

# PERMIT APPLICATION REVIEW



## **SADDLE RIDGE CLUSTER SUBDIVISION**

**SPORT HILL ROAD & CEDAR HILL ROAD  
EASTON, CONNECTICUT**

**February 16, 2026**



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- Soil & Wetland Studies
- Ecology • Application Reviews
- Listed Species Surveys • GPS
- Environmental Planning & Management
- Ecological Restoration & Habitat Mitigation
- Expert Testimony • Permitting

February 16, 2026

VIA HAND-DELIVERY & E-MAIL

Jeff Borofsky  
Interim Land Use Clerk  
Wetland Enforcement Officer  
Easton Town Hall  
225 Center Road  
Easton, CT 06612

**RE: REVIEW OF INLAND WETLANDS PERMIT APPLICATION 25-733**  
**Saddle Ridge Cluster Subdivision**

Sport Hill Road & Cedar Hill Road, Easton, Connecticut

*REMA Job No.: 26-2863-EAS8*

Dear Mr. Borofsky:

This review report has been prepared at the request of the Citizens for Easton, Inc. to evaluate the environmental impacts of the proposed 26-lot Saddle Ridge Cluster Subdivision. This is pursuant to the Town of Easton's Inland Wetlands and Watercourses Regulations (effective October 22, 2013), and also pursuant to Connecticut General Statutes § 22a-19, which asserts that the development as currently proposed is reasonably likely to cause unreasonable pollution, impairment, or destruction of the public trust in the air, water, and other natural resources of the State.

## **EXECUTIVE SUMMARY**

This report evaluates the environmental record supporting the proposed Saddle Ridge Conservation Subdivision relative to the Town of Easton Inland Wetlands and Watercourses Regulations, applicable scientific standards, and accepted hydrologic and ecological guidance.



Based upon review of the submitted materials and independent technical analyses, several components necessary for a complete and scientifically defensible administrative record remain incomplete, insufficiently documented, or unresolved.

The principal issues are summarized below:

- **Feasible and Prudent Alternatives** – At least two physically attainable alternative access corridors exist that were not evaluated by the applicant. Each appears capable of avoiding or materially reducing direct impacts to regulated wetlands when compared to the proposed wetland crossing. The record does not contain engineering or environmental analysis demonstrating that these alternatives are infeasible or imprudent.
- **Vernal Pool and Amphibian Habitat** – Field investigations did not occur during the spring breeding window for pool-dependent amphibians. No Vernal Pool Envelope (0–100 feet) or Critical Terrestrial Habitat (up to 750 feet) analysis was performed. The documented presence of an obligate vernal pool species in the project area, combined with the absence of seasonal hydroperiod evaluation, renders the record insufficient to determine whether vernal pool functions and associated terrestrial habitat will be maintained.
- **Wetland Delineation Currency** – The delineation depicted on the plans is based upon a 2008 investigation and has not been comprehensively reverified under current site conditions in areas of proposed concentrated disturbance.
- **Hydrologic Risk – Basin #210** – The proposed basin bottom and underdrain elevations are materially lower than adjacent wetland surface elevations, creating a substantial likelihood of shallow groundwater interception and alteration of groundwater-supported wetland hydroperiod. Subsurface characterization at the basin footprint is not documented.
- **Sedimentation Risk** – Extensive grading on multiple steep slopes, including avoidable grading in areas such as Lots 12, 13, and 18, increases the risk of sediment delivery to downgradient wetlands.
- **Stormwater Quality Performance** – Independent review modeling indicates that minimum pollutant removal efficiencies required under the 2024 CT DEEP Stormwater Quality Manual are not achieved for Total Suspended Solids, Total Phosphorus, and Total Nitrogen.
- **Baseline Water Quality Data** – No pre-development water quality characterization of the southeastern headwater pond–wetland system has been provided, preventing evaluation of incremental and cumulative impacts.



- **Long-Term Nutrient Loading** – The cumulative effect of clustered septic systems in shallow glacial till soils has not been evaluated relative to nitrate transport, denitrification potential, and wetland attenuation capacity.
- **Grading Impacts** – Proposed grading across multiple lots exceeds what appears necessary to accommodate development. Removal of native topsoil horizons reduces natural filtration capacity and increases erosion and runoff potential. Native soils are also optimal for sustaining healthy residential landscaping without excessive nutrient inputs.
- **Buffer Adequacy** – Retained forested buffers have not been quantitatively evaluated relative to slope, soil permeability, discharge concentration, and peer-reviewed literature regarding sediment interception, nutrient attenuation, and hydroperiod stability. Downgradient wetlands have not been evaluated for sensitivity to additional nutrient inputs.
- **Listed Species Context** – NDDDB automated screening identifies mapped habitat for state-listed species in proximity to the site. Species-specific habitat evaluation has not been incorporated into the record. Acidic bedrock outcrops on knolls in the southern portion of the site may meet CTDEEP Critical Habitat criteria; although too small for mapped polygon designation, if canopy conditions are appropriate, they may support listed plant species.
- **Conservation Subdivision Constraints** – The record does not include: (1) mapped  $\geq 25\%$  slopes, (2) surveyed bedrock knoll/outcrop overlays, or (3) transparent net land area calculations sufficient to substantiate the proposed lot yield relative to site constraints.
- **Public Water Supply Watershed Context** – The site drains to both the Aspetuck Reservoir and Easton Reservoir systems. The planning implications of development within these water supply watersheds have not been fully evaluated, including protection of downgradient watercourses and riparian corridors that are presently non-impaired due to historically protective land use patterns. Certain proposed grading and lot configurations (e.g., Lots 15–19) may be inconsistent with the objectives of the CTDEEP Antidegradation Policy (CGS § 22a-426).

Individually and collectively, these issues prevent a conclusive determination, based on the present administrative record, that the proposed regulated activities will avoid direct and indirect physical impacts to wetlands and watercourses.

Additional field verification, hydrogeologic evaluation, quantitative buffer and nutrient analysis, and documented comparison of feasible and prudent alternatives would allow for a more complete and defensible review.



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## **1.0 PURPOSE AND SCOPE OF REVIEW**

This Wetlands and Environmental Review has been prepared by REMA Ecological Services, LLC (REMA) to evaluate the adequacy, completeness, and scientific sufficiency of the environmental documentation submitted in support of the proposed Saddle Ridge Conservation Development located off Sport Hill Road and Cedar Hill Road in the Town of Easton, Connecticut.

The scope of this review is limited to matters within the realm of environmental and ecological expertise and within the jurisdictional authority of the Easton Conservation Commission in its capacity as the Town's Inland Wetlands Agency.

Specifically, this review addresses:

- Wetland and watercourse resources,
- Vernal pool potential and associated terrestrial habitat,
- Stormwater–wetland interactions,
- Groundwater and hydroperiod stability,
- Water quality considerations,
- Soil and topographic constraints,
- The relationship between subdivision layout and natural resource protection.

This review is intended to assist the Commission in determining whether the environmental record before it is sufficiently complete and scientifically supported to allow an informed evaluation of potential direct and indirect physical impacts to regulated wetlands and watercourses, consistent with Section 10 of the Town's Inland Wetlands and Watercourses Regulations.

A petition pursuant to Connecticut General Statutes §22a-19 has been filed in connection with this application. Section 22a-19 permits submission of evidence concerning unreasonable pollution, impairment, or destruction of natural resources. This review does not expand the jurisdiction of the Inland Wetlands Agency beyond its statutory authority. Rather, it evaluates whether the current administrative record contains sufficient scientific and technical support to determine that the proposed regulated activities will avoid direct and indirect physical impacts to wetlands and watercourses within the Agency's regulatory framework. To the extent that hydrologic, water quality, habitat, or cumulative impact evidence informs that determination, such evidence is considered within the scope of the Agency's existing authority.



This review does not render a determination of project approval or denial but evaluates whether the record supports such a determination.

## **2.0 BASIS OF REVIEW AND MATERIALS CONSIDERED**

This review is based on the author's professional review of materials submitted by the applicant and its consultants, correspondence and peer review documents prepared for municipal review, and relevant secondary-source environmental data. Materials reviewed include, but are not limited to, the following:

### Applicant Submissions and Consultant Reports

- *Saddle Ridge Cluster Subdivision, Sport Hill Road & Cedar Hill Road, Easton, Connecticut*, prepared by SLR Consulting, dated October 9, 2025, revised October 15, 2025 and February 2, 2026
- *Saddle Ridge Cluster Subdivision Drainage Report*, prepared by SLR Consulting, dated October 9, 2025, revised October 15, 2025
- *Wetland and Soil Report*, prepared by Soil Science and Environmental Services, Inc., dated October 2025
- *Wetland Assessment Report*, prepared by Soil Science and Environmental Services, Inc., dated February 2, 2026
- *Subdivision Application, Special Permit and Site Plan Application for Conservation Development*, prepared by Cohen and Wolf, P.C., dated October 16, 2025
- Full Site Plan Set, Saddle Ridge Conservation Subdivision, prepared by SLR Consulting, latest revision dated February 2, 2026

### Third-Party and Peer Review Materials

- *Third-Party Engineering Review – Saddle Ridge Cluster Subdivision*, prepared by Trinkaus Engineering, dated January 2, 2026
- *Tighe & Bond Review Comments – Inland Wetlands Permit Application 25-733*, dated January 21, 2026
- *SLR Peer Review Comment Responses*, dated February 2, 2026
- *Third-Party Comments Submitted to the Easton Conservation Commission*, dated January 21, 2026



- *Third-Party Comments Submitted to the Easton Planning & Zoning Commission*, dated January 21, 2026

### Secondary-Source Environmental Data and Mapping

In addition to the materials listed above, REMA reviewed a range of secondary-source environmental data to provide broader site context and historical perspective, including:

- Connecticut Environmental Conditions Online (CT ECO), including soils, wetlands, hydrology, topography, and aerial imagery;
- USDA Natural Resources Conservation Service (NRCS) Web Soil Survey;
- Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM);
- Connecticut Department of Energy and Environmental Protection (CTDEEP) Natural Diversity Data Base (NDDDB) automated screening results, where available (NDDDB automated screening results were reviewed for informational context; this review does not expand the jurisdiction of the Inland Wetlands Agency but evaluates potential wetland function implications); and
- Historical aerial photography of the subject site and surrounding area, spanning back to approximately 1934 and including multiple intermediate and recent aerial datasets.

