environmental review team report

RC&D

EASTERN CONNECTICUT
RESOURCE CONSERVATION AND DEVELOPMENT PROJECT

ASSISTED BY: U.S. DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE AND COOPERATING AGENCIES

ENVIRONMENTAL REVIEW TEAM REPORT
ON THE
PROPOSED DOG TRACK
GRISWOLD, CONNECTICUT

JULY, 1974

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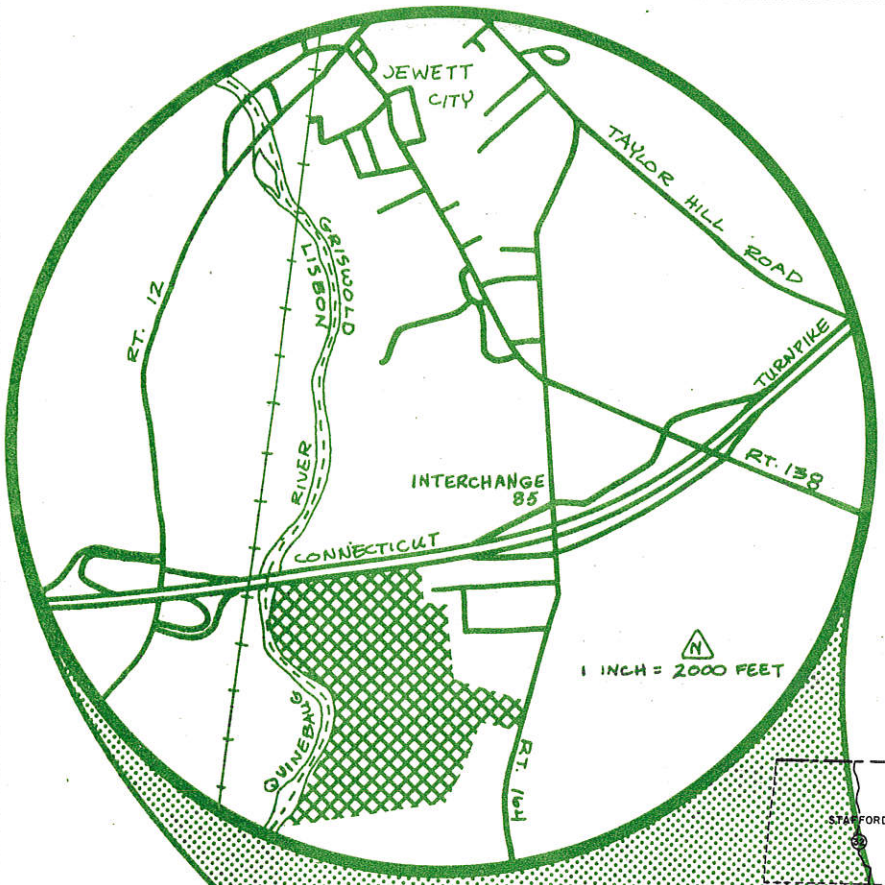
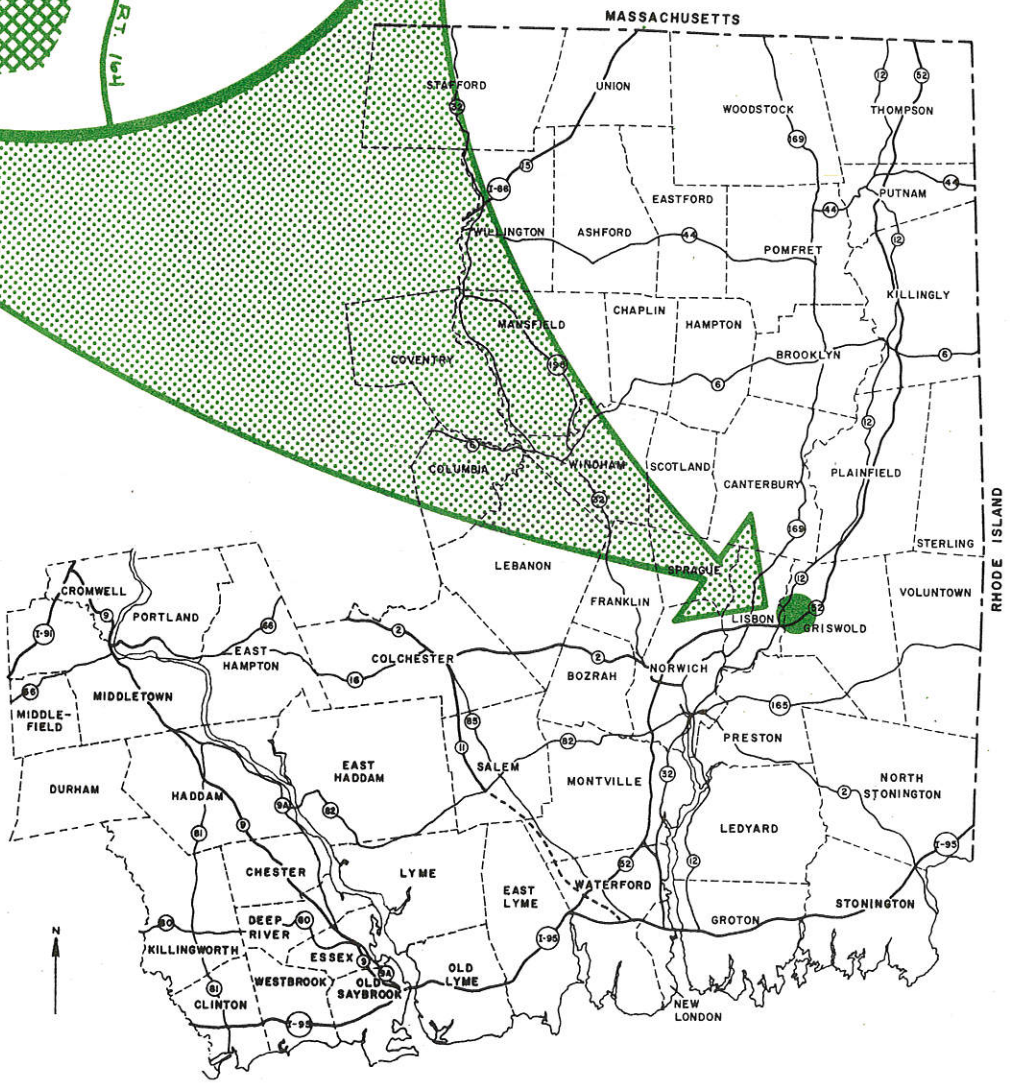
EASTERN CONNECTICUT RESOURCE CONSERVATION
AND DEVELOPMENT PROJECT
Environmental Review Team
139 Boswell Avenue
Norwich, Connecticut 06360

