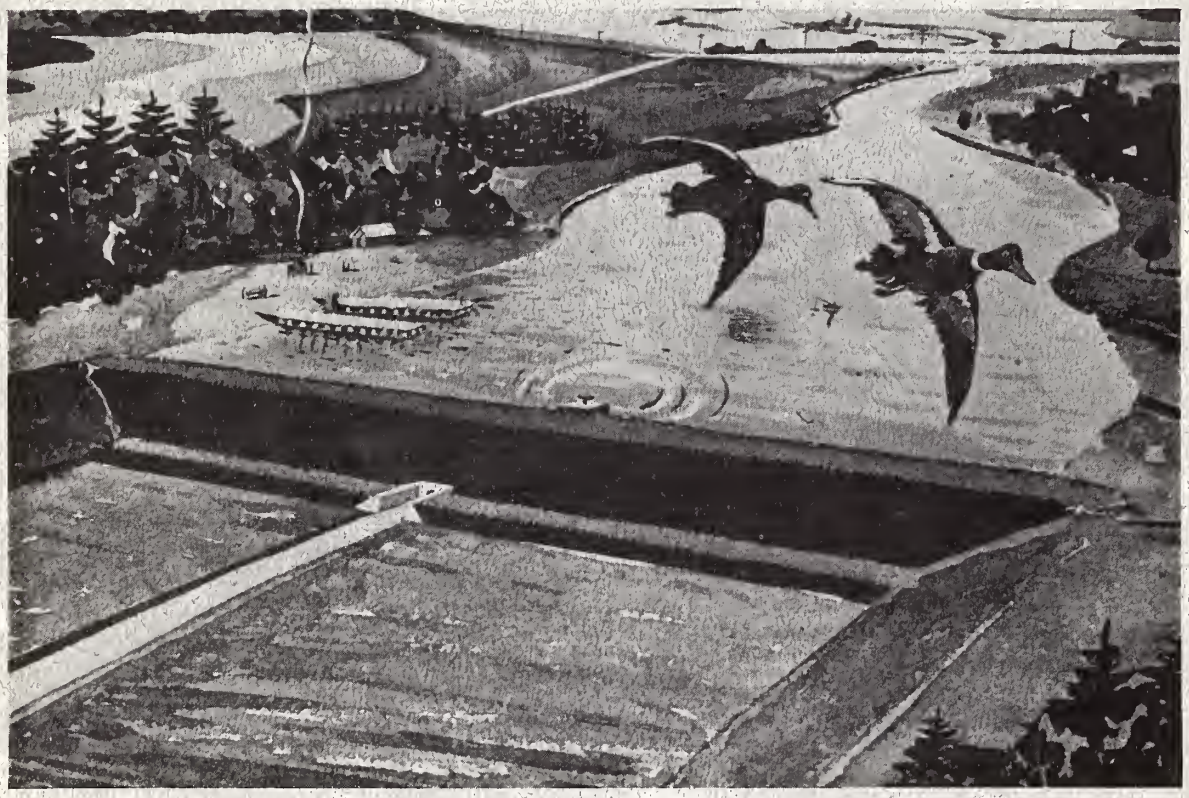
ENVIRONMENTAL STATEMENT

MILL BROOK WATERSHED

CHENANGO COUNTY, NEW YORK



Prepared by: U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
Syracuse, New York

USDA-SCS-EIS-WS-(ADM)-75-1-(F)-NY

MILL BROOK WATERSHED
CHENANGO COUNTY, NEW YORK

Final Environmental Statement

Robert L. Hilliard
State Conservationist

Sponsoring Local Organizations:

Chenango County Board of Supervisors
Norwich, New York 13815

Chenango County Soil and Water Conservation District
Norwich, New York 13815

Village of New Berlin
New Berlin, New York 13411

New York State Department of Environmental Conservation
Albany, New York 12201

April 1975

PREPARED BY

UNITED STATES DEPARTMENT OF AGRICULTURE

Soil Conservation Service

Syracuse, New York 13210

CONTENTS

LIST OF FIGURES

LIST OF TABLES

USDA ENVIRONMENTAL STATEMENT

Mill Brook Watershed Project

Chenango County

New York

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

Summary Sheet

I Final

II Soil Conservation Service

III Administrative

IV Description of Action

A project for watershed protection, flood prevention, and recreation and fish and wildlife in Chenango County, New York to be installed by the Sponsoring Local Organizations with federal assistance under authority of the Watershed Protection and Flood Prevention Act (Public Law 566, 83d Congress, 68 Stat. 666), as amended.

The project will consist of conservation land treatment measures, one floodwater retarding structure, one multiple-purpose structure, one public recreational and fish and wildlife development, and approximately 0.25 mile of channel work.

V Summary of environmental impact and adverse environmental effects

Installation of land treatment measures will reduce runoff from the 100-year frequency flood by about 3.6 percent and reduce flood damages by about $680 annually. Woodland wildlife habitat would be increased by about 15 acres.

Installation of the structural measures will provide urban protection for floods of magnitudes up to the 100-year frequency event, thus eliminating flood damages in the amount of $61,360. About 21 residences, 19 commercial establishments, and about 80 flood plain residents would directly benefit. In addition, an estimated 39,667 visitor days of recreation will be created. Recreational activities to be created by the structural measures include cold water fishing, picnicking, swimming, and nature studies. Average annual sediment yields at the mouth of the watershed will be reduced approximately 300 tons per year.

Installation of structural measures will result in wildlife habitat losses of about 51 acres of cropland, 23 acres of pastureland, and 55 acres of forest land. Wildlife habitat of about 51 acres of wetland (open water) and 78 acres of open land will be created. About 1,318 feet of open modified channel will be converted to a reinforced concrete conduit, 4,000 feet of natural channel will be destroyed, and 2,450 feet of natural channel will be subject to periodic inundation. Production from about 51 acres of cropland, 118 acres of pastureland, and 19 acres of forest land will be lost, and about 24 acres of pastureland and 4 acres of forest land will become subject to periodic inundation.

VI Alternatives

1. Land Treatment
2. Land Treatment and Floodproofing
3. Land Treatment and Reinforced Concrete Channel
4. Land Treatment, One Floodwater Retarding Structure, One Multiple-Purpose Structure, and a Public Recreational and Fish and Wildlife Development
5. No Project

VII Comments were requested but no response was received during the review of the draft Environmental Impact Statement from the following agencies:

Department of the Army
Department of Commerce
Office of Equal Opportunity - USDA
Appalachian Regional Commission
Federal Power Commission
New York State Planning and Development Clearinghouse (State Clearinghouse)
Southern Tier East Regional Planning and Development Board (Area Clearinghouse)
National Audubon Society
National Resource Defense Council
League of Women Voters

Comments were received from the following:

Department of Health, Education, and Welfare
Department of the Interior
Department of Transportation
Environmental Protection Agency
Advisory Council on Historic Preservation 1/
New York State Department of Environmental Conservation (designated State Agency)
Chenango County Planning Board

VIII Draft Statement Transmitted to CEQ on August 20, 1974.

1/ Comments from the Department of Environmental Conservation include comments from the State Clearinghouse.

USDA SOIL CONSERVATION SERVICE
DRAFT ENVIRONMENTAL STATEMENT

for

Mill Brook Watershed
Chenango County, New York

Installation of this project constitutes an administrative action. Federal assistance will be provided under authority of Public Law 83-566, 83d Congress, 68 Stat. 666, as amended.

SPONSORING LOCAL ORGANIZATIONS

Chenango County Board of Supervisors
Chenango County Soil and Water Conservation District
Village of New Berlin
New York State Department of Environmental Conservation

PROJECT PURPOSES AND GOALS

The Sponsoring Local Organizations and the Service agreed that a project would be formulated to meet the following objectives:

1. Provide protection from flooding up to the 100-year frequency flood throughout the village of New Berlin.

2. Reduce stream channel and bridge cleanout costs.

3. Help meet the water based recreational needs of the area.

PLANNED PROJECT

LAND TREATMENT

The land treatment phase of the plan applies to each acre in the watershed. Landowners and operators will be encouraged to manage their lands to maintain adequate cover and existing treatment measures. They will also be encouraged to install conservation measures to meet problems in the watershed. Individuals will install these measures dependent upon their individual interests, their means to do so, and applicable state and local laws.

Technical assistance will be provided to plan land use changes, install needed conservation measures, manage watershed resources, and maintain conservation measures. Assistance will be given to planning and zoning boards, community leaders, and land developers in the proper use, treatment, and development of resources. General technical assistance will also be provided for environmental education and stimulation of landowners to participate in good land management practices.

Through consensus of the conservation district, community leaders, landowners, and state and federal agencies, it was agreed that adequate land treatment should be applied to 250 acres of cropland, 300 acres of pastureland, 323 acres of forest land, and 50 acres of urban and other land during the 5-year installation period. It was also agreed that 36 acres of capability class VIIs pastureland would have an adjustment in land use. Table A indicates planned types of land treatment measures to be applied.

Wildlife habitat management practices will be interspersed throughout the watershed. These practices will include planting grasses, legumes, and shrubs; constructing watering facilities; and releasing apple trees and other valuable food plants.

TABLE A - LAND TREATMENT INSTALLATION

Land Use	Acres Needing Treatment	Land Treatment to be Applied 1/
Cropland	250	Conservation cropping system Contour Farming Diversion Pasture and Hayland Management Pasture and Hayland Planting Stripcropping Subsurface Drain
Pastureland	300	Brush Management Pasture and Hayland Management Pasture and Hayland Planting Pond Proper Grazing Use Trough or Tank
Forest Land	323	Hydrologic Cultural Operations Tree Planting Woodland Grazing Control Forest Management
Other	50	Fishpond Management Hedgerow Planting Pond Wildlife Wetland Habitat Management Wildlife Upland Habitat Management

1/ Definitions of land treatment measures in Appendix D.

STRUCTURAL MEASURES

Structural measures included in this plan are one floodwater retarding structure, one multiple-purpose structure, one public recreational and fish and wildlife development, and approximately 0.25 mile of channel work. The two structures will control 3.44 square miles of drainage area which is approximately 76 percent of the total watershed area. The design life for all structural measures is 100 years.

Structure No. 1

Floodwater retarding structure No. 1, with a drainage area of 2.09 square miles, is located on the north tributary just east of the Sherburne Turnpike. (See Appendix B, Project Map.)

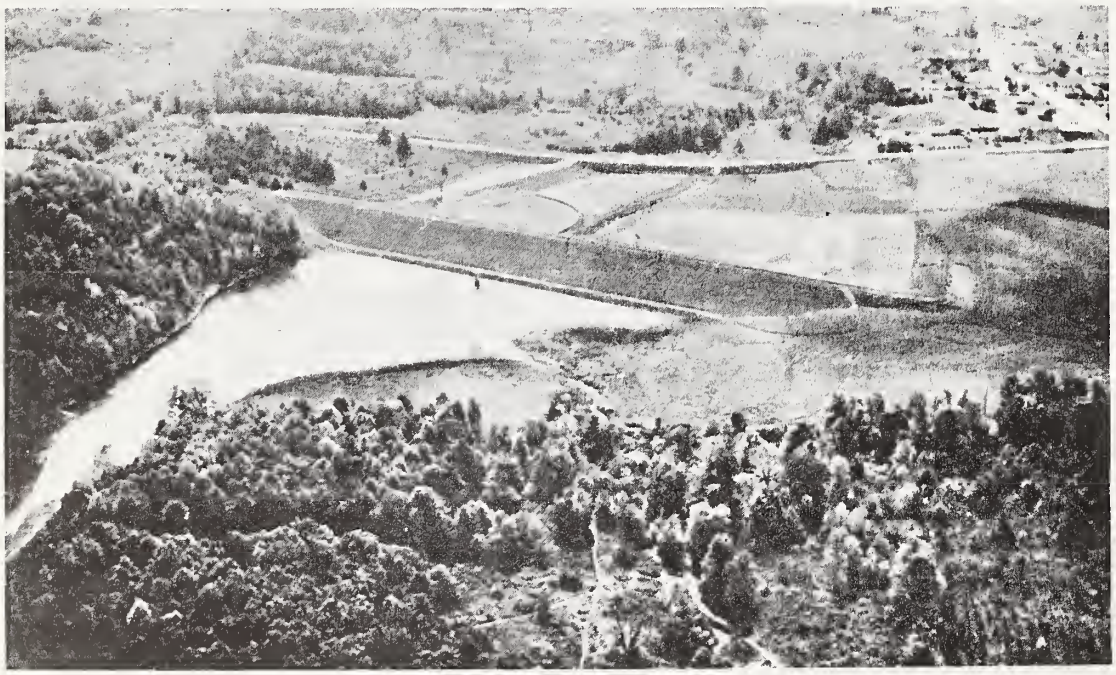


FIGURE 1 - TYPICAL FLOODWATER RETARDING STRUCTURE

The earth fill dam is a 58-foot high structure with a two-stage reinforced concrete drop inlet principal spillway with an energy dissipator and a vegetated earth emergency spillway.

Flow will be controlled through an ungated reinforced concrete conduit, which incorporates a two-stage principal spillway system that controls runoff resulting from storms up to the 100-year frequency flood event. Flow resulting from storms greater than the 100-year frequency event will be routed safely around the dam through the emergency spillway. (See Appendix B, Typical Cross Section of Floodwater Retarding Structure.)

The structure will provide capacity for a total of 3 acre-feet of submerged sediment, and 276 acre-feet of floodwater storage (2.47 inches). The floodwater detention storage will empty in less than 4 days after passage of the design storm.

The foundation for the structure is stable bedrock, consisting of sandstone and shale. Geologic investigations made at the site indicate that a cutoff trench 10 feet deep will contact rock. The emergency spillway is located on the right abutment and was designed to permit a velocity of 8.6 feet per second through the spillway during the passage of the peak of the emergency spillway design storm. The material excavated from the emergency spillway is glacial till (GC, GC-GM) (30) and is suitable for use as earth fill for the dam. Additional earth fill (glacial till) for the dam is available on the right abutment, downstream from the emergency spillway area.

The foundation has no critical earthquake hazards. The characteristics of the borrow material have been considered in the design of the embankment to minimize earthquake hazards of the structure.

Minimum land area required will include 17 acres for the temporary flood pool, one acre for sediment storage, 8 acres for the embankment, emergency spillway, outlet channel and access areas, and 10 acres for the borrow area. For inventories of present land use see Figure 10, and for future land use and land use changes, see Figure 4.

The sediment pool surface area will be approximately one acre and have a maximum initial depth of 10 feet. This area will gradually decrease as sediment accumulates over the life of the project. The flood pool area will be subject to short term temporary flooding and will experience normal vegetation successional trends over the life of the project. The access road and temporary construction area will be used intensively over the installation period. All disturbed areas including embankment, emergency spillway, access roads, and borrow area, will be seeded to desirable grasses and legumes. Public access to these areas will be discouraged by fencing to prevent damage during the vegetation establishment period.

Structure No. 2

Multiple-purpose structure No. 2, controlling a drainage area of 1.35 square miles, is located on the south tributary (Appendix B, Project Map).

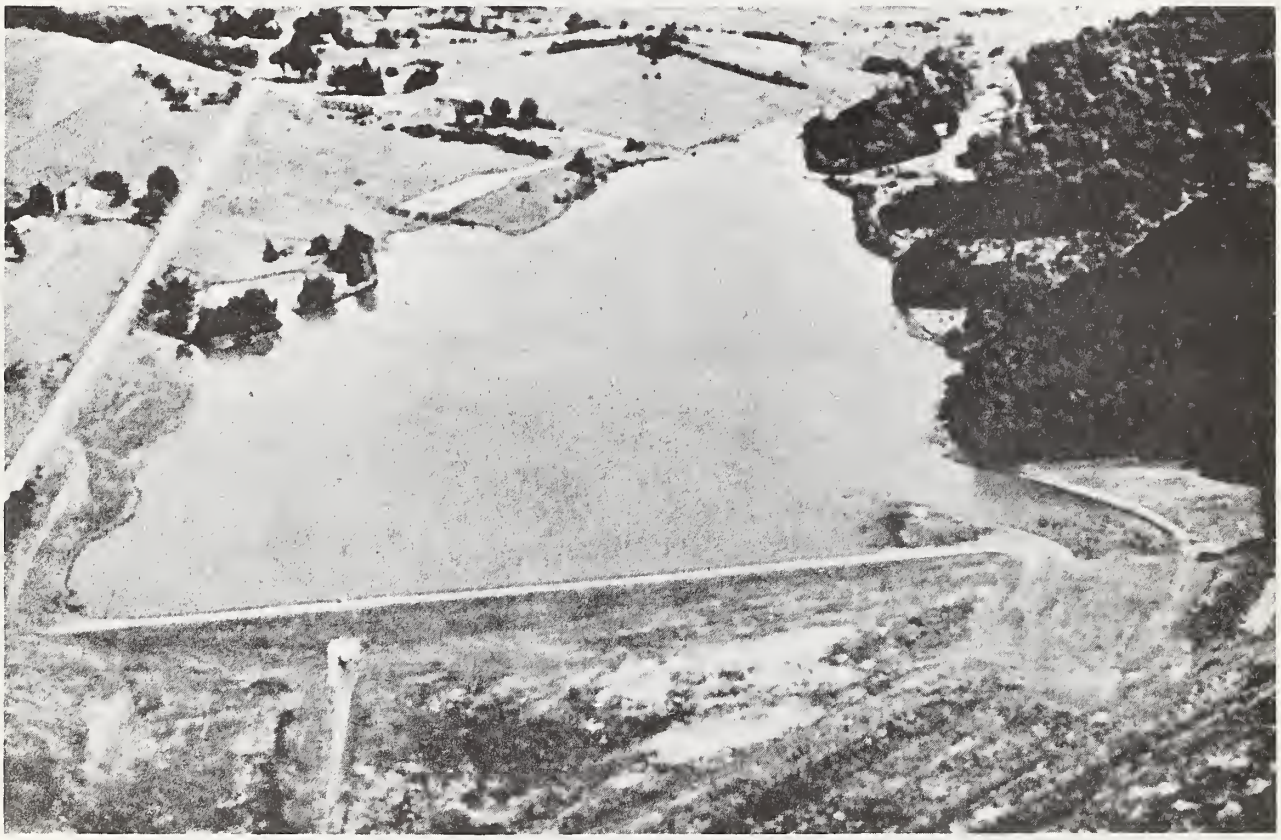


FIGURE 2 - TYPICAL MULTIPLE-PURPOSE STRUCTURE

This structure is planned as an 82-foot high earth fill dam which has a single-stage reinforced concrete drop inlet principal spillway, with an energy dissipater, and a vegetated earth emergency spillway. The structure will be fenced to prevent damage during the vegetation establishment period. The structure will provide storage for 21 acre-feet of submerged sediment, 2 acre-feet of aerated sediment, 797 acre-feet of recreation and fish and wildlife water, and 175 acre-feet (2.34 inches) of floodwater. It has a maximum release rate of 90 cfs and will empty the flood storage in less than 5 days. See Appendix B, Typical Cross Section of a Multiple-Purpose Structure.

Geologic investigations made at this site indicate the presence of a stable bedrock foundation consisting of sandstone and shale. A 24-inch pipe will be used for the principal spillway. The emergency spillway is located on the right abutment and was designed to pass the peak emergency spillway design discharge at a velocity of 7.6 feet per second. The material excavated from the emergency spillway is glacial till (GM) (30) and is suitable for use as earth fill for the dam. Additional earth fill (glacial till) for the dam is available upstream from the right abutment.

The foundation has no critical earthquake hazards. The characteristics of the borrow material have been considered in the design of the embankment to minimize earthquake hazards of the structure.

Minimum land area required for this site includes 16 acres for construction of the dam, spillway, and outlet channel; 50 acres for the recreation and fish and wildlife pool, 6 acres for the temporary flood pool; and 18 acres for public access. This land will be acquired by fee title, 12 acres of which will be donated by the town of New Berlin. For inventories of present land use see Figure 11, and for future land use and land use changes see Figure 5.

The flood pool area will be subject to short term temporary flooding and will experience normal vegetation successional trends over the life of the project. The access road and temporary construction area will be used intensively over the installation period. All disturbed areas including embankment, emergency spillway, access roads and borrow area, will be seeded to desirable grasses and legumes.

Public Recreational and Fish and Wildlife Development

The public recreational and fish and wildlife development (Appendix B - Recreational and Fish and Wildlife Development Map) will provide facilities for fishing, swimming, picnicking, field games, hiking, and nature studies. The facilities are designed to handle 440 swimmers and 400 picnickers during the normal heavy use season (Daily Design Capacity).

The development will contain approximately 2,750 feet of two-way oil and stone roads and 2,000 feet of one-way gravel interior service roads.

The oil and stone parking lot will handle 92 cars and 10 cars with boat trailers. Six-inch pressure-treated wood guideposts around the outside of the parking lot, and concrete bumper stops in the center, will be used to control traffic. Picnic facilities will include an open-sided pavilion type shelter, with a concrete floor and asphalt shingle roof; 40 tables; 20 cast iron charcoal grills, with concrete bases; and 14 garbage can stands, which will be pressure-treated wood post construction in concrete bases. A one-half acre 6-inch deep sand beach (100' x 200') will be constructed with an additional 50-foot strip of sand in the wading area. A lifeguard tower, a float, and buoy lines, to delineate swimming areas, will be provided.

FIGURE 3 - TYPICAL OPEN-SIDED PAVILION TYPE SHELTER

A bathhouse will be constructed to have separate facilities for each sex. Each facility will have 4 toilets, 2 lavatories, 2 change stalls and one shower. One toilet in each facility will be designed for use by the physically handicapped. The bathhouse will be concrete block, wood frame, construction with tile walls. Preliminary investigations have indicated there may be severe soil limitations for septic tank leach fields. A specially designed sewage disposal system may have to be designed and installed.

Water supply will be from a drilled well with water distributed through the picnic and beach area via buried plastic pipe. Drinking fountain and hydrant combinations will be chrome self-closing faucets, on pressure-treated wood posts, with a gravel drain pit.

A gravel boat launch ramp and boat loading area will be constructed.

Electricity will be supplied to the bathhouse. A floodlight will be provided at the entrance and at each parking lot. Swings, slide, and horseshoe pits will be installed. A hiking trail, which includes a foot bridge, will circle the reservoir. The general area will be smoothed and seeded leaving selected trees and shrubs. Shade trees will be planted in the picnic area, parking area, and along the entrance road. A screening hedge will be planted along the north boundary of the picnic area.

Landrights to a minimum of 90 acres will be needed for the development, and will be acquired in fee simple title. For inventories of present land use see Figure 11, and for future land use and land use changes see Figure 5.

All facilities will be designed and constructed to assure accessibility and usability by physically handicapped people in accordance with P.L. 90-480. The American Standards Specifications for making buildings and facilities accessible to, and usable by, the physically handicapped, will be used as guidelines. All sanitary and water supply facilities will be designed, installed, operated and maintained to comply with New York State Health Department regulations.

Investigations during planning revealed that installation of the public recreational and fish and wildlife development will require the removal of one set of farm dwellings and the relocation of one family. Approximately 2,850 feet of electrical powerline will be relocated.

Channel Work

The flow of Mill Brook will be picked up at the outlet of a rectangular culvert at Main Street and carried through a closed concrete transition section into a reinforced concrete pipe. This pipe will have a 6.5 foot inside diameter with a 6 foot designed flow depth. The flow will be on a uniform grade to an energy dissipating device before discharging into the Unadilla River.

Construction will take place within the existing channel, but easements will be required from adjacent property owners to provide access to the channel for construction and maintenance equipment. There are no relocations anticipated for the installation of the channel work. The village will maintain the existing culvert under Main Street to ensure

present capacity. All existing bank protection upstream from Academy Street to Main Street (see Urban Flood Plain Map in Appendix B) will be removed as part of the general excavation required. Backfill around the conduit will be compacted, graded and seeded. Trees along the channel, not within the immediate construction area, will remain to maintain the natural scenic beauty of the residential area.

The soil survey indicates that the entire reach of Mill Brook planned for channel work lies in Chenango gravelly silt loam (GM, GP-GM) (30). This area is a glacial outwash terrace with some glacial till knobs interspersed through the outwash material. The channel bed consists of cobbles, flags, and gravel.

There is no evidence of bedrock or bedrock influence in the channel from the outlet of the present underground channel to the confluence with the Unadilla River. The outwash deposits in this section appear to be sufficiently coarse and of sufficient depth to withstand loading from the proposed concrete pipe and therefore differential settlement and/or consolidation should not be a problem.

Landrights required for channel installation will include permanent access easements on about one acre of land. Disturbances to backyards of homes will be limited to areas adjacent to the existing channel.

General

Contractors will be required to adhere to strict guidelines prepared for each contract, for minimizing soil erosion, water, noise, and air pollution during construction. Borrow areas will be stripped only as they are ready for use. Measures, such as temporary diversions, sediment basins, temporary seedings, and mulching, will be used to protect exposed areas until final seeding. Adherence to state and local health requirements will be required regarding disease vector control, noise, and air pollution. Suppressors will be used to keep dust within tolerable limits on haul roads. Pollution of surface areas or ground water by chemicals, fuel, lubricants, sewage, and other pollutants, will not be permitted. Clearing and disposal of brush and vegetation will be carried out in accordance with applicable state and local laws.

There is no storage specifically provided in site No. 1 for recreational use. Adequate provisions will be made to exclude the public to prevent the creation of unsanitary conditions. If public use is allowed in the future, the sponsors will provide adequate sanitary facilities to serve the use contemplated.

The outlet channels below the dams will be designed and constructed to insure stability for at least 100 feet downstream by the use of vegetation or riprap.

Requirements for safety and health in conformance with the Federal Construction Safety Act of 1969 (P.L. 91-54) will be included in each construction contract. Design and construction will comply with applicable state laws.

The watershed work plan has been coordinated with the Office of Parks and Recreation and New York State Division of Historic Preservation. Investigations indicate that installation of the project will not encroach on any known archeological values, any historic place, or any places planned for historic preservation. An archeological survey was completed in the summer of 1974 under the supervision of Professor Fred Plog, State University of New York,at Binghamton. See Appendix E. If artifacts or other items of archeological or historical significance are uncovered by the Soil Conservation Service, or brought to its attention by others during construction, the Office of Parks and Recreation and the National Park Service will be notified. Appropriate arrangements will be made for survey or salvage as needed. Construction will not continue until the survey and salvage are completed.

In compliance with Public Law 86-523, the Soil Conservation Service will notify the Secretary of the Interior of the intent to construct a dam creating a reservoir that exceeds 40 surface acres.

Environmental Considerations

Potential adverse impacts recognized in the formulation of this project, and considerations given to minimize their effects include:

1. Water quality in the proposed multiple-purpose pool may be impaired by recreation users and induced housing developments. Bathhouse facilities, including septic tank disposal fields, will be designed for the recreation facility in accordance with New York State Health Department regulations. A buffer zone around the flood pool will be acquired to preclude land use and development that would be detrimental to water quality.

2. Destruction of wildlife habitat will occur due to construction. Disturbed areas will be vegetated with desirable species of grasses and legumes, which have a high value for wildlife.

3. Short term erosion rates will be increased during construction. Erosion rates will be minimized by following strict guidelines during construction and adhering to state and local health requirements.

4. No consideration was given to a level of protection less than the 100-year frequency flood since urban flood protection is an objective of the project.

5. Displacement of people, businesses or farm operations may occur. Requirements set forth in the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646) will be followed in the relocation or displacement.

6. Structural measures may disturb historical places. The project as formulated will not disturb any historical places.

7. The damming of a stream may bring about physical, and possibly chemical, changes in that water. The EPA Rochester Field Office was contacted to address itself to some of these potential changes and offer suggestions to help minimize their effects.

LAND USE CHANGES

Land use and wildlife habitat changes by the year 2000 directly attributable to structural measures is shown in Table B.

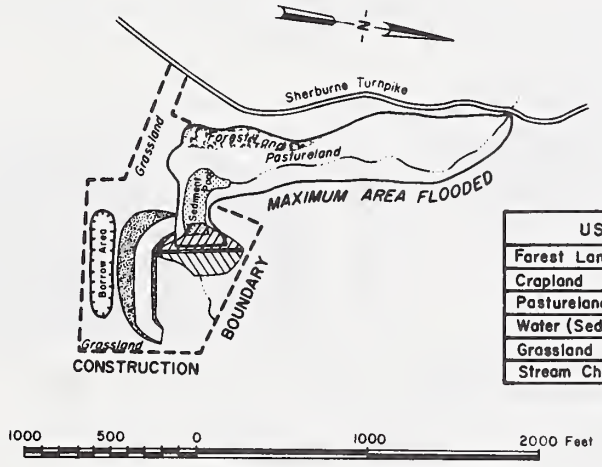
TABLE B - LAND USE AND WILDLIFE HABITAT CHANGE

	Without Project (acres)	With Project (acres)	Net Change (acres)	Wildlife Habitat
IMMEDIATE				
Cropland	662	611	- 51	Open land
Pastureland	980	857	-123	Open land
Forest Land	1,240	1,220	- 20	Forest land
Urban & Other Land	78	272	+194	
			(51)	1/ Wetland
			(58)	2/ Open Land & Wetland
			(20)	3/ Open land
			(65)	4/ Open land
YEAR 2000				
Cropland	572	521	- 51	Open land
Pastureland	963	840	-123	Open land
Forest Land	1,295	1,340	+ 45	Forest land
Urban & Other Land	130	259	+129	
			(51)	1/ Wetland
			(58)	2/ Open Land & Wetland
			(20)	3/ Open land

1/ Sites 1 and 2 - Permanent water
2/ Maintained grasses and legumes
3/ Recreational and fish and wildlife facilities
4/ Will change from open land to forest land habitat through plant succession

The installation of channel work will change 1,318 feet (0.25 miles) of open modified channel, which does not support a fishery, to a reinforced concrete conduit. This will limit any opportunity to develop potential aquatic and associated resources which could be provided by direct utilization and intangible aesthetic values of the stream. No land use or wildlife habitat changes will occur on the one acre of urban land.

