

To: Hamilton Planning Board  
From: Anne Gero  
Re: Comments on Athletic Campus Redevelopment Project  
Date: February 9, 2024

The following are my comments to date on the Athletic Campus Redevelopment Project as presented by Gale Associates (the "Project").

## **A. LIGHTING**

### **1. International Dark Sky Program for Sports Field Lighting**

The Application states that all lighting fixtures will be "dark sky certified or its equivalent". In addition, all lighting should comply with the International Dark Sky ("IDS") Outdoor Sports Lighting Program (the "IDS Program"). This is a certification program administered by the IDS. The School District either should complete the IDS Program or should have MUSCO Sports Lighting ("MUSCO"), the company that designed the lighting system for Gale Associates, provide a statement of the ways in which the proposed lighting complies/does not comply with the standards of the IDS Program.

The IDS Program has several elements other than merely the physical characteristics of the lights (ie., intensity, glare, direction, etc.) For example, it also covers topics such as whether there is a "lights out" time, who controls the off/on of the lights, what activities will use what intensity of lighting (ie., practice games and field maintenance require less lighting than league games), etc.

The School District should provide the Planning Board now with a proposal on how it intends to use and manage the lights. It's not sufficient for the School District merely to state that it will complete the IDS Program. This is because the IDS Program requires a description of how the lights will be used but does not dictate how. For example, the IDS Program requires a "lights out" time for the lighting system but does not dictate what that time should be.

Athletic field lighting can be very impactful upon neighbors, and the Planning Board should impose conditions on the actual use of the lights. In order to do so, however, the Planning Board first needs to receive a proposal on the use of the lights from the School District<sup>1</sup>.

### **2. Property Boundaries/Wetlands/Buffer Zones**

The two illumination plans submitted by Gale Associates should be revised to show property boundaries, wetland, and wetland buffer zones. In a number of instances, the lighting shown on these plans appears to extend beyond the boundaries of the school property, and into wetlands and their buffer areas.

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<sup>1</sup> The School District has rejected several requests to meet with abutters regarding lights and noise.

### 3. Conservation Commission Order of Conditions

The Conservation Commission Order of Conditions dated April 28, 2023 (the “Order”) states that the “Resource Areas” at the softball field and tennis courts must be protected from light pollution. (See Order at Condition 73). The current lighting plan appears to violate this condition.

## **B. NOISE**

The School District has provided NO information about sound systems or their program for mitigating sound impacts on neighbors.

### 1. Playing Fields

With respect to sound systems at the playing fields, the School District should be required to state at a minimum:

- where speakers will be located and how they will be directed,
- the maximum volume,
- when the sound systems will be used (some schools require that they be used only during league games, and not during practice sessions, pregame warm-ups, or adult recreation play),
- who will control the use of the sound systems, and
- a time after which the sound system will not be used.

### 2. Tennis/Pickleball Courts

Because of the nature of the sound from pickleball courts, these courts should be constructed with mass loaded vinyl sound mitigation material on the two sides of the court fence facing the residential properties. Such material needs to be secured to fencing of sufficient height (8’ to 10’) and strength to adequately deflect the sound and support the sound mitigation material.

## **C. DRAINAGE/STORMWATER REGULATIONS**

### 1. Proposed Drainage System

In its comment letter dated December 12, 2023, to the Planning Board, the Ipswich River Watershed Association (IRWA) noted that underground drainage systems “are virtually guaranteed to degrade and fail over time”. As a result, IRWA recommended that (a) the stormwater calculations for the Project should include a 30% reduced efficiency factor, and (b) there be some above ground water detention basins as backup to the underground system.

The recommendations of IRWA are quite important given the rate at which artificial turf sheds microplastic. An average artificial turf field of 80,000 sq.ft. contains 40,000 pounds of plastic carpeting, and loses .5% - 8% of its blades each year<sup>2</sup>. This means that such a field can shed 200 – 3200 pounds of plastic annually which will clog up the drainage system and pollute the environment.

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<sup>2</sup> Beyond Plastics, [Synthetic Turf is Hazardous](https://www.beyondplastics.org/), beyondplastics.org.

The drainage calculations submitted by Gale Associates and the comments of the peer reviewer do not take into account the shedding of these “grass” fibers. I urge the Planning Board to examine this issue and address it as recommended by IRWA.