LOCATION OF STUDY SITE

PROPOSED DOG TRACK
GRISWOLD, CONNECTICUT





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This report is an outgrowth of a request from the Griswold Planning and Zoning Commission, with the approval of the land owners, to the New London County Soil and Water Conservation District (S&WCD). The S&WCD referred this request to the Eastern Connecticut Resource Conservation and Development (RC&D) Executive Council for their consideration and approval as a project measure. The request has been approved and the measure reviewed by the Environmental Review Team.

The soils of the site were mapped by a soil scientist of the USDA Soil Conservation Service. Reproductions of the soil survey and a table of limitations for urban development were forwarded to all members of the Team prior to their review of the site.

The Team that reviewed the proposed development consisted of the following personnel: Sherman Chase, District Conservationist, Soil Conservation Service (SCS); Dennis Hutchison, Soil Scientist, SCS; Edwin L. Minnick, Civil Engineer, SCS; Richard Hyde, Geologist, Natural Resource Center, State of Connecticut Department of Environmental Protection (DEP); Clarence Merrill, Forester, DEP; Joseph Piza, Fisheries Biologist, DEP; T.E. Linkkila, Wildlife Biologist, DEP; Donald Capellaro, Principal Sanitarian, State of Connecticut Department of Health; David R. Miller, Climatologist, Connecticut Cooperative Extension Service; Charles Storrow, Regional Planner, Southeastern Connecticut Regional Planning Agency; Barbara A. Hermann, Team Coordinator, Eastern Connecticut RC&D Project.

The Team met and reviewed the site on June 6, 1974. Reports from each Team member were sent to the Team Coordinator for review and summarization.

This report is not meant to compete with private consultants by supplying site designs or detailed solutions to development problems. This report identifies the existing resource base and evaluates its significance to the proposed development and also suggests considerations that should be of concern to the Town of Griswold and the developers. The results of this Team action are oriented toward the development of a better environmental quality and the long-term economics of the land use.

The Eastern Connecticut RC&D Council hopes you will find this report of value and assistance in making your decisions on this particular site.

If you require any additional information, please contact: Miss Barbara A. Hermann (889-2324), Environmental Review Team Coordinator, Eastern Connecticut RC&D Project, 139 Boswell Avenue, Norwich, Connecticut 06360.

INTRODUCTION

The Environmental Review Team was requested by the Griswold Planning and Zoning Commission to review the dog track facilities being proposed by a group from New York. The site is located south of the Connecticut Turnpike at Exit 84 and west of Route 164. The Quinebaug River forms the western boundary of the site, while a residential subdivision and auto junkyard form the eastern boundary. On the southern boundary is primarily rural undeveloped land.

The proposed facilities include the dog track, paddock, grandstand, and two parking lots. The racing facilities and smaller parking lot are situated on the northern end of the site, with the larger parking lot to the south. A 500 foot buffer strip is proposed along the Quinebaug River. Present plans are to develop an on-site water supply, but provide sewer connections to the sewage treatment plant in Jewett City.

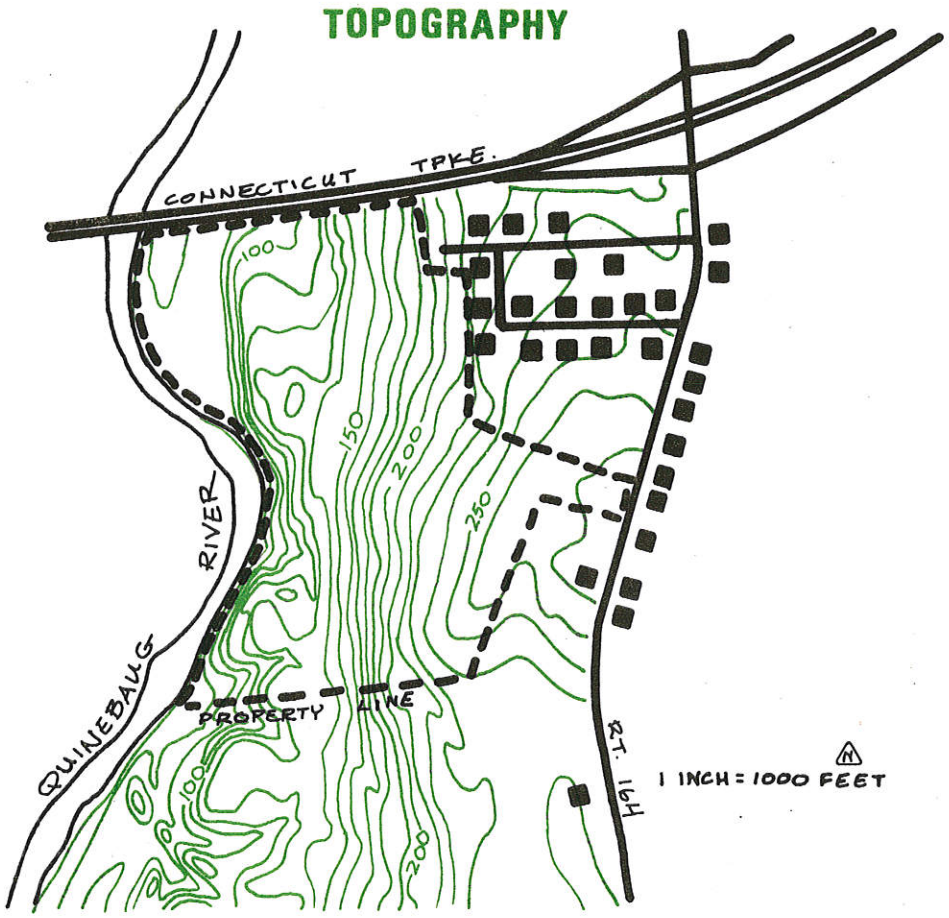
In evaluating this proposal, the Team looked at it from two viewpoints. First, the immediate site and the impact of the proposed construction was considered. Secondly, the areawide impact was considered with respect to items such as land use and traffic.