The construction area required for structure No. 1 will eliminate five acres of forest land and three acres of brushy pasture (Figure 4- Post Construction Wildlife Habitat Map - Site No. 1). One acre of forest land will be cleared for the sediment pool and 10 acres of cropland will be required for borrow.

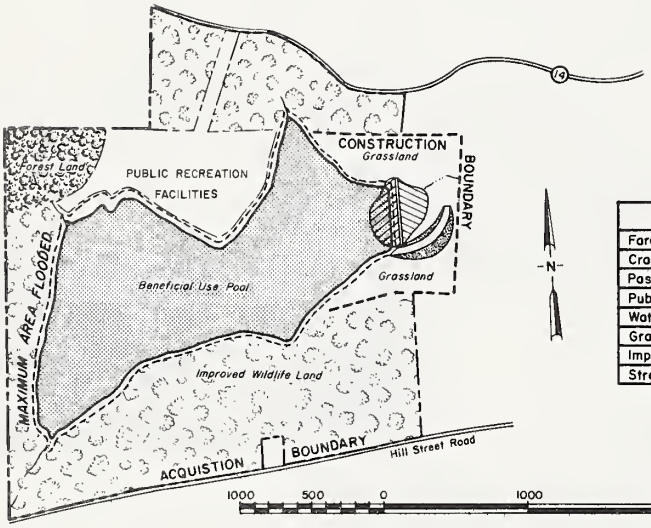


USE	PRESENT AMOUNT	WITH PROJECT AMOUNT	WITH PROJECT CHANGE
Forest Land	9 Acres	3 Acres	-6 Acres
Cropland	10 Acres	0	-10 Acres
Pastureland	17 Acres	14 Acres	-3 Acres
Water (Sediment Pool)	0	1 Acre	+1 Acre
Grassland	0	18 Acres	+18 Acres
Stream Channel	2850 Feet	2050 Feet	-800 Feet

FIGURE 4 - SITE 1 - POST CONSTRUCTION WILDLIFE HABITAT

The permanent pool of the multiple-purpose structure will inundate approximately one acre of cropland, five acres of forest land, and 44 acres of brushy pastureland.

The construction area will convert eight acres of forest land and eight acres of brushy pasture to maintained grasses and legumes. About 24 acres of land will be occasionally inundated. This includes one acre of forest land, five acres of cropland, and 18 acres of pastureland. The cropland and pastureland will convert to forest land under future conditions. (Figure 5 - Post Construction Wildlife Habitat Map - Site No. 2).



UNIT	AMOUNT	CHANGE
Forest Land	5 Acres	- 14 Acres
Cropland	0	- 41 Acres
Pastureland	0	- 120 Acres
Public Facilities	20 Acres	+ 20 Acres
Water(Beneficial Use Pool)	50 Acres	+ 50 Acres
Grassland	40 Acres	+ 40 Acres
Improved Wildlife Land	65 Acres	+ 65 Acres
Stream Channel	400 Feet	- 3200 Feet

FIGURE 5 - SITE 2 - POST CONSTRUCTION WILDLIFE HABITAT

Land use, on the additional 90 acres of land involved with the recreational and fish and wildlife development, will change from 35 acres of cropland, 50 acres of pasture and five acres of forest to 70 acres of forest and 20 acres of other (recreational and fish and wildlife facilities) during the project life.

OPERATION AND MAINTENANCE

Land treatment measures will be operated and maintained by the landowners and operators. Technical assistance will be provided by the Chenango County Soil and Water Conservation District and the New York State Division of Lands and Forests, subject to availability of resources.

Chenango County will operate and maintain structure No. 1, the Department (DEC) will operate and maintain structure No. 2, and the village of New Berlin will operate and maintain the channel work. The county will be permitted to operate and maintain the recreation facility and structure No. 2, under the jurisdiction of the Department.

Operation and maintenance of the channel will include minor works of improvement necessary to stabilize channel areas upstream of the proposed channel work. Maintenance will be provided on the total channel within the village limits to ensure its stability and existing capacity for the life of the project. This will include repairs and maintenance to the existing culvert under Main Street.

The county and village will utilize their existing labor and equipment resources or will furnish funds through regular appropriations to accomplish necessary operation and maintenance activities. Under current Department policy, no user fees may be charged for use of the fish and wildlife resources. No user fees are contemplated for the recreation facilities, however, if at a later date Chenango County elects to charge user fees,provisions must be made to allow for unrestricted use of the fish and wildlife resources, with no charge to these users for items such as parking, boat launching, and sanitary facilities. The schedules of admission and use fees, together with other requirements for operation and maintenance, must be mutually agreed to by the Sponsoring Local Organizations and the Service and set forth in the Operation and Maintenance Agreement. Fees will be limited to produce revenues necessary only to amortize the initial investment and to provide for adequate operation and maintenance.

Total estimated annual cost of operation and maintenance of structural measures is $17,800. Estimated annual costs of maintenance of the channel is $1,000, including costs of debris removal and necessary repairs. Estimated annual costs of maintenance of structures No. 1 and No. 2 is $3,200. These costs include mowing of dams and spillways, cleaning trash racks, eliminating floating debris and any necessary repairs.

Estimated cost of operation, maintenance and replacement of the recreational and fish and wildlife facilities is $13,600 annually. These costs include garbage and trash collection, policing, mowing grass in the recreation and waterfowl area, trimming trees and shrubs, daily cleaning of sanitary facilities, general care, repair and replacement of equipment, roads,

parking lots, and signs, and providing lifeguards. Operation and maintenance costs of the public development will be shared by the county and the Department, estimated at $10,600 and $3,000 respectively. The Department's costs include an estimated $1,200 for stocking the multiple-purpose reservoir with approximately 4,000 trout annually. Operation of the development will comply with the requirements of state and local health agencies.

Water stored in the recreation and fish and wildlife pool should not be withdrawn and used for any other purpose. The Department will notify the Service, through the state conservationist, whenever the reservoir is operated below 1,452 feet m.s.l. elevation, except when this occurs through normal evaporation and seepage losses. If the Department allows the use of the recreation and fish and wildlife storage for municipal or industrial purposes, on a continuing basis, the Sponsoring Local Organization will reimburse the federal government for all P.L. 566 funds used for the public recreation and fish and wildlife costs associated with the reservoir.

The Sponsors and the Soil Conservation Service will make a joint inspection annually, after unusually severe floods, and after the occurrence of any other unusual conditions that might adversely affect the structural measures. They will jointly determine what maintenance measures are needed. These inspections will continue for three years following installation of the structure. Inspection after the third year will be made annually by the Sponsors. They will prepare a report and send a copy to the Service.

An establishment period of three years is provided for all structural works of improvement and associated vegetative cover. During this period, the Service may use P.L. 566 funds to cost share on any repairs or other work resulting from unknown conditions or deficiencies. The cost of repairs will be shared in the same ratio as the original structure.

Repairs or additional work not eligible for P.L. 566 financial assistance include maintenance work, and work resulting from improper operation and maintenance. However, the Service will provide technical assistance that may be needed in performing any of these tasks.

An operation and maintenance agreement between the Service and the Sponsors will be executed prior to the signing of a landrights or project agreement. An operation and maintenance plan will be prepared for each structure in accordance with guidelines outlined in the State of New York Watersheds Operation and Maintenance Handbook, published by the Soil Conservation Service.

The operation and maintenance agreement will include specific provisions for retention and disposal of property acquired or improved with P.L. 566 financial assistance.

PROJECT COSTS

The following table summarizes Public Law 566 and other costs involved in project installation. For a further breakdown of cost detail refer to Table 1 of the work plan.

TABLE C - PROJECT INSTALLATION COSTS SUMMARY

	P.L. 566	Other	Total
Land Treatment	8,300	31,100	39,400
Structural Measures			
Construction	966,900	282,500	1,249,400
Engineering	145,100	12,100	157,200
Landrights	31,000	47,700	78,700
Relocation	4,500	1,500	6,000
Project Administration	134,900	22,900	157,800
Total Project	$1,290,700	$397,800	$1,688,500

ENVIRONMENTAL SETTING

PHYSICAL RESOURCES

Mill Brook Watershed is located in the northeastern portion of Chenango County in south-central New York. It is approximately 48 miles southeast of Syracuse (population 197,210), 46 miles northeast of Binghamton (population 64,120), and 36 miles south of Utica (population 91,610) (32). See the Watershed Location Map, Figure 6. The total drainage area is 4.62 square miles or 2,960 acres. It is about 3 miles in length and varies in width from about 3 miles at the western boundary to less than one-half mile at the village of New Berlin.

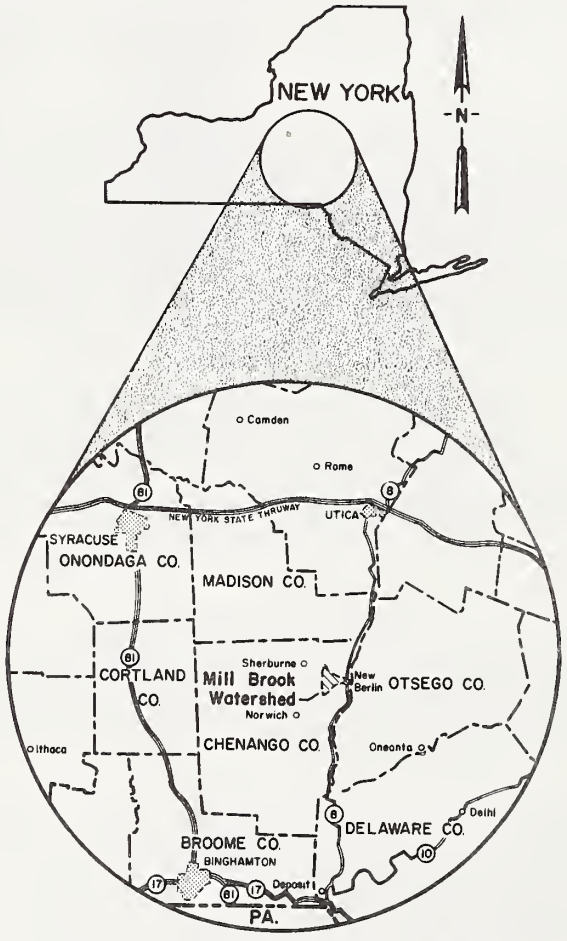


FIGURE 6 - WATERSHED LOCATION MAP

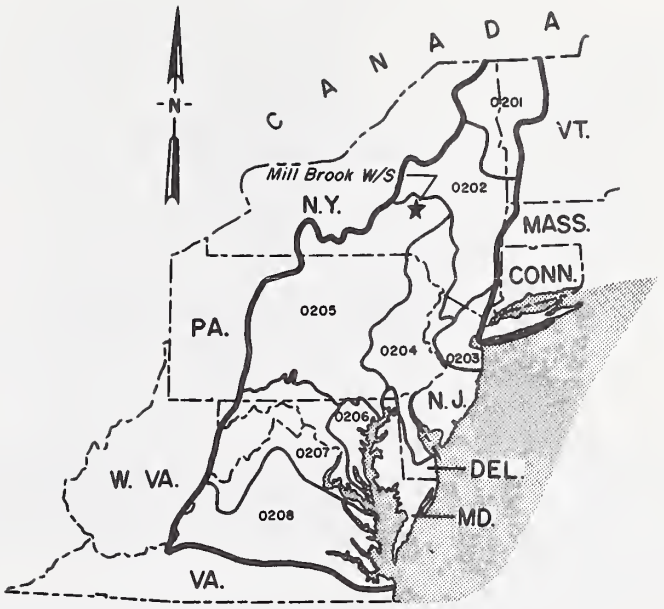


FIGURE 7 - WATER RESOURCE REGION MAP

The watershed is located in the Water Resources Council's Middle Atlantic Water Resource Region and the Susquehanna Subregion (0205) (Figure 7 - Water Resource Region Map). Conditions and characteristics of the watershed are similar to those in the Susquehanna Subregion, which is covered by rolling to steep glacial topography, except for the flat river valleys. Table D illustrates present and projected populations and per capita income for the region, subregion, and the village of New Berlin.

The primary soil and water resource problem is flooding in the village of New Berlin. An area of approximately 13 acres is subject to occasional inundation with resultant damage to 21 houses, 19 businesses, and several streets and bridges. High velocities in the previously modified channel, in the urban area, damage bank stabilization structures. (See Appendix B, Urban Flood Plain Map.) The forecasted recreational needs of the Central New York Region show that the capacity should be expanded by 21.7 percent over the next 20 years.

Temperature and precipitation are characterized by a humid continental-type climate (14). Summers are relatively cool with temperatures averaging about 63 degrees from May through September. Winters are generally colder and snowier than in other parts of

TABLE D - WATER RESOURCE REGION PROJECTIONS

Year	Middle Atlantic Region 1/	Susquehanna Subregion 1/	Village of New Berlin
		POPULATION	
1970	38,639,058	3,547,524	1,369 2/
1980	44,262,900	3,806,700	1,468
2000	50,365,800	4,301,600	1,656
		PER CAPITA INCOME (1967 $)	
1970	3,994	3,136	1,950 3/
1980	5,400	4,400	2,730
2000	9,000	7,700	4,777

1/ U.S. Water Resources Council; 1972 OBERS PROJECTIONS, SERIES E POPULATION: Regional Economic Activity in the U.S., Vol. 3, Water Resource Regions 1-8, U.S. Government Printing Office, Washington, D. C.

2/ U.S. Bureau of the Census: Census of Population: 1970 GENERAL SOCIAL AND ECONOMIC CHARACTERISTICS, Final Report PC(1)-C34 New York; U.S. Government Printing Office, Washington, D. C.

3/ Chenango County Planning Board, January 15, 1973.

the Appalachian Region of New York. Maximum and minimum temperatures recorded at Norwich are 101 degrees and minus 31 degrees, respectively. Average annual precipitation is approximately 41 inches with about 50 percent falling during the 135 day growing season (6) (Figure 8, Monthly Precipitation Distribution). Average annual runoff is approximately 20 inches. Average annual lake evaporation is approximately 28 inches.

The watershed lies in the Allegheny Plateau Physiographic Province, a rolling terrain of glacial till covered uplands with glacial outwash deposits in the major stream valleys.

Elevations range from about 1,800 feet at the western boundary to about 1,080 feet above mean sea level at the confluence of Mill Brook with the Unadilla River. The stream valleys are relatively steep with little flood plain, except at the village of New Berlin.

Bedrock is predominantly shale and sandstone of the Genesee Group, Devonian age (10). Exposures are found in the streambed, on the northern tributary, and at the junction of the two tributaries, upstream of the village line. On the southern tributary bedrock is exposed in the stream channel, upstream from the existing village reservoir.

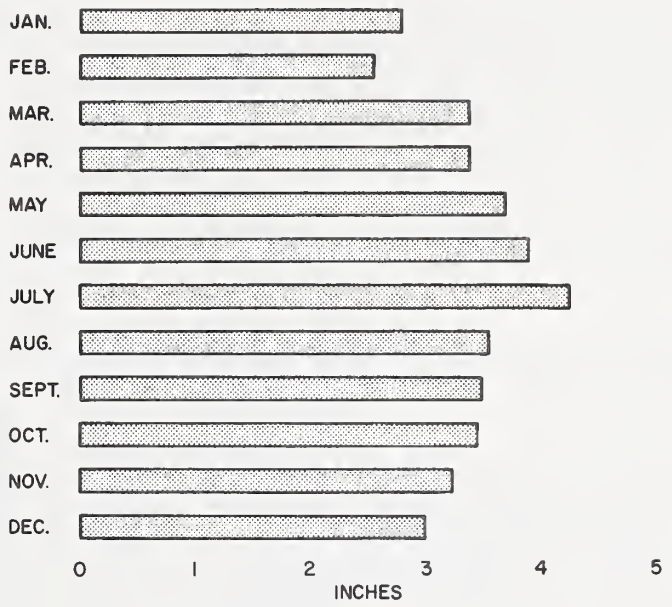


FIGURE 8 - MONTHLY PRECIPITATION DISTRIBUTION

Known mineral resources of Chenango County include natural brines, rock salt, and sand and gravel. Of these, only sand and gravel is currently being produced. Within the watershed only one sand and gravel pit is in operation on the extreme western edge adjacent to the southern tributary.

Records from "Earthquake History of United States, Part I," indicate that the area was shaken, at least eight times during the past 300 years, by major earthquakes having epicenters to the north in Seismic Risk Zone 3, the St. Lawrence Valley Region. The most recent of these occurred at Attica, New York, in 1929 and at Massena, New York,in 1944. The damage ratings are based on damage to existing rigid structures (9).

The primary soils in the upland part of the watershed are derived from glacial till. They include Mardin, a moderately well drained soil containing a fragipan; Valois, a deep well drained soil; Lordstown, a moderately deep soil; and Arnot, a moderately shallow soil. Minor areas of Howard soil, formed in permeable glacial outwash material, are found on valley slopes.

Soils have been grouped by land use into land capability subclasses. (See Table E.) Land capability classification (26), is a system by which soils are grouped together by classes and subclasses, based upon their limitations and hazards for agricultural use. Capability classes are designated by Roman numerals, with limitations in use becoming progressively greater from Class I to Class VIII. Capability subclasses are a grouping of soils having similar kinds of limitations and hazards. Four general kinds of limitations or hazards are recognized: (1) e, erosion hazard, (2) w, wetness, (3) s, rooting zone limitations, and (4) c, climate.

TABLE E - LAND CAPABILITY BY LAND USE

Land Use 1/	CAPABILITY SUBCLASSES 2/ IIe Acres	IIw Acres	IIs Acres	IIIe Acres	IIIw Acres	IVe Acres	IVw Acres	Vw Acres	VIIs Acres	TOTAL
Cropland	70	228	60	190	17	90	7			662
Pastureland	60	203	48	312	70	217	20	14	36	980
Forest Land	21	145	3	454	24	400	39	24	130	1,240
Urban and Other Land			58	10		10				78
TOTAL	151	576	169	966	111	717	66	38	166	2,960

1/ Cropland - Land which is used for row crop, close-grown field crops, fallow, rotation hay and pasture,and hayland.
Pastureland - Land producing forage plants for animal consumption.
Forest Land - Land at least 10 percent stocked or formerly stocked by forest trees, noncommercial trees, and afforested (plantations) areas.
Urban and Other Land - Built-up areas, industrial and commercial sites, farmsteads, farm roads, feedlots, ditch banks, fence and hedgerows, marshes, and recreation areas.
2/ Capability classes I, VI, and VIII do not occur within this watershed.

Ninety percent of the forest cover is comprised of the northern hardwood type (7). Sugar maple, red maple, and beech are the predominant species with associated mixtures of white ash, black cherry, basswood, hemlock, and white pine. The remaining 10 percent of forest cover is in plantations containing white pine, red pine, Norway spruce, and larch in pure or mixed stands. Woodlots generally vary in size from 10 to 50 acres, however, there is one large woodlot of approximately 400 acres.

General plant communities that provide wildlife habitat are shown in Table F.

TABLE F - WILDLIFE RESOURCE HABITAT PLANT COMMUNITIES

Land Use	Acres	Plant Communities
Cropland	662	Corn, oats, alfalfa, clover, and timothy
Pastureland	980	Woody - thornapple, dogwood and aspen Herbaceous - grasses, clover, trefoil, plantain, nut sedge, dandelion, and bedstraw
Forest Land	1,240	Sugar maple, red maple, beech, white ash, black cherry, basswood, hemlock, and white pine with small plantations of white pine, red pine, Norway spruce and larch
	8	Wetlands - Alder, buttonbush and dogwood
Water	8	Species of algae, potamogeton, sagettaria, and nymphaea
Urban and Other	62	Woody - ornamental trees and shrubs Herbaceous - domestic grasses

The ground water supplies are estimated to be adequate to meet future needs. Well yields from the upland areas range from 10 to 30 gallons per minute; the acquifers are in glacial till or bedrock. Well yields from the flood plain of the Unadilla River range from 5 to 30 gallons per minute; the acquifers are in sand, gravel, or bedrock

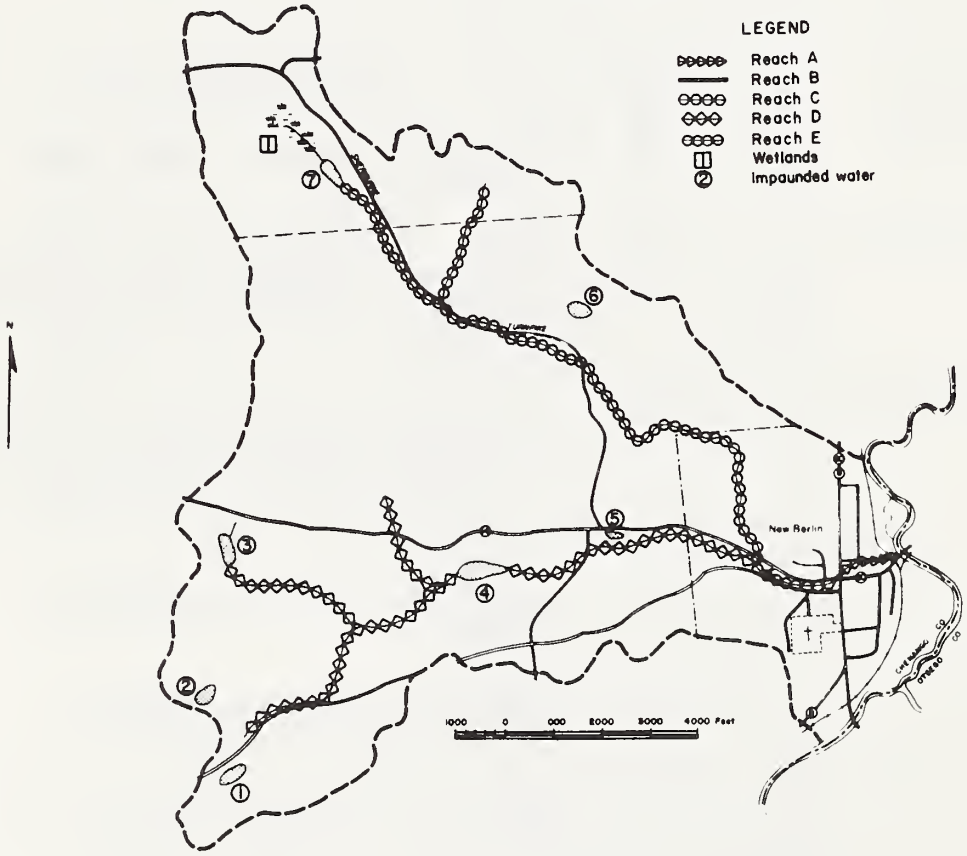


FIGURE 9 - SURFACE WATER RESOURCE MAP

The existing water system, serving the village of New Berlin, is a combined gravity and pumped system supplied from a system of springs, located below the existing reservoir, and wells, located in the Unadilla River flood plain. The only treatment of the supply is chlorination. Water quality tests indicate a hardness of 124 parts per million and alkalinity of 121 parts per million (8).

The present sources have a combined yield of about 0.14 million gallons per day, which is sufficient to meet the average daily demands (1970). The existing village reservoir, located on the southern tributary, was constructed in 1887 and is used only as an emergency water source. Metcalf and Eddy (13) proposed to increase the supply capacity of the system by staged construction of two wells to meet the maximum daily demand of about 0.44 Mgal/d in the year 2020.

There are two main tributaries in the Mill Brook Watershed. The northern tributary drains an area of about 1,520 acres and the southern tributary drains an area of about 1,340 acres. These tributaries flow in an easterly direction, joining near the western edge of the village of New Berlin (Figure 9, Surface Water Resource Map). The stream flows under West Street, Main Street, and three commercial buildings before outletting into the Unadilla River. Existing stream characteristics are described in Table G.

In April, 1974, the United States Department of Interior, Geological Survey, Water Resources Division installed a stream gage on Mill Brook. Daily discharge data are available from April 30 to September 25, 1974. Discharges for a period of missing record (June 5-20 and June 23-August 14) were estimated on the basis of a correlation with records of Butternut Creek at Morris. The maximum discharge recorded, for the period of record, was 38 cubic feet per second on May 12, 1974. The minimum discharge was 0.5 cubic feet per second on August 21, 1974. Flow duration for the period of record is graphically illustrated in Appendix F.

At the request of the Soil Conservation Service, a water sample on Mill Brook, at New Berlin, was taken by the New York State Department of Health. The results of the laboratory analysis of this sample are displayed in Table H. Although one point sample is inconclusive, there were no parameters which indicated the evidence of major pollution sources.

TABLE G - EXISTING STREAM CHARACTERISTICS

Reach 1/	Length (miles)	Channel Type	Flow 2/	Vegetative Cover (%)	Water Quality 3/	Physical Description 4/ Pool/Riffle (%)	Depth (inches)	Width (feet)	Bed Material 5/
A-Outlet to Main Street	0.25	Modified Open Channel	Perennial	90	D	Riffle-100	10	16	Gravel Rubble
B-Main Street to inlet of culvert	0.07	Box Culvert	Perennial		D	-	-	-	-
C-Box culvert inlet to stream intersection	0.30	Natural Well Defined	Perennial	40 Within Pool Shelter-20%	D	Pool-14 Riffle-86	23 10	14 16	Sand and Gravel Gravel Rubble
D-Southern Tributary	3.50	Natural Well Defined	Inter-mittent	33 Within Pool Shelter-21%	C(T)	Pool-12 Riffle-72 Cascades- 16	16 7 -	11 8 -	Sand and Gravel Gravel Rubble
E-Northern Tributary	2.70	Natural Well Defined	Inter-mittent	80 Within Pool Shelter-26%	C(T)	Pool-8 Riffle-92	18 7	8 9	Sand and Gravel Gravel Rubble

1/ See Figure 9 - Surface Water Resource Map.

2/ Reconnaissance Report, Mill Brook Watershed, dated February 5, 1973, Bureau of Sport Fisheries and Wildlife, USDI.

3/ Class C - Fishing and any other usages except for bathing or as source of water supply for drinking, culinary, or food processing purposes. (Class C(T) indicates trout stream.)
Class D - Agricultural or source of industrial cooling or process water supply and any other usage except for fishing, bathing, or as source of water supply for drinking, culinary, or food processing purposes. Source: Classifications and Standards Governing the Quality and Purity of Waters of New York State (Parts 700-703, Title 6, Official Compilation of Code, Rules, and Regulations, New York State DEC, Albany, N. Y.).

4/ Stream physical descriptions determined in April 1974. Approximate flow at watershed outlet was 20 cubic feet per second.

5/ Bedrock outcropping are common.

TABLE H - WATER QUALITY DATA 1/
Mill Brook at New Berlin

Parameter	Unit	Result
Color	Apparent	7.
Turbidity	J.T.U.	0.9
Ammonia Nitrogen	MG/L	0.01
Nitrite Nitrogen	MG/L	6.
Nitrate Nitrogen	MG/L	1.0
Chlorides	MG/L	6.2
Hardness	MG/L	108.
Alkalinity	MG/L	112.
PH (Laboratory)		8.3
Sulfates	MG/L	10.
Total Residue	MG/L	271.
Total Volatile Residue	MG/L	155.
Color (Field)		1.015
Turbidity (Field)		1.
Water Temp. at Site	Deg. C	22.
PH (Field)		8.0
Dissolved Oxygen-Field	MG/L	8.8
Cloud Cover	Percent	10.
Air Temperature	Deg. C	27.
Weather		1.
Suspended Matter	MG/L	5.
Volatile Suspended Matter	MG/L	1.
B.O.D. 5 Day	MG/L	0.2
KJELDAHL-N Incl. Ammonia	MG/L	0.23
Chemical Oxygen Demand	MG/L	4.
Iron	MG/L	0.02
Manganese	MG/L	0.02
Potassium	MG/L	1.4
Sodium	MG/L	1.4
Calcium	MG/L	43.
Magnesium	MG/L	1.
Coliform Bact.	MF Col/100ML	570.
Conduc 25 Deg.	micro mhos/SQ CM	150.
Total Phosphates	MG/L	0.02
Orthophosphate	MG/L	0.22

1/ Sample taken by the New York State Department of Health, Division of Laboratories and Research, Environmental Health Center on July 30, 1973.

In March 1974, the Environmental Protection Agency, Rochester, New York, began to periodically sample water quality in Mill Brook Watershed. Sampling stations were selected to evaluate the existing stream water quality; to isolate possible sources of pollution; and to obtain the best possible indication of quality that might be anticipated within the proposed multiple-purpose reservoir. The primary factors considered in deciding on relevant parameters for the survey were the existing and future water uses, existing and future land use, types of waste water discharges, and applicable water quality standards criteria. Because of the intended recreational usages the important criteria includes aesthetics, clarity, pH, nutrients and bacteriological indicators. Relative to the fisheries or aquatic life in general, such things as dissolved oxygen, pH, toxic metals, organic compounds, pesticides, solids and temperature are important. For this survey, 48 physical and chemical parameters were included. Water quality data from the preliminary report, Water Quality Survey, Mill Brook Watershed, U.S. Environmental Protection Agency, Region II, Rochester Field Office, July 1974, is shown in Appendix F.

