



February 22, 2013

Paul Cincotta
New England Development
One Wells Avenue
Newton, MA 02459

**Re: University Station
Response to Stormwater Management Peer Review Comments**

Dear Paul:

Tetra Tech has completed our review of the comments provided by Weston & Sampson dated January 12, 2013. Weston & Sampson provided comments on behalf of the Dedham-Westwood Water District. For ease of review, responses are numbered to coincide with the numbering system utilized in the original letters. Responses are shown in *italic* font.

January 12, 2013 Correspondence from Weston & Sampson

Recharge:

Comment 1: In order to accurately assess changes in recharge to the well field, it is necessary to look at changes in the existing conditions (2013) to the proposed conditions. The current comparison provided by the Applicant is using the former developed conditions which were the conditions approximately five years ago.

Response: *The project site is fully permitted for a 4.5 million square foot development and all permits are still active. The project is being modified, to reduce density and align with the current economic realities. All comparisons must be between the Industrial Park (which existed prior to the start of construction) and the current University Station Master Plan.*

That said, the MA DEP Stormwater Management Policy Standard 3 requires that the infiltration volume of stormwater under post development conditions be at least as much as the infiltration volume under pre-development conditions. Furthermore, the MA DEP Stormwater Policy considers pre-development conditions to be prior to any impervious surfaces being placed within the project site. MA DEP provides target depth of infiltration based on Hydrologic Soil type in order to arrive at the required volume of recharge. For the University Station Master Plan recharge calculations, we have conservatively assumed that all on-site soils are Hydrologic Soil Group A, which yields the greatest required recharge volume. Under the proposed conditions, there will be approximately 84 acres of impervious

cover. This includes all building roofs, parking areas, sidewalks and other hardscape features. Therefore, the project must provide at least 4.2 acre-feet of groundwater recharge.

To achieve compliance with this MA DEP Standard, 5 subsurface infiltration systems have been incorporated into the project. Combined, these recharge systems have been designed to recharge 4.2 acre-feet of stormwater. As required by the MA DEP Stormwater Management Policy, over 65% of the impervious site surfaces are directed to infiltration facilities. The on-site infiltration systems will serve more than 65% of the proposed impervious areas and are designed to recharge the first 1.41 inches of rainfall in order to meet the 4.2 acre-foot volume requirement. However, our analysis indicates that all infiltration systems can actually recharge the first 2 inches of rainfall. Therefore, the recharge component of the design exceeds the annual potential recharge of the site as it exists today or prior to development of the former industrial park.

Comment 2: The drainage site plans provided do not allow for an assessment of changes in recharge to the aquifer. Please provide a map and associated table that details which areas (road and roof) are diverted to which sub-surface infiltration gallery and an analysis of the changes from existing (2013) conditions. A discussion of the overall site water balance should complement this map and table.

Response: Please refer to the attached graphic entitled *Infiltration Basin Watersheds*. Areas draining to infiltration practices have been color coded and keyed into the infiltration system that each area discharges to. Infiltration volumes in the water balance calculations only consider areas that are shown to be tributary to the infiltration system as on the above mentioned graphic.

As requested, a water budget calculation has been prepared for the University Station project. The water balance budget calculation prepared for the prior Westwood Station project determined that under the existing conditions (the former industrial park) the annual aquifer recharge (surplus) was approximately 8.1 million gallons per year, when considering annual water demand.

The analysis for the proposed University Station project indicates that there will be a net annual recharge benefit (surplus) of approximately 10.9 million gallons per year, or an increase of 2.8 million gallons per year over the existing conditions.

In preparing the water budget, the University Station project followed the same methodology as the Westwood Station project. The following considerations were made:

- *Rainfall data was analyzed from Norwood Airport's weather station from 2000 to 2009. The rainfall data is attached for reference.*



- *Evapotranspiration was calculated using the Thornwaite method. Long term average temperature data was obtained from the Blue Hill weather station.*
- *Although the project proponent intends to use native, drought tolerate plant and tree species, it was assumed that 20% of the impervious area would require irrigation (the same assumption as in the Westwood Station water budget). It was assumed that 1" of water would be required from the middle of May to the middle of September.*
- *Domestic water consumption was estimated in the same fashion as the Westwood Station water budget. Title V rates were reduced by 50% to represent average demand. Also, water conserving fixtures will be used as required by plumbing code, therefore the average demand was further reduced by 15%.*
- *Evaporative cooling needs for the Westwood Station project were estimated for approximately 1,500,000 square feet of office space. The University Station project is proposing 325,000 square feet of office space, or 22% of the previous project. Therefore, evaporative cooling demands from the Westwood Station project were reduced to 22% of what was previously calculated.*

Comment 3: Please provide a discussion of which Low Impact Design (LID) alternatives were evaluated for this development and found to be infeasible.