This report will begin with a description of the existing resources on the site and the surrounding land uses. Following will be an evaluation of the various aspects of the proposed development and how they relate to the site and neighboring area. Information and suggestions are provided for the use of the developer and town in the preparation and review of the development plans. Any comments or recommendations made should not be construed as mandatory or regulatory in nature.

EVALUATION

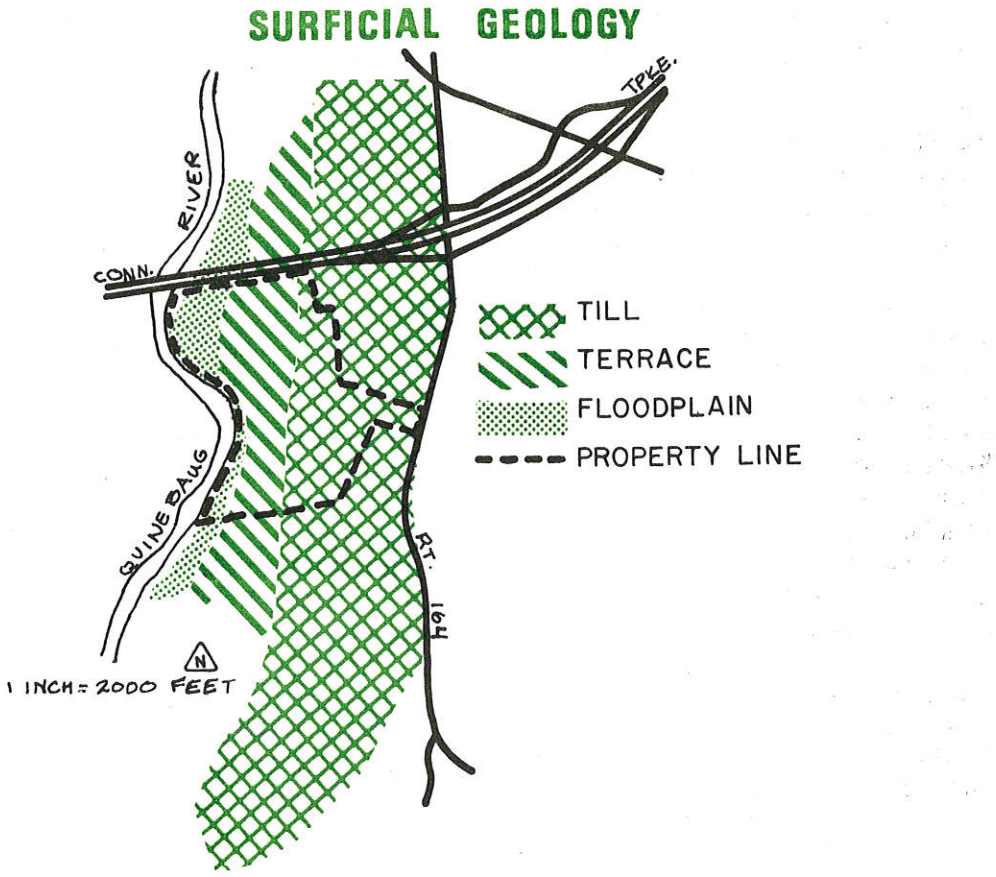
EXISTING RESOURCES

Topography. As can be seen on the map below, the topography of the site is moderately steep with the flatter portions of the site occurring on the floodplains of the river, in the vicinity of the proposed track itself at the northern end of the property, and at the entrance to the site along Route 164. The site slopes downward towards the Quinebaug River, with slopes ranging from 3 percent or less along Route 164 to nearly 50 percent on the river banks. The small parking lot, located between the track and the subdivision, exhibits slopes of 10 to 15 percent. The larger parking lot at the southern end of the site is located in an area with slopes ranging from 4 to over 25 percent.



Surficial Geology. The surficial geology of the site is such that for purposes of discussion it can be divided into three zones, each with its own characteristic overburden. (See the map on the next page.) The first zone topographically encompasses the land

area between Route 164 and the 150 foot land elevation contour line to the west. Overburden materials within this zone are termed till by the geologist. The second zone begins at the 150 foot elevation line and runs westward down to the 80 or 90 foot elevation line. Within this zone is a fairly well-defined step or terrace consisting of stratified drift deposits. The third zone is the low, flat land adjacent to the Quinebaug River. This property too is underlain by stratified drift but there are more recent alluvial deposits at the surface.



