

October 18, 2021

Enfield Inland Wetlands and Watercourse Agency  
Enfield Town Hall  
820 Enfield Street  
Enfield, Connecticut 06082

Re: Wetland and Watercourse Assessment  
190 Elm Street, Enfield, Connecticut

Dear Members of the Agency:

William Kenny Associates LLC (WKA) investigated 190 Elm Street in Enfield, Connecticut to inventory and assess existing and proposed wetland and watercourse conditions related to the proposed construction of a gas station and convenience store building, car wash, asphalt drives and parking lots and related site improvements. Provided in this letter are the methods and results of our investigations. Field investigations were conducted in January, August and September of 2021. The assessment of proposed conditions is based on a review of the following documents:

- The Site Development drawings, prepared by Solli Engineering, dated October 18, 2021.
- The *Engineering Report*, prepared by Solli Engineering, dated October 18, 2021.
- The *Wetland and Watercourse Mitigation Plan* drawing, prepared by WKA, dated October 18, 2021.

In summary, the commercial development will mitigate the proposed loss of historically disturbed wetlands through a Wetland and Watercourse Mitigation Plan that will result in a net-gain of wetlands with a high functional capacity. A high-value pond and a bordering woodland wetland will be created in the undeveloped portion of the site. A network of gravel paths is proposed to allow for the educational and recreational use of the pond, wetlands and uplands at the property. We find that the proposed project will improve the functional capacity and value of onsite wetlands at the property while allowing for the commercial redevelopment and upgrades.

### ***Existing Site Conditions***

The approximate 6.75-acre property is located at 190 Elm Street in Enfield Connecticut. The property consists of two lots: Lot 1 (0.6 acres) and Lot 2 (6.14 acres). Lot 1 is 190 Elm Street, a developed commercial parcel, to the northeast and Lot 2, is an undeveloped parcel that abuts 190 Elm Street at its southern and eastern property boundaries. Elm Street borders the property to the north and Fox Hill Lane borders the property to the south. The surrounding land use is variable with single-family residential properties to north and west, commercial developments to the west, a school, hospital and agricultural land to the east and a multi-family apartment complex to the southwest of the property. There are also undeveloped and wooded areas in the

surrounding area. Existing property improvements include an automotive service center and an asphalt parking area at Lot 1. Public water supply mains and public sanitary sewers service the property. Lot 2 is undeveloped but historically disturbed, as observed through aerial imagery and the topographical conditions at the property. It appears that major earthwork occurred over a 10-year period, perhaps in preparation for a development project that never occurred. Grading has altered the land to create drainage ditches and piping has also been installed at the southern property line to direct drainage towards the offsite apartment complex. However, no formal measures to manage the quantity and quality of stormwater runoff are present throughout the property. On broad scale, the property is a relative level outwash plain with the high point in the northwestern portion of the property and the low point is in the southeastern portion of the property. However, the significant historic human disturbance in the southwestern, northern and eastern portions of the property have created various fill piles, slopes, swales, berms, basins and ditches. As such, stormwater runoff generally flows from the northwest and coalesces northern, central and western portions of the property, where the land acts as a basin collecting stormwater runoff. Water collected in these areas generally flows north to south through a manmade drainage ditch in the western portion of property and conveys surface water to the subsurface pipe that continues to the apartment complex development to south of the property. There is also a drainage ditch in the eastern portion of the property that flows north to south along the eastern property boundary. The ditch conveys surface and subsurface ground water from the property and stormwater from a culvert beneath Elm Street offsite towards Freshwater Brook. The brook located to the southeast of the property continues to flow east to west through Enfield and ultimately enters the Connecticut River about two miles west of the property.

The primary vegetative cover at the property is a broadleaved deciduous woodland. The majority of the site, being relatively recently disturbed, consists of pole- to timber-sized trees including red maple, black cherry, dead and/or dying ash, American elm with some eastern cottonwood, black locust and pignut hickory. Oriental bittersweet is extensive throughout much of the property and is dominant in the shrub and groundcover layers. Other shrub, vine and groundcover vegetation includes staghorn sumac, Japanese knotweed, raspberry, Virginia creeper, garlic mustard and jumpseed. Disturbance in the southeastern portion of the site appears to have pre-dated disturbance throughout the rest of the site, as the trees in this portion of the property are more mature. Trees are primarily 20 to 30 inches in DBH and primarily consist of red maple, pin oak, quaking aspen and black walnut. Invasive vegetation generally is more limited in abundance and density. However, the oriental bittersweet is still dominant, but to a lesser degree.

