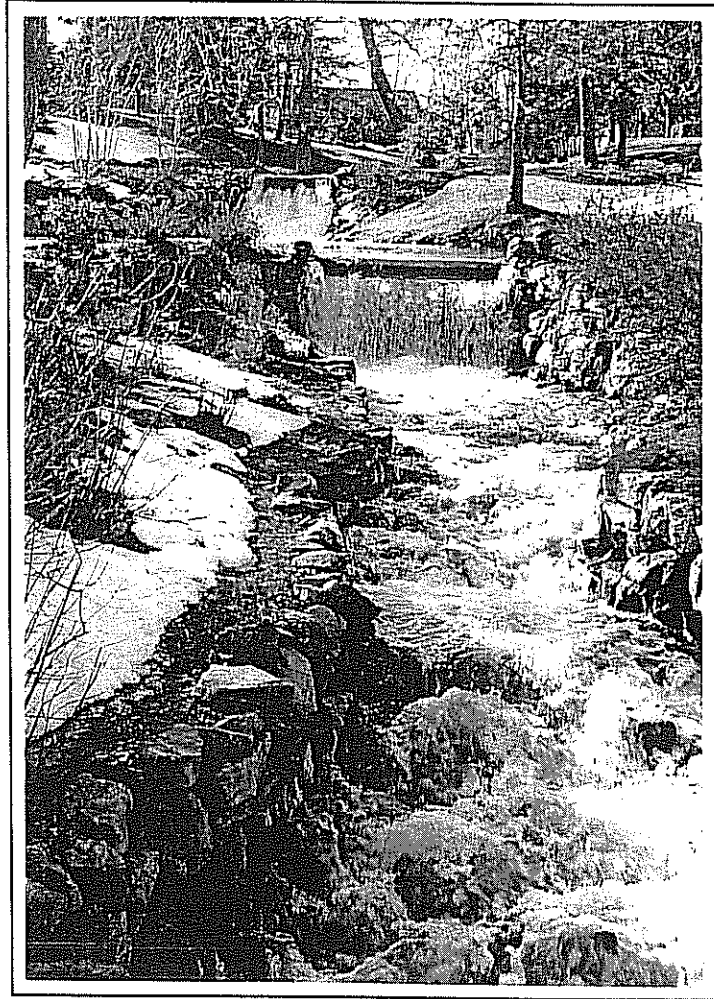


WATERSHED

MONITORING PROGRAM



GREEN TOWNSHIP SUSSEX COUNTY, NEW JERSEY

PREPARED BY
ECOSYSTEMS ENVIRONMENTAL CONSULTANTS
17 INDIAN TERRACE, LAFAYETTE, N. J. 07848

GREEN TOWNSHIP ENVIRONMENTAL COMMITTEE

Richard Vohden, Chairman
Cynthia Moyano
Bruce Mueller
Larry Putera
Linda Neary
Eric Derby
Gary Stern

ACKNOWLEDGMENTS

Acknowledgments are deserved by all the individuals and organizations who contributed their efforts and funding toward the accomplishment of this "Watershed Monitoring " report, one of series of Sensitive Environmental Features reports.

In particular, special thanks go to: Dede Esenlohr, for her time and initiative in meeting the Township's in-kind grant match and making this series of baseline water testing reports possible; and to all the members of the Environmental Committee, for their efforts and commitment to the environment; Patricia Sullivan, Secretary, Green Township Planning Board, for providing access to all necessary records and documents; Robert Canace, NJ Geological Survey, NJDEP, for providing the technical data & mapwork; and Glenn Wersing for the cover photograph.

This document was prepared with the aid of a Grant from the New Jersey Department of Environmental Protection, Office of Intergovernmental Affairs, Environmental Services Program.

*

Additional copies of this report may be purchased at the Green Township Municipal Building, PO Box 65, Tranquility, NJ. 07879

December - 2000

GREEN TOWNSHIP ENVIRONMENTAL COMMITTEE

Richard Vohden, Chairwoman
Cynthia Moyano
Bruce Mueller
Larry Putera
Linda Neary
Eric Darby
Gary Stern

ACKNOWLEDGMENTS

Acknowledgments are deserved by all the individuals and organizations who contributed their efforts and funding toward the accomplishment of this "Watershed Monitoring " report, one of series of Sensitive Environmental Features reports.

In particular, special thanks go to: Dede Esenlohr, for her time and initiative in meeting the Township's in-kind grant match and making this series of baseline water testing reports possible; and to all the members of the Environmental Committee, for their efforts and commitment to the environment; Patricia Sullivan, Secretary, Green Township Planning Board, for providing access to all necessary records and documents; Robert Canace, NJ Geological Survey, NJDEP, for providing the technical data & mapwork; and Glenn Wersing for the cover photograph.

This document was prepared with the aid of a Grant from the New Jersey Department of Environmental Protection, Office of Intergovernmental Affairs, Environmental Services Program.

