Martin Brogie, Inc.
ENVIRONMENTAL SERVICES

• Environmental Site Investigations
• Building Contaminant Surveys
• Wetlands Consulting
• Remediation Contract Management

September 29, 2023

Will Walter, PE
Civil/Site Group Manager | Senior Associate
Alfred Benesch & Company
120 Hebron Avenue - 2nd Floor
Glastonbury, CT
06033

RE: Wetland Functions and Values Report
Town of Norfolk
Volunteer Fire Department Facility
Shepard Road
Norfolk, CT

Dear Will:

Martin Brogie, Inc. (MBI) is pleased to submit the following Wetland Functions and Values Report regarding wetlands located on and adjacent to the above-referenced property. The purpose of the report is to assess existing wetland functions and values and assess potential impacts to those functions and values as they may be affected by the proposed redevelopment of the site with a new Fire House facility.

A Site Location Map is provided as Figure 1 and an Aerial Site Plan depicting the wetland delineation is provided as Figure 2.

SITE DESCRIPTION

The subject Site consists of approximately 1.75 acres of land including a 1.25-acre property occupied by the Norfolk Fire Department Fire House and approximately 0.5 acres of land abutting the Fire House parcel to the south and west. A paved driveway accesses the site along the south side of Shepard Road and pavement extends passed the west side of the Firehouse and extends to the southwestern corner of the site where a one-bay garage and an above-ground diesel tank are located. A gravel driveway also enters the site off of Shepard Road in the northwest portion of the property. Silt fence has been

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established along the west side of the gravel driveway area to mitigate erosion across the gravel and in to the adjacent wetlands to the west.

The current Fire House property is occupied by a 3,800+/- square foot Fire Station building constructed in 1980 along with an addition constructed on the west side in 1990. A former ambulance garage was located northwest of the Fire House and was demolished in 2017. The Fire House building is served by municipal and private sewer and water systems. The station accommodates four fire trucks in two long garage bays with overhead doors accessing each bay on the north and south sides of the building. The eastern side of the building includes a meeting/break room and kitchen and two restrooms as well as a dispatchers/communication station. A boiler room, accessed from the outside, is located along the north side of the eastern building extension. Wooden sheds are located adjacent to the east side of the north end of the building. The northern shed contains two, above-ground, 330-gallon heating oil tanks and the southern shed, which formerly contained a diesel generator, is utilized for storage.

A liquid propane-fired generator is located adjacent to the north of the boiler room, and two 250-gallon, liquid propane tanks that serve the generator are located along the building's east wall.

Grassed lawn extends from the east and south sides of the Fire House to the eastern and southern boundaries. Pavement and gravel extend west of the Fire House. A grassed island is located northwest of the Fire House along Shepard Road.

Densely vegetated wetlands abut the property to the south and west. A shallow drainage ditch extends across the grassed, southeastern portion of the site and enters the adjacent vegetated wetland area and turns west terminating at man-made pond just southwest of the site. The pond discharges to a watercourse which flows northward just west of the site and passes through a culvert below Shepard Road.

Residences are located across Shepard Road to the north and D&R Auto Sales borders the site to the east.

WETLAND DELINEATION AND DESCRIPTION

On September 13, 2021, MBI's Soil Scientist Martin Brogie, LEP reported to the site to assess the presence of wetlands and watercourses/intermittent watercourses in accordance with the definitions provided in Connecticut General Statutes Section 22a-38 definitions (15) and (16) including: soil types designated as poorly drained, very poorly drained, alluvial, and floodplain by the National Cooperative Soils Survey; and, rivers, streams, brooks, waterways, lakes, ponds, marshes, swamps, bogs and all other bodies of water, natural or artificial, vernal or intermittent. In addition, intermittent watercourses defined as having a permanent channel and bank and the occurrence of two or more of the following characteristics: evidence of scour or deposits of recent alluvium or detritus; the presence of standing or

flowing water for a duration longer than a storm incident; and/or the presence of hydrophytic vegetation were delineated.

MBI accessed the property via Shepard Road and proceeded to the grassed area behind the Firehouse and the southeast property corner. This area of the site exhibited saturated soils, wetland shrubs along the perimeter of the grass and poorly drained (low chroma soils) within 20-inches of the surface. Topographically, this area was higher in elevation than the firehouse and the remainder of the developed portion of the site indicating likely, poorly drained conditions downslope. Proceeding along the eastern property boundary, a grassed drainage ditch was observed paralleling the property boundary and pitched toward the south, directed in to the adjacent vegetated wetlands. The ditch was designed to capture overland flows and direct them away from the developed portion of the site. The ditch became more shallow as it entered the vegetated portion of the wetlands along the south side of the developed area of the site. It then turned westward and headed down slope, discharging to a man-made pond just off the southwestern corner of the property.