### ***Existing Wetland Conditions***

Two inland wetland and watercourse systems are located at the property. The first system is a disturbed and partially drained broadleaved deciduous woodland located in the northern, central and southwestern portions of the property. A smaller portion of the wetland is isolated in the central portion of the property due to land disturbance. The system is characterized by a flat outwash plain; however, human alteration and disturbance throughout the area has created various features like swales and slopes that have turned the system into a depressional feature. The manmade southwestern drainage ditch runs through this system and conveys surface water

from the property toward the apartment complex to the south of the property. The drainage ditch is approximately three- to six-feet-wide. During WKA’s August 2021 investigation, the stream was saturated, but no surface water was flowing until a passing storm dropped approximately half an inch of precipitation over the course of an hour in the evening. Vegetation surrounding the ditch is dominated by invasive multiflora rose with some native jewelweed, skunk cabbage and various grasses interspersed throughout the ditch. The woodland wetland is dominated by red maple with some sweet birch, American elm and black cherry ranging from pole- to timber-size. Invasive oriental bittersweet is extensive throughout the system and dominates the groundcover and some of the shrub and tree saplings. Other understory vegetation primarily consists of catalpa saplings, buckthorn and multiflora rose. Groundcover vegetation includes jewelweed, sensitive fern and Jack-in-the-pulpit. The central portions of the system are wetter and tree and shrub vegetation less dense. The primary vegetation in this area consists of grasses, sedges and rushes. Wetland soils are primarily poorly drained fine loamy sands that are formed from glacial outwash deposits or from human altered deposits.

The second system is a stream and bordering fringe of woodland wetlands. This system, which is located along the eastern property boundary, extends and flows approximately 500 feet north to south from an offsite culvert beneath Elm Street and outlets to Freshwater Brook to the south of the property. The channel is approximately six feet wide and the water depth was approximately one foot deep in August. The streambed consists of various fines and debris. Little to no aquatic vegetation was observed within the stream. Some woody debris and thick shrubs block certain portions of the channel. The bordering fringe of woodland wetland is dominated by invasive oriental bittersweet in the trees, shrub and groundcover layer. Wetland soils are primarily poorly drained fine loamy sands formed from alluvial material.

The following table provides the primary characteristics of the wetland and watercourse systems.

**Table One: Wetland & Watercourse Primary Characteristics**

<u>WETLAND ID</u>	<u>PRINCIPAL SOURCE(S) OF HYDROLOGY</u>	<u>WATER TABLE TYPE</u>	<u>HGM CLASSIFICATION</u>	<u>USFWS CLASSIFICATION</u>	<u>VEGETATION COVER TYPE(S)</u>
<i>DISTURBED &amp; PARTIALLY DRAINED WOODLAND WETLAND</i>	<i>SURFACE WATER INTERCEPTION &amp; PRECIPITATION</i>	<i>APPARENT</i>	<i>FLAT</i>	<i>PFO1E<sup>1</sup></i>	<i>WOODLAND</i>
<i>STREAM &amp; BORDERING FRINGE OF WOODLAND WETLAND</i>	<i>SURFACE WATER INTERCEPTION</i>	<i>APPARENT</i>	<i>RIVERINE</i>	<i>R4SB2<sup>2</sup></i>	<i>WOODLAND</i>

<sup>1</sup>*Paulustrine (P); Forested (FO); Broad-Leaved Deciduous (1); Seasonally Flooded / Saturated (E)*

<sup>2</sup>*Riverine (R); Intermittent (4); Streambed (SB); Rubble (2)*

The disturbed and partially drained woodland wetland has an overall moderate functional capacity. The system provides groundwater recharge to a high degree and provides modification of water quality and storm and flood water storage to a moderate-to-high level due to the basin shape of the system. The stream and bordering fringe of woodland wetland functions at an

overall moderate level, with its primary function being water conveyance and export of detritus. Each system also contributes to the abundance and diversity of wetland flora and fauna; however, the density of invasive vegetation within the systems diminishes their ability to provide for these functions.