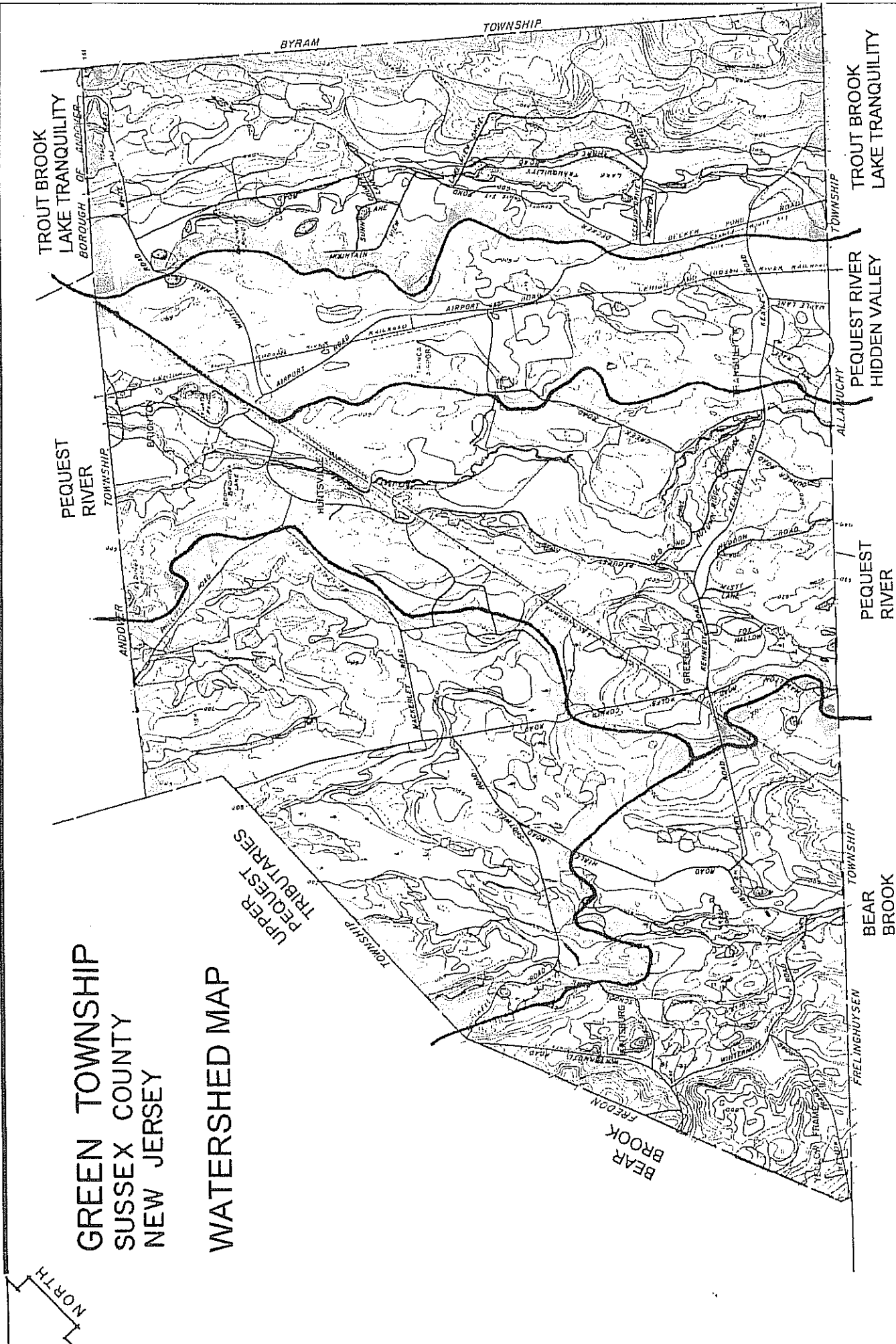
*

Additional copies of this report may be purchased at the Green Township Municipal Building, PO Box 65, Tranquility, NJ. 07879

December - 2000

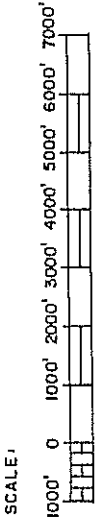
GREEN TOWNSHIP SUSSEX COUNTY NEW JERSEY

WATERSHED MAP



MAP SOURCE : UNITED STATES GEOLOGICAL SURVEY
1954 PHOTO REVISED 1971
CONTOUR INTERVAL 20 FEET
PHOTOGRAPHICALLY REDUCED

NOTES:
"This document was prepared with the aid of a grant from the
New Jersey Department of Environmental Protection, Office of
Environmental Services."



Green Township Watershed Map

Watersheds

Watersheds are topographic areas drained by a river, stream, or other surface-water body. Watersheds are classified within a framework of management units, the largest of which is the basin. A drainage basin is a regional area drained by a major river and its tributaries, such as the Delaware River Basin. Basins are subdivided into sub-basins, which are subsequently subdivided into watersheds. Therefore, a watershed is usually a part of a larger drainage basin.

Watersheds are defined by boundaries called drainage divides. Drainage divides consist of an imaginary line connecting adjacent topographic high-points. Surface drainage flows away from a divide, toward a receiving stream. All of the land between a divide and its associated stream are within the watershed of the stream. Watersheds maybe further subdivided into subwatershed and catchment drainage features (Schueler, 1997).

Many environmental agencies, including the USEPA and the NJDEP, are moving toward a watershed-based management approach for evaluating and monitoring water quality and other environmental indicators. The watershed-based management approach integrates the effects that land use, climate, hydrology, drainage, and vegetation have on water quality. The approach also allows for the coordination of existing programs regulating flood control, wastewater discharges, and land use. Because the drainage characteristics and mechanics of watersheds are independent of political boundaries, an element of this strategy involves coordination between agencies within the watershed. Environmental public education on a watershed level is an important component of the management strategy.

Water in the Watershed

Aquifers, reservoirs for ground water, underlie all of the Township's watersheds. Precipitation and runoff that infiltrates the ground recharges the aquifers. Hydrologic divides can also be defined for ground-water basins. Like surface water, the area from which a stream receives ground-water drainage is the ground-water basin or ground-water watershed for the stream. The boundaries of surface-water basins and ground-

water basins do not always exactly coincide. Aquifers under certain conditions could receive recharge from more than one watershed. This could be true for areas underlain by cavernous limestone, such as detailed in the "Sensitive Geology" report for Green Township.

Water Quality

The concepts of groundwater recharge and surface water runoff are important considerations with respect to water quality within the watershed. The USEPA and NJDEP recently began focusing on the impacts of nonpoint source, or diffuse pollution within watershed management units. Individual, relatively small quantities of contaminants resulting from agricultural activities, septic systems, stormwater runoff, and other widespread practices occurring throughout the entire watershed may be concentrated within the groundwater and tributary streams. The NJDEP has prepared a document entitled "Storm Water and Nonpoint Source Pollution Control, Best Management Practices" to address the growing problem.

