workers;
- Construction of the access Road is expected to average approximately 5-10 workers;
- Installation of stormwater infrastructure is expected to average approximately 5-10 workers;
- Construction of disposal area is expected to average approximately 20-30 workers; and
- Construction of leachate pumping system and conveyance is expected to average approximately 5-10 workers.

Based on a typical construction workday, the majority of construction workers travel to and from work during off-peak periods (i.e., during the early morning hours between 6:00 AM and 7:00 AM and the mid-afternoon between 3:00 PM and 4:00 PM) and therefore do not impact traffic conditions during the standard peak vehicular travel hours, which in the City of Gardner are from 8:00 AM to 10:00 AM and 5:00 PM to 7:00 PM. In addition, this vehicle traffic added to the street network during construction would be temporary (occurring intermittently over a period of 22 months).

Project-related construction truck trips, including the delivery and removal of soil, construction materials, and equipment are typically distributed throughout the workday and generally arrive and depart the work site between the hours of 7:30 AM and 3:30 PM. Based on the City of Gardner experiences with similarly sized capital projects, it is estimated that the following truck trips would be generated during the following major stages of Project construction:

- Mobilization, an average of 2 to 3 trucks per day;
- Grading, construction of the access road, installation of the stormwater infrastructure, construction of the disposal area, and construction of the leachate and conveyance system, an average of 20 to 30 trucks per day;
- Final finishes, an average of approximately 5 to 10 truck trips per day.

Based on this truck trip generation, it is expected that over the course of a workday, only a limited number of these truck trips would travel to or from the construction site during the standard peak vehicular hours (e.g., 8:00 AM to 10:00 AM). This project-generated construction truck traffic may also temporarily affect the local street network.

It is expected that construction of the Project would generate up to an estimated average of 15 workers and 26 truck deliveries per day.

As described above, most construction activities take place from 7:30 AM and 3:30 PM. While construction truck trips are dispersed throughout the day (with more trips during the morning), and most trucks would remain in the area for short durations, most construction workers would commute during the hours before and after the work shift. For analysis purposes, each truck delivery was assumed to result in two truck trips during the same hour (one "in" and one "out"), whereas each worker vehicle was assumed to arrive near the work shift start hour and depart near the work-shift end hour. Further, it was assumed that each truck has a passenger car equivalent of two.

The estimated daily vehicle trips were distributed throughout the workday based on likely arrival/departure patterns for construction workers and trucks. For construction workers, the majority (approximately 80 percent) of the arrival and departure trips are expected during the hour before and after each work shift (6:00 to 7:00 AM for arrival and 3:00 to 4:00 PM for departure on a regular day shift). Construction truck

deliveries into the construction site typically peak during the hour (6:00 to 7:00 AM) before each shift (25 percent), overlapping with construction worker arrival traffic; construction truck deliveries departing the construction site typically peak during the hour after the work shift has started (7:00 to 8:00 AM) since on-site activities do not commence until 7:00 AM.

**Table 9-1** presents the hourly trip projections for the peak construction period. As shown in **Table 9-1**, the maximum construction-related traffic increments would be approximately 48 Passenger Car Equivalents between 6:00 AM and 7:00 AM and 28 Passenger Car Equivalents between 3:00 PM and 4:00 PM. These maximum construction-related traffic increments would not materially affect traffic in the City of Gardner and the Project is not expected to result in any significant adverse traffic impacts during construction.

**TABLE 9-1: PEAK CONSTRUCTION VEHICLE TRIP PROJECTIONS**

| Hour | Passenger Vehicle Trips | | | Truck Trips | | | Total | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Vehicle Trips | | | Passenger Car Equivalent Trips | | |
| | In | Out | Total | In | Out | Total | In | Out | Total | In | Out | Total |
| **6AM-7AM** | **12** | **0** | **12** | **6** | **6** | **12** | **18** | **6** | **24** | **36** | **12** | **48** |
| 7AM-8AM | 3 | 0 | 3 | 4 | 4 | 8 | 7 | 4 | 11 | 14 | 8 | 22 |
| 8AM-9AM | 0 | 0 | 0 | 3 | 3 | 6 | 3 | 3 | 6 | 6 | 6 | 12 |
| 9AM-10AM | 0 | 0 | 0 | 3 | 3 | 6 | 3 | 3 | 6 | 6 | 6 | 12 |
| 10AM-11AM | 0 | 0 | 0 | 2 | 2 | 4 | 2 | 2 | 4 | 4 | 4 | 8 |
| 11AM-12PM | 0 | 0 | 0 | 2 | 2 | 4 | 2 | 2 | 4 | 4 | 4 | 8 |
| 12PM-1PM | 0 | 0 | 0 | 2 | 2 | 4 | 2 | 2 | 4 | 4 | 4 | 8 |
| 1PM-2PM | 0 | 0 | 0 | 2 | 2 | 4 | 2 | 2 | 4 | 4 | 4 | 8 |
| 2PM-3PM | 0 | 0 | 0 | 1 | 1 | 2 | 1 | 1 | 2 | 2 | 2 | 4 |
| **3PM-4PM** | **0** | **12** | **12** | **1** | **1** | **2** | **1** | **13** | **14** | **2** | **26** | **28** |
| 4PM-5PM | 0 | 3 | 3 | 0 | 0 | 0 | 0 | 3 | 3 | 0 | 6 | 6 |
| Daily Total | 15 | 15 | 30 | 26 | 26 | 52 | 41 | 41 | 82 | 82 | 82 | 164 |

Because the project would take place within a large site (Project Area), it would not effect on-street parking during construction. Therefore, the Project would not result in potential significant adverse parking impacts during construction. There are no transit facilities near the Project Site that would be affected during construction. Based on the analysis above, the Project would not result in potential significant adverse

transit impacts during construction. The Project would have no impact on pedestrian facilities and circulation outside the boundaries of the Project Area. Therefore, it is concluded that the Project would not result in any pedestrian impacts during construction.

Although specific construction and staging details have not been finalized, the City and its selected Contractor would work to ensure that staging areas would be located to minimize impacts to the operation of West Street, the City's Transfer Station, Wildwood Cemetery, and operations at the existing sludge landfill. The delivery of heavy equipment would be scheduled in coordination with the City, with off-peak delivery times scheduled, on an as needed basis.

## 9.3 Cut and Fill Analysis

As shown on **Figure 9-1**, the Project Site elevations (identified by color in 5-foot increments) were used to quantify the amount of soil that would need to be removed to facilitate the Project. The cut and fill analysis estimated that approximately 46,500 cubic yards of soil would be transported during construction. Of that number, approximately 27,000 cubic yards are expected to be recycled and used as fill. There would be approximately 19,500 cubic yards of soil left to be exported from the Project Site, and it would be up to the selected Contractor to determine where the soil would be transported. Of the construction truck trips analyzed above, approximately 10 of those trucks would be used for soil transport (approximately one-third of the daily construction truck deliveries). In addition, approximately 6,900 cubic yards of clay and 2,100 cubic yards of woodchips would be imported and used during construction. Of the construction truck trips analyzed above, approximately two would be used for clay and one for woodchips for the daily construction truck deliveries.

## 9.4 Soil and Stockpile Management

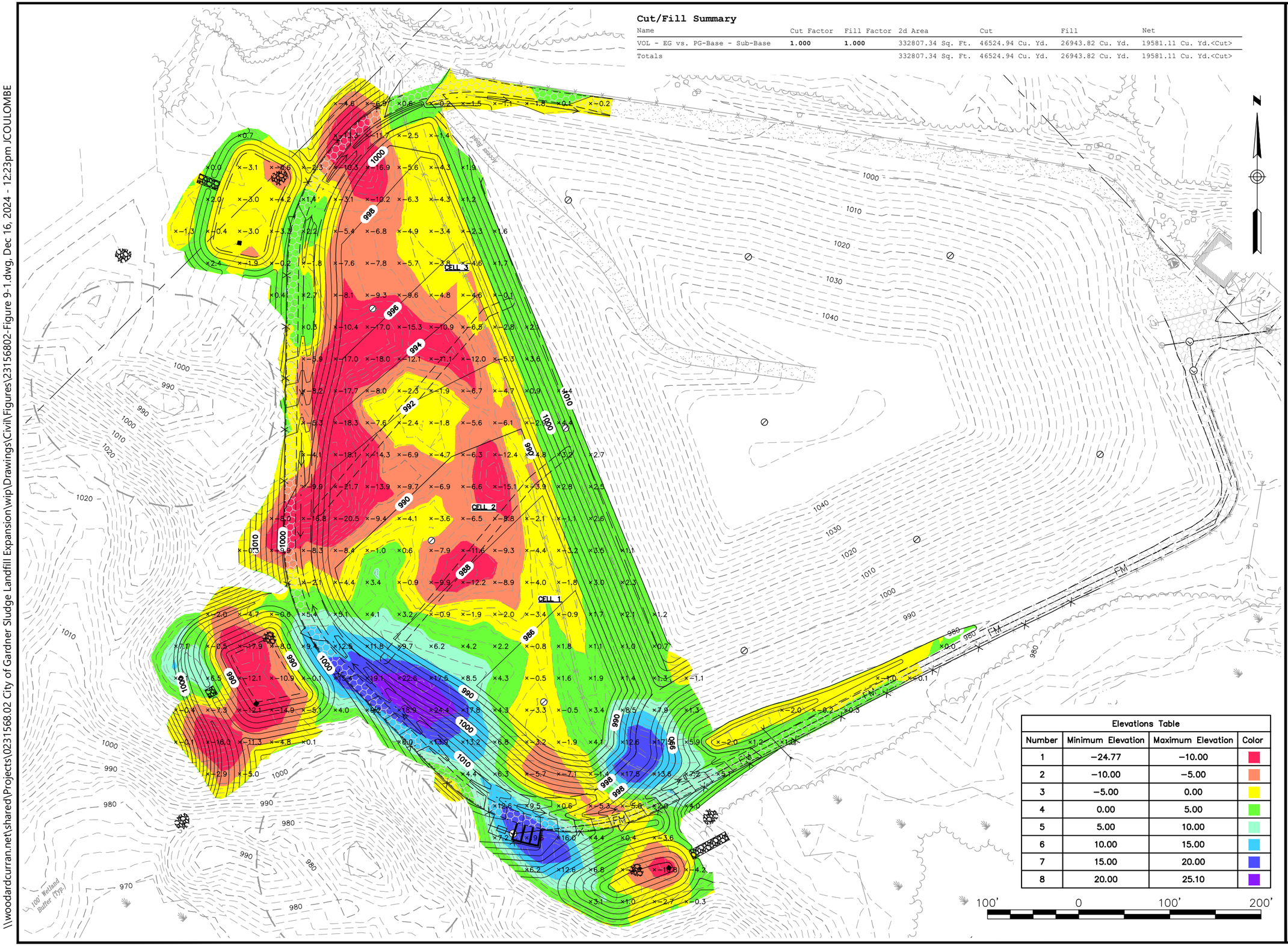
Soils generated during construction would be managed in stockpiles or directly loaded into trucks. The soil material would be transported in triaxle trucks or dump trailers with load covers. All excavated soil that cannot be reused on site shall be stockpiled or placed directly in covered state-approved trucks. Erosion control measures shall be employed to prevent the offsite runoff of stockpiled soil.

## 9.5 Erosion Control

Erosion and sedimentation controls and dust control measures would be implemented for all stockpiles. Erosion control measures shall be employed, as required by the Order of Conditions and as outlined in the SWPPP, to prevent the offsite runoff of soil from the Project Site and stockpiles. Erosion control measures may include straw roll/wattle, silt fence, plastic membrane, the covering of storm drain catch basins, or other suitable measures, provided that stockpile and offsite soil runoff is effectively prevented for the duration of the work or the time that the stockpile is present. Perimeter erosion controls that surround the entire area of work at the Project Site are acceptable for stockpile control.

**Cut/Fill Summary**

| Name | Cut Factor | Fill Factor | 2d Area | Cut | Fill | Net |
|---|---|---|---|---|---|---|
| VOL - EG vs. PG-Base - Sub-Base | **1.000** | **1.000** | 332807.34 Sq. Ft. | 46524.94 Cu. Yd. | 26943.82 Cu. Yd. | 19581.11 Cu. Yd.<Cut> |
| Totals | | | 332807.34 Sq. Ft. | 46524.94 Cu. Yd. | 26943.82 Cu. Yd. | 19581.11 Cu. Yd.<Cut> |




| Elevations Table | | | |
|---|---|---|---|
| Number | Minimum Elevation | Maximum Elevation | Color |
| 1 | −24.77 | −10.00 | |
| 2 | −10.00 | −5.00 | |
| 3 | −5.00 | 0.00 | |
| 4 | 0.00 | 5.00 | |
| 5 | 5.00 | 10.00 | |
| 6 | 10.00 | 15.00 | |
| 7 | 15.00 | 20.00 | |
| 8 | 20.00 | 25.10 | |

100’ 0 100’ 200’

**Woodard & Curran**

40 Shattuck Road, Suite 110
Andover, Massachusetts 01810
866.702.6371 | www.woodardcurran.com



PE SEAL:

**NOT FOR CONSTRUCTION**

CLIENT INFO:

CITY OF GARDNER, MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS

GARDNER SLUDGE LANDFILL EXPANSION

| | |
|---|---|
| JOB NO: | 231568.02 |
| DATE: | OCTOBER 2024 |
| SCALE: | AS NOTED |
| DESIGNED BY: | MG |
| DRAWN BY: | JBC |
| CHECKED BY: | MG |
| FILENAME: | 23156802-FIGURE 9-*.dwg |

DRAWING TITLE:

**CIVIL**
**CUT/FILL ANALYSIS**
**EXISTING GROUND**
**VS.**
**SUBBASE OF LINER**

DRAWING NO:

**FIGURE 9-1**

## 9.6 Impact Summary

As stated above, the overall duration of project construction is estimated to be approximately 22 months. The noise, air, water, and traffic impacts described above would be temporary and would progress in stages. Therefore, with the above measures in place, no significant adverse construction impacts are anticipated with the Project.

# 10. MITIGATION AND DRAFT SECTION 61 FINDINGS

As directed by the MEPA Certificate Scope and in accordance with MEPA Regulation 301 CMR 11.07(6)(j), this chapter includes the proposed mitigation measures, including both construction-period and operational measures. This represents a comprehensive list of commitments made by the Proponent to avoid, minimize, and mitigate the environmental and related public health impacts of the Project. In addition, commitments related to the City's state-designated Environmental Justice populations are also provided herein. The parties responsible for implementation, and a schedule for implementation of the measures and, where applicable, individual costs of each proposed measure have also been identified to ensure adequate measures are in place to mitigate the impacts associated with each development phase. Finally, this chapter includes Draft Section 61 Findings for each Agency action taken on the Project.

## 10.1 Mitigation Measures

**Table 10-1** describes the measures to be implemented to mitigate the impacts of the Project related to the required state permits, the schedule for implementation, and associated costs. The City of Gardner is the party responsible for implementation and commits to implementing these mitigation measures.

**TABLE 10-1: MITIGATION MEASURES**

| Environmental / Public Health Impact | Mitigation Measure | Responsible Party for Implementation | Schedule for Implementation | Cost |
|---|---|---|---|---|
| **Landfill Design and Construction** | | | | |
| | Replace 10-foot overlap with a hydraulic separation liner. | City of Gardner (Woodard & Curran, Inc.-Final Design) | Incorporated into Final Design | Included in Project design estimate. |
| **Groundwater** | | | | |
| | To ensure the protection of groundwater resources, two additional monitoring wells are proposed to be installed. An additional monitoring well, designated SL-4, would be installed upgradient of the landfill near the north entrance road at the southern edge of the solar field that would exhibit background groundwater characteristics; and an additional downgradient monitoring location (CDR-5) is proposed to be installed after the Project is constructed to assist with evaluating potential effects on groundwater from the Project. To further protect groundwater resources, environmental monitoring and reporting would include these two additional monitoring wells. | City of Gardner (Woodard & Curran, Inc. – Final Design; selected Contractor – Construction; Veolia, Inc. – Landfill Operator) | Monitoring wells would be implemented during construction and would be incorporated into the groundwater monitoring program once the Project is operational (anticipated in 2028) | Included in Project construction estimate. Would result in a modest increase to operational cost |
| **Stormwater** | | | | |
| | The Project's stormwater system has been designed to comply with applicable regulatory design standards, including compliance with the MassDEP Stormwater Management Standards, and future increases in precipitation based on climate conditions up to the Project's design life. Therefore, no mitigation measures are proposed. | N/A | During construction | Included in Project construction estimate. |
| | The Project would comply with MassDEP issued Order of Conditions for the protection of Wetland Resource Area Buffer Zone. | City of Gardner | Implemented prior to and during construction activities. | Included in Project construction estimate. |

| Environmental / Public Health Impact | Mitigation Measure | Responsible Party for Implementation | Schedule for Implementation | Cost |
|---|---|---|---|---|
| **Air Quality** | | | | |
| | To mitigate odors associated with the existing landfill, the Project would implement an interim cover and cap portions of the existing landfill no longer receiving sludge (projected to occur in 2028 based on remaining volume). | City of Gardner | Implemented post-initial construction after the existing landfill has reached capacity (projected for 2028 based on remaining volume) | ~$2.9 million |
| | A new detailed complaint form would be implemented to ensure consistency of information being collected and investigated to be included in future Annual Operations Reports. Information such as weather conditions, temperature, wind speed from a consistent source (i.e., weather.com), the date and time odor was experienced and for how long, would be collected. Detailed investigative measures, corrective action taken, and any relevant correspondence would be appended. | City of Gardner | Implemented during Project operational period. | ~$5,000 |
| | A fact sheet on air quality and odors and its relationship to public health; information on the protocol for filing an odor complaint; information on sludge landfill operations and when the public is likely to experience odors from sludge handling activities; and an online survey would be posted to the City website and advertised on the City's social media accounts. The survey would assist the City in determining if odors are emanating from the sludge landfill (and not other potential contributors of odor in the City). Survey data would be tracked and mapped to help the City gain a better understanding of existing odor concerns and would inform changes in operational practices and future odor reduction projects pursued by the City. The City would continue to explore technologies that reduce odors and the feasibility of their implementation on a continual basis. | City of Gardner | Implemented during Final Environmental Impact Report (FEIR)/MassDEP Permitting | ~$5,000-$10,000 |

| Environmental / Public Health Impact | Mitigation Measure | Responsible Party for Implementation | Schedule for Implementation | Cost |
|---|---|---|---|---|
| **Climate Change** | | | | |
| | The Project's stormwater system has been designed to comply with applicable regulatory design standards, including compliance with the MassDEP Stormwater Management Standards, and future increases in precipitation based on climate conditions up to the Project's design life. Therefore, no mitigation measures are proposed. | N/A | During construction | Included in Project construction estimate. |
| **Construction Period** | | | | |
| **Noise** | The following measures would be implemented to control noise:<br>• Using appropriate mufflers on all equipment and ongoing maintenance of intake and exhaust mufflers;<br>• Muffling enclosures on continuously running equipment;<br>• Replacing specific construction operations and techniques with less noise-producing ones, where feasible;<br>• Selecting the quietest of alternative items of equipment, where feasible;<br>• Scheduling equipment operations to keep average noise levels low, to synchronize the noisiest operations with times of highest ambient levels, and to maintain relatively uniform noise levels; and<br>• Turning off idling equipment. | City of Gardner (implemented by selected Contractor) | During Construction (anticipated to commence in 2026 and be completed by 2028) | Costs included in construction cost estimate for Project |
| **Air Quality** | The following measures would be implemented to minimize dust:<br>• Using wetting agents on areas of exposed soil on a scheduled basis;<br>• Using covered trucks;<br>• Using stone aprons to clean the tires of construction vehicles entering and exiting the Project Site;<br>• Minimizing spills on the construction site;<br>• Monitoring of construction practices to reduce unnecessary transfers; | | | |

| Environmental / Public Health Impact | Mitigation Measure | Responsible Party for Implementation | Schedule for Implementation | Cost |
|---|---|---|---|---|
| | • Minimizing mechanical disturbances of loose materials;<br>• Minimizing storage of debris on the construction site; and<br>• Periodic street and sidewalk cleaning with water to minimize dust accumulations.<br><br>To prevent the tracking of Project Site soil into the public roadways, a stabilized construction entrance shall be established, such that the tires of each vehicle exiting the Project Site are free of soil and dust that could be tracked into the street or otherwise mobilized. All truck tires and equipment would be cleaned as necessary prior to leaving the Project Site. If necessary, additional measures such as a tire wash area may be necessary to achieve the performance objectives of this section. | | | |
| **Water Quality** | To protect water quality, the Project would comply with the specifications and conditions set for in the Order of Conditions.<br><br>A SWPPP would be prepared in accordance with EPA NPDES Construction General Permit. Pursuant to 40 CFR 450.21, the EPA establishes minimum NPDES effluent limitations. The City and its selected Contractor would comply with these requirements, which include:<br><br>• Design, install, and maintain effective erosion and sediment controls, and pollution prevention measures, to minimize the discharge of pollutants;<br><br>• Stabilize disturbed areas immediately when construction has ceased and would not resume for more than 14 days;<br><br>• Prohibit the dewatering discharges unless managed by appropriate controls;<br><br>• Prohibit the discharge of: | | | |

| Environmental / Public Health Impact | Mitigation Measure | Responsible Party for Implementation | Schedule for Implementation | Cost |
|---|---|---|---|---|
| | ○ Wastewater from concrete washout (unless managed by appropriate control), or washout/cleanout of stucco, paint, form release oils, other wastewater materials;<br>○ Fuels, oils, or other pollutants used for vehicles; and<br>○ Soaps or solvents to wash vehicles and equipment.<br><br>Erosion and sediment controls would be installed by the selected Contractor as required by and shown on the final design drawings to prevent erosion, sedimentation, and the discharge of other pollutants during construction and other land disturbing activities. These measures would be maintained and kept in place until the disturbed areas of the Project Site have fully stabilized. | | | |
| **Air Quality** | | | | |
| | To mitigate odors associated with the existing landfill, the Project would implement an interim cover and cap portions of the existing landfill no longer receiving sludge (projected to occur in 2028 based on remaining volume). | City of Gardner | Implemented post-initial construction after the existing landfill has reached capacity (projected for 2028 based on remaining volume) | ~$2.9 million |
| | A new detailed complaint form would be implemented to ensure consistency of information being collected and investigated to be included in future Annual Operations Reports. Information such as weather conditions, temperature, wind speed from a consistent source (i.e., weather.com), the date and time odor was experienced and for how long, would be collected. Detailed investigative measures, corrective action taken, and any relevant correspondence would be appended. | City of Gardner | Implemented during Project operational period. | ~$5,000 |
| | A fact sheet on air quality and odors and its relationship to public health; information on the protocol for filing an odor | City of Gardner | Implemented during Final Environmental Impact | ~$5,000-$10,000 |

| Environmental / Public Health Impact | Mitigation Measure | Responsible Party for Implementation | Schedule for Implementation | Cost |
|---|---|---|---|---|
| | complaint; information on sludge landfill operations and when the public is likely to experience odors from sludge handling activities; and an online survey would be posted to the City website and advertised on the City's social media accounts. The survey would assist the City in determining if odors are emanating from the sludge landfill (and not other potential contributors of odor in the City). Survey data would be tracked and mapped to help the City gain a better understanding of existing odor concerns and would inform changes in operational practices and future odor reduction projects pursued by the City. The City would continue to explore technologies that reduce odors and the feasibility of their implementation on a continual basis. | | Report (FEIR)/ MassDEP Permitting | |

## 10.2 Draft Section 61 Findings

This section includes draft Section 61 Findings for State Agencies as well as a summary discussion of mitigation commitments.

In accordance with M.G.L. c. 30, Section 61 and 301 CMR 11.12(5), any State Agency that takes Action on a project for which the Secretary required an EIR shall determine whether the project is likely, directly, or indirectly, to cause Damage to the Environment and shall make a finding describing the Damage to the Environment and confirming that all feasible measures have been taken to avoid or minimize the Damage to the Environment.

*Contents of Section 61 Findings (301 CMR 11.12(5)(a)):* In all cases, the Agency shall base its Section 61 Findings on the EIR and shall specify in detail: all feasible measures to be taken by the Company or any other Agency or Person to avoid Damage to the Environment or, to the extent that Damage to the Environment cannot be avoided, to minimize and mitigate Damage to the Environment to the maximum extent practicable; an Agency or Person responsible for funding and implementing mitigation measures, if not the Company; and the anticipated implementation schedule that will ensure that mitigation measures shall be implemented prior to or when appropriate in relation to environmental impacts.

*Section 61 Findings and Agency Action (301 CMR 11.12(5)(b):* Provided that mitigation measures are specified as conditions to or restrictions on the Agency Action, the Agency shall:

1. Make its Section 61 Findings part of the Permit, contract, or other document allowing or approving the Agency Action, which may include additional conditions to or restrictions on the Project in accordance with other applicable statutes and regulations; or
2. Refer in its Section 61 Findings to applicable sections of the relevant Permit, contract, or other document approving or allowing the Agency Action.

*Subject Matter Jurisdiction Limitations (301 CMR 11.12(5)(c)):* In the case of a Project undertaken by a person that requires state permits or land transfers, but no funding, the Scope of any EIR is limited to those aspects of the project that are within the subject matter of the permit(s) or within the area subject to a land transfer that are likely, directly, or indirectly, to cause damage to the environment. Any Participating Agency shall limit its Section 61 Findings, or any mitigation measures specified as conditions to or restrictions on the Agency Action, to those aspects of the Project that are within the subject matter of any required Permit or within the area subject to a Land Transfer. In the words of the MEPA statute (M.G.L. c. 30, sec. 62A), "[a]ny finding required by section sixty-one shall be limited to those matters which are within the scope of the environmental impact report, if any, required by this section."

State Agencies that will be required to make Section 61 Findings for the Project prior to issuing permits for, funding, or otherwise implementing the Project include or may include the Agencies identified in **Section 1.4.** Depending on agency procedures, as described above, the various Section 61 Findings may be part of permits or agency actions or may be stand-alone documents.

The Proposed Section 61 Findings below and the subsequent sections contain commitments the Proponent has made as a basis for respective agency Section 61 Findings. See also the Summary of Impacts and Mitigation Measures, **Table 10-1**.

## 10.3 Draft Section 61 Findings – MassDEP

| | |
|---|---|
| Project Name: | Gardner Sludge Landfill Expansion |
| Project Location: | 808 West Street, Gardner, Massachusetts |
| Project Proponent: | City of Gardner |
| EEA Number: | 16643 |

Date Environmental Notification Form Noticed in Monitor: December 23, 2022

The potential environmental impacts of the Project have been characterized and quantified in the Environmental Notification Form dated December 9, 2022, the Draft EIR dated [**DATE**], and the final EIR, dated [**DATE**], which are incorporated by reference into this Section 61 Finding. Throughout the planning and environmental review process, the Proponent has been working to develop measures to mitigate significant impacts of the Project. With the mitigation proposed and carried out in cooperation with state agencies, the City of Gardner finds that there are no significant unmitigated impacts.

The Proponent recognizes that the identification of effective mitigation, and implementation of that mitigation throughout the life of the Project, is central to its responsibilities under the MEPA. The Proponent has accordingly prepared the attached Table of Impacts and Mitigation Measures that specifies, for each potential state permit category, the mitigation that the Proponent will provide.

As this Project is currently described, the following permits will be required from the Department:

- WP33 – Approval of Wastewater Treatment Residual Landfills;

Based upon its review of the MEPA documents, the request for authorization submitted to date, and the Department's regulations, the Department finds that the terms and conditions to be incorporated into the authorization required for this Project will constitute all feasible measures to avoid damage to the environment, including consideration of the potential effects of climate change, and will minimize and mitigate such damage to the maximum extent practicable for those impacts subject to the Department's authority (see the appended Mitigation Table). Implementation of the mitigation measures will occur in accordance with the terms and conditions set forth in the authorization.

_____
Department of Environmental Protection

_____
By

_____
[Date]

# 11. RESPONSE TO COMMENTS

## 11.1 MEPA Certificate and Associated Comment Letters

This chapter responds to comment letters received from government agencies, private organizations, and members of the public on the Environmental Notification Form submitted on December 12, 2022. Each letter has been assigned an abbreviation; the Massachusetts Environmental Policy Act (MEPA) Certificate and related comment letters are listed below in **Table 11-1**. The comment letters are reprinted in this section followed by a chapter identifier in parentheses (e.g., "Project Description" or "Groundwater"), and specific comments within each letter are noted in the margin with an abbreviation and a sequential numbering. Following the letter is a listing of the comments accompanied by a response to each.

**TABLE 11-1**
**SECRETARY'S CERTIFICATE AND COMMENT LETTERS**

| Commenter | Abbreviation |
|---|---|
| Certificate of the Secretary of Energy and Environmental Affairs | MEPA |
| Robert Chicoine (first letter) | CHI1 |
| David K. Peabody | PEA |
| Town of Templeton Select Board | TEM |
| Josh Forgues | FOR |
| Jeffrey W. Lore | LOR |
| Cheryl Alvarez | ALV |
| Taylor Sala | SAL |
| Kelsey Coates | COA |
| David Antaya | ANT |
| David Legere (first letter) | LEG1 |
| David Legere (second letter) | LEG2 |
| Robert Chicoine (second letter) | CHI2 |
| Millers River Watershed Council, Inc. | MRW |
| Mike Wilczynski | WIL |
| Jennifer M. Albertine | ALB |
| Gardner Clean Air | GCA |
| Mary E. Marsh | MAR |
| Theresa Griffis | GRI |
| Thomas B. Esposito | ESP |

| Table 11-1 (Continued)<br>Secretary's Certificate and Comment Letters | |
|---|---|
| **Commenter** | **Abbreviation** |
| Anonymous1 | ANO1 |
| Connecticut River Conservancy | CRC |
| Jo-Anne Burdin | BUR |
| Ivan Ussach (first letter) | USS1 |
| Ivan Ussach (second letter) | USS2 |
| Anonymous2 | ANO2 |
| Anonymous3 | ANO3 |
| Erin Kiewel | KIE |
| Hugh Jardon | JAR |
| Massachusetts Department of Environmental Protection: Boston and Central Regional Office | MassDEP |
| Paul Demeo | DEM |
| Rice Flanders | FLA |
| Tim Gurczak | GUR |
| Victoria Heidorn | HEI |
| Denise Trabbic-Pointer, MS, CHMM Emeritus | POI |

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February 10, 2023

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
ENVIRONMENTAL NOTIFICATION FORM

| | |
|---|---|
| PROJECT NAME | : Gardner Sludge Landfill Expansion |
| PROJECT MUNICIPALITY | : Gardner |
| PROJECT WATERSHED | : Millers River |
| EEA NUMBER | : 16643 |
| PROJECT PROPONENT | : City of Gardner |
| DATE NOTICED IN MONITOR | : December 23, 2022 |

Pursuant to the Massachusetts Environmental Policy Act (MEPA; M.G.L. c. 30, ss. 61-62L) and Section 11.06 and 11.11 of the MEPA Regulations (301 CMR 11.00), I have reviewed the Expanded Environmental Notification Form (EENF) and hereby determine that this project **requires** the submission of a Draft Environmental Impact Report (DEIR).

Project Description

As described in the Environmental Notification Form (ENF), the project consists of the expansion of the City of Gardner's (City's) existing sludge landfill to provide additional capacity to dispose of 276,500 cubic yards (cy) of sludge generated by the City's wastewater treatment plant (WWTP). According to the ENF, the additional capacity will not be used to increase the daily tonnage of sludge disposed of at the landfill; rather, it will permit the City to continue its current practice of disposing of five dry tons of sludge per day (two truck trips from the WWTP to the landfill per day), five days a week, for 17 years after the existing landfill is filled to capacity. To improve the stability of the material, dry sludge delivered to the site is mixed with sand at a ratio of 3 parts sand to 1 part sludge prior to disposal on the landfill.

The additional landfill capacity will be provided over an 8.75-acre area, including 2.75 acres within the footprint of the existing landfill and an expanded area of approximately six acres on the southwest side of the existing landfill. Construction of the expansion area will involve regrading by removing up to 20 feet of soil over the six-acre area to establish a subbase sloping from approximately elevation 1005 feet NAVD 88 at the north end to 985 ft NAVD 88 at the

south end. According to the ENF, the design of the landfill expansion includes measures to manage leachate, which is the liquid produced when precipitation comes into contact with the dry sludge. The subbase will be a minimum of four feet above the seasonal high groundwater (SHGW) elevation. A Groundwater Protection System (GWPS) will be constructed on top of the subbase to act as a barrier between the sludge/leachate and groundwater. The GWPS will be constructed so as to extend a minimum of 10 feet beyond the limit of the existing landfill liner. The GWPS will consist of the following, which will be installed in the order below (from the bottom of the liner in contact with the subbase to the top of the liner in contact with sludge/leachate):

- A low permeability layer which will cover the subbase with 12 inches of compacted soil with low hydraulic conductivity, a geosynthetic clay liner (GCL) and a high-density polyethylene (HDPE) geomembrane;
- A leak detection and secondary leachate collection system over the low permeability layer listed above;
- A primary low permeability layer with a GCL and HDPE geomembrane to cover the leak detection and secondary leachate collection system;
- A primary leachate collection system over the primary layer; and,
- A 12-inch layer of low permeability material over the primary leachate collection system to protect the underlying components of the GWPS; sludge will be placed into the cell on top of this layer.

The expanded area of the landfill will include three cells that are proposed to be constructed at the same time and then filled sequentially, beginning with Cell 1 located at the southern end of the facility. The cells will be separated by berms covered with HDPE geomembrane liner material to prevent flow of leachate between the cells. A 15,000-sf area at the southernmost and lowest end of Cell 1 will be used as a detention area to which leachate from the remainder of Cell 1 and Cells 2-3 will be directed. Leachate will be pumped from the detention area in Cell 1 by a new pump station through a new 4-inch diameter, 1,200-ft long force main to the existing leachate conveyance system, which will pump leachate from the landfill to an 8-inch diameter gravity sewer main in West Street that will convey flows to the existing WWTP for treatment. The leachate detention area in Cell 1 will be filled with sludge after Cells 2 and 3 are filled to capacity.

The project also includes construction of structures outside the footprint of the landfill and GWPS, including a new leachate pump station, force main, a 12-ft wide perimeter gravel access road and a stormwater management system consisting of a perimeter swale, a bioretention area at the north end of the site and infiltration basins to the west and south.

The landfill, including the existing and proposed expansion area, will be capped at the end of its operations with a three-foot thick cap consisting of a gas venting layer, a low permeability layer, a drainage layer and a vegetative support layer. The final elevation of the mound will be 1,054 ft NAVD 88, or approximately 15 ft higher than the top of the existing landfill and approximately 50 to 70 ft above the existing grade of the expansion area. As noted below, the Massachusetts Department of Environmental Protection (MassDEP) recommends that the project incorporate early closure of portions of the landfill into the project design and a phased expansion plan. MEPA 01

Project Site

The 41.4-acre project site is located within a larger parcel owned by the City in west Gardner. A cemetery and the City's former solid waste landfill (now closed) are located to the east and northeast and another cemetery and a ground-mounted solar photovoltaic generating facility are located to the north of the project site. Vehicular access to the site is provided by a driveway from West Street, which runs along the northern edges of the cemeteries and former solid waste landfill. Areas to the south and west of the site consist of undeveloped woodlands, including conservation land. The municipal boundary between Gardner and Templeton coincides with the course of the Otter River approximately 1,500 feet west and south of the project site.

Wetlands are located north, east and south of the site. Two certified vernal pools, which are designated as Outstanding Resource Waters (ORWs) pursuant to the Massachusetts Surface Water Quality Standards (314 CMR 4.00), are located approximately 300 feet west and southwest of the existing sludge landfill and approximately 100 feet from the edge of the proposed landfill expansion. As shown on the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map (FIRM) Number 2503050008B (effective July 2, 1981), the site is not located within the 100-year floodplain. Areas of flooding associated with nearby wetlands are mapped on the FIRM as 500-year floodplain and extend onto the northern and southern areas of the project site adjacent to the existing sludge landfill. Two water supply wells for the Town of Gardner are located approximately 4,000 feet west and south of the site. The western edge of the proposed landfill expansion is approximately 1,700 ft east of the nearest part of the Zone II wellhead protection area of one of the public water supply wells and approximately 3,500 feet north of the Zone II of the other well.

According to preliminary mapping of Environmental Justice (EJ) populations available when the ENF was filed, the site is located just outside the one-mile radius from one EJ population designated by Income and within five miles of 10 EJ populations in Gardner, including seven designated as Income, two designated as Minority and one designated as Minority and Income. Updated mapping issued on November 12, 2022 and made effective January 4, 2023, did not materially change these designations, except that the EJ populations within a five-mile radius are now designated under different demographic categories. As discussed below, the City should establish a Public Involvement Plan, in consultation with MassDEP, and hold at least one public meeting prior to filing the DEIR. MEPA 02

Environmental Impacts and Mitigation

Potential environmental impacts of the project include alteration of 5.9 acres of land and creation of 4.1 acres of impervious area. The purpose of the project is to extend the duration of current sludge disposal practices, including disposal of 5 tons of sludge per day (two truck trips), for an additional 17 years. Construction and operation of the project will generate dust, odor and Greenhouse Gas (GHG) emissions.

Measures to avoid, minimize and mitigate impacts include construction of a double composite liner and leachate conveyance system to minimize infiltration of leachate into the soil and groundwater, construction of a cap over the landfill at the end of its operations (??) to minimize odors and production of leachate, mixing of sludge with sand to minimize odor and

add stability to the landfill, installation of a gas venting system and construction of a stormwater management system. The DEIR should provide a comprehensive discussion of proposed mitigation measures. MEPA 03

Jurisdiction and Permitting

The project is undergoing MEPA review because it requires Agency Actions and meets the ENF review threshold at 301 CMR 11.03(5)(b)(5)(a), New Capacity or Expansion in Capacity for combustion or disposal of any amount of sewage sludge, sludge ash, grit, screenings, or other sewage sludge residual materials. The project requires an Approval of Wastewater Treatment Residual Landfill and a Superseding Order of Conditions (SOC) from MassDEP. According to MassDEP, the project will also require a WP34 Approval of Closure Plans for Wastewater Residual Landfills. The project requires a National Pollutant Discharge Elimination System (NPDES) Stormwater General Permit from the Environmental Protection Agency (EPA).

Because the project is not seeking Financial Assistance from an Agency, MEPA jurisdiction extends to those aspects of the project that are within the subject matter of any required or potentially required Agency Actions and that may cause Damage to the Environment, as defined in the MEPA regulations.

Review of the ENF

The ENF described existing site conditions, provided a project description and site plans and identified alternatives to the project. It included appendices describing proposed stormwater management measures and a hydrogeological report. Consistent with the MEPA Interim Protocol on Climate Change Adaptation and Resiliency, the EENF contained an output report from the MA Climate Resilience Design Standards Tool prepared by the Resilient Massachusetts Action Team (RMAT) (the "MA Resilience Design Tool"),[1] together with information on climate resilience strategies to be undertaken by the project.

I received comments from residents and community groups expressing concerns about the environmental impacts of the proposed landfill expansion. Issues of particular concern include a desire for the City to evaluate alternatives to the continued operation of the landfill; odor and air quality impacts, including GHG emissions; potential for contamination of groundwater, including drinking water supplies; alteration of wetlands, wildlife habitat and recreational open space; and impacts to EJ populations. The City will provide additional information and analyses of the project's impacts in the DEIR. In addition, the City will be required to establish a Public Involvement Plan and has been encouraged to conduct at least one public meeting before the DEIR is filed. The Scope also includes information requested by MassDEP with respect to the construction of the proposed sludge landfill expansion, capping of the existing sludge landfill and other measures that will minimize impacts associated with the facility.

[1] https://resilientma.org/rmat_home/designstandards/

*Alternatives Analysis*

The ENF reviewed nine alternatives to the proposed project. The No Action Alternative would continue to use the existing landfill for approximately 2-3 more years until it reaches capacity, at which point the landfill would be closed and capped and the City would have no means of disposing of sludge. Because the WWTP will continue to operate and generate sludge beyond that time period, the No Action Alternative does not address the purpose of the project to facilitate disposal of the sludge material. Similarly, avoiding the generation of sludge by the WWTP by discontinuing operation of the facility or discharging untreated wastewater (the "Eliminate Sludge Generation Alternative") does not address the project need because sludge is an unavoidable product of sewage treatment. MEPA 04

The Land Application Alternative would involve converting sludge to fertilizer pellets to be used for agricultural purposes. The ENF did not describe what additional processes would be involved in converting sludge to fertilizer or identify impacts associated with those processes. MEPA 05 According to the ENF, land application of sludge has been effectively halted in Massachusetts because of the presence of per- and polyfluoroalkyl substances (PFAS) in sludge, which would also be present in fertilizer and could potentially contaminate soil and groundwater in areas where the fertilizer would be applied. A similar Construct a Composting Facility Alternative would include construction of a composting facility at the site of the proposed landfill expansion or at another location. MEPA 06 The ENF did not identify potential impacts associated with a composting facility. This alternative was also determined to be infeasible because of concerns that the compost would contain PFAS.

The Modify the WWTP to Add Anaerobic Digestion Alternative would expand the WWTP to add an anaerobic digester that would generate biogas, which could be used as an energy source, through the processing of sludge produced at the facility. According to the ENF, this alternative is not feasible because anaerobic digestion is not economically feasible for facilities that treat less than 10 million gallons per day (mgd) of wastewater; the existing WWTP treats approximately 3 to 4 mgd. In addition, anaerobic digestion would produce solids that would need to be disposed of as compost or fertilizer, which the City believes are infeasible disposal methods; alternatively, the solids would need to be taken to a landfill. Several commenters noted that the City of Fitchburg is evaluating the feasibility of constructing an anaerobic digester at its wastewater treatment facility which could accept sludge from Gardner. As detailed below, the DEIR should further evaluate the feasibility of this alternative. MEPA 07

The Construct an Incinerator and Construct a Pyrolysis or Gasification Facility Alternatives would reduce the volume of sludge to be disposed of by either incinerating (burning) sludge generated by the WWTP or by using pyrolysis or gasification to transform sludge into gas and char through a high-temperature process that do not involve incineration. According to the ENF, incineration of sludge has not been shown to destroy PFAS, which would be emitted into the air. The temperatures used in the pyrolysis and gasification processes are higher than those achieved in incineration and may be high enough to destroy PFAS; however, the effectiveness of these processes has not been demonstrated and no such facilities have yet

been permitted in Massachusetts.[2] For this reason, the City determined that these disposal methods are not feasible. Furthermore, incineration, hydrolysis and gasification produce solid wastes which would require disposal.

According to the ENF, the Construct a New Sludge Landfill Elsewhere in the City Alternative is not feasible because alternative locations were deemed less suitable than the Preferred Alternative and none have been permitted for sludge disposal. The ENF did not identify any sites that were considered or provide a comparative analysis of the impacts associated with siting a landfill at those locations. The DEIR should identify alternative locations evaluated by the City and describe potential impacts of siting a sludge landfill at those locations. MEPA 08

The Contract Hauling and Disposal Alternative would involve hiring a contractor to haul sludge from the WWTP to an off-site disposal facility. According to the ENF, the City evaluated this alternative in 2016 by obtaining data from WWTPs who employ this sludge disposal method. Sludge hauling contracts were found to be typically short-term (2-5 years) due to contractor concerns about uncertainty in availability of disposal locations and associated costs.

According to the ENF, the Preferred Alternative has been designed to accommodate the existing rate of sludge production for at least 17 years. The volume of wastewater treated and sludge produced at the WWTP is not expected to change significantly based on long-term population trends and because the City does not intend to accept sludge from other communities for disposal at the landfill. According to the ENF, the Preferred Alternative is the most cost-effective sludge disposal option, which is an important consideration in light of the income base of the City's residents who will have to bear the cost of any disposal plan. The expansion will include a double membrane liner that will be designed as a barrier between leachate and soil and groundwater, and with a leachate management system that will collect leachate and discharge it back to the WWTP for treatment.

According to the ENF, both the existing and expanded section of the landfill will be capped at the same time when the expanded area reaches capacity in the year 2041 or later. As detailed in MassDEP's comment letter, the City should cap portions of the existing landfill, which is nearing its capacity, as it expands capacity in other locations in order to minimize odors, reduce leachate production, stabilize slopes and improve stormwater management. Capping of the existing landfill would be consistent with MassDEP's regulations for solid waste landfills, which require that capping commence soon after the landfill ceases to accept waste. As detailed in the Scope, the DEIR should include an evaluation of alternatives for interim and final capping of the existing landfill when it reaches capacity. MEPA 09 MEPA 10

*Leachate Management*

The landfill is designed to minimize potential infiltration of leachate into the soil and groundwater through a GWPS consisting of a double composite liner with a primary and secondary leachate management systems, as described above. According to the ENF, most leachate will be collected by the primary leachate management system and the secondary

[2] A DEIR was filed in February 2022 describing a proposed gasification facility in Taunton (Aries Taunton Biosolids Gasification Project, EEA# 16311). The lack of data regarding the destruction of PFAS by the gasification process was a key concern expressed by MassDEP and other commenters.

leachate management system is intended as a backup for any leachate that is not contained by the primary leachate management system, which will pump the leachate to a sewer main via the leachate conveyance system. Any leachate reaching the secondary leachate management system will be similarly pumped to the leachate conveyance system and discharged into a sewer main.

The ENF included a Hydrogeological Evaluation Report (HER) that described existing soil and groundwater conditions and modeled groundwater flow under proposed conditions. Subsurface conditions are characterized by coarse-grained glacial outwash deposits on top of bedrock. Groundwater data was collected from 21 wells, including 13 wells near the sludge landfill and eight wells to the north and northeast of the sludge landfill. According to the HER, groundwater flow within the proposed expansion area is generally to the south-southeast under existing conditions. Groundwater flows were modeled for proposed conditions, including regrading of the site, construction of the landfill expansion and proposed infiltration basins and bioretention pond. The model evaluated groundwater flows under a steady-state condition representing an average annual rainfall, as well as under a 24-hour, 100-year storm event. The model indicated that groundwater flow would continue to flow to the south under proposed conditions. Groundwater elevations modeled under 24-hour, 100-year storm conditions were estimated to be up to approximately five feet higher than those observed under existing conditions and up to one foot higher than modeled post-construction, steady-state conditions; however, it appears that a separation of at least four feet will be maintained between groundwater and the proposed landfill expansion subbase.

Two public water supply wells in Templeton are located less than one mile to the west and south of the project site. The Zone II Wellhead Protection Area associated with the well to the west extends to within one-half mile of the expansion site; the nearest point of the Zone II of the well to the south is approximately 0.7 miles from the site. The ENF identified 18 private drinking water wells in Gardner located within a mile north of the site along West Street and Bridge Street. Several commenters asserted that 71 private water wells in Templeton and Gardner are located within one mile of the site, including wells south and east of the site. As described below, the DEIR should confirm the presence of any additional wells within one mile of the site and review the results of the HER as related to those sites. MEPA 11

*Landfill Construction and Design*

The project involves a vertical expansion of the landfill as well as an expansion of its footprint. Placement of sludge on the western portion of the existing landfill will result in a final elevation approximately 10 to 15 ft higher than the current height of the landfill. The GPS will be designed to overlap with the lower slope of the existing landfill; however, no cap or liner is proposed to cover areas where additional sludge will be placed on the landfill. According to MassDEP, areas of the existing landfill where vertical expansion is proposed should be covered by a hydraulic separation layer consisting of a combination of low permeability barriers and high-capacity drainage systems. The DEIR should include a revised design of areas of vertical expansion that includes a system for hydraulically separating the existing landfill from waste to be placed as part of the expansion project. MEPA 12

As described in the ENF, the three cells in the proposed landfill expansion area will be constructed at the same time in order to minimize construction impacts and reduce costs. According to MassDEP, construction of all cells at the same time, including Cells 2 and 3 which

will remain empty until partial filling of Cell 1 is completed, may result in damage to the liner that will reduce its effectiveness. As detailed below, the DEIR should include an evaluation of alternatives involving construction of the expansion cells in a phased manner and a description of additional inspection and maintenance tasks that will need to be performed to ensure the impermeability of the liner is not reduced while the cell remains empty. MEPA 13

The City proposes to cap both the existing and expanded portions of the landfill at the same time when the landfill reaches capacity in 2041. According to MassDEP, the existing landfill should be capped as soon as possible after it has reached capacity, as required by the Solid Waste Regulations at 310 CMR 19.115(e)(1)(a). Capping as much of the landfill as soon as possible will minimize impacts, including odor and potential leachate production. The DEIR should include a discussion of potential cap designs for the existing landfill and identify and associated construction impacts with installation of the cap. MEPA 14

*Stormwater Management*

The ENF described the proposed stormwater management system for the landfill expansion area. Runoff will be collected by grass-lined swales, deep-sump catch basins and HDPE pipes and directed to a bioretention pond and two infiltration basins. The swales and HDPE pipes will have the capacity to convey stormwater runoff from a 10-year storm event and will be constructed with check dams to reduce flow velocities in the channels during larger storms. The bioretention pond will be located north of the expansion area and will consist of a soil bed planted with non-invasive vegetation. Runoff entering the pond will be filtered through a 24-inch layer of soil filter media and pea gravel before entering an underdrain system that will discharge through an outlet control structure. The infiltration basins will be constructed to the west and south of the expanded landfill. The infiltration basins will be designed to have the capacity to store and infiltrate a 24-hour, 100-year storm. According to the ENF, the stormwater management system will meet SMS requirements by decreasing peak discharge rates for the 2-, 10-, 25-, and 100-year, 24-hour storm events compared to existing conditions, recharging groundwater and removing between 85 and 90 percent of the Total Suspended Solids (TSS) in runoff.

*Odor*

Odors associated with the proposed landfill expansion will be produced by the sludge and landfill gas; measures to control landfill gas are discussed below. According to the Operations and Maintenance Plan included in the ENF, odor produced by sludge is controlled by applying daily cover to the landfilled sludge and keeping the sludge as dry as possible by preventing ponding of water.[3] Odor is monitored daily by City employees using an Odor Intensity ranking system to record the level of odor experienced at the site. The Odor Intensity scale ranges from 0 to 5, with 0 representing no odor and 5 indicating an overpowering odor that is not tolerable for any length of time. Odor complaints from the public are tracked by the Gardner Board of Health and the WWTP staff; the tracking system also includes information concerning the activity level at the landfill and the weather, including temperature, wind direction and wind speed. According to the ENF, additional cover material may be applied to mitigate nuisance odors.

[3] The Engineering Report included in the ENF states that daily cover is not necessary. The DEIR should clarify whether daily cover will be applied. MEPA 15

Commenters note that persistent odors emanate from the landfill and affect visitors to the cemeteries and conservation land adjacent to the site, as well as more distant residential areas. As noted above, MassDEP has recommended that portions of the existing landfill be capped once those areas reach capacity; this would mitigate odors generated from sludge deposited in the existing landfill. The DEIR should review odor mitigation measures that will be implemented during filling of the expansion area. MEPA 16

*Climate Change*

*Adaptation and Resiliency*

Effective October 1, 2021, all new MEPA projects are required to submit an output report from the MA Resilience Design Tool to assess the climate risks of the project. The ENF included an output report from the tool for the project. As shown in the output report, the project has a high exposure rating based on the site location for urban flooding associated with extreme precipitation and extreme heat. Based on the 30-year useful life and the self-assessed criticality of the landfill, the MA Resilience Design Tool recommends a planning horizon of 2050 and a return period associated with a 10-year (10 percent chance) storm event when designing the project. The 30-year useful life appears to have been selected because the landfill expansion will be filled during an approximately 20-year period; however, it does not take into account the long-term maintenance of the landfill once it is capped. In addition, a 10-year storm event recommendation appears based on a "Low" criticality assessment for the landfill, despite its stated importance in maintaining sludge disposal for the City. For "Medium" to "High" critical assets, the Tool recommends a 25-year or 50-year storm event as of the planning year. MEPA 17

According to the ENF, the project's high risk for urban flooding identified by the MA Resilience Design Tool is due to the addition of impervious area associated with the landfill liner. During the period when the expansion cells are being filled, rainfall will filter through a minimum of 12 inches of protective cover before reaching the impervious liner, at which point it will be conveyed through the leachate management system rather than flow on the surface; therefore, the project is unlike most projects that add impervious area at the surface and cause an increase in surface runoff. The leachate management system was designed to operate under extreme weather conditions based on the EPA's Hydrologic Evaluation of Landfill Performance (HELP) model, which was used to simulate 20 years of daily weather conditions to identify the 7-day extreme condition to be accommodated by the leachate management system and leachate collection pond. According to MassDEP, the most current version of the HELP model should be used to calculate the conditions for which the leachate management system should be designed. MEPA 18

As noted above, the stormwater management system has been designed to collect, convey and treat stormwater runoff based on the National Oceanic and Atmospheric Administration's (NOAA's) Atlas 14, Volume 10 rainfall data. The NOAA Atlas 14 estimates a rainfall depth of 6.9 inches for the 100-year storm event, which is greater than the 5.7-inch precipitation depth for the 2050 10-year storm event included in the MA Resilience Design Tool output report. Because the landfill and stormwater management system will remain in place beyond 2050, I encourage the City to review the recommendations generated by the MA Resilience Design Tool for the project based on a useful life longer than 30 years and for higher criticality assets (25-year or 50-year storm events). A dashboard showing anticipated 24-hour rainfall volumes under a wide MEPA 19

variety of future storm events is now available as a resource on the Resilient MA Climate Change Projections Dashboard.[4]

*Greenhouse Gas Emissions*

Sludge produces emissions of GHG, including methane and carbon dioxide. The ENF included an estimate of annual emissions of landfill gas through the year 2130 using the EPA's Landfill Gas Emissions Model (LandGEM). Total emissions are anticipated to peak between 2040 and 2045 at a rate of approximately 275 short tons per year. A gas venting system will be incorporated into the final cap design to allow the gas to passively vent into the air. According to the ENF, the amount of gas emitted by the landfill is too low to warrant management, such as flaring.

During landfill operations prior to final capping, gas will migrate upward to the surface of the landfill and be passively released to the atmosphere. According to MassDEP, gas may be prevented from venting through the landfill surface under certain conditions, such as when the ground is frozen during the winter. The City should monitor landfill gas to ensure that it is not migrating away from the landfill toward on-site structures or off-site properties. MEPA 20

Conclusion

The ENF described the design of the proposed landfill expansion and identified construction-period impacts and mitigation measures. The DEIR should describe additional components of the project, including interim and final caps, that may be required by MassDEP in connection with permitting of the landfill expansion. MEPA 21

## SCOPE

General

The DEIR should follow Section 11.07 of the MEPA regulations for outline and content and provide the information and analyses required in this Scope. It should demonstrate that the Proponent will pursue all feasible measures to avoid, minimize and mitigate Damage to the Environment to the maximum extent feasible MEPA 22

Project Description and Permitting

The DEIR should identify any changes to the project since the filing of the ENF, including potential design of a cap for the existing landfill and potential environmental impacts of the construction of the cap. It should identify and describe state, federal, and local permitting and review requirements associated with the project and provide an update on the status of each of these pending actions. The DEIR should include a description and analysis of applicable statutory and regulatory standards and requirements, and a discussion of the project's consistency with those standards. The DEIR should identify the need for a Landfill Closure Permit from MassDEP and address relevant regulatory standards. MEPA 23 MEPA 24

[4] https://resilientma-mapcenter-mass-eoeea.hub.arcgis.com/

The DEIR should include site plans for existing and post-development conditions at a legible scale. Plans should clearly identify wetland resource areas, buildings, roads, impervious areas, and stormwater infrastructure. The DEIR should provide plans, sections, and elevations to accurately depict existing and proposed conditions, including proposed above- and below-ground structures, on- and-off-site open space, and resiliency and other mitigation measures. The DEIR should clarify whether the project site was taken for recreational or other purposes and whether the project is subject to Article 97; if necessary, the DEIR should include an analysis consistent with the EEA Article 97 Land Disposition Policy. MEPA 25 MEPA 26

The information and analyses identified in this Scope should be addressed within the main body of the DEIR and not in appendices. In general, appendices should be used only to provide raw data, such as drainage calculations, traffic counts, capacity analyses and energy modelling, that is otherwise adequately summarized with text, tables and figures within the main body of the DEIR. Information provided in appendices should be indexed with page numbers and separated by tabs, or, if provided in electronic format, include links to individual sections. Any references in the DEIR to materials provided in an appendix should include specific page numbers to facilitate review. MEPA 27

Alternatives Analysis

The DEIR should include a supplemental alternatives analysis that provides additional details that may be available concerning a proposed anaerobic digester in Fitchburg. It should review an alternative involving trucking sludge to the proposed Fitchburg anaerobic digestion facility, if it were to be available for sludge disposal, and evaluate potential environmental impacts and impacts on EJ populations. MEPA 28

Environmental Justice

While the project site is not located within one mile of an EJ population, MassDEP has indicated to the MEPA Office that it will require the City to develop and implement a Public Involvement Plan (PIP) in connection with filing of applications for the landfill expansion. MassDEP expects a fact sheet prepared using a MassDEP template describing the project be distributed by Gardner to appropriate local distribution outlets prior to the issuance of a draft permit. The DEIR should establish a public involvement plan to engage nearby EJ populations. The DEIR should contain a full description of measures the Proponent intends to undertake to promote public involvement by such EJ populations during the remainder of the MEPA review process, including a discussion of any of the best practices listed in the MEPA Public Involvement Protocol for Environmental Justice Populations (the "MEPA EJ Public Involvement Protocol") that the City intends to employ. The DEIR, or a summary thereof, should be distributed to all Community Based Organizations (CBOs) and tribes/indigenous organizations included in an "EJ Reference List" available from the MEPA Office; all statewide entities and those located in municipalities within one miles of the project site should be included. The City is encouraged to consult with the EEA EJ Director and the MEPA Office regarding community engagement strategies appropriate for the project, well before the filing of the DEIR. The City should hold at least one public information meeting about the project before filing the DEIR. MEPA 29

Landfill Design and Construction

The DEIR should include an analysis of alternative designs and construction methods for the phased construction of the expansion cells. For each alternative, the DEIR should discuss its feasibility, describe inspection and maintenance procedures, and an evaluation with respect to minimizing erosion, siltation and degradation of the liner. MEPA 30

The DEIR should clarify the anticipated timeline for the existing sludge landfill to reach capacity. According to MassDEP's guidance document entitled "Wastewater Residuals Guidance Document No. 89 2, Closure/Post Closure Requirements For Residuals Landfills", the owner or operator of a landfill must submit for MassDEP's review and approval a closure/post-closure plan at least six months prior to proposed closure activities. The closure/post-closure plan must be submitted to MassDEP as part of a WP34 Approval of Closure Plans for Wastewater Residual Landfills application. The DEIR should review alternatives for capping any portion of the existing landfill where new waste has not or will not be applied within a one-year period, unless the area is permitted to accept additional waste, has reached final approved elevations, or any other criteria stated in the Solid Waste Management regulations at 310 CMR 19.115(e)(1)(a). The DEIR should include an analysis of capping designs and describe how the feasibility of the design and how it would address leachate production/management, odors, slope stability, and stormwater management. As requested in MassDEP's comment letter, the DEIR should evaluate alternative designs for construction of a hydraulic separation layer, in accordance with the requirements of MassDEP Solid Waste Management Regulations 310 CMR 19.110(5)(c), and leachate management system over the existing landfill in connection with its vertical expansion, and identify potential impacts of each alternative design.

As noted above, a revised version of the HELP model is available for use in designing the proposed leachate management system in the expanded landfill. The DEIR should provide an updated leachate system design based on the use of the current version of the HELP model.

Groundwater

The DEIR should confirm the number of all public and private water supply wells in Gardner and the surrounding communities within one mile of the site expansion area, and provide a map of the location of each well. In addition, it should include a map of all existing monitoring wells associated with the existing sludge landfill, municipal solid waste landfill, and proposed monitoring wells for the expansion project. It should discuss potential impacts to wells from migration of groundwater from the landfill and describe how the proposed groundwater monitoring program, including any additional monitoring wells that may be proposed, will detect potential impacts to the wells. MEPA 31

Stormwater

The DEIR should include a discussion of how runoff will be managed during the period that the expanded landfill is being filled with sludge. It should clarify whether the proposed BMPs identified for the final capped condition will be in place and whether any additional BMPs or conveyance systems will be necessary on a temporary basis. The project will be required to develop a Stormwater Pollution Prevention Plan (SWPP) in accordance with its NPDES CGP to MEPA 32

manage stormwater during the construction period. The DEIR should describe stormwater management measures that will be implemented during construction.

Air Quality

MEPA 33

The DEIR should describe the source of all the model parameters used in the LandGEM tool as they apply to sludge landfills rather than solid waste landfills. It should describe how landfill gas will be collected from the existing and proposed new portions of the sludge landfill evaluate potential measures to minimize odors and GHG emissions associated with the gas. At a minimum, the DEIR should evaluate the feasibility of conveying those gases to the existing flare in operation at the nearby municipal solid waste landfill, which was approved by MassDEP in an Air Quality Plan Approval issued in 2005 and amended in 2008. The analysis of this connection between landfill gas collection systems should describe how gas will be vented, including during the winter when the ground surface is frozen, and monitored. The City should review federal regulations related to landfill gas emissions from solid waste landfills, including 40 CFR Part 60, to determine whether standards for capture and control of landfill gas would trigger MassDEP air permitting. The DEIR should confirm whether or not daily cover will be applied to the landfill; if not, it should discuss why this odor mitigation measure cannot be implemented.

Climate Change

MEPA 34

The DEIR should review projected rainfall data for the years beyond 2050 available from the Resilient MA Climate Change Projections Dashboard to discuss the resiliency of the stormwater and leachate management system to future climate conditions associated with the 10-year, 25-year, and 50-year storm events. The DEIR should clarify whether the leachate management system is designed to be resilient to a certain storm event (e.g., 24-hour rainfall for a 100-year storm), and how such event compares to the recommended values provided by the MA Resilience Design Tool. The DEIR should include an analysis of the landfill's resilience to future climate conditions and describe any potential changes to the design of the final cap or proposed stormwater management system that may be necessary to maintain the long-term integrity of the landfill.

Construction Period

MEPA 35

The DEIR should provide a cut and fill analysis, including a plan, of the area in which the landfill expansion will be constructed. It should describe management of soil, including on-site stockpiling, off-site disposal, or reuse. The DEIR should identify construction-period impacts and mitigation relative to noise, air quality, water quality, and traffic, including the number and route of construction vehicles. It should confirm that the project will require its construction contractors to use Ultra Low Sulfur Diesel fuel, and discuss the use of after-engine emissions controls, such as oxidation catalysts or diesel particulate filters. More information regarding construction-period diesel emission mitigation may be found on MassDEP's web site at http://www.mass.gov/dep/air/diesel/conretro.pdf.

Mitigation and Draft Section 61 Findings

MEPA 36

The DEIR should include a separate chapter summarizing all proposed mitigation measures including construction-period measures. This chapter should also include a

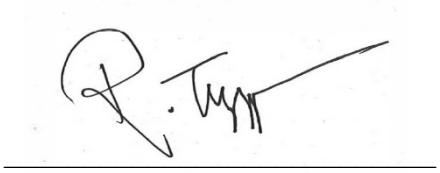
comprehensive list of all commitments made by the Proponent to avoid, minimize and mitigate the environmental and related public health impacts of the project, and should include a separate section outlining mitigation commitments relative to EJ populations. The filing should contain clear commitments to implement these mitigation measures, estimate the individual costs of each proposed measure, identify the parties responsible for implementation, and contain a schedule for implementation. The list of commitments should be provided in a tabular format organized by subject matter (traffic, water/wastewater, GHG, environmental justice, etc.) and identify the Agency Action or Permit associated with each category of impact. Draft Section 61 Findings should be separately included for each Agency Action to be taken on the project. The filing should clearly indicate which mitigation measures will be constructed or implemented based upon project phasing to ensure that adequate measures are in place to mitigate impacts associated with each development phase.

Responses to Comments

The DEIR should contain a copy of this Certificate and a copy of each comment letter received. It should include a comprehensive response to comments on the ENF that specifically address each issue raised in the comment letter; references to a chapter or sections of the DEIR alone are not adequate and should only be used, with reference to specific page numbers, to support a direct response. This directive is not intended to, and shall not be construed to, enlarge the Scope of the DEIR beyond what has been expressly identified in this certificate. MEPA 37

Circulation

The Proponent should circulate the DEIR to each Person or Agency who previously commented on the ENF, each Agency from which the Project will seek Permits or Financial Assistance, and to any other Agency or Person identified in the Scope. Per 301 CMR 11.16(5), the Proponent may circulate copies of the EIR to commenters in CD-ROM format or by directing commenters to a project website address. However, the Proponent must make a reasonable number of hard copies available to accommodate those without convenient access to a computer and distribute these upon request on a first-come, first-served basis. The Proponent should send correspondence accompanying the digital copy or identifying the web address of the online version of the DEIR indicating that hard copies are available upon request, noting relevant comment deadlines, and appropriate addresses for submission of comments. A copy of the DEIR should be made available for review at the Gardner Public Library. MEPA 38



February 10, 2023
Date

Rebecca L. Tepper

Comments received:

01/03/2023 Robert L. Chicoine
01/04/2023 David K. Peabody

| | |
|---|---|
| 01/09/2023 | Templeton Select Board |
| 01/17/2023 | Josh Forgues |
| 01/17/2023 | Pastor Jeffrey W. Lore |
| 01/20/2023 | Cheryl Alvarez |
| 01/20/2023 | Taylor Sala |
| 01/21/2023 | Kelsey |
| 01/22/2023 | David Antaya |
| 01/22/2023 | David Legere |
| 01/23/2023 | Bob Chicoine |
| 01/27/2023 | Millers River Watershed Council (MRWC) |
| 01/28/2023 | Gardner Clean Air |
| 01/28/2023 | Mary E. Marsh |
| 01/28/2023 | Theresa Griffis |
| 01/28/2023 | Thomas B. Esposito |
| 01/30/2023 | Anonymous |
| 01/30/2023 | Connecticut River Conservancy |
| 01/30/2023 | Jo-Anne Burdin |
| 01/30/2023 | Millers River Watershed Council (MRWC) |
| 01/31/2023 | Anonymous |
| 01/31/202 | cortkiewel@gmailcom |
| 01/31/2023 | Erin Kiewel |
| 01/31/2023 | Hugh Jardon |
| 01/31/2023 | Massachusetts Department of Environmental Protection (MassDEP) |
| 01/31/2023 | Paul N. Demeo |
| 01/31/2023 | Rice Flanders |
| 01/31/2023 | Tim Gurczak |
| 01/31/2023 | Victoria Heidorn |

RLT/AJS/ajs

## 11.2 Secretary's Certificate on the Environmental Notification Form

**MEPA 01** **The Massachusetts Department of Environmental Protection (MassDEP) recommends that the project incorporate early closure of portions of the landfill into the project design and a phased expansion plan. (Landfill Design and Construction)**

**Response** A discussion of Project sequencing, including interim and final capping of the sludge landfill, and the feasibility of phased expansion is described in **Section 4.5 Chapter 4, "Landfill Design and Construction**."

**MEPA 02** **The City should establish a Public Involvement Plan, in consultation with Mass DEP, and hold at least one public meeting prior to filing the DEIR. (Environmental Justice)**

**Response** A Public Involvement Plan was developed in consultation with MEPA and MassDEP and is appended to this DEIR **(Appendix B**). Prior to filing the DEIR with MEPA, a public meeting was held on February 10, 2025.

**MEPA 03** **The DEIR should provide a comprehensive discussion of proposed mitigation measures. (Mitigation Measures)**

**Response** A comprehensive discussion of the Project's mitigation measures can be found in **Chapter 10, "Mitigation and Draft Section 61 Findings**," of this DEIR.

**MEPA 04** **The ENF reviewed nine alternatives to the proposed project. The No Action Alternative would continue to use the existing landfill for approximately 2-3 more years until it reaches capacity, at which point the landfill would be closed and capped and the City would have no means of disposing of sludge. Because the WWTP will continue to operate and generate sludge beyond that time period, the No Action Alternative does not address the purpose of the project to facilitate disposal of the sludge material. Similarly, avoiding the generation of sludge by the WWTP by discontinuing operation of the facility or discharging untreated wastewater (the "Eliminate Sludge Generation Alternative") does not address the project need because sludge is an unavoidable product of sewage treatment. (Alternatives Analysis)**

**Response** See **Chapter 2, "Alternatives Analysis**." The DEIR evaluates two alternatives to the Project for sludge disposal, which adequately addresses the purpose of the project to facilitate disposal of sludge material – Alternative 1: landfill closure and off-site hauling (including the proposed Fitchburg Biosolids Management Facility) and Alternative 2: Hydrothermal Carbonization.

**MEPA 05** **The Land Application Alternative would involve converting sludge to fertilizer pellets to be used for agricultural purposes. The ENF did not describe what additional processes would be involved in converting sludge to fertilizer or identify impacts associated with those processes. According to the ENF, land application of sludge has been effectively halted in Massachusetts because of the presence of per- and polyfluoroalkyl substances (PFAS) in sludge, which would also be present in fertilizer and could potentially contaminate soil and groundwater in areas where the fertilizer would be applied. (Alternatives Analysis)**

**Response** See **Section 2.3, Chapter 2, "Alternatives Analysis**." Due to the potential presence of PFAS in sludge material and neighboring states enacting bans of land application of sludge material, the Land Application Alternative evaluated in the ENF is no longer considered a viable alternative.

**MEPA 06** **A similar Construct a Composting Facility Alternative would include construction of a composting facility at the site of the proposed landfill expansion or at another location. The ENF did not identify potential impacts associated with a composting facility. This alternative was also determined to be infeasible because of concerns that the compost would contain PFAS. (Alternatives Analysis)**

**Response** See **Section 2.3, Chapter 2, "Alternatives Analysis**." See response to MEPA 05. Recent regulation and emerging contaminant concerns have rendered the Construct a Composting Facility Alternative no longer viable.

**MEPA 07** **The Modify the WWTP to Add Anaerobic Digestion Alternative would expand the WWTP to add an anaerobic digester that would generate biogas, which could be used as an energy source, through the processing of sludge produced at the facility. According to the ENF, this alternative is not feasible because anaerobic digestion is not economically feasible for facilities that treat less than 10 million gallons per day (mgd) of wastewater; the existing WWTP treats approximately 3 to 4 mgd. In addition, anaerobic digestion would produce solids that would need to be disposed of as compost or fertilizer, which the City believes are infeasible disposal methods; alternatively, the solids would need to be taken to a landfill. Several commenters noted that the City of Fitchburg is evaluating the feasibility of constructing an anaerobic digester at its wastewater treatment facility which could accept sludge from Gardner. As detailed below, the DEIR should further evaluate the feasibility of this alternative. (Alternatives Analysis)**

**Response** See **Section 2.3, Chapter 2, "Alternatives Analysis**." Option 3 (Anaerobic Digestion)/ENF Alternative 5 (Modify the WWTP to Add Anaerobic Digestion) was considered but dismissed due to high capital and operational costs and would not eliminate the need for disposal. Alternative 1: landfill closure and off-site hauling (no build alternative), including off-site hauling to the planned Fitchburg Biosolids Management Facility), is further evaluated in **Chapter 2, "Alternatives Analysis."**

**MEPA 08** **The DEIR should identify alternative locations evaluated by the City and describe potential impacts of siting a sludge landfill at those locations. (Alternatives Analysis)**

**Response** See **Section 2.2.2, Chapter 2, "Alternatives Analysis**." A site evaluation was conducted for the Project. The site evaluation concluded that the Project Site was the most suitable location for the Project as it is City-owned land, thus avoiding costly and time-consuming acquisition processes; provides the necessary space; is already identified for sludge landfill use; avails of existing infrastructure in-place, which avoids costly duplication of infrastructure elsewhere in Gardner; and avoids floodplains and other protected land use areas.

**MEPA 09** **As detailed in MassDEP's comment letter, the City should cap portions of the existing landfill, which is nearing its capacity, as it expands capacity in other locations in order**

**to minimize odors, reduce leachate production, stabilize slopes and improve stormwater management. (Landfill Design and Construction)**

**Response** A discussion of Project sequencing, including interim and final capping of the sludge landfill, and the feasibility of phased expansion is described in **Section 4.5 Chapter 4, "Landfill Design and Construction**."

**MEPA 10** **The DEIR should include an evaluation of alternatives for interim and final capping of the existing landfill when it reaches capacity. (Landfill Design and Construction)**

**Response** A discussion of Project sequencing, including interim and final capping of the sludge landfill, and the feasibility of phased expansion is described in **Section 4.5 Chapter 4, "Landfill Design and Construction**."

**MEPA 11** **The DEIR should confirm the presence of any additional wells within one mile of the site and review the results of the HER [Hydrogeological Evaluation Report] as related to those sites. (Groundwater)**

**Response** **Figure 5-1** illustrates the location of public and private wells within one mile of the Project Site. A review of the results of the Hydrogeological Evaluation Report as it relates the location of these wells can be found in **Section 5.4, Chapter 5, "Groundwater,"** of this DEIR.

**MEPA 12** **According to MassDEP, areas of the existing landfill where vertical expansion is proposed should be covered by a hydraulic separation layer consisting of a combination of low permeability barriers and high-capacity drainage systems. The DEIR should include a revised design of areas of vertical expansion that includes a system for hydraulically separating the existing landfill from waste to be placed as part of the expansion project. (Landfill Design and Construction)**

**Response** See **Chapter 4, "Landfill Design and Construction**." The Project design would be revised to include a hydraulic separation layer during final design.

**MEPA 13** **According to MassDEP, construction of all cells at the same time, including Cells 2 and 3 which will remain empty until partial filling of Cell 1 is completed, may result in damage to the liner that will reduce the effectiveness. As detailed below, the DEIR should include an evaluation of alternatives involving construction of the expansion cells in a phased manner and a description of additional inspection and maintenance tasks that will need to be performed to ensure the impermeability of the liner is not reduced while the cell remains empty. (Landfill Design and Construction)**

**Response** See **Chapter 4, "Landfill Design and Construction**." Damage to the liner would be avoided by implementing best operational practices including regular inspections by the operator. As described in that chapter, unused cells would be monitored to ensure that the protective sand layer that is placed over the unused cells remains intact. This layer is essential for protecting the underlying groundwater protection system materials from sunlight, which can degrade the integrity of the system. Initially, the woodchip layer on top of the groundwater protection system would control erosion of the sand layer. Upon inspection, the operator shall replenish woodchips in areas where sand has become exposed, providing continued protection. Over time, vegetation would naturally establish on the woodchip layer, further stabilizing the surface. Once the vegetation is established,

the operator would mow the area at least twice annually to prevent excessive root growth, which could impact the underlying landfill systems. In the unlikely event of groundwater protection system damage, the operator would isolate that cell from the normal operation of the landfill and make immediate plans to repair and/or replace the damage. Repairs to the synthetic membrane would be performed in accordance with the specifications approved in the design plans. These ongoing inspections and maintenance activities are crucial for the long-term functionality of the landfill and for minimizing environmental risks. A discussion of the feasibility of phased construction can also be found in **Section 4.5.1 Chapter 4 "Landfill Design and Construction. "**

**MEPA 14** **According to MassDEP, the existing landfill should be capped as soon as possible after it has reached capacity, as required by the Solid Waste Regulations at 310 CMR 19.115(e)(1)(a). Capping as much of the landfill as soon as possible will minimize impacts, including odor and potential leachate production. The DEIR should include a discussion of potential cap designs for the existing landfill and identify and associated construction impacts with installation of the cap. (Landfill Design and Construction)**

**Response** A discussion of Project sequencing, including interim and final capping of the sludge landfill, and the feasibility of phased expansion is described in **Section 4.5 Chapter 4, "Landfill Design and Construction**."

**MEPA 15** **The DEIR should clarify whether daily cover will be applied. (Landfill Design and Construction)**

**Response** The Project would be governed by a MassDEP-approved Operations and Maintenance Plan. As described in the Operations and Maintenance Plan, daily cover would be applied at the end of each day, with timing considerations given to wet weather conditions for surface stabilization and odor reduction. The cover material would be substantially odor-free, and deeper cover would be applied intermediately and as necessary to control odor. These measures would be taken in accordance with 310 CMR 19.130 (15)(a)(3); (15)(c)(2); and (16)(a). Approximately 230 cubic yards of mixing soils per week are required for the weekly disposal of sludge based on a 3:1 sand/sludge mixing ratio.

**MEPA 16** **The DEIR should review odor mitigation measures that will be implemented during filling of the expansion area. (Air Quality)**

**Response** See **Section 7.6, Chapter 7, "Air Quality"** and response to MEPA 15. As described in that chapter, updated operational practices are proposed to address odor issues and catalog and respond to complaints. These practices include stabilizing sludge by mixing it with sand at a 3:1 ratio and applying cover material daily. Landfill personnel would record odor readings and respond to complaints. The City is committed to exploring technological updates to further reduce odors. Citizens are encouraged to use the following odor complaint procedure:

To report an odor complaint please contact VEOLIA at 978-630-8791 during normal business hours. After business hours, sludge landfill complaints can be reported by calling the non-emergency number for the Gardner Police Department dispatch at 978-632-5600 and leaving call back information and a brief description of the complaint. The complaint

is forwarded to the appropriate on-call staff for follow-up. When reporting a complaint please provide the exact location and time of the complaint so VEOLIA operators can respond appropriately.

