ARTIFICIAL GRASS OAKVILLE · RESEARCH SERIES

Artificial Grass & the Environment in Oakville: An Evidence Review

Surface heat, microplastics, water savings and biodiversity trade-offs — the published evidence assessed for Oakville, Ontario

REPORT	RR-2026-OAK-03 · August 2026
COVERAGE	Town of Oakville, Region of Halton, Ontario
PREPARED BY	Artificial Grass Oakville Research, Oakville, Ontario
CONTACT	+1 289-815-3105 · artificialgrassoakville.ca

Artificial Grass Oakville Research publishes data-driven local studies on residential landscaping, water use and outdoor surfaces in Oakville and the Greater Toronto Area. This report is provided free for information purposes.

ABSTRACT

This report reviews the published environmental evidence for residential artificial grass as it applies to Oakville, Ontario. It draws on peer-reviewed surface-temperature studies, a 2025 Canadian environmental-health review, the Region of Halton's water-rate schedule and flood records, and the Bronte Creek watershed context — assembling the principal claims on each side of the turf debate into a single local evidence base.

The finding is neither that artificial grass is environmentally benign nor that it is categorically harmful. Surface temperatures are demonstrably elevated, microplastic shedding from crumb-rubber infill is a documented pathway, and biodiversity is reduced where living soil is replaced. Against these, a typical 500 sq ft Oakville lawn avoids roughly **27.9 m³ of seasonal irrigation**, eliminates fertilizer and pesticide applications, and — when installed on an engineered base — does not worsen stormwater runoff. The balance depends on what a household values most.

KEY FINDINGS AT A GLANCE

20–30°C	16,000 t/yr	27.9 m³	$93/yr
surface temperature differential, synthetic turf vs natural grass (peer reviewed)	microplastic infill loss estimated by ECHA for the European Union	seasonal irrigation avoided per 500 sq ft lawn (24-week model)	Halton combined water + wastewater cost of that irrigation (2026 rates)

Contents

1 The debate in brief

Artificial turf occupies a contested place in environmental discourse. Critics cite elevated surface temperatures, microplastic shedding from crumb-rubber infill, and the loss of living soil and the biodiversity it supports. Proponents counter with eliminated irrigation, zero fertilizer and pesticide inputs, and service lives measured in decades rather than seasons. This report assembles the published evidence relevant to an Oakville homeowner weighing those trade-offs. The finding is that the environmental balance depends on where the surface is installed, what it replaces, and which outcomes a household prioritizes.

2 Surface temperature evidence

The strongest empirical signal in the turf literature is surface heat. Synthetic turf absorbs more solar radiation than natural grass and lacks the evaporative cooling that living plants provide, producing consistent, measurable temperature differentials across multiple peer-reviewed studies and a 2025 state-level government review (Table 1; Figure 1).

For Oakville, where the July average daily high reaches **27.4°C** under the 1991–2020 ECCC normals [2], a south-facing backyard turf surface can reasonably be expected to reach **50–65°C** on still, sunny afternoons. Irrigation cools the surface only temporarily: Penn State recorded full temperature rebound within 30 to 120 minutes of watering [8]. The effect matters most where the lawn abuts living space, where children or pets use the surface, and where mature tree canopy is absent.

Table 1 — Published surface-temperature differentials, synthetic turf vs natural grass. *Sources: [8][9][10][11].*

Study	Year	Differential	Context
Penn State (McNitt et al.)	2008	20–30°C hotter	Peaks of 60–77°C on hot sunny days
Cumberbatch et al., *Sustainability*	2025	24.1°C hotter	Mid-day infrared measurement, June, NJ
Williams & Pulley, BYU	2002	48°C hotter	Also 20.6°C hotter than asphalt; peak 93°C
Petrass et al., *JSET*	2014	12–22°C hotter	Incl. “cool climate” turf products
NJDEP state review	2025	Confirms	Cites urban heat island concerns