Impervious Cover

The increase in impervious cover, such as roads, parking lots, roof tops, and manicured turf, within watersheds is recognized as an indicator of development activity and poses adverse impacts to environmental quality within the watershed. Impervious cover 1) reduces infiltration thereby increasing surface water runoff and flooding, and 2) collects residues from automobiles and other sources which are captured by stormwater and carried into surface and groundwater. The evaluation of the present and future (buildout) extent of impervious cover is an important aspect of watershed management.

Watersheds in Green Township

Green Township lies mainly within the Pequest River basin. Small areas on the northern and southeastern edges of the Township drain to the Paulins Kill basin and Musconetcong River basin. The principal streams within the Township are the Pequest River, Trout Brook and Bear Brook. Both Trout and Bear Brooks drain to the Pequest River.

The main stem of the Pequest River has its headwaters in the northern part of the Township. Headwaters of the Pequest River drain to the north, toward Whittingham Wildlife Refuge. The northeast corner of the Township drains to the northeast and into the Pequest River.

The main stem of the Pequest flows northeast to southwest through the Township. From upstream in Andover Township it enters Green Township near Brighton, flows over the wing dam at Huntsville, and flows to Allamuchy Township below Tranquility. Andover Township is upstream and Allamuchy Township downstream on the Pequest.

The Bear Brook watershed occupies the northwestern part of the township. This area, which makes up the headwaters of Bear Brook, drains into Frelinghuysen Township to the west. Bear Brook drainage eventually discharges to the Pequest River in Great Meadows. A small area of the northwestern corner of the township drains to the Paulins Kill Basin.

The southern part of the township lies mainly within the Trout Brook basin. The Lake Tranquility watershed dominates this area. The Lake Tranquility watershed consists of land that drains directly to the lake. This includes a small branch of Trout Brook.

Several small watersheds on top of Allamuchy Mountain drain to the Musconetcong Watershed. Most of this area drains to Cranberry Lake in Byram Township.

Green Township Watershed Characteristics

The attached Table provides estimates of the areas of the various watersheds in Green Township. Pequest River drainage covers the greatest area of the Township. Those watersheds draining to the Pequest within or at the edge of Green Township cover approximately 10 square miles of the Township. Trout Brook drainage covers 3.57 square miles. Bear Brook drainage 2.28 square miles. Paulins Kill drainage covers only 0.19 square miles and Musconetcong River drainage only 0.12 square miles.

Geology and Soils

The rugged, irregular landscape associated with limestone bedrock makes for unusual drainage conditions in the Township. The irregular topography makes precise delineation of watershed boundaries difficult in places. More detailed topographic surveys may be needed to accurately place watershed boundaries in limestone areas.

This report assigns the name Pequest River Hidden Tributary for the sub-watershed of the main stem Pequest River that is not drained by streams. Drainage in this area is predominantly underground. Sandy glacial deposits overlie cavernous limestone at a relatively high elevation. The relatively coarse grained sand material was deposited in an environment of moving water where the finer grained material was removed by turbulent flowing water. The presence of the flowing water also contributed to solution of the underlying limestone fractures.

These geologic conditions result in a unique drainage system. Underground drainage in this watershed is most likely to the southwest, parallel to the river and parallel to fractures within the underlying limestone strata. More hydrologic information is needed to better understand this area.

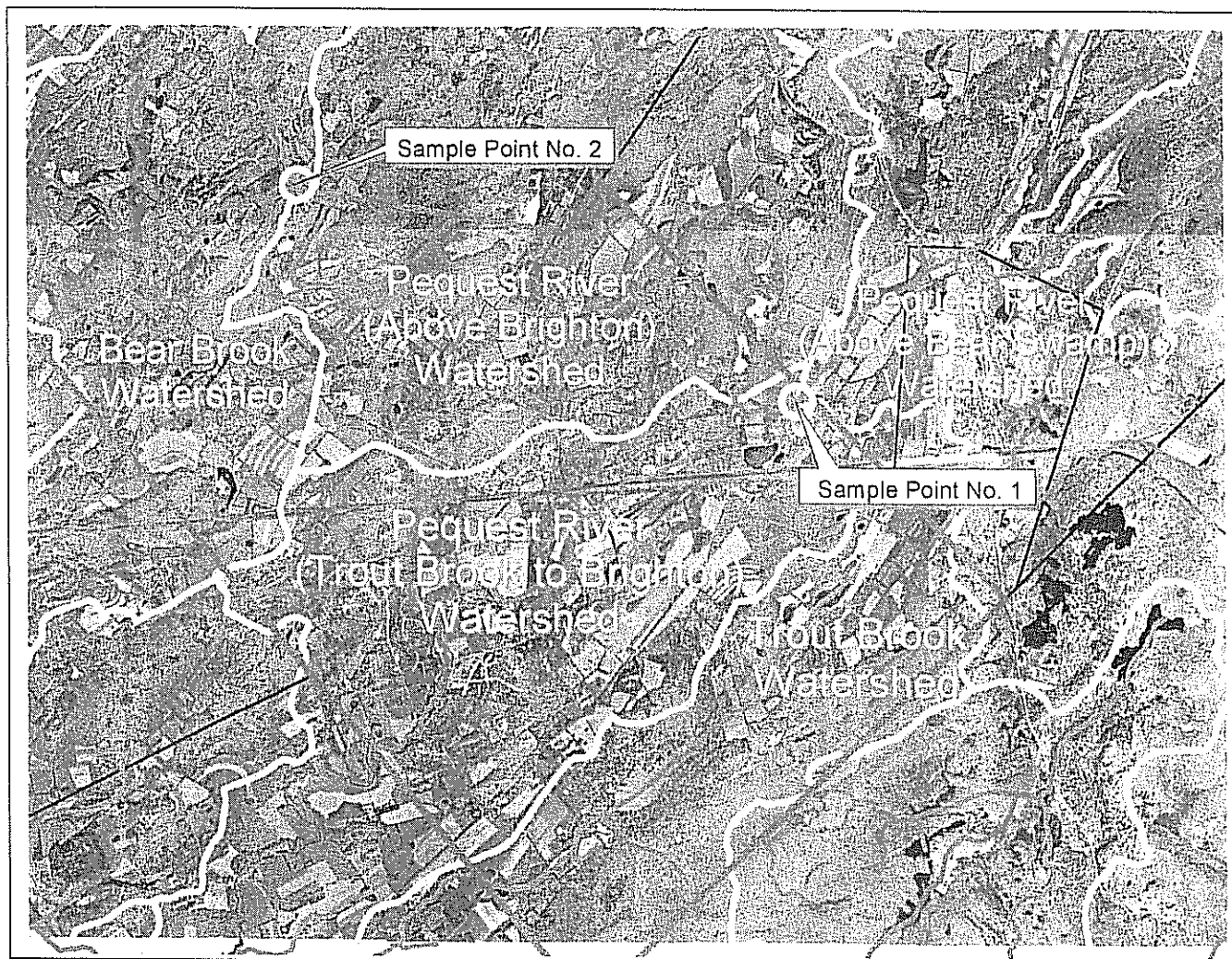
Several large bogs occur within the areas underlain by limestone. In places streams flow into these, and their well-defined channel dissipates in the bog. These bogs may be areas of ground-water discharge. They may have been formed by dissolving and collapse of the limestone over its history of weathering.



