



# HANOVER CONSERVANCY

*Protecting land & water in our community*

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Hanover Planning Board  
Hanover Zoning Board of Adjustment  
PO Box 483  
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January 6, 2023

RE: Dartmouth North Campus Proposal

To Members of the Planning and Zoning Boards:

The Hanover Conservancy has been following the proposals by Dartmouth College to develop a new campus on Lyme Road, north of the traditional campus, on its former golf course land ("North Campus Proposal"). The Hanover Conservancy is the oldest local land trust in New Hampshire, formed in 1961 in response to the town's adoption of its first zoning ordinance, which omitted conservation planning. Our mission is to protect land and waters in our community through land conservation and stewardship, education, and advocacy for conservation-oriented public policy. In this role, we would like to share our thoughts about this major proposal that could permanently affect a significant watershed.

Conservancy staff and a number of our board members attended the North Campus Proposal site visit offered by the Planning Board in November 2022. We appreciated the opportunity to participate in this process and better inform ourselves. After reviewing project proposals and attending the site visit, we offer the following comments.

The Conservancy is concerned that the soils in the proposed location present significant environmental challenges to any development of this scale and that Dartmouth's proposed drainage design is inadequate. In the absence of a plan that addresses all of the future development plans for this site, we are concerned that Dartmouth's development of this parcel will permanently impair Girl Brook and its watershed.

While the site may look easily developable – level land close to a major road – the site is compromised by what is out of view: the complex soils and drainage patterns associated with the landscape legacy of glacial

Lake Hitchcock. This area is underlain by lacustrine (“originating in lakes”) soils laid down by glacial Lake Hitchcock in alternating clay/sand layers called varves.<sup>1</sup>



**Varves are well known to require special engineering,**<sup>2</sup> because focused water can move sideways through sandy layers instead of downward to groundwater, when blocked by the clay layers. The traditional campus area, while partially built on similar soils, is served by a complex urban stormwater collection network, unlike the proposed North Campus.

Climate change, and the heavy storms it is bringing to our area, requires careful and substantial stormwater management, a highly challenging task in areas of lacustrine soils. In 2010, a heavy storm overwhelmed a stormwater detention pond built on such soils by



Dartmouth at Rivercrest, just up the road from the current proposed project, resulting in failure (photo at L) of the nearby Connecticut riverbank that cost the college over \$1 million to fix (photo at R). A similar event occurred on such soils a few



years earlier in Lyme, where a pond on the east side of River Road captured runoff from a heavy storm creating an avulsion in a field on the west side, leading to failure of the riverbank. These scenes are already familiar on the former golf course where runoff from the manicured area created erosion on east walls of the Girl Brook ravine.

Any development in the proposed location must be able to **capture and infiltrate stormwater and meltwater on site**, following generally accepted best practices for stormwater management. This must take into account updated flow models that reflect the new reality of more frequent, intense storm events associated with climate change. It must also include capture of pollutants such as phosphorus and nitrogen that could otherwise escape through stormwater into the nearby impaired waters of Girl Brook.

It will be difficult if not impossible for the project at the proposed scale to create enough safe, well-dispersed on-site storage and infiltration capacity for the runoff from the currently proposed North Campus impervious surfaces (roofs, sidewalks, parking, other paved areas), not to mention future development. Inadequately managed drainage could

<sup>1</sup> Glacial Geology, Laurence Becker and David Wunsch, in *Where the Great River Rises, An Atlas of the Upper Connecticut River Watershed in Vermont and New Hampshire*, Rebecca A. Brown, Ed., p. 14. Connecticut River Joint Commissions, University Press of New England, 2009

<sup>2</sup> DeGroot, D.J. & Luttenegger, Alan. (2003). *Geology and engineering properties of Connecticut Valley varved clay. Characterization and Engineering Properties of Natural Soils*. 1, p. 695-724.

also create soil instability beneath the buildings. Directing stormwater from a new detention pond to the existing pond, then under Route 10, then down into Girl Brook's already compromised channel may cause further damage to Hanover's most impaired stream system.



