



# Brookhaven Landfill Plume: Groundwater and Surface Water Quality Update

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# Brookhaven Landfill Timeline

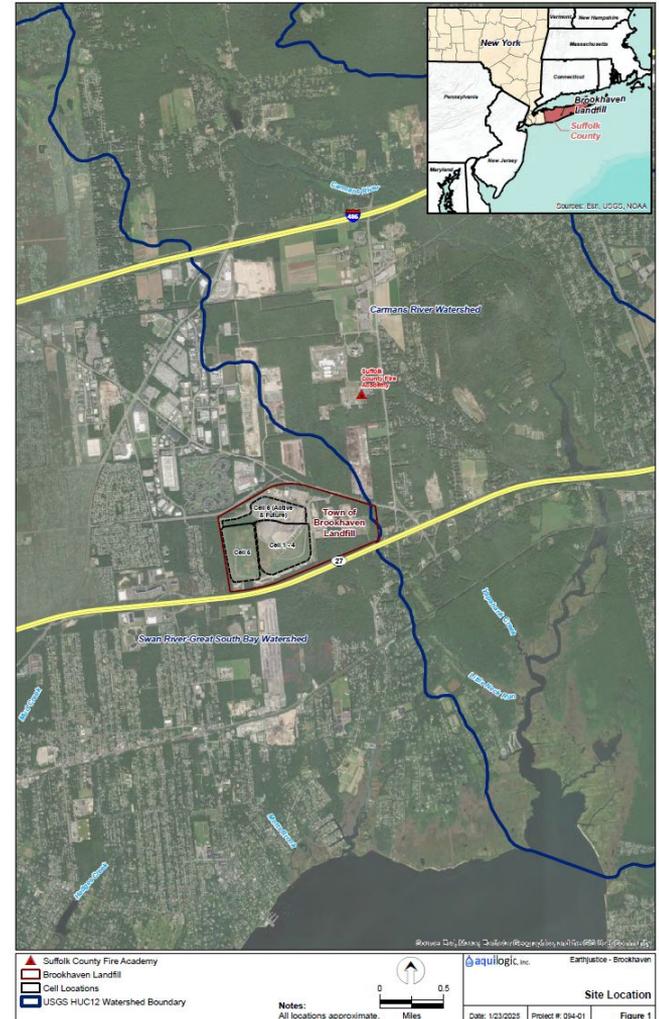
- ▶ **December 2024:** Brookhaven releases draft report suggesting chemicals in toxic plume came from sources other than the landfill.
- ▶ **February:** State Department of Environmental Conservation rejects town report, orders new draft.
- ▶ **July 31:** DEC accepts new draft, orders Brookhaven to craft cleanup plan that could include closing landfill.
- ▶ **Aug. 27:** Brookhaven sends letter to residents living near plume outlining findings.
- ▶ **December:** Brookhaven must hold community meeting to discuss findings.
- ▶ **Feb. 13, 2026:** Deadline for Brookhaven to submit cleanup plan.
- ▶ **2028:** Landfill expected to close when it runs out of capacity.

# Background

Brookhaven Town acquired the landfill in 1976.

There are 3 landfill modules.

- ▶ Cells 1 through 4:
  - ▶ accepted municipal solid waste
  - ▶ no liners used for cell 1, 2 and 3.
  - ▶ Capped and closed
- ▶ Cell 5:
  - ▶ Accepted ash and construction and demolition materials
  - ▶ Is capped and closed
- ▶ Cell 6:
  - ▶ Stopped accepting C&D in December.
  - ▶ Now accepts ash.
  - ▶ Anticipated to be closed in 2028



# Groundwater Flow & Direction

- ▶ Depth to groundwater: 45 - 50 ft near the landfill cells.
- ▶ Depth to groundwater: Less than 5 ft at the headwaters of Beaver Dam Creek and near the creek south of Beaver Dam Road.
- ▶ Groundwater (Upper Glacial aquifer) flows southeast within the landfill, towards Beaver Dam Creek.
- ▶ Previous investigations (Wexler and Maus, 1988) found shallow groundwater downgradient of the landfill discharges to Beaver Dam Creek - supplies 95% percent of the creek's baseflow.
- ▶ Deeper groundwater also travels SE, past the surface water.
- ▶ Deeper groundwater discharges to tidal portions of Beaver Dam Creek, the Carmens River & its tributary, Little Neck Run.



# Investigation Findings: Groundwater

- ▶ PFAS was detected upgradient and downgradient of the landfill.
- ▶ No plume coming from Cells 5 and 6.
- ▶ An industrial park 1 mile northwest of the landfill could be a contributing factor to groundwater contamination (west of Station Road).
  - ▶ Test results show 980 ppt of PFOS and 1000 ppt on Plantinum Court
- ▶ Suffolk County Firematics:
  - ▶ PFAS - 330 ppt
  - ▶ PFOS - 270 ppt
  - ▶ Finalized report for Firematics (2021) found maximum concentrations of 0f 20,700 for PFAS.
  - ▶ This plume is unlikely to impact the landfill. Will likely migrate SE to Carmens River.



