

Spicer Road Realty Subdivision Thompson, Connecticut



Eastern Connecticut Environmental Review Team Report

Eastern Connecticut Resource Conservation & Development Area, Inc.

Spicer Road Realty Subdivision Thompson, Connecticut

Environmental Review Report



Prepared by the
Eastern Connecticut
Environmental Review Team

Of the

Eastern Connecticut
Resource Conservation and Development Area, Inc.

For the
Inland Wetlands Commission
Thompson, Connecticut

June 2006

Report #599

Acknowledgments

This report is an outgrowth of a request from the Thompson Inland Wetlands Commission to the Eastern Conservation District (ECD) and the Eastern Connecticut Resource Conservation and Development Area (RC&D) Council for their consideration and approval. The request was approved and the measure reviewed by the Eastern Connecticut Environmental Review Team (ERT).

The Eastern Connecticut Environmental Review Team Coordinator, Elaine Sych, would like to thank and gratefully acknowledge the following Team members whose professionalism and expertise were invaluable to the completion of this report.

The field review took place on, Wednesday, April 12, 2006.

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I would also like to thank Bernard Davis, chairman, inland wetland commission, Howard Peck, Ron Tillen, and H. Charles Obert, inland wetland commission members, Judy Rondeau, wetland agent, John Guskowski, town planner, David Held and Greg Glaude project engineers, Frank Dirrigl, project consultant, and Scott Gravatt, Eastern

Conservation District, for their cooperation and assistance during this environmental review.

Prior to the review day, each Team member received a summary of the proposed project with location and soils maps. During the field review Team members received plans and additional information. Some Team members were able to review an additional environmental report prepared after the field review. Following the review, reports from each Team member were submitted to the ERT coordinator for compilation and editing into this final report.

This report represents the Team's findings. It is not meant to compete with private consultants by providing site plans or detailed solutions to development problems. The Team does not recommend what final action should be taken on a proposed project - all final decisions rest with the town and applicant. This report identifies the existing resource base and evaluates its significance to the proposed use, and also suggests considerations that should be of concern to the town. The results of this Team action are oriented toward the development of better environmental quality and the long term economics of land use.

The Eastern Connecticut RC&D Executive Council hopes you will find this report of value and assistance in reviewing the proposed subdivision application.

If you require additional information please contact:

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Introduction

Introduction

The Thompson Inland Wetlands Commission has requested Environmental Review Team (ERT) assistance in reviewing a proposed residential subdivision.

The 41.4 acre site is located to the south of Spicer Road at the end of Logan's Lane. Logan's Lane is an approved but not yet built road and subdivision (a completed sand and gravel excavation site). The site has been mined for sand and gravel and is zoned R-80. The proposal is for the creation of 13 residential lots with on-site sewage disposal and water supply wells. There will be the construction of approximately 2300 feet of roadway and a bridge across Robbins Brook. The road will connect Parcel "A" at the end of Logan's Lane with Parcel "C" that will connect with Quaddick Town Farm Road. The lots are in the 1.8 to 2.7 acre range in size with one large lot of 12.7 acres.

The brook crossing is necessary because ending the road with a cul-de-sac would exceed the town's subdivision regulations and the town's Planning and Zoning Commission would not consider a waiver. The crossing of Robbins Brook in another area is not possible due to land ownership problems.

Objectives of the ERT Study

The inland wetland commission has requested the ERT to assist in a review of this project because the commission had previously denied the project because of significant impact to Robbins Brook. This project is a re-submission of that plan and the commission wants a review in order to have information to support or not support its previous decision. Specific issues and concerns raised by the commission include: soils limitations, bridge construction and possible impacts, stormwater management, erosion and sediment control, and possible impacts to Robbins Brooks and other wetland and aquatic resources.

The ERT Process

Through the efforts of the Thompson Inland Wetlands Commissions this environmental review and report was prepared for the Town of Thompson.

This report provides an information base and a series of recommendations and guidelines which cover the topics requested by the town. Team members were able to review maps, plans and supporting documentation provided by the applicant.

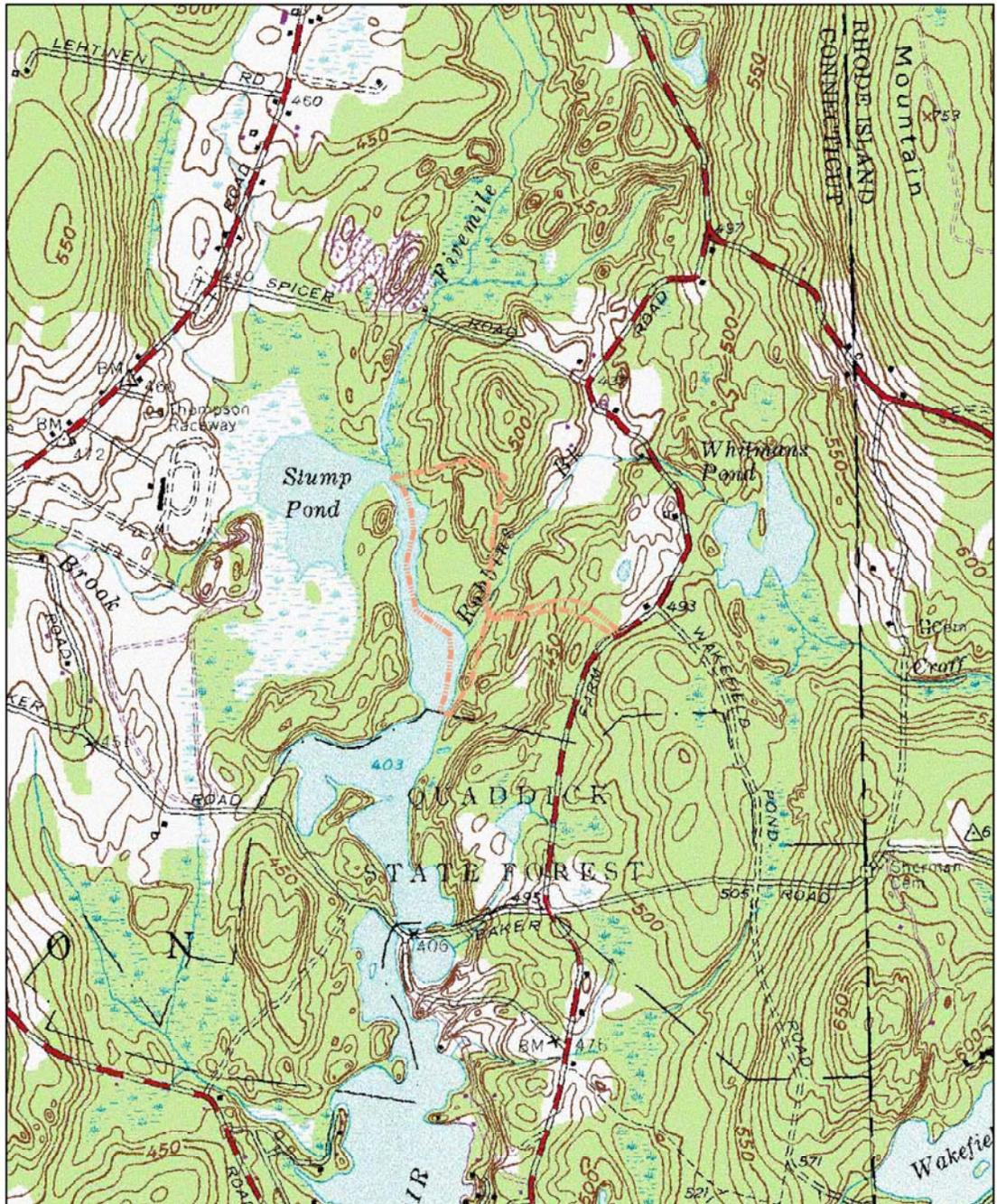
The review process consisted of four phases:

1. Inventory of the site's natural resources;
2. Assessment of these resources;
3. Identification of resource areas and review of plans; and
4. Presentation of education, management and land use guidelines.

The data collection phase involved both literature and field research. The field review was conducted Wednesday, April 12, 2006. The emphasis of the field review was on the exchange of ideas, concerns and recommendations. Being on site allowed Team members to verify information and to identify other resources.

Once Team members had assimilated an adequate data base, they were able to analyze and interpret their findings. Individual Team members then prepared and submitted their reports to the ERT coordinator for compilation into this final ERT report.

