

**64 CAMBRIDGE & 4 INDEPENDENCE DRIVE
WETLAND REMEDIATION**

APPLICATION FOR MONROE
PERMIT APPROVAL
AMENDMENT

**WETLAND
ASSESSMENT
REPORT**

PROJECT LOCATION:

64 CAMBRIDGE DRIVE &
INDEPENDENCE DRIVE
MONROE, CT, 06468

APPLICANTS:

**Astro Land Holdings, LLC &
Spacely Land Holdings, LLC**

APRIL 2025

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1.0 Introduction

William Kenny Associates (WKA), on behalf of the Applicants, Astro Land Holdings, LLC and Spacely Land Holdings, LLC, investigated the approximate 71.9-acre project site at 64 Cambridge Drive and 4 Independence Drive in Monroe, Connecticut. The site was inventoried and assessed regarding the ecological conditions of existing and proposed inland wetlands, watercourses, and critical habitat areas; these areas relate to work which has been completed under excavation/filling permit (EFP-2023-04) and the Restoration/Remediation Permit (IWC-2021-06R) for restoration activities, as well as for the proposed Application for a Permit Approval Amendment Modification regarding the proposed site modifications. Regarding the proposed site modifications, inland wetlands and watercourses were field delineated by William Kenny Associates in February and April of 2020 and site investigations and vernal pool assessments were conducted in March through June of 2024, and on March 4, 2025. Surveys were conducted on foot, and observations were made while walking systematically through the property in areas of proposed activities along and within critical habitats (i.e., wetlands and watercourses), with a specific focus on Vernal Pool 2, 3, and 4.

In summary, the proposed modification of the previously approved site remediation activities will reduce the net quantity of fill, the duration of site remediation activities, and the area of disturbance within upland review areas. Also, the modifications modestly affect stormwater management controls, landscape plans, and wetland enhancement activities. The project is not expected to have adverse impacts on inland wetlands, watercourses, or critical habitat areas (i.e. vernal pools) as no direct disturbances to inland wetlands or watercourses are proposed. Indirect adverse impacts will be avoided through the implementation and maintenance of soil erosion and sediment control best management practices (BMPs) during construction, stormwater management practices following construction, and through the modification to previously approved wetland rehydration activities.

2.0 SITE CONDITIONS & DEVELOPMENT HISTORY

The approximately 71.90-acre combined properties are located at 64 Cambridge Drive and 4 Independence Drive in Monroe, Connecticut. 4 Independence Drive is an approximately 21.34-acre property in the northwest portion of the project site and 64 Cambridge Drive is an approximately 50.54-acre property that bounds 4 Independence Drive to the east and south. Cambridge Drive is south of the site and Independence Drive is north of the site.

In 2006, Town of Monroe Planning and Zoning (P&Z) issued an approval for the development of two industrial buildings at 64 Cambridge Drive and 4 Independence Drive. The approval allowed for the alteration of the contributing watershed areas to the site. Unapproved quarry activities dramatically altered the land and the contributing watershed areas to inland wetlands. The quarry activities significantly altered the shape and grade of the central portion of the property, extending from the northern site boundary to the southern site boundary, and encompassed approximately 39.03 acres (54 percent) of the site. Much of the altered land area, but not all, was approved in 2006 for some level of alteration. The conditions on the project site included a greater area of disturbance and deeper excavation than what was referenced in the approved site plans. The deepened excavation activity required pumps to remove water from the quarry and direct it toward a stormwater basin at 4 Independence Drive. Quarry excavation and the pumping of water from one watershed to another resulted in significant changes to onsite wetlands. The land surface modifications reduced the size of the watershed for one onsite wetland by about 50 percent. The remaining relatively undisturbed ecological communities at the project site included areas of upland and wetland forests to the west, east and south.

In September 2021, the Applicants received an approval for site restoration and resolution of notice of violation from the Town of Monroe Office of Inland Wetlands (IWC-2021-06R). In 2023, the Applicants also received an approval for an Excavation/Filling Permit from the Town of Monroe Planning and Zoning Commission (EFP-2023-04). Additionally, a resubdivision for Section Four of the Pepper Street Business Park (SUB-2015-02) was approved by the commission in 2016 and was recently completed. Improvements associated with the resubdivision included the construction of a cul-de-sac at the end of Cambridge Drive, the extension of a paved site access drive onto the current project site, the installation of utilities and drainage features, as well as implementation of landscape restoration activities. Under the restoration and excavation/filling permits, approved activities primarily included the deposition of approximately 490,397 cubic yards (CY) of imported fill material, construction of three stormwater basins, extension of the paved drive permitted under the resubdivision approval onto the project site, the restoration of wetlands and vernal pools, and installation of native landscape plantings.

Beyond work which was completed under the resubdivision approval, work has also been conducted under the excavation/filling permit issued in 2023. Work completed has brought the elevation of the site from the 2020 elevation of 382.00 +/- to its current condition of 422.00 +/-, where it is proposed to remain under this permit approval amendment modification. This modification would reduce the overall 490,397 CY of approved fill to be imported to a total net import of 69 CY, which has already been imported. Additionally, restoration plantings have

been installed in approved locations in the western portions of the site and activities were conducted to temporarily rehydrate Vernal Pool 2 in the east.