Response: Multiple Low Impact Design alternatives have been considered for the project. Below is a discussion of each alternative:

- *Porous Pavement: Porous pavement was considered as an alternative to a conventional pavement and drainage system. Porous pavement would allow stormwater to infiltrate where it falls. The project applicant has extensive operational knowledge of porous pavement as the owner of one the largest porous pavement installations in the northeast, located in Greenland, NH. Porous pavement systems provide winter maintenance challenges and often require heavier applications of deicing chemicals in order to maintain an ice free surface, which is a must in a retail setting. Deicing chemicals tend to leach through the porous pavement as opposed to creating a brine as it would on standard pavement, which reduces the effectiveness. Additionally, in the warmer months, vehicle tires scour and loosen the aggregate of the pavement's surface, which compromises the pavement's thickness, stability and performance.*
- *Rain Gardens: Rain gardens were considered as a mechanism to promote local infiltration. The presence of ledge along the building fronts in the core retail area and poor infiltration rates in the center of the core retail parking field are significant constraints and limits the potential sites for rain gardens. Rain gardens in retail*

settings also tend to accumulate litter, which reduces the functionality. Finally, in the event of a small fuel or oil leak, rain gardens would not capture the pollutants in the same manner as a catch basin, and would allow the pollutants to leach directly into the aquifer.

- *Smaller, localized infiltration systems: Ledge and poor soil infiltration rates have limited the location of the infiltration systems. Infiltration systems have been located in areas where the soils are suitable for infiltration and have been designed to maximize groundwater recharge.*
- *Utilize On-site materials: The infiltration systems proposed as well as site retaining walls will utilize ledge excavated from and processed on the project site. The excavated ledge will also be processed as gravel for use under parking areas and building pads. This reduces both material export and import and the associated construction traffic.*
- *Drought tolerant, hardy, native plantings: The planting design will rely on drought tolerant, hardy, native species as a mechanism to reduce irrigation needs. By reducing irrigation requirements, cisterns and/or rainwater harvesting systems are not needed and rainwater can be directed to infiltration systems to improve aquifer recharge.*

Comment 4: Although, the source of the data is not referenced, the precipitation data used in the modeling effort appears to be from Technical Paper No. 40, Rainfall Frequency Atlas of the United States published in 1961. This paper has been the standard for many years; however updates to this dataset have been published by the Northeast Regional Climate Center (NRCC) and are available at the following website <http://precip.eas.cornell.edu/> for the area of interest. Weston & Sampson recommends the use of the NRCC dataset to be inclusive of the last 40 years of precipitation data as well as the effects of climate change in our precipitation record post 1970.

Response: See page 4-13 of the *Hydrology Handbook for Conservation Commissioners*, prepared by MA DEP. It states “current DEP policy also requires using rainfall data from the TP-40 Atlas”. This recommendation is not consistent with MA DEP policy or the previously reviewed and approved stormwater analyses.

Comment 5: Provide all supporting input information and calculations for the SWMM model including ground covers, soil groups, hydraulic conductivity calculations, and time of concentrations.

Response: A revised stormwater management report will be submitted along with updated Site Development Plans in the near future. A copy of the previous SWMM



calculations will be provided as a reference. The HydroCAD model will be updated to include a description of ground covers and time of concentrations.

Comment 6: Provide soil test and seasonal high groundwater elevation data for proposed infiltration system.

Response: A revised stormwater management report will be submitted along with updated Site Development Plans in the near future. In addition, a geotechnical data report will be submitted with the results of subsurface investigations in the vicinity of the subsurface infiltration systems. The data report will include the depth and elevation of the seasonal high groundwater table where field evidence of such is observed, and the results of field infiltration tests.

Water Quality:

Comment 1: Considering that the location of the stormwater infiltration is entirely within the Zone II of the well field, the Applicant should assess the impact on nitrogen loading and concentration in the aquifer.

Response: The proposed infiltration systems are part of an overall treatment train that includes routine pavement sweeping (monthly minimum), deep sump hooded catch basins and oversized Stormceptor water quality units. At this time, MA DEP has not provided removal rates for nitrogen for catch basins or Stormceptor water quality units. However, infiltration basins are estimated to result in 50 to 60% reduction nitrogen loading, prior to discharging to groundwater. The frequent street sweeping will also be effective in removing potential pollutants from the parking surfaces and capturing them prior to introduction to the stormwater management system.