**MEPA 17** **Based on the 30-year useful life and the self-assessed criticality of the landfill, the MA Resilience Design Tool recommends a planning horizon of 2050 and a return period associated with a 10-year (10 percent chance) storm event when designing the project. The 30-year useful life appears to have been selected because the landfill expansion will be filled during an approximately 20-year period; however, it does not take into account the long-term maintenance of the landfill once it is capped. In addition, a 10-year storm event recommendation appears based on a "Low" criticality assessment for the landfill, despite its stated importance in maintaining sludge disposal for the City. For "Medium" to "High" critical assets, the Tool recommends a 25-year or 50-year storm event as of the planning year. (Climate Change)**

**Response** See **Chapter 8, "Climate Change**." The ResilientMass Action Team Climate Resilience Design Standards Tool has been updated to account for the 47-year design life of the Project. The design life includes the landfill's operational years (17 years) as well as the post-closure period (30 years) as outlined in DWPC Wastewater Residuals Guidance Document No. 89-2.

**MEPA 18** **According to MassDEP, the most current version of the HELP model should be used to calculate the conditions for which the leachate management system should be designed. (Landfill Design and Construction)**

**Response** See **Section 4.2.1 of Chapter 4, "Landfill Design and Construction**." EPA's model for Hydrologic Evaluation of Landfill Performance (HELP V 4.0) was used to calculate the conditions for which the Project's leachate management system; however, it resulted in lower peak precipitation, runoff, and leachate generation values than what was estimated previously in the Environmental Notification Form using HELP V3.07. To remain conservative, the leachate management system is designed to the higher values generated by the HELP V3.07 model.

**MEPA 19** **Because the landfill and stormwater management system will remain in place beyond 2050, I [MEPA] encourage the City to review the recommendations generated by the MA Resilience Design Tool for the project based on a useful life longer than 30 years and for higher criticality assets (25-year or 50- year storm events). A dashboard showing anticipated 24-hour rainfall volumes under a wide variety of future storm events is now available as a resource on the Resilient MA Climate Change Projections Dashboard (https://resilientma-mapcenter-mass-eoeea.hub.arcgis.com/). (Climate Change)**

**Response** See **Chapter 8, "Climate Change**" and response to MEPA 17. Based on the future climate projection precipitation and peak runoff data, the design of the Project's stormwater and leachate management systems incorporates measures to accommodate climate projections through its approximately 17-year operational life. The proposed design meets the current 100-year 24-hour precipitation and peak runoff rates as well as the projected 25-year storm of 2050, which is beyond the operational life of the landfill. Therefore, the

Project has considered climate change impacts through its operational life and is adequately resilient to future climate conditions.

Prior to 2050, in 2044, the landfill would be decommissioned, and a final cover and cap would be designed, which affords the opportunity to reassess and upgrade as necessary the landfill's stormwater management system using updated climate projections at that time. As stated above, the stormwater management system would be monitored periodically throughout its lifespan and modifications to ensure its continued operability would be made as necessary. Post closure monitoring would include monitoring for signs of erosion and monitoring of surface and groundwater in accordance with the regulations governing sludge landfills and measures to modify the infrastructure would be implemented, as necessary.

**MEPA 20** **The City should monitor landfill gas to ensure that it is not migrating away from the landfill toward on-site structures or off-site properties. (Project Description and Permitting)**

**Response** See **Section 1.10 of Chapter 1, "Project Description and Permitting**." A landfill gas monitoring system would be included in nearby structures (i.e., leachate pump station) to ensure landfill gas is not migrating away from the landfill toward on-site structures. Given the distance to off-site properties, the migration of landfill gas is not a concern.

**MEPA 21** **The DEIR should describe additional components of the project, including interim and final caps, that may be required by MassDEP in connection with permitting of the landfill expansion. (Landfill Design and Construction) (Project Description and Permitting)**

**Response** See response to **MEPA 01**. A discussion of Project sequencing, including interim and final capping of the existing landfill is described in **Chapter 4, "Landfill Design and Construction**." A discussion of all required permits and approvals is included in **Section 1.15, Chapter 1, "Project Description and Permitting"** of this DEIR.

**MEPA 22** **The DEIR should follow Section 11.07 of the MEPA regulations for outline and content and provide the information and analyses required in this Scope. It should demonstrate that the Proponent will pursue all feasible measures to avoid, minimize, and mitigate damage to the environment to the maximum extent feasible. (Project Description and Permitting) (Mitigation and Draft Section 61 Findings)**

**Response** This DEIR follows MEPA Regulations Section 11.07 for outline and content and includes information and analyses required in the scope identified by the Environmental Notification Form Certificate. As illustrated in this DEIR, the Proponent is pursuing all feasible measures to avoid, minimize, and mitigate damage to the environment to the maximum extent feasible.

**MEPA 23** **The DEIR should identify any changes to the project since the filing of the ENF, including potential design of a cap for the existing landfill and potential environmental impacts of the construction of the cap. (Project Description and Permitting)**

**Response** A discussion of changes to the Project since the filing of the Environmental Notification Form is included in **Section 1.10, Chapter 1, "Project Description and Permitting**," of this DEIR.

**MEPA 24** **It should identify and describe state, federal, and local permitting and review requirements associated with the project and provide an update on the status of each of these pending actions. The DEIR should include a description and analysis of applicable statutory and regulatory standards and requirements, and a discussion of the project's consistency with those standards. The DEIR should identify the need for a Landfill Closure Permit from MassDEP and address relevant regulatory standards. (Project Description and Permitting)**

**Response** A discussion of the project's consistency with applicable statutory and regulatory standards and requirements and the status of pending actions is included in **Section 1.15, Chapter 1, "Project Description and Permitting**."

**MEPA 25** **The DEIR should include site plans for existing and post-development conditions at a legible scale. Plans should clearly identify wetland resource areas, buildings, roads, impervious areas, and stormwater infrastructure. The DEIR should provide plans, sections, and elevations to accurately depict existing and proposed conditions, including proposed above- and below-ground structures, on- and-off-site open space, and resiliency and other mitigation measures. (Project Description and Permitting)**

**Response** This DEIR includes site plans for existing and proposed development conditions and the plans include the elements identified in this comment. See **Figure 1-1** through **Figure 1-5b** and drawings in **Appendix A** of this DEIR (page 338).

**MEPA 26** **The DEIR should clarify whether the project site was taken for recreational or other purposes and whether the project is subject to Article 97. If necessary, the DEIR should include an analysis consistent with the EEA Article 97 Land Disposition Policy. (Project Description and Permitting)**

**Response** See **Figure 1-3**. The Project is not subject to Article 97 as it is not within lands of Massachusetts Open Space Legal Interest or Ownership Records or identified by the City of Gardner as parks or open space. See **Section 1.10, Chapter 1, "Project Description and Permitting,"** for the Project's consistency with Article 97's Land Disposition Policy.

**MEPA 27** **The information and analyses identified in this Scope should be addressed within the main body of the DEIR and not in appendices. In general, appendices should be used only to provide raw data, such as drainage calculations, traffic counts, capacity analyses and energy modelling, that is otherwise adequately summarized with text, tables and figures within the main body of the DEIR. Information provided in appendices should be indexed with page numbers and separated by tabs, or, if provided in electronic format, include links to individual sections. Any references in the DEIR to materials provided in an appendix should include specific page numbers to facilitate review. (Project Description and Permitting)**

**Response** This DEIR provides information and analysis within the main body of the document and appendices have been used to provide raw data, as applicable.

**MEPA 28** **The DEIR should include a supplemental alternatives analysis that provides additional details that may be available concerning a proposed anaerobic digester in Fitchburg. It should review an alternative involving trucking sludge to the proposed Fitchburg anaerobic digestion facility, if it were to be available for sludge disposal, and evaluate potential environmental impacts and impacts on EJ populations. (Alternatives Analysis)**

**Response** Alternative 1 of the DEIR analyzes a landfill closure and off-site hauling scenario, including the potential to haul to the proposed Fitchburg Biosolids Management Facility. This analysis includes potential environmental impacts and impacts on environmental justice populations. See **Section 2.6, Chapter 2, "Alternatives Analysis**," for further detail.

**MEPA 29** **While the project site is not located within one mile of an EJ population, MassDEP has indicated to the MEPA Office that it will require the City to develop and implement a Public Involvement Plan (PIP) in connection with filing of applications for the landfill expansion. MassDEP expects a fact sheet prepared using a MassDEP template describing the project be distributed by Gardner to appropriate local distribution outlets prior to the issuance of a draft permit. The DEIR should establish a public involvement plan to engage nearby EJ populations. The DEIR should contain a full description of measures the Proponent intends to undertake to promote public involvement by such EJ populations during the remainder of the MEPA review process, including a discussion of any of the best practices listed in the MEPA Public Involvement Protocol for Environmental Justice Populations (the "MEPA EJ Public Involvement Protocol") that the City intends to employ. The DEIR, or a summary thereof, should be distributed to all Community Based Organizations (CBOs) and tribes/indigenous organizations included in an "EJ Reference List" available from the MEPA Office; all statewide entities and those located in municipalities within one miles of the project site should be included. The City is encouraged to consult with the EEA EJ Director and the MEPA Office regarding community engagement strategies appropriate for the project, well before the filing of the DEIR. The City should hold at least one public information meeting about the project before filing the DEIR. (Environmental Justice)**

**Response** See **Chapter 3, "Environmental Justice**," **Appendix B and MEPA 02**.

**MEPA 30** **The DEIR should include an analysis of alternative designs and construction methods for the phased construction of the expansion cells. For each alternative, the DEIR should discuss its feasibility, describe inspection and maintenance procedures, and an evaluation with respect to minimizing erosion, siltation and degradation of the liner. The DEIR should clarify the anticipated timeline for the existing sludge landfill to reach capacity. According to MassDEP's guidance document entitled "Wastewater Residuals Guidance Document No. 89 2, Closure/Post Closure Requirements For Residuals Landfills", the owner or operator of a landfill must submit for MassDEP's review and approval a closure/post-closure plan at least six months prior to proposed closure activities. The closure/post-closure plan must be submitted to MassDEP as part of a WP34 Approval of Closure Plans for Wastewater Residual Landfills application. The DEIR should review alternatives for capping any portion of the**

**existing landfill where new waste has not or will not be applied within a one-year period, unless the area is permitted to accept additional waste, has reached final approved elevations, or any other criteria stated in the Solid Waste Management regulations at 310 CMR 19.115(e)(1)(a). The DEIR should include an analysis of capping designs and describe how the feasibility of the design and how it would address leachate production/management, odors, slope stability, and stormwater management. As requested in MassDEP's comment letter, the DEIR should evaluate alternative designs for construction of a hydraulic separation layer, in accordance with the requirements of MassDEP Solid Waste Management Regulations 310 CMR 19.110(5)(c), and leachate management system over the existing landfill in connection with its vertical expansion, and identify potential impacts of each alternative design. As noted above, a revised version of the HELP model is available for use in designing the proposed leachate management system in the expanded landfill. The DEIR should provide an updated leachate system design based on the use of the current version of the HELP model. (Landfill Design and Construction)**

**Response** See **Chapter 4, "Landfill Design and Construction**." See also response to **MEPA 01** and **MEPA 15**.

**MEPA 31** **The DEIR should confirm the number of all public and private water supply wells in Gardner and the surrounding communities within one mile of the site expansion area, and provide a map of the location of each well. The DEIR should confirm the number of all public and private water supply wells in Gardner and the surrounding communities within one mile of the site expansion area, and provide a map of the location of each well. In addition, it should include a map of all existing monitoring wells associated with the existing sludge landfill, municipal solid waste landfill, and proposed monitoring wells for the expansion project. It should discuss potential impacts to wells from migration of groundwater from the landfill and describe how the proposed groundwater monitoring program, including any additional monitoring wells that may be proposed, will detect potential impacts to the wells. (Groundwater)**

**Response** See **Chapter 5, "Groundwater**."

**MEPA 32** **The DEIR should include a discussion of how runoff will be managed during the period that the expanded landfill is being filled with sludge. It should clarify whether the proposed BMPs identified for the final capped condition will be in place and whether any additional BMPs or conveyance systems will be necessary on a temporary basis. The project will be required to develop a Stormwater Pollution Prevention Plan (SWPP) in accordance with its NPDES CGP to manage stormwater during the construction period. The DEIR should describe stormwater management measures that will be implemented during construction. (Stormwater)**

**Response** See **Chapter 6, "Stormwater**."

**MEPA 33** **The DEIR should describe the source of all the model parameters used in the LandGEM tool as they apply to sludge landfills rather than solid waste landfills. It should describe how landfill gas will be collected from the existing and proposed new portions of the sludge landfill evaluate potential measures to minimize odors and**

**GHG emissions associated with the gas. At a minimum, the DEIR should evaluate the feasibility of conveying those gases to the existing flare in operation at the nearby municipal solid waste landfill, which was approved by MassDEP in an Air Quality Plan Approval issued in 2005 and amended in 2008. The analysis of this connection between landfill gas collection systems should describe how gas will be vented, including during the winter when the ground surface is frozen, and monitored. The City should review federal regulations related to landfill gas emissions from solid waste landfills, including 40 CFR Part 60, to determine whether standards for capture and control of landfill gas would trigger MassDEP air permitting. The DEIR should confirm whether or not daily cover will be applied to the landfill; if not, it should discuss why this odor mitigation measure cannot be implemented. (Air Quality)**

**Response** See **Chapter 7, "Air Quality**." See also responses to **MEPA 15** and **MEPA 16**.

**MEPA 34** **The DEIR should review projected rainfall data for the years beyond 2050 available from the Resilient MA Climate Change Projections Dashboard to discuss the resiliency of the stormwater and leachate management system to future climate conditions associated with the 10- year, 25-year, and 50-year storm events. The DEIR should clarify whether the leachate management system is designed to be resilient to a certain storm event (e.g., 24-hour rainfall for a 100-year storm), and how such event compares to the recommended values provided by the MA Resilience Design Tool. The DEIR should include an analysis of the landfill's resilience to future climate conditions and describe any potential changes to the design of the final cap or proposed stormwater management system that may be necessary to maintain the long-term integrity of the landfill. (Climate Change)**

**Response** See **Chapter 8, "Climate Change**."

**MEPA 35** **The DEIR should provide a cut and fill analysis, including a plan, of the area in which the landfill expansion will be constructed. It should describe management of soil, including on-site stockpiling, off-site disposal, or reuse. The DEIR should identify construction-period impacts and mitigation relative to noise, air quality, water quality, and traffic, including the number and route of construction vehicles. It should confirm that the project will require its construction contractors to use Ultra Low Sulfur Diesel fuel, and discuss the use of after-engine emissions controls, such as oxidation catalysts or diesel particulate filters. More information regarding construction-period diesel emission mitigation may be found on MassDEP's web site at http://www.mass.gov/dep/air/diesel/conretro.pdf.The DEIR should describe the source of all the model parameters used in the LandGEM tool as they apply to sludge landfills rather than solid waste landfills. (Construction Period**)

**Response** See **Chapter 9, "Construction Period**."

**MEPA 36** **The DEIR should include a separate chapter summarizing all proposed mitigation measures including construction-period measures. This chapter should also include a comprehensive list of all commitments made by the Proponent to avoid, minimize and mitigate the environmental and related public health impacts of the project, and should include a separate section outlining mitigation commitments relative to EJ populations. The filing should contain clear commitments to implement these**

**mitigation measures, estimate the individual costs of each proposed measure, identify the parties responsible for implementation, and contain a schedule for implementation. The list of commitments should be provided in a tabular format organized by subject matter (traffic, water/wastewater, GHG, environmental justice, etc.) and identify the Agency Action or Permit associated with each category of impact. Draft Section 61 Findings should be separately included for each Agency Action to be taken on the project. The filing should clearly indicate which mitigation measures will be constructed or implemented based upon project phasing to ensure that adequate measures are in place to mitigate impacts associated with each development phase. (Mitigation and Draft Section 61 Findings)**

**Response** **Chapter 10 "Mitigation and Draft Section 61 Findings**" of this DEIR includes a summary of all proposed mitigation measures, including construction-period mitigation measures, all intended to avoid, minimize, and mitigate the environmental and public health related impacts of the Project. Chapter 10 also includes Draft Section 61 Findings.

**MEPA 37** **The DEIR should contain a copy of this Certificate and a copy of each comment letter received. It should include a comprehensive response to comments on the ENF that specifically address each issue raised in the comment letter; references to a chapter or sections of the DEIR alone are not adequate and should only be used, with reference to specific page numbers, to support a direct response. This directive is not intended to, and shall not be construed to, enlarge the Scope of the DEIR beyond what has been expressly identified in this certificate. (Response to Comments)**

**Response** This **Chapter 11, "Response to Comments**" of the DEIR is intended to address MEPA Comment 37.

**MEPA 38** **The Proponent should circulate the DEIR to each Person or Agency who previously commented on the ENF, each Agency from which the Project will seek Permits or Financial Assistance, and to any other Agency or Person identified in the Scope. Per 301 CMR 11.16(5), the Proponent may circulate copies of the EIR to commenters in CD-ROM format or by directing commenters to a project website address. However, the Proponent must make a reasonable number of hard copies available to accommodate those without convenient access to a computer and distribute these upon request on a first-come, first-served basis. The Proponent should send correspondence accompanying the digital copy or identifying the web address of the online version of the DEIR indicating that hard copies are available upon request, noting relevant comment deadlines, and appropriate addresses for submission of comments. A copy of the DEIR should be made available for review at the Gardner Public Library. (Circulation)**

**Response** See **Chapter 12, "Circulation List**." The DEIR will be circulated to parties as instructed. DEIR copies will be made available following the requirements as outlined in this comment.

**From:** Bob Chicoine
**To:** Strysky, Alexander (EEA)
**Subject:** Gardner Sledge Landfill Extension
**Date:** Tuesday, January 3, 2023 1:21:32 PM



Dear Secretary Theoharides,

This letter contains my comments on the Gardner Sludge Landfill Expansion Environmental Notification Form (ENF). This expansion project raises important concerns with the ENF and the need for further in-depth analysis via an Environmental Impact Report (EIR).My concerns are:

1. **Risk of ground water contamination with impact to drinking water and watershed.** CHI1 01

The project Vicinity Map – One Mile Radius (G002) does not identify all of the approximate 70 private drinking water wells. The ENF does identify the two Town of Templeton Public Drinking Water Wells within one mile of the site.

The Hydrogeological Evaluation Report (Appendix F) describes the geology of the site as having glacial outwash sand and gravel atopfractured and weathered bedrock. Therefore, this geology does not provide any natural containment and allows contaminants to travel faster and further. The ENF shows no attempt to model the release of contaminants to groundwater from the sludge landfill. CHI1 02

The ENF mentions a double composite groundwater protection system (GWPS). The GWPS's life expectancy is not specified and not guaranteed for any time period. Manmade infrastructure ultimately fails. If this system fails in 1, 5, 10, 25, or 100 years, no remediation procedure is specified to deal with contaminated private wells, public wells, or wetland resources. No bonding or reserve funding has been designated for remediation. CHI1 03

PFAS contamination has become a growing concern in Massachusetts and the Country. According to the US EPA, peer-reviewed studies have shown that PFAS may lead to increased risk of some cancers, reproductive effects in pregnant women, and developmental delays in children. According to the Gardner Wastewater Treatment Plant (WWTP) NPDES Permit (No. MA0100994), the now-closed Gardner Sanitary Landfill discharges an average on 1,182 gallons of non-process leachate to Gardner's WWTP. It is highly likely that this landfill leachate contains PFAS and this leachate is not tested for PFAS. Neither Gardner sludge or the Sludge Landfill monitoring wells are tested for PFAS. PFAS testing must be CHI1 04

done in order to determine the level of PFAS and evaluate the risk of dumping 4,000 cubic yards of sludge per year for 17 years at this site.

2. **Negative impacts to the public recreational use of the Wildwood Cemetery Forest, Cummings Otter River Conservation Area, and the Ebenezer Keyes Conservation Area.** CHI1 05

For many years, the community has used the Sludge Landfill Expansion project site location, within Gardner's Wildwood Cemetery Forest, for community recreation. This property abuts and connects with a network of trails on the Cummings Otter River Conservation Area. A blazed trail along the property's glacial period esker provides year-around use by the public for hiking, snow-shoeing, cross-country skiing, and hunting. The Gardner Conservation Department, North County Land Trust, and Millers River Watershed Council have conducted guided hikes to theseproperties. Destruction of 6 acres of forest and the persistent odors from the Sludge Landfill negatively impacts the use of both of thesebeautiful properties and the new NCLT-owned Ebenezer Keyes Conservation Area, located to the east of the expansion site.

3. **Continued source of ongoing poor air quality for entire area.** CHI1 06

The ENF does not mention historical odor problems with the existing Sludge Landfill. Air quality has been a consistent problem over many years and numerous odor complaints have been submitted by residents and visitors to the nearby conservation areas and cemeteries, includes 3 Catholic Cemeteries owned by Annunciation Parish. The cemeteries and conservation areas are visited by thousands of people. There are residential neighborhoods with approximately 563 adult residents with 272 homes per the street listings for Gardner and Templeton. The one-mile radius is also home to facilities owned by 13 businesses, 3 social organizations, and 3 religious organizations.
The odors are nauseating to those who visit this area. The City has not installed air quality monitoring devices in order to determine the frequency and intensity of odors. Instead, the City has depended on residents and visitors filing odor complaints, a process neithereffective and widely known.

4. **Destruction of 6 acres of natural resources including wildlife habitat, forest, a natural esker, and close-proximity to two certified vernal pools.** CHI1 07

The planned expansion will destroy 6 acres of Gardner's natural resources, including a hardwood forest, wildlife habitat, and a geologically important esker in the Wildwood Cemetery Forest.
This expansion is inconsistent with the City's own Wildwood Forest Management Plan (2012) that has the following stated goals: "The City of Gardner would like to improve and protect the forest resources on the Wildwood Cemetery property for the benefit of the residents of Gardner. Protecting water quality is a high priority.

Maintaining and improving aesthetics near the Cemetery is extremely important as well."

5. **Failure of the City of Gardner to present a thorough and accurate examination of alternative sludge management options.** CHI1 08

The alternatives analysis dismisses sludge disposal alternatives without completing a single feasibility study of any such alternative. The alternatives analysis fails to consider partnering with any neighboring communities or pursuing a private sector partnership for a viable alternative to the project. The City has rejected pursuit of a phased construction of the project which will, in effect, commit the City to the 17-year landfill expansion. This effectively prevents the City from migrating to an economically and environmentally better alternative within 17 years. With this Project, Gardner will not be able to take advantage of innovation in the other alternatives or partner with other communities in pursuit of a sustainable solution prior to 2042.

The presence of an Environmental Justice community is within one mile of the project site and should trigger the threshold for requiring an Environmental Impact Report (EIR). An EIR will provide more in-depth analysis of the environmental & human impacts and alternatives to this project. CHI1 09

Please feel free to contact me if you have any questions.

Sincerely,

Robert L Chicoine
300 Clark Street
Gardner Ma 01440
bobchic1s@aim.com
978-410-4044

Sent from my iPhone

## 11.3 Robert Chicoine1 (CHI1)

**CHI1 01** **Risk of ground water contamination with impact to drinking water and watershed. The project Vicinity Map – One Mile Radius (G002) does not identify all of the approximate 70 private drinking water wells. The ENF does identify the two Town of Templeton Public Drinking Water Wells within one mile of the site. (Groundwater)**

**Response** See **Chapter 5, "Groundwater**," and response to MEPA 11. **Figure 5-1** illustrates the location of public and private wells within one mile of the Project Site.

**CHI1 02** **The Hydrogeological Evaluation Report (Appendix F) describes the geology of the site as having glacial outwash sand and gravel atop fractured and weathered bedrock. Therefore, this geology does not provide any natural containment and allows contaminants to travel faster and further. The ENF shows no attempt to model the release of contaminants to groundwater from the sludge landfill. (Groundwater)**

**Response** See **Section 5.5, Chapter 5, "Groundwater**." As described in that chapter, the Project would be constructed with a double composite groundwater protection system with leak detection and be designed to meet a more rigorous standard historically reserved for solid waste landfills (310 CMR 19.110). The Project would also be designed to a higher standard than the existing sludge landfill and would be an improvement over existing conditions. The Project's groundwater protection system would function as a barrier to separate the applied sludge and any generated leachate from the groundwater sources beneath it. Thus, the project would be designed to protect groundwater resources from contamination.

A groundwater flow model was developed for the Project. The primary objective of the groundwater flow model was to simulate groundwater conditions in the vicinity of the Project Site to support design activities. Specifically, the model was used to predict the effect of landfill expansion on groundwater flow; evaluate the adequacy of the existing monitoring well network; make recommendations for additional wells to be installed and other changes to the existing monitoring program; and model the effects of mounding at stormwater detention basins where stormwater is to be directed. Based on the results of the pre-construction and post-expansion model runs, the adequacy of the existing monitoring well network was evaluated. Anticipated changes to groundwater flow within the Project Site post-construction are expected to be minimal. Groundwater elevations appear slightly elevated in the Project Site compared with pre-construction modeling and the effects of the planned stormwater ponds on the water table are expected to be minimal.

Hydrogeologic modeling determined that with the proposed groundwater protection system, and the implementation of the monitoring and sampling plan, impacts to groundwater are not anticipated with this Project.

To ensure the protection of groundwater resources, two additional monitoring wells are proposed to be installed. An additional monitoring well, designated SL-4, would be installed upgradient of the landfill near the north entrance road at the southern edge of the solar field to monitor background groundwater characteristics; and an additional downgradient monitoring location (CDR-5) is proposed to assist with evaluating potential effects on groundwater from the Project. To further protect groundwater resources,

environmental monitoring and reporting would include these two additional monitoring wells.

**CHI1 03** **The ENF mentions a double composite groundwater protection system (GWPS). The GWPS's life expectancy is not specified and not guaranteed for any time period. Manmade infrastructure ultimately fails. If this system fails in 1, 5, 10, 25, or 100 years, no remediation procedure is specified to deal with contaminated private wells, public wells, or wetland resources. No bonding or reserve funding has been designated for remediation. (Groundwater)**

**Response** See **Chapter 5, "Groundwater**." The materials used for the proposed groundwater protection system are expected to have a lifespan that exceeds the Project's life expectancy, and the materials used in the design of the landfill expansion would be approved through the permitting process with MassDEP.

If damage occurs to the leachate collection system or the liner, the operator shall isolate that cell from the normal operation of the landfill and make immediate plans to repair and/or replace the damage. Repairs to the synthetic membrane must be performed in accordance with the specifications approved in the design plans.

**CHI1 04** **PFAS contamination has become a growing concern in Massachusetts and the Country. According to the US EPA, peer-reviewed studies have shown that PFAS may lead to increased risk of some cancers, reproductive effects in pregnant women, and developmental delays in children. According to the Gardner Wastewater Treatment Plant (WWTP) NPDES Permit (No. MA0100994), the now-closed Gardner Sanitary Landfill discharges an average of 1,182 gallons of non-process leachate to Gardner's WWTP. It is highly likely that this landfill leachate contains PFAS and this leachate is not tested for PFAS. Neither Gardner sludge or the Sludge Landfill monitoring wells are tested for PFAS. PFAS testing must be done in order to determine the level of PFAS and evaluate the risk of dumping 4,000 cubic yards of sludge per year for 17 years at this site. (Groundwater)**

**Response** See **Chapter 5, "Groundwater**." Groundwater monitoring would be conducted in accordance with all applicable regulations as outlined in the Operations and Maintenance Plan. Leachate collected at the existing sludge landfill is directed to the City's WWTF, where it is required to be tested for PFAS. With the Project, leachate would continue to be tested in accordance with all applicable regulations. Operation of the former solid waste landfill is outside the scope of this DEIR.

**CHI1 05** **Negative impacts to the public recreational use of the Wildwood Cemetery Forest, Cummings Otter River Conservation Area, and the Ebenezer Keyes Conservation Area.**

**For many years, the community has used the Sludge Landfill Expansion project site location, within Gardner's Wildwood Cemetery Forest, for community recreation. This property abuts and connects with a network of trails on the Cummings Otter River Conservation Area. A blazed trail along the property's glacial period esker provides year-around use by the public for hiking, snowshoeing, cross-country skiing, and hunting. The Gardner Conservation Department, North County Land Trust, and**

**Millers River Watershed Council have conducted guided hikes to these properties. Destruction of 6 acres of forest and the persistent odors from the Sludge Landfill negatively impacts the use of both of these beautiful properties and the new NCLT-owned Ebenezer Keyes Conservation Area, located to the east of the expansion site. (Project Description and Permitting) (Air Quality)**

**Response** See **Chapter 1, "Project Description and Permitting**." There would be no direct impacts to open space at the Wildwood Cemetery, Cummings Conservation Area, or the Ebenezer Keyes Conservation Area with the Project.

According to City GIS records, the Esker Ridge Trail traverses the Project Site (see **Figure 1-3**). The Project would eliminate a portion of the Esker Ridge Trail; however no formal easements onto 850 West Street have been found on record. Therefore, the loss of portions of this trail is not considered a significant adverse open space impact. In addition, there is approximately 150 acres (78.5-acre Cummings Conservation Area, 44-acre St. John's Cemetery, 27.9-acre Notre Dame Cemetery) of open space available to the public nearby.

See **Chapter 7, "Air Quality**." Odors are likely to continue to be experienced at adjacent recreational spaces; however, as odors are present in existing conditions, this does not constitute a significant adverse impact with the Project.

**CHI1 06** **Continued source of ongoing poor air quality for entire area. - The ENF does not mention historical odor problems with the existing Sludge Landfill. Air quality has been a consistent problem over many years and numerous odor complaints have been submitted by residents and visitors to the nearby conservation areas and cemeteries, includes 3 Catholic Cemeteries owned by Annunciation Parish. The cemeteries and conservation areas are visited by thousands of people. There are residential neighborhoods with approximately 563 adult residents with 272 homes per the street listings for Gardner and Templeton. The one-mile radius is also home to facilities owned by 13 businesses, 3 social organizations, and 3 religious organizations.**

**The odors are nauseating to those who visit this area. The City has not installed air quality monitoring devices in order to determine the frequency and intensity of odors. Instead, the City has depended on residents and visitors filing odor complaints, a process neither effective and widely known. (Air Quality)**

**Response** See **Chapter 7, "Air Quality**." As described in **Section 7.6.1**, existing odor concerns have been evaluated. Sludge landfill operations are not proposed to increase from existing operations and landfilling would continue at the same rate and quantity. Therefore, there would be no air quality and/or odor impact with the implementation of the Project. Odors are proposed to continue to be managed through operational practices.

To mitigate odors associated with the existing landfill, the Project would implement an interim cover and cap portions of the existing landfill no longer receiving sludge. It is currently projected, based on remaining volume, that this would occur in Quarter 3 of 2028 (see **Chapter 4, "Landfill Design and Construction"**). Additionally, it is proposed that, with the Project, a new detailed complaint form would be implemented to ensure consistency of information being collected and investigated upon to be included in future

Annual Operations Reports. Furthermore, the City would prepare a fact sheet on air quality and odors and its relationship to public health; information on the protocol for filing an odor complaint; information on sludge landfill operations and when the public is likely to experience odors from sludge handling activities; and an online survey that would be posted to the City's website and advertised on the City's social media accounts.

The survey would assist the City in determining if odors are emanating from the sludge landfill (and not other potential contributors of odor in the City). Survey data would be tracked and mapped, help the City gain a better understanding of existing odor concerns, and would inform changes in operational practices and future odor reduction projects pursued by the City.

Finally, the City would continue to explore technologies that reduce odors and the feasibility of their implementation on a continual basis.

Air quality monitoring devices (i.e., electronic monitoring) are not considered to be an accurate method for assessing odors. This approach would include a continuous monitor measuring a specific chemical (e.g. hydrogen sulfide) known to be a significant contributor to odor. However, landfills emit a variety of chemicals that contribute to odor, and measurement of one specific chemical to serve as a surrogate is not considered reliable. Another issue with this approach is where to site the monitor(s), as odors would tend to drift with wind direction and emanate differently depending on whether the face is being worked, the composition of recently received material, the weather and time of year. Therefore, electronic monitoring is not proposed with the Project.

**CHI1 07** **Destruction of 6 acres of natural resources including wildlife habitat, forest, a natural esker, and close proximity to two certified vernal pools.**

**The planned expansion will destroy 6 acres of Gardner's natural resources, including a hardwood forest, wildlife habitat, and a geologically important esker in the Wildwood Cemetery Forest. This expansion is inconsistent with the City's own Wildwood Forest Management Plan (2012) that has the following stated goals: "The City of Gardner would like to improve and protect the forest resources on the Wildwood Cemetery property for the benefit of the residents of Gardner. Protecting water quality is a high priority. Maintaining and improving aesthetics near the Cemetery is extremely important as well." (Project Description and Permitting)**

**Response** See **Chapter 1, "Project Description and Permitting**." Construction of the Project would involve tree removal, including approximately 5.8 acres of forested area, consisting primarily of white pine and mixed hardwoods, within the Project Site. With the availability of approximately 102.2 acres of forested area remaining in the Project Area after expansion of the landfill is complete, the loss of 5.8 acres of forested area is not considered a significant adverse natural resource or wildlife habitat impact.

See **Section 1.10** for a discussion of the Wildwood Forest Management Plan. This plan expired in 2021. The City may pursue an update to this plan to include the harvest of timber removed in the Project Site footprint, an action that is consistent with the original plan,

which states "the proposed areas [for timber harvesting] may change based on priority, markets and landowner goals for the property."

See also **Chapters 5, "Groundwater**," and **6, "Stormwater**," for a discussion on the Projects measures to protect water quality.

Furthermore, the Project would not be visible from the Wildwood Cemetery; therefore, no significant adverse aesthetic impacts are anticipated with the Project.

**CHI1 08** **Failure of the City of Gardner to present a thorough and accurate examination of alternative sludge management options. The alternatives analysis dismisses sludge disposal alternatives without completing a single feasibility study of any such alternative. The alternatives analysis fails to consider partnering with any neighboring communities or pursuing a private sector partnership for a viable alternative to the project. The City has rejected pursuit of a phased construction of the project which will, in effect, commit the City to the 17-year landfill expansion. This effectively prevents the City from migrating to an economically and environmentally better alternative within 17 years. With this Project, Gardner will not be able to take advantage of innovation in the other alternatives or partner with other communities in pursuit of a sustainable solution prior to 2042. (Alternatives Analysis)**

**Response** See **Chapter 2, "Alternatives Analysis**."

**CHI1 09** **The presence of an Environmental Justice community is within one mile of the project site and should trigger the threshold for requiring an Environmental Impact Report (EIR). An EIR will provide more in-depth analysis of the environmental & human impacts and alternatives to this project. (Environmental Justice)**

**Response** See **Chapter 3, "Environmental Justice**" and comment/response to **MEPA 02** and **MEPA 29**. Using geographic information system (GIS), the one-mile radius was measured from the Project Site boundary, which is the extent of the limit of disturbance and footprint of the Project. This methodology followed MEPA guidance on calculating the distance. Although the project is not located within one mile of an Environmental Justice population, the City has provided a preliminary environmental justice assessment (**Chapter 3, "Environmental Justice"** of this DEIR) and developed a Public Involvement Plan (**Appendix B**) to inform and involve the Environmental Justice-designated communities of the City in the Project.

| | |
|---|---|
| **From:** | David Peabody |
| **To:** | Strysky, Alexander (EEA) |
| **Cc:** | Alan Rousseau |
| **Subject:** | Gardner, MA Sludge Landfill |
| **Date:** | Wednesday, January 4, 2023 12:35:57 PM |



Dear Mr. Strysky,

As a resident and taxpayer in Gardner, MA I have witnessed folly, ego, and utter disregard for liveability in the decisions made, taken, and then clung to by city official. While it is arguable that Gardner should use Town Meeting governance and would perhaps be more responsive to citizen objection... that is a battle for a different day.

Today's battle is an old one. Two decades ago the solution for the cities sewage sludge was to create another pile behind the already capped rubbish landfill. The stench cloud from that new facility has been almost ever-present where I live 2.6 miles downwind. I even discussed with my attorney suing the city for "infringing upon the peaceful enjoyment of my property" for the invisible olfactory offense. He suggested I move rather than waste money suing. There have been many warm summer evenings when the gaseous invader, the sludge landfill stench, has forced me inside. It has not allowed me to sit on my beautiful stone patio for which I saved for years for and worked hard to create. PEA 01

To describe the stench, assume the smell of the most viral of diarrheas' concentrated as in a small toilet room without a fan. This is the offense that is being transported in the air to my home. You step outside... take a deep inhale of the "fresh air" only to realize that today, IT IS NOT CLEAN AIR.

With an almost constant wind from the west ALL of metropolitan Gardner is downwind. The topography of Gardner's hills bend the flow around a bit to the southeast placing my home directly in the line of fire(see illustration). The freeze of winter brings some respite, frozen poop cannot molder and therefore off-gasses less.

There ARE so many better solutions than to expand the current sludge dump. Digester methane to energy, processing for fertilizers, commercial char production,... ANYTHING BUT STACKING IT UP. and repeating the twenty year old mistake. PEA 02

For an illustration of how irresponsible the city can be, I give you the methane harvest from the capped city landfill. Originally the methane was just burned and wasted. Citizens raised concern, a grant was obtained and a methane to electricity generator was obtained and installed. More than 8 years ago now, a fire burned the inside of the generator building. It has not been repaired. The disposal of the methane has returned to being wasted... just burned. PEA 03

I want you to consider also that after 50 years of EPA mandated BETTER water PEA 04

treatment, the otters have returned to the Otter River. The water that drains from the sludge landfill when breaches or overflows occur goes almost directly into tributaries of the Otter River. Expanding the Sludge Landfill will exacerbate this current problem.

I also add to the fact pile that Gardner official have quietly said behind the scenes, that in order to make the current proposal work financially, the city may have to import sludge from other cities. This flimflam was also used three decades ago during the 10 year long "capping" of the old landfill. In order to "pay" for the capping, the city imported commercial construction refuse for 8 long years. ONLY then, as time was running out on the "within ten years mandate" they placed the methane pipes, the cover membrane, soil, and grass seed. PEA 05

Mr. Strysky, the alternate solution may not be within your purview, BUT a denial will force the city to consider other less harmful solutions.

Regards and Thank You for you time

David K Peabody
3 Jackson Park
Gardner, MA 01440
508-479-5278


68
Central St
Parker St
Gardner
Main St
Elm St
101
2A
2A
2
2
Home
4131 ft
68

## 11.4 David K Peabody (PEA)

**PEA 01** **Two decades ago the solution for the cities sewage sludge was to create another pile behind the already capped rubbish landfill. The stench cloud from that new facility has been almost ever-present where I live 2.6 miles downwind. I even discussed with my attorney suing the city for "infringing upon the peaceful enjoyment of my property" for the invisible olfactory offense. He suggested I move rather than waste money suing. There have been many warm summer evenings when the gaseous invader, the sludge landfill stench, has forced me inside. It has not allowed me to sit on my beautiful stone patio for which I saved for years for and worked hard to create.**

**To describe the stench, assume the smell of the most viral of diarrheas' concentrated as in a small toilet room without a fan. This is the offense that is being transported in the air to my home. You step outside… take a deep inhale of the "fresh air" only to realize that today, IT IS NOT CLEAN AIR.**

**With an almost constant wind from the west ALL of metropolitan Gardner is downwind. The topography of Gardner's hills bend the flow around a bit to the southeast placing my home directly in the line of fire(see illustration). The freeze of winter brings some respite, frozen poop cannot molder and therefore off-gasses less. (Air Quality)**

**Response** See response to **MEPA 16** and **CHI1 06**.

**PEA 02** **There ARE so many better solutions than to expand the current sludge dump. Digester methane to energy, processing for fertilizers, commercial char production,… ANYTHING BUT STACKING IT UP. and repeating the twenty-year-old mistake. (Alternatives Analysis)**

**Response** See **Chapter 2, "Alternatives Analysis**."

**PEA 03** **For an illustration of how irresponsible the city can be, I give you the methane harvest from the capped city landfill. Originally the methane was just burned and wasted. Citizens raised concern, a grant was obtained and a methane to electricity generator was obtained and installed. More than 8 years ago now, a fire burned the inside of the generator building. It has not been repaired. The disposal of the methane has returned to being wasted… just burned. (Air Quality)**

**Response** The former solid waste landfill is outside the scope of this DEIR. See **Chapter 7, "Air Quality**," for a discussion on the Project's gas emissions.

**PEA 04** **I want you to consider also that after 50 years of EPA mandated BETTER water treatment, the otters have returned to the Otter River. The water that drains from the sludge landfill when breaches or overflows occur goes almost directly into tributaries of the Otter River. Expanding the Sludge Landfill will exacerbate this current problem. (Stormwater)**

**Response** See **Chapter 6, "Stormwater**" and **MEPA 32**. As described in that chapter, clean rainwater would be directed to the Project's proposed stormwater management infrastructure, which have been designed in accordance with MassDEP Stormwater Management Standards, and which would naturally attenuate and treat stormwater. Massachusetts regulatory design standards require the stormwater management system

to control the peak rate of run-off resulting from a 24-hour, 25-year storm and control the peak rate of run-off from the landfill resulting from a 24-hour, 100-year design storm event to the most prudent extent practicable. Stormwater that falls onto active sludge landfill areas is called leachate. Leachate would be collected and pumped back to the City's WWTF for treatment in accordance with applicable water quality regulations. A Stormwater Pollution Prevention Plan would be prepared in accordance with EPA's National Pollutant Discharge Elimination System Construction General Permit and would detail the measures to prevent stormwater contamination, control sedimentation and erosion, and maintain compliance with the Clean Water Act during construction.

**PEA 05** **I also add to the fact pile that Gardner official have quietly said behind the scenes, that in order to make the current proposal work financially, the city may have to import sludge from other cities. This flimflam was also used three decades ago during the 10 year long "capping" of the old landfill. In order to "pay" for the capping, the city imported commercial construction refuse for 8 long years. ONLY then, as time was running out on the "within ten years mandate" they placed the methane pipes, the cover membrane, soil, and grass seed. Mr. Strysky, the alternate solution may not be within your purview, BUT a denial will force the city to consider other less harmful solutions. (Alternatives Analysis)**

**Response** See **Chapter 2, "Alternatives Analysis**." Comments made with respect to the City's former solid waste landfill, are outside the scope of this DEIR.

alexander.strysky@mass.gov



# View Comment

## Comment Details

| | | | |
|---|---|---|---|
| **EEA #/MEPA ID**<br>16643 | **First Name**<br>Adam | **Address Line 1**<br>160 Patriots Road, Rm. 6 | **Organization**<br>Town of Templeton |
| **Comments Submit Date**<br>1-9-2023 | **Last Name**<br>Lamontagne | **Address Line 2**<br>-- | **Affiliation Description**<br>Municipality |
| **Certificate Action Date**<br>1-31-2023 | **Phone**<br>-- | **State**<br>MASSACHUSETTS | **Status**<br>Accepted |
| **Reviewer**<br>Alexander Strysky (857)408-6957, alexander.strysky@mass.gov | **Email**<br>alamontagne@templetonma.gov | **Zip Code**<br>01438 | |

## Comment Title or Subject

**Topic**: Letter from Select Board

## Comments

Please find the attached letter from the Templeton Select Board

## Attachments

Letter to EEA re Gardner Sludge Exp_Templeton SB_28DEC22_esign.pdf(null)

## Update Status

**Status**

Accepted

SUBMIT

## Share Comment

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BACK TO SEARCH RESULTS

**TOWN OF TEMPLETON**
**SELECT BOARD**
**160 Patriots Road, P.O. Box 620**
**EAST TEMPLETON, MASSACHUSETTS 01438**
**TEL: (978) 894-2755**

December 28, 2022

Beth A. Card, Secretary of Energy and Environmental Affairs
Executive Office of Energy and Environmental Affairs (EEA)
Attn: MEPA Office
EEA No. TBD
100 Cambridge Street, Suite 900
Boston, MA 02114

Secretary Card,

Congratulations on your appointment in May 2022! We, the Select Board of Templeton, are writing to you today relative to the 4.3-acre 850 West Street Landfill Expansion Project, or commonly known as the "Sludge Landfill Expansion" in Gardner, MA. We currently have a great intermunicipal relationship with Mayor Nicholson and several of his city departments; we would like to continue this, but we are writing as we are pressed with the EEA deadline of January 12th.

A Templeton Village, East Templeton, not only shares a border with Gardner and the proposed expansion, but this village is currently serviced by Gardner's Waste Water Plant and therefore interlinked with the project as a whole. We would also like to further describe our town's proximity to the landfill by offering that 2 of our 4 town fresh water wells are in relatively close proximity, hydrologically speaking. We have had 2 public meetings where various experts (from our own water and sewer department), local abutters, and concerned residents offered observations, support, and opposition. We share many of these concerns and ask you to investigate and provide oversight in this matter. Our Town Administrator sent a letter dated August 4, 2022 to the Gardner Conservation Commission with our succinct but direct concerns with no response.

The environmental impact of the existing sludge landfill and proposed expansion are a potential threat to our wells and wetlands. We understand the technical sureties of this project, but we are still concerned with the process of compliance, hazard mitigation, and potential liability in the event of a containment breach. We understand that the Gardner DPW Water and Sewer's fact sheet on the project identifies that an Analysis of Alternatives was conducted and 8 other projects were considered; we were never consulted concerning these, nor impacts in the event of a leakage, however unlikely. With respect to risk mitigation, we would petition the project owners to offer a Hazard Mitigation plan, reviewed by experts and selected emergency management officials that is based in likelihood and severity of a possible containment breach.

TEM 01

TEM 02

TEM 03

Finally, we understand that the Gardner Conservation Commission approval vote of 14 November 2022 was not unanimous. We hope you will take these concerns into consideration. We wish for our water to be clean and safe! Our Town Administrator can be reached at alamontagne@templetonma.gov. Thank you!

SELECT BOARD,

Timothy Toth (Jan 6, 2023 21:28 EST)
Timothy Toth, Chair

Michael Currie, Vice Chair

Theresa Griffis
Theresa Griffis (Jan 5, 2023 21:50 EST)
Theresa Griffis, Clerk

Julie Richard
Julie Richard (Jan 6, 2023 15:24 EST)
Julie Richard, Member

Jeffrey P. Bennett
Jeffrey P. Bennett (Jan 7, 2023 09:51 EST)
Jeffrey Bennett, Member

## 11.5 Town of Templeton Select Board (TEM)

**TEM 01** **The environmental impact of the existing sludge landfill and proposed expansion are a potential threat to our wells and wetlands. We understand the technical sureties of this project, but we are still concerned with the process of compliance, hazard mitigation, and potential liability in the event of a containment breach. (Project Description and Permitting) (Groundwater)**

**Response** A discussion of potential impacts to wells is provided in **Chapter 5, "Groundwater**," of this DEIR. As discussed in that chapter, with the measures in-place (i.e., redundant leachate management and leak detection systems) and two additional monitoring wells, no significant adverse impacts to groundwater are anticipated. A discussion of potential impacts to wetlands is provided in **Chapter 6, "Stormwater,"** of this DEIR. As discussed in that chapter, with the measures in place (i.e., bioretention pond, infiltration basins, stormwater conveyance, and stormwater pretreatment) and the Project's compliance with the MassDEP issued Order of Conditions, no significant adverse impacts to wetlands are anticipated. The Project has been designed and would be constructed and operated in accordance with all applicable regulations and approvals from MassDEP. In the event of a containment breach, the landfill operator would enact appropriate procedures as defined in the Operations and Maintenance Plan. See also response to CHI1 03.

**TEM 02** **We understand that the Gardner DPW Water and Sewer's fact sheet on the project identifies that an Analysis of Alternatives was conducted and 8 other projects were considered; we were never consulted concerning these, nor impacts in the event of a leakage, however unlikely. (Circulation) (Groundwater)**

**Response** See **Chapter 12, "Circulation**." The Town of Templeton has been added to the DEIR Circulation List.

See also responses to **CHI1 02** and **CHI1 03**. If damage occurs to the groundwater protection system, the operator would isolate that cell from the normal operation of the landfill and make immediate plans to repair and/or replace the damage. Repairs to the synthetic membrane would be performed in accordance with the specifications approved in the design plans.

**TEM 03** **With respect to mitigation, we would petition the project owners to offer a Hazard Mitigation plan, reviewed by experts and selected emergency management officials that is based in likelihood and severity of a possible containment breach. (Landfill Design and Construction)**

**Response** Operation and maintenance of the landfill expansion would be conducted in accordance with an approved Operation and Maintenance Plan. The development of a separate Hazard Mitigation Plan for the Project is outside the scope of this DEIR.

Beyond the State Hazard Mitigation and Climate Adaptation Plan, cities and towns in Massachusetts that receive Federal Emergency Management Agency (FEMA) funding must have a local or regional hazard mitigation plan. The Montachusett Region Hazard Mitigation Plan, prepared by the Montachusett Regional Planning Commission, served as this region's hazard mitigation plan from 2016 until its expiration in 2021. While some municipalities covered under this regional plan went on to develop their own local hazard

mitigation plans after the 2021 expiration, other municipalities in this region do not currently have their own plans (i.e., Hubbardston, Templeton, Gardner). The City would support the Montachusett Regional Planning Commission in pursuing and obtaining FEMA funding to update its regional plan.

Energy & Environmental Affairs (https://www.mass.gov/orgs/executive-office-of-energy-and-environmental-affairs)

# Public Comments Portal

alexander.strysky@mass.gov



# View Comment

## Comment Details

**EEA #/MEPA ID**
16643

**Comments Submit Date**
1-17-2023

**Certificate Action Date**
1-31-2023

**Reviewer**
Alexander Strysky (857)408-6957, alexander.strysky@mass.gov

**First Name**
Josh

**Last Name**
Forgues

**Phone**
--

**Email**
Underpantgnome83@yahoo.com

**Address Line 1**
104 Ryan St

**Address Line 2**
--

**State**
MASSACHUSETTS

**Zip Code**
01440

**Organization**
Resident

**Affiliation Description**
Individual

**Status**
Opened

## Comment Title or Subject

**Topic**: No on the Sludge Landfill Expansion

## Comments

Hello,

As a 30+ year resident of Gardner, who currently lives about 1 mile away from the Sludge Landfill, I do not see any benefit of expanding its size. As it is currently, we can smell it festering anytime the wind blows from that direction, and it is exponentially worse in the summer months. This project also appears that it could have a dramatic impact on the local wildlife and wetlands/drinking water in the area. It does appear that there could be other, environmentally friendly options to recycle this sludge, that would better benefit the wildlife and residents of the surrounding communities.

Thanks you,

FOR 01

## Attachments

## Update Status

**Status**

Opened

SUBMIT

## Share Comment

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## 11.6 Josh Forgues (FOR)

**FOR 01** **As a 30+ year resident of Gardner, who currently lives about 1 mile away from the Sludge Landfill, I do not see any benefit of expanding its size. As it is currently, we can smell it festering anytime the wind blows from that direction, and it is exponentially worse in the summer months. This project also appears that it could have a dramatic impact on the local wildlife and wetlands/drinking water in the area. It does appear that there could be other, environmentally friendly options to recycle this sludge, that would better benefit the wildlife and residents of the surrounding communities. (Alternatives Analysis) (Air Quality) (Project Description and Permitting) (Groundwater) (Stormwater)**

**Response** See **Chapter 2, "Alternatives Analysis**." In summary, expanding the sludge landfill is an economical solution to Gardner's continued sludge disposal needs that would shelter City ratepayers from increasingly volatile off-site hauling costs with relatively limited environmental impact compared to other alternatives.

See **Chapter 7, "Air Quality**" and responses to **MEPA 16** and **CHI1 06**.

See **Chapter 1, "Project Description and Permitting**" and response to **CHI1 07**. With the availability of approximately 102.2 acres of forested area remaining in the Project Area after expansion of the landfill is complete, the loss of 5.8 acres of forested area is not considered a significant adverse natural resource or wildlife habitat impact.

Potential impacts to wetlands and drinking water and measures to protect these resources are discussed in **Chapters 5, "Groundwater**," and **6, "Stormwater."** See also responses to **TEM 01** and **CHI1 02**.

**From:** Jeffrey Lore"
**To:** Strysky, Alexander (EEA)
**Subject:** Gardner sludge landfill project
**Date:** Tuesday, January 17, 2023 12:15:30 PM

---



Sir,
I have resided at 19 Watkins Street I the city of Gardner, MA for more than thirty years. I am highly opposed to approval of this project for a great many reasons. The greatest being it's very real potential to pollute, and render drinkable, my well water. My community grew out of an area that was a recreational area many years ago with just a few scattered camps around what is known as Parker's Pond. There is no city water in our community. While there is city sewerage, outside of a very few homes close to the West Street end of the neighborhood, the remaining majority of homes receive their water via wells. There are 71 wells that would be affected. Several are still shallow dug, which will certainly be impacted by draining and dredging as they were the last time the city did this. What the city is proposing is simply dangerous and would be disastrous to the community as well as the conservation and wild lands surrounding it. I beg you to please reject this project that the city is proposing. It is thoughtless, short sighted, and motivated by a wrong headed mentality in our local government.
Thank you for you kind consideration.
Sincerely, Pastor Jeffrey W. Lore,
Sent from my iPhone

LOR 01

## 11.7 Jeffrey Lore (LOR)

**LOR 01** **I am highly opposed to approval of this project for a great many reasons. The greatest being it's very real potential to pollute, and render drinkable, my well water. My community grew out of an area that was a recreational area many years ago with just a few scattered camps around what is known as Parker's Pond. There is no city water in our community. While there is city sewerage, outside of a very few homes close to the West Street end of the neighborhood, the remaining majority of homes receive their water via wells. There are 71 wells that would be affected. Several are still shallow dug, which will certainly be impacted by draining and dredging as they were the last time the city did this. What the city is proposing is simply dangerous and would be disastrous to the community as well as the conservation and wild lands surrounding it. I beg you to please reject this project that the city is proposing. It is thoughtless, short sighted, and motivated by a wrong headed mentality in our local government. (Groundwater) (Construction Period)**

**Response** The City acknowledges that the commenter is opposed to the project. See **Chapter 5, "Groundwater"** regarding protection of groundwater resources. As detailed in that chapter, the Project would include measures to protect groundwater, including a leachate management system consisting of five impermeable barrier layers, a primary leachate collection system, and a leak detection and secondary leachate collection system. The leak detection system is designed to warn of a potential breech in the primary leachate collection system such that it can be assessed and remedied. The system is designed to capture leachate that moves through the landfill and transport this leachate back to the Gardner WWTF creating a closed loop system thereby protecting the underlying groundwater and significantly reducing the likelihood of impacting downgradient surface water and groundwater resources.

See **Chapter 9, "Construction Period**." a Stormwater Pollution Prevention Plan would be prepared in accordance with EPA's National Pollutant Discharge Elimination System Construction General Permit. The Stormwater Pollution Prevention Plan would detail the construction activities to be incorporated to prevent stormwater contamination, control sedimentation and erosion, and maintain compliance with the Clean Water Act. The Stormwater Pollution Prevention Plan would also contain erosion and sediment controls specific to project activities and detailed in a supplemental Erosion and Sediment Control Plan.

See also **Chapter 1, "Project Description and Permitting**." As detailed in that chapter, the Project would not directly affect adjacent conservation lands.

**From:** Cheryl Alvarez
**To:** Strysky, Alexander (EEA)
**Subject:** Gardner Sludge
**Date:** Friday, January 20, 2023 8:29:54 PM

---



Hello

Saw this circulating. My family resides in Templeton. We believe that sludge from landfills or dumps is most likely to be toxic in some way. We would like for the expansion of Gardners Landfill dump to be stopped. We are concerned about our water supply in Templeton MA. We have children drinking and bathing in the towns water. ALV 01

Thank You,
Cheryl Alvarez Templeton MA resident

## 11.8 Cheryl Alvarez (ALV)

**ALV 01** **My family resides in Templeton. We believe that sludge from landfills or dumps is most likely to be toxic in some way. We would like for the expansion of Gardners Landfill dump to be stopped. We are concerned about our water supply in Templeton MA. We have children drinking and bathing in the towns water. (Groundwater)**

**Response** See **Chapter 5, "Groundwater**" and responses to **CHI1 02** and **TEM 01**. With the measures in-place (i.e., redundant leachate management and leak detection systems) and two additional monitoring wells, no significant adverse impacts to groundwater are anticipated.

**From:** Taylor Sala
**To:** Strysky, Alexander (EEA); Strysky, Alexander (EEA)
**Subject:** Gardner MA toxic sludge landfill project
**Date:** Friday, January 20, 2023 3:57:36 PM

---



Hello Mr. Strysky,

I wanted to reach out in regards to the Gardner toxic sludge landfill. I am incredibly disheartened and astounded that the city is proposing to move their landfill close to the water supply of our town of Templeton. It is reminding me of the movie A Civil Action based on the reservoir case I once studied in torts class in college. It is a very unsettling thought that the city thought this was a good idea to push their landfill boundaries and pollute our water that is used for drinking, showering/baths, and washing clothes/dishes. It feels as though there is a complete disregard for human life to move forward with this project. I had contacted Jan Greenwood who laughed off my concerns and said the notice was posted in December around the 15th which is not enough time for residents of Templeton to learn and know the next steps, especially when it's the holiday season and everyone is busy with that and school vacation with their kids, such as myself who didn't learn about this till Christmas and wondering how this would affect my family of 3 young children if this project were to move forward. I beg you to please take these comments from my fellow neighbors with great consideration as many of us are upset, displeased, and nauseated that Gardner shows a lack of human decency to push toxic sludge close to the water supplies of our town and put thousands of people at risk.

SAL 01

SAL 02

We were also given one email address and your number to contact but Jan gave me a separate email address and I'm hoping both of these are working and will reach you because only one was shared on our town's social media to contact.

Thank you for your time,

Taylor Sala

## 11.9 Taylor Sala (SAL)

**SAL 01** **I am incredibly disheartened and astounded that the city is proposing to move their landfill close to the water supply of our town of Templeton. It is reminding me of the movie A Civil Action based on the reservoir case I once studied in torts class in college. It is a very unsettling thought that the city thought this was a good idea to push their landfill boundaries and pollute our water that is used for drinking, showering/baths, and washing clothes/dishes. It feels as though there is a complete disregard for human life to move forward with this project. (Groundwater)**

**Response** See **Chapter 5, "Groundwater**" and responses to **CHI1 02** and **TEM 01**. With the measures in-place (i.e., redundant leachate management and leak detection systems) and two additional monitoring wells, no significant adverse impacts to groundwater are anticipated**.**

**SAL 02** **I had contacted Jan Greenwood who laughed off my concerns and said the notice was posted in December around the 15th which is not enough time for residents of Templeton to learn and know the next steps, especially when it's the holiday season and everyone is busy with that and school vacation with their kids, such as myself who didn't learn about this till Christmas and wondering how this would affect my family of 3 young children if this project were to move forward. I beg you to please take these comments from my fellow neighbors with great consideration as many of us are upset, displeased, and nauseated that Gardner shows a lack of human decency to push toxic sludge close to the water supplies of our town and put thousands of people at risk.**

**We were also given one email address and your number to contact but Jan gave me a separate email address and I'm hoping both of these are working and will reach you because only one was shared on our town's social media to contact. (Public Involvement Plan)**

**Response**

A Public Involvement Plan (PIP) has been developed for the Project and can be found in **Appendix B** of this DEIR. The PIP was developed to be an evolving document used to outline the City's approach to public engagement for the Project and describes the history of public involvement opportunities; explains how the public involvement process has addressed community concerns regarding the Project; and outlines the roles and responsibilities of those involved in implementing the PIP.

**From:** Kelsey Coates
**To:** Strysky, Alexander (EEA)
**Subject:** Gardner Sludge Expansion
**Date:** Saturday, January 21, 2023 1:10:48 PM

---



Hi Alex,

My name is Kelsey. I am a Templeton resident living right on the Gardner line near this proposed project. COA 01

I can already smell the sludge from my house now. The LAST thing we need in the area is to double the size of it and move it closer to the road. Idk what we have to do to prevent it, seems like it was really short notice too…but I know many more people in the area who are 100% against it for even more reasons than just the pure stench of it.

There has GOT to be a better place for this project - away from residential areas. There is no need to expand.

If there is anything we can do - or sign - or literally anything to prevent this, please let me know what we can do. I don't need to raise my little family next to a sludge landfill.

Thank you,

Kelsey

## 11.10 Kelsey Coates (COA)

**COA 01** **I am a Templeton resident living right on the Gardner line near this proposed project. I can already smell the sludge from my house now. The LAST thing we need in the area is to double the size of it and move it closer to the road. Idk what we have to do to prevent it, seems like it was really short notice too…but I know many more people in the area who are 100% against it for even more reasons than just the pure stench of it. There has GOT to be a better place for this project - away from residential areas. There is no need to expand. If there is anything we can do - or sign - or literally anything to prevent this, please let me know what we can do. I don't need to raise my little family next to a sludge landfill. (Air Quality) (Public Involvement Plan) (Alternatives Analysis) (Project Description and Permitting)**

**Response** See **Chapter 7, "Air Quality**" and response to **MEPA 16** and **CHI1 06**.

See **Appendix B** and response to **SAL 02**. The Project has been in development since 2016 and is currently in the environmental review process.

As described in **Chapter 2, "Alternatives Analysis**," which includes a description of previous site evaluations and an updated site evaluation, the Project Site is sited approximately a half mile from the nearest residential area.

See **Section 1.8** of this DEIR for the Project's purpose and need.

**From:** david antaya
**To:** Strysky, Alexander (EEA)
**Subject:** ENF Comment/Gardner Sludge Landfill Expansion
**Date:** Sunday, January 22, 2023 2:53:13 PM



Dear Alex,

I was one of the 30 plus people who attended your site visit at the Gardner Sludge Landfill. The following statements are some of my concerns and comments about the Gardner Sludge Landfill Extension. Hopefully, with all the comments you receive, a more in depth study will be needed in the form of an Environmental Impact Report(EIR).

1. Ground Water Contamination of Drinking Water ANT 01

   I am concerned that the private wells in Templeton and the Otter River Watershed have the potential to be contaminated being within the one mile radius of the sludge landfill extension. Especially, when the 4 plus acre extension will overlap the present Garner Sludge Landfill and be 70 feet high. I am not sure there was enough information provided in the ENF to successfully mediate the runoff from the combined sludge landfill parcels. ANT 02

2. Recreation ANT 03

   The Cummings Otter River Conservation Area will be one of the borders where the Gardner Sludge Landfill Extension will be located. An esker is part of the boundary where a recreation trail will travel on top of. As the sludge is piled 70 feet high against the esker, There will be limited enjoyment smelling and walking the Cummings, Otter River Conservation Area. Possibly, with the sludge piled 70 feet high, it maybe above the esker! Again a need to have an EIR completed to see how the esker and the trail will be impacted by the sludge landfill.

3. Environmental Justice Community (EJC) ANT 04

   Gardner's ENF report states there is no Environmental Justice Community within a mile radius of the sludge landfill extension. Depending which point on of the sludge landfill you are measuring, the mile radius will make a difference for the houses considered an EJC. How did the City decide which point to use to measure the radius?

Public Involvement Activities ENF Section III A part 2 page 25 ANT 05

In this section, it is stated that at a public hearing the City Council approved the acquisition of funds to pay for the Gardner Sludge Landfill Extension Project. In year 2018-2019, the City Council provided engineering money, not money for the total project. At Alexander's MEPA site visit, a question was asked how much the entire project would cost over the 17 year

period, no answer was given. The public needs to know the price for the total cost of the project including capping. An EIR would assist the city in arriving at a total cost for the project including capping the 70 foot sludge landfill extension.

Public Involvement Activities ENF Section III part C page 26 ANT 06

In general, this section states that the City would engage the community by notifying the community through their website and social media for public meetings related to the project. The MEPA visit with Alex, was a public meeting that the City advertised in the Gardner News Newspaper on December 9, 2022. The Gardner News is not the City of Gardner's website nor social media. The roughly 30 people who attend the site visit were notified by flyers, e-mails and word of mouth by non-profit organizations and private citizens, NOT the City of Gardner. The City of Gardner needs to follow through on what was stated in the ENF for notifying citizens. In the end, the tax payers of Gardner need to be notified because they will be paying the bill for handling sludge over the life of the landfill.

Recommendation ANT 07

The City of Gardner have an EIR completed for the proposed Gardner Sludge Landfill Extension project. Hopefully, by completing an EIR, the City of Gardner would have data on the environmental and residential impacts of constructing the sludge landfill extension. From the data, the City could provide a better calculation of the entire cost of the project and possible alternatives for handling Gardner's sludge.

Thank-you
David Antaya
444 Stone Street Gardner MA 01440
978-630-2811
dantaya@fitchburgstate.edu

## 11.11 David Antaya (ANT)

**ANT 01** **I was one of the 30 plus people who attended your site visit at the Gardner Sludge Landfill. The following statements are some of my concerns and comments about the Gardner Sludge Landfill Extension. Hopefully, with all the comments you receive, a more in-depth study will be needed in the form of an Environmental Impact Report (EIR). Ground Water Contamination of Drinking Water - I am concerned that the private wells in Templeton and the Otter River Watershed have the potential to be contaminated being within the one-mile radius of the sludge landfill extension. Especially, when the 4 plus acre extension will overlap the present Garner Sludge Landfill and be 70 feet high. (Groundwater)**

**Response** See responses to **CHI1 02, TEM 01** and **LOR 01**.

**ANT 02** **I am not sure there was enough information provided in the ENF to successfully mediate the runoff from the combined sludge landfill parcels. (Stormwater)**

**Response** See **Chapter 6, "Stormwater**," and responses to **MEPA 32** and **PEA 04**. Based on hydrologic and hydraulic modelling, the proposed stormwater management design would have no significant impact to stormwater discharge from the Project Site. The proposed stormwater management system is designed with the capacity to manage 24-hour, 100-year storm events. This capacity to control large storm events increases the resiliency of the Project to climate change and potential extreme weather conditions. The increased capacity of the Project to manage stormwater would limit potential pollution or sedimentation of downstream water resources and prevent impacts to the surrounding natural communities. Therefore, there are no stormwater-related impacts anticipated with the Project.

**ANT 03** **Recreation - The Cummings Otter River Conservation Area will be one of the borders where the Gardner Sludge Landfill Extension will be located. An esker is part of the boundary where a recreation trail will travel on top of. As the sludge is piled 70 feet high against the esker, There will be limited enjoyment smelling and walking the Cummings, Otter River Conservation Area. Possibly, with the sludge piled 70 feet high, it maybe above the esker! Again a need to have an EIR completed to see how the esker and the trail will be impacted by the sludge landfill. (Project Description and Permitting)**

**Response** See response to **CHI1 05**.

**ANT 04** **Environmental Justice Community (EJC) - Gardner's ENF report states there is no Environmental Justice Community within a mile radius of the sludge landfill extension. Depending which point on of the sludge landfill you are measuring, the mile radius will make a difference for the houses considered an EJC. How did the City decide which point to use to measure the radius? (Environmental Justice)**

**Response** See **Chapter 3, "Environmental Justice**" and comment/response to **MEPA 02, MEPA 29**, and **CHI1 09**.

**ANT 05** **Public Involvement Activities ENF Section III A part 2 page 25 - In this section, it is stated that at a public hearing the City Council approved the acquisition of funds to pay for the Gardner Sludge Landfill Extension Project. In year 2018-2019, the City Council provided engineering money, not money for the total project. At Alexander's MEPA site visit, a question was asked how much the entire project would cost over the 17-year period, no answer was given. The public needs to know the price for the total cost of the project including capping. An EIR would assist the city in arriving at a total cost for the project including capping the 70-foot sludge landfill extension. (Project Description and Permitting)**

**Response** The total Project cost is provided in **Section 1.11** of **Chapter 1, "Project Description and Permitting**."

**ANT 06** **Public Involvement Activities ENF Section III part C page 26 - In general, this section states that the City would engage the community by notifying the community through their website and social media for public meetings related to the project. The MEPA visit with Alex, was a public meeting that the City advertised in the Gardner News Newspaper on December 9, 2022. The Gardner News is not the City of Gardner's website nor social media. The roughly 30 people who attend the site visit were notified by flyers, e-mails and word of mouth by non-profit organizations and private citizens, NOT the City of Gardner. The City of Gardner needs to follow through on what was stated in the ENF for notifying citizens. In the end, the tax payers of Gardner need to be notified because they will be paying the bill for handling sludge over the life of the landfill. (Public Involvement Plan)**

**Response** See **Appendix B** and response to **SAL 02**.

**ANT 07** **Recommendation - The City of Gardner have an EIR completed for the proposed Gardner Sludge Landfill Extension project. Hopefully, by completing an EIR, the City of Gardner would have data on the environmental and residential impacts of constructing the sludge landfill extension. From the data, the City could provide a better calculation of the entire cost of the project and possible alternatives for handling Gardner's sludge. (Project Description and Permitting) (Alternatives Analysis)**

**Response** See response to **MEPA 22**. The Secretary of Energy and Environmental Affairs issued a certificate on the Environmental Notification Form requiring the submission of this DEIR. The preparation of this DEIR intends to fulfill that requirement. Consistent with MEPA regulations at 301 CMR 11.07(3), this DEIR provides a "reasonably complete and stand-alone description and analysis of the Project and its alternatives, and an assessment of its potential environmental and public health impacts and mitigation measures." This DEIR demonstrates that the City will avoid, minimize, and mitigate Damage to the Environment to the maximum extent practicable.

Energy & Environmental Affairs (https://www.mass.gov/orgs/executive-office-of-energy-and-environmental-affairs)

# Public Comments Portal

alexander.strysky@mass.gov



# View Comment

## Comment Details

**EEA #/MEPA ID**
16643

**Comments Submit Date**
1-22-2023

**Certificate Action Date**
1-31-2023

**Reviewer**
Alexander Strysky (857)408-6957, alexander.strysky@mass.gov

**First Name**
david

**Last Name**
legere

**Phone**
--

**Email**
legere3161@aol.com

**Address Line 1**
10 turner road

**Address Line 2**
--

**State**
MASSACHUSETTS

**Zip Code**
01436

**Organization**
--

**Affiliation Description**
--

**Status**
Opened

## Comment Title or Subject

**Topic**: Gardner sludge landifll expeansion site

## Comments

Segoe UI | 10 pt | Paragraph

This is a problem for the residents on Turner Road, Baldwinville and Bridge St. Gardner. This will affect the water from the seepage, we have lived here for 30 years and I do not accept this type of project. This is a problem created by the town of Gardner, possible contamination to the water in case of a system failure is a major concern for the residents. More research and funding for all areas that will be affected should be developed before any plans to be considered.

LEG1 01

## Attachments

## Update Status

**Status**

Opened

SUBMIT

## Share Comment

SHARE WITH A REGISTERED USER

BACK TO SEARCH RESULTS

Energy & Environmental Affairs (https://www.mass.gov/orgs/executive-office-of-energy-and-environmental-affairs)

Public Comments Portal

alexander.strysky@mass.gov



# View Comment

## Comment Details

| EEA #/MEPA ID | First Name | Address Line 1 | Organization |
|---|---|---|---|
| 16643 | david | 10 turner road | -- |
| **Comments Submit Date** | **Last Name** | **Address Line 2** | **Affiliation Description** |
| 1-22-2023 | legere | -- | -- |
| **Certificate Action Date** | **Phone** | **State** | **Status** |
| 1-31-2023 | -- | MASSACHUSETTS | Opened |
| **Reviewer** | **Email** | **Zip Code** | |
| Alexander Strysky (857)408-6957, alexander.strysky@mass.gov | legere3161@aol.com | 01436 | |

## Comment Title or Subject

**Topic**: gardner sludge landfill expansion

## Comments

please do not let this go through not a good idea very up setting to people in this area right down the street from me do not want it seeping in to my water and do not want the god awful smell it would be very unhealthy it is time to work for the people and not the money thank you

LEG2 01

## Attachments

## Update Status

**Status**

Opened

SUBMIT

## Share Comment

SHARE WITH A REGISTERED USER

BACK TO SEARCH RESULTS

## 11.12 David Legere (LEG1)

**LEG1 01** **This is a problem for the residents on Turner Road, Baldwinville and Bridge St. Gardner. This will affect the water from the seepage, we have lived here for 30 years and I do not accept this type of project. This is a problem created by the town of Gardner, possible contamination to the water in case of a system failure is a major concern for the residents. More research and funding for all areas that will be affected should be developed before any plans to be considered. (Groundwater)**

**Response** See **Chapter 5, "Groundwater**" and response to **CHI1 02.**

## 11.13 David Legere (LEG2)

**LEG2 01** **Please do not let this go through not a good idea very upsetting to people in this area right down the street from me do not want it seeping in to my water and do not want the god awful smell it would be very unhealthy it is time to work for the people and not the money thank you (Groundwater) (Air Quality)**

**Response** See **Chapter 5, "Groundwater**" and responses to **CHI1 02** and **TEM 01**. With the measures in-place (i.e., redundant leachate management and leak detection systems) and two additional monitoring wells, no significant adverse impacts to groundwater are anticipated.

See **Chapter 7, "Air Quality"** and responses to **MEPA 16** and **CHI1 06.**

## Strysky, Alexander (EEA)

**From:** Bob Chicoine <bobchic1s@aim.com>
**Sent:** Monday, January 23, 2023 2:52 PM
**To:** Alan Rousseau; Strysky, Alexander (EEA)
**Cc:** Terry Griffis; JoAnne Burdin; Susan Rousseau; Schmitz, Judith (DEP); Matt Marro
**Subject:** Re: Gardner Sludge Landfill MEPA Site Visit



Pictures of the problem at outfall pipe #2 is quite unnerving. CHI2 01

Sent from the all new AOL app for iOS

On Monday, January 23, 2023, 12:51 PM, Alan Rousseau <rousseaua@verizon.net> wrote:

Hi Alex,

I reviewed the sign-sheet and there are a few folks not on the sheet. They probably they arrived as the site meeting was in progress. I cc'd them on this email so you would have their email addresses.

1. Terry Griffis, Templeton
2. Jo-Anne Burdin, Templeton
3. Bob Chicoine, Gardner
4. Sue Rousseau, Gardner

Also, Judith Schmitz (Mass DEP) asked about the current siltation problem at outfall pipe #2 at the southwest end of the existing sludge landfill. We did not see this area at the site visit because we walked to the northwest end. For your reference, attached are a couple of pictures of this area taken on 9/22/22. I cc'd Matt Marro, (PWTPO, CSI Principal Consultant with Matthew S. Marro Environmental Consulting), as he is familiar with this erosion issue and had documented it to the Gardner Conservation Commission on 9/26/22.

Best Regards,
Alan

## 11.14 Robert Chicoine2 (CHI2)

**CHI2 01** **Pictures of the problem at outfall pipe #2 is quite unnerving. (Project Description and Permitting)**

**Response** Corrective measures were taken immediately and the erosion issue at outfall pipe #2 has been rectified.

MILLERS RIVER WATERSHED COUNCIL, INC.
100 Main Street, Athol, MA 01331
council@millersriver.net

Jan. 27, 2023

Rebecca Tepper, Secretary of Energy and Environmental Affairs
Executive Office of Energy and Environmental Affairs (EEA)
**Attn:** MEPA Office
Alexander Strysky EEA #16643
100 Cambridge Street, Suite 900
Boston, MA 02114

Subject: EEA #16643 — ENF Comment / Gardner Sludge Landfill Expansion
Via email: alexander.strysky@mass.gov

Dear Secretary Tepper,

These comments on the ENF for the proposed Gardner Sludge Landfill Expansion, EEA #16643, are being submitted by the Millers River Watershed Council, Inc. (MRWC) **on behalf of the Coalition for a Sustainable Alternative to the Gardner Sludge Landfill Expansion (Coalition)**. MRWC is a non-profit organization formed in 1970 with the mission to protect and enhance the health of the Millers River and its watershed for the long-term benefit of its human and non-human residents. The proposed Project is within the Millers River Watershed, and within a half-mile of the Otter River, the largest tributary to the Millers River.

In response to the Project, the Coalition was formed in 2021 and consists of the following local, regional and statewide organizations: Athol Bird and Nature Club, Clean Water Action, Connecticut River Conservancy, Gardner Clean Air, MassPIRG, Mass Rivers Alliance, MRWC, Mount Grace Land Conservation Trust and North County Land Trust; The Sierra Club of Massachusetts provides the Coalition with technical support.

The ENF submission is deficient in many important respects. Here are the main problems with the ENF and the project and the reasons an EIR should be required: MRW 01

1. **The ENF Project Description does not acknowledge recreational resources:** The Project Description omits mention of the recreational use of the Wildwood Cemetery Forest at the project site by the local community; that property abuts and connects with a network of trails on the Cummings Otter River Conservation Area.—**See attached 1-mile Radius Site Map.** Page 6 of the ENF is therefore wrong to say it is consistent with open space impacts because the area is not targeted for recreation.