ERT Project Location Map



The Connecticut Environmental Review Team

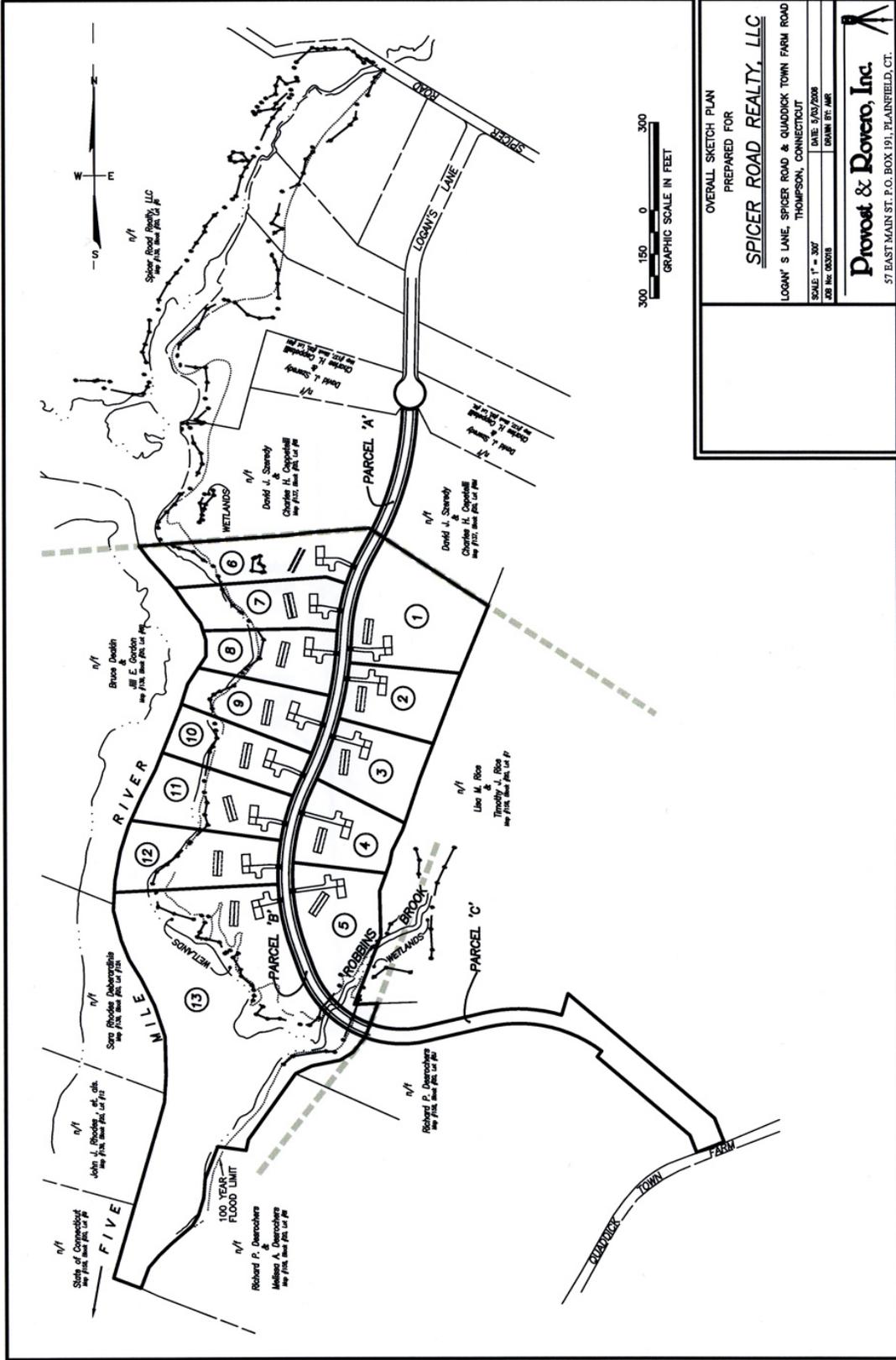


This map was prepared by Amanda Fargo-Johnson for the Connecticut Environmental Review Team. This map is for educational use only. It contains no authoritative data. May 2006.

Thompson, CT N

Proposed Site





OVERALL SKETCH PLAN
 PREPARED FOR
SPICER ROAD REALTY, LLC
 LOGAN'S LANE, SPICER ROAD & QUADDICK TOWN FARM ROAD
 THOMPSON, CONNECTICUT
 SCALE 1" = 300'
 DATE 5/02/2008
 JOB NO. 082078
 DRAWN BY: ABR

Provost & Rovero, Inc.
 57 EAST MAIN ST. P.O. BOX 191, PLAINFIELD, CT.

ERT Project Location Map



The Connecticut Environmental
Review Team  

This map was prepared by Amanda Fargo-Johnson for
the Connecticut Environmental Review Team.
This map is for educational use only.
It contains no authoritative data.
May 2006.

Thompson, CT 
0 0.05 0.1 0.2 0.3
Miles

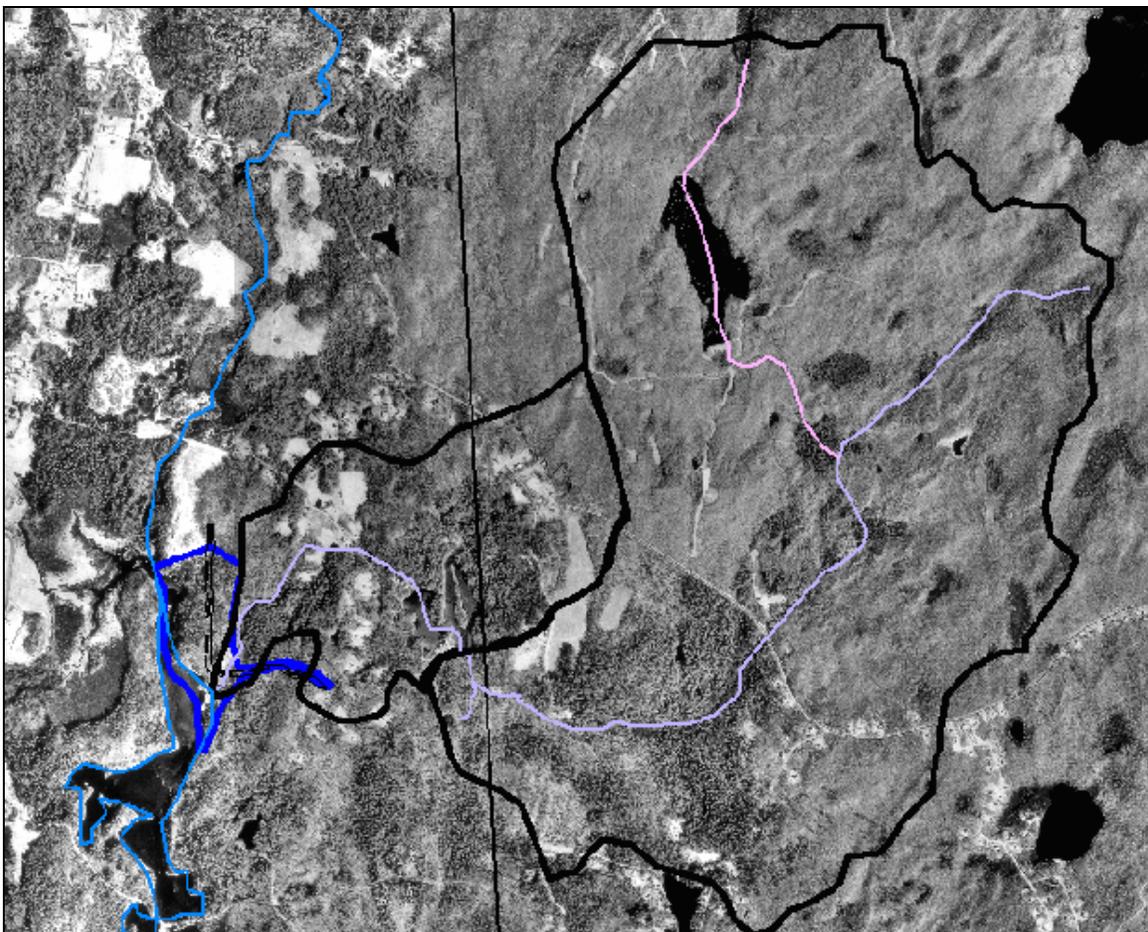
A Watershed Perspective

This section has been completed and added to the appendix.

Wetland Review

The plan proposes construction of 13 residential lots on a 41.4 acre site along a continuation of Logan's Lane in east-central Thompson. The principle wetland issue in this proposal is the road construction proposed to cross Robbins Brook. A secondary issue is the preservation of the water quality of the Five Mile River.

The watershed of Robbins Brook extends east into Rhode Island. Cold Spring Brook from the east and Leesom Brook from the north combine to form Croff Farm Brook which passes into Thompson and flows into Whitmans Pond. Upon exiting the pond, it is known as Robbins Brook and by that name it flows ~ three quarters of a mile downstream and empties into the Five Mile River.



The black lines in the image above depict the watershed of Robbins Brook and its tributaries above the project site. The Watershed is shown in black and divided into two sections: above Whitman's Pond ~1573 acres, and below the Pond, ~341 acres. The Five Mile River and its various impoundments are on the left (west) side of the image. Note: This image is from 1995 photography. Newer 2004 photography does not overlap quite as far into Rhode Island.

