Sheldon Gravel Extraction
Pomfret, Connecticut

Eastern Connecticut Environmental review team Report

Eastern Connecticut Resource Conservation & Development Area, Inc.

Sheldon Gravel Extraction
Pomfret, Connecticut

Environmental Review Team Report

Prepared by the
Eastern Connecticut Environmental Review Team
of the
Eastern Connecticut
Resource Conservation and Development Area, Inc.

for the

Conservation Commission
Pomfret, Connecticut

Report #596

April 2006

CT Environmental Review Team Program
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Acknowledgments

This report is an outgrowth of a request from the Pomfret Conservation 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, February 22, 2006.

Karen Leonard Allen	Stormwater Permit Engineer DEP – PERD (860) 424-3842
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Kurt Walton	Transportation Planner ConnDOT – Office of Intermodal Planning (860) 594-2145

I would also like to thank Ann Hennen of the Pomfret Conservation Commission, James Rabbitt, Pomfret Town Planner, Jim Rivers, Pomfret First Selectman, Pat McLaughlin, project engineer and the applicant, and Scott Gravatt and Greg Smith, Eastern Connecticut 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 were able to view additional maps and plans. Some Team members made separate or follow-up visits to the site, while others conducted a map review only. 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. 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 sand and gravel extraction application.

If you require additional information please contact:

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Introduction

Introduction

The Pomfret Conservation Commission has requested Environmental Review Team (ERT) assistance in reviewing a proposed sand and gravel extraction.

The project site is 176 acres in size located on Searles Road behind the Steak-Umm facility. The proposal is to remove 150,000 cubic yards of material in three (3) phases over three (3) years depending upon demand for the material. There may be some possible screening of material conducted on-site. The access to and from the site will be through the Steak-Umm parking lot and access road. All truck traffic will be directed north to Route 101. No development plans have been presented for use of the site after the excavation is complete.

The site includes White Brook and its associated floodplain and wetlands. The area has been clear cut and some extraction activity has already occurred.

Objectives of the ERT Study

The town has requested the ERT to assist in a review of the project by providing comments and recommendations on the following concerns: impacts to the underlying geology and hydrology, erosion and sediment controls, stormwater management, wetlands impacts, water quality, aquatic habitat, archaeological and historic significance and traffic and access issues.

The appendix contains a copy of a review from the Eastern Connecticut Conservation District to the Pomfret Inlands Wetlands and Watercourses Commission. Also included in the report in the Stormwater Review section is a two page fact sheet from the Maine DEP for an organic sediment barrier made from stump grindings and shredded bark. It may be useful on the site since there are so many downed trees and stumps that must be dealt with.

The ERT Process

Through the efforts of the Pomfret Conservation Commissions this environmental review and report was prepared for the Town of Pomfret.

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

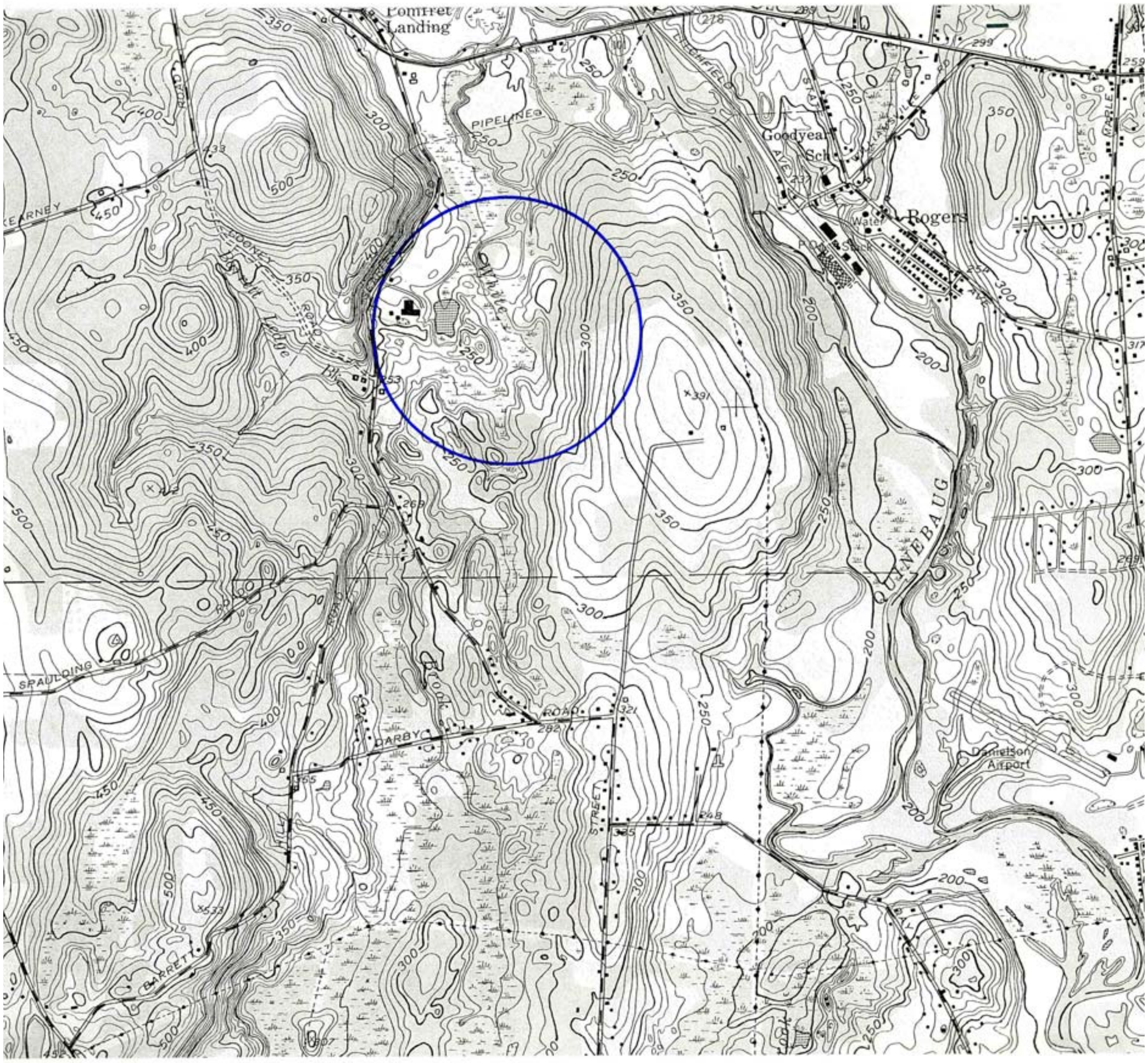
4. Presentation of education, management and land use guidelines.