3.0 WETLAND CONDITIONS – PAST & PRESENT

3.1.1 Inland Wetland & Watercourse Delineation

Four wetlands were identified and delineated onsite by Environmental Planning Services, LLC (EPS) in 2004 and 2014 with little variation in the delineation results. These wetlands are identified as Wetlands 1 through 4 in Figure 1 of the EPS *Wetland Functions and Values and Vernal Pool Assessment: 64 Cambridge Drive & 4 Independence Drive, Monroe report*, dated May 30, 2014 (Appendix A). Wetland 1 encompasses the western portion of the properties, and Wetlands 2, 3 and 4 are located in the eastern portion. In 2020, WKA re-investigated the site and identified and delineated three wetlands, corresponding to the previously delineated Wetland 1, 2 and 4 (Appendix B). Wetland boundaries delineated by EPS and WKA all relatively correspond to the same boundaries with slight variations between, based on differing professional judgement. The EPS Wetland 3 was not considered to be a wetland in WKA's 2020 delineation, as the soils were not poorly or very poorly drained. The quarry pit also had ponding surface water present in 2020. The feature met the definition of a watercourse; however, WKA did not map it as such because it was a temporary construction feature. In 2021, WKA revisited the site and there were no measurable differences observed from the 2020 investigation. In March 2025 WKA revisited the site once again to determine if wetland conditions had changed. As previously found, no measurable differences in wetland boundaries were observed from the 2020 and 2021 investigations. The temporary feature that met the definitions of a watercourse was no longer present and wetland morphological features within the area were not present. As a note, onsite temporary sediment traps/basins related to construction are not considered to be regulated wetlands by WKA.

3.1.2 Hydrologic & Morphologic Conditions

EPS characterized the hydrologic and vegetative characteristics of the wetland systems in their 2014 report and WKA reaffirmed our findings in the *Wetland & Vernal Pool Assessment Report* dated May 7, 2021. Wetland 1 extends and flows north to south through the western portion of the project site, and discharges into the West Branch of the Pequonnock River approximately 4,000 feet south of Cambridge Drive. During the 2014 EPS investigation, Wetland 2 extended and flowed south to north through the eastern portion of the project site and fed into Pine Swamp to the north. WKA's wetland delineation and site investigations of the properties since 2020 indicate that the northern portion of Wetland 2's connection to Pine Swamp, north of the site, was disrupted due to construction activities that were approved by the Monroe IWC for the extension of Independence Drive. Due to these activities, Wetland 2 now is classified as an isolated system. EPS Wetland 3, which was a relatively small isolated system in the eastern portion of the project site, was described in the 2014 report as being deep and containing very dark tannic water' and approximately 25 feet in diameter. No surface water was present in 2020 and 2021. During WKA's 2020 investigations, it was determined that Wetland 3 did not contain wetland drainage conditions; the findings of those investigations remain true. Wetland 4, which extends and flows both south to north and north to south is located along the eastern border of the project site. The northern portion of this wetland feeds into Pine Swamp to the north and the southern portion of this wetland drains to the West Branch of the Pequonnock River 3.3 miles south of the site. The West Branch of the Pequonnock River drains to the

Pequonnock River. In 2024, WKA closely monitored Wetland 2, which contains Vernal Pool 2, during the breeding and development season of obligate vernal pool amphibians, March through June. Water had previously been pumped to the wetland and vernal pool. Rehydration activities resulted in temporary rehydration of the system during the March investigations, though no surface water was present following the initial investigation.

3.1.3 Watershed Conditions

The site lies within two subregional watersheds. The eastern portion of the property, including Wetland 2 and Vernal Pool 3, is partially within the Halfway River watershed, and the majority of the site, including Wetlands 1 and 4, is within the Pequonnock River watershed. The drainage area to Wetland 2 has been previously altered as a result of onsite development.

At the time of the 2021 *Wetland & Vernal Pool Assessment Report*, prepared by WKA, and according to *Engineering Report* prepared at the time by Solli Engineering, Wetland 2's drainage area was approximately 57 percent smaller than the conditions which were present at the time of the 2006 approval for the site. This had a significant effect on Wetland 2, which has since become significantly drier than in the past. During the initial 2024 investigation, when proper rehydration pumping was occurring, Wetland 2/Vernal Pool 2 was found to contain approximately 10"-12" of standing water in some locations, with evidence of amphibian breeding, including wood frog egg masses, located in pooled areas. However during subsequent investigations, without proper pumping, the pool was absent of surface water. Small monitoring wells, which were previously installed, were visited during each investigation and ground water levels were recorded. Depths of groundwater were variable with March having the greatest depth of approximately 13-16 inches of water in the monitoring wells. During subsequent visits, ground water levels ranged from 6 inches to 2 inches or less. Based on investigations, it appears when proper rehydration pumping was occurring, the system was effectively rehydrated.

