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Country Line Creek Watershed

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Final Environmental Impact Statement

Rockingham and Caswell Counties
North Carolina



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Country Line Creek Watershed
Caswell, and Rockingham Counties, North Carolina

Final Environmental Impact Statement

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July 1975

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FINAL ENVIRONMENTAL IMPACT STATEMENT

for

Country Line Creek Watershed

Caswell and Rockingham Counties, North Carolina

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USDA ENVIRONMENTAL IMPACT STATEMENT

Country Line Creek Watershed
Caswell and Rockingham Counties,
North Carolina

Prepared in Accordance with
Sec. 102(2)(C) of P.L. 91-190

SUMMARY SHEET

- I Final
- II Soil Conservation Service
- III Administrative
- IV Brief Description of Action: This action is a watershed project to be carried out in Country Line Creek Watershed (parts of Caswell and Rockingham Counties, North Carolina) under the provisions of Public Law 566. The project proposes conservation land treatment over the watershed, one multiple-purpose structure for a municipal and industrial water supply, and one multiple-purpose structure for recreation with a complete recreational development.
- V Summary of Environmental Impacts and Adverse Environmental Effects: Create 80 man-years of employment during project installation; create nine jobs for the project life; improve income of the watershed residents; reduce erosion and sediment by 68 percent; reduce sediment land damages by 31 percent; reduce floodwater damages to crops and pasture and other agricultural property by 69 percent; reduce sediment transported to the mouth of the watershed by 56,385 tons (394 mg/l) annually; reduce sediment delivered to Kerr Lake by 11,275 tons annually; provide 135,000 visitor-days of recreation annually; create 1,030 surface acres of fishery habitat; provide 3,190 acre-feet of municipal and industrial water supply; encourage industrial and economic growth over the watershed; develop 640 acres for upland wildlife habitat; reduce sediment associated pollutants; stabilize 67 acres of critical eroding land; temporarily increase sedimentation during construction; eliminate eight miles of stream fishery habitat; and eliminate about 1,100 acres of wildlife habitat; restrict wildlife use of 770 acres; restrict use of 665 acres in floodpools; cause 15 family displacements.
- VI Alternatives Considered: Accelerated land treatment program; alternate physical arrangements of structures; other considerations; and no project.

Summary

VII Agencies From Which Written Comments Were Received: Advisory Council on Historic Preservation; U.S. Department of the Interior; United States Department of Health, Education, and Welfare; United States Environmental Protection Agency; Federal Power Commission; United States Department of Transportation, United States Coast Guard; North Carolina Department of Natural and Economic Resources, North Carolina Wildlife Resources Commission.

Draft statement received by CEQ on January 9, 1975

PLANNED PROJECT^{1/}

Land Treatment

This part of the planned project involves an accelerated land treatment program on 2,599 acres of cropland, 2,163 acres of pastureland and hayland, and 4,255 acres of forestland. These measures are necessary to conserve, develop, and improve agricultural land within the watershed, and to assure the realization of benefits used in the justification of structural measures. Vegetative conservation measures will include conservation cropping systems, minimum tillage, crop residue use, field border plantings, contour farming, and stripcropping. Grassed waterways, terraces, and tile or open ditch drainage will constitute the mechanical conservation measures. Conservation treatment on the forested areas will consist of tree planting for critical area stabilization, tree planting for watershed protection, and stand improvement measures.

Technical assistance for planning and installing land treatment measures will be provided by the Soil Conservation Service through the Caswell County and Rockingham County Soil and Water Conservation Districts. The North Carolina Division of Forest Resources will provide assistance in installing all forestry measures.

Land treatment on both the cropland and forestland may involve a combination of several practices to obtain an "adequate" level of treatment. Therefore, a particular acre may be included more than once in the following descriptions of individual practices, and the summation of the acres to be treated by individual practices will exceed the actual acres to be treated. Land adequately treated is defined as land used within its capability on which the conservation practices that are essential to its protection and planned improvement have been applied.

Approximately 67 acres of critically eroding areas will be treated. The National Handbook of Conservation Practices (1) defines critical area planting as the planting to trees, shrubs, vines, grasses, or legumes on severe sediment producing, highly erodible, or existing badly eroded areas, such as gullies, cuts, fills, etc. Of these 67 acres, 30 will be planted to trees and 37 will be planted to grasses and legumes. Some of the critical areas (27 acres) are located above the planned reservoirs. The sponsors are responsible for treating 75 percent (20 acres) of the critical areas above the reservoirs before the advertisement of bids for their construction.

^{1/} All information and data, except as otherwise noted by reference to source, were collected during watershed planning investigation by the Soil Conservation Service or the Forest Service, United States Department of Agriculture.

Planned Project

The planned project includes the installation of conservation cropping systems on 2,213 acres. The Handbook (1) defines the practice as the growing of crops in rotation systems in combination with needed cultural and management techniques.

Crop residue use (1) will be initiated on 4,329 acres for the purpose of adding organic matter and improving growing conditions in the soil. This measure normally involves the plowing of leaves, stalks, and other plant remains back into the soil after the crop has been harvested.

Minimum tillage (1) incorporates the use of chemicals and limited cultural operations to keep the disturbance of the soil to a minimum. Use of this measure is planned on 1,029 acres.

A total of 25,650 linear feet of field border planting (1) is planned for the watershed. The field border is a strip of perennial vegetation established around a planted field to protect against erosion.

Stripcropping (1) is another practice planned on 899 acres to reduce soil erosion and control water. It involves the growing of crops in alternate bands of grass or close-growing crop and a row crop or the use of alternate bands of fallow (bare field) and a close-growing crop.

Adequate treatment of pastureland and hayland (1) involves the adoption of a sound management and improvement program such as proper fertilization and liming, brush control, proper timing of harvesting, etc., on already existing pastureland and hayland. Approximately 2,163 acres of pastureland and hayland will be adequately treated during the operation period. New pastureland and hayland will be established on 943 acres.

To be used on 5,305 acres, contour farming (1) is one of the most beneficial mechanical conservation practices to be applied to sloping cropland. In this practice, all cultural operations and planting are done on the contour.

Terrace systems, usually used in conjunction with contour farming, are sometimes needed on sloping cropland to intercept runoff water and to transport it off the field at a non-erosive velocity. The goal for this project is installation of 92,320 linear feet of terrace systems on the sloping cropland.

The diversion is very similar to a terrace except the location and purpose are different (1). Its purpose is to divert undesirable or excess water from one area to another, where it can be used or disposed of safely. For this watershed, 85,006 linear feet of diversions are planned for installation.

Planned Project

Grassed waterways (1) are used as outlets for terrace systems or other places where runoff tends to accumulate. A total of 167 acres of waterways will be installed.

Approximately 810 linear feet of drainage mains and laterals and 810 linear feet of field ditches will be installed. Open drains consist of graded ditches for collecting excess water within a field (1). Some of the ditches will serve to lower the water table on areas having drainage problems. Other ditches will serve as outlets for subsurface drains and to convey floodwater from the fields.

Land smoothing (1) involves the removal of surface irregularities, such as depressions, mounds, old terraces, and turn rows by use of special equipment. Smoothing of 130 acres in the watershed is planned.

The Soil Conservation Service has predicted that 5,064 acres of cropland and 814 acres of pastureland and hayland will receive partial treatment. This will be in addition to the acres of crop and pastureland described previously which will receive adequate treatment. Partially treated land has had one or more conservation measures applied on it, but it still needs other measures to be fully and adequately treated.

The forestry phase of the land treatment program consists of the following measures:

- (a) Tree Planting - Critical Area Stabilization (30 acres)
- (b) Tree Planting - Watershed Protection (700 acres)
- (c) Stand Improvement Measures (3,525 acres)

The forest management program is aimed at meeting watershed needs and objectives. The forestland will be developed to fulfill timber, wildlife, and recreation needs to the extent that such management is compatible with the overall watershed program. Hardwoods will be maintained on hardwood sites and pine-hardwood mixtures will be encouraged on pine lands. A balance will be maintained between food-bearing, den, and potential timber trees. Any problems arising from urban development taking place in the forested part of the watershed will be alleviated through the co-ordinate effort of the watershed forester and planning commission, land developers, or the particular organization involved.

A total of 640 acres of privately owned land will be developed for the improvement or preservation of given wildlife habitat types. Wildlife management on this acreage represents either a primary or secondary land use on which a plan will be developed outlining the types of management by species. Wildlife development will include installation of 11 ponds, pits, or reservoirs.

Planned Project

The land treatment phase of this project will be carried out largely through soil and water conservation plans on individual farm units. The soil and water conservation plan (2) is a document which makes specific plans concerning land use and conservation measures to be installed on a particular farm. The plan is made by the landowner or operator with technical guidance and advice provided by the Soil Conservation Service. It is estimated that conservation plans will be developed for an additional 89 units during the project installation period, and that 65 additional landowners will enter into co-operative agreements with soil and water conservation districts for assistance in installing land treatment measures. Revisions of 26 existing conservation plans are anticipated.

Structural Measures

Structural works of improvement to be installed will consist of two multiple-purpose reservoirs. The Caswell County Board of Commissioners will be responsible for the installation of Structure No. 4; and the Yanceyville Sanitary District and Caswell County Board of Commissioners will have this responsibility for Structure No. 1 (see project map). All items of construction, except public road modifications, will be performed under contracts let, administered, and financed by these organizations. Necessary public road modifications will be made by the North Carolina Department of Transportation and Highway Safety.

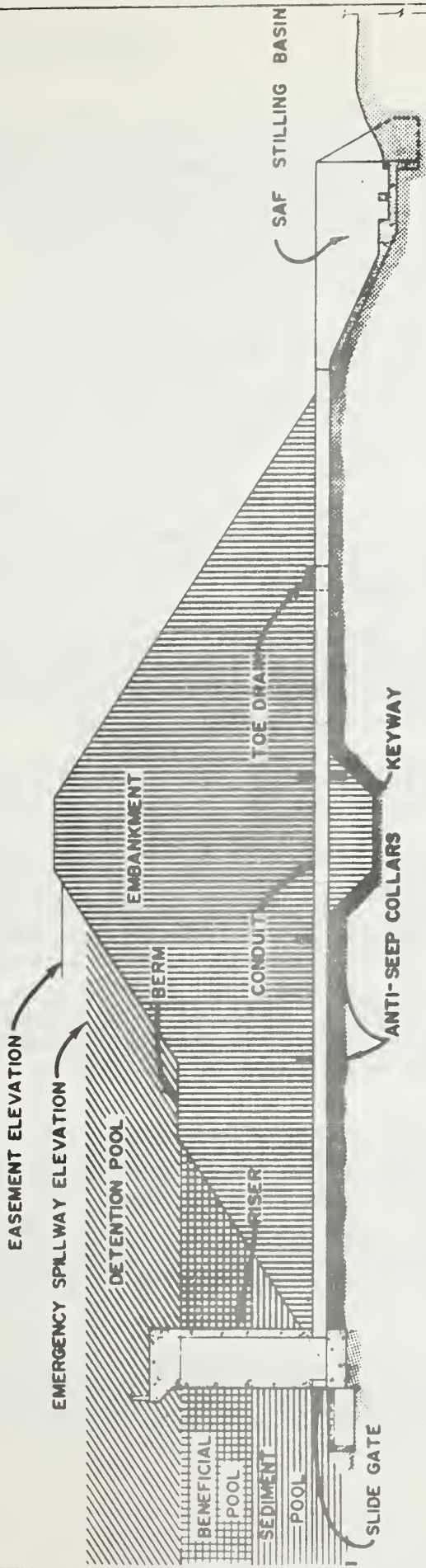
The Board of Commissioners will develop and maintain a financial management system that will provide for disclosure of the financial results of each Public Law 566 undertaking in which the Soil Conservation Service has a financial interest in accordance with Soil conservation Service reporting requirements.

The multiple-purpose structure (1) has storage capacity for floodwater, expected sediment accumulation, and one or more other beneficial uses, such as recreation. (Figure 1) The storage capacity allotted to sediment is that which is expected to accumulate in the structure over a 100-year period.

All applicable state health laws and regulations will be complied with both in design and installation and in operation and maintenance.

The storage allotted to floodwater depends on the size of the structure's drainage area and its classification. (The structure's classification is made according to the hazards that would result if the structure failed.) Storage capacity for the other uses of a multiple-purpose structure (e.g. recreation) is determined according to local needs and physical constraints of the structure site.

Multiple-purpose Structure No. 1 (see project map), to be located on Country Line Creek, will have allotted storage for municipal and industrial water in addition to its floodwater and sediment storage. The compacted earth fill dam will be 70.5 feet high. A 5.5-foot x 5.5-foot



SECTION OF A TYPICAL
MULTIPLE-PURPOSE STRUCTURE

Figure 1

concrete monolithic box through the dam will empty into an energy dissipator to prevent stream scour. A reinforced concrete riser will set the elevation of the permanent pool at 483.5 feet mean sea level. At this level the structure will have 2,210 acre-feet of sediment storage, and 3,190 acre-feet of municipal and industrial water storage. A layer of about 15 feet of alluvial fill over the centerline of the structure will produce a yielding foundation for the principal spillway.

The emergency spillway will be excavated so it will be located in rock. It will likely be necessary to do some "dental grouting" in the rock of the emergency spillway to improve its stability. The crest elevation of the emergency spillway will be at 500.5 feet mean sea level, enabling the structure to temporarily store 9,162 acre-feet of floodwater. It will be designed for a one percent chance of use.

The upstream face of the dam will be riprapped from two feet below the elevation of the permanent pool to four feet above the permanent pool to protect against damage from wave action. The structure will control runoff from 29,720 acres (33 percent) of the watershed.

Public access and minimum recreation facilities will be provided to Structure No. 1. Use of the structure for incidental recreation will be kept in compliance with all applicable laws of the North Carolina Division of Health Services. Sanitary facilities will also be provided.

A water intake for municipal and industrial water supply will also be constructed in conjunction with Structure No. 1.

Multiple-purpose Structure No. 4, to be located on South Country Line Creek, will have additional storage capacity for recreational use. Its compacted earth fill dam will be 59.0 feet high. A 4.5-foot x 4.5-foot concrete monolithic box emptying into an energy dissipator will pass through the dam, and the reinforced concrete riser will set the permanent pool at elevation 490.0 feet mean sea level. At this water level, the structure will have 1,280 acre-feet of sediment storage, and 12,620 acre-feet of recreational storage. The upstream face of the dam will be riprapped from two feet below to four feet above the permanent pool. The foundation under the principal spillway will be yielding.

A two-part emergency spillway system will be employed on this structure. The two spillways will be set at elevation 500.5 feet mean sea level and will be located in rock. Some "dental work" on the spillway rock may be beneficial in improving its stability. The frequency of use of the spillway will be less than one percent and the structure will have 7,800 acre-feet of flood water storage. It will control runoff from 17,340 acres (19.2 percent) of the watershed.

In conjunction with Structure No. 4, there will be a recreational development constructed (see recreational development map). This development will include such facilities as parking spaces, picnic tables, grills,

boat ramps and docks, rest rooms, camp sites, access roads, etc. Structure No. 4 is expected to have an annual visitation of 104,200, with a maximum design capacity of 1,625 persons.

The public recreation lake will have a surface area of 640 acres at elevation 490.0 feet mean sea level. Land rights will be acquired in fee simple for the dam and spillway area, recreation area, and in the reservoir area to a line representing the permanent pool elevation plus 100 feet horizontally. The land required amounts to 908 acres for the dam and spillway and reservoir area and 770 acres for the facilities area. About 40 acres of flowage easements will also be needed in the upper arms of the reservoir. Approximately one mile of Secondary Road 1736 will be abandoned and replaced by 1.4 miles of new road to be located below the dam.

The water supply for the public recreational development will come from drilled wells and be piped to all use areas. Package sewage treatment plants with tertiary treatment will be installed at four different locations. One plant will provide treatment for Areas 1 and 2 and one plant each for Areas 4, 5, and 6. (See recreational development map.) The plants will be constructed to meet requirements of sanitation laws of the State of North Carolina.

An electric system will be installed which will furnish power to all public buildings. Outlets for campers will be provided in Area 6 (see recreational development map).

Area 1 (see recreational development map) is a group camping area. Facilities will consist of sanitary facilities, parking areas, picnic tables, water fountains, grills, waste receptacles, boat dock and ramp, and pads for tenting or similar type camping.

Area 2 (see recreational development map) is an overlook and picnic area. Facilities planned are: a parking area, sanitary facilities, tables, grills, a rustic picnic shelter, waste receptacles, and water fountains.

Area 3 (see recreational development map) is an overlook area only. Facilities are limited to a parking area and trees will be removed so that there is a clear view of the lake.

Area 4 (see recreational development map) will be a multiple-use development. It will consist of a three-mile riding trail, boat dock and ramp, parking area, tables, grills, rustic picnic shelters, water fountains, and sanitary facilities.

Area 5 (see recreational development map) is for picnicking. Facilities will consist of a rustic picnic shelter, tables, water fountains, grills, waste receptacles, boat dock and ramp, parking area, and sanitary facilities.

Planned Project

Area 6 (see recreational development map) is planned as a trailer-type camping area. Facilities will consist of camp sites, a bath house, tables, grills, water fountains, waste receptacles, a boat dock and ramp, a parking area, and sanitary facilities. A sewage dump station will be included as a part of the bath house installation.

All exposed embankment areas, spillways, borrow areas, and other areas disturbed during construction will be vegetated as construction progresses. Debris basins, diversions, and similar measures will also be used, as needed, to prevent sediment damage during construction. Construction will also be contracted and let seasonally so as to minimize erosion and sediment.

Land Use Changes

Installation of the project will result in some land use changes within the watershed. The two structures will permanently commit 1,030 acres of cropland, pastureland, and forestland to permanent water. Another 655 acres of cropland, pastureland, and forestland in the flood pools of the two structures will be limited to future uses which can tolerate flooding. About 50 acres of mostly forests will be taken up in the dams and emergency spillways of the two structures.

Considering the watershed as a whole, these changes in the broad categories of land use are predicted over the project installation period.

Losses Gains	Cropland	Hay and Pasture	Forest land	Idle	Miscellaneous (roads, home- sites, etc.)	Total Losses
Present Use	16,287	7,659	60,072	1,738	3,017	
Cropland		349	743	7	1,018	2,117
Hay & Pastureland	107	-	603	-	296	1,006
Forestland		38		-	1,497	1,535
Idle	263	550	534	-	67	1,414
Miscell- aneous	-	-	-	-	-	-
Total Gains	370	937	1,880	7	2,878 ^{1/}	6,072
Net Change	(1,747)	(69)	345	(1,407)	2,878	
Future Use	14,540	7,590	60,417	331	5,895	

^{1/} Includes land for structures, permanent pools, recreational development area and wildlife habitat.

Included in these land use changes are certain conversions expected to take place in the flood plain below the proposed structure, as shown in the following table:

Planned Project

<u>Land Use</u>	<u>Present</u> (acres)	<u>Future With Project</u> (acres)
Corn	131	369
Pasture	242	193
Tobacco	8	8
Idle	29	---
Forest	1,418	1,258
Miscellaneous	<u>92</u>	<u>92</u>
Total	1,920	1,920

Other land use changes will occur in the years after the installation period as a result of industry moving into Yanceyville and Caswell County. No practical estimate of these changes was made, however.

Operation and Maintenance

Land Treatment

Land treatment measures (including critical area plantings) for open land will be maintained by the landowners or operators of the land on which these measures are installed. This work will be encouraged through the soil and water conservation districts with technical assistance furnished by the Soil Conservation Service.

Landowners and operators will maintain the forestry land treatment measures (including critical area plantings) under agreement with the Caswell County and Rockingham County Soil and Water Conservation Districts. The North Carolina Division of Forest Resources, in cooperation with the United States Forest Service, will provide technical assistance necessary under the going Cooperative Forest Management Program. They will continue to furnish fire protection under the going Cooperative Forest Fire Control Program.

The district supervisors or their representatives will make a periodic review of the land treatment measures installed (including critical area plantings) to see that they are adequately maintained.

Structural Measures

The Yanceyville Sanitary District and the Caswell County Board of Commissioners will operate and maintain multiple-purpose Structure No. 1, including the water intake system and the public access facilities. Multiple-purpose Structure No. 4, including the recreational development, will be operated and maintained by the Caswell County Board of Commissioners.

Structural works of improvement will be operated in such a manner that they will serve the purpose, both as to function and time, for which they were installed. The maintenance of both structures will consist of, but not be limited to, the following:

Planned Project

- a. Removal and disposal of debris from principal and emergency spillways.
- b. Refilling, smoothing, and vegetating rills on embankments, spillways, and drainageways.
- c. Maintenance of good vegetative cover.
- d. Replacement of metal used in construction, as required, for proper structural function.

Services that will be specifically required to operate and maintain recreational development are:

- a. Superintendent
- b. Additional semi-skilled labor, such as carpenters, mechanics, etc.
- c. Additional laborers for ground care, road repair, trash pickup, etc.
- d. Additional compensation, medical, or other workers' benefits.

Operating supplies for the development will include:

- a. Seed, fertilizer, paint, lumber, etc.
- b. Repair parts for water systems, machinery, etc.
- c. Utilities (telephone, electricity, etc.)
- e. Fuel, grease, etc., for motor equipment.

Equipment around the development which will require replacement includes:

- a. Maintenance shop, office, and furnishings.
- b. Tractor for mowing, seeding, etc.
- c. Pickup or other truck for refuse collection and other use.
- d. Boat and motor for rescue, enforcement, etc.
- e. Playground or sports equipment.
- f. Hand tools and minor equipment.

Maintenance of structural measures will be by force account or by contracts administered by the aforementioned county entity. Funds for maintenance will be raised by taxation or levy.

The Soil Conservation Service and the sponsors will make a joint inspection annually, or after unusually severe storms.

Average annual cost of the operation and maintenance of Structure No. 1 will be about \$1,000. Average annual operation and maintenance cost of Structure No. 4 has been estimated at \$51,000. This includes \$50,000 for the operation and maintenance of the recreational development and replacement of equipment.

Specific agreements for the operation and maintenance of structural works of improvement will be executed prior to issuance of invitation to bid for construction. The agreements will cover such items as source of funds, methods of providing maintenance, annual maintenance inspections, and the responsibility for providing these funds and service. A plan of operation and maintenance is included in the agreement using the North Carolina Operation and Maintenance Handbook as a guide.