### ***Proposed Site Conditions***

The proposed commercial development involves the demolition of existing improvements and the construction of a gas station and convenience store building, car wash, asphalt drives and parking lots and related site improvements in the northern portion of the property. The development will be serviced by the existing public water mains and sanitary lines beneath Elm Street. The project will result in approximately 2.13 acres of impervious cover at the property. Several stormwater management best management practices (BMPs) are proposed to collect and treat runoff generated from the majority of proposed impervious surfaces. To accommodate the improvements, approximately 1.6 acres of the historically disturbed wetlands in the northern and central portions of the property will be eliminated. To compensate for the impact, the project includes a mitigation plan to create an approximate 0.33-acre pond with approximately 1.8 acres of bordering meadow and woodland wetland in the southern portion of the property. An additional 0.34 acres of disturbed wetlands will be restored. This will result in a net-gain of wetlands at the property and the functional capacity of the system will be higher than the existing wetlands. The adjacent wetland buffer will be enhanced and naturalized with native vegetation following mitigation activity. The eastern stream and bordering wetland will not be impacted as a result of the project, with the exception of proposed enhancement activities to control invasive vegetation. The mitigation plan includes the revegetation of remaining disturbed land with native trees, shrubs and groundcover and physical demarcation features that will be installed to provide protection to the established wetland buffer and wetlands. During construction, mitigation measures such as construction phasing and soil erosion and sedimentation controls are proposed to prevent adverse impacts to wetlands and watercourses.

### ***Potential Wetland Impacts and Mitigation***

Land development has the potential to cause short- and long-term as well as direct and indirect impacts to wetlands and watercourses from activities such as vegetation clearing, soil filling, excavation or pollution of stormwater. The proposed site improvements are designed to avoid, minimize and mitigate indirect and direct impacts in the short- and long-term. Permanent impacts will be mitigated through the creation of a high-value pond and wetland system and various BMPs are included to avoid impacts to remaining wetlands during and after construction through the incorporation of a construction phasing plan, soil erosion and sediment controls and stormwater management structures.

The proposed project will directly impact the disturbed and partially drained woodland wetland. To compensate for the loss, a mitigation plan is included to create a pond and woodland wetland system in the southern portion of the property. In addition to providing compensation for the loss of wetlands, the pond and wetland will provide stormwater storage and water quality treatment for runoff generated from the majority of proposed impervious surfaces at the property. A network of gravel paths is proposed within the wetland and adjacent upland woodland to allow the low-impact recreational and

educational use of the naturalized areas at the property. To achieve this, approximately 1.9 acres of the disturbed wetlands will be impacted: 1.6 acres of permanent disturbance and 0.34 acres of temporary disturbance. Permanent disturbance in wetlands will result from eliminating the wetlands to accommodate improvements in the northern and central portions of the property. Temporary disturbance will result from construction and mitigation activity required to regrade upland and existing wetland areas to create one larger wetland system. The wetland will be created by lowering the surface elevation in the wetland mitigation area to the elevation of the adjacent floodplain wetland and ground water to create the required hydrologic conditions for the wetland. For additional habitat diversity and benefits, additional excavation is required to create one large pond and two smaller shallow pools, which are proposed to the southeast and southwest of the proposed pond. A boulder pile will be installed within the deep portion of the pond to provide habitat for fish populations. The edge of the pond and shallow pools will be planted with native emergent wetland vegetation and the remaining wetland mitigation area will be planted native wetland trees, meadow plants and wetland seed mix will be used to establish groundcover vegetation. Overtime, a woodland wetland will succeed from the planted meadow wetland that will be immediately established. The total wetland mitigation area will create or restore approximately 2.4 acres of wetlands. Following mitigation activity, the preserved woodland upland areas to the west, south and east of the wetland mitigation area will be enhanced through control of invasive vines that are smothering existing vegetation. The control will be accomplished through the cutting of the vines and the controlled application of systemic, non-persistent herbicides to the cut vine stems. A naturalized buffer will be established to the north of the wetland between the wetland and the development. The buffer will be planted with native trees, shrubs and groundcovers to provide protection to the wetland. A permanent demarcation feature will be installed along the pond and naturalized wetland buffer to provide protection to the wetlands and buffer. A monitoring and maintenance plan is included in the mitigation plan to protect the ecological value of the wetlands and naturalized buffer in the long-term. The monitoring includes annual reporting on water table depth, vegetative species within selected sample plots and an inventory of invasive vegetation. Overall, the mitigation plan will result in the protection of over 2.5 acres of wetlands and naturalized buffers onsite. This will improve the habitat value onsite through the removal of dominant invasive vegetation and establishment and long-term protection of native vegetation and through the incorporation of a pond to create new habitat opportunities for a greater abundance and diversity of native flora and fauna. The proposed network of gravel paths throughout the southern portion of the property will allow the low-impact recreational use of the property and provide educational opportunities through the incorporation of descriptive signage and observation decks. Only enhancement activity (i.e., invasive vine control and monitoring) is proposed within the eastern woodland wetland. No other activity is proposed within the wetland or stream and as such, no direct adverse impacts will occur.