There are seven water impoundments located within the watershed. Location of these impoundments may be found on Figure 9, Surface Water Resource Map. Table I exhibits the physical characteristics of these impoundments.

TABLE I - LAKES AND PONDS

Impoundment	Size (Acres)	Type	Ownership	Use
1	2.0	Manmade	Private	Livestock and wildlife
2	2.0	Manmade	Private	Livestock and wildlife
3	1.0	Manmade	Private	Livestock and wildlife
4	2.5	Manmade Reservoir	Village of New Berlin	Supplemental Water Supply
5	0.1	Manmade	Private	Livestock and wildlife
6	0.2	Manmade	Private	Livestock and wildlife
7	0.2	Manmade	Private	Livestock and wildlife

The watershed contains one wetland, approximately 8 acres in size. See Figure 9, Surface Water Resource Map for location. The lower portion of this wetland has been developed into a pond. The undisturbed portion of the wetland is classified as Type 6 (Shrub swamps) (25). The soil is usually waterlogged and may be covered with up to 6 inches of water. Woody vegetation consists of Alder, buttonbush, and dogwood.

PLANT AND ANIMAL RESOURCES

Wildlife species have diverse requirements and occupy a vast variety of niches in the ecosystem. However, species may be generally grouped by main habitat into forest wildlife, open land or agricultural wildlife, and wetland wildlife. See Table F, Wildlife Resource Habitat Plant Communities.

Forest wildlife species are those which find both food and cover within the forest, although they may venture into open land to feed. Factors affecting the density of these species may include woodlot size, density of humans, and vegetative composition, by type and successional stage. These factors, in conjunction with climatic conditions, determine species range. The woodlots of the watershed provide good habitat for game and furbearing species typical of cutover hardwoods in New York (Table J, Species and Density).

TABLE J - ESTIMATED DENSITIES OF GAME AND FURBEARING SPECIES

Species of the Watershed 1/	Density
Forest Wildlife	
Whitetail Deer	Good (3-4 per 100 acres)
Ruffed Grouse	Good (1 per 10-15 acres)
Gray Squirrels	Good (1 per 2 acres)
Open Land Wildlife	
Cottontail Rabbit	Good (2-3 per 10 acres)
Raccoon	Moderate (1 per 20-25 acres)
Skunk	Unknown
Opossum	Unknown
Ringneck Pheasant	Very low (less than 1 per 100 acres)
Wetland Wildlife	
Waterfowl	Migrant - very low nesting (2 per 10 acres)
Woodcock	Migrant - very low nesting (2-3 per 100 acres)
Muskrat	Unknown
Mink	Unknown

1/ A listing of nongame mammals found throughout New York is found in Appendix D.

Open land or agricultural wildlife species commonly find food in open fields, close to woody vegetation (hedgerows, forest edges, etc.), which provides escape and winter cover. The type of agriculture and management practices are important factors determining habitat suitability.

Early mowing, fall plowing, decreasing grain production, and the elimination of hedgerows are some practices detrimental to open land wildlife. Agricultural land management limits populations of species such as the ringneck pheasant which depend on high grain production for high densities.

Species commonly associated with water are known as wetland wildlife (waterfowl), shorebirds, and furbearers. The density of these species are determined by the abundance of open surface water and variety of aquatic vegetation. The limited surface water resources and wetlands of the watershed has evolved a wetland wildlife community comprised primarily of mammals. Woodcock and migratory waterfowl pass through the area, but little nesting is found. A variety of aquatic amphibians and reptiles is common throughout the habitat (Appendix D, Listing of Reptiles and Amphibians).

Surface water resources provide very little public sport fishing. A cold water trout fishery exists in the northern tributary (reach E), primarily above Sherburne Turnpike (1.5 miles). See Figure 9, Page 24. A July 1958 shocking of the reach (New York State Department of Environmental Conservation) produced wild brook trout ranging from 2 1/2 to 9 inches in length. Competitive species included creek chubs and blacknose dace. Although maintained by natural reproduction, fish of harvestable size are limited due to lack of pools and low base flow.

Trout rarely occur in the southern tributary (reach D). The New York State Department of Environmental Conservation Survey of 1958 produced only two brook trout. Suckers and blacknose dace are common. Trout which occur in this reach are limited to small spring fed pools because of low flows and lack of shade.

Reaches A, B, and C do not contain trout. Fish species of these reaches include creek chubs, blacknose dace, and suckers.

The small impoundments of the watershed support bass and bluegill fisheries which are limited to private use.

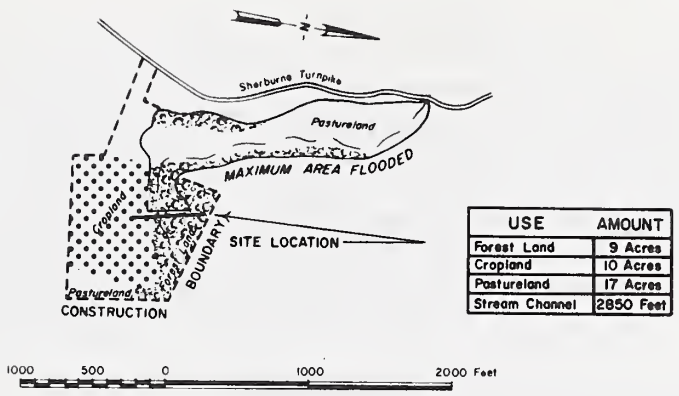
Present land use of the potential impoundment sites is found in Figures 10 and 11. Land use and wildlife affected are shown in Table K. These areas represent 8 percent of the total watershed area. Present land use in the location of the proposed channel work is urban, consisting primarily of the existing channel and backyards of residences.

Hunting opportunities in the watershed are few. Much of the land where game species occur is posted and hunter-use is limited to landowners and their friends. Most hunting occurs on state game lands in surrounding counties, especially during deer season.

TABLE K - WILDLIFE HABITAT RESOURCES AT POTENTIAL STRUCTURE SITES

Structure Location	Crop-land (Acres)	Forest land (Acres)	Brushy Pasture (Acres)	Stream Channel 1/ (Feet)	Wildlife Species
Site 1					
Construction Area	-	5	3	500	Songbirds, rabbits, grouse and some browse for deer
Flood Pool	-	3	14	2,050	Songbirds, rabbits, some browse for deer, and an occasional woodcock
Sediment Pool	-	1	-	300	Rabbits, songbirds and some browse for deer
Borrow Area	10	-	-	-	Songbirds
Site 2					
Construction Area	-	8	8	300	Rabbits, Songbirds and some browse for deer
Permanent Pool	1	5	44	2,900	Rabbits, songbirds and some browse for deer
Emergency Spillway Crest Elevation	1	-	5	200	Songbirds and an occasional rabbit
Maximum Area Flooded	1	-	3	200	Songbirds and an occasional rabbit
Public Development and Wildlife Areas	38	6	60	-	Songbirds, rabbits, and some cover for deer
TOTAL	51	28	137	6,450	

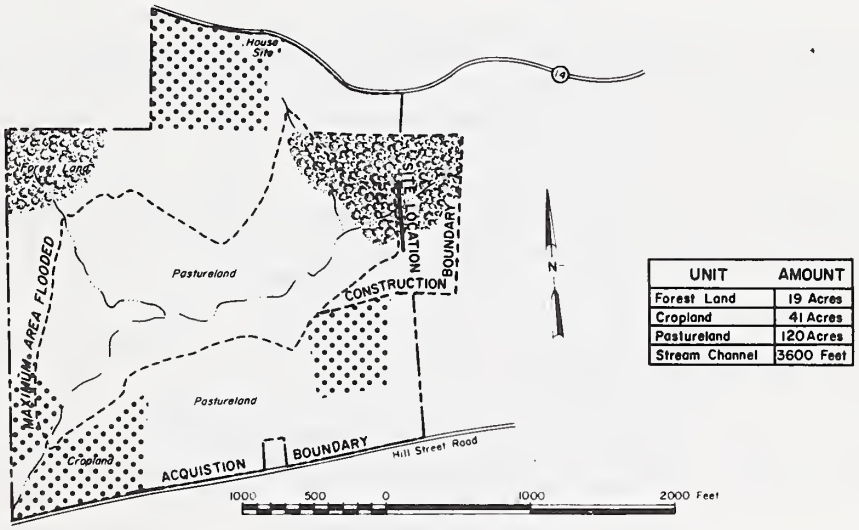
1/ No sport fishery exists.



USE	AMOUNT
Forest Land	9 Acres
Cropland	10 Acres
Pastureland	17 Acres
Stream Channel	2850 Feet

FIGURE 10 - WILDLIFE HABITAT AT POTENTIAL SITE 1

Rare and endangered species of New York State are listed in the publication, "Rare and Endangered Fish and Wildlife of the United States," U. S. Bureau of Sport Fisheries and Wildlife, 1968 Edition (34). Investigations indicate that no species listed in this publication are in or near the watershed.



UNIT	AMOUNT
Forest Land	19 Acres
Cropland	41 Acres
Pastureland	120 Acres
Stream Channel	3600 Feet

FIGURE 11 - WILDLIFE HABITAT AT POTENTIAL SITE 2

ECONOMIC RESOURCES

The watershed is located approximately 30 miles south of the major industrial, transportation, and population belt of the state. This region is characterized by mixed agricultural and industrial service centers, interconnected by the New York State Thruway (Interstate 90) and the State Barge Canal System. Major industrial centers along this corridor include Syracuse, Utica, Amsterdam, Schenectady, and Albany. The system of state and county roadways provide access, for marketing and commuting, to these centers. Route 8 is the main north-south route passing through the village of New Berlin. (See Figure 6, Watershed Location Map.) Two county roads are located in the central and northern portion of the watershed providing access from rural areas to the village of New Berlin.

The economic base of New Berlin is related to that of the surrounding agricultural area. Opportunity for local employment is limited to farms, a feed mill, shoe manufacturing, a nursing home, and service type commercial businesses. There is considerable commuting to nearby industrial jobs. Chenango County has experienced substantial unemployment in recent years, consistently higher than the state average. Comparison of unemployment rates (19) as of November 1973 are: Chenango County, 5.0 percent; New York State, 4.9 percent; and the United States, 4.7 percent.

There are 16 full-time upland family farms in the watershed averaging approximately 100 acres in size. Dairy farming is the principal type of agriculture. There is also some production of poultry products. In addition to the 16 full-time farms, there are 19 nonfarm ownerships. Nonfarm ownerships consist of individual dwellings on one to five acre lots. These residents are dependent upon their own wells for water supply and septic tanks for sewage. Some of these people are employed as farm laborers. Others commute to jobs in nearby villages and cities.

Principal crops and crop yields, according to 1969 agriculture census data are listed in Table L.

TABLE L - CROPS AND CROP YIELDS

Crop	Yield/Acre	Unit
Corn - grain	98	Bushel
Corn - silage	16	Ton
Alfalfa hay	3	Ton
Clover and Timothy	2	Ton
Oats	58	Bushel
Grasses - silage	5	Ton

There is no forest industry within the watershed boundary. However, there is a strong market in the surrounding area for hardwood sawlogs and some demand for veneer stock. Markets for pulpwood and low grade logs are very slight, but the feasibility of an increased demand in the future does exist. About 40 percent of the forest acreage contains sawtimber stands with 1,500 or more board feet per acre. Forty-five percent of the forest stands are classed as pole size and 15 percent as seedling or sapling.

Most of the land in the watershed is privately owned. The only public ownership is a 41-acre tract belonging to the village of New Berlin. The acreage surrounds the village reservoir.

Historically, construction of new dwellings has been equal to the demand, and property values have been stable while relatively consistent with regional trends. Land in the village of New Berlin has an approximate average value of $750/acre. Agricultural property values vary with terrain, but the value of cropland average $200-$300/acre. Agricultural land prices are being inflated by second home and recreational purchasers. Farmlands and woodlots have been selling for as much as $1,000/acre for small tracts.

Village plans for population growth include an adequate water supply, streets, medical facilities, newspaper, churches, attractive shopping areas, and new land for development. Plans have been made for a sewer system and water treatment plant for the village.

Mill Brook Watershed is located in the South Central New York Resource Conservation and Development Area and the Appalachia Area. Resource conservation and development projects are initiated and carried out by local people with the assistance of agencies of the states, and agencies of the United States Department of Agriculture. The Appalachian Regional Development Program in New York State is to create an economically attractive environment which, in turn, will stimulate the development of private business and industry, and generate new opportunities for economic and social well-being for the people of this region.

RECREATIONAL RESOURCES

Existing recreational resources and the potential for recreational use include scenic and water resources, fish and game resources, and winter recreation resources.

The topography of Chenango County presents a panorama of rolling hills and valleys. Perhaps the most pronounced scenic asset is the broad Unadilla Valley. The western half of the county is dotted with numerous small ponds and lakes which are scenic assets.

The Unadilla River and the small lakes and ponds are available for warm water fishing. Two major streams for trout fishing are the Otselic River in the northwestern corner of the county and Geneganslet Creek in the western portion of the county. Fish and game resources, for the watershed specifically, are indicated in the preceding "Fish and Wildlife Resources" section.

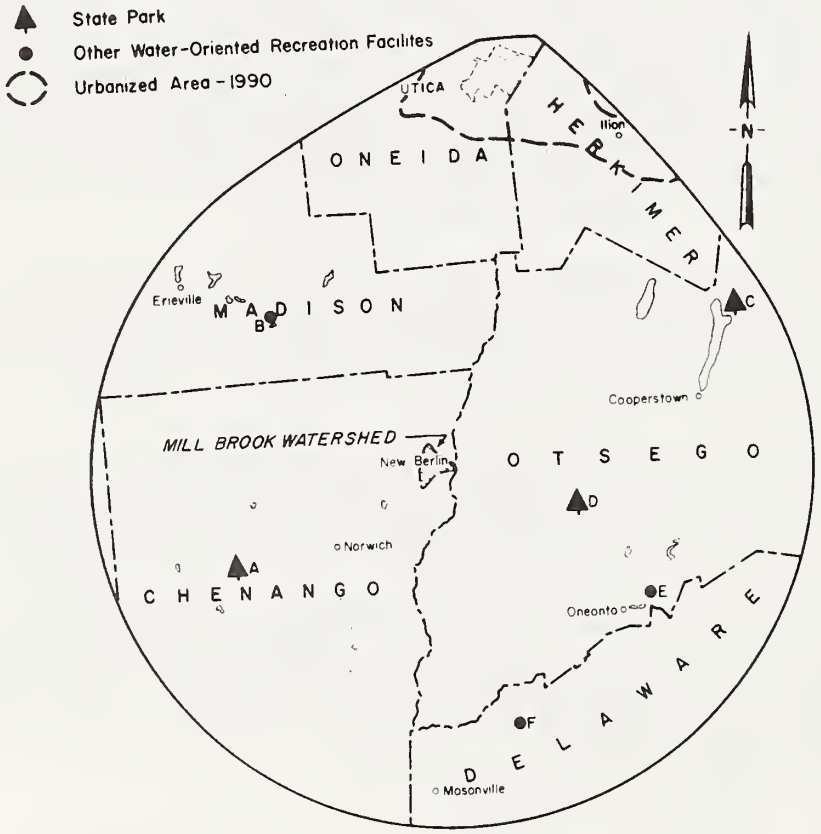


FIGURE 12- LOCAL AREA OF INFLUENCE MAP

TABLE M - WATER BASED DAY-USE
RECREATION FACILITIES WITHIN THE LAI

(Picnicking, Lake Swimming, Playfields)

Map Code	Facility	Size Lake (Acres)	Picnic Tables (No.)	Swimming Beach (Lin.Ft.)
	Chenango County			
A	Bowman Lake State Park	35	235	450
	Madison County			
B	Lebanon Reservoir Picnic Area	90	50	210
	Otsego County			
C	Glimmerglass State Park (Otsego Lake)	3,987	425	900
D	Gilbert Lake State Park	40	775	400
E	Wilber Town Park	20	70	200
	Delaware County			
F	East Sidney Dam	200	25	300
TOTAL		4,372	1,580	2,460

Source: New York State Outdoor Recreation Facility Inventory, Office of Parks and Recreation, Albany, New York, May 1972.

There are no water based recreation facilities located within the watershed. However, within the "local area of influence" (LAI), there are three state parks and three other recreation facilities that provide water based day-use recreation activities (Table M. The local area of influence is the distance recreationists will generally drive to participate in day-use activities such as picnicking and swimming. The LAI for Mill Brook Watershed consists of all of Chenango County, half of Madison, four-fifths of Otsego, and one-fifth of Oneida, Herkimer, and Delaware Counties. This includes the metropolitan city of Utica, which is on a major highway leading to Mill Brook. Day-use capacity needs are shown in Table N.

TABLE N - AVERAGE DAY-USE RECREATION FACILITIES CAPACITIES AND NEEDS

	Day-Use Needs		Available Capacity
	1970	1990	1970
Swimming	744,000	875,000	307,000
Picnicking	786,000	981,000	790,000

The existing water based day-use recreation facilities are generally well distributed throughout the LAI (Figure 12, Local Area of Influence Map).

There are no locations in the watershed where there is sufficient vertical drop in topography to support a ski area based upon the minimum of 600 feet change in elevation. Though the county has few dramatic topographic changes, the generally rolling terrain and high snowfall on areas of higher elevation suggest that snowmobiling, sledding, and tobogganing are enjoyed.

ARCHEOLOGICAL AND HISTORICAL RESOURCES

The Office of New York State Parks and Recreation identified three historic places in the village of New Berlin. These places are Preferred Manor, a building nominated to the National Register of Historic Places; the New Berlin Library; and Upjohn's St. Andrews Church (Urban Flood Plain Map).

A New York State Museum and Science Service literature review revealed no archeological sites in the vicinity of planned structural measures. As there is a significant hilltop site (Indian activity) identified in the general area, the Museum and Science Service recommended that an archeological survey be conducted at the proposed structural sites. An archeological survey was completed during the summer of 1974 under the supervision of Professor Fred Plog, State University of New York at Binghamton. Their report, in part, is attached in Appendix E.

SOIL, WATER, AND PLANT MANAGEMENT STATUS

The most obvious trend in land use change is that of cropland being converted to pastureland. Much of the pastureland is changing through natural succession from herbaceous plants to woody growth and will eventually become forest land if left uncontrolled. Projected future land use is shown in Table O.

TABLE 0 - FUTURE LAND USE (2000)

Land Use	Present Use		Future Use Without Project (2000)	
	(percent)	(acres)	(percent)	(acres)
Cropland	22	662	19	572
Pastureland	33	980	33	963
Forest Land	42	1,240	44	1,297
Urban and Other	3	78	4	130
TOTAL	100	2,960	100	2,960

Inefficient use of factors of production (land, labor and capital) are being applied to about 90 acres of capability subclass IVe and seven acres of capability subclass IVw cropland. However, the IVw soils are included in larger fields of better drained soils.

About 36 acres of pasture in capability subclass VIIs are being inefficiently used and are producing low returns.

The Chenango County Soil and Water Conservation District has been conducting an intensive program of land use planning and installation of treatment measures. Fifty-seven percent of the land area within the watershed is under District agreement. Of the 16 cooperators in the watershed, 15 have basic conservation plans and approximately 80 percent of the cropland practices have been applied. About 30 percent of the pastureland is being managed under a regular pasture and hayland management system. Brush control measures have been applied to about 40 percent of the pastureland.

Land "adequately treated" includes 330 acres of cropland, 280 acres of pastureland, 860 acres of forest land, and 70 acres of urban and other land. 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.

All land in the watershed is adequately protected in that it has annual soil losses within tolerance limits for the soils occurring in the area, with the exception of one gravel pit and 850 feet of eroding streambank. Land "adequately protected" is defined as land on which the soil, water, and related plant resources are adequately protected from deterioration, either naturally or by action of the land user.

Adequate forest fire protection is being provided by local volunteer fire departments and the New York State Department of Environmental Conservation in cooperation with the U. S. Forest Service through the Clarke-McNary Cooperative Forest Control Program. There have been no forest fires in the watershed during the last five years. State-Federal Cooperative Forestry Programs presently providing assistance in the area include: Cooperative Forest Management (CFM), Cooperative Forestation (CM-4), and Cooperative Forest Insect and Disease Control.

PROJECTS OF OTHER AGENCIES

The village and town of New Berlin have been identified by the Federal Insurance Administration of the U. S. Department of Housing and Urban Development as having special flood hazard areas. To qualify for participation in the National Flood Insurance Program, these communities must adopt adequate land use controls and enforcement measures. Should they fail to comply voluntarily, Article 36 of the Environmental Conservation Law gives the State of New York mandatory authority to impose regulations which would include these communities in the National Flood Insurance Program. These regulations will apply by July 1, 1975 and November 8, 1975 for the village and town respectively.

The New York Statewide Comprehensive Recreation Plan, the Appalachian Regional Development Program, and the South Central New York Resource Conservation and Development Project each have objectives which promote the development of land and water resources. This project proposal will not contravene these objectives, but is a parallel action relative to the proposed land treatment for the control of runoff and erosion, and is complementary to the objectives of flood protection and recreation.

WATER AND RELATED LAND RESOURCE PROBLEMS

LAND AND WATER MANAGEMENT

There are about 36 acres of capability class VIIs pastureland that should have an adjustment in land use due to steepness of slopes and rocky conditions. These conditions limit use of modern farm equipment in reestablishment of vegetation and application of management practices.

There are about 330 acres of cropland, 700 acres of pastureland, 380 acres of forest land and 8 acres of urban and other land on which treatment has not been planned.

Though the average soil loss per acre shown in Table P is within tolerable levels, the 2-ton per acre soil loss can be further reduced with planned conservation practices. Also, the productivity and efficiency of use can be improved.

Approximately 177 acres of capability subclass IIIw and IVw in the watershed need drainage or other water control measures to improve crop yields and increase efficiency of use.

There are about 217 acres of capability cubclass IVe pastureland in the watershed on which management practices need to be improved.

Land, labor, and capital are being used inefficiently on about 380 acres of forest land where management guidelines are lacking. Trees are being harvested indiscriminately, tree stands need improving, and erosion is occurring on skid trails and access roads.

FLOODWATER DAMAGE

Urban flood damages in the village of New Berlin begin approximately at the 5-year frequency flood. 1/ From the 5 to 10-year frequency flood, damage is limited to yards, driveways, and bank stabilization structures. The capacity of the box culvert upstream of Main Street is exceeded by floods greater in magnitude than the 10-year event. From the 10 to 100-year frequency flood, basements, garages, and first floors are flooded, and streets and sidewalks are damaged. Approximately 21 houses and 19 commercial buildings, including one housing the

1/ A 5-year frequency flood is the peak discharge expected to be equaled or exceeded 20 times during a 100-year period or has a 20 percent chance of occurrence during a given year.

New Berlin Library, are subject to flood damage by the 100-year event (Appendix B - Urban Flood Plain Map). Erosion by floodwater is also responsible for the deterioration and failure of several bank stabilization measures presently installed in the channel. The undercutting of these structures has caused many of them to either fall into the channel or lean toward the channel to a point where they will eventually fail. Estimated value of property subject to flooding is $661,000.

The flood of record, estimated at 100-year frequency, occurred in 1905. While no damage records are available, photographs of damages are on display in the local publishing office. One person was killed, foundation walls were cracked, buildings were shifted on their foundations, streets and sidewalks were destroyed, and retail merchandise was damaged. Estimated future damages of $272,000 would result if a storm of this magnitude were to recur.

The total flood plain in the rural reaches of the watershed is less than 16 acres. Land use is forest and pasture. Flood damages were not evaluated in these reaches.

Average annual floodwater damages to urban properties, including residences, commercial buildings, streets, and public utilities are estimated to be $30,510. Average annual floodwater damage to the channel stabilization structures on Mill Brook, through the village, are estimated to be $23,590. Indirect flood damages resulting from loss of sales, employment, and road closings are estimated to be $8,120 annually.

EROSION AND SEDIMENT DAMAGE

Erosion, or the wearing away of land surface by running water, wind, ice, or other geological agents, is present throughout the watershed. Erosion occurs in the upland areas as a result of poor management, steep topography, cultural operations, and erosive soils. Erosion in the flat sections of the watershed is occurring, but at a very low rate.

Sheet erosion is the removal of a fairly uniform layer of soil from the land surface by runoff water (23). Sheet erosion rates by land use are shown in Table P.

TABLE P - SHEET EROSION BY LAND USE

Land Use	Sheet Erosion Rates (tons/acre/year)
Cropland	0.40 - 2.00
Pastureland	0.40 - 0.60
Forest Land	0.03 - 0.07
Other 1/	0.90 - 30.00

1/ Includes roads, farmsteads, urban and built-up areas.

A 2-acre gravel pit near the extreme western edge of the watershed is the only significant upland sediment source. Sediment delivered to the stream from this source has been calculated at approximately 20 tons per year.

Streambank erosion is occurring along approximately 850 feet of the channel downstream from the culvert on Main Street. The streambank generally consist of loose gravelly soil with little to no vegetative cover. Estimated sediment contributed to the stream from this source is 30 tons per year.

Rates of erosion vary from storm to storm, with variations in rainfall intensity, soil condition, and vegetative cover. Sediment may be deposited in the stream channel, to remain until subsequent storm runoff carries it downstream.

Sediment is transported by streams as suspended sediment with larger solids moving along the streambed as bedload. Since the specific gravity of soil materials is about 2.65, the particles of suspended sediment tend to settle to the channel bottom, but upward currents in the turbulent flow counteract the gravitational settling. As velocities decrease larger particles settle out with smaller particles remaining in suspension longer to be deposited farther downstream.

Average annual sediment discharge at the mouth of the watershed is approximately 390 tons per year. This is equivalent to a sediment concentration of 57.1 milligrams per liter. The turbidity of a water quality sample (Table H) collected July 30, 1973, was 0.9 Jackson Turbidity Units or approximately 0.9 mg/1.

RECREATION AND PLANT AND ANIMAL RESOURCE PROBLEMS

The state's recreation needs over the next two decades have been forecast as a part of the New York State Comprehensive Recreation Plan (21). Overall, an approximate 25 percent expansion of statewide public and private recreation capacities will be required over the next 20 years, ranging from 9 percent to 30 percent for different activities. The recreational needs of the Central New York Region show that the capacity should be expanded by 21.7 percent.

In 1990 there will be an estimated net deficiency of about 2,000 weekend fisherman days and 20,000 weekend day-use days in the Central New York Region (21). The Central New York Region includes the counties of Broome, Cayuga, Cortland, Chenango, Delaware, Madison, Oneida, Onondaga, Oswego, Otsego, Tioga, and Tompkins and a portion of Herkimer County.

The defined LAI of Mill Brook Watershed lies within the Central Recreation Planning and Development Region (Figure 12). The population within the LAI was 164,000 in 1970 and is projected to be 190,000 by 1990. This represents approximately 10 percent of the present and projected population within the Central Region. Existing water based facilities supply approximately 790,000 annual picnic days and 307,500 annual swimmer days. The projected recreation needs for 1990 are 981,000 annual picnic days and 875,000 annual swimmer days. The net unfulfilled needs in 1990 are about 191,000 annual picnic days and 568,000 swimmer days. The Sponsors are interested in developing water based day-use facilities within the watershed to serve the local residents and those from the surrounding villages and towns. Approval to develop a facility passed by a vote of 1303 to 346 taken on May 11, 1971. The State Office of Parks and Recreation has written the watershed sponsors and have indicated that they are in agreement with the need for the additional facilities.

ECONOMIC-SOCIAL PROBLEMS

Farms in the watershed are family operations utilizing a minimum of hired labor. It is estimated that most of the farms are low income-producing units. The watershed is considered to be economically depressed as the per capita income is 36 percent less than the Susquehanna Subregion. See Table D, Population and Per Capita Income, Page 20. Economic stimulation is required to improve the standard of living for area residents, including farm families.

RELATIONSHIP TO LAND USE PLANS, POLICIES AND CONTROLS

There are no known approved or proposed federal, state, or local land use plans which will conflict with the proposed project measures. The proposed project measures conform with the objectives of the Clean Air Act and the Federal Water Pollution Control Act Amendments of 1972.

ENVIRONMENTAL IMPACTS

CONSERVATION LAND TREATMENT

The installation of vegetative and structural types of land treatment measures would effectively reduce runoff, conserve soil moisture, and reduce losses of topsoil. The amount of sediment leaving the watershed would be reduced by 20 tons annually. Land treatment measures would enable landowners to better implement sound land management plans and increase efficiencies of production, increase wildlife habitat, and improve water quality.

STRUCTURAL MEASURES

The area within the village of New Berlin to be benefited by the installation of the combined program of land treatment and structural measures is delineated on the urban flood plain map (Appendix B). With the project installed, peak discharges will be reduced and flows up to the 100-year frequency discharge will be contained by the closed conduit channel. Comparison of present and future peak discharges for selected frequencies are listed in Table Q.