## 2. Right to Drain onto Property of Others

The existing fields drain onto the property of others. While the drainage calculations submitted by Gale Associates show that the amount of water draining onto the property of others will remain the same, water from the artificial turf fields will be qualitatively different. That is to say, the drainage water from the artificial turf fields will contain harmful pfas, other chemicals, and micro-plastics. The owners have not given permission for this type of drainage onto their properties. The Planning Board should not approve the plans until the School District shows that it has obtained these rights.

## **D. ARTIFICIAL TURF SHOULD BE PROHIBITED**

### 1. Artificial turf is not appropriate

Artificial turf is not appropriate for playing fields that are used by student athletes as well as for gym classes and daily recess for middle school students:

- There are health concerns for athletes with respect to both the infill and the “blades” due to exposure to pfas and other chemicals.<sup>3</sup>
- High school athletes are 58% more likely to sustain injuries on artificial turf than on natural grass.<sup>4</sup>
- Artificial turf can get quite hot on warm clear days. Studies have shown that artificial turf can get 35° - 50° hotter than natural grass regardless of the type of infill. On a clear sunny day, artificial turf can reach a temperature of 150° when the air temperature is only 85°. <sup>5</sup>
- PFAS, other chemicals, and microplastics leach from artificial turf and contaminate the surrounding environment. This risks contaminating 3 private drinking water wells on Longmeadow Way for which the School District and Town could be held liable.
- One of Hamilton’s drinking water wells was taken off-line in late 2021 due to pfas levels in excess of the Massachusetts limit. EPA is poised to further lower those limits. We don’t need to add more pfas to the environment that could end up in our drinking water supply or that of the Town of Ipswich.
- 99% of Americans already have pfas in our blood. We should not be adding more pfas to the environment regardless of the existing “background levels”. Pfas are “forever chemicals” that build up in our bodies over time. Pfas levels in blood only go up – they don’t go down.

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<sup>3</sup> Letter of Dr. Sara Evans dated January 5, 2024, to Chairpersons Allara and Crouch.

<sup>4</sup> Washington University School of Medicine, A Retrospective Cohort Study, July 2021 (a study of injuries of high school athletes over 26 schools)

<sup>5</sup> TURI, Sports Turf Alternative Assessment: Preliminary Results – Physical and Biological Hazards (2016); Penn State Center for Sports Surface Research, Surface Temperature of Synthetic Turf.

## 2. Grass Fields Will Work in Hamilton

Grass fields that are appropriately constructed and maintained can support the amount of play at the high school/middle school. Gale Associates has reported the hourly use of the fields as follows<sup>6</sup>:

	Hours per year
Football field	260
Baseball field	248
Softball field	712
Field 1	554
Field 2	648
Field 3	410

Case studies of grass fields in Marblehead and Springfield show that they have grass fields that are used 1,860 hours per year and 1050 hours per year, respectively<sup>7</sup>. These numbers are well above those in Hamilton.

If natural grass is correctly aerated and overseeded, rest periods are not needed.<sup>8</sup> With appropriate drainage, such fields can be played on within several hours of a rain event.<sup>9</sup>

### **E. IF ARTIFICIAL TURF IS PERMITTED**

#### 1. Testing for PFAS and Other Chemicals<sup>10</sup>

If artificial turf is permitted, it should be required to be pfas free.

All components of the artificial turf (blades, backing, shock pad and infill) should be tested for pfas, metals and semi-volatile organic compounds prior to installation. This testing should be done at an independent lab and test results should be given to the Planning Board and Board of Health.

Currently, there are approximately 15,000 pfas compounds that have been identified and tests have been developed for approximately 70 of them. Given this, the pfas testing should be for these 70 or so specific pfas as well as for “total organic fluorine”. All pfas compounds give off

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<sup>6</sup> See Presentation by Kathy Hervol to Planning Board (January 9, 2024) (the “Hervol Presentation”). Note that the Hervol Presentation sets forth the number of “annual uses” for these fields. In its 2015 Master Study, Gale Associates defines an “annual use” as 2 hours of game or practice. In my comments, I have converted the “annual uses” to hours in order compare the use of Hamilton’s fields to those of other communities.

<sup>7</sup> University of Lowell Toxic Use Reduction Institute (“TURI”), Natural Grass Playing Field Case Study: Marblehead, MA: 20 Acres of Organically Managed Playing Fields (July 2019, revised November 2020); TURI, Natural Grass Playing Field Case Study: Springfield, MA: Organic Grass Fields Meet Athletes’ Needs and Protect Connecticut River Watershed (June 2019).

