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January 13, 2025

VIA-EMAIL

Town of East Lyme
Planning Commission
Town Hall
108 Pennsylvania Avenue
Niantic, CT 06357-1510

Attn.: Mr. Richard Gordon, Chairman

RE: ***ENVIRONMENTAL IMPACT ASSESSMENT***
Proposed three-lot Lakeshore Point Subdivision
Heritage Road, East Lyme, CT
REMA Job #24-2721-ELY21

Dear Chairman Gordon and Commission Members:

At the request of the applicant, Mr. Stephen Harney, REMA ECOLOGICAL SERVICES, LLC (REMA) has prepared this *Environmental Impact Assessment* for the above-referenced residential development proposal, pursuant to Sections 4-14-2 and 4-14-3 of the Town of East Lyme Subdivision Regulations.

1.0 INTRODUCTION

A three-lot residential subdivision has been proposed on a 12.8-acre property with frontage on the southeastern shoreline of Lake Pattagansett. All development and clearing will take place landward of a proposed conservation easement, averaging 75 feet in width. A septic system will be located at the rear of each lot, just north of the combined driveway, an old, unpaved woods road that parallels the lake, following the lots' rear property lines. Access to the subdivision is via a south-to north driveway from the north end of Heritage Road, which is elevated 85 feet above the lakeside terrace. The applicant owns a 50-foot wide, roughly 740

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foot long strip of hillside land for this combined driveway, which connects to the old roadway at the rear of the subdivision.

Potential environmental impacts from the proposed activities will be considered consistent with the aforementioned Subdivision Regulations. Will there be impacts on lake water quality during the construction phase, or over the long-term from septic system leachate and the proposed lawns? Will the lake's littoral zone be stressed by increased water temperatures due to loss of shade after tree cutting? Will site-clearing and grading eliminate rare or uncommon species or archaeological resources? Will sensitive ecological communities be disrupted by disturbance, e.g., yard maintenance equipment, or by insecticides or extended nighttime artificial illumination?

2.0 ENVIRONMENTAL RECEPTORS

2.1 Lake Pattagansett

The Pattagansett River enters the northwestern corner of 128-acre Lake Pattagansett, and exits the southern end of the lake, just north of US Route 1, then flows roughly 4.8 miles to Long Island Sound. Water quality entering Pattagansett Lake is excellent because its source, a mile to the north, is Powers Lake with an entirely preserved forested envelope totaling approximately 1,274 acres, as well as the south part of Nehantic State Forest. Pattagansett Lake itself is bordered by 119 acres of open space to the northwest and 76 acres to the northeast. A large, wooded swamp, to the east of the lake, is privately owned. Multiple conservation easement strips protect over a mile of lake shoreline. However, a broad swath of residential development borders the southern half of the lake, and a smaller developed area is the far north end, along upper Pattagansett Road.

The lake's maximum depth is 35 feet. The central and northern portion of the lake are over 16 feet deep; depths are under nine feet at the south end, and in the coves. This is an important fishing lake, managed by CTDEEP for bass, with a public boat launch; fish species include largemouth bass, chain pickerel, calico bass, sunfish, and yellow perch. Fishing is best in the deeper northern portion, with lower density of aquatic vegetation. Two surveys by the CT Agricultural Experiment Station (CAES) in 2006 and 2013 found excessive densities of aquatic vegetation, especially at the south end of the lake, with more shoreline residential development. Species found by CAES included Robbins pondweed, invasive variable milfoil, humped bladderwort, purple bladderwort, and water lilies (*Nuphar lutea* and *Nymphaea odorata*). Density of invasive milfoil increased from 40% to 60% between 2006 and 2013. Densities at the south end were high enough to interfere with boating. This pattern is consistent



with the distribution of residential neighborhoods on the lake perimeter. However, hydro raking by the Pattagansett Lake Association (PLA) maintains clear corridors for boating.

Potential for adverse impacts: The lake is somewhat, but not severely impaired by nutrients. Considering the extent of dilution in a 128-acre lake, impacts of additional nutrient loading from three lots will be minor. However, nutrient impacts can be cumulative. The proposed conservation easement over the forested lakeside zone, in combination with educational measures, will serve as mitigation to essentially eliminate nutrient loading to the lake. See Section 3.1 for this report for additional discussion. After a very rainy early and mid-summer, aquatic vegetation did not appear excessive in August 2024 when REMA visited the site. Outreach by the Lake Association does on lawn maintenance practices that minimize nutrient loading may well have improved conditions since 2013.