TABLE Q - WITHOUT AND WITH PROJECT CONDITIONS

	Without Project			With Project
Frequency	Discharge	Stage 1/	Urban Area Flooded	Discharge
(years)	(cfs)	(feet)	(Acres)	(cfs)
100	1680	2.7	13.1	620
50	1410	2.4	11.7	530
20	1090	1.7	9.1	420
10	860	1.2	6.1	330
5	640	0	0	250
2	380	0	0	140

1/ Stage above bankfull 1200 feet east of Main Street.

Floodwater damages to urban properties, streets and utilities, and streambank stabilization structures and indirect flood damages, from floods up to the magnitude of the 100-year frequency event, will be eliminated in New Berlin. It is estimated that if a storm of the magnitude which created the 1905 flood were to recur under project conditions, there would be no flooding in the village of New Berlin.

Floodwater damages to the historical New Berlin Library will be eliminated from storms up to the magnitude of the 100-year frequency event. None of the three historic places identified by the Office of New York State Parks and Recreation will be affected during construction of the proposed project.

Structural measures and the project development will eliminate 51 acres of cropland which produce about $6,350 worth of crops annually, 118 acres of pasture which produce about $1,100 worth of forage annually, and 19 acres of forest land which produce about $100 worth of wood products annually. In addition, about 24 acres of pasture and four acres of forest land will sustain periodic damage from floodwater storage.

The sand and gravel deposits identified in the watershed are described by the U. S. Department of Interior as being "thin and unimportant except for occasional local use." The impact on mineral resources will be insignificant.

Streambank erosion, contributing an estimated sediment yield of 30 tons per year, will be eliminated. Average annual sediment yields at the mouth of the watershed will be reduced by approximately 300 tons per year. The remaining sediment concentration will be equivalent to less than 20 milligrams per liter.

Direct beneficiaries to the proposed project include about 80 residents, living in the present flood prone area, and owners, operators, and employees of the 19 businesses subject to flooding. Elimination of flooding on approximately 13 acres will allow continuation of present land use without the implementation of restrictive flood plain zoning as required by the National Flood Insurance Program. Flood reduction benefits will accrue indirectly to individuals in the surrounding area by eliminating the interruption of services and transportation. See Appendix A for a summary of annual project costs, benefits, and benefits to cost ratio.

Permanent pools of the two reservoirs will have a mean lake evaporation rate of 119 acre-feet per year. Normally if precipitation is higher than net evaporation, according to DeWiest (38), streamflow will increase by the construction of a reservoir. Average monthly evaporation rates are greatest during the months of May through September. However, average monthly precipitation for the same period is equal to or exceeds the average monthly evaporation. It is concluded that effects on streamflow and associated aquatic life will be insignificant.

It is recognized that the two constructed lakes will undergo evolutionary changes from the time of their creation. A very slow increase in growth of algae and other aquatic plants, over a long period of time, is a natural successional change called eutrophication. The Department of Environmental Conservation, Division of Fish and Wildlife, is aware of the phenomona of eutrophication and will manage the fishery resource accordingly.

ENVIRONMENTAL IMPACTS

CONSERVATION LAND TREATMENT

The installation of vegetative and structural types of land treatment measures would effectively reduce runoff, conserve soil moisture, and reduce losses of topsoil. The amount of sediment leaving the watershed would be reduced by 20 tons annually. Land treatment measures would enable landowners to better implement sound land management plans and increase efficiencies of production, increase wildlife habitat, and improve water quality.

STRUCTURAL MEASURES

The area within the village of New Berlin to be benefited by the installation of the combined program of land treatment and structural measures is delineated on the urban flood plain map (Appendix B). With the project installed, peak discharges will be reduced and flows up to the 100-year frequency discharge will be contained by the closed conduit channel. Comparison of present and future peak discharges for selected frequencies are listed in Table Q.

TABLE Q - WITHOUT AND WITH PROJECT CONDITIONS

	Without Project			With Project
Frequency (years)	Discharge (cfs)	Stage 1/ (feet)	Urban Area Flooded (Acres)	Discharge (cfs)
100	1680	2.7	13.1	620
50	1410	2.4	11.7	530
20	1090	1.7	9.1	420
10	860	1.2	6.1	330
5	640	0	0	250
2	380	0	0	140

1/ Stage above bankfull 1200 feet east of Main Street.

Floodwater damages to urban properties, streets and utilities, and streambank stabilization structures and indirect flood damages, from floods up to the magnitude of the 100-year frequency event, will be eliminated in New Berlin. It is estimated that if a storm of the magnitude which created the 1905 flood were to recur under project conditions, there would be no flooding in the village of New Berlin.

Floodwater damages to the historical New Berlin Library will be eliminated from storms up to the magnitude of the 100-year frequency event. None of the three historic places identified by the Office of New York State Parks and Recreation will be affected during construction of the proposed project.

Structural measures and the project development will eliminate 51 acres of cropland which produce about $6,350 worth of crops annually, 118 acres of pasture which produce about $1,100 worth of forage annually, and 19 acres of forest land which produce about $100 worth of wood products annually. In addition, about 24 acres of pasture and four acres of forest land will sustain periodic damage from floodwater storage.

The sand and gravel deposits identified in the watershed are described by the U. S. Department of Interior as being "thin and unimportant except for occasional local use." The impact on mineral resources will be insignificant.

Streambank erosion, contributing an estimated sediment yield of 30 tons per year, will be eliminated. Average annual sediment yields at the mouth of the watershed will be reduced by approximately 300 tons per year. The remaining sediment concentration will be equivalent to less than 20 milligrams per liter.

Direct beneficiaries to the proposed project include about 80 residents, living in the present flood prone area, and owners, operators, and employees of the 19 businesses subject to flooding. Elimination of flooding on approximately 13 acres will allow continuation of present land use without the implementation of restrictive flood plain zoning as required by the National Flood Insurance Program. Flood reduction benefits will accrue indirectly to individuals in the surrounding area by eliminating the interruption of services and transportation. See Appendix A for a summary of annual project costs, benefits, and benefits to cost ratio.

Permanent pools of the two reservoirs will have a mean lake evaporation rate of 119 acre-feet per year. Normally if precipitation is higher than net evaporation, according to DeWiest (38), streamflow will increase by the construction of a reservoir. Average monthly evaporation rates are greatest during the months of May through September. However, average monthly precipitation for the same period is equal to or exceeds the average monthly evaporation. It is concluded that effects on streamflow and associated aquatic life will be insignificant.

It is recognized that the two constructed lakes will undergo evolutionary changes from the time of their creation. A very slow increase in growth of algae and other aquatic plants, over a long period of time, is a natural successional change called eutrophication. The Department of Environmental Conservation, Division of Fish and Wildlife, is aware of the phenomona of eutrophication and will manage the fishery resource accordingly.

Changed land use caused by project measures installation will reduce the application of agri-nutrients and other factors affecting water quality. Removal of one farmstead will eliminate a potential source of animal pollution above the multiple-purpose structure.

During the period of construction there will be the normal inconveniences of noise and dust pollution from construction equipment and the need for detours around construction areas. A short term increase in sediment rate downstream may be observed as a result of runoff during construction.

Floodwater will occasionally inundate three acres of forest land and 14 acres of pastureland. The construction of structure No. 1 will increase the stream's present carrying capacity for trout by creating a one-acre pool, 10 feet deep. This will gradually decrease in size as it fills with sediment, over the life of the project.

Construction of the multiple-purpose structure will create a 50-acre lake which, with its environs, will provide habitat for trout, waterfowl, songbirds, and other wildlife. Fifteen acres of the lake will be between 20 and 65 feet deep, 15 acres will be 10 to 20 feet deep, and approximately 20 acres will be less than 10 feet deep.

The construction of this site will eliminate habitat for an estimated 12 rabbits, 25 squirrels, some browse for deer and an unknown number of songbirds. Establishing a permanent cover of grass and legumes following construction will increase the quality of summer forage for deer and rabbits of adjacent habitat. This cover will also replace habitat for some species of ground nesting songbirds and create a feeding and nesting area for waterfowl associated with the permanent pool.

Approximately 4,000 feet of natural stream channel will be altered by the construction of the two floodwater retarding structures. The dams will eliminate 800 feet, and the sediment pool of site No. 1 and beneficial use pool of site No. 2 will permanently inundate 300 feet and 2,900 feet of channel respectively. Occasional, short-term inundation of 2,450 feet of natural channel will occur in the flood retarding pools of the sites.

Degradation of natural stream channel below the structures will occur. Van Kirk (36) reports that when floodwaters are impounded behind a dam the stream below the dam cuts the stream channel wider and slightly deeper. This condition results in greater meandering of the stream. The outlet channels below the dams will be designed and constructed to ensure stability for at least 100 feet downstream by the use of vegetation or riprap.

During construction of the structures, there will be an increase in the sediment load of Mill Brook below the sites. Van Kirk (36), however, found that in a test stream these sediments had no effect on bottom fauna and most were removed by high water. Most of the

sediment resulting from the construction of site No. 2 will drop out in the upper end of the existing village reservoir. A short term increase in turbidity will be apparent during construction. There will be no effect on the current water system since the village is obtaining their supply from wells.

The flooding within the flood pools may drown nestlings and fresh forage may become mud covered, Hendrickson (12). Inundation of the flood pools will normally occur in late March and early April. This is before most ground nesting species of wildlife begin to nest or lay eggs. Many moles, mice, woodchucks, rabbits and other such mammals will move to higher ground as the water level rises.

The recreational and fish and wildlife development will provide 39,667 recreation visits annually. A recreation visit is defined as a visit by one person to the site during a day, regardless of how long he stays or in what kind of activity he may participate. Activities available for recreationists will include swimming, picnicking, fishing, hiking, and nature study.

ECONOMIC AND SOCIAL

Labor necessary for construction of the project will result in approximately 31 man-years of labor, while project operation and maintenance will create opportunity for approximately 3.5 man-years of employment per year. Induced secondary sales, stemming from the fish and wildlife development, will produce seasonal employment estimated at 1.5 man-years per year. Increased sales and employment will generate a slight rise in per capita income of the watershed.

The family which will be relocated is currently occupying an adequate, safe, and sanitary dwelling. They will be provided the opportunity to obtain equivalent housing and will be reimbursed for reasonable relocation cost.

Public ownership of the 168 acres of private land, to be purchased, will reduce the tax base. Operation and maintenance of the structural measures will cost an average of $17,800 per year. These monies will have to be raised via taxes or by charging use fees as mutually agreed to by the Sponsoring Local Organizations and the Service.

Increased traffic is anticipated in the vicinity of the fish and wildlife and recreational development with resultant increases in pollution (noise, exhaust fumes, litter, etc.). The county will bear the costs of controlling the additional traffic in the area.

FAVORABLE ENVIRONMENTAL EFFECTS

a. Urban flood damage from floods up to the magnitude of the 100-year frequency event will be eliminated in the village of New Berlin.

b. Direct beneficiaries include about 80 residents and owners, operators, and employees of 19 businesses.

c. Streambank erosion estimated at 30 tons per year will be eliminated.

d. Average annual sediment yields at the mouth of the watershed will be reduced by approximately 300 tons.

e. Installation of land treatment measures will provide flood damage reduction benefits of $860 annually. Runoff, erosion, and sedimentation will be reduced. Crop yields will be improved, animal carrying capacity on pasture will be improved and forest stands will be improved.

f. A 50-acre lake will be created which with its environs, will provide habitat for trout, waterfowl, songbirds, and other wildlife.

g. The impoundment will create a pool regimen which will not be considered a part of the stream.

h. Establishing a permanent cover of grass and legumes following construction will increase the quality of summer forage for deer and rabbits of adjacent habitat.

i. Changed land use will reduce the application of agri-nutrients above the project development.

j. Removal of one farmstead will eliminate a potential source of animal pollution.

k. Fifteen acres of open land will be planted to trees during the project installation period.

l. Creation of the 50-acre lake and the recreational and fish and wildlife development will provide for 39,667 annual recreation visits.

m. Construction of structural measures will result in approximately 31 man-years of employment, while project operation and maintenance will create approximately 3.5 man-years of employment annually.

n. Approximately 1.6 miles of lakeshore line will be created.

o. Flood damages to the historic New Berlin Library will be eliminated.

ADVERSE ENVIRONMENTAL EFFECTS

a. Construction of structural measures and project development will eliminate 51 acres of cropland, 118 acres of pasture land, and 19 acres of forest land.

b. Permanent pools of the two reservoirs will have a mean lake evaporation rate of 119 acre-feet per year.

c. Noise and dust pollution will increase during the construction period.

d. Inconvenience of detours will be required.

e. Short term increase in sediment downstream may occur as a result of runoff during construction.

f. Installation of the reinforced concrete conduit will limit any opportunity to develop potential aquatic and associated resources which could be provided in direct utilization and intangible aesthetic values of the stream.

g. Eight hundred feet of natural stream channel will be eliminated by construction of the structures.

h. Thirty-two hundred feet of natural channel will be permanently inundated due to the pools of the structures.

i. Occasional short term inundation of 2,450 feet of natural stream channel will occur in the floodwater retarding pools of the structures.

j. Habitat for an estimated 17 rabbits, 25 squirrels, some browse for deer, and an unknown number of songbirds will be eliminated.

k. One family will be required to relocate due to the project development.

l. Construction of the project will remove 168 acres of land from the Chenango County tax roll.

m. Vehicular traffic and road maintenance will be increased.

ALTERNATIVES

Many alternatives to the planned project are possible, including some which are not realistic. During the evaluation of alternatives, those which proved to be unworkable or impossible were not explored further.

Land Treatment

This alternative would provide technical assistance to review and make needed revisions of conservation and woodland plans; to maintain existing cover which is adequate and install essential land treatment measures; and to plan and apply land treatment measures applicable to land areas which require treatment.

The land treatment would apply to all land in the watershed. Conservation measures would be applied on cropland, pastureland, forest land, and urban and other land as described under the "Works of Improvement to be Installed" section.

The cost of the land treatment would be about $40,000. Implementation of this alternative would result in the following impacts:

1. Average annual sediment yields at the mouth of the watershed would be reduced by approximately 20 tons.

2. Installation of land treatment measures would reduce runoff, erosion, and sedimentation. Crop yields would be improved, animal carrying capacity on pasture would be improved, and forest stands would be improved.

3. Fifteen acres of open land would be planted to trees during the project installation period.

This alternative would not meet the selected objectives of the Sponsors. Although floodwater damages in the village of New Berlin would be reduced, the resulting protection is not at the level desired. The erosion rates would be within the limits allowable for the proposed land use.

The adoption of the land treatment alternative alone would preclude the following impacts of the selected alternative:

1. Construction of structural measures and project development will eliminate 51 acres of cropland, 118 acres of pasture, and 19 acres of forest land.

2. Permanent pools of the two reservoirs will have a mean lake evaporation rate of 119 acre-feet per year.

3. Noise and dust pollution will increase during construction.

4. Inconvenience of detours will be required.

5. Short term increase in sediment downstream may occur as a result of runoff during construction.

6. Installation of the reinforced concrete conduit will foreclose any opportunity to develop potential aquatic and associated resources which could be provided in direct utilization and intangible aesthetic values of the stream.

7. Eight hundred feet of natural stream channel will be eliminated by construction of the structures.

8. Thirty-two hundred feet of natural channel will be permanently inundated due to the pools of the structures.

9. Occasional short term inundation of 2,450 feet of natural stream channel will occur in the floodwater retarding pools of the structues.

10. Habitat for an estimated 17 rabbits, 25 squirrels, some browse for deer, and an unknown number of songbirds will be eliminated.

11. One family will be required to relocate due to the project development.

12. Construction of the project will remove 168 acres of land from the Chenango County tax roll.

13. Vehicular traffic and road maintenance will be increased.

Land Treatment and Floodproofing

This alternative includes installation of land treatment measures and floodproofing (24).

Land treatment would be the same as that described under the "Land Treatment Alternative" and the same costs and effects would be applicable.

Floodproofing of 21 flood plain residences and 19 businesses, including the New Berlin Library, would be required. Each residence would be evaluated by a technical team to determine its structural stability and the revisions and measures necessary to ensure its integrity during the onslaught of floodwaters from a 100-year frequency storm. It is estimated that nine business places, lacking structural integrity, would be removed from the flood plain. Raising of houses, reinforcement of walls and foundations; installing cellar drain valves; sealing of walls, windows and floors, and similar measures would cost an average of $10,000 per residence and $20,000 per business. Estimated cost of floodproofing would be about $410,000. Total installation cost would be about $450,000.

Implementation of this alternative would result in the following impacts:

1. Flood damages to residential and commercial properties from floods up to the magnitude of the 100-year frequency event would be eliminated in the village of New Berlin.

2. Direct beneficiaries include about 80 residents and owners, operators, and employees of 19 businesses.

3. Average annual sediment yields at the mouth of the watershed would be reduced by approximately 20 tons.

4. Installation of land treatment measures would reduce runoff, erosion, and sedimentation. Crop yields would be improved, animal carrying capacity on pasture would be improved, and forest stands would be improved.

5. Fifteen acres of open land would be planted to trees during the project installation period.

6. The floodproofing of existing structures would disrupt schedules and budgets of the homeowners and businesses, and cause other inconveniences during the construction period . Neighborhood activities and local peace and tranquility would be disturbed.

7. Should any residences be removed from the flood plain, the owners and the neighbors in both the gaining and losing neighborhoods would experience psychological readjustments. The owners would incur personal expenses during the move and financial losses could result from the move.

8. Future flood plain improvements would be restricted to those which would neither be susceptible to flood damage nor contribute to the flooding problem.

This alternative would not meet the Sponsors' objectives. Although damage to businesses and residences would be eliminated there would be no reduction in stream channel and bridge cleanout cost. This alternative would not meet the water based recreational needs of the area.

The adoption of this alternative would preclude the impacts of the selected alternative as described in the "Land Treatment Alternative" section.

Land Treatment and Reinforced Concrete Channel

This alternative would consist of the described land treatment measures and approximately 2,000 feet of reinforced concrete channel, 10 feet wide by eight feet deep. Construction of this alternative would require the relocation of three businesses and the alteration of three streets and bridges. The channel would be concrete lined to provide stability with sidewalls extended to provide capacity for the 100-year discharge. Estimated project installation cost of this alternative, which provides for urban flood protection and land treatment, is $1,706,000.

Dikes and levees in lieu of, or as a supplement to, this alternative have several limiting engineering features. The rights-of-way would require the relocation of several houses as well as additional alterations to the described businesses and roads. Due to the unstable channel condition and the high velocities the channel would have to be constructed of reinforced concrete with rock riprap located along the dikes. The estimated cost would be greater than with the reinforced concrete channel alone.

The costs and effects of the land treatment measures of this alternative would be the same as that discussed under the "Land Treatment Alternative" section. Additional impacts of this alternative are as follows:

1. Urban flood damage from floods up to the magnitude of the 100-year frequency event would be eliminated in the village of New Berlin.

2. Direct beneficiaries include about 80 residents and owners, operators, and employees of 16 businesses.

3. Installation of land treatment measures would reduce runoff, erosion, and sedimentation. Crop yields would be improved, animal carrying capacity on pasture would be improved and forest stands would be improved.

4. Construction of structural measures would result in approximately 40 man-years of employment, while project operation and maintenance would create approximately 0.3 man-years of employment annually.

5. Streambank erosion, contributing an estimated sediment yield of 30 tons per year, would be eliminated.

6. Three businesses would be relocated.

7. Reconstruction of streets and bridges would require the need for detours around construction areas. Inconveniences of noise and dust pollution from construction equipment would occur.

Selection of this alternative would provide for flood protection but would not meet the water based recreational needs of the area. The adoption of this alternative would preclude the impacts of the floodwater retarding structure and multiple purpose structure described in the proposed plan.

Land Treatment, One Floodwater Retarding Structure, One Multiple-Purpose Structure, and a Public Recreational and Fish and Wildlife Development

This alternative consists of land treatment, a single purpose floodwater retarding structure, a multiple-purpose structure, and a public recreational and fish and wildlife development. The land treatment would be the same as that discussed under "Land Treatment Alternative" and costs as shown would apply. Estimated project installation cost of this alternative is about $1,289,000.

Implementation of this alternative would result in the following impacts:

1. Urban flood damage from floods up to the magnitude of the 100-year frequency event would be eliminated in the village of New Berlin.

2. Direct beneficiaries include about 80 residents and owners, operators, and employees of 19 businesses.

3. Average annual sediment yields at the mouth of the watershed would be reduced by approximately 270 tons.

4. Installation of land treatment measures would reduce runoff, erosion, and sedimentation. Crop yields would be improved, animal carrying capacity on pasture would be improved and forest stands would be improved.

5. A 50-acre lake would be created which would provide habitat for trout, waterfowl, and songbirds.

6. Construction of structure No. 1 would increase the streams present carrying capacity for trout by creating a one-acre pool, 10 feet deep.

7. Establishing a permanent cover of grass and legumes following construction would increase the quality of summer forage for deer and rabbits of adjacent habitat.

8. Changed land use would reduce the application of agri-nutrients above the project development.

9. Removal of one farmstead would eliminate a potential source of animal pollution.

10. Fifteen acres of open land would be planted to trees during the project installation period.

11. Creation of the 50-acre lake and the recreational and fish and wildlife development would provide for 39,667 annual recreation visits.

12. Construction of structural measures would result in approximately 250 man-years of employment, while project operation and maintenance would create approximately 3.0 man-years of employment annually.

13. Approximately 1.6 miles of lake shoreline would be created.

The Sponsors' objective of reducing stream channel and bridge cleanout costs in the village of New Berlin would not be met with this alternative. The existing channel would continue to contribute an estimated 30 tons of sediment per year to the stream.

The adoption of this alternative would preclude the following impact of the selected alternative:

Installation of the reinforced concrete conduit will foreclose any opportunity to develop potential aquatic and associated resources which could be provided in direct utilization and intangible aesthetic values of the stream.

No Project Alternative

The "do nothing" approach would not make any changes in the existing environment. The watershed would remain essentially as outlined in the "Watershed Resources - Environmental Setting" section of this report. It would still be plagued with the problems which led to the initiation of this project; however, the Soil Conservation Service's on-going programs would continue. Both the adverse and favorable effects of the selected project measures would be eliminated. Flood damage reduction, fish and wildlife and recreation, and secondary benefits, would be foregone. Net average annual monetary benefits foregone would total $35,400.

SHORT-TERM VS. LONG-TERM USE OF RESOURCES

The most obvious trend in land use change is that of cropland being converted to pastureland. Much of the pastureland is changing through natural succession from herbaceous plants to woody growth, and will eventually become forest land if left uncontrolled. The following table summarizes the expected land use trends for the watershed.

TABLE R - PRESENT AND FUTURE LAND USE

Land Use	Present Use	Future Use W/O Project	Future Use With Project
	(percent)	(percent)	(percent)
Cropland	22	19	18
Pastureland	33	33	29
Forest Land	42	44	45
Urban and Other	3	4	8

Land use changes will occur due to project installation and will restrict options for future use or limit productivity. Structures, reservoirs and borrow areas will preclude optional use of 2.8 percent of the watershed area. On the remaining 97.2 percent, opportunities for productive use will be maintained or enhanced.

The immediate need for flood prevention, recreational facilities, and land treatment will be met by the project. By building a multiple-purpose dam to include only flood prevention, recreation, and fish and wildlife, the option to include water supply for future needs is limited without infringing upon the recreation and fish and wildlife use.

This project is designed to meet the needs for flood prevention and help satisfy the recreation demand for the next 100 years without infringing upon the present and future development of the soil and water resources. It is anticipated that greater pressures of fishing, and other outdoor recreation activities will be experienced throughout the watershed. The plan is compatible with the long-term uses of the natural resources. The project is expected to provide benefits long after its 100-year evaluated life.

During the development of the Mill Brook Watershed Work Plan consideration was given to the needs and objectives of the New York Statewide Comprehensive Recreation Plan, the Appalachian Regional Development Program, and the South Central New York Resource Conservation and Development project.

The structural measures and objectives outlined in the plan meet many of the broad long-term objectives of the other programs. The New York Statewide Comprehensive Recreation Plan is concerned with meeting the recreation demands within the next 20 years. The Appalachian Regional Development Plan calls for immediate attention to development of recreational and cultural activities and to stimulate the development of private business and industry, generating new opportunities for economic and social well-being for the people of this region. The program of Resource Conservation and Development is based on the principles of prudent management, and protection of natural resources, with full consideration of the social and economic benefits to the people.

The Mill Brook Watershed is located in the Susquehanna River Basin. The watershed was not studied under the Type II Comprehensive Study of the Susquehanna River Basin.

Status of P.L. 566 planning in the New York State portion of the Susquehanna River Basin as of January 1, 1973 is as follows:

Construction Completed	Under Construction
Great Brook (Pilot Watershed)	Newtown-Hoffman
Upper Five Mile Creek	Nanticoke Creek
Genegantslet Creek	Patterson, Brixius, and Grey Creeks
	Finch Hollow
	Little Choconut Creek
Planning Stage	Trout Brook
	Patterson Creek
Mill Brook	Marsh Ditch

In Pennsylvania, four P.L. 566 projects (North Fork, Mill Creek, Marsh Creek, and Martin Creek) have been completed and two projects (Briar and Middle Creek) are under construction. Maryland has one P.L. 566 project, Little Deer Creek, which has been completed.

These 19 projects comprise a total of 589,000 acres or 3.3 percent of the 17,600,000 acres in the Susquehanna River Basin (subregion 0205).

The Mill Brook Watershed Project Work Plan was reviewed by appropriate state and federal agencies and is compatible with other water resource projects. The cumulative effects of the project outside the watershed are as follows:

1. The development of the 50-acre lake and the recreational and fish and wildlife development will provide additional recreation opportunities to the region.

2. The reduction of sediment contributed at the mouth of Mill Brook will be reduced by 300 tons annually.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Construction of the floodwater retarding structure and the multiple-purpose structure and the acquisition of land for watershed protection and recreational and fish and wildlife development will require the use of about 216 acres of land. Forty-four acres of pasture, one acre of cropland, and six acres of forest will be permanently inundated by water in the sediment and multiple use pools. Floodwater will occasionally inundate approximately four acres of forest land, 32 acres of pastureland, and five acres of cropland. Approximately 13 acres of forest land, 11 acres of pastureland and 10 acres of cropland will be required for the dams, emergency spillways and borrow areas of the two structures. This area will all be reseeded to grasses and legumes after construction is complete. Approximately 90 acres of land will be acquired for the recreational and fish and wildlife development of which approximately 35 acres is cropland. This land will be committed to recreation and wildlife habitat uses during the project life; following project life, land can be used for other purposes.

Approximately 0.7 miles of channel will be permanently inundated and 0.4 mile of channel will experience occasional flooding due to the pools of the two structures. About 119 acre-feet of water will be lost due to evaporation each year.

Approximately 0.25 miles of open channel through the village of New Berlin will be converted to a closed conduit by construction of this project.

Other commitment of resources includes labor, materials, and energy required for construction of the project.

Commitment of land and water areas to features of the project will preclude these areas from other uses for a period to exceed the life of the project. The storage volume in the reservoirs allocated to sediment will be filled during the life of the project. However, the structures will be operational for flood reduction for many years.

CONSULTATION AND REVIEW WITH APPROPRIATE AGENCIES AND OTHERS

GENERAL

The Chenango County Soil and Water Conservation District and the Chenango County Board of Supervisors initiated a letter of intent to apply for P.L. 566 planning assistance, as outlined in the Office of Management and Budget Circular No. A-95, in 1968. The Sponsors filed for planning assistance, under P.L. 566 in November 13, 1968, which was approved by the New York State Department of Environmental Conservation, Division of Water Resources, on December 5, 1968. The Soil Conservation Service's State Conservationist requested a planning authorization, from the SCS Administrator, in December 1969; the Administrator authorized planning on January 15, 1969.

Upon receipt of planning authority, the State Conservationist advised interested agencies of the authorization and requested that they provide comments or expressions of interest concerning the project.

Throughout the planning phase of this watershed, the local people were kept informed through open meetings and newspaper articles. During June and July of 1969, four workshops for public information were set up in cooperation with the Mill Brook Watershed Steering Committee, the South Central Resource Conservation and Development Project Council, and the New York State Cooperative Extension. From the date of planning application to June of 1972, there have been over 15 meetings with local interests involved. On November 18, 1971, a public information tour of the watershed was conducted, and included representatives of the Service, the local steering committees, the town board, the county board, and the assistant to Congressman Hanley. The purpose of this tour was to acquaint the public with the location of potential structural measures.

A watershed subcommittee for recreation was formed to help investigate potentials for developing water based facilities. Potential sites were evaluated in the field by the subcommittee and the Service. The group developed a proposed recreation site development plan. Members of the Division of Fish and Wildlife, Lake and Stream Improvement Section, and the Service presented additional site development information. Site development information and cost estimates were presented to the County Board of Supervisors for approval.

In October 1971, representatives of the Bureau of Sports Fisheries and Wildlife, USDI, the Department of Environmental Conservation, and the Soil Conservation Service, made a field reconnaissance to evaluate the fish and wildlife aspects of the project and other environmental considerations.