The wetland delineation commenced with flag WF#1 placed along the upgradient/east side of the ditch. The line then bent generally westward in to the grassed area southeast of the firehouse alongside a catch basin with a French drain extending northward along the east side of the Firehouse. The upslope ditch, yard basin and French drain all indicate efforts to control near surface and surface flows as a result of shallow groundwater. These conditions and observations were consistent with the findings of poorly drained soil throughout the grassed area south of the Firehouse.

The wetland line extended southward along the edge of pavement to the vegetated wetland along the southern property perimeter and then westward along filled land associated with the one-bay garage area. The wetland line then looped back toward the north along the west side of the pavement and the adjacent wetland/watercourse feature to the west, terminating at the roadway culvert.

The majority of the wetlands delineated by the Firehouse were highly disturbed, drained and filled, although the soils remain poorly drained and thus, Connecticut Regulated Wetlands.

Wetland Setting

The wetland system located on and adjacent to the property is situated in a topographic bowl, generally rising to the east, south and west, and discharging to the north forming an unnamed watercourse which is culverted below Shepard Road. The wetland system is primarily a wet meadow which transitions to a freshwater cattail marsh in the vicinity of the pond and then includes an approximate 5,000 square foot open water area. Two smaller open water areas are located within the offsite wetland system further to the south. Overall, the wetland system includes a wide variety of herbaceous species as well as various shrubs and a few tree species primarily in the northern portion of the wetland. The wetland is

surrounded on all sides by developed land including roadways, residences, and commercial development and is considered a wetland/habitat island.

Wetland Soils

The Natural Resource Conservation Service Soil Survey Map of the site and vicinity indicates that the upland area soil associated with the property consists of Belgrade Silt Loam. This soil series consists of very deep, moderately well drained soils formed in glaciolacustrine material. They are nearly level to moderately steep soils on terraces. Slope ranges from 0 to 25 percent. Saturated hydraulic conductivity is moderately high or high in the solum and moderately low to high in the substratum.

Wetland soils identified by the Soil Survey consists of the Raynham Soil series which consists of very deep, poorly drained soils that formed in silty estuarine or glaciolacustrine deposits on glacial lake plains and marine terraces. Saturated hydraulic conductivity is moderately high or high in the solum and moderately low or moderately high in the substratum. Slope ranges from 0 through 12 percent.

The 1992 Surficial Material Map of Connecticut depicts the site and adjacent wetland soils as derived from finely deposited sand, silt and clay consistent with glaciolacustrine deposition whereas the adjacent, surrounding slopes consist of glacial till.

Site soil exploration findings using a hand auger are consistent with the above descriptions.

Wetland Vegetation

The grassed lawn area south of the Fire House contained poorly-drained wetland soil which had been significantly altered as a result of historic development. A Norway Spruce (*Picea abies*) is located in the central part of the rear lawn area within the wetland. The area bordering the disturbed lawn area to the east and south contains a variety of wetland shrubs and herbaceous plants including: Downy Serviceberry (*Amelanchier arborea*); Speckled Alder *(Alnus rugosa);* Alder Buckthorn (*Frangula alnus*); Silky Dogwood (*Cornus amomum*); New England Aster (*Symphytotrichum novae-angliae*); Virginia Creeper (*Parthenocissus quinquefolia);* and, Jewelweed *(Impatiens capensis).*

Further south, in to the core of the wetland area just above (east of) the pond herbaceous plants encountered included: Common Reed (*Phragmites australis*); Broadleaf Cattail (*Typha latifolia*); Eastern Marsh Fern (*Thelypteris palustris);* Shallow Sedge *(Carex lurida);* Common Rush *(Juncus effusus)* and Green Bulrush *(Scirpus atrovirens)* were encountered as well as a few Red Maple *(Acer rubrum)* and Eastern Cottonwood *(Populus deltoides*) trees.