In the short-term, wetlands can be indirectly impacted from sediment-laden stormwater from construction activities. To prevent this short-term impact, the project includes a construction phasing plan and a soil erosion and sedimentation control plan. The project will occur in two phases to limit the area and duration of soil disturbance at a given time during construction. Phase 1 one will consist of demolition of existing structures, land clearing and the wetland mitigation activity. Phase 2 includes all remaining activity. Soil erosion and sediment control measures are proposed specific to each phase, in accordance with the CT DEP 2002 Guidelines for Soil Erosion and Sediment Control. The proposed pond will function as a sediment trap to collect runoff and sediment throughout both

phases of construction and a row of silt fencing backed by haybales will be installed along the eastern stream and wetland system. Additional control measures include diversion swales, check dams, inlet protection, silt fencing and antitracking pads throughout the property to contain sediment within the construction site. The monitoring and maintenance of control measures will be critical to ensure efficacy.

In the long-term, and if not properly mitigated, wetlands and watercourses can be indirectly adversely impacted by stormwater runoff that flows from structures, pavement and vegetated surfaces. The project plan proposes approximately 2.13 acres, or 31.5 percent, impervious surface cover at the property following construction activity. To compensate for the increase, the project proposes several stormwater management BMPs to manage runoff at the property in accordance with the 2004 Connecticut Stormwater Quality Manual and the Town of Enfield Zoning Regulations. The primary BMP is the proposed pond, as previously discussed, that will capture runoff generated from the majority of impervious surfaces within the development. Prior to entering the pond, the captured water will pass through hydrodynamic separators and/or catch basins fitted with deep sumps and hooded outlets to capture a portion of sediments and pollutants. The pond will provide water storage and water quality treatment through soil infiltration and biofiltration through vegetation uptake. Following the completion of the wetland mitigation activity, ground and subsurface water entering the wetland mitigation area will exit the property as it does under existing conditions. Following all construction activity, any remaining disturbed soils will be stabilized via the planting plan. The commercially developed northern portion of the property will be vegetated with lawn and primarily native trees and shrubs. The wetlands and buffers in the southern portion of the property will be vegetated through the mitigation activity, as previously described, and the vegetation within the naturalized buffer and wetlands will provide additional water quality protection to wetlands onsite and downstream of the project.

#### ***Wetlands Functions and Values: Existing versus Proposed Conditions***

A comparison of the capacity of the onsite wetlands and watercourse to perform typical wetland and watercourse functions before and after the completion of the proposed site improvements was performed. This comparison was generated by evaluating the existing wetland functions and anticipated wetland functions after construction of the development within the context of typical wetlands functions and values as established by Normandeau Associates, Inc. in the 1998 publication, *A Rapid Procedure for Assessing Wetland Functional Capacity*. Wetland functions are those self-sustaining properties of a wetland that exist in absence of society.

The comparison of the existing wetland functions and the anticipated wetland functions following implementation of the proposed development revealed that the wetland functions will be improved through the implementation of the wetland mitigation plan. A summary of this evaluation is presented in the tables below.

**Table Two: Wetland and Watercourse Functions: Existing versus Proposed Conditions**

<u>WETLAND FUNCTIONS</u>	<u>RELATIVE CAPACITY TO PERFORM FUNCTION</u>		<u>FUNCTIONAL DETAILS</u>
	<u>EXISTING</u>	<u>PROPOSED</u>	
<b><i>DISTURBED &amp; PARTIALLY DRAINED WOODLAND VS PROPOSED POND &amp; BORDERING WETLAND</i></b>			
Modification of Groundwater Discharge	LOW	MODERATE	<i>Improved</i> - The capacity of the wetland to influence the amount of water moving from ground water to surface water will be increased due to wetland mitigation activity.
Modification of Groundwater Recharge	MODERATE	HIGH	<i>Improved</i> - The capacity of the wetland to influence the amount of water moving from surface water to ground water will be increased due to wetland mitigation activity.
Storm and Flood Water Storage	MODERATE-HIGH	HIGH	<i>Improved</i> - The capacity of the wetland to store floodwater will be increased due to creation of a pond within the wetland mitigation area.
Modification of Water Quality	MODERATE-HIGH	HIGH	<i>Improved</i> - The capacity of the wetland to modify water quality will be increased due to creation of a pond within the wetland mitigation area.
Export of Detritus	LOW	LOW	<i>Unchanged</i> - The capacity of the wetland to export organic detritus from the wetland to the adjacent and downstream aquatic ecosystems will not be altered due to wetland mitigation activity.
Contribution to Abundance and Diversity of Wetland Flora	MODERATE	HIGH	<i>Improved</i> - The capacity of the wetland to contribute to the abundance and diversity of wetland flora will be improved due mitigation activity which will provide varying wetland habitats, control invasive vegetation and establish native trees, shrubs and groundcovers within the wetlands and buffers.
Contribution to Abundance and Diversity of Wetland Fauna	MODERATE	HIGH	<i>Improved</i> - The capacity of the wetland to contribute to the abundance and diversity of wetland fauna will be improved due mitigation activity which will provide varying wetland habitats, control invasive vegetation and establish native trees, shrubs and groundcovers within the wetlands and buffers to provide additional habitat opportunities for wetland fauna.
<b><i>STREAM &amp; BORDERING WOODLAND WETLAND (NO IMPACTS PROPOSED)</i></b>			
Modification of Groundwater Discharge	MODERATE	MODERATE	<i>Unchanged</i> - The capacity of the wetland to influence the amount of water moving from ground water to surface water will not be altered with the proposed project.
Modification of Groundwater Recharge	LOW	LOW	<i>Unchanged</i> - The capacity of the wetland to influence the amount of water moving from surface water to ground water will not be altered with the proposed project.
Storm and Flood Water Storage	LOW-MODERATE	LOW-MODERATE	<i>Unchanged</i> - The capacity of the wetland to store floodwater will not be altered with the proposed project.