These secondary data sources were reviewed to evaluate long-term landscape patterns, hydrologic setting, historical disturbance, wetland persistence, and potential ecological functions that may not be fully characterized through site plan review alone.

## **3.0 SUMMARY OF SITE CONDITIONS AND PHYSICAL SETTING**

### **3.1 Regional Setting and Regulatory Context**

The proposed Saddle Ridge Conservation Development is located within a public water supply watershed in the Town of Easton, Connecticut. The site occupies the upper portion of two headwater drainage systems.

The eastern portion of the site contributes to Patterson Brook, a downstream cold-water resource supporting brook trout habitat. Patterson Brook ultimately contributes to Easton Reservoir, located approximately 1.5 miles east of the subject site. The western portion of the site drains northerly and southwesterly via two feeder streams toward Ballwall Brook, a tributary of the Aspetuck River, which is impounded to form the Aspetuck Reservoir.



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Water quality in the Ballwall Brook basin is likewise expected to be high. A USGS StreamStats analysis of the Ballwall Brook Basin indicates approximately 1% impervious surface, 9.1% developed land uses, and only 11 local road crossings within the 1.68-square-mile basin. Downgradient of the site, riparian corridors exceed 250 feet in width along more than 80% of the stream length.

Headwater systems are inherently sensitive to disturbance. Because they lie at the origin of drainage networks, alterations in hydrology, sediment loading, nutrient transport, and thermal regime can propagate downstream with cumulative effect. In lightly developed public water supply watersheds such as this, existing water quality in Patterson Brook and Ballwall Brook is reasonably assumed to be high in the absence of contrary data. This context elevates the importance of maintaining existing hydrologic and water quality conditions.

The lightly developed landscape also increases the ecological value and functional integrity of on-site wetlands. The SSES Wetland Assessment appropriately evaluated wetland functions using the 1995 Highway Methodology, including consideration of surrounding undeveloped uplands, landscape connectivity, total wetland area, cover type diversity, and plant species diversity.

It is widely accepted that narrow setbacks, hydrologic alteration, and sedimentation promote invasive plant establishment and long-term wetland degradation. The currently high level of wetland function increases the ecological significance of potential direct and indirect impacts.

The site is subject to review under the Town's Inland Wetlands and Watercourses Regulations and Conservation Development provisions, both of which emphasize avoidance and minimization of adverse impacts to wetlands, watercourses, and associated ecological functions.

### **3.2 Headwater Hydrologic Position**

The southeastern wetland and pond complex functions as the headwaters of Patterson Brook. Two tributaries to Ballwall Brook originate within northwestern and southwestern on-site wetlands. Both intermittent and perennial tributaries begin within the project site and convey flow downstream.

Headwater wetlands perform ecological functions disproportionate to their size, including:

- Flow moderation
- Nutrient transformation
- Sediment retention



- Thermal buffering
- Baseflow support

Because headwaters lack upstream buffering systems, pollutant inputs and hydrologic alterations are not attenuated by prior treatment. Disturbances within the site therefore have limited opportunity for natural mitigation before reaching downstream waters.

Headwater streams are substantially more sensitive to nitrate concentrations than drinking water standards for human health. Ecological degradation has been documented at nitrate concentrations above approximately 1 mg/L, whereas the public health standard for groundwater is 10 mg/L. The EPA draft nutrient criterion for nitrate is 0.33 mg/L. Research by Chambers et al. (2012) demonstrated that macroinvertebrate communities lose pollution-sensitive taxa when nitrate and phosphorus concentrations exceed EPA ecological thresholds. These considerations are directly relevant in evaluating septic density and stormwater nutrient loading within a headwater setting.

### **3.3 Topography, Soils, and Bedrock Constraints**

The site is characterized by:

- Steep slopes
- Bedrock-controlled knolls and outcrops
- Shallow-to-bedrock glacial till soils
- Localized sand and gravel deposits

These geomorphic conditions impose physical constraints on development and directly influence hydrologic behavior.

In shallow glacial till systems:

- Infiltration capacity is variable and often limited.
- Subsurface flow frequently occurs as shallow lateral movement above restrictive layers.
- Groundwater recharge and discharge patterns are closely tied to slope position and soil depth.
- Pollutant transport may occur rapidly where preferential pathways exist.

Steep slopes further increase the potential for:

- Concentrated surface runoff



- Reduced infiltration residence time
- Erosive flow conditions
- Delivery of sediment-bound nutrients to downslope wetlands

Hillsides with shallow glacial till can be highly effective at removing residual nitrate in septic leachate — but only where forested buffers are sufficiently long and intact. Multiple studies have measured greater than 90% nitrate removal within approximately 30-meter (100-foot) forested buffers (Hill et al., 1996; see also Section 3.6). Effective nitrate removal does not occur on short slopes that are cleared of trees and stripped of natural topsoil.

The proposed grading and clearing plan does not appear to maximize nitrate attenuation potential in downslope buffer areas. These physical characteristics are directly relevant to stormwater design, septic siting, excavation depth, and buffer performance.

### **3.4 Wetlands, Watercourses, and Aquatic Structure**

The project site contains extensive inland wetlands and watercourses, including:

- A large contiguous forested wetland complex traversing the site
- Several smaller isolated wetlands within a matrix of moderately well-drained Sutton soils (Wetlands 2, 3, and 5–7)
- A forested southwestern wetland with seasonal flooding and a dense, diverse shrub stratum
- A southeastern pond–marsh system exhibiting structural heterogeneity
- Shrub swamp cover type and both deep and shallow organic soils (Timakwa, Natchaug, and Scarborough series) within the northwestern wetland

The southeastern system includes:

- A smaller pond (approximately 40 x 40 feet) exhibiting sediment infilling
- A larger pond with open water in its northern portion
- Emergent marsh and shallow vegetated margins in its southern portion

Aquatic vegetation, including water lilies, is present. Pond depth and fish presence were not determined in the submitted assessment.



The SSES report characterizes these wetlands as functioning and not degraded, providing flood attenuation, water quality treatment, and wildlife habitat — the latter identified as a principal function.

The wildlife list includes species associated with relatively intact forest systems, including wood thrush, veery, and pileated woodpecker, as well as eastern towhee, a species of forest edge and successional habitat. While some invasive species are present, the wetlands are not characterized by substantial invasive dominance. Plant community composition, including widespread highbush blueberry within Wetland 1B, suggests mesotrophic nutrient status.

### **3.5 Groundwater and Shallow Flow Dynamics**

Given the site's glacial till soils and slope configuration, shallow groundwater movement likely occurs as lateral subsurface flow toward downslope wetlands, particularly hillside seep systems such as the southern lobes of Wetland 1B north of Lots 4 and 5.

In such landscapes:

- Seasonal perched water tables are common
- Wetland hydroperiod is sustained by diffuse groundwater discharge
- Shallow excavation below seasonal groundwater elevation can intercept flow paths
- Underdrains may function as preferential drainage conduits

The stability of seep wetland soils and vegetation is closely tied to the maintenance of shallow groundwater elevation and duration of saturation.

Accordingly, excavation depth, basin underdrain elevation, and upslope recharge alteration are hydrologically consequential in this setting. Given the documented elevation differential and glacial till flow regime, dewatering of the southern lobes of Wetland 1B is more likely than not if Basin 210 is constructed as proposed, as further discussed in detail in Section 5.5.

### **3.6 Wetland Buffer Function and Physical Attenuation Capacity**

Forested wetland buffers perform measurable physical functions, including:

- Sediment interception
- Nutrient attenuation
- Runoff velocity reduction
- Temperature moderation



- Maintenance of shallow groundwater recharge
- Support of hydroperiod stability

Scientific literature in glaciated northeastern landscapes demonstrates that buffer effectiveness depends upon:

- Width
- Slope
- Soil permeability
- Continuity
- Flow dispersion versus concentration

Narrow buffers may intercept coarse sediment but are less effective at attenuating dissolved nutrients such as nitrate, which require sufficient residence time and organic soil interaction for denitrification.

In steep, shallow-to-bedrock systems, concentrated flow paths can bypass buffer interception capacity.

The environmental record does not include quantitative evaluation of retained buffer width, continuity, or performance relative to slope and soil conditions. Nor does it include analysis of wetland sensitivity to nutrient enrichment or hydroperiod alteration.

Plans depict significant buffer-related concerns in Lots 15–19 along the approximately 350-foot hillside sloping east toward Wetland 1A and the southeastern pond complex. This hillside drains directly toward a nutrient-sensitive headwater pond.

Septic systems for Lots 16, 17, and 18 are proposed in the lower portion of this hillside, which is to be cleared. Tree removal reduces nitrogen uptake, increases runoff coefficients, and elevates erosion risk across a large contributing area. Cessation of transpiration may also elevate the local groundwater table. Hinkley soils at the base of the slope, creates a probable pathway for residual nitrate transport to the downgradient pond system, particularly given Hinkley soil permeability and slope position.

Buffer width is further diminished by stormwater basins and associated 15-foot access drives. Additional erosion risk may result from substantial grading and potential blasting associated with bedrock knolls on Lots 12, 13, and 15.



An alternative layout retaining most of the steep forested hillside, with houses and septic systems relocated upslope into less steep, well-drained Charlton soils, would substantially reduce the probability of nitrogen and sediment delivery to the pond. Because buffer function is physical and directly tied to soil and hydrologic integrity, its adequacy is relevant to evaluation of indirect physical impacts.

### **3.7 Baseline Water Quality Conditions**

No baseline water quality characterization is provided for the receiving wetland and headwater systems, including:

- Nitrogen and phosphorus
- Total suspended solids
- Temperature
- Conductivity
- Dissolved oxygen
- pH

In the absence of baseline data:

- Incremental change cannot be quantified
- Cumulative loading cannot be evaluated
- Stormwater performance claims cannot be independently validated

For headwater systems supporting downstream cold-water habitat, baseline characterization is particularly important.