2. **Site geology is completely unsuitable for proposed expansion**: The Hydrogeological Evaluation Report, Appendix F of the January, 2022 Engineering Report prepared by Woodard & Curran, describes the geology at the site of the project as glacial outwash atop fractured and weathered bedrock. That material does not provide any natural containment for leachate leakage to groundwater. No modeling or discussion of the release of contaminants to groundwater from the sludge landfill is mentioned in the ENF.—**See attached comments by Mike Wilczynski**, Certified Professional Geologist. MRW 02

3. **Potential leakage, migration and groundwater contamination at existing sludge landfill should be discussed in the ENF and in an EIR**: Analysis of data from the sludge landfill's Annual Operations Reports and the former Gardner solid waste landfill's Annual Environmental Monitoring Reports suggest that deicing salt may have contaminated groundwater down gradient of the landfill.—**See attached comment #4 by Denise Trabbic-Pointer**, Certified Hazardous Material Manager Emeritus. Additional analysis indicates that portions of the sludge landfill were installed at a depth below the assessed four feet above seasonal high groundwater table levels, which may be contributing to contaminant migration.—**See attached comment #7 by D. Trabbic-Pointer**. These two analyses suggest that the Project could result in the migration of contaminants into groundwater that are not limited to salt. MRW 03

4. **The Project will threaten nearby water bodies and wetlands**: As noted in the Engineering Report's Hydrogeological Evaluation Report, groundwater flow at the proposed landfill expansion site moves to the south and southeast. The area to the south and southeast of the proposed expansion has many interconnected wetlands, spring-fed ponds, and streams that flow through City-owned (Cummings) and privately owned (Ebenezer Keyes) Conservation Areas on their way to the Otter River, which joins the Millers River as it flows west to meet the Connecticut River. Any sludge landfill contamination of surface or ground water will likely impact these vital water bodies. Such impacts are not addressed in the ENF. MRW 04

5. **The Project will threaten drinking water wells:** 71 private drinking water wells in Gardner and Templeton, as well as Templeton's Otter River and Sawyer Street municipal wells, are within a mile of the site and—based on the reported groundwater flows—likely rely on the groundwater under the Project site. No plans exist for mitigation of future well contamination; indeed such mitigation is notoriously difficult and expensive.

6. **Inadequate alternatives analysis**: The alternatives analysis dismisses sludge disposal alternatives without completing a single feasibility study of any such alternatives. The alternatives analysis fails to consider partnering with any neighboring communities or pursuing a private sector partnership for a viable alternative to the project. Feasible sludge management alternatives exist: The nearby city of Fitchburg is currently working to develop a biosolids processing plant using proven anaerobic digestion (AD) technology that would be able to accept sludge waste from surrounding towns, like Gardner. Several other AD facilities are operational in other communities in Massachusetts. The City of Gardner has itself recently contracted with SoMax for a feasibility assessment of its hydrothermal carbonization (HTC) technology, which SoMax is piloting in Pennsylvania in a town of similar size to Gardner. There is no mention of these Project alternatives in the ENF.—**See attached comments on Project Alternatives.** MRW 05

7. **No phased construction**: The City has rejected pursuit of a phased construction of the project which will, in effect, commit the City to the 17-year landfill expansion. This effectively prevents the City from migrating to an environmentally and economically better alternative within 17 years. With this Project, Gardner will not be able to take advantage of innovation in the other alternatives or partner with other communities in pursuit of an environmentally sustainable solution prior to 2042. MRW 06

8. **Potential stormwater management/erosion issues:** The Project site is adjacent to the western edge of the existing landfill, where documented wash-out incidents in 2020 and 2022 resulted in landfill material exiting an outfall pipe near "Wetland D." These direct discharges in the Buffer Zone to the Bordering Vegetated Wetland (BVW) have gone unabated and introduced silt into the BVW. The source of the erosion has not been identified, and temporary mitigation measures have been ineffective. Given that the Project is in close proximity to two Zone II recharge areas and the Otter River, it is likely that the wetland resource areas on the site help protect the public water supply for Templeton's water district. The existing *and potential* erosion issues are not mentioned or addressed in the ENF. MRW 07

9. **Irreversible Environmental Damage - Inconsistency with Gardner's stated goals:** The proposed sludge landfill expansion will destroy six acres of Gardner's natural resources, including a hardwood forest, wildlife habitat, and a geologically important esker in the Wildwood Cemetery Forest. This expansion is inconsistent with the City's own Forest Management Plan (2012) that has the following stated goals: "*The City of Gardner would like to improve and protect the forest resources on the Wildwood Cemetery property for the benefit of the residents of Gardner. Protecting water quality is a high priority. Maintaining and improving aesthetics near the Cemetery is extremely important as well."* Item II.C of the ENF's Land Section on page 6 should have been checked Yes. MRW 08

10. **Poor air quality:** The Project will perpetuate and increase the existing odor problem. Persistent odors emanating from the existing sludge landfill were documented in the sludge landfill Annual Operations Reports for 2020 and 2021. These results indicate that odor was present at **100 percent** of the twelve inspections. The odors negatively affect visitors to the abutting cemeteries and the recreational use of the nearby Conservation Areas. These odors impact Gardner residents, including the City's large Environmental Justice (EJ) community. MRW 09

11. **ENF's climate change modeling is faulty - underestimates impacts**: Section 8 and Appendix M of Woodard & Curran's Engineering Report appear to dismiss the impact of gas emissions as *not measurable*. An analysis of these documents indicates possible flaws in the methods and data used by Woodward & Curran. Specifically, the LandGEM (Landfill Gas Emissions Model) Version 302 does not factor in all potential point sources of GHG emissions, leading to a significant underestimate. To effectively assess the impact of a project, maximum possible emissions should be assessed. An analysis of the Gardner sludge landfill's GHG emissions using the Biosolids Emissions Assessment Model (BEAM) Version 1.1 resulted in a figure of 7,257 CO2 eq (Mg/year).— All GHG emissions should be considered significant, and their mitigation should be addressed.—**See attached comment #10 by D. Trabbic-Pointer**. MRW 10

12. **Article 97 checkbox should be marked Yes**: Item II.D of the ENF's Land Section asks: "Does any part of the project involve conversion of land held for natural resources purposes in accordance with Article 97 of the Amendments to the Constitution of the Commonwealth to any purpose not in accordance with Article 97?" This box should have been checked Yes: This project involves conversion of land held for natural resources purposes in accordance with Article 97 of the Amendments to the Constitution of the Commonwealth.—**See attached "Plan of Taking by the Town of Gardner for Cemetery and Park Purposes"** dated July 14, 1919. MRW 11

13. **ENF's Public Involvement Activities (p. 25, EJ Section - III.A.2) include several inaccurate or misleading statements**: 1). The City has held NO public meetings regarding the *overall* expansion proposal since 2016; those public meetings covered a project design and alternatives analysis that is now over six years old. 2). The Gardner Conservation Commission's public meet- MRW 12

ings held in 2022 were limited to discussion of the project's 'Notice of Intent', and therefore narrowly focused on subject matter relative only to the MA Wetlands Protect Act and the Gardner Wetland Protection Ordinance—not the project in general. 3). The ENF does not include a description of "any issues of concern that were raised at such meetings, and any steps taken (including modifications to the project design) to address such concerns." 4). While the Gardner City Council approved expenditures totaling $440k for engineering work at two meetings in 2018 & 2019, no additional funds have been appropriated for construction—though the ENF response suggests otherwise. 5) Flyers posted on the City website are lacking any information specific to environmental impacts, project costs or alternatives to expansion. 6) According to the ENF, the City made no mailings to any members of the Gardner community, including the EJ population.

Other:

**EIR triggered - EJ Threshold**: In addition to the above deficiencies, the presence of an Environmental Justice community within one mile of the project site triggers the threshold for requiring an EIR. The ENF statement that there are no environmental justice (EJ) populations within I mile of the project site is incorrect.—**See attached EJ vicinity map and attached Environmental Justice Concerns** MRW 13

According to Section 7 of the Gardner Sludge Landfill Expansion Engineering Report (Jan. 2022): "Closure of the sludge landfill expansion is proposed to occur as a single event together with the original landfill closure, after filling has been completed in all landfill cells." Therefore, the original Sludge Landfill will remain part of the expansion project until the predicted date of closure in 2041. The project site boundary is 0.934 miles from an EJ population, and the fence line of the original landfill is 0.999 miles from an EJ population. MRW 14 MRW 15

Thank you for your consideration of these comments. The Coalition's member organizations, listed below, agree that the ENF is adequate and a a viable alternative to landfill expansion exists that will have substantially less impact on the surrounding environment. Given the EJ threshold trigger and the significant deficiencies identified with the ENF and the proposed expansion, we ask that the Secretary not issue a Certificate for the ENF and require submission of an EIR.

Respectfully,

Ivan Ussach,
Director, MRWC

Alan Rousseau,
Co-chair, Gardner Clean Air

David Small,
President, Athol Bird & Nature Club

Elizabeth Saunders,
Mass State Director, Clean Water Action

Ron Rhodes
Acting Executive Director,
Connecticut River Conservancy

Janet Domenitz,
Executive Director, MassPIRG

Julia Blatt,
Executive Director, Mass Rivers Alliance

Emma Ellsworth,
Executive Director,
Mount Grace Land Conservation Trust

Anna Wilkins,
Executive Director, North County Land Trust

***Coalition for a Sustainable Alternative to Gardner's Planned Sludge Landfill Expansion***

Millers River Watershed Council

Gardner Clean Air

NORTH COUNTY LAND TRUST

Mount Grace Land Conservation Trust 35

MASSACHUSETTS Rivers Alliance

CLEAN WATER ACTION

Clean water. Healthy habitat. Thriving communities. Connecticut River Conservancy

MASSPIRG

Athol Bird & Nature Club

## 11.15 Millers River Watershed Council, Inc. (MRW)

**MRW 01** **These comments on the ENF for the proposed Gardner Sludge Landfill Expansion, EEA #16643, are being submitted by the Millers River Watershed Council, Inc. (MRWC) on behalf of the Coalition for a Sustainable Alternative to the Gardner Sludge Landfill Expansion (Coalition). MRWC is a non-profit organization formed in 1970 with the mission to protect and enhance the health of the Millers River and its watershed for the long-term benefit of its human and non-human residents. The proposed Project is within the Millers River Watershed, and within a half-mile of the Otter River, the largest tributary to the Millers River.**

**In response to the Project, the Coalition was formed in 2021 and consists of the following local, regional and statewide organizations: Athol Bird and Nature Club, Clean Water Action, Connecticut River Conservancy, Gardner Clean Air, MassPIRG, Mass Rivers Alliance, MRWC, Mount Grace Land Conservation Trust and North County Land Trust; The Sierra Club of Massachusetts provides the Coalition with technical support.**

**The ENF submission is deficient in many important respects. Here are the main problems with the ENF and the project and the reasons an EIR should be required:**

**The ENF Project Description does not acknowledge recreational resources: The Project Description omits mention of the recreational use of the Wildwood Cemetery Forest at the project site by the local community; that property abuts and connects with a network of trails on the Cummings Otter River Conservation Area. Page 6 of the ENF is therefore wrong to say it is consistent with open space impacts because the area is not targeted for recreation. (Project Description and Permitting)**

**Response** See response to **CHI1 05** and **CHI1 07**.

**MRW 02** **Site geology is completely unsuitable for proposed expansion: The Hydrogeological Evaluation Report, Appendix F of the January, 2022 Engineering Report prepared by Woodard & Curran, describes the geology at the site of the project as glacial outwash atop fractured and weathered bedrock. That material does not provide any natural containment for leachate leakage to groundwater. No modeling or discussion of the release of contaminants to groundwater from the sludge landfill is mentioned in the ENF. (Groundwater)**

**Response** See **Chapter 5, "Groundwater**" and responses to **CHI1 02** and **CHI1 03**.

**MRW 03** **Potential leakage, migration and groundwater contamination at existing sludge landfill should be discussed in the ENF and in an EIR: Analysis of data from the sludge landfill's Annual Operations Reports and the former Gardner solid waste landfill's Annual Environmental Monitoring Reports suggest that deicing salt may have contaminated groundwater down gradient of the landfill. Additional analysis indicates that portions of the sludge landfill were installed at a depth below the assessed four feet above seasonal high groundwater table levels, which may be contributing to contaminant migration. These two analyses suggest that the Project could result in the migration of contaminants into groundwater that are not limited to salt. (Groundwater)**

**Response** See **Chapter 5, "Groundwater**" and responses to **CHI1 02** and **CHI1 03**.

**MRW 04** **The Project will threaten nearby water bodies and wetlands: As noted in the Engineering Report's Hydrogeological Evaluation Report, groundwater flow at the proposed landfill expansion site moves to the south and southeast. The area to the south and southeast of the proposed expansion has many interconnected wetlands, spring-fed ponds, and streams that flow through City-owned (Cummings) and privately owned (Ebenezer Keyes) Conservation Areas on their way to the Otter River, which joins the Millers River as it flows west to meet the Connecticut River. Any sludge landfill contamination of surface or ground water will likely impact these vital water bodies. Such impacts are not addressed in the ENF.**

**The Project will threaten drinking water wells: 71 private drinking water wells in Gardner and Templeton, as well as Templeton's Otter River and Sawyer Street municipal wells, are within a mile of the site and—based on the reported groundwater flows—likely rely on the groundwater under the Project site. No plans exist for mitigation of future well contamination; indeed such mitigation is notoriously difficult and expensive. (Stormwater) (Groundwater)**

**Response** See **Chapters 5, "Groundwater**" and **6, "Stormwater."** See also responses to **MEPA 11** and **ANT 02**.

**MRW 05** **Inadequate alternatives analysis: The alternatives analysis dismisses sludge disposal alternatives without completing a single feasibility study of any such alternatives. The alternatives analysis fails to consider partnering with any neighboring communities or pursuing a private sector partnership for a viable alternative to the project. Feasible sludge management alternatives exist: The nearby city of Fitchburg is currently working to develop a biosolids processing plant using proven anaerobic digestion (AD) technology that would be able to accept sludge waste from surrounding towns, like Gardner. Several other AD facilities are operational in other communities in Massachusetts. The City of Gardner has itself recently contracted with SoMax for a feasibility assessment of its hydrothermal carbonization (HTC) technology, which SoMax is piloting in Pennsylvania in a town of similar size to Gardner. There is no mention of these Project alternatives in the ENF. (Alternatives Analysis)**

**Response** See **Chapter 2, "Alternatives Analysis**."

**MRW 06** **No phased construction: The City has rejected pursuit of a phased construction of the project which will, in effect, commit the City to the 17-year landfill expansion. This effectively prevents the City from migrating to an environmentally and economically better alternative within 17 years. With this Project, Gardner will not be able to take advantage of innovation in the other alternatives or partner with other communities in pursuit of an environmentally sustainable solution prior to 2042. (Landfill Design and Construction)**

**Response** See **Chapter 4, "Landfill Design and Construction**."

**MRW 07** **Potential stormwater management/erosion issues: The Project site is adjacent to the western edge of the existing landfill, where documented wash-out incidents in 2020**

**and 2022 resulted in landfill material exiting an outfall pipe near "Wetland D." These direct discharges in the Buffer Zone to the Bordering Vegetated Wetland (BVW) have gone unabated and introduced silt into the BVW. The source of the erosion has not been identified, and temporary mitigation measures have been ineffective. Given that the Project is in close proximity to two Zone II recharge areas and the Otter River, it is likely that the wetland resource areas on the site help protect the public water supply for Templeton's water district. The existing and potential erosion issues are not mentioned or addressed in the ENF. (Stormwater)**

**Response** See **Chapter 6, "Stormwater**" and responses to **MEPA 32, PEA 04**, and **ANT 02**. Through design and the inclusion of Best Management Practices for stormwater management, the Project would result in an improvement over the existing condition. Although issues associated with the existing sludge landfill are outside the scope of this DEIR, the City has addressed any deficiencies at the existing sludge landfill as soon as they were reported.

**MRW 08** **Irreversible Environmental Damage - Inconsistency with Gardner's stated goals: The proposed sludge landfill expansion will destroy six acres of Gardner's natural resources, including a hardwood forest, wildlife habitat, and a geologically important esker in the Wildwood Cemetery Forest. This expansion is inconsistent with the City's own Forest Management Plan (2012) that has the following stated goals: "The City of Gardner would like to improve and protect the forest resources on the Wildwood Cemetery property for the benefit of the residents of Gardner. Protecting water quality is a high priority. Maintaining and improving aesthetics near the Cemetery is extremely important as well." Item II.C of the ENF's Land Section on page 6 should have been checked Yes. (Project Description and Permitting)**

**Response** See **Chapter 1, "Project Description and Permitting**." See also responses to **CHI1 05** and **CHI1 07**.

**MRW 09** **Poor air quality: The Project will perpetuate and increase the existing odor problem. Persistent odors emanating from the existing sludge landfill were documented in the sludge landfill Annual Operations Reports for 2020 and 2021. These results indicate that odor was present at 100 percent of the twelve inspections. The odors negatively affect visitors to the abutting cemeteries and the recreational use of the nearby Conservation Areas. These odors impact Gardner residents, including the City's large Environmental Justice (EJ) community. (Air Quality)**

**Response** See **Chapter 7, "Air Quality**." See also responses to **MEPA 16** and **CHI1 06**.

**MRW 10** **ENF's climate change modeling is faulty - underestimates impacts: Section 8 and Appendix M of Woodard & Curran's Engineering Report appear to dismiss the impact of gas emissions as not measurable. An analysis of these documents indicates possible flaws in the methods and data used by Woodward & Curran. Specifically, the LandGEM (Landfill Gas Emissions Model) Version 302 does not factor in all potential point sources of GHG emissions, leading to a significant underestimate. To effectively assess the impact of a project, maximum possible emissions should be assessed. An analysis of the Gardner sludge landfill's GHG emissions using the Biosolids Emissions Assessment Model (BEAM) Version 1.1 resulted in a figure of 7,257 CO2 eq (Mg/year).**

**— All GHG emissions should be considered significant, and their mitigation should be addressed. (Air Quality)**

**Response** See **Section 7.3, Chapter 7, "Air Quality**," for a discussion of the LandGEM model inputs. EPA default values were used to estimate total landfill gas emissions. LandGEM is the accepted screening tool for estimating landfill gas emissions. The decomposition of the sludge is the source of greenhouse gas emissions. The LandGEM model utilizes a first order decomposition equation to calculate how much methane and $CO_2$ would be generated based on the mass of sludge added to the landfill and default factors for the methane generation capacity of the landfill and the methane generation rate. Based on conventional default factors (k=0.04/year and Lo=100$m^3$/year) the resulting emissions are 253.6 tons/year including 78.1 tons/year of methane and 175.5 of carbon dioxide. Based on the Global Warming Potential of 27.2 for methane the resulting total emissions are 2,301 tons of $CO_2$ equivalents ($CO_2e$) per year. Even doubling these emissions is below 75,000 tons of $CO_2e$ per year, which is below the threshold at which 310 CMR 7.02(1)(d) is applicable.

The Biosolids Emission Assessment Model (BEAM) was developed to calculate net greenhouse gas emissions from various biosolids management processes and allow comparisons for planning purposes. BEAM also requires a number of different default inputs. To compare the 2,230 tons of $CO_2e$ emissions from LandGEM vs. 7,257 $CO_2e$/year referenced in the comment from BEAM, a review of the inputs that were selected to generate the BEAM output would be required.

**MRW 11** **Article 97 checkbox should be marked Yes: Item II.D of the ENF's Land Section asks: "Does any part of the project involve conversion of land held for natural resources purposes in accordance with Article 97 of the Amendments to the Constitution of the Commonwealth to any purpose not in accordance with Article 97?" This box should have been checked Yes: This project involves conversion of land held for natural resources purposes in accordance with Article 97 of the Amendments to the Constitution of the Commonwealth. —See attached "Plan of Taking by the Town of Gardner for Cemetery and Park Purposes" dated July 14, 1919. (Project Description and Permitting)**

**Response** See response to **MEPA 26.**

**MRW 12** **ENF's Public Involvement Activities (p. 25, EJ Section - III.A.2) include several inaccurate or misleading statements: 1). The City has held NO public meetings regarding the overall expansion proposal since 2016; those public meetings covered a project design and alternatives analysis that is now over six years old. 2). The Gardner Conservation Commission's public meetings held in 2022 were limited to discussion of the project's 'Notice of Intent', and therefore narrowly focused on subject matter relative only to the MA Wetlands Protect Act and the Gardner Wetland Protection Ordinance—not the project in general. 3). The ENF does not include a description of "any issues of concern that were raised at such meetings, and any steps taken (including modifications to the project design) to address such concerns." 4). While the Gardner City Council approved expenditures totaling $440k for engineering work at two meetings in 2018 & 2019, no additional funds have been appropriated for construction—though the ENF response suggests otherwise. 5)**

**Flyers posted on the City website are lacking any information specific to environmental impacts, project costs or alternatives to expansion. 6) According to the ENF, the City made no mailings to any members of the Gardner community, including the EJ population. (Public Involvement Plan) (Project Description and Permitting) (Alternatives Analysis)**

**Response** See **Appendix B**. See also **Chapter 1, "Project Description and Permitting.**" The project design was modified following a peer review, part of the Conservation Commission approval process, which reduced the size of the overall Project Site to avoid impacts to vernal pools. See also **Chapter 2, "Alternatives Analysis."**

**MRW 13** **EIR triggered - EJ Threshold: In addition to the above deficiencies, the presence of an Environmental Justice community within one mile of the project site triggers the threshold for requiring an EIR. The ENF statement that there are no environmental justice (EJ) populations within I mile of the project site is incorrect (Environmental Justice)**

**Response** See **Chapter 3, "Environmental Justice**" and comment/response to **MEPA 02**, **MEPA 29**, and **CHI1 09**.

**MRW 14** **According to Section 7 of the Gardner Sludge Landfill Expansion Engineering Report (Jan. 2022): "Closure of the sludge landfill expansion is proposed to occur as a single event together with the original landfill closure, after filling has been completed in all landfill cells." Therefore, the original Sludge Landfill will remain part of the expansion project until the predicted date of closure in 2041. (Landfill Design and Construction)**

**Response** See **Chapter 4, "Landfill Design and Construction**."

**MRW 15** **The project site boundary is 0.934 miles from an EJ population, and the fence line of the original landfill is 0.999 miles from an EJ population. (Environmental Justice)**

**Response** See **Chapter 3, "Environmental Justice**" and comment/response to **MEPA 02, MEPA 29,** and **CHI1 09**. Using geographic information system (GIS), a one-mile radius was measured from the Project Site boundary, which is the extent of the limit of disturbance and footprint of the Project, and it was determined that there is no Environmental Justice population within a one-mile radius of the Project. This methodology followed MEPA guidance on calculating distance.

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May 9, 2022

Gardner, MA Proposed Landfill Expansion-Hydrogeological Review

Pangea Environmental LLC has conducted a review of the geological and hydrogeological information for the area around the proposed sludge (biosolids) landfill expansion.

The hydrogeological review was conducted by Mike Wilczynski, Certified Professional Geologist-Emeritus with Pangea Environmental, LLC. Mr Wilczynski has over 40 years of professional experience, which includes hydrogeological and environmental studies in over a dozen states, Canada and Colombia, SA. He has a BS and MS in Geology and has completed post-graduate studies in hydrogeology. He has worked for several large mining and oil companies and retired from Macomb Community College and the Michigan Department of Environmental Quality.

The purpose of the hydrogeological study was to assess the suitability of the area's geology for a landfill expansion for biosolids. Biosolids are emerging as a major source of groundwater and soil contamination.

Biosolids are not the inert material that people have been believing. Recently, in Livingston County, Michigan, a herd of cattle had to be destroyed because the meat contained PFAS from the spreading of biosolids on the pasture. PFAS accumulates in the food chain and works its way up into our diet.

The soil borings for the monitoring wells contained in Appendix F of the Expansion Engineering report and other sources indicate the near surface geology consists mostly of glacial outwash sand and gravel. The material is highly permeable and can make excellent aquifers when saturated with groundwater. This material is very good at allowing contaminants to migrate. WIL 01

Beneath the glacial outwash is a bedrock that is fractured and weathered in places. The fractures and weathering can increase the permeability of the material allowing groundwater to flow faster and further. Groundwater can flow much faster and further in fractures than in porous material, such as the overlying unconsolidated glacial outwash sand and gravel. Therefore, the contaminants can also travel faster and further.

The nearby municipal wells are shallow and may be vulnerable to contamination from the landfill and proposed expansion. In addition to PFAS, the biosolids can also contain other contaminants

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that are not routinely analyzed prior to disposal. PFAS do not naturally degrade to less toxic

compounds, as so many other contaminants and their behavior in the subsurface is not well understood.

We reviewed the very limited information available for the computer model used to produce the wellhead protection zones around the East Templeton municipal wells. A complete review was not possible with the information in the Templeton Zone II Approval Letter. WIL 02

The computer model of the extent from which groundwater is being drawn by the municipal systems indicates no groundwater flow under the Otter River. However, it is stated in the report that surface water was used as a barrier to flow in the computer model. In other words, the groundwater was “forced” to discharge to surface water because of how the computer model was designed. The wells may draw groundwater beyond what is estimated in the computer model.

The computer model of groundwater flow in Expansion Engineering Report Appendix F was designed to estimate the changes in groundwater flow as a result of the proposed landfill expansion. However, there was no attempt to model a release of contaminants to groundwater from the landfill.

The analytical results for sodium and chloride from monitoring wells in the northern part of the study area, just northwest of the closed landfill warrant further study. The unusually high concentrations could be an indication of leachate leaking from the solid waste landfill. WIL 03

This could be the result of road salt for deicing. However, the large increase in concentrations downgradient from the landfill may indicate a larger problem, such as a leaking landfill liner.

Sodium and chloride concentrations in groundwater also appear to be elevated in the monitoring wells associated with the current sludge landfill. This again, could be an indication of leachate from the landfill reaching the groundwater. This leachate could also contain PFAS.

The permeable unconsolidated glacial sediments and fractured bedrock will allow any contaminants to migrate to an aquifer. Landfills are typically located in areas that have extensive clay deposits and/or a large separation between the bottom of a landfill and the water table. Neither of these conditions exist at the proposed expansion. WIL 04

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The 4 ft separation between the water table and bottom of the proposed sludge landfill expansion could lead to problems if the groundwater rises. Groundwater can provide uplift forces on the bottom of a landfill liner and compromise the integrity. There is also less of an unsaturated zone to allow natural degradation of some contaminants before they reach the groundwater. Climate change is leading to higher surface water levels which will most likely lead to increased groundwater elevation in the future. WIL 05 WIL 06

In conclusion, it would be difficult to find a location that is more poorly suited for a landfill. The location is better suited for an aggregate mine than a landfill.

More study is needed to understand the hydrogeology of the area, but it will not likely change our opinion about the suitability of the proposed location for a landfill of any kind. In addition, groundwater samples should be collected and analyzed for PFAS. WIL 07

Please let us know if we can be of further assistance.

Pangea Environmental, LLC
Mike Wilczynski
Certified Professional Geologist-Emeritus
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Reference:

https://www.mlive.com/public-interest/2022/01/advisory-warns-of-pfas-in-beef-from-michigan-cattle-farm.html

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# Plan 64

WORCESTER DISTRICT REGISTRY OF DEEDS-WORCESTER, MA
PLAN BOOK 32 PLAN 64
Received July 1st, 1919
12 h 01 m P M
Sheet 1 of 1
ATTEST: Arthur W. Thresher
Register

## PLAN of TAKING
by the
## TOWN OF GARDNER
for
Cemetery and Park Purposes

Scale 1 inch = 200 ft. as of January, 1919
Frank T. Beach, Civil Engineer
66 Parker St, Gardner, Mass.

Examined, Approved and Filed in the Worcester District Registry of Deeds.

BRIDGE STREET

WEST STREET

STREET

Mary O'Brien
8 Woo acres

Michael & James B. Kelly
48 Woo acres

Michael J. Kelly
10 Woo acres

Edward G. Barthel
12 Woo acres

Archbishop of Gardner
5.0 Woo acres

Charles H. Easton
7 Woo acres

Arthur T. Harris et al
9 Woo acres

Heirs of Levi Heywood
13 Woo acres

Heirs of Levi Heywood
4 Woo acres

Henry W. Sanders
18 Woo acres

Catholic Bishop of Springfield Inc.

Mary O'Brien

Levi H. Greenwood
19 Woo acres

Charles H. Easton
4 Woo acres

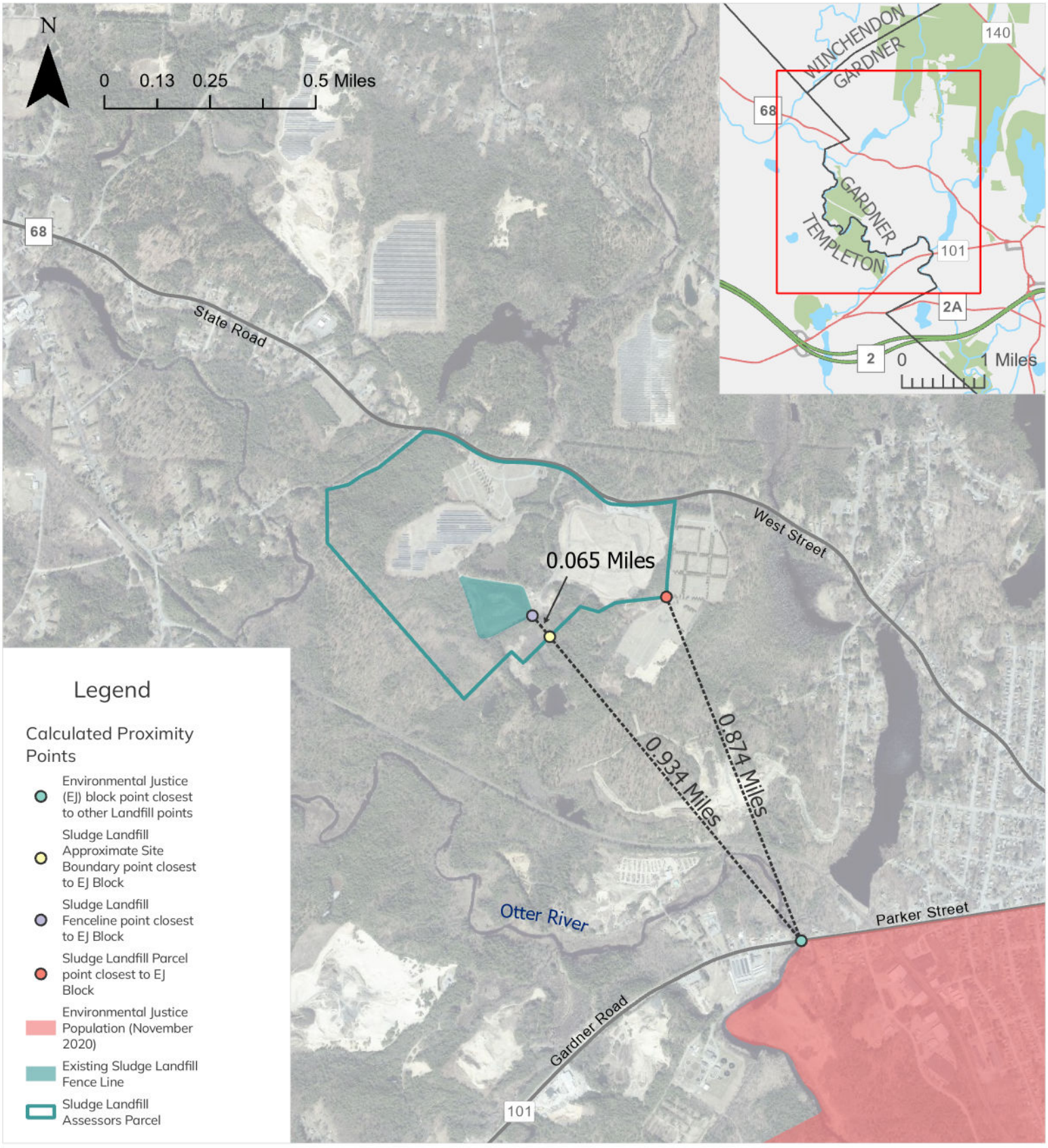
Heirs of Levi Heywood
7 Woo acres

Henry W. Sanders

Catholic Bishop of Springfield Inc.

N

# Gardner Sludge Landfill Proximity to Environmental Justice Populations




## Legend

Calculated Proximity Points

- Environmental Justice (EJ) block point closest to other Landfill points
- Sludge Landfill Approximate Site Boundary point closest to EJ Block
- Sludge Landfill Fenceline point closest to EJ Block
- Sludge Landfill Parcel point closest to EJ Block
- Environmental Justice Population (November 2020)
- Existing Sludge Landfill Fence Line
- Sludge Landfill Assessors Parcel

**Methodology -**

-Sludge Landfill parcel sourced from MassGIS L3 Assessors Data.
-Existing Sludge Landfill Fence Line created based on MassGIS 2021 Orthoimagery
-Environmental Justice Populations Layer (2020) sourced from MassGIS
-Parcel Boundary, Fence Line and EJ Block nearest points calculated using ArcGIS Pro
-Site Boundary nearest point based on a reasonable interpretation of Gardner Sludge Landfill Vicinity Map - 1 Mile Radius, revised March 2022 prepared by Woodard & Curran. Site Boundary appears to run along parcel boundary for section nearest the EJ Block. Nearest point was calculated at parcel boundary point along shortest distance line from EJ Block to the Fence Line..
- Distances displayed calculated using ArcGIS Pro

**THIS MAP IS NOT A SURVEY.**

*This map was prepared without the benefit of field measurements and it and the calculations presented are intended solely for illustrative purposes.*

Map created by Aaron Nelson, Mount Grace Land Conservation Trust

## 11.16 Mike Wilczynski (WIL)

**WIL 01** **The soil borings for the monitoring wells contained in Appendix F of the Expansion Engineering report and other sources indicate the near surface geology consists mostly of glacial outwash sand and gravel. The material is highly permeable and can make excellent aquifers when saturated with groundwater. This material is very good at allowing contaminants to migrate. Beneath the glacial outwash is a bedrock that is fractured and weathered in places. The fractures and weathering can increase the permeability of the material allowing groundwater to flow faster and further. Groundwater can flow much faster and further in fractures than in porous material, such as the overlying unconsolidated glacial outwash sand and gravel. Therefore, the contaminants can also travel faster and further. The nearby municipal wells are shallow and may be vulnerable to contamination from the landfill and proposed expansion. In addition to PFAS, the biosolids can also contain other contaminants that are not routinely analyzed prior to disposal. PFAS do not naturally degrade to less toxic compounds, as so many other contaminants and their behavior in the subsurface is not well understood. (Groundwater)**

**Response** See **Chapter 5, "Groundwater**" and response to **CHI1 02.**

**WIL 02** **We reviewed the very limited information available for the computer model used to produce the wellhead protection zones around the East Templeton municipal wells. A complete review was not possible with the information in the Templeton Zone II Approval Letter. The computer model of the extent from which groundwater is being drawn by the municipal systems indicates no groundwater flow under the Otter River. However, it is stated in the report that surface water was used as a barrier to flow in the computer model. In other words, the groundwater was "forced" to discharge to surface water because of how the computer model was designed. The wells may draw groundwater beyond what is estimated in the computer model. The computer model of groundwater flow in Expansion Engineering Report Appendix F was designed to estimate the changes in groundwater flow as a result of the proposed landfill expansion. However, there was no attempt to model a release of contaminants to groundwater from the landfill. (Groundwater)**

**Response** See **Chapter 5, "Groundwater**" and response to **CHI1 02.**

**WIL 03** **The analytical results for sodium and chloride from monitoring wells in the northern part of the study area, just northwest of the closed landfill warrant further study. The unusually high concentrations could be an indication of leachate leaking from the solid waste landfill. This could be the result of road salt for deicing. However, the large increase in concentrations downgradient from the landfill may indicate a larger problem, such as a leaking landfill liner. Sodium and chloride concentrations in groundwater also appear to be elevated in the monitoring wells associated with the current sludge landfill. This again, could be an indication of leachate from the landfill reaching the groundwater. This leachate could also contain PFAS. (Groundwater)**

**Response** The former solid waste landfill is outside the scope of this DEIR. See **Chapter 5, "Groundwater"** and responses to **CHI1 02, TEM 01,** and **LOR 01**.

**WIL 04** **The permeable unconsolidated glacial sediments and fractured bedrock will allow any contaminants to migrate to an aquifer. Landfills are typically located in areas that have extensive clay deposits and/or a large separation between the bottom of a landfill and the water table. Neither of these conditions exist at the proposed expansion. (Groundwater)**

**Response** See **Chapter 5, "Groundwater**" and response to **CHI1 02**.

**WIL 05** **The 4 ft separation between the water table and bottom of the proposed sludge landfill expansion could lead to problems if the groundwater rises. Groundwater can provide uplift forces on the bottom of a landfill liner and compromise the integrity. There is also less of an unsaturated zone to allow natural degradation of some contaminants before they reach the groundwater. (Landfill Design and Construction)**

**Response** See **Chapter 4, "Landfill Design and Construction**."

**WIL 06** **Climate change is leading to higher surface water levels which will most likely lead to increased groundwater elevation in the future. In conclusion, it would be difficult to find a location that is more poorly suited for a landfill. The location is better suited for an aggregate mine than a landfill. More study is needed to understand the hydrogeology of the area, but it will not likely change our opinion about the suitability of the proposed location for a landfill of any kind. (Climate Change)**

**Response** See **Chapter 8, "Climate Change**" and response to **MEPA 19**. Based on the ResilientMass Action Team Climate Resilience Design Standards Tool analysis, in general, the Project Site is not identified as being at high risk to rising surface water (e.g., lakes, rivers). The Project Site is noted as having a "low" risk of riverine flooding due to its location.

**WIL 07** **In addition, groundwater samples should be collected and analyzed for PFAS. (Groundwater)**

**Response** See **Chapter 5, "Groundwater**" and response to **CHI1 04**. Groundwater monitoring would be conducted in accordance with all applicable regulations.

**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*

December 2021

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.

ALB 01

ALB 02

ALB 03

<u>*Smell and particulate matter*</u>: 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]

ALB 04

<u>*Methane Production*</u>: 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]

ALB 05

ALB 06

ALB 07

[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. ALB 08

*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] ALB 09

*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] ALB 10

*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 ALB 11

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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.

Author:

Jennifer M. Albertine, PhD

Climate and Land Justice Specialist, Conservation and Stewardship Associate

Mount Grace Land Conservation Trust

For additional information:

Millers River Watershed Council (MRWC): council@millersriver.net; www.millerswatershed.org

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

## 11.17 Jennifer M. Albertine (ALB)

**ALB 01** **Steps should be taken to protect the city's residents from more environmental harm.**

**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. (Project Description and Permitting) (Alternatives Analysis)**

**Response** See **Chapter 1, "Project Description and Permitting**." The purpose of the Massachusetts Environmental Policy Act (MEPA) (301 CMR 11.00) is to provide meaningful opportunities for public review of the potential environmental impacts of Projects for which Agency Action is required and to assist the Agency in using all feasible means to avoid Damage to the Environment or, to the extent Damage to the Environment cannot be avoided, to minimize and mitigate Damage to the Environment to the Maximum extent practicable. MEPA review is an informal administrative process that is intended to involve any interested Agency or Person as well as the Proponent and each Participating Agency (301 CMR 11.01(b)).

See also **Chapter 2, "Alternatives Analysis**." Similar to existing conditions, the Project would continue to only accept sludge from the City's WWTF, located on Plant Road in Templeton, which serves approximately 20,000 City residents (about 95 percent of the City's population), 1,680 Town of Ashburnham residents (about 25 percent of the Town's population), and 150 East Templeton residents (about two percent of the Town's population).

**ALB 02** **Disposing of sludge into a landfill has become an outdated way of dealing with this type of waste and holds the most environmental impact. (Project Description and Permitting) (Alternatives Analysis) (Mitigation Measures and Draft Section 61 Findings)**

**Response** See **Section 1.13.1** in **Chapter 1, "Project Description and Permitting**," and **Chapter 2, "Alternatives Analysis**. According to MassDEP's PFAS and Residuals Technology and Management Study, Part 1, "landfills and purpose-built sludge monofills in Massachusetts and surrounding states handle a relatively small proportion of sludge (around 14 percent of the total) compared with landfill rates in northern New England states and New York, likely due to the historical availability of the two other primary management options (land application and incineration)." Nationally, about 27 percent of wastewater sludge is disposed of in landfills.

See also **Chapter 10, "Mitigation and Draft Section 61 Findings**" and response to MEPA 36. This DEIR has been developed to evaluate the Project's potential impact on the environment. With the mitigation measures proposed, no significant adverse impacts are anticipated.

**ALB 03** **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. (Project Description and Permitting)**

**Response** See **Chapter 3, "Environmental Justice**," and comment/response **MEPA 29**. This DEIR has evaluated the potential environmental impacts of the Project and concludes that, with the proposed protective measures in place, no significant adverse impacts, or disproportionate impacts to populations with Environmental Justice concerns are anticipated with the Project.

**ALB 04** **Particulate matter can carry particles of pathogenic bacteria that can cause respiratory illness to residents downwind from the sludge landfill. 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. (Air Quality)**

**Response** See **Chapter 7, "Air Quality**" and responses to **MEPA 16** and **CHI1 06**. Methane and carbon dioxide are the primary emissions from the landfill. Particulate matter is not typically emitted since the sludge is nearly 70 percent water.

**ALB 05** **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. (Air Quality)**

**Response** See **Chapter 7, "Air Quality"** and responses to **MEPA 20** and **MassDEP 17.** Based on the EPA regulatory default values in the LandGEM model, the peak annual landfill gas emission rate (including both methane and carbon dioxide) is considered too low to trigger a regulatory requirement for an active capture and control system.

**ALB 06** **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. (Climate Change) (Air Quality)**

**Response** See **Chapters 7, "Air Quality**," and **8, "Climate Change**." In general, the warming effect of greenhouse gases, such as those emitted by the landfill, mix and disperse in the atmosphere and are transported across the globe as a result of the relative long residence time of greenhouse gases like $CO_2$ in the atmosphere. While in some cases, greenhouse gases concentrations can build up locally due to persistent emission sources (typically combustion and other industrial sources) and create what has been termed a "$CO_2$ dome", this kind of buildup is generally associated with highly stagnant locales with many sources of greenhouse gas emissions, such as highly urbanized areas, which have additional thermal effects that could exacerbate in the presence of a $CO_2$ dome. However, because the Project is in a generally rural area with no persistent stagnation regime anticipated and the greenhouse gas emissions are quite low relative to what is typically associated with more urbanized environments, there wouldn't likely be the potential for a $CO_2$ dome and associated local effects of greenhouse gas emissions from the Project.

**ALB 07** **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. (Alternatives Analysis) (Air Quality)**

**Response** See **Chapters 2, "Alternatives Analysis**," **7, "Air Quality**," and response to **ALB 05**. Gas migration through soil is controlled by the landfill liner system. The liner restricts landfill gas from entering the subsurface. The gas would migrate to the landfill surface, following the path of least resistance and be passively released into the atmosphere.

**ALB 08** **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, which is one of the largest risks climate change poses to human health. 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, 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. (Climate Change)**

**Response** Given the distance of residences to the Project, it is highly unlikely that temperature anomalies would be experienced due to the loss of tree canopy with the Project. There would be approximately 102.2 acres of forested area remaining in the Project Area after expansion of the landfill is complete. Any benefits related to the existing tree canopy surrounding the Project Area and closer to the residences (e.g., potential cooling) would be retained with this Project.

**ALB 09** **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. Ozone negatively affects human health through irritating our respiratory system making us more susceptible to other air pollutants. Trees are also capable of removing air pollution and can improve air quality. (Air Quality)**

**Response** Methane is a potent greenhouse gas, but it does not photochemically react in the presence of sunlight to form ground level ozone (smog).

**ALB 10** **The current sludge landfill has had issues in the past with erosion from the top of the landfill. 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. 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. (Groundwater)**

**Response** See **Chapter 5, "Groundwater**," and response to comment **CHI1 02** and **CHI1 04**.

**ALB 11** **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. The area of the proposed 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. (Project Description and Permitting) (Air Quality)**

**Response** See response to **CHI1 05.**

1/28/2023

**Rebecca Tepper, Secretary of Energy and Environmental Affairs**
**Executive Office of Energy and Environmental Affairs (EEA)**
**Attn: MEPA Office**
**EEA No. 16643 (Alexander Strysky)**
**100 Cambridge Street, Suite 900**
**Boston MA 02114**
**Subject: ENF Comment / Gardner Sludge Landfill Expansion**
**Sent via email to: alexander.strysky@mass.gov**

Dear Secretary Tepper,

On behalf of Gardner Clean Air (GCA), we are submitting these comments on the Gardner Sludge Landfill Expansion Environmental Notification Form (ENF). GCA (211 Betty Spring Road, Gardner MA 01440) is a local citizens group formed by Alan & Susan Rousseau in 2014 to support clean and sustainable solutions for wastewater sludge management as an alternative to expansion of the Gardner Sludge Landfill. Alan Rousseau owns property abutting to the south of City parcel H32-16-4 where the expansion is proposed.

This expansion project raises the following significant issues:

1. Failure of the City of Gardner to present a thorough and accurate examination of various sludge management alternatives which would be less harmful to the environment.
2. Risk of ground water contamination with impact to drinking water and watershed.
3. Negative impacts to the public recreational use of the Wildwood Cemetery Forest, Cummings Otter River Conservation Area, and the Ebenezer Keyes Conservation Area.
4. Continued source of ongoing poor air quality for the entire area.
5. Destruction of 6 acres of natural resources including wildlife habitat, forest, a natural esker, and close-proximity to two certified vernal pools.

The ENF is missing key relevant data. This missing information must be made available to you, state agencies, and the public through a more thorough Environmental Impact Report (EIR).

Also, the 41.4-acre project site is within a mile of one of Gardner's Environmental Justice (EJ) populations. Based on the lack of key information in the ENF and the proximity to an EJ population, I request that an Environmental Impact Report (EIR) be required for this project.

Comments on specific sections of the ENF are on the following pages along with relevant attachments.

Respectfully,

Alan Rousseau, Co-Chair

Susan Rousseau, Co-Chair

## Project Description

According to the Woodard & Curran Gardner Sludge Landfill Expansion Engineering Report January - 2022 (referred to as the 'Engineering Report' in this document) included with the ENF, the Sludge Landfill expansion project will result in the dumping of approximately 4,000 cubic yards per year of sludge over a 17-year period from 2024 to 2041. A total of approximately 68,000 cubic yards of sludge will be dumped at this location in the Wildwood Cemetery Forest (WCF).

GCA 01

**The ENF project description is incomplete as it does not adequately describe important information about the project and its potential impacts on the environment. The ENF does not include information on the existing conditions and land uses within the 41.4-acre project site boundary and within the project locus area depicted in the Engineering Report Appendix D: Drawings G-002 Vicinity Map – One Mile Radius:**

### Geological & Hydrogeological Features

GCA 02

**There was no attempt to model a release of contaminants to groundwater from the project.** The Engineering Report, Appendix F: Hydrogeological Evaluation Report describes conditions at the site that do not support the expansion. Specific site geology indicates the near surface geology consists mostly of mostly glacial outwash sand and gravel. Beneath the glacial outwash is a bedrock that is fractured and weathered in places. Therefore, contaminants can travel faster and further through such subsurface conditions. Landfills are typically located in areas that have extensive clay deposits and/or a large separation between the bottom of the landfill and the water table. See attachment #7 - Gardner, MA Proposed Landfill Expansion-Hydrological Review, Mike Wilczynski, Certified Professional Geologist, Pangea Environmental, LLC, May 9 2022. **More study and information is needed to understand the hydrology of the area as this appears to be a poor location for a landfill expansion to prevent damage to the environment.**

### Gardner Sludge & PFAS

GCA 03

The Gardner Wastewater Treatment Plant (WWTP) receives leachate pumped from the now-closed Solid Waste Gardner Sanitary Landfill, a Significant Industrial User (SIU). The SIU leachate is not tested for PFAS. There is a high probability that this SIU and the resulting leachate contains significant PFAS given the materials deposited in the landfill. The sludge that is currently dumped in the existing Sludge Landfill is not tested for PFAS. **PFAS testing must be done in order to determine the current level of PFAS in Gardner sludge in order to evaluate the risk of dumping 68,000 cubic yards of this material at the proposed location**. See bullet points #1, #2, & #3 in attachment #8: Comments Regarding the expansion of the City of Gardner Municipal Wastewater Sludge Landfill, by Denise Trabbic-Pointer, MS, CHMM Emeritus, Sierra Club – MI, May 5 2022.

### Groundwater Protection

The ENF mentions a double composite groundwater protection system (GWPS). This liner is not guaranteed to never fail and manmade infrastructure ultimately fails. As such, State regulations prohibit landfills from being sited in a Zone II area for an existing or potential public water supply well (310 CMR 19.038 (2)(c)(1)(a)). **No corrective action and remediation procedure, if nearby wetland resources are contaminated, is provided if this system fails in 1, 5, 10, 25, or 100 years.** No City bonding or funding has been designated to support corrective action and remediation procedures. The Engineering Report, Appendix F: Hydrogeological Evaluation Report, submitted to MA DEP with the WP33 permit application, indicates that groundwater in the expansion area flows south and southeast toward water resources. GCA 04

Ms. Denise Trabbic-Pointer (Sierra Club – MI) has reviewed the Engineering Report, along with current and historical reports on the existing Gardner Sludge Landfill and now-closed Gardner Solid Waste Municipal Landfill, and found monitoring wells indicating groundwater contamination. See bullet points #4, #5, & #6 in attachment #8: Comments Regarding the expansion of the City of Gardner Municipal Wastewater Sludge Landfill, by Denise Trabbic-Pointer, MS, CHMM Emeritus, May 5, 2022.

## Alternatives

According to the Mass Sludge Survey 2018 v1.1 (published in September 2019) by the North East Biosolids and Residuals Association (NEBRA) for the Massachusetts Clean Energy Center, **only 18%** of the wastewater sludge produced in Mass was sent to landfills. The other 82% was disposed of through incineration or applied to soils. This proves that there are viable alternatives to this Project. GCA 05

According to Jennifer Wood (Environmental Engineer with Mass DEP NPDES and Residuals Program), no other Mass city or town is seeking to create or expand a sludge landfill. Athol, MA discontinued use of their sludge landfill roughly 20 years ago due to public outcry resulting from their inability to control odors. Athol currently hauls out for incineration to Upper Blackstone in Millbury MA. GCA 06

If sludge landfills were a good solution, then most communities with a waste water treatment plant would be trying to construct a sludge landfill. Alternatively, conversion of wastewater sludge to energy and recycling of the residual material is the future and is consistent with the Massachusetts 2030 Solid Waste Master Plan: Working Together Toward Zero Waste – October 2021. GCA 07

The ENF Report Section 4 Alternatives Analysis contains an analysis of 9 alternatives. **This analysis is inadequate so should not be accepted by the MEPA office.** It contains no detailed references, financial data, or calculations to back it up. GCA 08

Over the past 10 years, the City has not completed a single feasibility study on any alternative to the expansion. The City has not looked at public/private sector partnerships or grant programs that could assist the City in properly exploring alternatives to the proposed expansion.

**Alternatives #1 and #2** in the ENF are not really alternatives because Gardner has a wastewater treatment plant and the City can't dump untreated wastewater into the Otter River.

**Alternative #3 and #4** involve land application and a composting facility. These alternatives should not have been dismissed. According to The Mass Sludge Survey 2018 v.1.1, these methods are utilized for 38% of the sludge disposal in Massachusetts. Composting is currently done by Ipswich, MA utilizing a private contractor (Agresource). Montague, MA recently received $150K for an in-depth feasibility study grant and is currently evaluating feasibility studies for a new compost facility. Previously, Montague had a compost capability that earned over $1.2 M for a 7-year period.

**Alternative #5** mentions Anaerobic Digestion (AD) which is done on a large scale at Deer Island in Winthrop, MA and Greater Lawrence Sanitary District in North Andover MA. Residual material is converted to fertilizer by a private contractor. In Dartmouth, MA, Commonwealth Resource Management Corporation successfully operates a private sector AD facility at smaller scale. **Fitchburg MA is implementing a private sector run AD facility at the West Fitchburg wastewater treatment plant with a scheduled start-up of December 2025, which would be a disposal option for Gardner.** Thus, AD is a feasible alternative.

**Alternative #6** involves constructing an incinerator, a process which is utilized for 43% of the sludge disposal in Massachusetts according to The Mass Sludge Survey 2018 v.1.1. To utilize this alternative, Gardner would need to do a feasibility study for an incinerator.

**Alternative #7** involves Gasification which is currently being pursued by Taunton, MA. The Taunton project is currently in MEPA review and more information will be forthcoming about this project and in general about the viability of this new technology, so this alternative should not be dismissed so quickly. **The ENF does not mention that, in October 2022, Gardner contracted with SoMax for a feasibility study of a hydrothermal carbonization (HTC) facility, which So-Max is piloting in Phoenixville, PA, a town similar in size to Gardner.** The Gardner study is now under way. Hydrothermal carbonization (HTC) converts organic waste, recovering valuable resources and creating clean, useful bioproducts that can be used to produce biogas, fertilizers, concrete, and other products. The energy produced from HTC can be used to power a wastewater treatment plant. In November 2021, the U.S. Department of Energy (DOE) awarded SoMax a Water Recovery Prize for small- and medium-sized facilities based on their work on HTC in Phoenixville, PA.

**Alternative #8** involves constructing a new SLF elsewhere in the City. Although we do not see this as a good solution, we have seen no analysis of this alternative.

**Alternative #9** involves hauling out the sludge for disposal. Many communities utilize this alternative which results in incineration or fertilizer conversion/composting at another facility in or out of Massachusetts. PFAS concerns have created a challenge in the sludge disposal industry equally for all methods of sludge disposal. However, because PFAS has such a wide impact, solutions will be forthcoming to deal with this challenge.

Overall, the City has not completed a sufficient alternative analysis to the Sludge Landfill expansion. (SLF). Instead, the City seems to have chosen to continue on the SLF path, primarily due to a 37-year-old site assignment for a portion of the Wildwood Cemetery Forest.

The City has not explored the alternative of partnering with any neighboring communities or pursued a private sector partnership for a viable alternative to the SLF expansion.

In addition, the City has rejected pursuit of a phased construction of the SLF expansion and therefore will be committing the City to a 17-year SLF solution to the year 2042. Phased construction will limit environmental damage and allow Gardner to take advantage of innovation in the other alternatives or partner with other communities in pursuit of a sustainable solution prior to 2042.

## Community Use of the Site

GCA 09

The Sludge Landfill Expansion project site location is within Gardner's Wildwood Cemetery Forest, a parcel that is currently used for community recreation. This property abuts and connects with a network of trails on the Cummings Otter River Conservation Area. A blazed trail along the property's glacial period Esker provides year-around use by the public for hiking, snow-shoeing, cross-country skiing, and hunting. The Gardner Conservation Department, North County Land Trust, and Millers River Watershed Council have conducted guided hikes to this property. (See attachment #1: Guided Hikes) The goals for community use of this property are included in the Wildwood Forest Stewardship Plan, which is referred to in Gardner's Open Space Plan 2015 and which states on pages 3 & 4: "The Forest Stewardship Committee has developed the following goals for the Wildwood Cemetery property. Management will focus on promoting a healthy forest environment for the safety and enjoyment of the residents of Gardner and others who will visit the property." One of the goals states: "Improve hiking trails for public recreational use." **The landfill expansion plan is contrary to the forest stewardship plan goals and future community use of the site.**

## Residential Neighborhoods include Environmental Justice Populations.

GCA 10

The ENF fails to state that the zoning for the project site and one-mile radius around it is mostly Rural Residential (R2) with a small portion zoned as Single Family Residential (R1) and General Residential (G3). There are residential neighborhoods with approximately 563 adult residents with 272 homes per the street listings for Gardner and Templeton. The one-mile radius is also home to facilities owned by 13 businesses, 3 social organizations, and 3 religious' organizations. This includes 3 Catholic Cemeteries owned by Annunciation Parish. Importantly, Environmental Justice populations, just within the 1-mile radius are in Block Group 2, Census Tract 7073. (See attachment #5) In 2020, this block group had a population of **1,829** in **843 households.**

## Private Water Supplies

**The ENF does not identify all private drinking water wells within one mile of the project.** There are approximately 65 Gardner homes and 6 Templeton homes with private drinking water wells within one mile according to assessor property cards. See Attachment #2: Private Drinking Water Wells, which has a summary of the street locations of private wells. The ENF does not cover potential impact to these wells. GCA 11

### Air Quality

**The ENF does not mention historical odor problems with the existing Sludge Landfill.** Air quality has been a consistent problem over many years and numerous odor complaints have been submitted by residents and visitors to the nearby cemeteries and conservation areas. McClure Engineering inspects the existing Sludge Landfill on a bi-monthly basis and the results are published in the Sludge Landfill Annual Operations Reports. The 2020 and 2021 Annual Operations Reports indicate that odor was present at 100% of the 12 inspections in 2020 and 2021. There was not one inspection that indicated odors as "not detected." Per the McClure Engineering 2020 Operations report, landfill operators had found a source of odors to be runoff on the east side that stinks of old sludge. The landfill expansion will perpetuate odors and increase the odor problem. As part of the Project, the City must be required to install odor emissions monitoring equipment that is able to measure and report gases causing the odors on a 24/7 bases prior to permitting of this expansion project. In order to mitigate odors, the City must be required to cap the existing landfill footprint and install a gas management system as part of the expansion. GCA 12

### DEQE site Assignment

The 41.4-acre project site boundary in the ENF does not match the 37.36-acre parcel (see attachment 4 map) referred to in the 1985 DEQE Site Assignment Letter (attachment #4, page 1 & 2) which was included in the CDR Maguire WP44 Application Gardner Landfill Vertical Expansion for United Water – August 7,2014 that was used for the Sludge Landfill Vertical Expansion approved by MA DEP in 2016. **The ENF provides no explanation for this discrepancy**. GCA 13

## Water Resources

Groundwater flows exist in this area such that landfill leachate liner leakage will eventually pose risk to several surface water resources within a one-mile radius. These surface water resources exist in all directions within one-mile around the expansion site. GCA 14

**Hilchey Pond** – The ENF indicates that Hilchey Pond is an impaired water body within half mile radius of the project site. It is located approximately 2,151 feet to the North of the site. The ENF did not include the information that this pond is fed by nearby Bailey Brook and the outlet feeds Bailey Brook and eventually flows to the nearby Otter River.

The following other important water resources are located within one-mile. Distances to the expansion site were approximated using MassMapper.

**Rousseau Ponds –** The Rousseau ponds, wetlands, and perineal streams are to the south and in the watershed of the Otter River. The three Rousseau ponds are spring-fed. The nearest Rousseau-pond is approximately 700 feet to the South of the site.

**Otter River –** The Otter River is the only river that flows through Gardner. The Wildwood Cemetery Forest (including the Project site) and Cummings Otter River Conservation Area are in the watershed. The Cummings Otter River Conservation Area has a substantial frontage length of 2,500 feet on the Otter River. The Otter River is to the South and West with two locations within ½ mile with the closest distance of approximately 1,607 feet to the West of the site. The Millers River Watershed Council has established a recreational Blue Trail on the Otter River in this area.

**Bailey Brook** – Bailey Brook is approximately 1,647 feet to the Northwest of the site. Bailey Brook is a cold-water fisheries brook. Bailey Brook flows from North Gardner to the Otter River and a portion of this brook is within the Wildwood Cemetery Forest. Gardner has recently invested in the creation of the new Bailey Brook Conservation Area and Open Space Park. Gardner also has invested recently in the Bailey Brook Greenway project with the goal of conservation of properties along Bailey Brook from Winchendon town line to the Otter River.

**Wilder Brook** – Wilder Brook is approximately 4,015 feet to the East of the site. Wilder Brook flows from North Gardner to Parker Pond.

**Parker Pond** – Parkers Pond is approximately 4,980 feet to the East of the site. At 29 acres, this is Gardner's 5th largest water body. This pond is fed by Wilder Brook and Perley Brook and the outlet feeds the Otter River.

**Unnamed EKCA Pond** – An unnamed Ebenezer Keyes Conservation Area (EKCA) pond is approximately a distance of 1,960 feet to the South of the site. An outlet from this pond flows through a perennial stream to the Otter River. The EKCA was established in 2021 and owned by the North County Land Trust.

## Stormwater Management

The ENF and Engineering Report Section 6 Stormwater Management does not address the following issues: GCA 15

**Does not comply with performance standards for work in buffer zone because the extensive work in and the lack of adequate proposed natural vegetation within the Buffer Zone, where some portions are steeply sloped, will result in an increase in stormwater and sediment flow to BVW and the warming of water temperatures in BVW.**

**The project should be considered LUHPLP under the Stormwater Management Standards and comply with Stormwater Standard 6.**

**The project did not review all impacts to resource areas by addressing an existing erosion problem at the existing vertically expanded sludge landfill at outfall pipe 002.**

The Engineering Report Section 6 Stormwater Management not include alternative locations for the two stormwater infiltration basins such that outfall pipes that would not be located within the 100-foot buffer zones for Wetland C and Wetland D.

## Land Section

**II. C.** The project site is currently and proposed to be in active Forestry use. A copy of the Forest Management Plan is available on the Gardner City website at: Wildwood Forest Stewardship Plan. GCA 16
**II. D.** This project involves conversion of land held for natural resources purposes in accordance with Article 97 of the Amendments to the Constitution of the Commonwealth. See attachment #3 "Plan of Taking by the Town of Gardner for Cemetery and Park Purposes" dated July 14, 1919.
**III. B.1)** The project is not consistent with the Gardner Community Development Plan -2006. Operation of a landfill, with continual odor problems for a 17-year period, will impede development of open land north of route 68 in this area.
**III. B.2**) The project adds leachate infrastructure that will increase the input to Gardner's existing Waste Water Treatment Plant. The project adds the infrastructure maintenance cost of 3 stormwater basins / ponds that will require perpetual maintenance. GCA 17 GCA 18
**III. B.3)** The project is within an area currently used for open space and recreation. The Wildwood Forest Stewardship Plan for the Wildwood Cemetery Forest has specific goals on the conservation value of the project site. GCA 19
**III. B.4)** The project is not compatible with adjacent land uses. In 2012, the City utilized State and Federal funding to acquire the abutting Cummings Otter River Conservation Area for open space and recreation as well as water supply protection. The purchase was made using a $197,625 Mass Drinking Water Supply Protection Grant, along with a Northwestern Area Forest Legacy Project grant awarded to the North County Land Trust. The Gardner Open Space Plan – 2015 Map 9 identifies this area as an Aquifer Protection Area.

## Climate Change Adaption and Resiliency Section

### Greenhouse Gas Emissions

Ms. Denise Trabbic-Pointer, MS, CHMM Emeritus, Sierra Club – MI has reviewed the Engineering Report and provided comments on greenhouse gases emissions that are reflected in attachment #8 entitled: Comments Regarding the expansion of the City of Gardner Municipal Wastewater Sludge Landfill, by Denise Trabbic-Pointer, May 5, 2022 & Attachment 1 - Gardner SLF GHG Emissions Calculations.

Excerpts from her review are as follows:

*"Greenhouse gas emissions are of concern at all landfills. According to the EPA, "Municipal solid waste (MSW) landfills are the third-largest source of human-related methane emissions in the United States, accounting for approximately 15.1 percent of these emissions in 2019." We have assessed CO2 equivalents (Mg/year) emissions from each process at a sludge landfill and land disposal of WWTP sludge. Attachment 1 are the calculations and results for the Gardner SLF. The Biosolids Emissions Assessment Model (BEAM) Version 1.1 © 2011 Canadian Council of Ministers of the Environment was used to derive these results. Note that calculations are based on the reported design flow of the Gardner WWTP of 5 million gallons per year as well as the metric tons/year – dry (Sludge). The Woodward & Curran Supplement No. 1 to Gardner Sludge Landfill Expansion Application Record No. 22-WP33-0003-APP indicates that "The average amount of sludge to be disposed of at the landfill on a daily basis is 5 dry tons per day, five days per week" and this is what was used in the attached calculations"*

"*Our results for the Gardner SLF GHG emissions have been compared to reported GHG emissions from similar sized municipal solid waste (MSW) landfills and found to be similar.* ***Final assessed annual GHG emissions from operations at the Gardner SLF are 7,257 CO2eq (Mg/year).***"

*"We have reviewed the documents Gardner SLF Expansion Engineering Report, Section 8 and Appendix M. Woodward & Curran seem to be dismissing the impact of gas emissions as not measurable. We disagree with this determination and believe that there are flaws in the methods and data used by Woodward & Curran. That is, the LandGEM – Landfill Gas Emissions Model, Version 302, does not factor in all potential point sources of GHG emissions and the assessed annual Mg/year of sludge to be disposed are significantly underestimated. To truly assess the impact of a project, maximum possible emissions should be assessed. "*

## Green Infrastructure

**The ENF does not recognize that the Wildwood Cemetery Forest (WCF) is an important part of Gardner's Green Infrastructure**. Using Mass Audubon's MAPPR Tool 2.0, attachment #10 illustrates the value of Wildwood Cemetery Forest. The WCF scored as a high priority parcel with a total score of "11" and is equal or higher than other parcels in this area of Gardner. GCA 20

In 2019, Gardner applied for and was awarded a grant for Municipal Vulnerability Preparedness (MVP) Planning from the Executive Office of Energy and Environmental Affairs (EEA) MVP program. The project was led by Lyndsy Butler and Jeff Legros, supported by a core team which included Rachael Catlow (Department of Public Works), Dane Arnold (DPW), Robert Oliva (DPW), Chris Coughlin (City Engineer), Anna Wilkins (North County Land Trust), David Beauregard (Conservation Commission), Paul Topolski (Emergency Management), Ivan Ussach (Millers River Watershed Council), and Trevor Beauregard (Department of Community Development & Planning). Andrew Smith, Massachusetts EEA's regional MVP coordinator for this project, provided additional support.

The following are two excerpts from the Community Resilience Building Workshop, Summary of Findings, September 30, 2020 (filename: Gardner MVP Report_2020_0930_DRAFT)

### Environmental Vulnerabilities

"Cummings Conservation Area. 122 acres that were acquired with Forest Legacy and Water Supply Protection funds. The land includes an undisturbed glacial esker, wetlands, vernal pools, floodplain, and riparian habitat of Otter River. Large, protected forest landscapes, flood zones, and connected riparian corridors increase Gardner's resilience to climate change. Development pressure outside of the protected areas threaten the resource functions and values within the Conservation Area."

### Areas of Concern (Specific Locations)

- "Sludge landfill, whose on-site stormwater system may be threatened by increasing storms" GCA 21

## Environmental Justice Section

**I.A. The ENF statement that there are no EJ populations within I mile of the project site is incorrect.** The project site boundary, indicated in Engineering Report G-002 Vicinity Map – One Mile Radius, is identified as a 41.4-acre parcel. This parcel is approximately 0.934 miles from an EJ population. (See attachment #5: Proximity to Environmental Justice Populations, Aaron Nelson, Project Manager, Mount Grace Conservation Land Trust, December 20, 2022.) This location also roughly coincides with the 37.36-acre parcel referred to in the 1985 DEQE Site Assignment (attachment #3 & #4) and included in the CDR Maguire WP44 Application Gardner Landfill Vertical Expansion for United Water – August 7, 2014. GCA 22

According to the Engineering Report: Section 7 Landfill Closure Plan: "Closure of the sludge landfill expansion is proposed to occur as a single event together with the original landfill closure, after filling has been completed in all landfill cells." Therefore, the original Sludge Landfill will remain part of the expansion project until the predicted date of closure in 2041. The fence line of the original landfill, is 0.999 miles from an EJ population. (See attachment #5: Proximity to Environmental Justice Populations, Aaron Nelson, Project Manager, Mount Grace Conservation Land Trust, December 20, 2022)

**Therefore, this project meets the definition of a Designated Geographic Area per MEPA regulation 11.02(2) and meets the mandatory threshold for an Environmental Impact Report (EIR).**

Use of this site for a landfill expansion removes 6.0-acres of City land that has been utilized for recreational purposes by Gardner residents and subjects this population to the continued poor air quality generated by the Sludge Landfill.

Additional information on Environmental Justice concerns is in attachment #9: Environmental Justice Concerns regarding the expansion of the Gardner Sludge Landfill, Jenn Albertine, PhD, Climate & Land Justice Specialist, Conservation & Stewardship Associate, Mount Grace Land Conservation Trust.

**III. A. 2. The ENF "description of activities conducted prior to filing to promoted involvement by EJ populations" is inadequate.** The ENF is missing the dates for public meetings (held 7 years ago in 2016) and a description of issues of concern raised at these meetings and steps taken to address the concerns. The recent project's "Notice of Intent (NOI)" public meetings were of a narrow scope to only include issues related to the Mass Wetland Protection Act and Gardner Wetland Protection Ordinance and not the project's wider impact. The ENF is missing a description of issues raised at these NOI meetings and steps taken to address the issues. GCA 23

## ENF Distribution List

The ENF distribution list does not include community organizations within or near the one-mile distance of this project and all the abutting property owners. GCA 24

Religious organizations not included are:

Bethany Baptist Church – 72 Ryan Street, Gardner, MA 01440
Jehovah's Witnesses - Kingdom Hall – 1071 West Street, Gardner, MA 01440
Annunciation Parish, 135 Nichols Street, Gardner, MA 01440. This parish has an active Hispanic Ministry and 3 Cemeteries located on West Street.

Social organizations not included are:

Gardner Fish & Gun Club – 538 Clark Street, Gardner, MA 01440
West End Beagle Club – Off Clark Street, Gardner, MA 01440
Gardner Trout Club – 44 Watkins Road, Gardner, MA 01440
Otter River Sportman's Club - PO Box 28, Baldwinville, MA 01436

The ENF distribution list does not include any departments from the Town of Templeton, a Municipality affected by this project. Templeton Town Officials including the Select Board, Conservation Commission, Light & Water Commission, etc were not properly notified in the ENF.

The ENF distribution list does not include abutters to the City property Parcel ID H32-16-4, the location of the existing sludge landfill and expansion. Attachment #6: City of Gardner Certified Abutters List. This is the certified abutters list that was included in the Notice of Intent submitted for the Project to the Gardner Conservation Commission on 6/23/22.

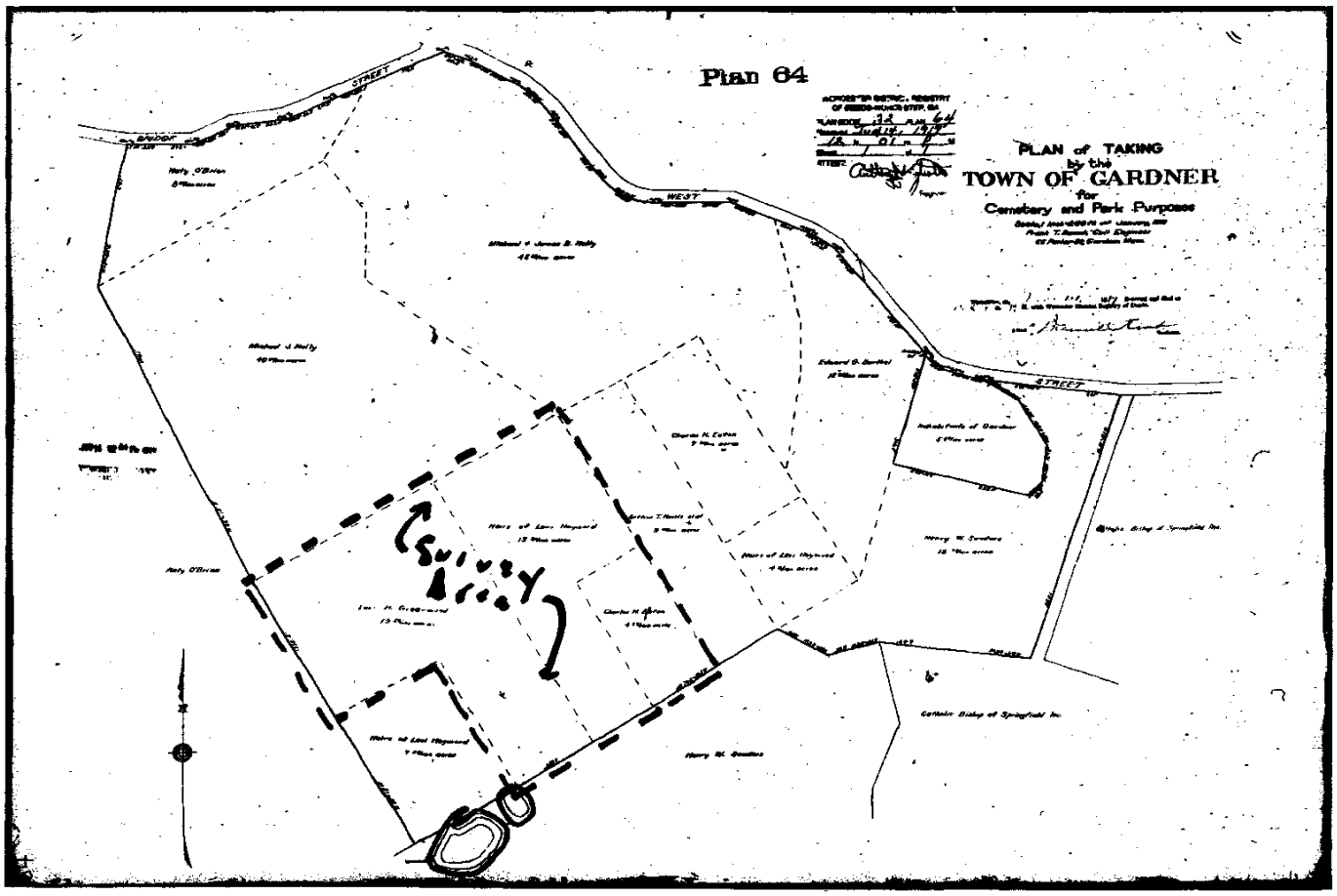
## Attachment #1: Guided Hikes




## Attachment #2: Private Drinking Water Wells

| 1/18/2022 (updated 1/26/22, 2/7, | **Private Wells within the 1-Mile Radius of Gardner Sludge Landfill** | | | |
|---|---|---|---|---|
| **Street Name** | **Community** | **Total Private Wells** | **Approximate Distance to Sludge Landfill (miles)** | |
| CLARK ST | Gardner | 1 | 1.0 | |
| EDGELL AVE | Gardner | 3 | 0.8 | |
| KEYES RD | Gardner | 9 | 0.75 | |
| NOTRE DAME RD | Gardner | 1 | 0.3 | |
| PRINCETON ST | Gardner | 24 | 0.9 | |
| RICHARDSON ST | Gardner | 2 | 0.9 | |
| RIVERSIDE RD | Gardner | 7 | 0.75 | |
| RUGBY ST | Gardner | 2 | 0.9 | |
| WATKINS ST | Gardner | 11 | 0.9 | |
| WEST ST | Gardner | 5 | 0.3 | |
| RIVERSIDE RD | Templeton | 3 | 0.9 | |
| TURNER ST | Templeton | 3 | 0.75 | |
| | | | | |
| | | | | |
| | Gardner Total | 65 | | |
| | Templeton Total | 6 | | |
| | Total | 71 | | |
| | | | | |
| list of private drinking water wells project sorted by water utilities column 26Jan2022 | | | | |
| Approximate Distance to Sludge Landfill estimated using vacinity map filename: SludgeLandfill with Labels 8Oct2016 updated 12Mar2021 v3. | | | | |

## Attachment #3: Plan of Taking



## Attachment #4: DEQE Site Assignment Letter (page 1)

KM / KM

The Commonwealth of Massachusetts
Executive Office of Environmental Affairs
Department of Environmental Quality Engineering
Central Region
75 Grove Street, Worcester, Massachusetts 01605

November 21, 1985

John W. Meany, Director
Department of Public Works
City Hall
Gardner, MA 01440

Re: GARDNER-Water Pollution Control
Chapter 83, Section 6 Hearing
for sludge-only landfill

Gentlemen:

In accordance with Section 6 of Chapter 83 of the General Laws, the Department of Environmental Quality Engineering held a public hearing on October 31, 1985 relative to the use of certain land in the City of Gardner for the proposed construction of a wastewater treatment facility sludge only landfill. The hearing was held in the Department's office at 75 Grove St., Worcester.

The land in question, which is located at the southwest edge of the City's sanitary landfill near the cemeteries and the Otter River, consists of one parcel containing 37.36 acres and is depicted on drawings in a report entitled:

Report of Sludge Disposal Site Evaluation
Gardner, Massachusetts
Feasibility Study-EID
January 1985

Oral testimony was heard and recorded at the hearing; no written testimony was received. The hearing tape and support documentation are on file at the Department of Environmental Quality Engineering, Central Regional Office.

Proponents of the project indicated the proposed site was the only economically and environmentally acceptable site.

Reviewers have expressed concern about the loss of wildlife habitat and protection of potential water supplies.

## Attachment #4: DEQE Site Assignment Letter (page 2)



After reviewing the information submitted, it is the opinion of the Department that the above concerns must be addressed during design to assure that the sludge landfill can be constructed and operated at the proposed site in a manner acceptable to all environmental concerns. The city shall therefore submit during design a summary of all measures being taken to mitigate impacts of the project on wildlife habitat and potential water supplies.

The Department conditionally approves the use of land in accordance with Section 6 of Chapter 83 of the General Laws of the Commonwealth subject to review of the summary document described above.

Be advised that detail plan approval, a Sewer Connection Permit, and an amended Finding of No Significant Impact must also be approved prior to construction of the landfill.

