



Gale Associates, Inc.

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October 31, 2006

Mr. Brian Monahan
Conservation Administrator
Town of Wayland
Town Building
41 Cochituate Road
Wayland, MA 01778

RECEIVED
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WAYLAND CONSERVATION COMMISSION

Re: Leachate Analysis Report
Wayland High School Athletic Facility
Gale JN 712050

Dear Mr. Monahan:

Gale Associates, Inc. (Gale) was hired by the Wayland Boosters Association to assist them with the planning, design, and permitting of a synthetic turf athletic field at the Wayland High School. This report has been developed for the Wayland Conservation Commission to address questions and/or concerns related to the potential risk that a synthetic turf athletic field will have on the Town's drinking water supply and wetland resource areas.

Project Summary/Background

The proposed synthetic turf field, as designed, will be located within the limits of an existing bituminous concrete running track that currently sits behind the Wayland High School building. The existing field is natural turf and is in chronically poor conditions due to overuse and the inability to apply proper fertilization due to its proximity to a wetland resource area and a Town drinking well. The use of a synthetic turf field will alleviate the current conditions of the natural turf field and provide a safe playing surface for the Wayland High School athletic teams as well as Wayland Recreation Department programs.

During the Notice of Intent application process, the Conservation Commission (the Commission), in an effort to protect the Town's public drinking supply, questioned the make-up of the proposed synthetic turf product as it relates to the effects on the environment. The proposed in-filled synthetic turf system consists of a carpet of slit-film polyethylene fibers that are punched through a fiberglass and urethane backing. The carpet is loose laid over a gravel stone base and filled on top with a clean, silica sand and crumb rubber to a depth of approximately two (2) inches. The crumb rubber is composed of recycled tires, to a gradation established by the Engineer and/or manufacturer of the synthetic turf product.

The turf industry maintains that the materials used in the "in-filled" systems are chemically inert and that there is no hazardous leachate. Gale previously provided the Commission testing results provided by various turf manufacturers which reflect that leachate from the fields is free from hazardous contamination.

Boston
Baltimore
Orlando
San Francisco



Given the potential lack of objectivity of such testing, questions regarding water quality remained.

Testing Procedures

To answer the questions posed by the Commission, Gale has completed independent laboratory testing to provide the Town with data relating to the quality of the leachate that is created after stormwater percolates through the in-filled system. Gale incorporated two testing procedures into the research to get a combination of in-situ conditions and also product conditions.

The first procedure performed to test the leachate of in-filled synthetic turf field included field sampling direct drainage outflows of several turf fields that have been installed in Massachusetts. Gale collected runoff, during and after a rain event, from one FieldTurf® ProSeries field, one Sportexe® Momentum 41 field and a Sprinturf® Field. The reason for choosing these three fields was to gather a sample for sand and rubber infill composed of Cryogenic rubber (FieldTurf®), a sample for sand and rubber infill composed of ambient rubber (Sportexe®) and a sample of an all rubber infill (Sprinturf®). Samples were collected using prescribed collection methods directly from the outlets of formal field under-drain systems. After collection, the samples were given to Groundwater Analytical, an independent testing agency located in Hyannis, Massachusetts, and tested for volatile organic compounds (VOCs).

The second testing procedure was the Synthetic Precipitation Leaching Procedure (SPLP) which is a test established by the Environmental Protection Agency (EPA Method 1312) to test the long term leaching of metals into the ground and groundwater. This method provides a more realistic assessment of metal mobility under actual field conditions, i.e. what happens when it rains (or snows). The extraction fluid is intended to simulate precipitation. East of the Mississippi River the fluid is slightly more acidic at pH 4.20 reflecting the air pollution impacts of heavy industrialization and coal utilization. The SPLP test procedure consists of placing a 100 gram sample into a plastic cylinder, which contains water with a PH level of 4.20 as required in the testing procedure. The sample and water is then agitated for a period of eighteen (18) hours. Following the agitation period, the water was extracted from the sample and tested for total solids (metals), volatile organic compounds (VOCs), Polynuclear Aromatic Hydrocarbons (PAHs), nitrogen, phosphorous and sulfate. The tests were performed by Groundwater Analytical.

Gale tested two samples of the synthetic turf in-filled product using the SPLP test procedure. Sample #1 is ProSeries as manufactured by FieldTurf®, and Sample #2 is Momentum 41 as manufactured by Sportexe®. These two products are similar in many ways but differ significantly in the crumb rubber used in their system. Fieldturf® has patented the use of Cryogenic rubber. Cryogenic rubber is processed by freezing the rubber prior to pulverization. Sportexe® and all other in-filled synthetic turf companies on the market use ambient rubber,



which is not frozen prior to pulverization. Gale has specified and installed both systems in projects analogous to the proposed field at Wayland High School.