### **3.8 Ecological Complexity and Vernal Pool Potential**

The combination of open water, emergent marsh, shallow vegetated margins, and forested wetland creates a structurally complex aquatic system.

The presence of wood frog (*Lithobates sylvaticus*), an obligate vernal pool breeder, is documented. However, no spring-season amphibian surveys were conducted.

Even where fish may be present in deeper portions of a pond, shallow vegetated margins and seasonally isolated depressions may support breeding habitat for pool-dependent amphibians. Absent seasonal hydrologic and biological evaluation, vernal pool function cannot be conclusively determined.



### **3.9 Existing Landscape Condition**

The site remains largely forested with limited impervious cover. Although portions reflect historic agricultural use, the overall landscape retains substantial ecological integrity and habitat continuity.

The proposed subdivision represents a substantial increase in:

- Land disturbance
- Impervious surfaces
- Stormwater infrastructure
- Septic density
- Forest fragmentation

In a headwater setting, such changes may produce cumulative hydrologic and water quality effects.

### **3.10 Design Implications in a Constrained Headwater Landscape**

The physical setting described above indicates a landscape in which:

- Shallow groundwater sustains wetland hydroperiod
- Slopes promote concentrated runoff
- Buffers perform critical attenuation functions
- Nutrient removal capacity is finite
- Downstream systems lack upstream buffering

In such a setting, avoidance-based design, verified wetland boundaries, scientifically defensible buffer widths, and robust hydrologic analysis are necessary to avoid direct and indirect physical impacts to wetlands and watercourses.

The layout of Lots 25 and 26 illustrates potential failure to avoid such impacts. On Lot 25, existing topography conveys shallow groundwater toward the southeastern end of Wetland 1B. Proposed regrading would redirect runoff and shallow groundwater toward the road, driveway, and stormwater basin rather than toward the wetland, while removing stable topsoil and vegetative cover.



On Lot 26, clearing of the southeastern treed hillside portion (approximately 1,000 square feet) and septic placement downslope reduces the potential for nitrate attenuation. If the septic system were relocated upslope and a forested swath retained, greater than 90% nitrate removal could occur within an adequately long buffer, rather than discharging to a dry detention basin with minimal nitrate removal capacity, as noted in the Trinkaus Engineering review.

These site conditions provide the scientific context for evaluating stormwater design, wetland delineation adequacy, buffer performance, and hydrologic alteration in the sections that follow.

#### **4.0 VERNAL POOL POTENTIAL AND SEASONAL HABITAT EVALUATION**

##### **4.1 Timing of Field Investigations**

The wetland and ecological assessments submitted for the proposed development were conducted primarily during September and October 2025. While late-season investigations may be adequate for general wetland boundary identification, they are not sufficient to determine the presence or absence of vernal pool function or obligate amphibian breeding activity.

Vernal pools are seasonal systems whose ecological function is most reliably documented during late winter and early spring, when:

- Seasonal ponding is present,
- Egg masses of wood frog and mole salamanders are visible,
- Calling activity can be detected,
- Larval development is observable.

Field investigations conducted outside the breeding window cannot be used to conclusively rule out vernal pool habitat (Calhoun and Klemens 2002; USACE 2014).

No spring-season amphibian survey or hydroperiod monitoring was conducted as part of the record. During the first public hearing, Ms. Jen Beno of SSES, Inc. stated that a vernal pool inventory had not yet been performed.

##### **4.2 Evidence of Pool-Breeding Amphibians**

The wetland assessment documentation reports the presence of wood frog (*Lithobates sylvaticus*) within the project area. The SSNE wildlife inventory also references spring peeper (*Pseudacris crucifer*) and gray tree frog (*Hyla versicolor*), both pool-breeding amphibians that typically develop more rapidly than wood frog.



Several neighboring property owners have reported loud spring choruses of frogs within the wooded portions of the site during the breeding season, although species were not definitively identified.

Wood frog is an obligate vernal pool breeder, relying on fish-free or seasonally isolated aquatic habitats for reproduction (Calhoun and Klemens 2002). The documented presence of this species indicates that vernal pool-type habitat is likely present within or immediately adjacent to the site.

Importantly, complex pond-marsh systems may support embedded or partial vernal pool habitat even where fish are present in deeper portions of the basin. Shallow vegetated margins, seasonally isolated depressions, and emergent marsh zones may provide fish-free breeding refugia.

Given the structural complexity of the southeastern pond-wetland complex described in Section 3.4, and the absence of seasonal hydrologic and fish presence data, the potential for embedded vernal pool habitat cannot be dismissed.

Wetland 4 (the southwestern wetland complex) was also reported to pond floodwaters, although depth and duration were not documented. Embedded vernal pool habitat may likewise be associated with very poorly drained organic soils in the northern portion of Wetland 1B (the large northwestern wetland system).

#### **4.3 Aquatic-Terrestrial Coupling and Hydroperiod Stability**

Vernal pool systems are hydrologically coupled to surrounding uplands. In glaciated till landscapes, pool hydroperiod may be influenced by:

- Shallow groundwater discharge,
- Seasonal perched water tables,
- Diffuse subsurface flow paths (see Section 3.5).

Excavation, grading, or interception of shallow groundwater may alter hydroperiod duration and depth. Because amphibian reproductive success depends upon sufficient hydroperiod to allow larval development, even moderate reductions in seasonal water persistence can impair recruitment.

Vernal pool stability is therefore linked not only to the aquatic basin but to surrounding groundwater integrity and upland forest condition.



The proposed layout of Lot 12 presents a reasonably foreseeable risk of hydrologic alteration to adjacent Wetland 4, which may contain embedded vernal pool habitat. Under existing conditions, the steep western flank of the southeastern bedrock knoll conveys shallow groundwater and surface runoff downslope into Wetland 4. This slope also functions as upland forest habitat for tree frogs and potentially wood frog and spotted salamander (*Ambystoma maculatum*).

The proposed grading plan would substantially flatten this slope, with removal of most of the knoll to accommodate Lots 12 and 13. Grading of irregular, steep terrain introduces significant erosion risk to Wetland 4. Drainage would be redirected northerly toward the roadway, reducing water supply to the eastern portion of Wetland 4. Approximately 3,850 square feet of steep to very steep forested slope within the upland review area (URA) would be cleared and replaced with lawn.

Tree clearing and redirection of runoff toward roadways and centralized stormwater basins occurs at multiple locations across the site, necessitating four large detention basins. The footprints of these basins eliminate areas that currently contribute to adjacent wetland hydrology.

The design does not reflect low-impact development (LID) principles, which could include distributed infiltration practices such as rain gardens, rooftop runoff infiltration, roadside swales, and smaller bioretention systems.

In addition, bedrock outcrops on several knolls proposed for excavation currently provide crevices and denning habitat for wetland-associated wildlife, including bobcat. Removal of these features would diminish both wildlife habitat function and the landscape integrity of Wetlands 1B and 4, which were identified by SSES as high-quality systems with Uniqueness/Heritage value.

#### **4.4 Vernal Pool Envelope (VPE) and Critical Terrestrial Habitat (CTH)**

Scientific literature consistently demonstrates that protection of the aquatic basin alone is insufficient to sustain pool-breeding amphibian populations.

Calhoun and Klemens (2002) describe a two-zone conservation framework:

- Vernal Pool Envelope (VPE) – approximately 100 feet from the pool edge
- Critical Terrestrial Habitat (CTH) – extending up to 750 feet from the pool edge

The VPE supports:

- Egg deposition



- Larval development
- Juvenile emergence
- Immediate post-metamorphic refuge

However, long-term population persistence depends primarily on forested terrestrial habitat within the broader CTH, where amphibians:

- Forage
- Disperse
- Overwinter
- Avoid predation

USACE New England guidance (2014) incorporates this terrestrial framework and emphasizes that fragmentation, clearing, and roadway crossings within the CTH significantly reduce recruitment and long-term viability.

Peer-reviewed research further demonstrates that narrow upland buffers may maintain wetland soil function yet fail to sustain amphibian demographic performance. Veysey Powell and Babbitt (2015) documented reduced body size and lower survival indicators in landscapes with narrow buffers relative to forested reference conditions.

These findings indicate that terrestrial habitat extent and continuity — not merely aquatic basin protection — drive long-term amphibian persistence.

#### **4.5 Landscape Constraints and Movement Barriers**

Two existing public roadways — Sport Hill Road (northeast) and Westport Road (southeast) — function as partial dispersal barriers.

Where major roads constrain movement in certain directions, the remaining contiguous forest block assumes disproportionate importance for sustaining breeding populations.

As described in Section 3.6, forested uplands in shallow glacial till systems also provide hydrologic buffering and microclimate regulation that support amphibian habitat stability.

The long, steep hillside immediately west of the southeastern pond–wetland complex likely represents the primary viable terrestrial habitat zone for pool-breeding amphibians. As discussed in Section 3.6, preservation of forest cover along this hillside would maintain terrestrial habitat continuity while also reducing nitrogen and sediment delivery to the pond.



Clearing, grading, roadway construction, septic systems, and stormwater infrastructure within this zone may:

- Fragment CTH,
- Reduce canopy continuity,
- Alter soil moisture regimes,
- Increase edge effects,
- Increase mortality during dispersal events.

No mapping or analysis of VPE or CTH extent, configuration, or fragmentation has been included in the record.

#### **4.6 Distinction Between Vernal Pool Buffers and General Wetland Buffers**

Vernal pool conservation zones are not equivalent to general wetland buffers designed primarily for sediment interception.

General wetland buffers address:

- Sediment interception
- Nutrient attenuation
- Runoff moderation

Vernal pool conservation zones address:

- Species life-cycle requirements
- Terrestrial habitat continuity
- Dispersal corridors
- Overwintering substrate
- Microclimate stability

As discussed in Section 3.6, buffer adequacy in steep, glaciated landscapes depends upon slope, soil depth, and hydrologic connectivity.

Where vernal pool function is present or reasonably suspected, terrestrial habitat protection must be evaluated independently of general sediment-buffer criteria.



