



Wetland Impact Assessment Report

The Gateway
190, 218, 240, 252 and 274 Buckland Road
South Windsor, Connecticut
May 13, 2020

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MMI #3571-31-02

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ENGINEERING | PLANNING | LANDSCAPE ARCHITECTURE | ENVIRONMENTAL SCIENCE

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1.0 INTRODUCTION

The third phase of the Buckland Road development project is proposed on portions of the 190, 240, 218, 252, and 274 Buckland Road properties. This project consists of four commercial buildings occupying approximately 88,800 square feet and associated appurtenances including access, parking, stormwater management, along with wetland creation, preservation, and reestablishment within the eastern portion of project area. The project lies north of the first and second phases of development on 190, 218, and 240 Buckland Road, which were authorized by the Town of South Windsor Inland Wetlands Agency in February 2019 and September 2019.

Similar to the previous work on these parcels, the proposed activities will directly alter inland wetlands that are predominantly comprised of farm field and manicured lawn wetland areas. The direct impact has been critically reviewed and cannot be avoided. The direct wetland disturbance has been minimized to the greatest extent practicable and mitigation is provided. Wetland mitigation will be comprised of a suite of compensation strategies that will include wetland creation, wetland reestablishment, and wetland preservation. Through these strategies, the proposed project will not result in a net loss of wetland functionality in the watershed.

In conjunction with the development of a master plan for these properties, Megan B. Raymond, a professional wetland scientist and registered soil scientist with Milone & MacBroom, Inc. (MMI) evaluated and characterized inland wetland areas. MMI identified four primary wetland types and determined the functional capacity of each wetland community on the property. Following the functional assessment, MMI evaluated the proposed project within the context of existing wetland function to document impacts and determine appropriate compensatory mitigation.

The impact assessment methodology and mitigation strategy are consistent to the approach with the first and second phases of development in terms of the overall goal of no net loss of wetland functionality. However, the extent agricultural manipulation of surface drainage increases in the northern portion of the properties. As a result, the area of direct wetland disturbance has increased and the ability to mitigate 1:1 through wetland creation is reduced. Resultantly the application has broadened the scope of mitigation strategies to include wetland reestablishment and wetland preservation.

In summary, and as described in the following report, though direct wetland impact is necessary, these impacts are not anticipated to result in significant reduction in wetland functionality in the watershed. Significant reduction in wetland functionality is avoided by creating and restoring wetlands on the site and preserving wetland communities in perpetuity. Compensation of existing wetland function through wetland creation and restoration is viable on the site given the relatively low functional capacity of the poorly drained farm field soils and the cleared and tilled nature of the upland proposed for wetland creation. The design approach will allow for development of the western portion of these properties in concert with the realization of a greenway within the eastern portion of the site. The greenway will be comprised of a heterogeneous composition of existing wetlands and upland, restored wetlands, and created wetland areas that span a variety of wetland classes from open water to forested. The diversity of hydrologic and vegetative regime will provide a variety of wetland and ecological functions.

2.0 SITE DESCRIPTION

The approximately 32.64-acre property is comprised of the 12.98-acre 190 Buckland Road, 9.79-acre 240 Buckland Road, 1.26-acre 218 Buckland Road, 0.86-acre 252 Buckland Road, and 7.74-acre 274 Buckland Road properties (Figure 1). The western property line of each of the parcels contains frontage on Buckland Road. The site is located in a mixed-use commercial and agricultural area in the southern portion of South Windsor. M&R Liquors abuts 218 Buckland Road to the south. Two commercial centers lie adjacent to the property: The Promenade Shops at Evergreen Walk and The Shoppes at Buckland Hills.

Land use on the properties is primarily agricultural. Each of the properties has been used to support agricultural activities in the recent past, with some areas actively farmed, some recently fallow and successional, and others containing the farmhouse, barns, and sheds to support these activities. The southwestern parcel, 218 Buckland Road, is an undeveloped frontage lot comprised of successional herbs and shrubs in the western portion of the site and an early successional inland wetland adjacent to the eastern property line. The smallest parcel, 252 Buckland Road, is comprised of an old farmhouse and manicured lawn which transitions to a manicured lawn wetland in the eastern portion of the site. The three larger parcels, 190, 274, and 240 Buckland Road, are larger agriculture lots containing active or remnant fields. In general, site topography is relatively flat adjacent to Buckland Road and transitions to moderately to steeply sloping to the east.