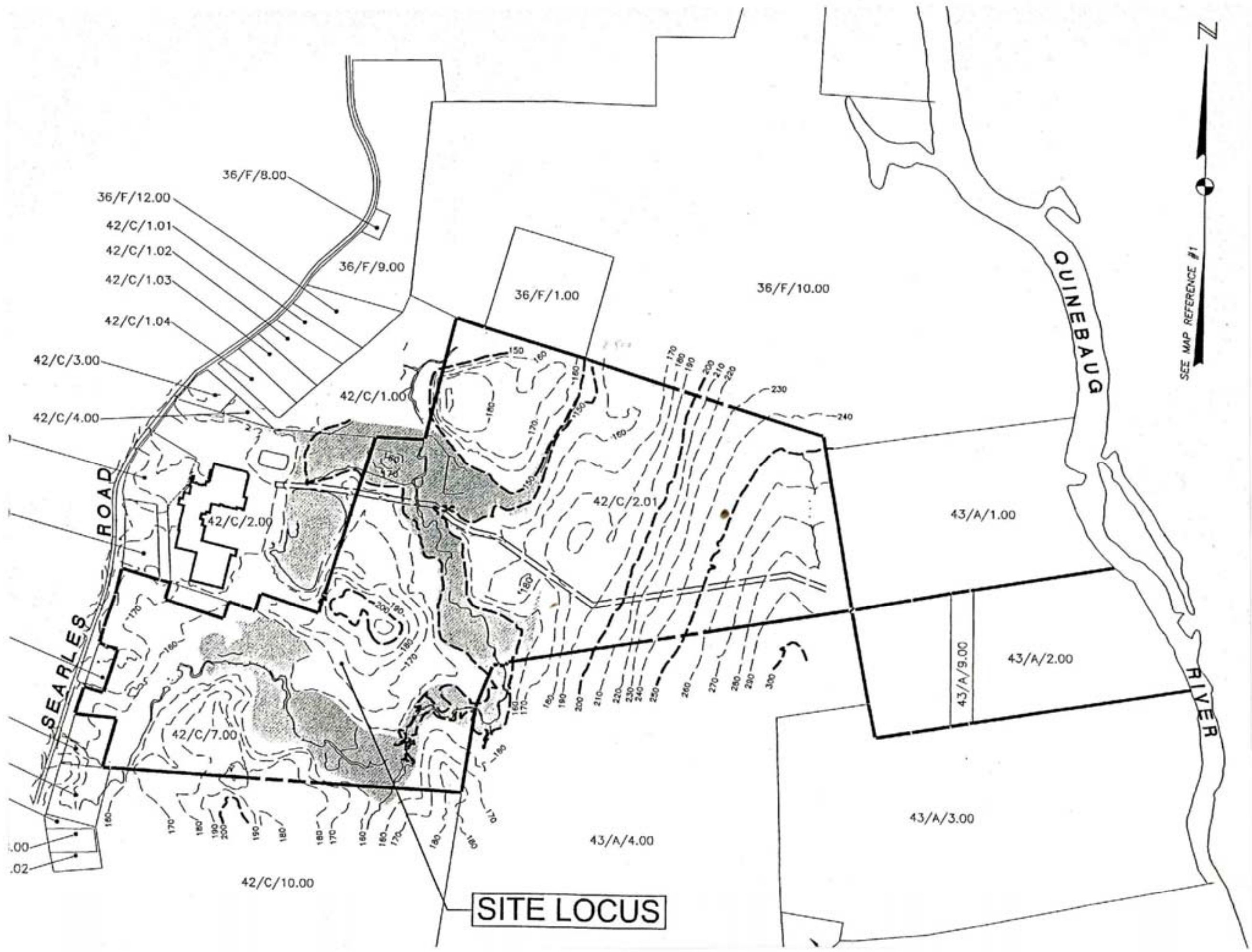
The data collection phase involved both literature and field research. The field review was conducted Wednesday, February 22, 2006. The emphasis of the field review was on the exchange of ideas, concerns and recommendations. Being on site allowed Team members to verify information and to identify other 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.

Topographic/Location Map

General Location Map
Scale 1" = 2000'





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SEARLES ROAD
QUINEBAUG RIVER
SEE MAP REFERENCE #1
N
SITE LOCUS

Geology Review

A deposit of sand and gravel fills the valley bottom of the northward flowing White Brook. The White Brook valley bottom is hummocky and uneven with knolls and small hills scattered throughout its length. The Sheldon Gravel Extraction Project proposes the excavation of one of the small hills (Fig. 1). The USGS topographic map (Danielson Quadrangle) indicates the hill has a maximum elevation of 280+' above MSL (note that engineering maps, using a different base elevation, show an elevation of 210+') whereas White Brook has an elevation that increases from just greater than 210' near the northern edge of the parcel to 220' just south of the parcel (the engineering map shows an elevation of 150' just south of the hill)[1]. Thus the hill has 60-70' of relief. The flood-plain wetlands adjacent to White Brook have elevations (as mapped by the engineering firm) that increase from 150' on the north to 160' in the south. Groundwater elevations beneath the hill should be just slightly greater (test borings indicate that to be the case).

1. *From this point on this report will refer to the engineering firm's elevation datum realizing that it is about 70 less than the MSL datum.*

Test borings and a shallow excavation (non-collapsed headwalls at the site are about 10' maximum) indicate that the hill is composed of silty-sand with minor amounts of gravel. Rare large boulders are present; none, however, were observed *in situ*. Bedding exposed in the excavation is inclined at about 20^{o} to the south. Bedding does not appear disturbed. The inclined bedding suggests the sediment was formed by deposition as foresets* on the front of a delta at the edge of a standing body of water (lake or pond). Because the size of the sand is fine, deposition was likely in water10' or more in depth.

*(*Forset Beds: The distinctly dipping sediment layers deposited on the front of a prograding delta.)*

The surficial geologic map of the area was published by Randall and Pessl (1968). Two depositional sequences are recognized in White Brook. The older sequence fills the southern part of the valley of White Brook: it extends northward to just south of the parcel (Fig. 1). This is inferred to be the southern edge of the melting glacier when that sequence was deposited. Continued melting of the ice left a depression on the valley floor that filled with water. The pond was held-in by glacial ice to the north and the older sand and gravel deposit of the first sequence to the south. It is possible that unmelted ice formed part of the barrier dam to the south (Stone et al, 2005, infer that the lake or pond was ice-dammed). The lake elevation stood about 220' (engineering datum). It is likely that scattered large blocks of ice remained in the valley. Melt water streams washed large amounts of sand and silt and some gravel into the pond, forming a delta where it entered the pond. The pond eventually and filled it in, covering any unmelted blocks of ice. The buried ice eventually melted causing the sediment deposited on top of it to collapse forming the hummocky topography. The glacier finally melted northward allowing melt-water streams access to the Quinnebaug River valley.
Final grades indicated by the engineering plans are 6 or more feet above the local water table and hence the water table elevation (see cross-section AA', Fig. 4) will likely be little-affected by the removal of the sand and gravel. Most sand and gravel aquifers

produce relatively high-yielding water wells. The amount of fine-grained sand and silt in the local aquifer will cause diminished well yields unless a layer of coarse-grained sand or gravel is encountered. Encountering a coarse grained layer is more likely to the north (because it is closer to the mouth of the melt-water stream on the delta top) and less likely to the south (closer to the pond center). Vehicle traffic during the excavation process may cause compaction of the sand and gravel near the surface but is unlikely to affect the saturated portion of the deposit. Because of the porous nature of the deposit it is unlikely that storm-water runoff or infiltration and groundwater recharge will be affected by the proposed project once vegetation has been reestablished.