Very truly yours,

For the Commissioner

Robert A. Kimball

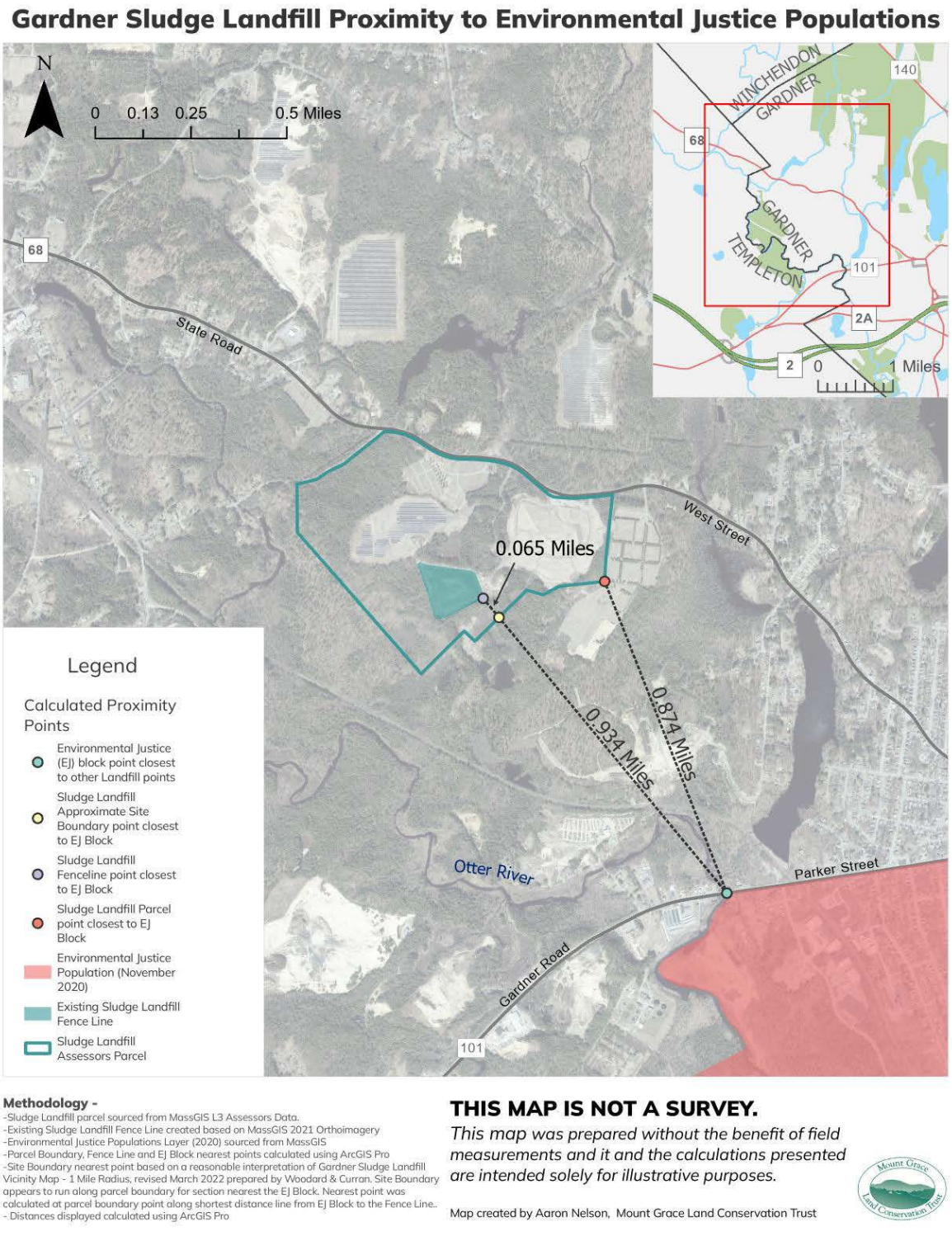
Robert A. Kimball, P.E.
Deputy Regional Environmental Engineer

KM/mjm

cc: William Gaughan, DWPC-Boston
Stan Linda, DWPC-Boston
Ed Benoit, DREE-Worcester
Steve Seigal, Whitman & Howard, Inc.
Conservation Commission-Gardner
Board of Health-Gardner
City Council-Gardner

## Attachment #5: Proximity to Environmental Justice Populations

Gardner Sludge Landfill Proximity to Environmental Justice Populations Aaron Nelson, Project Manager, Mount Grace Land Conservation Trust, December 20, 2022.




**Methodology -**
-Sludge Landfill parcel sourced from MassGIS L3 Assessors Data.
-Existing Sludge Landfill Fence Line created based on MassGIS 2021 Orthoimagery
-Environmental Justice Populations Layer (2020) sourced from MassGIS
-Parcel Boundary, Fence Line and EJ Block nearest points calculated using ArcGIS Pro
-Site Boundary nearest point based on a reasonable interpretation of Gardner Sludge Landfill Vicinity Map - 1 Mile Radius, revised March 2022 prepared by Woodard & Curran. Site Boundary appears to run along parcel boundary for section nearest the EJ Block. Nearest point was calculated at parcel boundary point along shortest distance line from EJ Block to the Fence Line..
- Distances displayed calculated using ArcGIS Pro

**THIS MAP IS NOT A SURVEY.**

*This map was prepared without the benefit of field measurements and it and the calculations presented are intended solely for illustrative purposes.*

Map created by Aaron Nelson, Mount Grace Land Conservation Trust

# Attachment #6: City of Gardner Certified Abutters List

CITY OF GARDNER
CERTIFIED ABUTTERS LIST

| Parcel ID | Location | Owner | Owner2 | Mailing Address | City | State | Zip |
|---|---|---|---|---|---|---|---|
| H27-7-2 | 500 Notre Dame Rd | Alan Rousseau | | 211 Betty Spring Rd | Gardner | MA | 01440 |
| H27-7-6 | Keyes Rd | Roman Catholic Bishop of Worcester | | 49 Elm St | Worcester | MA | 01609 |
| H32-19-2 | West St | Roman Catholic Bishop of Worcester | | 49 Elm St | Worcester | MA | 01609 |
| C32-19-2 | Bridge St | City of Gardner | | 95 Pleasant St | Gardner | MA | 01440 |
| C32-14-18 | West St | Roman Catholic Bishop of Worcester | | 49 Elm St | Worcester | MA | 01609 |
| H32-17-11 | West St | D&E Realty Corp | | PO Box 752 | Hudson | MA | 01749 |
| C32-15-21 | 939 West St | West Street Realty Trust | Albert F Yraola - Trustee | PO Box 315 | Westminster | MA | 01473 |
| H32-11-5 | 929 West St | West Street Realty Trust | Albert F Yraola - Trustee | PO Box 315 | Westminster | MA | 01473 |
| C32-15-22 | West St | West Street Realty Trust | Albert F Yraola - Trustee | PO Box 315 | Westminster | MA | 01473 |
| H32-11-7 | West St | West Street Realty Trust | Albert F Yraola - Trustee | PO Box 315 | Westminster | MA | 01473 |
| H32-11-8 | 911 West St | Peter F Yraola | Kimberly Yraola | PO Box 315 | Westminster | MA | 01473 |
| H32-11-9 | West St | Peter F Yraola | Francis A Yraola | PO 315 | Westminster | MA | 01473 |
| H32-11-10 | West ST | Mass Elec Co. | | 40 Sylvan Rd | Waltham | MA | 02451 |
| H32-17-11 | D&E Realty Corp | | | PO Box 752 | Hudson | MA | 01749 |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**Location:** 850 West St
**PID:**
**Special Considerations:** H32-16-4

**Type:** Conservation
**GIS Date:** 6/16/2022
**CAMA Date:** 6/16/2022

**This is to certify that at the time of the last assessment for taxation made by the City of Gardner, the above names and address and the parties assessed as adjoining owners to the proposed property.**

Assessors Signature Lauren Stinnett

Date: 6/16/2022

Page 1 of 1

## Attachment #7: Gardner, MA Proposed Landfill Expansion-Hydrological Review

Gardner, MA Proposed Landfill Expansion-Hydrological Review, Mike Wilczynski, Certified Professional Geologist, Pangea Environmental, LLC, May 9, 2022


gardner report v2.pdf

## Attachment #8: Comments Regarding the expansion of the City of Gardner Municipal Wastewater Sludge Landfill

Comments Regarding the expansion of the City of Gardner Municipal Wastewater Sludge Landfill, by Denise Trabbic-Pointer, MS, CHMM Emeritus, Sierra Club – MI, May 5 2022

Comments Regarding the Gardn

Attachment 1 - Gardner SLF GHG Emissions Calculations, Denise Trabbic-Pointer, MS, CHMM Emeritus, Sierra Club - MI, May 5, 2022

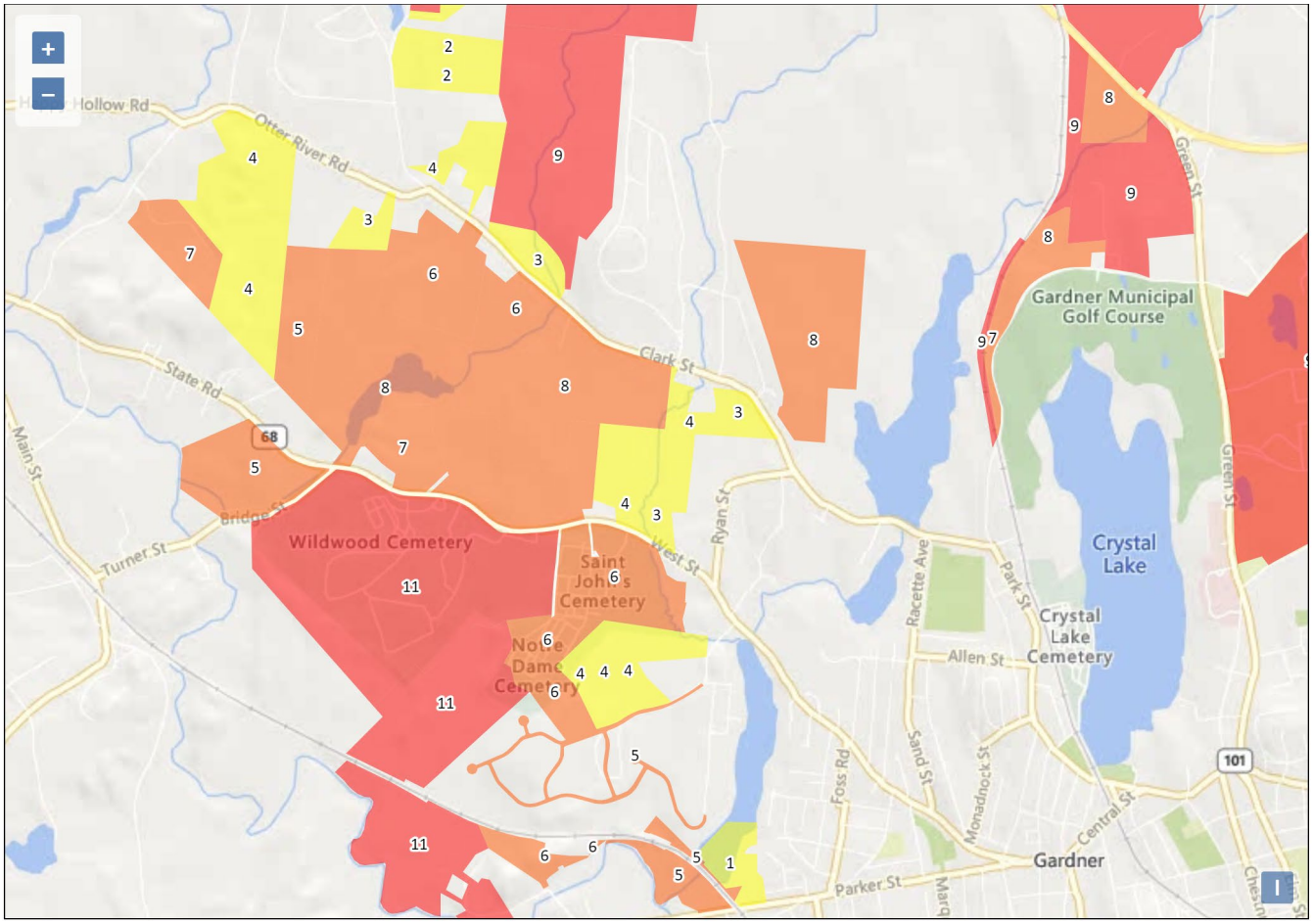
Gardner SLF Estimated GHG Emiss

## Attachment #9: Environmental Justice Concerns regarding the expansion of the Gardner Sludge Landfill

Environmental Justice Concerns regarding the expansion of the Gardner Sludge Landfill, Jenn M. Albertine, PhD, Climate & Land Justice Specialist, Conservation & Stewardship Associate, Mount Grace Land Conservation Trust, December 2021


Environmental Justice Concerns the

## Attachment #10: Wildwood Cemetery Forest Vicinity Map (Mass Audubon MAPPR Tool 2.0)




Priority

- High Priority Parcels
- Medium Priority Parcels
- Lower Priority Parcels

## 11.18 Gardner Clean Air (GCA)

**GCA 01** **The ENF project description is incomplete as it does not adequately describe important information about the project and its potential impacts on the environment. The ENF does not include information on the existing conditions and land uses within the 41.4-acre project site boundary and within the project locus area depicted in the Engineering Report. (Project Description and Permitting)**

**Response** A detailed project description, information on existing conditions and land uses within the Project Site, Project Area, and Surrounding Areas can be found in **Sections 1.5 1.6, and 1.7**of **Chapter 1, "Project Description and Permitting,"** of this DEIR, respectively. Information on existing conditions for each analysis area is included in each chapter. The potential impacts of the Project have been described throughout the DEIR and summarized in **Chapter 10 "Mitigation and Draft Section 61 Findings,"** with measures to mitigate potential environmental impacts.

**GCA 02** **There was no attempt to model a release of contaminants to groundwater from the project. The Engineering Report, Appendix F: Hydrogeological Evaluation Report describes conditions at the site that do not support the expansion. Specific site geology indicates the near surface geology consists mostly of mostly glacial outwash sand and gravel. Beneath the glacial outwash is a bedrock that is fractured and weathered in places. Therefore, contaminants can travel faster and further through such subsurface conditions. Landfills are typically located in areas that have extensive clay deposits and/or a large separation between the bottom of the landfill and the water table. More study and information is needed to understand the hydrology of the area as this appears to be a poor location for a landfill expansion to prevent damage to the environment. (Groundwater)**

**Response** See **Chapter 5, "Groundwater**" and response to **CHI1 02**.

**GCA 03** **The Gardner Wastewater Treatment Plant receives leachate pumped from the now-closed Solid Waste Gardner Sanitary Landfill, a Significant Industrial User (SIU). The SIU leachate is not tested for PFAS. There is a high probability that this SIU and the resulting leachate contains significant PFAS given the materials deposited in the landfill. The sludge that is currently dumped in the existing Sludge Landfill is not tested for PFAS. PFAS testing must be done in order to determine the current level of PFAS in Gardner sludge in order to evaluate the risk of dumping 68,000 cubic yards of this material at the proposed location. (Groundwater)**

**Response** See response to **CHI1 04**.

**GCA 04** **The ENF mentions a double composite groundwater protection system (GWPS). This liner is not guaranteed to never fail and manmade infrastructure ultimately fails. As such, State regulations prohibit landfills from being sited in a Zone II area for an existing or potential public water supply well (310 CMR 19.038 (2)(c)(1)(a)). No corrective action and remediation procedure, if nearby wetland resources are contaminated, is provided if this system fails in 1, 5, 10, 25, or 100 years. No City bonding or funding has been designated to support corrective action and remediation procedures. The Engineering Report, Appendix F: Hydrogeological**

**Evaluation Report, submitted to MA DEP with the WP33 permit application, indicates that groundwater in the expansion area flows south and southeast toward water resources. Ms. Denise Trabbic-Pointer (Sierra Club – MI) has reviewed the Engineering Report, along with current and historical reports on the existing Gardner Sludge Landfill and now-closed Gardner Solid Waste Municipal Landfill and found monitoring wells indicating groundwater contamination. (Groundwater)**

**Response** See response to comment **CHI1 03**. The former solid waste landfill is outside the scope of this DEIR.

**GCA 05** **According to the Mass Sludge Survey 2018 v1.1 (published in September 2019) by the North East Biosolids and Residuals Association (NEBRA) for the Massachusetts Clean Energy Center, only 18% of the wastewater sludge produced in Mass was sent to landfills. The other 82% was disposed of through incineration or applied to soils. This proves that there are viable alternatives to this Project. (Alternatives Analysis)**

**Response** See **Chapter 2, "Alternatives Analysis**" and response to **ALB 02**.

**GCA 06** **According to Jennifer Wood (Environmental Engineer with Mass DEP NPDES and Residuals Program), no other Mass city or town is seeking to create or expand a sludge landfill. Athol, MA discontinued use of their sludge landfill roughly 20 years ago due to public outcry resulting from their inability to control odors. Athol currently hauls out for incineration to Upper Blackstone in Millbury MA. If sludge landfills were a good solution, then most communities with a waste water treatment plant would be trying to construct a sludge landfill. (Alternatives Analysis)**

**Response** See **Chapter 2, "Alternatives Analysis**."

**GCA 07** **Alternatively, conversion of wastewater sludge to energy and recycling of the residual material is the future and is consistent with the Massachusetts 2030 Solid Waste Master Plan: Working Together Toward Zero Waste – October 2021. (Alternatives Analysis)**

**Response** See **Chapter 2, "Alternatives Analysis."**

**GCA 08** **The ENF Report Section 4 Alternatives Analysis contains an analysis of 9 alternatives. This analysis is inadequate so should not be accepted by the MEPA office. It contains no detailed references, financial data, or calculations to back it up. Over the past 10 years, the City has not completed a single feasibility study on any alternative to the expansion. The City has not looked at public/private sector partnerships or grant programs that could assist the City in properly exploring alternatives to the proposed expansion.**

**Alternatives #1 and #2 in the ENF are not really alternatives because Gardner has a wastewater treatment plant and the City can't dump untreated wastewater into the Otter River.**

**Alternative #3 and #4 involve land application and a composting facility. These alternatives should not have been dismissed. According to The Mass Sludge Survey 2018 v.1.1, these methods are utilized for 38% of the sludge disposal in Massachusetts. Composting is currently done by Ipswich, MA utilizing a private**

**contractor (Agresource). Montague, MA recently received $150K for an in depth feasibility study grant and is currently evaluating feasibility studies for a new compost facility. Previously, Montague had a compost capability that earned over $1.2 M for a 7-year period.**

**Alternative #5 mentions Anaerobic Digestion (AD) which is done on a large scale at Deer Island in Winthrop, MA and Greater Lawrence Sanitary District in North Andover MA. Residual material is converted to fertilizer by a private contractor. In Dartmouth, MA, Commonwealth Resource Management Corporation successfully operates a private sector AD facility at smaller scale. Fitchburg MA is implementing a private sector run AD facility at the West Fitchburg wastewater treatment plant with a scheduled start-up of December 2025, which would be a disposal option for Gardner. Thus, AD is a feasible alternative.**

**Alternative #6 involves constructing an incinerator, a process which is utilized for 43% of the sludge disposal in Massachusetts according to The Mass Sludge Survey 2018 v.1.1. To utilize this alternative, Gardner would need to do a feasibility study for an incinerator.**

**Alternative #7 involves Gasification which is currently being pursued by Taunton, MA. The Taunton project is currently in MEPA review and more information will be forthcoming about this project and in general about the viability of this new technology, so this alternative should not be dismissed so quickly. The ENF does not mention that, in October 2022, Gardner contracted with SoMax for a feasibility study of a hydrothermal carbonization (HTC) facility, which So-Max is piloting in Phoenixville, PA, a town similar in size to Gardner. The Gardner study is now under way. Hydrothermal carbonization (HTC) converts organic waste, recovering valuable resources and creating clean, useful bioproducts that can be used to produce biogas, fertilizers, concrete, and other products. The energy produced from HTC can be used to power a wastewater treatment plant. In November 2021, the U.S. Department of Energy (DOE) awarded SoMax a Water Recovery Prize for small- and medium-sized facilities based on their work on HTC in Phoenixville, PA.**

**Alternative #8 involves constructing a new SLF elsewhere in the City. Although we do not see this as a good solution, we have seen no analysis of this alternative. Alternative #9 involves hauling out the sludge for disposal. Many communities utilize this alternative which results in incineration or fertilizer conversion/composting at another facility in or out of Massachusetts. PFAS concerns have created a challenge in the sludge disposal industry equally for all methods of sludge disposal. However, because PFAS has such a wide impact, solutions will be forthcoming to deal with this challenge. Overall, the City has not completed a sufficient alternative analysis to the Sludge Landfill expansion. (SLF). Instead, the City seems to have chosen to continue on the SLF path, primarily due to a 37- year-old site assignment for a portion of the Wildwood Cemetery Forest. The City has not explored the alternative of partnering with any neighboring communities or pursued a private sector partnership for a viable alternative to the SLF expansion. In addition, the City has rejected pursuit of a phased construction of the SLF expansion and therefore will be committing the City to a 17-year SLF solution to the year 2042. Phased construction will limit**

**environmental damage and allow Gardner to take advantage of innovation in the other alternatives or partner with other communities in pursuit of a sustainable solution prior to 2042. (Alternatives Analysis)**

**Response** See **Chapter 2, "Alternatives Analysis**."

**GCA 09** **The Sludge Landfill Expansion project site location is within Gardner's Wildwood Cemetery Forest, a parcel that is currently used for community recreation. This property abuts and connects with a network of trails on the Cummings Otter River Conservation Area. A blazed trail along the property's glacial period Esker provides year-around use by the public for hiking, snow-shoeing, cross-country skiing, and hunting. The Gardner Conservation Department, North County Land Trust, and Millers River Watershed Council have conducted guided hikes to this property. The goals for community use of this property are included in the Wildwood Forest Stewardship Plan, which is referred to in Gardner's Open Space Plan 2015 and which states on pages 3 & 4: "The Forest Stewardship Committee has developed the following goals for the Wildwood Cemetery property. Management will focus on promoting a healthy forest environment for the safety and enjoyment of the residents of Gardner and others who will visit the property." One of the goals states: "Improve hiking trails for public recreational use." The landfill expansion plan is contrary to the forest stewardship plan goals and future community use of the site. (Project Description and Permitting)**

**Response** See **Chapter 1, "Project Description and Permitting**." See also responses to **MEPA 26**, **CHI1 05** and **CHI1 07**.

**GCA 10** **The ENF fails to state that the zoning for the project site and one-mile radius around it is mostly Rural Residential (R2) with a small portion zoned as Single Family Residential (R1) and General Residential (G3). There are residential neighborhoods with approximately 563 adult residents with 272 homes per the street listings for Gardner and Templeton. The one-mile radius is also home to facilities owned by 13 businesses, 3 social organizations, and 3 religious' organizations. This includes 3 Catholic Cemeteries owned by Annunciation Parish. Importantly, Environmental Justice populations, just within the 1-mile radius are in Block Group 2, Census Tract 7073. In 2020, this block group had a population of 1,829 in 843 households. (Project Description and Permitting) (Environmental Justice)**

**Response** See **Chapter 1, "Project Description and Permitting**" for a discussion on zoning and land uses on the Project Site, Project Area, and Surrounding Area. See also **Chapter 3, "Environmental Justice"** and comment/response to **MEPA 02, MEPA 29**, and **CHI1 09**. regarding Environmental Justice concerns.

**GCA 11** **The ENF does not identify all private drinking water wells within one mile of the project. There are approximately 65 Gardner homes and 6 Templeton homes with private drinking water wells within one mile according to assessor property cards. The ENF does not cover potential impact to these wells. (Groundwater)**

**Response** See **Chapter 5, "Groundwater**" and response to **MEPA 11**. **Figure 5-1** illustrates the location of public and private wells within one mile of the Project Site.

**GCA 12** **The ENF does not mention historical odor problems with the existing Sludge Landfill. Air quality has been a consistent problem over many years and numerous odor complaints have been submitted by residents and visitors to the nearby cemeteries and conservation areas. McClure Engineering inspects the existing Sludge Landfill on a bi-monthly basis and the results are published in the Sludge Landfill Annual Operations Reports. The 2020 and 2021 Annual Operations Reports indicate that odor was present at 100% of the 12 inspections in 2020 and 2021. There was not one inspection that indicated odors as "not detected." Per the McClure Engineering 2020 Operations report, landfill operators had found a source of odors to be runoff on the east side that stinks of old sludge. The landfill expansion will perpetuate odors and increase the odor problem. As part of the Project, the City must be required to install odor emissions monitoring equipment that is able to measure and report gases causing the odors on a 24/7 bases prior to permitting of this expansion project. In order to mitigate odors, the City must be required to cap the existing landfill footprint and install a gas management system as part of the expansion. (Air Quality)**

**Response** See **Chapter 7, "Air Quality**" and responses to **MEPA 16** and **CHI1 06**.

The City of Gardner uses the most common odor monitoring technique as part of operations and would continue to do so with the Project. Other odor measurement techniques are less reliable and accurate, and more costly and are not proposed with the Project. One such measure involves taking bag samples during representative times periods and sending them to an odor lab for determination of odor strength and character. Real-time measurement involves utilizing a Nasal Ranger; however, this single person/grab sample approach is less accurate. Electronic monitoring would be less accurate still. This approach would include a continuous monitor measuring a specific chemical (e.g. hydrogen sulfide) known to be a significant contributor to odor. However, there are a variety of chemicals that contribute to odor, and measurement of one specific chemical to serve as a surrogate is not considered reliable.

**GCA 13** **The 41.4-acre project site boundary in the ENF does not match the 37.36-acre parcel referred to in the 1985 DEQE Site Assignment Letter which was included in the CDR Maguire WP44 Application Gardner Landfill Vertical Expansion for United Water – August 7,2014 that was used for the Sludge Landfill Vertical Expansion approved by MA DEP in 2016. The ENF provides no explanation for this discrepancy. (Project Description and Permitting)**

**Response** See **Sections 1.3, 1.5** and **1.6** of **Chapter 1, "Project Description and Permitting**" and Figure 1-2. Clarity has been provided on the definition and size of the Project Site and the Project Area. Note the current MassDEP Residuals Management Program policy on the Design and Operation of Sludge Landfills states that such sludge-only disposal facilities are not subject to the site assignment requirements of Chapter 111, Section 150A (MassDEP Residuals Management Program. (1983) *Policy on the Design and Operation of Sludge Landfills* (Retrieved from https://www.mass.gov/doc/sludge-landfills-design-operation/download).

**GCA 14** **Groundwater flows exist in this area such that landfill leachate liner leakage will eventually pose risk to several surface water resources within a one-mile radius. These surface water resources exist in all directions within one-mile around the expansion**

**site. Hilchey Pond – The ENF indicates that Hilchey Pond is an impaired water body within half mile radius of the project site. It is located approximately 2,151 feet to the North of the site. The ENF did not include the information that this pond is fed by nearby Bailey Brook and the outlet feeds Bailey Brook and eventually flows to the nearby Otter River. The following other important water resources are located within one-mile. Distances to the expansion site were approximated using MassMapper. Rousseau Ponds – The Rousseau ponds, wetlands, and perineal streams are to the south and in the watershed of the Otter River. The three Rousseau ponds are spring-fed. The nearest Rousseau-pond is approximately 700 feet to the South of the site. Otter River – The Otter River is the only river that flows through Gardner. The Wildwood Cemetery Forest (including the Project site) and Cummings Otter River Conservation Area are in the watershed. The Cummings Otter River Conservation Area has a substantial frontage length of 2,500 feet on the Otter River. The Otter River is to the South and West with two locations within ½ mile with the closest distance of approximately 1,607 feet to the West of the site. The Millers River Watershed Council has established a recreational Blue Trail on the Otter River in this area. Bailey Brook – Bailey Brook is approximately 1,647 feet to the Northwest of the site. Bailey Brook is a cold-water fisheries brook. Bailey Brook flows from North Gardner to the Otter River and a portion of this brook is within the Wildwood Cemetery Forest. Gardner has recently invested in the creation of the new Bailey Brook Conservation Area and Open Space Park. Gardner also has invested recently in the Bailey Brook Greenway project with the goal of conservation of properties along Bailey Brook from Winchendon town line to the Otter River. Wilder Brook – Wilder Brook is approximately 4,015 feet to the East of the site. Wilder Brook flows from North Gardner to Parker Pond. Parker Pond – Parkers Pond is approximately 4,980 feet to the East of the site. At 29 acres, this is Gardner's 5th largest water body. This pond is fed by Wilder Brook and Perley Brook and the outlet feeds the Otter River. Unnamed EKCA Pond – An unnamed Ebenezer Keyes Conservation Area (EKCA) pond is approximately a distance of 1,960 feet to the South of the site. An outlet from this pond flows through a perennial stream to the Otter River. The EKCA was established in 2021 and owned by the North County Land Trust. (Project Description and Permitting) (Stormwater)**

**Response** As discussed in **Chapters 5, "Groundwater**," and **6, "Stormwater,"** of this DEIR, the Project includes measures to protect surface and groundwater resources. Therefore, there are no impacts anticipated to these resources as a result of the Project.

**GCA 15** **The ENF and Engineering Report Section 6 Stormwater Management does not address the following issues: Does not comply with performance standards for work in buffer zone because the extensive work in and the lack of adequate proposed natural vegetation within the Buffer Zone, where some portions are steeply sloped, will result in an increase in stormwater and sediment flow to BVW and the warming of water temperatures in BVW. The project should be considered LUHPLP under the Stormwater Management Standards and comply with Stormwater Standard 6. The project did not review all impacts to resource areas by addressing an existing erosion problem at the existing vertically expanded sludge landfill at outfall pipe 002. The Engineering Report Section 6 Stormwater Management not include alternative**

**locations for the two stormwater infiltration basins such that outfall pipes that would not be located within the 100-foot buffer zones for Wetland C and Wetland D. (Stormwater)**

**Response**

See **Chapter 6, "Stormwater**" and responses to **MEPA 32, PEA 04, ANT 02,** and **MRW 07**. The Project would comply with the conditions set forth in the MassDEP-issued Order of Conditions for the protection of wetlands. The stormwater calculations completed for the Project provide justification for the location of the Project's stormwater infiltration basins. The location of the infiltration basins is based on HydroCAD modelling. Peak rates of runoff from the Project Site during various storm events under three stages of landfill development were analyzed with consideration given to soil types, surface cover, watershed slope, and flow paths. The infiltration basins and their appurtenances were designed in accordance with all applicable regulations, including the Massachusetts Stormwater Handbook and the Federal Highway Administration's Hydraulic Design of Energy Dissipators for Culverts and Channels.

**GCA 16**

**The project site is currently and proposed to be in active Forestry use. A copy of the Forest Management Plan is available on the Gardner City website at: Wildwood Forest Stewardship Plan. This project involves conversion of land held for natural resources purposes in accordance with Article 97 of the Amendments to the Constitution of the Commonwealth. The project is not consistent with the Gardner Community Development Plan -2006. Operation of a landfill, with continual odor problems for a 17-year period, will impede development of open land north of route 68 in this area. (Project Description and Permitting)**

**Response**

See **Chapter 1, "Project Description and Permitting**," and responses to **MEPA 26**, and **CHI1 07**. See also **Chapter 7, "Air Quality**" and responses to **MEPA 16** and **CHI1 06**. Existing odor complaints have generally been made at locations south/ southeast and west of the existing sludge landfill and wouldn't be expected to affect development on surrounding parcels to the north.

**GCA 17**

**The project adds leachate infrastructure that will increase the input to Gardner's existing Waste Water Treatment Plant. (Stormwater)**

**Response**

The increase in leachate directed to the WWTF has been considered and accommodated in design.

**GCA 18**

**The project adds the infrastructure maintenance cost of 3 stormwater basins / ponds that will require perpetual maintenance. (Landfill Design and Construction)**

**Response**

See **Chapter 4, "Landfill Design and Construction**." Stormwater management is a critical component of this Project's design. To operate at maximum efficiency, regular maintenance would be performed. This maintenance would be completed in accordance with the facilities' Operations and Maintenance Plan.

**GCA 19**

**The project is within an area currently used for open space and recreation. The Wildwood Forest Stewardship Plan for the Wildwood Cemetery Forest has specific goals on the conservation value of the project site. The project is not compatible with adjacent land uses. In 2012, the City utilized State and Federal funding to acquire the abutting Cummings Otter River Conservation Area for open space and recreation as**

**well as water supply protection. The purchase was made using a $197,625 Mass Drinking Water Supply Protection Grant, along with a Northwestern Area Forest Legacy Project grant awarded to the North County Land Trust. (Project Description and Permitting)**

**Response** See **Chapter 1, "Project Description and Permitting**" and responses to **CHI1 05** and **CHI1 07**.

**GCA 20** **The ENF does not recognize that the Wildwood Cemetery Forest (WCF) is an important part of Gardner's Green Infrastructure. Using Mass Audubon's MAPPR Tool 2.0, attachment #10 illustrates the value of Wildwood Cemetery Forest. The WCF scored as a high priority parcel with a total score of "11" and is equal or higher than other parcels in this area of Gardner. "Cummings Conservation Area. 122 acres that were acquired with Forest Legacy and Water Supply Protection funds. The land includes an undisturbed glacial esker, wetlands, vernal pools, floodplain, and riparian habitat of Otter River. Large, protected forest landscapes, flood zones, and connected riparian corridors increase Gardner's resilience to climate change. Development pressure outside of the protected areas threaten the resource functions and values within the Conservation Area." (Project Description and Permitting)**

**Response** See **Chapter 1, "Project Description and Permitting**" and responses to **CHI1 05** and **CHI1 07**.

**GCA 21** **"Sludge landfill, whose on-site stormwater system may be threatened by increasing storms" (Stormwater) (Climate Change)**

**Response** See **Chapters 6, "Stormwater," 8, "Climate Change,"** and response to **MEPA 19**.

**GCA 22** **The ENF statement that there are no EJ populations within I mile of the project site is incorrect. The project site boundary, indicated in Engineering Report G-002 Vicinity Map – One Mile Radius, is identified as a 41.4-acre parcel. This parcel is approximately 0.934 miles from an EJ population. This location also roughly coincides with the 37.36-acre parcel referred to in the 1985 DEQE Site Assignment and included in the CDR Maguire WP44 Application Gardner Landfill Vertical Expansion for United Water – August 7, 2014. According to the Engineering Report: Section 7 Landfill Closure Plan: "Closure of the sludge landfill expansion is proposed to occur as a single event together with the original landfill closure, after filling has been completed in all landfill cells." Therefore, the original Sludge Landfill will remain part of the expansion project until the predicted date of closure in 2041. The fence line of the original landfill, is 0.999 miles from an EJ population. Therefore, this project meets the definition of a Designated Geographic Area per MEPA regulation 11.02(2) and meets the mandatory threshold for an Environmental Impact Report (EIR). Use of this site for a landfill expansion removes 6.0-acres of City land that has been utilized for recreational purposes by Gardner residents and subjects this population to the continued poor air quality generated by the Sludge Landfill. III. A. 2. The ENF "description of activities conducted prior to filing to promoted involvement by EJ populations" is inadequate. (Project Description and Permitting) (Environmental Justice) (Air Quality)**

**Response** See **Chapter 3, "Environmental Justice"** and comment/response to **MEPA 02, MEPA 29,** and **CHI1 09** regarding environmental justice concerns. See **Chapter 1, "Project Description and Permitting"** and responses to **CHI1 05** and **CHI1 07** regarding open space concerns. See **Chapter 7, "Air Quality"** and responses to comments **MEPA 16** and **CHI1 06** regarding air quality concerns.

**GCA 23** **The ENF is missing the dates for public meetings (held 7 years ago in 2016) and a description of issues of concern raised at these meetings and steps taken to address the concerns. The recent project's "Notice of Intent (NOI)" public meetings were of a narrow scope to only include issues related to the Mass Wetland Protection Act and Gardner Wetland Protection Ordinance and not the project's wider impact. The ENF is missing a description of issues raised at these NOI meetings and steps taken to address the issues. (Public Involvement Plan)**

**Response** See this chapter and **Appendix B** As detailed in that appendix, the history of public involvement has been cataloged. Public concerns have been expressed through the MEPA process via public comment on the Environmental Notification Form and have been addressed as part of this DEIR.

**GCA 24** **The ENF distribution list does not include community organizations within or near the one-mile distance of this project and all the abutting property owners. Religious organizations not included are:**

- **Bethany Baptist Church – 72 Ryan Street, Gardner, MA 01440**
- **Jehovah's Witnesses - Kingdom Hall – 1071 West Street, Gardner, MA 01440**
- **Annunciation Parish, 135 Nichols Street, Gardner, MA 01440. This parish has an active Hispanic**
- **Ministry and 3 Cemeteries located on West Street.**

**Social organizations not included are:**

- **Gardner Fish & Gun Club – 538 Clark Street, Gardner, MA 01440**
- **West End Beagle Club – Off Clark Street, Gardner, MA 01440**
- **Gardner Trout Club – 44 Watkins Road, Gardner, MA 01440**
- **Otter River Sportman's Club - PO Box 28, Baldwinville, MA 01436**

**The ENF distribution list does not include any departments from the Town of Templeton, a Municipality affected by this project. Templeton Town Officials including the Select Board, Conservation Commission, Light & Water Commission, etc. were not properly notified in the ENF. The ENF distribution list does not include abutters to the City property Parcel ID H32-16-4, the location of the existing sludge landfill and expansion. (Circulation List)**

**Response** See **Chapter 12"Circulation List**" and response to **MEPA 38.** The religious and social organizations listed in this comment have been added to the circulation list as well as the Town of Templeton town departments, officials, select board, conservation commission, and light and water commission. Property abutters were included in the Environmental Notification Form distribution list and remain included for the DEIR Circulation list.

29 January, 2023

**Ms. Bethany A. Card, Secretary of Energy and Environmental Affairs**
**Executive Office of Energy and Environmental Affairs (EEA)**
**Attn: MEPA Office**
**Alexander Strysky EEA No. 16643**
**100 Cambridge Street, Suite 900**
**Boston MA 02114**
**Subject: ENF Comment / Gardner Sludge Landfill Expansion**
**Sent via email: alexander.strysky@mass.gov**

Dear Secretary Card:

As a concerned citizen of the City of Gardner, I am submitting to you this letter with my comments regarding the Gardner Sludge Landfill Expansion, Environmental Notification Form (ENF). This expansion project raises important concerns with the ENF and the need for further in-depth analysis via an Environmental Impact Report (EIR).

The comments in this letter mirror those sent to you by Gardner Clean Air (GCA) of Gardner. As a result, and in respect of your time, I will include the shared concerns, but will ask you to refer to the GCA letter submitted to you. To give you a bit of background on why I share GCA's concerns, my 1940's era house is within a mile of the City of Gardner's former dump and landfill, which emitted different noxious odors until it was ultimately capped. The current sludge landfill now emits odors routinely blown across my property, necessitating closing windows in the house so that I can try to escape. However, this is only one of the concerns about the proposed expansion of the current sludge landfill. My other concerns are as follows: MAR 01

**1. Risk of ground water contamination with impact to drinking water and watershed.** MAR 02
The project Vicinity Map – One Mile Radius (G002) does not identify all of the approximate 70 private drinking water wells. The ENF does identify the two Town of Templeton Public Drinking Water Wells within one mile of the site. As the structure standing between the waste, likely containing PFAS and other toxins, is man-made, there is always a risk of failure of containment. PFAS contamination has become a growing concern in Massachusetts and the Country. According to the US EPA, peer-reviewed studies have shown that PFAS may lead to increased risk of some cancers, reproductive effects in pregnant women, and developmental delays in children. There are "forever" chemicals that can be leached into our groundwater permanently. This is not acceptable. There have, in recent years, MAR 03
been earthquakes centered in Athol and in Templeton, which caused minor damage on my property. Although rare, earthquakes in the area do have the potential to damage the liner of the landfill. During the recent MEPA site visit to the landfill and its proposed extension area, which we were not actually allowed to view, questions arose about the monitoring of, and response to, any incidents which could overwhelm or breach the liners of the current and proposed modules. These questions about a response plan in the case of a breach of the liners, directed to the Gardner city officials, went unanswered.

**2. Negative impacts to the public recreational use of the Wildwood Cemetery Forest, Cummings Otter River Conservation Area, and the Ebenezer Keyes Conservation Area.** MAR 04

Once again, the foul odors that the landfill emits deter people from extended visits with loved ones, or from hiking in Gardner's conservation areas, negating part of the purpose of this land.

**3. Continued source of ongoing poor air quality for entire area.** MAR 05

The ENF does not mention historical odor problems with the existing Sludge Landfill. Air quality has been a consistent problem over many years and numerous odor complaints have been submitted by residents and visitors to the nearby conservation areas and cemeteries, includes three Roman Catholic Cemeteries owned by the Diocese of Worcester and maintained by Annunciation Parish. The cemeteries and conservation areas are visited by thousands of people. They abut residential neighborhoods with approximately 563 adult residents with 272 homes per the street listings for Gardner and Templeton. The one-mile radius is also home to facilities owned by 13 businesses, 3 social organizations, and 3 religious organizations. 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.

The odors are nauseating to those who visit this area. The City has not installed air quality monitoring devices in order to determine the frequency and intensity of odors. Instead, the City has depended on residents and visitors filing odor complaints, a process neither effective and widely known. Vile odors emanate from the current sludge landfill and the expansion will perpetuate and increase the odor problem. It is so heartbreaking to visit my parents', grandparents', great grandparents' and friends' graves at St. John and Notre Dame Cemeteries, only to have to abort my visit because the foul odor is overwhelming. This occurs routinely during the spring, summer, and fall.

**4. Destruction of 6 acres of natural resources including wildlife habitat, forest, a natural esker, and close-proximity to two certified vernal pools.** MAR 06

These land features assist in filtration of rainwater through to the water table. The more land that is unnecessarily destroyed, the more unfiltered rain run off occurs.

**5. Failure of the City of Gardner to present a thorough and accurate examination of alternative sludge management options.** MAR 07

This is such an important concern. The alternatives analysis dismisses sludge disposal alternatives without completing a single feasibility study of any such alternative. The alternatives analysis fails to consider partnering with any neighboring communities or pursuing a private sector partnership for a viable alternative to the project. The City has rejected pursuit of a phased construction of the project which will, in effect, commit the City to the 17-year landfill expansion. **This effectively prevents the City from migrating to an economically and environmentally better alternative within 17 years. With this Project, Gardner will not be able to take advantage of innovation in the other alternatives or partner with other communities in pursuit of a sustainable solution prior to 2042.**

This truly is unacceptable, because if Fitchburg's proposed sludge processing facility is built, and Gardner is one of the communities that can utilize it, and will likely be needed by Fitchburg to help support the operation, it will be too late for us. The damage will already have been done to our environment as acres of forest are razed.

The presence of an Environmental Justice community is within one mile of the project site and should trigger the threshold for requiring an Environmental Impact Report (EIR). An EIR will provide more in-depth analysis of the environmental and human impacts and alternatives to this project.

MAR 08

Thank you for your time and consideration. Please feel free to contact me with any questions about my concerns.

Sincerely,

Mary E. Marsh

150 Acadia Road
Gardner, MA 01440
Cell: 1-508-612-9882
Home: 1-978-632-1711
mary.marsh@shutr.net

## 11.19 Mary E. Marsh (MAR)

**MAR 01** **As a concerned citizen of the City of Gardner, I am submitting to you this letter with my comments regarding the Gardner Sludge Landfill Expansion, Environmental Notification Form (ENF). This expansion project raises important concerns with the ENF and the need for further in-depth analysis via an Environmental Impact Report (EIR).**

**The comments in this letter mirror those sent to you by Gardner Clean Air (GCA) of Gardner. As a result, and in respect of your time, I will include the shared concerns, but will ask you to refer to the GCA letter submitted to you. To give you a bit of background on why I share GCA's concerns, my 1940's era house is within a mile of the City of Gardner's former dump and landfill, which emitted different noxious odors until it was ultimately capped. The current sludge landfill now emits odors routinely blown across my property, necessitating closing windows in the house so that I can try to escape. However, this is only one of the concerns about the proposed expansion of the current sludge landfill. My other concerns are as follows: (Air Quality)**

**Response** See response to **ANT 07**. See also **Chapter 7, "Air Quality"** and responses to **MEPA 16** **CHI1 06**.

**MAR 02** **Risk of ground water contamination with impact to drinking water and watershed. The project Vicinity Map – One Mile Radius (G002) does not identify all of the approximate 70 private drinking water wells. The ENF does identify the two Town of Templeton Public Drinking Water Wells within one mile of the site. As the structure standing between the waste, likely containing PFAS and other toxins, is man-made, there is always a risk of failure of containment. PFAS contamination has become a growing concern in Massachusetts and the Country. According to the US EPA, peer-reviewed studies have shown that PFAS may lead to increased risk of some cancers, reproductive effects in pregnant women, and developmental delays in children. There are "forever" chemicals that can be leached into our groundwater permanently. This is not acceptable. (Groundwater)**

**Response** See **Chapter 5, "Groundwater**," and response to **MEPA 11** and **CHI1 04**.

**MAR 03** **There have, in recent years, been earthquakes centered in Athol and in Templeton, which caused minor damage on my property. Although rare, earthquakes in the area do have the potential to damage the liner of the landfill. During the recent MEPA site visit to the landfill and its proposed extension area, which we were not actually allowed to view, questions arose about the monitoring of, and response to, any incidents which could overwhelm or breach the liners of the current and proposed modules. These questions about a response plan in the case of a breach of the liners, directed to the Gardner city officials, went unanswered. (Project Description and Permitting)**

**Response** See responses to **CHI1 03** and **TEM 03.**

**MAR 04** **Negative impacts to the public recreational use of the Wildwood Cemetery Forest, Cummings Otter River Conservation Area, and the Ebenezer Keyes Conservation Area.**

**Once again, the foul odors that the landfill emits deter people from extended visits with loved ones, or from hiking in Gardner's conservation areas, negating part of the purpose of this land. (Project Description and Permitting) (Air Quality)**

**Response** See **Chapter 1, "Project Description and Permitting,"** and responses to **CHI1 05** and **CHI1 07**. See also **Chapter 7, "Air Quality,"** and responses to **MEPA 16** and **CHI1 06**.

**MAR 05** **Continued source of ongoing poor air quality for entire area. The ENF does not mention historical odor problems with the existing Sludge Landfill. Air quality has been a consistent problem over many years and numerous odor complaints have been submitted by residents and visitors to the nearby conservation areas and cemeteries, includes three Roman Catholic Cemeteries owned by the Diocese of Worcester and maintained by Annunciation Parish. The cemeteries and conservation areas are visited by thousands of people. They abut residential neighborhoods with approximately 563 adult residents with 272 homes per the street listings for Gardner and Templeton. The one-mile radius is also home to facilities owned by 13 businesses, 3 social organizations, and 3 religious organizations. 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.**

**The odors are nauseating to those who visit this area. The City has not installed air quality monitoring devices in order to determine the frequency and intensity of odors. Instead, the City has depended on residents and visitors filing odor complaints, a process neither effective and widely known. Vile odors emanate from the current sludge landfill and the expansion will perpetuate and increase the odor problem. It is so heartbreaking to visit my parents', grandparents', great grandparents' and friends' graves at St. John and Notre Dame Cemeteries, only to have to abort my visit because the foul odor is overwhelming. This occurs routinely during the spring, summer, and fall. (Air Quality)**

**Response** See **Chapter 7, "Air Quality,"** and response to **MEPA 16, CHI1 06**, and **GCA 12**.

**MAR 06** **Destruction of 6 acres of natural resources including wildlife habitat, forest, a natural esker, and close-proximity to two certified vernal pools. These land features assist in filtration of rainwater through to the water table. The more land that is unnecessarily destroyed, the more unfiltered rain run off occurs. (Project Description and Permitting) (Stormwater)**

**Response** See responses to **CHI1 07** and **PEA 04**.

**MAR 07** **Failure of the City of Gardner to present a thorough and accurate examination of alternative sludge management options. This is such an important concern. The alternatives analysis dismisses sludge disposal alternatives without completing a single feasibility study of any such alternative. The alternatives analysis fails to consider partnering with any neighboring communities or pursuing a private sector partnership for a viable alternative to the project. The City has rejected pursuit of a phased construction of the project which will, in effect, commit the City to the 17-year landfill expansion. This effectively prevents the City from migrating to an economically and environmentally better alternative within 17 years. With this**

**Project, Gardner will not be able to take advantage of innovation in the other alternatives or partner with other communities in pursuit of a sustainable solution prior to 2042. This truly is unacceptable, because if Fitchburg's proposed sludge processing facility is built, and Gardner is one of the communities that can utilize it, and will likely be needed by Fitchburg to help support the operation, it will be too late for us. The damage will already have been done to our environment as acres of forest are razed. (Alternatives Analysis)**

**Response** See response to **CHI1 08**.

**MAR 08** **The presence of an Environmental Justice community is within one mile of the project site and should trigger the threshold for requiring an Environmental Impact Report (EIR). An EIR will provide more in-depth analysis of the environmental and human impacts and alternatives to this project. (Project Description and Permitting)**

**Response** See **Chapter 3, "Environmental Justice"** and comment/response to **MEPA 02, MEPA 29,** and **CHI1 09** regarding environmental justice concerns. See also response to **ANT 07** regarding DEIR intent.

**Rebecca Tepper, Secretary of Energy and Environmental Affairs** 01/28/2023
**Executive Office of Energy and Environmental Affairs (EEA)**
**Attn: MEPA Office**
**Alexander Strysky EEA No. 16643**
**100 Cambridge St. Suite 900**
**Boston, MA 02114**
**Subject: ENF Comment/Gardner Sludge Landfill Expansion**
**Sent Via email:alexander.strysky@mass.gov**

Dear Secretary Tepper,

Please consider my comments and concerns, shared in this letter, with respect to the Gardner Sludge Landfill Expansion Environmental Notification Form. I am a citizen in Templeton, MA. I am concerned with this project's ENF. I believe that there is a need for further analysis via an Environmental Impact Report (EIR). I attended the recent MEPA tour of the proposed Landfill Expansion site, and have walked the trails on the backside of the proposed site through the Cummings Forest.

**My concerns are as follows :**

**1.) Zone Two Wells, and the risk of contamination to drinking water sources and the watershed.** GRI 01

The ENF identifies two of Templeton's Public Drinking Water Wells within one mile of the site. It *does not* include any private wells on the Templeton side. Neither Templeton nor its private well owners have been notified as abutters. GRI 02 GRI 03

I would reference the Templeton Water Report from June 2022, on page 5: www.mass.gov/dep/water/drinking/swap/2294000pdf. **The SWAP Program** clearly states: "These wells supply ground water from an aquifer of high vulnerability because of an absence of barriers such as clay." Local temperatures are changing rapidly in the Northeast. Has any consideration been given to Climate Change, or to how extreme weather events will affect the landfill's lining system over time? GRI 04 GRI 05

Landfills are known for producing tremendous volumes of leachate, an aqueous fluid containing high concentrations of ammonia and natural organic matter. They are also known to

contain man-made chemicals such as polyfluoroalkyl substances (PFAS). They do not degrade naturally and are persistent in the environment. The EPA has found PFAS to be detrimental to human health, and will be issuing contaminant limits in 2023. A failure to the landfill's lining could cause the aquifer to become contaminated, and compromise drinking water sources for the entire community of Templeton. Clean-up of the aquifer may not be feasible, and, at the least, be extremely costly. There are no controls in place that require Gardner to maintain insurance or hold a bond in the event that Templeton is affected by a landfill failure. GRI 06

The loss of natural cooling forests is also a major concern. The landfill expansion plans to remove both trees and a natural esker. Removal of these resources will add heat to the area. The removal of the esker as a barrier is also detrimental to the water supply and wetlands if the Otter River floods. In total this expansion will remove 4.3 acres of natural resources, including a hardwood forest, a wildlife habitat, and the above mentioned esker. It comes in close proximity to two certified vernal pools. GRI 07 GRI 08

Please consider an EIR to assess the risks posed to local water supplies by contamination from the landfill, and how Climate Change over time will impact the Otter River, vernal pools, and local wildlife habitat.

**2.) Air Quality and Public Recreational Land Use**

The ENF does not mention odor problems with the existing Sludge Landfill. Air quality has been a consistant problem over the years. Numerous complaints have been filed. GRI 09

This property abuts and connects to Wildwood Cemetary and Forests, Cummings Otter River Conservation Area, and the Ebenezer Keyes Conservation Area. There are also three local cemetaries. Residents with loved ones in these cemetaries are put off by the smell when visiting and are forced to limit the duration of their stay at the gravesite. The smell is nauseating and a deterrant to how often they go. The odor also detracts from the recreational use of the hiking trails in the aforementioned forests and conservation areas. Odors travel through these areas and extend through Turner Lane in Templeton, whose residents have complained since the first sludge landfill went in.

The City of Gardner has no measures in place to assess air quality. There are no monitoring devices to quantify the frequency and intensity of odors. The City leaves it to the community to file complaints, and most citizens are unaware of the protocols. Residents from Templeton are concerned about retaliation if they call attention to any issues. The City of Gardner does not maintain open communications with Templeton. They have not established GRI 10

protocols if problems do arise. These are major concerns.

As a citizen with grandchildren, I consider the current 17 year plan a band-aid that could have disasterous effects on the land, air, and water quality for our future residents. If you proceed with an Environmental Impact Report, I would ask that you study the land area on both sides of the river, and sincerely hope that any projected impacts would be forecast beyond the current term. Regardless of duration, I respectfully ask that you consider the impacts from these landfills to Templeton, its public and private wells, neighborhoods, and abutting land. GRI 11

Sincerely,

Theresa Griffis
12 Drury Lane
Templeton,Ma 01468
978-939-7370
t.griffis@gmail.com

## 11.20 Theresa Griffis (GRI)

**GRI 01** **Zone Two Wells, and the risk of contamination to drinking water sources and the watershed. (Groundwater)**

**Response** See **Chapter 7, "Groundwater"** and response to **CHI1 02**.

**GRI 02** **The ENF identifies two of Templeton's Public Drinking Water Wells within one mile of the site. It does not include any private wells on the Templeton side. (Groundwater)**

**Response** See **Chapter 5, "Groundwater"** and response to **MEPA 11**.

**GRI 03** **Neither Templeton nor its private well owners have been notified as abutters. (Circulation List)**

**Response** See **Chapter 12"Circulation List"** and responses to **MEPA 38** and **GCA 13**. The Town of Templeton and known private well owners have been added to the DEIR Circulation List.

**GRI 04** **The SWAP Program clearly states: "These wells supply ground water from an aquifer of high vulnerability because of an absence of barriers such as clay." (Groundwater)**

**Response** See response to **CHI1 02**.

**GRI 05** **Local temperatures are changing rapidly in the Northeast. Has any consideration been given to Climate Change, or to how extreme weather events will affect the landfill's lining system over time? (Climate Change) (Groundwater)**

**Response** See **Chapter 8, "Climate Change**" and **Section 5.5.1** in **Chapter 5 "Groundwater."**

**GRI 06** **Landfills are known for producing tremendous volumes of leachate, an aqueous fluid containing high concentrations of ammonia and natural organic matter. They are also known to contain man-made chemicals such as polyfluoroalkyl substances (PFAS). They do not degrade naturally and are persistent in the environment. The EPA has found PFAS to be detrimental to human health, and will be issuing contaminant limits in 2023. A failure to the landfill's lining could cause the aquifer to become contaminated, and compromise drinking water sources for the entire community of Templeton. Clean-up of the aquifer may not be feasible, and, at the least, be extremely costly. There are no controls in place that require Gardner to maintain insurance or hold a bond in the event that Templeton is affected by a landfill failure. (Groundwater)**

**Response** See **Chapter 5, "Groundwater,"** and response to **CHI1 03** and **CHI1 04**.

**GRI 07** **The loss of natural cooling forests is also a major concern. The landfill expansion plans to remove both trees and a natural esker. Removal of these resources will add heat to the area. (Climate Change)**

**Response** See response to **ALB 08**.

**GRI 08** **The removal of the esker as a barrier is also detrimental to the water supply and wetlands if the Otter River floods. In total this expansion will remove 4.3 acres of natural resources, including a hardwood forest, a wildlife habitat, and esker. It comes in close proximity to two certified vernal pools. Please consider an EIR to assess the risks posed to local water supplies by contamination from the landfill, and how**

**Climate Change over time will impact the Otter River, vernal pools, and local wildlife habitat**. **(Project Description and Permitting) (Groundwater) (Stormwater) (Climate Change)**

**Response** See response to **ANT 07** regarding DEIR intent.

Potential impacts to wetlands and drinking water and measures to protect these resources are discussed in **Chapters 5, "Groundwater**," and **6, "Stormwater."** See also responses to **TEM 01** and **CHI1 02**.

See **Chapter 8, "Climate Change"** and response to **MEPA 19** for a discussion on the Project's consideration of climate change effects.

**GRI 09** **The ENF does not mention odor problems with the existing Sludge Landfill. Air quality has been a consistant problem over the years. Numerous complaints have been filed. This property abuts and connects to Wildwood Cemetary and Forests, Cummings Otter River Conservation Area, and the Ebenezer Keyes Conservation Area. There are also three local cemetaries. Residents with loved ones in these cemetaries are put off by the smell when visiting and are forced to limit the duration of their stay at the gravesite. The smell is nauseating and a deterrant to how often they go. The odor also detracts from the recreational use of the hiking trails in the aforementioned forests and conservation areas. Odors travel through these areas and extend through Turner Lane in Templeton, whose residents have complained since the first sludge landfill went in. The City of Gardner has no measures in place to assess air quality. There are no monitoring devices to quantify the frequency and intensity of odors. The City leaves it to the community to file complaints, and most citizens are unaware of the protocols. Residents from Templeton are concerned about retaliation if they call attention to any issues. (Air Quality)**

**Response** See **Chapter 7, "Air Quality,"** and response to **MEPA 16, CHI1 06,** and **GCA 12.**

**GRI 10** **The City of Gardner does not maintain open communications with Templeton. They have not established protocols if problems do arise. These are major concerns. (Circulation List)**

**Response** The Town of Templeton has been added to the Public Involvement Plan Distribution list **(Appendix B)** and this DEIR's circulation list (see **Chapter 12**., **"Circulation List"**). See also response to **TEM 03**.

**GRI 11** **As a citizen with grandchildren, I consider the current 17 year plan a band-aid that could have disastrous effects on the land, air, and water quality for our future residents. If you proceed with an Environmental Impact Report, I would ask that you study the land area on both sides of the river, and sincerely hope that any projected impacts would be forecast beyond the current term. Regardless of duration, I respectfully ask that you consider the impacts from these landfills to Templeton, its public and private wells, neighborhoods, and abutting land. (Project Description and Permitting)**

**Response** See response to **ANT 07** regarding DEIR intent.

| | |
|---|---|
| **From:** | Tom Esposito |
| **To:** | Strysky, Alexander (EEA) |
| **Subject:** | Gardner Sludge Landfill EEA#16643 |
| **Date:** | Saturday, January 28, 2023 3:01:24 PM |
| **Attachments:** | Gardner Sludge Landfill EEA No 16643 ENF General Comment Letter 6Jan2023.docx |



I thank you for your time in the matter of the Gardner Sludge Landfill expansion and opposed to if for many reasons.

Attached are my sentiments of such along with a general message of such as well.

Sincerely,

Thomas B. Esposito
20 Becky Ave
Gardner, MA 01440

t1/6/2023

**Bethany A. Card, Secretary of Energy and Environmental Affairs**
**Executive Office of Energy and Environmental Affairs (EEA)**
**Attn: MEPA Office**
**Alexander Strysky EEA No. 16643**
**100 Cambridge Street, Suite 900**
**Boston MA 02114**
**Subject: ENF Comment / Gardner Sludge Landfill Expansion**
**Sent via email: alexander.strysky@mass.gov**

Dear Secretary Card,

I first want to thank you for your time in this matter of the Sludge Landfill Expansion here in Gardner, MA.

Albeit a general letter sent to your administration amongst many others for this matter I would like to offer my sense of such an atrocity as well for this project to go forth. ESP 01

Imagine for a moment this is done in your backyard of your property or family member or friends home. What would you do to protect the nature of such?

We all need to worry about waste from any aspect of life from this to trash, recyclables or any other waste as well.

There is another way for this sludge to be taken care of for a more appropriate and far less financial existence that was proposed to the town. There is no need whatsoever to decimate acres of land for this project that would potentially upset the water supply, decimation of acres of land and livelihood of the towns own people who live close and or near to this supposed project.

I have hiked and hunted within this area for many years and to decimate such land for this project goes against all that is near and dear to myself along with multitudes of residents within the town of Gardner.

Please keep the integrity of the woods, forest, wildlife, water supply, vernal pools and all that is dear for this rural community to be as pure as it can be in the times we live in.

I again thank you for your time and care for this matter of the people in this town and perhaps other towns within Massachusetts who care for the land and nature of such.

Sincerely,

Thomas B. Esposito

This letter contains my comments on the Gardner Sludge Landfill Expansion Environmental Notification Form (ENF). This expansion project raises important concerns with the ENF and the need for further in-depth analysis via an Environmental Impact Report (EIR). My concerns are:

**1. Risk of ground water contamination with impact to drinking water and watershed.** ESP 02

The project Vicinity Map – One Mile Radius (G002) does not identify all of the approximate 70 private drinking water wells. The ENF does identify the two Town of Templeton Public Drinking Water Wells within one mile of the site.

The Hydrogeological Evaluation Report (Appendix F) describes the geology of the site as having glacial outwash sand and gravel atop fractured and weathered bedrock. Therefore, this geology does not provide any natural containment and allows contaminants to travel faster and further. The ENF shows no attempt to model the release of contaminants to groundwater from the sludge landfill. ESP 03

The ENF mentions a double composite groundwater protection system (GWPS). The GWPS's life expectancy is not specified and not guaranteed for any time period. Manmade infrastructure ultimately fails. If this system fails in 1, 5, 10, 25, or 100 years, no remediation procedure is specified to deal with contaminated private wells, public wells, or wetland resources. No bonding or reserve funding has been designated for remediation. ESP 04

PFAS contamination has become a growing concern in Massachusetts and the Country. According to the US EPA, peer-reviewed studies have shown that PFAS may lead to increased risk of some cancers, reproductive effects in pregnant women, and developmental delays in children. According to the Gardner Wastewater Treatment Plant (WWTP) NPDES Permit (No. MA0100994), the now-closed Gardner Sanitary Landfill discharges an average on 1,182 gallons of non-process leachate to Gardner's WWTP. It is highly likely that this landfill leachate contains PFAS and this leachate is not tested for PFAS. Neither Gardner sludge or the Sludge Landfill monitoring wells are tested for PFAS. PFAS testing must be done in order to determine the level of PFAS and evaluate the risk of dumping 4,000 cubic yards of sludge per year for 17 years at this site. ESP 05

**2. Negative impacts to the public recreational use of the Wildwood Cemetery Forest, Cummings Otter River Conservation Area, and the Ebenezer Keyes Conservation Area.** ESP 06

For many years, the community has used the Sludge Landfill Expansion project site location, within Gardner's Wildwood Cemetery Forest, for community recreation. This property abuts and connects with a network of trails on the Cummings Otter River Conservation Area. A blazed trail along the property's glacial period esker provides year-around use by the public for hiking, snow-shoeing, cross-country skiing, and hunting. The Gardner Conservation Department, North County Land Trust, and Millers River Watershed Council have conducted guided hikes to these properties. Destruction of 6 acres of forest and the persistent odors from the Sludge Landfill negatively impacts the use of both of these beautiful properties and the new NCLT-owned Ebenezer Keyes Conservation Area, located to the east of the expansion site.

3. **Continued source of ongoing poor air quality for entire area.** ESP 07

The ENF does not mention historical odor problems with the existing Sludge Landfill. Air quality has been a consistent problem over many years and numerous odor complaints have been submitted by residents and visitors to the nearby conservation areas and cemeteries, includes 3 Catholic Cemeteries owned by Annunciation Parish. The cemeteries and conservation areas are visited by thousands of people. There are residential neighborhoods with approximately 563 adult residents with 272 homes per the street listings for Gardner and Templeton. The one-mile radius is also home to facilities owned by 13 businesses, 3 social organizations, and 3 religious organizations.

The odors are nauseating to those who visit this area. The City has not installed air quality monitoring devices in order to determine the frequency and intensity of odors. Instead, the City has depended on residents and visitors filing odor complaints, a process neither effective and widely known.

4. **Destruction of 6 acres of natural resources including wildlife habitat, forest, a natural esker, and close-proximity to two certified vernal pools.** ESP 08

The planned expansion will destroy 6 acres of Gardner's natural resources, including a hardwood forest, wildlife habitat, and a geologically important esker in the Wildwood Cemetery Forest. This expansion is inconsistent with the City's own Wildwood Forest Management Plan (2012) that has the following stated goals: "The City of Gardner would like to improve and protect the forest resources on the Wildwood Cemetery property for the benefit of the residents of Gardner. Protecting water quality is a high priority. Maintaining and improving aesthetics near the Cemetery is extremely important as well."

5. **Failure of the City of Gardner to present a thorough and accurate examination of alternative sludge management options.** ESP 09

The alternatives analysis dismisses sludge disposal alternatives without completing a single feasibility study of any such alternative. The alternatives analysis fails to consider partnering with any neighboring communities or pursuing a private sector partnership for a viable alternative to the project. The City has rejected pursuit of a phased construction of the project which will, in effect, commit the City to the 17-year landfill expansion. This effectively prevents the City from migrating to an economically and environmentally better alternative within 17 years. With this Project, Gardner will not be able to take advantage of innovation in the other alternatives or partner with other communities in pursuit of a sustainable solution prior to 2042.

The presence of an Environmental Justice community is within one mile of the project site and should trigger the threshold for requiring an Environmental Impact Report (EIR). An EIR will provide more in-depth analysis of the environmental & human impacts and alternatives to this project. ESP 10

Please feel free to contact me if you have any questions.

Sincerely,

Thomas B. Esposito
20 Becky Ave Gardner, MA
tbrag_8@yahoo.com

## 11.21 Thomas Esposito (ESP)

**ESP 01** **I first want to thank you for your time in this matter of the Sludge Landfill Expansion here in Gardner, MA. Albeit a general letter sent to your administration amongst many others for this matter I would like to offer my sense of such an atrocity as well for this project to go forth. Imagine for a moment this is done in your backyard of your property or family member or friends home. What would you do to protect the nature of such? We all need to worry about waste from any aspect of life from this to trash, recyclables or any other waste as well. There is another way for this sludge to be taken care of for a more appropriate and far less financial existence that was proposed to the town. There is no need whatsoever to decimate acres of land for this project that would potentially upset the water supply, decimation of acres of land and livelihood of the towns own people who live close and or near to this supposed project. I have hiked and hunted within this area for many years and to decimate such land for this project goes against all that is near and dear to myself along with multitudes of residents within the town of Gardner. Please keep the integrity of the woods, forest, wildlife, water supply, vernal pools and all that is dear for this rural community to be as pure as it can be in the times we live in. I again thank you for your time and care for this matter of the people in this town and perhaps other towns within Massachusetts who care for the land and nature of such. (Alternatives Analysis)**

**Response** See **Chapter 2, "Alternatives Analysis"** and responses to **CHI1 05** and **CHI1 07**.

**ESP 02** **Risk of ground water contamination with impact to drinking water and watershed.**

**The project Vicinity Map – One Mile Radius (G002) does not identify all of the approximate 70 private drinking water wells. The ENF does identify the two Town of Templeton Public Drinking Water Wells within one mile of the site. (Groundwater)**

**Response** See **Chapter 5, "Groundwater,"** and response to **CHI1 01**.

**ESP 03** **The Hydrogeological Evaluation Report (Appendix F) describes the geology of the site as having glacial outwash sand and gravel atop fractured and weathered bedrock. Therefore, this geology does not provide any natural containment and allows contaminants to travel faster and further. The ENF shows no attempt to model the release of contaminants to groundwater from the sludge landfill. (Groundwater)**

**Response** See **Chapter 5, "Groundwater,"** and response to **CHI1 02**.

**ESP 04** **The ENF mentions a double composite groundwater protection system (GWPS). The GWPS's life expectancy is not specified and not guaranteed for any time period. Manmade infrastructure ultimately fails. If this system fails in 1, 5, 10, 25, or 100 years, no remediation procedure is specified to deal with contaminated private wells, public wells, or wetland resources. No bonding or reserve funding has been designated for remediation. (Groundwater)**

**Response** See response to **CHI1 03**.

**ESP 05** **PFAS contamination has become a growing concern in Massachusetts and the Country. According to the US EPA, peer-reviewed studies have shown that PFAS may**

**lead to increased risk of some cancers, reproductive effects in pregnant women, and developmental delays in children. According to the Gardner Wastewater Treatment Plant (WWTP) NPDES Permit (No. MA0100994), the now-closed Gardner Sanitary Landfill discharges an average on 1,182 gallons of non-process leachate to Gardner's WWTP. It is highly likely that this landfill leachate contains PFAS and this leachate is not tested for PFAS. Neither Gardner sludge or the Sludge Landfill monitoring wells are tested for PFAS. PFAS testing must be done in order to determine the level of PFAS and evaluate the risk of dumping 4,000 cubic yards of sludge per year for 17 years at this site. (Project Description and Permitting)**

**Response** See response to **CHI1 04**.

**ESP 06 Negative impacts to the public recreational use of the Wildwood Cemetery Forest, Cummings Otter River Conservation Area, and the Ebenezer Keyes Conservation Area. For many years, the community has used the Sludge Landfill Expansion project site location, within Gardner's Wildwood Cemetery Forest, for community recreation. This property abuts and connects with a network of trails on the Cummings Otter River Conservation Area. A blazed trail along the property's glacial period esker provides year-around use by the public for hiking, snowshoeing, cross-country skiing, and hunting. The Gardner Conservation Department, North County Land Trust, and Millers River Watershed Council have conducted guided hikes to these properties. Destruction of 6 acres of forest and the persistent odors from the Sludge Landfill negatively impacts the use of both of these beautiful properties and the new NCLT-owned Ebenezer Keyes Conservation Area, located to the east of the expansion site. (Project Description and Permitting)**

**Response** See response to **CHI1 05**.

**ESP 07 Continued source of ongoing poor air quality for entire area.**

**The ENF does not mention historical odor problems with the existing Sludge Landfill. Air quality has been a consistent problem over many years and numerous odor complaints have been submitted by residents and visitors to the nearby conservation areas and cemeteries, includes 3 Catholic Cemeteries owned by Annunciation Parish. The cemeteries and conservation areas are visited by thousands of people. There are residential neighborhoods with approximately 563 adult residents with 272 homes per the street listings for Gardner and Templeton. The one-mile radius is also home to facilities owned by 13 businesses, 3 social organizations, and 3 religious organizations.**

**The odors are nauseating to those who visit this area. The City has not installed air quality monitoring devices in order to determine the frequency and intensity of odors. Instead, the City has depended on residents and visitors filing odor complaints, a process neither effective and widely known. (Air Quality)**

**Response** See response to **CHI1 06**.

**ESP 08 Destruction of 6 acres of natural resources including wildlife habitat, forest, a natural esker, and close proximity to two certified vernal pools.**

**The planned expansion will destroy 6 acres of Gardner's natural resources, including a hardwood forest, wildlife habitat, and a geologically important esker in the Wildwood Cemetery Forest. This expansion is inconsistent with the City's own Wildwood Forest Management Plan (2012) that has the following stated goals: "The City of Gardner would like to improve and protect the forest resources on the Wildwood Cemetery property for the benefit of the residents of Gardner. Protecting water quality is a high priority. Maintaining and improving aesthetics near the Cemetery is extremely important as well." (Project Description and Permitting)**

**Response** See response **CHI1 07**.

**ESP 09** **Failure of the City of Gardner to present a thorough and accurate examination of alternative sludge management options.**

**The alternatives analysis dismisses sludge disposal alternatives without completing a single feasibility study of any such alternative. The alternatives analysis fails to consider partnering with any neighboring communities or pursuing a private sector partnership for a viable alternative to the project. The City has rejected pursuit of a phased construction of the project which will, in effect, commit the City to the 17-year landfill expansion. This effectively prevents the City from migrating to an economically and environmentally better alternative within 17 years. With this Project, Gardner will not be able to take advantage of innovation in the other alternatives or partner with other communities in pursuit of a sustainable solution prior to 2042. (Alternatives Analysis)**

**Response** See response to **CHI1 08**.

**ESP 10** **The presence of an Environmental Justice community is within one mile of the project site and should trigger the threshold for requiring an Environmental Impact Report (EIR). An EIR will provide more in-depth analysis of the environmental & human impacts and alternatives to this project. (Environmental Justice)**

**Response** See response to **CHI1 09**.

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# Public Comments Portal

alexander.strysky@mass.gov



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| 16643 | -- | -- | -- |
| **Comments Submit Date** | **Last Name** | **Address Line 2** | **Affiliation Description** |
| 1-30-2023 | -- | -- | Individual |
| **Certificate Action Date** | **Phone** | **State** | **Status** |
| 1-31-2023 | -- | -- | Opened |
| **Reviewer** | **Email** | **Zip Code** | |
| Alexander Strysky (857)408-6957, alexander.strysky@mass.gov | -- | -- | |

## Comment Title or Subject

**Topic**: There are better alternatives to the sludge landfill.

## Comments

Segoe UI | 10 pt | Paragraph

We need to look into alternatives to the sludge landfill expansion. Shame on our elected city officials to take us backwards instead of being a leader in green energy.

https://www.veolia.com/en/solution/sewage-sludge-green-energy-biogas-wastewater (https://www.veolia.com/en/solution/sewage-sludge-green-energy-biogas-wastewater)

ANO1 01

## Attachments

## Update Status

**Status**

Opened

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## 11.22 Anonymous 1 (ANO1)

**ANO1 01** **We need to look into alternatives to the sludge landfill expansion. Shame on our elected city officials to take us backwards instead of being a leader in green energy. Referenced a link to Veolia: Recovering Sewage Sludge process. https://www.veolia.com/en/resources/energy-efficiency/recovering-sewage-sludge (Alternatives Analysis)**

**Response** See **Chapter 2, "Alternatives Analysis."**

Connecticut River Conservancy

*Clean water. Healthy habitat. Thriving communities.*

15 Bank Row, Greenfield, MA 01301

Rebecca Tepper, Secretary of Energy and Environmental Affairs
Executive Office of Energy and Environmental Affairs (EEA)
EEA No. 16643 (Alexander Strysky)
100 Cambridge Street, Suite 900
Boston MA 02114

Secretary Tepper,

1.30.2023

I am writing on behalf of the Connecticut River Conservancy (CRC), which is the principal environmental advocate for the protection, restoration, and sustainable use of the Connecticut River and its watershed. The proposed project, Gardner Sludge Landfill Expansion, EEA #16643, is in proximity to Otter River, within the Millers River watershed; the Millers River is a direct tributary to the Connecticut River and so is of interest to CRC. The Connecticut River watershed has some of the most pristine water bodies in the state; therefore, managing water in a sustainable way is of paramount importance to our organization, and we also look at the issue from many different perspectives.

CRC recognizes the important work or of wastewater operators to sustainably manage wastewater and biosolids, providing a critical service for the city. CRC is supportive of the comment submitted by Coalition for a Sustainable Alternative to the Gardner Sludge Landfill Expansion (Coalition) and will focus our comments on areas specifically related to water quality concerns. CRC 01

The proposed project would impact 21,000 SF within a 100-foot Wetlands Protection Act buffer zone, representing a 30% increase in disturbance from existing conditions. As suggested in the Coalition's comments, CRC has concerns regarding potential contamination within the area that could impact surface water quality. Draft Massachusetts Integrated List of Waters for the Clean Water Act 2022 Reporting Cycle lists the Otter River in this area and downstream as impaired for Ambient Bioassays - Chronic Aquatic Toxicity, Dissolved Oxygen and Escherichia Coli (E. Coli). Given the proximity of this project to wetlands that connect to the Otter River, CRC is concerned about potential contamination from surface and ground waters that could further prolong these impairments.

CRC appreciates the consideration of alternatives to this project and understands the City's need to balance cost and environmental concerns. The report lists a number of alternatives, some of which are ultimately considered not feasible given concerns about PFAS contamination in compost and land applications. We are particularly interested in understanding more about how Alternative 5, Modify the WWTP to Add Anaerobic Digestion (AD), was assessed compared to landfill expansion. AD is not considered viable in the report due to the small scale of the WWTP, such that return on investment makes the project cost prohibitive. Given the landfill expansion is projected to only accommodate sludge disposal for the next 17 years, we would like to know over what period of time this return on investment was calculated and if cost-benefit calculations considered the monetary costs associated with the relative environmental impacts of each alternative. AD seems to provide a longer-term solution to sludge disposal and addresses CRC and the Coalitions concerns CRC 02

about potential contamination of ground and surface waterbodies within the watershed. Thank you for your consideration of these comments, as well as the comments submitted by the Coalition for a Sustainable Alternative to the Gardner Sludge Landfill Expansion, which CRC fully supports.

Sincerely,

Kelsey J Wentling

Kelsey Wentling (she/her)
River Steward
Connecticut River Conservancy
413-772-2020x216| kwentling@ctriver.org

## 11.23 Connecticut River Conservancy (CRC)

**CRC 01** **I am writing on behalf of the Connecticut River Conservancy (CRC), which is the principal environmental advocate for the protection, restoration, and sustainable use of the Connecticut River and its watershed. The proposed project, Gardner Sludge Landfill Expansion, EEA #16643, is in proximity to Otter River, within the Millers River watershed; the Millers River is a direct tributary to the Connecticut River and so is of interest to CRC. The Connecticut River watershed has some of the most pristine water bodies in the state; therefore, managing water in a sustainable way is of paramount importance to our organization, and we also look at the issue from many different perspectives.**

**CRC recognizes the important work or of wastewater operators to sustainably manage wastewater and biosolids, providing a critical service for the city. CRC is supportive of the comment submitted by Coalition for a Sustainable Alternative to the Gardner Sludge Landfill Expansion (Coalition) and will focus our comments on areas specifically related to water quality concerns. The proposed project would impact 21,000 SF within a 100-foot Wetlands Protection Act buffer zone, representing a 30% increase in disturbance from existing conditions. As suggested in the Coalition's comments, CRC has concerns regarding potential contamination within the area that could impact surface water quality. Draft Massachusetts Integrated List of Waters for the Clean Water Act 2022 Reporting Cycle lists the Otter River in this area and downstream as impaired for Ambient Bioassays - Chronic Aquatic Toxicity, Dissolved Oxygen and Escherichia Coli (E. Coli). Given the proximity of this project to wetlands that connect to the Otter River, CRC is concerned about potential contamination from surface and ground waters that could further prolong these impairments. (Groundwater) (Stormwater)**

**Response** Potential impacts to wetlands and surface water and measures to protect these resources are discussed in **Chapters 5, "Groundwater," and 6, "Stormwater."** See also responses to **TEM 01** and **GCA 15**.