## **4.7 Conclusions Regarding Vernal Pool Evaluation**

Based upon:

- Off-season field investigations,
- Documented presence of an obligate vernal pool species,
- Structural complexity of the pond–wetland system,
- Absence of hydroperiod and fish presence data,
- Lack of spring-season amphibian surveys,
- Absence of VPE and CTH mapping or fragmentation analysis,

the current environmental record is insufficient to determine whether vernal pool habitats are present or absent within the project site, or whether surrounding terrestrial habitat necessary to sustain such systems would be maintained.

In a headwater landscape characterized by shallow groundwater dependence (Section 3.5) and forest-buffer coupling (Section 3.6), disturbance within likely terrestrial habitat zones creates a reasonable likelihood of indirect physical alteration of wetland-dependent ecological functions if vernal pool systems are present.

Additional seasonal field evaluation and terrestrial habitat analysis are necessary to resolve this uncertainty.

## **5.0 STORMWATER MANAGEMENT AND HYDROLOGIC RISK ASSESSMENT**

### **5.1 Overview and Site Sensitivity**

Stormwater management is a central issue for the proposed Saddle Ridge Conservation Development due to the site’s headwater hydrologic position, shallow glacial till soils, steep slopes, extensive wetlands, and the presence of a structurally complex pond–marsh system functioning as the origin of Patterson Brook.

As described in Section 3, headwater systems lack upstream buffering capacity. Alterations in runoff volume, groundwater recharge, sediment delivery, and nutrient loading occur at the point of origin and may propagate downstream with cumulative effect.

The proposed development includes multiple stormwater detention basins, including Basins #210, #150, and #160, several of which are located in close proximity to wetland boundaries and discharge directly to wetlands, watercourses, and the southeastern pond system.

In this hydrologic context, both:

- Water quality treatment performance, and



- Physical alteration associated with basin excavation and placement are critical considerations.

## **5.2 Stormwater Quality Performance and Independent Review**

The applicant's drainage report states that sediment chambers, forebays, and detention storage volumes have been incorporated to satisfy Water Quality Volume (WQV) and Groundwater Recharge Volume (GRV) requirements under the 2024 CT DEEP Stormwater Quality Manual.

However, the independent engineering review conducted by Trinkaus Engineering concluded that the proposed stormwater management system does not achieve minimum pollutant removal performance standards required by the Manual.

Specifically, modeling indicates that the system does not meet minimum removal efficiencies for:

- Total Suspended Solids (90%),
- Total Phosphorus (60%), and
- Total Nitrogen (40%).

These standards represent minimum performance thresholds necessary to demonstrate compliance with water quality protection objectives.

In a headwater wetland system receiving multiple basin discharges, failure to meet minimum pollutant removal criteria results in a failure to meet minimum numeric performance thresholds and therefore creates a high likelihood of chronic nutrient and sediment loading to receiving wetlands:

- Chronic sediment deposition in wetlands,
- Phosphorus enrichment of shallow pond margins,
- Nitrogen loading exceeding denitrification capacity (see Section 3.6),
- Increased primary productivity and vegetative community shift,
- Downstream thermal and nutrient effects.

Where stormwater systems are designed primarily for peak flow attenuation rather than enhanced pollutant removal, and where dry detention basins are used without advanced treatment mechanisms, pollutant reduction performance is typically limited.



### **5.3 Cumulative Discharge to a Sensitive Receiving System**

The southeastern wetland–pond complex receives discharge from multiple proposed stormwater basins.

This system is not an isolated feature but a structurally complex headwater resource characterized by:

- Open water,
- Emergent marsh,
- Shallow vegetated margins,
- Forested wetland,
- Tributary outflow to downstream cold-water habitat.

Headwater wetlands are particularly sensitive to incremental pollutant loading due to limited dilution capacity and absence of upstream attenuation.

As discussed in Section 3.6, buffer function and wetland nutrient attenuation capacity are finite and influenced by slope, soil depth, and residence time. Chronic loading from multiple sources — including stormwater and septic systems — may exceed natural assimilative capacity.

The record does not include cumulative nutrient loading analysis relative to wetland attenuation capacity or documented evaluation of combined stormwater and septic contributions.

### **5.4 Absence of Baseline Water Quality Data**

No pre-development water quality characterization has been provided for:

- Nutrients,
- Suspended sediment,
- Temperature,
- Conductivity,
- Dissolved oxygen.

Without baseline data:

- Incremental change cannot be quantified,



- Model outputs cannot be independently validated,
- Cumulative effects cannot be meaningfully assessed,
- Long-term degradation cannot be distinguished from existing conditions.

In a headwater system functioning as the origin of downstream cold-water habitat, the absence of baseline characterization represents a material limitation in the environmental record.

### **5.5 Basin #210 – Groundwater Interception and Wetland Hydroperiod Alteration**

In addition to water quality concerns, Basin #210 presents a distinct hydrologic issue related to excavation depth and underdrain elevation.

According to the submitted plans:

- Basin bottom elevation is approximately 417 feet,
- Underdrain elevation is approximately 415 feet,
- Existing ground surface in the basin area is approximately 424 feet,
- Adjacent hillside wetland edge occurs at approximately elevation 426 feet.

The basin excavation therefore extends approximately 9–10 feet below the elevation of the adjacent wetland surface and below the likely seasonal shallow groundwater elevation sustaining that wetland.

As described in Section 3.5, shallow lateral groundwater flow in glacial till landscapes commonly supports seep wetlands. Excavation below seasonal groundwater elevation, combined with installation of an underdrain, may function as a preferential discharge point.

Potential physical consequences include:

- Interception of shallow groundwater flow paths,
- Reduction in wetland baseflow contributions,
- Shortening of wetland hydroperiod,
- Alteration of soil saturation regimes,
- Vegetative community shift from hydrophytic to facultative species,
- Increased susceptibility to invasive colonization.



The environmental record does not include:

- A soil test pit or groundwater observation point at the basin footprint,
- Seasonal high groundwater documentation at the excavation location,
- Hydrogeologic modeling evaluating potential interception,
- Demonstration that the basin underdrain elevation will not function as a drainage outlet.

Based on documented elevations and absence of subsurface investigation, it is more probable than not that Basin 210 will intercept shallow groundwater contributing to the adjacent hillside wetland.

This concern is independent of stormwater discharge quality and relates to physical alteration of groundwater-supported wetland hydrology.

### **5.6 Relationship to Buffer Integrity and Hydroperiod Stability**

As described in Section 3.6, forested buffers contribute to hydroperiod stability, groundwater moderation, and nutrient attenuation.

Placement of deep stormwater infrastructure immediately adjacent to wetlands reduces effective buffer width and introduces concentrated discharge pathways that may bypass diffuse sheet-flow attenuation mechanisms.

In steep glacial till systems, concentrated discharge may:

- Increase erosive force,
- Shorten residence time,
- Reduce nutrient uptake opportunity,
- Accelerate sediment delivery to wetlands.

The environmental record does not include quantitative analysis of buffer performance relative to slope, soil permeability, discharge concentration, or altered recharge patterns.

### **5.7 Summary of Stormwater and Hydrologic Findings**

Based upon the current administrative record:

- Minimum pollutant removal standards under the 2024 CT DEEP Stormwater Quality Manual are not achieved.



- Cumulative discharge to a headwater wetland–pond system has not been evaluated relative to attenuation capacity.
- Baseline water quality data are absent.
- Basin #210 excavation depth and underdrain elevation present a substantial likelihood of shallow groundwater interception and wetland hydroperiod alteration.
- Buffer performance has not been evaluated relative to slope, soil, and discharge configuration.

In a shallow glacial till headwater landscape, these deficiencies collectively increase the likelihood of both short-term construction-related and long-term indirect physical impacts to regulated wetlands and watercourses.

## **6.0 FEASIBLE AND PRUDENT ALTERNATIVES**

### **6.1 Regulatory Standard**

Under Section 10.2 of the Inland Wetlands Regulations, the Agency shall not grant a permit for a regulated activity unless it finds that a feasible and prudent alternative does not exist. This determination must be based upon substantial evidence in the administrative record and requires consideration of alternatives that would avoid or minimize impacts to wetlands and watercourses.

The burden of demonstrating the absence of a feasible and prudent alternative rests with the applicant.

### **6.2 Regulated Activity Requiring Alternatives Analysis**

The regulated activities associated with the proposed development include:

- A direct wetland and watercourse crossing,
- Placement of stormwater infrastructure immediately adjacent to wetland boundaries,
- Extensive grading and tree clearing on steep slopes above wetlands, and
- Basin placement with potential indirect hydrologic alteration.

Because these activities involve both direct and indirect physical impacts to regulated resources, the alternatives analysis must evaluate whether such impacts are avoidable through alternative site access or layout configurations.



For example, the number and size of stormwater basins could potentially be reduced through grading modifications designed to maintain existing diffuse flow patterns into wetlands or onto level, naturally vegetated terrain, rather than redirecting runoff toward roadways and centralized catch basin systems. Low-impact development (LID) practices, including rain gardens and distributed infiltration systems as referenced in Section 4.3, may also reduce reliance on large detention basins.

The record does not include documented analysis of such avoidance-based design alternatives.

### **6.3 Westport Road Access Alternative**

The subject property includes frontage along Westport Road. The record demonstrates that vehicular access from this frontage is physically possible (see Figure A, attached).

A potential alignment from Westport Road would encounter a localized pinch point of approximately 41.5 feet between the wetland boundary and the adjacent property boundary. This constraint extends for approximately 15 to 20 linear feet along the potential road corridor. Beyond this limited segment, the corridor opens into an area characterized by mild to moderate slopes and substantially fewer environmental constraints.

The existence of a short constrained segment does not, in itself, render an alternative infeasible or imprudent. Residential developments routinely address such localized constraints through engineering measures including:

- Retaining structures,
- Reduced roadway width consistent with fire and safety standards,
- Controlled grading,
- Targeted drainage design.

The administrative record does not include:

- An engineering feasibility evaluation of a Westport Road access alignment,
- A grading and structural analysis of the pinch point segment,
- A comparative wetland impact footprint analysis between access alternatives, or
- Documentation demonstrating that retaining structures or on-site design solutions are technically infeasible.

While the applicant may assert that slope easements from adjacent property owners would be necessary, the record does not contain documentation establishing that such easements are



unattainable or that compliant engineering solutions cannot be achieved within the applicant's property limits.