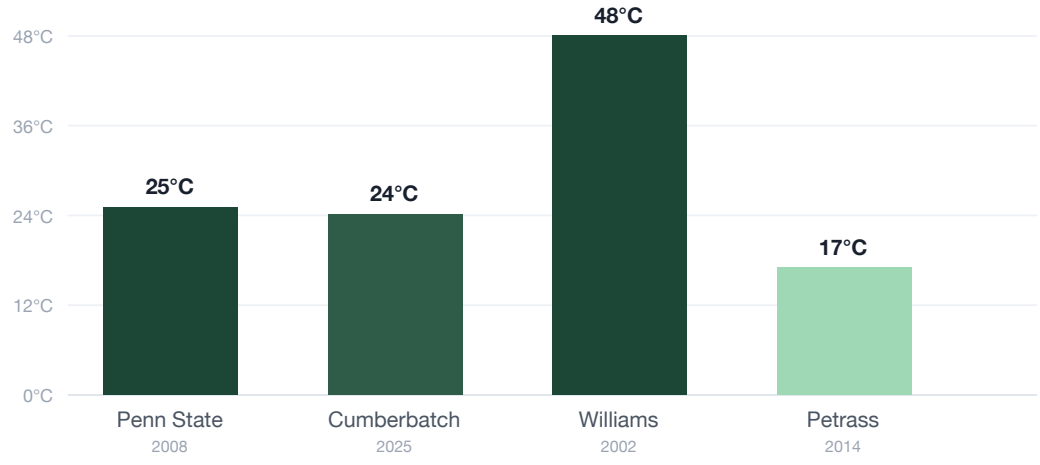

Figure 1 — Surface temperature differential of synthetic turf above natural grass, four peer-reviewed studies. Values are midpoints where studies report ranges. *Sources: [8][9][10][11].*

3 Microplastics and infill

The second major environmental concern in the turf literature is the release of microplastic particles and chemical leachate — principally from crumb-rubber infill, but also from the turf fibres themselves. Canada's National Collaborating Centre for Environmental Health (NCCEH, 2025) found that SBR crumb rubber contains **metals (zinc, lead, cadmium), polycyclic aromatic hydrocarbons, volatile organic compounds, phthalates, and 6PPD-quinone**, a chemical acutely toxic to salmonids [11]. A 2018 study identified 92 distinct chemicals in tire-crumb samples, approximately half never studied for health effects [12].

Most well-conducted health risk assessments published between 2014 and 2025 concluded that average crumb-rubber exposures remained below levels of concern for both cancer and non-cancer endpoints, and two epidemiological studies found no association between turf fields and cancer incidence [11]. The environmental pathway, however, remains a live concern: the European Chemicals Agency estimates that synthetic turf releases roughly **16,000 tonnes of microplastics annually** across the EU, prompting a 2031 ban on the sale of granular infill for sports surfaces [11]. Nordic studies rank rubber infill as the second-largest microplastics source in Norway and Sweden after tire and road wear [12].

3.1 Mitigation options available in Ontario

Residential turf need not use crumb rubber. The alternatives available to Oakville homeowners include **silica sand** (inert mineral, no plastic content), **zeolite** (a naturally occurring mineral with a negatively charged honeycomb structure that absorbs ammonia gases), **acrylic-coated sand** (Envirofill-type products infused with antimicrobial agents, containing no SBR rubber), and **infill-free turf systems** that rely on denser pile construction and knitted backing [13][14]. Canada's 2020 Federal Science Assessment of Plastic Pollution invoked the precautionary principle to recommend reducing microplastics entering the environment, while noting that human-health effects at current exposure levels remain uncertain and require further research [12].

LOCAL CONTEXT — THE BRONTE CREEK WATERSHED

Bronte Creek drains a 315 km² watershed through Oakville to Lake Ontario, and Bronte Village sits at the confluence of creek overflow, sewer surcharge and lake-surge risk [5]. Any surface that sheds microplastics or chemical leachate into stormwater ultimately feeds that watershed. Homeowners near the Morrison–Wedgewood creek corridor — where 266 properties are formally classified as flood-at-risk [5] — have an additional reason to choose non-rubber infill or infill-free systems.

4 Inputs avoided: water, fertilizer, pesticides

The environmental case for artificial turf rests most firmly on the inputs it eliminates. A natural lawn in Oakville requires irrigation through the 24-week southern Ontario growing season, periodic fertilizer and weed-control applications, and regular mowing — each of which carries a measurable resource cost. Table 2 summarizes the inputs a 500 sq ft artificial lawn removes.