The properties contain portions of a long, linear swath of poorly drained soils derived from eolian deposition that extend from the southern portion of Buckland Road to Deming Street. These fine-grained soils are ideal for crop propagation and have regionally supported this use for decades. Over the years of agricultural use, drainage improvements such as ditches and subsurface tile infrastructure have been installed in the fields to create suitable hydrological conditions for farming. These improvements have resulted in the consolidation and collection of groundwater, which is then expressed as surface water in an excavated farm pond and ditches throughout the sites. Taken together, the drainage improvements and land use resulted in the creation of four wetland ecological communities on the property:

1. Farm field/manicured lawn (5.74 acres)
2. Ditches and farm pond (0.33 acres)
3. Early successional (2.31 acres)
4. Forested (0.45 acres)

These wetland systems comprise 8.83 acres or 27% of the total site area, with farm field/manicured lawn wetlands the dominant wetland community comprising 65% of the total wetland area. Evaluating wetland systems from an ecological community perspective allows for a discernment of basic wetland function provided by each community.

In addition to these previously existing wetlands, early successional wetlands have been created in the eastern portion of 190 Buckland Road property as mitigation for impacts for the first two development sites on the properties. These early successional wetlands occupy an additional 2.25 acres of wetlands on the site. Approximately 0.51 acres of these wetlands were reestablished

within farm field wetland areas, while 1.74 acres were created within upland areas adjacent to these wetlands.

The property is located in the Plum Gulley Brook watershed. Plum Gulley Brook commences 2.5 miles north of the property and flows southwest, crossing under Buckland Road north of the property and flowing through an undeveloped area west of Buckland Road before joining the Podunk River northeast of Vintons Millpond. The Podunk River is in turn a tributary to the Connecticut River. No mapped surface waters exist on the subject property. A small unnamed intermittent tributary stream to Plum Gulley Brook is present on 70 Buckland Road and is depicted on the United States Geological Survey (USGS) maps and in the USGS *StreamStats* mapping tool. This off-site unnamed stream flows northwest through 130 Buckland Road, draining approximately 0.3 square miles. The National Wetlands Inventory maps this off-site stream as intermittent and seasonally flooded, meaning that surface water is present for extended periods especially early in the growing season but is absent by the end of the growing season in most years. This intermittent watercourse does not flow through the site.

Historical USGS maps and aerial maps were reviewed to evaluate the extent – if any – of surface water manipulation to facilitate previous and current farming practices. On the subject property, no surface waters have been mapped on USGS quadrangles spanning 1892 to 2018. Similar observations were made reviewing aerial photographs of the subject properties spanning 1934 to 2018.

3.0 WETLAND COMMUNITIES

Inland wetlands and watercourses (including created wetlands on 190 Buckland Road property) comprise approximately 34% of the total land area. The majority of the wetland boundaries depicted on the site plans were delineated by others. John Ianni demarcated wetlands on 218, 240, and 274 Buckland Road in 2011 while soil scientist Tom Pietras flagged 190 Buckland Road in 2014. As design concepts for a comprehensive redevelopment of the three parcels were considered, Megan B. Raymond delineated wetlands at the common boundary between 190, 218, and 240 Buckland Road and characterized the existing wetland communities and functions on all five parcels November 12, 2018, and December 12, 2019 (Figure 2).

Seven soil map units were identified on the property (one wetland and six upland) (Table 3-1). Each map unit represents a specific area on the landscape and consists of one or more soils for which the unit is named. Other soils (inclusions that are generally too small to be delineated separately) may account for 10 to 15 percent of each map unit. The mapped units are by name, symbol, and typical characteristics (parent material, drainage class, high water table, depth to bedrock, and slope) (Table 3-1). These characteristics are generally the primary characteristics to be considered in land use planning and management. A description of each characteristic and its land use implications follows the table. A complete description of each soil map unit can be found in the Soil Survey of the State of Connecticut (USDA, 2005) and at <http://soils.usda.gov/technical/classification/osd/index>.













TABLE 3-1
Soil Unit Properties

Map Unit		Parent Material	Slope (%)	Drainage Class	High Water Table			Depth to Bedrock (inches)
Sym.	Name				Depth (feet)	Kind	Months	
Upland Soil								
53B	Wapping very fine sandy loam	Eolian deposits over melt-out till	3-8	Moderately well drained	>3.0			>6.5
66C	Narragansett silt loam	Eolian deposits over melt-out till	8-15	Well drained	>6.5			>6.5
67B	Narragansett silt loam	Eolian deposits over melt-out till	3-8	Well drained	>6.5			>6.5
68D	Narragansett silt loam	Eolian deposits over melt-out till	15-25	Well drained	>6.5			>6.5
702A	Tisbury silt loam	Eolian deposits over glaciofluvial deposits	0-3	Moderately well drained	>3.0			>6.5
702B	Tisbury silt loam	Eolian deposits over glaciofluvial deposits	3-8	Moderately well drained	>3.0			>6.5
Wetland Soil								
12	Raypol silt loam	Eolian deposits over glaciofluvial deposits	-	Poorly drained	0.5			>6.5