During March 2024 investigations, Vernal Pool 3 contained approximately 15.6 inches of water at its maximum depth. By April, this had decreased to approximately 9.6 inches and during subsequent investigations the depressional pool was absent of standing surface water. The absence of poorly and very poorly drained soils, which effectively retain surface water, does not provide a clear baseline for the rate at which Vernal Pool 3 would normally retain water or dry out.

The hydrologic conditions of Wetlands 1 and 4 had not been noticeably altered during 2020 investigations; this remained true for 2024 investigations. Soil saturation and/or inundation was present in much of Wetlands 1 and 4 during all of our site visits.

3.1.4 Vegetative Conditions

The vast majority of the property has been under construction and subject to significant earthwork over the past decade. As such, the core of the property is substantially disturbed and

largely devoid of vegetation, save for sporadic patches of graminoids, invasive species, and other vegetation which readily establishes in disturbed sites. Outside of the work area, the eastern and western portions of the site remain as sound forested communities. As the onsite wetlands are sensitive areas and encompass much of the area beyond the limits of disturbance, vegetation inventories primarily relate to these critical habitats. The vegetation across wetlands 1, 2, and 4 are very similar in composition and are primarily native red maple swamps. Additional tree species are found in these systems primarily include American elm, yellow birch, green ash, ironwood, and sweet gum ranging in size from sapling to sawtimber. The shrub strata is primarily composed of native spicebush, speckled alder, silky dogwood, sweet pepperbush, winterberry, and northern arrow-wood viburnum. Groundcover species found throughout the systems include native tussock sedge, skunk cabbage, cinnamon fern, royal fern, Virginia chain fern, sensitive fern, Canadian mayflower and northern white violet. Vine species are fairly limited and primarily include fox grape and poison ivy. Vernal pool 3 (previously Wetland 3) essentially has the same vegetative community composition, though generally has a denser shrub layer than the tree and groundcover species also associated with the pool.

3.2 Wetland & Watercourse Functional Capacity Comparison

A comparison of the capacity of the onsite wetland and watercourse systems to perform typical wetland and watercourse functions was performed. The functional capacities of two development scenarios were compared and contrasted: the work conducted under excavation/filling permit (EFP-2023-04) and the Restoration/Remediation Permit (IWC-2021-06R), and the work proposed under the current application for a Permit Approval Amendment Modification. This assessment was completed within the context of typical wetlands functions and values as established by Normandeau Associates, Inc. in the 1998 publication, *A Rapid Procedure for Assessing Wetland Functional Capacity*, and in consideration of the 2020 and 2021 evaluation of onsite wetlands by WKA and the assessment completed by EPS in 2014.

The assessment revealed that the proposed project will maintain or improve the functional capacity of wetlands from what would be expected if the work approved under IWC-2021-06R and EFP-2023-04 was fully developed. A summary of this evaluation is presented in the table below.

Table One: Wetlands & Watercourses Functional Capacity Assessment: 2021-Approved Conditions Versus 2025-Proposed Conditions

Approved Conditions Periods 2020 - Proposed Conditions			
WETLAND FUNCTIONS	RELATIVE CAPACITY TO PERFORM FUNCTION		FUNCTIONAL DETAILS
	Approved Functions	Proposed Functions	
WETLAND 1			
1. Modification of Groundwater Discharge	HIGH	HIGH	Unchanged - The capacity of the wetland to influence the amount of water moving from ground water to surface water is not expected to be altered.

2. Modification of Groundwater Recharge	<i>LOW</i>	<i>LOW</i>	<i>Unchanged</i> - The capacity of the wetland to influence the amount of water moving from surface water to ground water is not expected to be altered.
3. Storm and Flood Water Storage	<i>HIGH</i>	<i>HIGH</i>	<i>Unchanged</i> - The capacity of the wetland to store floodwater is not expected to be altered.
4. Modification of Stream Flow	<i>MODERATE</i>	<i>MODERATE</i>	<i>Unchanged</i> - The capacity of the wetland to produce or affect the hydrology of a downgrade stream is not expected to be altered.
5. Modification of Water Quality	<i>HIGH</i>	<i>HIGH</i>	<i>Unchanged</i> - The capacity of the wetland to modify water quality is not expected to be altered.
6. Export of Detritus	<i>MODERATE</i>	<i>MODERATE</i>	<i>Unchanged</i> - The capacity of the wetland to export organic detritus from the wetland to the adjacent and downstream aquatic ecosystems is not expected to be altered.
7. Contribution to Abundance and Diversity of Wetland Flora	<i>HIGH</i>	<i>HIGH</i>	<i>Unchanged</i> - The wetland's capacity to contribute to the abundance and diversity of wetland flora is not expected to be altered.
8. Contribution to Abundance and Diversity of Wetland Fauna	<i>HIGH</i>	<i>HIGH</i>	<i>Unchanged</i> - The wetland's capacity to contribute to the abundance and diversity of wetland fauna is not expected to be altered.
WETLAND 2			
1. Modification of Groundwater Discharge	<i>HIGH</i>	<i>HIGH</i>	<i>Unchanged</i> - The capacity of the wetland to influence the amount of water moving from ground water to surface water is not expected to be altered.
2. Modification of Groundwater Recharge	<i>LOW</i>	<i>LOW</i>	<i>Unchanged</i> - The capacity of the wetland to influence the amount of water moving from surface water to ground water is not expected to be altered.
3. Storm and Flood Water Storage	<i>HIGH</i>	<i>HIGH</i>	<i>Unchanged</i> - The capacity of the wetland to store floodwater is not expected to be altered.
4. Modification of Stream Flow	<i>LOW</i>	<i>LOW</i>	<i>Unchanged</i> - The capacity of the wetland to produce or affect the hydrology of a downgrade stream is not expected to be altered.
5. Modification of Water Quality	<i>HIGH</i>	<i>HIGH</i>	<i>Unchanged</i> - The capacity of the wetland to modify water quality is not expected to be altered.