Robbins Brook, under all its names, has a water quality of ‘A’ for its entire length. The water quality maps issued by the Connecticut DEP rate the classification of water on the following scale: AA being the best, A the next best, B after that, then C, and finally D.

There are many reasons both historic and current for first-class water quality. And it is noteworthy that the water quality is the reflection of the land use in the watershed. Thus, a fairly undeveloped watershed should, and in this case does, yield high water quality throughout its flowpath.

(The DEP’s Water Quality Classifications is available at: <http://www.dep.state.ct.us/wtr/wq/wqs.pdf>)

The run of Robbins Brook that the Team assessed, just upstream from the Five Mile River, is home to fingerling trout. Their presence is indicative of a clean, clear running, coarse-bottomed, cold water stream. At the time of the Team’s visit, Robbins Brook was flowing in its stream bed of six to eight feet in width, though occasionally widening to twelve feet or more in places.



Robbins Brook stream bottom is coarse and the water is clear in the photo on the left. This is at the approximate location of the proposed road crossing. On the right, three team members observe the Brook and its tree cover near the location of the proposed crossing.

Issues

Thermal Heating of Robbins Brook – There was concern that an increase in water temperature would result from the loss of overhanging/shading (riparian) vegetation removed for construction purposes. As we can see in the first photograph, Robbins Creek, under all its names, from the furthest reaches of the watershed, flows a little under four miles before emptying into the Five Mile River. For almost every foot of the way it is shaded by trees, and

enjoys a very wide protective riparian buffer. It is along this stretch of river that the die is cast in its formation as a cold water stream. In addition to near constant shading, much of the precipitation that falls in the watershed infiltrates downward into the ground water, eventually resurfacing in the stream. It is cooled along that journey as well. Additionally, there are no large parking lots spewing their heated and degraded runoff into the Brook. By all measures, the watershed is predominantly pristine, and for these reasons yields a cold water stream. Thus, the clearing of the needed cover to accommodate the road crossing will be thermally insignificant. Indeed, the greater chance for elevated water temperature comes when the water resides, fully exposed to the sun, in the 18 acre Whitmans Pond. And the bigger, long term threat is the heating that could occur over time as the watershed becomes developed.

Flooding – A large scale storm event (the “100 Year” storm) will cause the Five Mile River to back flood and inundate the proposed crossing. That Robbins Brook will also have high water would be a moot event. A review of the flood lines on the FEMA Flood Insurance Rate Maps for the 100 and 500 year storm event will show the expected areas of inundation. Specifically regarding Robbins Brook, the engineering report shows that the 27 foot clear span will pass the 100 year storm event (although technically it couldn’t because the area would be engulfed by the Five Mile River’s flood flow.).

Of greater local concern is the span 3,300 feet upstream of this location that carries Quaddick Town Farm Road over Robbins Brook. This 14.5 feet wide arched span features a natural bottom which drains an area of ~1,760 upstream acres. By comparison, the proposed Logan’s Road crossing will drain ~1,914 acres with a span of 27 feet. Since the construction of the 14.5 foot span looked newer, it may not have been tested for a large storm event.



However with the steep slope above the span and its width being almost half of the Logan's Road span, a review of the flood numbers for that crossing may be of greater interest.

The photo at left looks down from the Quaddick Town Farm Road bridge/span to Robbins Brook. It shows the Brook stair-stepping its way downhill just before it passes under the road. Notice the undercutting along the right hand bank exposing rocks and cobbles.

The photo at right shows the 14.5 foot span that passes Robbins Brook under Quaddick Town Farm Road. This span uses wing walls to narrow and direct the flow under the span. The tree on the left of this photo is the same leaning tree in the above photo on the left half of the image.



Erosion and Sediment Controls – Because of the proximity of the proposed footings to the Brook, strict attention to the proper 2002 Connecticut Guidelines for Erosion and Sediment controls is needed. The fisheries and stormwater sections of this report mention methods of control: turbidity curtain, coffer dam, etc. for construction in such close proximity to the water course. The agreed upon method should be inspected regarding its effectiveness especially during, or immediately after, larger storm events. This is essential to prevent sediment loading from the clear water, coarse bottomed stream. These characteristics are needed to maintain the watercourse as a trout nursery.

Subdivision Infrastructure - Since Thompson does not allow detention basins within subdivisions, a discharge of road runoff from the proposed road into the 50 foot buffer of Five Mile Brook is intended at Lot 13. This will be moderated by sumps in the storm drains and a rip-rapped, energy dispersing depression before the discharge point. However, this system will be the recipient of runoff from 2,250 feet of road. (This length, times a 24 foot road width, yields 1.25 acres of asphalt/impermeable surface, though there will ultimately be much more with rooftops and driveways.) Therefore, minimizing the runoff that the proposed construction would yield is a noteworthy goal. Two recommendations towards this end are: 1.) using curbless roads, this will allow the greatest portion of road runoff to infiltrate into the sandy substrate, thereby reducing pressure on the drainage system; and 2.) tying roof runoff directly into the ground. In combination, these will minimize the work the stormwater removal system will have to do.

Thompson is one of the few towns that does not allow for detention basins in subdivisions. It may be worth-while to reconsider the decision. The Team was told that maintenance of these structures by the town would be costly and demanding to the town services. However, increasingly, the ERT teams are seeing municipalities that specify homes proposed for new construction must form a homeowner's association. That association is then responsible for the maintenance of the detention structure. As development pressure continues in the rural watersheds, the skills of keeping sediments out of the wetland and watercourses will be at a premium. And while detention basins have been proven to be effective along these lines, the town need not take on additional work, instead relying on the homeowners association to manage that portion of the infrastructure.

Lots with Water Frontage - Proposed lots 6 through 13 will front the impounded Five Mile River. These lots will likely command a premium selling price, and with that will come expected rights of use. Though variable by lot, the water's edge will be 250 to 400 feet back from the road. With a setback/wetland buffer of 50 feet there is still plenty of lawn space for the homeowner. Still, it should be documented in the deed that the agreed upon buffer must be left in a well defined "natural setting." The homeowner's association will be held responsible for any incursions into it. The prospect of lawns down-to-the-water with fertilizer and pesticide runoff entering the Fivemile River is an impact that needs to be avoided both in the short and in the long term.

Linear Connection & Open Space - Lot 13 is the largest of the thirteen proposed lots. It could be favorable if Lot 13 had, for instance, a ± 250 feet width from the lot 12/13 lot line. The remaining acreage, though small in actual land area, could be established as open space. That open space could then make use of a constructed-by-the-developer trail that ties into the 264 acre Quaddick State Forest which this property abuts.

Stormwater Review

The proposal is for a 13 lot residential subdivision on a 41.4 acre site with approximately 2,300 ft of paved roadway and a bridge across Robbins Brook.

Stormwater Permitting

Since the site construction involves the disturbance of over one acre, the project must comply with the requirements of Connecticut's *General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities* (general permit) issued 10/1/02 and modified 4/8/04. The developer must submit a registration to the Department of Environmental Protection (CTDEP) *at least* thirty days before the start of construction activities. If 10 or more acres of land will be disturbed, regardless of phasing, the developer must also submit the Stormwater Pollution Control Plan (the "Plan") with the registration. The permit requires that the "Plan shall ensure and demonstrate compliance with the Connecticut Guidelines for Soil Erosion and Sediment Control (the "guidelines"). Also, the Plan must be flexible to account for adjustment of controls as necessary to meet field conditions. Please note that many erosion, sediment control, and stormwater detention issues must be dealt with on a local level before being included in the Plan.

Stormwater Pollution Control Plan

The Stormwater Pollution Control Plan (plan) must include a site map as described in Section 6(b)(6) of the permit, a description of the erosion and sediment controls that will be used during each phase of construction, details of each control used, details of all outlet structures and velocity dissipation controls, a description of procedures to maintain all erosion and sediment control measures, and a description of post-construction stormwater management. Specific dewatering procedures must be addressed. Section 6(b)(6)(C)(ii) recommends that dewatering wastewater be infiltrated into the ground

where feasible, but if the discharge must be directed to a surface water then measures must be taken to minimize discoloration of the receiving stream. The locations of all stockpiled materials must be shown along with necessary erosion control measures. The permit requires inspections by qualified personnel provided by the permittee at least once every seven calendar days and after every storm of 0.1 inches or greater. In addition, the Plan must include monthly inspections of stabilized areas for at least three months *following* stabilization. The plan should note the qualifications of personnel doing the inspections and must allow for the inspector to require additional erosion and sediment control measures as necessary.

The permittee shall provide a copy of the Plan to all contractors or developers conducting activities that may affect stormwater runoff on individual lots or buildings within the overall plan of development, regardless of ownership. These additional contractors and developers must sign the contractor certification (Section 6(b)(6)(E)).

The Plan must be maintained on site during construction and updated as necessary.