The northern portion of the wetland, west of the proposed development on the site and including the watercourse that flows from the pond to beneath the roadway, consists of similar, identified wetland

plant species and also includes some upland meadow species such as Canada Goldenrod (*Solidago canadensis*) and Curly Dock (*Rumex crisus*) as well as a few Spruce trees and invasive shrubs including Autumn Olive (*Elaeagnus umbellata*) and Multiflora Rose (*Rosa multiflora*). Cottonwood trees and Black Cherry were also noted in this are along the west side of the developed area of the site. Highly invasive Mugwort (*Artemisia vulgaris)* was observed through much of the wetland perimeter areas.

Wetland Hydrology

The wetland system forms from groundwater seeps along the side slopes of the "bowl" containing the majority of the wetland extent. The hydrology culminates within the man-made pond at the bottom of the bowl and discharges via an intermittent watercourse to the north where it is directed under Shepard Road just west of the site. The watercourse daylights approximately 380 feet to the north to an open culvert located along the south and west side of a cultivated field. From here surface flows continue another 500 feet to wooded wetlands associated with Wood Creek which continues on to the north.

WETLAND FUNCTIONS AND VALUES

A qualitative review of the functions and values of the on-site wetlands was performed to assist in determining wetland impacts resulting from the project. Wetland functions consistent with U.S. Army Corps of Engineers methodology were assessed and are summarized below.

Groundwater Recharge/Discharge – This function considers the potential for a wetland to serve as a groundwater recharge and/or discharge area. Recharge should relate to the potential for the wetland to contribute water to an aquifer. Discharge should relate to the potential for the wetland to serve as an area where groundwater can be discharged to the surface. The onsite wetlands systems primarily provide groundwater discharge functions given the seepage to the pond area and continued discharge from the pond.

Floodflow Alteration - (Storage & Desynchronization) - This function considers the effectiveness of the wetland in reducing flood damage by attenuation of floodwaters for prolonged periods following precipitation events. The wetlands systems associated with the site provide flood flow alteration including storage within the wetlands, pond and vegetated wetlands as well as comparatively slow release of stormwater via overland flow across vegetated areas and storage/release associated with organic media.

Sedimentation/Shoreline Stabilization – This function relates to the effectiveness of a wetland to stabilize streambanks and shorelines against erosion. The wetland system adjacent to the site is relatively isolated with a limited watershed. No significant erosional forces due to stormwater flows are expected and thus stabilization against erosive forces is not a necessary function.

Sediment/Toxicant Retention and Nutrient Removal/Retention/Transformation – The wetlands on the subject property offer some retention and transformation of nutrients/toxicants created as a result of nearby run-off from developed areas to the south but few discharge sources to the site wetlands are evident. Nutrient uptake by vegetation and organic soil materials would otherwise be expected to be significant given the shape of the landscape, generally slow-moving waters, and the presence of organic soils.

Production Export – This function relates to the effectiveness of the wetland to produce food or usable products for humans or other living organisms. The wetlands on the site offer some wildlife food sources including berry producing trees and shrubs, likely amphibians, rodents, birds and insects.

Fish and Shellfish Habitat – This function considers the effectiveness of seasonal or permanent waterbodies associated with the wetlands in question for fish and shellfish habitat. The man-made pond is too small and shallow to offer these functions.

Wildlife Habitat - This function considers the effectiveness of the wetland to provide habitat for various types and populations of animals typically associated with wetlands and the wetland edge. Both resident and/or migrating species are considered. The wetlands offers some potential wildlife habitat due to its size, diversity and the presence of open water. However, since the wetland area is not part of a wildlife corridor, its functions in this capacity may be fairly limited to resident users and occasional waterfowl.

Endangered Species Habitat – The Connecticut Department of Energy and Environmental Protection (CTDEEP) Natural Diversity Database Map for Norfolk (June 2023) does not depict any mapped State or Federal Listed Species or Significant Natural Communities on or adjacent to the Property.

Visual Quality/Aesthetics – The wetland area including the pond, Cattails, the presence of different wetland classes, and its visual accessibility from adjacent properties offers visual qualities/aesthetics to area observers.

Educational/Scientific Value, Recreation, and Uniqueness Heritage – A boardwalk trail is located within the wetlands and is accessible from a Town parking area as well as the site. The trail includes an overlook by the pond and provides good accessibility throughout the wetland. As such, it offers a significant, leisure recreational opportunity. The wetland system overall is fairly typical and does not offer any significant Scientific or Unique Heritage qualities. The interior access to the wetland via the trail does provide opportunities for general wetland education.

Overall, the functions and values of the site and adjacent wetland system are consistent with an accessible, park-like urban wetland system providing some stormwater attenuation and treatment as well

as recreational and education opportunities. Wildlife habitat benefits are present, but not expected to be significant given the isolated nature of the system.

