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MEMORANDUM

Date: October 23, 2019 Job No.: 19.06850.00

To: Daniel C. Hill, Esq. – Hill Law
6 Beacon Street, Suite 600
Boston, MA 02108

Subject: Soil Evaluation – 40B Development, 144 Seekonk Street, Norfolk, MA

On October 3, 2019, Nover-Armstrong, A Division of BETA Group, Inc. (BETA) conducted soil evaluations on the property located at 144 Seekonk Street in Norfolk, Massachusetts (the Site). This technical memorandum provides descriptions of the soil evaluations conducted on-site as well as an empirical determination on whether Area 2 is an area Subject to Protection under the Massachusetts Wetlands Protection Act (M.G.L. Chapter 131 Section 40 - *the Act*) and Norfolk Wetlands Protection Bylaw (Norfolk Town Bylaws - Article VII, Section 2). Specifically, BETA evaluated whether Area 2, as shown on the Environmental Inspection Report prepared by Patrick C. Garner Company, Inc., met the definition of an "area Subject to Protection" prior to its land disturbance.

Present during the site visit were Caitlin Nover (MA Approved Soil Evaluator) and Laura Krause of BETA; Dan O'Driscoll of O'Driscoll Land Surveying Co.; Sara White of Tetra Tech; David Crossman, Wetland Scientist; and Edward O'Harte, the Applicant.

Documents Reviewed

- Environmental Inspection Report – 144 Seekonk Street (Assessors' Map 23, Block 76, Lot 71); dated August 8, 2019; prepared by Patrick C. Garner Company, Inc.
- Custom Soil Report for Norfolk and Suffolk Counties, Massachusetts (144 Seekonk Street, Norfolk, MA).
- Delineating Bordering Vegetated Wetlands Under the Massachusetts Wetlands Protection Act; dated March 1995; Issued by the Massachusetts Department of Environmental Protection.
- Deep Hole Observation Hole Log – TP1; dated September 12, 2006; prepared by O'Driscoll Land Surveying Co.
- Publicly available GIS information.

Soil Evaluation Summary

A total of three (3) soil observation pits were excavated. The observation pits are described below:

- BETA-1 – The first observation pit was performed immediately adjacent to Area 2, approximately 15' east of the existing piezometer well located near Area 2. See, map attached hereto. BETA observed 10 inches of fill material underlain by what appeared to be a natural soil profile. BETA concluded that the Estimated Seasonal High Groundwater (ESHGW) mark to be approximately 21-inches, or 9 inches below the top of the A Horizon of the natural, undisturbed soil profile. This ESHGW observation was agreed upon by O'Driscoll. Based on the above observations, the soil from BETA-1 may have classified as a hydric soil prior to the placement of the fill material.

Layer	Depth	Color	Texture	Notes
Fill	0 – 10”	N/A	N/A	
O	10 – 12”	10 YR 2/2	Organic	
A	12 – 22”	10 YR 3/2	FSL	
C_1	22 – 28”	2.5 Y 4/3	FSL	Slight redox, greater than 2%
C_2	28 – 60” *approx.	2.5 Y 5/4 (matrix) 7.5 YR 5/8 (redox)	FSL	40 % redox concentrations

- BETA-2 – The second observation pit was performed approximately 80’ south BETA-1, closer to the downgradient wetlands. BETA observed what appeared to be a natural soil profile in this location. BETA concluded that the Estimated Seasonal High Groundwater (ESHGW) mark to be approximately 18-inches below grade. This ESHGW observation was agreed upon by O’Driscoll. Based on the above observations, the soil from BETA-2 would not classify as a hydric soil.

Layer	Depth	Color	Texture	Notes
O	0 – 6”	10 YR 2/1	Organic	40 % roots
A	6 – 12”	10 YR 3/3	FSL	40 % cobbles and stones
B	12 – 22”	10YR 3/4 (matrix) 10 YR 5/8 (redox)	FSL	6” band of heavy redox concentrations (60-70%) @ 18”
C	22 – 60” *approx.	2.5 Y 6/4	Med sand	25 % cobbles and stones

- The third observation pit was located approximately 80’ north of BETA-1, slightly upgradient from Area 2. This pit is in the location of a proposed stormwater BMP. A complete evaluation of the pit was not conducted based on its similarity to other test pits completed within the area (for example, TP20-23 which was described by O’Driscoll and witnessed by BETA prior to the commencement of the Area 2 specific on-site). BETA noted that the C-horizon was located approximately 36” below grade with a matrix color of 10YR 6/3. It is likely that there is high groundwater in this area which should be of consideration when approving the potential stormwater BMP design.