In fact, we note a head cut forming in the gully of the driving range on the east side of Lyme Road (photo at L, taken 1/5/23 by HC board member) that appears to have started or become exacerbated by the recent heavy rains in late December. This area drains directly to Girl Brook and is now sending sediment to the stream. While we do not know whether this is a result of overflow delivered from the pond across the road, it reinforces our concern that the watershed of this brook cannot accept significant new and focused heavy loading.

The Conservancy strongly supports the Town's plans to require an independent engineering analysis of the North Campus Proposal's plans for stormwater management and drainage. This analysis must account for

the unique soils underlying the project site and assume that additional development of this area is likely to be proposed in the future. A pollutant loading analysis should also be required. The Town should deny any waiver requests related to the project's siting and development, including stormwater management and drainage.

Particular concerns include potential impacts on the Girl Brook Gorge in **Pine Park, the oldest conservation area** in Hanover. In some places, the gorge is 120' deep with 60 degree slopes on its walls. The Town recently sponsored an old growth forest workshop in Pine Park highlighting this important natural area. The gorge supports a rare example of very old forest, where steep and difficult terrain protected the gorge from logging. Experts in this field determined that this forest will show characteristics of old growth in the next 30 years. Forests, and in particular old forests, are critical to combatting climate change. New Hampshire's 2020 Forest Action Plan calls for the protection of forests because of the important role they play in mitigating climate change. The plan instructs: "Encourage conservation and management of a portion of the forested landscape – on public and private lands – for old growth and natural area conditions that would minimize vegetation and soil disturbance and optimize forest carbon storage."<sup>3</sup>

The North Campus Proposal includes a large parking area located very close to the Girl Brook Gorge. A heavy storm could overwhelm or bypass the proposed detention pond and send runoff directly onto Pine Park property and into this chasm, with potentially tremendous erosive effects that would impact not just Girl Brook but also the Connecticut River immediately downstream. There is just not enough space for an adequate buffer

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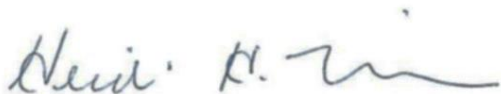
<sup>3</sup> NH Division of Forests and Lands, New Hampshire Forest Action Plan – 2020, p. 141 (available at [https://www.nh.gov/nhdfl/documents/nh-stateforestactionplan\\_2020.pdf](https://www.nh.gov/nhdfl/documents/nh-stateforestactionplan_2020.pdf)).

between the proposed development and the gorge. The Girl Brook area is also home to state-listed rare, threatened, and possibly endangered species. The Conservancy recommends a query to the NH Natural Heritage Bureau to determine if those species may be impacted by the proposal.

The Conservancy is further concerned about the potential loss of green space and disturbance of recreational trail access and connectivity in the project location. Any review of the North Campus Proposal should consider the project's impact on these valued socio-cultural features and require the project to minimize and mitigate those impacts.

The Hanover Conservancy believes that the drainage plan is inadequate and that an independent professional consultant experienced in engineering in the context of varved soils should be hired. Unless and until stakeholders review expert opinions on soils and stormwater management and are satisfied that the design will adequately protect Girl Brook and Pine Park, the Hanover Conservancy cannot support the planned development. Furthermore, any consideration of the environmental impacts of the project should take into account the overall plan for the entire parcel, rather than considering this discrete development in isolation.

Very truly yours,

A handwritten signature in blue ink, appearing to read "Heidi Trimarco".

Heidi Trimarco, *President*

A handwritten signature in blue ink, appearing to read "Adair Mulligan".

Adair Mulligan, *Executive Director*

cc: Hanover Conservation Commission  
Hanover Select Board  
Pine Park Association  
Dartmouth College Campus Planning Office