Disappearing streams occur in several locations. These are places where surface drainage flows underground into cavities in the limestone or through permeable stream gravel atop the limestone. The most notable of these disappearing streams is Dead End Creek the upper reach of Bear Brook. Dead End Creek flows south off the higher elevations in the northern part of the township and from areas in Fredon until it reaches Wintermute Road (County Route 519). After crossing under Wintermute Road, the creek sinks into the streambed and becomes part of the ground-water system. During periods of flooding much of the creek's drainage overflows this sinkhole and flows to other sinkholes near Hibler Road.

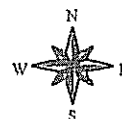
Size of Watersheds in Green Township

<u>Watershed</u>	<u>Area (square miles)</u>	<u>Area (acres)</u>
Pequest River Basin		
Mainstream Pequest River	3.09	1975
Pequest River hidden tributary	2.18	1395
Pequest River tributary	1.15	738
Pequest River headwaters	1.14	725
Pequest River headwaters tributary	1.13	723
Old Pond	0.52	332
Fox Hollow	0.51	326
Dowstream Pequest River	0.29	188
Trout Brook Basin		
Lake Tranquility	2.34	1500
Trout Brook	1.02	654
Trout Brook branch	0.21	133
Bear Brook Basin		
Bear Brook headwaters	2.28	1460
Paulins Kill Basin		
Paulins Kill drainage	0.19	121
Musconetcong River Basin		
Cranberry Lake drainage	0.12	76

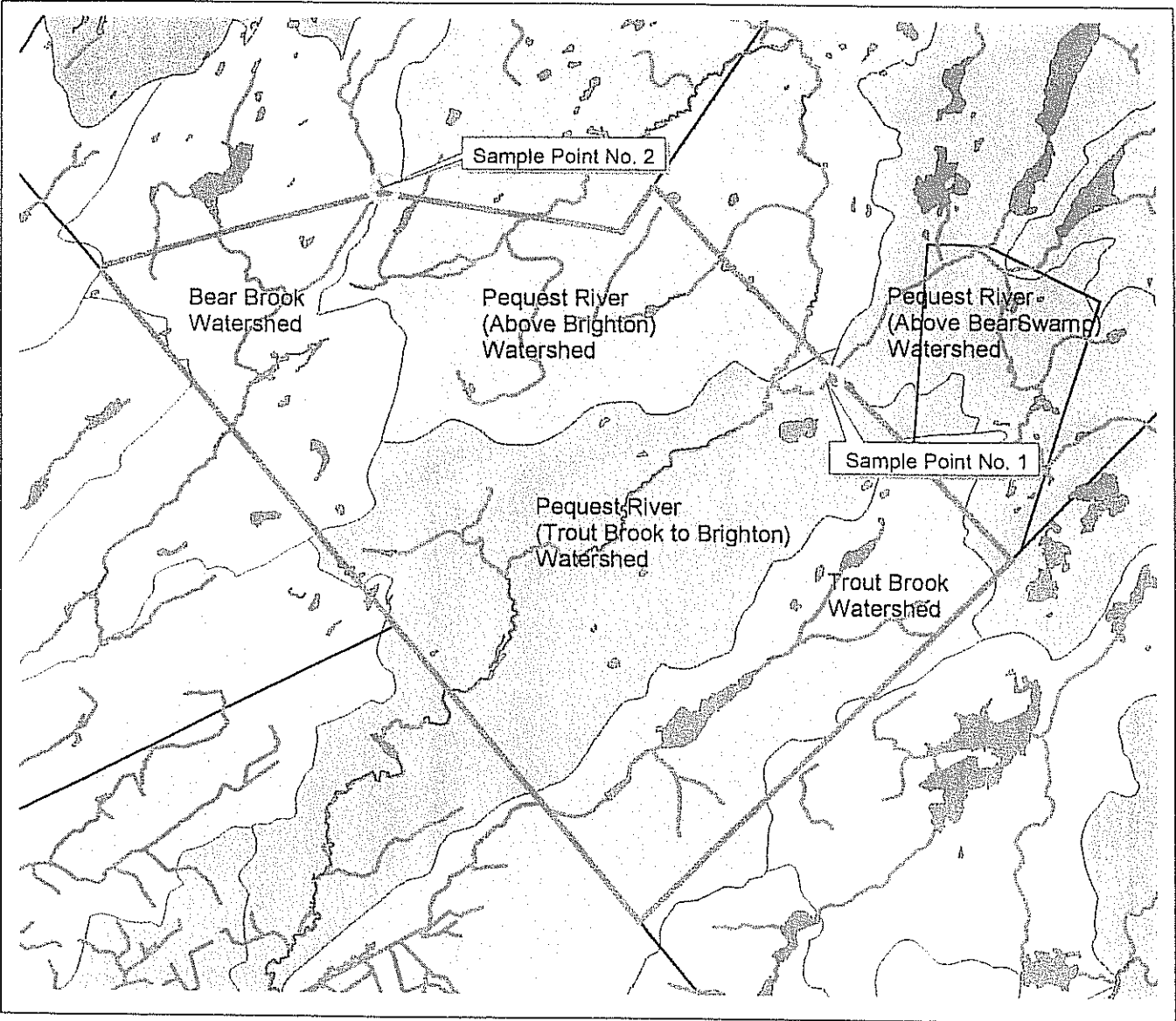
GREEN TOWNSHIP - BASELINE SAMPLING POINTS