4.0 WETLAND FUNCTIONS AND VALUES

A functional evaluation of each wetland community identified on the property – based on MMI field observations – is summarized in Table 4-1. The first column lists the functions generally ascribed to wetlands; the second column summarizes the rationale used to determine whether these functions are being performed within the subject wetland and/or watercourse. As revealed in the following four tables, each wetland community displays potential to contribute to basic wetland functions. However, factors such as landscape position, hydrology, vegetation, and land use factor into the capacity for each community to provide these basic functions.













TABLE 4-1
Functions and Values Assessment – Farm Field/Manicured Lawn Wetlands

	Functions and Values	Comments
	Groundwater Recharge/Discharge	No – Surficial expression of groundwater is not evident in these wetland systems.
	Flood Flow Alteration (Storage & Desynchronization)	No – The landscape position and hydrology of these wetlands limits contribution to this function.
	Fish & Shellfish Habitat	No – The hydrology of the wetland does not support finfish or shellfish habitat.
	Sediment/Toxicant Retention	Yes – Biochemical interactions in the soil allow for contribution to this function.
	Nutrient Removal/Retention/ Transformation	Yes – The wetland does provide for nutrient retention and transformation.
	Production Export (Nutrient)	No – The wetland is not hydrologically connected to a perennial waterbody.
	Sediment/Shoreline/Watercourse Bank Stabilization	No – The landscape position of this wetland does not contribute to this function.
	Wildlife Habitat	No – The wetland systems are homogenous and do not display structural heterogeneity. This structure limits potential contribution to wildlife habitat.
	Recreation (Consumptive & Non-Consumptive)	No – This wetland does not provide recreational opportunities.
	Educational Scientific Value	No – This wetland does not provide educational value.
	Uniqueness/Heritage	No – This area does not present unique attributes.
	Visual Quality/Aesthetics	No – This wetland area does not contain inherent visual quality or aesthetic value and its appearance is no different than adjacent upland area.
ES	Endangered Species	No – The site is not a mapped Natural Diversity Data Base area outlined by the Connecticut Department of Energy & Environmental Protection (CTDEEP).

The principal functions and values of the wetland system at this location include the following:

- Sediment/Toxicant Retention
- Nutrient Removal/Retention/Transformation













TABLE 4-2
Functions and Values Assessment – Early Successional Wetlands

	Functions and Values	Comments
	Groundwater Recharge/Discharge	No – Surficial expression of groundwater is not evident in this wetland system.
	Flood Flow Alteration (Storage & Desynchronization)	No – The wetland area is limited in size and does not affect localized flood flow.
	Fish & Shellfish Habitat	No – The hydrology of the wetland does not support finfish or shellfish habitat.
	Sediment/Toxicant Retention	Yes – The landscape position of this wetland allows contribution to this function.
	Nutrient Removal/Retention/Transformation	Yes – The wetland does provide for nutrient retention and transformation, though this function is limited due to the small size of the wetland.
	Production Export (Nutrient)	No – The wetland is small in size and not hydrologically connected to a perennial waterbody.
	Sediment/Shoreline/Watercourse Bank Stabilization	No – The landscape position of this wetland does not contribute to this function.
	Wildlife Habitat	Yes – The small wetlands display a variable groundcover and moderately dense shrub layer that may provide some habitat opportunities for wildlife.
	Recreation (Consumptive & Non-Consumptive)	No – This wetland does not provide recreational opportunities.
	Educational Scientific Value	No – This wetland does not provide educational value.
	Uniqueness/Heritage	No – This area does not present unique attributes.
	Visual Quality/Aesthetics	No – This wetland area does not contain inherent visual quality or aesthetic value.
ES	Endangered Species	No – The site is adjacent to a mapped Natural Diversity Data Base area outlined by CTDEEP.