Table 2 — Inputs eliminated by a 500 sq ft artificial lawn in Oakville, per growing season. *Sources: [3][4][7]; assumptions in §M.*

Input	Natural lawn (per season)	Artificial lawn
Irrigation water	27.9 m³ at ~$93 (Halton 2026 combined rate)	None required
Fertilizer and weed control	$250–$600 (4–6 professional visits)	None required
Mowing service	20–25 visits ($1,200–$1,800 annually)	None required

The water figure deserves context. Halton Region bills water and wastewater at a combined **$3.3441/m³** (2026, By-laws 48-25 and 49-25) with no tiered discount block, meaning every 1,000 litres of outdoor watering costs about $3.34 [3]. Summer lawn watering can double household water demand across Halton, and the Region can impose mandatory outdoor restrictions when treated-water volumes, reservoir levels or weather patterns warrant [4]. During hot, dry periods outdoor demand can push up to 50% above normal.

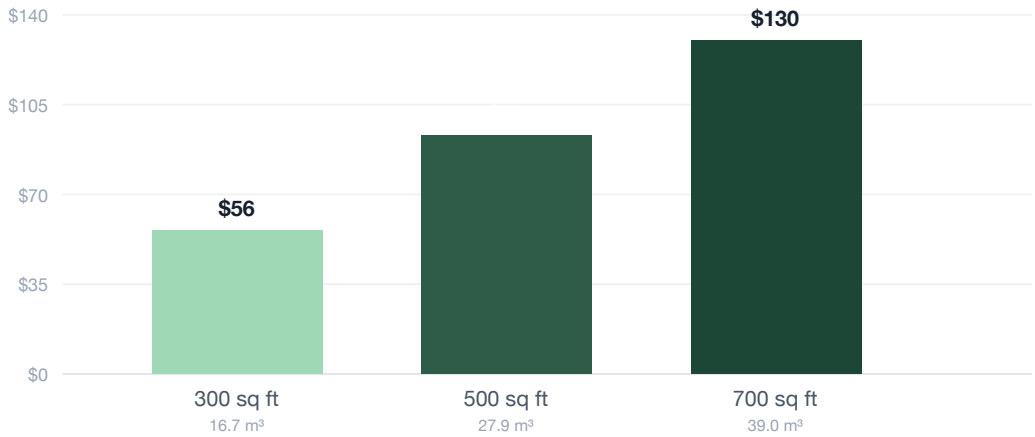

Figure 2 — Seasonal irrigation cost avoided by lawn area at Halton's 2026 combined rate of $3.3441/m³, assuming 2.5 cm per week over a 24-week growing season. Volume labels below each bar. *Derived; assumptions in §M.*

Ontario's Cosmetic Pesticide Ban (2009) already prohibits the use of most synthetic herbicides on residential lawns, so the pesticide-avoidance argument carries less weight in Oakville than it would in jurisdictions without such regulation. Fertilizer runoff into the Bronte Creek watershed and ultimately Lake Ontario, however, remains a documented concern, and artificial turf eliminates it entirely at the lot level.

5 Biodiversity trade-offs

The most honest entry in the environmental ledger is also the simplest: artificial turf replaces living soil with a synthetic surface, and that replacement eliminates whatever biodiversity the lawn supported. A maintained Kentucky-bluegrass lawn is itself a low-diversity monoculture, but it still hosts soil microorganisms, provides limited foraging habitat, and contributes to carbon sequestration in the root zone. Artificial turf does none of these.

The biodiversity cost is proportional to what is replaced. A worn, compacted backyard that supports little plant or insect life — common in high-traffic families with dogs — carries a lower biodiversity loss than a lawn managed for pollinator habitat or one incorporating native ground covers. A 2022 lifecycle study found that over ten years a natural soccer field contributed roughly twice as much to global warming as an artificial one (driven mainly by construction and maintenance emissions), while artificial turf caused more of other pollution types [12]. A 2021 Zurich study found that per hour of use, natural turf had the lowest overall footprint, followed by unfilled artificial, then infill-filled turf [12].