Test Results

The results from the first testing procedure are included in Enclosure #1. Based on results from the field tests, the samples had no detectable amounts of VOCs.

Below is a summary of the results of the SPLP testing procedure: (see Enclosure #2 for full report from Groundwater Analytical)

| Testing | FieldTurf® ProSeries | Sportex® Momentum 41 | Maximum Contaminant Level (MCL) 310 CMR |
|--|-------------------------|--------------------------------|---|
| Volatile Organic Compounds (VOC) | BRL | BRL | 13 ug/L |
| Synthetic Precipitation Leaching Procedure (SPLP) Trace Metals | BRL | 0.01 mg/L Chromium | 0.1 mg/L |
| Extractable Petroleum Hydrocarbons by GC/FID | BRL | BRL | (Varies depending on target analyte) |
| Extractable Petroleum Hydrocarbons by GC/MS-SIM | BRL | 0.01 ug/L Benzo[b]fluoranthene | **1 ug/L (Varies depending on target analyte) |
| Inorganic Chemistry | 1.0 mg/l Total Nitrogen | 1.3 mg/L Total Nitrogen | 10 mg/L |

* BRL – Indicates concentration, if any, is below reporting limit of testing apparatus.

** All other Analyte detections for Sportex® Momentum 41 were below the reporting limit of the apparatus. MCL shown is for Benzo[b]fluoranthene.

Conclusion

Based on the results of the two testing procedures performed by our office, we have determined through EPA approved testing procedures and in accordance with 310 CMR 22.00 Drinking Water & 310 CMR 40 Massachusetts Contingency Plan, the above results indicate that the leachate from the proposed in-filled synthetic turf athletic fields will have no adverse effect on the bordering wetland resource areas or the Town of Wayland drinking water supply. The levels of metals and inorganics detected were 10 x below the Maximum Contaminant



Level and the PAHs were 100 x below the Maximum Contaminant Level as defined in 310 CMR 22.06.

Argumentatively, the proposed system will provide an environmentally sensitive alternative to natural turf grass, due to eliminating the required applications of potentially hazardous chemicals (i.e., fertilizers, pesticides, herbicides, etc.), irrigation (water consumption) and other typical maintenance standards (i.e., mowing, overseeding, striping, etc.) related to the upkeep of a quality natural turf field.

We hope this information addresses any concerns that the Commission may have towards the proposed in-fill synthetic turf field project at the Wayland High School. Should you have any questions, please do not hesitate to contact our office at (781) 335-6465.

Very truly yours,

GALE ASSOCIATES, INC.

A handwritten signature in cursive script that reads "Nathan A. Collins".

Nathan A. Collins
Project Manager

NAC/gmc

Enclosure(s):

1. Groundwater Analytical report dated October 18, 2006
2. Groundwater Analytical report dated October 27, 2006

cc: Wayland Board of Health
Craig Foreman -- Wayland Boosters Association
Nancy McShea -- Wayland Recreation Department
Wayland Water Commission

GROUNDWATER ANALYTICAL

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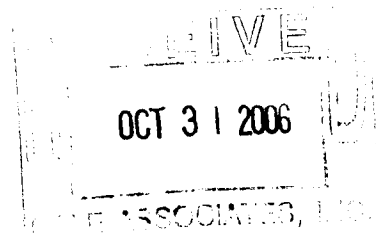
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October 27, 2006

Mr. Christopher Morris
Gale Associates, Inc.
163 Libbey Parkway
Weymouth, MA 02189

LABORATORY REPORT

Project: **Crumb Rubber Leachate/712050**
Lab ID: **100214**
Received: **10-20-06**



Dear Christopher:

Enclosed are the analytical results for the above referenced project. The project was processed for Priority turnaround.

This letter authorizes the release of the analytical results, and should be considered a part of this report. This report contains a sample receipt report detailing the samples received, a project narrative indicating project changes and non-conformances, a quality control report, and a statement of our state certifications.

The analytical results contained in this report meet all applicable NELAC standards, except as may be specifically noted, or described in the project narrative. This report may only be used or reproduced in its entirety.

I attest under the pains and penalties of perjury that, based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

Should you have any questions concerning this report, please do not hesitate to contact me.

Sincerely,


Eric H. Jensen
Operations Manager

EHJ/kh
Enclosures