2.2 *Shoreline Plant Communities*

Lowland Forest with a Thicket Understory

On the subject property a forested terrace borders the lake shoreline. Trees are deciduous, and include red maple, red oak, black birch, and sassafras; they average only ten to twelve inches in diameter, indicating that logging took place in the late 20th century. A dense understory of native shrubs reaches to the water's edge. Sweet pepperbush (*Clethra alnifolia*) and mountain laurel (*Kalmia latifolia*) are dominant. Adjacent to the lake, swamp azalea (*Rhododendron viscosum*) and highbush blueberry (*Vaccinium corymbosum*) are also common; the wetland zone with hydrophytic vegetation and soils is very narrow, and in places coincident with the Lake shore. These shrubs are heavy nectar and pollen producers, with showy flowers appreciated by boaters. They provide excellent cover and seeds for wildlife. Dense shrubs overhang the water's edge by several feet, providing cover for small fish, and terrestrial habitat for adult stages of aquatic insects. The trees also provide important habitat.

Potential for adverse impact: The project design uses a no-clear zone protected by a ~75-foot wide conservation easement to *minimize impacts* to this lowland forest with a thicket understory, and entirely *prevent impacts* to the most diverse and productive shoreline zone.

Shoreline Rare Plants

Shade from the dense overhanging shrubs limits the extent of shoreline herbs. Some jewelweed (*Impatiens capensis*) and clearweed (*Pilea pumila*) grew on the low bank, which averaged only about a foot high. The substrate is clean gravel and sandy, derived from glacial



outwash parent material. Robbins’ pondweed (*Potamogeton robbinsii*) was rooted in very shallow, shaded water near the bank, and white waterlily was observed further from shore.

Four rare, “Connecticut-listed” (i.e., Endangered, Threatened, Special Concern) herbaceous plants have been found in the past on the shoreline of Lake Pattagansett, and reported to the CTDEEP Natural Diversity Database (NDDDB). They are listed in the table below. Their habitat needs were researched and compared with available habitat along this section of shoreline. During the two site visits on August 1st and August 18th, 2024, REMA staff was alert for these species. We prepared and studies a photo-illustrated reference sheet, so they would be recognized if encountered on the site. In fact, three of the four species are highly unlikely to occur on the site because they require sunny or only partly shaded shorelines. Only the clasping-leaved horehound could potentially grow here. Because this is a north-facing shoreline, shade persists through the day along the water’s edge. Note that because there will be less than five acres of soil disturbance, a formal NDDDB rare species survey, per the Stormwater General Permit, is not required. However, discussions with Ms. Shannon Kearney of the CT DEEP, have taken place, and a review will continue, including of the Conservation Easement document.

Potential for adverse impacts: Because shoreline habitat will be protected by the conservation easement, there is no potential for adverse impacts to rare shoreline plant species. There is no need for an exhaustive search for the rare horehound beneath shoreline shrubs. There will not be any irreversible and irretrievable losses of waters’ edge habitat for rare plants.

Special Concern	<i>Lycopus amplexans</i>	Clasping-leaved water-horehound
Endangered	<i>Polygala cruciata</i>	Field milkwort
Endangered	<i>Lachnanthes caroliniana</i>	Carolina redroot
Threatened	<i>Rhynchospora macrostachya</i>	Tall beaksedge

2.3 Upland Rare Species

The CTDEEP Natural Diversity Database (NDDDB) does not include any records of plant species of upland forest from this area. Local bedrock formations are Hope Valley granitic gneiss and the Plainfield formation with quartzite, mica shist, and dark gray gneiss. Neither include formations with sub-acidic rocks (e.g. traprock) that have elevated likelihood of supporting rare species or formations with substantial mineral-rich amphibolite.

A swath of trees has been cleared along the old roadway, on the south side of the development, without soil disturbance. It now supports a continuous weedy groundcover of resprouting



forest herbs and other early colonizers, such as Virginia creeper, poison ivy, blackberry seedlings, common yellow sorrel, asters and goldenrods. No rare or invasive plants were observed, either along the shoreline, in the forest, or in cleared areas.

Potential for adverse impacts: The project is therefore very unlikely to impact to rare plants of upland forest habitats, which will be cleared for the three home sites and the access driveways.

Whip-poor-will

Potential impacts to wildlife were assessed, in particular whip-poor-will, a CT listed Species of Special Concern that has been observed in the vicinity of the site. The high shrub density in the understory drastically limits the site's suitability for whip-poor-will. This species needs to be able to navigate at night within the forested areas where it roosts, and it requires a low to very low density shrub/sapling stratum. It also needs nearby early successional meadow or shrub habitat for foraging. Because of past records in the NDDDB database, REMA did conduct a twilight auditory survey for this species on August 1, 2024, during the half hour before and the half hour after sunset.