<i>Modification of Water Quality</i>	<i>LOW</i>	<i>LOW</i>	<i>Unchanged - The capacity of the wetland to modify water quality will not be altered with the proposed project.</i>
<i>Export of Detritus</i>	<i>HIGH</i>	<i>HIGH</i>	<i>Unchanged - The capacity of the wetland to export organic detritus from the wetland to the adjacent and downstream aquatic ecosystems will not be altered with the proposed project.</i>
<i>Contribution to Abundance and Diversity of Wetland Vegetation</i>	<i>MODERATE</i>	<i>MODERATE</i>	<i>Unchanged - The wetland's capacity to contribute to the abundance and diversity of wetland flora will not be altered with the proposed project.</i>
<i>Contribution to Abundance and Diversity of Wetland Fauna</i>	<i>MODERATE</i>	<i>MODERATE</i>	<i>Unchanged - The wetland's capacity to contribute to the abundance and diversity of wetland fauna will not be altered with the proposed project.</i>

***Feasible and Prudent Alternatives Analysis***

In developing the proposed project, alternatives were considered by the Applicant. These alternatives include no action, development within existing upland areas and an alternate stormwater management plan design. Each of these alternatives is described below.

No Action: A course of no-action on this commercial property does not represent a practicable and substantially equivalent alternative to the proposed plan. The proposed improvements can be constructed in a manner that is consistent with existing local, state and federal land-use regulations, simultaneously allowing for development of the property. As such, this alternative is not proposed.

Development within the Existing Upland: The past disturbance at the property resulted in areas of disturbed and partially drained wetlands in the central portion of the site. To feasibly develop the site, some wetland impacts would occur even if the development was primarily proposed in the upland portions of the property. The largest upland portion is in the southeastern portion of the property and a wetland crossing would likely be required to access the developable portion of the site. The development would be much closer to the higher-value eastern stream and wetland system and development would occur directly adjacent to the altered wetlands. The current project design creates a naturalized area of meadow and woodland wetlands and uplands in the southern portion of the property, contains property development to the north and separates the two areas through a naturalized planted buffer and physical demarcation features. Although wetland impacts are proposed, the mitigation area will be significantly more protected in the long-term through this development design to redevelop the entire property rather than maintaining existing conditions. As such, a development primarily within the existing upland is not proposed.

Alternate Stormwater Management Design: The Applicant reviewed a plan to manage the majority of stormwater runoff through a proposed stormwater detention basin. To improve the ecological and habitat value of the basin, this design was changed to incorporate the proposed pond. The pond offers stormwater management treatment and storage while providing habitat opportunities for fish and wildlife and provides recreational and educational value through the incorporation of a foot path. As such, the stormwater basin is no longer proposed.

The proposed project allows for property development while mitigating the wetland loss through the creation of high-value wetlands at the property. The created pond will provide stormwater management and the pond and wetlands will provide greater ecological and habitat value to the property in addition to recreational and education value through the project design. As such, we find the current proposal to be the most feasible and prudent option.

### ***Conclusions***

We completed an assessment of existing and proposed wetland and watercourse conditions related to the proposed site development activity and related site improvements. Based on this assessment, we conclude that the proposed project mitigates impacts to wetlands and watercourses through the creation of higher-value wetlands at the property. Thank you for your consideration of this information. If you should have any questions or comments, please do not hesitate to contact us at (203) 366-0588.

Sincerely,



William L. Kenny, PWS, PLA  
Principal



Carolyn Matthews  
ESA Certified Ecologist  
ISA Certified Arborist, NE-6822A