At a meeting on September 16, 1969, it was decided that the steering committee would inventory the areas above the floodwater retarding sites to determine sanitary conditions. Information to be included was location of houses, barns, septic tank disposal fields, dairy herds and soil types. This information was presented to the New York State Health Department on February 19, 1970 requesting an opinion as to the suitability of the proposed lake for swimming. The response was that the population and sanitary facilities in the watershed would probably not present a hazard to swimming and that the steering committee should proceed with plans for the swimming areas. It was also stated that a final determination would be made later.

The planning of this watershed has been coordinated with the New York State Office of Parks and Recreation regarding historical and archeological investigation. See Appendix E for the archeological report of the investigation.

In March 1974, the Environmental Protection Agency, Rochester, New York, began to periodically sample water quality at four locations on Mill Brook. Results of these analyses are included in Appendix F.

This project was reviewed by Chenango County Planning Board, as well as the newly created town and village planning boards of New Berlin. There have been numerous other meetings with individuals in the watershed to obtain information necessary for the plan.

The following agencies were requested to comment on the draft statement:

Department of the Army
Department of Commerce
Department of Health, Education, and Welfare
Department of the Interior
Department of Transportation
Office of Equal Opportunity - USDA
Environmental Protection Agency
Advisory Council on Historic Preservation
Appalachian Regional Commission
Federal Power Commission
New York State Department of Environmental Conservation
(designated State Agency)
New York State Planning and Development Clearinghouse
(State Clearinghouse)
Southern Tier East Regional Planning and Development Board
(Area Clearinghouse)
National Audubon Society
National Resource Defense Council
League of Women Voters
Chenango County Planning Board

DISCUSSIONS AND DISPOSITIONS OF EACH COMMENT ON DRAFT ENVIRONMENTAL STATEMENT

No response was received during the review of the Draft Environmental Impact Statement from the following agencies:

Department of the Army
Department of Commerce
Office of Equal Opportunity - USDA
Appalachian Regional Commission
Federal Power Commission
New York State Planning and Development Clearinghouse
(State Clearinghouse)
Southern Tier East Regional Planning and Development Board
(Area Clearinghouse)
National Audubon Society
National Resource Defense Council
League of Women Voters

Comments were received from the following agencies:

Department of Health, Education, and Welfare
Department of the Interior
Department of Transportation
Environmental Protection Agency
Advisory Council of Historic Preservation
New York State Department of Environmental Conservation
(designated State Agency) 1/
Chenango County Planning Board

Each issue, problem, or objection to the Environmental Statement is summarized and a response given on the following pages. Comments are serially numbered where agencies have supplied multiple comments. The original letters of comment appear in Appendix C.

1/ Comments from the Department of Environmental Conservation include comments from the State Clearinghouse

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

(1) Comment: We have reviewed the above noted document and believe that it is generally accurate and complete.

Response: Noted.

(2) Comment: We recommend that the following changes be incorporated in the Final EIS: In the last sentence of paragraph 7 on page 5, the words ". . . and the life of the project." should be deleted. This point was discussed at the October 21, 1974 meeting with your agency. Although the Soil Conservation Service has no policy on public access to non-fee title sediment pools, informal public access for fishing purposes should not be discouraged in this document. Such public access may be acceptable to all participating agencies at a future date. We believe that SCS should reconsider a more liberal policy on informal public access to these single purpose areas.

Response: The words ". . . and the life of the project." were deleted from the narrative. During the formulation and planning phase, the capabilities of the sediment pool for incidental recreation was presented to the local Sponsors. Due to site limitations plus the development of a 50-acre lake for recreation and fish and wildlife only one mile away, the Sponsors chose not to plan for any recreational use of the sediment pool. The Soil Conservation Service informed the Sponsors that if at any time in the future recreational use was allowed at the site, controls including sanitary facilities must be provided so as not to degrade the environment.

(3) Comment: The project will not help satisfy any future demands for hunting as implied. Therefore, "hunting" should be deleted from line 4 of the last paragraph on page 57.

Response: The word in reference has been deleted in the narrative of the EIS.

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

(1) Comment: On the basis of our review of the above, we have determined that the impacts in those areas of concern to this Department have been adequately addressed. We have no adverse comment in relation to implementation of this project.

Response: Noted.

UNITED STATES DEPARTMENT OF THE INTERIOR

(1) Comment: The Department's Fish and Wildlife Service participated in the preparation of a Reconnaissance Report, dated February 5, 1973. That report outlined the following recommendations:

1. That public access and parking areas for bank fishing be provided at the single purpose impoundment (Site No. 1).

2. That public access, a parking area, and a boat-launching ramp be provided at the multiple-purpose impoundment (Site No. 2.).

3. That bank stabilization, flood walls, or other measures be adopted as alternatives to the stream channelization features in the project plan, which will preserve the natural characteristics of Mill Brook to the fullest extent possible.

Our review of the work plan shows that Recommendation No. 2 has been accommodated but Recommendations No. 1 and No. 3 have not. Public access and parking areas for bank fishing are not provided for at Structure No. 1.

Response:
1. See the response to DEC's Comment No. 2 (page 65).
2. Comment noted.
3. See the response to your Comment No. 2 (page 67).

(2) Comment: Paragraph 2, page 48, states that, "The flow of Mill Brook will be picked up at the outlet of a rectangular culvert at Main Street and carried through a closed concrete transition section into a reinforced concrete pipe." Our concern is for filling the stream channel and completely obliterating that section of Mill Brook downstream to its mouth, a distance of 0.25 miles. As Recommendation No. 3

indicates, we feel that natural characteristics of a stream should be conserved to the fullest possible extent. Perhaps the work plan can be revised to state the reasons for selecting reinforced concrete pipe over open channel measures. As the channel work is now presented there is a foregone opportunity to develop the potential aquatic and associated resources which streams can provide in direct utilization and intangible but high aesthetic value.

Response: An alternative has been included in the final EIS (page 55) to discuss the impacts of installing an open channel that would meet the Sponsor's project objectives of flood protection. The channel is unstable under its present condition, therefore, any utilization to carry floodflows will require modification and maintenance which will modify the stream's aesthetic appeal. Although the "natural stream" concept is desirable the present condition of Mill Brook, through the village, is described as having objectionable odors during low flow, unsightly debris, deteriorating walls, and flooding. An open channel was considered to convey the floodwater. This presents complex engineering problems to contain the extreme velocities encountered in this stream. Therefore, the closed conduit described in the plan was selected to meet the Sponsor's project objectives of flood protection and channel stabilization.

(3) Comment: The proposed project will not adversely affect any existing, proposed, or known potential unit of the National Park System, or any known historical, natural, or environmental education sites eligible for the National Landmark Program.

Response: Noted.

(4) Comment: Known mineral resources of Chenango County include natural brines, rock salt, and sand and gravel. Of these, only sand and gravel is currently being produced. Within the watershed of Mill Brook, only one sand and gravel pit is in operation on the extreme western edge. In general, sand and gravel deposits directly affected by the proposed project are thin and unimportant except for occasional local use. We believe the impact on mineral resources will be insignificant.

Response: Information provided has been included on page 21, Environmental Setting and page 47, Environmental Impacts. The EIS is strengthened by the inclusion of this information.

(5) Comment: We have noted that comments have been solicited from the Advisory Council on Historic Preservation but apparently no contact has been made with the State Historic Preservation Officer. This is necessary to determine what potential National Register properties may be currently inventoried for future designation.

Response: A letter, dated March 8, 1974, was received from the National Register Supervisor, Division for Historic Preservation, New York State Parks and Recreation which identified historic places in the watershed that may be in jeopardy from the proposed project. These places are discussed on page 38 of the EIS and are also located on the urban flood plain map in Appendix B. None of these places will be affected by construction of the proposed project.

(6) Comment: The draft statement indicates (page 38) that an archeological assessment was to be performed this summer. We have learned from the Syracuse Soil Conservation Service office that the survey would be accomplished during September. The results of this investigation should be discussed in detail in the final environmental statement. We suggest that the archeologist's report be appended, if possible. Any significant archeological values should be discussed in terms of: The existing environment and efforts being made to preserve such values, as well as discussing unavoidable adverse effects if any, mitigation measures if preservation cannot be arranged, and any irreversible or irretrievable commitments.

Response: The archeological report is included as Appendix E. Surveys indicate that the project is unlikely to have any adverse impact on archeological resources. However, in the event that archeological resources are discovered during the project, the New York Archeological Council will be notified.

(7) Comment: On Page 51, item f., states simply the adverse impact to be expected from installation of the reinforced concrete pipe. We believe this to be an inadequate discussion of an important project feature's impact on the local environment. The statement should discuss less damaging alternatives that might alleviate obliteration of the

urban stream reach or otherwise permit present and future generations to enjoy the potential values of the natural stream habitat. Such alternatives would be bank stabilization, flood walls, or other measures.

Response: See response to your Comment No. 2 and page 55, Alternatives, for a discussion on an open channel alternative to the proposed plan.

(8) Comment: Potential environmental problems related to geologic conditions are adequately discussed in the environmental statement. However, we suggest that, since some of the borrow material will apparently be obtained from outside the spillway and reservoir areas (pages 5 and 7), plans for restoration of the borrow areas should be discussed in the impact statement.

Response: The last paragraph on page 5 and paragraph 5 on page 7 have been modified to state that all disturbed areas including embankment, emergency spillway, access roads, and borrow areas will be seeded to desirable grasses and legumes after construction. Paragraph 5 on page 10 discusses the procedures to be followed during construction to minimize erosion.

(9) Comment: We do not expect that the proposed construction will cause any serious long-term adverse effects on water resources. As noted in the statement, an increase in sediment and turbidity will occur downstream during construction.

Response: Noted.

(10) Comment: On page 25 of the statement, the water system of New Berlin is described as consisting of a small reservoir, a system of springs, and two wells. The locations of these springs and wells are not given. Without knowing their locations, we cannot determine if there might be some effect on them from the new construction. On page 28, impoundment 4 is a man-made reservoir used as the supplemental water supply from the village. On the project map of the watershed it would appear that this small reservoir is directly downstream from the proposed site No. 2 dam. If this is true, then the anticipated effect of the new dam on the present reservoir should be discussed.

Response: During construction of the structures, there will be an increase in the sediment load below the sites. Most of the sediment resulting from the construction of site No. 2 will drop out in the upper end of the existing village reservoir. A short term increase in turbidity will be apparent during construction. There will be no effect on the current water system since the village is currently

obtaining their supply from wells located near the Unadilla River. (See pages 25, Environmental Setting and 48, Environmental Impacts.) Stream base flow to the existing village reservoir will not be significantly reduced by construction of the project. See Environmental Impact section page 47. Metcalf and Eddy's proposal to increase the supply capacity of the system by staged construction of two wells will not be affected by the proposed project since the location of these wells is in or near the Unadilla flood plain north of the village. Continuous monitoring of water quality during construction has been proposed by EPA. See Appendix F for location of sampling stations. This type of data will be very useful in evaluating the effects of this project and future similar projects.

DEPARTMENT OF TRANSPORTATION, UNITED STATES COAST GUARD

(1) Comment: The Department of Transportation has reviewed the material submitted. We have no comments to offer, nor do we have any objection to this project.

Response: Noted.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

(1) Comment: The water quality data provided in the EIS are not as recent or as extensive as the water quality data gathered by the EPA Rochester Field Office and made available to the Soil Conservation Service. A reviewing agency should be provided with all the available water quality information required to make a valid judgment of the environmental impact of a project, thus the final EIS should include the EPA data.

Response: The results of EPA's water quality survey are shown in Appendix F.

(2) Comment: The section entitled "Environmental Considerations" has omitted the consequences resulting from the damming of a stream. The subsequent formation of a standing body of water will bring about physical, and possibly chemical, changes in that water. Whether these changes are detrimental or beneficial should be determined in the final EIS. The EPA Rochester field office's water quality survey has addressed itself to some of these potential changes and has offered suggestions to help minimize their effects.

Response: Environmental considerations of the consequences resulting from the damming of a stream has been included on page 11 of the EIS. The results of EPA's water quality survey is included in Appendix F.

(3) Comment: Table G of the EIS lists the Southern Tributary and the Northern Tributary as being intermittent. Under some federal guidelines, a stream does not have to dry up completely to be considered intermittent and assigned a different water quality classification. The term intermittent as used here should be carefully defined in the final EIS.

Response: Intermittent, as used here, means there will be continous flow through some seasons of the year but little or no flow through other seasons. Except during extreme droughts some pools will have water year round with ground water interflow occurring between pools

(4) Comment: The EIS states that the present amount of sediment reaching the mouth of the Mill Brook is about 390 tons/year and that implementation of the project will reduce the sediment load by 300 tons/year. There would be a reduction of 20 tons/year by land management techniques, about 30 tons/year by downstream bank erosion control, and about 20 tons/year by management of the upstream gravel pit. Does this mean that the floodwater retarding structure and the multiple-purpose structure would prevent 230 tons/year from reaching the stream's confluence with the Unadilla River? If so, the final EIS should discuss the life expectancy and the maintenance dredging requirements for this project. The final EIS should also discuss how the sediment figures were calculated and what data were used. A more meaningful representation might be to present the solids concentration information instead of the average sediment concentration figure which now appears.

Response: The two dams controlling approximately 76 percent of the watershed drainage area, will prevent approximately 230 tons/year of sediment from reaching the stream's confluence with the Unadilla River. Methods of investigation are included in the Investigation and Analysis section of the Work Plan which states in part, "Sediment storage requirements for the proposed structures were calculated using the Musgrave Soil Loss Equation and procedures outlined in the Watershed Planning Guide and Soil Conservation Service Technical Release No. 12. Factors considered were land use, cover conditions, topography, sheet and channel erosion, delivery rates, and trap efficiency of the reservoirs. All of the basic data were obtained from soils maps, aerial photographs, and actual field measurements. Storage for an expected

100-year accumulation of sediment was computed for both sites." Therefore, there is no need for a maintenance dredging plan for the project. On page 4 of the EIS the design life for all structural measures is listed as 100 years. Possibly with more water quality data as being collected by EPA,information will be available to present the solids concentration instead of the average sediment concentration.

(5) Comment: The EIS states the possible future use of reservoir No. 2 for water supply purposes. Any change of purpose should be firmly and extensively addressed now to provide for comment under the review system. If a decision concerning the inclusion of municipal and industrial water supply as a project purpose cannot be made at this time, a new environmental impact statement dealing with any such future change in usage should be prepared. Also, although it is recognized that such a decision will be made at a later date, has any consideration been given to the types of boats to be permitted on the reservoir? If gasoline powered craft are allowed, an estimate of their pollution burden should be given.

Response: It is not anticipated that water stored in the recreation and fish and wildlife pool will be withdrawn and used for any other purpose. Under present criteria, P.L. 566 funds cannot be used to provide storage for municipal or industrial water supply. Therefore, in the event the recreation and fish and wildlife storage is used for municipal or industrial purposes, the Federal Government will be reimbursed for all P.L. 566 funds used for the public recreation and fish and wildlife costs associated with the reservoir. It is not anticiped that gasoline powered craft will be allowed on the multiple-purpose reservoir.

(6) Comment: Since the report and impact statements are not clear as to just where New Berlin's 12 MG reservoir is located in Mill Brook, we must assume that it is located below both construction sites. The water from this reservoir is used by New Berlin which provides chlorination treatment. We note that the turbidity of the water is presently well within 1 ppm. This meets the proposed New York State turbidity standard of 1 ppm as against the present standard of 3 ppm. Turbidity is expected to soon be listed as a health or mandatory standard. In view of this, steps should be taken to prevent any increase in turbidity at the water supply intake. If turbidity cannot be controlled, use of the reservoir should be discontinued during construction.

Response: The existing village reservoir is located immediately below proposed site No. 2. The village is currently obtaining their water supply from wells located near the Unadilla River. The reservoir, constructed in 1887, is used only as an emergency source. See page 25, paragraph 2.

(7) Comment: The EIS states that preliminary investigations have indicated severe soil limitations for the septic tank leach fields. The final EIS should discuss the nature of the preliminary soil investigations and indicate if percolation tests were performed. The necessity for a specially designed sewage disposal system should be determined at this time, so that the appropriate structural costs can be included in the final EIS.

Response: Procedures used in preliminary investigations of the site included the use of soil survey information and field observations. Percolation tests were not performed. Estimated cost included in the Table 2B allow for design of a specially designed sewage disposal system to allow for anticipated soil limitations. It is recognized that final detailed plans may show some variation of quantities from those indicated. This is an acceptable practice.

(8) Comment: Not all the possible alternatives were discussed in the EIS. Only channelization and floodproofing were discussed in connection with the upstream reservoirs. Levees and/or flood walls were mentioned but only in connection with the ponding structures. The final EIS should discuss the use of levees and/or flood walls in conjunction with channelization downstream. Non-structural alternatives should also be discussed since only 13 acres of the entire watershed are flooded at the 100 year flood levels.

Response: The alternative section includes discussion of several alternatives including three nonstructural alternatives; land treatment, land treatment and floodproofing, and land treatment and flood insurance. Through the review process New York State Department of Environmental Conservation has informed the service (SCS) that Flood Insurance is not an alternative. Article 36 of the Environmental Conservation Law gives the State of New York mandatory authority to impose regulations which would include the village and town of New Berlin in the National Flood Insurance Program. This alternative was deleted from the final EIS. Other nonstructural

alternatives and their reason for not being included are as follows: (1) warning system - considered to be inadequate for a small watershed with short lag times; (2) land purchase and relocations - not socially acceptable to the sponsors and does not meet the water based recreational needs of the area; and (3) flood plain regulation - the area subject to flooding is already developed and the alternative would not meet the water based recreational needs of the area. An alternative was included in the final EIS which discusses land treatment and reinforced concrete channel as a solution for meeting the objectives of the sponsors.

(9) Comment: The final EIS should indicate the purpose of using a closed concrete pipe as opposed to an open channel through New Berlin. Stream flows through this area do not vary greatly and thus should maintain a stable bank of an open channel.

Response: See response No. 2 for the United States Department of the Interior comments.

(10) Comment: The final EIS should include a topographic map or aerial photograph to help determine the total impact of the proposed structures on the surrounding area. The heights and widths of these structures should also be indicated.

Response: Beginning on page 4, the planned project section describes such things as the height of the structures, the number of acres necessary for construction of the dam, spillway, and outlet channel, and the number of acres needed for the permanent pool and flood pool. Although a topographic map is not included, a plan view of both sites is shown on pages 13 and 14. A topographic map, structure site centerline profiles, and an aerial photograph of the watershed was provided to Region II, Environmental Protection Agency office to assist in their review.

It is not the Soil Conservation Service policy to present this material in the Environmental Impact Statement.

(11) Comment: As a general note, land treatment measures play an integral part in the future success and general environmental compatibility of a project such as this. The final EIS should discuss what provisions were made to assure that these measures will be conscientiously carried out over the life of the project.

Response: Provisions for land treatment installation are included as a part of the Work Plan Agreement, items number 7, 8, and 9, found on page v of the Work Plan. In addition the following is set forth to assist you in understanding how an effective land treatment program is to be carried out without laws that mandate it:

The Soil Conservation Districts Law of New York, Chap. 727, L. 1940; Chap. 887, L.1964, as amended, provides for the conservation of the soil and water resources of the state and for the control of soil erosion, flooding, etc.

Under this state law, 56 soil and water conservation districts have been organized by county legislative bodies under state law. The first, in Schoharie County, was organized in 1940. The last, in Westchester County, in 1967. Districts cover all of the state except Nassau County and the five burroughs of New York City. Steps are being taken to organize them also as soil and water conservation districts. The Soil Conservation Service has working arrangements with all of these districts.

The basis for these working arrangements are appropriate memoranda of understanding between the local S&WCD's, USDA and SCS. Each district has a long range program which covers the problems and opportunities within the district, possible solutions to the problems and working arrangements with the various agencies that are involved in soil and water conservation.

Landusers have been cooperating willingly with the county-wide locally governed soil and water conservation districts throughout the state in reducing soil erosion and sedimentation. As a result sixty percent of the cropland in New York is now considered adequately protected.

The U. S. Soil Conservation Service, assisting the soil and water conservation districts in New York, is helping municipal and county officials, planning bodies, and developers on problems of erosion and sedimentation. SCS is providing guidelines for controlling erosion on subdivisions, highways, and other construction sites. The SCS is also providing standards for temporary erosion and sediment control devices for construction sites.

Several hundred construction site plans are reviewed for counties and towns each year by SCS. The SCS assisting the soil and water conservation districts worked with the developers and consulting engineers in preparing erosion and sediment control plans and the designs for desilting basins to control sediment. The local government exercises regulatory control usually by withholding conservation permits. A few now have regulations.

The New York State Department of Environmental Conservation has a basic memo of understanding with the several soil and water conservation districts in New York. It provides for establishing effective working relations between each of the soil and water conservation districts and the various divisions of DEC. DEC excercises regulatory control under state law, where classified streams are polluted by runoff.

Incentive cost sharing of conservation programs by the Federal Government with individual landusers has helped to accelerate implementation of land treatment.

New York State and local governments have also been working to reduce erosion and sedimentation. Public concern over environmental matters have focused more attention on soil erosion and sedimentation. The State Legislature is considering a State law to strengthen and extend the present erosion and sediment control activities in New York which would be helpful in bringing into line those who were never contacted or convinced of the need for conservation by persuasion.

Land treatment measures have been effectively installed and maintained by education and persuasion. At the present time there is no state, county, or federal law which dictates that land treatment measures be installed and maintained by all landusers.

CHENANGO COUNTY PLANNING BOARD

(1) Comment: First and foremost the Chenango County Planning Board supports, endorses and recognizes the urgent need for this project. We are particularly concerned about the flood hazard within the town and village of New Berlin.

Response: Noted.

(2) Comment: We do feel that the potential adverse effects as stated in the Environmental Impact Statement are understated. Specifically page 11 refers to potential adverse impacts and that considerations be given to minimize their effects, particularly those induced by housing developments. This language appears to refer to potential hazards from urban development such as septic tank malfunctionings and other problems caused by inadequate standards from housing developments. Admittedly we are all speculating that additional homes will be developed around the immediate drainage area. I am sure that experience will bear out this assumption.

Response: Noted.

(3) Comment: Our concern is the lack of effective local regulations. Chenango County does not have a health department, the town and village does not have subdivision ordinances, nor do they have zoning. While the state exercises some jurisdiction, it may not be adequate to prevent pollution of the lake, therefore, we would urge and recommend the adoption of local subdivision regulations by the village and town as well as sanitary ordinances. The adoption of these regulations would do much to prevent an adverse environmental situation.

Response: Noted.

(4) Comment: For your information we would advise you these are minor points that (page 35) there are no zoning.

Response: Deleted from narrative.

(5) Comment: Page 38 there are no skiing areas in Chenango County.

Response: Deleted from narrative.

(6) Comment: Page 64 this project was reviewed by Chenango County Planning Board as well as the newly created town and village planning boards of New Berlin.

Response: Added on page 63 to reflect town and village planning board's participation.

(7) Comment: The regional A-95 agency is the Southern Tier East Regional Planning and Development Board.

Response: The Central New York Planning Development Board was changed to read Southern Tier East Regional Planning and Development Board on pages ii and 64.

ADVISORY COUNCIL ON HISTORIC PRESERVATION

(1) Comment: While we infer that the three historic places identified by the Office of State Parks and Recreation will not be affected, your statement does not specifically state this. Please furnish us with a copy of either your determination of effect or that of the Office of State Parks and Recreation.

Response: Information has been included on page 47 in the "Environmental Impact" section which discusses the effects of the project in relation to the identified historical places in the watershed.

(2) Comment: When available please send the Advisory Council the results of this summer's archeological survey.

Response: A copy of the archeological survey has been sent to the Advisory Council on Historic Preservation.

LIST OF APPENDICES

APPENDIX A

Comparison of Benefits and Costs for Structural Measures

APPENDIX B

Project Map
Urban Flood Plain
Recreational and Fish and Wildlife Development Map
Typical Cross Section of Floodwater Retarding Structure
Along Principal and Emergency Spillways
Typical Cross Section of Multiple-Purpose Structure

APPENDIX C

Letters of Comment Received on Draft Environmental Statement

APPENDIX D

Definition of Land Treatment Measures
Nongame Mammals Found Throughout New York
Listings of Reptiles and Amphibians

APPENDIX E

Archeology Report

APPENDIX F

Flow Duration Curve
Water Quality Survey Report

APPENDIX G

Bibliography

APPROVED BY Robert P Gilliard DATE 3/9/76

State Conservationist

APPENDIX A

COMPARISON OF BENEFITS AND COSTS FOR STRUCTURAL MEASURES

Mill Brook Watershed, New York

(Dollars) 1/

Evaluation Unit	AVERAGE ANNUAL BENEFITS			Total	Average Annual Cost	Benefit Cost Ratio
	Damage Reduction	Fish and Wildlife & Recreation	Secondary			
All Structural Measures	61,360 2/	89,240	15,100	165,700	120,500	1.4:1
Project Administration	: : :	: : :	: : :	: : : :	10,900	: : :
GRAND TOTAL	61,360	89,240	15,100	165,700	131,400	1.3:1

1/ Cost: Price base 1974. Benefits: Future adjusted.

2/ In addition it is estimated that land treatment measures will provide flood damage reduction benefits of $860 annually.