**CRC 02** **CRC appreciates the consideration of alternatives to this project and understands the City's need to balance cost and environmental concerns. The report lists a number of alternatives, some of which are ultimately considered not feasible given concerns about PFAS contamination in compost and land applications. We are particularly interested in understanding more about how Alternative 5, Modify the WWTP to Add Anaerobic Digestion (AD), was assessed compared to landfill expansion. AD is not considered viable in the report due to the small scale of the WWTP, such that return on investment makes the project cost prohibitive. Given the landfill expansion is projected to only accommodate sludge disposal for the next 17 years, we would like to know over what period of time this return on investment was calculated and if cost-benefit calculations considered the monetary costs associated with the relative environmental impacts of each alternative. AD seems to provide a longer-term solution to sludge disposal and addresses CRC and the Coalitions concerns about potential contamination of ground and surface waterbodies within the watershed. Thank you for your consideration of these comments, as well as the comments**

**submitted by the Coalition for a Sustainable Alternative to the Gardner Sludge Landfill Expansion, which CRC fully supports. (Alternatives Analysis)**

Response

See **Section 2.3** of **Chapter 2, "Alternatives Analysis."** The anaerobic digestion alternative would not eliminate a wastewater biproduct requiring disposal, thus not meeting the purpose and need for the Project. Furthermore, due to high capital and operational costs, this alternative was dismissed before proceeding with assessing its potential environmental impacts.

**From:** Jo-Anne Burdin
**To:** Strysky, Alexander (EEA)
**Subject:** EEA#16643-ENF Comment-Proposed Gardner Sludge Landfill Expansion
**Date:** Monday, January 30, 2023 7:58:58 PM



Rebecca Tepper, Secretary of Energy and Environmental Affairs
Executive Office of Energy and Environmental Affairs
Attn: MEPA Office
Alexander Strysky EEA#16643
100 Cambridge Street, Suite 900
Boston MA 02114

Dear Secretary Tepper,

This letter contains my comments on the Gardner Sludge Landfill Expansion Environmental Notification
Form (ENF). The expansion project raises important concerns with the ENF and the need for further in-depth
analysis via an Environmental Impact Report (EIR). BUR 01

The expansion of the current landfill depository is at best a temporary measure that could place public and private water supplies at an increased risk of permanent and irreversible contamination. BUR 02
Forever chemical compounds, along with other chemical contaminants could create source pollution that could permeate
the groundwater resource proximal to the public wells in Templeton and private wells in the area. Subsequent large ground water withdrawal could possibly suck up these contaminants and pollute the drinking water supply.
The expansion would further encroach upon protected conservation areas and valuable water resources such as wetlands and surface waters including the semi restored Otter River. Thanks to the Clean Waters Act there has been significant recovery in the health of the Otter River and the Otters have returned. The landfill expansion jeopardizes the continued recovery of the Otter River. BUR 03
The Otter River is a major tributary of the Millers River which flows
into the Connecticut River.
Degradation of water quality through contamination and pollution of the Otter River would pose a far reaching negative impact for many within the commonwealth.
Alternative solutions should be sought and a complete alternative analysis submitted. BUR 04

Sincerely
Jo-Anne Burdin
299 Royalston Rd
Baldwinville (Village of Templeton)
MA 01436

## 11.24 Jo-Anne Burdin (BUR)

**BUR 01** **The expansion project raises important concerns with the ENF and the need for further in-depth analysis via an Environmental Impact Report (EIR). (Project Description and Permitting)**

**Response** See response to **ANT 07**.

**BUR 02** **The expansion of the current landfill depository is at best a temporary measure that could place public and private water supplies at an increased risk of permanent and irreversible contamination. Forever chemical compounds, along with other chemical contaminants could create source pollution that could permeate the groundwater resource proximal to the public wells in Templeton and private wells in the area. Subsequent large ground water withdrawal could possibly suck up these contaminants and pollute the drinking water supply. (Groundwater)**

**Response** See **Chapter 5, "Groundwater"** and response to comment **CHI1 02** and **CHI1 04**.

**BUR 03** **The expansion would further encroach upon protected conservation areas and valuable water resources such as wetlands and surface waters including the semi restored Otter River. Thanks to the Clean Waters Act there has been significant recovery in the health of the Otter River and the Otters have returned. The landfill expansion jeopardizes the continued recovery of the Otter River. Degradation of water quality through contamination and pollution of the Otter River would pose a far-reaching negative impact for many within the commonwealth. The Otter River is a major tributary of the Millers River which flows into the Connecticut River. (Project Description and Permitting)**

**Response** See responses to **GCA 14** through **GCA 15,** and **TEM 01**.

The existing sludge landfill has been in operation for approximately 39 years and in that time the condition of the Otter River has not diminished, but due to the operations of the Gardner WWTF, the conditions of the Otter River have improved to a point where otters have returned to the river.

**BUR 04** **Alternative solutions should be sought and a complete alternative analysis submitted. (Alternatives Analysis)**

**Response** See **Chapter 2, "Alternatives Analysis."**

**From:** Ivan Ussach <ivan@millersriver.net>
**Sent:** Friday, January 27, 2023 12:26 PM
**To:** Strysky, Alexander (EEA) <alexander.strysky@mass.gov>
**Subject:** Coalition ENF comments re MEPA EEA #16643 — Gardner Sludge Landfill Expansion



Dear Mr. Strysky,

Please find attached the following documents submitted by MRWC for the **Coalition for a Sustainable Alternative to the Gardner Sludge Landfill Expansion (Coalition);** MRWC may submit its own comments separately: USS2 01

* COALITION MEPA EEA #16643 COMMENTS 1-27-23

--This document makes reference to the following attachments:

* Gardner SLF 1-mile Radius Site Map

* Comments by Mike Wilczynski

* Comment by Denise Trabbic-Pointer

* Comments on Project Alternatives

* Plan of Taking by the Town of Gardner for Cemetery and Park Purposes

* Gardner SLF Proximity to Env. Justice

* Environmental Justice Concerns

Kindly acknowledge receipt if possible.

Thank you - Ivan

Ivan Ussach, director

Millers River Watershed Council

413-773-3830 - c

## 11.25 Ivan Ussach (USS1)

**USS1 01** **Hi Alex - There's a typo in the last paragraph of the Coalition MEPA comments document that I wish to draw your attention to:**

**"Thank you for your consideration of these comments. The Coalition's member organizations, listed below, agree that the ENF is INadequate and a a viable alternative to landfill expansion exists that will have substantially less impact on the surrounding environment."**

**Where I wrote "adequate" I meant to write "inadequate"--I think the context makes the meaning obvious, but it is important enough that I wanted to make you aware of it; I apologize for the inconvenience, and thank you for your attention to this matter – Ivan**

**Response** The comment has been addressed as suggested by the commenter, acknowledging that the comment intends to state that the Environmental Notification Form is inadequate.

**Ivan Ussach (USS2)**

**USS2 01** **Please find attached the following documents submitted by MRWC for the Coalition for a Sustainable Alternative to the Gardner Sludge Landfill Expansion (Coalition); MRWC may submit its own comments separately:**

***COALITION MEPA EEA #16643 COMMENTS 1-27-23**

**This document makes reference to the following attachments:**

***Gardner SLF 1-mile Radius Site Map**

***Comments by Mike Wilczynski**

***Comment by Denise Trabbic-Pointer**

***Comments on Project Alternatives**

***Plan of Taking by the Town of Gardner for Cemetery and Park Purposes**

***Gardner SLF Proximity to Env. Justice**

***Environmental Justice Concerns**

**Response** See responses **MRW 01** through **MRW 15**, which address comments made in the above-mentioned letter from the Coalition for a Sustainable Alternative to the Gardner Sludge Landfill Expansion (Coalition). The attachments referenced in the Coalition's letter, additionally listed in this comment, have been received and considered. Responses to comments made by Mike Wilczynski are addressed in WIL 01 – WIL 07, and comments by Denise Trabbic-Pointer are addressed in **POI 01 – POI 12.**

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alexander.strysky@mass.gov



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| 1-31-2023 | -- | -- | -- |
| **Certificate Action Date** | **Phone** | **State** | **Status** |
| 1-31-2023 | -- | -- | Opened |
| **Reviewer** | **Email** | **Zip Code** | |
| Alexander Strysky (857)408-6957, alexander.strysky@mass.gov | -- | -- | |

## Comment Title or Subject

**Topic**: No sludge landfill

## Comments

Segoe UI | 10 pt | Paragraph

Please do not expand the sludge landfill. It will bring more pollution and health problems to the residents of this city.

ANO2 01

## Attachments

## Update Status

**Status**

Opened

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| 1-31-2023 | -- | -- | -- |
| **Certificate Action Date** | **Phone** | **State** | **Status** |
| 1-31-2023 | -- | -- | Accepted |
| **Reviewer** | **Email** | **Zip Code** | |
| Alexander Strysky (857)408-6957, alexander.strysky@mass.gov | cortkiewel@gmail.com | -- | |

## Comment Title or Subject

**Topic**: Gardner Sludge Landfill

## Comments

Segoe UI | 10 pt | Paragraph

It is disappointing that city officials had 9 years (since 2014) to come up with a solution. The best they could come up with is start a larger dehydrated poo pile closer to the river. The current poo pile can be smelled by residents in the area. The addition of a larger poo pile will only increase the bad aroma issue. I do not think that the plan to add a larger dehydrated poo pile (only good for 17 years) next to the old poo pile is in the best interest of the city residents. This is a short term solution to a long term problem. The residents of Gardner are requesting from the State of Massachusetts a grant for a more environmentally friendly long term solution.

ANO3 01

## Attachments

## Update Status

**Status**

Accepted

SUBMIT

## Share Comment

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## 11.26 Anonymous 2 (ANO2)

**ANO2 01** **Please do not expand the sludge landfill. It will bring more pollution and health problems to the residents of this city. (Project Description and Permitting)**

**Response** See response to **ANT 07.**

## 11.27 Anonymous 3 (ANO3)

**ANO3 01** **It is disappointing that city officials had 9 years (since 2014) to come up with a solution. The best they could come up with is start a larger dehydrated poo pile closer to the river. The current poo pile can be smelled by residents in the area. The addition of a larger poo pile will only increase the bad aroma issue. I do not think that the plan to add a larger dehydrated poo pile (only good for 17 years) next to the old poo pile is in the best interest of the city residents. This is a short term solution to a long term problem. The residents of Gardner are requesting from the State of Massachusetts a grant for a more environmentally friendly long term solution. (Project Description and Permitting) (Air Quality) (Alternatives Analysis)**

**Response** See **Chapter 2, "Alternatives Analysis."**

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alexander.strysky@mass.gov



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| **EEA #/MEPA ID**<br>16643 | **First Name**<br>erin | **Address Line 1**<br>-- | **Organization**<br>-- |
| **Comments Submit Date**<br>1-31-2023 | **Last Name**<br>kiewel | **Address Line 2**<br>-- | **Affiliation Description**<br>Individual |
| **Certificate Action Date**<br>1-31-2023 | **Phone**<br>+19786606170 | **State**<br>MASSACHUSETTS | **Status**<br>Opened |
| **Reviewer**<br>Alexander Strysky (857)408-6957, alexander.strysky@mass.gov | **Email**<br>erin.kiewel@gmail.com | **Zip Code**<br>01440 | |

## Comment Title or Subject

**Topic**: WhAt ThE sLuDgE?

## Comments

**To those who may be concerned**

Gardner has been my hometown my entire life excluding my time in Boston for college and my time in Texas working for AmeriCorps and the NPS. I chose to return as an adult and buy a house here with my spouse. Since I have spent many years living here I have had the opportunity to see how the city is run and the ramifications of the decisions of those in power. To my observation we as a city have decided to plan and execute projects which ultimately leave people feeling unheard and bullied and our woodlands ravaged and turned to well lit parking lots. We never talk of the cost to our forest critters and waterways, only in the language of dollars and cents (but often without sense).

From the information I learned at the site visit I cannot support this project. The project will cost over $4million and only buy us 17 more years of sludge storage. The area surrounding the current set up is conservation land and wetlands and cemeteries, all places to contemplate our short existence on this planet. Expanding the current sludge landfill feels like a betrayal to all the babies and children around me. I cannot in good conscience look at them in their faces and tell them that the only solution we could dream up was to poop in the river for 17 more years, knowing that its bad for nature and for us.

I wish for once people who run this city realize they are the ones with the power to make a better and healthier decision instead of saying there are no other options. It's time to grow up, get creative, and figure out a viable solution. The future of our health and out part of the planet depends on it. I pray the days of sh*tting in the river are over.

KIE 01

## Attachments

## Update Status

Status

Opened

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## 11.28 Erin Kiewel (KIE)

**KIE 01** **Since I have spent many years living here I have had the opportunity to see how the city is run and the ramifications of the decisions of those in power. To my observation we as a city have decided to plan and execute projects which ultimately leave people feeling unheard and bullied and our woodlands ravaged and turned to well lit parking lots. We never talk of the cost to our forest critters and waterways, only in the language of dollars and cents (but often without sense). From the information I learned at the site visit I cannot support this project. The project will cost over $4million and only buy us 17 more years of sludge storage. The area surrounding the current set up is conservation land and wetlands and cemeteries, all places to contemplate our short existence on this planet. Expanding the current sludge landfill feels like a betrayal to all the babies and children around me. I cannot in good conscience look at them in their faces and tell them that the only solution we could dream up was to poop in the river for 17 more years, knowing that its bad for nature and for us. I wish for once people who run this city realize they are the ones with the power to make a better and healthier decision instead of saying there are no other options. It's time to grow up, get creative, and figure out a viable solution. The future of our health and our part of the planet depends on it. (Public Involvement Plan) (Project Description and Permitting) (Alternatives Analysis)**

**Response** See "Measures to Enhance Public Involvement" and "Proposed Community Outreach and Engagement" in **Appendix B**. See also response to **ANT 07**. The Secretary of Energy and Environmental Affairs issued a certificate on the Environmental Notification Form requiring the submission of this DEIR. The preparation of this DEIR intends to fulfill that requirement. Consistent with MEPA regulations at 301 CMR 11.07(3), this DEIR provides a "reasonably complete and stand-alone description and analysis of the Project and its alternatives, and an assessment of its potential environmental and public health impacts and mitigation measures." This DEIR demonstrates that the City will avoid, minimize, and mitigate Damage to the Environment to the maximum extent practicable.

See also **Section 1.11** of **Chapter 1, "Project Description and Permitting"** for project cost.

See also **Chapter 2, "Alternatives Analysis."**

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alexander.strysky@mass.gov



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| 16643 | Hugh | -- | -- |
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| 1-31-2023 | Jardon | -- | -- |
| **Certificate Action Date** | **Phone** | **State** | **Status** |
| 1-31-2023 | -- | -- | Opened |
| **Reviewer** | **Email** | **Zip Code** | |
| Alexander Strysky (857)408-6957, alexander.strysky@mass.gov | markmonahan4gardner@gmail.com | -- | |

## Comment Title or Subject

**Topic**: It's Poop Again!

## Comments

Segoe UI | 10 pt | Paragraph

Hi, this is a big stinking issue in our city! The neighbors don't want our city making their water and air shitty! In all seriousness, there has got to be a better way but at what cost? My understanding is that any alternative would be outrageously expensive with no ROI or possibly negative ROI! Now that sounds like a shitty investment! Everything in economics is a tradeoff! However, our city would be creating a negative externality for the surrounding towns. Many stakeholders, both in our city and outside would potentially be affected if it were to somehow contaminate the surrounding environment. Both second and third level consequences need to be considered, not just the first level ones. Also, if we were to go a different way then what is the tradeoff and opportunity cost? Will we take money away from the schools, raise taxes or not fix the roads to pursue a different option? Considering this issue has the potential to negatively impact a region rather than just a city, it seems like it should be a prime candidate for a federal or state grant to help come up with an option that won't shit on our neighbors.

JAR 01

## Attachments

## Update Status

**Status**

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BACK TO SEARCH RESULTS

## 11.29 Hugh Jardon (JAR)

**JAR 01** **Hi, this is a big stinking issue in our city! In all seriousness, there has got to be a better way but at what cost? My understanding is that any alternative would be outrageously expensive with no ROI or possibly negative ROI! Everything in economics is a tradeoff! However, our city would be creating a negative externality for the surrounding towns. Many stakeholders, both in our city and outside would potentially be affected if it were to somehow contaminate the surrounding environment. Both second and third level consequences need to be considered, not just the first level ones. Also, if we were to go a different way then what is the tradeoff and opportunity cost? Will we take money away from the schools, raise taxes or not fix the roads to pursue a different option? Considering this issue has the potential to negatively impact a region rather than just a city, it seems like it should be a prime candidate for a federal or state grant. (Alternatives Analysis) (Project Description and Permitting)**

**Response** See **Chapter 2, "Alternatives Analysis"** and response to **ANT 07.**

Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection
100 Cambridge Street 9th Floor Boston, MA 02114 • 617-292-5500

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Acting Commissioner

January 31, 2023

Rebecca Tepper
Secretary of Environment and Energy
Executive Office of Energy and
Environmental Affairs
100 Cambridge Street, Suite 900
ATTN: MEPA Office
Boston, MA 02114

RE: ENF Review. EOEEA 16643
GARDNER. Gardner Sludge Landfill at
808 West Street, Gardner
Date noticed in Monitor: December 23, 2022

Dear Secretary Tepper:

The Department of Environmental Protection (MassDEP), Boston and Central Regional Office (CERO) have reviewed the Environmental Notification Form (ENF) for the Gardner Sludge Landfill Expansion Project at 850 West Street, Gardner, Massachusetts (EOEEA 16643). The Project Proponent provides the following information for the Project in the ENF:

> The City of Gardner, Massachusetts (the City) is proposing to construct a 4.3-acre expansion to the existing sludge landfill located off West Street (Route 68.) The landfill receives biosolid residuals (sludge) from the City's Wastewater Treatment Plant (WWTP) and is anticipated to reach maximum capacity in the next few years. The landfill expansion will increase the capacity of the landfill by approximately 276,500 cubic yards, which is conservatively projected to accommodate the City's sludge production for at least seventeen years. The proposed expansion is immediately to the west of the existing landfill with filling continuing as an extension of the western face.
>
> Further details are provided below:
>
> - **Existing Site Conditions.** The site of the proposed landfill expansion was designated for use as sludge landfill operations in 1985 by the Massachusetts Department of Environmental Quality Engineering Central Region. The nearby wetland resources delineations and designation depicted on the project drawings were approved by MassDEP in a Superseding Order of Resource Delineation (SORAD), dated September 17, 2021.

- **Groundwater Protection System.** The expansion will be constructed with a double composite groundwater protection system (GWPS) with leak detection.

- **Landfill Operations.** Sludge placement in the landfill is anticipated to continue at the current rate based on population projections remaining constant for the next twenty years, with no plans to expand the sewerage collection system, and no plans to import sludge from other sources. Inspections and monitoring will continue to be performed to control access, odor, dust, vectors, leachate, stormwater, and erosion. Two additional monitoring wells will be sampled and analyzed to observe groundwater characteristics upgradient and downgradient of the landfill expansion.

- **Leachate Management.** Leachate produced by the landfill expansion will be directed to the City's existing sewerage collection system. The leachate collection and conveyance system for the expansion was designed to accommodate precipitation that would become leachate under worst-case extreme storm conditions.

- **Stormwater Management.** Stormwater runoff was modeled for various storm events under existing, filling, and closure conditions. Best Management Practices designed for stormwater treatment, attenuation, and groundwater recharge comply with the Massachusetts Stormwater Handbook.

- **Landfill Closure.** The landfill expansion was designed to accommodate a cap after it has reached capacity.

- **Gas Management.** Passive venting is proposed to manage the small amount of gas produced by the sludge decomposition.

In correspondence with the Project Proponent, MassDEP was provided the following additional information, "The total land area to be altered by the landfill expansion project is approximately 8.75 acres. This includes the area of the original landfill that will receive additional sludge from the proposed expansion, and the existing roadway that will be temporarily altered by the installation of the leachate force main. The average amount of sludge to be disposed of at the landfill on a daily basis is 5 dry tons per day, five days per week." Also, sludge at the Gardner Wastewater Treatment Plant is dried using centrifuges. MassDEP was informed that, "The centrifuges are producing a sludge cake with a solids content varying between 26.5 percent and 30.3 percent." Therefore, the sludge landfill expansion is expected to receive a maximum of 6.5 wet tons per day.

The City's existing sludge landfill has historically been the source of many odor complaints. Recently the City has improved Operation and Maintenance (O&M) practices and there have been fewer such complaints. MassDEP anticipates that a revised O&M plan will be needed to address the expansion of the sludge landfill.

MassDEP 01

MassDEP's Wastewater Program in Boston is responsible for issuance of the permit being sought through the WM33 permit application discussed in more detail in the Wastewater section

below. According to MassDEP "Policy on the Design and Operation of Sludge Landfills", "To reduce the possibility of groundwater, surface water, and air quality degradation, sludge-only landfills should be designed and operated according to standards applicable to sanitary landfills." Therefore, MassDEP uses solid waste regulations 310 CMR 19.00 for design criteria of sludge landfills. The Wastewater Program and the Solid Waste Program are coordinating on landfill design and monitoring requirements. MassDEP will require compliance with sampling requirements for landfills detailed in 310 CMR 19.00, and the Solid Waste Program's policies guidance, and any future revisions thereto. MassDEP 02

*Wastewater*

MassDEP Wastewater provides the following comments on the proposal:

- The project is proposed to be constructed in a single construction method for all three proposed cells. MassDEP is concerned that the single construction method will result in greater potential for erosion, operational challenges, and degradation of the landfill liner and prefers a phases approach. MassDEP will request further details on how the City will protect the landfill structure during and after construction, and how phasing of the project may minimize potential erosion, siltation and degradation of landfill liner materials. MassDEP 03
- The City is proposing not to cap the landfill or submit the Closure Plan until 2041. The existing landfill has received several odor complaints over the past few years. Also, it is basically at capacity and should be capped in accordance with an interim capping plan. The problem with odors and/or erosion will most likely continue until the existing sections are capped. The expansion will abut the western section of the existing landfill, so that section may not need to be capped until 2041, however, it is MassDEP's position that the remaining sides need to be capped in order to mitigate leachate production, reduce odors, stabilize slopes, and improve stormwater management. MassDEP 04

The Proponent is seeking MassDEP Approval of Wastewater Treatment Residual Landfills through a WP33 application process. Legislative authority for this approval is stated in Massachusetts General Laws, Chapter 21, sections 27 and 43(2); Chapter 83, sections 6 and 7; and Chapter 111, sections 17. MassDEP 05

Other applicable wastewater regulations include 257 CMR 2.00: Certification of Operators of Wastewater Treatment Facilities, 314 CMR 7.00: Sewer System Extension and Connection Permit Program, 314 CMR 12.00: Operation, Maintenance and Pretreatment Standards for Wastewater Treatment Works and Indirect Dischargers, 314 CMR 3.00: Surface Water Discharge Permit Program, 314 CMR 4.00: Surface Water Quality Standards, and 314 CMR 5.00: Groundwater Discharge Permit Program.

The Wastewater Program will coordinate with the Solid Waste Program during permitting to ensure that the current design standards for this type of landfill are fully met. This project also includes construction of a new leachate pump station for the expansion as well as upgrading the existing leachate pump station.

Stormwater Management/National Pollutants Discharge Elimination System (NPDES) Permit. The Proponent has identified that the Project may need a Construction General Permit and/or a Multisector Stormwater Permit under the NPDES program.

*Solid Waste Management*

MassDEP Solid Waste Management adds the following comments on the proposal:

- Section 3.3 of the ENF discusses the proposed mitigation measures for the project and mentions "environmental monitoring with sampling and analysis performed three times per year to assess potential effects on the groundwater and nearby surface waters" but does not mention environmental monitoring for landfill gas in accordance with Solid Waste Management Regulations 310 CMR 19.132(5). It is noted that Section 8 states that the groundwater protection system will restrict landfill gas from entering the subsurface and that the gas will follow the path of least resistance and migrate to the landfill surface to passively vent. However, during the winter, the ground surface may freeze, thus preventing the landfill gas from venting through the surface. During these times it would be beneficial to confirm that landfill gas is not migrating away from the landfill towards onsite structures or towards offsite properties. The applicant should revise the Application to include a detailed discussion for the proposed monitoring of landfill gas produced at the site to comply with 310 CMR 19.132(5). MassDEP 06
- Considering the Applicant plans to construct the full expansion footprint rather than constructing the landfill in phases, if the applicant continues to pursue full construction rather than phasing, the applicant is requested to expand on the information contained in Section 3.2 of the Engineering Report contained in Appendix A of the ENF submittal to provide details on proposed additional inspection and maintenance tasks that will need to be performed to ensure the landfill cell drainage sand layer will continue to function as intended and not experience a decrease in permeability from siltation, erosion, blowing dust, vegetative growth, etc. MassDEP 07
- Since this Application for an expansion of the Gardner Sludge Landfill proposes to place additional waste above the previously approved grades in this area, this project is considered both a horizontal and a vertical expansion and therefore shall comply with the requirements of 310 CMR 19.110. Additionally, since the existing Gardner Sludge Landfill only has a single 60-mil HDPE liner with leachate collection system, this area should have a hydraulic separation layer installed over it in accordance with 310 CMR 19.110(5)(c). Specifically, 310 CMR 19.110(5)(c)(1) which states "a hydraulic separation layer shall be constructed using technologies or components that will result in a system that prevents, to the maximum extent possible, leachate generated in areas approved after the effective date of these regulations from mixing with leachate collected in areas approved prior to these regulations. In general, such systems shall use combinations of low permeability barriers and high-capacity drainage systems. All leachate intercepted by the hydraulic separation layer shall be directed to and collected in a lined area designed in accordance with the requirements of 310 CMR 19.110(4). The applicant is requested to revise all applicable parts of the Application, including but not limited to the Drawings, to indicate that a hydraulic separation between the existing landfilled wastes and the MassDEP 08 MassDEP 09

waste placed in the area of the proposed landfill expansion will be constructed as part of the project.

- Section 5.2.2 discusses the leachate management system stating that the HELP Model was used to evaluate the leachate collection system's performance under extreme weather conditions. It appears that version 3.07 of the HELP Model was used to perform these calculations, which is an old version of the software. The Solid Waste Management program requires the use of the most recent version of the HELP Model when performing these types of analyses. The applicant is requested to revise all HELP Model calculations performed for this design using the most recent version of the HELP Model, which, as of the time of this writing, is version 4.0. MassDEP 10
- Section 5.3 discusses the Secondary leachate collection detection system and states that a flow meter will be used to measure the Action Leakage Rate, which is proposed to be 100 gallons of leachate per acre per day on a 30-day rolling average. The Applicant is requested to provide a detailed discussion of the steps that would be taken in the event the Action Leakage Rate is exceeded. MassDEP 11
- Section 6.5.4 discusses the Stormwater pretreatment design and states that pretreatment of the stormwater flows to the various basins will be "in the form of deep sump catch basins installed at the low point of each grass-lined swale." The Applicant is requested to provide a detailed discussion of the proposed inspection and maintenance tasks to be performed on the swales to prevent reduced capacity in the sumps and blockages of the beehive grates due to grass and sediment buildup after periodic mowing of the grass-lined swales and landfill side-slopes. MassDEP 12
- Section 6.6 describes the compliance of the closure condition of the landfill to the Massachusetts Stormwater Standards but does not provide any information on how the operating landfill, which will be open for seventeen years prior to the proposed closure of the expansion area. The Applicant is requested to revise the Application to provide a detailed discussion of how the operating landfill will comply with the Massachusetts Stormwater Standards. MassDEP 13
- Section 7 of the Application states, "Closure of the sludge landfill expansion is proposed to occur as a single event together with the original landfill closure, after filling has been completed in all landfill cells" and goes on to state, "The predicted date of closure is 2041 or later." Massachusetts Solid Waste Regulations 310 CMR 19.115(e)(1)(a) state that "The application of final cover…shall begin to be applied to a section of the landfill as soon as possible, but no later than 90 days, or other schedule as approved by the Department, after…a new lift has not or will not be applied within a one year period unless the area is permitted to accept additional waste, upon reaching final approved elevations, whenever a phase of the landfill has been completed, or whenever the permit expires or terminates for any reason, or is revoked." The Applicant is requested to provide a detailed discussion of how none of the above circumstances apply to provide justification for not capping any portion of the landfill until 2041 or later or revise the Application to state that all or part of the existing landfill will be capped as part of the proposed expansion project to comply with 310 CMR 19.1155(e)(1)(a). MassDEP 14
- Detail 5 on Sheet C-301 shows the proposed cell division berm that includes a leachate collection and removal pipe encases in 3/4-inch crushed stone. The detail also shows a "geotextile fabric separator" around the stone; however, it is difficult to determine if it completely surrounds the crushed stone. The Applicant is requested to confirm that the MassDEP 15

geotextile fabric completely encases the 3/4" crushed stone and indicate which material is being proposed for use in this instance with a discussion of whether it will provide adequate protection from abrasion, puncture, or other damage to the 60-mil HDPE geomembrane flap. Additionally, to protect the HDPE flap from ultraviolet degradation, the HDPE geomembrane flap should be covered. The Applicant is requested to revise the detail to include a proposed method to prevent degradation of the geomembrane flap due to exposure to sunlight.

*Stormwater*

The Project will create 4.1 acres of new impervious surfaces and is subject to the Massachusetts Stormwater Standards (the "Standards"). The Stormwater Management Report contained in the ENF demonstrates compliance with the MassDEP Stormwater Management Regulations at 310 CMR 10.05(6)(b) and 310 CMR(6)(k-q). MassDEP will review compliance with the Standards as part of the appeal. MassDEP 16

*Air Quality*

Passive venting is proposed to manage the gas produced by the sludge decomposition. MassDEP believes that rather than passive venting of gas, the sludge landfill expansion should include a gas collection system that is connected to the existing gas collection system. The additional gas generated by the expanded sludge landfill would then be burned in the existing flare that was initially approved for installation and operation in Air Quality Plan Approval TR# 067859 in 2005, and subsequently amended 2008. MassDEP 17

Collection and control of additional gas generated by the expansion may mitigate potential odor issues and will reduce the level of methane (a greenhouse gas) emitted to the atmosphere.

*Wetlands*

A portion of the stormwater management system associated with the sludge landfill, as well as grading operations, will be located within the 100-foot Buffer Zone (BZ) to Bordering Vegetated Wetlands (BVW). The project will alter approximately 21,000 square feet of BZ, of which 70% was previously disturbed. No wetland resource areas are proposed to be altered by the project, and all waste will be disposed of beyond the BZ. Due to the proposed work within the BZ, the Proponent filed a Notice of Intent with the Gardner Conservation Commission (the "Commission") and MassDEP on or about June 22, 2022. The Commission issued an Order of Conditions (OOC) approving the project on November 18, 2022. On December 1, 2022 an abutter to the project submitted a Request for Departmental Action appealing the OOC (the "appeal"). MassDEP will conduct a site visit and may request additional information from the Proponent related to design components of the stormwater management system, stormwater modelling, depth to groundwater, impacts to nearby wetlands, or construction period erosion/sedimentation controls prior to the issuance of a Superseding Order of Conditions. MassDEP 18

MassDEP appreciates the opportunity to comment on this proposal. If you have any questions regarding these comments, please contact Jennifer Wood at Jennifer.wood@mass.gov.

Sincerely,

Lealdon Langley, Director
Division of Watershed Management
Massachusetts Department of Environmental Protection

cc:
Alexander Strysky, MEPA Analyst
Lauren Saunders, Director of Public Health, Gardner Health Department
Dane E. Arnold, Director of Public Works
Janice M. Greenwood, P.E., Woodard & Curran
Ivan Ussach, Director, Millers River Watershed Council, Inc.
Kathleen Baskin, Assistance Commissioner, Bureau of Water Resources
MaryJude Pigsley, Deputy Regional Director, BWR
Deneen Simpson, MassDEP Director of Environmental Justice and BPE Program Manager
Marielle Stone, Deputy Regional Director Central Region MassDEP (CERO)
David Boyer, CERO Wastewater Section Chief
Bruce Bouck, MassDEP Hydrogeologist
Richard Friend, MassDEP Hydrogeologist
Dan Guglielmi, CERO Solid Waste Management Program
JoAnne Kasper-Dunne, CERO
Judith Schmitz, CERO Wetlands
Jennifer Wood, MassDEP NPDES and Residuals

## 11.30 Massachusetts Department of Environmental Protection: Boston and Central Regional (MassDEP)

**MassDEP 01** **MassDEP anticipates that a revised O&M plan will be needed to address the expansion of the sludge landfill. (Landfill Design and Construction)**

**Response** A revised Operations and Maintenance plan that addresses the expansion of the sludge landfill has been submitted with the City's WP33 application. Following the MEPA process, the City would work with MassDEP during the permitting process to revise the plan, as necessary.

**MassDEP 02** **MassDEP will require compliance with sampling requirements for landfills detailed in 310 CMR 19.00, and the Solid Waste Program's policies guidance, and any future revisions thereto**. (**Landfill Design and Construction**)

**Response** The Project would comply with all applicable landfill sampling requirements as defined by 310 CMR 19.00. Environmental monitoring of groundwater and surface waters, inclusive of sampling parameters, locations, and frequency would be detailed in the Operations and Maintenance Plan.

**MassDEP 03** **The project is proposed to be constructed in a single construction method for all three proposed cells. MassDEP is concerned that the single construction method will result in greater potential for erosion, operational challenges, and degradation of the landfill liner and prefers a phases approach. MassDEP will request further details on how the City will protect the landfill structure during and after construction, and how phasing of the project may minimize potential erosion, siltation and degradation of landfill liner materials. (Landfill Design and Construction)**

**Response** An analysis of a phased construction approach for the Project is provided in **Section 4.5.1** of **Chapter 4, "Landfill Design and Construction."**

**MassDEP 04** **The City is proposing not to cap the landfill or submit the Closure Plan until 2041. The existing landfill has received several odor complaints over the past few years. Also, it is basically at capacity and should be capped in accordance with an interim capping plan. The problem with odors and/or erosion will most likely continue until the existing sections are capped. The expansion will abut the western section of the existing landfill, so that section may not need to be capped until 2041, however, it is MassDEP's position that the remaining sides need to be capped in order to mitigate leachate production, reduce odors, stabilize slopes, and improve stormwater management. (Landfill Design and Construction) (Air Quality)**

**Response** See **Table 4-3** for the Project's operational sequencing plan. An interim cover and capping of portions of the existing landfill no longer receiving sludge is projected to occur 2028 based on remaining volume. See also **Chapter 7, "Air Quality"** and responses to MEPA 16 and CHI1 06 regarding odors.

**MassDEP 05** **The Proponent is seeking MassDEP Approval of Wastewater Treatment Residual Landfills through a WP33 application process. Legislative authority for this approval is stated in Massachusetts General Laws, Chapter 21, sections 27 and 43(2); Chapter 83, sections 6 and 7; and Chapter 111, sections 17. Other applicable wastewater**

**regulations include 257 CMR 2.00: Certification of Operators of Wastewater Treatment Facilities, 314 CMR 7.00: Sewer System Extension and Connection Permit Program, 314 CMR 12.00: Operation, Maintenance and Pretreatment Standards for Wastewater Treatment Works and Indirect Dischargers, 314 CMR 3.00: Surface Water Discharge Permit Program, 314 CMR 4.00: Surface Water Quality Standards, and 314 CMR 5.00: Groundwater Discharge Permit Program. (Project Description and Permitting)**

**Response** A discussion of all required permits and approvals is included in **Chapter 1, "Project Description and Permitting"** of this DEIR. The Project would comply with all applicable regulations.

**MassDEP 06** **Section 3.3 of the ENF discusses the proposed mitigation measures for the project and mentions "environmental monitoring with sampling and analysis performed three times per year to assess potential effects on the groundwater and nearby surface waters" but does not mention environmental monitoring for landfill gas in accordance with Solid Waste Management Regulations 310 CMR 19.132(5). It is noted that Section 8 states that the groundwater protection system will restrict landfill gas from entering the subsurface and that the gas will follow the path of least resistance and migrate to the landfill surface to passively vent. However, during the winter, the ground surface may freeze, thus preventing the landfill gas from venting through the surface. During these times it would be beneficial to confirm that landfill gas is not migrating away from the landfill towards onsite structures or towards offsite properties. The applicant should revise the Application to include a detailed discussion for the proposed monitoring of landfill gas produced at the site to comply with 310 CMR 19.132(5). (Project Description and Permitting) (Air Quality)**

**Response** See **Section 1.10** of **Chapter 1, "Project Description and Permitting."** Revisions to the landfill design would be made during MassDEP permitting and final design. A landfill gas monitoring system would be included in nearby structures (i.e., leachate pump station) to ensure landfill gas is not migrating away from the landfill toward on-site structures. See also **Chapter 7, "Air Quality."**

**MassDEP 07** **Considering the Applicant plans to construct the full expansion footprint rather than constructing the landfill in phases, if the applicant continues to pursue full construction rather than phasing, the applicant is requested to expand on the information contained in Section 3.2 of the Engineering Report contained in Appendix A of the ENF submittal to provide details on proposed additional inspection and maintenance tasks that will need to be performed to ensure the landfill cell drainage sand layer will continue to function as intended and not experience a decrease in permeability from siltation, erosion, blowing dust, vegetative growth, etc. (Landfill Design and Construction)**

**Response** See **Section 4.4.1** of **Chapter 4, "Landfill Design and Construction."** As part of the regular inspections by the operator, unused cells would be monitored to ensure that the protective sand layer remains intact. This layer is essential for protecting the underlying groundwater protection system materials from sunlight, which can degrade the integrity of the system. Initially, the woodchip layer on top of the groundwater protection system would control erosion of the sand layer. Upon inspection, the operator shall replenish

woodchips in areas where sand has become exposed, providing continued protection. Over time, vegetation would naturally establish on the woodchip layer, further stabilizing the surface. Once the vegetation is established, the operator would mow the area at least twice annually to prevent excessive root growth, which could impact the underlying landfill systems. In the unlikely event of groundwater protection system damage, the operator would isolate that cell from the normal operation of the landfill and make immediate plans to repair and/or replace the damage. Repairs to the synthetic membrane would be performed in accordance with the specifications approved in the design plans. These ongoing inspections and maintenance activities are crucial for the long-term functionality of the landfill and for minimizing environmental risks.

**MassDEP 08** **Since this Application for an expansion of the Gardner Sludge Landfill proposes to place additional waste above the previously approved grades in this area, this project is considered both a horizontal and a vertical expansion and therefore shall comply with the requirements of 310 CMR 19.110. (Landfill Design and Construction)**

**Response** The Project would comply with the requirements set forth in 310 CMR 19.110.

**MassDEP 09** **Additionally, since the existing Gardner Sludge Landfill only has a single 60-mil HDPE liner with leachate collection system, this area should have a hydraulic separation layer installed over it in accordance with 310 CMR 19.110(5)(c). Specifically, 310 CMR 19.110(5)(c)(1) which states "a hydraulic separation layer shall be constructed using technologies or components that will result in a system that prevents, to the maximum extent possible, leachate generated in areas approved after the effective date of these regulations from mixing with leachate collected in areas approved prior to these regulations. In general, such systems shall use combinations of low permeability barriers and high-capacity drainage systems. All leachate intercepted by the hydraulic separation layer shall be directed to and collected in a lined area designed in accordance with the requirements of 310 CMR 19.110(4). The applicant is requested to revise all applicable parts of the Application, including but not limited to the Drawings, to indicate that a hydraulic separation between the existing landfilled wastes and the waste placed in the area of the proposed landfill expansion will be constructed as part of the project. (Project Description and Permitting)**

**Response** See **Section 1.10** of **Chapter 1, "Project Description and Permitting."** A revision would be made to replace the 10-foot overlap with a hydraulic separation liner to achieve the requirements of MassDEP's Residuals Management Program, relevant guidance documents (i.e., Residuals Guidance Document No. 90-1 and Solid/Hazard Waste Policy #12) and MassDEP Solid Waste Management Regulations 310 CMR 19.110(5)(c).

**MassDEP 10** **Section 5.2.2 discusses the leachate management system stating that the HELP Model was used to evaluate the leachate collection system's performance under extreme weather conditions. It appears that version 3.07 of the HELP Model was used to perform these calculations, which is an old version of the software. The Solid Waste Management program requires the use of the most recent version of the HELP Model when performing these types of analyses. The applicant is requested to revise all HELP Model calculations performed for this design using the most recent version of the HELP Model, which, as of the time of this writing, is version 4.0. (Landfill Design and Construction)**

**Response** See **Section 4.2.1 of Chapter 4, "Landfill Design and Construction**." EPA's model for Hydrologic Evaluation of Landfill Performance (HELP V 4.0) was used to calculate the conditions for which the Project's leachate management system; however, it resulted in lower peak precipitation, runoff, and leachate generation values than what was estimated previously in the Environmental Notification Form using HELP V3.07. To remain conservative, the leachate management system is designed to the higher values generated by the HELP V3.07 model..

**MassDEP 11** **Section 5.3 discusses the Secondary leachate collection detection system and states that a flow meter will be used to measure the Action Leakage Rate, which is proposed to be 100 gallons of leachate per acre per day on a 30-day rolling average. The Applicant is requested to provide a detailed discussion of the steps that would be taken in the event the Action Leakage Rate is exceeded. (Groundwater)**

**Response** The 100 gallons per are per day rate and the intended steps to be taken in response to the Action Leakage Rate for this sludge landfill match those found in the Solid Waste Management regulation 310CMR 19.110 (9)(c). If the observed leak detection system flow is occurring at a rate greater than one half the Action Leakage Rate, the City shall notify the MassDEP in writing within 72 hours. If a measured single day leakage rate exceeds twice the Action Leakage Rate, the City would notify the MassDEP, in writing, within 48 hours. This notification process is then followed up with a timely assessment of the amount, characterization, and likely origins of the detected flow. If the elevated flow rate event is indicative of leakage through the primary liner, then the City shall take appropriate corrective action based on the quality and quantity of leachate collected or detected as determined by the MassDEP.

**MassDEP 12** **Section 6.5.4 discusses the Stormwater pretreatment design and states that pretreatment of the stormwater flows to the various basins will be "in the form of deep sump catch basins installed at the low point of each grass-lined swale."**

**The Applicant is requested to provide a detailed discussion of the proposed inspection and maintenance tasks to be performed on the swales to prevent reduced capacity in the sumps and blockages of the beehive grates due to grass and sediment buildup after periodic mowing of the grass-lined swales and landfill side-slopes. (Stormwater)**

**Response** In accordance with Volume 2, Chapter 2 of the Massachusetts Stormwater Handbook, the grass-lined swales (drainage channels) shall be inspected twice a year for slope integrity, soil moisture, vegetative health, soil stability, soil compaction, soil erosion, ponding, and sediment accumulation. Regular maintenance includes mowing at least once per year. Grass height shall not exceed 6-inches and should not be cut shorter than 3-4 inches. Sediment and debris would be removed manually at least once per year and/or after mowing. Re-seeding will be done periodically to maintain dense growth of grass vegetation. The deep sump catch basins shall be inspected at least four (4) times per year and at the end of the foliage and snow removal seasons. Sediments must be removed four (4) times per year or whenever the depth of deposits is greater than or equal to one half the depth from the bottom of the invert of the lowest pipe in the basin. Grass clippings shall be removed from around the grate after each mow as needed. Following the MEPA

process, the City would work with MassDEP during the permitting process to revise the Operations and Maintenance Plan, as necessary.

**MassDEP 13** **Section 6.6 describes the compliance of the closure condition of the landfill to the Massachusetts Stormwater Standards but does not provide any information on how the operating landfill, which will be open for seventeen years prior to the proposed closure of the expansion area. The Applicant is requested to revise the Application to provide a detailed discussion of how the operating landfill will comply with the Massachusetts Stormwater Standards. (Stormwater)**

**Response** A discussion of the Project's compliance with Massachusetts Stormwater Standards is provided in **Chapter 6, "Stormwater**" of this DEIR.

**MassDEP 14** **Section 7 of the Application states, "Closure of the sludge landfill expansion is proposed to occur as a single event together with the original landfill closure, after filling has been completed in all landfill cells" and goes on to state, "The predicted date of closure is 2041 or later." Massachusetts Solid Waste Regulations 310 CMR 19.115(e)(1)(a) state that "The application of final cover…shall begin to be applied to a section of the landfill as soon as possible, but no later than 90 days, or other schedule as approved by the Department, after…a new lift has not or will not be applied within a one year period unless the area is permitted to accept additional waste, upon reaching final approved elevations, whenever a phase of the landfill has been completed, or whenever the permit expires or terminates for any reason, or is revoked." The Applicant is requested to provide a detailed discussion of how none of the above circumstances apply to provide justification for not capping any portion of the landfill until 2041 or later or revise the Application to state that all or part of the existing landfill will be capped as part of the proposed expansion project to comply with 310 CMR 19.1155(e)(1)(a). (Landfill Design and Construction)**

**Response** A discussion of Project sequencing, including interim and final capping of the existing landfill is described in **Chapter 4, "Landfill Design and Construction."**

**MassDEP 15** **Detail 5 on Sheet C-301 shows the proposed cell division berm that includes a leachate collection and removal pipe encases in 3/4-inch crushed stone. The detail also shows a "geotextile fabric separator" around the stone; however, it is difficult to determine if it completely surrounds the crushed stone. The Applicant is requested to confirm that the geotextile fabric completely encases the 3/4" crushed stone and indicate which material is being proposed for use in this instance with a discussion of whether it will provide adequate protection from abrasion, puncture, or other damage to the 60-mil HDPE geomembrane flap. Additionally, to protect the HDPE flap from ultraviolet degradation, the HDPE geomembrane flap should be covered. The Applicant is requested to revise the detail to include a proposed method to prevent degradation of the geomembrane flap due to exposure to sunlight. (Landfill Design and Construction)**

**Response** The geotextile fabric separator is intended to completely surround the stone. A label to cross reference the geotextile fabric separator with the heavier Nonwoven Geotextile B within the technical specifications would be included on Detail 5, Sheet C-301. HDPE geomembrane materials can be exposed to the weather in certain design circumstances

because HDPE geomembrane has capacity to withstand UV light exposure for extended duration. The HDPE formulation contains two to three percent carbon black as a UV light stabilizer. Research by the Geosynthetic Institute [ "GRI-GS20: Exposed Lifetime Prediction of Geosynthetics Using Laboratory Weathering Devices." *Geosynthetic Institute*. (2019). https://geosynthetic-institute.org/grispecs/gs20.pdf] reports that the strength and elongation properties of HDPE geomembrane exposed to solar intensity equal that of Pheonix, Arizona have a half-life in excess of 90-years.

The cell division berm with HDPE geomembrane flap is a stormwater management feature used during the landfill operational period to prevent stormwater from an unused, upgradient cell entering an active landfill cell containing sludge waste. The exposed HDPE flap also serves the operator to more easily identify the boundary between the cells. Furthermore, the cell division berm is built above the groundwater protection system and is not purposed to prevent leachate leakage from the landfill. Any loss of strength or elastic in the HDPE on the berm from the few years of exposure during operations would have no effect on the performance of the groundwater protection system.

**MassDEP 16** **The Project will create 4.1 acres of new impervious surfaces and is subject to the Massachusetts Stormwater Standards (the "Standards"). The Stormwater Management Report contained in the ENF demonstrates compliance with the MassDEP Stormwater Management Regulations at 310 CMR 10.05(6)(b) and 310 CMR(6)(k-q). MassDEP will review compliance with the Standards as part of the appeal. (Stormwater)**

**Response** The City appreciates confirmation that the report contained in the Environmental Notification Form demonstrates compliance with stormwater regulations.

**MassDEP 17** **Passive venting is proposed to manage the gas produced by the sludge decomposition. MassDEP believes that rather than passive venting of gas, the sludge landfill expansion should include a gas collection system that is connected to the existing gas collection system. The additional gas generated by the expanded sludge landfill would then be burned in the existing flare that was initially approved for installation and operation in Air Quality Plan Approval TR# 067859 in 2005, and subsequently amended 2008. Collection and control of additional gas generated by the expansion may mitigate potential odor issues and will reduce the level of methane (a greenhouse gas) emitted to the atmosphere. (Air Quality)**

**Response** See **Chapter 7, "Air Quality."** There is no existing/active landfill gas collection system in the sludge landfill due to the low gas generation rate (only passive venting). The existing flare at the nearby municipal solid waste landfill, is not connected to the existing sludge landfill, is no longer in operation, and is owned by a private entity. It is therefore not feasible to connect the sludge landfill to the existing flare. Based on the EPA regulatory default values in the LandGEM model, it is also the case that the peak annual landfill gas emission rate (including both methane and carbon dioxide) is considered too low to trigger regulatory requirements for an active capture and control system.

**MassDEP 18** **A portion of the stormwater management system associated with the sludge landfill, as well as grading operations, will be located within the 100-foot Buffer Zone (BZ) to Bordering Vegetated Wetlands (BVW). The project will alter approximately 21,000**

**square feet of BZ, of which 70% was previously disturbed. No wetland resource areas are proposed to be altered by the project, and all waste will be disposed of beyond the BZ. Due to the proposed work within the BZ, the Proponent filed a Notice of Intent with the Gardner Conservation Commission (the "Commission") and MassDEP on or about June 22, 2022. The Commission issued an Order of Conditions (OOC) approving the project on November 18, 2022. On December 1, 2022 an abutter to the project submitted a Request for Departmental Action appealing the OOC (the "appeal"). MassDEP will conduct a site visit and may request additional information from the Proponent related to design components of the stormwater management system, stormwater modelling, depth to groundwater, impacts to nearby wetlands, or construction period erosion/sedimentation controls prior to the issuance of a Superseding Order of Conditions. (Project Description and Permitting)**

**Response** The City will comply with the requirements of the Order of Conditions.

## 11.31 Paul Demeo (DEM)

**DEM 01** **First off, let me start off by saying your office should request a full Environmental Impact Report for EEA# 16643, Gardner's Sludge Landfill expansion project to be Seventy feet in height (seven stories), covering over four acres of currently forested land and affecting six acres of land.**

**Response** See response to **ANT 07**.

**DEM 02** **Mayor Michael J. Nicholson, the proponent of the landfill and the signer of MEPA Documents, chose not to attend the MEPA site visit on Tuesday January 17th organized by MEPA analyst Alexander Strysky. Not only did Nicholson not attend, not one member of Gardner's City Council and the entire Gardner Conservation Commission attended. Gardner is a heavily populated Social Justice Community (79.8%) as designated by the Commonwealth of Massachusetts and very close to the proposed landfill expansion. The Social Justice Community (numbering16,758) and the residents of the City of Gardner were not notified by Mayor Nicholson of the MEPA Site Visit on January 17 and that they were invited to attend. The mayor runs a weekly media program, has a City Hall Web Page, a City Hall Facebook Page, and his personal Facebook page in which he posts city business but not on one of these sources did he ever let the public know of the MEPA Site Visit or that they had an opportunity to voice their opinion on the project. Mayor Nicholson has access to The Gardner News and failed to provide them with a Public Statement. (Environmental Justice) (Public Involvement Plan)**

**Response** See **Chapter 3"Environmental Justice"** and **Appendix B**.

**DEM 03** **The MEPA Site Visit on January 17th failed to walk the proposed site of the expanded landfill. This area includes the fragile vernal pools, mature forested land, and the precious glacial esker which are very unique to the area. (Project Description and Permitting)**

**Response** The Project Site is largely inaccessible due to dense overgrowth of vegetation. The vernal pools are not within the Project Site footprint. See **Section 1.5** of **Chapter 1, "Project Description and Permitting,"** for a description of the Project Site as well as responses to **CHI1 05** and **CHI1 07**.

**DEM 04** **The current sludge landfill has not been operating properly with numerous breaches of the storm water management system in which the EPA and DEP were notified. Because of my complaint, the EPA found the City of Gardner to be lacking a permit in which the agency allowed Gardner to get without any sanctions or fines. (Stormwater)**

**Response** See **Chapter 6, "Stormwater."**

**DEM 05** **It has been proven that ground water flows to the Northwest of Gardner's Sludge Landfill toward Bailey Brook, Gardner's only native trout brook. (Groundwater)**

**Response** See **Section 5.3.4.2** of **Chapter 5, "Groundwater."** Groundwater was observed to generally flow south-southeast.

**DEM 06** **City of Gardner failed to provide alternatives along with a financial analysis of different options. (Alternatives Analysis)**

**Response** See **Chapter 2, "Alternatives Analysis."**

**DEM 07** **Gardner's Conservation Commission failed in their fiduciary responsibility in not upholding Gardner's Wetland Ordinance in which they swore an oath, to uphold, when they took office. The commission failed to request a site visit from the engineering firm they hired to do a peer review for the DEP, Notice of Intent. The commission approved the Notice of Intent without requesting a wildlife study of the area to include wildlife corridors. (Stormwater)**

**Response** See responses to **TEM 01** and **CHI1 03.**

**DEM 08** **City distribution list failed to notify all abutters and organizations within a mile, and the Town of Templeton, a municipality affected by the project. City of Gardner never consulted the Town of Templeton as to their concerns and the close proximity to Town Public Drinking Water Wells. (Circulation List)**

**Response** See responses to **MEPA 38, GCA 13** and **GRI 03.**

**DEM 09** **Air quality has been an ongoing problem with the current sludge landfill that the City of Gardner has failed to address. They keep passing the liability to the hired contractor, hired to run the landfill. (Air Quality)**

**Response** See **Chapter 7, "Air Quality"** and responses to **MEPA 16** and **CHI1 06.**

**DEM 10** **Mayor Nicholson failed to notify Annunciation Parish (Holy Rosary Church) of which he is a parishioner, of the City of Gardner's plans to expand the sludge landfill. (Circulation List)**

**Response** See responses to **MEPA 38, GCA 13** and **GRI 03.**

**DEM 11** **Anyone visiting the Catholic and City Cemeteries which abut the sludge landfill, have experienced the nauseating odors from the human waste. "Pope Francis emphasizes that the protection of the poor and of the earth are connected: The poor suffer most when the earth is abused; our indifference to the poor is reflected in our mistreatment of nature. "Solidarity" should be re-imagined to extend both to the poor and to the earth." Unfortunately Mayor Nicholson disagrees with the teachings of Pope Francis, in protecting the earth. (Air Quality)**

**Response** See **Chapter 7, "Air Quality"** and responses to **MEPA 16** and **CHI1 06**.

**DEM 12** **Though Mayor Nicholson was invited numerous times by myself and abutter Alan Rousseau to tour the proposed sludge landfill expansion site, to the best of our knowledge Nicholson has never walked the forested and fragile esker land. In closing, the Office of Environmental Affairs and MEPA have an obligation to the Environmental Justice Community of Gardner, which numbers Seventy Nine Percent of the population, to require a FULL Environmental Impact Report from the City of Gardner. Failure to do so, would be an injustice to the low-income residential population of Gardner and the Commonwealth of Massachusetts, Environmental Justice initiative. (Environmental Justice)**

**Response** See **Chapter 3, "Environmental Justice**" and comment/response to **MEPA 02, MEPA 29,** and **CHI1 09** regarding environmental justice concerns.

**From:** Rice Flanders
**To:** Strysky, Alexander (EEA)
**Subject:** EEA#16643/ ENF Comment: Proposed Gardner Landfill Expansion
**Date:** Tuesday, January 31, 2023 9:13:38 AM

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FLA 01

Good morning, Alexander Strysky:
In haste (for which I apologize), I am adding my whole hearted support to the recent letter from our Board president, David Brule, stating our opposition, and the reasons for that opposition, to the proposed expansion of the Gardner Landfill.
Thank you.
Rice Flanders
Vice President, MRWC Board of Directors

Sent from my iPhone

## 11.32 Rice Flanders (FLA)

**FLA 01** **In haste (for which I apologize), I am adding my whole hearted support to the recent letter from our Board president, David Brule, stating our opposition, and the reasons for that opposition, to the proposed expansion of the Gardner Landfill. (General Opposition)**

**Response** The City acknowledges the commenter's opposition to the Project.

Energy & Environmental Affairs (https://www.mass.gov/orgs/executive-office-of-energy-and-environmental-affairs)

# Public Comments Portal

alexander.strysky@mass.gov



# View Comment

## Comment Details

| | | | |
|---|---|---|---|
| **EEA #/MEPA ID**<br>16643 | **First Name**<br>Tim | **Address Line 1**<br>143 Vernon St | **Organization**<br>-- |
| **Comments Submit Date**<br>1-31-2023 | **Last Name**<br>Gurczak | **Address Line 2**<br>-- | **Affiliation Description**<br>Individual |
| **Certificate Action Date**<br>1-31-2023 | **Phone**<br>+19782048103 | **State**<br>MASSACHUSETTS | **Status**<br>Opened |
| **Reviewer**<br>Alexander Strysky (857)408-6957, alexander.strysky@mass.gov | **Email**<br>timgurczak@gmail.com | **Zip Code**<br>01440 | |

## Comment Title or Subject

**Topic**: Best Choice Or Convenient Choice?

## Comments

The City of Gardner has an obligation to all of its taxpayers, but more important to protect all of its people, present and future (as well as the people of the surrounding areas). City officials must consider the effects upon those who have no say—those not-yet-born and those not old enough to participate in voting. We all must consider their lives and their health most of all.

One city representative at the site visit with MEPA on 1/17/23 said they 'trusted the science' in the strength of the double liner to hold and not leak into the groundwater. This science we are asked to trust will also tell us that knowingly choosing a project which increases the likelihood of groundwater contamination—however small—is to be avoided. This is an effect that cannot be undone. We cannot allow the idea of discomfort to opposing taxpayers be held above the protection of our water for the yet-to-be born citizens of Gardner the surrounding areas connected to this water source. For choices like that end up costing more in the present and in the future. GUR 01

What are the criteria necessary for the DPW and the City Of Gardner to adapt their plans away from the sludge landfill expansion as it is currently proposed? They acknowledged there are alternatives that have their own sets of pros and cons but did not detail what price points or technology would need to be available for the idea to be of interest to them. They mentioned a city report that is now many years old. One official mentioned 'the city' would likely not want to pay for another analysis of alternate technology anyway. The knowledge about the current likelihood of Fitchburg's possible Anaerobic Digestion facility coming online seemed to be cursory at best and city officials seemed unlikely in becoming more aware of its current developments. GUR 02

This project is projected to accommodate disposal for only 17 years. GUR 03

And then what?

The best course of action for today is the same best course of action for the next 100 years. We must be careful and not be ruled by what is deemed 'cost effective' without evidence, for losing clean water and air are far greater costs than what shows on balance sheets. GUR 04

We will all be judged on whether we chose the best choice or chose the convenient choice: one that will only be of twenty years' use but has effects that could last much, much longer.

## Attachments

## Update Status

Status

Opened

SUBMIT

## Share Comment

SHARE WITH A REGISTERED USER

BACK TO SEARCH RESULTS

## 11.33 Tim Gurczak (GUR)

**GUR 01** **The City of Gardner has an obligation to all of its taxpayers, but more important to protect all of its people, present and future (as well as the people of the surrounding areas). City officials must consider the effects upon those who have no say—those not-yet-born and those not old enough to participate in voting. We all must consider their lives and their health most of all.**

**One city representative at the site visit with MEPA on 1/17/23 said they 'trusted the science' in the strength of the double liner to hold and not leak into the groundwater. This science we are asked to trust will also tell us that knowingly choosing a project which increases the likelihood of groundwater contamination—however small—is to be avoided. This is an effect that cannot be undone.**

**We cannot allow the idea of discomfort to opposing taxpayers be held above the protection of our water for the yet-to-be born citizens of Gardner the surrounding areas connected to this water source. For choices like that end up costing more in the present and in the future. (Project Description and Permitting) (Groundwater)**

**Response** See response to **ANT 07, CHI1 02, TEM 01, LOR 01,** and **ALV 01.**

**GUR 02** **What are the criteria necessary for the DPW and the City Of Gardner to adapt their plans away from the sludge landfill expansion as it is currently proposed? They acknowledged there are alternatives that have their own sets of pros and cons but did not detail what price points or technology would need to be available for the idea to be of interest to them. They mentioned a city report that is now many years old. One official mentioned 'the city' would likely not want to pay for another analysis of alternate technology anyway. The knowledge about the current likelihood of Fitchburg's possible Anaerobic Digestion facility coming online seemed to be cursory at best and city officials seemed unlikely in becoming more aware of its current developments. (Alternatives Analysis)**

**Response** See **Chapter 2, "Alternatives Analysis."**

**GUR 03** **This project is projected to accommodate disposal for only 17 years. And then what? The best course of action for today is the same best course of action for the next 100 years. (Project Description and Permitting)**

**Response** The City of Gardner is committed to continually exploring the feasibility of a longer-term solution for sludge disposal.

**GUR 04** **We must be careful and not be ruled by what is deemed 'cost effective' without evidence, for losing clean water and air are far greater costs than what shows on balance sheets. We will all be judged on whether we chose the best choice or chose the convenient choice: one that will only be of twenty years' use but has effects that could last much, much longer. (Alternatives Analysis)**

**Response** See **Chapter 2, "Alternatives Analysis"** and response to **ANT 07**.

**From:** Vicki Heidorn
**To:** Strysky, Alexander (EEA)
**Subject:** Gardner Sludge Landfill project (EEA# 16643)
**Date:** Tuesday, January 31, 2023 11:01:44 AM
**Attachments:** image001.png

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Dear Mr. Strysky:
Thank you for coming to Gardner to listen to the community regarding the effects of the sludge expansion proposal. I attended the meeting.
Please issue a finding that the environmental impact of this proposed Gardner Sludge Landfill project (EEA# 16643) is SEVERE and PERMANENT. HEI 01

The affected area is vital to gentle recreation and to wildlife freedom of movement. HEI 02

Please see the attached map. When you look at the map of the one-mile radius of the sludge expansion area, the expansion area looks like it is a tiny dot amongst the Gardner Landfill area. It is not TINY. The sludge mountain is planned to be 70 feet up in the air, dominating the area. You can see the waterways on this map. The woods clean the rainfall on its way to the rivulets, streams, and rivers. HEI 03

At the meeting we heard that the new sludge capacity will be filled after 17 years of collection. When the trees are torn out to build the sludge containment area, the natural ability to produce oxygen from the trees will be gone. The natural filtration of rainwater will be gone. The entire area offers freedom of movement for wildlife. Permanently losing beneficial woods and beautiful gentle recreation land for only 17 years is shortsighted. HEI 04

I understand that Fitchburg has a sludge processing plant coming online in about 2 years that needs participation from outside communities. The amount of waste requiring disposal from the Fitchburg plant is significantly less than the proposed sludge expansion project. This new information was not available when the City Council endorsed the plan in 2016. I believe the Fitchburg facility will provide a practical alternative to the sludge expansion project. I hope the Gardner officials will pursue this and any other new technology to solve our sludge waste treatment and disposal. HEI 05

The amazing attraction of Gardner is the quality of life in our landscape. Children and adults of all diversity are able to ramble on public land and conservation land. There is room for wildlife to coexist. The sludge expansion area is SO BEAUTIFUL that it breaks my heart to think it will be permanently gone. My family and I have hiked the Cummings Otter River Conservation Area, the HEI 06

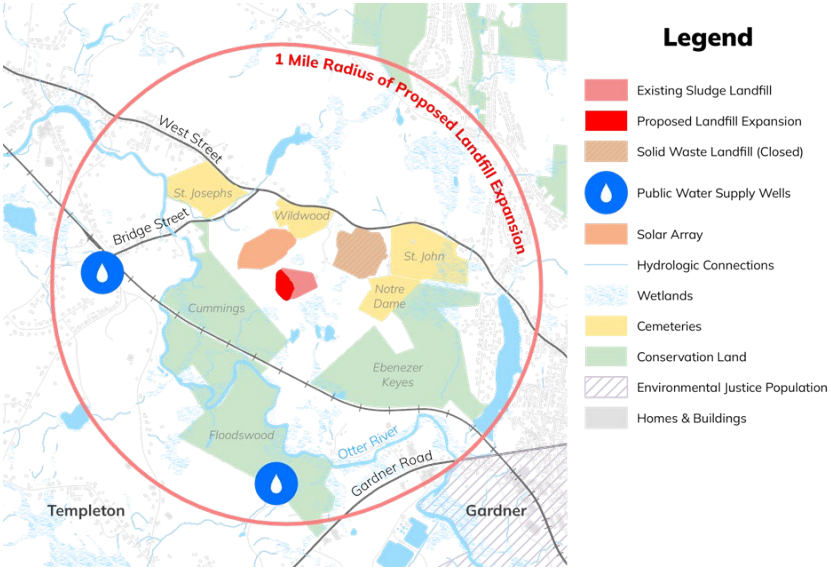
Wildwood Cemetery Forest, the Ebenezer Keyes Conservation Area, the Gardner City Forest, and the Gardner conservation land many times, and we have met other people on the land during our recreational walks.

Even if people did not use the land, it is being used by all kinds of animals and plants, providing clean air and natural filtration of rainwater.

Please issue a finding that the environmental impact of this project is SEVERE and PERMANENT and that an Environmental Impact Report (EIR) be required for the proposed expansion so that further analysis of proposed expansion impacts can be done. HEI 07

Thank you.

Sincerely,
Gardner Resident and Gardner business owner
Victoria (Vicki) Heidorn
978-895-6115
12 Crystal Lake Dr.
Gardner, MA 01440



## 11.34 Victoria Heidorn (HEI)

**HEI 01** **Thank you for coming to Gardner to listen to the community regarding the effects of the sludge expansion proposal. I attended the meeting. Please issue a finding that the environmental impact of this proposed Gardner Sludge Landfill project (EEA# 16643) is SEVERE and PERMANENT. (Project Description and Permitting)**

**Response** See response to **ANT 07**.

**HEI 02** **The affected area is vital to gentle recreation and to wildlife freedom of movement. (Project Description and Permitting)**

**Response** See **Chapter 1, "Project Description and Permitting,"** and responses to **CHI1 05** and **CHI1 07.**

**HEI 03** **When you look at the map of the one-mile radius of the sludge expansion area, the expansion area looks like it is a tiny dot amongst the Gardner Landfill area. It is not TINY. The sludge mountain is planned to be 70 feet up in the air, dominating the area. You can see the waterways on this map. The woods clean the rainfall on its way to the rivulets, streams, and rivers. (Project Description and Permitting)**

**Response** See **Chapter 1, "Project Description and Permitting,"** and responses to **CHI1 05** and **CHI1 07**.

**HEI 04** **At the meeting we heard that the new sludge capacity will be filled after 17 years of collection. When the trees are torn out to build the sludge containment area, the natural ability to produce oxygen from the trees will be gone. The natural filtration of rainwater will be gone. The entire area offers freedom of movement for wildlife. Permanently losing beneficial woods and beautiful gentle recreation land for only 17 years is shortsighted. (Project Description and Permitting)**

**Response** See responses to **CHI1 05** and **CHI1 07**.

**HEI 05** **I understand that Fitchburg has a sludge processing plant coming online in about 2 years that needs participation from outside communities. The amount of waste requiring disposal from the Fitchburg plant is significantly less than the proposed sludge expansion project. This new information was not available when the City Council endorsed the plan in 2016. I believe the Fitchburg facility will provide a practical alternative to the sludge expansion project. I hope the Gardner officials will pursue this and any other new technology to solve our sludge waste treatment and disposal. (Alternatives Analysis)**

**Response** See Section 2.4.1 of **Chapter 2, "Alternatives Analysis."**

**HEI 06** **The amazing attraction of Gardner is the quality of life in our landscape. Children and adults of all diversity are able to ramble on public land and conservation land. There is room for wildlife to coexist. The sludge expansion area is SO BEAUTIFUL that it breaks my heart to think it will be permanently gone. My family and I have hiked the Cummings Otter River Conservation Area, the Wildwood Cemetery Forest, the Ebenezer Keyes Conservation Area, the Gardner City Forest, and the Gardner conservation land many times, and we have met other people on the land during our recreational walks. Even if people did not use the land, it is being used by all kinds of**

**animals and plants, providing clean air and natural filtration of rainwater. (Project Description and Permitting)**

**Response** See responses to **CHI1 05** and **CHI1 07**.

**HEI 07** **Please issue a finding that the environmental impact of this project is SEVERE and PERMANENT and that an Environmental Impact Report (EIR) be required for the proposed expansion so that further analysis of proposed expansion impacts can be done. (Project Description and Permitting) (Mitigation and Draft Section 61 Findings)**

**Response** See response to **ANT 07**.

MASSACHUSETTS
SIERRA
CLUB

Comments Regarding the expansion of the City of Gardner
Municipal Wastewater Sludge Landfill

by Denise Trabbic-Pointer, MS, CHMM Emeritus
May 5, 2022

Introduction

I am a Chemical Engineer with a BS and MS in Hazardous Materials Management, a career EHS professional and a Certified Hazardous Material Manager (CHMM) Emeritus. I retired in January 2019 after 42 years with DuPont and a spin-off company, Axalta Coating Systems, as their Global Environmental Competency Leader. Since May 2019, I have been the Sierra Club – Michigan Chapter, Toxics & Remediation Specialist, and work nationally as a technical resource for communities impacted by releases of toxics to air, water and/or soil. I have been asked to review the impact(s) of the proposed expansion of the Gardner Sludge Landfill (SLF) and to comment on behalf of the State Director, Sierra Club Massachusetts because of my prior work on Sierra Club national projects concerning wastewater and biosolids. The following is my review summary and resulting comments as they relate to the City of Gardner proposal to expand the SLF.

The basic process and movement of sludge is important because of the cyclical nature of most toxics in sewage sludge. The following describes the current basic prcess: Sludge from the Gardner Wastewater Treatment Plant (WWTP) is transported to the City of Gardner Municipal Wastewater Sludge Landfill Facility [“SLF”] by truck for surface disposal. Leachate from the SLF is returned to the WWTP via underground pipe. The now-operating 12-acre SLF and now-closed 23-acre Solid Waste Landfill [“SWLF”] are on the same property in Gardner, MA. The SWLF is the only Significant Industrial User (SIU) discharging to the Gardner WWTP.

The primary sources of toxic contaminants to the SLF are from both the SLF and SWLF leachate. There are a multitude of hazardous contaminants documented in landfill leachate, including PFAS, 1,4-dioxane, synthetic hormones and pharmaceuticals, persistent pesticides, flame retardants in furniture and electronics, and Dioxins & Furans. Analysis of the potential full range of hazardous contaminants in the Gardner SLF leachate has not yet been performed. We are particularly concerned about the significant potential for the presence of per-and polyfluoroalkyl substances (PFAS) in the leachate. POI 01

The presence of PFAS in WWTP sludge is well documented. Michigan and Maine in particular, have performed significant investigations and evaluation of PFAS impacts from municipal and industrial WWTP effluent and treatment sludge/biosolids. Besides leachate from both landfills, potential sources of PFAS in the Gardner WWTP sludge include normal household activities such as laundering PFAS coated clothing, cleaning furniture and carpets, washing coated pans, surface run-off from lawns where biosolids-based fertilizers are used, and even normal sanitary sewage wastes from the presence of PFAS in people’s bodies. Small industry can also be sources of PFAS. Examples of small industry in Gardner that may discharge PFAS includes furniture and wood manufacturing, specialty paper coating and food wrap manufacturing, and plastic manufacturing and fabrication. Even potential contamination at the Gardner Municipal

Airport or local Fire Department can contribute PFAS to the WWTP. The mechanism for this to occur is normally from the use of AFFF for actual fire and training activities where the AFFF is simply flushed to surface water and sewers or from firefighting system and equipment operating and maintenance activities where residuals are simply flushed to nearby surface water and sewers. Impacts from contaminated sites have also impacted downstream wastewater treatment plants through infiltration of impacted groundwater to sewer systems.

The WWTP process does not treat and allows pass-through of PFAS to their effluent and sludge. Wastewater treatment can transform PFAS and increase measurable PFAS concentrations in effluent vs influent and sludge vs effluent. The City of Gardner SWLF is the only industrial user that discharges to the WWTP. The SWLF discharge consists of non-process leachate which contributes an average of 1,182 gallons per day. SLF leachate also discharges to the WWTP via the same conveyance system. SLF expansion engineering reports indicate an estimated 430 gallons per day from the SLF for a total of 1,612 gallons of leachate per day from both landfills. The cyclical nature of this process of WWTP to landfill and leachate back to the WWTP in Gardner will only compound this concentration of PFAS if present. This ill-conceived project to expand the Gardner SLF will, if approved, have substantial negative consequences for the community and the region. POI 02

Comments

I have reviewed much of the engineering documents that are available regarding the proposed expansion as well as the Gardner WWTP Final NPDES Permit No. MA0100994 and have the following comments.

1) We recognize and appreciate that the new permit for the City of Gardner WWTP includes provisions for monitoring PFAS in influent, effluent, and sludge as well as requiring leachate testing from the Gardner SWLF. However, other provisions in the permit significantly and unnecessarily extend the period of time before monitoring is required. The consequences of this delay could mean continued and unknown levels of PFAS being discharged from the WWTP to surface water. Although the permit requires monitoring for PFAS, it includes a "disclaimer" that states: "This reporting requirement for the listed PFAS parameters takes effect the first full calendar quarter beginning at least 6 months after EPA notifies the Permittee that a multi-lab validated method for biosolids is available." The permit further states: "If EPA's multi-lab validated method for wastewater has not been made available to the website public on EPA's Clean Water Act methods program by two years from the effective date of this Final Permit, the Permittee shall conduct monitoring of the influent, effluent (outfall 001) and sludge for PFAS compounds as detailed in the tables below using a method specified by MassDEP. If EPA's multi-lab validated method is not available by 20 months after the effective date of this Final Permit, the Permittee shall contact MassDEP (massdep.npdes@mass.gov) for guidance on an appropriate analytical method." There are two issues with these permit conditions: POI 03

    - There is no need to wait for a multi-lab validated method for analyzing for PFAS. Many states, including projects where Federal EPA is involved, are successfully using isotope dilution methods such as Method 537.1, ASTM D7979, or Method 8327

for PFAS analysis in wastewater and solids. According to the EPA, Method 1633, a single-laboratory validated method to test for 40 PFAS compounds, can be used in various applications, including National Pollutant Discharge Elimination System (NPDES) permits. SGS AXYS laboratories is currently approved to use Method 1633 and Pace Labs have nearly completed their validation. **Massachusetts should not wait for EPA to finalize their reviews as many states already are basing CWA permits on the methods highlighted above.**

- In two years, or even 6 months, there will be tens of millions of gallons of wastewater effluent and untold levels of PFAS passing through the WWTP to the Otter River, Connecticut River and ultimately to Long Island Sound (LIS). Consequences also include possible releases to ground water due to the land disposal of potentially PFAS-impacted sludge, including to nearby residential drinking water wells. **This is an unnecessary delay that will lead to human health and environmental impacts**.

2) Current permit requirements prohibit passthrough of pollutants. The permit states: "Pollutants introduced into the POTW by a non-domestic source (user) shall not pass through the POTW or interfere with the operation or performance of the works." Both the SLF and SWLF discharge leachate to the WWTP. The described leachate likely contains PFAS and will pass through the POTW. **Based on these facts, leachate from the landfill should be immediately analyzed and discharge prohibited, or treatment required prior to discharge if it contains PFAS or other harmful chemicals**. POI 04

3) The February 3, 2016, Gardner SLF vertical expansion permit "general conditions" state: POI 05

**Permit Modifications** – MassDEP reserves the right to rescind, suspend or modify this permit by the imposition of additional conditions based upon a determination of actual or the threat of adverse impacts from the construction, operation, maintenance, or closure of the sludge landfill.

- The potential is high for PFAS to be leaching from the landfill (see Introduction) and we believe that this constitutes "actual or the threat of adverse impacts" from the construction of the expansion, operation and/or maintenance of the sludge landfill. There is significant data from other states and from EPA that, if present in influent, PFAS will pass through most or all wastewater treatment plants as constructed today. **This is just another reason for MassDEP to require testing for PFAS sooner, rather than later**.

4) My review of the SLF annual operations reports (DMR) and former Gardner Solid Waste Landfill (SWLF) annual environmental monitoring reports indicates the following. POI 06

- The use/addition of street sweepings at the landfill may have been cause for or contributed to elevated levels of chloride, sodium, specific conductance, and TDS in monitoring wells (SL-1, SL-2, and SL3). This assumes that deicing salt would likely

be present in the street sweepings and the cause for the elevated levels of contaminants.

- Results for chloride, sodium, specific conductance, and TDS all could indicate leaching of salts. I suspect these results indicate that deicing salt may have contaminated GW downgradient of the landfill. This could be as a results of street sweepings being used at the landfill as well as a possible leak from the landfill liner. Note that elevated TDS can also be from the sewage sludge. Elevated levels of these parameters are highest in deep wells 13D and 14D. Brine (high concentration of salts) is denser than water so groundwater contaminated with high concentrations will sink into the aquifer. Brine contamination is much more difficult to remediate than hydrocarbons.

- Another concern with street sweepings is the potential of the presence of a chemical called N-(1,3-Dimethylbutyl)-N′-phenyl-p-phenylenediamine-quinone, also known as 6PPD quinone. 6PPD-quinone is a degradation contaminant from tires and was recently identified as a toxic chemical that causes acute mortality in coho salmon following exposure to urban runoff. If 6PPD-quinone is present in the street sweepings and, as indicated by ground and surface water results for sodium and chloride, this chemical might also be in surface and GW. 6PPD-quinone is also reportedly very difficult to remediate from GW.