Site Development Plan

A review of the Site Development Plan provided with the ERT materials resulted in the following comments:

1. The Department would like to encourage the developer and the Town of Thompson to consider alternatives to the traditional curbing and gutter systems, such as grass drainage channels, water quality swales and pervious pavement, to improve pollutant removal and reduce the volume of stormwater runoff directed to one discharge location.
2. No erosion and sediment control details were provided with the ERT materials to show how Robbins Brook will be protected during bridge construction. Some type of coffer dam, perhaps using sand bags, that will divert stream flow around the work site

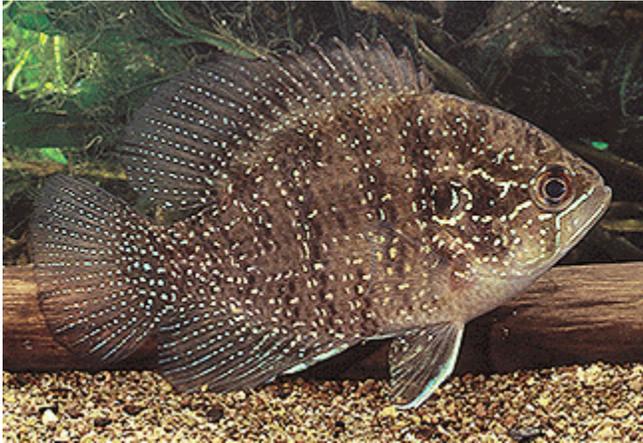
and retain sediment from the disturbance of the stream bank should be considered. A plan for water-handling, during construction and during emergency circumstances, must also be prepared.

3. Although the riprap stilling basin and swale at FES 101 will provide velocity dissipation and some sediment retention, an alternative design such as the combination of the stilling basin and a grassed water quality swale or bioretention area should be considered to improve pollutant removal prior to the discharge to the Five-Mile River, and to reduce the impact to the wetlands in the area
4. No details were provided to show how the 2:1 (horiz:vert) slopes on the eastern side of the proposed roadway will be stabilized. Although riprap swales are shown above these slopes, the Connecticut Guidelines for Soil Erosion and Sediment Control require reverse slope benches or other engineered slope stabilization measures whenever the vertical height of any slope steeper than 3:1 exceeds 15 feet. In addition, the Department recommends the use of erosion control matting for 3:1 slopes and steeper. The site development plan must address this issue.
5. The proposed modified riprap swales should be installed with an underlying filtering material such as a granular material or geotextile to prevent soil movement through the riprap.
6. Catch basins in paved areas that may receive sediment from construction activities must be protected with silt sacks or filter fabric wrapped under the grate and in front of the catch basin throat.
7. Erosion and sediment controls must be inspected at least once every seven calendar days and after every storm of 0.1 inches or greater.
8. Soil stabilization measures must be implemented within three days of reaching final grade or when construction activities have permanently ceased or are temporarily suspended for more than seven days.

9. Areas that will remain disturbed but inactive for 30 days, including stockpiles, must receive temporary seeding in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control (Guidelines).

The Natural Diversity Data Base

The Natural Diversity Data Base maps and files regarding the project area have been



Banded Sunfish

reviewed. According to our information, there are known extant populations of State Special Concern *Enneacanthus obesus* (banded sunfish) in the adjacent Quaddick Reservoir. Further information may be found in the Fish Resources section.

Natural diversity Data Base information includes all information regarding critical biological resources available to us at the time of the request. The information is a compilation of data collected over the years by the Natural Resources Center's Geological and Natural History Survey and cooperating units of DEP, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Consultations with the Data Base should not be substitutes for on-site surveys required for environmental assessments. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as, enhance existing data. Such new information is incorporated into the Data Base as it becomes available.

Please be advised that this is a preliminary review and not a final determination. A more detailed review may be conducted as part of any subsequent environmental permit applications submitted to DEP for the proposed site.

Fish Resources

Robbins Brook

Robbins Brook runs through the property, which is a tributary of Upper Quaddick Reservoir, an impoundment of the Five Mile River. Due to its small size, Robbins Brook could be overlooked as far as its relative importance as an aquatic resource. However, this small perennial 1st order stream supports a viable coldwater fish community that is known to support native brook trout. Brook trout typically spawn in Connecticut during the month of October. Eggs incubate within gravel over the fall and winter periods with eggs hatching in late February or early March. Fry remain in the gravel until their yolk sacs are absorbed at which time the fry emerge from underneath the gravel and move into preferred stream microhabitats. Realizing the importance of brook trout and their habitats, a unique partnership is now underway between state, federal, and local agencies, academia, as well as non-profit government organizations and private citizens called the Eastern Brook Trout Joint Venture (EBJTV). As part of the National Fish Habitat Initiative, this venture is a geographically focused, locally driven scientifically based effort with goals to protect, restore, and enhance aquatic habitat throughout the eastern range of brook trout. More can be learned about these efforts at www.fishhabitat.org. Robbins Brook may also support other stream species such as blacknose dace and white sucker and may serve as a coldwater thermal refuge during the summer for fluvial dependent fish species, which seasonally reside in Upper Quaddick Reservoir.

Robbins Brook, adjacent to the proposed subdivision is of low to moderate gradient. Albeit variable, most mesohabitat is in the form of alternating stretches of riffle/run habitats. Deep pool and holding habitats for adult brook trout are somewhat limited in the lower stretch of Robbins Brook. Streambed substrates are comprised of small cobbles, small to large size gravels, and coarse sand. Instream cover is in the form of woody debris and undercut streambanks. The stream is fairly well shaded although there has been riparian zone encroachment along the southeast side of the stream due to sand

and gravel activities. Trees provide a valuable overhead canopy, which serves to shade the watercourse and reduce surface water temperatures from warming during the summer.

Surface water quality of the Robbins Brook is classified by the Connecticut Department of Environmental Protection as Class A. Designated uses of Class A waters are as follows: potential drinking water supply, fish and wildlife habitat, recreational use, agricultural and industrial supply and other legitimate uses including navigation.

Upper Quaddick Reservoir

Upper Quaddick Reservoir is an impounded section of the Five Mile River, also referred to as Stump Pond. Adjacent to the proposed Spicer Road Subdivision, the reservoir is very shallow being less than 6 feet in depth. It has very dense coverage of aquatic plants including water milfoil, white water lily, yellow pond lily, watershield and coontail. Quaddick Reservoir supports a warmwater fish community comprised of largemouth bass, chain pickerel, yellow perch, black crappie, bluegill, pumpkinseed, and brown bullhead (Jacobs and O'Donnell, 2002). The Inland Fisheries Division also has established a successful northern pike fishery in this reservoir.

Banded sunfish (*Enneacanthus obesus*) have been documented in Quaddick Reservoir. The banded sunfish is currently classified as a Species of Special Concern pursuant to Connecticut General Statutes (CGS) Chapter 495. This classification was recommended by the Endangered Species Advisory Committee for Fish, based in part on the findings of Jann (2001). Much of our information on banded sunfish emanates from a University of Connecticut Masters Thesis by Jann (2001). Other sources of information on banded sunfish in Connecticut include Whitworth et al. (1968) and Whitworth (1996). Banded sunfish distribution in Connecticut has been correlated with muddy, leaf debris substrates, underground springs, seeps, high water clarity (i.e. low turbidity) and abundant levels of aquatic plants (Jann 2001).

Impacts

Erosion and Sedimentation

During housing and road construction, topsoil within the parcel may become exposed and susceptible to runoff events. Erosion and sedimentation due to construction related activities have long been regarded as a major cause of aquatic habitat degradation, especially if erosion and sedimentation controls are not properly installed or maintained. The negative impacts of sediment runoff have been well documented by researchers. Sediment will reduce populations of aquatic insects and fish by eliminating physical habitat while suspended sediments will reduce dissolved oxygen levels (Cordone and Kelley 1961). Suspended sediments may prevent successful nest development (Bell 1986). As reported by Meehan (1991), sediment deposition can severely impact spawning substrate abundance and quality. Reductions in egg survival are caused by smothering, insufficient oxygen supply and lack of proper removal of catabolic products (Bell 1986). Meehan (1991) indicated that erosion and sedimentation of instream habitat could alter channel morphology by increasing the stream width-depth ratio, incidence and severity of stream bank erosion, channel braiding, and reduce pool volume and frequency.

Stormwater Drainage

Stormwaters that outlet to wetlands and watercourses can contain a variety of pollutants that are detrimental to aquatic organisms. No stormwater detention is proposed for the subdivision due to local regulatory constraints. Pollutants commonly found in stormwaters are hydrocarbons (gasoline and oil), herbicides, heavy metals, road salt/sand, fine silts, and coarse sediment. Nutrients in stormwater runoff can fertilize stream waters causing water quality degradation. Roadway sands used in winter deicing activities also represent a potential phosphorous loading source to Upper Quaddick Reservoir and can encourage the growth of nuisance aquatic vegetation. Accidentally spilled petroleum based chemicals or other toxicants can cause partial or complete fishkills if introduced in high concentrations.