For Oakville homeowners, the practical implication is that the biodiversity trade-off is smallest where the lawn is already low-functioning and largest where it is managed for ecological value. Partial conversions — turf in high-traffic zones with planted beds and permeable borders retained elsewhere — capture most of the maintenance benefit while limiting the ecological cost.

6 A balanced decision framework for Oakville

The evidence reviewed in this report does not produce a simple verdict. Instead, it supports a decision framework keyed to the factors Oakville homeowners can evaluate for their own properties:

- **Heat exposure.** South-facing yards without tree canopy produce the highest surface temperatures. Where children, pets, or barefoot use are expected, natural grass or shaded installation is preferable.
- **Watershed sensitivity.** Properties near Bronte Creek, Morrison Creek, or Wedgewood Creek feed directly into a flood-sensitive watershed. Non-rubber infill or infill-free systems reduce the microplastic pathway [5][6].
- **Water consumption.** Halton's combined rate ($3.3441/m³) and summer demand spikes make irrigation elimination a meaningful but not dominant household saving (Figure 2).
- **Biodiversity value.** Lawns managed for ecological function — native plantings, pollinator habitat, reduced mowing — should not be converted; worn, low-functioning lawns carry a smaller biodiversity cost.
- **Stormwater performance.** A turf system on an engineered aggregate base drains at published rates far exceeding Halton's heaviest rainfall intensities. Turf is not, however, a flood-protection measure — grading, downspout management, and backwater valves address basement flooding far more effectively [5].

LOCAL CONTEXT — OAKVILLE LOT MAINTENANCE

The Town of Oakville regulates lot maintenance: grass and weeds must not exceed 20.33 cm (8 inches), and natural vegetation is permitted [7]. There is no municipal ban on artificial grass. Conservation Halton's Rainwater Conservation Fund offers grants up to $7,500 for soakaway pits, rain gardens, bioswales and permeable pavement — not for turf itself, but available to residential landowners pursuing broader stormwater resilience [6].

M Methodology & data sources

This is a desk-research report. Published figures were collected in August 2026 from the sources listed under References: peer-reviewed journal articles on surface temperature and microplastics, the NCCEH's 2025 Canadian evidence review, the NJDEP's 2025 government science review, the ECCC/Health Canada 2020 Federal Science Assessment of Plastic Pollution, Halton Region's 2026 water-rate schedule (By-laws 48-25 and 49-25) and outdoor-watering guidance, Halton's July 2024 storm staff report, Conservation Halton program documentation, Environment and Climate Change Canada climate normals (Toronto Pearson Int'l A, 1991–2020), the 2021 Census via Statistics Canada, and published Ontario lawn-care pricing guides.

Stated assumptions (not sourced facts): (i) irrigation model — an actively maintained lawn receives 2.5 cm of water per week over a 24-week southern Ontario growing season (a widely used horticultural guideline endorsed by the Region of Waterloo); (ii) the temperature differentials in Figure 1 use study midpoints where ranges are reported; (iii) seasonal cost figures in Figure 2 use Halton's 2026 combined residential rate of $3.3441/m³ applied uniformly with no tiered discount (consistent with the published rate structure). Derived figures combine these assumptions with the cited sources; changing any assumption changes the results.

Limitations

This report reviews published evidence; it does not present field measurements, product testing, or a site-specific environmental assessment. Surface-temperature figures are drawn from studies conducted in the United States; local Oakville readings would differ with cloud cover, wind, and Lake Ontario's moderating influence on shoreline areas. The microplastics evidence base continues to evolve rapidly, and the EU infill-ban timeline may change. Irrigation volumes are model estimates; real households water differently, and Oakville's 806.8 mm of well-distributed annual precipitation reduces irrigation need in normal summers. Lifecycle findings are drawn from sports-field studies, not residential installations. This report is not an engineering, agronomic, or environmental assessment of any specific property.