Project Costs

The total project cost is estimated to be \$5,862,750. The following table summarizes the important elements of total project cost.

<u>Item</u>	<u>P.L. 566</u>	<u>Other</u>	<u>Total Cost</u>
Land Treatment	\$ 129,000	\$ 723,300	\$ 852,300
Structural Measures	\$ 2,579,810	\$ 2,430,640	\$ 5,010,450

Construction cost, a part of structural measures cost, is estimated to be \$3,295,000. Public Law 566 funds will pay \$1,667,900 of this amount and other funds will pay \$1,627,100.

Archaeological, Historical, and Scientific

An archaeological survey made through a contract with the North Carolina Department of Cultural Resources, Division of Archives and History investigated the areas to be disturbed by the proposed project for sites of archaeological significance. The survey report recommended extensive tests be made at one site (Csl2) with intensive investigation in the area of greatest artifactual concentration in order to determine the advisability of full-scale archaeological research. This site is located in a field off SR 1750 just east of the confluence of Pension and Burkes Creeks and is in the proposed recreational development area of structure No. 4.

The Division of Archives and History also made a comprehensive architectural inventory of historic sites in Caswell County. They suggested that Womack's Mill, a large frame grist mill located in the permanent pool of structure No. 1 would possibly be eligible for inclusion in the National Register. The Department of the Interior determined that both Csl2 and Womack's Mill would be eligible.

Planned Project

The archaeological site will be located on design plans, protected during construction, and seeded to blend in with the remaining areas in the development. Meetings with the State Historic Preservation Officer and representatives of the Advisory Council on Historic Preservation are being held to insure compliance with PL 93-291 and Executive order 11593 concerning Womack's Mill. (See Consultation Section page 45).

The National Park Service will be notified if any previously unidentified evidence of cultural values is discovered during detailed investigations or construction and procedures in PL 93-291 will be followed.

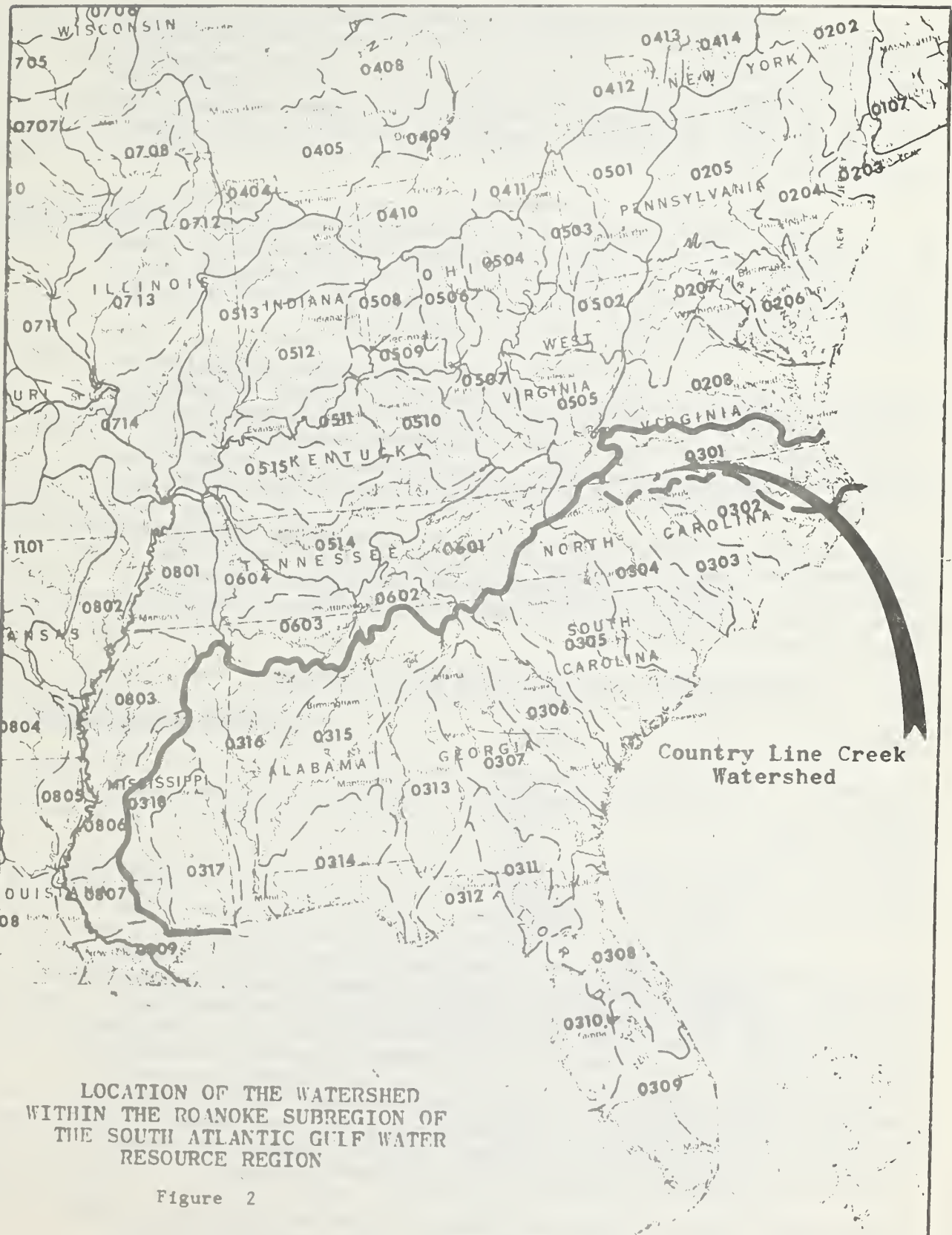
ENVIRONMENTAL SETTING

Physical Resources

The watershed, about 88,773 acres in size, is located in parts of Caswell and Rockingham Counties in north central North Carolina. Approximately 86,553 acres are in Caswell County and 2,220 acres are in Rockingham County. Yanceyville (Population 1,274) (3) and Milton (population 235) (4) are the only towns located within the watershed, although numerous small communities are dispersed through the area. The city of Danville, Virginia (Population 46,557) (4) lies about 15 miles to the north and Burlington, North Carolina population (35,930) (3) is located 25 miles to the southwest.

The watershed is located in subregion 0301 of the South Atlantic Gulf Water Resources Region as defined by the Water Resources Council (5) (Figure 2). The 276,000 square-mile area of the region extends from the North Carolina-Virginia boundary line at the Atlantic Ocean to the mouth of Lake Pontchartrain on the Gulf of Mexico in Louisiana (6). It includes parts of North Carolina, Georgia, Alabama, Louisiana, Mississippi, and all of South Carolina and Florida. The climate of the South Atlantic Gulf Region (6) is characterized by well-distributed rainfall, mild winters, and warm to hot-humid summers. The average rainfall varies from over 80 inches in the mountains to 44 inches in central Georgia. Annual natural runoff ranges from 10.5 inches to 20.8 inches among the subregions; however, variations of individual river basins may be considerable. The quality of streams in the region is generally excellent. Turbidity and color sometimes impair water physical quality in the coastal plain and moderate to sometimes high sediment loads are common. The quality of ground water is suitable for most uses; however, the yield varies considerably, depending on the type aquifer and the location within the region. The topography differs considerably throughout the region from rugged-densely-wooded mountains to rolling, well-drained plains to flatlands, wetlands, and marshes.

Subregion 0301 is made up of the Roanoke River Basin and contains all or parts of 37 North Carolina and Virginia counties. Its physical characteristics are typical of the piedmont and coastal plain of the South Atlantic Gulf region as a whole. The climatic conditions of the subregion are generally more harsh than other piedmont and coastal plain areas in the South Atlantic Gulf, due to its extreme northerly position within the region (Figure 2).



LOCATION OF THE WATERSHED
 WITHIN THE ROANOKE SUBREGION OF
 THE SOUTH ATLANTIC GULF WATER
 RESOURCE REGION

Figure 2

Environmental Setting

The watershed is typical of the middle piedmont area of both subregion 0301 and the South Atlantic Gulf region. It receives a well-distributed rainfall of approximately 45 inches annually (7). Average temperatures range from 42 degrees Fahrenheit in January to 78 degrees Fahrenheit in July (8), although extremes of 106 degrees in the summer and zero degrees in the winter occur occasionally. The normal growing season is about 200 days long, extending from the middle of April through the last of October (8).

The topography of the watershed is badly broken by steep slopes adjacent to the streams, and short erratic slopes on the remaining areas. Elevations range from about 700 feet mean sea level in the headwaters to 350 feet mean sea level at the confluence of Country Line Creek and the Dan River. All of the watershed is in the piedmont area.

Crushed stone is currently produced in both Caswell and Rockingham Counties. In addition, clay, sand and gravel are produced in Rockingham County. Present annual mineral production in the two counties is valued at approximately \$1,000,000. There is no current record of mineral production within the project area. Installation of the project is not anticipated to have an effect on the mineral resource base of the area.

Public ownership of land consists of 12,700 acres in the Caswell Wildlife Management Area, owned by the State of North Carolina. All of the remaining area, other than roads and public buildings, is privately owned. Of this, the Boy Scouts of America own 1,400 acres and timber companies own about 970 acres.

The principal land uses in the watershed are as follows:

<u>Land Use</u>	<u>Acres</u>	<u>Percent of Watershed</u>
Cropland	16,287	18
Forestland	60,035	68
Pasture & Hay	7,629	8
Idle	1,738	2
Wildlife	600	1
Miscellaneous	<u>2,484</u>	<u>3</u>
Total	88,773	100

The cropland in the watershed has been broken down into land capability groups (9). Capability grouping shows, in a general way, the suitability of soils for particular uses. The groups are classified according to the limitations of the soils for particular uses, the risk of damages or losses involved in their use, and the way they respond to treatment. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils; does not take into consideration possible but unlikely major reclamation projects; and does not apply to rice, cranberries, horticultural crops, or other crops requiring special management.

Those familiar with the capability classification can infer from it much about the behavior of soils, when used for other purposes, but this

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classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for range, for forest trees, or engineering.

In the capability system, all kinds of soils are grouped at three levels; the capability class, subclass, and unit. These are discussed in the following paragraphs:

Capability Classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use, defined as follows:

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants, require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants, require very careful management, or both.

Class V soils are not likely to erode, but have other limitations, impractical to remove, that limit their use largely to pasture, range, forestland, or wildlife.

Class VI soils have severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture, range, forestland, or wildlife.

Class VII soils have very severe limitations that make them unsuited to cultivation and that restrict their use largely to pasture, range forestland, or wildlife.

Class VIII soils and landforms have limitations that preclude their use for commercial plants and restrict their use to recreation, wildlife, water supply, or to esthetic purposes.

Capability Subclasses are soil groups within one class; they are designated by adding a small letter, e, w, or c, to the class numeral; for example, IIe. The letter e shows that the main limitation is risk of erosion, unless close-growing plant cover is maintained; w shows that water in or on the soil interferes with plant growth or cultivation (in some soils, the wetness can be partly corrected by artificial drainage); s shows that the soil is limited mainly because it is shallow, droughty, or stony; and c, used in only some parts of the United States, shows that the chief limitation is climate that is too cold or too dry.

In class I there are no subclasses, because the soils of this class have few limitations. Class V can contain, at the most, only the subclasses indicated by w, s, and c, because the soil in class V are subject to little or no erosion, though they have other limitations that restrict their use, largely to pasture, range, forestland, wildlife, or recreation.

Capability Units are soil groups within the subclasses. The soils in one capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management and to have similar productivity and other responses to management. Thus, the capability unit is a convenient grouping for making many statements about management of soils. Capability units are generally designated by adding an Arabic numeral to the subclass symbol; for example, IIe-2. Thus, in one symbol, the Roman numeral designates the capability class, or degree of limitation, as defined in the foregoing paragraph; and the Arabic numeral specifically identifies the capability unit within each subclass. The capability unit is oftentimes omitted if all the soils of a certain class and subclass (i.e. IIe) fall in the same capability unit. The cropland in the watershed has been broken down into capability class and subclass. Capability units have not been included because of the reason stated above.

The approximate acres of land use in the watershed by capability group are as follows:

<u>Capability Group</u>	<u>Cropland</u>	<u>Forestland</u>	<u>Hay & Pasture</u>	<u>Idle</u>	<u>Misc.</u>
IIe	7,326	7,265	2,289	521	-----
IIIe	4,886	8,535	1,526	434	-----
IVe	1,629	9,100	1,602	191	-----
VIe	1,955	28,640	1,144	556	-----
VIIe	163	3,530	610	36	-----
IIw	-----	1,980	-----	---	-----
IIIw	164	210	305	---	-----
IVw	164	775	153	---	-----
Any	-----	-----	-----	---	3,084
Total	16,287	60,035	7,629	1,738	3,084

As can be seen from these figures, erosion problems are the most serious problems on the cropland in the watershed. The planned land treatment measures are designed to help use this erosion-prone cropland in the most efficient manner possible.

The principal upland soils are from the Pacolet, Wilkes, and Helena series, with a small amount of Cecil, Appling, and Hiwassee series soils present (10). These soils have developed chiefly from weathered acid and basic crystalline rocks and vary from very shallow to moderately deep. Flood plain soils are members of the Wehadkee, and Chewcla series.

Pacolet soils (11) are well-drained, moderately permeable, and very strongly acid soils of the piedmont uplands. They have brownish-yellow sandy loam surface layers and thin red clayey subsoils over thick weathered rock layer. These soils are on short to medium length slopes adjacent to the bottom lands and drainageways. Slopes are commonly 15 to 40 percent.

The Wilkes soils (11) are well-drained, shallow soils on nearly level to steep topography of the piedmont uplands. Typically, these soils have a grayish-brown sandy loam surface layer and a thin, firm clay subsoil which extends from 12 to 20 inches below the surface. The sub-stratum is saprolite that crushes to sandy loam or loam texture. Hard rock lies at three to four feet below the soil surface and slopes range from four to 60 percent.

Consisting of moderately well-drained, slowly permeable subsoils, Helena soils (11) are found on nearly level to moderately steep topography of the piedmont. The typical surface layer is a sandy loam about 12 inches thick. The subsoil extends to a depth of about 46 inches and commonly is a plastic sandy clay loam in the upper part over very plastic clay that grades into a silty clay loam in the lower part. Slopes are commonly from two to 10 percent.

Located on flood plains the Wedhadkee series (11) are poorly drained, alluvial soils. Typically, these soils have a grayish-brown fine sandy loam surface layer and a dark gray sandy clay loam subsoil. The sub-stratum is commonly sandy loam or stratified sand, silt, clay, and gravel. Wedhadkee soils are on level or gently sloping areas.

Also found on flood plains, Chewacla soils (11) are likewise alluvial and moderately well-drained to somewhat poorly drained. These soils usually have a brown loam surface layer and a yellowish-brown loam, silt loam to silty clay loam subsoil that is mottled with gray within 24 inches of the surface. Slopes are less than two percent.

Country Line Creek originates just east of the community of Williamsburg in Rockingham County and flows northeast to its confluence with the Dan River at Milton (see project map). Principal tributary streams on the south side of Country Line Creek include Penson, Burkes, Byrds, and South Country Line Creeks. Holster Branch is the main tributary on the north side. The stream pattern of the watershed is primarily dendritic; that is, each stream or tributary branches out into smaller streams. The main stem of Country Line Creek and its major tributaries are permanently flowing streams with an average annual runoff of about 14 inches (12).

There are, at present, no large reservoirs located within the watershed area. The town of Yanceyville has a small, water supply reservoir on a tributary of Country Line Creek and there are numerous small farm ponds in private ownership used for recreation, livestock water, irrigation, etc. Hyco Lake is a large hydroelectric power lake located just east of the watershed and is available for limited fishing and boating.

The streams of the watershed have been classified in accordance with the system used by the North Carolina Office of Water and Air Resources, Department of Natural and Economic Resources (13). Country Line Creek

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from its source to North Carolina Highway 62 is classified "A-II" and is classified "C" from that point downstream to the Dan River (14). Byrds Creek is classified "C" from its source to Caswell County Secondary Road 1751 and "B" from there downstream to South Country Line (14). South Country Line Creek is classified "C" from source to Caswell County Secondary Road 1759, classified "B" from there downstream to the proposed dam at Structure No. 4 (see project map), and classified "C" below the proposed dam (14). Penson Creek is listed as being in class "C" from its source to North Carolina Highway 62 and class "B" from this road (14). Burkes Creek is class "C" from the headwaters to North Carolina Highway 62 and class "B" from there to Penson Creek (14). Holster Branch is designated as class "D" in its entire length (14).

The "A-II" classification designates the water as being suitable for a source of water supply, culinary or food processing purposes, after approved treatment equal to coagulation, sedimentation, filtration, and disinfection, etc., and any other usage requiring water of lower quality. Class "B" water is suitable for recreational use (human contact) and other lower quality uses. The "C" classification designates it as being suitable for fish and fish propagation, and any other usages requiring water of lower quality. The "D" classification designates the water as being suitable for agricultural and for industrial cooling and process water, after treatment by the user as may be required under each particular circumstance.

Slack and Wilder of the United States Geological Survey have reported on general water quality of many streams in North Carolina, including Country Line Creek (15). They show the creek to have an average hardness concentration of 31 to 69 milligrams per liter (expressed as CaCO_3). This concentration is generally considered to indicate "soft" water. Average chlorides concentration of the creek falls in the range of 3.0 to 5.9 milligrams per liter, with an average nitrate concentration of 0.0 to 0.5 milligrams per liter from the headwaters of Country Line to the junction of South Country Line Creek, and 0.5 to 0.9 milligrams per liter from that point downstream. The water quality information also shows that the average color of the streams in the area in which Country Line Creek is located ranges from 5 to 40 units. This color is that which comes from decomposition of organic material and industrial pollution, and does not include any color associated with sediment. Natural color becomes barely detectable to the human eye at about 5 units; while weak tea has a color equivalent of about 300 units.

Country Line Creek was sampled by Soil Conservation Service personnel at three locations in March, 1974, for various water quality parameters. Water temperature of those samples averaged 46 degrees Fahrenheit. Total hardness of all the samples averaged 33 milligrams per liter. Nitrate nitrogen averaged .16 milligrams per liter, although one sample showed no nitrogen at all. The average dissolved oxygen level was 11 milligrams per liter and the average pH was 7.5. Average turbidity was 17 Jtu.

It should be pointed out that these measurements are indicative of conditions at the time of sampling, and do not necessarily represent average conditions.

Economic and Social Resources

The total watershed population is about 6,100, consisting of 5,350 rural and 750 non-rural. There has been a general decline in the population during the period 1960 -1968, as there was an out-migration of approximately 400 persons from the watershed. The 1970 census showed that 48.1 percent of Caswell County's population was made up of minority groups, and although the watershed's percentage of minority people is not available, it would compare favorably with the county average.

The economy of the watershed is featured by a strong dependence on agriculture. Work force estimates, prepared by the North Carolina Employment Security Commission (16) show that Caswell County had a civilian work force estimate of 5,810 in 1970. The work force was employed by the various groups as follows:

Agriculture	---- 2,020
Manufacturing	---- 1,140
Nonmanufacturing (construction, transportation, government, etc.)	---- 1,190
Other nonagriculture (domestics, self-employed & unpaid family workers)	---- 1,150

There were about 310 persons unemployed in 1970 for a rate of 5.3 percent. This is an increase compared to the 1969 rate of 2.4 percent and the 1968 rate of 2.9 percent.

The per capita income was \$2,132 in 1970 for Caswell County, as compared to \$3,208 for the state (17). The county's median family income for the same year was \$6,868, as compared to \$7,774 for the state. Many of the lower income families are located on low-income producing family farms.

The United States Department of Commerce showed that the number of farms in Caswell County in 1969 as 1,263 (18). This includes part-time and part-retirement farms. Farms average about 132 acres in size with the average value of a farm unit being about \$27,564 (18). The average value of farmland in the watershed is about \$300 per acre.

The number of farms in the county, by economic classes in 1969, were as follows:

Class 1	-----	Sales of \$40,000 and over	-----	22
Class 2	-----	Sales of \$20,000 -- \$39,999	-----	87
Class 3	-----	Sales of \$10,000 -- \$19,999	-----	162

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Class 4	-----	Sales of \$ 5,000 -- \$9,999	-----	285
Class 5	-----	Sales of \$ 2,500 -- \$4,999	-----	295
Class 6 ^{1/}	-----	Sales of \$ 50 -- \$2,499	-----	109
Part-Time ^{2/}	-----	Sales of \$ 50 -- \$2,499	-----	181
Part-Retirement ^{3/}	-----	Sales of \$ 50 -- \$2,499	-----	122

1/ Farm operator under 65 years old who did not work off the farm 100 days or more.

2/ Farm operator under 65 years old who worked off the farm more than 100 days.

3/ Farm operator 65 years old and older

Major farm enterprises in the watershed are corn, tobacco, soybeans, small grain, livestock, and dairying. Lesser crops include peanuts and truck crops. Tobacco is the most important cash crop grown. The value of all farm products sold in Caswell County in 1969 amounted to \$9,561,850 (18). The portion of this generated by livestock sales was \$1,709,240 and \$7,673,284 was generated by sales of crops (18). This compares to corresponding sales of \$1,148,689 and \$10,267,970 respectively in 1964 (18). Sales of forestry products in 1969 amounted to \$179,326 (18).

The watershed is served by an adequate network of highways, primary roads, secondary roads, and railroads. U.S. Highway 158, N.C. Highways 86 and 62, and numerous other paved roads pass through the watershed. The Atlantic and Danville Railroad serves Milton in the northern end of the watershed.

Industry within the watershed is not significant. There are several small industries which employ approximately 500 persons.

Plant and Animal Resources

The major feature of the plant community in this watershed is the forestland. The forest types are 43 percent pine, 40 percent pine-hardwood, 10 percent hardwood-pine, and 7 percent hardwood. The principal species are shortleaf pine, Virginia pine, yellow poplar, red cedar, red oak, sweetgum, and hickory. Eighty-seven percent of the area is well-stocked with merchantable tree species. Timber volumes, based on the total forestland acreages, will average 840 board feet of pine and 480 board feet of hardwood per acre. Pulpwood volumes would average 495 cubic feet of pine and 203 cubic feet of hardwood per acre.