The principal functions and values of the wetland system at this location include the following:

- Sediment/Toxicant Retention
- Nutrient Removal/Retention/Transformation
- Wildlife Habitat













TABLE 4-3
Functions and Values Assessment – Farm Pond/Ditch Wetlands and Intermittent Watercourses

	Functions and Values	Comments
	Groundwater Recharge/Discharge	Yes – The excavation of the farm pond and ditches allow for groundwater communication, primarily groundwater discharge.
	Flood Flow Alteration (Storage & Desynchronization)	No – The landscape position of these wetlands does not affect flood flow alteration. These communities were created to either foster drainage conditions suitable for farming and/or create a source of crop irrigation.
	Fish & Shellfish Habitat	Yes – The farm pond may provide warm water finfish habitat, though this population would be quite small.
	Sediment/Toxicant Retention	Yes – The landscape position of this wetland allows contribution to this function.
	Nutrient Removal/Retention/Transformation	Yes – The wetland does provide for nutrient retention and transformation.
	Production Export (Nutrient)	Yes – The variable hydrology allows contribution in the form of trophic level transitions.
	Sediment/Shoreline/Watercourse Bank Stabilization	Yes – Vegetation along the pond and ditch banks provide this function.
	Wildlife Habitat	Yes – The variable hydrology and diverse vegetation within these wetland areas demonstrate potential to provide opportunities for wildlife use by songbirds, small mammals, and invertebrates.
	Recreation (Consumptive & Non-Consumptive)	No – This wetland does not provide recreational opportunities.
	Educational Scientific Value	No – This wetland does not provide educational value.
	Uniqueness/Heritage	No – This area does not present unique attributes.
	Visual Quality/Aesthetics	No – This wetland area does not contain inherent visual quality or aesthetic value.
ES	Endangered Species	No – The site is adjacent to a mapped Natural Diversity Data Base area outlined by the CTDEEP.

The principal functions and values of the wetland system at this location include the following:

- Groundwater Recharge/Discharge
- Finfish Habitat
- Sediment/Toxicant Retention
- Nutrient Removal/Retention/Transformation
- Production Export
- Wildlife Habitat

TABLE 4-4
Functions and Values Assessment – Forested Wetlands

	Functions and Values	Comments
	Groundwater Recharge/Discharge	Yes – This perched wetland is supported by groundwater discharge.
	Flood Flow Alteration (Storage & Desynchronization)	No – The landscape position of these wetlands – on a slope – does not result in contribution to this function.
	Fish & Shellfish Habitat	No – The hydrology of the wetland does not support finfish or shellfish habitat.
	Sediment/Toxicant Retention	Yes – The perched landscape position of this wetland allows contribution to this function.
	Nutrient Removal/Retention/Transformation	Yes – The wetland does provide for nutrient retention and transformation.
	Production Export (Nutrient)	No – The wetland is small in size and not hydrologically connected to a perennial waterbody.
	Sediment/Shoreline/Watercourse Bank Stabilization	No – The perched landscape position of this wetland does not contribute to this function.
	Wildlife Habitat	Yes – The small wetland displays a shrub layer and thin canopy, but the small size and landscape position limits opportunities for potential utilization by wildlife.
	Recreation (Consumptive & Non-Consumptive)	No – This wetland does not provide recreational opportunities.
	Educational Scientific Value	No – This wetland does not provide educational value.
	Uniqueness/Heritage	No – This area does not present unique attributes.
	Visual Quality/Aesthetics	No – This wetland area does not contain inherent visual quality or aesthetic value.
ES	Endangered Species	No – The site is adjacent to a mapped Natural Diversity Data Base area outlined by the CTDEEP.

The principal functions and values of the wetland system at this location include the following:

- Groundwater Recharge/Discharge
- Sediment/Toxicant Retention
- Nutrient Removal/Retention/Transformation
- Wildlife Habitat

5.0 WETLAND IMPACT ASSESSMENT

The proposed project involves the creation of two medical office buildings and two commercial retail buildings totaling approximately 88,800 square feet and associated access, parking, and stormwater management within approximately 11 acres of the total 32.64 acres comprised of the five properties. Developed infrastructure will be serviced by public water and sewer. Portions of the proposed project will take place within inland wetlands and mitigation for these impacts is proposed through wetland creation, reestablishment, and preservation within the eastern portion of the site. Proposed activities are depicted on site plans prepared by Design Professionals, Inc. (DPI) entitled *The Gateway Site Plan*, dated May 13, 2020.

The proposed project occupies portions 190, 240, 218, 252, and 274 Buckland Road, which contain approximately 11.09 acres of inland wetlands, including 2.25 acres of created/reestablished mitigation wetlands from prior development phases on these properties (Figure 2). Portions of the proposed development project will take place within 3.33 acres of poorly drained soils of farm fields, manicured lawn, and early successional wetlands and 4.7 acres of upland review area¹. The proposed project represents the most feasible and prudent alternative to achieve design objectives. Variations to the proposed development were considered, but due to the position of wetlands on the property, no alternative resulted in avoidance or minimization of direct wetland impact.