- Sample Point - 2
- Dead End Creek
- Sample Point - 1
- Pequest @ Brighton
-  Green Township
-  Surface Water
- Watershed Lines

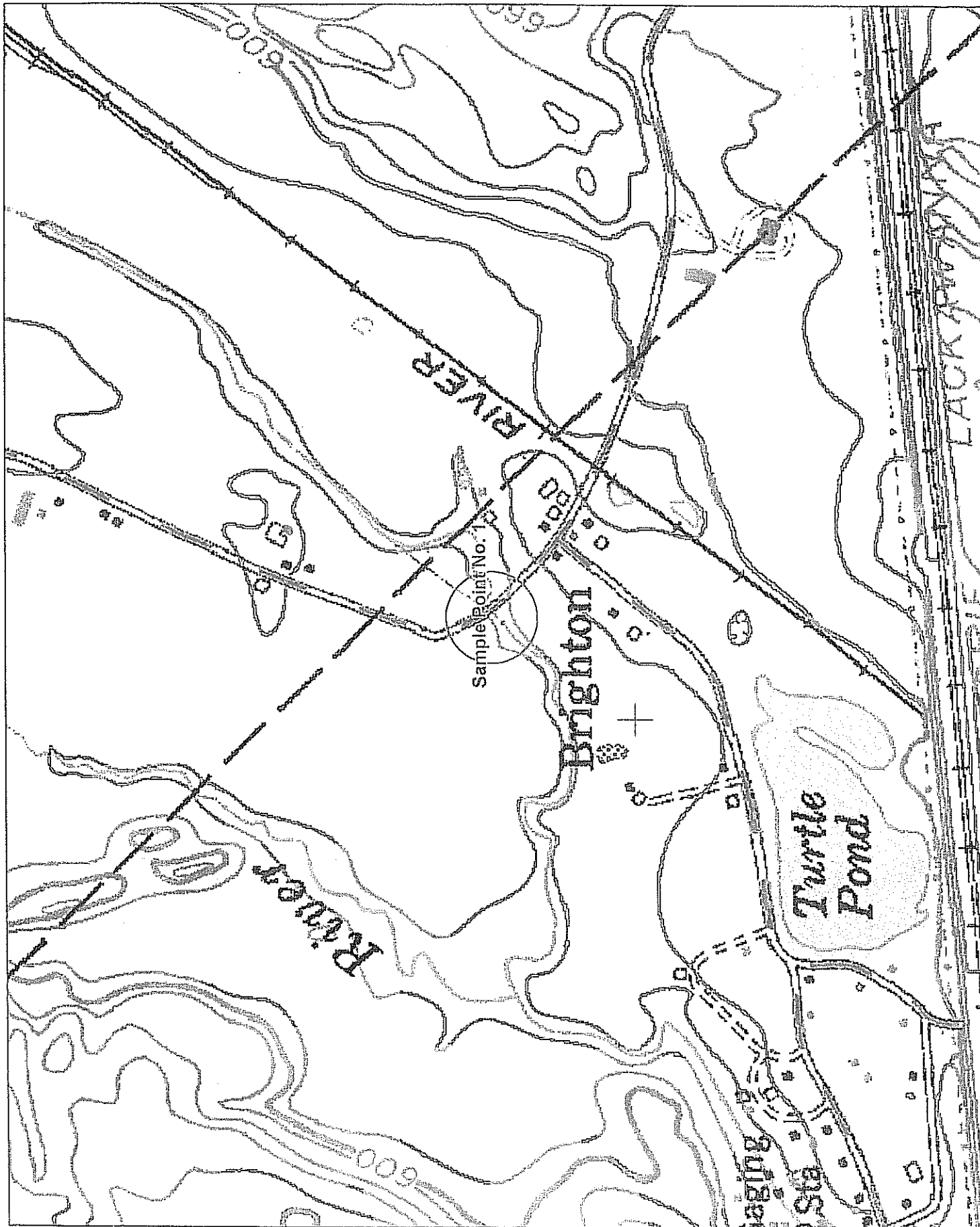


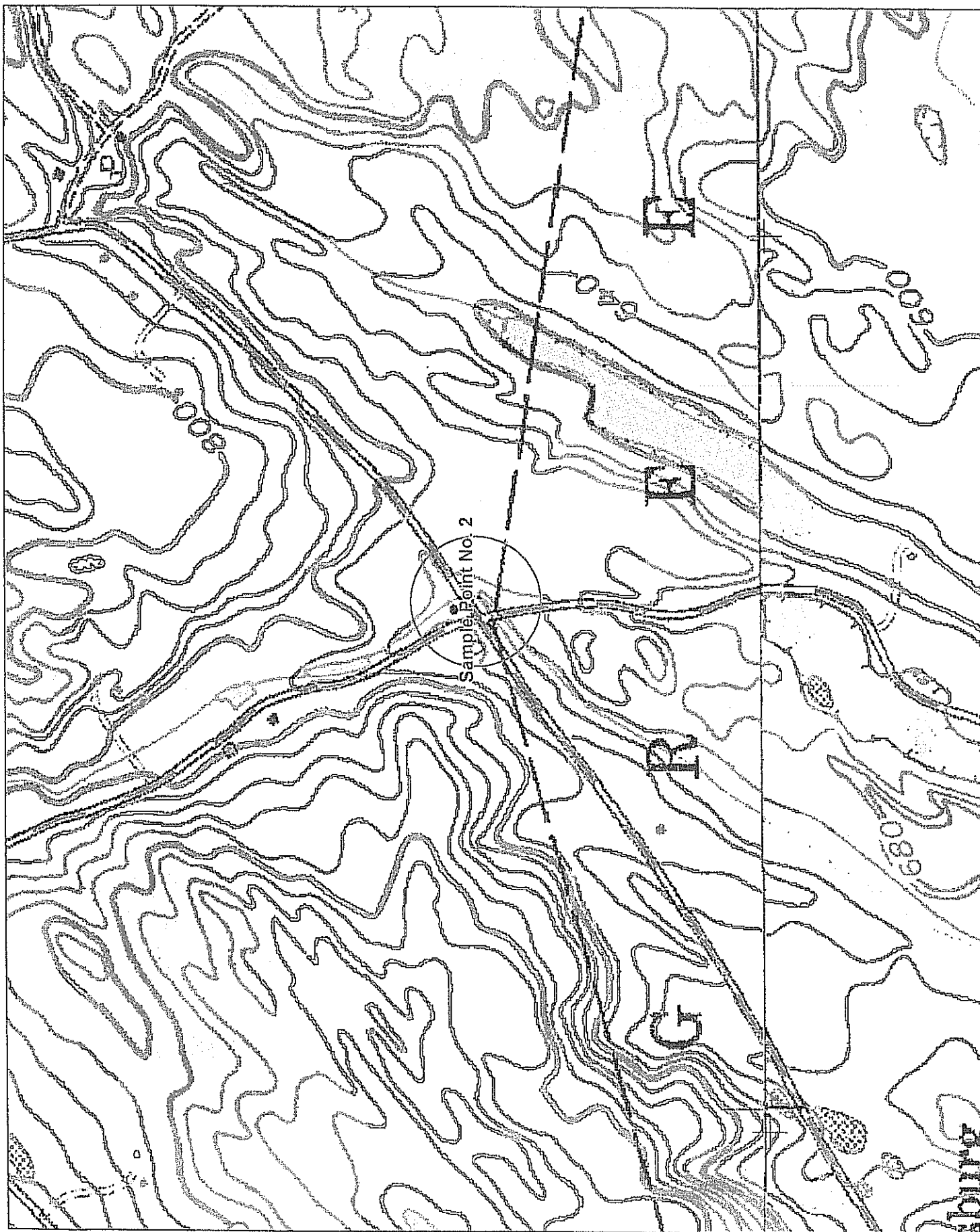
Green Township - Sampling Points



- Sample Point - 1
Pequest @ Brighton
- Sample Point - 2
Dead End Creek
- Green Township
- Surface Water
- Streams
- Township Lines







Pequest River Sampling Site No. 1

		<u>Date</u>			
		10/96	3/98	12/98	8/00
<u>Parameter</u>	<u>Results</u>				
	<u>Units</u>				
Conductivity	umhos/cm	137	298	363	370
Total Suspended Solids	mg/l	2	<3.0	<3.0	<3.0
pH	pH Units	7.19	8.23	7.53	7.62
Total Alkalinity	mg/l	39	116	164	140
Total Phosphate	mg/l	1.75	0.16	0.05	<0.05
Ammonia	mg/l	0.2	0.39	--	<0.5
TKN - Nitrogen	mg/l	0.7	0.41	--	<0.5
Nitrate	mg/l	<0.1	0.2	<1	<1.0
Nitrite	mg/l	0.01	<0.005	0.01	0.02
Turbidity	NTU	--	--	1.6	1.7
Biochemical Oxygen Demand	BOD	--	--	<3.0	<3.0
Dissolved Oxygen	percent	8.98	12.6	6.76	7.03
F.Coli	org/100ml	--	--	35	11
Temperature	units	53.4/F	20.6/F	3/C	3.1/C