The understory in the forested areas of the watershed is dominated primarily by various species of small trees and shrubs. Due to sharp variations in soil type and terrain (slope, aspect, etc.), the dominant understory species are often different even between areas with the same type of dominant overstory. Understory species that are common throughout the forest areas included sweetgum, dogwood, sourwood, blackberry, red cedar, red bud, persimmon, plum, huckleberry, gooseberry, spicewood,

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strawberry bush, red maple, and sumac. The most frequently dominant species would probably be sweetgum, dogwood, and sourwood.

Important plant communities include all stages in the secondary succession pattern typical in abandoned fields in the piedmont region of southeastern United States. The dominant community types in the different stages are described by Odum (19) as bare field, grassland, grass-shrub, pine forest and oak-hickory forest climax.

11,710 of the 12,700 acres of the Caswell Wildlife Area located in the watershed is in woodland and is managed primarily as wildlife area. However; a forester is employed to provide woodland management and commercial cutting is done.

A 1400 acre tract of forestland owned by the Boy Scouts of America is managed as a wilderness area and consists of hardwoods on steep slopes on which no commercial cutting is done.

Approximately 970 acres of forestland are industrially owned. There are no National Forests lands within the watershed.

Although there are no types 1 and 7 wetlands wildlife habitat (20) in the watershed, waterfowl do use the main stream as a resting area with adjacent trees providing some food and cover. The large areas of upland forests provide some excellent habitat for rabbit, quail, squirrel, deer, and turkey.

A variety of wildlife, including game and non-game species, is found in the watershed area. The big game species present are white-tailed deer and wild turkey with high populations of both, however, hunting is heavy only in the Caswell Wildlife Area. The primary small game species are bobwhite, rabbit, mourning dove, and gray squirrel, with populations ranging from moderate to high. Furbearer populations range from low to moderate and include raccoon, mink, muskrat, opossum, and both gray and red fox. There is a lower waterfowl population, with the wood duck being the primary species. There are many different species of song and other birds, reptiles, amphibians, and small non-game mammals, with populations ranging low to high locally dependent upon the habitat.

Country Line Creek is listed in A Catalog of the Inland Fishing Waters in North Carolina (21) with the lower four miles having an ecological classification (E/C) of catfish-sucker, the middle 12 miles having an E/C of largemouth-pickereel, and the upper 14 miles having an E/C of dace-trickle. Tributary streams were listed as "too small to be of fishing significance."

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The Survey and Classification of the Roanoke River and Tributaries, North Carolina (22), reports that the stream has harvestable populations of redbreast sunfish, redbfin pickerel, and channel catfish. Most fishing occurs in the lower 16 miles of stream, with the upper reaches and tributaries being limited primarily to sucker gigging in the spring.

The results from a sample station in the dace-trickle portion of the stream and a station in the catfish-sucker portion are given in the above-mentioned stream survey report. In the dace-trickle station, redbfin pickerel were found, along with members of the minnow family (such as several species of dace, chubs, and shiner) and members of the perch family (such as several species of darters). In the catfish-sucker section, redbreast sunfish, black crappie, yellow perch, and redbfin pickerel were found, along with members of the minnow family (chubs, shiners, dace, and carp), the perch family (darters), the sucker family (redhorse suckers and chubsuckers), and the catfish family (channel catfish and madtoms).

Fish food organisms (macrobenthic) were also sampled at these stations. At the dace-trickle station, the average number of organisms per square foot was 36.5 and average volume of organisms per square foot was 0.95 ml. These figures may be compared to similar figures for dace-trickle streams in the Roanoke Basin, where the average number was 12.9 and the average volume was 0.79 ml. At the catfish-sucker station, the number of organisms per square foot was 7.5 and the average volume was 0.2 ml. The similar figures for all catfish-sucker streams in the basin were 15.8 and 2.72 ml. No sampling was done in the largemouth-pickerel section of Country Line, but for this type of stream throughout the basin the average number of organisms per square foot was 9.1, with an average volume per square foot of 1.41 ml. Of the two reservoirs planned, No. 1 will be on the section of stream classified as dace-trickle and No. 4 will be on a tributary stream listed in the Catalog as being too small to be of fishing significance.

No rare or endangered species have been reported from this watershed area; however, three animals species on the Preliminary List of Endangered Plant and Animal Species in North Carolina (23) have ranges which indicate they might possibly be permanent or temporary residents of the watershed area.

A rare salamander, Hemidactylum scutatum, whose range is considered to cover all the piedmont and mountain counties in North Carolina, might be present, but there is no record from Caswell County. Although the larval form is aquatic, the adult is terrestrial. The project as planned should have little or no effect on this species even if present.

Two fish species, the rare Roanoke Hogsucker (Hypentelium roanokense) and the endangered Bigeye Jumprock (Moxostoma ariommum), are endemic to the Roanoke River system. Since both are known to make spring spawning runs up tributaries, Country Line Creek might be involved. However, since no channel work is planned and the two structure sites are in the upper reaches of the stream, the project should have little or no effect on these species even if they do utilize Country Line Creek.

Recreational Resources

There is a minimum of water-based recreational facilities within the watershed.

Most of the fishing that is done on Country Line Creek takes place at the few road crossings. Access to the main channel between North Carolina Highway 86 and the Dan River is very difficult, since there are no roads near or parallel the creek in this area. As a result, any fishing done other than at road crossings requires the crossing of private lands.

Hyco Lake, owned by Carolina Power and Light Company and controlled by the Person-Caswell County Lake Authority is located east of the watershed and provides a limited amount of boating and fishing, a 64 acre public recreation area is the only recreational facility. The annual recreation attendance has been estimated at 50,000 (24). The headwaters of Kerr Lake are located approximately 50 miles from the proposed recreation site. This reservoir provides most types of water-based recreation, but public access is limited to certain areas. Many of the watershed residents live outside the 50-mile radius of this lake, however. Also many of the people in the large population centers within 50 miles of the proposed recreation site (Burlington, Greensboro, etc.) are located 75 miles or more from Kerr Lake.

Public hunting in the watershed is more readily available as a result of the Caswell Wildlife Management Area being located almost entirely within the watershed. Game hunted in this area includes rabbit, quail, squirrel, dove, deer, and turkey. Much of this 14,000 acre area is available to the public on a managed and controlled basis. Annual attendance at this facility averages about 6,500 (24). Hunting opportunities for private landowners who own forested land are also good. These are several small hunting clubs in the watershed as well as a large hunting club at Hyco Lake with an annual attendance of 2,700 (24) and a wildlife access area at Milton.

A four acre pond near Red House is open to public fishing. Two small ponds are maintained by the North Carolina Wildlife Resources Commission and provide free fishing to the public. These ponds provide excellent bass and bluegill fishing through intensive management by the Commission.

No other public recreational facilities of any type are available within the watershed. A private boy scout camp of 1,400 acres is located within the project area.

Archaeological and Historic Values and Unique Scenic Areas

Several sites in Caswell County are identified in the National Register of Historic Places. These sites include Rose Hill and Moore House in the vicinity of Locust Hill; Milton Historic District and Milton State Bank in Milton and the Caswell County Courthouse and Yanceyville Historic District in Yanceyville. Yanceyville and Locust Hill are located on the northwestern rim of Country Line Creek Watershed and Milton is located at the confluence of Country Line Creek and Dan River.

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Two additional sites located during the planning of the project have been determined by the Department of the Interior as being eligible for inclusion in the Register (See Planned Project Section page 11). One of these is an archaeological site (Cs12) located in the recreational development area of structure No. 4. The other is Womack's Mill located in the permanent pool of structure No. 1.

Soil, Water, and Plant Management Status

To date, there have been about 240 soil and water conservation plans prepared on farms within the watershed. These plans cover about 30,000 acres and represent 42 percent of the farms and acreage.

Adequate conservation treatment has been applied to 4,440 acres of cropland and 3,681 acres of pastureland and hayland thus far. The Soil Conservation Service has estimated that there are 13,930 acres of eroding cropland in the watershed, of which 4,258 acres have been treated to reduce erosion.

Most of the forestland in the watershed is under a very limited or no management program. There have been very few conservation practices applied to forestland thus far. Much of the forestland areas now in the watershed were once cleared and used for growing cotton. However, severe erosion during the 1920's and 1930's forced much land to be abandoned from production allowing it to grow up in trees. The present poor hydrologic condition of the forestland stems directly from the past agricultural practices and the loss of valuable top soil due to erosion. Even today, farmers are forced to employ factors of production inefficiently on the erosion-prone cropland. This results from having to repair erosion damages to the fields, difficulty in cultivating fields with very shallow or no topsoil, etc.

The Caswell Wildlife Management Area is the only area of managed wildlife resources within the watershed. The privately owned ponds are used primarily for private recreation, livestock water, and irrigation.

WATER AND RELATED LAND RESOURCE PROBLEMS

Land and Water Management

Approximately 70 percent of the cropland in the watershed needs some type of treatment to be considered as adequately treated. The most seriously needed conservation practices include conservation cropping systems, contour farming, terracing, crop residue use, and field border planting. Some of the steeper areas which are now being used for crops need to be converted to less intensive uses, such as trees or pasture. There are also many areas that are used for row crops year after year which need conservation cropping systems that allow grass or other close-growing crops to be grown part of the time. The hydrologic condition of the cropland varies from fair to poor.

The hydrologic condition of the forestland is generally poor, and for this reason, excessive runoff is produced from the forestlands. The poor condition is due, in part, to the lack of a good humus layer to retard runoff.

A major problem in improving the forest resource is that of motivating the small forest landowner to invest in forest improvement practices which will not bring him a financial return for many years. However, planned management practice can provide forest landowners with periodic returns from thinnings and improvement cuts. The costs connected with regenerating a new forest can be minimal if properly planned and executed at the time of final harvest.

The 1968 fire loss index goal is 0.23 percent. The average burn for 1965-1969 was 0.008 percent. This burn record for the watershed shows adequate protection. The continued efficiency and effectiveness of the North Carolina Office of Forest Resources will be adequate to take care of any increase in hazard or risk.

Other land management problems not related directly to physical characteristics of the watershed also occur. It is difficult for the soil conservationist to encourage needed land treatment measures when absentee landowners are involved. This type landowner is often located at a distance and does not recognize the problems on his land. Another complicating factor is the speculative landowner whose main objective is to hold the land for development or higher prices and who is not really interested in maintaining the productivity of his land. The average age of Caswell County farmers is 52 years (18). At this age, many farmers are not willing to make investments in land treatment measures, whose full benefits are realized only over a number of years. Other problems involved in getting land treatment installed include small fields or farms, farmers working off the farm thus lacking time to do the work, and disinterest among some landowners.

Floodwater Damages

The major portion of the floodwater damages is due to small, frequent floods. Downstream from the proposed structures there are 1,920 acres that are inundated by the 100-year frequency storm. About 1,454 acres are inundated by the one-year frequency storm. The one-year and the six-month storm account for more than one-half of the average annual acres flooded, which amounts to about 3,182 acres.

Approximately 57 percent of the flooding occurs during the growing season. This flooding reduces production on the open land below structures which is used for crops. This threat of flooding also prevents a more intensive use of the land along the streams for crops, causing a heavy cropping stress to be placed on open upland.

Annual floodwater damages to crops and pasture have been estimated to be \$12,190. Damage to other agricultural property (fences, buildings, farm roads) amounts to \$4,710 annually. Other non-agricultural property (roads, bridges, etc.) suffers flood damages estimated at \$1,000 annually.

Sediment Damages

Damage to crop and pasture land from infertile deposition occurs at scattered locations throughout the watershed. These depositions are occurring

Resource Problems

at a slow enough rate, at present, that the material can be mixed and worked in with the existing fertile alluvial soil. This results in only moderate adverse effects to the production of the crop and pasture land. Damages to idle bottom land from infertile deposition may appear to be greater than damage to cropland, due to the lack of this mixing action. Where significant infertile deposition damages do occur, it is usually caused by debris jams in the channels.

Swamping occurs along some 265 acres of low-lying areas in the flood plain. This swamping has been caused by a raised water table caused by accelerated erosion and sedimentation which reached its peak in the 1920's. Channel fill has occurred along much of the streams and natural levees have been formed along the channel banks in those areas subject to flooding.

In addition to land damages resulting from infertile deposition and channel fill, sediment deposition also affects the Dan River and Kerr Lake Reservoir. It has been estimated by the Soil Conservation Service that 81,725 tons of sediment are delivered from the watershed into the Dan River annually. Of this amount, approximately 16,345 tons per year are deposited in Kerr Lake Reservoir. This deposition results in a loss of storage capacity as well as a decrease in recreational and aesthetic values of the lake.

Sediment has also been shown to be the major carrier of plant nutrients which create eutrophic conditions and nuisance algal blooms in lakes (25). Dangerous farm chemicals, such as insecticides, are likewise sediment associated (26). Thus, sediment getting into rivers and lakes has a potential of causing water quality problems as well as the more common problems (infertile depositions, channel fill, etc).

The total average annual damages from sediment amount to \$33,435. Of this amount, overbank deposition amounts to \$5,715, swamping damages are \$4,620, and damages to reservoirs are \$23,100.

Erosion Damages

The total erosion from all sources in the watershed is 226,600 tons annually, of which 178,700 tons are derived from cropland and 47,900 tons come from roads and other sources. An average annual erosion rate from all types of cropland would be 11.0 tons per acre annually, while the overall erosion rate from the watershed is 2.5 tons per acre per year.

Critical sediment source areas are limited to roadbanks, unpaved roads, and gullies. These areas produce 2,075 tons of sediment annually, resulting in a rate of 31 tons per acre per year.

Streambank erosion in the watershed is not a serious problem. Aggradation is occurring along many reaches as a result of sediment delivered into the channels.

Forest improvement practices, forest harvesting and regeneration if properly planned and executed, cause very limited erosion for only a short period of time.

Economic-Social Problems

One of the greatest problems of this type is the large number of people who have to leave the watershed for off-farm employment opportunities. In fact, it has been estimated that over 50 percent of the residents of Caswell County work outside the county. This results from the lack of industrial development around Yanceyville and the watershed area in general.

The lack of non-farm employment opportunities and the decrease in farming intensity has led to an out-migration from Caswell County in the past 20 years. For example, in the period 1960-1970, the net out-migration averaged 8.4 percent (17). Employment opportunities within the county and the watershed are needed to help curb this trend.

Low income is another problem facing watershed residents. Per capita income for Caswell County in 1970 was \$2,132, as compared to \$3,208 for the state, and \$3,910 for the nation (17). The median family income in Caswell County is \$6,868, as compared to \$7,774 for the state. This implies that half of the families in the watershed have incomes of less than \$6,868. In addition, the income, per agricultural worker, in Caswell County for 1970 was \$6,550, as compared to an average of \$10,226 for the state (17).

Associated with the low-income problem is a high unemployment rate among the minority groups of the county. Approximately 48 percent of the county is in minority groups (28). About 9.9 percent of the minority working force is unemployed. (This includes a 14.1 percent unemployment rate among minority women.)

Agricultural employment decreased considerably during the period 1963-1971. In 1963, there were 3,490 agricultural workers in Caswell County, but by 1970 this figure had declined to 1,990 workers. Much of the out-migration from the county has been from rural areas.

From the standpoint of education, Caswell County again ranks below the state average. The median years of school completed by persons 25 years or older in Caswell County is 7.5, as compared to 8.9 for the state. A curb in the out-migration from the county is necessary for the establishment and maintenance of an improved school system.

ENVIRONMENTAL IMPACTS

Conservation Land Treatment

Land treatment measures will have beneficial effects on 10,640 acres of crop and pasture land and 4,255 acres of forestland. Sheet erosion in the watershed will be reduced about 151,400 tons (65 percent) after land treatment measures are installed. Critical areas erosion will be reduced by 1,740 tons (84 percent) annually. Considering the watershed as a whole, total annual erosion, from all sources will be reduced by 154,100 ton (68 percent).

As erosion rates are reduced, related sediment damage will also be reduced. Reduction in sediment delivery will result in a 31 percent reduction of damages from infertile deposition. The combined effect of

Environmental Impacts

the land treatment and structures will be a decrease in sediment delivered from the watershed outlet to the Dan River of 56,385 tons annually (394 milligrams per liter) and a reduction 11,275 tons of sediment delivered to Kerr Lake annually.

Since sediment has been shown to be one of the greatest avenues of loss of farm chemicals (fertilizers, pesticides, etc) reductions in erosion and sediment delivery will improve the water quality of watershed streams. Researchers, such as Smith (25), and Taylor (26), have shown that phosphorous, nitrogen, potassium, etc., move into watercourses attached to sediment particles. These are the plant nutrients that cause eutrophication problems in lakes and other water bodies. Although figures are not available which show the amounts of sediment-derived plant nutrients and other chemicals in Country Line Creek and Dan River, it is a fact that the 68 percent reduction in total erosion from the watershed and the 56,385 tons reduction in sediment delivered into Dan River will cause some decrease in such chemicals in these two waterways.

The land treatment will tend to decrease the rate of runoff from treated areas under certain conditions. This helps, to limited extent, in reducing flooding, but flood runoff cannot be completely eliminated by land treatment. Land treatment measures which result in deep fertile topsoil, a high level of organic matter, good tilth and vegetative cover, increase the infiltration rate and moisture holding capacity of the soil. In addition to reducing runoff, this also makes more water available for crop production and ground water recharge. The effects of land treatment in reducing flooding are most noticeable on the small, short duration rainfalls. During major floods, however, the soil is usually saturated and land treatment measures have little effect in reducing peak rates of runoff.

Land use changes induced by the project have been cited previously under the Land Use Changes section of the environmental statement. Many of the changes cited represent conversions of land or individual farms to more well-suited and profitable uses and, therefore will improve land management on individual farms.

The tree plantings, as part of the forestry phase of land treatment, will contribute to an increase in the economy of the watershed through the sale of products from this land. Through continued efforts of protection and management the forest resource hydrologic condition will improve resulting in a decrease in the amount of runoff.

The wildlife habitat development on private lands should improve populations of upland game within the watershed area. This development will provide increased food supply, better cover, etc. The 640 acres of habitat development planned for this watershed, when added to the 12,700 acres in the Caswell Wildlife Management Area will represent a five percent increase in total managed wildlife area in the watershed. Waterfowl will probably use the two impoundments, to a limited degree, as resting areas, food supply and nesting areas. Heavy recreation use around Structure No. 4 will keep waterfowl use of this area to a minimum however.

Structural Measures

Structural measures in combination with the land treatment measures will reduce flooding and flood damages on 1,920 acres of flood plain land downstream from the two structures. Flood protection will provide a 70 percent reduction in the total average annual floodwater damages. Reduction of damages will range from about 90 percent in Reaches 1 and 2, to about 60 in Reach 4 (see project map). Areas to be protected from flooding with the project from various size storms are: one-year frequency -- 613 acres; two-year frequency -- 458 acres; 10-year frequency -- 345 acres; and 100-year frequency -- 307 acres. The average annual acres flooded will be reduced from 3,182 to 1,534 acres (52 percent).

The two impoundments will convert approximately eight miles of streams to 1,030 acres of permanent reservoir water. However, only one segment of these streams is listed in the Catalog of Inland Fishing Waters in North Carolina as having significant fishery. This is the segment of Country Line Creek to be inundated by Structure No. 1. The segment is listed with an ecological classification of dace-trickle. The average weight per surface acres of fish in streams of this type in the Roanoke Basin has been computed at 13.8 pounds (21). On the other hand, the productivity of the impounded structures should be considerably higher. The estimated maximum potential sustained annual harvest would be 100 pounds per surface acre (29). The fish species in the eight miles of stream will be changed from stream types to reservoir types (bluegill, bass, etc).

The effects of the structures on the water temperatures and dissolved oxygen levels of the streams on which they are to be located were analyzed after a review of the literature. Considerable information is in the literature on water temperature, stratification, dissolved oxygen, etc., in large reservoirs, such as Fontana Lake. However, temperature and oxygen regimes in smaller reservoirs like those planned in Country Line Creek Watershed would not compare with those in larger reservoirs. Excerpts from some of the literature references are summarized in the following paragraphs:

Impounded water warms up more than that in the stream due to the increased surface exposed to thermal effects of the sun. Circulation of water in ponds is such that limited stratification of temperature or oxygen occurs. During the summer, top waters become warmer than bottom waters; as a result, only the warm top layer (called the epilimnion) circulates and it does not mix with the colder bottom layer (called the hypolimnion). This creates a zone with a steep temperature gradient in-between (called the thermocline). If the thermocline is deeper than effective sunlight penetration, the oxygen supply in the hypolimnion is rapidly depleted. If stratified waters are transparent enough to permit growth of phytoplankton below the thermocline, oxygen will be present (30).

Stratified lakes with top-water releases discharge the warmer surface waters and tend to trap nutrients from upstream. A bottom-water release

Environmental Impacts

from such lakes would retain the warmer waters and release the colder, nutrient-rich bottom waters (31). Such releases from an oxygen-poor hypolimnion would be low in oxygen; however, the water is quickly re-aerated by stream turbulence. Dillon (32) states that water from the bottom of a floodwater retarding structure picks up oxygen as it goes through the primary outlet and is normally saturated when it comes out below the structure.

Shumacher (33) found that water drawn ten feet below the surface of a relatively small reservoir (4.3 surface acres) was discharged an average three degrees Fahrenheit warmer than the stream inflow during the summer months. This study was made in the mountains of Georgia where average air and stream temperatures were cooler than would be expected in the piedmont area.

Both of the planned Country Line Creek reservoirs will have more surface area exposed to the sun than in the Georgia study, thereby tending to heat the water more. However, both the reservoirs are to be at least 40 feet deep. They should stratify in the summer, causing water being drawn from near the bottom to be as cold or colder than that of the incoming stream. The principal spillway system of the structures will be constructed so that the water will have the necessary turbulence to pick up oxygen as it is discharged from the structures. Any adverse effects to the fishery resources in the reaches downstream from the structures as a result of increased water temperatures or lower dissolved oxygen levels should be avoided.

