

Michael W. Klemens, LLC
POB 432
Falls Village, CT 06031
June 6, 2016

Ms. Jo Ann Goodwin, Chair and Members of the
Town of Mansfield Inland Wetlands Agency
Audrey P. Beck Municipal Building
4 South Eagleville Road
Mansfield, CT 06268

Dear Ms. Goodwin and Members of the Mansfield IWA:

Introduction: On behalf of the Mansfield Environmental Trust, LLC I have reviewed the following list of documents. These documents are directly relevant to describing the wetlands and watercourses of the property proposed to be developed as the Lodges at Storrs. These documents also have relevance in assessing the impacts of the proposed development to the ecological and functional integrity of the wetlands and watercourses on the site, and the protection of the public trust in the waters and natural resources of the State. Included in this list of documents is a letter (Klemens to Chase dated September 10th 2013) which concerns the Storrs Technical Park. This letter is tangentially relevant to the application before you because representations have been made by the developer's consultant (Mr. Logan/REMA) invoking the Storrs Technical Park as a development model to which the Storrs Lodges aspires to follow as it pertains to vernal pool protection. While my letter to Ms. Chase was excluded from the hearing record because of a procedural technicality, I stand by the statements I made in that letter, and my opinion that the construction of the Storrs Technical Park has caused serious damage to those vernal pools, not only from the roadway, but from the over-development of the critical terrestrial habitat zone that lies from 100-750 from the vernal pool high water mark. This is relevant because these are the very same ecological issues that are emerging in the application before you.

Documents: Submitted on Behalf of the Applicant:

REMA –Logan and Gadwa (7 documents): Wetlands Assessment and Impact Analysis: Summary of Findings (March 18, 2016); Wetlands Assessment-Supplemental: Function and Values Assessment (April 4, 2016); Wetlands Assessment-Supplemental: Wetland Mitigation (April 4, 2016); Wetlands Assessment-Supplemental: Water Quality Investigation (April 4, 2016); Wetlands Assessment-Supplemental: Review of Stormwater System (April 6, 2016); Wetlands Assessment-Supplemental: Vernal Pool Investigation (March 30, 2016); Wetlands Assessment-Supplemental: Vernal Pool Investigation (April 14, 2016)

Hesketh and Associates –Plan Set Titled: the Lodges at Storrs, Hunting Lodge Road, Mansfield CT Inland Wetland and Watercourses Application March 18, 2016, revised 3/24/2016.

Document :Submitted on Behalf of the Town:

Memorandum from GEI/ Kimberly Bradley and John McGrane (May 12, 2016)

Documents: Submitted on Behalf of the Interveners (and Appended to this Report):

Pawlak, Ed/Connecticut Ecosystems LLC: Wetlands Report: Ponde Place, Mansfield CT (July 5, 2007)

Eastern Connecticut Environmental Review Team Report: Ponde Place Residential Apartment Community, Mansfield CT Report No. 624 (April 2009)

Calhoun, A. J. K. and M. W. Klemens (2002): Best Development Practices (BDPs) for Conserving Pool-breeding Amphibians in Residential and Commercial Developments. MCA Technical Paper No. 5, Metropolitan Conservation Alliance, Wildlife Conservation Society, Bronx, NY.

Klemens, M. W. Letter to Ms. Cheryl A. Chase, Director DEEP Inland Water Resources Division (September 10, 2013).

Vernal Pool Analysis Map Storrs Lodges (May 2016) Michael W. Klemens, LLC

Michael W. Klemens, CV

Results/Analysis: My concerns about the proposed development fall into two broad categories. The first is whether the development as proposed adequately protects the well-documented, highly functioning vernal pool located in the wetland complex that drains to Cedar Swamp Brook. The second is whether the application is complete as it pertains to wildlife and vernal pool conservation.