Till, as found in the first zone, is the most common type of unconsolidated overburden found in Connecticut. It is evident at nearly all locations outside the immediate vicinity of existing and historical stream valleys. Generally, till is a relatively thin deposit averaging 10 feet to 15 feet in thickness throughout most of the state. Occasionally, however, it is found to attain much larger thicknesses, as is the case of this site. From subsurface information gathered by the U.S. Geological Survey ("Quinebaug River Basin Report," Connecticut Water Resources Bulletin No. 8, 1966), in the area of Williams Drive, Stott Avenue, and Robert Street the till thicknesses appear to approach 40 feet.

The term till, as used by the geologist, refers to the mass of solid earth material that was remaining after all of the glacial ice had melted some 9,000 to 12,000 years ago. It is defined as a heterogeneous substance consisting of various mixtures of boulders, gravel, sand, silt, and clay particles, none of which are significantly sorted or stratified as to the particle sizes, as in the case of waterlain deposits.

The landform of the second zone is that of a terrace which is an elongate, relatively level inclined surface bounded by a steep descending slope contacting the old Quinebaug floodplain to the west, and bounded by a steep ascending slope which ends at the till-terrace contact. This particular glacial terrace does not exhibit the idealized form normally associated with such features, as a result of a past sand and gravel extraction operation. Test hole information indicates the materials within this zone in the upper 20 feet consist mainly of gravel with very fine to coarse sand. Below this point there is no direct information, but, from highway borings done in the floodplain zone, it is possible to interpret that alternating thin layers of gravel, sand, and silt are present. Sand and gravel layers appear to be more common right down to the bedrock at 40 feet below the land surface.

The conditions under which the terrace was formed was probably what is known as an ice-contact situation. Ice-contact deposits occur when melt-water streams flow against, on, or in close proximity to glacial ice. These streams are heavily laden with all sizes of particles after being released from the melting ice. The heavier and generally larger gravel and sand particles settle to the bottom first with the lighter and flatter silt and clay particles being transported much greater distances. Because glacial ice melt varied according to the daily air temperature and season of the year, characteristically these ice-contact deposits exhibit an irregular alteration of stratified layers with large ranges in texture between layers and over short lateral distances. Boulders up to 4 feet in diameter down to medium to fine sand and silt are not uncommon. Topographically, ice-contact deposits are generally hummocky interspersed with closed depressions and irregular ridges, reflecting the collapse of such deposits after complete melting of buried or supporting ice had occurred.

The floodplain zone land is flat, the result of historical flooding and meandering of the Quinebaug River at a time when general water levels were slightly higher than they are today. A small portion along the present river channel is subject to flooding during more extreme storms, but this is restricted to areas right along the river bank and is not within the land area of the proposal. From the logs of test borings it appears the deposits within this zone are the same type of ice-contact materials as those of the terrace, except the upper layers have been eroded and generally replaced by fine-grained alluvium. Alluvium is silt, clay, and organic materials deposited on adjacent river floodplains during times of flood since the close of the glacial age.

Soils. A detailed soils map of this property is given in the Appendix to this report along with a soils limitations chart. Due to the original scale at which the soils are mapped (1"=1,320') the lines shown on the soils map should not be viewed as precise boundaries, but rather as guidelines to the distribution of soil types on the property. The soils limitations chart indicates the probable limitations for each of the soils for on-site sewage, basements, landscaping, and streets and parking. However, limitations, even though very severe, do not always preclude the use of the land for development. If economics permit greater expenditures for land development and the intended objective is consistent with the objectives of local and regional development, many soils and sites with difficult problems can be used.

The soils on the map reflect the surficial geology, with the soils underlain by till (Natural Soil Groups B and C) occurring on the eastern portion of the site, and the soils underlain by sand and gravel (Natural Soil Group A) occurring towards the river.

Steep slopes throughout the site present the primary limitations for development. Within the Natural Soil Group A, droughtiness may also be a problem, particularly for establishing vegetation. Natural Soil Group C is characterized by hardpan soils which have a seasonal high water table that can present drainage problems. Natural Soil Group E includes floodplain soils, for which flooding is the major hazard. On this site, no construction is proposed for this area.

Vegetation and Wildlife. There is very little natural cover on this site that has any special value. The trees are mostly sapling and small pole size hickory, maple, and black birch. The greatest value of the forest is for wildlife, aesthetics, and a noise barrier.

There is a good variety of valuable understory wildlife food and cover shrubs. Because of the western aspect, the value is somewhat lessened. Overall there should be a good variety of wildlife species, such as grouse, quail, rabbits, and deer, along with many songbirds.

The quality of the Quinebaug River has been improving recently and is able to support a good fish population. A long-range program is in effect to restore shad, alewives, sea trout, and salmon to the Quinebaug River as far north as Putnam. This will include installation of fish ladders at dams that presently block passage of fish upstream. Presently the fish are stopped at the Greenville Dam in Norwich. Temperature of the water is a critical factor to survival of the fish during the summer months.