The project, when installed, will enhance the fishery resources in the lower reaches of Country Line Creek and in the Dan River, from a standpoint of a reduction in sediment and associated pollutants being delivered to these downstream areas. Fish food organism production and spawning success should improve as a result of sediment reduction. The structures will block access to the upper reaches of Country Line and South Country Line Creeks, if any fish in the lower reaches actually migrate this far upstream to spawn.

No adverse effects will result to the streams below structures from a low flow or base flow standpoint. During periods of normal inflow to the structures, the outflow will approximately equal the inflow. This assures that the normal flow of the stream below the structure remains about the same as it would be with no structures. The low flow orifices on the planned structures will insure that a flow at least equal to the ten year, seven-day low flow or .5 csm will occur in the reaches below the structures at all times. This is equivalent to 1.50MGD for Structure No. 1 and .875MGD for Structure No. 4. /

The cool water release orifice will be located at a depth great enough to insure outflow at temperatures at or below inflow temperature. If the hypolimnion exists at 15 ft below the permanent water surface and the cool water release orifice is located 25 ft below the surface,

outflow cooler than inflow can be assured. For the extreme condition of inflow less than or equal to evaporation loss and a cool water release configuration as described above with an outflow of .5csm, analysis shows that Structure No. 1 and Structure No. 4 will provide 24 and 139 days respectively of cool water release before discharging water from the thermocline zone.

Approximately 1,100 acres of wildlife habitat will be eliminated in the dams, spillways, and permanent pool area of the two impoundments. In addition, due to the recreational development and heavy human use at Structure No. 4, wildlife habitat in and around the recreational facilities will be detrimentally affected. Also, there are approximately 655 acres of forestland, cropland, and pastureland in the flood pool area which will be periodically inundated. The duration of flooding on these lands will be of such a limited extent, however, that their value as wildlife habitat should not be significantly affected. The primary detrimental effect which might result would be to increase the hazard to reproduction of small game species, such as rabbit and quail.

Some increased ground water recharge can be expected as a result of the impoundments and their sustained release flows. Both sites will have a permanent pool (standing water) at all times. Based on field investigations, no excessive seepage losses are expected from any site, and therefore, no large volumes of ground water recharge will occur from the structures. Minor amounts of natural seepage (incidental recharge) will occur throughout the pool areas where exposed rock contains fractures and joints. No practical estimate of this increase in recharge around the impounded areas was made. The quality of water which will infiltrate the soils and rocks beneath the pools will not adversely affect the quality of the existing ground water resource within the watershed. Water that will be coming into Structure No. 1 is presently class "A-11" and water that will be coming into Structure No. 4 is class "B". Both classifications indicate high quality water.

The construction of Structure No. 1 will supply the badly needed municipal and industrial water supply. At normal level the structure will contain 3,190 acre-feet (one billion plus gallons) of storage for this purpose. This water supply should provide an excellent incentive for the development of industry around Yanceyville and Caswell County. According to the sponsors, the lack of a sufficient water supply has been a limiting factor in attracting industry. Incidental recreation at Structure No. 1 will provide fishing and small boat activity. Public access and sanitary facilities will be provided.

Multiple-purpose Structure No. 4 will provide an estimated 104,200 visitor-days of recreation annually to the watershed and nearby residents. A visitor-day is defined as one individual going to the structure on one day. The construction of Structure No. 1 will produce incidental recreation estimated at 30,800 visitor-days annually. Development of these two reservoirs will provide high quality, publicly accessible water-based recreational opportunities for watershed residents, a situation which does not presently exist.

Environmental Impacts

One road (Secondary Road 1736) will have to be relocated in conjunction with the construction of Structure No. 4. About one mile of the present road will be replaced by construction of 1.4 miles of new road below the dam. Secondary Roads 1121 and 1122 will be raised in connection with Structure No. 1. Modifications of these roads will cause some temporary inconvenience to watershed residents.

Four packaged treatment plants will provide tertiary treatment of the sewage at the recreational development area. The effluent discharge will be in compliance with all North Carolina public health laws and should not present any serious water quality problems.

Archaeological, Historic and Scientific Impacts

According to the archaeological survey, local residents are aware of Csl2 and some digging had taken place prior to the survey. Having the site in a recreational area and seeded so as to blend in when the surrounding areas will preserve it until a proper investigation and evaluation is made.

Womack's Mill will be inundated by the permanent pool of structure No. 1 if left at its present location. The Consultation section page 45 discusses procedures now being followed concerning the mill.

Economic and Social Impacts

It has been estimated that the project will generate 80 man-days of employment during the installation period. Expenditures of funds during the project installation will pay \$650,000 into the local economy as wages. Three jobs will be created, either directly or indirectly, for local labor to operate and maintain the structural works of improvement and the recreational facilities. It is estimated that the increase in agricultural production will create six jobs.

The project will provide an estimated \$8,870 in average annual floodwater reduction benefits to crop and pasture land. Floodwater damage reduction to other agricultural property will amount to \$2,870. Damages to roads, bridges, and other non-agricultural property will be reduced \$800. Some floodwater damages will still be sustained even with the project installed. These remaining damages on an average annual basis are: crop and pasture - \$3,320; other agricultural - \$1,840; and non-agricultural - \$200.

Damages from overbank sediment deposition will be reduced \$4,925 by the project. Remaining damages of this type on an average annual basis will be \$790. Indirect damages (interrupted traffic, blocked mail delivery, etc.) will be reduced by \$5,040 with the installation of the project; but \$2,130 of annual damages will remain.

Recreation benefits from multiple-purpose Structure No. 4 are estimated at \$156,300 (\$1.50 per visitor-day x 104,200 visitor-days). Incidental recreation benefits from Structure No. 1 were estimated at \$30,800 annually, based on \$1.00 per visitor-day. A higher value per visitor-

day at Structure No. 4 was used because of the recreational facilities provided.

It is estimated that 123 farms will be benefited by the project. More efficient use of land, labor, and capital resources will permit improvement in the economic conditions of farm families. Reduction of flooding will result in increased production from flood plain soils.

Installation of the project will result in increased noise, litter, dust, etc., around the area of work during construction. Observation of the project map, however, shows that neither of the proposed structures are located within or near towns. Therefore, any inconvenience as a result of the construction will be limited to these persons living in rural areas around the construction.

There is expected to be no major disruptions of rural community life as a result of the project. Vector controls, in compliance with North Carolina state law, will be enforced around the construction areas.

Local business will be stimulated by providing goods and services to the recreational site visitors. Examples would include increased business to service station owners, bait and tackle dealers, sporting goods dealers, etc. These local secondary benefits have been estimated at \$37,000 annually.

The value of having the water supply stored by Structure No. 1 has been estimated by a consulting firm, hired by the local sponsors, to be \$100,000 annually. In making this estimate, account has been taken of new jobs to be created by industrial development, increases in the county's tax base, etc.

It is estimated that securing land rights for the structures will cause nine displacements from dwellings and six displacements from farms, as defined by the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970.

Structure No. 4 will account for all of the dwellings displacements and five of the farm displacements and Structure No. 1 will account for one farm displacement.

The quality of living for the nine families displaced will probably be improved after the project installation. The law requires that replacement housing be safe, sanitary, and decent, regardless of condition of the present dwelling. The law also requires that a relocation assistance advisory service be provided to the displaced persons. It is the general intent of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, that no displaced person, business, or farm operation shall suffer an economic loss as a result of project measures.

FAVORABLE ENVIRONMENTAL EFFECTS

- (a) Reduce soil erosion in the watershed by 154,100 tons annually (68 percent).

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- (b) Reduce sediment delivered to watershed outlets by 56,385 tons annually (394 milligrams per liter) and to Kerr Lake by 11,275 tons annually.
- (c) Reduce flood damages 73 percent overall and provide for better utilization of the flood plain land.
- (d) Bring about a decrease in sediment associated pollutants in watershed streams.
- (e) Provide 3,190 acre-feet of water supply for municipal and industrial storage.
- (f) Create 80 man-years of employment during construction and nine jobs over the project life.
- (g) Stimulate the development of industry around Caswell County and Yanceyville.
- (h) Provide 135,000 visitor-days of water-based recreation to watershed residents annually.
- (i) Improve stream flow and fish habitat below structures through insuring low flow release consistent with the 10-year, 7-day low flow levels, cold-water release, and sediment reduction.
- (j) Increase the tax base of the watershed and Caswell County.
- (k) Stimulate local business in association with recreation development around Structure No. 4.

ADVERSE ENVIRONMENTAL EFFECTS

- (a) Convert about 1,100 acres of cropland, forestland, and pastureland to permanent water, dams, and spillways.
- (b) Restrict the use of 655 acres of cropland, forestland, and pastureland in the flood pool of the two structures.
- (c) Temporarily increase sedimentation during construction.
- (d) Adversely affect wildlife habitat around multiple-purpose Structure No. 4.
- (e) Convert eight miles of stream to reservoir water.
- (f) Release treated effluent from the sewage treatment plant at Structure No. 4 into Country Line Creek.
- (g) Cause nine displacements from dwellings and six farm displacements.
- (h) Restrict wildlife use of 770 acres in the recreation development.

ALTERNATIVES

Accelerated land treatment program - This alternative would involve an accelerated conservation program on 2,599 acres of cropland, 2,163 acres of pastureland, 4,255 acres of forestland, and 67 acres of critically eroding areas. Technical assistance for applying these measures would be provided by the Soil Conservation Service through the Caswell County and Rockingham County Soil and Water Conservation Districts and the United States Forest Service.

The accelerated land treatment program would be the same as the land treatment program of the planned project (see pp 1-4). Some of the benefits of the planned project could be realized with this program and no structural measures. For example, the reduction of total erosion in the watershed by 154,100 tons annually (68 percent) would still be realized. Included in this would be an 84 percent reduction in critical area erosion.

Associated with the decreased erosion would be decreased sediment and sediment associated pollutants. Fish in Country Line Creek, especially the lower reaches, would benefit from decreased sediment, although the benefits would not be nearly as great as with the "trap effect" of the structures. The structures have been predicted to trap 60,250 tons of sediment per year.

Upland wildlife would benefit from the 640 acres of wildlife habitat development involved with the land treatment program. Any benefits occurring to waterfowl as a result of the structures would be foregone however.

While helping to a limited degree in reducing flooding from the frequent, less intensive storm, land treatment would have little effect in reducing damages from heavy, extended rainfalls. The estimated average annual flood damage reduction benefits from land treatment are \$6,850, but \$52,330 in average annual damages would continue with this alternative.

Adverse environmental impacts caused by the project such as the loss of eight miles of stream, 1,100 acres of wildlife habitat, displacements in securing land rights, and temporary increases in sedimentation during construction would be avoided. Future productivity of the land on which conservation measures are applied would be assured.

Favorable environmental effects of the project, including the creation of a reliable municipal and industrial water supply, and the stimulus it would provide to Yanceyville and Caswell County; the creation of 1,030 acres of fishery habitat; supplying 135,000 visitor-days of recreation annually; providing 80 man-years of employment during construction

Alternatives

and nine jobs over the project life; and the improvement in water quality provided by the structures would be foregone. The total average annual net monetary benefits that would be foregone with this alternative would amount to \$79,660.

Alternate physical arrangements of resources - This alternative would include any structure system different from the planned project. Of course, it would be impractical to discuss all possible systems. No specific alternate sites were analyzed for a detailed engineering cost estimate although in the early project formulation, a system of five structures was considered before selecting the two planned structures. The amount of storage required for the municipal and industrial water supply needs was determined by a consulting engineering firm. Thus, whether the water is stored in one structure or in several structures, the volume has been fixed. The topography of this watershed is such that storage volume can be built up much more economically at a single structure site location than can the same volume be stored at two or more locations. Another factor to consider is the reliability of flow in the stream. Observation of the project map shows that there are no structure site locations near Yanceyville (except on Country Line Creek) which have a large enough drainage area to provide a reliable water supply during drought periods. If any of the smaller tributaries were used, the storage required for the same reliability would have to be much greater than the storage required for the larger drainage area of the planned structure. Also, the farther the site from Yanceyville, the more costs there would be in pipes and water conveyance systems. Structure No. 4 could possibly be used as an alternate municipal and industrial water supply site, but its physical characteristics lend it as an excellent recreational impoundment. Also it is considerably farther from Yanceyville than Structure No. 1 (see project map).

The site of structure No. 4 is especially well adapted to recreational use since it is located at the junction of four tributaries (see project map) and the cost per surface acre of water created at this location is less than it would be at another site. A smaller recreation development could be built here or at an alternate location, but in view of the relatively large population within a 50-mile radius (725,000) and the projected population increases, the size of the planned lake is considered justified. The principal of one large lake being much cheaper than two half its size also holds true in this case.

The recreational and municipal and industrial benefits obtained by alternate structure sites (assuming the same amount and reliability of storage) would be the same as the planned project (\$256,300 annually). However, the two sites selected represent the most practical and economic way to achieve the objectives stated by the sponsors.

Alternatives

Other considerations included the possibility of obtaining the desired municipal and industrial water from ground water supplies; the possibility of buying or obtaining the water elsewhere and pumping it to Yanceyville; and the possibility of reducing flood and erosion damages through alternate methods.

The development of a public water supply from the ground water resources in the watershed would be impractical for two basic reasons; the underlying rocks are relatively poor aquifers and surface water is abundant and can be more economically developed.

In general, data obtained in the watershed indicates that the rock types (gneiss, sericite schist, greenstone schist, diorite) are relatively poor aquifers due to the thinness of the weathered zone above solid rock. The weathered zone does not form an adequate reservoir to collect and store the rainfall.

Yanceyville, the county seat of Caswell County, changed from a ground water municipal supply to a surface water supply in 1952 in order to meet their water supply needs. Wells used previous to 1952 had rather low yields and relatively large drawdowns and were considered unsatisfactory.

The most desirable type of well to use depends on the underlying rock formations of the specific area. The reliability of wells is also extremely variable from place to place. A high cost would be involved in geologic investigations and in attempting to develop a suitable water supply from a well system.

A private consulting firm hired by the sponsors also predicted that the projected water needs could not be met by ground water supplies.

It is possible for a water supply that would meet present needs to be taken from Country Line Creek either through a direct water intake system or a weir structure. Published water records (29) show that Country Line Creek at the planned structure location has an average flow of about 48 cubic feet per second. At this flow, the total yields per day would be about 30 million gallons. But the ten-year, seven-day low flow at this location is only two cubic feet per second (29), which is about four percent of average. The 10-year, 90-day low flow is about 15 cubic feet per second, slightly over 30 percent of normal (29). These low flows alone would not supply the projected needs, and therefore, supplemental storage in a structure is required. Adequate flow does exist in the Dan River to provide the water supply to the watershed from a direct water intake or a weir structure (29). If this were possible however, the cost of the pipe alone to take the required amount of water from the Dan River to Yanceyville would exceed ten million dollars. This does not take into account the cost of pumps, land rights,

easements, or the operation and maintenance of such a system. A similar system to Hyco Lake, assuming that water could be purchased, would cost at least as much as a system on the Dan River.

Channel work, in conjunction with the planned structures, was originally considered as a possible way to reduce flood damages. However, an analysis of the proposed channel system indicated that in order to derive enough benefits to justify the channel work, new land would have to be brought into agricultural production. P. L. 566 prohibits bringing new land into production as a primary purpose for structural measures. Therefore, the proposed channel work was eliminated.

Federal crop insurance is available in Caswell County only for tobacco. But tobacco is normally planted on the better, more well protected cropland. Corn, soybeans, and small grain are the crops most commonly grown on the areas susceptible to flood damage and since the insurance program is not applicable on these crops, it offers no relief from damages suffered. There are no other federal or state programs at this time which offer alternate uses of the entire flood plain in the watershed. The recently implemented Rural Environmental Conservation Program offers some possibilities for alternate uses on an individual basis.

No Project - The alternative of no action would avoid the elimination of 1,030 acres of wildlife habitat to be converted to permanent water in the two structures. However, the steep cropland would continue to be used for row crops. The sediment and erosion problems would continue to worsen, as well as flooding problems resulting from channel fill. The no project alternative would forego the 135,000 annual visitor-days of recreation to be created by the two planned structures as well as the stimulation to industrial growth, due to the municipal and industrial water supply. Beneficial effects occurring to the fishery resources (low flow augmentation, sediment reduction, etc.) and to upland wildlife (food plantings and habitat management) would be foregone. In addition, the out-migration of people from the county to urban centers would probably continue and the growth of Yanceyville would still be restricted as it has in the past. The net benefits that would be foregone with this alternative amount to \$86,510 annually.

SHORT-TERM VERSUS LONG-TERM USES OF RESOURCES

The trend in the past few years in Caswell County has been toward a decrease in the intensity of agriculture, in general, with livestock and livestock products becoming more important. The 1964 Census of Agriculture (18) showed that \$11,517,500 of agricultural products were sold, of which \$1,148,689 (10 percent) was derived from livestock. In

Resources

1969, however, only \$9,561,850 of agricultural products were sold, and livestock sales accounted for \$1,709,240 (18 percent). Thus, it is apparent that a significant amount of cropland has gone out of production or reverted to pasture. The land treatment phase of the watershed project will help to curb this trend.

The project, when installed, will solve the immediate problems of an inadequate municipal and industrial water supply, accelerated land erosion, and lack of water-based recreation. Although these are serious problems now, unless corrective measures are taken, the problems will worsen in the future. The commitment of 1,100 acres to the structures, while representing a permanent commitment, will help in solving these immediate problems in the watershed, as well as potential long-term problems.

Country Line Creek Watershed is located within the North Central Piedmont Resource Conservation and Development Project Area. The purpose of the RC&D project is to maintain and enhance land and water resources through various project measures.

Installation of the project will contribute directly toward accomplishing the following objectives of the North Central Piedmont Resource Conservation and Development Project as stated in the RC&D Project Plan:

1. Optimum development of water resources to meet urgent needs and to develop maximum potentials for economic growth.
2. The orderly adjustment of land uses for present and future needs; i.e.: agricultural, rural, recreational purposes.
3. Provide new and improved present job opportunities and incomes by development of natural resources for agricultural development, expansion of industry, recreation, and tourism.
4. Accelerate conservation planning and land treatment. Encourage planning and conservation measures for all lands.
5. Encourage and assist in development of parks, and outdoor recreational facilities.

Although the economic life of the structures in this project was considered to be 100 years for evaluation, they will be effective in helping to accomplish the above objectives long after this period. After 100 years, the storage allotted to sediment will be taken up. However, all the floodwater, recreation, and municipal and industrial capacity will remain..

Country Line Creek is the only active or potential Public Law 566 watershed project in the North Carolina portion of the Roanoke River Basin at the present time. There are two large impoundments (Kerr Lake and Lake Gaston) located downstream from Country Line Creek Watershed on the Roanoke River which have some similar characteristics to the proposed structures on Country Line Creek. These are Corps of Engineers' (Kerr) and Virginia Electric and Power Company (Gaston) reservoirs and are operated for hydroelectric power and recreation. They are much larger than the proposed structures in this project and are located more than 50 miles from the watershed.

The only significant cumulative effects of this project in relation to other water resource projects in the Roanoke River Basin are those resulting from impoundment of additional water. These structures, just as Kerr Lake and Lake Gaston, will trap sediment with associated pollutants and thus, improve quality of the water discharged. No adverse effects resulting from heating of the discharged waters will occur, however, due to the cold-water releases. More evaporation occurs from lake surfaces than from stream channels, decreasing the water yield to the estuary. Any cumulative effects of the two planned structures will be small in comparison with Kerr and Gaston Lakes, as the two planned watershed lakes would have a combined 1,030 surface acres, compared to a combined area of over 69,000 acres of surface area in these two large impoundments.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Approximately 1,100 acres of forestland, cropland, and pastureland will be permanently converted to water, spillways, and dams as a result of the project. Of this area to be lost to structures, 150 acres are in cropland or pastureland and the remaining 950 acres are in woodland. In addition, a recreational development will permanently occupy 770 acres around Structure No. 4. A capital expenditure of approximately \$5,525,340 will be foregone with installation of the project. This will be the only irreversible type commitment of a resource involved, except for the labor and energy required to build the structures.

There will be about 655 acres of forestland, cropland, and pastureland in the flood detention pools of these structures, which will be limited to uses which can tolerate periodic flooding.

General

Numerous contacts have been made with various agencies throughout the project formulation, either for gathering information or conducting necessary business connected with the project.

Before the application for P.L. 566 assistance had been made, the sponsors had recognized the need for obtaining a sound prediction of the area's future needs in a municipal and industrial water supply site. To do this, a private engineering firm was retained to make this estimate of future needs and recommend further consideration for the structures.

Soon after the application for assistance was received by the State Soil and Water Conservation Commission in April, 1969, the North Carolina Wildlife Resources Commission was contacted in regards to including fish and wildlife features in the planned structures.

Fish and Wildlife investigations in the watershed were made jointly by biologists from the North Carolina Wildlife Resources Commission, United States Fish and Wildlife Service, and the Soil Conservation Service, to determine the potential developments, benefits, and damages to fish and wildlife caused by the project.

Several meetings between the sponsors and the Soil Conservation Service were held during the early project formulation period. Other watershed residents were present at some of the meetings and contributed to the planning. The district conservationist at Yanceyville also contacted the local people occasionally for land values, land treatment information, etc.

The North Carolina Division of Forest Resources, in co-operation with the U.S. Forest Service and the Soil Conservation Service, made investigations to determine the forest conservation measures needed in the watershed and to formulate the forestry phase of the land treatment program. The goals for forestland treatment were set so they could reasonably be accomplished during the project installation period.

Numerous meetings were held and contacts made between the Soil Conservation Service, the sponsors, and the North Carolina Wildlife Resources Commission in connection with 630 acres of state-owned land in the Caswell Wildlife Management Area that will be involved with Structure No. 4. Originally, the Commission had agreed to donate the 630 acres for the structures in return for the right to use all the reservoir land (1,626 acres) as a managed hunting area. However due to legal restraints, this method was not allowable. Several other alternatives were explored by the sponsors and the North Carolina Wildlife Resources Commission before reaching an acceptable agreement on the state-owned lands. This arrangement came after the Commission had checked certain matters of law with the Bureau of Sport Fisheries and Wildlife. The agreement provided that the sponsors would buy the 630 acres of the game lands to exchange for fee title ownership of the 630 acres in question.