Vernal Pool in the Cedar Swamp Brook Watershed (Wetland A/Vernal Pool 1): The importance of this productive vernal pool is recognized by Pawlak (2007), ERT (2009), and REMA (2016). Pawlak reported in 2007 that this pool contained 53 wood frog (*Rana sylvatica*) and four spotted salamander (*Ambystoma maculatum*) egg masses. REMA (2016) reported 78 wood frog and five spotted salamander egg masses. These results, taken ten years apart, are quite similar, indicating that the pool is primarily one that produces wood frogs, however a lower number of spotted salamanders are also produced. I also believe that these data sets over a ten year period address GEI's questions (see GEI comment No. 8) concerning whether this pool maintains adequate hydrology to support successful obligate amphibian reproduction.

REMA uses the US-ACOE (U. S. Army Corps of Engineers) draft vernal pool characterization form in their reports. The analysis by REMA using this form indicates that the ecological integrity of the pool is high. That US-ACOE form is the result of a heightened interest by the Army Corps in vernal pools, using Calhoun and Klemens (2002) as the basis for its vernal pool guidance

strategies. Using the simplified form in Calhoun and Klemens (2002:9) this vernal pool is a Tier 1 pool, the highest ranking for a vernal pool based on its productivity and landscape integrity. So until this point, all the experts are in agreement that this is a very important vernal pool set in a largely intact landscape (as defined by a 750-foot radius from the high water mark of the pool).

However, REMA fails to comprehensively analyze the impacts of the proposed development to this valuable wetland resource using accepted scientific standards. Unlike Pawlak (2007) and the ERT report (2009) which predicted impacts to vernal pool biota because of proposed development footprints, REMA blithely concludes that (March 18, 2016, page 11, 3.0 Conclusion) "...it is REMA's professional opinion that the proposal, if constructed as designed and shown on the plans, will not result in long-term adverse impacts to the site's regulated resources, or the function and values that they provide." I can only imagine that REMA's reticence to analyze the impacts of this proposed development, using the accepted Calhoun and Klemens (2002) methodology, was the realization that the development as proposed is egregiously non-compliant with those standards, and therefore poses reasonable likelihood of unreasonable harm to this wetland. Instead of addressing the integrity of the critical terrestrial habitat, REMA takes us on a confusing side-trip, invoking the salamander tunnels of the Storrs Technical Park as the reason that this application should be approved. But, this application makes the exact same errors exhibited by the Storrs Technical Park project. In short, it is nonsensical to create wildlife corridors for salamanders and frogs to traverse a site if there remains insufficient terrestrial habitat for them to use because of the design of the proposed development.

In order to assist the IWA in understanding the impacts of this development, I have analyzed the landscape-scale impacts of this development and that map is appended to this report (Vernal Pool Analysis Map). The analysis demonstrates that this development, as proposed, far exceeds the sustainability thresholds within a vernal pool shed, promulgated by Calhoun and Klemens (2002). Those standards are incorporated by reference by the US-ACOE in its guidance documents. The analysis demonstrates that there is 7.39% existing development (shown in tan) in the critical terrestrial habitat zone. The proposed development (shown in red) will increase that disturbance by 31.14% which would result in an aggregate total of 38.53 % development in the critical terrestrial habitat zone. Calhoun and Klemens (2002) recommend that total development (i.e., existing plus proposed) not exceed 25% of critical terrestrial habitat zone. The amount of development in the critical terrestrial habitat zone is far in excess of what can be sustained without damage to the vernal pool.

Concerning the vernal pool envelope, which is at present without any development, the proposed development will remove 17.10% of that envelope. The vernal pool envelope, the first 100 feet surrounding a vernal pool, is essential for various functions of the pool. These functions include the entry and exit of adult amphibians, metamorph habitat, as well as the production of leaf litter which drives the pool ecosystem. Calhoun and Klemens (2002) recommend that no development occur within the vernal pool envelope, and that roads are excluded from the entire vernal pool management zone up to 750 feet. **Therefore this**

proposed development is non-compliant in three major areas: Overdevelopment of the critical terrestrial habitat zone, development within the vernal pool envelope, and the construction of a road within the vernal pool management zone (=pool + envelope + critical terrestrial habitat). The placement of two wildlife tunnels under the road do little, if anything, to alleviate these fundamental design flaws.