Accordingly, the record does not demonstrate that the Westport Road access alternative is infeasible or imprudent.

#### **6.4 Silver Hill Road Access Alternative**

Plan Sheet EX-1 of the submitted plans (February 2, 2026, revision), depicting the full extent of the subject property, indicates the presence of an existing farm road corridor extending between Wetland 1A to the northwest and Wetland 1B to the southeast, providing potential access from Silver Hill Road (see Figure B, attached).

This corridor crosses an area identified in the SSES February 2, 2026 report as previously disturbed wetland, including the presence of an existing culvert and fill material. The SSES report proposes restoration of this area, including removal of the culvert, removal of fill, and replanting with native vegetation.

Disturbance associated with this alternative alignment is estimated to be approximately 700 to 800 square feet, compared to approximately 3,165 square feet at the currently proposed wetland crossing location. In addition, the proposed crossing interrupts an undisturbed wetland corridor described in the SSES report as higher functioning and characterized by intact native vegetation.

The record does not include:

- An engineering feasibility analysis of the Silver Hill Road access alignment,
- A comparative environmental impact assessment between this alignment and the proposed crossing,
- A demonstration that this alternative would be technically infeasible or inconsistent with design standards.

Where an alternative corridor utilizes an already disturbed wetland area and presents a materially smaller impact footprint, the Agency must evaluate whether such an alternative represents a feasible and prudent option under Section 10.2 of the Inland Wetlands Regulations.



## **6.5 Absence of Demonstrated Impracticability**

The application materials include both a conventional subdivision layout and a cluster subdivision layout; however, neither is accompanied by a documented alternatives analysis addressing avoidance of the proposed direct wetland and watercourse crossing.

The existence of two distinct potential alternative access corridors — one from Westport Road and one from Silver Hill Road — indicates that avoidance-based access design has not been exhaustively evaluated.

In particular:

- The Westport Road alternative appears physically attainable with localized engineering controls;
- The Silver Hill Road corridor appears to involve substantially reduced wetland impact within an already altered wetland area.

The record does not contain engineering, grading, or environmental analysis demonstrating that either alternative is infeasible, imprudent, or incapable of meeting applicable safety and design requirements.

In the absence of documented engineering analysis demonstrating infeasibility, the statutory burden under Section 10.2 has not been satisfied.

## **6.6 Conclusion**

Under Section 10.2 of the Inland Wetlands Regulations, the Agency shall not approve a regulated activity unless it finds that a feasible and prudent alternative does not exist.

Based upon the current administrative record:

- Two alternative access corridors appear physically attainable;
- One alternative (Silver Hill Road) would substantially reduce direct wetland disturbance relative to the proposed crossing;
- Neither alternative has been subjected to documented engineering or environmental feasibility analysis.

Accordingly, the record does not support a finding that no feasible and prudent alternative exists to avoid or substantially reduce the direct wetland impact associated with the proposed access alignment.



## **7.0 INDIRECT IMPACTS TO WETLANDS AND WATERCOURSES**

### **7.1 Overview**

In addition to direct impacts associated with regulated activities, the proposed Saddle Ridge Conservation Development presents a range of indirect impacts to wetlands and watercourses. Indirect impacts are those effects that occur outside the immediate footprint of construction, but nonetheless alter wetland hydrology, water quality, ecological function, or long-term stability.

Indirect impacts are typically expressed through:

- Short-term effects during construction, and
- Long-term effects associated with altered hydrology, stormwater discharges, wastewater inputs, and reduced buffer protection.

Given the sensitivity of the site and the largely undisturbed condition of its wetlands, indirect impacts warrant careful evaluation.

### **7.2 Short-Term Indirect Impacts During Construction**

Construction activities associated with roadways, stormwater basins, utilities, and residential development can generate short-term indirect impacts to adjacent wetlands, even where erosion and sediment controls are proposed.

Potential short-term impacts include:

- Sediment-laden runoff entering wetlands and watercourses during storm events,
- Disturbance beyond intended limits due to grading tolerances, equipment access, and utility installation,
- Temporary dewatering or drawdown associated with excavation in shallow groundwater settings, and
- Increased risk of accidental encroachment where construction occurs in close proximity to wetland boundaries.

These risks are heightened where buffers are minimal, wetlands are immediately adjacent to construction limits, and soils are shallow or underlain by bedrock. In such settings, even well-designed erosion controls may be insufficient to fully prevent short-term indirect impacts.



### **7.3 Long-Term Hydrologic Alteration**

Long-term indirect impacts to wetlands often result from changes in water quantity, including both increased surface runoff volumes and reductions in groundwater contributions.

As discussed in Section 5, the placement and design of Basin #210 create a reasonable likelihood of intercepting shallow groundwater flows that currently sustain an adjacent hillside wetland. This interception is reasonably likely to result in chronic dewatering, particularly during late spring and summer low-flow periods.

Such hydrologic alterations can lead to:

- Shortened hydroperiods,
- Lowered water tables within wetland soils,
- Stress on hydrophytic vegetation, and
- Gradual conversion toward facultative or upland plant communities.

These changes represent long-term indirect impacts that can persist well beyond the construction phase and may not be readily reversible.

### **7.4 Long-Term Water Quality Impacts**

Long-term water quality impacts may result from chronic stormwater and wastewater inputs following project build-out. The southeastern wetland and pond system is proposed to receive discharges from multiple stormwater detention basins and is situated downslope of proposed on-site septic systems.

As previously discussed:

- Independent engineering review has concluded that the proposed stormwater system will not provide adequate pollutant treatment.
- Baseline water quality data are not available to establish existing conditions or assess incremental changes.

In this context, even modest increases in nutrient loading, sediment, or thermal inputs can degrade wetland and aquatic functions over time, particularly in headwater systems that support downstream cold-water fisheries, and in wetland plant communities that naturally have relatively infertile, acidic soils, derived from acidic, hard, parent rock material. The uplands immediately west of the southeastern pond-wetland complex likely represent the primary viable terrestrial habitat zone for pool-breeding amphibians.



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### Septic Systems and Nitrogen Transport

While on-site septic systems may be approved if designed in compliance with the Connecticut Public Health Code, compliance with health standards does not equate to absence of ecological impact to downgradient wetlands.

It is well documented in the scientific literature and in U.S. Environmental Protection Agency guidance that a substantial portion of nitrogen from conventional septic systems—often on the order of 30 to 50 percent—may migrate beyond the leaching field as nitrate (EPA 2002). Nitrate is highly soluble and mobile in groundwater and is not readily attenuated in well-drained or shallow soils lacking sufficient denitrification capacity.

The project site is characterized by shallow-to-bedrock glacial till soils. In such settings, groundwater flowpaths are often relatively short and can discharge directly into adjacent wetlands and ponds. Where wetlands are expressed at breaks in slope or along shallow groundwater convergence zones—as appears to be the case in portions of the southeastern system—nitrate transported in shallow groundwater may enter wetland soils and surface waters with limited opportunity for removal.

Clustering of residential development, while potentially reducing overall disturbance footprint if properly designed, also has the effect of concentrating septic systems within a smaller recharge area. This concentration can increase nitrogen loading density to downgradient receiving waters, particularly where multiple systems are located upslope of a single headwater wetland complex.

It should be noted that clustering is inherently more useful and practical when the especially sensitive and valuable natural resources are located in one or two parts of the site, distinct from other less sensitive terrain. At this site high quality wetlands occur throughout the site. Ordinary buildable forested terrain is interspersed with multiple bedrock knoll features with value for multiple reasons, including potential archeological value. Three-acre conventional zoning may in fact be best able to preserve generous wetland buffers and intact knoll features. Even without cluster zoning protection of the larger convoluted wetlands with their buffers yields sizable parcels of open space. The constraints method of calculating the number of lots this site can support makes the most sense, when so many dispersed constraints are present, and tree clearing is likely to raise the water table and render marginal soils for septic systems unsuitable.

In combination with stormwater discharges, septic-derived nitrate may:

- Alter nutrient regimes within historically low-nutrient wetlands,



- Promote shifts in plant community composition,
- Increase algal productivity in ponded areas,
- Affect dissolved oxygen regimes, and
- Contribute to cumulative downstream loading to cold-water resources.

In the absence of baseline nutrient data and without modeling or analysis of cumulative septic nitrogen loading, the long-term water quality implications of clustered on-site wastewater disposal within this headwater setting cannot be fully evaluated. However, in a headwater system with finite assimilative capacity, this loading is reasonably likely to alter existing nutrient regimes.

### **7.5 Importance of Buffers in Limiting Indirect Impacts**

The protection of wetland functions and values depends not only on the wetland basin itself but also on the condition and extent of adjacent upland buffers.

Forested buffers perform multiple ecological functions, including:

- Sediment interception,
- Nutrient uptake and transformation,
- Thermal regulation,
- Maintenance of soil moisture regimes,
- Support of wildlife habitat,
- Stabilization of groundwater recharge and discharge patterns.

Peer-reviewed literature in glaciated northeastern landscapes indicates that buffer width influences the degree to which these functions are maintained.

Sweeney and Newbold (2014), in a comprehensive review of riparian buffer effectiveness, concluded that approximately 30 meters (98 feet) represents a minimum threshold for maintaining basic stream water quality and habitat structure. However, wider buffers provide substantially greater ecological protection.

Research evaluating nutrient removal and ecological integrity has demonstrated that buffers exceeding 40 meters show improved nitrate attenuation and that forest cover approaching or exceeding 100 meters is more effective in sustaining biological communities and maintaining natural hydrologic processes.



Importantly, landscape-scale forest cover within 150 to 300 meters of headwater systems has been shown in multiple studies to be strongly correlated with improved water quality and biological condition.

While regulatory upland review areas are often fixed distances (e.g., 100 feet), ecological processes do not conform to arbitrary jurisdictional lines. In shallow-to-bedrock glaciated terrains such as the subject site, groundwater movement, nutrient transport, and wildlife use frequently extend beyond minimum regulatory setbacks.