April 1975

APPENDIX B

75° 22' 30"

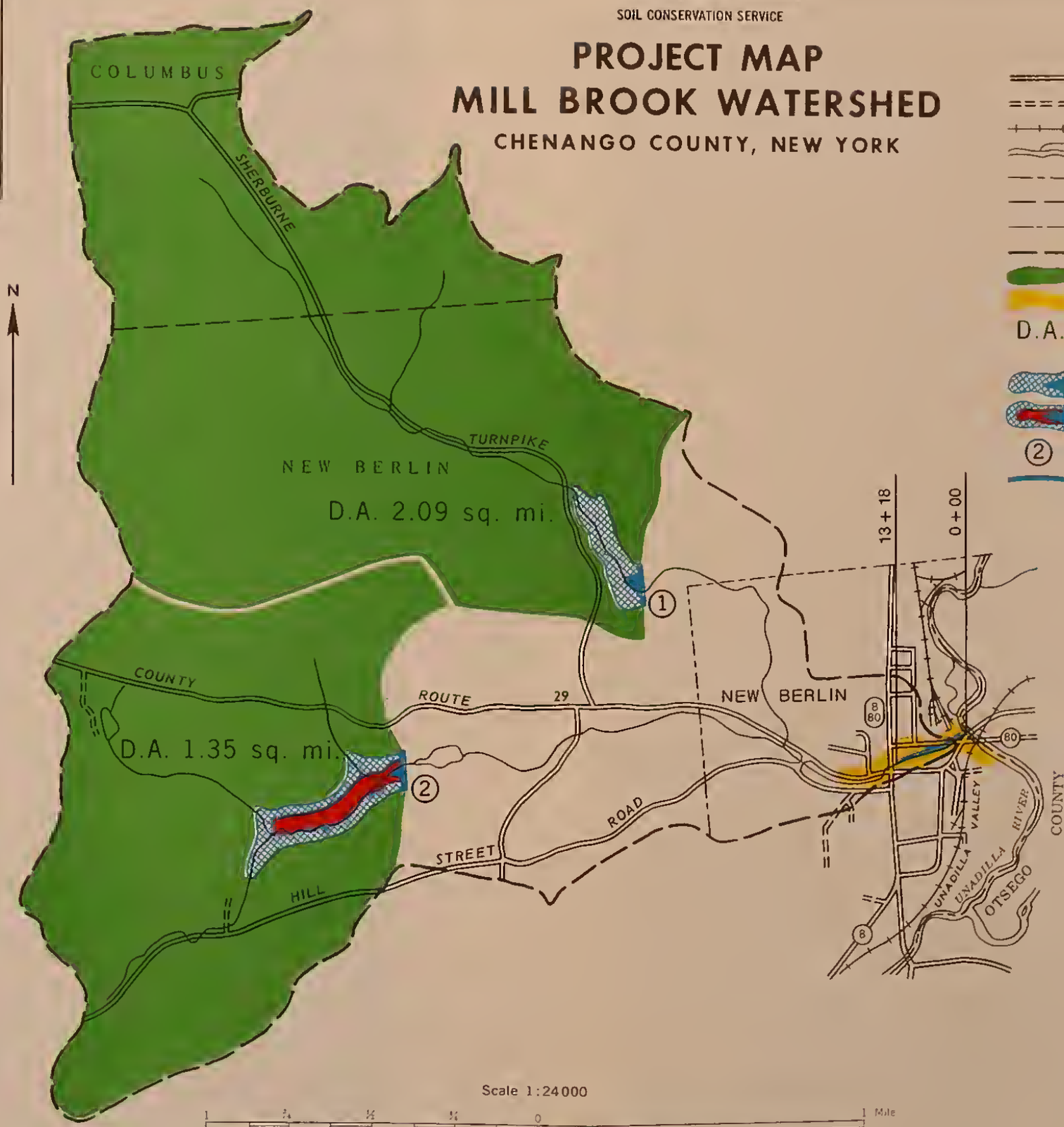
75° 20' 00"

U. S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

PROJECT MAP
MILL BROOK WATERSHED

CHENANGO COUNTY, NEW YORK



LEGEND

- Good motor road
- Poor motor or private road
- Railroad
- Streams
- County line
- Township line
- City limit
- Watershed boundary
- Drainage area controlled by structure
- Area benefited
- D.A. — Drainage area in square miles

PROJECT MEASURES

- Floodwater retarding structure
- Multiple-purpose structure
- ② — Structure number
- Stream channel modification for flood prevention

42° 37' 30"

42° 37' 30"

Scale 1:24000

1 ¾ ½ ¼ 0 1 Mile

5000 4000 3000 2000 1000 0 5000 Feet

SOURCE: USGS Topo Quad Sheets 1:24000

75° 22' 30"

75° 20' 00"

USDA SCS HYATTSVILLE, MD 1973

100 Year without project

Stream

Covered conduit

① Library

② Upjohn's St. Andrews church

U. S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

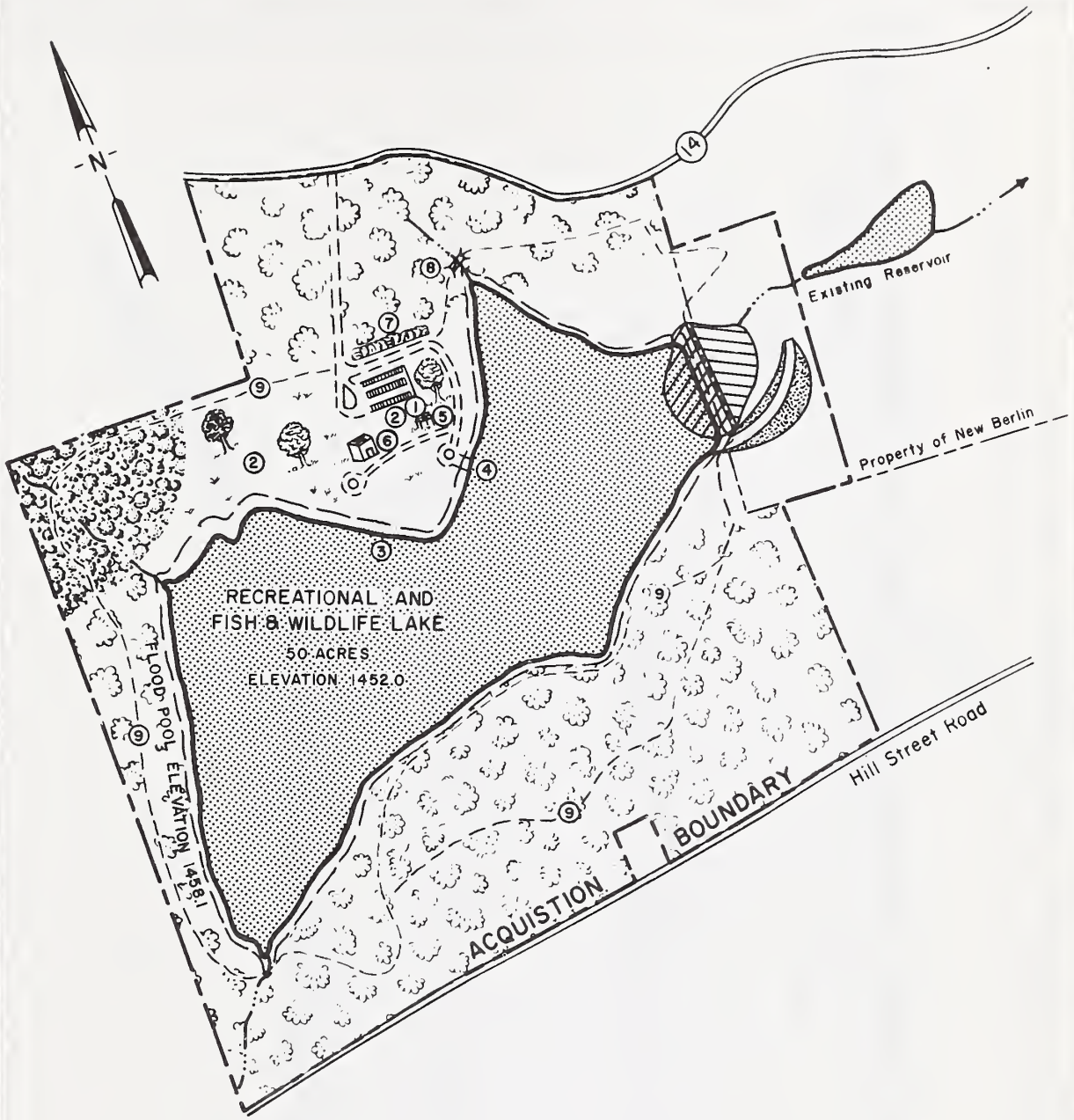
MILL BROOK WATERSHED
URBAN FLOODPLAIN

CHENANGO COUNTY, NEW YORK

Scale 1:4000

0 500 1000 Feet

USDA-SCS-HYATTSVILLE, MD. 1973



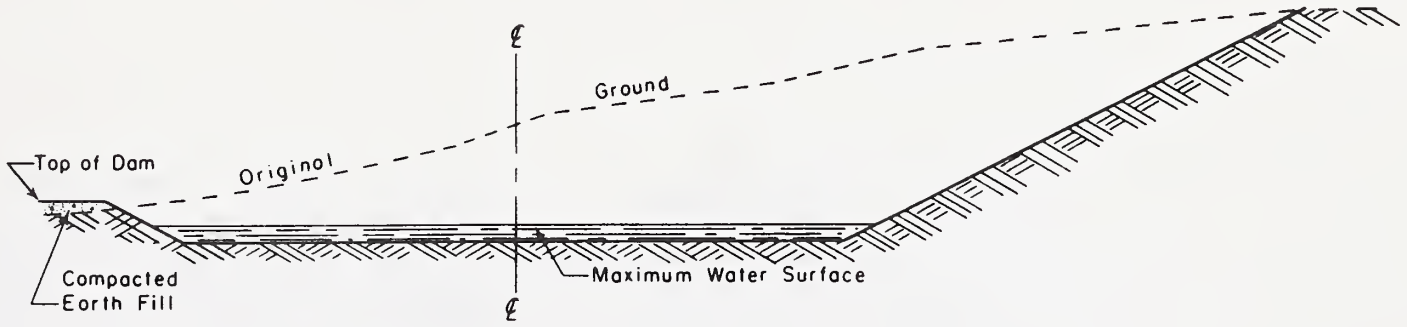
LEGEND

① Parking area
② Picnic area
③ Bathing area
④ Boat launching area
⑤ Shelter house
⑥ Bath house
⑦ Screening hedge
⑧ Footbridge
⑨ Nature and hiking trail

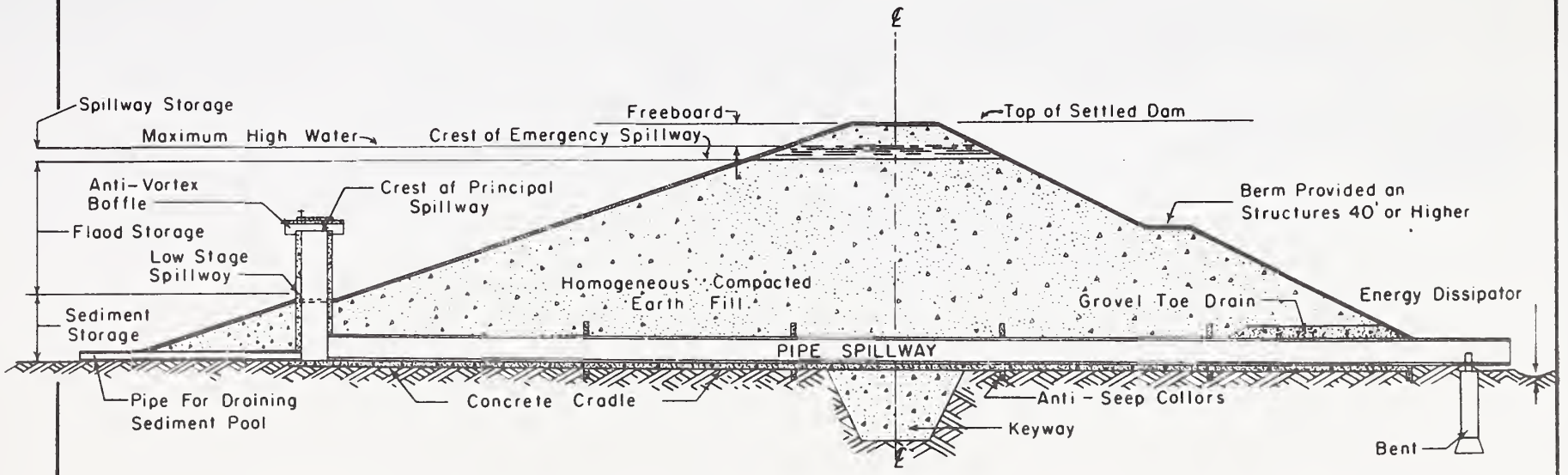
MILL BROOK WATERSHED

Recreational and Fish & Wildlife Map

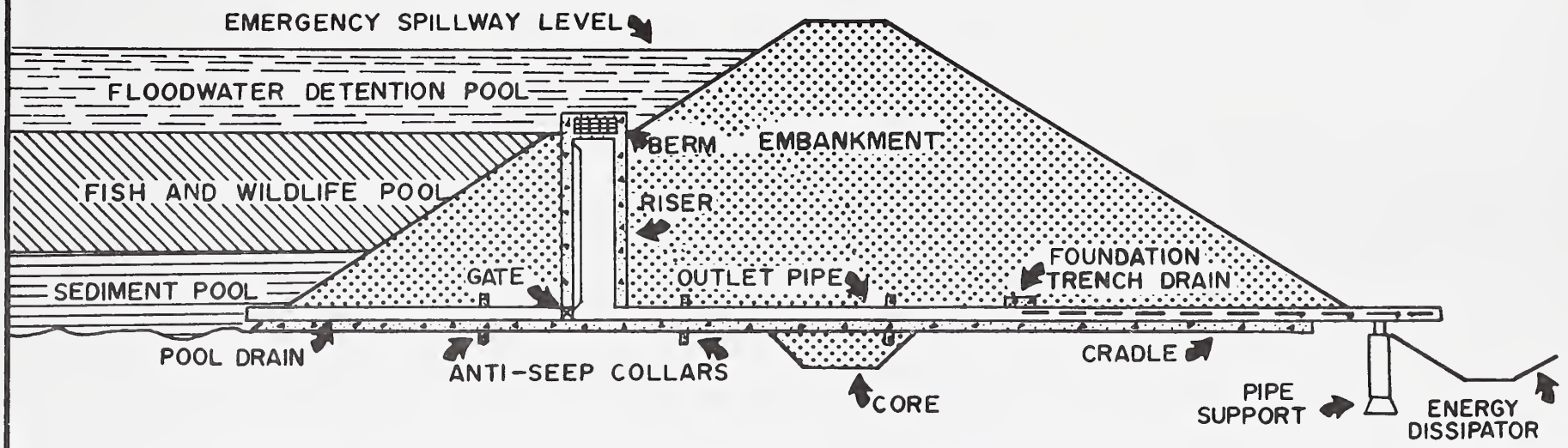
CHENANGO COUNTY, NEW YORK



CROSS SECTION OF EMERGENCY SPILLWAY
CONTROL SECTION



TYPICAL CROSS SECTION OF FLOODWATER RETARDING STRUCTURE
ALONG PRINCIPAL AND EMERGENCY SPILLWAYS



TYPICAL CROSS SECTION OF MULTIPLE-PURPOSE STRUCTURE

USDA SCS HYATTSVILLE MD 1973

APPENDIX C

3-28-75 - copy to H. Stamatel

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233

Ogden Reid,
Commissione

March 25, 1975

Mr. Robert L. Hilliard
State Conservationist
USDA Soil Conservation Service
Room 400 - Midtown Plaza
700 East Water Street
Syracuse, New York 13210

Dear Mr. Hilliard:

Draft Environmental Impact Statement
Mill Brook Watershed
Chenango County, New York
DEC Project No. 709-12-0054

We have reviewed the above noted document and believe that it is generally accurate and complete.

We recommend that the following changes be incorporated in the Final EIS:

1. In the last sentence of paragraph 7 on page 5, the words ". . .and the life of the project." should be deleted. This point was discussed at the October 21, 1974 meeting with your agency. Although the Soil Conservation Service has no policy on public access to non-fee title sediment pools, informal public access for fishing purposes should not be discouraged in this document. Such public access may be acceptable to all participating agencies at a future date. We believe that SCS should reconsider a more liberal policy on informal public access to these single purpose areas.

2. The project will not help satisfy any future demands for hunting as implied. Therefore, "hunting" should be deleted from line 4 of the last paragraph on page 57.

Thank you for the opportunity to review this statement.

Very truly yours,

Terence P. Curran
Director of Environmental Analysis

TPC:RW:jlr

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
REGION II
FEDERAL BUILDING
26 FEDERAL PLAZA
NEW YORK, NEW YORK 10007

October 9, 1974

OFFICE OF THE
REGIONAL DIRECTOR

Our Reference: ROFEC

Mr. Robert L. Hilliard
State Conservationist
Soil Conservation Service
Department of Agriculture
Room 400 - Midtown Plaza
700 East Water Street
Syracuse, New York 13210

Dear Mr. Hilliard:

Subject: Draft EIS #031-08-74
Mill Brook Watershed
Chenango County, New York

On the basis of our review of the above, we have determined that the impacts in those areas of concern to this Department have been adequately addressed. We have no adverse comment in relation to implementation of this project.

Sincerely yours,

Charles S. Josinsky
Regional Environmental Officer

United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

In Reply Refer to:
PEP ER-74/1078

NOV 21 1974

Dear Mr. Hilliard:

Thank you for your letter of August 20, 1974, requesting our views and comments on the work plan and draft environmental statement for the Mill Brook Watershed, Chenango County, New York. Comments on both documents are presented below.

Work Plan

The Department's Fish and Wildlife Service participated in the preparation of a Reconnaissance Report, dated February 5, 1973. That report outlined the following recommendations:

1. That public access and parking areas for bank fishing be provided at the single purpose impoundment (Site No. 1).

2. That public access, a parking area, and a boat-launching ramp be provided at the multiple-purpose impoundment (Site No. 2).

3. That bank stabilization, flood walls, or other measures be adopted as alternatives to the stream channelization features in the project plan, which will preserve the natural characteristics of Mill Brook to the fullest extent possible.

Our review of the work plan shows that Recommendation No. 2 has been accommodated but Recommendations No. 1 and No. 3 have not. Public access and parking areas for bank fishing are not provided for at Structure No. 1.

Paragraph 2, page 48, states that, "The flow of Mill Brook will be picked up at the outlet of a rectangular culvert at Main Street and carried through a closed concrete

transition section into a reinforced concrete pipe." Our concern is for filling the stream channel and completely obliterating that section of Mill Brook downstream to its mouth, a distance of 0.25 miles. As Recommendation No. 3 indicates, we feel that natural characteristics of a stream should be conserved to the fullest possible extent. Perhaps the work plan can be revised to state the reasons for selecting reinforced concrete pipe over open channel measures. As the channel work is now presented there is a foregone opportunity to develop the potential aquatic and associated resources which streams can provide in direct utilization and intangible but high aesthetic value.

The proposed project will not adversely affect any existing, proposed, or known potential unit of the National Park System, or any known historical, natural, or environmental education sites eligible for the National Landmark Program.

Known mineral resources of Chenango County include natural brines, rock salt, and sand and gravel. Of these, only sand and gravel is currently being produced. Within the watershed of Mill Brook, only one sand and gravel pit is in operation on the extreme western edge. In general, sand and gravel deposits directly affected by the proposed project are thin and unimportant except for occasional local use. We believe the impact on mineral resources will be insignificant.

Draft Environmental Statement

We have noted that comments have been solicited from the Advisory Council on Historic Preservation but apparently no contact has been made with the State Historic Preservation Officer. This is necessary to determine what potential National Register properties may be currently inventoried for future designation.

The draft statement indicates (page 38) that an archeological assessment was to be performed this summer. We have learned from the Syracuse Soil Conservation Service office that the survey would be accomplished during September. The results of this investigation should be discussed in detail in the final environmental statement.

We suggest that the archeologist's report be appended, if possible. Any significant archeological values should be discussed in terms of: the existing environment and efforts being made to preserve such values, as well as discussing unavoidable adverse effects if any, mitigation measures if preservation cannot be arranged, and any irreversible or irretrievable commitments.

On page 51, item f., states simply the adverse impact to be expected from installation of the reinforced concrete pipe. We believe this to be an inadequate discussion of an important project feature's impact on the local environment. The statement should discuss less damaging alternatives that might alleviate obliteration of the urban stream reach or otherwise permit present and future generations to enjoy the potential values of the natural stream habitat. Such alternatives would be bank stabilization, flood walls, or other measures.

Potential environmental problems related to geologic conditions are adequately discussed in the environmental statement. However, we suggest that, since some of the borrow material will apparently be obtained from outside the spillway and reservoir areas (pages 5 and 7), plans for restoration of the borrow areas should be discussed in the impact statement.

We do not expect that the proposed construction will cause any serious long-term adverse effects on water resources. As noted in the statement, an increase in sediment and turbidity will occur downstream during construction.

On page 25 of the statement, the water system of New Berlin is described as consisting of a small reservoir, a system of springs, and two wells. The locations of these springs and wells are not given. Without knowing their locations, we cannot determine if there might be some effect on them from the new construction. On page 28, impoundment 4 is a man-made reservoir used as the supplemental water supply from the village. On the project map of the watershed it would appear that this small reservoir is directly downstream from the proposed Site No. 2 dam. If this is true, then the anticipated effect of the new dam on the present reservoir should be discussed.

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

Sincerely yours,

Deputy Assistant Secretary of the Interior

Mr. Robert L. Hilliard
State Conservationist
Soil Conservation Service
Department of Agriculture
Room 400, Midtown Plaza
700 East Water Street
Syracuse, New York 13210

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

21 OCT 1974

Mr. Robert L. Hilliard
State Conservationist
Soil Conservation Service
700 East Water Street
Syracuse, New York 13210

Dear Mr. Hilliard:

This is in response to your letter of 20 August 1974 addressed to Commandant, U. S. Coast Guard concerning a draft environmental impact statement for the Mill Brook Watershed Project, Chenango County, New York.

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

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

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II
26 FEDERAL PLAZA
NEW YORK, NEW YORK 10007

OCT 22 1974 Class. ER-2

Mr. Robert L. Hilliard
U.S. Department of Agriculture
Soil Conservation Service
Room 400 Midtown Plaza
700 East Water Street
Syracuse, New York 13210

Dear Mr. Hilliard:

We have reviewed the draft environmental impact statement (EIS) for the Mill Brook Watershed in Chenango County, New York and have the following comments.

The water quality data provided in the EIS are not as recent or as extensive as the water quality data gathered by the EPA Rochester Field Office and made available to the Soil Conservation Service. A reviewing agency should be provided with all the available water quality information required to make a valid judgment of the environmental impact of a project, thus the final EIS should include the EPA data.

The section entitled "Environmental Considerations" has omitted the consequences resulting from the damming of a stream. The subsequent formation of a standing body of water will bring about physical, and possibly chemical, changes in that water. Whether these changes are detrimental or beneficial should be determined in the final EIS. The EPA Rochester Field Office's water quality survey has addressed itself to some of these potential changes and has offered suggestions to help minimize their effects.

Table G of the EIS lists the Southern Tributary and the Northern Tributary as being intermittent. Under some federal guidelines, a stream does not have to dry up completely to be considered intermittent and assigned a different water quality classification. The term intermittent as used here should be carefully defined in the final EIS.

The EIS states that the present amount of sediment reaching the mouth of the Mill Brook is about 390 tons/year and that implementation of the project will reduce the sediment load by 300 tons/year. There

would be a reduction of 20 tons/year by land management techniques, about 30 tons/year by downstream bank erosion control, and about 20 tons/year by management of the upstream gravel pit. Does this mean that the floodwater retarding structure and the multiple purpose structure would prevent 230 tons/year from reaching the stream's confluence with the Unadilla River? If so, the final EIS should discuss the life expectancy and the maintenance dredging requirements for this project. The final EIS should also discuss how the sediment figures were calculated and what data were used. A more meaningful representation might be to present the solids concentration information instead of the average sediment concentration figure which now appears.

The EIS states the possible future use of reservoir No. 2 for water supply purposes. Any change of purpose should be firmly and extensively addressed now to provide for comment under the review system. If a decision concerning the inclusion of municipal and industrial water supply as a project purpose cannot be made at this time, a new environmental impact statement dealing with any such future change in usage should be prepared. Also, although it is recognized that such a decision will be made at a later date, has any consideration been given to the types of boats to be permitted on the reservoir? If gasoline powered craft are allowed, an estimate of their pollution burden should be given.

Since the report and impact statements are not clear as to just where New Berlin's 12 MG reservoir is located in Mill Brook we must assume that it is located below both construction sites. The water from this reservoir is used by New Berlin which provides chlorination treatment. We note that the turbidity of the water is presently well within 1 ppm. This meets the proposed New York State turbidity standard of 1 ppm as against the present standard of 3 ppm. Turbidity is expected to soon be listed as a health or mandatory standard. In view of this, steps should be taken to prevent any increase in turbidity at the water supply intake. If turbidity cannot be controlled, use of the reservoir should be discontinued during construction.

The EIS states that preliminary investigations have indicated severe soil limitations for the septic tank leach fields. The final EIS should discuss the nature of the preliminary soil investigations and indicate if percolation tests were performed. The necessity for a specially designed sewage disposal system should be determined at this time, so that the appropriate structural costs can be included in the final EIS.

Not all the possible alternatives were discussed in the EIS. Only channelization and flood proofing were discussed in connection with the upstream reservoirs. Levees and/or flood walls were mentioned but only in connection with the ponding structures. The final EIS should discuss the use of levees and/or flood walls in conjunction with channelization downstream. Non-structural alternatives should also be discussed since only 13 acres of the entire watershed are flooded at the 100 year flood levels.

The final EIS should indicate the purpose of using a closed concrete pipe as opposed to an open channel through New Berlin. Stream flows through this area do not vary greatly and thus should maintain a stable bank of an open channel.

The final EIS should include a topographic map or aerial photograph to help determine the total impact of the proposed structures on the surrounding area. The heights and widths of these structures should also be indicated.

As a general note, land treatment measures play an integral part in the future success and general environmental compatibility of a project such as this. The final EIS should discuss what provisions were made to assure that these measures will be conscientiously carried out over the life of the project.

Thank you for the opportunity to review this EIS. All the information requested should be included in the final EIS. Four copies of the final EIS are requested for review.

Sincerely yours,

Paul H. Arbesman

Paul H. Arbesman
Chief
Environmental Impacts Branch

4-2-75 - copy to H. Stamatel

E. BIVENS
C-11

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II
26 FEDERAL PLAZA
NEW YORK, NEW YORK 10007

MAR 31 1975

Mr. Robert L. Hilliard
U.S. Department of Agriculture
Soil Conservation Service
Room 400 - Midtown Plaza
700 East Water Street
Syracuse, New York 13210

Dear Mr. Hilliard:

We have reviewed the Soil Conservation Service's March 5, 1975 responses to EPA's comments on the draft environmental impact statement for the Mill Brook Watershed and find them to be acceptable.

The topographic map, aerial photograph, and the structure centerline profile are being returned under separate cover. They were very helpful in our evaluation of the proposed project but need not be included in the final EIS.

Thank you for providing us with the additional data.

Sincerely yours,

Paul H. Arbesman

Paul H. Arbesman
Chief
Environmental Impacts Branch

CHENANGO COUNTY PLANNING BOARD

October 25, 1974

Mr. Robert Hilliard
700 East Water Street
Syracuse, New York 13210

Dear Mr. Hilliard:

The following are the comments of this agency relative to the environmental statement for the Millbrook Watershed, Chenango County, New York.

First and foremost the Chenango County Planning Board supports, endorses and recognizes the urgent need for this project. We are particularly concerned about the flood hazard within the town and village of New Berlin.

We do feel, however, that the potential adverse effects as stated in the Environmental Impact statement are understated. Specifically page 11 refers to potential adverse impact and that considerations be given to minimize their effects, particularly those induced by housing developments. This language appears to refer to potential hazard from urban development such as septic tank malfunctionings and other problems caused by inadequate standards from housing developments. Admittedly we are all speculating that additional homes will be developed around the immediate drainage area. I am sure that experience will bear out this assumption.

Our concern is the lack of effective local regulations. Chenango County does not have a health department, the town and village does not have subdivision ordinances nor do they have zoning. While the state exercises some jurisdiction it may not be adequate to prevent pollution of the lake, therefore, we would urge and recommend the adoption of local subdivision regulations by the village and town as well as sanitary ordinances. The adoption of these regulations would do much to prevent an adverse environmental situation.

99 NO. BROAD ST. • NORWICH, N.Y. 13815 • TEL. 607 334-3086

For your information we would advise you these are minor points that (page 35) there are no zoning. Page 38 there are no skiing areas in Chenango County. Page 64 this project was reviewed by Chenango County Planning Board as well as the newly created town and village planning boards of New Berlin. The regional A-95 agency is the Southern Tier East Regional Planning and Development Board.

Thank you for the opportunity of reviewing this project. These comments are intended as a positive criticism and will be withdrawn if they in anyway jeopardize or slow down the implementation of this needed project.

Very truly yours,

Martin Maier
Commissioner of Planning

MM:neg

P. S. Please be advised that this office would be more than willing to assist in the processing of any subdivision within the immediate area of this facility, and that we have coordinated our efforts with those of the newly created town and village planning boards.

Advisory Council
On Historic Preservation
1522 K Street N.W. Suite 430
Washington D.C. 20005

October 1, 1974

Mr. Robert L. Hilliard
State Conservationist
Soil Conservation Service
U.S. Department of Agriculture
Room 400 - Midtown Plaza
700 East Water Street
Syracuse, New York 13210

Dear Mr. Hilliard:

This is in response to your request of August 20, 1974, for comments on the environmental statement for the Mill Brook Watershed in Chenango County, New York. 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 while you have discussed the historical, architectural, and archeological aspects related to the undertaking, the Advisory Council needs additional information to adequately evaluate the effects on these cultural resources.

a. While we infer that the three historic places identified by the Office of State Parks and Recreation will not be affected, your statement does not specifically state this. Please furnish us with a copy of either your determination of effect or that of the Office of State Parks and Recreation.

b. When available please send the Advisory Council the results of this summer's archeological survey.

Should you have any questions or require any additional assistance, please contact Stephen Cochran of the Advisory Council staff at 202-254-3974.

Sincerely yours,

Ann Webster Smith

Ann Webster Smith
Director, Office of Compliance

APPENDIX D

DEFINITION OF LAND TREATMENT MEASURES

Conservation Cropping System: Growing crops in combination with needed cultural and management measures. Cropping systems include rotations that contain grasses and legumes as well as rotations in which the desired benefits are achieved without the use of such crops.

Contour Farming: Farming sloping cultivated land in such a way that plowing, preparing land, planting, and cultivating are done on the contour. (This includes following established grades of terraces, diversions, or contour strips.)

Diversion: A channel with a supporting ridge on the lower side constructed across the slope.

Pasture and Hayland Management: Proper treatment and use of pastureland or hayland.

Pasture and Hayland Planting: Establishing and reestablishing long-term stands of adapted species of perennial, biennial, or reseeding forage plants. (Includes Pasture and Hayland Renovation. Does not include Grassed Waterway or Outlet on cropland.)

Stripcropping: Growing crops in a systematic arrangement of strips or bands on the contour to reduce water erosion. The crops are arranged so that a strip of grass or close-growing crop is alternated with a strip of clean-tilled crop or fallow or a strip of grass is alternated with a close-growing crop.

Subsurface Drain: A conduit, such as tile, pipe, or tubing, installed beneath the ground surface and which collects and/or conveys drainage water.

Brush Management: Management and manipulation of stands of brush by mechanical, chemical, or biological means, or by controlled burning on rangeland, native pasture, pastureland, recreationland and wildlife-land. (Includes reducing excess brush to restore natural plant community balance and manipulating brush stands through selective and patterned control methods to meet specific needs of the land and objectives of the land user.)

Pond: A water impoundment made by constructing a dam or embankment, or by excavating a pit or "dugout".

Proper Grazing Use: Grazing at an intensity which will maintain enough cover to protect the soil and maintain or improve the quantity and quality of desirable vegetation.

Trough or Tank: A trough or tank with needed devices for water control and waste water disposal, installed to provide drinking water for livestock.

Tree Planting: Planting tree seedlings or cuttings.

Fishpond Management: Developing or improving impounded water to produce fish for domestic use or recreation.

Hedgerow Planting: Establishing a hedgerow or living fence of shrubs or trees within, across, or around a field.

Wildlife Wetland Habitat Management: Retaining, creating, or managing wetland habitat for wildlife.

Wildlife Upland Habitat Management: Retaining, creating, or managing wildlife habitat other than wetland.