A feasible and prudent alternative should be proposed that addresses these issues and properly conserves the vernal pool and its biota. Wood frogs, unlike any other vernal pool species, have been shown to be essential in the cycling of nutrients within vernal pool systems. **Survival of wood frogs is important because of their ability to cycle nutrients effectively in small wetlands during the tadpole stage, countering eutrophication. Loss of wood frog populations results in impairment to wetlands by altering the quality of the water chemistry, and thereby ultimately the quality of the wetlands.** The importance of wood frogs in the ecological balance of receiving waters was upheld by the 2010 *River Sound* Connecticut Appellate Court decision. The *River Sound* decision restored ecological sensibility to the analysis of impacts to small wetlands, and affirmed the vital importance of wood frog populations to health of the waters and to the wetlands in which they reproduce. This underscores why the proposed development works against the long-term conservation objectives of wetland protection that fall squarely within your Agency's purview, as well as against the public trust in natural resources.

Issues of Completeness: Second Vernal Pool?? Spring Salamander Study: Pawlak (2007:4) and ERT (2009:17) both noted the presence of a second, smaller vernal pool. Pawlak (2007) referred to this as Wetland 1D and was created as an impoundment of this tributary to Eagleville Brook by the access road off of Hunting Lodge Road. Pawlak (2007) noted eight wood frog egg masses and three spotted salamander egg masses in April and observed tadpoles in the wetland in June. Despite the documentation of this pool in the previous Ponde Place application, there is no mention of any effort to locate it, study it, or describe it in the current Storrs Lodges application. Certainly if the pool was no longer viable or present I would have expected REMA to mention this in their report. The fact that nothing is mentioned at all about this pool in REMA's report raises questions about the possibility of yet another unmapped vernal pool on this property?

Pawlak (2007) reported two species of stream salamanders occurring on the site, dusky (*Desmognathus fuscus*) and two-lined (*Eurycea bislineata*). REMA reported a single two-lined salamander. As the presence of the spring salamander (*Gyriniophilus porphyriticus*) has been raised by the DEEP, I am questioning the amount of effort that was expended in searching these headwater seepage areas for this State-threatened species. Any kind of intensive search effort for stream salamanders should have produced more than a single two-lined salamander. I would request that REMA provide information on the effort, timing, and duration of surveys of the site to locate stream salamanders.

Conclusions: In conclusion, it is my professional opinion that the project as proposed will unreasonably harm the ecological and functional integrity of the large, well-studied vernal pool

on site. That harm includes measurable adverse changes to the water quality within the vernal pool by the reduction or elimination of wood frog populations. I have identified at least one prudent and feasible alternative that would allow for development to occur on a portion of this site, and would not push the vernal pool into a non-compliant status as per Calhoun and Klemens (2002). The Applicant has not produced any feasible and prudent alternatives as required by law and as noted by GEI (see GEI comment 19). Apart from this major issue, there are secondary issues of completeness as it pertains to a possibly second vernal pool and inadequate efforts expended to evaluate the presence of spring salamanders (see GEI comment No. 20).

I look forward to discussing these issues with the Agency in greater detail.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael W. Klemens". The signature is fluid and cursive, with the first name "Michael" and last name "Klemens" clearly legible, and "W." in the middle.