Potential adverse impacts: We did not detect this species, and conclude that there will *not* be an adverse impact on this rare bird, subsequent to the development. Both Sigrun Gadwa and George Logan are familiar with this avian species, having observed them in the past in East Lyme, near Latimer Brook. The newly acquired open space tract just west of the site, has a mosaic of forest and open land and would be more suitable for this species.

Upland Forest Habitat

Direct, irretrievable losses of upland, forested hillside habitat for the driveway to the subdivision have already occurred, and were unavoidable.

Potential adverse impacts. The habitat loss is not highly significant. This is a very widespread, and not a highly diverse cover type. With appropriate seeding and planting a shrub/meadow cover type (less widespread than forest) on the roadsides, can partially mitigate for this loss.

However, without proactive early detection and removal (EDRR) of colonizing invasives, such as mugwort, along this 750-foot long driveway, invasive plant infestations could spread into



currently uninfested lakeshore habitats and forest., which would be a severe long-term adverse impact with cumulative negative effects. REMA would recommend that conservation seeding take place in any of the exposed areas along the common driveway, and that a two-year, growing season monitoring take place, in order to control and eradicate, to the extent practicable, invasive plant species, following the protocols promulgated by CT DEEP's Connecticut Invasive Plant Working Group (CIPWG).

2.4 Wildlife

Disturbance by Noise, Light, Chemicals

Potential adverse impacts: Waterfowl on the lake and avians of forested and shoreline habitats could include species with low tolerance for auditory/visual disturbance. They have low tolerance for construction noise, in the short-term, and noise from yard maintenance equipment, over the long-term. They may simply produce fewer offspring, or they may leave the area altogether.

Another category of potential adverse environmental impact from residential development is the depletion of insect food for wildlife, by nighttime artificial lighting, and by use of persistent, soluble, broad-spectrum soluble insecticides (neonics) for grub control. Cumulative impacts lead to wildlife population declines.

Mitigation: These impacts cannot be completely avoided (Section 3.0). However, the swath of protected shoreline forest will substantially limit disturbance experienced by waterbirds. We note that noise-sensitive species may no longer be present in the vicinity due to existing noise of motorboat traffic, in which case there would not be an adverse impact.

Again, the Conservation Easement will serve as mitigation for adverse impacts. Vegetation in the proposed conservation easement will screen light and noise and this area will continue to support lowland forested habitat with different food sources for wildlife than the much more widespread rocky hillside forest habitat. Insects in particular are abundant along the lake shore.

The Commission could specify that only motion-sensitive outdoor lighting, be used rather than fixtures that remain on for an extended period of time. This would minimize a long-term cumulative indirect impact on wildlife. Neo-nic pesticide use cannot be regulated by local land use boards, but dissemination of educational materials could significantly reduce its use



in the lake watershed. Note that procedural tactics were used to prevent passage of anti-neonic legislation with strong bipartisan support in 2023 and 2024.

3.0 PROPOSED CONDITIONS

3.1 Residential Lots

Proceeding west to east, lot sizes are 1.193 acres for Lot 1, 1.99 acres for Lot 2 1, and 1.78 acres for Lot 3. Note that the width of the Conservation Easement (CE) varies somewhat due to the somewhat irregular shoreline and the need for a straight line on the map. Along eastern and western property lines, we measured CE widths of 77.6 feet, 76.8 feet, 88.4 feet, and 72.8 feet. Proposed locations for lawns and homes correspond to the wider areas, south of the clearing limit along the conservation easement

Mitigation: Plan details will mitigate for environmental impacts discussed in Section 2.0. As shown on the plans, lawns are relatively small. We recommend that a set of lawn care guidelines consistent with Pattagansett Lake Associations be provided to each homeowner, calling for use of slow-release nitrogen fertilizers, no use of phosphorus fertilizer unless a soil test demonstrates a need, and use of shade-tolerant grass varieties in partly shaded areas, as poor growth will lead to excess turf chemical use. The sensitivity of the south end of the lake is reduced by the existing moderate level of nutrient impairment.

Each home will have a septic system sized for three bedrooms, located as far back from the lake as possible, e.g. just north of the driveway. Some minor increase in nutrient loading cannot be avoided. The CE itself is a mitigation measure. Within the >70 foot wide Conservation Easement, uptake of nutrients by deep tree and shrub roots will effectively limit loading of nitrogen, and denitrification will also take place in saturated horizon of shoreline wetlands. The fine texture of the upper horizons of Haven silt loam will retain rainfall, keep the soil moist, while underlying coarse textures will prevent waterlogging and help the vegetation continue to thrive. A requirement for regular septic system maintenance is another recommended mitigation measure.

3.2 Hillside Driveway

Potential adverse impacts. Erosion and sediment releases are a potential impacts both during completion of the driveway which will involve some grading to minimize steepness. Even



post-construction, intense rain events could cause erosion. Soils are very rocky, locally shallow to bedrock, with fine sandy loam texture.