6. Export of Detritus	MODERATE	MODERATE	Unchanged - The capacity of the wetland to export organic detritus from the wetland to the adjacent and downstream aquatic ecosystems is not expected to be altered.
7. Contribution to Abundance and Diversity of Wetland Flora	HIGH	HIGH	Unchanged - The wetland's capacity to contribute to the abundance and diversity of wetland flora is not expected to be altered.
8. Contribution to Abundance and Diversity of Wetland Fauna	HIGH	HIGH	Improved - The wetland's capacity to contribute to the abundance and diversity of wetland fauna will be improved through the restoration activity that will change a non-functioning vernal pool to a functioning vernal pool.
WETLAND 3 (WKA does not consider this area to be a wetland)¹			
1. Modification of Groundwater Discharge	LOW	LOW	Unchanged - The capacity of the area formerly known as Wetland 3 to influence the amount of water moving from ground water to surface water is not expected to be altered.
2. Modification of Groundwater Recharge	MODERATE -LOW	MODERATE -LOW	Unchanged - The capacity of the area formerly known as Wetland 3 to influence the amount of water moving from surface water to ground water is not expected to be altered.
3. Storm and Flood Water Storage	LOW	LOW	Unchanged - The capacity of the area formerly known as Wetland 3 to store floodwater is not expected to be altered.
4. Modification of Stream Flow	LOW	LOW	Unchanged - The capacity of the wetland to produce or affect the hydrology of a downgrade stream is not expected to be altered.
5. Modification of Water Quality	LOW	LOW	Unchanged - The capacity of the area formerly known as Wetland 3 to modify water quality is not expected to be altered.
6. Export of Detritus	LOW	LOW	Unchanged - The capacity of the area formerly known as Wetland 3 to export organic detritus from the wetland to the adjacent and downstream aquatic ecosystems is not expected to be altered.
7. Contribution to Abundance and Diversity of Wetland Flora	MODERATE -LOW	MODERATE -LOW	Unchanged - The capacity of the area formerly known as Wetland 3 to contribute to the abundance and diversity of wetland flora is not expected to be altered.

¹ The 2020/2021 WKA investigations showed this area is not a wetland. However, its ability as an upland to function at levels found in both wetlands and uplands are present due to its landform characteristics and vegetation.

8. Contribution to Abundance and Diversity of Wetland Fauna	MODERATE-LOW	MODERATE-LOW	Unchanged - The capacity of the area formerly known as Wetland 3 to contribute to the abundance and diversity of wetland fauna is not expected to be altered.
WETLAND 4			
1. Modification of Groundwater Discharge	HIGH	HIGH	Unchanged - The capacity of the wetland to influence the amount of water moving from ground water to surface water is not expected to be altered.
2. Modification of Groundwater Recharge	LOW	LOW	Unchanged - The capacity of the wetland to influence the amount of water moving from surface water to ground water is not expected to be altered.
3. Storm and Flood Water Storage	HIGH	HIGH	Unchanged - The capacity of the wetland to store floodwater is not expected to be altered.
4. Modification of Stream Flow	LOW	LOW	Unchanged - The capacity of the wetland to produce or affect the hydrology of a downgrade stream is not expected to be altered.
5. Modification of Water Quality	HIGH	HIGH	Unchanged - The capacity of the wetland to modify water quality is not expected to be altered.
6. Export of Detritus	MODERATE	MODERATE	Unchanged - The capacity of the wetland to export organic detritus from the wetland to the adjacent and downstream aquatic ecosystems is not expected to be altered.
7. Contribution to Abundance and Diversity of Wetland Flora	HIGH	HIGH	Unchanged - The wetland's capacity to contribute to the abundance and diversity of wetland flora is not expected to be altered.
8. Contribution to Abundance and Diversity of Wetland Fauna	HIGH	HIGH	Unchanged - The wetland's capacity to contribute to the abundance and diversity of wetland fauna is not expected to be altered.