Contacts were also made with the United States Department of the Interior, Bureau of Outdoor Recreation, and the North Carolina Department of Cultural Resources, Division of Archives and History, for possible locations of archaeological, historical, or scientific resources. Both of these agencies returned negative replies on any existing resources, although both did recommend further contacts with other agencies and personnel.

The North Carolina Department of Transportation and Highway Safety provided suggestions on dealing with required road modifications involved with the construction of the planned structures, as well as cost estimates for making the modification.

In 1972 the Soil Conservation Service revised criteria for structures having drainage areas over 10 square miles. Both of the planned structures on Country Line Creek fall into this category. After many technical reviews, Structure No. 1 was redesigned in January, 1973. A new geologic investigation was made and the report was presented to the sponsors in April, 1973. The Soil Conservation Service also requested that the sponsors provide concurrence that the sites would hold water.

The sponsors retained a consulting engineering firm to review the geologic investigation report of the Soil Conservation Service. In July, 1973, the sponsors received a reply to the effect that the firm concurred in the Soil Conservation Service's findings and in the ability of the sites to hold water.

In September, 1973, the Soil Conservation Service met with the sponsors to review revised cost estimates of the structures. (These revised costs resulted from a redesign of the structures to comply with the large dam criteria.) Also, the Soil Conservation Service conveyed to the sponsors the need to rewrite the work plan and to prepare an environmental statement on the project.

The Soil Conservation Service met with the sponsors again in December of 1973, to further talk about the watershed project and to discuss the need for a re-evaluation of some of the project benefits. Also discussed was the need for the sponsors to provide a letter stating their means for financing their share of the project costs.

The sponsors again contacted their consulting engineering firm on the re-evaluation of the municipal and industrial water supply. In March, 1974, the sponsors reconfirmed the value of the water stored and forwarded this information to the Soil Conservation Service. At this time, the Soil Conservation Service also received a letter from the sponsors outlining their method for financing the local share of the project costs.

A review of the National Register of Historic Places indicated no places of historic value to be affected by the project. Correspondence received from the State Department of Archives and History in October 1970 stated there were no plans to nominate Womack's Mill to the National Register. The National Park Service, United States Department of Interior stated in a letter dated June 7, 1971 that the project would not affect any natural landmarks or National Historic Landmarks registered or eligible for registration.

Consultation

After receiving the report on the archaeological survey and a letter in October, 1974 from the State Historic Preservation Officer indicating that Womack's Mill would possibly be eligible for inclusion in the National Register, the National Park Service was notified in November, 1974.

Correspondence from the State Historic Preservation Officer on December 9, 1974 stated that the State did not intend to seek nomination of Womack's Mill to the National Register. On December 31, 1974 the Department of Interior Officer of Archaeology and Historic Preservation informed the Service they were requesting the opinion and documentation on Womack's Mill and the archaeological site (Cs12) from the State Historic Preservation Officer.

The Service was notified March 27, 1975 by the National Park Service that the archaeological site was eligible for inclusion in the National Register and asked the Service to make a formal request for their determination of Womack's Mill. The Service made this request on April 17, 1975. The Department of the Interior responded June 1975 that Womack's Mill would be eligible for inclusion in the register. Following a meeting with the State Historic Preservation Officer for assistance in the following procedures of PL 89-665, comments were requested August 21, 1975 from the Advisory Council on Historic Preservation on alternatives for preservation of the Mill. The Council responded November 5, 1975 that an alternative that provides for measured drawings and photographs prior to the Mill being dismantled and stored until rebuilding could be accomplished appeared to be the only feasible choice. As provided in PL 93-291 the National Park Service has been provided the information concerning this alternative and the expected constructive schedule of structures no. 1 and has been requested to undertake the recovery of Womack's Mill.

The Service had numerous contacts with a representative of the North Carolina Department of Natural and Economic Resources during the period March-May 1975 to resolve questions raised by the Department on the draft statement. See Appendix F page F-26.

The following agencies were asked to comment

United States Department of the Army, Corps of Engineers; United States Department of Commerce; United States Department of Health, Education, and Welfare; United States Department of the Interior; United States Department of Transportation; Federal Power Commission; North Carolina Department of Natural and Economic Resources (for the Governor); North Carolina Department of Administration, State Planning Division (State Clearinghouse); Environmental Protection Agency; Advisory Council on Historic Preservation; and other interested parties.

Comments have been received from the following agencies:

Advisory Council on Historic Preservation; U.S. Department of the Interior; United States Department of Health, Education, and Welfare; United States Environmental Protection Agency; Federal Power Commission; United States Department of Transportation, United States Coast Guard; North Carolina Department of Natural and Economic Resources, North Carolina Wildlife Resources Commission.

A Summarization of Comments Received From the Draft Environmental Statement Together With Appropriate Responses are Listed Below:

Advisory Council On Historic Preservation

1. Comment: The Advisory Council On Historic Preservation has determined that your draft environmental statement is inadequate regarding our area of expertise as it does not contain sufficient information to enable the council to comment sustantively. Please furnish additional data indicating whether or not the proposed undertaking will contribute to the enhancement and preservation of non-federally owned districts, sites, buildings, structures, and objects of historical, archaeological architectural, or cultural significance and the results of the historic and archaeological survey conducted.

Response: Consultation with a representative of the Advisory Council on Historic Preservation revealed that the main concern is that information be presented that the Service has fully met its responsibility to determine the significance of its action on any archaeological or historical resource and that the proper procedures have been employed. The Soil Conservation Service has followed the proper procedures and the final environmental impact statement will show the results of all investigations and inquiries made to date.

United States Department of Health, Education, and Welfare

1. Comment: Based upon the data contained in the Draft Environmental Statement, it is our opinion that this proposed action will have only a minor impact upon the human environment with respect to the concerns of the Department.

Response: No response needed.

United States Department of the Interior

1. Comment: There is a statement in paragraph 5, page 21 of the work plan which indicates an agreement has been reached in the exchange or purchase of land in the Caswell Wildlife Management Area. What has actually been accomplished is an agreement to work out an agreement.

Response: The Soil Conservation Service agrees and has made the change in the work plan and environmental impact statement accordingly. For additional responses see comment number 2, North Carolina Department of Natural and Economic Resources, page 53.

2. Comment: If it is ultimately decided to construct Structure No. 4, the replacement lands should be purchased first. Further, the project sponsors must acquire replacement lands that are equal or greater in value, both monetarily and as wildlife habitat; these replacement lands must be acceptable to the North Carolina Wildlife Resources Commission and the United States Fish and Wildlife Service.

Response: The Soil Conservation Service requires land rights to be obtained before construction starts. See North Carolina Department of Natural and Economic Resources comment number 2 page 53.

3. Comment: In paragraph 2, page 31 of the draft work plan, it is stated that the 640 acres to be developed as wildlife habitat includes 11 ponds, pits, or reservoirs. It is impossible to determine the value of these structures to fish and wildlife since locations, dimensions, and other characteristics are not given.

Response: The 640 acres to be developed as wildlife habitat refer to privately owned land on which the primary or secondary land use is wildlife habitat. This development will be carried out on individual farms in accordance with the conservation plan for that farm. See North Carolina Department of Natural and Economic Resources comment number 7, page 55.

4. Comment: The work plan should set forth clearly what type of recreation will be allowed and detail the recreational amenities to be provided at Structure No. 1.

Response: The final statement has been revised to show incidental recreation will consist of primarily fishing and small boats and that public access and sanitary facilities will be provided.

5. Comment: We question whether the computations arriving at 135,000 visitor-days of recreation attributed to structures nos. 1 and 4 take the proximity of Hyco Lake into account.

Response: The attendance and facilities at Hyco Lake are recognized on page 23. It should be pointed out that facilities at Hyco Lake consist of a 64-acre recreational development area while Structure No. 4 will have 770 acres in its recreational area. Also the North Carolina Outdoor Recreation Plan prepared by the Office of Recreation Resources, North Carolina Department of Natural and Economic Resources, identifies the piedmont as having the greatest remaining needs for acquisition and development of water-oriented recreation.

6. Comment; If access fees are charged, the proposed project will provide a recreational resource similar in nature to Hyco Lake, and there is some question as to how much of the public will be attracted away from Hyco Lake to this project. Therefore, the work plan should indicate precisely what type of fees will be charged.

Response: It would not be practical, with several points of entry, to have access fees for the recreation area on site No. 4. User fees would be charged primarily for activities such as camping and boat launching. Also see North Carolina Department of Natural and Economic Resources comment number 14, page 57.

7. Comment: Using data given in the draft work plan, our calculations show that the ratio of drainage area to permanent pool surface area is 27:1 for structure No. 4 and 76:1 for structure No. 1. These large ratios indicate that extreme fluctuations are likely in the spring, which will disrupt the normal spawning by warm-water game fishes. Furthermore, the rapid rate of water exchanging in the reservoir will probably inhibit the development of a lake-type plankton community. Therefore, an effective fishery management plan for both reservoirs should be included in the work plan.

Response: As stated in the work plan agreement, operation and maintenance of structural works of improvement will be performed in accordance with agreements to be entered into prior to issuance of invitations to bid for construction work. The work plan has been revised to state that a fishery management plan will be included as a part of the operation and maintenance plan for the structures. Table 3 shows the maximum fluctuation to be 9.5 feet for site No. 4 and 17 feet for site No. 1. This would occur on an average of once in 100 years. Smaller storms would cause smaller fluctuations.

8. Comment: It is our understanding that the "Principles and Standards for Planning Water and Related Land Resources" indicate that the environmental quality plan addresses the maximum number of environmental quality components and those national economic development components that are compatible with the environmental quality objective. Including industrial and municipal water supply and reduction in overbank flooding at the expense of eight miles of free flowing stream and 1,100 acres of terrestrial habitat appears to be no more than an attempt to justify certain aspects of the recommended plan.

Response: The abbreviated environmental quality plan shown in the addendum to the work plan has been revised to emphasize environmental quality rather than economic development. The reader should bear in mind that the type, amount, and quality of the existing resource are all important considerations of a plan whether it be economic development, environmental quality or multi-objective.

9. Comment: The draft environmental impact statement does not refer to the effect of this project on hunting opportunities in the project area. Future urbanization and industrialization encouraged by the project will contribute to additional losses of hunting opportunities in the watershed. The statement should describe the effect of this project on hunting opportunities in the project area and should indicate what type of hunting opportunities, if any, will be provided around both structures.

Response: Under Adverse Environmental Effects, the statement recognizes the conversion of the 1,100 acres of crop and pastureland and forestland to permanent water, dams, and spillways. It also recognizes that the wildlife use in the recreation development will be restricted and structure No. 4 will adversely affect the wildlife habitat in that area. The land surrounding the structures and recreational area will remain in private ownership and, therefore, hunting in that area would not be affected by the project. Land exchanged with the Caswell Wildlife Management Area will insure that hunting opportunities on this land will continue. The project has no plans to limit hunting except as it would affect the recreational area.

0. Comment: The draft environmental impact statement fails to recognize overbank flooding as a natural phenomenon which enhances the growth of hardwoods, increases the productivity of many wildlife species, such as gray squirrel, racoon, opossum, wood duck, and various song birds, and provides spawning and foraging areas for resident fishes. Therefore, the statement should fully explore the effects of altered flow regimes on downstream fish and wildlife resources.

Response: It should be kept in mind as stated on pages 31-32, the project will reduce the frequency of flooding but will not eliminate it completely. Flooding now is of short duration (one to two days)and, therefore would have

little effect on growth of hardwoods, productivity of many wildlife species and the spawning and foraging areas for resident fish.

11. Comment: Neither the environmental statement nor the work plan discuss mineral resources. Crushed stone is currently produced in both Caswell and Rockingham Counties. In addition, clay and sand gravel are produced in Rockingham County.

Response: Information provided by the comment has been included in the statement under the section Environmental Setting.

12. Comment: The National Register of Historic Places (February 19, 1974) and subsequent entries list two historic districts and eight other places which may be in the Country Line Creek Watershed and be within the area of the project's influence as illustrated on the "project map." The section Archaeological, Historic, and Scientific, page 11, should be expanded to include these sites and the results of the survey being made by the North Carolina Department of Cultural Resources.

Response: The final statement has been revised to include the results of the archaeological survey and the places in the watershed listed in the National Register of Historic Places (Federal Register, Volume 40, Number 24, Part 2, February 4, 1975).

13. Comment: If structures in the Milton Historic District have been subject to flooding, any reduction of this hazard as a result of the proposed project may be interpreted as beneficial. If this is the case, the section on page 35, Favorable Environmental Effects should discuss the benefits.

Response: Our data and analysis show no buildings in Milton being flooded from floodwater on Country Line Creek.

14. Comment: On page 26 of the environmental statement and page 17 of the work plan, we note an estimate of 81,725 tons of sediment delivered annually from the watershed to the Dan River. This amounts to about 5000 tons/mi²/yr. We do not have any sediment data for Country Line Creek but our data on the next stream, to the west (Hyco Creek), shows a sediment yield of 98 tons/mi²/yr or about one-sixth that estimated.

Response: Several factors determine the sediment yield at a point in a watershed including land use, topography, soils, etc. Reasons other than above for comparison of two watersheds would be years each study was made, size of watershed and in the case of Hyco River whether the study was made below Hyco Lake. The analysis made by the Service is on file in the Raleigh Office.

15. Comment: Annual attendance of the 14,000-acre Caswell Wildlife Management Area is stated to be 6,500, page 22. Projected annual attendance for recreational use of the proposed project is stated as 135,000. This appears to be about a 2,000 percent increase in visitor-use of resources in the watershed. The statement should discuss potential impacts of this increase in use of recreational resources upon other resources in the area.

Response: As stated on page 7 of the environmental statement, the recreational development area is designed for a maximum capacity of 1,625 persons. The area has six points of entry (see Recreational Development Map, Appendix D) and can use either state highway 62 or 119 to reach the area. Visitation is expected to be highest during the summer week-ends. Local business stimulated by providing goods and services to the recreational site visitors is discussed on page 35.

16. Comment: On page 37 item (e) shows 3,190 acre-feet of storage for municipal and industrial water supply. This is the total storage at normal reservoir level. On the same page, the storage is shown to provide 135,000 visitor-days of water-based recreation. It would seem that if the water is used for water supply it would not also be available for recreation.

Response: Items listed on page 37 are a summary of the environmental impacts discussed on pages 30-36. On page 34 it states that structure No. 1 will contain 3,190 acre-feet of storage for municipal and industrial water. Structure No. 4 will provide an estimated 104,200 visitor-days of recreation annually. Structure No. 1 will produce 30,800 visitor-days of incidental recreation. The statement does not imply the same water is being used for the two purposes.

17. Comment: The statement provides no information on the impact of potential industrial development on cultural resources. Cultural resources are non-renewable and should be discussed in relation to impacts upon them as well as other resources.

Response: The Country Line Creek Watershed project is one phase of the planning which the sponsors are undertaking with the goal of development in the town and country. A water and sewer planning report has also been prepared by a consulting engineer. They are aware that problems created by development can be solved by advance planning of which this project is a part.

18. Comment: The second paragraph on page 41 contains a statement that "There are no other federal or state programs at this time which offer alternate uses of the entire flood plain in the watershed." The Water Resources Development Act of March 7, 1974 provides that all or portions of the flood plain may be acquired for recreation fish and wildlife purposes. We believe an additional alternative should have been explored in accord with the provisions of this law.

Response: It is our understanding that this Act has not been funded to date and therefore, flood plain purchase would not be a feasible alternative.

19. Comment: In addition to the 1,030 acres of wildlife habitat to be flooded in the permanent pools of the two reservoirs, some eight miles of Country Line and South Country Line Creeks will be permanently inundated. Consequently, these free-flowing stream sections will no longer provide habitat for stream-habiting fishes, benthic organisms, and associated wetland wildlife species. Moreover, the stream fishing opportunities now provided by these sections, although now somewhat limited in quantity and quality, will be permanently lost. The impacts should

be listed under Irreversible and Irretrievable Commitments of Resources, page 42.

Response: The commitment of eight miles of stream channel to impounded water has been added as a irreversible and irretrievable commitment of resources. The impact of this commitment is discussed under the Environmental Impact section pages 32-36. The existing quality of the resource is discussed under ENVIRONMENTAL SETTING pages 19-20.

United States Department of Transportation, U. S. Coast Guard

1. Comment: The Department of Transportation has reviewed the draft environmental impact statement for Country Line Creek. We have no comments to offer, nor do we have any objection to this project.

Response: No response needed.

United States Environmental Protection Agency

1. Comment: We have no objection to this action as proposed in the Draft Environmental Statement and have assigned a rating of LO (lack of objection) 1 (adequate) to the project and to the Impact Statement.

Response: No response needed.

Federal Power Commission

1. Comment: A review of the draft work plan and draft environmental statement for Country Line Creek Watershed indicates that this project should have no significant effect on any development licensed by the Federal Power Commission. Also, due to the relatively low average annual flow of Country Line Creek, the project appears to have little potential for hydroelectric development.

Response: No response needed.

2. Comment: All natural gas pipelines and electric transmission lines should be protected during construction and proper authorities notified.

Response: It is the Service's policy to contact proper authorities for all utilities involved with structural measures prior to construction.

United States Department of The Army

1. Comment: We have reviewed this work plan and foresee no conflict with any projects or current proposals of this Department. Page 43 of the work plan cites Lake Gaston as being a Corps of Engineers' reservoir. It should be a Virginia Electric and Power Company project.

Response: The change concerning Lake Gaston has been made.

2. Comment: The draft of the environmental statement satisfies the requirements of Public Law 91-190, 91st Congress, insofar as this Department is concerned.

Response: No response needed.

North Carolina Department of Administration

The Department of Administration, acting as the state clearinghouse, transmitted comments dated February 27, 1975 from the Department of Natural and Economic Resources which included comments dated January 28, 1975 from the North Carolina Wildlife Commission. (See pages E-15 through E-24). These comments were combined with comments received directly from the Department of Natural and Economic Resources and responses are given below.

North Carolina Department of Natural and Economic Resources

1. Comment: The amount of land to be protected by land treatment measures seems inadequate. The total cropland to be treated after project installation is 7,039 acres or 43% of the acres of cropland in the watershed. Similarly figures in the DEIS indicated only 2,163 acres of pasture will receive treatment.

Response: There were 3,681 acres of pastureland, considered adequately treated now, omitted from the draft EIS. The adjusted figures for the final EIS will be 76 percent of pastureland adequately treated and 43 percent of cropland at the end of project installation.

Consideration is also given to 5,064 acres of cropland and 814 acres of pastureland (page 3, EIS) which will receive partial treatment during the installation period. To be considered adequately treated, an individual acre may require two or more of the conservation practices as described on pages 1-3 of the EIS. Partial treatment means that one or more of these practices have been added; however, additional ones are needed but will probably not be installed due to the landowners' mode of operation. Adding the partially treated land to the adequately treated will give 74 percent of cropland and 87 percent of pastureland that will have been treated to reduce erosion.

The impact of land treatment measures applied during the installation period is explained on page 30 of the EIS as reducing sheet erosion in the watershed by 65 percent and reducing total annual erosion 68 percent.

2. Comment: Our chief criticism of both the draft work plan and draft environmental impact statement for your Country Line Watershed project concerns the indication that the question of land availability for the recreational development of Structure No. 4 had been resolved through final agreement between the sponsors and the Wildlife Resources Commission. This, as we see it, has not been achieved in spite of the fact that the sponsors must have the 630 acres of Commission-owned land if the project is to proceed in accordance with your work plan. Until some specific proposal that pertains to the land offered in exchange for the 630 acres of land in question has been received and accepted by the Wildlife Resources Commission and the Fish and Wildlife Service, the final arrangement for land control at Structure No. 4 has not been achieved and we believe it should be stated in the project documents.

Response: Your criticism for the implication that final agreement between the sponsors and the Commission has been resolved is noted and is a major concern to us. We agree the use of the word "final" is not correct and will be changed to reflect the correct status of the arrangement.

We have developed the work plan for submission to the Committee of Congress on the strength of three expressions of cooperative intent between the sponsors, the North Carolina Wildlife Resources Commission, and the United States Department of the Interior. On file is correspondence from the United States Department of the Interior that basically suggests that the sponsors meet with the North Carolina Wildlife Resources Commission and see if the Commission is willing to swap or sell the land rights in question. Secondly, we have a copy of a letter to you from Mr. A. D. Swann dated May 22, 1972, that agrees to purchase land to exchange for the needed land rights or agrees to purchase in fee title at appraised market value at time of purchase.

We believe this letter to be the basis for the resolution by the North Carolina Wildlife Resources Commission on June 12, 1972, that agrees to exchange the necessary land rights for other suitably located lands or in event such exchange cannot be arranged, agrees to sell such land in accord with established rules and regulations.

3. Comment: It is the opinion of this agency that half of the proposed water supply of 10 MGD would be more than sufficient to meet the requirements of the area over the next 40-50 years. Another issue related to the creation of the municipal and industrial water supply is the financial benefit attributed to it.

Response: The water supply proposed in Structure No. 1 will provide the needs of Caswell County as well as the town of Yanceyville. Providing the entire amount of future water needs at the time of construction is considerably cheaper than adding incremental amounts in the future. The benefits derived from the water supply were provided by a consulting engineering firm retained by the county, and concurred in by the Service.

4. Comment: In addition to the low flow release, we request the SCS give consideration to including minimum releases higher than this low flow.

Response: The map prepared by USGS and agreed to by the Service and the State shows the 7-day, 10-year minimum flow for site #1 to be 0.05 csm and for site #4 to be 0.005 csm. Since the dividing line for the two rates are close to site #4 and because of the problems of predicting low-flow accurately, the Service elected the higher rate of 0.05 for both structures. This figure will be included in the final statement. This rate is equivalent to 1.5 mgpd from site #1 and 0.875 mgpd from site #4. This storage and release is in the manner of mitigation to insure some flow downstream during the period in question. Any additional storage and release rates for low-flow augmentation would have to be provided by other than Public Law 566 funds.

5. Comment: Before beginning design or construction of the proposed sewage disposal plant, a Discharge Permit must be applied for and issued by the Environmental Management Commission. There is no mention of how the wastes will be collected and transported to the plant. If the transport of these wastes entails piping of collective wastes across or under impounded waters, construction design criterion consideration should be addressed in either the EIS or Work Plan. Generally, we find such design to be unacceptable.