References

Dixon, H.R., 1968, Bedrock Geologic Map of the Danielson Quadrangle, Windham County, CT. U.S.Geol. Surv. GQ-696.

Randall, A.D., and Pessl, F., Jr., 1968, Surficial Geologic Map of the Danielson Quadrangle, Windham County, CT. U.S. Geol. Surv. GQ-660.

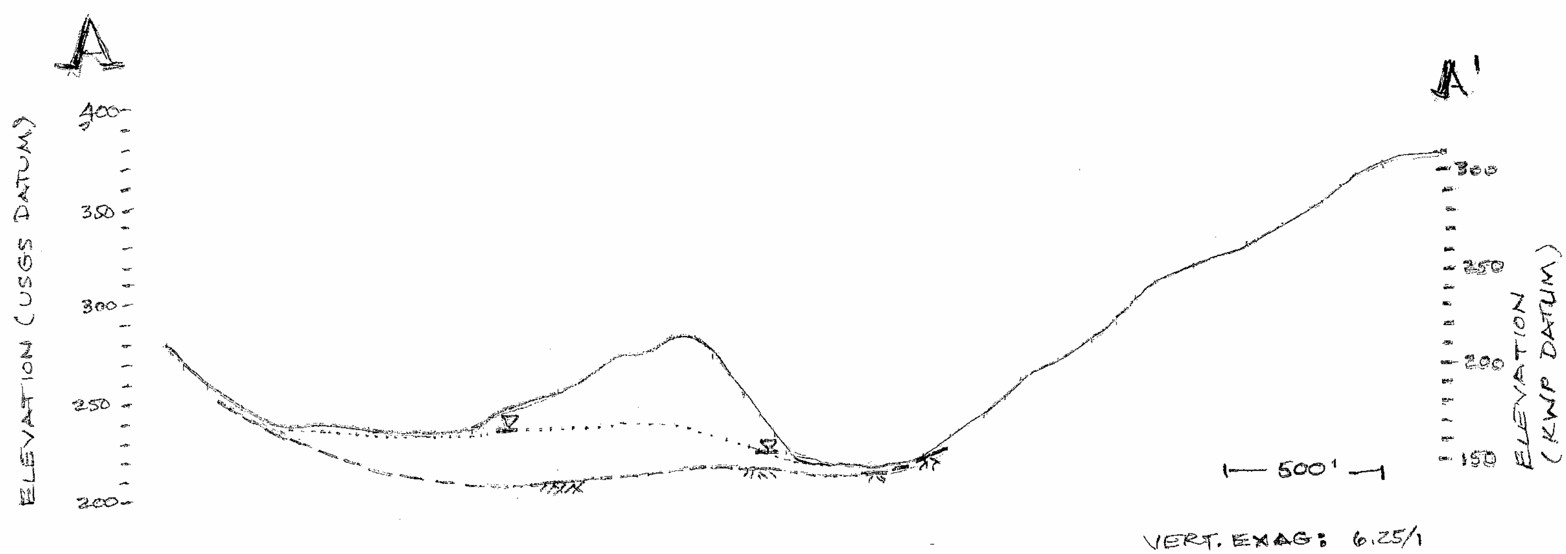
Stone, J.R., Schafer, J.P., London, E.H., DiGiagomo-Cohen, M.L., Lewis, R.S., and Thompson, W.B., 2005, Quaternary Geologic Map of Connecticut and Long Island Sound Basin. U.S. Geol Surv. Sci. Invest. Map 2784, 2 sheets.

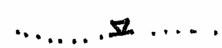
Qw_2	Sand and gravel, younger sequence
Qw_1	Sand and gravel, older sequence
Qt	Glacial till
	Melt-water channel system

Figure 1. Surficial geologic map (after Randall and Pessl, 1968) showing extent of sand and gravel deposits in White Brook and showing location of profile AA' (which is shown as Figure 4) Scale 1" = 2000'

Figure 2. Large-scale inclined bedding, dipping toward the south, in excavated portion of parcel. Note sand is predominantly fine-grained. Note also there is no evidence of deformation at this location.

Figure 3. Bedrock outcrop adjacent to White Brook east-southeast of proposed excavation. Brook here has a deep and rocky bottom, possibly bedrock. It must be noted, however, that subaqueous rocks at left center appears part of a stone fence. This observation constitutes part of the control for the cross-section AA' (Fig. 4).



 Water table; triangles are test-boring data (CKMW-2 and CKMW-5) projected into the plane of the cross-section.

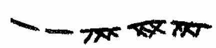
 Bedrock surface; cross-hatching are data from test borings (CKMW-7 and CKMW-2) and bedrock outcrops in and adjacent to White Brook.

Figure 4. Topographic profile AA' (see Fig. 1 for map location) showing bedrock profile and water table.

Wetland Review

The Team visited the project site and examined the areas that have already been, and have yet to be, excavated, the brook, and the floodplain. The proposal is to extract 150,000 cubic yards of sand from the property in three phases. At issue is the potential for impact to White Brook.

Discussion

The site is located in the southeast portion of town. The proposed area of work is surrounded on the northeast, east and south by White Brook. A pond of about 3.2 acres neighbors it to the northwest.

The site has varied topography. The highest point on the property has been mapped by the U.S. Geological Survey 7.5 minute Danielson topographic map at approximately 285 feet. As it passes the site, the stream lies at ~215 feet above mean sea level (MSL). In some areas, that drop of 70 feet occurs over the distance of 445 feet, yielding a slope of between 15 and 16 per cent. ***Note:*** The elevations on the plan maps as submitted use a different base elevation. The plan map elevations are 64 feet± below the USGS topographic elevations. The proposed bottom depth of the excavation on the USGS maps is 227 feet above MSL (which, minus 64 feet, is equal to the 163 elevation shown on the plans). This will be 12-13 feet above groundwater level.

White Brook was flowing unfrozen and clear at the time of the visit. It was ~12 to 15 feet wide and varied in depth, in places up to five feet. Only a stream that flows over a relatively flat surface can meander freely. A look at the stream course of White Brook reveals its wanderings, and thus the flat gradient. (A steeper gradient forces a straighter stream). It flows essentially south to north along the east side of the property.