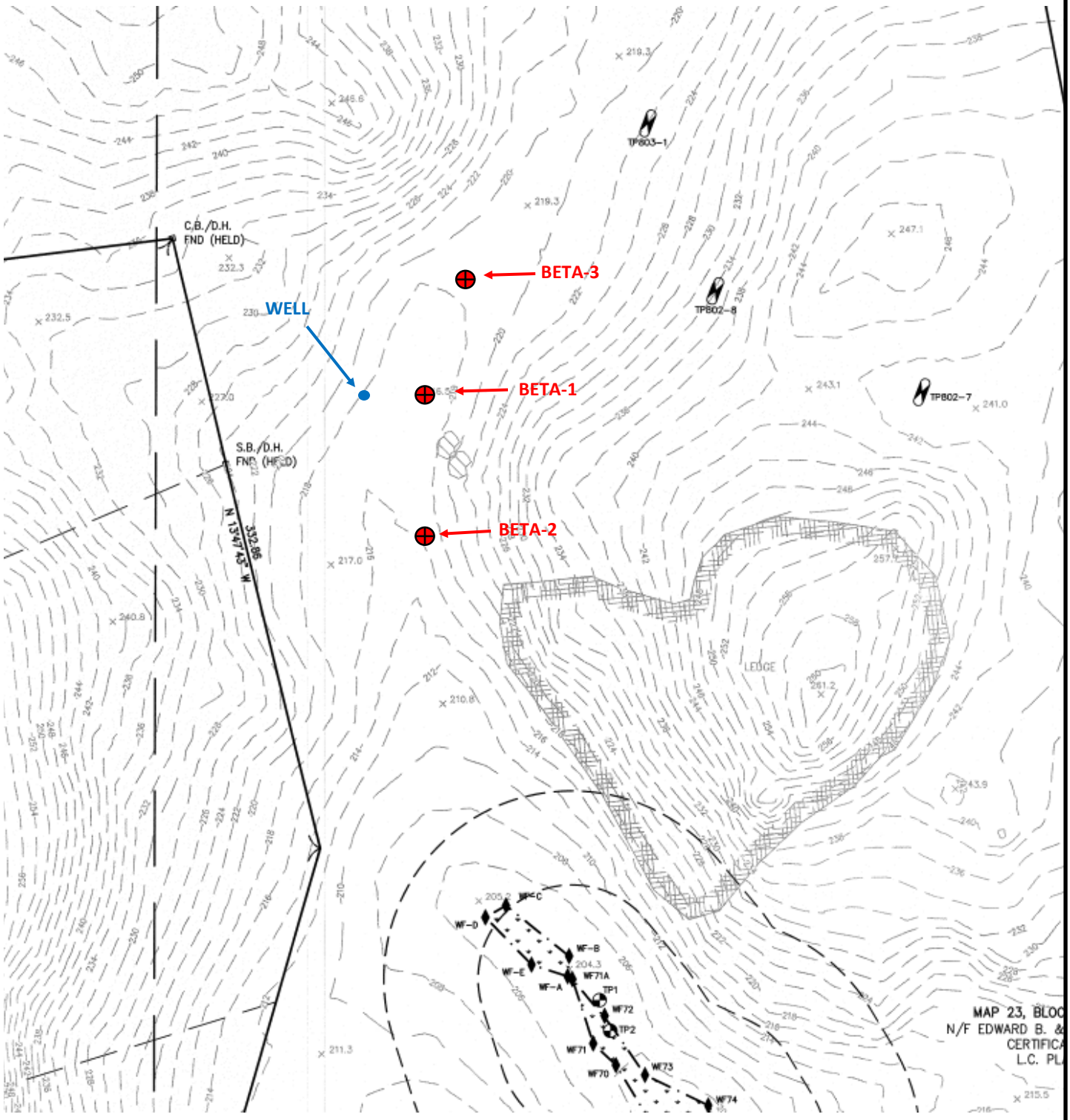
Bordering Vegetated Wetland Determination – Area 2

Per the definition of bordering vegetated wetland (BVW) found in the Massachusetts Wetland Regulations at 310 CMR 10.55(2)(c), a BVW’s vegetated community consists of >50% wetland indicator plants and saturated or inundated conditions exist. An indicator of saturated or inundated conditions are one or more of the following: groundwater within a major portion of the root zone; observation of prolonged or frequent flowing or standing water; and characteristics of hydric soils. To prove BVW exists where an area has been disturbed, evidence from a credible source should show that the area supported or would support under the disturbed conditions a predominance of wetland indicator plants prior to the disturbance. Such evidence would include indicators of saturated or inundated conditions.

Based on BETA's review of the aforementioned documents, the results of the soil evaluation, as well as other observations made during the assessment of the existing conditions (i.e. existing vegetation, topography) of the Site, it is our opinion that Area 2 would not have met the definition of BVW. The BETA 2 soil evaluation was performed in what appeared to be an undisturbed soil profile location downgradient of Area 2 and upgradient of the ephemeral stream identified by Garner in February 2018. Since hydric soils (an indicator of saturated or inundated conditions) were not identified in BETA 2, this area would likely not support a predominance of wetland indicator plants.

BETA does concur with Garner's finding that a stream per the definition found in Section 5 (36) of the Town of Norfolk Wetland Protection Regulations exists downgradient of Area 2 and BETA 1.[i] This area Subject to Protection under the Town of Norfolk Wetlands Protection Bylaw (Article VII, section 2) is not depicted on any project plan or the final Superseding Abbreviated Notice of Resource Area plan-of-record. It is BETA's opinion that water flows both on and below the ground at least once a year within this clear drainage pattern in a hydraulic gradient, ultimately hydraulically connecting to the resource areas depicted on the SORAD final plan-of-record. During our October 3, 2019 site visit, BETA investigated and discussed this drainage pattern with the Applicant's Wetland Scientist, David Crossman. At that time, he indicated that he did not dispute BETA's findings that there was evidence that water flows within the drainage pattern.

[i] In accordance with Section 5 (36) of the Town of Norfolk Wetland Protection Regulations, a stream is defined as "a body of running water, including brooks and creeks, which moves in a definite channel in or under the ground due to hydraulic gradient. A portion of a stream may flow through a culvert or beneath a bridge. A stream may be intermittent (i.e., does not flow throughout the year). A stream may also be man-made.



Site Figure—Approximate Soil Observation Pit Locations

144 Seekonk Street, Norfolk, MA

October 3, 2019

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Source: Existing Conditions Plan (Drawing C –2.2); dated July 25, 2019; prepared by Andrews Survey & Engineering, Inc.