Wetland disturbance will be mitigated through wetland creation, reestablishment, and preservation, as well as preservation of surrounding forested uplands. The compensatory wetlands lie to the east of and are anchored by the existing farm pond and intermittent stream. Compensatory wetlands for this phase of development are proposed surrounding the mitigation areas approved in February 2019 and September 2019. Wetlands will be created through the excavation of the ground surface to intercept the underlying groundwater. Following grading, the compensatory mitigation area will be planted with clusters of hydrophytic native shrubs and seeded with a wet meadow mix to foster wetland habitat. The area will be monitored for 3 years post construction to ensure native vegetation establishment. Non-native species will be removed from the created wetland as necessary. Additionally, preservation of 1.64 acres of existing wetlands adjacent to these mitigation areas is proposed.

Land development has the potential to cause short- and long-term direct and indirect impacts to wetlands and watercourses from activities such as vegetation clearing, soil filling, excavation, or pollution of stormwater. The proposed project implements measures to minimize wetland impacts in the short and long term. Specifically, sedimentation and erosion controls are proposed during construction to address short-term impacts while stormwater management measures are proposed to avoid long-term impacts to water quality within the watershed. As described above, direct wetland impacts will be addressed through wetland creation.

Sediment and Erosion Control Measures

¹ In addition, 0.86 acres of wetlands and 0.58 acres will be temporarily disturbed to restore and create mitigation wetlands.

In the short term, wetlands can be indirectly impacted from sediment-laden stormwater from the proposed construction activities. A Sediment and Erosion (S&E) Control Plan has been developed to mitigate the short-term impacts of the development during construction. The S&E Control Plan includes descriptive specifications concerning land grading, topsoiling, temporary and permanent vegetative cover, vegetative cover selection and mulching, and erosion checks. Details have been provided for erosion controls with corresponding labels on the S&E Control Plan. All of the S&E controls provided are in accordance with the 2002 *Connecticut Guidelines for Soil Erosion and Sediment Control*.

The construction site will be bordered by geotextile sediment filter fence and fortified with staked hay bales upgradient of the wetland areas. The site will be accessed from the previously authorized access road west of the proposed project. Temporary topsoil stockpile areas will be bounded by sediment filter fencing. The S&E controls will be inspected daily and modified as necessary throughout the construction process.

Water Quality Protection

In the long term, wetlands and watercourses can be adversely impacted in an indirect manner by stormwater runoff that flows from impervious and landscaped surfaces. To avoid this, the project includes a stormwater management system that is designed and will be installed and maintained in accordance with State and Town standards. The primary components of stormwater management are the two proposed stormwater basins adjacent to Buckland Road, which have been sized following recommendations set forth in the CTDEEP 2004 *Stormwater Quality Manual*.

The manual recommends methods for sizing stormwater treatment measures with Water Quality Volume (WQV) computations. The WQV addresses the initial stormwater runoff commonly referred to as the "first flush" runoff. The WQV provides adequate volume to store the initial 1 inch of runoff, which tends to contain the highest concentrations of potential pollutants. Storm events of 1 inch or less generally drive the hydrology in this region. With the proposed stormwater basins, water quality renovation will be accomplished through detention. The basins will be seeded and vegetated to further encourage water-quality renovation. Given the depth of groundwater at this portion of the site, the basin is anticipated to be dry absent storm events.

6.0 CONCLUSIONS

MMI evaluated the third phase of development at Buckland Road comprised of a total of approximately 88,800 square feet of medical offices and commercial retail buildings and associated access, parking, stormwater management, and wetland creation. Though 3.33 acres of direct alteration to poorly drained farm field soils are necessary, this disturbance is unavoidable and will be mitigated. Mitigation is proposed through a suite of strategies including wetland creation, wetland enhancement, and wetland preservation.

Wetlands will be created, enhanced, and permanently protected within the eastern portion of the sites. Upon completion, this portion of the properties will be comprised of a heterogeneous assemblage of wetlands varied in hydrologic regime and vegetative cover type. The intent is to foster a greenway that juxtaposes the development along the property frontage. Given properly installed and monitored sedimentation and erosion control during construction, long-term

maintenance of the proposed stormwater management system, and realization of created, restored, and permanently protected wetlands on the property, the proposed work will not impact or affect the physical characteristics of wetland resources within the Plum Gulley Brook watershed.

Very truly yours,

MILONE & MACBROOM, INC.

