

September 8, 2016

Mr. Roland Bartl, Director  
Planning Department  
Town of Acton  
472 Main Street  
Acton, MA 01720

**RE: Response to Comments from the Engineering Department dated 1/8/2016  
Nagog Pond Water Treatment Plant  
Acton, Massachusetts**

Dear Mr. Bartl:

We have been forwarded public comments submitted by the Town of Acton Engineering Department dated January 8, 2016 which reference "Site Plan Special Permit #11/20/15 - #459 – Concord Water – 180-182 Skyline Drive". Please find presented below our responses to these comments. We have numbered our responses to correspond with the numbered comments.

1. Comment: Fire Department driveway access

Response: We consulted with the Fire Department during the initial design and adjusted the driveway width and other site features accordingly. We have not received any formal comments from the Fire Department since submitting this application.

2. Comment: Fire Department signage

Response: No such signage is planned.

3. Comment: Sidewalks

Response: No sidewalks are planned.

4. Comment: Vertical datum conversion factor

Response: A vertical datum conversion factor will be shown on future plans.

5. Comment: The proposed site work is outside the 100-year flood zone

Response: No response required. A small section of the proposed perimeter fence traverses the flood zone and floodway.

6. Drainage comments:

- a. Comment: The water balance calculations should quantify the annual volume of infiltration

Response: A supplemental water balance calculation has been performed and is attached. The calculation closely follows the first example provided by the Engineering Department.

- b. Comment: The applicant should address how stormwater runoff is being handled in the PV area

Response: This comment is no longer pertinent based on the proposed distributed power units in lieu of the PV system.

- c. Comment: Certain area calculations do not exactly match.

Response: The differences in areas are trivially small and are not expected to affect the overall calculations. We identified a typo on SW-3: the 25,756.50 sf area should have been 27,756.50 sf. Various layout changes have occurred during the permitting process. Stormwater calculations will be revised prior to construction.

- d. Comment: Catch basin design and modelling

Response: A small volume of storage (a 4-foot diameter cylinder) is provided below the catch basin rims. This matches our construction detail for catch basins. The HydroCAD calculations include peak elevations for each pond, including catch basins. A review of each catch basin rim elevation versus the calculated peak elevations suggests that stormwater is not expected to rise above the catch basin rims – even during the 100-year storm.

7. Comment: Provide an as-built plan

Response: As-built plans will be provided.

If you should have any questions or require additional information, please do not hesitate to contact me at (617) 657-0276. I can also be reached via e-mail at [pcm@envpartners.com](mailto:pcm@envpartners.com).

Very Truly Yours,

**Environmental Partners Group, Inc.**



Paul C. Millett, P.E.  
*Project Manager*

Encl:

Attachment A: Supplemental Water Balance Calculation

CC: Richard Reine, Public Works Director  
Alan Cathcart, Concord Water/Sewer Division, Superintendent  
Concord Public Works Commission  
Town of Acton, Conservation Commission  
Town of Acton, Planning Department

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*Attachment A*  
*Supplemental Water Balance Calculation*

## Supplemental Water Balance Calculation

Project: Nagog Water Treatment Plant  
 Location: Acton, MA  
 Date: January 25, 2016  
 Calculation By: Adam Kran, P.E.

Groundwater Zone 4 - Watershed Protection Area

$$P = DR + ET + I$$

Based on the sample calculation furnished by the Town of Acton Engineering Department, the following values were used to calculate infiltration for both the existing and developed site conditions:

<b>Event:</b>	<i>2-year, 24-hour rainfall</i>
<b>2-year Rainfall</b>	3.06 in
<b>Evapotranspiration Potential (ET)</b>	21 in/yr
<b>Mean Annual Precipitation (P)</b>	44 in/yr

The watershed is approximately 242,000 square feet. Therefore, the total volume of precipitation is

$$242,000 \text{ sq ft} \times 3.06 \text{ in} / 12 = 61,710 \text{ cf}$$

The HydroCAD 2-year, 24-hour storm runoff volumes from the November 20, 2015 water balance calculations are provided in the following table. The runoff is divided by the total volume of precipitation to obtain % of total precipitation which becomes runoff. Annual direct runoff (DR) is this percentage multiplied by the mean annual precipitation.

	<b>Existing Conditions</b>	<b>Developed Conditions</b>
Runoff	2,050 cf	1,525 cf
% of Total P	3.32%	2.47%
Direct Runoff (DR)	1.46 in/yr	1.09 in/yr

$$I = P - DR - ET$$

	<b>Existing Conditions</b>	<b>Developed Conditions</b>
Infiltration (I)	21.54 in/yr	21.91 in/yr

In summary, there is expected to be more groundwater recharge in the post-development condition as a result of additional stormwater recharge facilities.