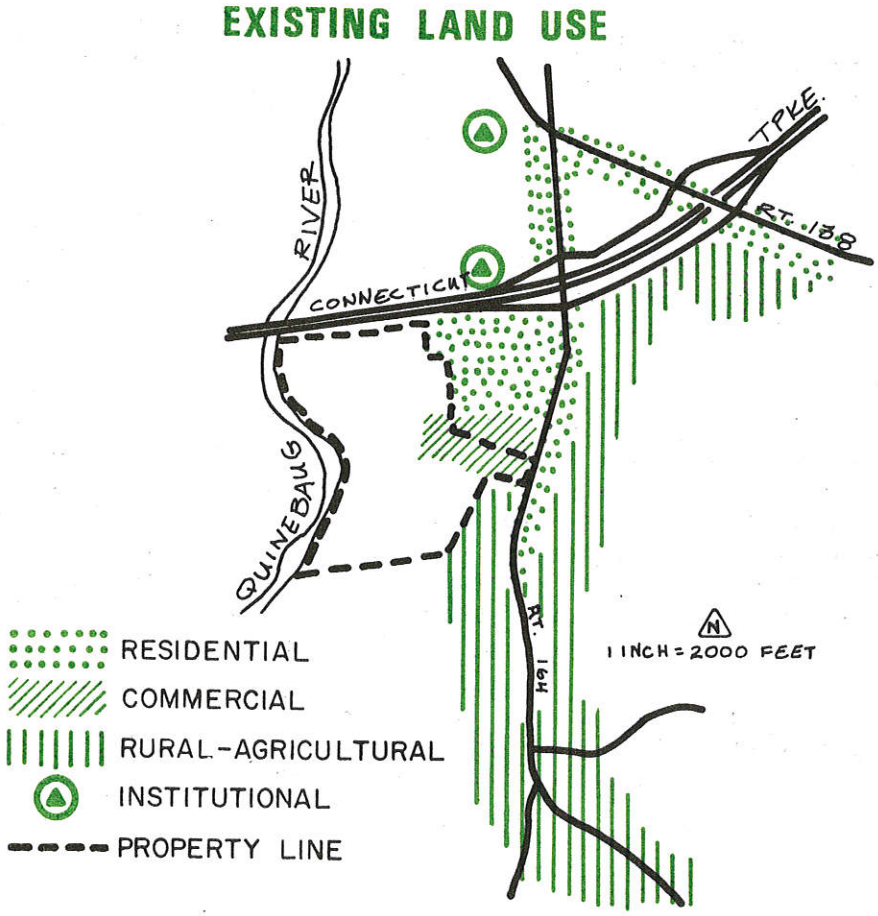
Land Use. Zoning in the immediate area of the site is R-40. This zone permits single-family homes on minimum lot sizes of 40,000 square feet. Development of a dog track on the site will require a zone change.

The Griswold Plan of Development, published in 1971, shows the area of the site in the residential mixed urban densities category. The reason for this is indicated by the map of existing land uses published in the plan, which shows the area as residential in 1971. Ordinarily, a location such as this adjacent to the intersection of a major limited access highway and a state highway is better utilized by some other use than residential. In many cases, commercial uses are the most appropriate.

There is an area across Route 164 from the proposed dog track site and adjacent to Route 52 that is recommended by the Griswold Plan of Development for industrial uses. This area was at one time also zoned industrially but the zoning has now been changed to the R-40 mentioned above, presumably because all of the surrounding property was zoned R-40. This would indicate the desire of property owners in the vicinity to maintain the existing residential character of the area.

The Regional Development Plan closely agrees with the Griswold plan described above. It shows the area of the site as medium density residential (1 to 4 families per acre), and it also shows the adjacent industrial area shown on the Griswold Plan of Development.

The map below shows the existing land use in the vicinity of the proposed dog track.



Along both Routes 164 and 138, development is principally strip residential in the immediate vicinity of the site. Away from the roads, rural and agricultural uses predominate. The one exception to this is the commercial use (an auto junkyard) on Route 164. This use is partly on the proposed dog track property. There are also several institutional uses north of the Connecticut Turnpike (nursing home and schools).

To the south of the site along Route 164, land use is primarily agricultural. In fact, the strip along Route 164 as far as Preston City must qualify as one of the most beautiful rural drives in Southeastern Connecticut.

WATER SUPPLY

Water for the proposed project is to be provided by the development of an on-site supply. Preliminary engineering design data has indicated that water usage would be in the range of 25,000 gallons per day of track operation. It is apparent that the peak demand for water would come in a short span of several hours during the actual operation or racing time at the track.

A source of water should be no problem in terms of meeting the quantity and quality needs of the proposed facility. This parcel of land is situated along the eastern half, roughly in the middle, of a north-south elongate stratified drift aquifer. The U.S. Geological Survey, Water Resources Division, in their report, "Hydrogeology of Southeastern Connecticut," 1974, indicates from its investigations that the aquifer is capable of long-term sustained yields of over a million gallons of water per day if the properly sized and placed wells are established.

Calculations indicate the conditions of the terrace area (see map of surficial geology on page 7) will allow for possible individual well yields between the range of 0 to 75 gallons per minute, while wells located in the lower floodplain area will yield from 75 to 900 gallons per minute. Along the river there also is a small area where, based on the texture and saturated thickness of the overburden, it has been calculated it may be possible to develop a well with a yield ranging between 900 and 1,800 gallons per minute.* With the presence of such a potential source of water it would seem the use of bedrock wells would be unnecessary, since they are generally more costly and less productive.

A water system for a project of this type would be classified as a public water supply and would have to be approved by the State

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* The ranges of yield given here are rough and only through a thorough subsurface drilling and pumping investigation can more definitive numbers be placed on the water yields of this aquifer.

Department of Health under the provisions of Section 25-33 of the General Statutes and Section 19-13-B50 of the Public Health Code.

While it should be possible to develop an on-site potable water supply, consideration could also be given to the possibility of extending the public water supply of the Jewett City Water Company.

WASTE DISPOSAL

Although at the present time the site does not have the availability of public sewers, it is understood the developer would provide the necessary facilities in order to have sanitary wastes discharged into the sewage treatment plant of the Borough of Jewett City. A preliminary engineering report has been prepared by the firm of Chandler, Palmer and King on this aspect. In addition to servicing the track, there is also consideration for possible service to other facilities, both existing and planned for the future. Installation of transmission lines should not encounter any serious difficulties.