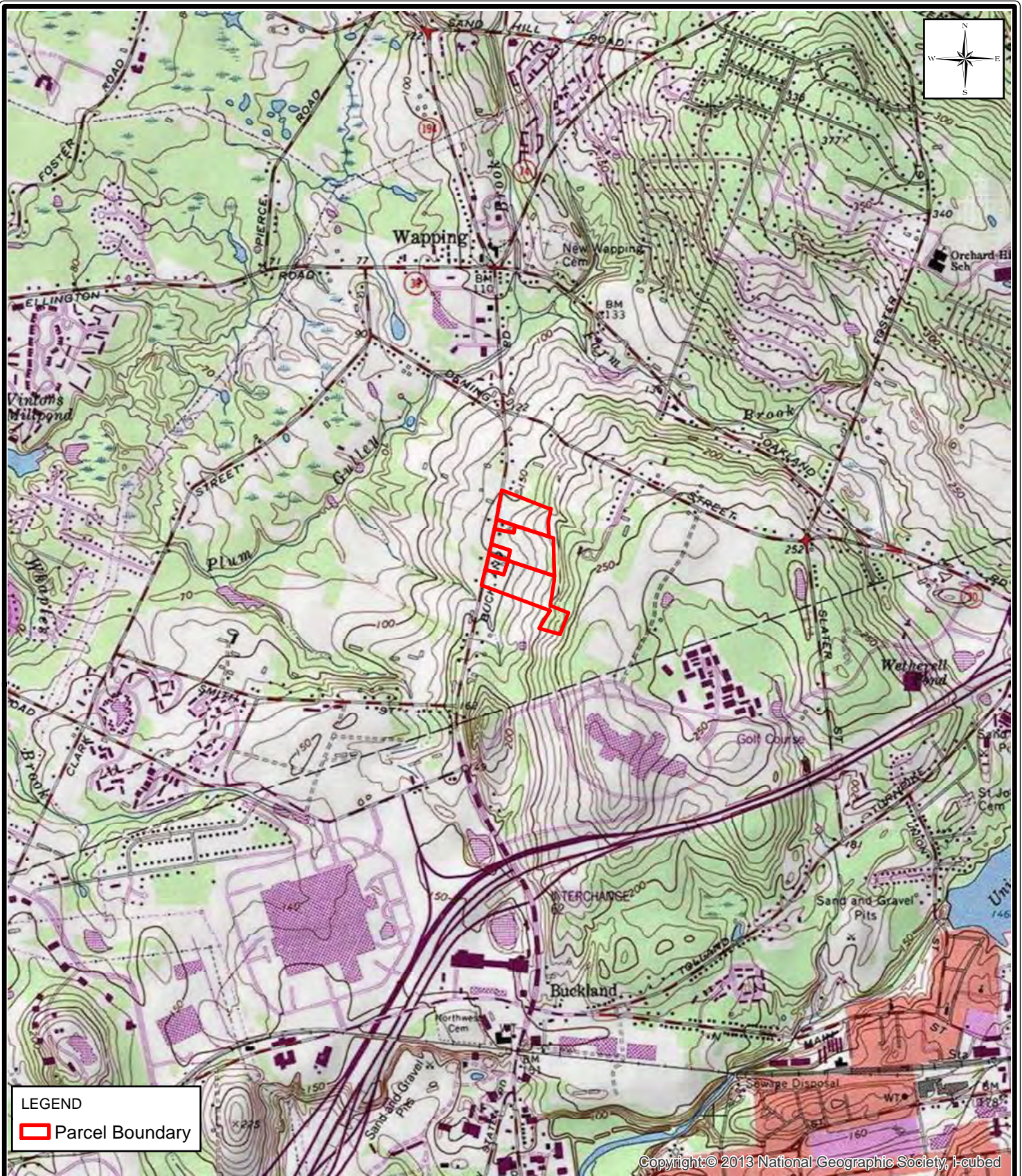


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3571-31-02-m1320-rpt

FIGURES

FIGURE 1 – USGS LOCATION



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SITE LOCATION

190, 206, 218, 240 AND 274 BUCKLAND ROAD
SOUTH WINDSOR, CONNECTICUT

SOURCE: NATIONAL GEOGRAPHIC SOCIETY, 2013

DATE: MAY 12, 2020

SCALE: 1"=2000'