Response: The Service made further analysis of handling waste treatment because of the comment that piping waste across or under impounded waters is generally unacceptable. It was found that package sewage treatment plants with tertiary treatment could be installed at four different locations than the one larger plant below the dam for approximately the same cost. One plant would provide treatment for areas #1 and #2 and one plant each in areas #4, #5, and 6. The final EIS will be revised to reflect this change in waste treatment facilities. Information concerning this type of facility was obtained from Environmental Contractors, Inc., Raleigh, North Carolina a firm recommended by DNER, Raleigh. They are familiar with State laws and regulations concerning waste treatment. Application for any discharge permit or approval required would be made prior to beginning final designs.

6. Comment: The Division of Forest Resources, DNER, is extremely concerned that the work plan and DEIS do not adequately address the importance of the forest resources in the watershed, and its relationship to the proposed project.

Response: The final environmental impact statement has been revised to include changes suggested by the Division of Forest Resources in a meeting with a representative from U.S. Forest Service.

7. Comment: The project is plainly agriculturally conceived and based, and yet seeks to urbanize the Yanceyville area. Insofar as this is the case, the project should include more careful consideration of the impacts and implications of growth and procedures for dealing with them.

Response: The county is aware of the problems associated with growth and development. They are re-evaluating their waste disposal system. They have also joined the Triad Council of Governments and are participating in the audit process of the Division of Community Assistance. Additional plans call for the hiring of a county manager and building inspector.

8. Comment: Floodplain delineation and regulations must be drawn before the project is satisfactory to DNER.

Response: The Caswell County Board of Commissioners has passed a resolution to adopt and implement a flood plain control ordinance. The Service has the data collected and is presently preparing the maps.

9. Comment: The third paragraph, page 8 of Part III Addendum, contains the statement that "no public access or incidental recreation would be allowed" at Structure No. 1. The Addendum, as we understand it, does not necessarily affect project work plans. Nevertheless, we do wish to point out that this statement appears totally inconsistent with the one appearing on page 33 of the work plan and repeated on page 6 of the environmental statement that "public access areas, sanitary facilities, and minimum recreation facilities will be provided at Structure No. 1." It is also on page 71 of the work plan that 30,800 visitor-days are claimed as a recreation benefit for Structure No. 1.

Response: The plan definitely provides for public access areas, sanitary facilities, and minimum recreation facilities to be provided at Structure No. 1. Part III of the Addendum is an abbreviated environmental quality plan as required of all plans being submitted for approval during the phase in period for the Water Resources Council's Principles and Standards for Water and Related Land Resource Planning. This is an attempt to display an optimum environmental quality plan. Under this setting the planner perceived that the optimum water quality would be provided by excluding the public from other use of the stored water.

10. Comment: We believe that the water-based recreational resources available in the general project area have been understated. The work plan and environmental statement fails to state the fact that the 3,750 -acre Hyco Lake is in the adjoining watershed and at less than 10 miles greater distance from Yanceyville. This lake offers an abundance of opportunity for water-based recreation with fully developed facilities and is a "private power company lake" only in the sense that there is a charge for access.

Response: The statement has been revised to include additional information concerning location, types of recreation provided, and the operation and maintenance of facilities on Hyco Lake. The average annual recreational attendance for Hyco of 50,000 is recognized (see page 23). On page 28, it states that "the Piedmont has the greatest remaining needs for acquisition and development of water oriented recreation." The planned project will offer 770 acres of recreational development area as well as 640 acres of permanent water.

11. Comment: The work plan suggests that most fishing is done at road crossings and any fishing done elsewhere requires crossing private land. There is a four-acre pond open to public fishing near Red House and, in addition, the Commission has two small ponds open to free fishing on the Caswell game land. The latter ponds are little used in spite of easy access and excellent bass and bluegill fishing maintained through intensive management.

Response: The work plan and environmental impact statement has been changed to include recognition of the four-acre pond open to public fishing and the two small ponds on the Caswell Wildlife Management area.

12. Comment: It does not concern our interests but there appears a discrepancy between the two documents respecting the amount of the average monetary benefits to be foregone were the structural features eliminated from the project plans. On pages 26 and 48 of the work plan, this amount is stated as \$414,660 whereas on page 39 of the environmental statement it is stated to be \$89,165.

Response: The average annual net benefits are \$86,510 (\$89,165 in the draft statement). The average annual total evaluated benefits were calculated to be \$414,600. Both figures are therefore valid, however the final statement has been revised to use the net figure where possible to provide a clearer understanding of the benefit comparison of the project and alternatives.

13. Comment: We believe that "excludes" rather than "includes" was intended in the second sentence of the third paragraph, page 4. This sentence now reads, "This includes 11 ponds, pits or reservoirs for fish and wildlife." It refers to a total of 640 acres to be developed as wildlife habitat which, in context, would be the acreage devoted to wildlife through conservation plans for individual farms. The same sentence appears at the top of page 32 of the workplan.

Response: The 640 acres to be developed as wildlife habitat refer to all privately owned land on which the primary or secondary land use plan is wildlife habitat. This should not be confused with the 630 acres to be transferred to the Wildlife Resources Commission. The management and installation of the ponds, pits or reservoirs are a part of the wildlife development.

14. Comment: The work plan states that "Recreation user fees will be used to pay operation and maintenance cost of structure No. 4 and the recreation facilities." We wish to point out that a user fee for either hunting or fishing on water created by public funds would be contrary to Commission policy.

Response: It is the policy of the Soil Conservation Service to permit the local organization to charge admission or use fees provided such fees do not produce revenues in excess of the local organization requirement to amortize the non-federal share of the construction cost and to provide adequate operation and maintenance of the facilities. This is consistent, for example, with other federal programs such as the use of federal aid in Fish and Wildlife Restoration funds.

15. Comments: The work plan does not define the circumstances under which low-flow augmentation will occur. It appears that the reservoir discharges will not exceed reservoir inflows except when flood storage is released. At all times when the reservoirs are at the permanent pool elevation it seems that flow would be reduced rather than augmented, except for the rare occasion when reservoir inflows fall below 7-day/10-year minimum.

Response: Augmentation implies improvements or supplementing flow in streams below structures over and above conditions that now exist. Low-flow augmentation would require additional storage for this purpose. Proper terminology would be automatic provisions to insure low-flow release consistent with the 10-year, 7-day flow levels. Evaporation losses have been taken into consideration in the low-flow orifices and their locations will insure the 10-year, 7-day flow is maintained. This subject was properly explained on page 33 of the environmental statement; however, the word "augmentation" did appear on page 37 and has been removed.

16. Comment: The deep discharges from both reservoirs will provide a cold-water discharge only as long as the volume of water contained in the hypolimnion at the time stratification develops can match the rate of reservoir inflow. It is quite possible, however, that both hypolimnions might well be exhausted by late summer whereupon the downstream biota would be subjected to a temperature shock far greater than would occur under regulated flows or even were surface reservoir discharges provided.

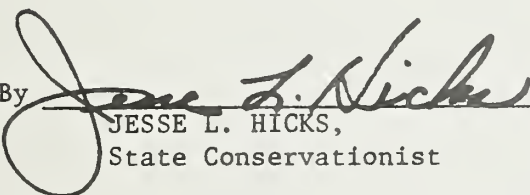
Responses: The intent of the deep discharges from both reservoirs is to attempt to release water near the same temperature as the inflow under existing conditions. This water would be cooler than the surface water but not colder than the incoming water. The outlet works of the structure will be designed to achieve this effect. The environmental impact statement will be expanded to include possible impacts under exceptional conditions.

17. Comments: The Commission recommends that the final watershed work plan agreement carry the stipulation that the sponsoring local organization be responsible for obtaining, as well as implementing, a program of continuing fish management at Structure No. 4.

Response: We believe that paragraph 12 of the watershed work plan agreement already sets the stage for any agreements to be entered into by either party. The work plan will state that a fish management program will be carried out in the maintenance phase of the plan.

LIST OF APPENDIXES

- Appendix A - Comparison of Benefits and Cost for Structural Measures
(taken from watershed work plan)
- Appendix B - Project Map
- Appendix C - Problem Location Map
- Appendix D - Recreational Development Map
- Appendix E - Bibliography
- Appendix F - Comment on the Country Line Creek Watershed Draft Environmental
Impact Statement

Approved By  Date September 16, 1975
JESSE L. HICKS,
State Conservationist

Appendix A- COMPARISON OF BENEFITS AND COSTS FOR STRUCTURAL MEASURES

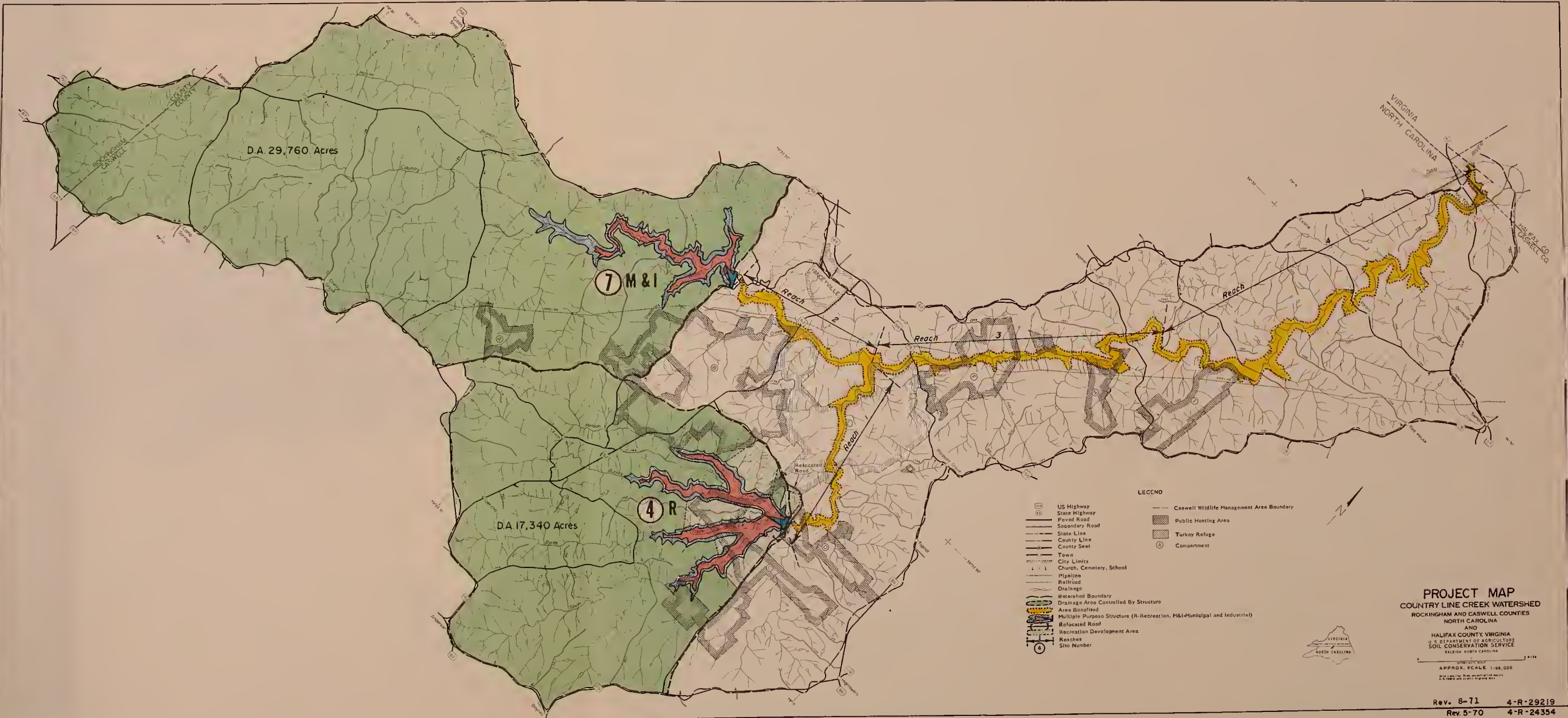
Country Line Creek Watershed
 Caswell and Rockingham Counties, North Carolina

(Dollars)

Evaluation Unit	Average	Annual	Benefits _{1/}	: Average : Benefit						
				Damage : Intensive: Incidental :	M & I :	Annual : Cost				
	Reduction: Land Use :	Secondary: Water :	Recreation: Redevelopment:	Total :	Cost _{2/} :	Ratio				
All Structural Measures	36,260	7,800	30,000	37,000	100,000	47,300	156,300	414,660	309,400	1.3 to 1.0
Project Administration	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxxxx	25,600	xxxxxxx
Grand Total	36,260 ^{3/}	7,800	30,000	37,000	100,000	47,300	156,300	414,660	335,000	1.2 to 1.0

1/ Price base: 1973 prices for all values except agricultural products which are adjusted normalized.
 2/ Based on 1973 prices amortized at 5 5/8 percent interest for 100 years.
 3/ In addition, it is estimated that land treatment measures will provide flood damage reduction benefits of \$6,850 annually.

Date: December 1974

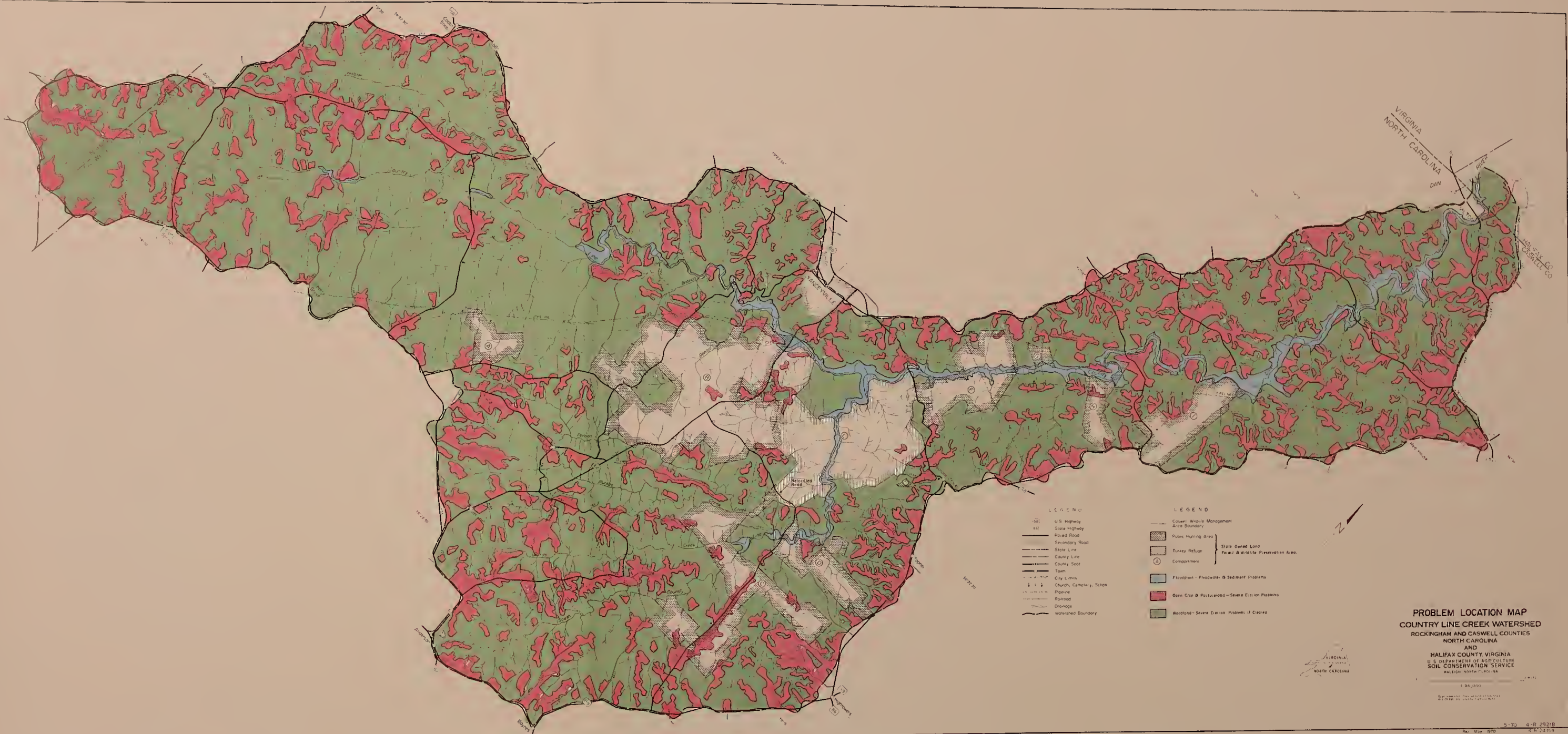


- LEGEND**
- US Highway
 - State Highway
 - Paved Road
 - Secondary Road
 - State Line
 - County Line
 - County Seat
 - Town
 - City Limits
 - Church, Cemetery, School
 - Pipeline
 - Railroad
 - Drainage
 - Watershed Boundary
 - Drainage Area Controlled By Structure
 - Area Bonafied
 - Multiple Purpose Structure (R-Recreation, M&I-Municipal and Industrial)
 - Relocated Road
 - Recreation Development Area
 - Reaches
 - Site Number
 - Caswell Wildlife Management Area Boundary
 - Public Hunting Area
 - Turkey Refuge
 - Compartment

PROJECT MAP
COUNTRY LINE CREEK WATERSHED
 ROCKINGHAM AND CASWELL COUNTIES
 NORTH CAROLINA
 AND
 HALIFAX COUNTY, VIRGINIA
 U.S. DEPARTMENT OF AGRICULTURE
 SOIL CONSERVATION SERVICE
 RALEIGH, NORTH CAROLINA

APPROX. SCALE 1:100,000
ONE INCH ON THIS MAP EQUALS ONE HUNDRED THOUSANT FEET
 ONE CENTIMETER ON THIS MAP EQUALS ONE THOUSANT METERS

Rev. 8-71 4-R-29219
 Rev. 5-70 4-R-24354



- LEGEND**
- 141 U.S. Highway
 - 62 State Highway
 - Paved Road
 - Secondary Road
 - State Line
 - County Line
 - County Seat
 - Town
 - City Limits
 - ⊙ Church, Cemetery, School
 - Pipeline
 - Railroad
 - Drainage
 - Watershed Boundary

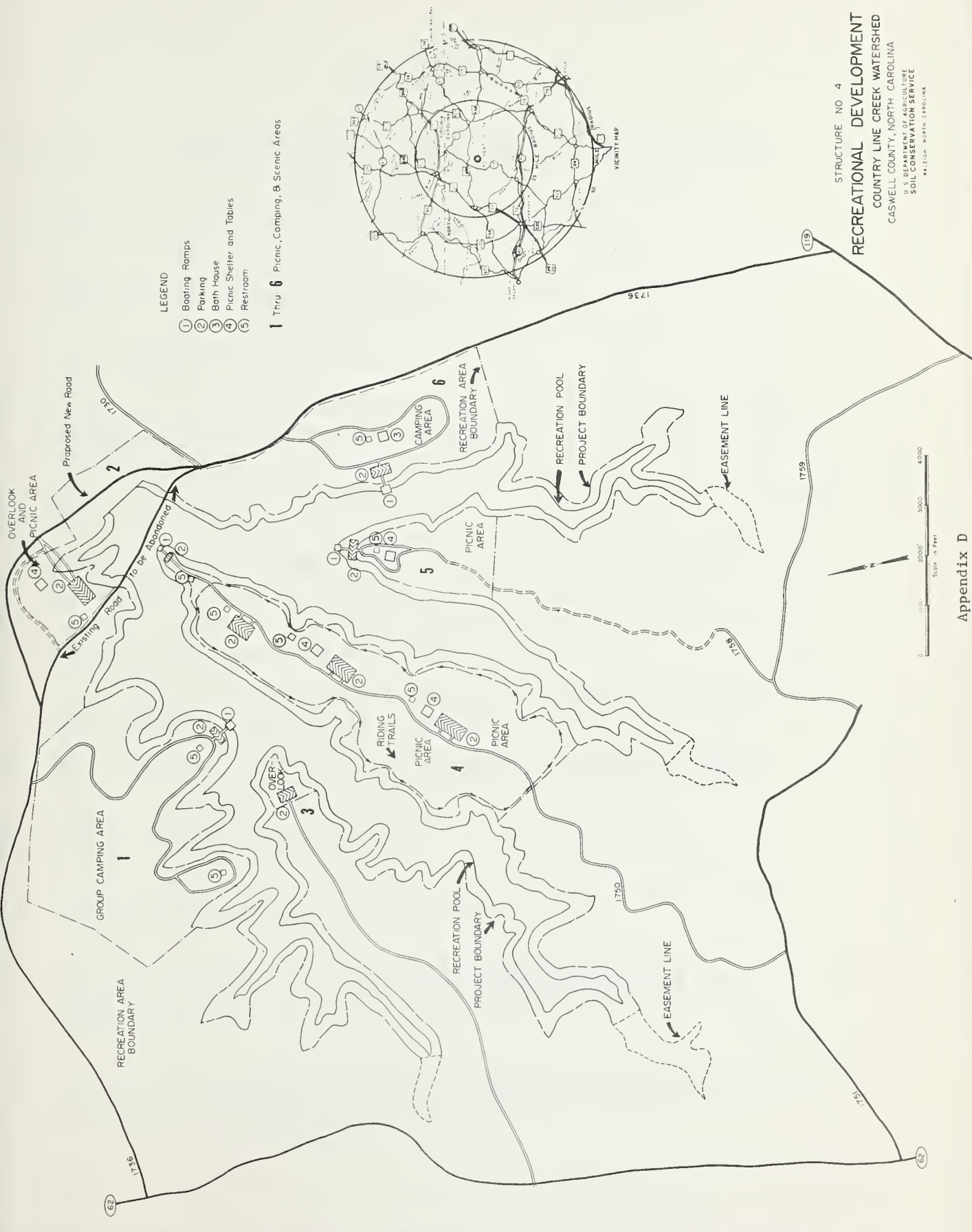
- LEGEND**
- Coverd Waste Management Area Boundary
 - ▨ Public Hunting Area
 - ⊙ State Owned Land
 - ⊙ Turkey Refuge
 - ⊙ Fox & Wildlife Preservation Area
 - ⊙ Compartment
 - ▭ Floodplain - Floodwater & Sediment Problems
 - ▭ Open Crop & Pastureland - Severe Erosion Problems
 - ▭ Woodland - Severe Erosion Problem if Cleared



PROBLEM LOCATION MAP
COUNTRY LINE CREEK WATERSHED
 ROCKINGHAM AND CASWELL COUNTIES
 NORTH CAROLINA
 AND
 HALIFAX COUNTY, VIRGINIA
 U.S. DEPARTMENT OF AGRICULTURE
 SOIL CONSERVATION SERVICE
 RALEIGH, NORTH CAROLINA

1:50,000

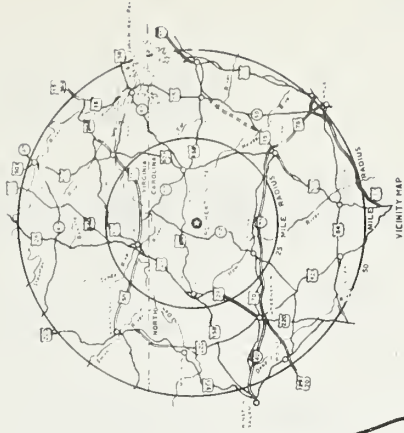




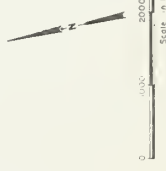
LEGEND

- ① Boating Ramps
- ② Parking
- ③ Bath House
- ④ Picnic Shelter and Tables
- ⑤ Restroom

1 Thru 6 Picnic, Camping, & Scenic Areas



STRUCTURE NO. 4
RECREATIONAL DEVELOPMENT
 COUNTRY LINE CREEK WATERSHED
 CASHWELL COUNTY, NORTH CAROLINA
 U.S. DEPARTMENT OF AGRICULTURE
 SOIL CONSERVATION SERVICE
 RALEIGH, NORTH CAROLINA



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APPENDIX F

COMMENTS ON THE
COUNTRY LINE WATERSHED
DRAFT ENVIRONMENTAL STATEMENT

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Advisory Council
On Historic Preservation

1522 F Street N.W. Suite 430
Washington D.C. 20004

MAR 14 1975

Mr. Jesse L. Hicks
State Conservationist
United States Department of Agriculture
Soil Conservation Service
P.O. Box 27307
Raleigh, North Carolina 27611

Dear Mr. Hicks:

This is in response to your request of December 26, 1974, received January 8, 1975, on the environmental statement and work plan for Country Line Creek Watershed, Rockingham and Caswell Counties, North Carolina. Pursuant to its responsibilities under Section 102(2)(c) of the National Environmental Policy Act of 1969, the Advisory Council on Historic Preservation has determined that your draft environmental statement is inadequate regarding our area of expertise as it does not contain sufficient information to enable the Council to comment substantively. Please furnish additional data indicating:

- a. Compliance with Executive Order 11593 of May 13, 1971.
 1. In the case of lands not under the control or jurisdiction of the Federal Government, a statement should be made as to whether or not the proposed undertaking will contribute to the preservation and enhancement of non-federally owned districts, sites, buildings, structures, and objects of historical, archeological, architectural, or cultural significance. The results of the historic and archeological survey contracted to the North Carolina Department of Cultural Resources, Office of Archives and History should be included in the final statement.