NONGAME MAMMALS FOUND THROUGHOUT NEW YORK

Least Weasel

Chipmunk

Bonaparte's Weasel

N. Y. Weasel

Norway (House) Rat

Allegheny Wood Rat

Water Shrew

Smoky Shrew

Star-nosed Mole

Hairy-tailed Mole

Common Mole

Least Shrew

Short-tailed Shrew

Gray Fox

Red Squirrel

Eastern Flying Squirrel

Common (cinereous) Shrew

Pigmy Shrew

Say's Bat

Big Brown Bat

Pipistrelle

Hoary Bat

Canadian Deer Mouse

Woodland Jump Mouse

Red Backed Mouse

House Mouse

Field (Meadow) Mouse

Lemming Mouse

Rock (yellow-nosed) Vole

Red Fox

Woodchuck

LISTINGS OF REPTILES AND AMPHIBIANS

Reptiles	Common Name	Scientific Name
A) Snakes		
	Eastern Worm Snake	Carphophis amoenus amoenus
	Eastern Ring-Necked Snake	Diadophis punctatus edwardsi
	Northern Water Snake	Natrix sipedon sipedon
	DeKay's Snake	Storeria dekayi
	Eastern Ribbon Snake	Thamnophis sauritus sauritus
	Eastern Garter Snake	Thamnophis sirtalis sirtalis
	Eastern Hog-Nosed Snake	Heterodon platyrhinos platyrhinos
	Northern Black Racer	Coluber constrictor constrictor
	Eastern Smooth Green Snake	Opheodrys v. vernalis
	Black Rat Snake	Elaphe obsoleta obsoleta
	Eastern Milk Snake	Lampropeltis doliata triangulum
	Red-Bellied Snake	Storeria occipitomaculata
	Eastern Timber Rattlesnake	Crotalus horridus horridus
	Northern Copperhead	Ancistrodon contorteix mokeson
B) Turtles		
	Stinkpot	Sternotherus odoratus
	Wood Turtle	Clemmys insculpta
	Eastern Box Turtle	Terrapene carolina carolina
	Map Turtle	Graptemys geograp
	Eastern Painted Turtle	Chrysemys picta picta
	Common Snapping Turtle	Chelydra serpentina serpentina
	Spotted Turtle	Clemmys guttata
Amphibians		
A) Salamanders		
	Red Eft Newt	Diemictylus viridescens
	Red-Backed Salamander	Plethodon cinercus
	Slimy Salamander	Plethodon glutinosus
	Spring Salamander	Gyrinophilus porphyriticus
	Two-Lined Salamander	Eurycea bislineata
	Dusky Salamander	Desmognathus fuscus
	Spotted Salamander	Ambystoma maculatum
	Mountain Salamander	Desmognathus ochrophaeus

Amphibians	Common Name	Scientific Name
B) Toads & Frogs		
	Spadefoot	Scaphiopus holbrooki
	American Toad	Bufo terrestris americanus
	Fowlers Toad	Bufo woodhousei fowleri
	Cricket Frog	Acris gryllus
	Swamp Cricket Frog	Pseudacris nigrita triseriata
	Peeper	Hyla crucifer
	Tree Toad	Hyla versicolor
	Mink Frog	Rana septentrionalis
	Wood Frog	Rana sylvatica
	Pickerel Frog	Rana palustris
	Meadow or Lepard Frog	Rana pipiens
	Green Frog	Rana clamitans
	Bullfrog	Rana catesbeiana

APPENDIX E

SURVEY OF MILL BROOK WATERSHED SITES

Three archeologists from the State University of New York at Binghamton working under the supervision of Professor Fred Plog have examined the three sites of proposed activity by the United States Department of Agriculture Soil Conservation Service in the New Berlin Watershed. This report describes the various steps in the examination of the proposed projects and summarizes our findings.

1. Previous Archeological Activity in the Area

The first step in our efforts to assess the impact of the proposed project on cultural resources focused on previous archeological activity in the area. First, written records of archaeological researches in the vicinity of the proposed activity were examined. Second, we reviewed with Mr. Ted Whitney of the Chenango Chapter of the New York State Archeological Association that chapters knowledge of site distributions in the area. Third, we requested that Dr. Charles Gillette of the New York State Museum and Science Service examine that agencies files for any evidence of sites in the area. Fourth, we requested that Lenore Renenkampf of the New York State Historic Trust examine the files of that agency. The first two efforts resulted in no evidence of prehistoric cultural activity in the area. Dr. Gillette did indicate sites in the general area of the activity, and requested site examination by field archeologists.

2. Field Examination: Site No. 1

Project Site 1 lies on two properties designated Page and Graveson. The entire area to be affected by the proposed project on both properties was examined. The affected Graveson property lies on deeply forested hillsides through which a number of streams flow. The soil in the vicinity is quite shallow. The area was examined by three archaeologists who placed ten test pits in areas where the land surface was sufficiently gentle that a prehistoric occupation might have been present. However, no such evidence was found. Moreover, the owner reported having seen no artifacts while plowing and walking the area.

While in the field, permission was obtained to evaluate the Page properties. Fifteen test pits were placed in likely locations on this property and a cleared hay field immediately adjacent to the construction site was thoroughly traversed as it was felt that any cultural remains in the area would be evident in this extensive exposure. While some field flint was discovered in the test pits, no evidence of human activity at this site was found.

3. Field Examination: Site No. 2

Site 2 covers properties designated Nielsen, Tuttle, and Parry. Permission could not be obtained to examine either the Nielsen or Parry properties. Three archaeologists opened twenty small test pits at regular intervals over the Tuttle property. Soil in the location is very thin, some field flint was in evidence, but no prehistoric cultural remains were found. In addition, the archeologists consulted with the owner of the property who has seen no evidence of artifacts in plowing the area. While the Nielsen and Parry properties remain to be examined, no evidence of prehistoric cultural remains is indicated in the case of the Tuttle property.

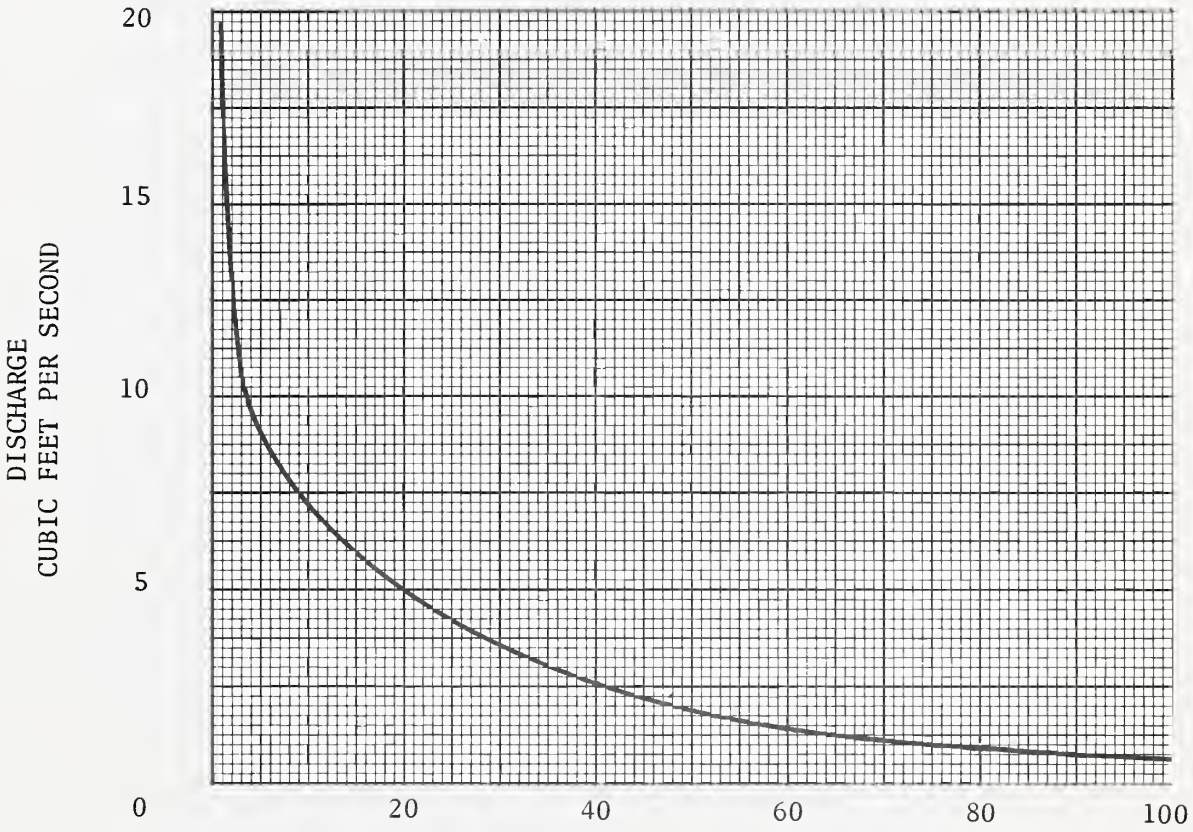
4. Field Examination: Site No. 3

Site 3 lies in the town of New Berlin. While test pits could not be dug, the archeologists consulted with the owner of the property, as well as, one individual who had helped dig the original drainage ditch. No one knew of any prehistoric cultural remains having been found in the process of constructing the ditch or in digging cisterns and gardens in its vicinity.

5. Conclusion

Therefore, survey indicates that the project is unlikely to have any adverse impact on archeological resources. However, in the event that archeological resources are discovered during the project, the New York Archeological Council should be notified.

APPENDIX F



MILL BROOK - FLOW DURATION 1/

1/ Period of record: April 30 to September 25, 1974

MILL BROOK WATERSHED
Water Quality Survey

Sections I and II of the original report, in essence, were excerpts from the work plan, therefore they were deleted to save space. Copies of the complete report, Water Quality Survey, may be obtained from the U.S. Environmental Protection Agency, Region II, Rochester Field Office.

III. INVESTIGATION FORMULATION

A. Site Selection - Sampling stations were selected with three specific purposes in mind:

1. to evaluate the existing stream water quality;

2. to isolate possible sources of pollution; and

3. to obtain the best possible indication of quality that might be anticipated within the proposed reservoir.

The five sampling stations selected are shown in Figure 1 and are described below:

MB - 1; North branch at Sherburne Turnpike at upper end of proposed single-purpose impoundment.

MB - 2; South branch at lower end of abandoned water supply reservoir.

MB - 3; South branch 100 feet upstream of the upper end of the abandoned water supply reservoir.

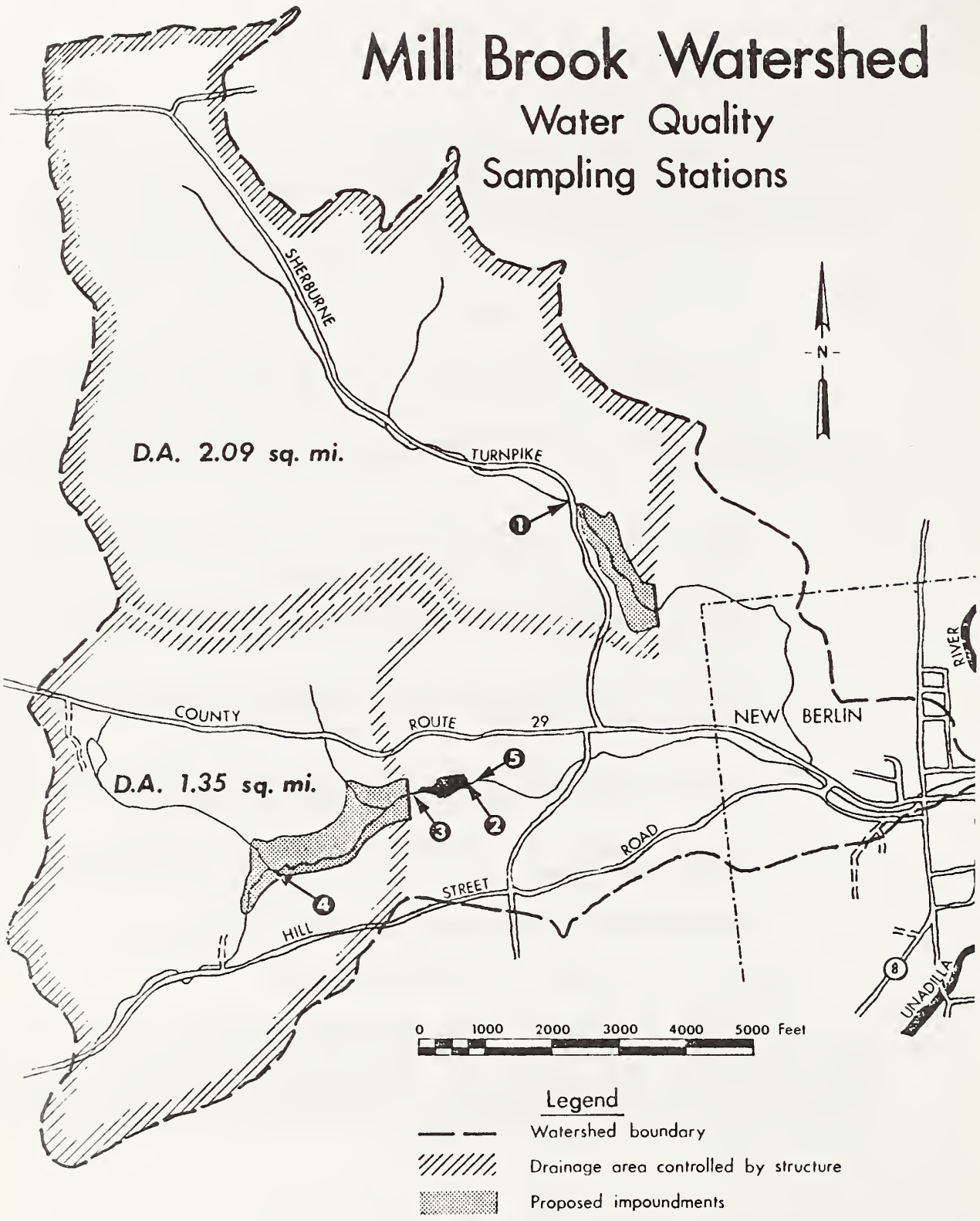
MB - 4; South branch 30 feet downstream of stream fork at upper end of proposed multi-purpose impoundment.

MB - 5; South branch 300 feet downstream of abandoned water supply dam.

(Physical descriptions are presented in Section IV.)

Reasons for each choice are discussed below:

Station MB - 1 was selected as being representative of the input to the single-purpose impoundment. It was considered that the nature of the use for which this structure is intended, coupled with the character of land use in the area, provides for an adequate assessment of water quality to be made from this station.


Mill Brook Watershed
Water Quality
Sampling Stations
SHERBURNE
N
D.A. 2.09 sq. mi.
TURNPIKE
1
RIVER
COUNTY
ROUTE
29
NEW BERLIN
D.A. 1.35 sq. mi.
5
3
2
ROAD
4
STREET
HILL
8
UNADILLA
0
1000
2000
3000
4000
5000 Feet
Legend
Watershed boundary
Drainage area controlled by structure
Proposed impoundments

Stations MB - 2 and MB - 3 have been used to evaluate the input to and outflow from the existing water supply reservoir located just downstream of the multi-purpose site. Although this existing impoundment will not itself be used to fulfill the overall project objectives it was considered that it affords an excellent opportunity to evaluate the condition of a standing body of water fed by the same sources which will feed the proposed site Number 2. The water quality of the future reservoir could thus be inferred by studying the quality of the existing one.

Station MB - 4 was chosen with rationale similar to MB - 1. In this case, however, the sampling site had to be placed within the borders of the proposed permanent pool in order to be downstream of the junction of two of the three major tributary inputs to the proposed multi-purpose reservoir. Land use within the watershed of these two tributaries is similar, therefore it was felt that one sampling location was adequate for both. The third significant tributary discharges only a few hundred feet upstream of the proposed dam. Inputs from this tributary will be reflected in the data collected at MB - 3.

Station MB - 5 was selected to evaluate stream conditions downstream of the existing reservoir. It should be noted when rationalizing the choice for this station's location that station MB - 2, although not far upstream, is located just within the reservoir at its downstream end and thus was expected to reflect more the conditions typical of a lake rather than a stream.

B. Selection of Physical and Chemical Parameters - The primary factors considered in deciding on relevant parameters for the Mill Brook Survey were:

1. existing and future water uses;
2. existing and future land use;
3. types of wastewater discharges; and
4. applicable water quality standards criteria.

Of the above, the controlling factor in the selection of parameters was the proposed water uses at the multi-purpose reservoir, e.g., swimming

and development of a warm and cold water fishery. Because of the intended recreational usage, particularly swimming, the important criteria are aesthetics, clarity, pH, nutrients and bacteriological indicators. Relative to the fisheries or aquatic life in general, such things as dissolved oxygen, pH, toxic metals, organic compounds, pesticides, solids and temperature are important. For this survey, 48 physical and chemical parameters were included.

C. Frequency - At the start of the survey, it was agreed that the total number of surveillance trips required plus their relative timing should remain flexible. Any firm decision was reserved until the preliminary sampling information could be examined to determine the nature and extent of the water quality problems, if any.

Five sampling surveys were carried out on the watershed. Each site was sampled on every survey with one exception; MB - 5 had not yet been established when the first survey was carried out on 7 March 1974 and so was not included that day. This first sampling trip was carried out in early March so that winter conditions might be observed and evaluated. The other four trips were made at approximate two week intervals beginning on 4 April and ending on 5 June 1974.

A sixth survey was conducted on 9 July, 1974 to resolve questions raised by the previous analyses. Areas of concern to which this survey addressed itself were:

1. Moderate amounts of nutrients available for algal growth. In addition to obtaining further nutrient data, it was felt that the most conclusive type of evidence would be a visual observation of the existing water supply reservoir during a critical growth period.

2. Temperatures which were found to be of some concern relati to the proposed fisheries.

3. Results of the bottom sediments collected earlier near the upper end of the existing reservoir which indicated that moderate amounts of toxic metals were present.

Relevant findings from the sixth survey may be found in Appendix "C".

IV. FIELD SURVEILLANCE

A. Physical Characteristics - Water quality samples were collected at only one station on the north tributary of Mill Brook. This station location is upstream of the proposed structure site Number 1. Four additional stations are located both above and below the proposed structure Number 2 on the south branch of Mill Brook. The station on the north branch, MB - 1, is located at the furthest downstream crossing of the brook by the Sherburne Turnpike. At this point the brook is rapidly flowing down a rocky bed that ranges from three to six feet in width and is between one-half and one foot in depth. The water is kept nearly saturated with oxygen by the continuous riffles.

The farthest upstream station on the south branch, MB - 4, is located in pastureland at the upper end of the proposed permanent pool behind structure Number 2. The samples were taken about ten yards downstream of the last fork in the brook. The brook flows through pools ranging from two to six feet wide and one-half to one foot deep with small riffles separating them. The stream bottom is mainly a mixture of sand and clay. The next station downstream, MB - 3, is located 100 feet upstream of the existing reservoir. This reservoir was formerly used as the water supply for the village of New Berlin but is now considered to be its emergency standby fire protection. Flowing in a rocky bed, the brook is equally divided into pool and riffle segments, one-half to one foot deep and two to four feet wide. Where the stream enters the reservoir, the water depth increases gradually and the bottom becomes a mixture of stone, leaves and sediment. A sample of the bottom sediment was collected in three feet of water about 50 feet from shore and was analyzed for toxic metals and pesticides. Another station, MB - 2, is located in the downstream end of the reservoir about 50 feet from its outlet. Water samples were taken in one to two feet of water which overlies a rock bottom. The outlet flows down a concrete spillway and the last sampling station, MB - 5, is located about 100 feet downstream from the lower end of the spillway. Here the brook continues downhill over low riffles three to eight feet wide and one-half to one foot deep with a rocky bed.

B. Sampling Procedures - The sampling procedures were similar at each station on every sampling survey. Bottles were manually filled at mid-depth at each station for laboratory analyses. Dissolved oxygen content was measured in the field by a calibrated dissolved oxygen meter

or by the Winkler method of titration from an APHA sampling unit. The temperature was measured by field thermometers and the pH was determined in the field on a portable pH meter. The bottles for chemical and bacteriological analysis were kept on ice while being transported to the laboratory.

C. Flow Measurements - An approximate flow measurement was made at the reservoir spillway on April 16, 1974 and a second measurement was attempted on June 5, 1974. The flow was determined by measuring the time of travel of a spot of dye for a known distance at four locations across the spillway and weighting the elapsed times by the cross-section areas of each dye spot's path. The flow, computed as the volume of water in the measured area divided by the average time, was eight cubic feet per second. The attempt to measure the flow on June 5 after a warm week without rain was frustrated by the shallowness of the water and the growth of algae in the spillway. The flow in the spillway was estimated at one to two cubic feet per second. No other sections of the brook had a constant cross-section over a sufficient length for the flow to be measured. SCS had a permanent type gaging station installed by the U.S. Geological Survey during the latter part of this survey. Preliminary flow data from this gage are available covering the last few weeks of the field surveillance work.

V. LABORATORY ANALYSES

The procedures used for the laboratory analyses of the water quality samples are set forth in Standard Methods for the Examination of Water and Wastewater, 1971 and the Environmental Protection Agency Methods for Chemical Analysis of Water and Wastes, 1971. Normal quality control procedures were followed to insure the validity of the data.

In some instances, the analysis did not meet the rigorous requirements of the standard methodology developed to provide legally enforceable data and these data (See Appendix "A") are so noted with an asterisk. Due to equipment breakdown, the organic nitrogen data that are noted were analyzed by the Technicon method rather than the EPA method. The total organic carbon, nitrate-nitrite-nitrogen and ammonia-nitrogen data, so noted, were held an additional day beyond the prescribed maximum holding time. The dissolved phosphorus data that are noted came from samples which were filtered in the laboratory rather than in the field at the time of collection. The bacteriology data that are noted results from not having any membrane filter plate on which the number of colonies fell within the recommended range. It should be emphasized that all values are useful for comparison, especially the bacteriology data which show that the number of fecal coliform and fecal strep organisms were very low.

VI. WATER QUALITY

A. General - Water quality determinations for the Mill Brook watershed were based primarily on the two volumes of the EPA publication Criteria for Water Quality dated October 1973. Almost all the criteria were taken from the National Academy of Science's report on Water Quality Criteria developed under contract to the EPA. Water quality criteria as compiled in these documents are defined as the acceptable limits of constituents in receiving waters based on an evaluation of the latest scientific information by EPA. Synergistic effects generally were not considered in development of these criteria. In any case, such effects are unlikely to be significant for this watershed because of the limited nature and sources of pollutants.

B. Stream At the time of EPA's investigation in the spring of 1974 the water quality in the Mill Brook watershed was excellent. There seems to be little significant difference in the water quality of the two major branches.

The sediment load, as shown by the total suspended solids and as supported by the turbidity data, is low. Conductivity values, which are a quick measure of the ion concentration and a rough indicator of mineral salts or brine and various chemical wastes, ranged from 76 to 139 micromhos per cm. These are extremely low values even for inland fresh water. The amount of oxygen-demanding organic material, as shown by the total organic carbon and organic and ammonia nitrogen levels, is very low. During the sampling period, dissolved oxygen at all stations did not drop below the 86 percent saturation level and often was in the super-saturation range.

A moderate amount of bacterial contamination is occurring in Mill Brook, but the coliform data indicate that it is from livestock wastes rather than from human sources. This was further substantiated by the fact the surveillance crew was often accompanied by cattle sampling the water at the same time.

Only a moderate amount of nutrients, as shown in the nitrate-nitrite-nitrogen and phosphorus data, are available for algal growth. Of these, total phosphorus was the only parameter which had an unusual increase at all stations during the May 15th sampling run. This was followed by an even sharper decline in June to previous low values. Apparently these data correspond with the application of fertilizer in May. Information provided EPA shows that at least 50 acres were fertilized above the proposed Site No. 1. This was mostly top dressing of pastures. Above Site No. 2, three fields were fertilized with a bulk spread and the balance through the planter.

For convenience, some of the significant parameters are presented graphically in Figure 2. Each individual full size block in Figure 2 represents 1 mg/l. A tabular presentation of chemical data and pertinent field observations appears in Appendix "A".

Results of the pesticide and toxic metals investigations are presented in Appendix "B". These were obtained from a single sediment sample collected at a point where the stream enters the water supply reservoir. Bottom sediments were analyzed in preference to water samples in an effort to obtain the best possible indication of both past and present usage of pesticides plus detection of any toxic metals which might have accumulated.

From an examination of 14 different pesticides, only DDT and DDE were present in measureable amounts. These values were low and should steadily decrease since all agricultural usage of these pesticides in this area was banned by EPA in June of 1973.

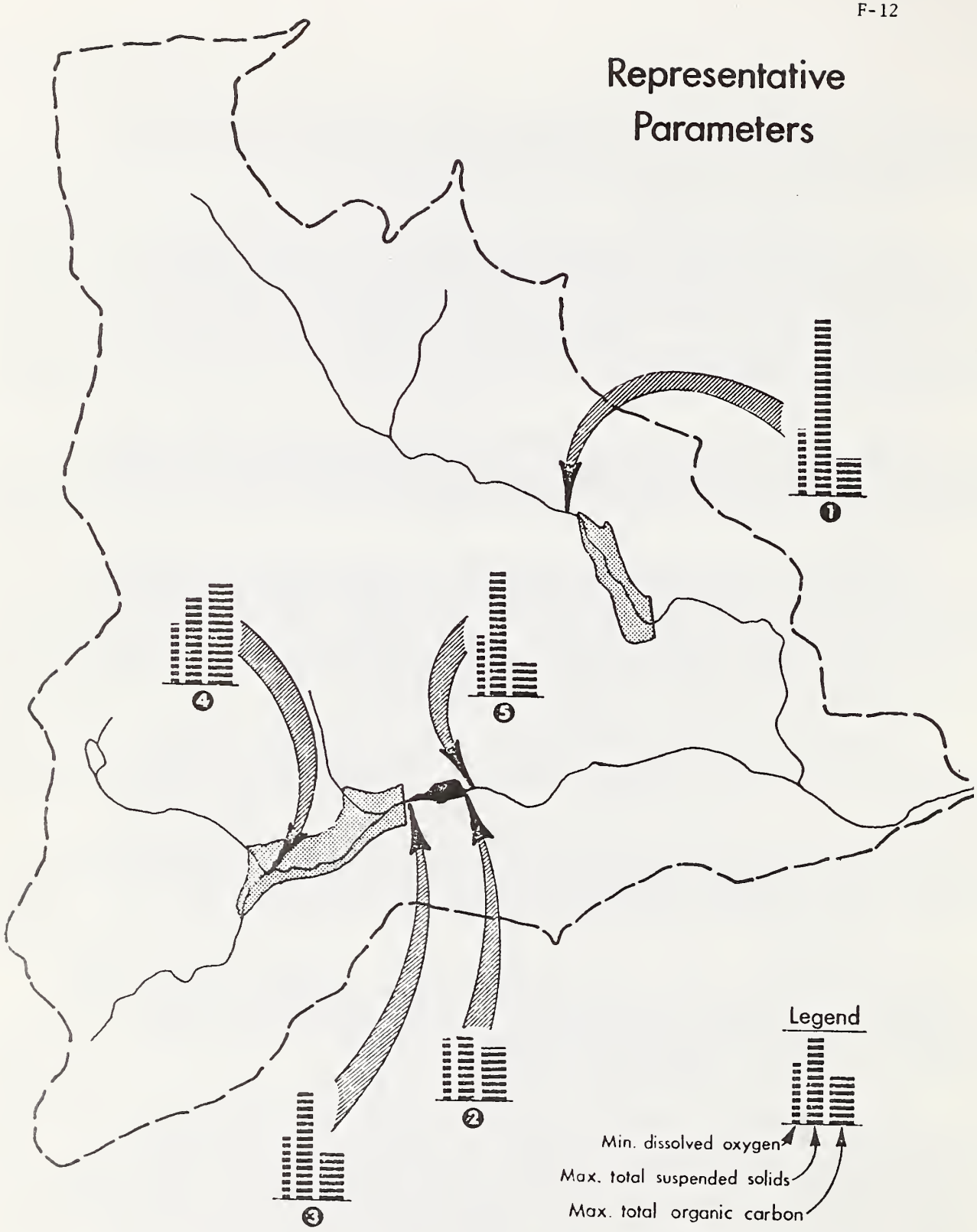
The sediment data further indicated that the 12 metals analyzed were all present in varying concentrations. A comparison of the metal values obtained at Mill Brook, with work done elsewhere, indicated that the sediments were relatively high in toxic metals. However, it is unlikely that these are present in a form or high enough concentrations to cause any problems for the intended water uses.

An additional surveillance trip was made on July 9th to verify the sediment results and extend the analyses to water samples as well. Results are presented in Appendix "C" and do substantiate our earlier contention that the toxic metal concentrations found in the water are not high enough to cause any serious problem. The only metal which is borderline relative to research performed by the National Water Quality Laboratory is mercury. However, concentrations fall within the lower range of levels found in selected rivers of the United States.

C. Reservoir - When a free-flowing stream is dammed, the resulting impoundment causes an increase in detention time accompanied possibly by thermal stratification, both of which exert a marked effect on water quality. Some of the related effects of impoundments improve the water, while others deteriorate the quality.

The proposed SCS reservoir Site No. 1 on the north branch is a single purpose flood control structure. As such, it will not have a large permanent pool. A small four to five acre pond may be formed on a permanent basis, but because of the excellent water quality of the north branch and the continual exchange of water which should take place, no serious degradation is anticipated. It is even possible that a slight reduction in the sediment load might be achieved through temporary detention during excessive run-off periods.