<sup>8</sup> Tom Irving Advisors; TURI, Athletic Playing Fields – FAQ, turi.org.

<sup>9</sup> TURI, Natural Grass Playing Field Case Study: Dennison University, Granville, OH.

<sup>10</sup> See generally TURI, Per- and Poly-fluoroalkyl Substances (PFAS) in Artificial Turf (February 2020); Letter from Jeff Gearhart, Ecology Center, to Chair Marnie Crouch dated February 9, 2024.

fluorine as they break down so tests for total organic fluorine will show that pfas are present even though the specific compounds cannot be identified.

The testing should include the standard tests as well as tests following a Synthetic Precipitation Leaching Procedure (“SPLP”). The SPLP is designed to show how much pfas will leach from the materials.

For those tests which identify specific pfas compounds, the testing should be done at detection limits of 4 parts per trillion (“ppt”) or below. For several years, Massachusetts has prohibited certain pfas in its drinking water at 20 ppt or above. The EPA is poised to ban PFOA and PFOS in drinking water at 4 ppt or above. In its explanation of this proposed limit, EPA declared that there was “no safe level” of such compounds but that this 4 ppt limit was the lowest amount that could be “reliably measured” using “routine laboratory operating procedures”.<sup>11</sup> There is no reason for tests to use a higher detection limit.<sup>12</sup>

For testing of total fluorine, see letter of Jeff Gearhart of the Ecology Center to Chair Crouch dated February 9, 2024, regarding recommended testing methodologies and detection limits.

## 2. Infill Should be of Organic Material

Various types of infill can be used in artificial turf. Crumb rubber is one type of infill that has been found to contain heavy metals and other chemicals that are known carcinogens. The Conservation Commission already mandated that the infill at the softball field be of natural material. The Planning Board should prohibit crumb rubber infill for all of the fields.

## 3. Temperature Testing Program

While watering the fields can lower the temperature of the fields, the plans submitted to the Planning Board do not show an irrigation system. Also, watering artificial turf fields will lower the surface temperature, but this only lasts for approximately 20 minutes after which the surface will be back to its original high temperature.

The proposed artificial turf fields will be used not only for athletic team practices and games, but for gym classes and the daily Middle School recess. It’s quite likely that these fields will exceed safe playing temperatures on clear sunny days during the months of June and September, and possibly other months as well.

The Planning Board should require the School District to submit its policy for testing the temperature of the artificial turf and halting use of the fields when certain temperatures are reached. Other schools have such policies.

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<sup>11</sup> Federal Register, [PFAS National Primary Drinking Water Regulations Rulemaking](#) (March 29, 2023).

<sup>12</sup> All of the PFAS testing samples submitted by Gale Associates in its Application were only for specific pfas compounds. In addition, they had detection limits in the parts per million (rather than trillion) or, if they were in the ppt, had detection levels greatly in excess of the 4 ppt. These are not acceptable detection limits for specific pfas compounds given the current advances in pfas testing.

#### 4. Minimization of Injuries

There are industry standards for measuring the compaction/impact absorption of artificial turf fields. The common measurement is a g-max measurement, and most manufacturers recommend annual g-max testing.

For safety reasons, the Synthetic Turf Council recommends that artificial turf should have a g-max reading of 165 or below. Many older artificial turf fields can test at 200 or above. (By comparison, an average grass field has a g-max of about 80, and a severely compacted grass field can test at 115-120.)<sup>13</sup>

The School District should explain how it intends on monitoring and minimizing the risk of injury to users of the fields, including the frequency of GMAX testing and who will receive copies of the test results.

#### 5. Supplier “Take Back”

There currently are no recycling programs in the US for artificial turf. Instead, they are being incinerated, landfilled, or stored in open fields. Not only does the equipment not exist to separate out the various components of the artificial turf for recycling (ie., separating out the infill, blades of “grass” and backing), but as a practical matter there is no market for the resulting materials.

Over time, it will likely become increasingly expensive to dispose of artificial turf. The Planning Board should require the supplier of the artificial turf to take it back the artificial turf back at the end of its life to minimize the cost/risk to the School District/Town of having to dispose of it in 8-10 years.

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<sup>13</sup> [Aging Artificial Turf Fields May Carry Risk of Head Injuries](#), Boston Globe (September 24, 2022).