Before it arrives at the southern part of the property, White Brook flows for a little over 3.4 miles. Upstream (south) of the project property White Brook drains approximately 2,850 acres, or about 4.5 square miles. The watershed is dominated by extensive forest cover, and includes, to a much lesser extent, agricultural land and development. As a result of this minimal land use impact on the stream, over its first 3.1 miles, the water quality is assessed by the DEP[*] as “A” on a scale of “AA”, “A”, “B”, “C”, and “D”. However, at the point of confluence with Barrett Ledge Brook the water quality degrades to “B” and continues as such as it flows past the site. After passing the site, it continues its flow north an additional ~1.5 miles and passes another excavation site before emptying into Mashamoquet Brook.

The overall land use, and its effects on the stream, has changed over time. Connecticut is fortunate to have a photographic record of land use which dates back to 1934 when the first statewide aerial photography was completed. A comparison of the site in 1934 and 2004 is seen below.

Figure 1 – This is the site in1934. Note that the pond was present and extensive agriculture in the form of cleared fields dominated the landscape. A small orchard and three farmstead buildings existed where Steak Umm is now.

Figure 2 – The site in spring of 2004. The agricultural fields are long gone with tree, shrub and grass vegetation dominating the site. The pond has changed shape and, to the east, the course of the brook has changed. Agriculture probably ended in the late1940s and revegetation of the site got underway.

The most easily recognized change between the photos is the land use, specifically, the lack of agriculture today. Seventy years ago agricultural practices had farmers clearing fields right up to the edge of the brook. That allowed sediment to runoff into the brook when heavy rain fell on open fields and moved downslope. Wind blowing over plowed but unvegetated fields caused soil erosion problems. By comparison, today the stream is somewhat difficult to detect in places on these photos as a result of its tree shaded riparian zone. These aerial photos were taken in spring of the year when the snow has melted and before the leaf canopy prevents a view-to-the-ground. It is likely that the agricultural use of the land ended in the late 1940s. The tree ring count of the stacked trees that the Team passed on the entrance road to the site indicated an age of about 50-55 years at the time of being cut in 2004.

Figure 3 – On the left is a stump typical of the tree removal from the site for sand excavation. On the right Team members pass the stacked trees which had annual ring counts indicating 50-55 years of age when cut in 2004.

Today, efforts to reduce soil erosion and sediment runoff have led to greatly improved water quality around the state. Sediment reduction has been one is one of the greatest goals for improved water quality and there is little that is more effective than a riparian zone dominated by woodlands. The woody debris (fallen branches, windthrows, etc.), leaf accumulation and vegetation at the tree, shrub and herb layer all serve to decrease the erosive forces of falling rain and to slow runoff as it passes over the land. The resistance to movement of water by the rough surfaced forest floor serves to slow water down and allow transported sediments to fall out of suspension well before it enters the stream. Additionally, the over hanging trees shade the stream from the sun, decreasing thermal heating and allowing for the possibility of a cold water species (like trout) to exist.

*Figure 4 – Above are two views looking downslope and east into White Brook. In the left hand photo there is little vegetation between the bottom of the slope and the open water. Silt fence can be seen in the lower right hand corner. The final installation of silt fence will be backed by staked hay bales before excavation begins. In the right hand photo, in the lower right hand corner, bare dirt has been exposed on the downslope side leading to the wetland and there is no silt fence or erosion control of any kind in place. The vegetation on the flood plain of the brook is dominated by 15 to 20 foot high speckled alder (*Alnus *spp.).*

This Sheldon property featured these well-vegetated characteristics before tree removal and excavation began. And these are the features, as they apply to the watercourse and floodplain wetland soils, that should be preserved throughout the construction process. The protection of the integrity of the stream is of foremost concern. And this can be accomplished with the implementation of a good management plan.

Recommendations

* **Observe all wetland setbacks -** This is especially important because of the longer term nature of this project – several years versus a typical building project of several months. For the reasons stated above, (i.e.: the preservation of the stream's integrity), the maximum distance from the watercourse should be employed. The upland review area has been stated as 150 feet and final decisions on the southern extent of the project should be closer to this 150 foot distance than some of the proposed distances on the plans. Moving the operation north, away from the brook, will still allow the applicant to maintain the same total of excavated material.

* **Erosion and Sediment Control -** Although the correct implementation of the proposed silt fence/staked hay bale combination should be very effective, accidents and equipment failures do happen. The greater the distance from the excavation to the wetlands, the lesser the chance of impact. This is especially applicable to the areas where proposed work closely approaches the wetland boundary such as at the south and southeast.

***** **The limits of excavation** should be flagged at all times after the boundaries are agreed upon between the town and the client. Flagging will help to minimize excavation errors on the part of the equipment operators.

***** **Inspections -** Regularly scheduled inspections of the provision of the final agreement should be carried out by the town. This will ensure erosion controls are in order, and that the "as-excavated" lines in the field agree with the final mapped agreement by town. The town could explore contracting a third party of their choice for this duty to be paid for by the applicant. Inspection schedules should be agreed upon and will be especially important in the first few weeks after installation, and within 24 hours of a storm greater than a half inch. Also, silt fence and hay bales are considered temporary protection, and as the phases of excavation could each take two to three years, there is much opportunity to lose effectiveness over time through degradation.

***** **Top Soil Storage** – is defined well on the plans. The stockpile will need to be checked and maintained as per the final agreement. Substantial erosion control should be in place as per the Connecticut Guidelines for Soil Erosion and Sediment Control DEP Bulletin 34, 2002. In section 5-2-3 it states: "the side slopes of stockpiles shall not exceed 2:1". Because of the permanence of this stock, it should be vegetated as soon as possible once the removal of topsoil in each phase is complete.

***** **There should be no buried stump dump locations** on the site. Decomposing stumps combine with some soils to cause degraded water quality. Also, long term, decaying wood can lead to sunken areas which, especially if located on slopes, can lead to gullying and erosion.

* Generally speaking, groundwater flows to low points on the landscape in the same direction as surface water. The sand on the site makes the material above the groundwater and below the bottom limit of excavation extremely permeable. Because of this direction of groundwater flow (directly to the stream) and rapid permeability of the unconsolidated material (sand), **petroleum products should be stored outside of, and away from, the excavation pit area.**

* **For the same reasons equipment should be maintained and washed outside of the pit area.**

* **The paved refueling pad should be located outside of the pit area.**

* **Minimize all areas of unvegetated slopes that flow downhill to watercourse by immediate reseeding or through the use of vegetative blankets.**

*Source: The water quality classifications may be reviewed on the DEP water quality maps and in the Summary of the Water Quality Standards and Classifications (1997); This document: http://www.dep.state.ct.us/wtr/wq/wqsinfo.htm

Stormwater Review

Stormwater Permitting – Construction

If the development activities to prepare the site for excavation (e.g. road building) will involve the disturbance of one or more acres regardless of phasing, the activity must comply with the requirements of Connecticut'*s General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities* ("construction general permit"). A registration under the construction general permit is not required if the site development activities will result in the disturbance of between one and five acres regardless of phasing, and the project receives town review and written approval of the erosion and sediment control plan. If there is no town review or if the development activities will result in the disturbance of five or more acres of land regardless of phasing, then the developer must register under the construction general permit.