R References

1. Statistics Canada. “Census Profile, 2021 Census of Population — Oakville, Town (T), Ontario.” https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/details/page.cfm?DGUIDlist=2021A00053524001&GENDERlist=1&HEADERlist=0&Lang=E&STATISTICIist=1&SearchText=Oakville (accessed August 2026).
2. Environment and Climate Change Canada. “Canadian Climate Normals 1991–2020 — Toronto Lester B. Pearson Int'l A.” https://climate.weather.gc.ca/climate_normals/index_e.html (accessed August 2026).
3. Halton Region. “Water Bills, Rates and Fees (2026 rate card; By-laws 48-25 / 49-25).” https://www.halton.ca/for-residents/water-and-wastewater-services/water-meters-rates-and-billing/water-bills-rates-and-fees (accessed August 2026).
4. Halton Region. “Outdoor Water Use and Restrictions (By-law 79-19).” https://www.halton.ca/for-residents/water-and-wastewater-services/water-conservation/outdoor-water-use-and-restrictions (accessed August 2026).
5. Halton Region. “Response to July 2024 Severe Weather Events — Regional staff report PW-25-24.” https://edmweb.halton.ca/OnBaseAgendaOnline/Documents/ViewDocument/PW-25-24.docx.pdf (accessed August 2026).
6. Conservation Halton. “Financial Assistance Programs — Rainwater Conservation Fund.” https://www.conservationhalton.ca/financial-assistance-programs/ (accessed August 2026).
7. Simply Grounds. “How Much Does Lawn Care Cost in Ontario? (2026 Pricing Guide).” https://www.simplygrounds.ca/how-much-does-lawn-care-cost-in-ontario-2026-pricing-guide/ (accessed August 2026).
8. McNitt, J. et al. (Penn State Center for Sports Surface Research). “Surface Temperature of Synthetic Turf.” 2008. https://plantscience.psu.edu/research/centers/ssrc/documents/temperature.pdf/@@download/file/temperature.pdf (accessed August 2026).
9. Cumberbatch, L. et al. “Artificial Turf Versus Natural Grass: A Case Study.” *Sustainability* (MDPI), 2025. https://www.mdpi.com/2071-1050/17/14/6292 (accessed August 2026).
10. New Jersey Department of Environmental Protection. “Synthetic Turf — A Review of the Current Science.” 2025. https://dep.nj.gov/wp-content/uploads/dsr/synthetic-turf-report-2025.pdf (accessed August 2026).
11. National Collaborating Centre for Environmental Health (NCCEH). “Artificial turf playing fields: A review of evidence on health risks.” November 2025. https://ncceh.ca/resources/evidence-reviews/artificial-turf-playing-fields-review-evidence-health-risks-and (accessed August 2026).
12. Environment and Climate Change Canada / Health Canada. “Federal Science Assessment of Plastic Pollution.” October 2020. https://science.gc.ca/site/science/en/blogs/science-behind-scenes/how-does-science-assessment-help-plastic-pollution-reduction (accessed August 2026). Additional lifecycle and microplastic findings compiled in Wikipedia, “Artificial turf.” https://en.wikipedia.org/wiki/Artificial_turf (accessed August 2026).
13. K9Grass (ForeverLawn). “Drainage rate FAQ — Flow-Through backing.” https://k9grass.com/faq/how-does-the-drainage-rate-of-k9grass-synthetic-turf-compare-to-the-industry-standard-fake-lawn-for-dogs/ (accessed August 2026).
14. Serenity Landscape Group. “9 Infill Types for Artificial Grass That Actually Work.” https://www.serenitylandscapegroup.com/9-infill-types-for-artificial-grass-that-actually-work/ (accessed August 2026).

CITE THIS REPORT

Artificial Grass Oakville Research (2026). *Artificial Grass & the Environment in Oakville: An Evidence Review*. AGO Research Series RR-2026-OAK-03, Oakville, Ontario. https://artificialgrassoakville.ca/research/artificial-grass-environmental-evidence-review-oakville/

Disclaimer. This report aggregates and analyzes publicly available data from the sources listed above. Figures marked as estimates or assumptions are derived from those published sources using the stated assumptions; they are not quotations, engineering measurements, or a substitute for a site-specific environmental assessment. Artificial Grass Oakville Research is the publications arm of Artificial Grass Oakville, a residential artificial-grass installation company serving Oakville and the GTA.