Lawn Fertilizers and Chemicals

Runoff and leaching of nutrients from lawn fertilizers can stimulate aquatic weed and algal growth in riverine/lake habitats and degrade ambient water quality conditions. Excessive applications of lawn insecticides and herbicides have been documented to cause "fish kills" and surface water quality degradation.

Recommendations

Stream Crossing Protection

The installation of an arch culvert will for the most part minimize direct impacts to Robbins Brook. This crossing structure will allow for unimpeded fish passage through this section of the brook and will also assist in the protection of instream habitats in the area of the crossing. That being said, the proposed existing bottom width of the arch (32 feet) could disturb the streambanks of Robbins Brook in areas where concrete footings will be installed. Thus, it is recommended that the bottom width of the arch be increased in size to minimize disturbances to both streambanks.

As a best management practice, any unconfined instream work within Robbins Brook should be restricted to the period from June 1 to September 30, inclusive. A June 1 through September 30 timeframe can be utilized as an effective mitigation measure for construction related disturbances due to the following reasons: (1) timeframe will serve to protect the spawning, egg incubation, and fry development of resident fishes, (2) timeframe does not interfere with seasonal migratory behaviors, and (3) timeframe coincides with historic low rainfall levels in Connecticut a period in which instream construction activities such as dewatering, excavation, trenching, and cofferdam placement are most effective.

Riparian Corridor Protection

It is the policy of the Connecticut Department of Environmental Protection Inland Fisheries Division that riparian corridors be protected with a 100-foot wide riparian buffer zone.

A copy of this policy was cited and presented in the applicant's report entitled "Ecological Evaluation and Assessment: Proposed Residential Lots Adjacent to Riparian Habitat along the Five Mile River". Due to prior disturbances from sand and gravel excavation, the existing riparian corridor along Upper Quaddick Reservoir/Five Mile River does not meet those recommended riparian corridor protection guidelines. That being said, there are still opportunities to increase vegetated riparian corridor width through plantings, especially on lots 8 through 10.

It is critical that a conservation easement be developed for this subdivision since lots abutting Upper Quaddick Reservoir may be marketed as shoreline/waterfront property and potential landowners would naturally be inclined to clear a view to the water's edge and replace the existing riparian zone vegetation with turfgrass. The easement should be designed such to protect the existing riparian corridor from future clearing and other vegetative alterations.

Erosion and Sediment Control Plan

It is recommended to develop an aggressive and effective erosion and sediment control plan that utilizes guidance as described in the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control. Proper installation and maintenance of erosion/sediment controls is critical to environmental well-being, especially for proposed arch culvert/road construction activities near Robbins Brook. This includes such mitigative measures as filter fabric barrier fences, staked hay bales, and sediment basins. Care also has to be taken for lots adjacent to Upper Quaddick Reservoir. Given the presence of banded sunfish in this waterbody, a fish species that require clear, low turbidity water conditions (Jann 2001), it is essential that construction related activities do not increase pond turbidity levels significantly above ambient conditions.

Land disturbance and clearing should be kept to a minimum and completed in phases. That includes construction related activities associated with the Robbins Brook crossing and construction of the sediment basin and its outlet. All disturbed areas should be restabilized as soon as possible. Exposed, unvegetated areas should be protected from

storm events. The applicant and the local wetland enforcement officer should be responsible for checking construction on a periodic basis to ensure that all soil erosion and sediment controls are being maintained. In addition, the applicant should post a performance bond with the town to protect against possible soil erosion violations. Past siltation disturbances in Connecticut have occurred when individual contractors either improperly deployed mitigation devices or failed to maintain these devices on a regular basis, especially after storm events.

Stormwater Management

Consideration should be given to converting the sediment basin to a combined sediment/detention basin so as to control stormwater runoff from this development. It is recommended to encourage stormwater sheet flow from streets by eliminating the placement of bituminous concrete curbs and consider the use of vegetated roadside swales. The use of sand and sodium chloride road salt to de-ice paved surfaces should be minimized.

Lawn Chemicals/Fertilizer

Property owners should consider having the soil in lawns tested to identify which nutrients are sufficiently abundant and which nutrients are not. This information tells you which nutrients you need and don't need to put on your lawn. Whenever possible, landowners should use fertilizers with little or no phosphorus. The use of low or non-phosphorous fertilizers can provide nutrients while avoiding threats to water quality.

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Conservation District Review

General Observations

The water quality of Robbins Brook (the “Brook”) is high (Class A watercourse by the Surface Water Quality Classifications for Connecticut) and the town of Thompson is concerned about impacts to the Brook. Concerns center on and near the confluence of the Brook and the Five Mile River (the “River”). The ECCD finds the location for a bridge, while not ideal, if constructed and maintained properly, should have little long term impact on the water quality of the Brook. The District recognizes that the town has already ruled that this bridge is a necessary response to the needs of developing this particular site due to the length of Logan’s Lane. However, the District finds that if the appropriate exceptions had been made for the construction of Logan’s Lane, obviating the need for a bridge, water quality concerns would have been significantly reduced. Stormwater is likely to be the most significant long-term concern for the water quality of the Brook and River.

Conservation Easements

As a conservation organization, ECCD submits the following for consideration:

- a) Quaddick State Forest property adjoins this property which offers a convenient amenity and value to the future property owners. This should be taken into consideration when considering approval of this development. The District suggests that adjoining land to the Five Mile River and the Brook within this development including the back portions of lots 5, 4, 3, 2 and 1 be designated as a Conservation area. This would contribute significantly to the long-term health of the river by assuring the long-term legal conservation of this important riparian buffer. This would likely add value to this land for its owners as well as providing

- a large contiguous area of wildlife habitat and a corridor connecting to the state land.
- b) Should the property be developed, ECCD notes that the wetland area where the Brook meets the Five Mile River and areas just up and downstream is an exceptionally beautiful site and is likely to be visited by residents and visitors, whether or not trails or access points are there for them to do so. The town may want to take this into consideration when making a decision about this property.

Erosion and Sediment Control

If the Town of Thompson plans to approve this proposal, it is strongly suggested that the Town require the applicant to comply with Connecticut's Erosion and Sediment Control Guidelines. This would involve requiring the submission of a complete and acceptable E & S plan, prior to granting final approval of the project. (Note: One of the services ECCD provides is an independent review of E & S plans, should the project proceed to that step.) A thorough review of the existing E & S plans is not submitted here, but the plans, as they exist, are insufficient.

Stormwater Impacts From The Property

The site plan, as it currently is proposed (January 2006), shows (sheet 3 of 18 "Subdivision Map [Lots 1-13 & Parcel 'B']") a stormwater drainage area approximately 50' in width and undefined length from Logan's Lane to Robbins Brook. This area appears on the development plans, and was indicated orally by Provost & Rover, Inc. representatives, to be the location where most, if not all, storm drainage would flow from the development. This includes runoff up to and probably from the proposed bridge over the Brook.

The existing Stormwater Management design as shown in the Plan uses traditional catch basins and storm drains to take all runoff from an elevation point of approximately 478

feet along Logan Lane (see Sheet #8) to a point just north and west of the bridge where runoff flows into the basin. It is not clear from these plans how much water exactly would be conveyed in this manner but the traditional design with a modified riprap sedimentation basin at the base is deemed inadequate by the District. In the District's own experience, and in consultation with state and federal agencies that routinely evaluate these designs, water quality entering the Brook will not be maintained and, indeed, the basin will become impaired for impeding water flow (energy dissipation). All runoff will receive no treatment from and into the basin. Once there it will merely be slowed before entering the brook. For some time it may catch sediments, however, once filled it will require vacuum removal of these sediments. The existing design will be difficult to maintain for the town. Conservatively designed basins use a concrete or similar filler both to hold the riprap in place and to ease the cleaning of the basin. Further, without the use of significant sized riprap (standard riprap) beyond what most developers routinely use (in this case modified riprap), a large storm event will wash many of these stones into the Brook.

In the District's experience, children of residents who begin to occupy the homes, will inevitably find this location, owing to its proximity to the bridge, the brook and river, and dislodge, remove and otherwise disturb the riprap, further contributing to the dissolution of this basin. Riprap must be properly installed and maintained in order to slow the flow of water entering the brook and to catch sediments. The district suggests that the commission, at the very least, have the basin be more robustly designed. Further, it is strongly suggested that a complete alternative design, the function of which is to treat and promote infiltration of the water before it enters the Brook. This can be accomplished using one of numerous natural (soils and sediments underlying the property are conducive to ameliorating the impact of storm events) or manmade designs most of which can be found and evaluated in the 2004 Connecticut Stormwater Quality Manual. Depending on the experience of the developer, costs can be less than those associated with the traditional stormwater system as shown in these plans. The need for the installation of a concrete water conveyance system can be eliminated at this site.