Stormwater Permitting – Industrial Activity

Mining operations are considered an industrial activity that requires registration under Connecticut's *General Permit for the Discharge of Stormwater Associated with Industrial Activity* ("industrial general permit"). In addition to the submittal of the registration, conditions of the industrial general permit include the preparation of a site-specific and certified Stormwater Pollution Prevention Plan and annual sampling if stormwater discharges from any detention or retention basin. The Stormwater Pollution Prevention Plan must address erosion and sediment controls, good housekeeping, vehicle and/or equipment washing, vehicle and/or equipment fueling, spill prevention and response procedures and inspection procedures.

Erosion and Sediment Control Notes

Review of the Proposed Gravel Removal Plan (Plan) prepared by KWP Associates and dated 12/1/05 resulted in the following comments:

- The perimeter erosion and sediment controls must be installed prior to the removal of trees.
- Erosion and sediment controls must be inspected at least once a week and within 24 hours of the end of a storm that is 0.5 inches of rainfall or greater. Sediment deposits must be removed when the sediment reaches approximately half the height of silt fence or other barrier.
- The windrowed loam erosion check will be vulnerable to erosion until vegetation is established. Temporary armoring of the berms with mulch or erosion control matting is recommended.
- The Plan must show additional detail of how the site will be accessed to install the stormwater basins.

- The stormwater basins are identified as detention/sedimentation basins. If these basins are expected to provide detention, then the Plan must include details of outlet structures and emergency overflow structures. If the basins are not equipped with outlet structures, the Plan must insure that the outer slopes of the sediment basins are stabilized to prevent erosion in case the basins do overflow. In addition, the Plan must include measures for dewatering the basins without discharging directly into wetlands or watercourses.

- The 2002 Connecticut Guidelines for Soil Erosion and Sediment Control require the installation of reverse slope benches that discharge to a stable outlet whenever the vertical height of any slope steeper then 3:1 exceeds 15 feet.

- If additional measures are needed to control sedimentation along the access road, install stone check dams in the swale.

- If possible, the fueling pad should be bermed <u>and</u> covered. At a minimum, the area surrounding the fueling pad should graded, or other measures installed, to prevent stormwater run-on.

DEP INFORMATION SHEET

EROSION CONTROL MIX-SEDIMENT BARRIERS

date: May 2002 **contact: Marianne Hubert (207) 287-4140**

A sediment barrier is a berm installed across or at the toe of a slope and down gradient of disturbed earth. Its purpose is to intercept and retain small amounts of sediment from disturbed or unprotected areas of limited extent. (For other sediment barrier use, see MDEP BMP handbook section 14.0.)

The sediment barrier is used where:

- Sedimentation can pollute or degrade a wetland or any other water resource.
- Sedimentation will reduce the capacity of storm drainage systems or adversely flood adjacent areas.
- The contributing drainage area does not exceed 1/4 acre per 100 ft of barrier length; the maximum length of slope above the barrier is 100 feet; and the maximum gradient behind the barrier is 50 percent (2:1). If the slope length is greater, additional measures such as diversions may be necessary to reduce that length.
- Sediment barriers cannot be used in areas of concentrated flows. *Under no circumstances* should erosion control mix sediment barriers be constructed in streams or in swales.

SPECIFICATIONS

Erosion control mix can be manufactured on or off the project site. It must consist primarily of organic material, separated at the point of generation, and may include: shredded bark, stump grindings, composted bark, or flume grit and fragmented wood generated from water-flume log handling systems. Wood chips, ground construction debris, reprocessed wood products or bark chips will not be acceptable as the organic component of the mix.

Erosion control mix shall contain a well-graded mixture of particle sizes and may contain rocks less than 4” in diameter. Erosion control mix must be free of refuse, physical contaminants, and material toxic to plant growth.

COMPOSITION

The mix composition shall meet the following standards:

- The organic matter content shall be between 80 and 100%, dry weight basis.
- Particle size by weight shall be 100 % passing a 6“ screen and a minimum of 70 %, maximum of 85%, passing a 0.75” screen.
- The organic portion needs to be fibrous and elongated.
- Large portions of silts, clays or fine sands are not acceptable in the mix.
- Soluble salts content shall be < 4.0 mmhos/cm.
- The pH should fall between 5.0 and 8.0.

INSTALLATION OF SEDIMENT BARRIERS

- On slopes less than 5 % *or* at the bottom of steeper slopes (<2:1) up to 20 feet long, the barrier must be *a minimum of* 12” high, as measured on the uphill side of the barrier, *and a minimum* of two feet wide. *On longer or steeper slopes*, the barrier should be wider to accommodate the additional flow.
- The barrier must be placed along a relatively level contour. It may be necessary to cut tall grasses or woody vegetation to avoid creating voids and bridges that would enable fines to wash under the barrier through the grass blades or plant stems.
- Good locations for stand-alone use without reinforcement by other BMPs are:
  - At toe of shallow slopes;
  - On frozen ground, outcrops of bedrock and very rooted forested areas; and
  - At the edge of gravel parking areas and areas under construction.
- Locations where other BMPs should be used:
  - At low points of concentrated runoff;
  - Below culvert outlet aprons;
  - Where a previous stand-alone erosion control mix application has failed;
  - At the bottom of steep perimeter slopes that are more than 50 feet from top to bottom (i.e., a large up gradient contributing watershed); and
  - Around catchbasins and closed storm systems.

CONSIDERATIONS

- Sediment barriers should not be used in streams and large drainage ways!
- If there is evidence of end flow around installed barriers, extend barriers uphill or consider replacing them with temporary check dams.
- Sediment barriers should be installed prior to disturbing soil in the drainage area above them.

MAINTENANCE

- The erosion control mix barriers should be inspected regularly and after each large rainfall. Any required repairs should be made immediately, with additional erosion control mix placed on the berm to reach the desired height and width. Failure is typically not catastrophic and is more easily repaired than silt fencing.
- If there is any sign of undercutting at the center or the edges, or any sign of impounding large volumes of water behind the barrier, it may be necessary to reinforce the barrier by adding another sediment barrier, such as a temporary rock check dam.
- Sediment deposits should be removed when they reach approximately one-half the height of the barrier.
- When the barrier is decomposed, clogged with sediment, eroded or ineffective, it must be replaced or repaired. The barrier should be reshaped as needed.
- Erosion control mix barriers can be left in place. Any sediment deposits remaining in place after barrier is no longer required should be spread to conform to the existing grade and be seeded and mulched.
- In the long-term, vegetation adds stability and will blend in the barrier to the natural environment. Woody vegetation can be planted into the barriers, or they can be over-seeded with legumes.
- If the barrier needs to be removed, it can be spread out into the landscape.