**For these reasons, we recommend that the practice of adding street sweepings to the landfill be discontinued and that sampling and analysis of ground and surface water for 6PPD-quinone and be initiated. If there is a breach in the landfill liner as we suspect, PFAS in surface and groundwater should also be assessed. We also recommend continued monitoring for sodium and chloride in deep wells to assure there are no off-site impacts**. POI 07

5) Vinyl Chloride (VC) in MW-7 is interesting and although levels are consistent with short-term historical data, **consideration should be given to testing representative up- and down-gradient GW wells for Trichloroethylene (TCE)**. TCE can degrade to Vinyl Chloride and then to ethene, which is much less hazardous. “However, under manganese or iron reducing conditions, … VC may also biologically decompose without the formation of ethene.” There are elevated manganese and iron conditions indicated in several downgradient GW results at the Gardner Landfill. By themselves, elevated levels of manganese and iron are primarily cause for unpleasant odors in GW and DW and not a cause for significant health concerns.

6) According to the document “Policy on the Design and Operation of Sludge Landfills memo 31Mar1983”, the SLF would be subject to 40 CFR 257. §257.3-4 Ground water, indicates that: POI 08

   (a) A facility or practice shall not contaminate an underground drinking water source beyond the solid waste boundary or beyond an alternative boundary specified in accordance with paragraph (b) of this section.

(b) … The court shall establish an alternative boundary only if it finds that such a change would not result in contamination of ground water which may be needed or used for human consumption…

It appears that MW-7 is beyond "the solid waste boundary" and MW-15 is borderline. As discussed in comment #5, MW-7 does indicate contamination. **MassDEP should review the data and determine if an underground drinking water source has already been impacted by the SLF.**

7) Whitman & Howard "Gardner Sludge Design Mods 12/20/1989" indicates that portions of the landfill were installed at a depth below the assessed 4 feet above the seasonal high GW table levels. That is, portions of the landfill indicate 3.8 feet of separation between the high-water table and the liner when it was not supposed to go below 4 feet of separation. Whitman & Howard suggested that this was a minor difference and not a problem, but MassDEP should make that determination and no such document was found in what has been provided to date. This is especially important now and in future as annual rain events and water levels are expected to rise. **MassDEP should review the data on the SLF liner depth to seasonal high GW levels, consider the hydraulic implications of areas that are < 4 feet separation, and provide a written determination as to whether current conditions are acceptable.** POI 09

**8)** Sludge characteristics from the Gardner WWTP have been assessed more than once as Type III biosolids due to the metals content. Document "Findings of no significant impact 10-19-1988" states that sludge testing from 1983, indicate that Gardner WWTP sludge is Type II for Cadmium and Type III for Nickel. A sludge test was conducted in May 2019 to characterize the Gardner WWTP sludge cake. The test results indicate the sludge exhibits a Type III classification according to Mass DEP regulations for the Land Application of Sludge and Septage, 310 CMR 32.00. The total boron content was 329 mg/kg, which is above the Type I and Type II maximum allowable concentration for water soluble boron (300 ppm) specified in 310 CMR 32.12. **The use of Type III biosolids is restricted from land application and one would assume, should be restricted from land disposal since land disposal at the Gardner SLF is subject to 40 CFR part 503. Accordingly, land disposal of SLF sludge must be recorded on the deed to the parcel of land on which it is applied (i.e. the Gardner SLF).** POI 10

- Type I biosolids meet very high quality standards and may be used as commercial fertilizers and soil conditioners.
- Type II biosolids meet a lower standard for use than Type I and require additional MassDEP permitting in order to be applied to land. Their use is restricted to a specific parcel of land.
- Type III biosolids have also been treated for pathogen reduction, but typically have more chemicals and metals than Type II biosolids. Use of Type III biosolids is restricted and any application must be recorded on the deed to the parcel of land on which it is applied.

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9) The document “Finding of No Significant Impact (10/19/1988)” includes the plan that the “Leachate collection force main will be jacked under Perley Brook.” The referenced section of the force main appears to be owned by the City of Gardner. Our concern is that someone must be responsible to assure ongoing integrity of the piping and connections that carries leachate from the Gardner SLF to the Gardner and particularly where a release could impact ground and/or surface water. Relying on monitoring well testing at the SLF is not a good method to proactively assure there will be no leaks from the pipe. It also does not appear that the SLF is sampling for everything that they should in groundwater (GW) monitoring wells (MWs). **Based on what I have reviewed and have mentioned above, Boron, Nickel and PFAS should also be included in analyses of GW MWs. We request that the City of Gardner also provide a plan for periodic integrity inspection or testing of the sanitary force main from the SLF leachate collection point, through to the Gardner WWTP**. POI 11

10) Greenhouse gas emissions are of concern at all landfills. According to the EPA, “Municipal solid waste (MSW) landfills are the third-largest source of human-related methane emissions in the United States, accounting for approximately 15.1 percent of these emissions in 2019.” We have assessed CO2 equivalents (Mg/year) emissions from each process at a sludge landfill and land disposal of WWTP sludge. *Attachment 1* are the calculations and results for the Gardner SLF. The Biosolids Emissions Assessment Model (BEAM) Version 1.1 © 2011 Canadian Council of Ministers of the Environment was used to derive these results. Note that calculations are based on the reported design flow of the Gardner WWTP of 5 million gallons per year as well as the metric tons/year – dry (Sludge). The Woodward & Curran *Supplement No. 1 to Gardner Sludge Landfill Expansion Application Record No. 22-WP33-0003-APP* indicates that “The average amount of sludge to be disposed of at the landfill on a daily basis is 5 dry tons per day, five days per week” and this is what was used in the attached calculations POI 12

Our results for the Gardner SLF GHG emissions have been compared to reported GHG emissions from similar sized municipal solid waste (MSW) landfills and found to be similar. Final assessed annual GHG emissions from operations at the Gardner SLF are 7,257 CO2eq (Mg/year).

We have reviewed the documents Gardner SLF Expansion Engineering Report, Section 8 and Appendix M. Woodward & Curran seem to be dismissing the impact of gas emissions as <u>not measurable</u>. We disagree with this determination and believe that there are flaws in the methods and data used by Woodward & Curran. That is, the LandGEM – Landfill Gas Emissions Model, Version 302, does not factor in all potential point sources of GHG emissions and the assessed annual Mg/year of sludge to be disposed are significantly underestimated. To truly assess the impact of a project, maximum possible emissions should be assessed. The Institute of Environmental Management & Assessment (IEMA) and environmental impact assessments (EIA) have identified “climate change as one of the defining environmental policy drivers of the future and that action to address GHG emissions is essential.” They have determined that there are three over-arching principles particularly relevant to considering the aspect of “significance”:

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"The GHG emissions from all projects will contribute to climate change; the largest interrelated cumulative environmental effect."

"The consequences of a changing climate have the potential to lead to significant environmental effects on all topics in the EIA Directive – e.g. Population, Fauna, Soil, etc."

"GHG emissions have a combined environmental effect that is approaching a scientifically defined environmental limit, as such any GHG emissions or reductions from a project might be considered to be significant."

In short, they have determined that, "in the absence of any significance criteria or a defined threshold, it might be considered that all GHG emissions are significant and an EIA should ensure the project addresses their occurrence by taking mitigating action."

**We believe that assessed GHG emissions from the Gardner SLF continued use <u>are significant</u> and must be considered in the proposed expansion**.

*by Denise Trabbic-Pointer, MS, CHMM Emeritus*
*April 27, 2022*
*On behalf of the Sierra Club Massachusetts Chapter*

## 11.35 Denise Trabbic-Pointer, MS, CHMM Emeritus (POI)

**POI 01** **I am a Chemical Engineer with a BS and MS in Hazardous Materials Management, a career EHS professional and a Certified Hazardous Material Manager (CHMM) Emeritus. I retired in January 2019 after 42 years with DuPont and a spin-off company, Axalta Coating Systems, as their Global Environmental Competency Leader. Since May 2019, I have been the Sierra Club – Michigan Chapter, Toxics & Remediation Specialist, and work nationally as a technical resource for communities impacted by releases of toxics to air, water and/or soil. I have been asked to review the impact(s) of the proposed expansion of the Gardner Sludge Landfill (SLF) and to comment on behalf of the State Director, Sierra Club Massachusetts because of my prior work on Sierra Club national projects concerning wastewater and biosolids. The following is my review summary and resulting comments as they relate to the City of Gardner proposal to expand the SLF. The basic process and movement of sludge is important because of the cyclical nature of most toxics in sewage sludge. The following describes the current basic prcess: Sludge from the Gardner Wastewater Treatment Plant (WWTP) is transported to the City of Gardner Municipal Wastewater Sludge Landfill Facility ["SLF"] by truck for surface disposal. Leachate from the SLF is returned to the WWTP via underground pipe. The now-operating 12-acre SLF and now-closed 23-acre Solid Waste Landfill ["SWLF"] are on the same property in Gardner, MA. The SWLF is the only Significant Industrial User (SIU) discharging to the Gardner WWTP. The primary sources of toxic contaminants to the SLF are from both the SLF and SWLF leachate. There are a multitude of hazardous contaminants documented in landfill leachate, including PFAS, 1,4-dioxane, synthetic hormones and pharmaceuticals, persistent pesticides, flame retardants in furniture and electronics, and Dioxins & Furans. Analysis of the potential full range of hazardous contaminants in the Gardner SLF leachate has not yet been performed. We are particularly concerned about the significant potential for the presence of per-and polyfluoroalkyl substances (PFAS) in the leachate. The presence of PFAS in WWTP sludge is well documented. (Project Description and Permitting)**

**Response** See response to **CHI1 04**. Groundwater monitoring would be conducted in accordance with all applicable regulations.

**POI 02** **Michigan and Maine in particular, have performed significant investigations and evaluation of PFAS impacts from municipal and industrial WWTP effluent and treatment sludge/biosolids. Besides leachate from both landfills, potential sources of PFAS in the Gardner WWTP sludge include normal household activities such as laundering PFAS coated clothing, cleaning furniture and carpets, washing coated pans, surface run-off from lawns where biosolids-based fertilizers are used, and even normal sanitary sewage wastes from the presence of PFAS in people's bodies. Small industry can also be sources of PFAS. Examples of small industry in Gardner that may discharge PFAS includes furniture and wood manufacturing, specialty paper coating and food wrap manufacturing, and plastic manufacturing and fabrication. Even potential contamination at the Gardner Municipal Airport or local Fire Department can contribute PFAS to the WWTP. The mechanism for this to occur is normally from the use of AFFF for actual fire and training activities where the AFFF is simply flushed**

**to surface water and sewers or from firefighting system and equipment operating and maintenance activities where residuals are simply flushed to nearby surface water and sewers. Impacts from contaminated sites have also impacted downstream wastewater treatment plants through infiltration of impacted groundwater to sewer systems. The WWTP process does not treat and allows pass-through of PFAS to their effluent and sludge. Wastewater treatment can transform PFAS and increase measurable PFAS concentrations in effluent vs influent and sludge vs effluent. The City of Gardner SWLF is the only industrial user that discharges to the WWTP. The SWLF discharge consists of non-process leachate which contributes an average of 1,182 gallons per day. SLF leachate also discharges to the WWTP via the same conveyance system. SLF expansion engineering reports indicate an estimated 430 gallons per day from the SLF for a total of 1,612 gallons of leachate per day from both landfills. The cyclical nature of this process of WWTP to landfill and leachate back to the WWTP in Gardner will only compound this concentration of PFAS if present. This ill-conceived project to expand the Gardner SLF will, if approved, have substantial negative consequences for the community and the region.**

**Response** See response to **CHI1 04**. Groundwater monitoring would be conducted in accordance with all applicable regulations.

**POI 03** **Comments I have reviewed much of the engineering documents that are available regarding the proposed expansion as well as the Gardner WWTP Final NPDES Permit No. MA0100994 and have the following comments. 1) We recognize and appreciate that the new permit for the City of Gardner WWTP includes provisions for monitoring PFAS in influent, effluent, and sludge as well as requiring leachate testing from the Gardner SWLF. However, other provisions in the permit significantly and unnecessarily extend the period of time before monitoring is required. The consequences of this delay could mean continued and unknown levels of PFAS being discharged from the WWTP to surface water. Although the permit requires monitoring for PFAS, it includes a "disclaimer" that states: "This reporting requirement for the listed PFAS parameters takes effect the first full calendar quarter beginning at least 6 months after EPA notifies the Permittee that a multi-lab validated method for biosolids is available." The permit further states: "If EPA's multi-lab validated method for wastewater has not been made available to the website public on EPA's Clean Water Act methods program by two years from the effective date of this Final Permit, the Permittee shall conduct monitoring of the influent, effluent (outfall 001) and sludge for PFAS compounds as detailed in the tables below using a method specified by MassDEP. If EPA's multi-lab validated method is not available by 20 months after the effective date of this Final Permit, the Permittee shall contact MassDEP (massdep.npdes@mass.gov) for guidance on an appropriate analytical method." There are two issues with these permit conditions: There is no need to wait for a multi-lab validated method for analyzing for PFAS. Many states, including projects where Federal EPA is involved, are successfully using isotope dilution methods such as Method 537.1, ASTM D7979, or Method 8327 for PFAS analysis in wastewater and solids. According to the EPA, Method 1633, a single-laboratory validated method to test for 40 PFAS compounds, can be used in various applications, including National Pollutant Discharge Elimination System (NPDES)**

**permits. SGS AXYS laboratories is currently approved to use Method 1633 and Pace Labs have nearly completed their validation. Massachusetts should not wait for EPA to finalize their reviews as many states already are basing CWA permits on the methods highlighted above. In two years, or even 6 months, there will be tens of millions of gallons of wastewater effluent and untold levels of PFAS passing through the WWTP to the Otter River, Connecticut River and ultimately to Long Island Sound (LIS). Consequences also include possible releases to ground water due to the land disposal of potentially PFAS-impacted sludge, including to nearby residential drinking water wells. This is an unnecessary delay that will lead to human health and environmental impacts. (Project Description and Permitting) (Groundwater)**

**Response** See response to **CHI1 04**. Groundwater monitoring would be conducted in accordance with all applicable regulations.

**POI 04** **Current permit requirements prohibit pass through of pollutants. The permit states: "Pollutants introduced into the POTW by a non-domestic source (user) shall not pass through the POTW or interfere with the operation or performance of the works." Both the SLF and SWLF discharge leachate to the WWTP. The described leachate likely contains PFAS and will pass through the POTW. Based on these facts, leachate from the landfill should be immediately analyzed and discharge prohibited, or treatment required prior to discharge if it contains PFAS or other harmful chemicals.**

**Response** See response to **CHI1 04**. Groundwater monitoring would be conducted in accordance with all applicable regulations.

**POI 05** **The February 3, 2016, Gardner SLF vertical expansion permit "general conditions" state: Permit Modifications – MassDEP reserves the right to rescind, suspend or modify this permit by the imposition of additional conditions based upon a determination of actual or the threat of adverse impacts from the construction, operation, maintenance, or closure of the sludge landfill. The potential is high for PFAS to be leaching from the landfill (see Introduction) and we believe that this constitutes "actual or the threat of adverse impacts" from the construction of the expansion, operation and/or maintenance of the sludge landfill. There is significant data from other states and from EPA that, if present in influent, PFAS will pass through most or all wastewater treatment plants as constructed today. This is just another reason for MassDEP to require testing for PFAS sooner, rather than later.**

**Response** See response to **CHI1 04**. Groundwater monitoring would be conducted in accordance with all applicable regulations.

**POI 06** **My review of the SLF annual operations reports (DMR) and former Gardner Solid Waste Landfill (SWLF) annual environmental monitoring reports indicates the following. The use/addition of street sweepings at the landfill may have been cause for or contributed to elevated levels of chloride, sodium, specific conductance, and TDS in monitoring wells (SL-1, SL-2, and SL3). This assumes that deicing salt would likely be present in the street sweepings and the cause for the elevated levels of contaminants. Results for chloride, sodium, specific conductance, and TDS all could indicate leaching of salts. I suspect these results indicate that deicing salt may have contaminated GW downgradient of the landfill. This could be as a results of street**

**sweepings being used at the landfill as well as a possible leak from the landfill liner. Note that elevated TDS can also be from the sewage sludge. Elevated levels of these parameters are highest in deep wells 13D and 14D. Brine (high concentration of salts) is denser than water so groundwater contaminated with high concentrations will sink into the aquifer. Brine contamination is much more difficult to remediate than hydrocarbons. Another concern with street sweepings is the potential of the presence of a chemical called N-(1,3-Dimethylbutyl)-N′-phenyl-p-phenylenediamine-quinone, also known as 6PPD quinone. 6PPD-quinone is a degradation contaminant from tires and was recently identified as a toxic chemical that causes acute mortality in coho salmon following exposure to urban runoff. If 6PPD-quinone is present in the street sweepings and, as indicated by ground and surface water results for sodium and chloride, this chemical might also be in surface and GW. 6PPD-quinone is also reportedly very difficult to remediate from GW. For these reasons, we recommend that the practice of adding street sweepings to the landfill be discontinued and that sampling and analysis of ground and surface water for 6PPD-quinone and be initiated. (Groundwater)**

**Response** See response to **CHI1 04**. Groundwater monitoring would be conducted in accordance with all applicable regulations.

**POI 07** **If there is a breach in the landfill liner as we suspect, PFAS in surface and groundwater should also be assessed. We also recommend continued monitoring for sodium and chloride in deep wells to assure there are no off-site impacts. 5) Vinyl Chloride (VC) in MW-7 is interesting and although levels are consistent with short-term historical data, consideration should be given to testing representative up- and down-gradient GW wells for Trichloroethylene (TCE). TCE can degrade to Vinyl Chloride and then to ethene, which is much less hazardous. "However, under manganese or iron reducing conditions, … VC may also biologically decompose without the formation of ethene." There are elevated manganese and iron conditions indicated in several downgradient GW results at the Gardner Landfill. By themselves, elevated levels of manganese and iron are primarily cause for unpleasant odors in GW and DW and not a cause for significant health concerns. (Groundwater)**

**Response** See response to **CHI1 04**. Groundwater monitoring would be conducted in accordance with all applicable regulations.

**POI 08** **According to the document "Policy on the Design and Operation of Sludge Landfills memo 31Mar1983", the SLF would be subject to 40 CFR 257. §257.3-4 Ground water, indicates that: (a) A facility or practice shall not contaminate an underground drinking water source beyond the solid waste boundary or beyond an alternative boundary specified in accordance with paragraph (b) of this section. (b) … The court shall establish an alternative boundary only if it finds that such a change would not result in contamination of ground water which may be needed or used for human consumption… It appears that MW-7 is beyond "the solid waste boundary" and MW-15 is borderline. MW-7 does indicate contamination. MassDEP should review the data and determine if an underground drinking water source has already been impacted by the SLF. (Groundwater)**

**Response** **See Chapter 5, "Groundwater."** MW-7 and MW-15 are monitoring wells associated with the former municipal solid waste landfill. Issues with respect to the former municipal solid waste landfill are outside the scope of this DEIR. The City will work with the appropriate regulatory agencies to ensure protection of drinking water.

**POI 09** **Whitman & Howard "Gardner Sludge Design Mods 12/20/1989" indicates that portions of the landfill were installed at a depth below the assessed 4 feet above the seasonal high GW table levels. That is, portions of the landfill indicate 3.8 feet of separation between the high-water table and the liner when it was not supposed to go below 4 feet of separation. Whitman & Howard suggested that this was a minor difference and not a problem, but MassDEP should make that determination and no such document was found in what has been provided to date. This is especially important now and in future as annual rain events and water levels are expected to rise. MassDEP should review the data on the SLF liner depth to seasonal high GW levels, consider the hydraulic implications of areas that are < 4 feet separation, and provide a written determination as to whether current conditions are acceptable. (Landfill Design and Construction) (Climate Change)**

**Response** The designs and specifications of the existing sludge landfill are beyond the scope of this DEIR. See also response to **CHI1 02**.

**POI 10** **Sludge characteristics from the Gardner WWTP have been assessed more than once as Type III biosolids due to the metals content. Document "Findings of no significant impact 10-19-1988" states that sludge testing from 1983, indicate that Gardner WWTP sludge is Type II for Cadmium and Type III for Nickel. A sludge test was conducted in May 2019 to characterize the Gardner WWTP sludge cake. The test results indicate the sludge exhibits a Type III classification according to Mass DEP regulations for the Land Application of Sludge and Septage, 310 CMR 32.00. The total boron content was 329 mg/kg, which is above the Type I and Type II maximum allowable concentration for water soluble boron (300 ppm) specified in 310 CMR 32.12. The use of Type III biosolids is restricted from land application and one would assume, should be restricted from land disposal since land disposal at the Gardner SLF is subject to 40 CFR part 503. Accordingly, land disposal of SLF sludge must be recorded on the deed to the parcel of land on which it is applied (i.e. the Gardner SLF). Type I biosolids meet very high-quality standards and may be used as commercial fertilizers and soil conditioners. Type II biosolids meet a lower standard for use than Type I and require additional MassDEP permitting in order to be applied to land. Their use is restricted to a specific parcel of land. Type III biosolids have also been treated for pathogen reduction, but typically have more chemicals and metals than Type II biosolids. Use of Type III biosolids is restricted and any application must be recorded on the deed to the parcel of land on which it is applied. (Alternatives Analysis)**

**Response** See **Chapter 2, "Alternatives Analysis."** Type II or III sludge would not be restricted from lined landfill disposal such as the proposed Project. See also response to **CHI1 02**.

**POI 11** **The document "Finding of No Significant Impact (10/19/1988)" includes the plan that the "Leachate collection force main will be jacked under Perley Brook." The**

**referenced section of the force main appears to be owned by the City of Gardner. Our concern is that someone must be responsible to assure ongoing integrity of the piping and connections that carries leachate from the Gardner SLF to the Gardner and particularly where a release could impact ground and/or surface water. Relying on monitoring well testing at the SLF is not a good method to proactively assure there will be no leaks from the pipe. It also does not appear that the SLF is sampling for everything that they should in groundwater (GW) monitoring wells (MWs). Based on what I have reviewed and have mentioned above, Boron, Nickel and PFAS should also be included in analyses of GW MWs. We request that the City of Gardner also provide a plan for periodic integrity inspection or testing of the sanitary force main from the SLF leachate collection point, through to the Gardner WWTP. (Groundwater) (Landfill Design and Construction)**

**Response** As a separate project, the City is upgrading the leachate collection force main and pump station. Periodic inspections of this infrastructure would be done in accordance with all applicable regulations. See also response to **CHI1 02** and **MassDEP 02.**

**POI 12** **Greenhouse gas emissions are of concern at all landfills. According to the EPA, "Municipal solid waste (MSW) landfills are the third-largest source of human-related methane emissions in the United States, accounting for approximately 15.1 percent of these emissions in 2019." We have assessed CO2 equivalents (Mg/year) emissions from each process at a sludge landfill and land disposal of WWTP sludge. *Attachment 1* are the calculations and results for the Gardner SLF. The Biosolids Emissions Assessment Model (BEAM) Version 1.1 © 2011 Canadian Council of Ministers of the Environment was used to derive these results. Note that calculations are based on the reported design flow of the Gardner WWTP of 5 million gallons per year as well as the metric tons/year – dry (Sludge). The Woodward & Curran *Supplement No. 1 to Gardner Sludge Landfill Expansion Application Record No. 22-WP33-0003-APP* indicates that "The average amount of sludge to be disposed of at the landfill on a daily basis is 5 dry tons per day, five days per week" and this is what was used in the attached calculations Our results for the Gardner SLF GHG emissions have been compared to reported GHG emissions from similar sized municipal solid waste (MSW) landfills and found to be similar. Final assessed annual GHG emissions from operations at the Gardner SLF are 7,257 CO2eq (Mg/year). We have reviewed the documents Gardner SLF Expansion Engineering Report, Section 8 and Appendix M. Woodward & Curran seem to be dismissing the impact of gas emissions as not measurable. We disagree with this determination and believe that there are flaws in the methods and data used by Woodward & Curran. That is, the LandGEM – Landfill Gas Emissions Model, Version 302, does not factor in all potential point sources of GHG emissions and the assessed annual Mg/year of sludge to be disposed are significantly underestimated. To truly assess the impact of a project, maximum possible emissions should be assessed. The Institute of Environmental Management & Assessment (IEMA) and environmental impact assessments (EIA) have identified "climate change as one of the defining environmental policy drivers of the future and that action to address GHG emissions is essential." They have determined that there are three over-arching principles particularly relevant to considering the aspect of "significance": "The GHG emissions from all projects will contribute to climate**

**change; the largest interrelated cumulative environmental effect." "The consequences of a changing climate have the potential to lead to significant environmental effects on all topics in the EIA Directive – e.g. Population, Fauna, Soil, etc." "GHG emissions have a combined environmental effect that is approaching a scientifically defined environmental limit, as such any GHG emissions or reductions from a project might be considered to be significant." In short, they have determined that, "in the absence of any significance criteria or a defined threshold, it might be considered that all GHG emissions are significant and an EIA should ensure the project addresses their occurrence by taking mitigating action." We believe that assessed GHG emissions from the Gardner SLF continued use are significant and must be considered in the proposed expansion. (Climate Change) (Air Quality)**

**Response** See **Section 7.3** of **Chapter 7, "Air Quality."** EPA default values were used to estimate total landfill gas emissions. LandGEM is the accepted regulatory screening tool for estimating landfill gas emissions. The decomposition of the sludge is the source of greenhouse gas emissions. The LandGEM model utilizes a first order decomposition equation to calculate how much methane and $CO_2$ would be generated based on the mass of sludge added to the landfill and default factors for the landfill's methane generation capacity and the methane generation rate. Based on conventional default factors (k=0.04/year and Lo=100$m^3$/year), the resulting emissions are 253.6 tons/year including 78.1 tons/year of methane and 175.5 of $CO_2$. Based on the Global Warming Potential of 27.2 for methane, the resulting total emissions are 2,301 tons of $CO_2$ equivalents ($CO_2e$) per year. Using more conservative "Clean Air Act Regulatory Defaults" (k=0.05/year and Lo=170$m^3$/year), the resulting emissions would be 4,184 tons $CO_2e$ per year. The BEAM was developed to calculate net GHG emissions from various biosolids management processes and allow comparisons for planning purposes. LandGEM is a regulatory screening tool, and BEAM is a planning tool. Comparisons between the LandGEM and BEAM models could be evaluated further but both produce a greenhouse gas estimate that is well below the 75,000 tons per year $CO_2e$ plan approval requirement under the air regulations. See also **Chapter 8 "Climate Change."**

# 12. CIRCULATION

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| Massachusetts Environmental Policy Act (MEPA) Office<br>100 Cambridge Street, Suite 900<br>Boston, MA 02144<br>MEPA@mass.gov | Massachusetts Department of Transportation<br>District #3<br>Attn: MEPA Coordinator<br>499 Plantation Parkway<br>Worcester, MA 01605<br>Jeffrey.r.gomes@dot.state.ma.us |
| Massachusetts Environmental Policy Act (MEPA) Office<br>Attn: EEA EJ Director<br>100 Cambridge Street, Suite 900<br>Boston, MA 02144<br>MEPA-EJ@mass.gov | Massachusetts Historical Commission<br>The MA Archives Building<br>220 Morrissey Boulevard<br>Boston, MA 02125<br>mhc@sec.state.ma.us |
| Massachusetts Department of Environmental Protection<br>Central Regional Office<br>Attn: MEPA Coordinator<br>8 New Bond Street<br>Worcester, MA 01606<br>Andrea.briggs@mass.gov | Montachusett Regional Planning Commission (MRPC)<br>464 Abbott Avenue<br>Leominster, MA 01453<br>mrpc@mrpc.org |
| Massachusetts Department of Environmental Protection<br>Residuals Management Program<br>Attn: Jennifer Wood, Residuals Statewide Coordinator<br>One Winter Street<br>Boston, MA 02108<br>Jennifer.wood@state.ma.us | Gardner City Council<br>George Tyros, President<br>95 Pleasant Street, Room 121<br>Gardner, MA 01440<br>gtyros@gardner-ma.gov<br>tsiriphan@gardner-ma.gov |
| Massachusetts Department of Transportation<br>Public/Private Development Unit<br>10 Park Plaza, Suite 4150<br>Boston, MA 02116<br>MassDOTPPDU@dot.state.ma.us | Gardner Community Development & Planning<br>Manca Annex<br>115 Pleasant Street, Room 201<br>Gardner, MA 01440<br>jstevens@gardner-ma.gov |
| Gardner Conservation Commission Manca Annex<br>115 Pleasant Street, Room 201<br>Gardner, MA 01440<br>mailto:jenright@gardner-ma.gov | Polish American Citizens Club<br>171 Kendall Pond Rd W<br>Gardner, MA 01440<br>paccinfo@comcast.net |
| Gardner Health Department<br>95 Pleasant Street, Room 29<br>Gardner, MA 01440<br>mblondeau@gardner-ma.gov | American Legion Post #129<br>22 Elm Street, PO Box 1092<br>Gardner, MA 01440<br>royalcadet@comcast.net |

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|---|---|
| Levi Heywood Memorial Library<br>55 West Lynde Street<br>Gardner, MA 01440<br>syoung@cwmars.org | Fraternal Order of Eagles<br>71 City Hall Avenue<br>Gardner, MA 01440<br>help@foe.com |
| Natural Heritage and Endangered Species Program<br>Massachusetts Division of Fisheries & Wildlife<br>1 Rabbit Hill Road<br>Westborough, MA 01581<br>melany.cheeseman@mass.gov<br>Emily.holt@mass.gov | Gardner Rotary Club<br>mellis0144@comcast.net |
| Massachusetts Department of Public Health<br>250 Washington Street<br>Boston, MA 02108<br>https://www.mass.gov/forms/contact-dph-by-web-form | Gardner Lions Club<br>184 Pearson Blvd.<br>Gardner, MA 01440<br>Gardnerlionsclub@gmail.com |
| Millers River Watershed Council<br>Attn: David Brule, President<br>Millers River Environmental Center<br>100 Main Street<br>Athol, MA 01331<br>(978) 248-9491<br>watershed@millersriver.net | Bethany Baptist Church<br>72 Ryan Street<br>Gardner, MA 01440<br>office@bethanygardner.org |
| Alan Rousseau<br>211 Betty Spring Road<br>Gardner, MA 01440<br>Rousseaua@verizon.net | Jehovah's Witnesses<br>Kingdom Hall<br>1071 West Street<br>Gardner, MA 01440<br>(603) 899-2700<br>No email available. |
| Annunciation Parish<br>135 Nichols Street<br>Gardner, MA 01440<br>Rev. Sierra (Pastor):<br>pastor@annunciationgardner.org<br>William Lawton (Business Manager):<br>BusinessManager@AnnunciationGardner.org<br>Deb McGonigal (Secretary):<br>deb@annunciationgardner.org | Gardner Trout Club<br>44 Watkins Road<br>Gardner, MA 01440<br>No email available. |
| Otter River Sportsman's Club<br>PO Box 28<br>Baldwinville, MA 01436<br>orscmailbox@gmail.com | Gardner Fish & Gun Club<br>PO Box 396<br>Gardner, MA 01440<br>(978) 632-9774<br>No email available. |

| | |
|---|---|
| West End Beagle Club<br>110 Clark Street<br>Gardner, MA 01440<br>(978) 632-9792<br>No email available. | St. John's Cemetery<br>West Street<br>Gardner, MA 01440<br>George DiLorenzo, Director of Cemeteries:<br>georged@stjcemetery.com |
| Wildwood Cemetery<br>West Street<br>Gardner, MA 01440<br>(978) 630-4003<br>No email available. | Town of Templeton: Board of Assessors<br>Attn: Justice J.H. Graves<br>160 Patriots Road, P.O. Box 620<br>East Templeton, MA 01438<br>(978) 894-2760<br>jgraves@templetonma.gov |
| Town of Templeton: Conservation Commission/Community Preservation Committee/Planning Board<br>Attn: Jessica Case<br>160 Patriots Road, P.O. Box 620<br>East Templeton, MA 01438<br>(978) 894-2767<br>jcase@templetonma.gov | Town of Templeton: Development Services<br>Attn: Richard Hanks<br>160 Patriots Road, P.O. Box 620<br>East Templeton, MA 01438<br>(978) 894-2770<br>rhanks@templetonma.gov |
| Town of Templeton: Light and Water Department<br>Attn: John Driscoll, General Manager<br>86 Bridge St<br>P.O. Box 20<br>Baldwinville, MA 01436<br>978-939-5323, x11<br>jdriscoll@templetonlight.com | Town of Templeton: Office of Public Services<br>Attn: Bob Szocik<br>Highway Barn<br>381 Baldwinville Road<br>Templeton, MA 01468<br>(978) 939-8666<br>bszocik@templetonma.gov |
| Town of Templeton: Town Administrator<br>Attn: Adam Lamontagne<br>160 Patriots Road, P.O. Box 620<br>East Templeton, MA 01438<br>(978) 894-2755<br>alamontagne@templetonma.gov | Greater Gardner Chamber of Commerce<br>31 Lake Street, Suite 151<br>P.O. Box 1381<br>Gardner, MA 01440-6381<br>chamber@gardnerma.com |
| Gardner Clean Air<br>(978) 618-5755<br>rousseaua@verizon.net | Connecticut River Conservancy<br>Attn: Rebecca Todd, Executive Director<br>15 Bank Row<br>Greenfield, MA 01301<br>(413) 772-2020<br>crc@ctriver.org |

| ENF Commenters | |
|---|---|
| Bob Chicoine<br>300 Clark Street<br>Gardner, MA 01440<br>978-410–4044<br>bobchic1s@aim.com | David K Peabody<br>3 Jackson Park<br>Gardner, MA 01440<br>508-479-5278<br>david.peabody@verizon.net |
| Adam Lamontagne<br>160 Patriots Road<br>East Templeton, MA 01438<br>alamontage@templetonma.gov | Josh Forgues<br>104 Ryan Street<br>Gardner, MA 01440<br>Underpantgnome83@yahoo.com |
| Jeffrey W Lore<br>19 Watkins Road<br>Gardner, MA 01440<br>evangelistjefflore@hotmail.com | Cheryl Alvarez<br>Templeton, MA (No street address available)<br>No phone number available<br>cherylalvarez1979@gmail.com |
| Taylor Sala<br>Templeton, MA (No street address available)<br>No phone number available<br>taylor.sala2021@gmail.com | Kelsey Coates<br>Templeton, MA (No street address available)<br>No phone number available<br>kcoates978@gmail.com |
| David Antaya<br>444 Stone Street<br>Gardner, MA 01440<br>978-630-2811<br>dantaya@fitchburgstate.edu | David Legere<br>10 Turner Road<br>Baldwinville, MA<br>No phone number available<br>Legere3161@aol.com |
| Mike Wilczynski<br>No address available<br>Certified Professional Geologist<br>248-318-4732<br>Pangea52@yahoo.com | Jennifer M Albertine<br>Climate and Land Justice Specialist, Conservation and Stewardship Associate<br>Mount Grace Land Conservation Trust<br>No address or phone available<br>council@millersriver.net |
| Gardner Clean Air<br>Ala Rousseau<br>Sean Rousseau<br>211 Betty Spring Road<br>Gardner, MA 01440<br>No email or phone available | Mary E Marsh<br>150 Acadia Road<br>Gardner, MA 01440<br>508-619-9882<br>Mary.marsh@shutr.net |
| Theresa Griffis<br>12 Drury Lane<br>Templeton, MA 01468<br>978-939-7370<br>t.griffis@gmail.com | Thomas B Esposito<br>20 Becky Ave<br>Gardner, MA 01440<br>No phone available<br>tbrag_8@yahoo.com |

| ENF Commenters | |
|---|---|
| Kelsey Wentling<br>River Steward<br>Connecticut River Conservancy<br>413-772-2020 x216<br>kwentling@ctriver.org | Jo-Anne Burdin<br>299 Royalston Rd<br>Baldwinville, MA 01436<br>No phone available<br>jo0@verizon.net |
| Ivan Ussach<br>MRWC Director<br>No address available<br>413-773-3830<br>ivan@millersriver.net | Tim Gurczak<br>143 Vernon Street<br>Gardner, MA 01440<br>Timgurczak@gmail.com |
| Erin Kiewel<br>MA 01440 (No street address provided)<br>978-660-6170<br>Erin.kiewel@gmail.com | cortkiewel@gmail.com<br>(Only email provided) |
| Hugh Jardon<br>No phone or address available<br>Markmonahan4gardner@gmail.com<br>Note: email as provided is not valid. | Lealdon Langley<br>Director, MassDEP<br>No phone available<br>lealdon.langley@mass.gov |
| Paul DeMeo<br>9 Willis Road<br>Gardner, MA 01440<br>ryanrealty@comcast.net | Rice Flanders<br>Vice President, MRWC Board of Directors<br>No address or phone available<br>riceflanders@hotmail.com |
| Vicki Heidorn<br>12 Crystal Lake Dr<br>Gardner, MA 01440<br>978-895-6115<br>surroundingsgallery@gmail.com | |
| **Private Well Owners (approximate address)** | |
| 38 Turner Street, Baldwinville, MA 01436 | 184 Main Street, Baldwinville, MA 01436 |
| 137 Depot Road, Templeton, MA 01468 | 111 Depot Road, Templeton, MA 01468 |
| 217 Riverside Road, Gardner, MA 01440 | 20 Nyman Road, Templeton, MA 01440 |
| 23 Riverside Road, Templeton, MA 01440 | 248 Gardner Road, Templeton, MA 01440 |
| 254 Gardner Road, Templeton, MA 01440 | 146 Princeton Street, Gardner, MA 01440 |
| 115 Princeton Street, Gardner, MA 01440 | 84 Keyes Road, Gardner, MA 01440 |
| 36 Watkins Street, Gardner, MA 01440 | 27 Suomi Road, Gardner, MA 01440 |
| 370 Clark Street, Gardner, MA 01440 | 929 West Street, Gardner, MA 01440 |
| 14 Sand Road, Baldwinville, MA 01436 | |

# 13. LIST OF PREPARERS

This document was prepared for the City of Gardner, Massachusetts. Key individuals involved in the preparation of this Environmental Impact Report are indicated below.

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|---|---|
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| **Woodard & Curran, Inc.** | |
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| Kim Clyma, JD | Technical Review Lead, Environmental Review |
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| Paul Porada, PE | Engineering Lead |
| Katie Evans | Senior Communications Strategist, Public Involvement Plan |
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| Reid Heaton | Project Scientist, Groundwater |
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| | |
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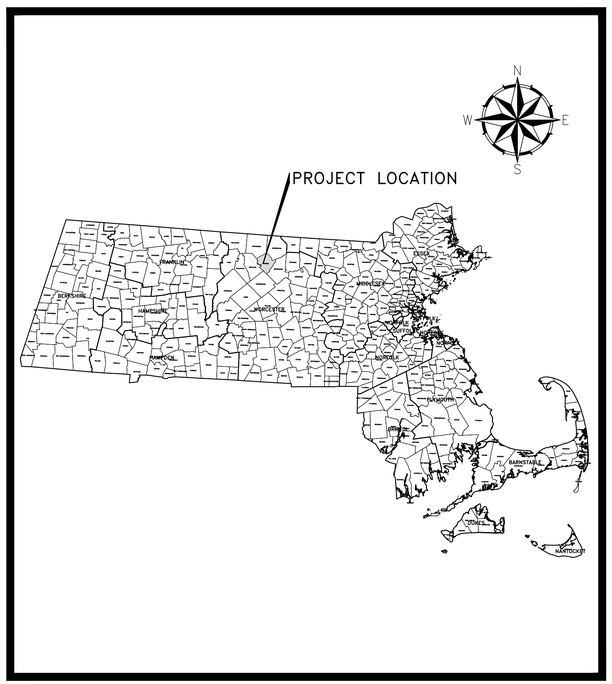
| Kelly Dodd | Project Delivery Specialist |
| Evan Marchant | Project Delivery Specialist |

# APPENDIX A: PROJECT DRAWINGS

# CITY OF GARDNER, MASSACHUSETTS
# DEPARTMENT OF PUBLIC WORKS

# GARDNER SLUDGE LANDFILL EXPANSION

**PROJECT NO. 0231568.02**




**PROJECT LOCATION MAP**

# JANUARY 2022

## ISSUED FOR PERMITTING

COMMONWEALTH OF MASSACHUSETTS
PAUL J. PORADA
CIVIL
No. 55489
REGISTERED PROFESSIONAL ENGINEER

WOODARD & CURRAN

40 Shattuck Road, Suite 110
Andover, Massachusetts 01810
866.702.6371 | www.woodardcurran.com

COMMITMENT & INTEGRITY DRIVE RESULTS




SOURCE: USGS TOPOGRAPHIC MAP

**SITE LOCATION MAP**

# LEGEND

## EXISTING

| | |
|---|---|
| | INTERVAL CONTOUR (2' INTERVAL) |
| 1020 | INDEX CONTOUR (10' INTERVAL) |
| | LANDFILL GWPS LIMIT |
| | TREELINE |
| | FENCE |
| | PROPERTY LINE |
| | INTERNAL PROPERTY LINE |
| | WETLAND BUFFER |
| | VERNAL POOL NO-DISTURB BUFFER |
| D | DRAINAGE PIPE |
| | GRAVEL ROAD |
| | LEACHATE COLLECTION AND REMOVAL (LCR) PIPE |
| | LIMIT OF WORK |
| E | UNDERGROUND ELECTRIC |
| S | SEWER LINE |
| | FORCEMAIN LINE |
| D | DRAINAGE CULVERT |
| | DRAINAGE SWALE FLOW LINE |
| SL-3 | MONITORING WELL (INSTALLED BY OTHERS) |
| CDR-1 | MONITORING WELL (INSTALLED BY CDR MAGUIRE) |
| | HORIZONTAL SURVEY CONTROL STATION |
| | LCR CLEANOUT |
| 998.8 | SPOT ELEVATION |
| | BUILDING |
| | DETAIL LABEL "5" INDICATES DETAIL NUMBER |
| | "8" INDICATES SHEET WHERE DETAIL CAN BE FOUND |
| | GAS VENT |
| a1 | WETLAND BOUNDARY FLAG |
| | CATCH BASIN |
| | OUTLET CONTROL STRUCTURE |
| SMH-06 | LEACHATE TRANSPORT MANHOLE |
| | FLARED END SECTION |
| | WETLANDS |
| | CLEAR AND GRUB AREA |
| | PROPOSED GRAVEL ACCESS ROAD |
| | EXISTING GRAVEL ACCESS ROAD |
| | RIPRAP |

## PROPOSED

| | |
|---|---|
| | INTERVAL CONTOUR (2' INTERVAL) |
| 1040 | INDEX CONTOUR (10' INTERVAL) |
| | LANDFILL GWPS LIMIT |
| | TREELINE |
| | FENCE |
| | PROPERTY LINE |
| | INTERNAL PROPERTY LINE |
| | WETLAND BUFFER |
| | VERNAL POOL NO-DISTURB BUFFER |
| SD | DRAINAGE PIPE |
| | GRAVEL ROAD |
| LCR | LEACHATE COLLECTION AND REMOVAL (LCR) PIPE |
| LW | LIMIT OF WORK |
| E | UNDERGROUND ELECTRIC |
| | SEWER LINE |
| FM | FORCEMAIN LINE |
| | DRAINAGE CULVERT |
| | DRAINAGE SWALE FLOW LINE |
| | MONITORING WELL (INSTALLED BY OTHERS) |
| | MONITORING WELL (INSTALLED BY CDR MAGUIRE) |
| | HORIZONTAL SURVEY CONTROL STATION |
| CO-01 | LCR CLEANOUT |
| 981.0 | SPOT ELEVATION |
| | BUILDING |
| 5 / 8 | DETAIL LABEL "5" INDICATES DETAIL NUMBER |
| | "8" INDICATES SHEET WHERE DETAIL CAN BE FOUND |
| | GAS VENT |
| | WETLAND BOUNDARY FLAG |
| | CATCH BASIN |
| | OUTLET CONTROL STRUCTURE |
| LMH-01 | LEACHATE TRANSPORT MANHOLE |
| | FLARED END SECTION |
| | WETLANDS |
| | CLEAR AND GRUB AREA |
| | PROPOSED GRAVEL ACCESS ROAD |
| | EXISTING GRAVEL ACCESS ROAD |
| | RIPRAP |

## GENERAL NOTES

1. CONTRACTOR IS REQUIRED TO PERFORM ALL WORK AND SHALL PROVIDE EROSION AND SEDIMENT CONTROL MEASURES IN ACCORDANCE WITH MASSACHUSETTS STORMWATER HANDBOOK AND STANDARDS VOLUME 2 CHARTER 2, STRUCTURAL BMP SPECIFICATIONS FOR THE MASSACHUSETTS STORMWATER HANDBOOK AND THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL PERMIT FOR DISCHARGES FROM CONSTRUCTION ACTIVITIES (CGP) AND RELATED STORMWATER POLLUTION AND PREVENTION PLAN (SWPPP).
2. ALL WORK SHALL BE CONDUCTED IN ACCORDANCE WITH THE TECHNICAL CIVIL SPECIFICATIONS WHICH, ALONG WITH THESE DRAWINGS, COMPRISE THE CONTRACT DOCUMENTS.
3. THE CONTRACTOR SHALL PRESERVE AND PROTECT EXISTING STRUCTURES TO REMAIN, EXISTING UTILITIES, AND NEW SITE IMPROVEMENTS DURING THE COURSE OF THE WORK.
4. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR IMPACTS AND DAMAGE TO EXISTING SITE FEATURES DUE TO THEIR WORK, AND FOR CORRECTIVE ACTION OR REPAIRS NEEDED TO RESTORE THE FEATURES TO THEIR ORIGINAL CONDITION AT NO ADDITIONAL COST TO THE OWNER.
5. THE CONTRACTOR SHALL MANAGE AND LEGALLY DISPOSE OFF-SITE ALL EXCESS EXCAVATED MATERIALS, INCLUDING, BUT NOT LIMITED TO, SOIL, ROCK, BOULDERS, WATER, DEMOLITION WASTE, AND DEBRIS THAT CANNOT BE REUSED ON-SITE.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING ALL LINES, GRADES AND OTHER SURVEY CONTROLS TO COMPLETE THE WORK AS SHOWN ON THE DRAWINGS.
7. THE ENTIRE SITE SHALL BE DEVELOPED AND/OR MAINTAINED AS DEPICTED ON THE SITE PLAN. APPROVAL OF THE OWNER SHALL BE REQUIRED FOR ANY ALTERATION TO OR DEVIATION FROM THE APPROVED SITE PLAN, INCLUDING.
8. THE CONTRACTOR SHALL CALL "DIG SAFE" AT 811 AT LEAST 72 HOURS PRIOR TO EXCAVATION IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL SAFETY CODES.
9. PROPERLY PROTECT AND DO NOT DISTURB PROPERTY IRONS AND MONUMENTS. IF DISTURBED, THE PROPERTY MONUMENT SHALL BE RESET AT THE CONTRACTOR'S EXPENSE BY A LICENSED LAND SURVEYOR ACCEPTABLE TO THE CITY. PROPERTY MONUMENTS SHALL BE RESET IN ACCORDANCE CITY OF GARDNER STANDARDS.
10. DO NOT PARK, IMPEDE ACCESS TO, OR STORE EQUIPMENT ON ADJACENT CITY OR PRIVATELY OWNED LOTS, UNLESS PERMISSION HAS BEEN GRANTED IN WRITING BY CITY AND/OR LAND OWNER. DO NOT IMPEDE ACCESS TO THE EXISTING CITY LANDFILL UNDER ANY CIRCUMSTANCE.
11. CONTRACTOR IS RESPONSIBLE FOR ALL SNOW REMOVAL AND WINTER MAINTENANCE OF ACCESS PATHS WITHIN THE LIMIT OF WORK.
12. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL RELOCATIONS THAT CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE SITE DRAWINGS, INCLUDING BUT NOT LIMITED TO ALL UTILITIES, STORM INFRASTRUCTURE, SIGNS, UTILITY POLES, FENCES, ETC. AS REQUIRED. ALL COSTS SHALL BE INCURRED BY THE CONTRACTOR.
13. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL SAFETY CODES, REGULATIONS, LEGAL REQUIREMENTS, PERMIT CONDITIONS, ETC. SAFETY IS THE RESPONSIBILITY OF THE CONTRACTOR. PERFORM ALL WORK IN ACCORDANCE WITH SAFETY STANDARDS OF APPLICABLE LAWS, BUILDING AND CONSTRUCTION CODES, THE "MANUAL OF ACCIDENT PREVENTION IN CONSTRUCTION" PUBLISHED BY THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA, THE REQUIREMENTS OF THE OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA) OF 1970, AND THE REQUIREMENTS OF TITLE 9 OF THE CODE OF FEDERAL REGULATIONS, PART 1926, "SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION".
14. THE CONTRACTOR SHALL TAKE ADEQUATE PRECAUTIONS TO PROTECT ALL WALKWAYS, STREETS, PAVEMENTS, CURBING, TREES, PLANTINGS, LAWN, FENCING TO REMAIN ON OR OFF THE PREMISES, AND SHALL REPAIR AND REPLACE AT HIS/HER OWN EXPENSE, AS DIRECTED BY THE ENGINEER, ANY ITEMS DAMAGED AS A RESULT OF THE CONTRACTOR'S WORK.
15. THE CONTRACTOR SHALL PROVIDE ADEQUATE BRACING AND SHORING OF ALL EXCAVATIONS IN ACCORDANCE WITH THE REQUIREMENTS OF ALL GOVERNING CODES AND REGULATIONS.
16. RESTORE ALL AREAS DISTURBED BY CONTRACTOR'S OPERATIONS TO ORIGINAL FINISH (GRAVEL, PAVEMENT, RIPRAP, GRASS, ETC.) UNLESS OTHERWISE NOTED ON PLANS. RESTORATION OF ALL AREAS DAMAGED BY CONTRACTOR SHALL BE INCIDENTAL TO THE PROJECT.
17. ALL MATERIAL SHALL BE FURNISHED BY CONTRACTOR UNLESS OTHERWISE NOTED.
18. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFICATION OF ALL DIMENSIONS PRIOR TO START OF CONSTRUCTION.
19. RESTRICT ACCESS TO SITE THROUGH THE USE OF APPROPRIATE SIGNAGE, BARRIERS, FENCES, ETC. SITE SHALL BE LEFT WITH APPROPRIATE SAFETY MEASURES IN PLACE DURING NON-WORKING HOURS. NO TRENCH SHALL BE LEFT OPEN DURING NON-WORKING HOURS. SITE SAFETY IS THE RESPONSIBILITY OF CONTRACTOR, DURING BOTH WORKING AND NON-WORKING HOURS.
20. CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL NECESSARY CONSTRUCTION PERMITS. PERMIT APPLICATIONS SHALL BE SUBMITTED WITH ADEQUATE TIME SO AS NOT TO DELAY CONSTRUCTION.
21. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR IMPACTS AND DAMAGE TO THE EXISTING LANDFILL, INCLUDING THE LINER AND VENTILATION SYSTEM, AND FOR CORRECTIVE ACTIONS OR REPAIRS NEEDED TO RESTORE THE LANDFILL TO IT'S ORIGINAL CONDITION AT NO ADDITIONAL COST TO THE OWNER.
22. CONTRACTOR STAGING AND STORAGE SHALL OCCUR WITHIN THE LIMITS OF THE SITE BOUNDARY. AREAS OUTSIDE THIS LIMIT MAY BE UTILIZED IF PERMISSION IS GRANTED BY THE OWNER AND APPROPRIATE EROSION AND SEDIMENTATION CONTROLS ARE INSTALLED AS DIRECTED BY THE ENGINEER.
23. THE MAIN ENTRANCE GATE SHALL NOT BE USED BY CONSTRUCTION VEHICLES. CONTRACTOR SHALL USE AND MAINTAIN A SEPERATE CONSTRUCTION VEHICLE ACCESS TO THE SITE.
24. LINER GRADES SHOWN ON THE LANDFILL GRADING PLANS REPRESENT THE TOP OF THE PROTECTIVE SAND LAYER UNLESS OTHERWISE NOTED. FOR CLARITY, GRADING DOES NOT SHOW MOUNDS OVER LCR PIPES AND STORMWATER DIVERSION BERMS.
25. VEHICLE TRAFFIC IS RESTRICTED WITHIN THE LANDFILL CELL LIMITS TO ENSURE PROTECTION OF THE LINER SYSTEM GEOSYNTHETICS. NO VEHICLE SHALL PASS OVER THE LINER SYSTEM WITH LESS THAN 1 FOOT DEPTH OF SOIL/STONE OVER ANY GEOSYNTHETICS (GEOMEMBRANE, GEOTEXTILE, GCL, DRAINAGE GEOCOMPOSITE). TRACKED VEHICLES MAY PASS OVER GEOSYNTHETICS WITH A MINIMUM OF 1 FOOT OF COVERAGE DEPTH. WHEELED VEHICLES REQUIRE A MINIMUM OF 3 FEET COVERAGE DEPTH.

## EROSION CONTROL NOTES:

1. THIS PROJECT EXCEEDS ONE (1) ACRE OF DISTURBANCE AND THUS REQUIRES A NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) CONSTRUCTION GENERAL PERMIT (GCP) STORM WATER POLLUTION PREVENTION PLAN (SWPPP). THE NPDES CGP SWPPP SHALL BE PREPARED BY THE CONTRACTOR. THE CONTRACTOR SHALL BE FAMILIAR WITH THE NDPES CGP SWPPP AND KEEP AN UPDATED COPY OF THE NPDES CGP SWPPP ONSITE AT ALL TIMES.
2. THE FOLLOWING REPRESENTS THE GENERAL OBSERVATION AND REPORTING PRACTICES THAT SHALL BE FOLLOWED AS PART OF THIS PROJECT
   2.1. OBSERVATIONS OF THE PROJECT FOR COMPLIANCE WITH THE NPDES CGP SWPPP SHALL BE MADE BY THE CONTRACTOR AT LEAST ONCE A WEEK OR WITHIN 24 HOURS OF A STORM 0.25 INCHES OR GREATER;
   2.2. AN OBSERVATION REPORT SHALL BE MADE AFTER EACH OBSERVATION AND DISTRIBUTED TO THE ENGINEER, THE OWNER, AND THE CONTRACTOR;
   2.3. A REPRESENTATIVE OF THE SITE CONTRACTOR, SHALL BE RESPONSIBLE FOR MAINTENANCE AND REPAIR ACTIVITIES;
   2.4. IF A REPAIR IS NECESSARY, IT SHALL BE INITIATED WITHIN 24 HOURS OF REPORT.
3. PROVIDE EROSION CONTROL MEASURES AS SHOWN ON DRAWINGS.
4. ALL SOIL AND EROSION CONTROLS SHALL BE PLACED PRIOR TO ANY CONSTRUCTION ACTIVITIES. CONTRACTOR TO NOTIFY THE ENGINEER AND THE OWNER AT LEAST 48 HOURS PRIOR TO ANY CONSTRUCTION ACTIVITIES.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING ALL EROSION CONTROL MEASURES NECESSARY TO PREVENT OFF-SITE TRACKING OF EARTH, SEDIMENT AND DEBRIS.
6. DUST SHALL BE CONTROLLED AS NECESSARY. ROADWAY SURFACES SHALL BE WETTED AND MECHANICALLY SWEPT AS NECESSARY TO CONTROL DUST ON AN ONGOING BASIS. THE USE OF CALCIUM CHLORIDE FOR DUST CONTROL IS NOT ALLOWED UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
7. NO DISTURBANCE OR STORAGE OF EQUIPMENT OR MATERIALS SHALL BE PERMITTED IN RESOURCE AREAS AND BUFFER ZONES.
8. WHEN THE STOCKPILES ARE NOT BEING ACTIVELY WORKED, SURROUND STOCKPILE BY SILTSOXX, AND AT ANY OTHER TIME IF DIRECTED BY ENGINEER.
9. IF STOCKPILE IS UNUSED FOR A MAXIMUM OF SEVEN (7) CALENDAR DAYS, COVER SUCH AS TARPS, BLOWN STRAW, AND/OR HYDROSEEDING WILL BE APPLIED TO THE STOCKPILE TO PROVIDE APPROPRIATE TEMPORARY STABILIZATION.
10. RESTORE ALL UNPACKED AREAS WITH 6" OF LOAM AND SEED. RE-SEED BARE AREAS AS NEEDED.
11. CONTRACTOR SHALL COORDINATE LOCATION OF CONCRETE WASHOUT WITH THE OWNER. THE CONTRACTOR IS RESPONSIBLE FOR PROPERLY MANAGING CONCRETE WASHOUT WASTEWATER IN ACCORDANCE WITH ALL APPLICABLE STATE/FEDERAL REGULATIONS.
12. EROSION CONTROL BLANKETS OR SIMILAR EROSION CONTROL MEASURES WILL BE INSTALLED OUTSIDE PERMANENT SEEDING TIME FRAMES.

## SURVEY NOTES

1. ELEVATION SHOWN HERE IN, IN U.S. SURVEY FEET, ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).
2. WASTE PLACEMENT WITHIN THE EXISTING LANDFILL HAS RESULTED IN CHANGES TO TOPOGRAPHY SINCE DATE OF THE SURVEY.
3. EXISTING TOPOGRAPHY BASED ON;
   - TOPOGRAPHY SHOWN WITHIN THE EXISTING LANDFILL LINER LIMITS ARE PROPOSED GRADES APPROVED BY PERMIT TRANSMITTAL #X260790, FEBRUARY 3, 2016.
   - PLANIMETRIC FEATURES, CONTOUR LINES, AND SPOT ELEVATIONS STEREO COMPILED AT A SCALE OF 1" = 40' BY COL-EAST, NORTH ADAMS, MA SUB CONSULTANTS TO THE OWNER/DEVELOPER, FROM BLACK AND WHITE PHOTOGRAHPY TAKEN APRIL 25, 1999 AT A SCALE OF 1" = 500' WITH ADDITIONAL FIELD SURVEY BY DIPRETE ENGINEERING IN AUGUST 2012, AND OCTOBER & NOVEMBER 2013.
4. WETLAND DELINEATION FLAGGING WAS PREPARED BY DIPRETE ENGINEERING FOR TATA & HOWARD, INC. AND IS BASED ON A PLAN TITLED "TOPOGRAPHIC SURVEY, GARDNER LANDFILL, WEST STREET, ROUTE 68, GARDNER, MA", REVISED 6/29/2021.
5. ALL PROPOSED ITEMS MUST BE LAID OUT BY A REGISTERED SURVEYOR AS NOTED. CONTRACTOR TO COORDINATE WITH SURVEYOR OF RECORD AND ENGINEER TO ESTABLISH CONTROL FOR PROPOSED CONDITIONS LINEWORK.

## SHEET LIST TABLE



## ABBREVIATIONS

| | | | | | |
|---|---|---|---|---|---|
| ANSI | AMERICAN NATIONAL STANDARDS INSTITUTE | LMH | LEACHATE MANHOLE | SMH | SEWER MANHOLE |
| APPROX; ± | APPROXIMATELY | LP | LOW POINT | SQ | SQUARE |
| | | LTP | LEACHATE TRANSPORT PIPE | SS | STAINLESS STEEL |
| CL | CENTERLINE | | | SY | SQUARE YARD |
| CO | CLEANOUT | MAX. | MAXIMUM | | |
| | | MIL | 0.001 INCHES | TBM | TEMPORARY BENCH MARK |
| DIA. | DIAMETER | MIN | MINIMUM | TOC | TOP OF CONCRETE |
| | | | | TYP | TYPICAL |
| E | EASTING | N | NORTHING | | |
| EL | ELEVATION | NE | NORTHEAST | UD | UNDERDRAIN (PERFORATED PIPE) |
| FT | FEET | N.T.S. | NOT TO SCALE | USGS | UNITED STATES GEOLOGIC SURVEY |
| | | OD | OUTSIDE DIAMETER | W/ | WITH |
| GAL. | GALLON | O.C. | ON CENTER | | |
| GCL | GEOSYNTHETIC CLAY LINER | OZ | OUNCES | | |
| GPH | GALLONS PER HOUR | | | | |
| GPM | GALLONS PER MINUTE | PERF | PERFORATED | | |
| GWPS | GROUNDWATER PROTECTION SYSTEM | PSF | POUNDS PER SQUARE FOOT | | |
| | | PSI | POUNDS PER SQUARE INCH | | |
| HDPE | HIGH DENSITY POLYETHYLENE | PVC | POLYVINYL CHLORIDE | | |
| HP | HORSEPOWER | PL | PROPERTY LINE | | |
| | | | | | |
| ID | INSIDE DIAMETER | R | RADIUS | | |
| IN. | INCHES | | | | |
| INT. | INTERSECTION | S | SLOPE | | |
| INV. | INVERT | SCH | SCHEDULE | | |
| | | SDR | STANDARD DIMENSION RATIO | | |
| LCR | LEACHATE COLLECTION & REMOVAL | SE | SOUTHEAST | | |
| LF | LINEAR FEET | SHT | SHEET | | |

ISSUED FOR PERMITTING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COMMITMENT & INTEGRITY DRIVE RESULTS



COMMONWEALTH OF MASSACHUSETTS — PAUL J. PORADA — CIVIL — No. 35469 — REGISTERED PROFESSIONAL ENGINEER

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| DESIGNED BY: | BMLT | |
| DRAWN BY: | CBL/JCBM | |
| CHECKED BY: | JG | |
| 231568G-G01.dwg | | |

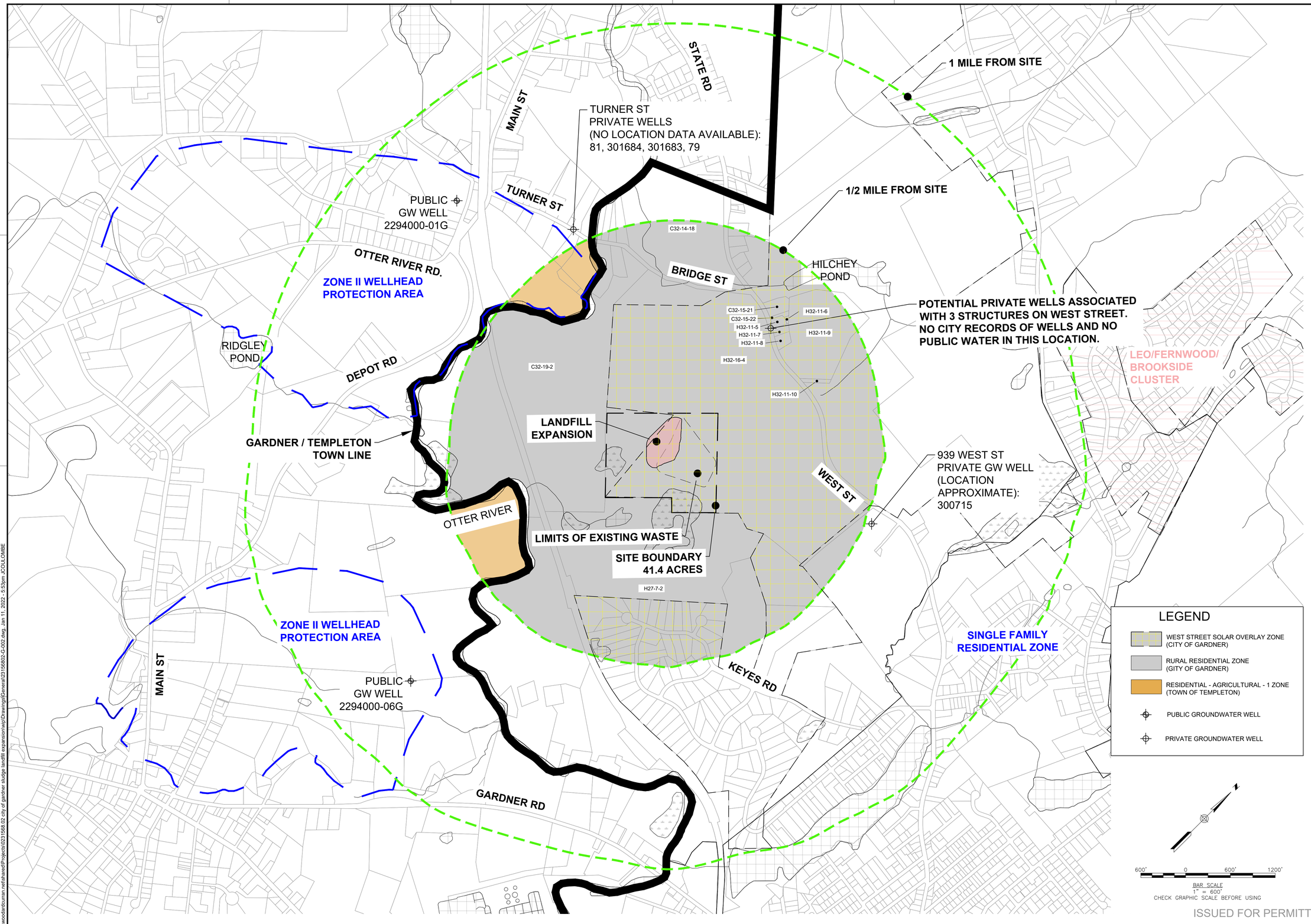
# GENERAL NOTES, ABBREVIATIONS, LEGEND AND DRAWING INDEX LIST

CITY OF GARDNER MASSACHUSETTS

GARDNER SLUDGE LANDFILL EXPANSION

| | |
|---|---|
| JOB NO: | 0231568.02 |
| DATE: | JANUARY 2022 |
| SCALE: | AS NOTED |
| SHEET: | 2 OF 19 |

G-001

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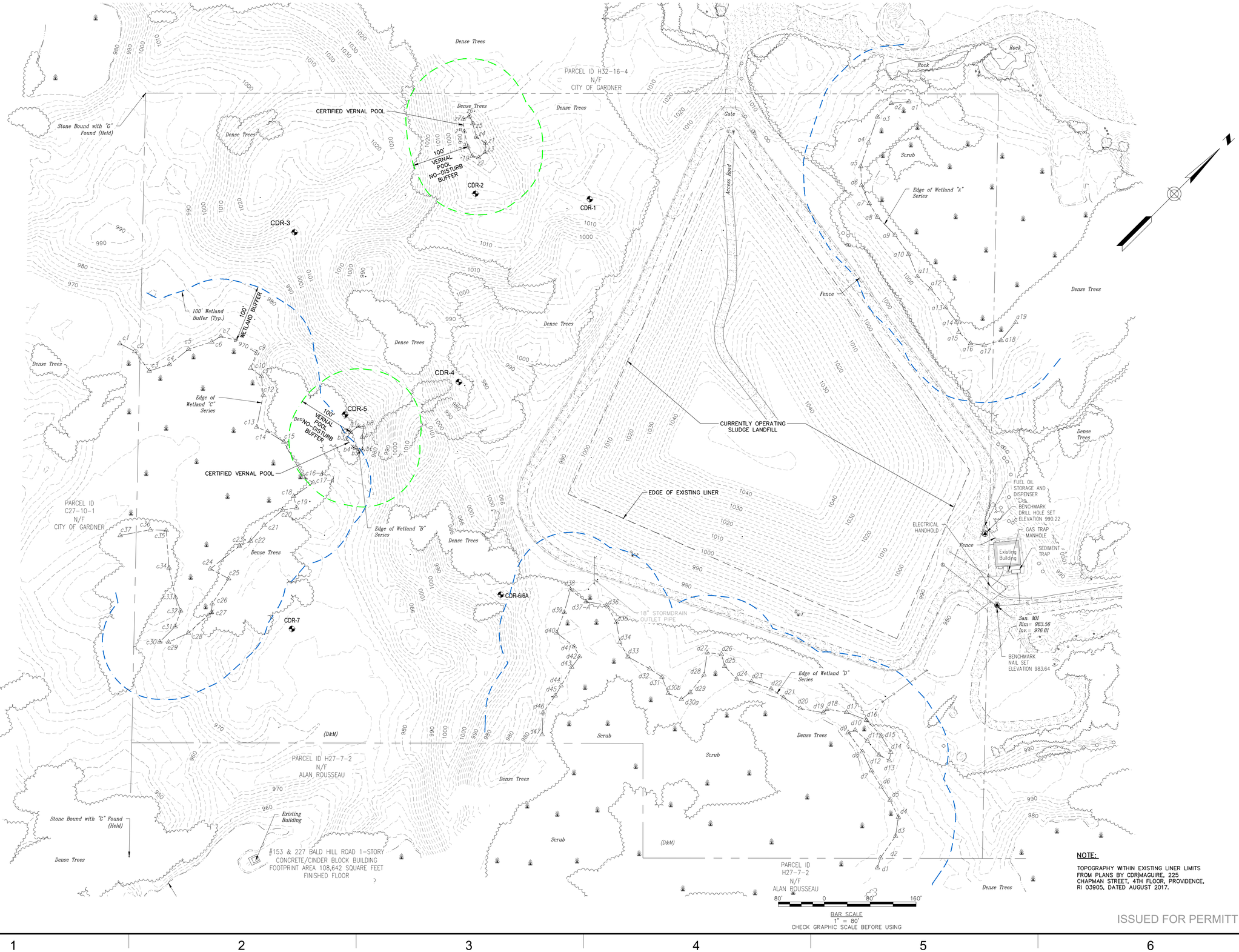
VICINITY MAP - ONE MILE RADIUS

CITY OF GARDNER MASSACHUSETTS

GARDNER SLUDGE
LANDFILL EXPANSION

| | |
|---|---|
| JOB NO: | 0231568.02 |
| DATE: | JANUARY 2022 |
| SCALE: | AS NOTED |
| SHEET: | 3 OF 19 |

G-002




NOTE:

TOPOGRAPHY WITHIN EXISTING LINER LIMITS FROM PLANS BY CDRMAGUIRE, 225 CHAPMAN STREET, 4TH FLOOR, PROVIDENCE, RI 03905, DATED AUGUST 2017.

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CIVIL
No. 35469
REGISTERED PROFESSIONAL ENGINEER

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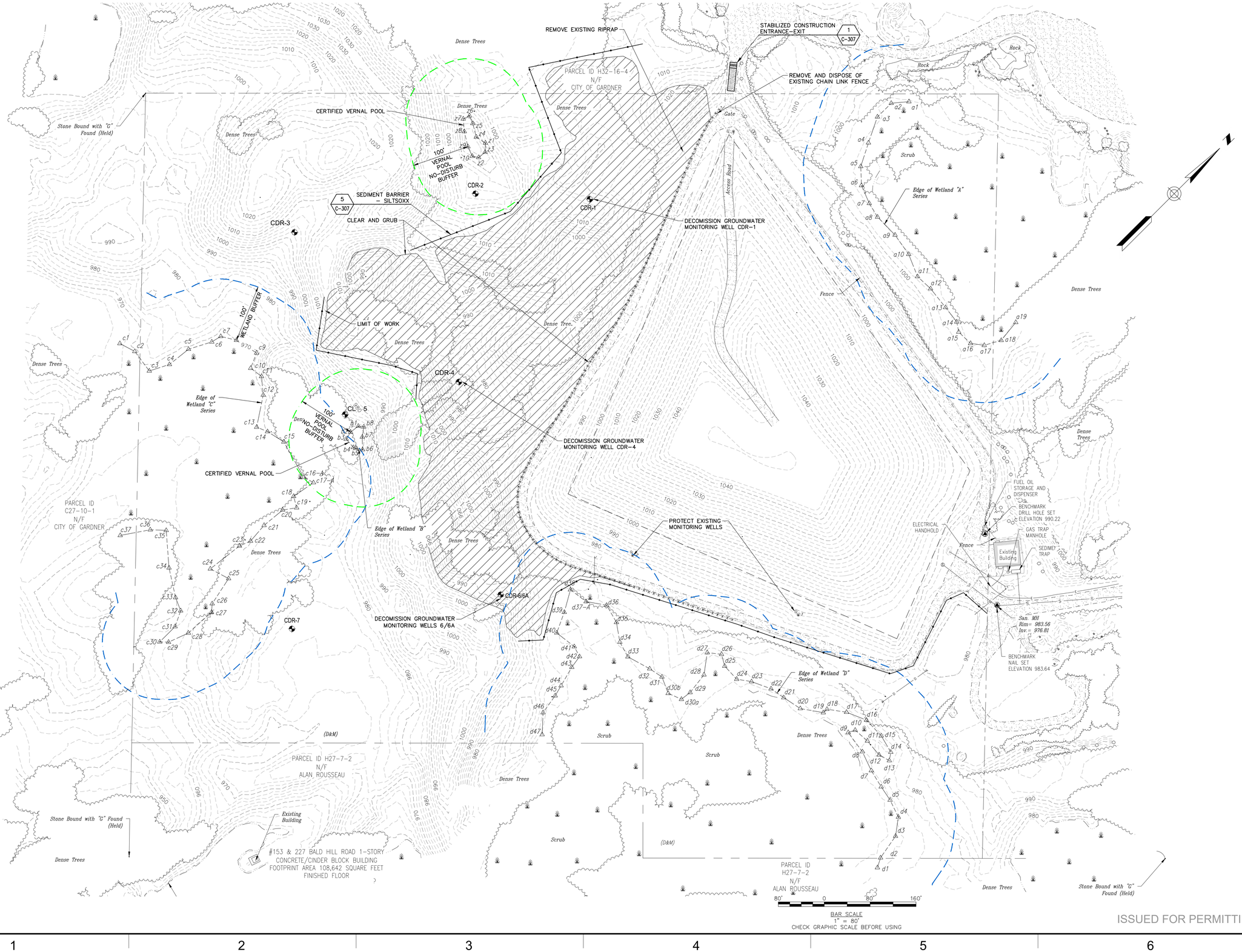
# EXISTING CONDITIONS

CITY OF GARDNER MASSACHUSETTS

GARDNER SLUDGE LANDFILL EXPANSION

| | |
|---|---|
| JOB NO: | 0231568.02 |
| DATE: | JANUARY 2022 |
| SCALE: | AS NOTED |
| SHEET: | 4 OF 19 |

C-001

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CIVIL
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REGISTERED PROFESSIONAL ENGINEER

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| CHECKED BY: | JG | |
| 23156802-C-100.dwg | | |

# SITE PREPARATION PLAN

CITY OF GARDNER MASSACHUSETTS

GARDNER SLUDGE LANDFILL EXPANSION

| | |
|---|---|
| JOB NO: | 0231568.02 |
| DATE: | JANUARY 2022 |
| SCALE: | AS NOTED |
| SHEET: | 5 OF 19 |

C-100

BIORETENTION POND #1 (BP-1)
100-YEAR STORM EL: 1001.85
BOT. EL: 1001.00
TOP EL: 1006.00
INV. IN (CB-1): 1001.15

6" PERF. HDPE UD
@ 0.0% SLOPE
INV: 998.35

EMERGENCY OVERFLOW SPILLWAY
CREST EL: 1005.50
SEE DETAIL ON C-309

INV. OUT 997.50

6" HDPE

12" HDPE

(CB-1) W/DOME GRATE
RIM: 1004.35
INV. OUT:1001.75 (BP-1)

OUTLET CONTROL STRUCTURE #1
RIM: 1005.00
INV. OUT: 998.35
SEE DETAIL ON C-308

HP 1008.65

CERTIFIED VERNAL POOL

100' VERNAL POOL NO-DISTURB BUFFER

(DMH-1)
RIM: 1000.84
INV. IN (LCR-1): 991.20
INV. OUT (CB-2): 991.10

GRASS LINED SWALE W/CHECK DAMS EVERY 100' (TYP.)

12' WIDE ACCESS ROAD

2:1 SLOPE

INFILTRATION BASIN #1 (IB-1)
100-YEAR STORM EL: 994.00
BOTTOM EL: 986.50
TOP EL: 998.00
INV. IN (CB-2): 990.00
INV. IN (LCR-3): 986.80

GRADE TO MEET EXISTING ACCESS ROAD

EMERGENCY OVERFLOW SPILLWAY
CREST EL: 997.50
SEE DETAIL ON C-309

2:1 SLOPE

12" HDPE

LP 998.08

12" HDPE

(CB-2) W/DOME GRATE
RIM: 998.08
INV. IN (DMH-1): 990.45
INV. OUT (IB-1): 990.25

24" HDPE

100' WETLAND BUFFER

100' Wetland Buffer (Typ.)