PROPOSED PROJECT

The proposed consists of: the construction of a new Fire House building to be located along the western edge of the current site; a 3-bay garage located in the southeastern portion of the property; paved parking and driveway areas; grass and landscaped areas; and stormwater management features as well as the extension of the existing boardwalk along the west side of the new Fire House such that it is readily accessible from a designated onsite parking area off of Shepard Road.

The project utilizes the existing developed/disturbed areas of the site and encroaches slightly in to existing vegetated wetlands in the southwestern corner of the development to facilitate the new boardwalk and storm drainage features. The program has addressed the challenge of maintaining the necessary operations of the existing Fire House for public safety while facilitating a new, state-of-the-art facility with expanded public safety capabilities.

The proposed site improvements include pervious paver units to decrease impervious surface; context sensitive landscaping including ground seed mixes, shrubs and trees; access and separated parking for City Meadow Boardwalk; ADA Accessibility; underground stormwater detention chambers; and, swirl-type storm water renovation manholes. The proposed stormwater management system achieves both stormwater quantity and quality controls on the site where no current stormwater management system is located.

ACOE to be notified

The project results in 8,100 square feet of direct wetland impacts. However, approximately 95% of these impacts are within areas that are already disturbed with buildings, pavement and altered lawn areas. Direct wetland impacts to existing vegetated wetlands occur in the area adjacent to the southwest of the proposed Fire House to provide for a catch basin structure, 12" HDPE stormwater conveyance piping, and boardwalk footings. This area contains mature trees including Cottonwoods, Spruce, Grey Birch, and Black Cherry along the disturbed edge of the driveway/parking area. The native landscape treatment proposed for this area is robust and enhances the new recreational opportunity provided for by the board walk extension.

CONCLUSIONS AND RECOMMENDATIONS

Based on our review of the proposed plans, the stormwater management report and our understanding of the site natural resources and existing development we offer the following recommendations:

- The proposed retaining wall and foundation wall associated with the 3-bay garage in the southwestern portion of the property will include back-drainage/footing drains to intercept near-surface groundwater flow entering from upslope to the east. The associated discharge from these drains will likely require a daylight outfall along the rear (south side) of the developed area.

is there any need to discuss and retaining wall

Such water would be considered clean and could be directed to an appropriately designed outfall to mitigate erosion and serve as a recharge source for the adjacent, vegetated wetland area.

- The plans do not indicate landscaping features east of the above referenced retaining wall or garage. Native tree and shrub plantings are suggested to provide a visual buffer between the development and the adjacent, vegetated wetland.
- Lighting specifications and layout should be sensitive to the adjacent wetlands to the south and west. Full cut-off lighting and/or directed flood lights should be used in the southern portion of the development to avoid light spillage into the wetland area. Lighting along the boardwalk west of the building should be for safety and also be sensitive to light spillage into the wetlands.
- Additional wetland shrubs are suggested for the area around the stormwater outfall northwest of the proposed building as well as along the west side of the proposed retaining wall located along the west side of the northwestern parking area.
- Erosion and sedimentation controls should be carefully installed, monitored and maintained for all work along the west side of the project where work will be conducted in close proximity to and within the wetlands.