Bridge Construction and Associated Water Quality Concerns for Robbins Brook

A copy of the Stream Crossing Assessment and Mitigation Plan, prepared by Triton Environmental, Inc. was given to the District. Additionally, the Senior Project Manager of this plan was available for an overview and for answering questions on the day of the ERT. The ECCD will defer to this report for the commission to make an assessment of the biological impacts post construction of the bridge.

The District found that the scope of the mitigation report prepared by Triton did not encompass an evaluation or recommendations for the construction period of the bridge. It is during this period, assuming the bridge is properly built and maintained, that the most biologic and physical impact to the stream is likely to take place, and this being only yards upstream of the Five-Mile River, leads to several concerns. Often a temporary stream crossing to prevent construction vehicles from damaging stream banks and tracking sediment and other pollutants into the stream is performed. The District concludes from the plans that no diversion of the stream or temporary stream crossing has been proposed. It is suggested that the bridge construction plans include all accepted BMP's for such construction and that a qualified professional review those plans on the town's behalf. The District suggests that the town agent perform daily inspections at the time of clearing and when the footings are built and that the plans clearly indicate where and how proper barriers will be erected prior to the construction of the bridge to prevent equipment and streambank eroded materials from entering the Brook

The ECCD suggests that the town inspect (or have a qualified inspector on its behalf, hereafter referred to as an "agent") monitor the construction of the bridge for proper E & S controls, particularly before and after significant rain events. The District also would concur with the offer by Triton Environmental that a post-construction inspection of the stream by a qualified biologist be performed, particularly if, during the construction phase, the town's agent finds any areas of concern that may impact biologic functionality of the stream.

The District does not believe that there will be sufficient loss of streambank vegetative cover to thermally impact the Brook. What loss will occur will largely be mitigated by the shading provided by the bridge and the additional affected areas on either side of the bridge are insignificant in regards to thermal impact. Larger areas upstream along the brook were observed to lack full canopy coverage and the stream's biologic integrity has remained high. The Commission's long-term concerns for the thermal integrity of this brook are likely to be 1) the future loss of large swaths of vegetation along the banks of the Brook, and 2) the future installation of impervious surfaces near the Brook, and 3) the addition of ponds in the watershed of the brook.

Appendix

A Watershed Perspective

General Watershed Characterization

This subdivision development proposal lies within the Five Mile River Subregional Basin, or watershed, approximately 39 square miles in size. This smaller watershed in turn is nested within the Five Mile River Regional Watershed (DEP Region Basin #34), which is about 76 square miles in size. Approximately 75% of this regional basin lies within Connecticut's boundaries. In turn, this regional basin is nested with the larger Thames River Major Basin. The regional Five Mile River watershed originates in south-central Massachusetts (in towns of Webster and Douglas) and north-western Rhode Island, before flowing through the major conduit, the Five Mile River, through the town of Thompson, downstream into the Town of Putnam, and then through the Town of Killingly. The Five Mile River eventually discharges into the Quinebaug River in the Danielson section of Killingly, before traveling eventually to the Shetucket River and Thames River before discharging to Long Island Sound at New London and Groton, CT.

The term watershed can mean different things to different people. Here, one can envision a "watershed" as the land area that drains to a common receiving water body such as a stream, lake or wetlands. It is an easily identifiable landscape unit that ties together terrestrial, aquatic, geologic, and atmospheric processes.

The major river in this regional basin is of course the Five Mile River, with several tributaries that include Blackmore Brook, Rocky Brook, Mary Brown Brook, and Whetstone Brook. Robbins Brook does originate in Burrillville, Rhode Island in Douglas State Forest. Several sizeable lakes and ponds within the Town of Thompson include Little Pond, Long Pond, the impoundment Five Mile River at Stump Pond and Quaddick Reservoir (North and South), Lower Pond, along with several smaller waterbodies. Large wetlands include Jerry's Swamp in the northern portion of Town forming partial

headwaters to the Five Mile River. At the mouth of the Five Mile River is the impounded Five Mile Pond in Danielson.

The development proposal location has underlying Quaternary geology map units identified as glacial period deposits of related river sediments from dammed ponds – these are known as Five Mile River Deposits. Site plan reviewers utilize this Quaternary geology data to interpret the glacial and post-glacial deposits across Connecticut. Complementing this information is Connecticut’s Surficial Materials data. Surficial material units describe *textures* of unconsolidated glacial and post-glacial materials including artificial fill, postglacial, fine, coarse, stacked coarse, coarse over fine, fine over coarse, till, thick till, end moraine and water. These units are generally comprised of gravel, sand, fines, till, alluvium, and swamp deposits. Glacial melt-water deposits (stratified deposits) are described in terms of their vertical distribution of textures as well as their areal extent. These deposits are particularly emphasized because they comprise the major groundwater aquifers in the State and are also a major source of construction aggregate. For this Thompson site development proposal, the clear evidence is seen with the active sand and gravel extraction operation occurring on portions of this site. The surficial materials are texturally identified as Sand and Gravel over Sand.

This regional basin has a relatively rural human population across the landscape, with an average of nearly 300 people per square mile. There are some urbanized portions in the lower basin at Danielson, CT. Nearly 53 % of the regional watershed is classified as having deciduous forest cover, followed by nearly 13% of coniferous forest cover, followed in decreasing land cover dominance by mixed forest (7%), and a combined residential/active agriculture/turf land cover classification of around 5 %.

The CT Department of Environmental Protection (DEP) and the USDA Natural Resources Conservation Service (NRCS) conducted a Unified Watershed Assessment (UWA) for all Connecticut regional basins or watersheds, as part of the 1998 federal Clean Water Action Plan. The assessments were the results of a compilation and review of available information on surface water conditions, land use conditions and known pollution sources. Local knowledge and critique was requested to reinforce the

assessments. The Five Mile River regional watershed was classified as a Category 1 watershed – identifying the watershed priority need for Protection (as opposed to Category 2 watersheds with priority for Restoration). The UWA Classification for the Five Mile River regional basin has assisted both DEP and NRCS with forming watershed management objectives to focus work towards protection of the relatively intact watershed processes and functions. These same agencies also use the UWA process to target watershed restoration funds made available under Section 319 of the federal Clean Water Act. Nearby regional basins with Category 2 assessments include the Quinebaug River basin.

Water Quality Conditions

Surface and Ground Water Classification

The current Connecticut surface water quality classification for the Five Mile River and the Robbins Brook tributary is A. These waterbodies are either known or presumed to meet the Criteria which support designated uses. These surface waters have designated uses for: habitat for fish and other aquatic life and wildlife; potential drinking water supplies; recreation; navigation; and water supply for industry and agriculture. The management goal is to protect these designated uses. Permitted wastewater discharges are limited in Class A and AA surface waters.

The current Connecticut ground water classification for the associated development area is GA. The designated uses for GA waters are: existing private and potential public or private supplies of water suitable for drinking without treatment; baseflow of hydraulically-connected surface water bodies. The CT DEP presumes that ground water in such areas is, at a minimum, suitable for drinking or other domestic uses without treatment. The management goal is to protect these designated uses of the Five Mile River and Robbins Brook ground water resources.

Water Quality Assessment

The 2004 Connecticut Water Quality Assessment report (aka the biennial 305b Report to Congress) indicates the Five Mile River segment associated with this subdivision development proposal is in Full Support for Fish Consumption; but no other designated uses have been recently assessed. CT DEP has not conducted a water quality assessment for Robbins Brook. There are no known impairments to segments of either the Five Mile River or of Robbins Brook in the vicinity of this subdivision development proposal.

Potential Water and Watershed Issues

Leachate and Wastewater Discharge Inventory

There are no known wastewater discharges or leachate sources included in the Connecticut DEP databases for area included within or adjacent to the Spicer Road Realty subdivision parcel. This database for the greater Thames River basin is being revised and will be brought forward for public comment in the summer of 2006.

Contamination or Potential Contamination Sites

The Department maintains a database of “Hazardous Waste Facilities” as defined in Section 22a-134f of the Connecticut General Statutes. A review of the listings within the Town of Thompson does not indicate any sites within or proximate to this proposed development site. For more information about this statewide database, visit the CT DEP website at: <http://www.dep.state.ct.us/wst/remediation/sites/sites.htm>

Water Supply Wells

A cursory review of the CT DEP’s database indicates there are no identified major public wells associated with this subdivision proposal.

Stream Channel Encroachment Lines (SCEL)

These SCELs are regulated areas in Connecticut. They are a nonstructural element in the State of Connecticut’s ongoing effort to reduce the loss of life and property from flooding events. This program is administered to assure that floodplain development is compatible

both structurally and hydraulically with the flood flows expected in 270 miles of the State's most flood prone rivers regulated under this program. The actual encroachment lines delineate the limits of State authority, and in general, roughly outline the limits of the national flood insurance program 100-year riverine floodplain. Town land use commissions reviewing site conservation and development proposals can assist State regulatory actions by alerting private and public landowners of designated SCELs. There are no SCELs designated for this or other segments of the Five Mile River. There are designated SCELs in the abutting French River corridor in Thompson. Any questions regarding the SCEL program should be directed to the CT DEP Inland Water Resources Division at (860) 424-3019.