It is also critical to distinguish between:

- General wetland buffers designed primarily for sediment and pollutant interception; and
- Species-driven terrestrial habitat requirements associated with vernal pool ecosystems, which extend substantially farther (see Section 4.4 and Appendix D).

In this case, portions of the proposed development—particularly roadway segments, grading areas, and stormwater infrastructure—are shown in close proximity to wetlands, with limited retained forest buffer in some locations.

Given:

- The headwater sensitivity of the southeastern pond–wetland system;
- The concentration of stormwater discharges;
- The clustering of septic systems upslope; and
- The potential presence of vernal pool-dependent species,

the adequacy of retained buffer areas warrants careful evaluation.

In the absence of a quantitative analysis of buffer width, slope interaction, and forest retention percentages within 100, 150, and 300 feet of wetlands, the long-term capacity of the site to maintain wetland functions and values cannot be fully assessed.

## **7.6 Functional Value of On-Site Wetlands**

The wetland assessment prepared by Soil Science and Environmental Services, Inc. concludes that the site’s wetlands are, for the most part, undisturbed and provide numerous principal wetland functions and values, including flood storage, water quality protection, wildlife habitat, and ecological connectivity.



Where wetlands provide high functional value and have not been substantially degraded, indirect impacts resulting from adjacent development are of heightened concern. Protection of such wetlands relies not only on avoidance of direct fill, but also on maintaining adequate buffers and hydrologic integrity.

## **7.7 Summary of Indirect Impacts**

In summary, the proposed development presents a range of indirect impacts to wetlands and watercourses, including:

- Short-term construction-related sedimentation and disturbance risks,
- Long-term hydrologic alteration, including probable dewatering of a hillside wetland adjacent to Basin #210,
- Long-term water quality degradation associated with inadequately treated stormwater and wastewater inputs, and
- Reduced buffer effectiveness, increasing vulnerability of otherwise undisturbed wetlands.

Taken together, these indirect impacts warrant careful consideration by the Inland Wetlands Agency, particularly in light of the high functional value of the affected wetlands and the site's sensitive headwater setting.

## **8.0 WETLAND DELINEATION ADEQUACY AND UPLAND REVIEW AREA EVALUATION**

### **8.1 Age and Basis of Delineation**

The wetlands and watercourses on the subject property were originally delineated in 2008. While partial re-flagging was conducted in 2025 by a qualified soil scientist whose credentials are identified in the record, a full site-wide re-delineation was not performed.

A delineation that is nearly 18 years old warrants careful scrutiny, particularly in a headwater landscape characterized by shallow soils, glacial till, perched groundwater conditions, and evolving hydrologic regimes. Over such a time period, changes in vegetation, soil saturation patterns, and hydrologic expression may occur, especially in marginal wetland areas and along slope breaks where hillside seep wetlands are present.

While partial re-flagging may confirm certain boundary segments, it does not substitute for a comprehensive re-evaluation of the entire wetland boundary where significant infrastructure is proposed in close proximity.



## **8.2 Partial Re-Flagging and Documentation Gaps**

The record indicates that select wetland flags were reviewed or reset in 2025. However:

- A comprehensive reset-flag findings table is not included in the materials submitted to date;
- Certain flags identified in prior delineations (including, but not limited to, WF #109–117 in the vicinity of Basin #160) do not appear to have been fully re-evaluated or reset;
- The documentation provided does not demonstrate that soil morphology was re-examined comprehensively across all wetland/upland transition zones affected by proposed grading and stormwater infrastructure.

Because the proposed development places roadways, basins, septic systems, and grading activities within close proximity to mapped wetland boundaries, boundary precision is material to the Agency's evaluation.

## **8.3 Implications for Upland Review Area Impacts**

Multiple components of the proposed development occur within the 100-foot upland review area, including:

- Stormwater basins located only a few feet from wetland boundaries;
- A loop roadway shown approximately 5–8 feet from wetland edges in certain locations;
- Lot 18 septic system components located within the upland review area;
- Significant grading on Lot 12 occurring approximately 48 feet from a mapped wetland;
- Infrastructure associated with Basin #160 in the vicinity of previously flagged wetland segments.

In such circumstances, even modest boundary shifts—whether due to refined soil evaluation or hydrologic reassessment—could materially alter the extent of direct encroachment, buffer intrusion, or grading proximity to regulated resources.

Where regulated activities are proposed in close proximity to wetland boundaries, reliance on a delineation originally performed in 2008 without full site-wide re-verification introduces uncertainty into the environmental record.



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#### **8.4 Relationship to Indirect Physical Impacts**

Accurate delineation is not merely a jurisdictional formality. Wetland boundaries reflect the extent of regulated wetlands soils (i.e., poorly and very poorly drained) and sustained saturation. In headwater seep systems, these boundaries often coincide with shallow groundwater discharge zones.

Where stormwater basins, roadway cuts, or grading activities are proposed within tens of feet of mapped wetland limits, the precision of the boundary directly affects evaluation of:

- Potential interception of shallow groundwater flow;
- Changes in hydroperiod at the wetland edge;
- Buffer adequacy for pollutant attenuation;
- Sediment transport pathways; and
- Long-term vegetative transition zones.

Without comprehensive re-verification of wetland boundaries in areas of concentrated infrastructure and grading, the Agency lacks a fully reliable basis to determine whether adverse physical impacts will be avoided.

#### **8.5 Conclusion**

This section does not assert that the existing delineation is incorrect. Rather, it identifies that:

- The original delineation is nearly 18 years old;
- Only partial re-flagging has occurred;
- Comprehensive reset documentation is not included in the current record; and
- Significant regulated activities are proposed in close proximity to wetland boundaries.

Under these circumstances, a full site-wide re-delineation in areas of proposed disturbance would provide the Agency with greater certainty in evaluating both direct and indirect physical impacts to wetlands and watercourses.

Absent such verification, the current record does not provide sufficient precision to support a definitive finding that adverse impacts will be avoided.



## **9.0 NDDB SCREENING, LISTED SPECIES, AND WETLAND HABITAT FUNCTION**

### **9.1 NDDB Screening Methods and Record Context**

Two distinct methods exist for identifying potential state-listed species in the vicinity of a project site:

1. Review of publicly available GIS mapping layers showing generalized Natural Diversity Data Base (NDDB) habitat polygons; and
2. Submission through the Connecticut DEEP ezFile portal to obtain an Automated Site Assessment.

The environmental documentation prepared for the application relied primarily on GIS-based mapping review, which identified a mapped listed-species polygon west of the project site that does not directly overlap the property.

However, a DEEP ezFile Automated Site Assessment generated on February 9, 2026 indicates that populations of State Endangered, Threatened, or Special Concern species have been documented “within or in close proximity” to the delineated project area. The automated assessment identifies, among others:

- Eastern box turtle (State Special Concern)
- Northern long-eared bat (Federally Endangered; State Endangered)
- Tri-colored bat (State Endangered)

While the automated assessment is not a final NDDB determination, it reflects current DEEP-maintained data and represents the screening tool utilized in state permitting processes, including those associated with significant ground disturbance, such as the proposed.

The existence of documented listed species in close proximity does not establish on-site presence. It does, however, establish that the project lies within a landscape context where listed species habitat has been documented<sup>1</sup>.

### **9.2 Jurisdictional Framework: *Physical Impacts to Wetlands***

Under Connecticut law, the Inland Wetlands and Watercourses Act regulates direct and indirect physical impacts to wetlands and watercourses. It does not confer independent authority over wildlife species in the abstract.

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<sup>1</sup> Relevant information on the three “listed” species is provided as an Attachment.



However, wildlife habitat is an intrinsic physical component of wetland systems. Wetland soils, hydrology, vegetative structure, hydroperiod, and groundwater discharge collectively create the physical conditions that support wildlife use.

Physical alteration of:

- Wetland hydrology,
- Soil saturation regimes,
- Vegetative composition,
- Sediment deposition patterns, or
- Groundwater recharge and discharge dynamics

constitutes a regulated impact where such alteration degrades wetland function.

The SSES wetland assessment identifies wildlife habitat as a *principal* function for multiple wetlands on the site. Where regulated activities physically alter the structural characteristics of wetlands and associated uplands, degradation of that habitat function falls squarely within the Agency's jurisdiction.

Accordingly, the relevance of NDDB screening in this context is not that the Agency regulates listed species per se, but that documented proximity of listed species heightens the importance of ensuring that no physical degradation of wetland habitat occurs.

### **9.3 Habitat Context and Proposed Disturbance**

The project site contains:

- Headwater wetlands and seep systems;
- A pond-marsh complex functioning as the headwaters of Patterson Brook;
- Extensive contiguous forest blocks;
- Wetland-upland transition zones;
- Shallow-to-bedrock soils characteristic of glacial till landscapes.

The proposed development includes:

- Wetland crossings;
- Stormwater basins discharging to headwater wetlands;



- Grading on steep slopes adjacent to wetlands;
- Septic systems within upland review areas;
- Road construction and forest fragmentation.

The DEEP Automated Site Assessment specifically notes that significant ground disturbance and conversion of natural lands may necessitate species-specific surveys and habitat characterization. No such surveys or targeted habitat assessments are included in the present record.

In landscapes where forest fragmentation, roadway construction, and alteration of wetland hydrology occur, the physical structure of habitat is altered. For species such as eastern box turtle and forest-roosting bats, fragmentation, tree removal, and soil disturbance are among the principal mechanisms of habitat degradation.

Absent species-specific evaluation, the record does not establish that the proposed regulated activities will avoid physical degradation of wetland-dependent habitat.

#### **9.4 Relationship to §22a-19**

The §22a-19 intervention does not expand the Agency's jurisdiction beyond physical impacts to wetlands and watercourses. It does, however, require the Agency to consider whether proposed activities are reasonably likely to cause unreasonable pollution, impairment, or destruction of natural resources.

Where the record demonstrates:

- Documented listed species in close proximity to the site,
- Headwater wetland systems identified as supporting wildlife habitat,
- Stormwater treatment deficiencies,
- Potential hydrologic alteration, and
- Forest fragmentation within a contiguous habitat block,

the potential for physical impairment of wetland habitat function assumes heightened significance.

The issue before the Agency is therefore not the regulation of listed species as such, but whether the physical alterations associated with the proposed development will impair wetlands and watercourses that serve documented habitat functions.