4.0 VERNAL POOL CONDITIONS – PAST & PRESENT

4.1.1 Vernal Pool 2014 Conditions

According to the 2014 EPS report, each wetland system supported vernal pool obligate species. At the time, the pools in Wetlands 1, 2 and 4 supported the breeding and development of vernal pool obligate wood frogs (*Lithobates sylvaticus*) and spotted salamanders (*Ambystoma maculatum*). Vernal Pool 3 (previously Wetland 3) contained amphibian vernal pool indicator species in the 2004 survey, however, no amphibian indicator species were observed in the 2014 survey. Fairy shrimp (*Anostraca sp.*) were observed during the 2014 study and follow-up surveys were recommended to re-assess the pool for amphibian obligate species due to this observation. Vernal Pool 2 was considered to be the most productive pool onsite, as greater than 100 egg clutches of wood frog and/or spotted salamander egg masses were observed. In addition to obligate vernal pool species observed onsite, several facultative vernal pool species such as spring peeper (*Pseudacris crucifer*), four-toed salamander (*Hemidactylium scutatum*) and grey treefrog (*Hyla versicolor*) were observed in or adjacent to vernal pools. Spring peepers, four-toed salamanders and grey treefrogs will use vernal pool systems for their breeding but are not confined to such systems, as wood frogs and spotted salamanders are for their development, and are therefore registered as a facultative species.

4.1.2 Vernal Pool 2020 & 2021 Conditions

WKA conducted vernal pool assessments in March and April 2020 and April 2021. Each pool identified in ESP's 2014 report was investigated for vernal pool obligate species.

Vernal Pool 1, located within the southern portion of Wetland 1, was identified as a 'cryptic' vernal pool by EPS in 2014. In 2020, the pool did not support breeding of vernal pool obligate species; however, in 2021, breeding was observed. No egg clutches of wood frog nor spotted salamanders were identified during 2020 and no fairy shrimp were identified within the pool. Small warm water fish were observed within the pool at the time. Additional species encountered during investigations included spring peepers, green frogs (*Lithobates clamitans*), common musk turtle (*Sternotherus odoratus*), and mallard ducks (*Anas platyrhynchos*). In 2021, both wood frog and spotted salamander egg masses were observed in the pool.

Vernal Pools 2 and 3 were inactive in 2020 and 2021 due to the absence of surface water within the vernal pools during investigations. Vernal Pool 2 includes a portion of Wetland 2, while Vernal Pool 3 encompassed the entirety of the formerly identified Wetland 3 (not a wetland per WKA field observations).

Vernal Pool 4 is located within the northern portion of Wetland 4 and was the only vernal pool identified by WKA that served as amphibian breeding habitat in 2020 and 2021. In 2020, approximately 30 clutches of intact wood frog eggs and three clutches of intact spotted salamander eggs were identified within the central portion of Vernal Pool 4. Fairy shrimp were discovered during the initial investigation of this pool but were absent during the subsequent survey. No finfish were observed within the pool. Wood frog tadpoles and spotted salamander

egg masses were also observed in 2021. The pool conditions and characteristics were similar to the 2020 investigation.

4.1.3 Vernal Pool 2024 Conditions

WKA conducted a vernal pool assessment once a month from March through June 2024 in accordance with the Connecticut Association of Wetland Scientists' (CAWS) Vernal Pool Monitoring Program protocol. WKA investigated Vernal Pools 2, 3, and 4 during each investigation. Vernal Pool 1 was omitted from the 2024 investigations.

Vernal Pool 2 was found to contain surface water exclusively during the March investigation. The presence of surface water was relegated to certain pooled areas throughout the system and was not contiguous. The maximum water depth pooled within the system was approximately 1.3 feet. Approximately 23 wood frog egg masses were identified in the various locations where water was present. During subsequent investigations in April, May, and June, no surface water was present within the system and the breeding and development of vernal pool obligate species ceased. Water pumping to Wetland 2/Vernal Pool 2 did not continue during the breeding season, which led to surface water conditions that were inadequate for the breeding and development of vernal pool obligate amphibians.

Vernal Pool 3 was found to contain surface water during the April and May investigations. During the April investigation, the maximum depth of the pool coincided with that of Vernal Pool 2, at 1.3 feet. A single wood frog egg mass was observed during the initial investigation. Upon return in May, water levels had decreased to approximately 9.6 inches. After thorough investigation, the egg mass previously identified was found to be absent and no tadpoles were observed within the pool. However, fairy shrimp were found to be present in May. Following the May investigation, no surface water was present within the system and obligate species were no longer present.

Vernal Pool 4 was found to be the most consistent and productive system throughout investigations. In March, the system was found to contain approximately 57 wood frog egg masses and one spotted salamander egg mass. Marbled salamander juveniles were also located within the pool. Average depth of the pool was approximately one foot. Upon return in April, the vast majority of wood frog egg masses had hatched and approximately 60 new spotted salamander egg masses were located. Once again, marbled salamander juveniles were present. Additionally, green frogs (*Lithobates clamitans*) and a garter snake (*Thamnophis sirtalis sirtalis*) were also found within the system. The maximum depth of the pool was found to be approximately 10 inches. In May, wood frog tadpoles were found to be larger and continuing development. The majority of spotted salamander egg masses were found to have hatched. The maximum depth of the pool remained at approximately 10 inches. Come the final investigation in June, very small, mostly developed, wood frogs were found, and spotted salamanders were assumed to be continuing development, though no juveniles were located. The maximum depth of the pool was found to be approximately 8 inches.