FOR MORE INFORMATION

For more information, contact:

Maine Department of Environmental Protection
Bureau of Land & Water Quality, ATTN: Marianne Hubert, (207) 287-4140

The Natural Diversity Data Base

The Natural Diversity Data Base maps and files regarding the Sheldon Gravel Extraction project area have been reviewed. According to our information there are no known extant populations of Federal or State Endangered, Threatened or Special Concern Species that occur at the site in question.

Natural Diversity Data Base information includes all information regarding critical biologic resources available to us at the time of the request. This information is a compilation of data collected over the years by the Environmental and Geographic Information 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 substituted 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.

Also 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.

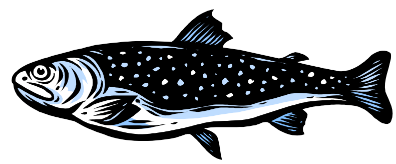
FISH RESOURCES

STREAM RESOURCES

WHITE BROOK

This stream, which is tributary to Mashamoquet Brook, is bordered by extensive wetlands. Low gradient in nature, the stream has a high degree of sinuosity and in many areas the stream channel has braided. Streambed substrates are mainly comprised of silts and wetland mucks. There is a limited amount of coarse-grained substrates in the stream adjacent to this property. Coarse substrates in the form of small to medium size gravels are mainly present in riffle areas where there is a visible change in gradient. Instream fish habitats are mainly in the form of run and pool mesohabitats. There is an extensive amount of sidestream vegetative cover in the form of speckled alder, which are dominant in the area. These trees provide a valuable overhead canopy, which serves to shade the watercourse and reduce surface water temperatures from warming during the summer. Streambanks are highly erosive as well as the stream channel, which contains some deep (>2 ft.) pocket waters that provide valuable instream cover for the resident fish community.

The Inland Fisheries Division has sampled this watercourse just downstream of its confluence with Barrett Ledge Brook. The stream could be best described as supporting a mixed coldwater/warmwater fish community. White Brook supports a native brook trout population and fluvial dependent species, which include tessellated darter and white sucker. Warmwater species include largemouth bass, pumpkinseed, green sunfish, chain pickerel and golden shiner.



Surface water quality of the White Brook below its confluence with Barrett Ledge Brook is classified by the Connecticut Department of Environmental Protection as Class B/A. Designated uses of Class B waters are as follows: fish and wildlife habitat, recreational use, agricultural and industrial supply and other legitimate uses including navigation. This designation means that the area is presently not meeting Class A water quality criteria or one or more designated uses. The future goal is to improve water quality to meet a Class A designation.

IMPACTS

EROSION AND SEDIMENTATION

The development proposal involves the excavation and removal of sands and gravels off the property in three phases over a 3- year period for an approximate material total of 150,000 cubic yards. Separate detention/sediment basins designed to store runoff from a 100-year storm event will be constructed for each phase. All will be filled-in upon project completion and replaced with a permanent detention basin designed to store runoff from only a 1-year storm event. The development area is characterized by a steep, hilly knob with surface water drainage to wetlands associated with White Brook. The footprint of excavation encroaches very close to White Brook wetlands on the northeast and southern sections of the property.

As with any commercial mining operation, there is always a potential for erosion and stream sedimentation to occur during construction because of disturbed soils. 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.

Recommendations

Wetland and 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 is available upon request. Thus, it is highly recommended that a 100-foot wide riparian buffer zone be maintained along the wetland edge of White Brook. To meet this recommendation, the limit of disturbance will have to be pulled back in some areas from the demarcated 166 contour line. A riparian buffer is one of the most natural mitigation measures to protect water quality and fisheries resources. Research has shown that 100-ft. wide buffer zone helps prevent damage to wetlands, stream, and pond ecosystems that support diverse fish and aquatic insect life since they help absorb and filter surface runoff. No construction and alteration of existing habitat should be allowed in this zone.

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. This includes such mitigative measures as filter fabric barrier fences, staked hay bales, and sediment basins. Land disturbance and clearing should be kept to a minimum and completed in phases. 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 this mining operation 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.

Stormwater Management

Plans show the installation of a permanent stormwater detention basin; however, plans did not provide any specific information as to the design of an outlet control structure and the area where stormwaters would outlet into wetlands associated with White Brook. This information needs to be provided. Also, the basin has only been designed to contain a 1-year storm event. Consideration should be given to increasing the storage size of the detention basin. The construction of a larger detention basin will ensure added protection to sensitive resources located immediately down gradient of the basin and minimize concerns for warm stormwaters being conveyed into White Brook.

Literature Cited

Bell, M.C. 1986. Fisheries handbook of engineering requirements and biological criteria. U.S. Army Corps of Engineers. Fish Passage Development and Evaluation Program. North Pacific Division, Portland, OR. 290 pp.

Cordone, A. J., and D. W. Kelley. 1961. The influences of inorganic sediment on the aquatic life of streams. California Fish and Game 47:189-228.

Meehan, W.R. 1991. Influences of forest and rangeland management on salmonid fishes and their habitats. American Fisheries Society Special Publication 19, Bethesda, MD. 751 pp.

Archaeological and Historical Review

The Office of State Archaeology (OSA) and the State Historic Preservation Office (SHPO) have reviewed the proposed Sheldon Gravel Extraction project. They note that the project area possesses moderate to high sensitivity for prehistoric and historic archaeological resources. The OSA and the SHPO recommend that a professional reconnaissance survey be undertaken to identify and evaluate archaeological resources which may exist within proposed project limits, including equipment storage and associated work areas. All archaeological studies must be undertaken in accordance with the State Historic Preservation Office's *Environmental Review Primer for Connecticut's Archaeological Resources.*

No ground disturbance or construction-related activities should be initiated until the OSA and SHPO has had an opportunity to review and comment upon the recommended archaeological survey report.

The OSA and the SHPO are prepared to offer technical assistance in conducting the archaeological survey and they look forward to working with the town of Pomfret and the applicant in the conservation and preservation of Pomfret's cultural resources.

Transportation Review

After reviewing the subject project, concerning the effects of heavy equipment and truck traffic, generated from the excavation process, onto roadways at the subject location, the Department of Transportation (ConnDOT) anticipates that the additional heavy vehicle traffic would not have a significant impact on the operations or safety of the State roadway network in this area.