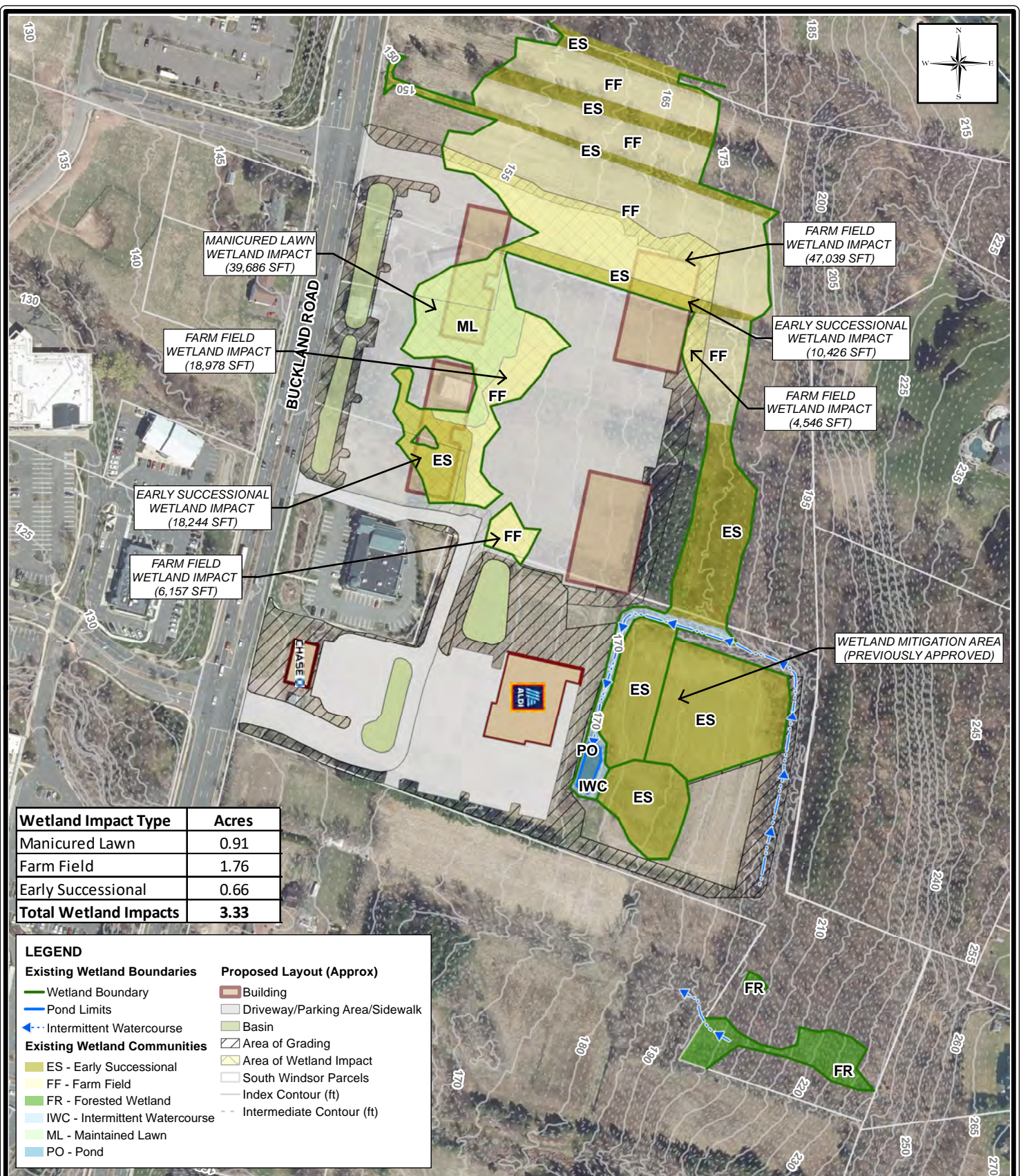
PROJ. NO.: 3571-31

DESIGNED	DRAWN	CHECKED
MBR	AYO	MBR

DRAWING NAME:

FIG. 1

FIGURE 2 – WETLAND COMMUNITY MAP



195 Church Street
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WETLAND IMPACT ASSESSMENT

190, 206, 218, 240, AND 274 BUCKLAND ROAD
SOUTH WINDSOR, CONNECTICUT

SOURCE: 2019 AERIAL PHOTO, CTDEEP

DATE: 08 MAY 2020

SCALE: 1"=250'