Comment 2: The Applicant should address the use of de-icing chemicals on the development as well as a discussion of the stockpiling and disposal of snow or ice removed from streets located outside the Zone II that contain sodium chloride, chemically treated abrasives or other chemicals used for snow and ice removal.

Response: As stated in the MEPA Certificate for the former Westwood Station project, deicing chemicals containing sodium chloride were prohibited. The University Station project will also be subject to the sodium chloride prohibition. A snow management plan will be developed in accordance with MA DEP requirements. However, given the above mentioned prohibition, there will not be any snow or ice that is removed from the site that will contain sodium chloride.

Comment 3: The Applicant has agreed to installing and sampling monitoring (sentinel) wells in proximity to the pumping wells. Please provide estimates of time of travel such that



the placement of the monitoring wells is of sufficient distance from the pumping well that the sampling time is less than the time of travel.

Response: *As part of the previous Westwood Station project, three monitoring well couplets were installed in the vicinity of the DWWD wells (each couplet consisting of a deep monitoring well and a shallow monitoring well). The Applicant proposes to install three additional individual monitoring wells adjacent to the three proposed subsurface storm water infiltration structures. The locations of the existing well couplets and the proposed monitoring wells are shown on the attached DWWD Monitoring Well Plan.*

The Applicant is agreeable to having its consulting engineer estimate the groundwater travel time from the storm water infiltration structures to the DWWD wells so that the time frequency of sampling is less than the time of travel. The Applicant proposes to estimate the groundwater time of travel using previous data from pumping tests and Zone II delineation studies completed by the DWWD for its wells. We respectfully request that reports of previous DWWD studies that contain hydrogeological data for the wells and surrounding aquifer be provided to the Applicant for use in estimating the groundwater travel time (e.g., well construction details, drawdown versus pumping rates, hydraulic conductivity of aquifer materials, and hydraulic gradient). After the groundwater travel time estimate is completed, a time frequency of sampling will be proposed.

Comment 4: The Applicant should provide a table detailing the proposed sampling schedule and analytes to be tested for in the proposed sentinel wells.

Response: *As part of the Westwood Station project, Weston & Sampson had developed a groundwater monitoring plan that included a proposed list of wells to be sampled, a list of analytes for each sampling round, and the frequency of sampling. Given that this plan was reviewed and approved previously, we would suggest that a similar plan be implemented in terms of the number of wells to be sampled and the list of analytes. We acknowledge that the frequency of sampling may be modified based on the estimate of groundwater travel time noted in response to Comment #4. A copy of the previous plan is attached.*

Comment 5: In the last meeting, the Applicant indicated some bedrock would need to be blasted to install the stormwater piping. The DWWD is concerned about the use of explosives in the Zone II. Explosives containing perchlorate, a toxic chemical which is highly soluble and can travel significant distances in groundwater. The DWWD would recommend other means of removing bedrock and requests that that alternative be addressed.

Response: *Similar to the Westwood Station project, a blasting specification will be prepared that prohibits the use of explosives that contain perchlorate. The blasting specification will require the contractor to prepare a Blasting Plan, and submit MSDS sheets for all explosive materials for review by the Applicant's consulting engineer. The*



specifications will require that all blasting be performed in accordance with the state fire prevention regulations in 527 CMR 13.00. An updated blasting specification will be submitted for review.

Comment 6: Will there be long term financial support for BMP's relative to stormwater? Will there be an escrow account, a fee structure from renters, a designated entity or person(s) responsible? The DWWD requests that notifications of any changes in ownership should be made to the DWWD within 30-60 days of the change.

Response: *Westwood Marketplace Holdings LLC or their successor's will retain the responsibility of maintaining common stormwater BMP's, such as pavement sweeping, catch basin cleaning, subsurface infiltration system maintenance and bio-retention basins maintenance. For individual parcels that are sold, maintenance responsibility will fall to the specific land owner for BMP's on their property. All parcels within the Development Area will be subject to the requirements of the approved Stormwater Operation and Maintenance Plan. Any changes in ownership will be reported to the Town and DWWD within 30 to 60 days of closing.*

As always, please do not hesitate to contact me should you have any questions or wish to discuss any of the enclosed information in greater detail. I can be reached at (508) 903-2085.

Sincerely,

A handwritten signature in red ink, appearing to read 'Nathan H. Cheal'.

Nathan H. Cheal, P.E.
Project Manager

Cc: John Twohig, Esq. – Goulston & Storrs
Bob Daylor, PE, PLS - Tt
Austin Turner – Tt
Vern Kokosa – Sanborn Head

Enc: Draft Water Budget
Stormwater Operations and Maintenance Plan
DWWD Monitoring Well Plan
Weston & Sampson Groundwater Monitoring Plan (2008)