## **9.5 Conclusion**

The GIS-based NDDDB polygon mapping does not show direct overlap with the project site. However, the DEEP Automated Site Assessment indicates documented listed species within or in close proximity to the area.

The proposed development involves significant land disturbance in two headwater wetland systems identified as providing wildlife habitat function. No species-specific surveys, targeted habitat assessments, or formal NDDDB review documentation have been provided to address the automated screening findings.

In the absence of such evaluation, the current record does not demonstrate that the proposed regulated activities will avoid physical degradation of wetland habitat. In light of both wetlands jurisdiction and §22a-19 considerations, this represents a material limitation in the environmental analysis.

## **10.0 CONSERVATION DEVELOPMENT DESIGN & IMPLICATIONS FOR WETLAND IMPACT EVALUATION**

### **10.1 Regulatory Context**

The proposed Saddle Ridge development is presented as a Conservation Development under Section 5900 of the Easton Zoning Regulations. In addition, the Subdivision Regulations require that land be of such character that it can be used for building purposes without danger to health, safety, or the environment, and specifically reference limitations associated with steep slopes and other unsuitable terrain (Subdivision Regulations §3.01). The regulations further provide that subdivision layouts shall preserve and enhance natural features and minimize disturbance to natural terrain and vegetation (§3.02), and that streets should follow natural contours and avoid excessive cuts and fills (§4.01).

While primary authority for subdivision approval rests with the Planning and Zoning Commission, the Inland Wetlands Agency may properly consider whether subdivision design and landform disturbance materially affect regulated wetlands and watercourses. Where grading intensity, slope disturbance, or infrastructure placement alter runoff generation or groundwater recharge in headwater systems, those effects fall squarely within the Agency's jurisdiction over indirect physical impacts.

### **10.2 Landform Constraints and Design Emphasis**

The application materials include delineation of wetlands and identification of significant trees (24 inches and greater in diameter). Extensive soil testing was conducted in support of septic



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feasibility and lot yield calculations. However, the record does not include a comprehensive mapping or analysis of:

- Steep slopes ( $\geq 25\%$ ),
- Bedrock knolls and outcrops beyond generalized depiction, or
- Landform constraints as they relate to runoff generation and groundwater recharge.

Review of the submitted plans indicates that areas of steep slope are present and are commonly associated with bedrock knolls and elevated terrain across the site. Several of the lots previously identified in this report—including, but not limited to, Lots 10, 11, 12, 13, 15, and portions of Lots 16–18—exhibit significant grading in areas where slopes appear steep and terrain constraints are evident.

The absence of a comprehensive slope and landform inventory limits the ability to evaluate whether grading has been minimized or whether alternative lot and roadway alignments could reduce disturbance to steep terrain.

### **10.3 Relationship to Wetland and Watercourse Impacts**

Steep slopes and bedrock knolls are not merely aesthetic features. In glacial till landscapes such as this site, they influence:

- Surface runoff velocity and concentration,
- Soil stability and erosion potential,
- Infiltration capacity and groundwater recharge,
- The routing of shallow subsurface flow, and
- Sediment delivery to downslope wetlands and watercourses.

Disturbance of steep slopes through cut-and-fill grading increases the likelihood of accelerated runoff and sediment transport. In headwater systems, even incremental increases in sediment and nutrient loading can result in measurable downstream effects.

Because the southeastern pond and associated wetlands function as the headwaters of Patterson Brook, a downstream cold-water fishery, alterations in runoff dynamics attributable to steep slope disturbance are directly relevant to the Agency's jurisdiction over watercourses and downstream aquatic resources.



Where slope disturbance contributes to increased stormwater generation or reduced recharge to seep wetlands, such effects constitute indirect physical impacts within the meaning of the Inland Wetlands Act.

#### **10.4 Record Limitations and Advisory Context**

The subdivision design appears to emphasize septic feasibility, wetland boundary delineation, and tree preservation. However, the absence of a comprehensive landform analysis addressing steep slopes and bedrock features limits the Agency's ability to evaluate indirect hydrologic impacts to wetlands and watercourses.

The existence of steep terrain and concentrated grading in proximity to regulated resources underscores the importance of evaluating whether design alternatives could reduce disturbance intensity.

This section is not offered as a zoning compliance determination, but rather as advisory context relevant to the Agency's assessment of indirect physical impacts to wetlands and watercourses. Where subdivision density and layout drive extensive slope disturbance in a headwater system, the resulting hydrologic consequences fall within the Agency's environmental review responsibilities.

### **11.0 SUMMARY OF ENVIRONMENTAL RECORD DEFICIENCIES AND COMPLIANCE CONSIDERATIONS**

#### **11.1 Standard of Review**

Under Section 10 of the Town of Easton Inland Wetlands and Watercourses Regulations, the Commission must consider:

- The environmental impact of the proposed regulated activity on wetlands and watercourses;
- The cumulative impact of the proposed activity in conjunction with existing and reasonably foreseeable activities;
- Feasible and prudent alternatives that would avoid or minimize impact;
- Measures to mitigate adverse effects.

The Commission's determination must be supported by substantial evidence in the administrative record demonstrating that direct and indirect physical impacts to regulated resources have been avoided or minimized.



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## **11.2 Feasible and Prudent Alternatives**

The proposed layout includes a direct wetland and watercourse crossing associated with primary site access.

The administrative record does not include a documented engineering or environmental feasibility analysis evaluating:

- Access from Westport Road;
- Access from Silver Hill Road utilizing the existing disturbed corridor;
- Comparative wetland impact footprints among access alternatives;
- Demonstration that retaining structures or localized grading solutions are technically infeasible.

Two physically attainable alternative access corridors appear available within the subject property or along its frontage. One alternative appears capable of materially reducing wetland disturbance relative to the proposed crossing.

Under Section 10.2 of the Inland Wetlands Regulations, the Commission may not approve a regulated activity unless it finds that a feasible and prudent alternative does not exist.

The current record does not establish that the proposed direct wetland crossing is unavoidable, and the absence of substantive analysis leaves the statutory burden unmet.

## **11.3 Vernal Pool and Terrestrial Habitat Evaluation**

Field investigations were conducted outside the spring breeding window for pool-dependent amphibians.

The presence of wood frog, an obligate vernal pool breeder, is documented within the project area.

No spring-season amphibian surveys, hydroperiod documentation, Vernal Pool Envelope mapping, or Critical Terrestrial Habitat analysis has been provided.

Given the headwater setting, documented species presence, and forested landscape context, the record fails to establish, by substantial evidence, that vernal pool-dependent ecological functions will be maintained.



#### **11.4 Wetland Delineation Adequacy**

The wetland delineation depicted on the plans is based on a 2008 investigation, with partial re-flagging in 2025. No comprehensive site-wide re-delineation has been conducted.

In areas of concentrated disturbance, including near proposed stormwater infrastructure and roadway crossings, the record does not include updated soil and hydrologic verification sufficient to confirm boundary accuracy under current site conditions.

Because regulated activity limits are measured from delineated wetland boundaries, the absence of full re-verification introduces uncertainty into impact calculations and buffer determinations.

#### **11.5 Stormwater Pollutant Removal Performance**

Independent engineering review indicates that the proposed stormwater system does not achieve minimum pollutant removal efficiencies required under the 2024 CT DEEP Stormwater Quality Manual for:

- Total Suspended Solids,
- Total Phosphorus,
- Total Nitrogen.

In a headwater wetland–pond system receiving multiple basin discharges, failure to meet minimum removal standards increases the likelihood of chronic sediment and nutrient loading to regulated wetlands.

No cumulative nutrient loading evaluation relative to wetland attenuation capacity is included in the record by the applicant.

#### **11.6 Absence of Baseline Water Quality Data**

No pre-development water quality characterization of the receiving wetland and pond system has been provided.

Without baseline data:

- Incremental change cannot be quantified;
- Model projections cannot be independently validated;
- Long-term degradation cannot be distinguished from existing condition.

This limits the ability to evaluate cumulative impact under Section 10 criteria.



### **11.7 Basin #210 – Probable Groundwater Interception**

The proposed Basin #210 bottom and underdrain elevations are materially lower than adjacent wetland surface elevations.

No soil test pit or groundwater observation point is documented at the basin footprint.

Given the glacial till hydrology and documented lateral shallow groundwater flow described in Section 3, combined with the basin excavation depth, underdrain elevation relative to adjacent wetland surface elevations, and the absence of site-specific hydrogeologic investigation, it is more probable than not that shallow groundwater contributing to the adjacent hillside seep wetlands will be intercepted.

This represents an indirect adverse physical impact independent of stormwater quality performance.

### **11.8 Buffer Integrity and Physical Attenuation Capacity**

The record does not include quantitative evaluation of retained buffer width and configuration relative to:

- Slope,
- Soil permeability,
- Concentrated discharge points,
- Peer-reviewed buffer performance thresholds.

In steep, shallow glacial till landscapes, buffer effectiveness is sensitive to these variables.

The adequacy of retained buffers to maintain sediment interception, nutrient attenuation, and hydroperiod stability has not been demonstrated.

### **11.9 Conservation Development and Site Constraints**

Although subdivision density may be derived through zoning methodologies, the record does not include comprehensive mapping of:

- $\geq 25\%$  slopes,
- Bedrock knolls and outcrops,
- Net land area constraints relative to grading intensity.



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Where steep slopes and shallow soils are present adjacent to wetlands, grading-driven erosion and hydrologic alteration may increase the likelihood of indirect physical impact.

The relationship between lot yield and documented site constraints has not been transparently demonstrated in the administrative record.

### **11.10 Concluding Determination**

Based upon the current administrative record and the technical analyses summarized above, the following conclusions are supported:

First, the administrative record does not contain substantial evidence demonstrating that the proposed direct wetland crossing is unavoidable. Two alternative access corridors appear physically attainable and have not been subjected to documented engineering or environmental feasibility analysis. Under Section 10.2 of the Inland Wetlands Regulations, the absence of such analysis precludes a finding that no feasible and prudent alternative exists.