Mitigation: The plan for the driveway includes roadside swales to convey and infiltrate runoff. On this very long and steep hillside roadway, to prevent erosion impacts, both short-term and long term, we recommend adding several check dams and/or several water-bars discharging into moderately sloping infiltration areas. Without a very robust erosion control plan, including monitoring and maintenance, there is potential to discharge sediment into the lake, with associated phosphorus.

4.0 CONCLUSION

In our professional opinion the proposal has succeeded in minimizing direct and indirect environmental impacts to Pattagansett Lake, the existing forest habitats, and local fauna and flora.

Please feel free to contact our office with any questions on the above.



Respectfully submitted,


REMA ECOLOGICAL SERVICES, LLC



George T. Logan, MS, PWS, CSE
Professional Wetland Scientist
Registered Soil Scientist, Certified Senior Ecologist


Sigrun N. Gadwa, MS, PWS
Ecologist, Registered Soil Scientist
Professional Wetland Scientist



Attachments: Photos 1 to 6; Reference Sheets for NDDDB plants

	SITE/LOCATION: Lake Shore Point Subdivision Heritage Road East Lyme, CT	REMA JOB NO.: 24-2721-ELY21	ANNOTATED PHOTO LOG
	INVESTIGATOR(S): G.T. Logan MS & S.N. Gadwa, MS		
DATE: August 1, 2024	FACING: NORTHERLY	PHOTO NO.: 1	
		<i>Comments: View of Pattagansett Lake with tall shrub thicket in foreground. Swamp azalea at right. This spot is at the end of an existing, narrow access path to the lake within Lot 3.</i>	

DATE: August 1, 2024	FACING: EASTERLY	PHOTO NO.: 2	
		<i>Comments: Shoreline shrub thicket overhanging land shading the lake shore just west of the sharp bend to the south in Lot 3. Note white waterlily in foreground.</i>	

	SITE/LOCATION: Lake Shore Point Subdivision Heritage Road East Lyme, CT	REMA JOB NO.: 24-2721-ELY21	ANNOTATED PHOTO LOG
	INVESTIGATOR(S): G.T. Logan MS & S.N. Gadwa, MS		
DATE: August 1, 2024	FACING: EASTERLY	PHOTO NO.: 3	
		<i>Comments:</i> Close up of bank and sandy-gravelly substrate. Note leaves of a sassafras sapling and od sweet pepperbush (<i>Clethra alnifolia</i> .)	

DATE: August 1, 2024	FACING: N/A	PHOTO NO.: 4	
		<i>Comments:</i> Close-up of swamp azalea with a cluster of immature seed capsules. In early summer it has showy white flowers. This species is common along the lake shoreline, within the proposed conservation easement.	

	SITE/LOCATION: Lake Shore Point Subdivision Heritage Road East Lyme, CT	REMA JOB NO.: 24-2721-ELY21	ANNOTATED PHOTO LOG
	INVESTIGATOR(S): G.T. Logan MS & S.N. Gadwa, MS		
DATE: August 1, 2024	FACING: NORTHEASTERLY	PHOTO NO.: 5	
			Comments: View of young hardwood forest on the level lakeshore terrace within Lot 3. Note the dense, continuous shrub stratum.

DATE: August 18, 2024	FACING: NORTHERLY	PHOTO NO.: 6	
			Comments: Cleared swath for combined driveway; no sedimentation into adjacent forest areas noted at the time of the site visit.

E	<i>Polygala cruciata</i>	Cross-leaved milkwort	Bogs, meadows and fields, shores of rivers or lakes, swamps
E	<i>Lachnanthes caroliniana</i>	Carolina redroot	Shores of rivers or lakes



Carolina bloodroot *Lachnanthes caroliniana*
 At northern limit of range, flower stalks to 3 feet tall, blooms May to July, needs oligotrophic peaty or sandy wetlands & ample light.

**Cross-leaved milkwort
*Polygala cruciata***

Flower heads pale green to pink, oligotrophic, tiny plant, grows in sun or partial shade light, opposite branching.



SC	<i>Lycopus amplexans</i>	Clasping-leaved water-horehound	Shores of rivers, lakes and swamps
T	<i>Rhynchospora macrostachya</i>	Tall beaksedge	Shores of rivers or lakes

Tall beaksedge
Rhynchospora macrostachya
 grows on shores of oligotrophic peaty or sandy wetlands
 triangular stem,
 bristles at base of achene, fruit 5-6 mm,
 Leaves 3-15 mm wide



Clasping horehound
Lycopus amplexans

Only sessile horehound. Not aromatic, flat-topped fruit.
 5 petals, partly fused
 Lower half of leaf lacks teeth