Michael W. Klemens, PhD

Attachments (6):

Pawlak, Ed/Connecticut Ecosystems LLC: Wetlands Report: Ponde Place, Mansfield CT (July 5, 2007)

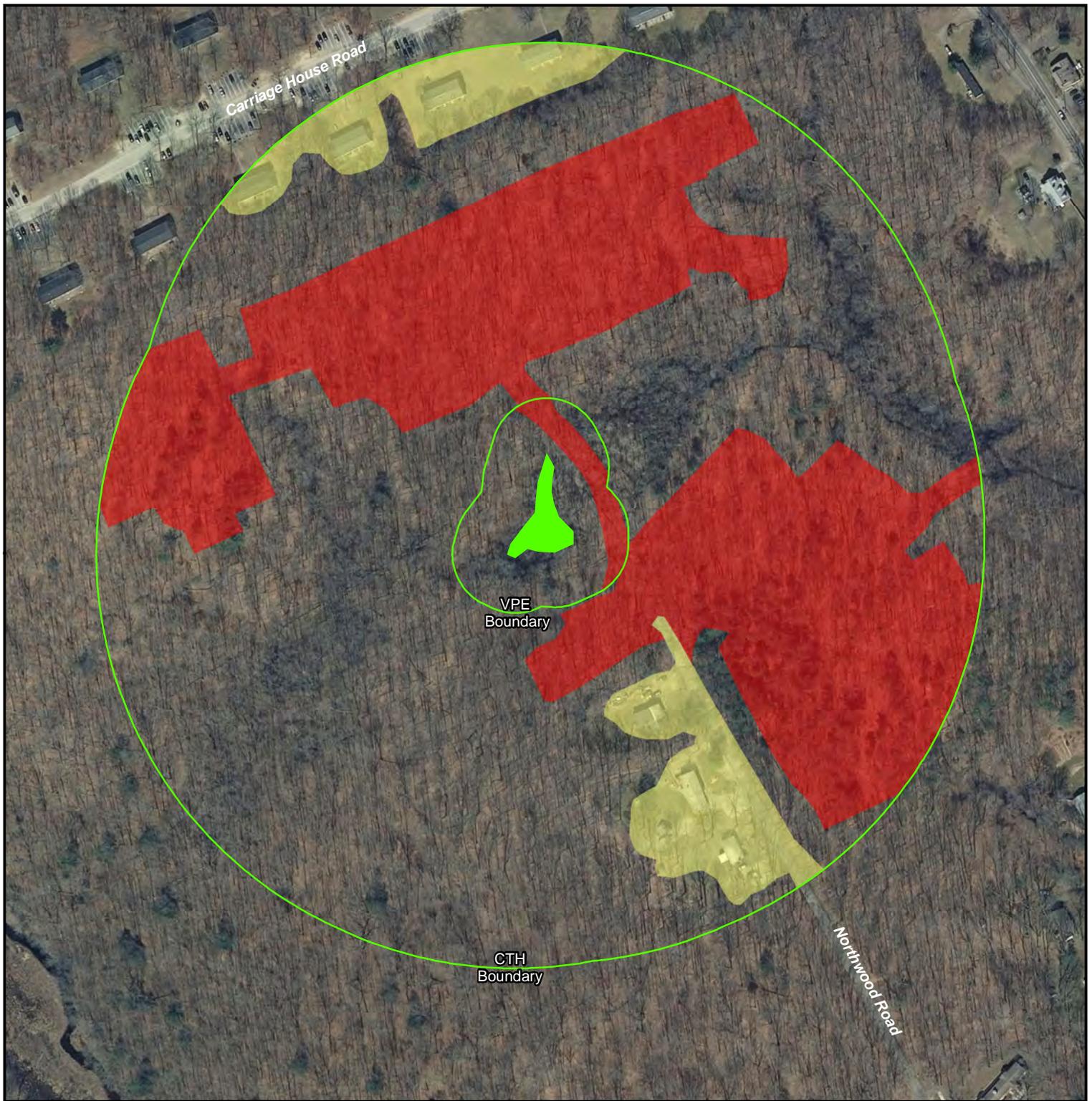
Eastern Connecticut Environmental Review Team Report: Ponde Place Residential Apartment Community, Mansfield CT Report No. 624 (April 2009)

Calhoun, A. J. K. and M. W. Klemens (2002): Best Development Practices (BDPs) for Conserving Pool-breeding Amphibians in Residential and Commercial Developments. MCA Technical Paper No. 5, Metropolitan Conservation Alliance, Wildlife Conservation Society, Bronx, NY.