Public sewerage facilities, in lieu of possible on-site subsurface sewage disposal, is certainly recommended for the track. The matter should be investigated with the appropriate state agency (Department of Environmental Protection) and local officials in order to be assured that the treatment plant is capable of handling a sizable increase in flow.

If on-site septic systems must be utilized for a short term period, that is, before permanent connection to the municipal treatment system can be achieved, serious consideration should be made to the placement of these on-site systems into the till soils, as opposed to the valley sand and gravel deposits. The reason for this recommendation is that sand and gravel deposits are capable of passing large quantities of fluids rapidly with fairly little influence on water quality. Particles which make up such deposits are primarily sorted and stratified sand and gravel materials. This means the content of silt and clay, which is an important factor in septic effluent purification, is low, leaving the intergranular pore spaces open and interconnected so fluids can pass relatively uninhibited.

Most till deposits contain a high percentage of silt and clay which surrounds each sand and gravel grain. This situation helps to retard fluid movement and it also offers increased surface area contact between the particles and the moving septic effluent, thereby allowing the opportunity for certain chemical and physical processes to take place. These processes remove, alter, and stabilize the potential pollutants found within septic effluent and thereby help to render it acceptable.

In short, stratified sand and gravel deposits are much more

likely to pass relatively unaltered septic effluent greater distances and thereby increasing the chance for contamination of local surface water bodies or even nearby wells. If the town feels the potential aquifer along the Quinebaug River is or will be an important supply of water to the town or region, then there should be a conscious effort to protect such a ground water aquifer from surrounding sources of pollution. One possibility for sewage disposal not mentioned previously, which may warrant investigation, is an on-site sewage treatment plant.

FOUNDATION DEVELOPMENT AND GRADED CONDITIONS

Foundations. Slight to moderate limitations of the soils in the vicinity of the planned track and associated buildings should not produce any major difficulties in structure stability.

Drainage. The steep slopes, change in land use, and the major grading required to produce the needed road system and parking facilities should be of primary concern to the developer. Approximately 25 percent (20 acres) of the site will be encompassed by the roads and parking lots.

Based on present conditions, a 5 inch rain in 24 hours (10 percent chance storm) will result in a runoff of about 2.8 acre feet of water. By changing the land use to roads and parking lots, as shown on the plan, the same rainfall will produce about 6.5 acre feet of water, an increase of 3.7 acre feet or 132 percent.

When you consider the 650+ square miles of watershed associated with the Quinebaug River above the proposed site, the addition of 3.7 acre feet of water will have very little effect on the river itself. On the other hand, consider the effect if the land use change over the entire 650 square miles was in the same ratio as proposed for this site. The river would no longer be able to contain the flow within its banks and flooding would run rampant. Costly man-made flood control structures would have to be installed.

The above hypothetical elaboration is not meant to discourage development, but to point out the need for the macro as well as the micro approach to planning and development. There are methods and practices that can be employed on individual sites that are effective in reducing or temporarily storing excess runoff, such as pervious asphalt paving and storage basins with controlled release.

The accumulation and drainage of rainwater from completed buildings and paved surfaces on this site can be quite easily controlled and disposed of without direct piping to the river proper. Because of the rapid water carrying capacity of the overburden materials of the terrace and floodplain areas, surface drainage could be channeled to strategically placed dry wells, catch basins with leachfields, or pits or galleries within these areas for disposal. In this way the Quinebaug River can be protected from the

addition of soil particles which adversely effect the quality of the water and the river channel system itself. This would also prevent the possible introduction of water into the river while still heated from the hot pavement of the parking lots.

Oil and debris will also collect on the parking lot, and through the drainage system, be a potential pollution hazard to the river. Consideration should be given to providing some type of collecting device.

Due to a seasonal high water table, some subsurface drainage may be required for the smaller parking lot. Tile drainage lines should be installed across the slope and below the hardpan to intercept the underground water. Gravel would be recommended under, around, and above the tile. The New London County S&WCD could provide consultative assistance regarding the placement of tile.

Erosion and sedimentation. The stripping and grading operation necessary to install the roads and parking lots without causing a high degree of erosion will be the most critical aspect during the proposed construction. It was obvious from the on-site visit there are sections of this property where steep slopes can be a definite problem unless special engineering designs are included to overcome such problems.

Proposed parking lot locations will be difficult and costly to construct unless the plan is revised to utilize a bench or step down system of smaller interconnected parking lots. Cut and fill slopes should be no steeper than one vertical to three horizontal, with topsoil spread back over the banks, in order to facilitate the establishment and maintenance of good vegetative cover. The New London County S&WCD would, if requested, supply seeding instructions.

During construction, as much water as possible should be diverted from the working area. Because of the steep slopes, the clearing of ground vegetation should be restricted in time and acreage to the parcel actually being worked on. Construction schedules should control the level and degree of vegetative clearing at any one point in time, in order to keep erosional forces from stripping away the valuable soil cover.

Where possible, runoff from a disturbed area should be detained by the use of sediment basins or traps before being allowed to enter the streams or rivers. Mulching and seeding would also be suggested for erosion control. There is an Erosion and Sediment Control Handbook for Connecticut available from the New London County S&WCD which provides standards and specifications for numerous vegetative and mechanical measures for the prevention and control of erosion.

ROADS AND UTILITIES

On-site. With the development, access roads that service the parking areas may be on relatively steep grades. When developing the final plan, it may be necessary to realign or possibly relocate some of the parking facilities to take better advantage of the existing ground conditions. As mentioned above, it is also recommended that the large parking lot be terraced.

Off-site. Probably the greatest impact on the area surrounding the track will result from the increased traffic. At the present time there is insufficient data with which to conduct a thorough evaluation. This sort of study should be required of the developer before permitting any construction. Some comments and questions which did occur to Team members are given below.