Depth	feet	1.6	2.5	1.4	1.75

Dead End Creek Sampling Site No. 2

<u>Parameter</u>	<u>Date</u>				<u>Results</u>	<u>Units</u>
	10/96	3/98	12/98	2/99	8/00	
Conductivity	350	148	175	157	180	umhos/cm
Total Suspended Solids	3	<3.0	<3.0	<3.0	<3.0	mg/l
pH	7.78	8.26	7.53	7.3	7.62	pH Units
Total Alkalinity	131	18	56	26	58	mg/l
Total Phosphate	<0.05	0.1	<0.05	<0.05	0.05	mg/l
Ammonia	<0.05	0.18	—	<0.5	—	mg/l
TKN - Nitrogen	0.8	0.29	—	0.91	—	mg/l
Nitrate	0.1	1	<1	<1.0	0.6	mg/l
Nitrite	0.005	<0.005	0.01	0.01	—	mg/l
Turbidity	—	—	<0.1	0.85	1.83	NTU
Biochemical Oxygen Demand	—	—	<3.0	<3.0	—	BOD
Dissolved Oxygen	10.9	12	10.2	8.65	7.87	percent
F.Coli	—	—	—	1	16	org/100ml
Temperature	48.8/F	20/F	3/C	2.5/C	—	units
Depth	0.94	1	0.94	0.62	—	feet

ANALYTICAL RESULTS SUMMARY

Client ECO Systems
17 Indian Terrace

Lafayette, NJ 07848

Contact

Project

Report Date 08/01/2000 18:19

APL Order ID Number 20060505

Date Sampled 06/09/2000 10:30

Date Received 06/09/2000 10:35

Matrix Lake

Site

Customer Service Rep.