# Investigation Findings

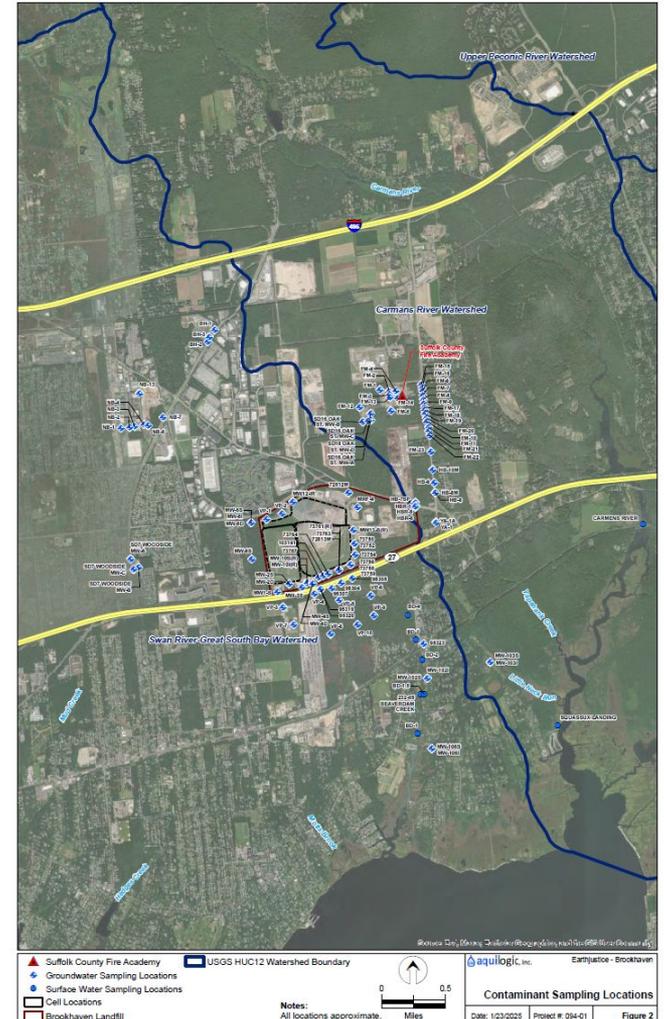
The chemical composition in samples at on-site down-gradient locations and upgradient locations are consistent.

The chemical composition from those samples is significantly different from the samples collected in the NW Source Area and Fire Academy Source Area.

This indicates that a separate contaminant plume with both PFOA and PFOS is associated with the Brookhaven Landfill.

# Investigation Findings: Groundwater

- ▶ A leachate-influenced groundwater plume extends from Cells 1,2 and 3 and travels offsite and southeast.
- ▶ The plume extends approximately 9000 feet to the vicinity of Beaver Dam Road.
- ▶ Estimated plume width of 4,500 feet, in Upper Glacial aquifer.
- ▶ Contaminants found above standards in downgradient groundwater tests include
  - ▶ PFOA
  - ▶ PFOS
  - ▶ 1,4 dioxane



# Investigation Findings: Groundwater

**Sampling On-Site Down-gradient** - 20 groundwater samples were taken from on-site down-gradient monitoring wells located within 300 feet of landfill cells (north of Sunrise Highway):

PFOA over NYSDEC guidance value (6.7 ppt) in 8 of 9 shallow wells.

- ▶ All 4 intermediate wells
- ▶ 3 of 7 deep wells, from 22 ppt - 560 ppt

PFOS over the NYSDEC guidance value (2.7 ppt) in 8 of 9 shallow wells.

- ▶ 3 of 4 intermediate wells
- ▶ 4 of 7 deep wells, from 4.3 ppt - 64 ppt

1,4-dioxane over the NYSDEC guidance value (0.35 ppt) in 6 of 9 shallow wells.