This determination was based in part on the average daily traffic on the State roads in this area, the estimated heavy vehicle traffic generated as well as the hours of operation of the gravel excavation operation.

Appendix

Copy of Eastern Conservation District Review

EASTERN CONNECTICUT CONSERVATION DISTRICT, INC.

238 West Town Street
Norwich, CT 06360-2111
(860) 887-4163, Ext. 3011

Conservation District
Eastern Connecticut

139 Wolf Den Road
Brooklyn, CT 06234
(860) 774-8397, Ext. 203

January 27, 2006

Mr. David St. Martin
Chairman
Pomfret Inland Wetlands and Watercourses Commission
5 Haven Road
Pomfret Center, CT 06259

Mr. St. Martin:

In response to your request, I have reviewed the plans and inspected the site of a proposed gravel operation submitted by Brian N. Sheldon. The site is located on Searles Road in Pomfret, behind the "Steak-Umms" building.

Based on my review, I have the following comments for you and your commission to consider:

1. The area proposed to be excavated is surrounded by wetlands and therefore the mining operation has the potential to cause negative impacts to the wetlands. If this proposal goes forward:
    a) Leaving a vegetated buffer is a practice which has been proven to reduce negative impacts to wetlands and watercourses. We recommend a minimum 100 ft. wide undisturbed buffer between the limits of disturbance and the edge of the wetlands, along the entire border of the excavation.
    b) Proper installation and maintenance of erosion and sediment (E&S) control measures will be essential in order to prevent sediment from fouling the wetlands.

2. The plans show that the finished grade includes embankments which will be as steep as 2:1. One of these slopes is approximately 35 feet high, and does not include reverse slope benches. Connecticut's E&S Control Guidelines specify that slopes steeper than 3:1 and greater than 15 feet require a reverse slope bench. We strongly recommend that the plans comply with the E&S Guidelines by including 2 reverse bench slopes, or the slope be redesigned to be less steep. We suggest that a slope of 4:1, although still quite steep, will have less chance of failure and will eliminate the requirement for reverse slope benches.

3. In your letter you asked us to comment on groundwater and aquifer impacts. For an in depth analysis of these factors the Commission should have the proposal reviewed by a hydro-geologist. Our evaluation is based on a comparison of the depth of the excavation and the elevation of the surrounding wetlands. The depth of the deepest excavation is approximately 10 to 12 feet higher than the elevation of the wetland. This being the case, it seems unlikely that the proposed excavation will have much of an impact on the groundwater in the area.

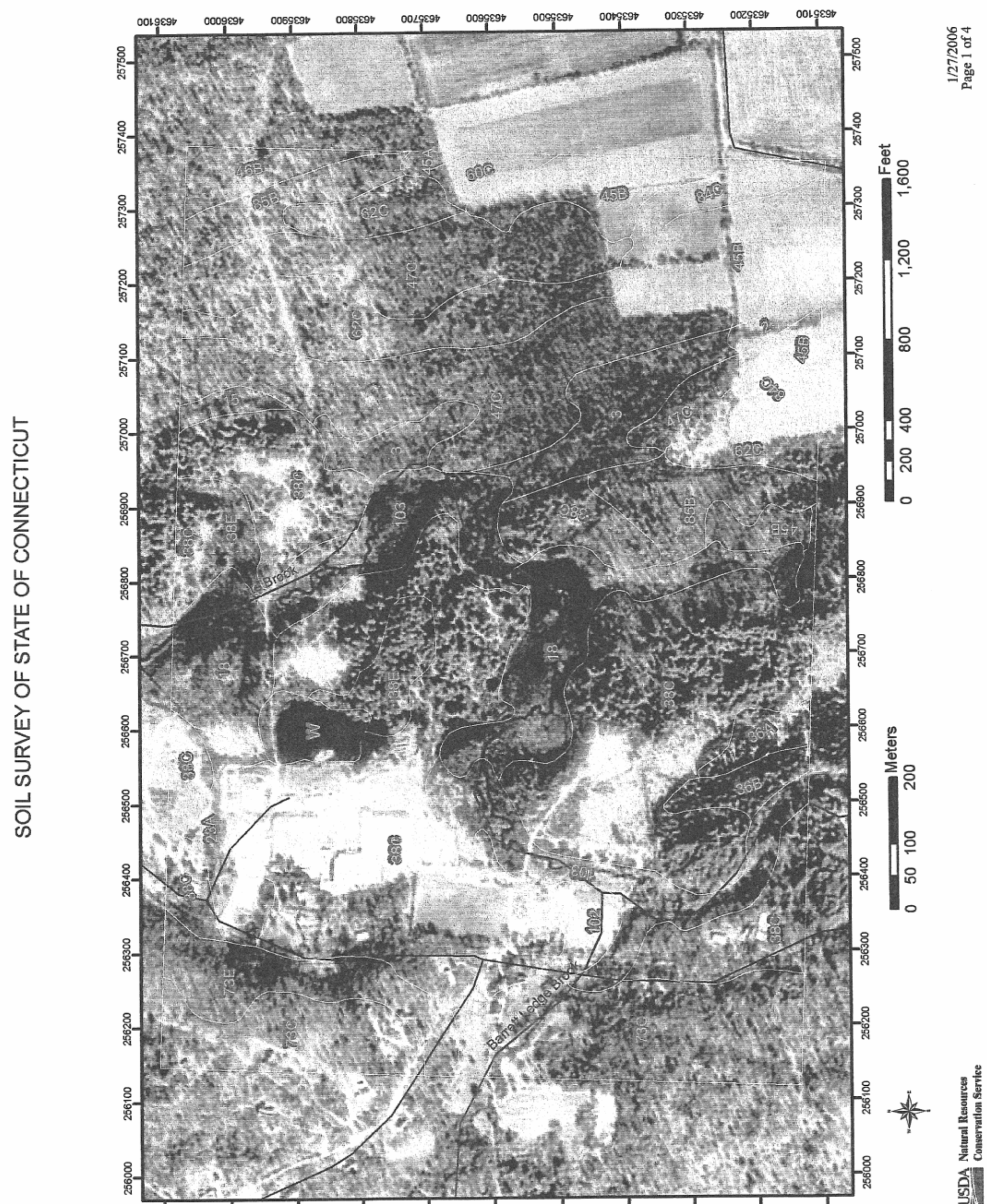
4. Stormwater readily infiltrates the soils on this site (see enclosed soils information). Although the proposed operation will change the topography, the overwhelming majority of stormwater will infiltrate into the same approximate 20 acre area as it does presently.

Conclusion:
Due to the proximity of the wetlands surrounding this site, we view this as a less than desirable proposal. However, if our recommendations are followed and the operation is conducted following proper E&S Control procedures, the risk of damage to the wetlands should be small.

If you have any questions, please do not hesitate to contact me by mail, by phone at (860) 774-8397 x3, or by email at scott.gravatt@ct.nacdnet.net.