Sample Number/ Parameter	Method	Analysis Time	Analyst	Result	Units	MDL
20060505-001 Sample Point#1						
Alkalinity	SM 2320B	06/12/2000 16:00	RAISA	140	mg/L	5
Conductivity	EPA 2501B	06/09/2000 10:30	DBA	370	µS/cm	1
Dissolved Oxygen	4500-O G	06/09/2000 11:35	DBA	7.87		
Fecal Coliform	SM#18 9222	06/09/2000 15:05	JOYCE	82	cfu/100ml	2
Nitrate as N	EPA 300	06/09/2000 17:30	JEN	0.7	mg/L	0.2
pH	EPA150.1/SM4500H-B	06/09/2000 11:35	DBA	7.62	pH Units	
Total Phosphorus as P	4500PE	06/12/2000 16:00	RAISA	<0.05	mg/L	0.05
TSS	EPA 160.2/ SM 2540 D	06/15/2000 10:45	MARK	<3.0		
Turbidity (Nephelometric)	SM-18/ 2130-B	06/09/2000 16:45	JEN	1.53	NTU	0.1
20060505-002 Sample Point #2						
Alkalinity	SM 2320B	06/12/2000 16:00	RAISA	58	mg/L	5
Conductivity	EPA 2501B	06/09/2000 11:35	DBA	180	µS/cm	1
Dissolved Oxygen	4500-O G	06/09/2000 11:35	DBA	7.87		
Fecal Coliform	SM#18 9222	06/09/2000 15:05	JOYCE	16	cfu/100ml	2
Nitrate as N	EPA 300	06/09/2000 17:30	JEN	0.6	mg/L	0.2
pH	EPA150.1/SM4500H-B	06/09/2000 11:35	DBA	7.62	pH Units	
Total Phosphorus as P	4500PE	06/12/2000 16:00	RAISA	0.05	mg/L	0.05
TSS	EPA 160.2/ SM 2540 D	06/15/2000 10:45	MARK	<3.0		
Turbidity (Nephelometric)	SM-18/ 2130-B	06/09/2000 16:45	JEN	1.83	NTU	0.1

SA: See attached report

B. Wood

Brian Wood
Laboratory Director



QA

CLIENT : Green Township Environmental Commission
SOURCE : Sampling Point #1
LOCATION : Pequest River at Brighton
DATE Sampled : 2-11-99
 Received : 2-11-99
 Completed : 3-20-99

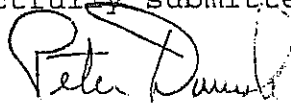
IDENTIFICATION : 99020503-001
SUBMITTED FOR : Various

(All Liquid sample units are in mg/L, or PPM)

<u>Parameter</u>	<u>Concentration (mg/L)</u>
Conductivity (unhos)	304.
Total Suspended Solids	<3.0
Field pH (units)	7.42
Total Alkalinity	136.0
Total Phosphate	<0.05
Ammonia	<0.5
Nitrate	<1.0
Nitrite	0.02
TKN	<0.5
Turbidity (NTU)	1.7
Biochemical Oxygen Demand (BOD)	<3.0
Field Dissolved Oxygen	7.03
Fecal Coliform (cfu/100ml)	11.
Temperature °C	3.1
Depth of Water (Feet)	1.75

The liability of Aqua Pro-Tech Laboratories, Inc. shall in no event exceed the amount of the invoice.

We certify that this report is a true report of results obtained from our tests of this material. Respectfully submitted,



Peter Dominski
Laboratory Director



AQUA PRO-TECH LABORATORIES

CERTIFICATIONS:

NJ DEP # 07010/NY DOH # 11634
CT # PH-0233

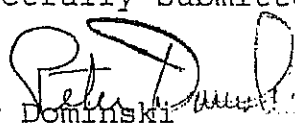
CLIENT : Green Township Environmental Commission
SOURCE : Sampling Point #2
LOCATION : Dead End Creek at Wintermute/Shotwell Road
DATE Sampled : 2-11-99
 Received : 2-11-99
 Completed : 3-20-99

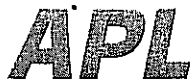
IDENTIFICATION : 99020502-001
SUBMITTED FOR : Various
(All Liquid sample units are in mg/L, or PPM)

<u>Parameter</u>	<u>Concentration (mg/L)</u>
Conductivity (umhos)	157.
Total Suspended Solids	<3.0
Field pH (units)	7.30
Total Alkalinity	26.0
Total Phosphate	<0.05
Ammonia Nitrogen	<0.5
TKN-N	0.91
Nitrate	<1.0
Nitrite	0.01
Turbidity (NTU)	0.85
Biochemical Oxygen Demand (BOD)	<3.0
Field Dissolved Oxygen	8.65
Fecal Coliform	1
Temperature °C	2.5
Depth of Water (Feet)	0.62

The liability of Aqua Pro-Tech Laboratories, Inc. shall in no event exceed the amount of the invoice.

We certify that this report is a
true report of results obtained
from our tests of this material.
Respectfully submitted,


Peter Dominski
Laboratory Director



AQUA PRO-TECH LABORATORIES

CERTIFICATIONS:

NJ DEP # 07010/NY DOH # 11634

CT # PH-0233

CLIENT : Green Township Environmental Commission
SOURCE : Sampling Point #1
LOCATION : Pequest River at Brighton
DATE Sampled : 12-28-98
 Received : 12-28-98
 Completed : 02-05-99

IDENTIFICATION : 98121018-001 to -004
SUBMITTED FOR : Various

(All Liquid sample units are in mg/L, or PPM)

<u>Parameter</u>	<u>Concentration (mg/L)</u>
Conductivity (unhos)	363.
Total Suspended Solids	<3.0
Field pH (units)	7.53
Total Alkalinity	164.0
Total Phosphate	0.05
Nitrate	<1.0
Nitrite	0.01
Turbidity (NTU)	1.6
Biochemical Oxygen Demand (BOD)	<3.0
Field Dissolved Oxygen	6.76
Fecal Coliform (cfu/100ml)	35.
Temperature °C	3.0
Depth to Water (Feet)	1.4
Flow Rate (gal/sec)	79.7

The liability of Aqua Pro-Tech Labs shall in no event exceed the amount of the invoice.