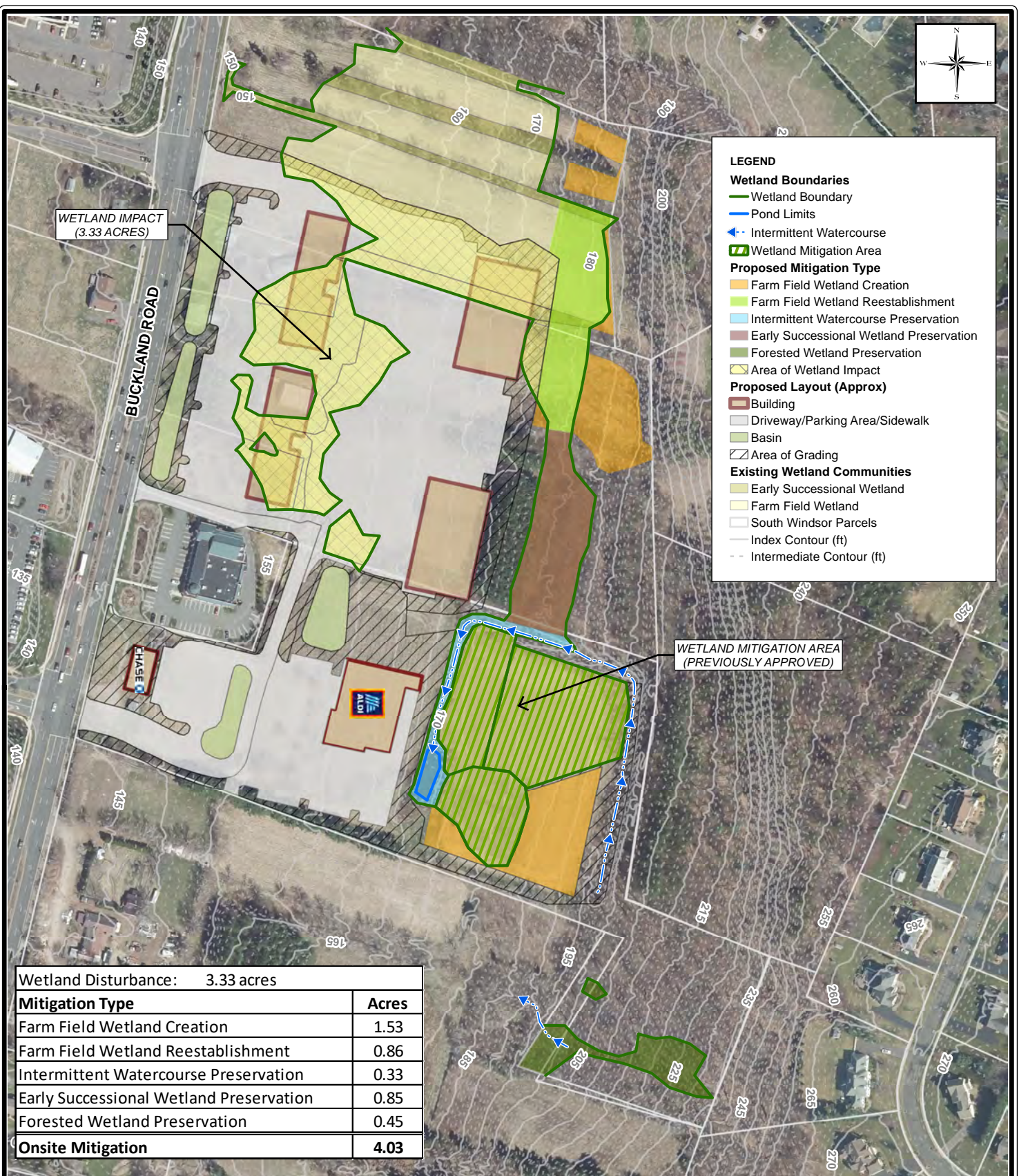
PROJ. NO.: 3571-31

DESIGNED AYO	DRAWN AYO	CHECKED MBR
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DRAWING NAME:

FIG. 1

FIGURE 3 – PROPOSED WETLAND DISTURBANCE MAP



Wetland Disturbance:	3.33 acres
Mitigation Type	Acres
Farm Field Wetland Creation	1.53
Farm Field Wetland Reestablishment	0.86
Intermittent Watercourse Preservation	0.33
Early Successional Wetland Preservation	0.85
Forested Wetland Preservation	0.45
Onsite Mitigation	4.03



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WETLAND IMPACT ASSESSMENT

190, 206, 218, 240, AND 274 BUCKLAND ROAD
SOUTH WINDSOR, CONNECTICUT

SOURCE: 2019 AERIAL PHOTO, CTDEEP

DATE: 13 MAY 2020

SCALE: 1"=250'

PROJ. NO.: 3571-31

DESIGNED AYO	DRAWN AYO	CHECKED MBR
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DRAWING NAME:

FIG. 3