INV OUT: 985.75

OUTLET CONTROL STRUCTURE #2
RIM: 995.00
INV. OUT: 986.50
SEE DETAIL ON C-309

100' VERNAL POOL NO-DISTURB BUFFER

CERTIFIED VERNAL POOL

2:1 SLOPE

HP 1010.20

SEE SHEET C-304 FOR GRADING AT SUMP

PUMP STATION

FM

AR-01

GATE FOR POND ACCESS (TYP. OF 3)

INFILTRATION BASIN #2
100-YEAR STORM EL: 984.50
BOTTOM EL: 980.00
TOP EL: 994.00
INV. IN (CB-3): 982.25

12" HDPE

OUTLET CONTROL STRUCTURE #3
RIM: 986.00
INV. OUT: 980.00
SEE DETAIL ON C-309

EMERGENCY OVERFLOW SPILLWAY
CREST EL: 993.50
SEE DETAIL ON C-309

HP 981.0

(CB-3) W/DOME GRATE
RIM: 985.75
INV OUT (IB-2): 983.75

INV. OUT: 979.50

6" HDPE

LMH-02

EXIST. SMH-06

CONNECT TO EXISTING ACCESS ROAD

Dense Trees
Rock
Scrub
Gate
Access Road
Edge of Wetland "A" Series
Fence
Edge of Wetland "C" Series
Edge of Wetland "B" Series
Edge of Wetland "D" Series
ELECTRICAL HANDHOLD
Existing Building
FUEL OIL STORAGE AND DISPENSER
GAS TRAP MANHOLE
BENCHMARK DRILL HOLE SET ELEVATION 990.22
BENCHMARK NAIL SET ELEVATION 983.64
San. MH Rim= 983.56 Inv.= 976.81

BAR SCALE
1" = 60'
CHECK GRAPHIC SCALE BEFORE USING

ISSUED FOR PERMITTING

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PAUL J. PORADA
CIVIL
No. 35469
REGISTERED PROFESSIONAL ENGINEER

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# LANDFILL SUB-BASE GRADING PLAN

CITY OF GARDNER MASSACHUSETTS

GARDNER SLUDGE LANDFILL EXPANSION

| | |
|---|---|
| JOB NO: | 0231568.02 |
| DATE: | JANUARY 2022 |
| SCALE: | AS NOTED |
| SHEET: | 6 OF 19 |

C-101

22x34 SHEET
1:1

# LANDFILL BASE GRADING PLAN

BAR SCALE
1" = 60'
CHECK GRAPHIC SCALE BEFORE USING

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| | DRAWN BY: CBL/JCBM | 23156802-C-102.dwg |

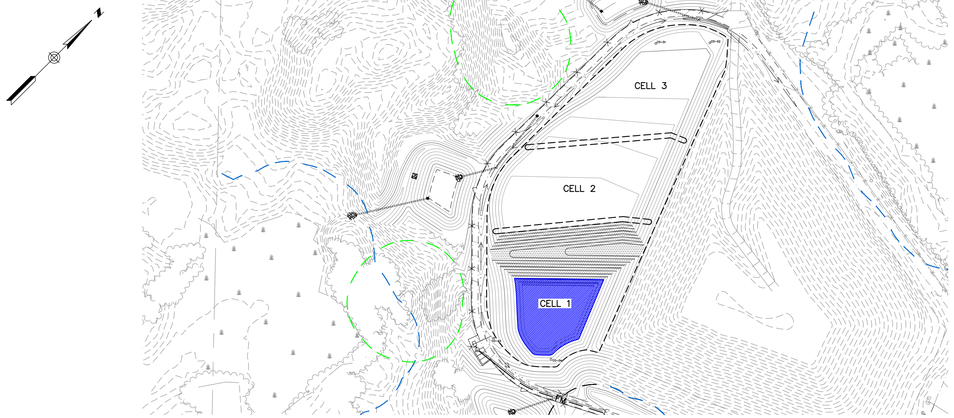
CITY OF GARDNER MASSACHUSETTS

GARDNER SLUDGE LANDFILL EXPANSION

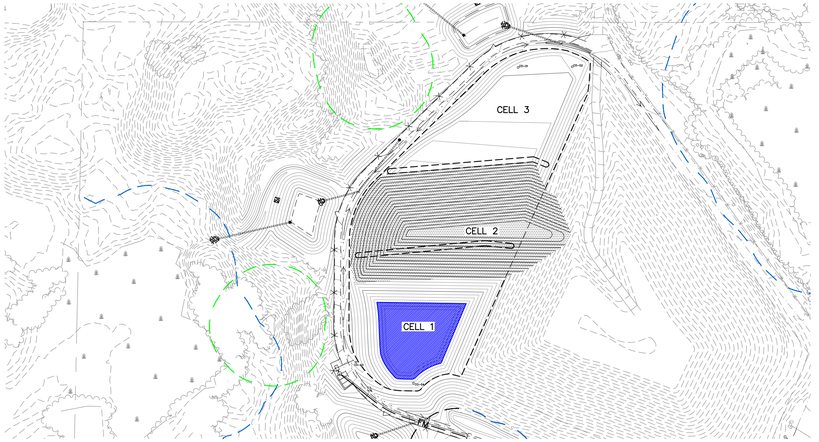
| | |
|---|---|
| JOB NO: | 0231568.02 |
| DATE: | JANUARY 2022 |
| SCALE: | AS NOTED |
| SHEET: | 7 OF 19 |

C-102

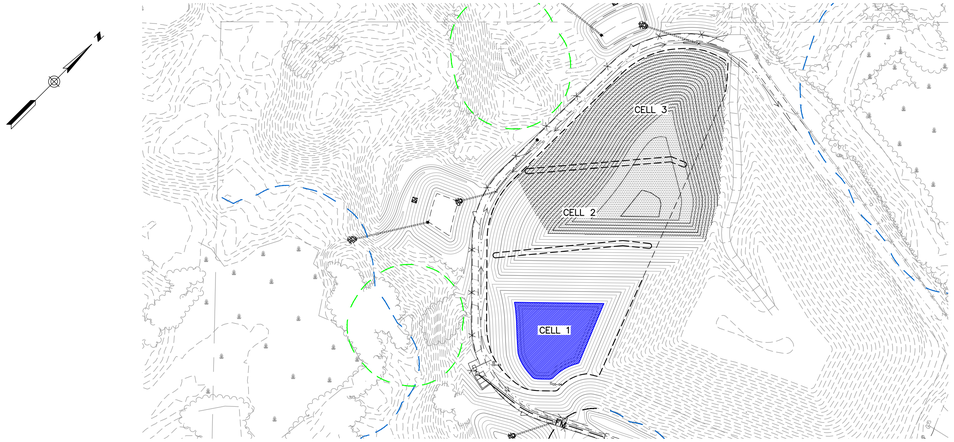
\\woodardcurran.net\shared\Projects\0231568.02 city of gardner sludge landfill expansion\wip\Drawings\Civil\23156802-C-102.dwg, Jan 11, 2022 - 5:55pm, JCOULOMBE



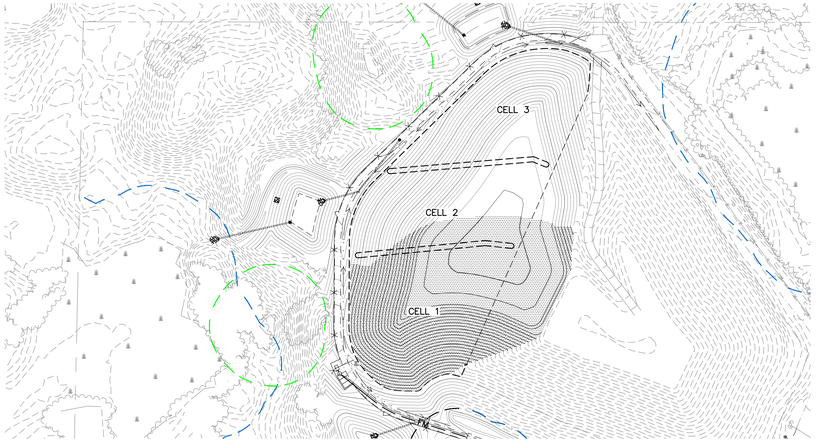

CELL 1




CELL 2




CELL 3




FULL BUILDOUT WASTE GRADES

**NOTES:**

1. LANDFILL OPERATOR TO MAINTAIN ACCESS TO WORKING FACE AND TOP OF LANDFILL, AS NECESSARY.

150' 0 150' 300'

BAR SCALE
1" = 150'
CHECK GRAPHIC SCALE BEFORE USING

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| | CHECKED BY: JG | |
| | 231568Z2-C-103.dwg | |

# OPERATIONAL SEQUENCE PLAN

CITY OF GARDNER MASSACHUSETTS

GARDNER SLUDGE LANDFILL EXPANSION

| | |
|---|---|
| JOB NO: | 0231568.02 |
| DATE: | JANUARY 2022 |
| SCALE: | AS NOTED |
| SHEET: | 8 OF 19 |

C-103

22x34 SHEET
1:1

INFILTRATION POND 1
INFILTRATION POND 2
INFILTRATION POND 3
CERTIFIED VERNAL POOL
100' VERNAL POOL NO-DISTURB BUFFER
100' WETLAND BUFFER
12' WIDE ACCESS ROAD
PERIMETER SWALE
CONNECT TO EXISTING ACCESS ROAD
CONNECT TO EXISTING ACCESS ROAD
Edge of Wetland "A" Series
Edge of Wetland "B" Series
Edge of Wetland "C" Series
Edge of Wetland "D" Series
EXIST. SMH-06
FUEL OIL STORAGE AND DISPENSER
BENCHMARK DRILL HOLE SET ELEVATION 990.22
BENCHMARK NAIL SET ELEVATION 983.64
GAS TRAP MANHOLE
ELECTRICAL HANDHOLD
Existing Building
Dense Trees
Rock
Scrub
Fence
Gate
Access Road
CDR-2
CDR-3
CDR-5
CDR-7
Bound with "C" Found (field)
San. MH Rim= 983.56 Inv= 976.81
1" = 60'
BAR SCALE
CHECK GRAPHIC SCALE BEFORE USING
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REGISTERED PROFESSIONAL ENGINEER

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# LANDFILL CAP & FINAL GRADING PLAN

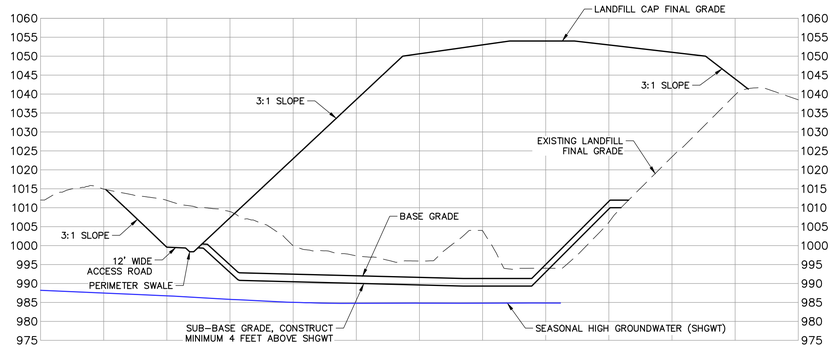
CITY OF GARDNER MASSACHUSETTS

GARDNER SLUDGE LANDFILL EXPANSION

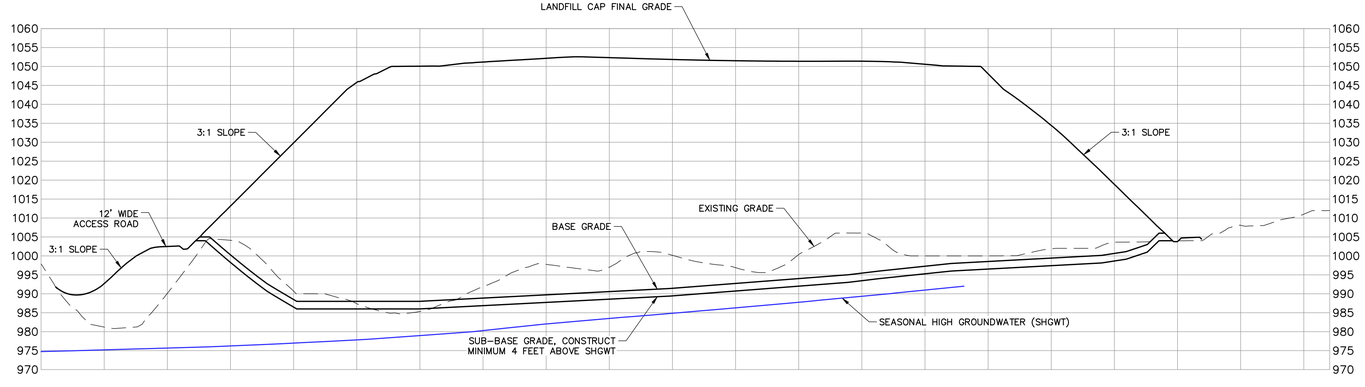
| | |
|---|---|
| JOB NO: | 0231568.02 |
| DATE: | JANUARY 2022 |
| SCALE: | AS NOTED |
| SHEET: | 9 OF 19 |

C-104

\\woodardcurran.net\shared\Projects\0231568.02 city of gardner sludge landfill expansion\wip\Drawings\Civil\2315680Z-C-104.dwg, Jan 11, 2022 - 5:56pm, JCOULOMBE




SECTION 1 / C-201
SCALE: 1" = 60' HORIZONTAL
SCALE: 1" = 20' VERTICAL




SECTION 2 / C-201
SCALE: 1" = 60' HORIZONTAL
SCALE: 1" = 20' VERTICAL

20' 0 20' 40'
VERTICAL BAR SCALE
1" = 20'
CHECK GRAPHIC SCALE BEFORE USING

60' 0 60' 120'
HORIZONTAL BAR SCALE
1" = 60'
CHECK GRAPHIC SCALE BEFORE USING

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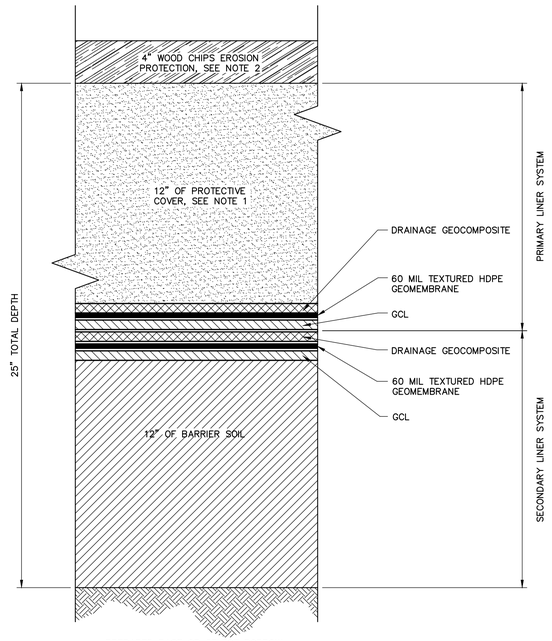
LANDFILL SECTIONS

CITY OF GARDNER MASSACHUSETTS

GARDNER SLUDGE LANDFILL EXPANSION

| | |
|---|---|
| JOB NO: | 0231568.02 |
| DATE: | JANUARY 2022 |
| SCALE: | AS NOTED |
| SHEET: | 10 OF 19 |

C-201

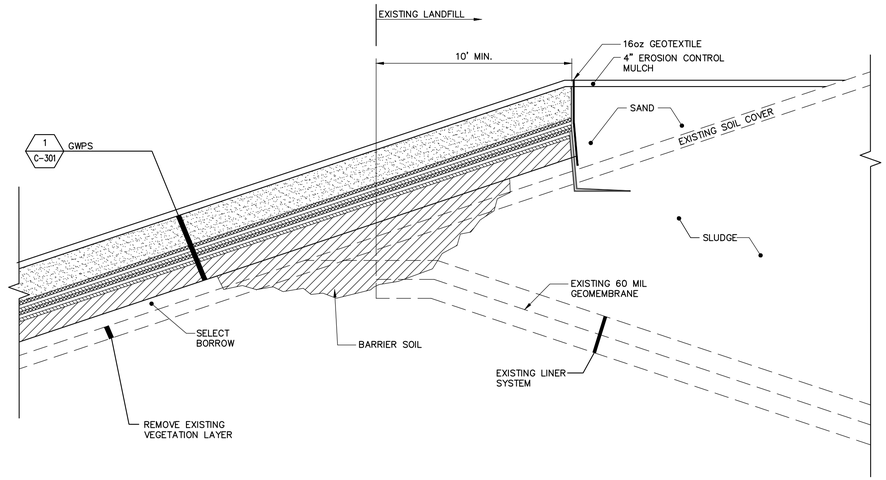



NOTES:

1. PROTECTIVE COVER SHALL BE DRAINAGE STONE WHERE SHOWN ON CELL 1 DETAIL.
2. DO NOT PLACE WOODCHIPS ON STONE OR IN CELL 1 POND AREA – SEE CELL 1 DETAIL.

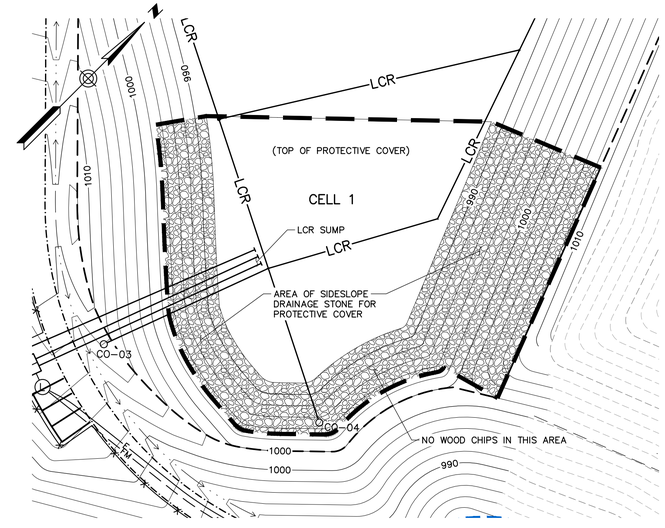
## 1 C-301 DOUBLE COMPOSITE GROUND WATER PROTECTION SYSTEM (GWPS)

SCALE: NOT TO SCALE



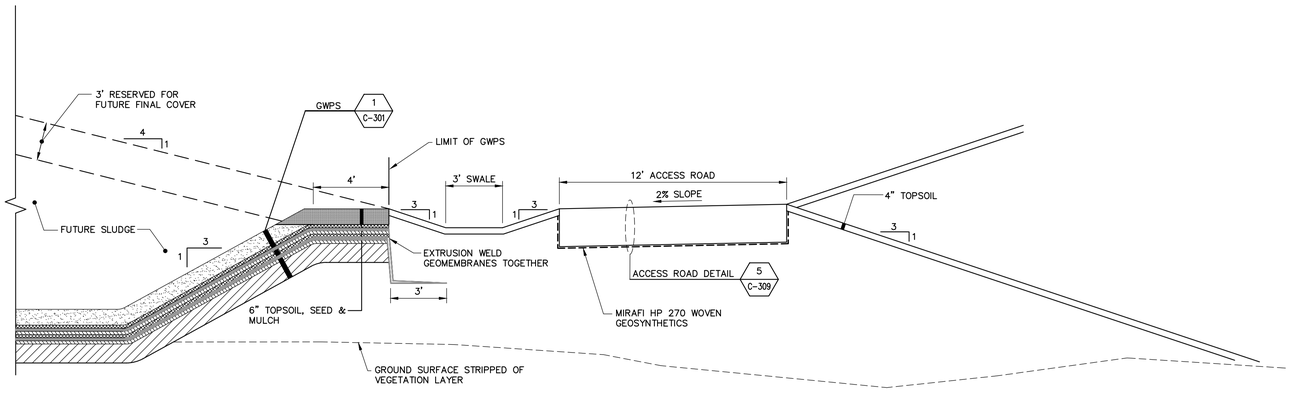

## 2 C-301 LINER ANCHORING AT EXISTING LANDFILL

SCALE: NOT TO SCALE



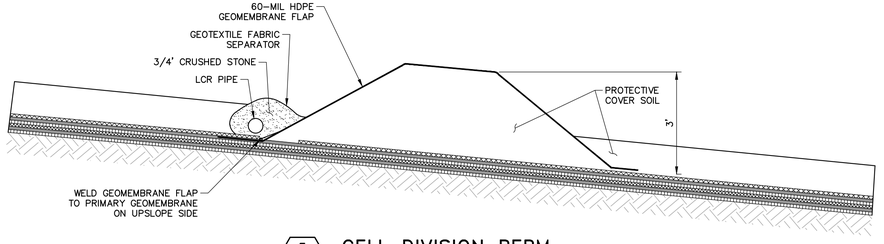

## 3 C-301 CELL ONE DETAIL

SCALE: 1" = 40'




## 4 C-301 EXTERIOR BERM WITH ANCHOR TRENCH

SCALE: NOT TO SCALE




## 5 C-301 CELL DIVISION BERM

SCALE: NOT TO SCALE

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| DRAWN BY: | CBU/CBM | 23156802-C-501-C-5XX.dwg |

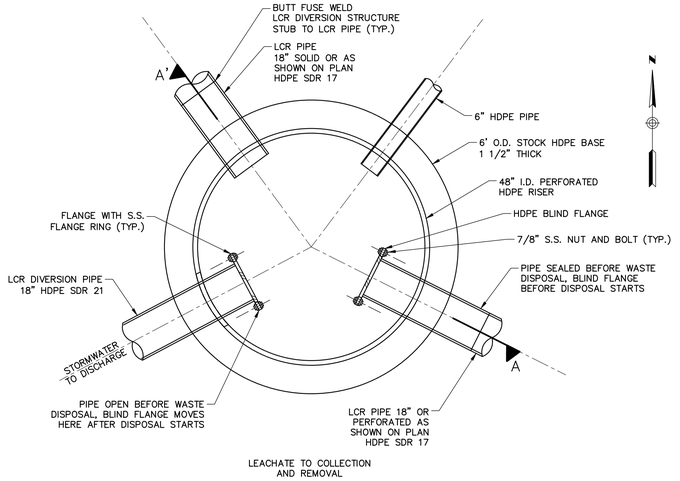
GWPS DETAILS - 1

CITY OF GARDNER MASSACHUSETTS

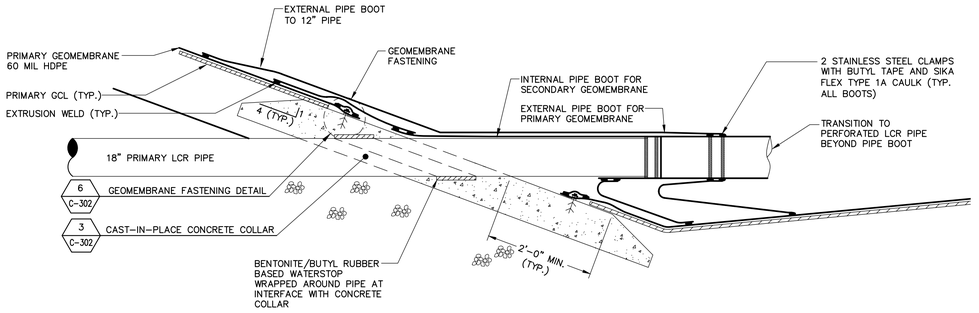
GARDNER SLUDGE LANDFILL EXPANSION

| | |
|---|---|
| JOB NO: | 0231568.02 |
| DATE: | JANUARY 2022 |
| SCALE: | AS NOTED |
| SHEET: | 11 OF 19 |

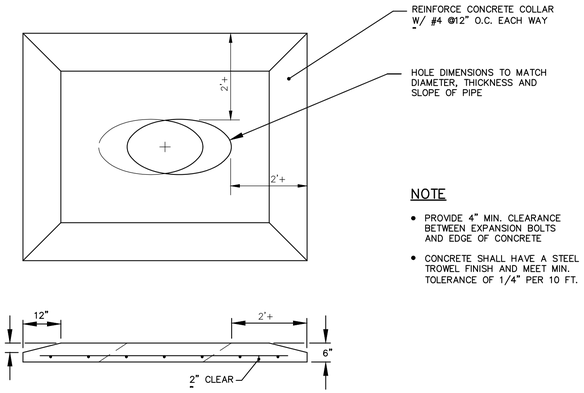
C-301




1 C-302 **PLAN – LCR3**
SCALE: NOT TO SCALE



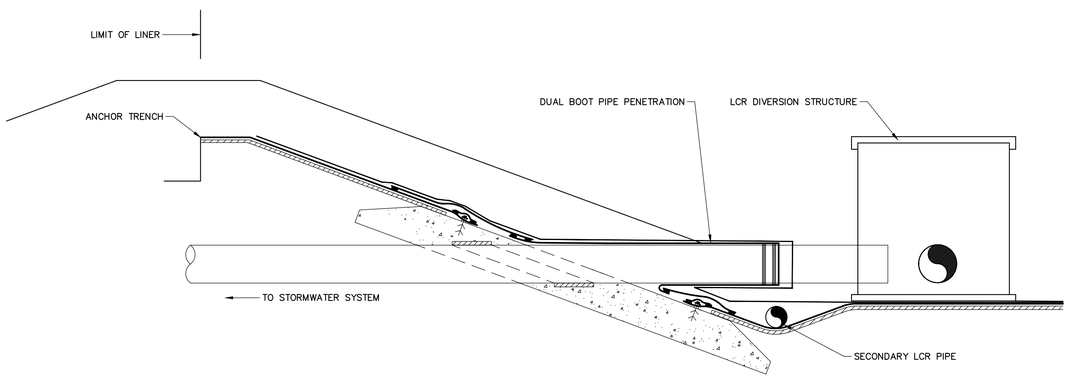

2 C-302 **PRIMARY LCR PIPE PENETRATION WITH DOUBLE BOOT DETAIL**
SCALE: NOT TO SCALE



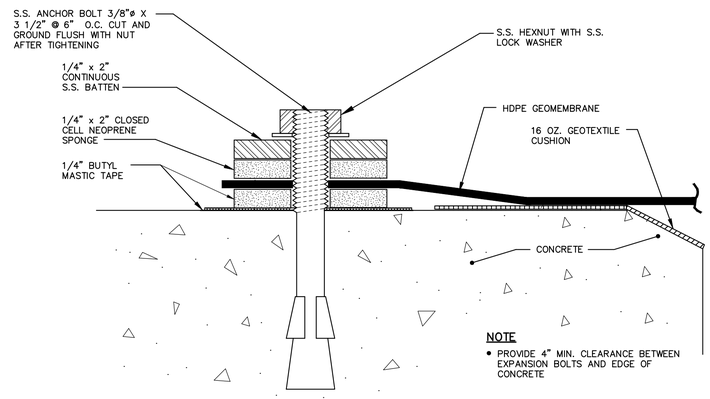

**NOTE**

- PROVIDE 4" MIN. CLEARANCE BETWEEN EXPANSION BOLTS AND EDGE OF CONCRETE
- CONCRETE SHALL HAVE A STEEL TROWEL FINISH AND MEET MIN. TOLERANCE OF 1/4" PER 10 FT.

3 C-302 **CAST-IN-PLACE CONCRETE COLLAR**
SCALE: NOT TO SCALE




5 C-302 **LCR DIVERSION STRUCTURE**
SCALE: NOT TO SCALE




**NOTE**

- PROVIDE 4" MIN. CLEARANCE BETWEEN EXPANSION BOLTS AND EDGE OF CONCRETE

6 C-302 **GEOMEMBRANE FASTENING DETAIL**
SCALE: NOT TO SCALE

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| REV. | DESCRIPTION | DATE |
|---|---|---|
| DESIGNED BY: | BMLT | CHECKED BY: JG |
| DRAWN BY: | CBL/JCBM | 2315802-C-501-C-SXX.dwg |

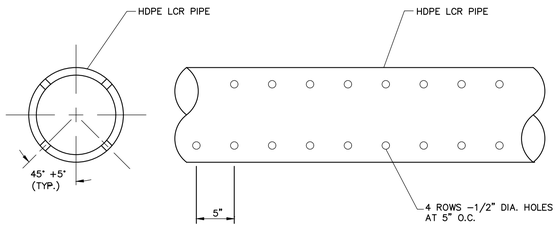
GWPS DETAILS - 2

CITY OF GARDNER MASSACHUSETTS

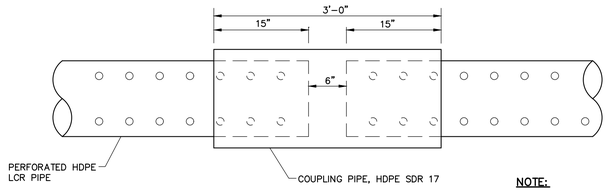
GARDNER SLUDGE
LANDFILL EXPANSION

| | |
|---|---|
| JOB NO: | 0231568.02 |
| DATE: | JANUARY 2022 |
| SCALE: | AS NOTED |
| SHEET: | 12 OF 19 |

C-302

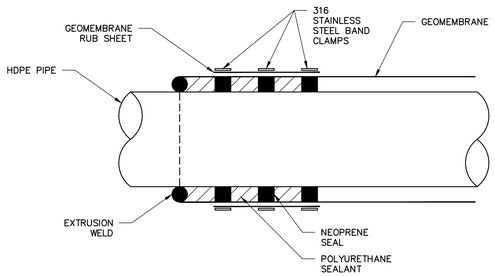



1 C-303 **PERFORATED LCR PIPE DETAIL**
SCALE: NOT TO SCALE

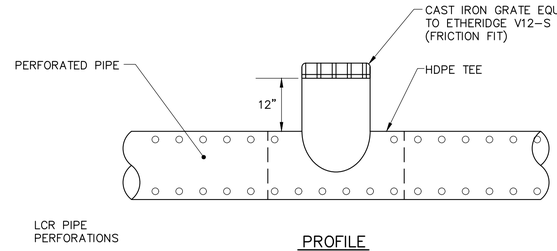



**NOTE:**
- CONSTRUCT PIPE EXPANSION JOINTS @ 200' (MAX.) INTERVALS ON THE LCR PIPE

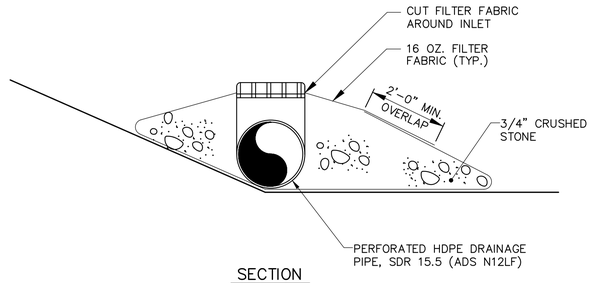
3 C-303 **LCR PIPE EXPANSION JOINT**
SCALE: NOT TO SCALE




4 C-303 **LCR PIPE HDPE PIPE CONNECTION TO HDPE BOOT**
SCALE: NOT TO SCALE




PROFILE




SECTION

2 C-303 **SURFACE INLET**
SCALE: NOT TO SCALE

ISSUED FOR PERMITTING

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COMMONWEALTH OF MASSACHUSETTS
PAUL J. PORADA
CIVIL
No. 35469
REGISTERED PROFESSIONAL ENGINEER

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| DRAWN BY: | CBI/JCBM | |
| CHECKED BY: | JG | |
| 23156802-C-501-C-SXX.dwg | | |

LCR PIPE DETAILS

CITY OF GARDNER MASSACHUSETTS

GARDNER SLUDGE
LANDFILL EXPANSION

| | |
|---|---|
| JOB NO: | 0231568.02 |
| DATE: | JANUARY 2022 |
| SCALE: | AS NOTED |
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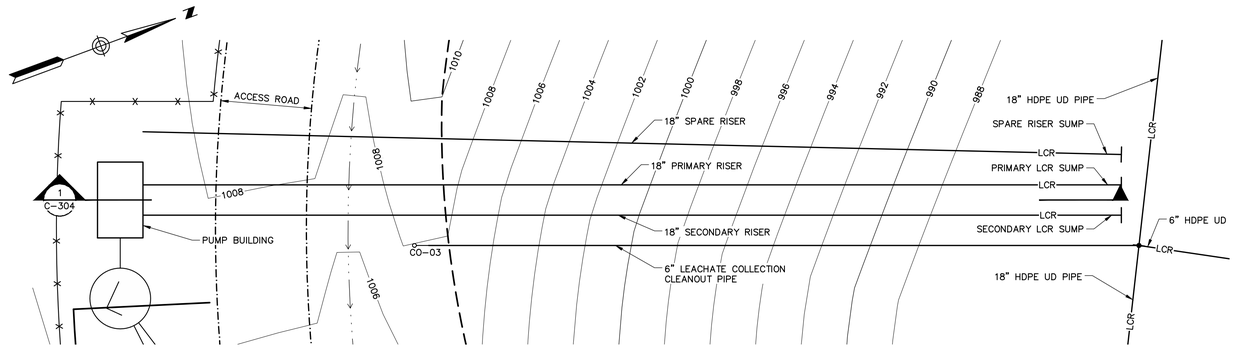
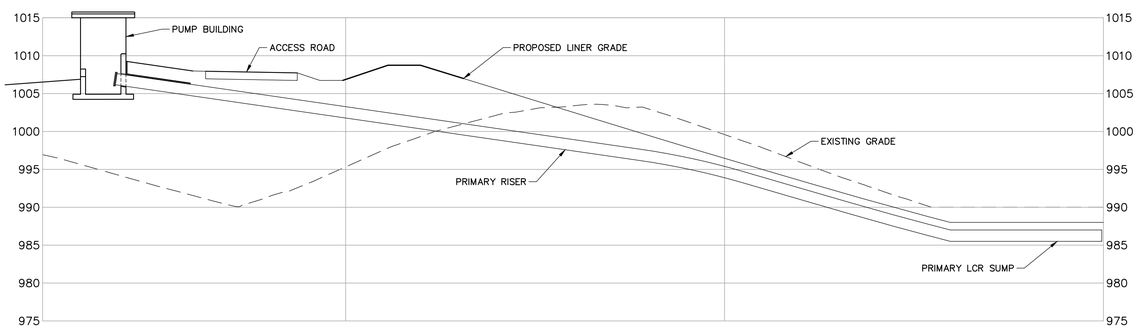



## SUMP PLAN VIEW

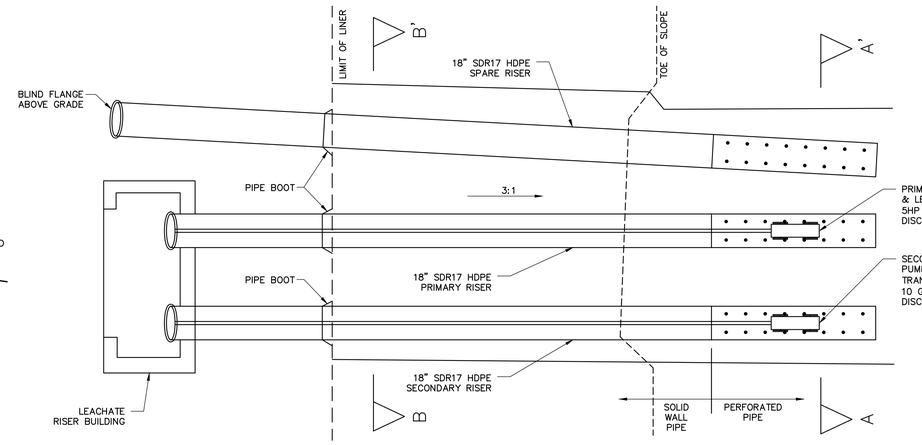
SCALE: 1"=10'




## SUMP SECTION VIEW

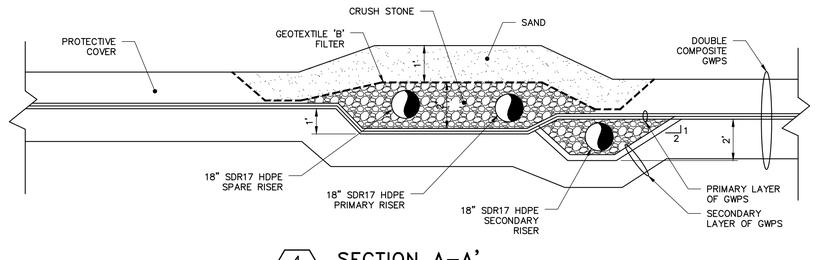
SCALE: 1" = 10'

1 C-304



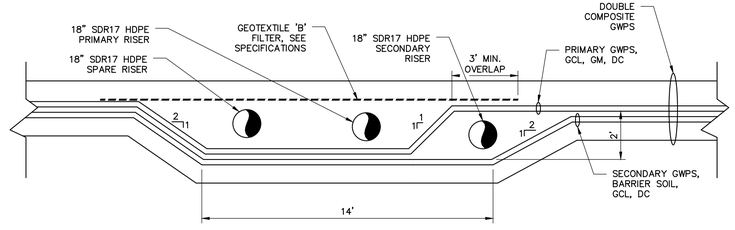

1 C-304 **LCR SUMP DETAIL**

SCALE: NO TO SCALE



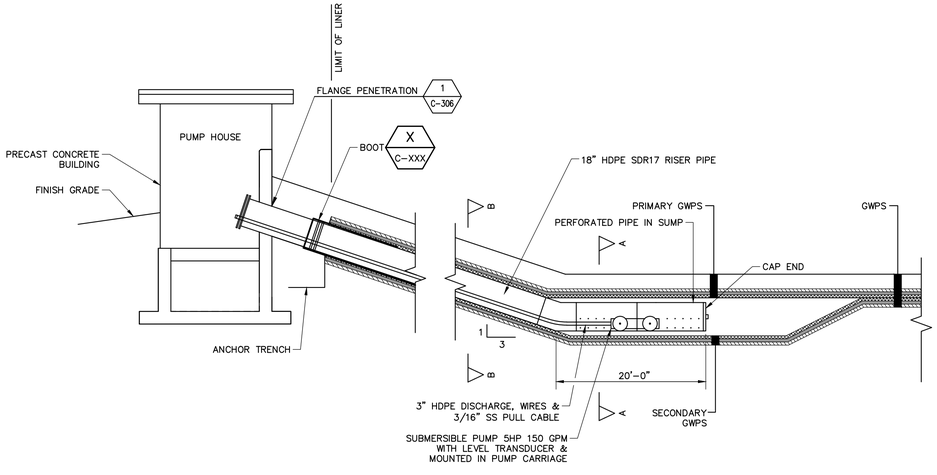

4 C-304 **SECTION A–A'**

SCALE: NO TO SCALE



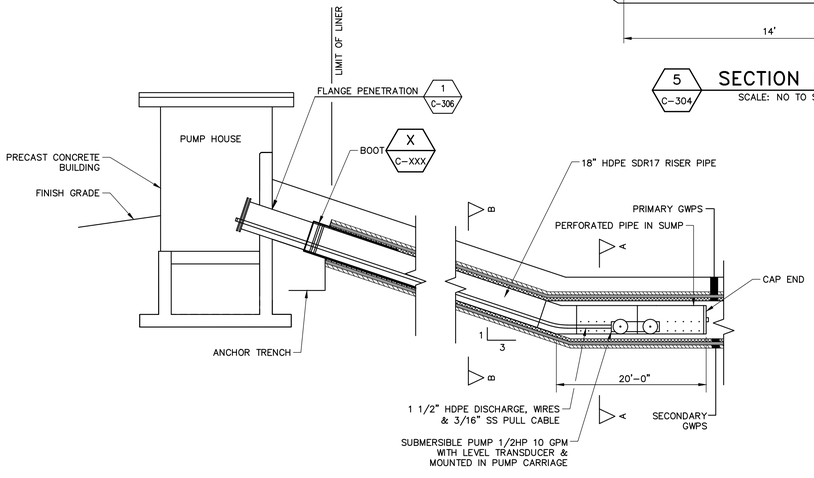

5 C-304 **SECTION B–B'**

SCALE: NO TO SCALE




2 C-304 **PRIMARY LCR SUMP SECTION**

SCALE: NO TO SCALE




3 C-304 **SECONDARY LCR SUMP SECTION**

SCALE: NO TO SCALE

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PAUL J. PORADA
CIVIL
No. 35469
REGISTERED PROFESSIONAL ENGINEER

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| CHECKED BY: | JG | |
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LEACHATE SUMP DETAILS

CITY OF GARDNER MASSACHUSETTS

GARDNER SLUDGE LANDFILL EXPANSION

| | |
|---|---|
| JOB NO: | 0231568.02 |
| DATE: | JANUARY 2022 |
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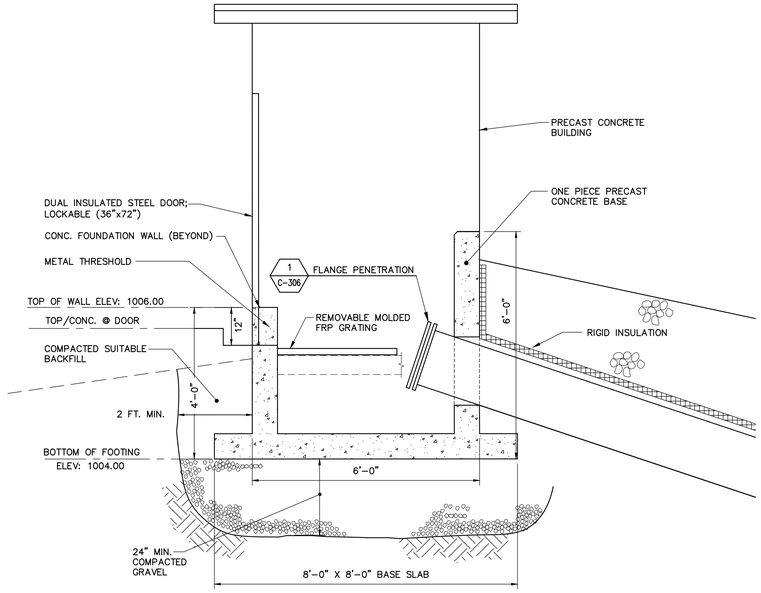
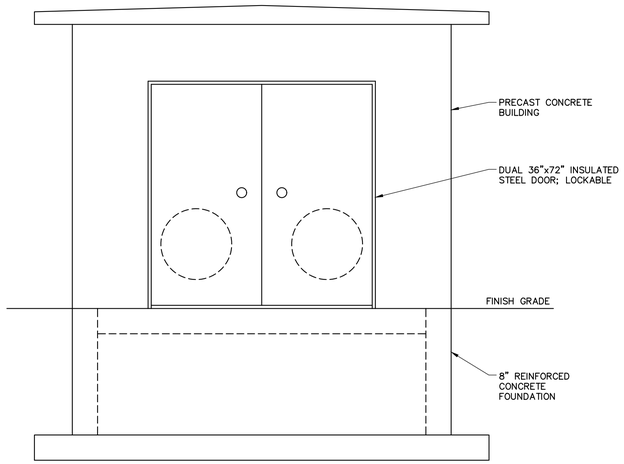
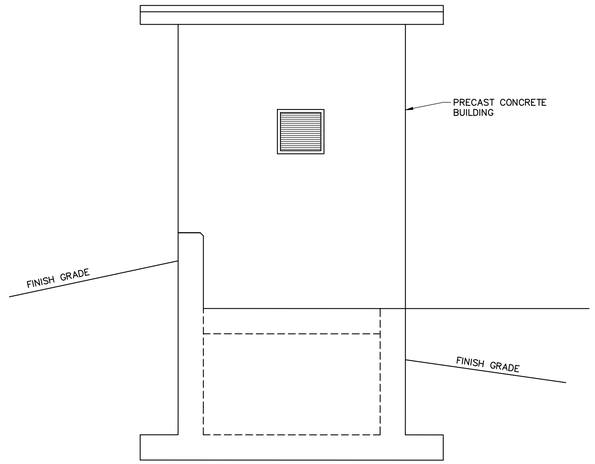
| SHEET: | 14 OF 19 |

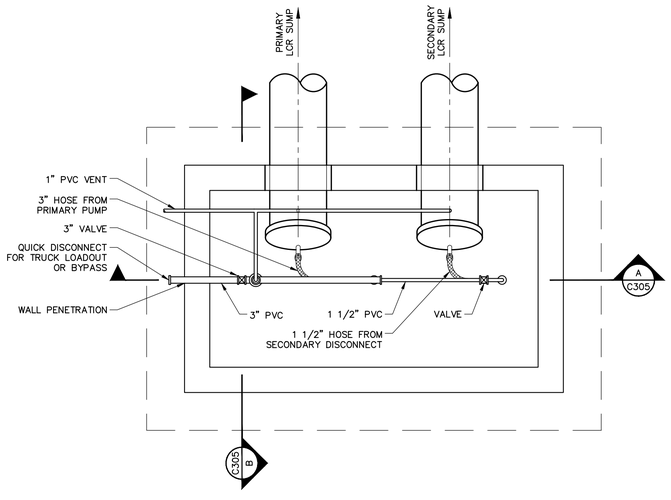
C-304



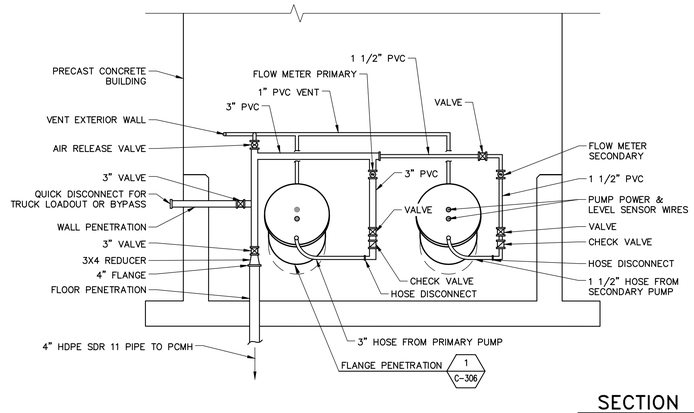

1 C-305 **LCR PUMP STATION**
SCALE: NOT TO SCALE




2 C-305 **MECHANICAL PLAN**
SCALE: NOT TO SCALE

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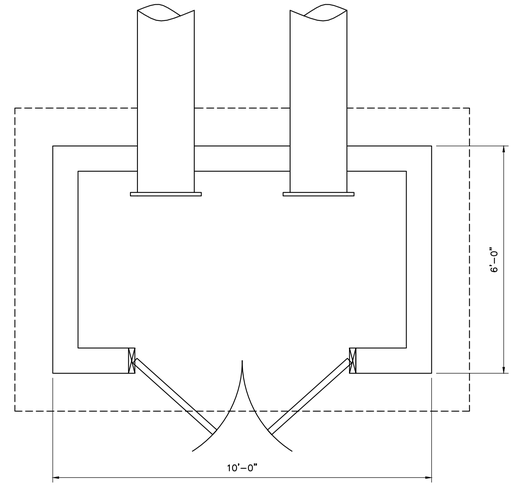


3 C-305 **LCR PUMP STATION ELEVATIONS**
SCALE: NOT TO SCALE

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# PUMP HOUSE PLAN & ELEVATIONS

CITY OF GARDNER MASSACHUSETTS

GARDNER SLUDGE LANDFILL EXPANSION

| | |
|---|---|
| JOB NO: | 0231568.02 |
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| SCALE: | AS NOTED |
| SHEET: | 15 OF 19 |

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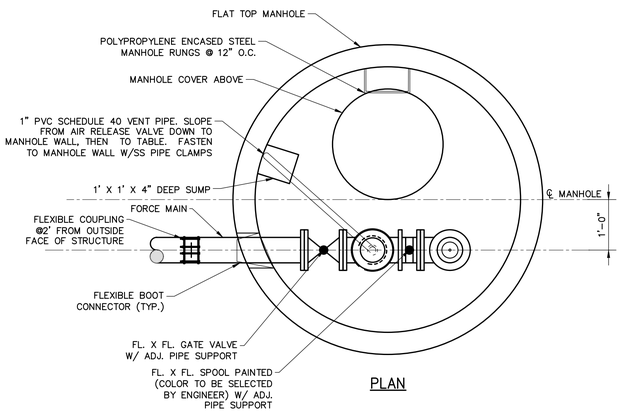
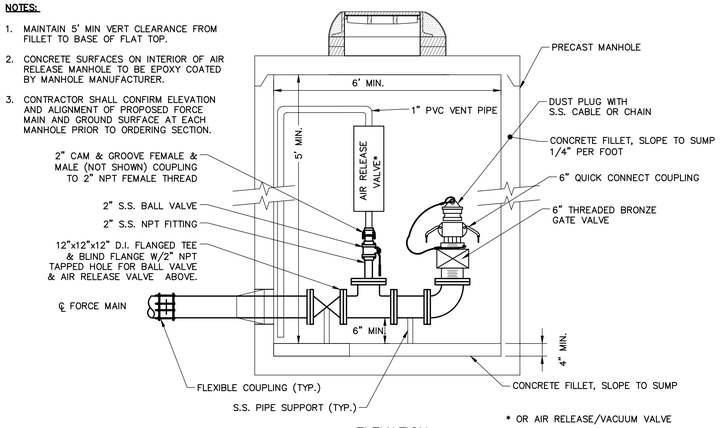



PLAN

NOTES:

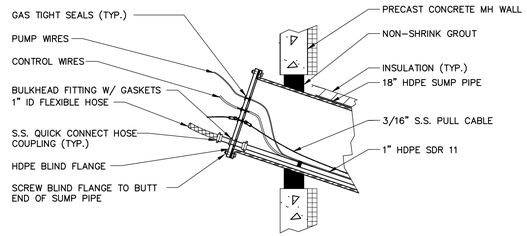
1. MAINTAIN 5' MIN VERT CLEARANCE FROM FILLET TO BASE OF FLAT TOP.
2. CONCRETE SURFACES ON INTERIOR OF AIR RELEASE MANHOLE TO BE EPOXY COATED BY MANHOLE MANUFACTURER.
3. CONTRACTOR SHALL CONFIRM ELEVATION AND ALIGNMENT OF PROPOSED FORCE MAIN AND GROUND SURFACE AT EACH MANHOLE PRIOR TO ORDERING SECTION.




ELEVATION

## 3 C-306 FORCEMAIN AIR RELEASE MANHOLE WITH BYPASS CONNECTION

SCALE: NOT TO SCALE

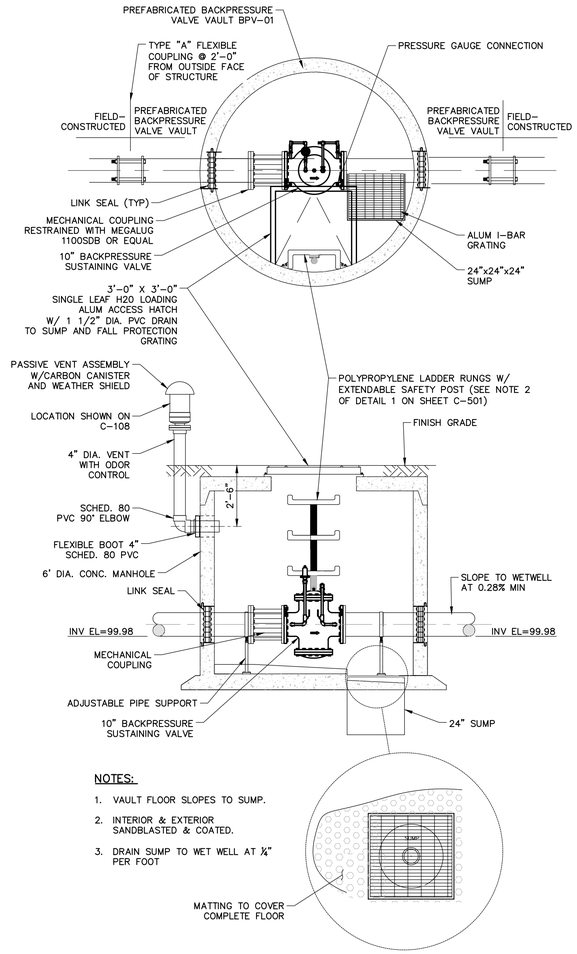



NOTES:

1. QUICK DISCONNECT COUPLINGS: GLASS FIBER REINFORCED NYLON COUPLERS MEETING MIL-C-27487 SPECIFICATIONS, WITH PRESSURE RATING OF 175 PSI OR GREATER. VITON SEALS.
2. PVC PIPE: SCHEDULE 80 PVC TYPE 1 PIPE AND FITTINGS MEETING ASTM D1784 REQUIREMENTS, CELL CLASSIFICATION 12454-B. SOLVENT WELDED OR SCREW JOINTS. ANSI CLASS 150 FLANGES WHERE REQUIRED.

## 1 C-306 FLANGE PENETRATION

SCALE: NOT TO SCALE

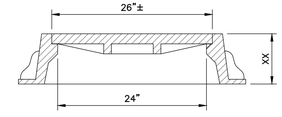



NOTES:

1. VAULT FLOOR SLOPES TO SUMP.
2. INTERIOR & EXTERIOR SANDBLASTED & COATED.
3. DRAIN SUMP TO WET WELL AT ¼" PER FOOT

## 4 C-306 BACK PRESSURE VALVE (BPV)

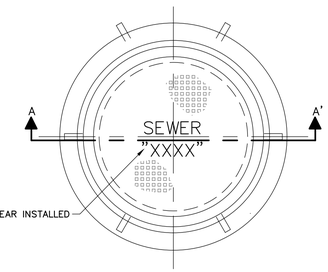
SCALE: NOT TO SCALE




SECTION A-A' STANDARD COVER

NOTES:

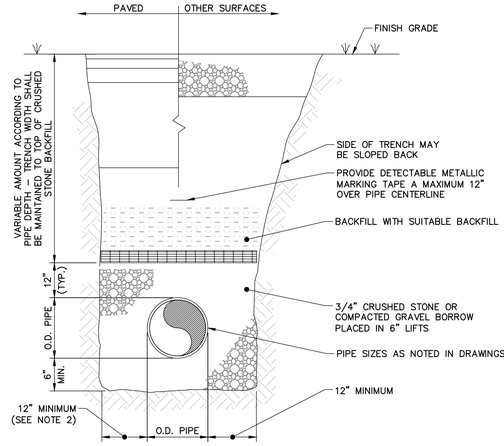
1. PROVIDE WATERTIGHT MANHOLE FRAME & COVERS FOR ALL MANHOLES LOCATED WITHIN THE MASSDOT R.O.W., OUTSIDE ANY ROAD R.O.W. IN UNPAVED AREAS, IN THE 100' WETLAND BUFFER ZONE AND/OR WETLAND AREAS, OR WITHIN THE 100-YEAR FLOOD PLAIN.
2. COVER TO READ "SEWER" OR "DRAIN"




PLAN

## 2 C-306 STANDARD MANHOLE FRAME AND COVER

SCALE: NOT TO SCALE




NOTES:

1. MAINTAIN UNIFORM TRENCH WIDTH TO 6" OVER PIPE.
2. BRACING AND SHEETING OR OTHER TRENCH PROTECTION TO BE PROVIDED TO MEET APPLICABLE O.S.H.A. SAFETY REGULATIONS. ALL SUCH TRENCH PROTECTION TO BE RESPONSIBILITY OF CONTRACTOR.

## 5 C-306 SINGLE PIPE TRENCH

SCALE: NOT TO SCALE

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PUMP HOUSE DETAILS

CITY OF GARDNER MASSACHUSETTS

GARDNER SLUDGE LANDFILL EXPANSION

| | |
|---|---|
| JOB NO: | 0231568.02 |
| DATE: | JANUARY 2022 |
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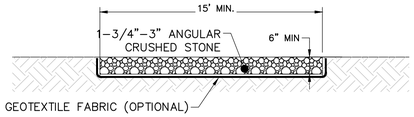
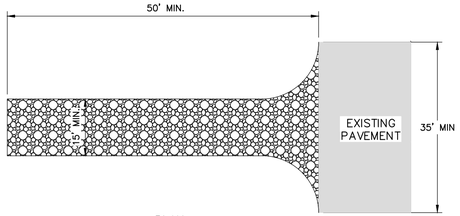



SECTION



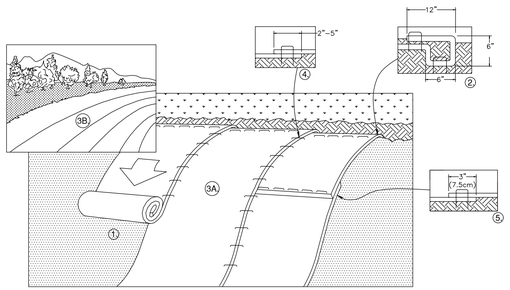

PLAN

NOTES:

1. EACH SITE ENTRANCE IS TO HAVE A TEMPORARY CONSTRUCTION ENTRANCE.
2. STONE IS TO BE 1-3/4" TO 3" ANGULAR CRUSHED STONE
3. ANY SEDIMENT TRACKED INTO THE ROADWAY NEEDS TO BE CLEANED IMMEDIATELY
4. ADDITIONAL STONE IS TO BE ADDED TO THE PAD AS NEEDED TO MAINTAIN THE ORIGINAL DEPTH.

## 1 C-307 STABILIZED CONSTRUCTION ENTRANCE-EXIT

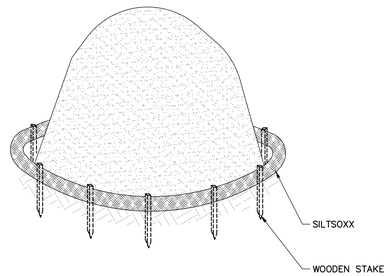
SCALE: NOT TO SCALE




1. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECP's), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED AS WELL AS REMOVING ANY PROTRUDING ROCKS, STUMPS OR ROOTS. DURING THE GROWING SEASON (APRIL 15-SEPTEMBER 15) USE RECP'S ON THE BASE OF GRASSED WATERWAYS, SOIL SLOPES HAVING A GRADE GREATER THAT 15%, OR ANYWHERE WHERE HAY MULCH HAS PROVEN TO BE INEFFECTIVE AT CONTROLLING SHEET EROSION. RECP'S ARE A MANUFACTURED COMBINATION OF MULCH AND NETTING DESIGNED TO PREVENT EROSION AND RETAIN SOIL MOISTURE. FOR OVER WINTER PROTECTION, APPLY RECP'S ON THE BASE AND SIDE SLOPES OF GRASSED WATERWAYS AND ON SLOPES STEEPER THAN AN 8% GRADE.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE RECP's IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF RECP's EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE RECP's WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF RECP's BACK OVER SEED AND COMPACTED SOIL. SECURE RECP's OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE RECP's.
3. ROLL THE RECP's (A.) DOWN OR (B.) HORIZONTALLY ACROSS THE SLOPE. RECP's WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECP's MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING THE DOT SYSTEM, STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. THE EDGES OF PARALLEL RECP's MUST BE STAPLED WITH APPROXIMATELY 2" - 5" OVERLAP DEPENDING ON RECP's TYPE.
5. CONSECUTIVE RECP's SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART ACROSS ENTIRE RECP's WIDTH. NOTE: *IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY SECURE THE RECP's.
6. UNTIL GRASS IS ABUNDANT, INSPECT PERIODICALLY AND AFTER EACH RAINSTORM TO CHECK FOR EROSION. IMMEDIATELY REPAIR AND ADD MORE MULCH UNTIL GRASSES ARE FIRMLY ESTABLISHED. DO NOT MOW THE FIRST YEAR.

## 4 C-307 ROLLED EROSION CONTROL MATTING

SCALE: NOT TO SCALE



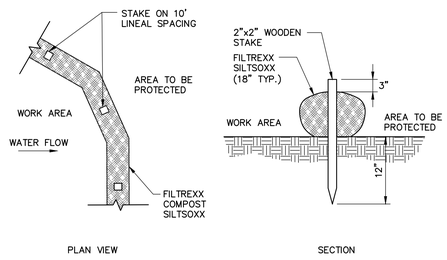

NOTES:

1. STOCKPILES SHALL BE SURROUNDED BY SILTSOXX.
2. STOCKPILES SHALL HAVE A MAXIMUM 2:1 (H:V) SIDE SLOPE.
3. REPAIR OR REPLACE DAMAGED SILTSOXX DUE TO CONSTRUCTION ACTIVITIES OR STOCKPILE MITIGATION.

## 2 C-307 TEMPORARY SOIL STOCKPILE

SCALE: NOT TO SCALE

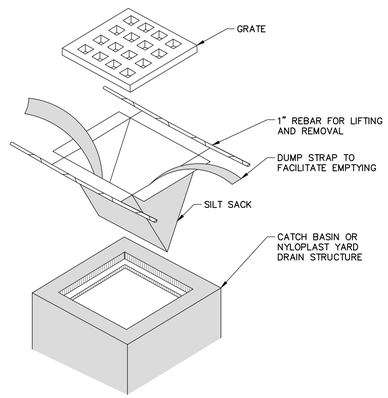
NOTE: SILTSOXX SHALL NOT BE USED IN WETLAND AREAS




PLAN VIEW SECTION

## 5 C-307 SEDIMENT BARRIER - SILTSOXX

SCALE: NOT TO SCALE

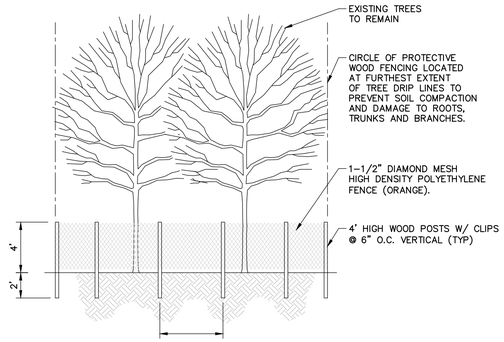



NOTES:

1. INSTALL SILT SACK PER MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.
2. EMPTY OR REMOVE SEDIMENT FROM SILT SACK WHEN RESTRAINT CORD IS NO LONGER VISIBLE. CLEAN, RINSE, AND REPLACE AS NEEDED.
3. SILT SACKS TO BE INSTALLED WHEN THE POTENTIAL FOR SEDIMENT TO ENTER EXISTING & PROPOSED BASINS EXISTS.

## 7 C-307 SILT SACK

SCALE: NOT TO SCALE

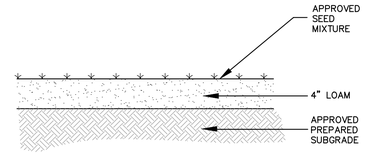



NOTES:

1. LOCATE FENCING AS SHOWN ON PLANS.
2. NO MATERIAL OR EQUIPMENT SHALL BE STORED OR STOCKPILED WITHIN THE AREA SURROUNDED BY TREE PROTECTION FENCING.
3. FENCE MUST REMAIN AND BE MAINTAINED THROUGHOUT ENTIRE BUILDING PHASES DURING WHICH CONSTRUCTION MAY AFFECT TREES.

## 3 C-307 TREE PROTECTION

SCALE: NOT TO SCALE

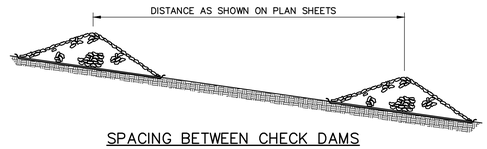



NOTES:

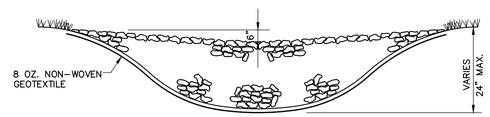
1. ALL DISTURBED AREAS WILL BE SEEDED WITH A NEW ENGLAND WILDLIFE/CONSERVATION MIX OR A NATIVE TURF GRASS SPECIES EQUIVALENT UNLESS OTHERWISE STATED

## 6 C-307 LOAM AND SEED

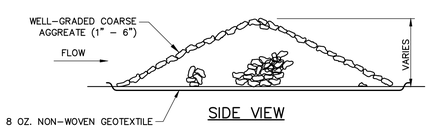
SCALE: NOT TO SCALE




SPACING BETWEEN CHECK DAMS




FRONT VIEW




SIDE VIEW

## 8 C-307 STONE CHECK DAM

SCALE: NOT TO SCALE

# EROSION AND SEDIMENT CONTROL NOTES

## TEMPORARY EROSION CONTROL

| Measure | Dates For Use | Timing, Activity, and Location |
|---|---|---|
| Sedimentation Barrier | ALL | Before soil disturbance, install downhill of areas to be disturbed and around material stockpiles. |
| Up-slope Diversion | ALL | Before soil disturbance, install uphill of areas to be disturbed and material stockpiles. |
| Catch Basin Protection | ALL | Before soil or pavement disturbance, install ACF Environmental, Inc. High Flow Siltsack, Siltsaver Inlet Filter. or equal, installed per manufacturer's requirements. |
| Dust Control | ALL | During dry weather, apply water and calcium chloride to control dust. |
| Temporary Seeding | April 15 to Oct. 1 | Soil stockpiles that are not covered and disturbed areas that will not be disturbed again within 14 days. If grass growth provides less than 95% soil coverage by Nov. 1, apply mulch and anchor with erosion control blanket. |
| Mulch | April 15 to Sept. 15 | On all areas of exposed soil prior to rain events or every 7 days, apply 100-150 lbs (2.5 bales) per 1,000 sq ft. by mechanical blower. |
| Rolled Erosion Control Matting | April 15 to Sept. 15 | Use RECM on the base of grassed waterways, soil slopes having a grade greater than 15%, or anywhere where hay mulch has proven to be ineffective at controlling sheet erosion. |
| Winter Mulch | Sept. 16 to Oct. 31 | On all areas of exposed soil prior to precipitation or every 7 days, apply 150 to 170 lbs. mulch (4 bales) per 1,000 sq. ft. by mechanical blower, Erosion control blanket may be used as a substitute for winter mulch. |
| | Nov. 1 to April 14 | On all areas of exposed soil, apply 150 to 170 lbs. mulch (4 bales) per 1,000 sq. ft. and anchor with netting at the end of each working day. Erosion control blanket may be used as a substitute for winter mulch. |
| Inspections | Until site is permanently stabilized | Inspect the erosion and sedimentation control measures daily, and maintain and repair as necessary. |

## Permanent Erosion Control:

| Measure | Dates For Use | Timing, Activity, and Location |
|---|---|---|
| Permanent Seeding | April 15 to Sept. 15 | On final grade areas, within 7 days of grade preparation, prepare topsoil, followed by seed and mulch application. |
| Dormant Seeding | Sept. 16 to April 15 | On final grade areas, with prepared topsoil. Apply seed at double the specified rate on bare soil, and follow with an application of winter mulch. |
| Ground Cover, Trees, Shrubs | April 15 to Nov. 1 | Install with final landscaping. |
| Permanent Mulch | ALL | Install with final landscaping. |

## Inspections:

Regular inspections of all erosion and sedimentation controls shall be made at least weekly and within 24 hours of a precipitation event greater than 0.25". Minimum inspections shall be made as listed in the table below.

| Inspected Item | Look For |
|---|---|
| Mulched Surfaces | Thin mulch or inadequate application. Wind movement. |
| Seeded Surfaces | Poor seed germination. Loss of mulch. Development of rivulets. |
| Sediment Barrier | Sediment build-up to one half the height of the barrier. Undermining of the barrier. Supporting stakes loose, toppled, or unmarked. Breaks in barrier. |
| Perimeter Diversion | Discharge is to stabilized area. Erosion or breaks in barrier. Supporting stakes loose, toppled or unmarked. |
| Dewatering Filter | Breaks in fabric or supporting structure. Slow flow, indicating high sediment build-up. |
| Construction Entrance | Sedimentation of roadways. Off-site dust complaints. |

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COMMONWEALTH OF MASSACHUSETTS
PAUL J. PORADA
CIVIL
No. 35469
REGISTERED PROFESSIONAL ENGINEER

| REV. | DESCRIPTION | DATE |
|---|---|---|
| DESIGNED BY: | BMLT | |
| DRAWN BY: | CBL/JCBM | |
| CHECKED BY: | JG | |
| 23156802-C-501-C-SXX.dwg | | |

EROSION & SEDIMENTATION CONTROLS

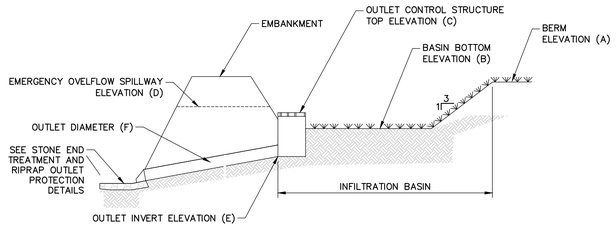
CITY OF GARDNER MASSACHUSETTS

GARDNER SLUDGE LANDFILL EXPANSION

| | |
|---|---|
| JOB NO: | 0231568.02 |
| DATE: | JANUARY 2022 |
| SCALE: | AS NOTED |
| SHEET: | 17 OF 19 |

C-307

ISSUED FOR PERMITTING

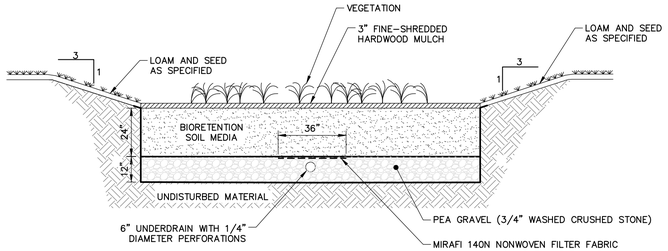


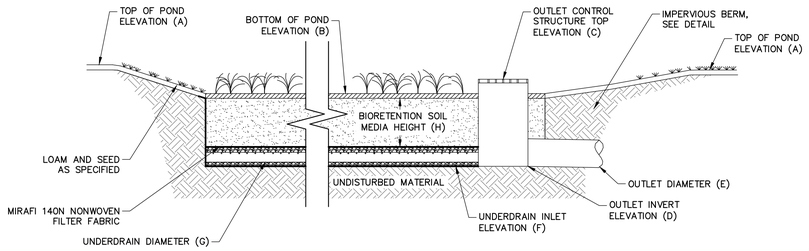

| INFILTRATION BASIN SCHEDULE | | |
|---|---|---|
| POND | BASIN #1 | BASIN #2 |
| BERM EL. (A) | 998.00 | 994.00 |
| INFILTRATION BASIN BOTTOM EL. (B) | 986.50 | 980.00 |
| OUTLET CONTROL STRUCTURE TOP EL. (C) | 995.00 | 986.00 |
| EMERGENCY OVERFLOW SPILLWAY EL. (D) | 997.50 | 993.50 |
| OUTLET INVERT EL. (E) | 986.50 | 980.00 |
| OUTLET DIAMETER (F) | 12" | 6" |

NOTE:

1. VEHICLES WILL BE PROHIBITED FROM TRAVERSING THE INFILTRATION BASIN AFTER SUBGRADE HAS BEEN REACHED AND THE BASIN HAS BEEN CONSTRUCTED

1 / C-308 INFILTRATION BASIN DETAL
SCALE: NOT TO SCALE




| BIORETENTION POND SCHEDULE | |
|---|---|
| POND | POND #1 |
| TOP OF POND EL. (A) | 1006.00 |
| BOTTOM OF POND EL. (B) | 1001.00 |
| OUTLET CONTROL STRUCTURE EL. (C) | 1005.00 |
| OUTLET INVERT EL. (D) | 998.35 |
| OUTLET DIAMETER (E) | 6" |
| UNDERDRAIN INVERT EL. (F) | 998.35 |
| UNDERDRAIN DIAMETER (G) | 6" |
| BIORETENTION SOIL HEIGHT (H) | 24" |

| PLANTING SOIL CHARACTERISTICS | |
|---|---|
| PARAMETER | VALUE |
| SAND | 40% |
| TOPSOIL | 20–30% |
| COMPOST | 30–40% |

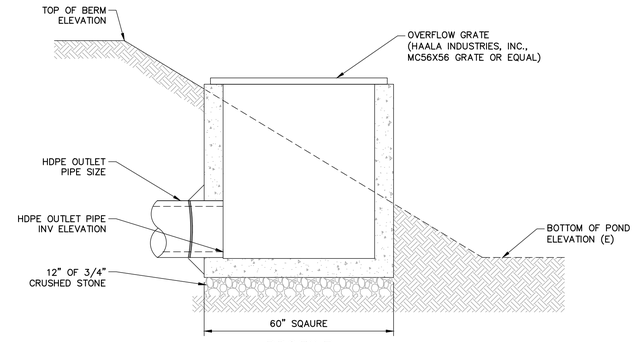
NOTES:

1. IF UNSUITABLE MATERIAL IS OBSERVED BELOW THE POND DEPTH, AT A MINIMUM IT SHALL BE REMOVED TO A DEPTH OF TWO FEET AND REPLACED WITH CLEAN SAND AND THE ENGINEER SHOULD BE NOTIFIED.
2. SOIL WITHIN BIORETENTION AREA TO BE PLACED, DO NOT COMPACT. LIFTS TO BE LIGHTLY WATERED TO ENCOURAGE NATURAL COMPACTION.
3. THE SOIL MIX MUST BE UNIFORM, FREE OF STONES, STUMPS, ROOTS, OR SIMILAR OBJECTS LARGER THAN 2 INCHES. CLAY CONTENT SHOULD NOT EXCEED 5%. SOIL PH SHOULD GENERALLY BE BETWEEN 5.5–6.5, A RANGE THAT IS OPTIMAL FOR MICROBIAL ACTIVITY AND ADSORPTION OF NITROGEN, PHOSPHORUS, AND OTHER POLLUTANTS. USE SOILS WITH 1.5% TO 3% ORGANIC CONTENT AND MAXIMUM 500–PPM SOLUBLE SALTS. THE TOPSOIL COMPONENT SHALL BE A SANDY LOAM, LOAMY SAND, OR LOAM TEXTURE. THE COMPOST COMPONENT MUST BE PROCESSED FROM YARD WASTE IN ACCORDANCE WITH MASSDEP GUIDELINES. THE SAND COMPONENT OF THE SOIL MIX SHOULD BE GRAVELLY SAND THAT MEETS ASTM D 422 AND THE FOLLOWING:

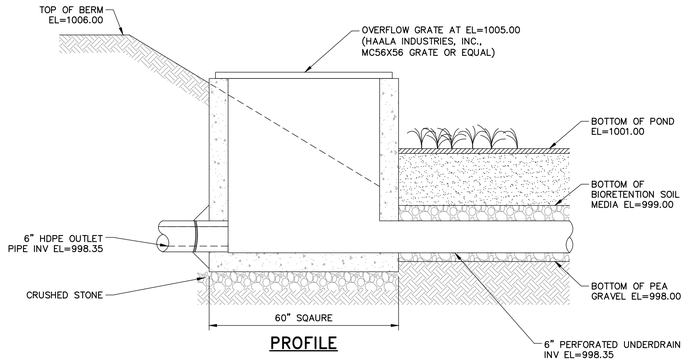
| SIEVE SIZE | % PASSING |
|---|---|
| 2–INCH | 100% |
| 3/4–INCH | 70–100% |
| 1/4–INCH | 50–80% |
| U.S. #40 | 15–40% |
| U.S. #200 | 0–3% |

4. 100% OF THE BOTTOM AREAS OF THE BIORETENTION PONDS SHALL HAVE BIORETENTION SOIL MEDIA INSTALLED.

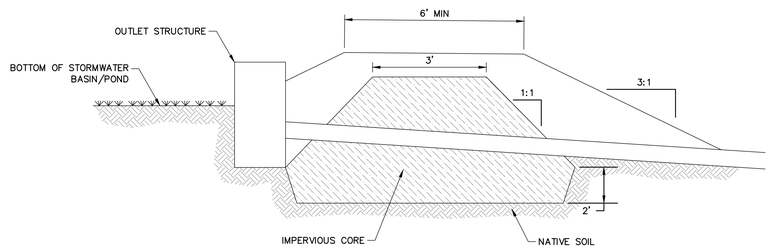
3 / C-308 BIORETENTION POND
SCALE: NOT TO SCALE




2 / C-308 INFILTRATION BASIN OUTLET CONTROL STRUCTURE
SCALE: NOT TO SCALE




4 / C-308 BIORETENTION POND OUTLET CONTROL STRUCTURE
SCALE: NOT TO SCALE



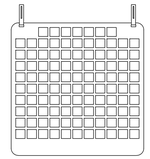

NOTES:

1. CORE MATERIAL SHALL MEET USGS CLASSIFICATION SC, SM, CL OR ML AND HAVE A MAXIMUM PARTICLE SIZE OF 3" AND A PERMEABILITY LESS THAN ~0.00005 CM/S, AND MEET THE FOLLOWING GRADATION:

| SIEVE SIZE | PERCENT FINER BY WEIGHT |
|---|---|
| 3 INCH | 100 |
| #200 | 50–100 |

2. PIPE SHALL BE FULLY EMBEDDED IN CORE TO ELIMINATE.

6 / C-308 IMPERVIOUS BERM DETAIL
SCALE: NOT TO SCALE



NOTES:

1. OUTLET STRUCTURE GRATE SHALL BE HAALA INDUSTRIES, INC. MC56X56 TOP MOUNT GRATE OR EQUAL.
2. GRATE TO BE SECURED TO CONCRETE STRUCTURE.

5 / C-308 HAALA MC56X56 GRATE
SCALE: NOT TO SCALE

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COMMONWEALTH OF MASSACHUSETTS
PAUL J. PORADA
CIVIL
No. 35469
REGISTERED PROFESSIONAL ENGINEER

| REV. | DESCRIPTION | DATE |
|---|---|---|
| DESIGNED BY: | BMLT | CHECKED BY: JG |
| DRAWN BY: | CBJ/CBM | 23156802-501-C-SXX.dwg |

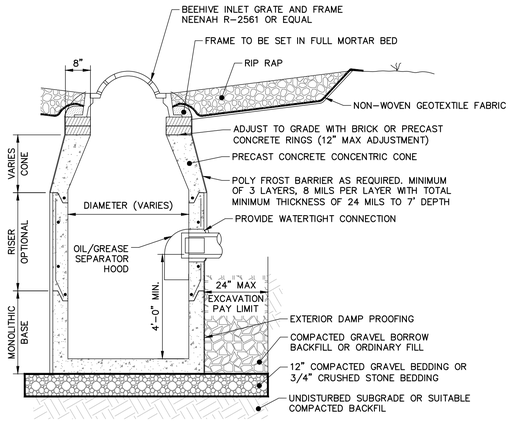
GENERAL CIVIL DETAILS - 1

CITY OF GARDNER MASSACHUSETTS

GARDNER SLUDGE LANDFILL EXPANSION

| | |
|---|---|
| JOB NO: | 0231568.02 |
| DATE: | JANUARY 2022 |
| SCALE: | AS NOTED |
| SHEET: | 18 OF 19 |

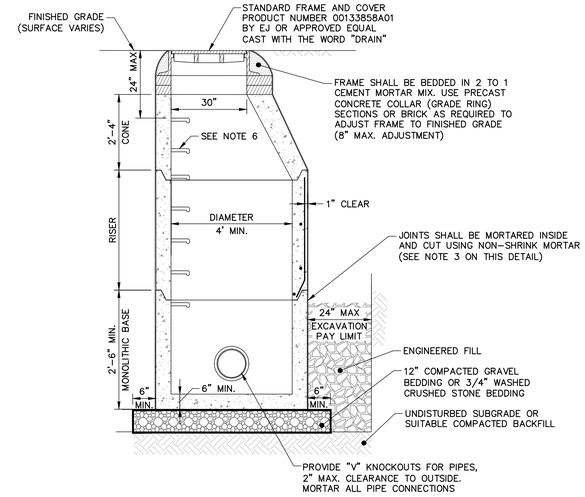
C-308




NOTES:

1. PRECAST CONCRETE STRUCTURES AND CASTINGS SHALL BE SUITABLE FOR HS-20 LOADINGS.
2. PRECAST CONCRETE STRUCTURES SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM C-478.
3. ALTERNATE TOP SLAB MAY BE USED AS DICTATED BY DESIGN AND/OR FIELD CONDITIONS.
4. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE BUTYL RUBBER.
5. DOUBLE CATCH BASIN FRAME AND GRATE SHALL BE INSTALLED ON A MINIMUM 5'-0" DIAMETER TOP SLAB.
6. PROVIDE MINIMUM 24" DIAMETER OPENING.
7. PROVIDE ANTIFLOATATION SLAB EXTENSION AS REQUIRED TO SATISFY ANTIFLOATATION REQUIREMENTS.