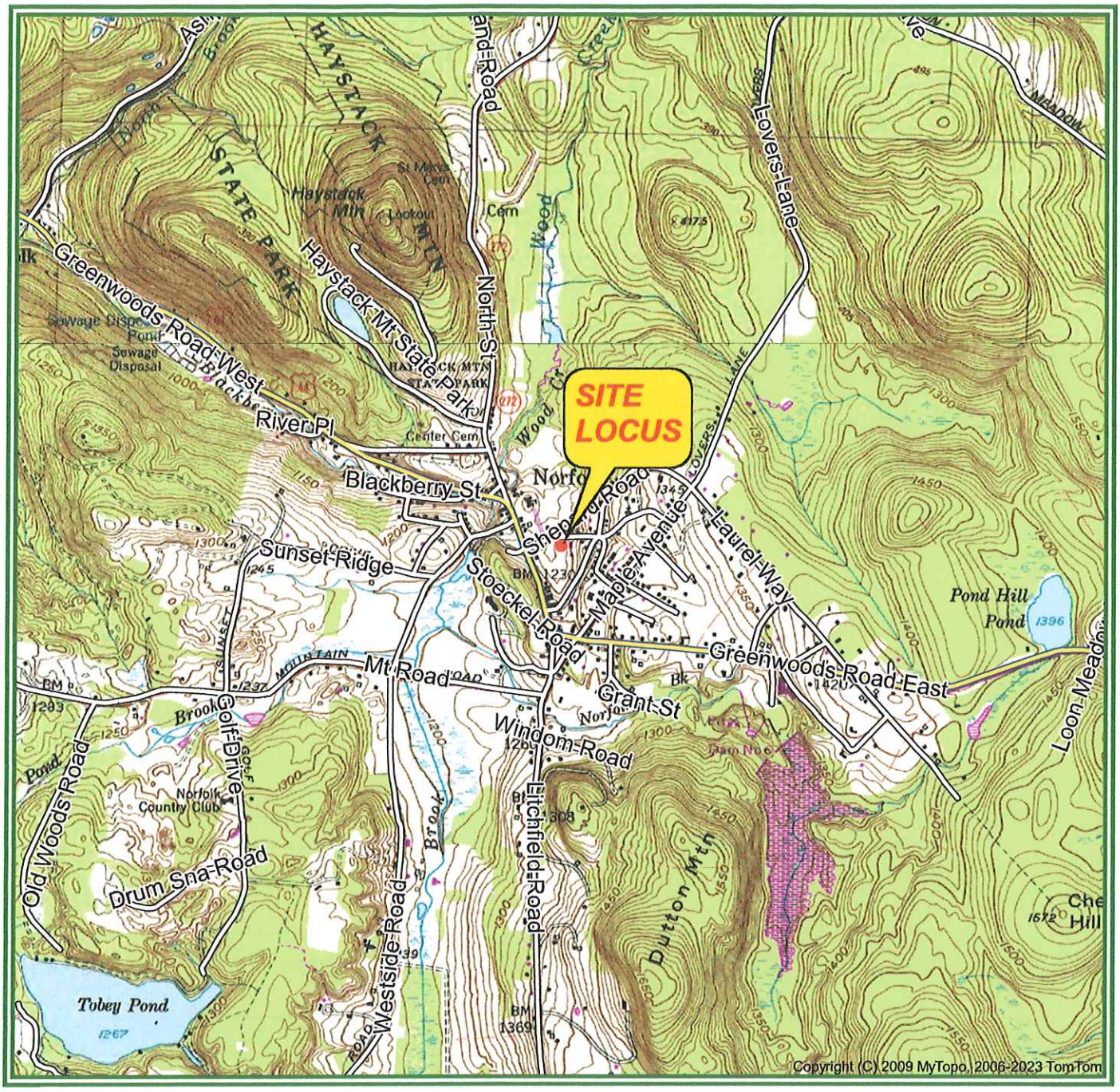
Although work along and within a portion of the wetlands on the west side of the site would otherwise be avoided or minimized under normal circumstances and the proposed building located further east, the requirements for continued operation of the existing station and for grading required to ensure safe operation of the new facility necessitate the encroachment. The benefits of the increased recreational accessibility, the proposed landscape design and the improved stormwater management associated with the site further mitigate associated wetland impacts.

Implementation of a sensitive lighting plan and additional, native buffer plantings will further mitigate wetland impacts. Overall, given the existing wetland functions and values, which are those provided by an "urban", publicly accessible wetland in the upper reaches of a watershed, the proposed development will not have any negative impacts to wetland functionality. Erosion control during and after construction is essential to maintaining wetland quality and should be thoroughly installed, monitored and maintained. who will maintain & how

Please contact the undersigned at 860-208-0360 if you have any questions or require further information. Thank you for the opportunity to be of service.

Sincerely,

Martin Brogie, LEP
Soil Scientist



NORFOLK Topographic 1956 41073-H2-TF-024 National Geodetic Vertical Datum 1929

N
W E
S

SCALE 1:24000

0 1000 2000 3000 4000 5000
FEET

0 1
MILE

Site Coordinates:
041° 59' 33.26" N, 073° 11' 59.20" W

Project:
20 Shepard Road

Site Location:
20 Shepard Road,
Litchfield County,
Norfolk, Connecticut

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Figure 1
Site Locus Map

SCALE

0 50 100

APPROXIMATE SCALE IN FEET

LEGEND

DELINEATED WETLAND LINES

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Figure 2 - Aerial Site Plan

20 Shepard Road
Norfolk, Litchfield County, Connecticut

Project:	20 Shepard Road
Drawn by:	K. Hazel
Date:	9/22/23
Scale:	AS SHOWN