The primary routes to the site would appear to be the Connecticut Turnpike from the north, west, and southwest, Route 138 from the east (including inland Rhode Island), and Route 164 from the south and southeast. An important intersection would appear to be at Preston City where Norwich traffic on Route 165 would be merging with traffic from the south and southeast. Traffic could well have an adverse effect on the village.

A more critical class of traffic problems would be posed by the intersection of Routes 138, 164, and 52 (Turnpike) in the immediate vicinity of the site. Handling of this traffic, and its relation to existing residential development and probable future commercial development near the track, would demand careful consideration.

Specific questions which need to be answered include the number of spectators, their probable approach to the site, present capacity and probable impact on these roads, impact on scenic or historic areas (i.e. Preston City), and proposed traffic control around the site. The effect in terms of noise, hazard, and inconvenience to the immediate neighbors also must be considered. One specific question arose in looking at the site plan. The seating capacity of the grandstand and the number of parking spaces were about the same. This would seem to indicate the parking spaces were overestimated or the seating underestimated. This might affect the expected traffic at the site.

HAZARDS

The only natural hazard on the site, flooding, will not affect the proposal since no development is planned for the floodplain. Possible contamination of the lower reaches of the Quinebaug River could arise from sediment or other deleterious material contained in the runoff from the site. Provided the suggestions made earlier in this report are followed, this situation can be prevented.

The site may present a visual hazard to persons driving east

on the Connecticut Turnpike, unless adequate precautions are taken.

Degradation of air quality to some degree can be expected from the increased traffic, particularly near the intersections of Routes 138, 164, and 52 and at the entrance to the site. Idling and slow movement of traffic in the parking lot at the completion of an evening's racing will also create peak levels of air pollutants. However, these situations will fall within the definition of the State Department of Environmental Protection (DEP) as indirect sources of air pollution. As of October 1, 1974, permits will be required from DEP for the construction and operation of indirect sources. A permit will be issued only when it can be insured that the construction or operation of the proposed facility (in this case, the dog track) "will neither prevent nor interfere directly with the attainment or maintenance of any applicable ambient air quality standard."*

Evening noise (loudspeakers, cheering, etc.) at the track will carry easily up the hill to the residential area. If the woods between the track site and the houses could be left intact and the small parking lot moved south or west of the track, this effect could be minimized. Removal of large amounts of vegetation may also increase the amount of highway noise reaching the housing.

AESTHETICS AND PRESERVATION

There are no unique wildlife or vegetation on the site. The proposed development will remove most of the valuable wildlife habitat, but with the remaining 500 foot buffer strip along the Quinebaug River there should remain small populations of the species mentioned at the beginning of the report. This buffer strip is also important for protection of the river bank from erosion and shading of the river.

The plans show a 50 foot buffer strip adjacent to the housing. To be most effective, these strips of vegetation should be at least 100 feet deep with the outer edges planted to conifers, preferably white pines. This would require moving the smaller parking lot.

With the long range program for restoring certain fish to the Quinebaug River, temperature of the water will be a critical factor. Of concern with the proposed dog track would be runoff from the parking lots on hot days that might increase the river temperatures. If direct piping to the river is avoided and retaining structures and/or subsurface disposal are used, this can be prevented. This would also reduce sediment reaching the river which would be detrimental.

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* "State of Connecticut, Rules and Regulations of the Department of Environmental Protection Concerning Construction Permits for Sources of Air Pollution," January, 1974.

The dog track itself will have little effect on the microclimate of the area. The large areas of parking lot will produce heat. This effect can be minimized by planting 10 to 20 foot wide rows of trees on the terraces between the levels of the parking lot. This will also reduce the heating effect on the storm runoff.

SERVICES TO SUPPORT DEVELOPMENT

Except for the proposed sewer extension, most utilities are on-site or within a short distance of the site. Not being familiar with this type of development, it is difficult to predict what services may be desired by the spectators. This might include gas stations, motels, and restaurants.

COMPATIBILITY OF SURROUNDING LAND USES

The most important land use conflict caused by the dog track, aside from traffic considerations, would appear to be the adverse effects on the houses in the small subdivision, east of the proposed track, on William Drive, Robert Street, and Stott Avenue. Were the dog track to be built, there would probably be pressure for the property along Route 164 to be rezoned from residential to commercial. This could leave the subdivision surrounded by commercial activities. Their value would be decreased because the neighborhood would become less desirable. Also, they would not be suited for conversion to commercial uses, as would be the homes on Route 164, because they have no access to the highway.

ALTERNATIVE LAND USES FOR AREA

Due to the extremely steep slopes, portions of the site are not suited for any type of development except perhaps for a nature area. Recreational opportunities exist for fishing on the river and active recreation on the more level areas. With respect to future development, if the dog track should be denied, it would appear that residential uses on the more suitable areas would be likely.

ADDITIONAL COMMENTS AND SUMMARY

In reviewing the proposed dog track facilities in Griswold, it appeared that there were no on-site problems which could not be dealt with through proper engineering and site design. The main question here would be whether the additional safeguards and design features would make the project economically unfeasible for the developers, though this does not seem likely.