Klemens, M. W. Letter to Ms. Cheryl A. Chase, Director DEEP Inland Water Resources Division (September 10, 2013).

Vernal Pool Analysis Map Storrs Lodges (May 2016) Michael W. Klemens, LLC

Michael W. Klemens, CV



VERNAL POOL ANALYSIS MAP
Storrs Lodges

Legend

- Vernal Pool
- Vernal Pool Envelope (0-100ft)
- Critical Terrestrial Habitat (100-750ft)
- Existing Development
- Proposed Development

Pre- and Post-Development Calculations:

Existing	Proposed	Total
VPE 0.00%	VPE 17.10%	VPE 17.10%
CTH 7.39%	CTH 31.14%	CTH 38.53%

Map Description
 Map showing the pre and post development levels within the Vernal Pool Envelope (VPE) and Critical Terrestrial Habitat (CTH) management zones that surround the vernal pool per Calhoun and Klemens (2002). This analysis is based on a georeferenced site plan prepared by F.A. Hesketh and Associates and aerial photograph (source USDA 2012) analysis. The data provided on this map is approximate only and is intended for general environmental planning purposes.

SCALE

0 75 150 300 Feet

Map prepared by:
 Michael W. Klemens, LLC

May 2016

Michael W. Klemens, PhD
POB 506
Salisbury, CT 06068
September 10, 2013

Ms. Cheryl A. Chase
Director, Inland Water Resources Division
c/o Office of Adjudications
CT-DEEP 3rd floor 79 Elm Street
Hartford, CT 06106

Dear Ms. Chase:

I wish to enter the following comments into the public record concerning the proposed University of Connecticut Tech Park (Diversion of Water Application No. DIV-201205385 and Inland Wetlands and Watercourses Application No. IW-201205383). I make these comments solely as a concerned citizen of the State, not representing or receiving compensation from any other agency or interest. My *curriculum vitae* is attached which documents my expertise to speak on the following matters.

For the record I should also state that I am a UConn graduate [BSc (1975) and MSc (1978)], the son of a UConn professor, and have worked in partnership with the University on the Storrs Downtown project. I have tremendous respect for the University and its mission. The transformation of the University into a world class institution is a source of pride to many of us—yet that growth needs to be tempered with respect and consideration for the ecological and human environment that is part of, and surrounds, the Storrs campus.

When I worked with the Leyland Alliance, the University, and the Storrs Downtown Partnership, I focused my studies on the site's vernal pool resources and the streams and springs that flowed from the crest of Rte. 195 to the Fenton River. My goal in that project was to protect the vernal pools on the Storrs Downtown site using the standards that I developed in collaboration with Dr. Aram Calhoun, published in the document: Calhoun, A. J. K. and M. W. Klemens. 2002. Best Development Practices (BDPs) for Conserving Pool-breeding Amphibians in Residential and Commercial Developments. MCA Technical Paper No. 5, Metropolitan Conservation Alliance, Wildlife Conservation Society, Bronx, NY. Under my guidance, the Storrs Downtown Project was re-designed to protect the vernal pools on site using these standards. In addition, streams and springs were studied on the site and a plan developed to protect, restore, and enhance them was prepared. The driving issue behind the stream studies was the potential for the State-threatened spring salamander to use these waters.

I was dismayed upon reading the Vernal Pool Evaluation of the North Hillside Road Extension prepared by Fuss & O'Neill which extensively cites Calhoun and Klemens (2002) and makes on page 9 incorrect and misleading statements as to the protection of the vernal pools on the

subject parcel *vis a vis* Calhoun and Klemens (2002). As the co-author of the repeatedly-cited (by Fuss & O'Neill) document I wish to clearly state that the current plan for the roadway does not comply with the standards for vernal pool protection within a development context that appear in Calhoun and Klemens (2002).