Figure 2


Representative Parameters
1
2
3
4
5
Legend
Min. dissolved oxygen
Max. total suspended solids
Max. total organic carbon
Note: All values in mg/l
(1 block = 1 mg/l)

The proposed SCS reservoir Site No.2 on the south branch of Mill Brook, is a multi-purpose structure. Intended water use is for body-contact recreation and development of a warm and cold water fishery. When examining Site No.2, it is extremely important to:

1. assess the existing quality of incoming water to the reservoir;

2. predict how the reservoir will change the characteristics of the incoming water; and

3. consider the downstream effects of the reservoir.

The stream quality, discussed in the previous sub-section, is presented in tabular form in Table No. 1. Particular attention was devoted to those parameters related directly to proposed reservoir water uses. Table No.1 also depicts what the acceptable limits are for the aforementioned water uses. Water sampling stations MB -3,4 and 5 were summarized collectively as being representative of stream conditions in the south branch. Station MB - 2 was isolated since it is located in the lower end of the existing water supply reservoir and is perhaps most representative of what might be expected at Site No.2.

In comparing the data in Table 1 with acceptable limits, both nutrients and temperature deserve further consideration. Total phosphorus values approach concentrations which could promote nuisance aquatic plant growths or algal blooms. Excessive growths of algae may destroy the esthetic and recreational value of a reservoir in addition to being a safety hazard. Algae may discolor the water and cause turbidity. Wave action may wash large masses of unsightly decaying algae onto bathing beaches causing obnoxious odors. Fish mortality may result from direct poisoning or from oxygen imbalance caused by algae. Blue-green algae often associated with more advanced eutrophic stages may cause problems to both fish and bathers alike. The point to be made here is that exceptions to the stated phosphorus limits in Table 1 must be recognized and made an intregal part of any reservoir management program in order to avoid such occurrences.

In the case of Site No.2, several factors may tend to lessen the development of excessive algal blooms and provide the cooler temperatures necessary for a cold water fishery. Construction of structure No. 2 and the public fish and wildlife development will require the acquisition of 180 acres of land by fee simple title. This will require the removal of one set of farm buildings and the relocation of one family. With this action nutrient input should be reduced to lower concentrations. Also, improved land treatment measures will be implemented at the remaining farms.

TABLE 1

WATER USE CONSIDERATIONS
(Multi-Purpose Project)

Parameter (Units) Sampling Station	No. of Samples	Range (Min.-Max.)	Acceptable Limits: Body-Contact Recreation	Acceptable Limits: Warm & Cold Water Fishery
Dissolved Oxygen (mg/l)				
MB-3,4,5	12	8.4 to 11.4	----------	6.0 Min. (1)
MB-2	5	8.8 to 11.9	----------	6.0 Min.
pH				
MB-3,4,5	13	7.4 to 8.3	6.5 to 8.3	6.5 to 8.5 (1)
MB-2	4	7.4 to 8.0	6.5 to 8.3	6.5 to 8.5
Fecal Coliform (/100 ml)				
MB-3,4,5	12	2 to 112	Approx. 200 Max.	----------
Phosphorous (ug/l)				
MB-4,5	9	8 to 61	100 Max.	----------
MB-3	5	10 to 51	50 Max. (2)	----------
MB-2	5	7 to 41	25 Max.	----------
Temperature (°C)				
MB-3,4,5	12	6.0 to 21.0	30.0 Max.	15.0 to 17.0 (3)
MB-2	5	7.0 to 20.2	30.0 Max.	15.0 to 17.0

FOOTNOTES:

1. Proposed NYS standards (6.0 mg/l D.O., min. daily avg. for trout)

2. At a point where a stream enters a lake or reservoir

3. Optimum or preferred temperature for lake trout; reference: Calif. Water Quality Control Bd., "Water Qu
Criteria".

In the reservoir, the depth will be such that thermal stratification should take place. This could be beneficial for two reasons:

1. Both a spring and fall turnover should occur. This mixing will help control excessive buildups of nutrients in the hypolimnion. Because the longitudinal axis of the reservoir lies generally in an east-west direction with prevailing winds from the west, a more thorough mixing probably will be achieved. This will also help to maintain a higher level of dissolved oxygen in the hypolimnion.

2. Stratification will provide a zone of cooler temperatures below the thermocline which is necessary to support a cold water fishery.

In summary, the possibility of nutrient or temperature related problems deserves serious recognition but, because of the measures already advocated by SCS, is not expected to be a major problem in this case.

A sixth survey was made in July to clarify questions raised by earlier sampling concerning the eutrophic potential within the proposed reservoir, temperature differentials and toxic metal analyses as previously mentioned. Field data, obtained while air temperatures were approximately 90° Fahrenheit, showed dissolved oxygen at 88 percent of saturation or better at all stations. A stream temperature differential of 8° centigrade existed between station MB - 1 on the north branch and MB - 3 on the south branch. The apparent reason for this difference is that the area upstream of MB - 1 is densely wooded, while upstream of MB - 3 there are extensive reaches exposed to direct sunlight. Surprisingly, there was no apparent temperature increase from the inlet to outlet of the shallow water supply reservoir. The area surrounding the reservoir and immediately downstream also have excellent cover. A decrease in temperature was observed from the outlet to station MB - 5 downstream. This illustrates the importance of maintaining adequate vegetative cover along the stream. Improved cover in the upstream reaches of the south branch would aid in maintaining lower reservoir water temperatures.

Visual observations during the July survey revealed no problems from excessive algal blooms. The only growths noted in the reservoir proper was a small patch of rooted aquatic plants north of the spillway and another small patch at the upper end of the reservoir.

Other important parameters not included in Table 1, but which did receive consideration are such things as solids, clarity and general esthetics. These may be found in Appendix "A".

No downstream water quality problems are foreseen as a result of the single purpose project (Site 1). At the multi-purpose Site 2, however, possible thermal and dissolved oxygen problems could develop immediately downstream and perhaps in the water supply reservoir. Normal flow release procedures are to draw water from the surface of the epilimnion through an ungated vertical riser. However, a gated horizontal bottom drain is provided, so that if thermal problems should develop downstream or dissolved oxygen depletion problems occur in the hypolimnion, combined releases from both might be beneficial. With reference to downstream dissolved oxygen problems, it is obvious that some reaeration will take place at the point of reservoir discharge as it drops four to five feet into the plunge pool. These problems are not considered to be of a serious nature even if they should occur and could probably be resolved in a manner as suggested above.

During construction of all projects, SCS has proposed steps to reduce sedimentation downstream. These include the stripping of borrow areas only as they are ready for use and the construction of temporary sediment basins where feasible. These measures should help keep adverse downstream effects to a minimum.

D. Biological Observations - The biological field investigation on the Mill Brook Watershed Project was conducted on May 15, 1974. Four stations were investigated and observations for each are listed below:

Station MB - 1; Station 1 showed no signs of being affected by excessive nutrients (e.g., very little periphyton, such as algae, was present) or organic overloading. The dominant macroinvertebrate group in the riffle community was the mayflies. Other organic pollution intolerant-facultative type organisms (e.g., Psephenus sp., riffle beetles; and caddisflies) were present.
Overall Evaluation - unpolluted (undisturbed community).

Station MB - 3; The pool and riffle areas at this station showed no indications of being polluted (e.g., oil in sediments or excessive aquatic vegetation). The riffle macroinvertebrate community was dominated by the may flies and other organisms characteristic of relatively clean water (e.g., caddisflies, riffle beetles and black flies).
Overall Evaluation - unpolluted

Station MB -4; This area supported the most aquatic vegetation (e.g., algae and aquatic plants) of any of the four stations investigated. However, the station appeared to be only marginally enriched (nutrient). Northern creek chubs were observed and the riffle macroinvertebrate community was dominated by the caddis flies (which reflects the increase in algae since it is part of their diet) and other organic pollution intolerant-facultative type organisms (e.g., mayflies, riffle beetles, black flies and midges).
Overall Evaluation - relatively clean but with some indication of minor enrichment.

Station MB - 5; The pools and riffle areas at Station 5 showed no signs of being polluted. The riffle macroinvertebrate community was again dominated by organic pollution intolerant-facultative type organisms (e.g., mayflies, riffle beetles, stoneflies and black flies).
Overall Evaluation - unpolluted (normal community).

The biological field investigation demonstrated that all stations were unpolluted except MB - 4, which had only minor indications of enrichment. Livestock are grazed along the stream above station MB - 4, but this situation is subject to change in accordance with proposals made by the SCS.

VII. CONCLUSIONS AND RECOMENDATIONS

The water quality on the north branch of Mill Brook is excellent; no problems should result from the construction of a single purpose flood control structure at Site No. 1. On the south branch, at Site No. 2 for the proposed multi-purpose structure, no serious problems are foreseen. However, it is important that SCS institute the proposed land treatment measures and insure that livestock grazing areas bordering the creek either be carefully controlled or relocated. This in itself will probably be satisfactory to prevent the occurence of minor eutrophic problems which might otherwise develop within the reservoir and in turn cause some downstream problems.

An additional measure, which would be extremely beneficial in maintaining cooler temperatures and thereby promoting higher levels of dissolved oxygen, is to encourage, where feasible, the planting of trees along the upstream reaches of the south branch.

As a result of information derived from this survey, it is rec-- ommended that Mill Brook be considered as an ideal pilot watershed for future follow-up investigations. This watershed, in particular the south branch, would readily lend itself to more detailed analyses with minimal resource requirements.

Future studies could provide useful information with regard to the water quality effects during and after construction both in the reservoir and downstream of Site No. 2. They would also afford an opportunity to determine the effects of proposed land treatment measures on the water quality. Current release patterns from the reservoir and effects of the plunge pool on water quality could be examined and result in a redesign of future outlet works or an improved operational management program benefiting all water uses. Above all, a sound base would be provided from which to more accurately predict the effects of similiar projects on water quality.

While considerable information has been compiled on water quality behavior in reservoirs, very little of this information provides the necessary background for making accurate predictions. Earlier investigations tended to either focus attention on one or two parameters which, in many cases did not present the before and after situation, or neglected some of the physical, geologic and hydrologic data essential to such a study. Therefore, this is an excellent opportunity for a joint study between SCS and EPA, which would provide both agencies with a wealth of knowledge.

Appendices

APPENDIX A

MILL BROOK WATERSHED, CHENANGO COUNTY, NEW YORK
MB - 1; North Branch At Sherburne Turnpike At Upper End Of Proposed Single-Purpose Impoundment

Date	3/7/74	4/16/74	4/30/74	5/15/74	6/5/74
Sampling Method	Grab	Grab	Grab	Grab	Grab
RFO Lab No.	0698	0704	0719	0740	0766
Time	1145	1033	0705	1100	1045
Weather	Overcast	Clear	Overcast	Partly Cloudy	Clear
Surface	Clean	Clean	Clean	Clean	Clean
Bottom	Rock	Rock	Rock	Rock	Rock
Color	Clear	Clear	Clear	Clear	Clear
Air Temperature (°C)	--	4	16	26	29
Sample Depth (Ft.)	0.5	0.5	0.5	1.0	0.5
pH	7.5	7.4	7.0	7.3	7.7
Temperature (°C)	10.0	5.0	10.0	13.0	15.5
Dissolved Oxygen (mg/l)	--	11.5	10.4	9.1	9.9
Turbidity (J.T.U.)	3.3	2.0	9.0	5.0	1.7
Total Solids (mg/l)	--	70	103	51	93
Dissolved Solids (mg/l)	--	60	79	48	87
Total Sus. Solids (mg/l)	--	10	24	3	6
Conductivity (u mhos/cm)	76	--	--	--	--
Chloride (mg/l)	1.6	--	--	--	--
Total Organic Carbon (mg/l)	1.6	--	5.4*	--	5.3
Organic Nitrogen (mg/l)	0.107	0.103*	0.068*	0.170*	0.105
Ammonia Nitrogen (mg/l)	0.023	0.008*	0.009	< 0.001	0.027
NO2-NO3 Nitrogen (mg/l)	0.359	0.407*	0.266	0.168	--
Total P (mg/l)	0.023	0.019	0.031	0.071	0.010
Dissolved P (mg/l)	0.015	0.011	0.022*	--	0.007
Total Coliform/100 ml	--	--	--	--	4100
Fecal Coliform/100 ml	==	--	--	--	29
Fecal Strep/100 ml	--	--	--	--	34

*Analysis did not meet standard requirements

APPENDIX A

MILL BROOK WATERSHED, CHENANGO COUNTY, NEW YORK
MB - 2; South Branch At Lower End Of Abandoned Water Supply Reservoir

Date	3/7/74	4/16/74	4/30/74	5/15/74	6/5/74
Sampling Method	Grab	Grab	Grab	Grab	Grab
RFO Lab No.	0699	0705	0720	0741	0768
Time	1312	1125	0751	1130	1130
Weather	Overcast	Clear	Overcast	Partly Cloudy	Clear
Surface	Ice	Clean	Clean	Clean	Clean
Bottom	Rock	Rock	Rock	Rock	Rock
Color	Clear	Clear	Clear	Clear	Clear
Air Temperature (C°)	--	--	16	28	29
Sample Depth (Ft.)	1.0	--	0.5	1.5	0.5
pH	--	7.4	8.0	7.8	7.9
Temperature (C°)	11.0	7.0	14.0	15.5	20.2
Dissolved Oxygen (mg/l)	11.9	10.9	9.2	9.4	8.8
Turbidity (J.T.U.)	4.5	4.8	3.0	3.0	1.4
Total Solids (mg/l)	--	76	124	85	114
Dissolved Solids (mg/l)	--	67	119	78	111
Total Sus. Solids (mg/l)	--	9	5	7	3
Conductivity (u mhos/cm)	139	--	--	--	--
Chloride (mg/l)	3.4	--	--	--	--
Total Organic Carbon (mg/l)	2.1	--	6.7*	--	7.8
Organic Nitrogen (mg/l)	0.327	0.180*	0.099*	0.141*	0.173
Ammonia Nitrogen (mg/l)	0.056	0.010*	0.009	< 0.001	0.027
NO2-NO3 Nitrogen (mg/l)	1.113	0.909*	1.026	0.627	--
Total P (mg/l)	0.030	0.020	0.021	0.041	0.007
Dissolved P (mg/l)	0.021	0.013	0.017*	--	0.005
Total Coliform/100ml	--	--	--	--	--
Fecal Coliform/100ml	--	--	--	--	--
Fecal Strep/100ml	--	--	--	--	--
Stream Flow (cfs)	--	8	--	--	1-2(Est.)

*Analysis did not meet standard requirements

APPENDIX A

MILL BROOK WATERSHED, CHENANGO COUNTY, NEW YORK
MB - 3; South Branch 100 Feet Upstream Of The Upper End Of The Abandoned Water Supply Reservoir

Date	3/7/74	4/16/74	4/30/74	5/15/74	6/5/74
Sampling Method	Grab	Grab	Grab	Grab	Grab
RFO Lab No.	0700	0707	0722	0743	0769
Time	1330	1145	0850	1135	1145
Weather	Overcast	Clear	Overcast	Partly Cloudy	Clear
Surface	Clean	Clean	Clean	Clean	Clean
Bottom	Rock	Rock	Rock	Rock	Rock
Color	Clear	Clear	Clear	Clear	Clear
Air Temperature (°C)	--	--	15	27	30
Sample Depth (FT)	--	--	0.5	--	0.5
pH	7.9	7.7	8.0	7.7	8.3
Temperature (°C)	13.0	8.0	13.0	17.0	18.5
Dissolved Oxygen (mg/l)	11.2	11.1	9.8	8.9	9.9
Turbidity (J.T.U.)	3.4	2.3	4.0	3.0	1.7
Total Solids (mg/l)	--	75	135	65	137
Dissolved Solids (mg/l)	--	75	120	55	134
Total Sus. Solids (mg/l)	--	0	15	10	3
Conductivity (u mhos/cm)	119	--	--	--	--
Chloride (mg/l)	3.2	--	--	--	--
Total Organic Carbon (mg/l)	1.6	--	5.0*	--	7.0
Organic Nitrogen (mg/l)	0.172	0.118	0.109*	0.131	0.1
Ammonia Nitrogen (mg/l)	< 0.001	< 0.004*	0.009	< 0.001	0.0
NO2-NO3 Nitrogen (mg/l)	1.041	1.110*	1.131	0.727	--
Total P (mg/l)	0.024	0.010	0.025	0.051	0.0
Dissolved P (mg/l)	0.014	0.003	0.015*	--	0.0
Total Coliform/100ml	--	610	1200	2100	3100
Fecal Coliform/100ml	--	7*	29	84	68
Fecal Strep/100ml	--	8*	83	96	74

*Analysis did not meet standard requirements

APPENDIX A

MILL BROOK WATERSHED, CHENANGO COUNTY, NEW YORK
MB - 4; South Branch 30 Feet Downstream Of Stream Fork At Upper End
Of Proposed Multi-Purpose Impoundment

Date	3/7/74	4/16/74	4/30/74	5/15/74	6/5/74
Sampling Method	Grab	Grab	Grab	Grab	Grab
RFO Lab No.	0701	0708	0723	0744	0770
Time	1430	1235	0940	1255	1210
Weather	Overcast	Clear	Partly Cloudy	Partly Cloudy	Clear
Surface	Clean	Clean	Clean	Clean	Clean
Bottom	Gravel	Gravel	Gravel	Gravel	Gravel
Color	Clear	Clear	Clear	Clear	Clear
Air Temperature (°C)	--	6	18	--	29
Sample Depth (Ft.)	0.5	0.5	0.5	--	0.5
pH	--	7.4	8.0	7.7	8.0
Temperature (°C)	--	--	13.0	17.0	21.0
Dissolved Oxygen (mg/l)	--	11.1	10.5	8.4	10.4
Turbidity (J.T.U.)	3.0	2.2	3.0	3.0	2.4
Total Solids (mg/l)	--	57	115	92	117
Dissolved Solids (mg/l)	--	45	106	86	110
Total Sus. Solids (mg/l)	--	12	9	6	7
Conductivity (u mhos/cm)	109	--	--	--	--
Chloride (mg/l)	--	--	--	--	--
Total Organic Carbon (mg/l)	1.3	--	14.0*	--	7.8
Organic Nitrogen (mg/l)	0.163	0.135*	0.099*	0.131	0.171
Ammonia Nitrogen (mg/l)	< 0.001	< 0.004*	0.009	< 0.001	0.012
NO2-NO3 Nitrogen (mg/l)	1.007	0.784*	0.790	0.534	--
Total P (mg/l)	0.020	0.008	0.019	0.059	0.012
Dissolved P (mg/l)	--	0.003	0.009*	--	0.010
Total Coliform/100 ml	--	220	610	2500	6800
Fecal Coliform/100 ml	--	4*	39	110	112
Fecal Strep/100 ml	--	12*	22	146	54

*Analysis did not meet standard requirements

APPENDIX A

MILL BROOK WATERSHED, CHENANGO COUNTY, NEW YORK
MB - 5; South Branch 300 Feet Downstream Of Abandoned Water Supply Dam

Date	4/16/74	4/30/74	5/15/74	6/5/74
Sampling Method	Grab	Grab	Grab	Grab
RFO Lab No.	0706	0721	0742	0767
Time	1005	0735	1210	1105
Weather	Clear	Overcast	Partly Cloudy	Clear
Surface	Clean	Clean	Clean	Clean
Bottom	Rock	Rock	Rock	Rock
Color	Clear	Clear	Clear	Clear
Air Temperature (°C)	4	16	27	29
Sample Depth (Ft.)	0.5	0.5	0.5	0.5
pH	7.8	7.6	7.8	7.6
Temperature (°C)	6	14	16	17.5
Dissolved Oxygen (mg/l)	11.4	9.0	8.9	9.0
Turbidity (J.T.U.)	4.8	4.0	4.0	5.4
Total Solids (mg/l)	78	130	95	127
Dissolved Solids (mg/l)	75	115	68	120
Total Sus. Solids (mg/l)	3	15	17	7
Conductivity (u mhos/cm)	--	--	--	--
Chloride (mg/l)	--	--	--	--
Total Organic Carbon (mg/l)	--	5.0*	--	3.2
Organic Nitrogen (mg/l)	0.137*	0.113*	0.141	0.160
Ammonia Nitrogen (mg/l)	< 0.004*	0.009	< 0.001	0.015
NO2-NO3 Nitrogen (mg/l)	0.943*	0.011	0.648	--
Total P (mg/l)	0.021	0.024	0.061	0.019
Dissolved P (mg/l)	0.011	0.015*	--	0.009
Total Coliform/100 ml	200	570	1400*	3000
Fecal Coliform/100 ml	15*	2*	60	11*
Fecal Strep/100 ml	44	30	52	24

*Analysis did not meet standard requirements

APPENDIX B

Analysis of Sediment From the Upstream End
of
The Existing Reservoir, South Branch,
Mill Brook - 5 June 1974

PESTICIDES

Aldrin	None detected
Dieldrin	<0.1 ug/kg
Chlordane	None detected
DDD	None detected
DDE	3.6 ug/kg
DDT	2.5 ug/kg
Endrin	None detected
Heptachlor	" "
Lindane	" "
Toxaphene	" "
2,4-D	" "
2,4,5-T	" "
Parathion	" "
Malathion	" "

METALS

Arsenic	4.5 mg/kg
Barium	7,200 "
Cadmium	<3 "
Chromium (total)	12 "
Lead	<50 "
Mercury	<0.2 "
Zinc	69 "
Copper	7 "
Iron	21,000 "
Nickel	18 "
Silver	<6 "
Aluminum	6900 "

APPENDIX C

Sixth Survey
Mill Brook Watershed
9 July 1974

FIELD DATA

	MB - 1	MB - 2	MB - 3	MB - 4	MB - 5
Air Temp. (°C)	34	30	31	34	28
Stream Temp (°C)	17.5	25.0	25.5	20.0	22.5
D.O. (mg/l)	9.1	7.8	7.7	8.8	7.6
% Sat.	94%	93%	95%	96%	88%

METALS

Parameter	Sediments (In mg/kg)	Water (In Micrograms/l)			
	MB - 3	MB - 1	MB - 3	MB - 4	MB - 5
Mercury	0.57	1.52	1.48	0.56	1.14
Silver	5	< 1.5	< 1.5	< 1.5	< 1.5
Barium	< 420	< 170	< 270	< 260	< 180
Aluminum	9,460	44	82	15	80
Cadmium	< 3	11	21	20	18
Copper	7	7.5	6.5	5.5	12
Lead	< 50	26	22	32	19
Zinc	59	29	16	14	46
Iron	24,000	90	150	350	120
Chromium	16	3	3	3	3
Arsenic	2.4	< 0.5	< 0.5	< 0.5	< 0.5
Nickel	24	< 5	< 5	< 5	5

All analyses except barium were performed by atomic absorption. Barium was done by emission spectrometry.

APPENDIX C
(Continued)

Station	MB - 1	MB - 3	MB - 4	MB - 5
Sampling Method	Grab	Grab	Grab	Grab
RFO Lab No.	0787	0789	0790	0791
Weather	Clear	Clear	Clear	Clear
Turbidity (J.T.V.)	0.50	1.50	0.80	1.10
Total Solids (mg/l)	99	151	132	128
Dissolved Solids (mg/l)	91	132	123	123
Total Sus. Solids (mg/l)	8	19	9	5
Total Organic Carbon (mg/l)	5.5	4.1	3.3	4.0
Organic Nitrogen (mg/l)	.071	.122	.118	.141
Ammonia Nitrogen (mg/l)	.006	.015	.007	.007
Total Phosphorus (mg/l)	.009	.028	.013	.015
Dissolved P (mg/l)	.009	.016	.006	.006

NOTE

Under no circumstances is this report intended to pre-empt or negate an official EPA review of the final environmental impact statement. EPA reserves the right to alter any conclusions or judgements should new or contradictory information be received after preparation of this report and prior to the final preparation and review of the environmental impact statement.

APPENDIX G

BIBLIOGRAPHY

(1) Anonymous (1970), *Land Use and Wildlife Resources*, National Academy of Sciences, Washington, D. C., 262 pgs.

(2) Appalachian Regional Commission, State of New York, *Abstract of New York State Appalachian Program, A Development Plan*, October 1968.

(3) Austin, Morris E., *Land Resource Regions and Major Land Resource Areas of the United States*, Agricultural Handbook 296, USDA-Soil Conservation Service, Washington, D. C., 1965.

(4) Bureau of Outdoor Recreation, *1965 Survey of Outdoor Recreation Activities, and Outdoor Recreation Trends*, USDI, Washington, D. C.

(5) Cline, Marlin G., *Soils and Soil Associations of New York*, New York State College of Agriculture, Cornell University, Ithaca, New York, Extension Bulletin 930.

(6) Dethier, Bernard E., *Precipitation in New York State*, Cornell University Agricultural Experiment Station, New York, State College of Agriculture, Ithaca, New York, Bulletin 1009.

(7) Dickson, Alex, *Management of Small Woodlands in New York*, New York State College of Agriculture, Ithaca, New York, Cornell Extension Bulletin 1125, January 1967.

(8) Egner & Niederkorn Associates, *New York State Appalachian Resource Studies, Community Facilities*, Albany, N. Y. 1970.

(9) ESSA, *Earthquake History of United States*, Part I, 1965.

(10) *Geologic Map of New York*, Hudson-Mohawk Sheet, The University of the State of New York, The State Education Department, Albany, New York, 1961.

(11) Grizzel, Ray (1958), *Proceedings of Southeastern Conference of game and fish commissioners*, Louisville, Kentucky, 1958.

(12) Hendrickson, G. O., (1957), *Cottontail Management in Iowa*, 12th N. A. Wildlife Conference, 473-479.

(13) Metcalf and Eddy, *Town of New Berlin Water Supply Study*, July 1968.

(14) Mordoff, R. A., *The Climate of New York State,* New York State College of Agriculture at Cornell, Ithaca, New York, Extension Bulletin 764.

(15) *National Flood Insurance Act of 1968 as Amended,* U. S. Department of Housing and Urban Development, Washington,D. C.

(16) New York State Department of Environmental Conservation, Albany, New York, *Classification and Standards Governing the Quality and Purity of Waters of New York State,* Parts 700-703, Title 6, Official Compilation of Codes, Rules, and Regulations.

(17) New York State Department of Environmental Conservation, *Records of Wells and Test Borings in the Susquehanna River Basin, New York,* Bulletin 69, 1972.

(18) New York State, *Statewide Comprehensive Outdoor Recreation Plan, Sec. 1-State Responsibility,* May 1966.

(19) New York State Department of Labor, Division of Research and Statistics, *Manpower Trends,* January 1974.

(20) *New York State Environment,* New York State Department of Environmental Conservation, Albany, New York.

(21) New York State Parks and Recreation Commission, *People-Resources-Recreation, New York Statewide Comprehensive Recreation Plan,* September 1972.

(22) *North Atlantic Regional Water Resources Study, Appendix H, Minerals, North Atlantic Regional Water Resources Study Coordinating Committee,* New York, N. Y., May 1972, Pages H-86-87, Figure H-14.

(23) ----, *Resource Conservation Glossary Journal of Soil and Water Conservation,* January-February 1970, Vol. 25, No. 1.

(24) Shaeffer, John R., *Introduction to Floodproofing, An Outline of Principles and Methods,* Department of Army Corps of Engineers, April 1967, Washington, D. C.

(25) Shaw, Samuel P., and C. Gordon Fredine, *Wetlands of the United States,* Department of the Interior, Fish and Wildlife Service, Circular 39, GPO, Washington, D. C., 1956.

(26) Soil Conservation Service, *Land-Capability Classification,* USDA, Washington, D. C., January 1973, Agriculture Handbook No. 210.

(27) The National Archives of the United States, *Federal Register, Water Resources Council, Water and Related Land Resources, Establishment of Principles and Standards For Planning,* Vol. 38, No. 174, Part III, Monday, September 10, 1973, Page 24804.

(28) Trippensee, R. E., (1948), *Wildlife Management,* McGraw-Hill Book Co., New York, Toronto, London, 478 pages.

(29) U. S. Army Corps of Engineers, *Floodproofing Regulations,* Department of the Army, Washington, D. C., June 1972, Sections 100 and 1404.

(30) American Society for Testing and Materials, *"Classification of Soils for Engineering Purposes"* ASTM Designation: D 2487 - 69.

(31) U. S. Army Corps of Engineers, *Preliminary Long Range Water Supply Study, Volume VII,* November 1971, Department of the Army, Washington, D. C.

(32) U. S. Bureau of the Census, Census of Population: *1970 General Social and Economic Characteristics,* Final Report PC(1)-C34 New York, GPO, Washington, D. C., 1972.

(33) United States Department of Agriculture, *1969 Agricultural Statistics,* U. S. Government Printing Office, Washington, D. C., 1969.

(34) United States Department of the Interior, *Rare and Endangered Fish & Wildlife of the United States,* U .S. Bureau of Sport Fisheries and Wildlife, 1968.

(35) U. S. Water Resources Council, *1972 OBERS Projections, Regional Economic Activity in the U. S., Vol. 3, Water Resource Regions 1-8,* U. S. Government Printing Office, Washington, D. C.

(36) Van Kirk, Robert Ray, 1969, *The Effects of the Construction of a Dry Dam on Brown Trout Population,* University of Georgia, Athens, Georgia.

(37) Williams, Henry G. and Belden, William M., *Recreation and Culture, Phase I: Inventory,* New York State Appalachian Resource Studies 1970.

(38) DeWiest, Rojer J.M., *Geohydrology,* John Wiley & Sons, Inc., New York, London, Sydney (1965).