Aquifer Protection Areas (APAs)

This parcel is not located within an approved Aquifer Protection Area (APA). Additional information about the Connecticut APA Program, including guidance to municipalities for aquifer protection not included in the current designation areas, can be found at the CT DEP website at: <http://www.dep.state.ct.us/wtr/aquiferprotection/index.htm> .

Watershed Planning Considerations

Riparian/Wetland Areas

When developing watershed management efforts, riparian/wetland areas are often the first place one looks. This is true in part because a functioning riparian area (the interface between water and adjoining lands) can be an indication of a functioning watershed. Although riparian/wetland areas occupy a rather small footprint on most landscapes, their highly variable and complex combinations of physical and biological characteristics create tremendously productive ecosystems.

The physical functions of healthy riparian systems include:

- sediment and pollutant filtering,
- bank stabilization, and
- surface/ground water storage and release.

When these physical features are working they are able to sustain a range of benefits or values such as fish and wildlife habitat, flood control, erosion and sediment control, recreational opportunities, and more. In brief, these areas serve as places of great ecological, social, cultural, historic and aesthetic importance.

An important aspect of the Thompson IWC site plan review should go towards the protection of myriad resources within the shoreline of the Five Mile River and the Robbins Brook tributary. These natural shorelines do produce a variety of benefit to landowners, and the natural world, in significant ways.

With water quality, shorelines can effectively trap and filter sediments and debris from rain events and snow melt. On average, wider shorelines are more effective than narrow shorelines. Further, vegetated shorelines comprised of trees, shrubs and grasses are more effective in this function than with just grass cover.

With flood control, shoreline vegetation will slow the flow of runoff and provide for infiltration into soil. This in turn will aid in subsurface, or ground water, recharge. That ongoing process, if left undisturbed, can supply benefits to Robbins Brook and the Five Mile River by maintaining water flow during the drier times of the year. Building within or adjacent to delineated floodplains can increase the risk for property damage on-site and to downstream portions of the community. It should be noted that there are mapped floodplain areas that extend beyond the delineated inland wetland areas of this subdivision proposal. Full and complete floodplain resource protection should be a priority consideration by the Thompson Inland Wetlands Commission.

Another value to protect is that of shoreline stability. Native vegetation or well-designed naturalized plantings can stabilize these zones and reduce erosion potential. Within the stream channel, aquatic plants can help protect the abutting shoreline by deflecting and absorbing wave action and boat wakes.

Additional benefits of protecting intact shorelines are aquatic habitat, upland wildlife habitat, recreation, aesthetics, and even property values. Prospective buyers to an approved subdivision at this site are likely drawn in part to the current and future potential high quality condition of Robbins Brook and the Five Mile River shorelines.

The protection and enhancement of these shoreline resources can be realized through several options available to the IWC. Some of these are provided in the following discussion points and recommendations.

Thinking About the Watershed Picture

It may help the Commission to step back from this lengthy site development review process and think about the big picture. Everyone lives in a watershed. Everyone lives downstream. Everyone has an impact, and everyone can make a difference.

With that said, there are no known watershed-based plans developed for the Five Mile River basin. However, there are several local initiatives and actions taken that reflect community interest and support to protect the high quality water resources of this river basin:

- The Town of Thompson lies within the federally designated Quinebaug and Shetucket Rivers Valley National Heritage Corridor. It is the mission of the Quinebaug-Shetucket Heritage Corridor, Inc. “to conserve, celebrate and enhance the significant historical, cultural, natural and scenic resources of the Last Green Valley while promoting a quality of life based on a strong, healthy economy compatible with the region’s character.” A ten-year Management Plan is being managed by the non-profit management entity, QSHC, Inc., headquartered nearby in Putnam, Connecticut. One tangible element of the Plan’s objective related to water resources planning and management and this subdivision proposal is a volunteer water quality monitoring pilot program, coordinated through a QSHC Committee, being proposed in at least one Thompson watercourse within the coming months. Information about the Corridor’s Management Plan can be found online at: www.thelastgreenvalley.org

- The Nature Conservancy (and the Wyndham Land Trust) has acquired acreage on upper watershed Long Pond to protect several Connecticut listed species in this rather unique freshwater habitat.
- The State of Connecticut has acquired substantial acreage as Quaddick State Forest just downstream of this subdivision proposal and along portions of Quaddick Reservoir (including Quaddick State Park).
- In 2001 the Town of Killingly adopted a Five Mile River Protection Overlay District for a segment of this river. The publicly recognized purposes of the regulations include:
 - ❖ contribution to the regional conservation of the river corridor;
 - ❖ prevention of any alterations to the natural flow of the river, in order to maintain its ecological, recreational, aesthetic and other qualities;
 - ❖ prevention of water pollution caused by erosion, sedimentation, nutrient or pesticide runoff and waste disposal facilities and to encourage retention and enhancement of shore vegetation cover;
 - ❖ conservation of the ecological, water supply and flood storage functions of the river's floodplain and related groundwater table and aquifer recharge areas;;
 - ❖ protection of valuable fisheries and wildlife habitat within and along the Five Mile River;
 - ❖ conservation and enhance the natural scenic and topographic conditions of the river corridor; and
 - ❖ carrying out the recommendations of the Town Plan of Conservation and Development and the State Plan of Conservation and Development.

Recommendation

The Town of Thompson IWC, in consultation with the Town Planner, should consider communicating with the Town of Killingly, Director of Planning and Development, to better understand that Town's adoption of the overlay protection district and determine if portions of the northern Five Mile River may be better protected within Thompson with

such overlay protection regulatory review. A river resource protection vision could include the combination of:

- a) site-specific conservation easements and/or dedicated open space provisions to the Town of Thompson (or agreed-upon third party land trust) to protect critical river corridor resources within the Spicer Road Realty Subdivision proposal; and
- b) longer-term coordination with the Town of Killingly (and in the future with the Town of Putnam) to plan, design, and effect a river corridor protection and commensurate conservation development system for the Five Mile River and its significant tributaries.

The Town of Thompson can look to the successful, 10-year old Farmington River Overlay Protection Districts that were researched, adopted and regulated by five (5) towns sharing borders along the Farmington River in north-central Connecticut. For more information, contact the Farmington River Coordinating Committee, on the web at: www.farmingtonriver.org.

Because non-point source pollution comes from almost everywhere, it cannot be regulated in the same way as point source discharges (those areas having a limited number of specific places where the pollutants originate). Conventional zoning can actually contribute to the problem of nonpoint source pollution by not including the impacts of nearby development. As an example, this subdivision proposal includes the Town-required 50-foot setback (in the RA-80 Zone) from the proposed Logan's Lane. This Town regulation effectively pushes proposed building envelopes closer to the river/stream and associated riparian/wetland area, raising the potential for degradation to those resources with construction and post-construction activities.

Recommendation

The Thompson Inland Wetland Commission should consider requesting practical and feasible alternative site plan design(s) to accommodate flexible subdivision, protection of priority natural resources, and lot layout and configuration to protect the integrity of the Five Mile River shoreline and associated riparian/wetland area. This recommendation is supported at the local level through resource inventory, analyses, and conclusions published in the *Town of Thompson Conservation and Open Space Plan*, December 2005.

Storm Water Management and Treatment Practices

Considerable discussion took place during the March 22, 2006 ERT site walk about alternative site design and incorporation of low impact development (LID) elements into a potential revised submission to Thompson IWC. As this reviewer understands the current proposal, approximately 18 acres will be subject to a conventional “capture and conveyance” stormwater management system. The development’s stormwater runoff will then discharge through a single, modified riprap-lined sedimentation basin that is partially located within the riparian wetland area of the Five Mile River and close to the confluence with Robbins Brook.

One issue of concern for this proposed stormwater discharge location was potential resource impact to the confluence of Robbins Brook and the Five Mile River. It was hypothesized the cooler Robbins Brook water temperature may provide summer refugia to cool/cold-water riverine fish species inhabiting the Five Mile River. Precipitation from summer storm events is currently proposed to be collected from rooftops, driveways and paved Logan’s Lane and conveyed to this single discharge location near the confluence of these two watercourses. A likely result will be quick spikes in elevated water temperatures and other pollutant loadings that enter the mixing zone of the Five Mile River during low river-flow conditions. This is an example of considering the cumulative impacts of numerous activities within a given watershed that may affect either the quality and/or quantity of water resources within the Five Mile River.

Another issue of concern voiced during the site visit was the limited use to work with on-site resources to protect existing hydrologic processes and hydraulic connections. This parcel has been extensively altered with earth materials extraction activities.