- ▶ 3 of 4 intermediate wells
- ▶ 3 of 7 deep wells, from 0.37 ppb - 5.2 ppb

<b>PFOA (NYSDEC Guidance Value = 6.7 ng/L)</b>									
Sample Screen Interval	Off-Site Up-gradient (> 5,000 ft)		On-Site Up-gradient (< 500 ft)		<b>Brookhaven Landfill Groundwater Flow ---&gt;</b>	On-site Down-gradient (< 300 ft, north of Sunrise Hwy)		Off-Site Down-gradient (> 300 ft, south of Sunrise Hwy)	
	Min. (ng/L)	Max. (ng/L)	Min. (ng/L)	Max. (ng/L)		Min. (ng/L)	Max. (ng/L)	Min. (ng/L)	Max. (ng/L)
Shallow	< 1.9	<b>40</b>	5.6	<b>140</b>		3.4	<b>560</b>	0.32 J	<b>78</b>
Intermediate	3.3	<b>20</b>	3.3	<b>11</b>		<b>47</b>	<b>68</b>	1.2	<b>170</b>
Deep	< 1.9	<b>12</b>	< 0.24	2.4	< 0.23	<b>54</b>	0.45 J	<b>59</b>	
<b>PFOS (NYSDEC Guidance Value = 2.7 ng/L)</b>									
Sample Screen Interval	Off-Site Up-gradient (> 5,000 ft)		On-Site Up-gradient (< 500 ft)		<b>Brookhaven Landfill Groundwater Flow ---&gt;</b>	On-site Down-gradient (< 300 ft, north of Sunrise Hwy)		Off-Site Down-gradient (> 300 ft, south of Sunrise Hwy)	
	Min. (ng/L)	Max. (ng/L)	Min. (ng/L)	Max. (ng/L)		Min. (ng/L)	Max. (ng/L)	Min. (ng/L)	Max. (ng/L)
Shallow	< 1.9	<b>19</b>	<b>4.1</b>	<b>33</b>		2.5	<b>64</b>	< 1.9	<b>29</b>
Intermediate	< 2.0	<b>890</b>	2.5	<b>2.8</b>		1.7	<b>42</b>	< 0.94	<b>36</b>
Deep	< 1.9	<b>1,000</b>	< 0.35	0.56	< 0.34	<b>20</b>	< 0.90	<b>110</b>	
<b>1,4-Dioxane (NYSDEC Guidance Value = 0.35 ug/L)</b>									
Sample Screen Interval	Off-Site Up-gradient (> 5,000 ft)		On-Site Up-gradient (< 500 ft)		<b>Brookhaven Landfill Groundwater Flow ---&gt;</b>	On-site Down-gradient (< 300 ft, north of Sunrise Hwy)		Off-Site Down-gradient (> 300 ft, south of Sunrise Hwy)	
	Min. (ug/L)	Max. (ug/L)	Min. (ug/L)	Max. (ug/L)		Min. (ug/L)	Max. (ug/L)	Min. (ug/L)	Max. (ug/L)
Shallow	< 0.1	< 0.1	< 0.2	0.12 J		< 0.2	<b>4.7</b>	< 0.2	<b>0.6</b>
Intermediate	< 0.1	< 0.1	< 0.2	< 0.2		< 0.2	<b>5.2</b>	< 0.2	<b>6.1</b>
Deep	0.15	0.17	0.18 J	<b>0.6</b>	< 0.2	<b>3.7</b>	< 0.2	<b>10.5</b>	

- From Aquilogic expert consultant report for Earth Justice, Jan. 2025

# Investigation Findings: Surface Water

NYSDEC ambient water quality guidance (same as groundwater)

- ▶ PFOA (6.7 ppt)
- ▶ PFOS (2.7 ppt)
- ▶ 1,4-dioxane (0.35 ppt)

Samples collected from Beaverdam Creek, Carmans River, Squassux Landing (also in Carmans River) + a background surface water sample from Forge River.

- ▶ PFOA over guidance value in 5 of 8 samples, 22 ppt - 500 ppt
- ▶ PFOS over guidance value in 6 of 8 samples, 2.8 ppt - 16 ppt
- ▶ 1,4-Dioxane over guidance value in 5 of 8 samples, 0.68 ppb - 2.3 ppb

# Investigation Findings: Surface Water

- ▶ PFOA (.78 ppt) and PFOS (.39 ppt) in background surface water sample from Forge River. 1,4-dioxane not detected in the background surface water sample.
- ▶ Maximum levels of PFOA (500 ppt) and PFOS (16 ppt) are significantly higher than background concentrations in the area.
- ▶ It is likely that the contaminant plume associated with the Fire Academy Source Area extends to, and discharges into, Carmans River.
- ▶ It is likely that the contaminant plume associated with Brookhaven Landfill extends to, and discharges into, Beaverdam Creek



# Next Steps

## Corrective Measures Assessment Program (Mandated by DEC):

- ▶ Within 30 days, Town must notify everyone living over or within 500 ft downgradient of the plume.
- ▶ Town must draft a Corrective Measures Assessment Report outlining proposed actions to address the plume.
- ▶ Town must host a public meeting to discuss the corrective measures once proposed, including opportunity for public comment.
- ▶ Town must include a summary of public comments with the final Corrective Measures Assessment Report.
- ▶ Town must conclude the Corrective Measures Assessment period by February 1, 2026, and submit the Corrective Measures Report by February 16, 2026, for review and approval by DEC.

# What Needs to Be Done

- Complete characterization of the plume. (define the boundaries)
- Prevent the continued off-site migration of groundwater contamination -
- Identify "hot spots" and remediate
- Prevent the discharge of contaminated groundwater to surface water resources.
- Clean up groundwater offsite.