4.2 *Vernal Pool Assessment Comparison*

The results of WKA's investigations of onsite vernal pools in 2020/2021 provided for the determination that Vernal Pool 1 and 4 remained as productive habitat for vernal pool obligate species and that Vernal Pool 2 and 3 no longer provided adequate habitat for obligate amphibians or fairy shrimp, as there was no standing water present at the time of investigation. The results of the 2024 investigations provide insight as to how these Vernal Pools, save for Vernal Pool 1, are functioning since previous investigations. Overall, of the investigated systems, Vernal Pool 4 remains the most productive habitat for obligate species onsite, with an abundance of several obligate species utilizing the system and sufficient surface water levels throughout necessary time periods to support amphibian breeding and development. Interestingly, despite the overall absence of necessary surface water throughout the duration of amphibian breeding periods, when Vernal Pool 2 and 3 were initially investigated, they were found to be used by obligate species for breeding, but conditions did not support development.

The presence of wood frog egg masses within Vernal Pool 2 during the March 2024 investigation was unique, as no obligate amphibian species were found to be utilizing the pool since the 2004 EPS investigations. However, Vernal Pool 3 was previously evaluated and was found to not contain wetland soils. As such, this pool dries out quickly and ultimately does not retain adequate surface water to support the development of amphibian species. The presence of wood frog egg masses likely can be attributed the overall productivity of the area as a whole, as Vernal Pool 4 is a short distance from Vernal Pool 3 and supported an abundance of amphibians in 2024. The presence of fairy shrimp within the system was less surprising, as they had been previously observed by EPS in 2014.

Vernal Pool 2 overall was unproductive in 2024, as was found in 2020/2021. However, the presence of obligate amphibian egg masses during the 2024 investigations offered some promise of potential for restoration. When investigated in 2024, despite the system not being fully hydrated, pooled areas did contain wood frog egg masses. As previously discussed, the watershed to this system was altered in the past and the annual passive rehydration of the system was largely lost. However, with the remaining presence of poorly to very poorly draining soils, and the insight provided by observation of amphibians returning to the pool when surface water is present, the idea is supported that appropriate rehydration of the system via mechanical means could adequately restore the breeding and development of vernal pool obligate species within the system.

5.0 POTENTIAL IMPACT EVALUATION

5.1 Proposed Remediation Amendment

The proposed work involved with the application to amend the existing permit includes various revisions across the site, primarily related to the proposed overall reduction in net fill to be imported on the site. These revisions include the reduction of imported fill, the implementation of site grading and stormwater basin modifications, the incorporation of wetland restoration and amended planting locations, and finally the installation of a well and pump system to rehydrate Vernal Pool 2.

The primary component of the proposed amendment is the reduction of the overall net quantity of fill to be imported to the site. Previous approvals call for the site to be raised to an elevation of $461.00 \pm$ from the 2020 elevation of $382.00 \pm$, however, the proposed amendment would allow for the site to exist primarily in its current state at $422.00 \pm$. This modification would reduce the total net import of fill to the site by 490,328 CY. Some additional grading is required at the site, though the overall modification tremendously reduces the required earthwork at the site.

Stormwater basin modifications primarily include infrastructure improvements such as the installation of ripraps, spill ways, and level spreaders as well as pipe modifications and the potential to excavate accumulated materials within the basins. As these features are temporary construction elements intended to capture stormwater and sediment occurring from generally unstable soil surfaces, these are not considered to be true wetlands. For further description of these basins and proposed improvements, please refer to the *Engineering Report* prepared by Solli Engineering, dated March 17, 2025.

The permit modification work also includes the installation of a well and pump system which are proposed to rehydrate the altered Wetland 2/Vernal Pool 2 system. The pump system is proposed to be solar operated and run on a schedule independent of human intervention. The well pump is to be sized according to flow rates related to the loss of water volume from the previously eliminated watershed (gallons per minute). To determine this information, average monthly rainfall calculated from daily precipitation data, sourced from PRISM Climate Data from January 1, 2005 through the end of March 2025, was used, as well as local evapotranspiration rates and groundwater infiltration averages. The well will be installed in the eastern portion of the property, south of the vernal pool and closer to the existing disturbance area. Water will be conveyed via PVC main north to a 20-foot-wide level spreader, where it will travel surficially as sheet flow until it reaches Wetland 2. This improvement is to supersede the standing restoration approval, which calls for substantial restoration of Wetland 2/Vernal Pool 2's historic watershed. The proposed modification to the restoration approach allows for a significant reduction in earthwork in direct proximity to the system and ensures the system will be sufficiently rehydrated.