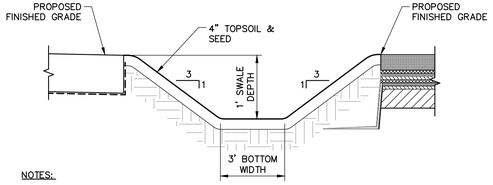
1 / C-309 **PRECAST CONCRETE CATCH BASIN WITH BEEHIVE GRATE**
SCALE: NOT TO SCALE




NOTES:

1. PRECAST CONCRETE STRUCTURES AND CASTINGS SHALL BE SUITABLE FOR HS-20 LOADINGS.
2. PRECAST CONCRETE STRUCTURES SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM C-478.
3. ALTERNATE TOP SLAB MAY BE USED AS DICTATED BY DESIGN AND/OR FIELD CONDITIONS.
4. UNLESS OTHERWISE NOTED, MANHOLES SHALL BE 48-INCH IN DIA.
5. MANHOLE FRAME AND GRATE(S) SHALL MEET MUNICIPAL AND STATE SPECIFICATIONS WHEN APPLICABLE.
6. 16" ALUM. OR REINFORCED PLASTIC MANHOLE STEPS 12" ON CENTER.

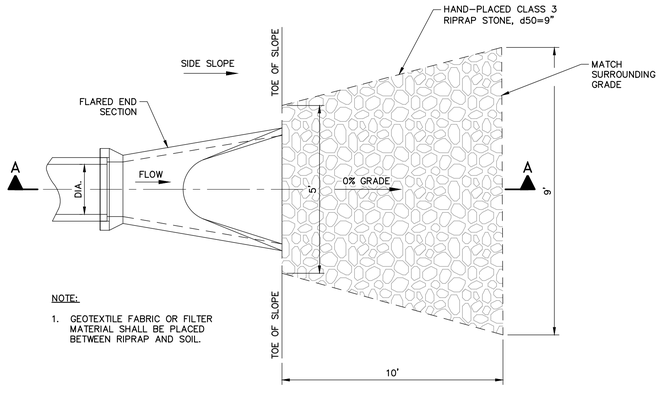
2 / C-309 **PRECAST CONCRETE DRAINAGE MANHOLE**
SCALE: NOT TO SCALE




NOTES:

1. THE FOUNDATION AREA OF THE WATERWAY SHALL BE CLEARED AND GRUBBED OF ALL TREES, BRUSH, STUMPS, AND OTHER OBJECTIONABLE MATERIAL. MATERIALS REMOVED SHALL BE DISPOSED OF SO THEY WILL NOT INTERFERE WITH THE CONSTRUCTION OR PROPER FUNCTIONING OF THE WATERWAY.
2. THE WATERWAY SHALL BE EXCAVATED FOR SHAPED TO LINE, GRADE AND CROSS-SECTION AS REQUIRED TO MEET THE DESIGN CRITERIA. THE WATERWAY SHALL BE FREE OF IRREGULARITIES WHICH WILL IMPEDE NORMAL FLOW.
3. EARTH FILLS REQUIRED TO MEET SUBGRADE REQUIREMENTS BECAUSE OF OVER EXCAVATION OR TOPOGRAPHY SHALL BE COMPACTED TO THE SAME DENSITY AS THE SURROUNDING SOIL TO PREVENT UNEQUAL SETTLEMENT THAT COULD CAUSE DAMAGE TO THE COMPLETED WATERWAY. EARTH REMOVED AND NOT NEEDED IN CONSTRUCTION SHALL BE SPREAD OR DISPOSED OF SO IT WILL NOT INTERFERE WITH THE FUNCTIONING OF THE WATERWAY.
4. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER AS TO MINIMIZE EROSION, AIR, AND WATER POLLUTION. ALL APPROPRIATE STATE AND LOCAL LAWS AND REGULATIONS SHALL BE COMPILED WITH FOR INSTALLATION.
5. VEGETATION SHALL BE ESTABLISHED IN THE SWALE PRIOR TO ALLOWING STORMWATER RUNOFF TO FLOW THROUGH THE SWALE.

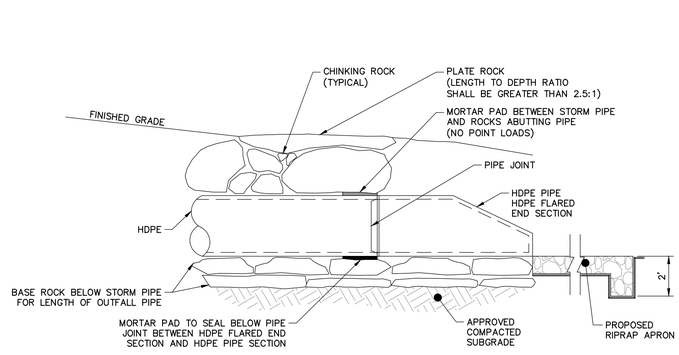
3 / C-309 **GRASS-LINED SWALE**
SCALE: NOT TO SCALE




NOTE:

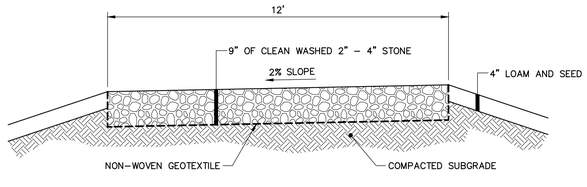
1. GEOTEXTILE FABRIC OR FILTER MATERIAL SHALL BE PLACED BETWEEN RIPRAP AND SOIL.

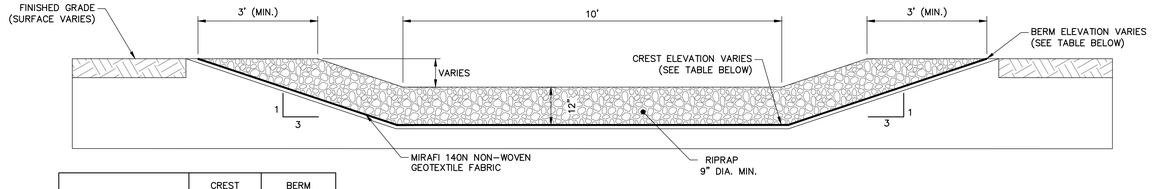
**PLAN**




**SECTION A-A**

4 / C-309 **RIPRAP APRON OUTLET PROTECTION AT FLARED END**
SCALE: NOT TO SCALE




| | CREST ELEVATION | BERM ELEVATION |
|---|---|---|
| BIORETENTION POND #1 | 1005.50 | 1006.00 |
| INFILTRATION BASIN #1 | 997.50 | 998.00 |
| INFILTRATION BASIN #2 | 993.50 | 994.00 |

6 / C-309 **EMEERGENCY SPILLWAY**
SCALE: NOT TO SCALE

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| REV. | DESCRIPTION | DATE |
|---|---|---|
| DESIGNED BY: | BMLT | CHECKED BY: JG |
| DRAWN BY: | CBI/JCBM | 231568\2-501-C-SXX.dwg |

GENERAL CIVIL DETAILS - 2

CITY OF GARDNER MASSACHUSETTS

GARDNER SLUDGE
LANDFILL EXPANSION

| | |
|---|---|
| JOB NO: | 0231568.02 |
| DATE: | JANUARY 2022 |
| SCALE: | AS NOTED |
| SHEET: | 19 OF 19 |

C-309

# APPENDIX B: PUBLIC INVOLVEMENT PLAN

# DRAFT PUBLIC INVOLVEMENT PLAN

Gardner Sludge Landfill Expansion

808 West Street

Gardner, Massachusetts

Prepared by:

The City of Gardner

95 Pleasant Street

Gardner, MA 01440

as of November 2024

# DRAFT PUBLIC INVOLVEMENT PLAN

### City of Gardner Sludge Landfill Expansion

## INTRODUCTION

Pursuant to 301 CMR 11.01, the City of Gardner (City) initiated the Massachusetts Environmental Policy Act (MEPA) process by filing an Environmental Notification Form with the MEPA Secretary of the Executive Office of Energy and Environmental Affairs on December 12, 2022. The MEPA Secretary issued a Certificate on the Environmental Notification Form (EEA Number 16643) on February 10, 2023 requiring that the City prepare a Draft Environmental Impact Report (DEIR) pursuant to MEPA; M.G.L. c. 30, ss. 61-62L and Section 11.06 and 11.11 of the MEPA Regulations (301 CMR 11.00). With respect to Environmental Justice, the Certificate indicated that while the Project Site is not located within one mile of an Environmental Justice population, the DEIR should establish a public involvement plan (PIP) to engage nearby Environmental Justice populations during the remainder of the MEPA review process. This Draft PIP is intended to meet that obligation.

This Draft PIP contains a description of measures undertaken by the City to promote public involvement by such Environmental Justice populations through both the MEPA review process and will subsequently be utilized during the Massachusetts Department of Environmental Protection (MassDEP) permit application process that will follow for the Project, including best practices listed in the MEPA Public Involvement Protocol for Environmental Justice Populations (the "MEPA Environmental Justice Public Involvement Protocol") that the City has or intends to employ. Through the development of the Draft PIP, the City has consulted with the Energy and Environmental Affairs Office of Environmental Justice and Equity and the MEPA Office regarding community engagement strategies appropriate for the Project on October 3, 2023, March 16, 2024, and July 18, 2024. This Draft PIP is intended to be a living document and may be revised as necessary during the course of the Project. If revisions are proposed, the City will add the proposed changes to the online information repository and will send a notice of the availability of the revised PIP to the email list (**Attachment 1 and 2**). The draft PIP will be appended to the DEIR when filed with MEPA; however, will continue to be utilized and updated through the MassDEP permit approval process.

The Draft PIP has been distributed to those listed on the expanded Environmental Justice Reference List (see **Attachment 1**), which includes all Community Based Organizations, relevant tribes/indigenous organizations (as applicable), all statewide entities, and those located in municipalities within one mile of the Project Site. Finally, a public information meeting about the Project will be held on February 10, 2025, from 6pm-8pm at 95 Pleasant Street, Room 121, Gardner, MA 01440 before filing the DEIR.

In addition to the above, the Draft PIP contains background information on the Project Site; lists public involvement that has occurred to date; describes proposed public involvement activities; and presents a schedule for those activities; explains how community concerns will be address through the process; outlines the roles and responsibilities of those involved in implementing the Draft PIP; and describes how the Draft PIP will be revised in the future to incorporate feedback from the public.

# PROJECT DESCRIPTION

## PROPOSED PROJECT

As described in the Environmental Notification Form, the City is proposing the Project, which would construct an 8.75-acre expansion to the existing sludge landfill located at 850 West Street, Gardner (H32-16-4; Route 68) (Project). The Project will include three cells and increase the capacity of the landfill by approximately 276,500 cubic yards, which is conservatively projected to accommodate the City's sludge production for at least seventeen years or until 2044. The Project is immediately to the west of the existing landfill and will allow for continued sludge landfill operations as an extension of the western face. Construction of the Project involves the removal of vegetation and forested area, then removing up to 20 feet of soil and regrading the Project Site to establish a sub-base. The subbase will be a minimum of 4 feet above the seasonal high groundwater elevation. The Project would leave the remaining 102.2 acres on the Project Area undeveloped.

## BACKGROUND

Sludge, defined as "Sewage sludge" is solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works (40 Code of Federal Regulations (CFR) 503.9(w))." Sewage sludge includes, but is not limited to, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment processes; and a material derived from sewage sludge. Sewage sludge does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screenings generated during preliminary treatment of domestic sewage in a treatment works (40 CFR 503.9(w)).

Sludge is a natural byproduct of the wastewater treatment process requiring disposal. The City's Wastewater Treatment Facility (WWTF), located on Plant Road in the adjacent Town of Templeton, MA, serves approximately 20,000 City residents (about 95 percent of the City's population), 1,680 Town of Ashburnham residents (about 25 percent of the Town's population), and 150 East Templeton residents (about 2 percent of the Town's population). Sludge or wastewater treatment residuals are generated during the primary and secondary treatment stages at the WWTF and require the City to have a place to dispose of this solid material. The City's Sludge Landfill is a lined facility dedicated to the disposal of the City's WWTF sludge removed during both the primary and secondary stages of the City's wastewater treatment process.

The City's Sludge Landfill was originally site-assigned, which is a process that determines if a piece of land is appropriate for a solid waste management facility, as a 37.65-acre site in August 1986 by the Department of Environmental Quality Engineering at its current location in the Project Area.[1] While a larger parcel was site-assigned, the disposal needs at the time only required the City develop approximately 9.7-acres to create the Sludge Landfill. Developing the site as needed

[1] Note the current MassDEP Residuals Management Program policy on the Design and Operation of Sludge Landfills states that such sludge-only disposal facilities are not subject to the site assignment requirements of Chapter 111, Section 150A (MassDEP Residuals Management Program. (1983) *Policy on the Design and Operation of Sludge Landfills*. Retrieved from https://www.mass.gov/doc/sludge-landfills-design-operation/download).

has allowed the City to be flexible to changing regulations and best available technologies to protect human health and the environment. The current lined area of the landfill occupies approximately 7.3 acres and has been in operation since November 1990. Originally approved with a volumetric capacity of approximately 140,000 cubic yards, this volume provided a life expectancy of approximately 25 years at a maximum generation rate of 80-100 cubic yards per week (4,160-5,200 cubic yards per year). The landfill was later vertically expanded through a permit application and authorization to construct issued from the MassDEP on February 3, 2016. With this vertical expansion, the capacity of the landfill was increased by 107,000 cubic yards and the lifespan was extended.

Sludge is thickened at the WWTF using gravity thickeners and a centrifuge. In 2019 as part of a WWTF improvement project, the original belt press dewatering process equipment was replaced with centrifuge dewatering process equipment. Conversion from belt press dewatering to centrifuge dewatering has improved the average dewatered sludge cake total solids content from a range of 19 percent to 23 percent with the belt press to a range of 25 percent to 30 percent with the centrifuge. Wet sludge requires addition of sand so that it is workable on the landfill. The drier sludge cake requires addition of less sand. Currently, the dewatering and hauling of the sludge cake occurs four days a week with two truckloads per day. Sludge is transported from the WWTF in Templeton to the landfill. At the landfill, the sludge is mixed with sand, dirt, and gravel to allow it to be easily spread and covered. The change to centrifuge dewatering has increase the expected lifespan of the landfill. It is now anticipated that capacity of the landfill would be reached between 2027 and 2030.[2]

## PURPOSE AND NEED

The receipt and disposal of sludge at the landfill is a critical component of municipal wastewater treatment infrastructure which prevents raw sewage from contaminating local waters. The existing Sludge Landfill is anticipated to reach capacity between 2027 and 2030. Therefore, the aim of the Project is to increase the capacity of the Sludge Landfill to continue to accept sewage sludge from the City's WWTF.

Sludge placement in the landfill is anticipated to continue at the current rate based on population projections remaining constant for the next twenty years. There are no plans to expand the sewerage collection system that contributes to the sludge landfill, and there are no intentions to import sludge from other sources. Similar to the existing sludge landfill, inspections and monitoring of the landfill expansion will be performed in accordance with applicable regulations to control odor, dust, and vectors; however, with the Project, measures would be included to improve leachate collection, manage stormwater, and reduce erosion over existing conditions.

The City has been operating and consistently improving their WWTF to manage the waste stream generated from the citizens of the City of Gardner, Town of Ashburnham, and East Templeton. The operation of the WWTF has allowed the City to improve the conditions in the Otter River. One of the end products of the WWTF is sewage sludge, and the City is responsible for managing this waste. The City has been and continues to explore options that are feasible, permittable, and

[2] Lifespan projection is updated based on annual reporting. As of July 2024, the capacity of the landfill is anticipated to be reached between 2027 and 2030.

provide a cost-effective option. In evaluating options, the City is responsible for providing the service of managing the City's wastewater in a manner that works to maintain a reasonable cost especially in light of the fact that portions of the City are within state-designated "Environmental Justice" block groups with the criteria "Income."

## PROJECT LOCATION

The Project Site is immediately West of the existing 9.7-acre Sludge Landfill and includes undeveloped City-owned property that is forested (see **Figures 1 and 2**). The Project Site is zoned Rural Residential (RR2). Municipal uses, defined by City Code Chapter 675 Zoning as "Facilities owned or operated by the City" are permitted within the RR2 zone.[3] Although no formal easement has been found on record, the Esker Ridge Trail, as identified on the City of Gardner Parks, Open Space & Trails GIS Web App, traverses the Project Site (see **Figure 3)**.[4]

With the Project, the existing sludge landfill site would be expanded to incorporate the 8.75-acre footprint of the sludge landfill expansion. The Project Site footprint would include the proposed groundwater protection system and disposal area, new leachate pumping system, force main, 12-foot-wide perimeter gravel access road and a stormwater management system consisting of a perimeter swale, bioretention area at the north end of the site and infiltration basins to the west and south.

## CHARACTERISTICS OF ENVIRONMENTAL JUSTICE POPULATIONS

As depicted on the Energy and Environmental Affairs Office of Environmental Justice and Equity environmental justice map viewer, there are 10 Block Groups identified as located in whole or in part within 5 miles of the Project Site (see **Figure 4**).[5] Of these Block Groups in the City of Gardner, eight are identified as an Environmental Justice population based on the income criterion, one is identified as an Environmental Justice population based on the minority criterion, and one is identified as an Environmental Justice population based on both minority and income criteria (see **Table 1**).



[3] City of Gardner, MA. *Zoning Map.* Retrieved from https://gardner.maps.arcgis.com/home/index.html.
[4] City of Gardner, MA. *Parks, Open Space & Trails.* Retrieved from https://gardner.maps.arcgis.com/home/index.html.
[5] These data were obtained from https://www.mass.gov/info-details/massgis-data-2020-environmental-justice-populations.

Bridge St

West St

Bridge St

West St

Wildwood Cemetery

Solar Farm

Former Solid Waste Landfill

Saint John's Cemetery

Notre Dame Rd

St Johns Rd

St Johns

ner St

Otter River

Sludge Landfill

Cummings Conservation Area

Notre Dame Cemetery

INSET

Albany

Nashua

Lowell

Gardner, MA

Boston

Worcester

Springfield

Plymouth

Hartford

Providence

New Bedford

Waterbury

RHODE ISLAND

## Project Location

City of Gardner, MA
Gardner Sludge Landfill Expansion

**Worcester County, MA**

*Legend*

Project Area

Project Site

0 50 100 200 300 400 500 Feet

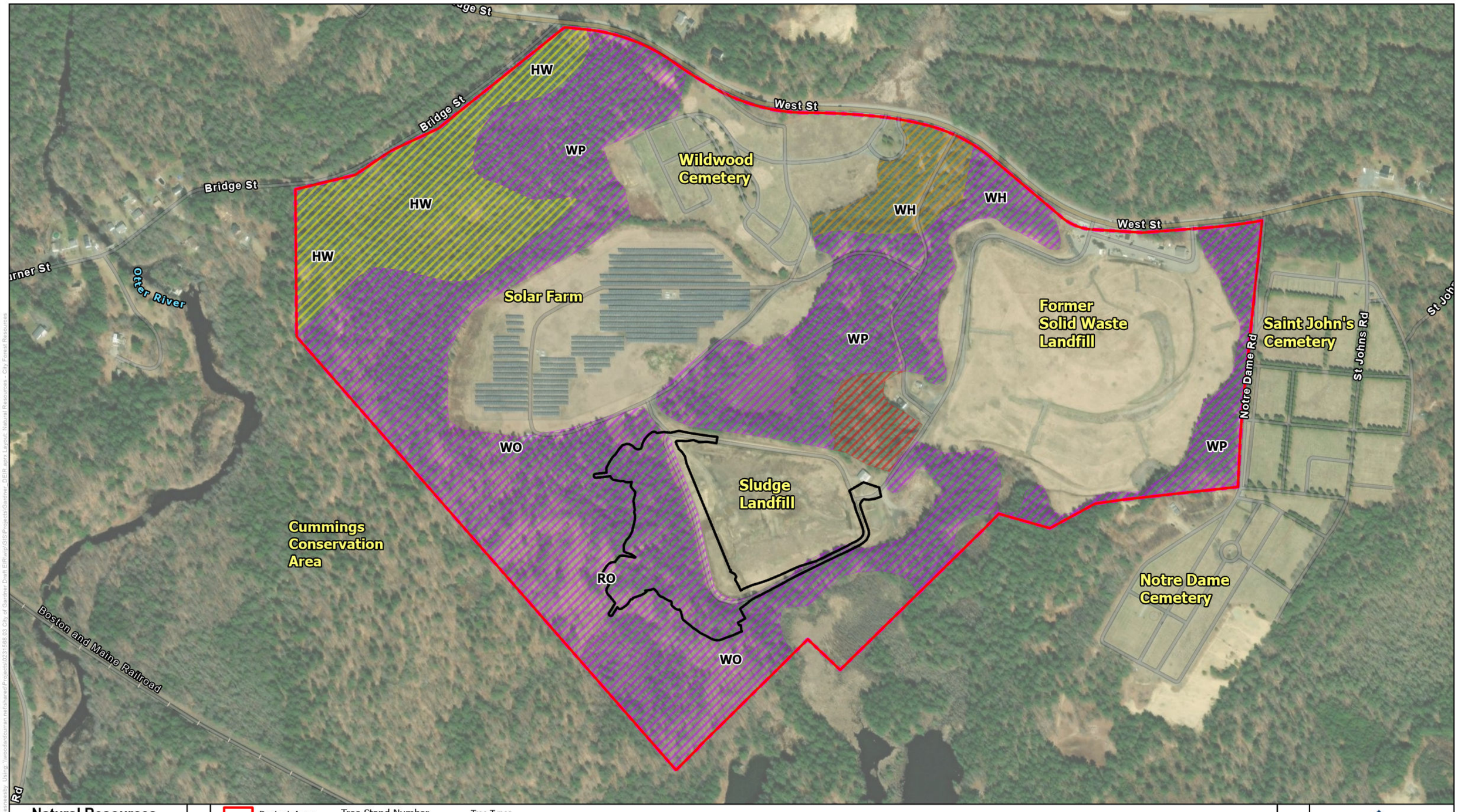
N

Woodard & Curran

Project #: 0231568.03
Map Created: July 2024



**Figure 1**




**Natural Resources - City Forest Resources**

City of Gardner, MA
Gardner Sludge Landfill Expansion
**Worcester County, MA**

*Legend*

- Project Area
- Project Site

Tree Stand Number
- Stand 1
- Stand 2
- Stand 3
- Stand 5

Tree Types
WO = White Oak
RO = Red Oak
WP = White Pine
WH = White Pine Hardwood
HW = Hemlock White Pine

0 50 100 200 300 400 500 Feet

N

Woodard & Curran

Project #: 0231568.03
Map Created: July 2024



**Figure 2**

Bridge St
Bridge St
West St
West St
Wildwood Cemetery
Solar Farm
Former Solid Waste Landfill
Saint John's Cemetery
St Johns Rd
Notre Dame Rd
Sludge Landfill
Cummings Conservation Area
Notre Dame Cemetery
Boston and Maine Railroad
Project Site
Clark St

# City of Gardner Parks, Trails, and Open Space

City of Gardner, MA
Gardner Sludge Landfill Expansion

**Worcester County, MA**

*Legend*

- Project Area
- Project Site
- Trails

**City of Gardner Open Space Ownership Records**

- Municipal
- Private

**MA State Open Space Ownership Records**

- Land Trust
- Municipal
- Private Non-Profit
- Private
- MA Open Space Legal Interest

0 50 100 200 300 400 500 Feet

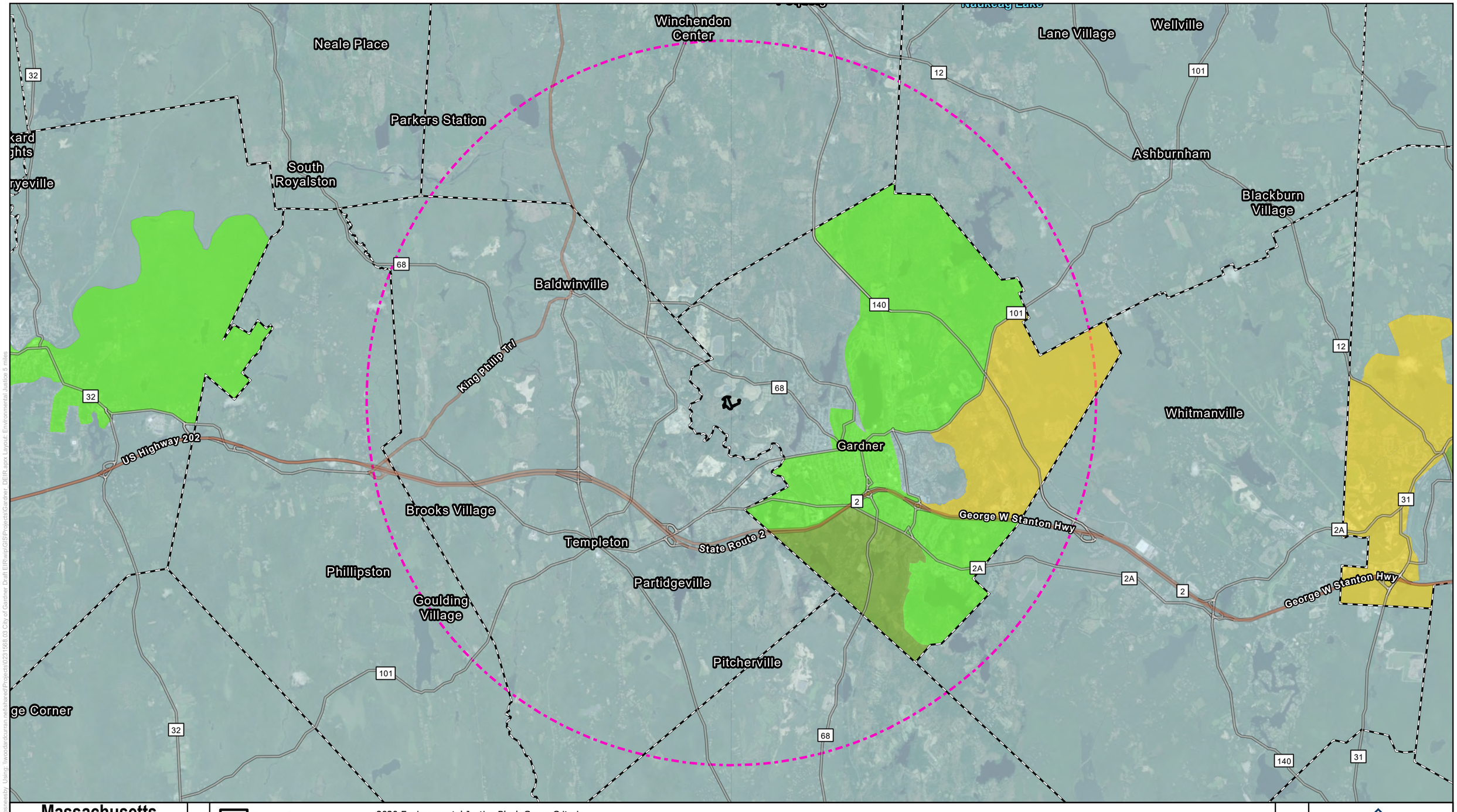
N

Woodard & Curran

Project #: 0231568.03
Map Created: July 2024



**Figure 3**




# Massachusetts 2020 Environmental Justice Populations

City of Gardner, MA
Gardner Sludge Landfill Expansion
**Worcester County, MA**

*Legend*

- Project Site
- Surrounding Area (5 miles)
- Municipal Boundaries

2020 Environmental Justice Block Group Criteria

- Minority
- Income
- Minority and Income
- No Environmental Justice Concerns

0 0.5 1 2 3 4 5 Miles

N

Woodard & Curran

Project #: 0231568.03
Map Created: August 2024

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions.
Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources:** These data were obtained from https://www.mass.gov/info-details/massgis-data-2020-environmental-justice-populations

**Figure 4**

**Table 1: Environmental Justice Characteristics by Block Group of Populations within 5-miles of the Project Site**

| Block Group | Census Tract | Population | Households | Criterion[1] | Minority Population | Median Household Income | Households with Language Isolation |
|---|---|---|---|---|---|---|---|
| 2 | 7074 | 1,196 | 586 | Income | 17% | $50,074 | 0% |
| 1 | 7075 | 2,053 | 781 | Income | 21% | $49,097 | 4% |
| 2 | 7072 | 1,125 | 595 | Income | 20% | $30,947 | 7% |
| 3 | 7073 | 1,059 | 535 | Income | 24% | $38,994 | 0% |
| 1 | 7073 | 1168 | 545 | Income | 17% | $30,972 | 4% |
| 2 | 7073 | 1,829 | 843 | Income | 18% | $36,219 | 1% |
| 2 | 7075 | 2,123 | 524 | Minority | 35% | $67,941 | 2% |
| 1 | 7072 | 995 | 364 | Income | 23% | $49,531 | 0% |
| 2 | 7071 | 2,232 | 841 | Income | 16% | $47,460 | 1% |
| 1 | 7071 | 1,853 | 764 | Minority and Income | 28% | $44,167 | 3% |

**Note:** [1]For a population to be designated under the "income," criterion, the annual median household income of a geographic area must be 65 percent or less of the statewide annual median household income. For a population to be designated under the "minority" criterion, minorities must make up 40 percent or more of the population. For a population to be designated under the "minority and income" criterion, minorities must make up 25 percent or more of the population and the annual median household income of the municipality in which the neighborhood is located does not exceed 150 percent of the statewide annual median household income.

There are no state-designated Environmental Justice Block Groups identified as located in whole or in part within one mile of the Project Site (see **Figure 5**).

Energy and Environmental Affairs Office of Environmental Justice and Equity 's languages spoken map does not identify languages spoken by 5 percent or more of the Environmental Justice population who also identify as not speaking English "very well."

The Massachusetts Department of Public Health reports that Gardner meets the Vulnerable Health Environmental Justice criterion for heart attack, childhood blood lead, low birth weight, and childhood asthma.[6]

[6] https://matracking.ehs.state.ma.us/Environmental-Data/ej-vulnerable-health/environmental-justice.html

## POTENTIAL EFFECTS ON ENVIRONMENTAL JUSTICE POPULATIONS

MEPA protocols require additional consideration of effects on Environmental Justice Populations when they are within one mile of a project, or, when within 5 miles the project, would generate 150 or more new average daily trips of diesel traffic (excluding public transit trips) over a duration of one year or more (301 CMR 11.03(8)(b)). As there are no Environmental Justice populations within one mile of the Project Site (see **Figure 5**) and the Project does not introduce 150 average daily trips annually of diesel traffic, the Project is not reasonably likely to negatively affect Environmental Justice Populations located within the designated geographic areas around the Project Site. However, due to comments received during the MEPA review process on the Environmental Notification Form, further review of the Project's effects to Environmental Justice communities has been completed. The likely effects of the Project, along with the mitigation measures the Project will undertake to minimize, avoid, and mitigation these potential impacts, include the following:.

- **Cost.** With the Project, the cost of sanitation services is likely to remain lower and exhibit more stability than with the Project's alternatives. Lower Project and sanitation service costs will collectively benefit Environmental Justice communities by prudently investing City funds to avoid long term rate increases or capital costs that would cause a greater effect on Environmental Justice communities. Therefore, the Project would not result in an increased or disproportionate effect on Environmental Justice Populations with respect to cost of sanitation services.
- **Air.** With the Project, there would be no new stationary sources and average daily trips of diesel vehicle traffic would remain unchanged. Therefore, the Project would not result in an increased or disproportionate effect on Environmental Justice Populations with respect to air emissions.
- **Traffic.** With the Project, there would be no increase in traffic or change in traffic patterns. Therefore, the Project would not result in an increased or disproportionate effect on Environmental Justice Populations with respect to traffic.
- **Odor.** With the Project, sludge landfill operations are not proposed to increase from existing operations and landfilling would continue at the same rate and quantity. Therefore, there would be no new air quality and/or odor impact with the implementation of the Project. Odors are proposed to continue to be managed through operational practices. In existing conditions, odor complaints are made sparingly (0 to 3 times per year), are generally made in the spring and fall seasons when weather conditions exacerbate odors and are generally made more frequently in closer proximity to the existing landfill. A seasonal odor issue with limited formal complaints that are made from locations in close proximity to the existing facility does not constitute a significant adverse impact with respect to odor. However, with the Project, mitigation measures are proposed. Odor is an inherent biproduct of any wastewater/wastewater residual operation and no technology (e.g., anaerobic digestion, incineration, composting, hydrothermal carbonization) offers an odorless alternative. To mitigate odors associated with the existing landfill, the Project would implement an interim cover and cap portions of the existing

# Massachusetts 2020 Environmental Justice Populations

City of Gardner, MA
Gardner Sludge Landfill Expansion
**Worcester County, MA**

*Legend*

- Project Site
- Surrounding Area (1 mile)
- Municipal Boundaries

2020 Environmental Justice Block Group Criteria

- Income
- No Environmental Justice Concerns

0 250 500 1,000 1,500 2,000 2,500 Feet

N

Woodard & Curran

Project #: 0231568.03
Map Created: July 2024

**Figure 5**

landfill no longer receiving sludge. It is anticipated that this would occur in Quarter 3 of 2028. Additionally, it is proposed that, with the Project, a new detailed complaint form would be implemented to ensure consistency of information collected and investigated to be included in future Annual Operations Reports. Furthermore, the Project will include a fact sheet on air quality and odors and its relationship to public health; information on the protocol for filing an odor complaint; information on sludge landfill operations and when the public is likely to experience odors from sludge handling activities; and an online survey on the City's website and advertised on the City's social media accounts. The survey will assist the City in determining if odors are emanating from the sludge landfill (and not other potential contributors of odor in the City) and if so if they are affecting state-designated Environmental Justice populations. Survey data will be tracked and mapped, helping the City gain a better understanding of existing odor concerns, and will inform changes in operational practices and future odor reduction projects pursued by the City. Finally, the City would continue to explore technologies that reduce odors and the feasibility of their implementation on a continual basis.

For questions regarding the City's Sludge Only Landfill or to report an odor complaint please contact VEOLIA at 978-630-8791 during normal business hours. After business hours, sludge landfill complaints can be reported by calling the non-emergency number for the Gardner Police Department dispatch at 978-632-5600 and leaving call back information and a brief description of the complaint. The complaint is forwarded to the appropriate on-call staff for follow-up. When reporting a complaint please provide the exact location and time of the complaint so VEOLIA operators can respond appropriately.

- **Land disturbance.** With the Project, approximately 8.75 acres of vacant municipal owned land that is forested would be disturbed to construct the Project. The Project Site has been considered for sludge landfill expansion and municipal use since the 1980s. While part of the Esker Ridge Trail goes beyond the Cummings Conservation Area boundaries onto the Project Site and would be removed to facilitate the Project, Environmental Justice populations would not be directly affected. Environmental Justice communities may be indirectly affected by loss of a section of trail; however, the effect is limited as the Project does not affect the Conservation Area that maintains the trails on its parcel and Environmental Justice communities would still have access to those trails. Therefore, there would be no significant adverse land disturbance effects to Environmental Justice Populations.
- **Stormwater.** With the proposed measures in-place (bioretention pond, infiltration basins, etc.), and regular maintenance of the stormwater features in accordance with the Massachusetts Stormwater Handbook to be outlined in the Project's Operation and Maintenance Plan, no stormwater effects are anticipated with the Project. Therefore, there would be no adverse stormwater effects to Environmental Justice Populations.
- **Groundwater.** The Project would be constructed with a double composite (a type of material where two layers of different composite materials are combined together) groundwater protection system with leak detection meeting the 310 CMR 19.110 standards for a solid waste landfill. As defined by 310 CMR 19.006, a groundwater

protection system is an engineered system that may include without limitation, liners, and barrier structures; leachate collection, storage, and disposal systems; drainage systems and/or other technologies intended to prevent the migration of leachate into and contamination of the groundwater. The groundwater protection system would be constructed on top of the subbase to act as a barrier to separate the applied sludge and any generated leachate from the groundwater resources beneath it. The groundwater protection system will consist of the following components, which will be installed in the order below (from the bottom of the liner in contact with the subbase to the top of the liner in contact with sludge/leachate):

- Low Permeability Layer - a low permeability layer will cover the subbase with one-foot of compacted low hydraulic conductivity soil, a geosynthetic clay liner, and a high-density polyethylene geomembrane;
- Leak Detection and Secondary Leachate Collection System - a leak detection and secondary leachate collection system would be installed over the low permeability layer;
- Primary Low Permeability Layer - a primary low permeability layer with a geosynthetic clay liner and high-density polyethylene geomembrane would be installed to cover the leak detection and secondary leachate collection system;
- Primary Leachate Collection System - a primary leachate collection system would be installed over the primary low permeability layer; and
- A one-foot layer of sandy soil material and stone would be installed over the primary leachate collection system to protect the underlying components of the GWPS. Once operational, sludge would be placed on top of this layer.

Similar to existing conditions, leachate produced by the Project would be directed to the City's existing sewerage collection system. As defined by Federal regulation 40 CFR 257.2, leachate is a liquid that has passed through or emerged from solid waste and contains soluble, suspended, or miscible materials removed from such waste. A 15,000 square foot portion at the southernmost and lowest end of Cell One will be used as a detention area to which leachate from the remainder of Cell One and Cells Two and Three will be directed. Leachate will be pumped out of the landfill and into the existing leachate conveyance system. From there, the leachate pump station delivers it to a gravity sewer main in West Street where it can flow to the existing WWTF for treatment. The leachate collection and conveyance system for the Project was designed to accommodate precipitation that would become leachate under worst case extreme storm conditions.

Anticipated changes to groundwater flow within the Project Site post-construction are expected to be minimal. Groundwater elevations appear slightly elevated in the Project Site compared with pre-construction modeling and the effects of the planned stormwater ponds on the water table are expected to be minimal. With the Project, monitoring wells CDR-1, CDR-4, and CDR-6/6A would need to be decommissioned. Based on hydrogeologic modeling, the proposed groundwater protection system and the implementation of the monitoring and sampling plan, impacts to groundwater are not

anticipated with this Project. Therefore, there would be no adverse groundwater effects to Environmental Justice Populations. To ensure the protection of groundwater resources, two additional monitoring wells are proposed to be installed. An additional monitoring well, designated SL-4, will be installed upgradient of the landfill near the north entrance road at the southern edge of the solar field that will exhibit background groundwater characteristics; and an additional downgradient monitoring location (CDR-5) is proposed to assist with evaluating potential effects on groundwater from the Project. To further protect groundwater resources, the environmental monitoring and reporting would include these two additional monitoring wells.

- **Construction.** The Project Site is located in a sparsely populated area and away from potential sensitive receptors. Construction vehicles would enter the Project Area from West Street and construction activities are expected to take place within the Project Site. Therefore, the construction period effects would be minimal to unnoticeable.

  The following measures would be implemented to control construction-related noise:

  - Using appropriate mufflers on all equipment and ongoing maintenance of intake and exhaust mufflers;
  - Muffling enclosures on continuously running equipment;
  - Replacing specific construction operations and techniques with less noise-producing ones, where feasible;
  - Selecting the quietest of alternative items of equipment, where feasible;
  - Scheduling equipment operations to keep average noise levels low, to synchronize the noisiest operations with times of highest ambient levels, and to maintain relatively uniform noise levels; and
  - Turning off idling equipment.

  The following measures would be implemented to minimize dust:

  - Using wetting agents on areas of exposed soil on a scheduled basis;
  - Using covered trucks;
  - Using stone aprons to clean the tires of construction vehicles entering and exiting the Project Site;
  - Minimizing spills on the construction site;
  - Monitoring of construction practices to reduce unnecessary transfers;
  - Minimizing mechanical disturbances of loose materials;
  - Minimizing storage of debris on the construction site; and
  - Periodic street and sidewalk cleaning with water to minimize dust accumulations.

  To prevent the tracking of Project Site soil into the public roadways, a stabilized construction entrance shall be established, such that the tires of each vehicle exiting the Project Site are free of soil and dust that could be tracked into the street or otherwise mobilized. All truck tires and equipment would be cleaned as necessary prior to leaving

the Project Site. If necessary, additional measures such as a tire wash area may be necessary to achieve the performance objectives.

To protect water quality, the Project would comply with the specifications and conditions set for in the Order of Conditions. A Stormwater Pollution Prevention Plan would be prepared in accordance with U.S. Environmental Protection Agency's (EPA) National Pollutant Discharge Elimination System (NPDES) Construction General Permit. Pursuant to 40 CFR 450.21, the EPA establishes minimum NPDES effluent limitations. The City and its selected Contractor would comply with these requirements, which include:

- Design, install, and maintain effective erosion and sediment controls, and pollution prevention measures, to minimize the discharge of pollutants;
- Stabilize disturbed areas immediately when construction has ceased and would not resume for more than 14 days;
- Prohibit the dewatering discharges unless managed by appropriate controls;
- Prohibit the discharge of:
- Wastewater from concrete washout (unless managed by appropriate control), or washout/cleanout of stucco, paint, form release oils, other wastewater materials;
- Fuels, oils, or other pollutants used for vehicles; and
- Soaps or solvents to wash vehicles and equipment.

Erosion and sediment controls would be installed by the selected Contractor as required by and shown on the final design drawings to prevent erosion, sedimentation, and the discharge of other pollutants during construction and other land disturbing activities. These measures would be maintained and kept in place until the disturbed areas of the Project Site have fully stabilized.

With the proposed construction-related mitigation measures, no construction related impacts to Environmental Justice Communities are anticipated with the Project.

## MEASURES TO ENHANCE PUBLIC INVOLVEMENT

Activities undertaken to involve the public serve the following objectives:

- to provide clear and transparent information to the public about Project impacts and associated mitigation measures, with particular consideration of Environmental Justice communities potentially facing existing unfair or inequitable environmental burdens;
- to provide opportunities for public involvement;
- to solicit concerns from the public; and
- change/adjust the Project to address public concerns as appropriate and feasible.

Public outreach will include information and discussions around topics such as project need,

project benefit, project costs, odor control, and potential environmental impacts.

To meet each of these objectives, the City proposes to undertake specific activities as described below.

**Informing the Public**

The City understands the importance of public participation for the Project. During the course of the DEIR preparation process, this Public Involvement Plan outlines the specific steps anticipated to engage with the public and the project stakeholders.

The City will provide Project information to the public by establishing an electronic information repository; establishing repositories for hard copy access of presentation materials and the DEIR, once available; hosting public information meeting(s); and developing and maintaining a Project emailing list to distribute Project updates and the DEIR, once available. Efforts to notify the public of the public information meeting in advance of noticing requirements will be made.

All materials and information regarding Project will be written and/or spoken in a way that is understandable to the public. The City will make its best effort to avoid jargon or overly technical language and utilize clear visuals to convey more complex aspects of the Project.

## Audience Identification

A critical step in successful outreach is understanding the audiences to whom the City will be communicating. The following are types of audiences the City anticipates communicating with:

- Environmental Justice communities (described above);
- Petitioners;
- Interested residents;
- Site abutters;
- Municipal officials (staff and elected);
- State officials (staff and elected);
- Regulatory agencies; and/or
- General public.

It is important to note that stakeholders could fit into multiple audience types or could change audience type based on timing, key issues, current events, or other factors.

It is similarly important to note that special consideration will be given to engaging environmental justice communities including targeted outreach, community involvement, and special meetings.

To evaluate the presence of limited English proficiency populations, The City referred to the Energy and Environmental Affairs Environmental Justice Maps viewer. There are no languages other than English that are spoken by 5 percent or more of residents within five miles of the Project Site. If updates on the Energy and Environmental Affairs Environmental Justice Maps results in the identification of language(s) spoken by 5 percent or more of residents within one mile of the Project Site, the need for interpretation and translation services will be reevaluated

and updated in the Draft PIP.

The City has acquired an Environmental Justice Reference List from MEPA (**Attachment 1**) and will make every effort to engage with pre-existing groups on this list to identify Environmental Justice outreach strategies and disseminate information about the Project. Additionally, the City will disseminate information in commonly visited areas such as libraries and community centers for those who do not have internet access.

# COMMUNITY OUTREACH AND ENGAGEMENT

### Public Involvement History

The following is a list of public involvement opportunities that have occurred:

- January 18, 2024 – Public presentation on Alternative 2, Hydrothermal Carbonization Study by SoMax, hosted by Gardner Clean Air at West End Beagle Club, Gardner, MA.
- December 19, 2023 – Presentation by Fitchburg's City Engineer to Fitchburg City Council on Alternative 1, planned Biosolids Management Facility
- April 3, 2023 – MassDEP site visit scheduled for Appeal of the Gardner Conservation Commissions Order of Conditions approved in November 2022.
- January 17, 2023 – MEPA site visit conducted with attendance from members of the public. Concerns raised during the site visit included the potential for landfill liner leakage, contamination of drinking water wells, and the City's limited consideration of alternatives.
- December 23, 2022 – The City of Gardner submits an Environmental Notification Form, which was posted in the December 23, 2022 Environmental Monitor, starting a 20-day public comment period for the MEPA review process. Public comments were due January 12, 2022. The review period was subsequently extended to January 31, 2023, allowing additional time for public comment.
- November 14, 2022 – Gardner Conservation Commission issued Order of Conditions.
- October 24, 2022 – Third Conservation Commission Public Hearing
- August 22, 2022 – Secord Conservation Commission Public Hearing (held in person and via Zoom)
- July 25, 2022 – First Conservation Commission Public Hearing
- October 17, 2016 – Public Hearing for New/Expanded Sludge Landfill held in the City Council Chamber, Room 219, City Hall, 95 Pleasant Street, Gardner, Massachusetts. Electronic flyers were also distributed to the Town of Templeton.
- October 6, 2016 – Notice of public hearing for new/expanded sludge landfill. Notice was given that the City Council would conduct a Public Hearing on Monday, October 17, 2016, at 6:00 PM in the City Council Chamber, Room 219, City Hall.
- September 16, 2016 – Informal Meeting of the City Council was held in the City Council Chamber Room, Room 219, City Hall. A presentation was given by CDR Maguire, Inc. on the history and future of sludge disposal in the City of Gardner, including wastewater

treatment development background and recent activities, a summary of the evaluation completed for new WWTF dewatering technology, and a review of alternatives for disposing sludge

- October 5, 1983 – Public Hearing for Industrial Pretreatment Program and Sludge Disposal Site Evaluation and Management Program

**Proposed Community Outreach and Engagement**

**Public Information Meeting**

The City will brief the public about Project milestones during public information meeting(s) to provide Project information, allow for questions, collect emails for future information distribution, and distribute printed materials.

A public information meeting will be held on February 10, 2025, from 6pm-8pm at 95 Pleasant Street, Room 121, Gardner, MA 01440. The City will provide a presentation that explains the Project and provide ample time for public input.

The City will distribute information at least 14 days in advance of public information meeting(s) to the local media, as well as posting notices online. Further, the City will send notices announcing the public information meeting to individuals on the email list and those listed in **Attachments 1 and 2** of this Draft PIP. Notice of the public meeting will also be posted physically in libraries, churches, senior centers, community centers, and other frequently visited areas to reach audiences without technological access or limited technology literacy.

To accommodate Environmental Justice communities, the City will:

- Ensure the public information meeting time is selected to maximize participation from Environmental Justice populations (such as scheduling during evening hours or over the weekend);
- Ensure that the public information meeting location is Americans with Disabilities Act accessible;
- Ensure the public information meeting location is accessible via public transportation; and
- Record and publish the meeting to provide virtual access.

During public information meeting(s), interested parties will have the opportunity to hear a presentation, ask questions and provide comments. Meeting recordings will be posted to the online repository for public review. Comments heard at the public information meeting will be noted and will be appended to the DEIR along with an explanation of how comments were addressed.

The need for additional public information meetings to discuss general or specific aspects of the Project, or with the goal of reaching particular Environmental Justice populations ahead of subsequent EIR filings will be assessed through feedback from community members and at the direction of the Secretary.

**Webpage Content and Social Media**

The City will update as necessary their webpage for the Project. The webpage is located at the

following link: https://www.gardner-ma.gov/1276/Sludge-Landfill-Expansion. The website will serve as the public repository for all documents related to the Project. The website will additionally allow a "Contact Us" function to submit questions. Alternatively, the public may email slf@gardner-ma.gov. Interested parties will be able to sign up for the email distribution list (**Attachment 1**) on the webpage.

Social media will be used to publicize the public information meeting and provide updates such as new Project information being posted to the webpage.

**Materials Development**

The City will prepare the following printed materials for information distribution to the public. In the event that materials need to be targeted to specific audiences, multiple versions may be created:

- Project summary;
- Fact sheets;
- Frequently Asked Questions; and
- Presentations for meetings.

These materials will be distributed as information becomes available and is appropriate to share. For instance, Project summaries and presentations will be prepared and posted to the Project website following the public information meeting. Materials may require updates and new materials will be created as necessary to provide the public with updated information.

A fact sheet, using the MassDEP permitting template describing the Project, has been developed and is currently on the City's website. Thie fact sheet will be updated as appropriate and distributed by the City to the appropriate local distribution outlets prior to the issuance of a draft permit.

**Information Repositories**

The City will establish and maintain a local online information repository to provide the community with access to information about the Project. Information will be added to the repository as it is developed. The information repository for the City of Gardner Sludge Landfill Expansion is available at https://www.gardner-ma.gov/1276/Sludge-Landfill-Expansion

The City will also establish and maintain a physical information repository. Information will be added to the repository as it is developed. The physical information repository for the City of Gardner Sludge Landfill Expansion is located at City Hall 95 Pleasant Street, Gardner, MA 01440. Additionally, a physical information repository will be at the Levi Heywood Memorial Library, located at 55 West Lynde Street, Gardner, MA 01440.

**Email and Mailing Distribution List**

The City will maintain an email distribution list of interested parties who have internet access for the Project. Interested parties will have the ability to sign up for the email list via the City website. The email distribution list will be used to announce upcoming public information meetings, distribute fact sheets, provide notices of public comment periods on, the availability of documents

in online and physical information repositories, and any other updates about the Project.

The City has acquired an Environmental Justice Reference List from MEPA and will look to engage with pre-existing groups on this list to identify Environmental Justice outreach strategies and disseminate information about the project. In addition to the Environmental Justice references provided by MEPA, additional community-based organizations were identified through public comments on the Environmental Notification Form (see **Attachment 1**). Those community-based organizations have been included in the distribution list and included in the circulation list for the DEIR (**Attachment 2**).

The City will maintain the mailing list and update it as necessary. The City will provide MassDEP with a copy of the mailing list. Anyone wishing to be added to the mailing list can subscribe on the website https://www.gardner-ma.gov/1276/Sludge-Landfill-Expansion.

**Response to Comments**

As part of the DEIR, the City will include responses to comments made on the Environmental Notification Form. The DEIR is anticipated to be filed in early 2025. Upon receiving the DEIR, the MEPA Secretary shall publish the notice of the availability of the EIR in the next *Environmental Monitor* in accordance with 301 CMR 11.52(2), which begins the DEIR review period. The EIR review period lasts for 37 days. The public can comment on the DEIR through the *Environmental Monitor* website, found here: https://eeaonline.eea.state.ma.us/EEA/MEPA-eMonitor/home.

**Pre-filing Consultation**

As discussed above, through the development of the Draft PIP, the City has consulted with the Energy and Environmental Affairs Office of Environmental Justice and Equity and the MEPA Office regarding community engagement strategies appropriate for the Project on October 3, 2023, March 16, 2024, and July 18, 2024.

**Public Involvement Requirements After Filing**

As discussed above, the Draft PIP is a living document intended to be updated to reflect ongoing community outreach and engagement through the Project's environmental review and permitting process. The Draft PIP will serve as a guiding document through the MassDEP permit application process for the Project.

## SCHEDULE FOR PUBLIC INVOLVEMENT ACTIVITIES

It is anticipated that the DEIR will be filed with MEPA in early 2025.

The City of Gardner will circulate copies of the DEIR and offer one-on-one meetings with members of the public to field questions about the document. The City is prepared to host an additional public meeting prior to the submittal of the FEIR and pursuant to the best practices outlined in this PIP, depending on the requirement set forth in the DEIR certificate. Efforts towards meaningful public engagement will continue throughout the MEPA review process and subsequent agency approvals.

## REVISIONS TO THE PUBLIC INVOLVEMENT PLAN

This Draft PIP is intended to be a living document and may be revised as necessary during the

course of the Project. If revisions are proposed, the City will add the proposed changes to the online information repository and will send a notice of the availability of recommended changes to the email list. The draft PIP will be appended to the DEIR when filed with MEPA; however, will continue to be utilized and updated through the MassDEP permit approval process.

## ATTACHMENT 1

| Statewide Environmental Justice Community Based Organizations (Environmental Justice Reference List) | | | | | |
|---|---|---|---|---|---|
| **First Name** | **Last Name** | **Title** | **Phone** | **Email** | **Affiliation** |
| Claire | B.W. Muller | Movement Building Director | (508) 308-9261 | claire@uumassaction.org | Unitarian Universalist Mass Action Network |
| Julia | Blatt | Executive Director | (617) 714-4272 | juliablatt@massriversalliance.org | Mass Rivers Alliance |
| Jodi | Valenta | Massachusetts State Director | (617) 367-6200 | Jodi.Valenta@tpl.org | The Trust for Public Land |
| Kerry | Bowie | Board President | Not Provided | kerry@msaadapartners.com | Browning the GreenSpace |
| Sylvia | Broude | Executive Director | (617) 292-4821 | sylvia@communityactionworks.org | Community Action Works |
| Heather | Clish | Director of Conservation & Recreation Policy | (617) 523-0655 | hclish@outdoors.org | Appalachian Mountain Club |
| Brittney | Jenkins | Vice President | (617) 850-1761 | Bjenkins@clf.org | Conservation Law Foundation |
| Ben | Hellerstein | MA State Director | (617) 747-4368 | ben@environmentmassachusetts.org | Environment Massachusetts |
| Robb | Johnson | Executive Director | (978) 443-2233 | robb@massland.org | Mass Land Trust Coalition |
| Cindy | Luppi | New England Director | (617) 338-8131 x208 | cluppi@cleanwater.org | Clean Water Action |
| | | | (508) 505-6748 | info@n2nma.org | Neighbor to Neighbor |

| Statewide Environmental Justice Community Based Organizations (Environmental Justice Reference List) | | | | | |
|---|---|---|---|---|---|
| **First Name** | **Last Name** | **Title** | **Phone** | **Email** | **Affiliation** |
| Rob | Moir | Executive Director | Not Provided | rob@oceanriver.org | Ocean River Institute |
| Vickash | Mohanka | Director, MA Chapter | (617) 423-5775 | Vick.mohanka@sierraclub.org | Sierra Club MA |
| Heidi | Ricci | Director of Policy | Not Provided | hricci@massaudubon.org | Mass Audubon |
| **Local Community Based Organizations** | | | | | |
| David | Brule | President | (978) 248-9491 | watershed@millersriver.net | Millers River Watershed Council |
| Alan | Rousseau | Executive Director | (978) 618-5755 | rousseaua@verizon.net | Gardner Clean Air |
| Rebecca | Todd | Executive Director | (413) 772-2020 | crc@ctriver.org | Connecticut River Conservancy |
| John | Driscoll | General Manager | (978) 939-5323, x11 | jdriscoll@templetonlight.com | Town of Templeton Light and Water Department |

**ATTACHMENT 2**
**DEIR Circulation List (Draft)**

| | |
|---|---|
| Massachusetts Environmental Policy Act (MEPA)<br>Office<br>100 Cambridge Street, Suite 900<br>Boston, MA 02144<br>MEPA@mass.gov | Massachusetts Department of Transportation<br>District #3<br>Attn: MEPA Coordinator<br>499 Plantation Parkway<br>Worcester, MA 01605<br>Jeffrey.r.gomes@dot.state.ma.us |
| Massachusetts Environmental Policy Act (MEPA)<br>Office<br>Attn: EEA Environmental Justice Director<br>100 Cambridge Street, Suite 900<br>Boston, MA 02144<br>MEPA-EJ@mass.gov | Massachusetts Historical Commission<br>The MA Archives Building<br>220 Morrissey Boulevard<br>Boston, MA 02125<br>mhc@sec.state.ma.us |
| Massachusetts Department of Environmental Protection<br>Central Regional Office<br>Attn: MEPA Coordinator<br>8 New Bond Street<br>Worcester, MA 01606<br>Andrea.briggs@mass.gov | Montachusett Regional Planning Commission (MRPC)<br>464 Abbott Avenue<br>Leominster, MA 01453<br>mrpc@mrpc.org |
| Massachusetts Department of Environmental Protection<br>Residuals Management Program<br>Attn: Jennifer Wood, Residuals Statewide Coordinator<br>One Winter Street<br>Boston, MA 02108<br>Jennifer.wood@state.ma.us | Gardner City Council<br>George Tyros, President<br>95 Pleasant Street, Room 121<br>Gardner, MA 01440<br>gtyros@gardner-ma.gov<br>tsiriphan@gardner-ma.gov |
| Massachusetts Department of Transportation<br>Public/Private Development Unit<br>10 Park Plaza, Suite 4150<br>Boston, MA 02116<br>MassDOTPPDU@dot.state.ma.us | Gardner Community Development & Planning<br>Manca Annex<br>115 Pleasant Street, Room 201<br>Gardner, MA 01440<br>jstevens@gardner-ma.gov |
| Gardner Conservation Commission Manca Annex<br>115 Pleasant Street, Room 201<br>Gardner, MA 01440<br>jenright@gardner-ma.gov | Polish American Citizens Club<br>171 Kendall Pond Rd W<br>Gardner, MA 01440<br>paccinfo@comcast.net |

| | |
|---|---|
| Gardner Health Department<br>95 Pleasant Street, Room 29<br>Gardner, MA 01440<br>mblondeau@gardner-ma.gov | American Legion Post #129<br>22 Elm Street, PO Box 1092<br>Gardner, MA 01440<br>royalcadet@comcast.net |
| Levi Heywood Memorial Library<br>55 West Lynde Street<br>Gardner, MA 01440<br>syoung@cwmars.org | Fraternal Order of Eagles<br>71 City Hall Avenue<br>Gardner, MA 01440<br>help@foe.com |
| Natural Heritage and Endangered Species Program<br>Massachusetts Division of Fisheries & Wildlife<br>1 Rabbit Hill Road<br>Westborough, MA 01581<br>melany.cheeseman@mass.gov<br>Emily.holt@mass.gov | Gardner Rotary Club<br>mellis0144@comcast.net |
| Massachusetts Department of Public Health<br>250 Washington Street<br>Boston, MA 02108<br>https://www.mass.gov/forms/contact-dph-by- web-form | Gardner Lions Club<br>184 Pearson Blvd.<br>Gardner, MA 01440<br>Gardnerlionsclub@gmail.com |
| Millers River Watershed Council<br>Attn: David Brule, President<br>Millers River Environmental Center<br>100 Main Street<br>Athol, MA 01331<br>(978) 248-9491<br>watershed@millersriver.net | Bethany Baptist Church<br>72 Ryan Street<br>Gardner, MA 01440<br>office@bethanygardner.org |
| Alan Rousseau<br>211 Betty Spring Road<br>Gardner, MA 01440<br>Rousseaua@verizon.net | Jehovah's Witnesses<br>Kingdom Hall<br>1071 West Street<br>Gardner, MA 01440<br>(603) 899-2700<br>No email available. |
| Annunciation Parish<br>135 Nichols Street<br>Gardner, MA 01440<br>Rev. Sierra (Pastor):<br>pastor@annunciationgardner.org<br>William Lawton (Business Manager):<br>BusinessManager@AnnunciationGardner.org<br>Deb McGonigal (Secretary):<br>deb@annunciationgardner.org | Gardner Trout Club<br>44 Watkins Road<br>Gardner, MA 01440<br>No email available. |

| | |
|---|---|
| Otter River Sportsman's Club<br>PO Box 28<br>Baldwinville, MA 01436<br>orscmailbox@gmail.com | Gardner Fish & Gun Club<br>PO Box 396<br>Gardner, MA 01440<br>(978) 632-9774<br>No email available. |
| West End Beagle Club<br>110 Clark Street<br>Gardner, MA 01440<br>(978) 632-9792<br>No email available. | St. John's Cemetery<br>West Street<br>Gardner, MA 01440<br>George DiLorenzo, Director of Cemeteries:<br>georged@stjcemetery.com |
| Wildwood Cemetery<br>West Street<br>Gardner, MA 01440<br>(978) 630-4003<br>No email available. | Town of Templeton: Board of Assessors<br>Attn: Justice J.H. Graves<br>160 Patriots Road, P.O. Box 620<br>East Templeton, MA 01438<br>(978) 894-2760<br>jgraves@templetonma.gov |
| Town of Templeton: Conservation Commission/Community Preservation Committee/Planning Board<br>Attn: Jessica Case<br>160 Patriots Road, P.O. Box 620<br>East Templeton, MA 01438<br>(978) 894-2767<br>jcase@templetonma.gov | Town of Templeton: Development Services<br>Attn: Richard Hanks<br>160 Patriots Road, P.O. Box 620<br>East Templeton, MA 01438<br>(978) 894-2770<br>rhanks@templetonma.gov |
| Town of Templeton: Light and Water Department<br>Attn: John Driscoll, General Manager<br>86 Bridge St<br>P.O. Box 20<br>Baldwinville, MA 01436<br>978-939-5323, x11<br>jdriscoll@templetonlight.com | Town of Templeton: Office of Public Services<br>Attn: Bob Szocik<br>Highway Barn<br>381 Baldwinville Road<br>Templeton, MA 01468<br>(978) 939-8666<br>bszocik@templetonma.gov |
| Town of Templeton: Town Administrator<br>Attn: Adam Lamontagne<br>160 Patriots Road, P.O. Box 620<br>East Templeton, MA 01438<br>(978) 894-2755<br>alamontagne@templetonma.gov | Greater Gardner Chamber of Commerce<br>31 Lake Street, Suite 151<br>P.O. Box 1381<br>Gardner, MA 01440-6381<br>chamber@gardnerma.com |
| Gardner Clean Air<br>(978) 618-5755<br>rousseaua@verizon.net | Connecticut River Conservancy<br>Attn: Rebecca Todd, Executive Director<br>15 Bank Row<br>Greenfield, MA 01301<br>(413) 772-2020<br>crc@ctriver.org |

| Environmental Notification Form Commenters | |
|---|---|
| Bob Chicoine<br>300 Clark Street<br>Gardner, MA 01440<br>978-410–4044<br>bobchic1s@aim.com | David K Peabody<br>3 Jackson Park<br>Gardner, MA 01440<br>508-479-5278<br>david.peabody@verizon.net |
| Adam Lamontagne<br>160 Patriots Road<br>East Templeton, MA 01438<br>alamontage@templetonma.gov | Josh Forgues<br>104 Ryan Street<br>Gardner, MA 01440<br>Underpantgnome83@yahoo.com |
| Jeffrey W Lore<br>19 Watkins Road<br>Gardner, MA 01440<br>evangelistjefflore@hotmail.com | Cheryl Alvarez<br>Templeton, MA (No street address available)<br>No phone number available<br>cherylalvarez1979@gmail.com |
| Taylor Sala<br>Templeton, MA (No street address available)<br>No phone number available<br>taylor.sala2021@gmail.com | Kelsey Coates<br>Templeton, MA (No street address available)<br>No phone number available<br>kcoates978@gmail.com |
| David Antaya<br>444 Stone Street<br>Gardner, MA 01440<br>978-630-2811<br>dantaya@fitchburgstate.edu | David Legere<br>10 Turner Road<br>Baldwinville, MA<br>No phone number available<br>Legere3161@aol.com |
| Mike Wilczynski<br>No address available<br>Certified Professional Geologist<br>248-318-4732<br>Pangea52@yahoo.com | Jennifer M Albertine<br>Climate and Land Justice Specialist,<br>Conservation and Stewardship Associate<br>Mount Grace Land Conservation Trust<br>No address or phone available<br>council@millersriver.net |
| Gardner Clean Air<br>Ala Rousseau<br>Sean Rousseau<br>211 Betty Spring Road<br>Gardner, MA 01440<br>No email or phone available | Mary E Marsh<br>150 Acadia Road<br>Gardner, MA 01440<br>508-619-9882<br>Mary.marsh@shutr.net |
| Theresa Griffis<br>12 Drury Lane<br>Templeton, MA 01468<br>978-939-7370<br>t.griffis@gmail.com | Thomas B Esposito<br>20 Becky Ave<br>Gardner, MA 01440<br>No phone available<br>tbrag_8@yahoo.com |

| | |
|---|---|
| Kelsey Wentling<br>River Steward<br>Connecticut River Conservancy<br>413-772-2020 x216<br>kwentling@ctriver.org | Jo-Anne Burdin<br>299 Royalston Rd<br>Baldwinville, MA 01436<br>No phone available<br>jo0@verizon.net |
| Ivan Ussach<br>MRWC Director<br>No address available<br>413-773-3830<br>ivan@millersriver.net | Tim Gurczak<br>143 Vernon Street<br>Gardner, MA 01440<br>Timgurczak@gmail.com |
| Erin Kiewel<br>MA 01440 (No street address provided)<br>978-660-6170<br>Erin.kiewel@gmail.com | cortkiewel@gmail.com<br>(Only email provided) |
| Hugh Jardon<br>No phone or address available<br>Markmonahan4gardner@gmail.com<br>Note: email as provided is not valid. | Lealdon Langley<br>Director, MassDEP<br>No phone available<br>lealdon.langley@mass.gov |
| Paul DeMeo<br>9 Willis Road<br>Gardner, MA 01440<br>ryanrealty@comcast.net | Rice Flanders<br>Vice President, MRWC Board of Directors<br>No address or phone available<br>riceflanders@hotmail.com |
| Vicki Heidorn<br>12 Crystal Lake Dr<br>Gardner, MA 01440<br>978-895-6115<br>surroundingsgallery@gmail.com | |
| **Private Well Owners (approximate address)** | |
| 38 Turner Street, Baldwinville, MA 01436 | 184 Main Street, Baldwinville, MA 01436 |
| 137 Depot Road, Templeton, MA 01468 | 111 Depot Road, Templeton, MA 01468 |
| 217 Riverside Road, Gardner, MA 01440 | 20 Nyman Road, Templeton, MA 01440 |
| 23 Riverside Road, Templeton, MA 01440 | 248 Gardner Road, Templeton, MA 01440 |
| 254 Gardner Road, Templeton, MA 01440 | 146 Princeton Street, Gardner, MA 01440 |
| 115 Princeton Street, Gardner, MA 01440 | 84 Keyes Road, Gardner, MA 01440 |
| 36 Watkins Street, Gardner, MA 01440 | 27 Suomi Road, Gardner, MA 01440 |
| 370 Clark Street, Gardner, MA 01440 | 929 West Street, Gardner, MA 01440 |
| 14 Sand Road, Baldwinville, MA 01436 | |

# APPENDIX C: RESILIENTMASS CLIMATE CHANGE PROJECTION DASHBOARD OUTPUT

| Site | Year | Duration | RI_1yr_10th | RI_1yr_50th | RI_1yr_90th | RI_2yr_10th | RI_2yr_50th | RI_2yr_90th | RI_5yr_10th | RI_5yr_50th | RI_5yr_90th |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Site 1446 | 2030 | 24h | 2.6 | 2.8 | 3 | 3.1 | 3.4 | 3.6 | 4 | 4.3 | 4.6 |
| Site 1446 | 2050 | 24h | 2.8 | 3.1 | 3.3 | 3.4 | 3.7 | 4 | 4.3 | 4.8 | 5.1 |
| Site 1446 | 2070 | 24h | 3.1 | 3.3 | 3.6 | 3.7 | 4 | 4.4 | 4.8 | 5.1 | 5.7 |
| Site 1446 | 2090 | 24h | 3.2 | 3.6 | 4 | 3.8 | 4.4 | 4.9 | 4.9 | 5.7 | 6.3 |

| RI_10yr_10th | RI_10yr_50th | RI_10yr_90th | RI_25yr_10th | RI_25yr_50th | RI_25yr_90th | RI_50yr_10th | RI_50yr_50th | RI_50yr_90th | RI_100yr_10th |
|---|---|---|---|---|---|---|---|---|---|
| 4.8 | 5.1 | 5.5 | 5.8 | 6.2 | 6.6 | 6.5 | 7 | 7.5 | 7.4 |
| 5.1 | 5.6 | 6 | 6.2 | 6.9 | 7.3 | 7 | 7.7 | 8.3 | 7.9 |
| 5.6 | 6 | 6.7 | 6.9 | 7.3 | 8.1 | 7.7 | 8.3 | 9.2 | 8.7 |
| 5.8 | 6.7 | 7.4 | 7.1 | 8.1 | 9 | 8 | 9.2 | 10.2 | 9 |

| RI_100yr_50th | RI_100yr_90th | RI_200yr_10th | RI_200yr_50th | RI_200yr_90th | RI_500yr_10th | RI_500yr_50th | RI_500yr_90th | RI_1000yr_10th |
|---|---|---|---|---|---|---|---|---|
| 7.9 | 8.4 | 8.4 | 8.9 | 9.6 | 9.9 | 10.6 | 11.3 | 11.2 |
| 8.7 | 9.3 | 8.9 | 9.9 | 10.6 | 10.6 | 11.7 | 12.5 | 11.9 |
| 9.3 | 10.3 | 9.9 | 10.6 | 11.7 | 11.7 | 12.5 | 13.8 | 13.2 |
| 10.3 | 11.4 | 10.2 | 11.7 | 13 | 12.1 | 13.8 | 15.3 | 13.7 |

| RI_1000yr_50th | RI_1000yr_90th | HUC8 | ObjectId |
|---|---|---|---|
| 11.9 | 12.8 | Miller | 19867 |
| 13.2 | 14.1 | Miller | 19877 |
| 14.1 | 15.7 | Miller | 19724 |
| 15.7 | 17.3 | Miller | 19844 |

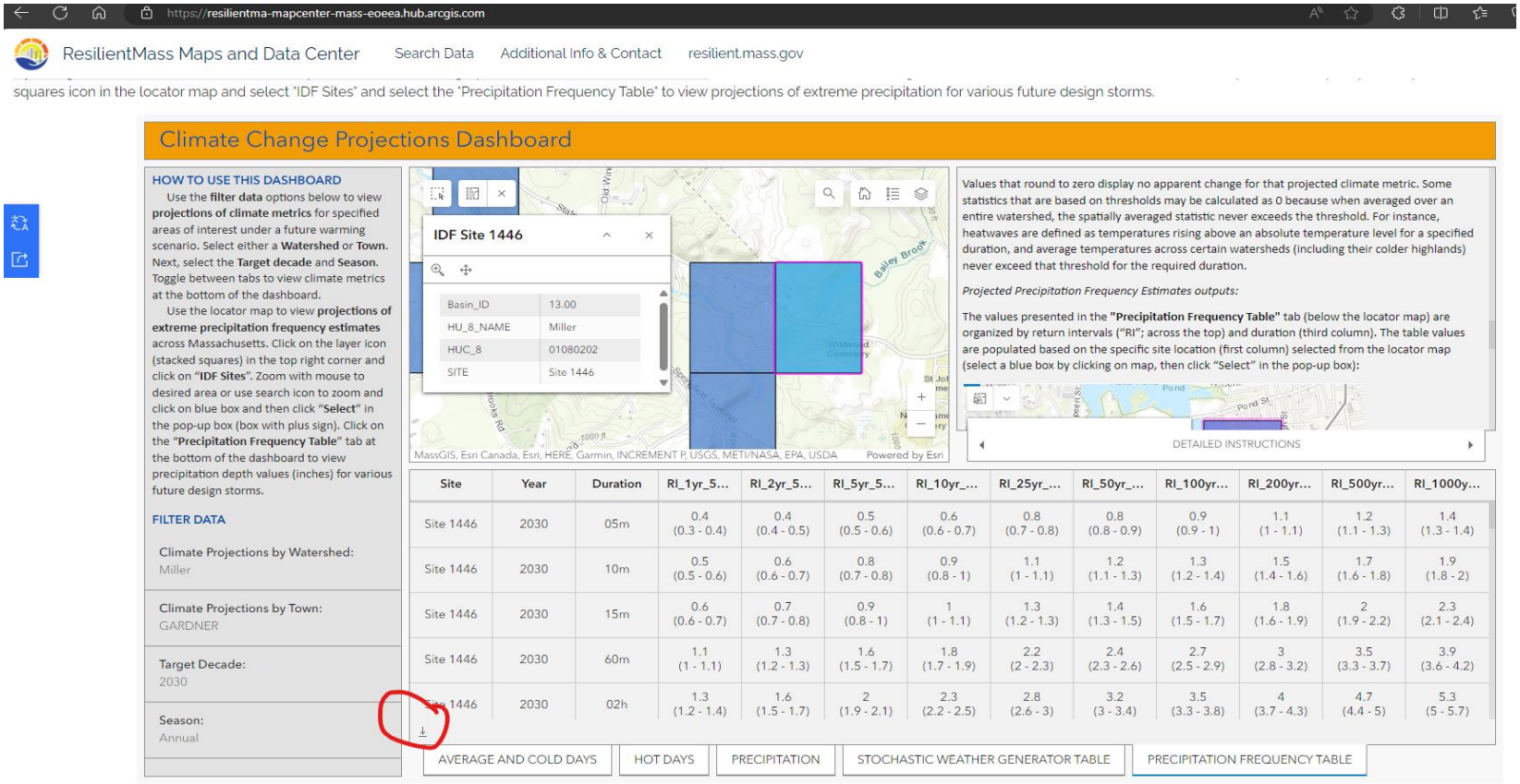
ResilientMass Climate Hub (arcgis.com)

Accessed 9/20/2024; msjones@woodardcurran.com

Nearest preciptiation downscale location = Site 1446

Statistic chosen: 50th percentile (median) for 2050,2070,2090 2-,10-,25-,50-,and 100-yr Return Intervals

Duration: 24h




| Site | Year | Duration | RI_1yr_5... | RI_2yr_5... | RI_5yr_5... | RI_10yr_... | RI_25yr_... | RI_50yr_... | RI_100yr... | RI_200yr... | RI_500yr... | RI_1000y... |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Site 1446 | 2030 | 05m | 0.4 (0.3 - 0.4) | 0.4 (0.4 - 0.5) | 0.5 (0.5 - 0.6) | 0.6 (0.6 - 0.7) | 0.8 (0.7 - 0.8) | 0.8 (0.8 - 0.9) | 0.9 (0.9 - 1) | 1.1 (1 - 1.1) | 1.2 (1.1 - 1.3) | 1.4 (1.3 - 1.4) |
| Site 1446 | 2030 | 10m | 0.5 (0.5 - 0.6) | 0.6 (0.6 - 0.7) | 0.8 (0.7 - 0.8) | 0.9 (0.8 - 1) | 1.1 (1 - 1.1) | 1.2 (1.1 - 1.3) | 1.3 (1.2 - 1.4) | 1.5 (1.4 - 1.6) | 1.7 (1.6 - 1.8) | 1.9 (1.8 - 2) |
| Site 1446 | 2030 | 15m | 0.6 (0.6 - 0.7) | 0.7 (0.7 - 0.8) | 0.9 (0.8 - 1) | 1 (1 - 1.1) | 1.3 (1.2 - 1.3) | 1.4 (1.3 - 1.5) | 1.6 (1.5 - 1.7) | 1.8 (1.6 - 1.9) | 2 (1.9 - 2.2) | 2.3 (2.1 - 2.4) |
| Site 1446 | 2030 | 60m | 1.1 (1 - 1.1) | 1.3 (1.2 - 1.3) | 1.6 (1.5 - 1.7) | 1.8 (1.7 - 1.9) | 2.2 (2 - 2.3) | 2.4 (2.3 - 2.6) | 2.7 (2.5 - 2.9) | 3 (2.8 - 3.2) | 3.5 (3.3 - 3.7) | 3.9 (3.6 - 4.2) |
| Site 1446 | 2030 | 02h | 1.3 (1.2 - 1.4) | 1.6 (1.5 - 1.7) | 2 (1.9 - 2.1) | 2.3 (2.2 - 2.5) | 2.8 (2.6 - 3) | 3.2 (3 - 3.4) | 3.5 (3.3 - 3.8) | 4 (3.7 - 4.3) | 4.7 (4.4 - 5) | 5.3 (5 - 5.7) |

Woodard & Curran

woodardcurran.com