Second, the record does not establish that vernal pool–dependent ecological functions will be maintained. The documented presence of an obligate vernal pool species, combined with the absence of seasonal hydroperiod and terrestrial habitat evaluation, represents a material gap in the ecological analysis.

Third, the configuration of Stormwater Basin #210 presents a substantial likelihood of indirect physical impact to adjacent hillside seep wetlands through shallow groundwater interception.

Fourth, independent review demonstrates that minimum stormwater pollutant removal standards are not achieved, increasing the likelihood of chronic water quality degradation within a sensitive headwater wetland system.

Finally, the absence of baseline water quality characterization, incomplete wetland re-verification, and lack of buffer performance evaluation collectively limit the Commission’s ability to conclude that direct and indirect physical impacts will be avoided.

Accordingly, based upon the present administrative record, it cannot be concluded that the proposed regulated activities will avoid direct and indirect physical impacts to wetlands and watercourses.



Please feel free to contact us if you have any questions on the above.

Respectfully submitted,

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Attachments: Figures A and B; Information on 3 CTDEEP NDDDB Species

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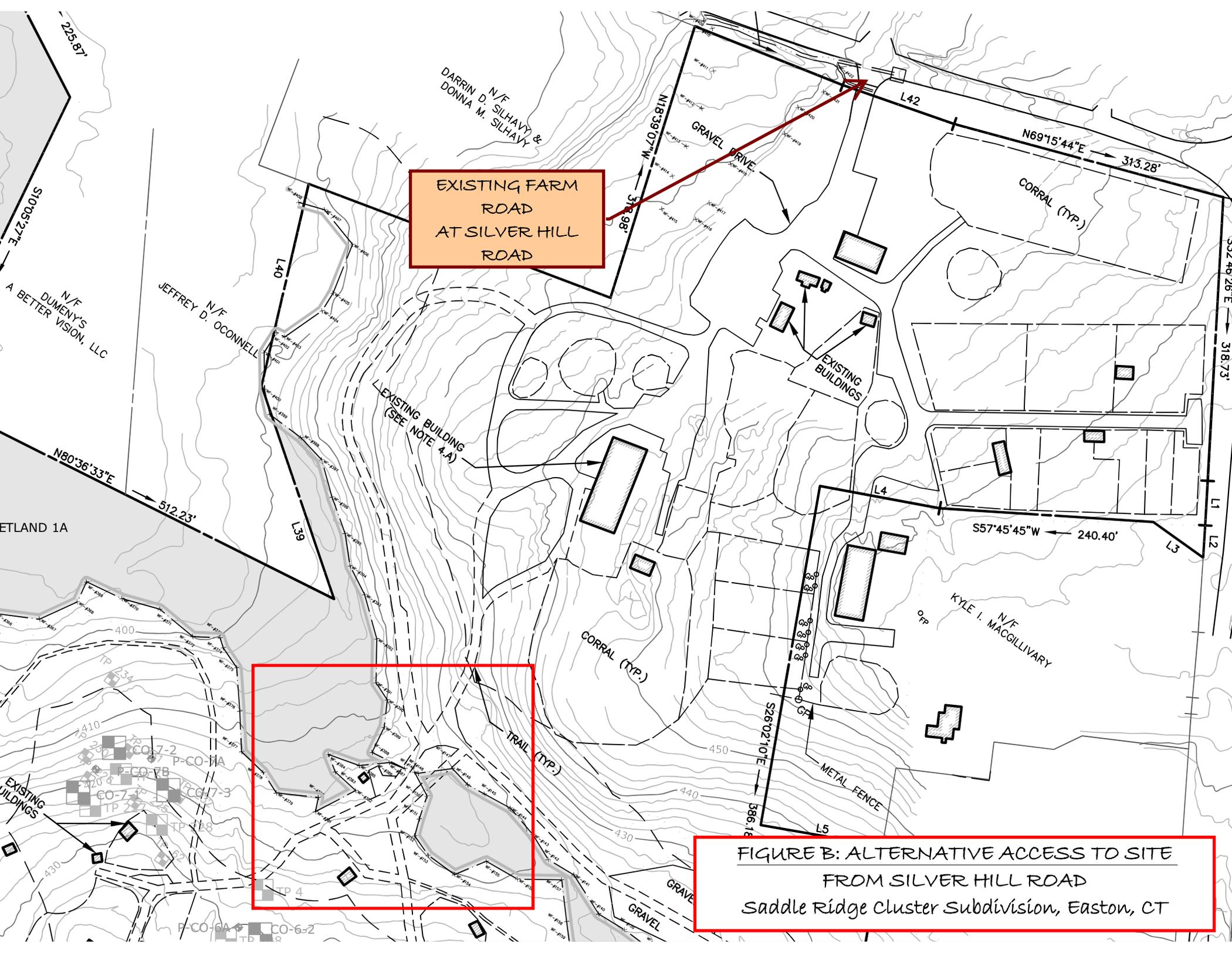
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EXISTING FARM  
ROAD  
AT SILVER HILL  
ROAD

FIGURE B: ALTERNATIVE ACCESS TO SITE  
FROM SILVER HILL ROAD  
Saddle Ridge Cluster Subdivision, Easton, CT

## ATTACHMENT

### Life History, Habitat Requirements, and Conservation Considerations

#### NDDB-Identified Species – Southern New England

#### (Saddle Ridge Cluster Subdivision, Easton, CT)

#### Eastern Box Turtle (*Terrapene carolina carolina*)

**Status:** Connecticut State Species of Special Concern



#### Life History & Demography

- Long-lived terrestrial turtle; lifespan often exceeds 50 years in the Northeast.
- Delayed sexual maturity (typically 7–10 years).
- Low reproductive output (generally 3–5 eggs per clutch).
- Population stability depends on high adult survivorship; loss of breeding adults has disproportionate impact.

#### Habitat Requirements – Southern Connecticut

- Mixed deciduous upland forest with well-drained soils.
- Leaf litter cover for thermoregulation and overwintering.
- Sunny canopy openings and soft sandy/loamy soils for nesting.
- Seasonal use of forest–field and forest–wetland ecotones.

#### Relevance to Cluster Subdivision Disturbances

- Internal road construction increases mortality risk, even at low traffic volumes.
- Lot clearing and infrastructure fragment small home ranges (2–10 acres typical).
- Grading and septic installation may eliminate nesting substrate.
- Edge hardening and landscape conversion reduce habitat permeability.
- Because recruitment is slow, incremental adult mortality may result in long-term decline.

## Northern Long-eared Bat (*Myotis septentrionalis*)

**Status:** Federally Endangered; Connecticut State Endangered



### Life History

- Federally Endangered; >95% regional population decline due to White-nose Syndrome.
- Single pup annually; maternity colonies form late May–July.
- Frequent roost switching within a connected forest network.

### Summer Habitat – Southern New England

- Roosts in snags, cavity trees, and live trees with exfoliating bark.
- Prefers mid- to late-successional hardwood forest.
- Forages within forest interior, along small streams, and at wetland margins.

### Relevance to Cluster Subdivision Disturbances

- Removal of mature trees and snags reduces roost availability.
- Canopy fragmentation reduces roost network connectivity.
- Conversion of interior forest to edge habitat alters microclimate.
- Hydrologic alteration of wetlands may affect insect prey availability.
- Given limited reproductive capacity, habitat loss may impair recovery.

## Tricolored Bat (*Perimyotis subflavus*)

**Status:** Federally Endangered; Connecticut State Endangered



### Life History

- Federally Endangered; severe regional decline from White-nose Syndrome.
- Single pup annually; small-bodied forest bat.

### Summer Habitat – Southern New England

- Roosts in leaf clusters, understory trees, and shrub layers.
- Commonly associated with forest edges and ecotones.
- Forages over wetlands, riparian corridors, and small openings.

### Relevance to Cluster Subdivision Disturbances

- Understory clearing simplifies vertical forest structure.
- Loss of forest–wetland transition zones reduces suitable foraging habitat.
- Artificial lighting alters insect distribution and foraging behavior.
- Hydrologic modification may reduce aquatic insect productivity.
- Incremental fragmentation is significant in already depressed populations.

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## ATTACHMENT

### Life History, Habitat Requirements, and Conservation Considerations Wood Frog – Southern New England Context (Saddle Ridge Cluster Subdivision, Easton, CT)

#### Wood Frog (*Lithobates sylvaticus*)

**Status:** Obligate Vernal Pool Indicator Species



#### Life History

- Obligate vernal pool–breeding amphibian in southern New England.
- Breeding occurs early spring (March–April), often immediately following ice-out.
- Females lay approximately 1,000–3,000 eggs in communal clusters attached to submerged vegetation.
- Larval development is completed within 8–12 weeks before seasonal pool drying.
- Adults spend the majority of the year in upland forest, often 100–750+ feet from breeding pools.
- Exhibits strong site fidelity to natal breeding pools.

#### Habitat Requirements – Southern Connecticut

- Fishless, seasonally flooded woodland pools (vernal pools). May also use refugia in pond/emergent systems with fish
- Intact forest canopy surrounding breeding pools to maintain hydroperiod and water temperature.
- Undisturbed leaf litter and coarse woody debris for upland refuge.
- Moist, shaded forest soils for post-breeding dispersal and overwintering.
- Functional forest–wetland connectivity between pool basin and surrounding uplands.

#### Relevance to Cluster Subdivision Disturbances

- Road construction within dispersal corridors increases amphibian mortality during spring migrations.
- Clearing within 100–750 feet of breeding pools reduces critical terrestrial habitat.
- Fragmentation interrupts seasonal movement between upland forest and breeding pool.
- Alteration of surface or shallow groundwater flow may shorten hydroperiod and reduce larval survival.
- Increased stormwater inputs may alter water chemistry and egg/larval viability.
- Edge creation increases predation pressure and desiccation risk.

#### Ecological Context and Conservation Considerations

Wood frog populations function as metapopulations across forested landscapes.

Incremental reduction of upland habitat surrounding vernal pools may not eliminate breeding immediately but can reduce recruitment over time, resulting in gradual local extirpation. Protection of the pool basin alone is insufficient to sustain long-term population viability. For this reason, development within the forest matrix surrounding documented or potential vernal pools warrants careful scrutiny.