Should you have any questions or require any additional assistance, please contact Stephen Cochran of the Advisory Council staff.

Sincerely yours,



John D. McDermott
Director, Office of Review
and Compliance

UNITED STATES DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

P. O. Box #27307, Raleigh, North Carolina 27611
Telephone: 919-755-4210

April 17, 1975

Mr. John D. McDermott
Director
Office of Review and Compliance
Advisory Council on Historic Preservation
1522 K. Street, N. W. - Suite 430
Washington, D. C. 20005

Dear Mr. McDermott:

We want to thank you for your letter of March 14, 1975 commenting on the Country Line Creek Watershed Environmental Impact Statement. In your letter you expressed concern that the draft impact statement was inadequate as it did not contain sufficient information in your area of expertise.

Further contact with Mr. Ernest Holz of your office revealed that your main concern is that information be presented that the Service has fully met its responsibility to determine the significance of its action on any archaeological or historical resource and that proper procedures were being employed.

Our response to your concern is that we will state in the final environmental impact statement the results of investigations and inquiries made to date.

The Soil Conservation Service is certainly interested and committed to following the procedures that have been established. For Country Line Creek Watershed we started by notifying the National Park Service of certain values found in the project area in November 1974. The historical significance of one site has not been resolved in order to take the next procedural step.

We find that your office has received copies of correspondence revealing background events in this issue. Therefore, we will keep you informed of future activities and decisions as they unfold.

Sincerely,

/S/ JESSE L. HICKS
State Conservationist





United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

In Reply Refer To:
ER-74/1571

APR 1975

Dear Mr. Hicks:

Thank you for your letter of December 26, 1974, requesting our views and comments on the draft environmental statement and work plan for the Country Line Creek Watershed, Rockingham and Caswell Counties, North Carolina. We believe that the documents accurately portray the project and the associated environmental impacts, although the treatment of fish and wildlife resources is rather general. Specific comments are presented below.

Work Plan

There are unresolved questions concerning the replacement of, or reimbursement for lands in the Caswell Wildlife Management Area which were purchased with funds obtained under the Federal Aid in Wildlife Restoration (Pittman-Robertson) Act. In addition, some doubt has been expressed as to whether Structure Number 4 will be built. This is the project feature for which the wildlife management lands would be taken. There is a statement in paragraph 5, page 22, which indicates that an agreement has been reached in this matter. What has actually been accomplished is an agreement to work out an agreement. If Structure Number 4 is not built, however, the problem associated with the wildlife management lands would be eliminated.

The Department's Fish and Wildlife Service has had limited participation in this project since 1971. It has been primarily concerned with resolving the question surrounding the replacement of 630 acres of land in the Caswell Wildlife Management Area that are needed for the construction of Structure Number 4. The Caswell Wildlife Management Area was purchased by the State of North Carolina with Federal funds under the Federal Aid in Wildlife Restoration Act. If it is ultimately decided to construct Structure Number 4, the replacement lands should be purchased first. Further, the project sponsors must acquire replacement lands that



Save Energy and You Serve America!

are equal or greater in value, both monetarily and as wildlife habitat; these replacement lands must be acceptable to the North Carolina Wildlife Resources Commission and the Fish and Wildlife Service.

Secretary's Rule No. 80.5, having to do with diversion of Federal Aid funds, states in part, that

"...A diversion of Federal Aid funds occurs whenever real property acquired or constructed with Federal Aid funds...passes from the control of the State fish and game department...When a diversion of funds occurs, a State thereby becomes ineligible to receive Federal Aid funds...until...Federal Aid financed real property which has passed from the control of the State fish and game department is restored to that control, or a property of equal value at current market prices and with commensurate benefits to fish and wildlife is acquired with non-Federal Aid funds to replace it... Provided further, that when State shall find, and the Secretary agree, that a property is no longer useful for the purposes for which it was acquired or constructed, and that it is not practical to convert the property to other fish and wildlife restoration, development, or management purposes, the State may sell the property and apply the proceeds of sale as the State fish and game department and the Secretary may then agree..."

Thus, if these lands are not replaced with lands of equal value, both montarily and as wildlife habitat, the North Carolina Wildlife Resources Commission faces the possible loss of all Federal Aid funds until such land is replaced.

In paragraph 2, page 32, it is stated that the 640 acres to be developed as wildlife habitat includes 11 ponds, pits, or reservoirs. It is impossible to determine the value of these 11 ponds, pits or reservoirs to fish and wildlife, since locations, dimensions, and other characteristics of these structures are not given. These structures should be fully described in the work plan in order that their value can be assessed. Presumably this is not an erroneous reference to the channel pools described on page 9 of the Abbreviated Environmental Quality Plan in the addendum.

In paragraph 7, page 33, it is stated that public access areas, sanitary facilities, and minimum recreation facilities will be provided for incidental recreation at Structure Number 1. Apparently incidental recreation means fishing, since the calculation of annual visitor-days of fishing is the only recreational project benefit described for this site on page 48. The work plan should set forth clearly what type of recreation will be allowed and detail the recreational amenities to be provided at Structure Number 1.

The compilation of project benefits attributes 135,000 visitor-days of recreation annually to Structures Number 1 and 4, which total 1,030 acres of surface area in the permanent pools. We question whether these computations have taken the proximity of Hyco Lake into account. Hyco Lake is a 3,750-acre lake, fully developed for water-based recreation, and offers a productive sports fishery; thus, it will continue to attract boaters and fishermen after the construction of the proposed reservoirs. Although fees are charged for access of Hyco Lake, it is otherwise open to the public. Moreover, the reference to "recreation user fees" in paragraph 4, page 53, does not indicate whether these will be camping or access fees. If access fees are charged, the proposed project will provide a recreational resource similar in nature to Hyco Lake, and there is some question as to how much of the public will be attracted away from Hyco Lake to this project. Therefore, the work plan should indicate precisely what type of fees will be charged.

Of the projected project benefits attributed to recreational uses, fishing is a prominent contributor. However, we doubt whether fishing in either reservoir will be of sufficient quality to attract fishermen away from nearby Hyco Lake or Kerr Reservoir. Using data given in the draft work plan, our calculations show that the ratio of drainage area to permanent pool surface area is 27:1 for Structure Number 4, and 76:1 for Structure Number 1. These large ratios indicate that extreme fluctuations are likely in the spring, which will disrupt the normal spawning by warm water game fishes. Furthermore, the rapid rate of water exchange in the reservoir will probably inhibit the development of a lake-type plankton community. Therefore, an effective fishery management plan for both reservoirs should be included in the work plan.

Addendum to Draft Work Plan

The addendum to the draft work plan is supposed to be presented for compliance with the "Principles and Standards for Planning Water and Related Land Resources," (Federal Register, Vol. 38, No. 174, September 10, 1973). This document provides for the consideration of two coequal objectives during planning, national economic development and environmental quality, and should indicate that the components of these objectives that are significantly related to the use and management of planning area resources will be defined by local, State, regional, and Federal groups at the outset and throughout the planning process.

The Principles and Standards require that alternative plans be formulated upon these specified components and that at least one alternative plan emphasize contributions to the environmental quality objective. It is our understanding that the Principles and Standards further indicate that the environmental quality alternative addresses the maximum number of specified environmental quality components and also include national economic development components that are compatible with the environmental quality objective. Such a plan, formulated with a view to satisfying one of the planning objectives (i.e., environmental quality), would aid in visualizing tradeoffs associated with a recommended multi-objective plan.

The Abbreviated Environmental Quality Plan for Country Line Creek Watershed appears to be no more than an attempt to justify certain aspects of the recommended plan. This being the case, the reader is lead to believe that the recommended plan will satisfy most of the environmental quality needs in the project area, while also providing the desired economic benefits. Although situations do exist where a recommended structural project would satisfy a broad range of both environmental and economic needs, it appears that in the present case, certain important environmental considerations have been neglected completely while other less relevant and questionable considerations have been emphasized.

For example, the Abbreviated Environmental Quality Plan has failed to consider the merits of maintaining and managing the eight miles of free-flowing stream and approximately 1,100 acres of terrestrial habitat that would be committed

to multipurpose structures. Instead, the draft document concludes that Structures Number 1 and 4 will contribute to the environmental quality objective by providing industrial and municipal water supply and reduced overbank flooding downstream. Since these measures are generally not related to enhancement of environmental quality, as defined by the Principles and Standards, it is not valid to include them in the environmental quality plan, particularly at the expense of precluding the conservation, preservation, restoration, or improvement of the existing natural resources in the area.

Draft Environmental Impact Statement

The draft environmental impact statement does not refer to the effect of this project on hunting opportunities in the project area. Hunting opportunities will be permanently lost in the 1,100 acres required for the dams, spillways, and permanent pools. Hunting opportunities will also be lost or greatly curtailed in the 770-acre recreational area around Structure Number 4. If it is built, future urbanization and industrialization encouraged by the project will contribute to additional losses of hunting opportunities in the watershed. The statement fails to mention whether hunting will be allowed in the flood pool areas. Further, the statement should describe the effect of this project on hunting opportunities in the project area and should indicate what type of hunting opportunities, if any, will be provided around both structures.

The discussion of downstream impacts to fish and wildlife is limited to projected fishery benefits resulting from low-flow augmentation, coldwater release, and sediment reduction. The draft environmental impact statement fails to recognize overbank flooding as a natural phenomenon which enhances the growth of hardwoods, increases the productivity of many wildlife species, such as gray squirrel, raccoon, opossum, wood duck, and various song birds, and provides spawning and foraging areas for resident fishes. Therefore, the statement should fully explore the effects of altered flow regimens on downstream fish and wildlife resources.

Neither the environmental statement nor the work plan discuss mineral resources. Crushed stone is currently produced in both Caswell and Rockingham Counties. In addition, clay and sand and gravel are produced in Rockingham County. Current

production is valued in excess of \$1 million. Although we have no record of any current mineral operations within the project area it is our judgment that the project should have no significant impact on mineral resources nor production. The final statement should address this subject.

The National Register of Historic Places (February 19, 1974 and subsequent entries) lists two historic districts and eight other places which may be in the Country Line Creek Watershed and be within the area of the project's influence as illustrated on the "project" map. The section Archeological, Historic and Scientific, page 11, should be expanded to include these sites, and the results of the survey being made by the North Carolina Department Cultural Resources.

Annual attendance of the 14,000 acre Caswell Wildlife Management Area is stated to be 6,500, page 22. Projected annual attendance for recreational use of the proposed project is stated as 135,000. This appears to be about a 2,000 percent increase in visitor use of resources in the watershed. The statement should discuss potential impacts of this increase in use of recreational resources upon other resources in the area.

The statement should contain information on the effect of floodwater on the Milton Historic District, page 25. If structures in the Milton Historic District have been subject to flooding, any reduction of this hazard as a result of the proposed project may be interpreted as beneficial. If this is the case, the section on page 36, Favorable Environmental Effects, should discuss the benefits.

On page 26 of the environmental statement and page 18 of the work plan we note an estimate of 81,725 tons of sediment delivered annually from the watershed to the Dan River. For the 140 square miles of watershed, this amounts to about 500 tons/mi²/yr. We do not have any sediment data for Country Line Creek but our data on the next stream to the east (Hycoc Creek), shows a sediment yield of 98 tons/mi²/year, or about one-sixth that estimated. There may be a decimal error in the figure used in the documents, or the figure might possibly refer to a larger source area.

On page 37 item (e) shows 3,190 acre-feet of storage for municipal and industrial water supply. This is the total storage at normal reservoir level. On the same page the storage is shown to provide 135,000 visitor days of water-based recreation. It would seem that if the water is used

for water supply it would not also be available for recreation. It might be appropriate to evaluate the yield of the reservoir in terms of different rates and then estimate recreation benefits on the basis of the storage available for recreation when water is used at different rates for water supply. The impacts on the human environment, insofar as water resources are concerned, cannot be properly evaluated without making this distinction, unless the flow through the reservoir is at least equal to the total of all withdrawals. This should be clarified in the final statement.

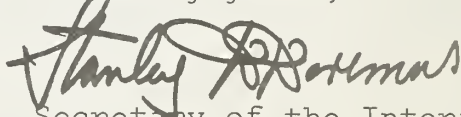
The lack of sufficient water supply is stated to limit growth of industry in Caswell County, especially around Yanncceyville. The statement provides no information on the impact of potential industrial development on cultural resources. Cultural resources are non-renewable and should be discussed in relation to impacts upon them as well as other resources.

The second paragraph on page 41 contains a statement that, "There are no other Federal or State programs at this time which offer alternate uses of the entire flood plain in the watershed." The Water Resources Development Act of March 7, 1974, (Public Law 93-251) provides that all or portions of the flood plain may be acquired for recreation, fish and wildlife purposes. We believe an additional alternative should have been explored in accord with the provision of this law.

In addition to the 1,030 acres of wildlife habitat to be flooded in the permanent pools of the two reservoirs, some eight miles of Country Line and South Country Line Creeks will be permanently inundated. Consequently, these free-flowing stream sections will no longer provide habitat for stream-inhabiting fishes, benthic organisms, and associated wetland wildlife species. Moreover, the stream fishing opportunities now provided by these sections, although now somewhat limited in quantity and quality, will be permanently lost. These impacts should be listed under Irreversible and Irrecoverable Commitments of Resources, page 43.

We hope these comments will be of assistance to you in preparing your final documents.

Sincerely yours,



Deputy Assistant

Secretary of the Interior

Jesse L. Hicks
Soil Conservation Service
P.O. Box 27307
Raleigh, North Carolina 27611



DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
REGION IV
50 7TH STREET N.E.
ATLANTA, GEORGIA 30323

OFFICE OF THE
REGIONAL DIRECTOR

February 24, 1975

Re: 486-1-75

Mr. Jesse L. Hicks
State Conservationist
U. S. Department of Agriculture
Soil Conservation Service
Post Office Box 27307
Raleigh, North Carolina 27611

Dear Mr. Hicks:

Subject: County Creek Watershed
Rockingham and Caswell Counties
North Carolina

We have reviewed the subject Draft Environmental Impact Statement. Based upon the data contained in the draft, it is our opinion that this proposed action will have only a minor impact upon the human environment with respect to the concerns of this Department.

Sincerely yours,

James E. Yarbrough
Regional Environmental Officer



DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

MAILING ADDRESS:
U.S. COAST GUARD (G-WS/73)
400 SEVENTH STREET SW.
WASHINGTON, D.C. 20590
PHONE: (202) 426-2262

• 30 JAN 1975

Mr. Jesse L. Hicks
State Conservationist
Soil Conservation Service
P. O. Box 27307
Raleigh, North Carolina 27611

Dear Mr. Hicks:

This is in response to your letter of 26 December 1974 addressed to Commandant, U. S. Coast Guard concerning a draft environmental impact statement for the Country Line Creek Watershed Project, Caswell and Rockingham Counties, North Carolina.

The Department of Transportation has reviewed the material submitted. We have no comments to offer nor do we have any objection to this project.

The opportunity to review this draft statement is appreciated.

Sincerely,

W. E. CALDWELL
Captain, U.S. Coast Guard
Deputy Chief, Office of
Environment and Safety
By direction of the Commandant



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

1421 PEACHTREE ST., N. E.
ATLANTA, GEORGIA 30309

February 25, 1975

Mr. Jesse L. Hicks
State Conservationist
United States Department of Agriculture
Soil Conservation Service
P. O. Box 27307
Raleigh, North Carolina 27611

Dear Mr. Hicks:

We have reviewed the Draft Environmental Statement and Watershed Work Plan for the Country Line Creek Watershed, North Carolina. We have no objection to the action as proposed in the Statement and have assigned a rating of LO- (lack of objection) 1 (adequate) to the project and to the Impact Statement.

We will appreciate receiving one copy of the final environmental impact statement when it is available. If we can be of further assistance in any way, please let us know.

Sincerely yours,

A handwritten signature in cursive script, appearing to read "Frank M. Redford".

David R. Hopkins
Chief, EIS Branch



DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
WASHINGTON, D.C. 20310

Honorable Robert W. Long
Assistant Secretary of Agriculture
Washington, D. C. 20250

Dear Mr. Long:

In compliance with the provisions of Section 5 of Public Law 566, 83d Congress, the North Carolina State Conservationist by letter of 26 December 1974, requested the views of the Chief of Engineers on the watershed work plan and draft environmental impact statement for the Country Line Creek Watershed, North Carolina.

We have reviewed this work plan and foresee no conflict with any projects or current proposals of this Department. Page 43 of the watershed work plan cites Kerr Lake and Lake Gaston as being Corps of Engineers' reservoirs. Kerr Lake is a Corps of Engineers project but Lake Gaston is a Virginia Electric and Power Company project. The draft of the environmental statement satisfies the requirements of Public Law 91-190, 91st Congress, insofar as this Department is concerned.

Sincerely,

A handwritten signature in cursive script, reading "Charles R. Ford".

Charles R. Ford
Deputy Assistant Secretary of the Army
(Civil Works)



FEDERAL POWER COMMISSION
REGIONAL OFFICE

730 Peachtree Building
Atlanta, Georgia 30308
January 15, 1975

U. S. Department of Agriculture
Soil Conservation Service
Raleigh, North Carolina 27611

Gentlemen:

We appreciate the opportunity to comment on your draft work plan and draft environmental statement for Country Line Creek Watershed for Rockingham and Caswell Counties, North Carolina.

Our primary concern with projects or improvements that affect land and water resources is their possible effect on natural gas pipelines or bulk electric power facilities, including potential and existing hydroelectric developments.

A review of these drafts indicate that this project should have no significant effect on any development licensed by the Federal Power Commission. Also, due to the relatively low average annual flow of Country Line Creek, the project appears to have little potential for hydroelectric development.

During construction all natural gas pipelines and electrical transmission lines should be protected and the proper authorities should be notified.

Very truly yours,



C. L. Fishburne
Regional Engineer



North Carolina Department
of Administration

OFFICE OF
INTERGOVERNMENTAL
RELATIONS

EDWIN DECKARD
DIRECTOR

JAMES E. HOLSHOUSER, JR., GOVERNOR • BRUCE A. LENTZ, SECRETARY

June 19, 1975

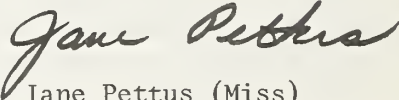
Mr. Jesse L. Hicks, State Conservationist
USDA, Soil Conservation Service
Post Office Box 27307
Raleigh, North Carolina 27611

Dear Mr. Hicks:

Re: Country Line Creek Draft Work Plan
and Draft Environmental Impact State-
ment Our File No. 097-74

Enclosed you will find comments on the above reference, for your use
and file. I apologize for the late submission of these comments.

Sincerely,



Jane Pettus (Miss)
Clearinghouse Supervisor

JP:mw

Enclosures

F-15

MEMORANDUM

February 27, 1975

TO: N.C. Clearinghouse and Information Center

FROM: Art Cooper 

SUBJECT: Clearinghouse File No. 097-74; DEIS and Work Plan, Country Line Creek Watershed, Rockingham and Caswell Counties, N.C.; USDA Soil Conservation Service

The North Carolina Department of Natural and Economic Resources has reviewed the subject documents and offers the following comments. These comments pertain to topics in both the Work Plan and the Draft Environmental Impact Statement:

Land Treatment Measures - The amount of land to be protected by land treatment measures seems inadequate. The amount of cropland which will receive accelerated land treatment is 2,599 acres. In the draft EIS, it is stated on page 24 that 1,440 acres of cropland now have adequate treatment. Therefore, the total cropland to be treated after project installation is 7,039 acres or 43% of the 16,287 acres of cropland in the watershed (page 16, DEIS).