Representatives for the development applicant indicate that the underlying groundwater table is currently protected by leaving an overburden thickness of 4+ feet above the seasonal water table elevation and planned final grading (per older State guidance/regulations). New phases of the permitted excavation were mentioned as

needing to be under revised regulations that require a minimum of 6 feet of appropriate overburden, and verified by standpipe tests. It is this reviewer's understanding that the Planning and Zoning Commission would assure satisfactory closure of the excavation on this parcel prior to any construction phase of a permitted residential subdivision.

The high percolation rates of these remaining stratified drift deposits may be appropriate for the encouragement of on-site infiltration, and possible pollutant treatment, of stormwater runoff associated with residential development.

The USDA Natural Resources Conservation Service - CT Office (NRCS) produced a publication in 2005 that will be of value to Town of Thompson commission site plan review. Entitled, *Soil Based Recommendations for Storm Water Management Practices* (CT-TP-2005-3), this report includes four soil survey interpretations that evaluate the suitability of Connecticut soils for four widely used post-construction stormwater runoff management systems. The purpose of these interpretations is to help people use soil survey information as a screening tool for successful selection and implementation of best management practices (BMPs) for stormwater runoff. NRCS personnel are available to provide more information about these interpretations. Contact Lisa Krall, Soil Interpretation Specialist, at the NRCS State office in Tolland at (860) 870-4942 X 110.

Another valuable guidance document is the *2004 Connecticut Stormwater Quality Manual*. Information about urban stormwater characteristics can be found in Volume 2 of that manual. The Town Hall should have at least one copy of the manual. An online, downloadable version is also available on the CTDEP website, at: <http://www.dep.state.ct.us/wtr/stormwater/strmwtrman.htm> . The CT DEP promotes this Manual for use as a planning tool and design guidance document. The Manual assists local (and state) land use commissions and government officials to design and review projects in a technically sound and consistent manner. A strong emphasis of the Manual is dedicated to site planning and design. This consists of preventative measures that address core causes of stormwater problems by maintaining the pre-development hydrologic functions and pollutant renovation mechanisms to the extent practical. Elements of such site design and planning include concepts raised in this review:

alternative site design for transportation infrastructure and lot layout, watershed planning, and LID management practices.

It is generally recommended that reducing and treating runoff from all developed sites and reducing the amount of impervious surfaces, where feasible, is the best way to manage stormwater runoff. By promoting infiltration, the volume is reduced and impacts to water quality and quantity are minimized. Thus, stormwater must be addressed with appropriate Best Management Practices.

This reviewer defers detailed stormwater design and management comments to other sections of this ERT report. However, the documents listed above are offered for consideration by the Thompson IWC for alternative site designs to utilize the available soils for effective stormwater treatment and overall management, thereby reducing potential direct and indirect impacts to the Five Mile River and Robbins Brook. This addresses at least one core concern raised by the Thompson IWC that initiated this ERT review.

Protection of Priority Sensitive Watershed Resources

The potential introduction of 13+ residential homes and associated transportation, water supply and sewage disposal facilities along Logan's Lane, and within close proximity to sensitive resources of the riparian/wetland areas of Robbins Brook and the Five Mile River, necessitate a long term management strategy and action plan.

Recommendation

- A. The Thompson IWC should suggest the applicant consider provision of either conservation (restriction) easements to the Town (or agreed upon third party land trust), or provide for fee simple open space transfer to the Town to encompass a 100 foot vegetated riparian and upland buffer along the two watercourses within this development site. The initial preference is for this area to be placed in common ownership, rather than scattered amongst a dozen or more future

- landowners, which can make long-term management of said resources very difficult.
- B. The agreement(s) should require a visible boundary marker program, complete with marker locations, allowable signage, delineation of boundaries on filed approved site plans, a schedule of marker installation prior to on-site construction phases and maintenance responsibilities through the post-construction period.
 - C. Further, specific language should be included in said agreements, whether this area is held in private or public ownership, which clearly describes permitted clearing limits for pedestrian paths, water views and other forecasted interests to access or otherwise use this resource area. Guidance may be offered in agreement language by area towns or land trusts that coordinate their own land conservation and stewardship programs.

Recommendation

The Thompson IWC should request reasonable public access to, and installation of, an information kiosk in an appropriate overlook segment of the protected riparian area to assist Town plans to educate its citizenry about the challenges and opportunities for watershed protection and issues relating to land use and water quality. This recommendation is supportive of a parallel statement made in the Town's Conservation and Open Space Plan.

Groundwater Resources Protection

The CT DEP has developed a useful guide for municipalities to promote locally-based groundwater resource protection. This guide and local town maps were provided during outreach presentations across the State – check with your Town Hall staff. Since the very large majority of Thompson residents, and potential residents of this subdivision, rely on individual private water wells for drinking and other consumptive uses, it is the Town's best interest to proactively plan for and develop action steps to protect ground water resources for current and future Thompson residents. The Department's Water Quality Planning program can provide a copy of this municipal handbook and other guidance for

site plan review to address concerns raised during the ERT request for development impacts to groundwater resources and eventual discharges to surface waters of Robbins Brook and Five Mile River. Contact the CT DEP Water Quality Planning program at (860) 424-3020.

Connecticut State Policies and Plan 2005-2010

The State Policies Plan serves as a statement of the development, resource management and public investment policies for the State. The Plan is used as a framework for evaluating plans and proposals submitted to OPM for review through mandated review processes. The latest revision of this five year Plan introduced six Growth Management Principles and associated policy recommendations intended to better integrate state planning functions across agency lines and to provide a more prescriptive advisory tool for municipalities and Regional Planning Organizations when they revise their own plans. The current State Plan designates this area of the Five Mile River watershed as a combination of Preservation lands, Conservation lands and Rural Lands. The State Plan has an essential visual component known as the Locational Guide Map.

Recommendation

This document should be considered for background review by the Thompson IWC when evaluating site conservation and/or development proposals, within a regional or watershed context, as consistent with the local Plan of Conservation and Development. The Thompson Town Hall should have an accessible State Plan copy to review. The Plan can also be viewed and downloaded off the Connecticut Office of Policy and Management website at: <http://www.opm.state.ct.us/igp/cdplan/cdplan2.htm>

The following are the State Policies Plan components of Conservation Area Policies as identified on the Locational Guide Map (in order of priority):

- 1) Existing Preserved Open Space – Support the permanent protection of public and quasi-public land dedicated for open space purposes (e.g. Quaddick State Forest and State Park).

2) Preservation Areas – Protect significant resource, heritage, recreation, and hazard-prone areas by avoiding structural development, except as directly consistent with the preservation value (e.g. Five Mile River floodway, inland wetlands, existing waterbodies, archaeological and natural resource of regional or state significance).

3) Conservation Areas – Plan for the long-term management of lands that contribute to the state’s need for food, water and other resources and environmental quality by ensuring that any changes in use are compatible with the identified conservation value (e.g. flood fringe areas, sand and gravel resource areas exceeding 50 acre feet, natural areas of local significance, including conservation easements).

4) Rural Lands – Protect the rural character of these areas by avoiding development forms and intensities that exceed on-site carrying capacity for water supply and sewage disposal, except where necessary to resolve localized public health concerns (policy is to discourage development that exceeds on-site carrying capacity for water supply and sewage disposal and inconsistent with adjoining rural community character).

ABOUT THE TEAM

The Eastern Connecticut Environmental Review Team (ERT) is a group of professionals in environmental fields drawn together from a variety of federal, state and regional agencies. Specialists on the Team include geologists, biologists, foresters, soil specialists, engineers and planners. The ERT operates with state funding under the supervision of the Eastern Connecticut Resource Conservation and Development (RC&D) Area — an 86 town region.

The services of the Team are available as a public service at no cost to Connecticut towns.

PURPOSE OF THE TEAM

The Environmental Review Team is available to help towns and developers in the review of sites proposed for major land use activities. To date, the ERT has been involved in reviewing a wide range of projects including subdivisions, landfills, commercial and industrial developments, sand and gravel excavations, active adult, recreation/open space projects, watershed studies and resource inventories.

Reviews are conducted in the interest of providing information and analysis that will assist towns and developers in environmentally sound decision-making. This is done through identifying the natural resource base of the project site and highlighting opportunities and limitations for the proposed land use.

REQUESTING A REVIEW

Environmental reviews may be requested by the chief elected official of a municipality and/or the chairman of town commissions such as planning and zoning, conservation, inland wetlands, parks and recreation or economic development. Requests should be directed to the chairman of your local Conservation District and the ERT Coordinator. A request form should be completely filled out and should include the required materials. When this request is reviewed by the local Conservation District and approved by the ERT Subcommittee, the Team will undertake the review on a priority basis.

For additional information and request forms regarding the Environmental Review Team please contact the ERT Coordinator: 860-345-3977, Eastern Connecticut RC&D Area, P.O. Box 70, Haddam, Connecticut 06438, e-mail: cert@comcast.net