From the local or regional viewpoint, the main questions will revolve around the adverse impact on the adjacent housing, the

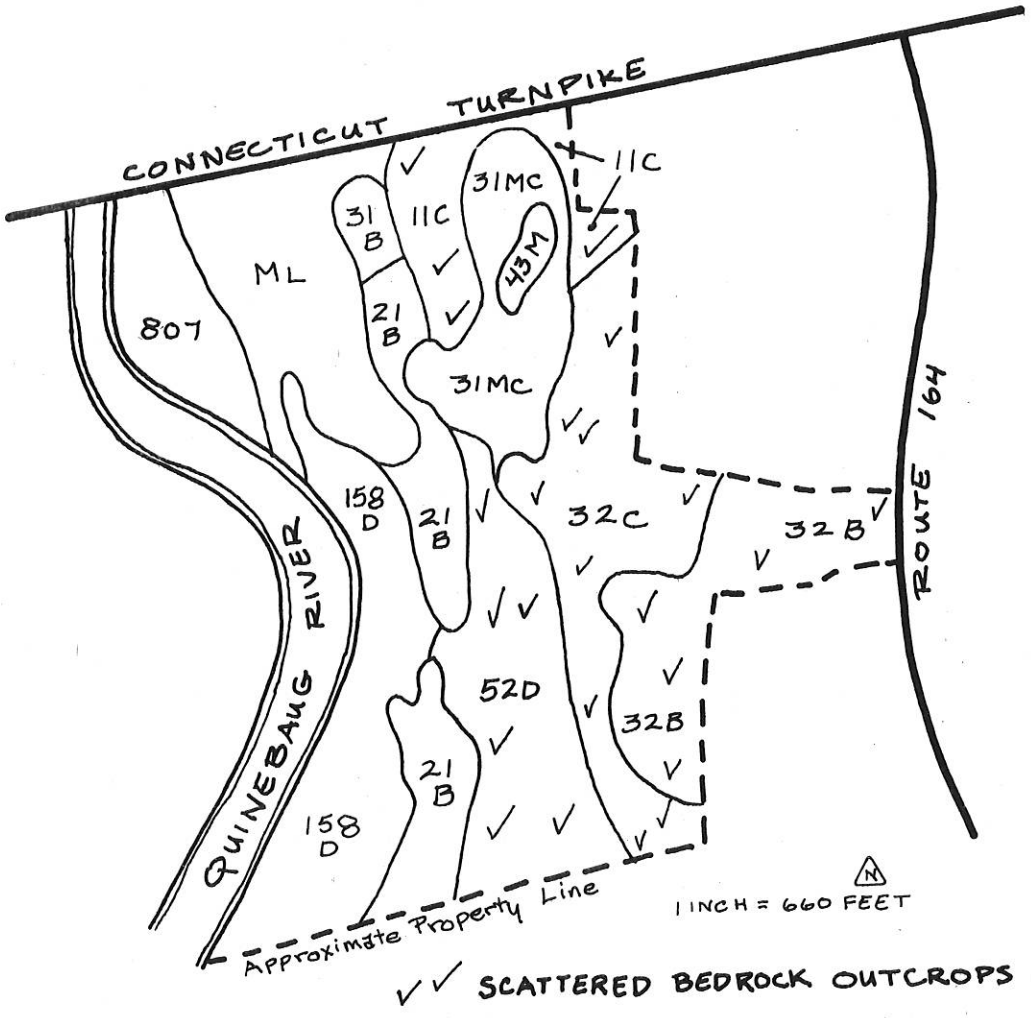
possibility of traffic tieups at the site and on the major routes approaching the site, the affect of the traffic on the air pollutant levels, and pressures for additional commercial development in the area. These items will have to be evaluated along with the local and regional opinions and anticipated benefits to the Town. The final decision can only be made by the locality, which is in the best position to weigh the pros and cons of such a major development.

APPENDIX

SOILS MAP

PROPOSED DOG TRACK

GRISWOLD, CONNECTICUT



NOTE: The area mapped as 32B and 32C has a complex and rapidly changing soil pattern. A backhoe is recommended for more detailed information.

Prepared by: UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service

ADVANCE COPY, SUBJECT TO CHANGE *MAY, 1974*

SOILS LIMITATIONS CHART

Natural Soil Group*	Mapping Symbols	Acres	Percent of Total Acres	Limitations For:** On-Site Sewage	Basements	Landscaping	Streets and Parking	Principal Limiting Factor(s)
A-1b	21B	7.9	9.4	2	1	3	2	Slope 3-8%, droughtiness.
A-1c	158D	12.0	14.3	3	3	4	3	Slope over 15%, droughtiness.
B-1a	32B	9.2	10.9	1	1	1	2	Slope 3-8%.
B-1b	11C, 32C	17.5	20.8	2	1	2	3	Slope 8-15%.
B-1e	52D	11.0	13.1	3	3	4	4	Stoniness, slope over 15%.
B-3b	43M	1.0	1.2	4	4	4	4	High water table, stoniness.
C-2a	31B	1.0	1.2	3	2	2	2	Hardpan, seasonal high water table.
C-2b	31MC	8.0	9.5	3	2	3	3	Hardpan, stoniness, seasonal high water table.
E-1	807	5.5	6.5	3	3	2	3	Flood hazard, droughtiness.
Unclassified	ML	11.0 84.1	13.1 100.0	Suitability can be determined only by on-site investigation.				

* Refer to Know Your Land, Natural Soil Groups for Connecticut, Soil Conservation Service, USDA Connecticut Cooperative Extension Service, for further explanation of the natural soil groups.

** Limitations: 1-slight; 2-moderate; 3-severe; 4-very severe.

ACREAGE SUMMARY OF SOILS LIMITATIONS

	Slight		Moderate		Severe		Very Severe	
	Acres	%	Acres	%	Acres	%	Acres	%
On-Site Sewage	9.2	10.9	25.4	30.2	37.5	44.6	1.0	1.2
Basements	34.6	41.1	9.0	10.7	28.5	33.9	1.0	1.2
Landscaping	9.2	10.9	24.0	28.5	15.9	18.9	24.0	28.6
Streets and Parking	-	-	18.1	21.5	43.0	51.1	12.0	14.3