Similarly, figures in the Work Plan and DEIS seem to indicate that only 2,163 acres of pasture will receive treatment, out of a total 7,629 acres of pasture in the watershed (28%).

Because of the importance of land treatment as an objective of this project, the Department of Natural and Economic Resources requests that the Soil Conservation Service make every effort to increase the amount of accelerated land treatment of open lands in this project. It is our opinion that the Soil Conservation Service should plan for and implement a minimum of 50% land treatment on all open land (cropland and pasture) within the watershed as an integral element of this project.

Water Supply - The impoundment at Site No. 1 is planned to supply approximately 10 MGD for Yanceyville. This is about 40 times the present average use and considerably more than DNER's estimated requirements for the year 2020 A.D.

Apparently, the need for this large increase in water supply is based on the speculation by local sponsors that the availability of an increased supply of water will attract industry. We question this line of reasoning. In order to determine the potential for industry locating in the Yanceyville area, members of the Industrial Development Section of the Division of Economic Development, were asked to comment on the proposed water supply and its effect on attracting industry to the area. Their response was less than encouraging. Although it would seem that increased industrial water supply would provide some small benefit

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in attracting industry, the overall lack of industrial-oriented services and facilities in the area (railways, natural gas and waste treatment) make Yanceyville a poor prospect for industrial location. In addition, Yanceyville has not participated in the Governor's Award Program, a program oriented toward upgrading the economic viability of North Carolina towns which lie outside large metropolitan areas. This would seem to indicate that the Town of Yanceyville has not been able to mount a concerted effort to upgrade its overall desirability to new industry. Thus, it seems highly unlikely to us that a vast over-supply of water will compensate for the town's other limitations.

In view of the above, DNER feels that the local sponsors and the SCS should seriously reevaluate the proposal to supply 10 MGD. It is the opinion of this agency that half of this amount (5 MGD) should be more than sufficient to meet the requirements of the area over the next 40-50 years, even with any reasonably predictable immigration of industry to the area.

Another issue related to the creation of the Municipal and Industrial Water Supply aspect of the project is the financial benefit attributed to this supply. Since serious questions have been raised with regard to the attraction of industry from increased water supply, the \$100,000 per year benefit attributed to this aspect of the project must be questioned. It is requested that the final Work Plan contain a detailed explanation of how these benefits were derived by the consulting engineers to the sponsors.

Low Flow Release - The Work Plan provides that each reservoir include minimum low flow releases equalling the 7 day-10 year low flow. These figures need to be spelled out in the Work Plan. In addition, we request that SCS give consideration to including minimum releases higher than this low flow. This should not cause any complications in reservoir design in view of the size of the structures proposed.

Wastewater Treatment - On page 35 (Work Plan), reference is made to the construction of a sewage disposal plant to serve the recreation development accompanying Structure No. 4. It is further stated on page 46 (Work Plan) that this plant will be designed to meet effluent limits established by the Division of Environmental Management, DNER. Before beginning design or construction of the proposed plant, a Discharge Permit must be applied for and issued by the Environmental Management Commission.

All rest rooms are located on peninsulas separated from the proposed sewage treatment plant by extensive spans of water. There is no mention of how the wastes will be collected and transported to the plant. This information should be included in the Work Plan. If the transport of these wastes to the plant entails piping of collective waste across or under impounded waters, construction design criterion consideration should be addressed in either the EIS or Work Plan. Generally, we find such design to be unacceptable.

Forest Resources - The Division of Forest Resources, DNER, is extremely concerned that the Work Plan and DEIS do not adequately address the importance of the forest resources in the watershed, and its relationship to the proposed project. This concern is shared by the department as a whole.

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The comments below represent the position of DNER on the coverage of forest resources in the DEIS and Work Plan:

Pages 37 and 43 - What are the actual forest land losses to impoundments, spillways, recreational complex, etc.?

Page 8 - Net land use change increases the forest land by 345 acres. What was the gross increase and what was the previous use?

The Work Plan does not adequately cover the importance of the forest resource. Its influence on the problem, and the solution, is hidden under numerous other headings. In only one instance is the forest resource given a separate identity (Work Plan, page 11). With 68% of the land area in forest cover, the forest resource should be covered as such under each of the major headings.

Much of the flood problem stems from the excessive run-off from forest land, generated by the poor hydrologic condition of the forest soil (Work Plan, page 16). This condition should have been covered in depth so that the sponsors and the landowners in the watershed are fully informed.

The authors of the Work Plan are surely aware of the flood prevention value of a good forest cover in intercepting rainfall and in retarding and reducing surface run-off from sloping land. They must also be aware that the best way to rebuild the depleted, eroded and abandoned crop land and restore some semblance of the original hydrologic condition is to establish or re-establish full stocked forests. (Work Plan, page 15). Therefore, the Work Plan should provide for a larger degree of forest resource improvement.

With the exception of the reduction of erosion from crop and pasture land, all of the major objectives (flood prevention, pure water for municipal and recreational use, wildlife habitat, economic improvement) are dependent upon the forest resource.

Admittedly, the Country Line Creek Watershed Work Plan was developed to reduce flood and sediment damage to acceptable levels in six years.. However, it seems only logical that the plan should present the problem in its entirety and place a great deal more emphasis on improving the forest resource during the six year period. The final solution to the flood problem must include a great improvement in the forest resource base and a PL 566 Work Plan is the place to start.

Improving forest cover and forest soil hydrology should be a major component of all PL 566 projects in the Piedmont and mountain counties of North Carolina.

Work Plan, page 1 - Summary, second paragraph - Add: the second major problem is flooding, principally surface water from the 60,000 acres of forest land with poor soil hydrology.

Work Plan, page 11 - Forest Resource - Data from the 1974 Forest Survey will be available from the Southeastern Forest Experiment Station in a few weeks and this section will be updated for the final plan.

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Work Plan, page 14 - Change to "Soil, Water, Forest and Plant Management Status."

Work Plan, page 16 - Revise to include all forest resource problems under a heading of Forest Resources. Add: "A major problem in improving the forest resource is that of motivating the small forest landowner to invest in forest improvement practices which will not bring him a financial return for many years. However, planned management practices can provide forest landowners with periodic returns from thinnings and improvement cuts. The costs connected with regenerating a new forest can be minimal if properly planned and executed at the time of final harvest."

Work Plan, page 17 - Erosion Damage: include in Forest Resource. Show the erosion rate from forest and compare this with the erosion from other land uses. Add statement to the effect that forest improvement practices, forest harvesting and regeneration, if properly planned and executed, cause very limited erosion for only a short period of time.

Work Plan, page 20 - Economic and Social: include in Forest Resource. Add: The sale of forest products from productive managed forests provide income to the landowner and contribute to the general economy when harvested and processed.

Updated values from the 1974 Forest Survey will be provided as soon as available.

Work Plan, page 29, last line - The N.C. Division of Forest Resources will continue the going cooperative Forest Fire Control Program in the forest lands of the watershed. It will not be necessary to accelerate protection (see page 16).

Work Plan, pages 31-32 - Please identify the tree planting needs as:

(b) Tree Planting - Watershed protection (700 acres).

1. Acres of open land to be planted as a result of land use changes.
2. Acres of understocked land to be planted.

(d) Delete this - protection is adequate.

Work Plan, page 41 - Please identify the forest land use change.

- (1) forest acres lost to dams, spillways and permanent pool.
- (2) forest acres lost to recreational development.
- (3) forest acres lost to land use changes.
- (4) forest acres gained from land use changes.
- (5) Net forest acre change +345.

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Land Use - The description and discussion of land uses within the watershed is heavily oriented toward agricultural land uses. Since several of the elements of the project will have a significant bearing on the present and future urbanization of the Yanceyville area, it would seem appropriate to broaden the discussion of land use to encompass this topic. The Piedmont Triad Council of Governments has published several documents which deal with the existing and projected physical land use patterns in the subject area. This material could be referenced in the text of the Work Plan/DEIS. Another possibility for expanding the discussion of land use in the area would be to present information, both in the text and visually, relative to existing land uses by classification in accord with the State Land Use Policy classifications.

General Comments - The local sponsors should take appropriate steps to have responsible local governments delineate floodways and establish floodway regulations from each structure downstream to the confluence with the Dan River. The local government is empowered to do this under North Carolina General Statute 143-215.51 through 143-215.61. Such measures would protect the flood control purposes of the project, should provide much long-term benefit to Caswell County, and will be included as DNER recommendations when the project is presented to the Environmental Management Commission for approval.

The local sponsors are urged to recommend to the Caswell County Commissioners that a County Septic Tank Ordinance be developed and adopted for those privately owned lands which will be subject to recreation type home development as a result of stimulation of this type of development by the project. The time to develop such land use controls is prior to development rather than after uncontrolled development has created a problem. The problem referred to here is future water pollution and health hazard due either to a high density of septic tanks or to septic tanks which do not function properly because of adverse soil conditions.

Finally, it is clear that this project has a number of inherent shortcomings. Generally, these seem to result because SCS has failed to consider modifications in the objectives of the local sponsors and because it has not seriously questioned water-related benefits. This has resulted, for example, in a failure to consider use of one structure for meeting flood control, water supply and recreation needs. We also believe that some mention should be made of the regional water quality ramifications that would result from the use of 10 MGD.

The comments of the N.C. Wildlife Resources Commission are attached.

Attachment



State of North Carolina

Wildlife Resources Commission

RALEIGH, N. C. 27611

January 28, 1975

K. ANDERSON, NEWLAND
CHAIRMAN
LACE E. CASE, HENDERSONVILLE
JACK HOOKS, WHITEVILLE
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O. L. WOODHOUSE, GRANDY

Mr. Jesse L. Hicks
State Conservationist
United States Department of Agriculture
Soil Conservation Service
Post Office Box 27307
Raleigh, North Carolina 27611

Dear Mr. Hicks:

We have reviewed the draft work plan and draft environmental statement for your Country Line Watershed Project which Mr. Folsche transmitted to Mr. Patton on December 26, 1974.

In our opinion, these two documents present the general project picture, as well as the environmental costs to be paid, very well.

Our chief criticism of both drafts concerns the implication carried in paragraph 5, page 22, of the work plan, and repeated in the last paragraph on page 44 of the environmental statement, that the question of land availability for the recreational development of structure No. 4 had been resolved through final agreement between the sponsors and the Wildlife Resources Commission. This, as we see it, has not been achieved in spite of the fact the sponsors must have the 630 acres of Commission-owned land if the project is to proceed in accordance with your work plan.

The transfer of the land in question, to our knowledge, at this time rests solely upon two expressions of willingness to cooperate in attempts at reaching a mutually satisfactory agreement. Mr. A. D. Swann, Chairman of the Caswell County Board of Commissioners, wrote Mr. Jay Waggoner on April 18, 1972 that the sponsors were "willing to sit down with the Commission and reach an agreement that is acceptable to the Commission and the sponsors." The Wildlife Resources Commission passed a resolu-

tion at its June 12, 1972 meeting expressing a willingness to cooperate with the Caswell County Board of Commissioners in an attempt at reaching a mutually acceptable solution. These expressions of cooperative intent are by no means tantamount to the necessary agreement over the terms of the land transfer.

You, in fact, stated the requirements for a satisfactory resolution of the land control issue in your letter to Mr. Swann under date of April 19, 1972:

"Your statement that you will furnish land rights for both structure sites is satisfactory with us. We will, however, need more information before we can proceed with development of the work plan, specifically:

1. A statement from the Caswell County Commissioners that they agree to transfer 630 acres in fee title to the North Carolina Wildlife Resources Commission in exchange for the 630 acres of Caswell Game Lands used for the project.
2. A statement from the North Carolina Wildlife Resources Commission to the effect that the above exchange of land is satisfactory with the Commission.
3. A statement from U. S. Department of Interior, Bureau of Sports Fisheries and Wildlife, to the effect that the exchange of land is satisfactory to them.

Receipt of these three positive statements will document the fact that a satisfactory agreement has been reached with concerned Federal and State agencies. The SCS can proceed with development of the plan."

We have no record in our files indicating the first statement you requested, and upon which the remaining two statements are dependent, was ever received from the Caswell County Board of Commissioners. Until some specific proposal that pertains to the land offered in exchange for the 630 acres of land in question has been received and accepted by the Wildlife Resources Commission and the Fish and Wildlife Service, the final arrangement for land control at structure No. 4 has not been achieved and we believe it should be stated in the project documents.

We have several other comments which probably are best discussed in the sequence in which they appear in your work plan.

The third paragraph, page 8 of Part III Addendum, contains the statement that "no public access or incidental recreation would be allowed" at structure No. 1. The Addendum, as we understand it, does

not necessarily affect project work plans. Nevertheless, we do wish to point out that this statement appears totally inconsistent with the one appearing on page 33 of the work plan and repeated on page 6 of the environmental statement that "public access areas, sanitary facilities, and minimum recreation facilities will be provided at structure No. 1. It is also on page 71 of the work plan that 30,800 visitor-days are claimed as a recreation benefit for structure No. 1.

We believe that the water-based recreational resources available in the general project area have been understated. It is literally true, as stated on page 13 of the work plan, that there "is a minimum of water-based recreational facilities within the watershed." What is not stated is the fact that 3,750-acre Hyco Lake is in the adjoining watershed and at less than ten miles greater distance from Yanceyville. This lake offers an abundance of opportunity for aquatic-based recreation with fully developed facilities and the unusual attraction of a productive year-round sports fishery stimulated by the warm condenser discharges from the CP&L steam plant. Hyco Lake is a "private power company lake" as you described it on page 13 only in the fact that the Caswell County Board of Commissioners, along with their Person County counterparts, charge for access to the lake.

It is also stated on page 13 that "Most of the fishing that is done on Country Line Creek takes place at the few road crossings.... As a result, any fishing done other than at road crossings requires the crossing of private lands." There is a 4-acre pond open to public fishing near Red House and, in addition, the Commission has two small ponds open to free fishing on the Caswell Game Land. The latter ponds are little used in spite of easy access and excellent bass and bluegill fishing maintained through intensive management.

It does not concern our interests but there appears a discrepancy between the two documents respecting the amount of the average monetary benefits to be foregone were the structural features eliminated from the project plans. On pages 26 and 48 of the work plan, this amount is stated as \$414,660 whereas on page 39 of the environmental statement it is stated to be \$89,165.

We believe that "excludes" rather than "includes" was intended in the second sentence of the third paragraph, page 32. This sentence now reads "This includes 11 ponds, pits or reservoirs for fish and wildlife." It refers to a total of 640 acres to be developed as wildlife habitat which, in context, would be the acreage devoted to wildlife through conservation plans for individual farms. The same sentence appears at the top of page 4 of the environmental statement.

The statement appears on page 53 that "Recreation user fees will be to pay operation and maintenance cost of structure No. 4 and the recreation facilities." We wish to point out that a user fee charged for either hunting or fishing on water created with public funds would be contrary to Commission policy.

We note among the project benefits listed on page 37 of the environmental statement "Improved stream flow and fish habitat below structures through low-flow augmentation, cold-water release, and sediment reduction."

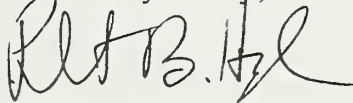
The work plan does not define the circumstances under which low-flow augmentation will occur. The primary purposes of both impoundments require that the full permanent pool be maintained whenever possible. The work plan implies a fixed weir at the permanent pool elevation, plus a low-flow orifice with capacity to discharge only the 7-day/10-year minimum, controlling the effluent from each reservoir. It would appear, therefore, that the reservoir discharges would not exceed reservoir inflows except in association with the relatively infrequent occasions when flood storage is being released. At all times when the reservoirs are at the permanent pool elevation, evaporation from both reservoirs -- coupled with the diversion of water from structure No. 1 for municipal and industrial purposes -- should reduce, rather than augment, natural stream flows. The one exception that would produce low-flow augmentation would be the exceedingly rare occasion when reservoir inflows fall below the 7-day/10-year minimum.

The deep discharges from both reservoirs will provide a cold-water discharge only as long as the volume of water contained in the hypolimnion at the time stratification develops can match the rate of reservoir inflow. Elevation-volume curves are not provided so estimates of the time the hypolimnions will be exhausted cannot be made. It is quite possible, however, that both hypolimnions might well be exhausted by late summer whereupon the downstream biota would be subjected to a temperature shock far greater than would occur under regulated flows or even were surface reservoir discharges provided.

Finally, the Commission recommends that the final Watershed Work Plan Agreement carry the stipulation that the sponsoring local organization be responsible for obtaining, as well as implementing, a program of continuing fish management at structure No. 4. Fishing figures so prominently in the total recreational pattern that maintenance of a high fishing success rate is essential to attainment of project objectives.

We do appreciate the opportunity of reviewing and commenting upon the Country Line Project documents in their final draft stage.

Yours very truly,



Robert B. Hazel
Assistant Executive Director

FFF:en

March 4, 1975

Mr. Jesse L. Hicks, State Conservationist
USDA Soil Conservation Service
Post Office Box 27307
Raleigh, North Carolina 27611

Dear Jesse:

Pursuant to our recent conversations about better coordination of planning for PL 566 projects, I am enclosing DNER's comments on the Second Broad River and Country Line Creek Watershed projects. My following comments will, I hope, assist in resolving what problems we foresee in these projects.

As you can judge from our comments, we do not see any major problems with the Second Broad River project. What problems we have pointed out in our EIS review should be amenable to resolution through the normal planning process at the Raleigh level. If you wish assistance with them, please contact me and I will be glad to put you in contact with the appropriate person in DNER.

The Country Line Creek project is plainly a much more complicated situation. As our comments show, we have a number of major reservations related to it. The major issues are:

1. Water Supply: The project calls for 10 MGD M&I water, better than twice what our staff regards as a reasonable amount. The overall economic development potential of the area is poor, because of a lack of support facilities for industrial development other than water. In short, 10 MGD are not justified.
2. Wildlife Commission Land: The Wildlife Resources Commission owns 630 acres at the site of one of the two proposed reservoirs. It is willing to give up this land if the Caswell County Commissioners come up with an equal amount of satisfactory "trade" land. So far, no progress has been made on this requisite.
3. Floodplain delineation and regulations have not yet been drawn and must be before the project is satisfactory to DNER.
4. As with other DEIS's produced by SCS, forest resources and their relationship to watershed problems and the project are inadequately addressed.
5. The project is plainly agriculturally conceived and based and yet seeks to urbanize the Yanceyville area. Insofar as this is the case, the project should include more careful consideration of the impacts and implications of growth and procedures for dealing with them. These are wholly absent.

Mr. Jesse L. Hicks
Page 2
March 4, 1975

In my opinion, these problems are of such magnitude that they can never be dealt with at the Raleigh level. Furthermore, DNER will not bring this project to the Environmental Management Commission until they are resolved. So that the matter is not left at an impasse, I am asking our Winston-Salem field office manager, Joe Robertson, to work with the local sponsors, your staff and our staff in an effort to resolve these problems. If he can do so, then we can move the project ahead.

Please give me a call if you wish to discuss any of these matters.

Sincerely,

Arthur W. Cooper

/WC:cj
Enclosures
cc Dan McDonald
Joe Robertson

(NOTE: Retyped for reproduction)



North Carolina Department of
Natural & Economic Resources

JAMES E. HOLSHOUSER, JR., GOVERNOR • JAMES E. HARRINGTON, SECRETARY

ARTHUR W. COOPER
ASSISTANT SECRETARY

BOX 27687, RALEIGH 27611
TELEPHONE 919-879-1924

June 4, 1975

Mr. Jesse L. Hicks, State Conservationist
USDA Soil Conservation Service
Post Office Box 27307
Raleigh, North Carolina 27611

Dear Jesse:

On March 4, 1975, I wrote you concerning certain problems arising from NER's review of the Country Line Creek project. Our review raised a number of questions that, it seemed to me, needed resolution before we would be able to present the project to the Environmental Management Commission for approval. As you are aware, Mr. Joe Robertson, Manager of our Winston-Salem field office, has been working on this project in an effort to resolve or clarify problems and issues raised in our review.

It appears that the majority of issues have been resolved. The following comments indicate the current status of the issue and our understanding of its status at the present time:

1. Water Supply

An adequate water supply is considered essential for future development of Caswell County, not just Yanceyville. This was not made clear in the earlier report we reviewed. A study, prepared by the Agricultural Extension Service, and other documents support this need. The county officials want the 8-10 million gallons of water for future growth of the entire county. Our Economic Development Division has been urging the county for years to come up with an adequate water supply. As far as the over-design of structure number four is concerned, the leaders of the county do not feel it is inappropriate to create the impoundment at this time. In view of the county-wide nature of the proposed system, and in view of the fact that the incremental cost of providing water is less now than it will be in the future, we withdraw our objections to the size of the water supply.

Our question concerning derivation of the \$100,00 per year benefits to be derived from the water supply have been answered by copy of a letter dated March 5, 1974, from the county consulting engineers to the Sanitary District Chairman (Reference 1).

Mr. George L. Hicks
June 3, 1975

Wastewater Treatment (Reference 11)

SCS plans to use package sewage treatment plants with tertiary treatment installed at four different locations. Water Quality staff in our Winston-Salem office questions this approach from a cost standpoint. You may wish to reexamine this matter.

Septic Tanks (Reference 12)

The Caswell County Commissioners have passed a resolution to operate under the rules and regulations as set forth by the North Carolina State Board of Health regarding the installation of septic tanks.

Obviously, several of these issues remain to be resolved and others remain as matters of written commitment on the part of the County Commissioners. It seems to me that no useful purpose would be served by demanding further resolution at this stage. Accordingly, we will be pleased to bring this subject to the Environmental Management Commission for consideration at a date agreeable to SCS and our staff.

Sincerely yours,



Arthur W. Cooper

cc: [unclear]
[unclear]
S. B. Farmer
Joe Robertson
Thayer Broili
Grady Lane
Earl McDonald