The proposed roadway runs through the middle of a series of vernal pools which have, by virtue of their landscape arrangement, a meta-population function. In short, this means that because of their geographic proximity to one another, as evidenced by their overlapping 750 foot critical upland habitat zones, there is significant movement and genetic exchange of amphibians between these pools. Placing a road in this manner violates the guidance of Calhoun and Klemens (2002:19) stating that "roads and driveways with projected traffic volumes in excess of 5-10 cars per hour should not be sited with 750 feet of a vernal pool."

Apart from the road cutting through the center of this vernal pool meta-population complex, two of the most highly ranked (Tier 1) vernal pools (1 and 10) are rendered non-compliant. Vernal pool 1 which is the most biodiverse and productive pool on the site based upon the data submitted by Fuss & O'Neill, will lose 2% of its vernal pool envelope (the 0-100 foot zone) which violates Calhoun and Klemens (2002) guidance that unequivocally states that any loss of the vernal pool envelope is not acceptable. Table 7 contradicts the narrative statement made on page 7 of the Fuss & O'Neill report stating that "no loss of habitat will result from the proposed development within the 100-foot vernal pool envelope." Vernal pool 1 will also lose 34% of its critical upland habitat (100-750 foot zone) while Calhoun and Klemens (2002) state that a maximum of 25% loss is permissible. Table 7 in the report is misleading—directing one's attention to the 26% loss increase shown in bold red, however the important figure is **34% total loss**. One has to consider the existing development of 8% **plus** the new development of 26% in arriving at the operative impact figure of 34%.

Vernal pool 1 is also severed ecologically from most of the other pools and wetlands by the entrance road. Attempt to reconnect pools using underpasses are a mis-use of Calhoun and Klemens (2002). Such underpasses do not obviate the prohibition against placing high traffic volume roads within the 750 foot areas around vernal pools. One cannot read the guidance document and cherry pick those items that fit a pre-conceived development agenda. Use of underpasses in this context contravenes the guidance document.

Compliance with Calhoun and Klemens (2002) is especially critical when one considers that this pool may be the source pool for the other pools within the meta-population complex. When one considers the standard of "reasonably likelihood to cause unreasonable harm" one must ask the question why, *the most valuable vernal pool on site is the most impacted? Why is vernal pool 1 the only pool to have its envelope impacted as well as its critical upland habitat zone to a degree considered non-compliant by Calhoun and Klemens (2002)? What other alternatives and designs for this entrance road would better protect this source pool?*

The importance of vernal pool wildlife to wetlands has been established in a series of landmark Connecticut court decisions. While the courts have taken a very strict interpretation of when

wildlife issues can be integrated and considered within a wetlands application context, the River Sound decision affirmed in the case of wood frogs, that their diminishment or loss within a wetland could affect the chemical and nutrient composition of the wetland. Wood frogs are a major component of the vernal pools that will be impacted by the current layout of the project, including vernal pool 1.

Apart from vernal pool issues, I would also request that a comprehensive stream and spring survey be conducted on the site to determine the presence of the State-threatened spring salamander. This was done at the Storrs Downtown site. Spring salamanders were historically reported at Storrs (*see*, Klemens, M. W. 1993: pp.65. The Amphibians and Reptiles of Connecticut and Adjacent Regions. Conn. Geol. Nat. Hist. Surv. Bulletin 112:1-318 + 32 plates. They have been and more recently rediscovered not far from the subject property. Spring salamanders are very sensitive to clearing and landscape disturbance. Their potential presence on the site should be explored prior to any permitting for development activity.

I trust that the DEEP will ensure that these issues are fully addressed so as to protect the public trust in the natural resources of our State. If I can provide any further guidance or input, please do not hesitate to contact me.

Sincerely,

A handwritten signature in cursive script, appearing to read "Michael W. Klemens".

Michael W. Klemens, PhD

Attachments (2):

Klemens CV

Calhoun and Klemens (2002)