Best regards,
D. Scott Gravatt

D. Scott Gravatt
District Director
Eastern Connecticut Conservation District


SOIL SURVEY OF STATE OF CONNECTICUT
Feet
0 200 400 800 1,200 1,600
Meters
0 50 100 200
1/27/2006
Page 1 of 4
USDA Natural Resources Conservation Service

SOIL SURVEY OF STATE OF CONNECTICUT

MAP LEGEND

- Soil Map Units
- Cities
- Interstate Highways
- Roads
- Rails
- Water
- Hydrography
- Oceans

MAP INFORMATION

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov

Coordinate System: UTM Zone 19

Soil Survey Area: State of Connecticut
Spatial Version of Data: 3
Soil Map Compilation Scale: 1:12000

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend Summary

State of Connecticut

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
102	Pootatuck fine sandy loam	2.4	0.7
103	Rippowam fine sandy loam	22.6	6.7
15	Scarboro muck	1.3	0.4
18	Catden and Freetown soils	21.1	6.3
2	Ridgebury fine sandy loam	1.4	0.4
23A	Sudbury sandy loam, 0 to 5 percent slopes	5.1	1.5
3	Ridgebury, Leicester, and Whitman soils, extremely stony	11.5	3.4
36A	Windsor loamy sand, 0 to 3 percent slopes	2.4	0.7
36B	Windsor loamy sand, 3 to 8 percent slopes	2.9	0.9
38C	Hinckley gravelly sandy loam, 3 to 15 percent slopes	108.0	32.1
38E	Hinckley gravelly sandy loam, 15 to 45 percent slopes	8.8	2.6
45A	Woodbridge fine sandy loam, 0 to 3 percent slopes	0.6	0.2
45B	Woodbridge fine sandy loam, 3 to 8 percent slopes	20.9	6.2
46B	Woodbridge fine sandy loam, 2 to 8 percent slopes, very stony	3.8	1.1
47C	Woodbridge fine sandy loam, 2 to 15 percent slopes, extremely stony	40.9	12.2
60C	Canton and Charlton soils, 8 to 15 percent slopes	2.1	0.6
62C	Canton and Charlton soils, 3 to 15 percent slopes, extremely stony	19.2	5.7
73C	Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky	29.3	8.7
73E	Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky	9.3	2.8
84C	Paxton and Montauk fine sandy loams, 8 to 15 percent slopes	6.9	2.1
85B	Paxton and Montauk fine sandy loams, 3 to 8 percent slopes, very stony	12.2	3.6

State of Connecticut

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
W	Water	3.6	1.1

RUSLE2 Related Attributes

State of Connecticut

Map symbol and soil name	Pct. of map unit	Hydrologic group	Kf	T factor	Representative value		
					% Sand	% Silt	% Clay
2:							
Ridgebury	80	D	.20	3	63.0	30.0	7.0
3:							
Ridgebury	40	D	---	3	0.0	0.0	0.0
Leicester	35	D	---	5	0.0	0.0	0.0
Whitman	15	D	---	2	0.0	0.0	0.0
15:							
Scarboro	80	D	---	3	0.0	0.0	0.0
18:							
Catden	40	D	---	3	0.0	0.0	0.0
Freetown	40	D	---	3	0.0	0.0	0.0
23A:							
Sudbury	80	B	---	5	0.0	0.0	0.0
36A:							
Windsor	80	A	---	2	0.0	0.0	0.0
36B:							
Windsor	80	A	---	2	0.0	0.0	0.0
38C:							
Hinckley	80	A	.28	2	64.0	30.0	6.0
38E:							
Hinckley	80	A	.28	2	64.0	30.0	6.0
45A:							
Woodbridge	80	C	.24	3	62.5	30.0	7.5
45B:							
Woodbridge	80	C	.24	3	62.5	30.0	7.5
46B:							
Woodbridge	80	C	.24	3	62.5	30.0	7.5
47C:							
Woodbridge	80	C	.24	3	62.5	30.0	7.5

This report shows only the major soils in each map unit. Others may exist.

Map Unit: 38C - Hinckley gravelly sandy loam, 3 to 15 percent slopes

Description Category: SOI

Hinckley Gravelly Sandy Loam, 3 To 15 Percent Slopes
This map unit is in the New England and Eastern New York Upland, Southern Part Major Land Resource Area. The mean annual precipitation is 40 to 50 inches (1016 to 1270 millimeters) and the average annual air temperature is 45 to 55 degrees F. (7 to 13 degrees C.) This map unit is 80 percent Hinckley soils. 20 percent minor components.

Hinckley soils
This component occurs on valley outwash plain, terrace, kame, and esker landforms. The parent material consists of sandy and gravelly glaciofluvial deposits derived from schist, granite, and gneiss. The slope ranges from 3 to 15 percent and the runoff class is low. The depth to a restrictive feature is greater than 60 inches. The drainage class is excessively drained. The slowest permeability within 60 inches is about 5.95 in/hr (rapid), with about 2.3 inches (very low) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 4e
Typical Profile:
0 to 8 inches; gravelly sandy loam
8 to 20 inches; very gravelly loamy sand
20 to 27 inches; very gravelly sand
27 to 42 inches; stratified cobbly coarse sand to extremely gravelly sand
42 to 60 inches; stratified cobbly coarse sand to extremely gravelly sand

Map Unit: 38E - Hinckley gravelly sandy loam, 15 to 45 percent slopes

Description Category: SOI

Hinckley Gravelly Sandy Loam, 15 To 45 Percent Slopes
This map unit is in the New England and Eastern New York Upland, Southern Part Major Land Resource Area. The mean annual precipitation is 40 to 50 inches (1016 to 1270 millimeters) and the average annual air temperature is 45 to 55 degrees F. (7 to 13 degrees C.) This map unit is 80 percent Hinckley soils. 20 percent minor components.

Hinckley soils
This component occurs on valley outwash plain, terrace, kame, and esker landforms. The parent material consists of sandy and gravelly glaciofluvial deposits derived from schist, granite, and gneiss. The slope ranges from 15 to 45 percent and the runoff class is high. The depth to a restrictive feature is greater than 60 inches. The drainage class is excessively drained. The slowest permeability within 60 inches is about 5.95 in/hr (rapid), with about 2.3 inches (very low) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 6e
Typical Profile:
0 to 8 inches; gravelly sandy loam
8 to 20 inches; very gravelly loamy sand
20 to 27 inches; very gravelly sand
27 to 42 inches; stratified cobbly coarse sand to extremely gravelly sand
42 to 60 inches; stratified cobbly coarse sand to extremely gravelly sand

ABOUT THE TEAM

The King's Mark 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 King's Mark Resource Conservation and Development (RC&D) Area — an 83 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: ctert@comcast.net