Further restoration activities are also proposed with the permit modification. This includes the enhancement of approximately 1,409 square feet of upland habitat immediately adjacent to the wetlands located in the southeast corner of the site. This remediation effort is proposed in

addition to the standing approval for the creation of approximately 1,215 square feet of wetland area on 64 Cambridge Drive. Activities related to the newly proposed restoration primarily include the control of invasive vegetation, establishment of wetland meadows featuring a diversity of native wetland shrubs. Likewise, wetland buffer restoration activities are proposed to occur in the northeastern portion of the site immediately adjacent to the northernmost portion of Wetland 2 and Vernal Pool 3. These activities also include control of invasive vegetation, and establishment of wetland meadows featuring a diversity of native wetland shrubs. For additional details, please refer to sheet 2.64 of the *Permit Approval Amendment Modification* plan set prepared by Solli Engineering.

5.2 Potential Impacts & Mitigation

Land development has the potential to directly and indirectly cause impacts to wetlands and watercourses during and after construction from activities such as vegetation clearing, soil filling, excavation or pollution of stormwater. For this investigation, a comparison of the approved conditions under excavation/filling permit (EFP-2023-04) and the Restoration/Remediation Permit (IWC-2021-06R), the present conditions of the site, and the proposed modifications of the standing approvals will be assessed.

5.2.1 Potential Direct Wetland Impacts

The 2021 Inland Wetlands approval plans indicated no potential adverse and direct long or short-term impacts to wetlands and watercourses onsite. Rather, the approved plans proposed net-beneficial impacts related to the restoration of approximately 1,200 square feet of previously filled wetlands. This involved the removal of fill and structures, control of invasive vegetation, and installation of native flora. Additionally, approximately 1,400 square feet of Regulated Upland Review Area (RURA) adjacent to Wetland 4 was approved to be converted to wetlands vegetated with native flora. For each, a three-year monitoring and maintenance plan was included related to the control of invasive vegetation following project completion. Furthermore, the approval allowed for mechanical irrigation of Wetland 2 and Vernal Pool 2 during construction activities to rehydrate the systems during the short term.

Likewise, the proposed modification to the approvals does not include adverse direct long- or short-term impacts to wetlands and watercourses onsite, but rather proposes additional and modified restoration activities which will lead to net-beneficial impacts in the long-term. In the southeastern portion of the site within the RURA, new wetland buffer habitat enhancement activities are proposed. This involves the remediation of land immediately adjacent to the wetlands located in the southeastern portion of the site, immediately southeast of Detention Pond 3. In addition to proposed stormwater management activities in this area, the modification proposes to remediate approximately 1,409 square feet of land between the detention pond and the wetlands at the southeast corner of the site. Remediation activities include the control of invasive vegetation, installation of native vegetation, and three years of subsequent monitoring. Additional wetland and buffer restoration activities are proposed in the northeastern portion of the site and likewise include the installation of native flora.

The proposed permit modification also includes the installation of a well and solar powered pump within the RURA to rehydrate Wetland 2 and Vernal Pool 2. Previously, irrigation to this system was approved as a part of the 2021 remediation plans. Since the approval, intermittent water pumping and rehydration occurred. The rehydration and breeding of vernal pool amphibians was successful during periods of pumping, but as expected, did not occur when no pumping occurred. The proposed modification will serve to replace short-term manual operation of pumps and will allow for automatic scheduled rehydration. The proposed modification also supersedes the restoration of the historic watershed drainage area, which was previously approved and intended to rehydrate the system via conveyance of stormwater to the system. The well is proposed to be installed southwest of the system within uplands and convey water north via pipe to a level spreader located in adjacent uplands before it discharges into the wetlands. By superseding this approval, the proposed modification will allow for adequate hydration to support obligate species' breeding and development within Vernal Pool 2, even in years where precipitation may be inadequate to provide hydration to other onsite systems. This will restore functionality to the overall system. To ensure no adverse effects occur as a result of the proposed modification, well water will be tested prior to discharge into the wetlands and monitoring of the system is recommended to occur twice per month over a period of March through June during the initial implementation year. It is also recommended that well water be monitored once per month over the same period for two subsequent years following the initial implementation to ensure the effectiveness of pumping.

5.2.2 Potential Indirect Wetland Impacts During Construction

During construction, wetlands and watercourses can be indirectly impacted from sediment-laden water. The previous approval included a robust and extensive soil erosion and sediment control plan, which has served to prevent indirect impacts during construction. This includes silt fencing, diversion swales, sediment basins, sediment traps, anti-tracking pads at construction entrances, dust control, riprap stabilization, and inlet protections. The proposed modification intends to maintain and improve existing sediment and erosion controls. The control measures are detailed in the permit modification drawings and will be installed and maintained in accordance with the CT DEEP 2024 Guidelines for Soil Erosion and Sediment Control. Monitoring and maintenance of these measures will be critical to ensure their effectiveness. They will be installed and maintained by the contractor and inspected by a qualified and approved site monitor.

Furthermore, the proposed modification inherently serves to reduce the potential for adverse impacts by eliminating approximately 490,328 CY of fill to be imported to the site. With this significant reduction in imported material, the potential for indirect impacts is reduced accordingly. Likewise, the proposed modification to rehydrate Vernal Pool 2 eliminates the need for creation of a substantial drainage area within close proximity to the system. Elimination of this feature translates to a minimized potential for adverse indirect impacts, as the system is well elevated and away from activities proposed with the modification. Ultimately, the reduction in imported fill inherently diminishes the potential for adverse indirect impacts.

5.2.3 Potential Indirect Wetland Impacts Following Construction

In the long-term and if not properly mitigated, wetlands and watercourses can be indirectly adversely impacted by stormwater runoff that flows from structures, pavement and vegetated surfaces. The proposed project improves onsite stormwater management capabilities.

According to the project engineer, “the proposed development results in an increase in impervious area of approximately 4.43± acres (4.12± acres of bedrock) when compared to pre-development (former) conditions. The project includes the modification of three stormwater detention basins for the attenuation of peak runoff. The stormwater management system serves to detain the increase in runoff by the proposed development. The stormwater detention basins have also been designed in anticipation of increased site disturbance and stormwater runoff as the result of future development.” As such, with the proposed improvements to onsite stormwater management systems, the potential for indirect impacts following construction is minimized to the greatest extent.

Furthermore, the proposed modification maintains and tweaks previously approved restoration activities including the establishment of native flora. With the installation of native trees, shrubs, and groundcovers established via seed, the site will be adequately stabilized and vegetated following construction. Plantings will serve to bolster wetland buffers, reduce the intensity of surficial stormwater traveling as sheet flow, and assist in uptake of stormwater deposited onsite.

The combination of proposed improvements to stormwater infrastructure and the establishment of native vegetation will work in conjunction to eliminate the potential for indirect adverse impacts in the long term.

6.0 Conclusion

Based on our investigation and assessment of onsite inland wetlands, watercourses systems, and vernal pools at 64 Cambridge Drive and 4 Independence Drive in Monroe, Connecticut, we conclude that the proposed restoration of the site will substantially maintain or restore the functions and values of onsite wetlands. The restoration plan includes activity to modify previous approvals and to restore the impacted hydrologic conditions of Vernal Pool 2 and to restore forested areas within portions of the onsite RURA and vernal pool buffers. One area of land adjacent to the southeastern wetlands will be enhanced and the previously approved wetland creation will be maintained. Both areas will be revegetated with native wetland plants and a three-year invasive management plan will monitor and control invasive vegetation following project completion. The proposed modification activities will result in substantially the same conditions expected from excavation/filling permit (EFP-2023-04) and the Restoration/Remediation Permit (IWC-2021-06R) for wetlands and watercourses on and off the site. Overall, the proposed permit modification will serve to reduce the potential for adverse impacts compared to the previous approval and will serve to restore functionality to previously diminished inland wetlands and vernal pools.

7.0 *References*

7.1 *Project References*

1. Engineering Report. 2025. "Permit Approval Amendment Modification: Existing Drainage Area Map," Solli Engineering.
2. Magee, Dennis W. and Hollands Garrett G. 1998. "A Rapid Procedure for Assessing Wetland Functional Capacity," Normandeau Associates Incorporated and ENSR, pg. 1-190.
3. Town of Monroe Planning and Zoning Commission. 2016. "Approval Resubdivision SUB-2015-02 – File #1257C: 64 Cambridge Drive – Section 4," Town of Monroe, Connecticut.
4. Town of Monroe Planning and Zoning Commission. 2021. "Approval for Site Restoration and Resolution of Notice of Violation: IWC-2021-06R," Town of Monroe, Connecticut.
5. William Kenny Associates LLC. 2021. "Wetland & Vernal Pool Assessment Report." Report prepared for Astro Land Holdings LLC & Spacely Land Holdings LLC.

7.2 *General References*

1. Calhoun, A.J.K. and M.W. Klemens. 2002. Best development practices: Conserving pool-breeding amphibians in residential and commercial developments in the northeastern United States. MCA Technical Paper No. 5, Metropolitan Conservation Alliance, Wildlife Conservation Society, Bronx, New York.
2. CT ECO. "Connecticut Environmental Conditions Online." Hartford, CT. Department of Environmental Protection and University of Connecticut, 2001.
3. McElroy, Marianne. 1981. "Natural Drainage Basins in Connecticut," State of Connecticut Natural Resources Center, Department of Environmental Protection in cooperation with the U.S. Geological and Natural History Survey.
4. Rodgers, John. 1985. "Bedrock Geology Map of Connecticut," U.S Geological Survey.
5. Stone, Janet Radway et al.. 1992. "Surficial Materials Map of Connecticut," Connecticut Department of Environmental Protection, Geologic and Natural History Survey.
6. Water Quality Classifications Map of Connecticut, South Central Coast, compiled by Bureau of Water Management, Planning and Standards Division, Connecticut Department of Environmental Protection, dated 1993.