We certify that this report is a true report of results obtained from our tests of this material. Respectfully submitted,

Peter Dominski
Laboratory Director



AQUA PRO-TECH LABORATORIES

CERTIFICATIONS:

NJ DEP #.07010/NY DOH # 11634
CT # PH-0233

CLIENT : Green Township Environmental Commission
SOURCE : Sampling Point #2
LOCATION : Dead End Creek at Wintermute/Shotwell Road
DATE Sampled : 12-28-98
 Received : 12-28-98
 Completed : 02-05-99

IDENTIFICATION : 98121019-001 to -004
SUBMITTED FOR : Various
(All Liquid sample units are in mg/L, or PPM)

<u>Parameter</u>	<u>Concentration (mg/L)</u>
Conductivity (umhos)	175.
Total Suspended Solids	<3.0
Field pH (units)	7.53
Total Alkalinity	56.0
Total Phosphate	<0.05
Nitrate	<1.0
Nitrite	0.01
Turbidity (NTU)	<0.1
Biochemical Oxygen Demand (BOD)	<3.0
Field Dissolved Oxygen	10.2
Temperature °C	3.0
Depth to Water (Feet)	0.94
Flow rate (gal/sec)	2.5

The liability of Environmental Pro-Tech Services, Inc. shall in no event exceed the amount of the invoice.

We certify that this report is a
true report of results obtained
from our tests of this material.
Respectfully submitted,

Peter Dominski
Laboratory Director



AQUA PRO-TECH LABORATORIES

CERTIFICATIONS:

NJ DEP # 07010/NY DOH # 11634
CT # PH-0233

ANALYTICAL RESULTS SUMMARY

DATE: 3/24/2000

CLIENT: Green Township Environmental
17 Indian Terr.
Lafayette, NJ 07848

LAB ORDER: 98030574

SAMPLES RECIEVED: 3/20/1998 1:30PM

ATTN:

PROJECT:

SITE: Sampling Point #1

Lab Sample ID: 98030574-001
Client Sample ID: Grab
Collect Date: 3/20/1998
Matrix: Drinking Water

TEST:		Result Unit
Alkalinity	116	mg/L
Analyzed:	3/23/1998 1:00PM	
Bicarbonate (HCO ₃)	115	mg/L
Analyzed:	4/20/1998 10:00AM	
Carbonate Alkalinity	1.83	mg/L
Analyzed:	4/20/1998 10:00AM	
Alkalinity- Total CO ₂	103	mg/L
Analyzed:	4/20/1998 10:00AM	
Aluminum	0.093	mg/L
Analyzed:	3/27/1998 2:00PM	
Ammonia	0.39	mg/L
Analyzed:	3/27/1998 2:45PM	
Arsenic	<0.005	mg/L
Analyzed:	3/25/1998 3:00PM	
Cadmium	<0.0005	mg/L
Analyzed:	3/27/1998 3:30PM	
Chloride	48	mg/L
Analyzed:	3/24/1998 1:45PM	
Chromium (Cr)	<0.01	mg/L
Analyzed:	3/30/1998 10:30AM	
Conductivity	298	µmhos/cm
Analyzed:	3/20/1998 4:20PM	
Copper (Cu)	<0.01	mg/L
Analyzed:	3/23/1998 12:15PM	

Signature

Lab Director

Peter Dominski

SA = See Attached Report



AQUA PRO-TECH LABORATORIES

CERTIFICATIONS:

NJ DEP # 07010/NY DOH # 11634

CT # PH-0233

ANALYTICAL RESULTS SUMMARY

DATE: 3/24/2000

CLIENT: Green Township Environmental
17 Indian Terr.
Lafayette, NJ 07848

LAB ORDER: 98030574

SAMPLES RECIEVED: 3/20/1998 1:30PM

ATTN:

PROJECT:

SITE: Sampling Point #1

Lab Sample ID: 98030574-001

Client Sample ID: Grab

Collect Date: 3/20/1998

Matrix: Drinking Water

TEST:		Result Unit
Depth	2.5	feet
Analyzed:	3/20/1998 10:00PM	
Dissolved Oxygen	12.6	mg/L
Analyzed:	3/20/1998 10:00AM	
Iron	0.07	mg/L
Analyzed:	3/23/1998 1:40PM	
Lead	<0.001	mg/L
Analyzed:	3/25/1998 12:00PM	
Mercury	<0.0005	mg/L
Analyzed:	3/31/1998 3:15PM	
Nitrates	0.2	mg/L
Analyzed:	3/20/1998 4:30PM	
Nitrites	<0.005	mg/L
Analyzed:	3/20/1998 4:25PM	
pH,Field	8.23	pH Units
Analyzed:	3/20/1998 10:00AM	
Phenol	<0.005	mg/L
Analyzed:	3/24/1998 1:00PM	
Phosphorus, Ortho	<0.05	mg/L
Analyzed:	3/26/1998 4:00PM	
Potassium	2	mg/L
Analyzed:	3/30/1998 12:05PM	
Sodium (Na)	27	mg/L
Analyzed:	3/23/1998 3:40PM	

Signature

Lab Director

Peter Dominski

SA = See Attached Report



AQUA PRO-TECH LABORATORIES

CERTIFICATIONS:

NJ DEP # 07010/NY DOH # 11634
CT # PH-0233

ANALYTICAL RESULTS SUMMARY

DATE: 3/24/2000

CLIENT: Green Township Environmental
17 Indian Terr.
Lafayette, NJ 07848

LAB ORDER: 98030574

SAMPLES RECIEVED: 3/20/1998 1:30PM

ATTN:

PROJECT:

SITE: Sampling Point #1

Lab Sample ID: 98030574-001
Client Sample ID: Grab
Collect Date: 3/20/1998
Matrix: Drinking Water

TEST:

		Result Unit
Sulfate	23.2	mg/L
Analyzed:	3/26/1998 1:30PM	
TDS	233	mg/L
Analyzed:	3/26/1998 11:00AM	
Temperature (Thermometric)	20.6	°F
Analyzed:	3/20/1998 10:00AM	
TKN	0.41	mg/L
Analyzed:	4/1/1998 8:30AM	
TOC	4	mg/L
Analyzed:	3/23/1998 10:00AM	
Phosphorus, Total	0.16	mg/L
Analyzed:	4/3/1998 10:30AM	
TS	<0.10	%
Analyzed:	4/1/1998 12:30PM	
Total Suspended Solids (TSS)	<3	mg/L
Analyzed:	3/23/1998 6:00PM	
VO502.2	<3	
Analyzed:		
Zinc	<0.01	mg/L
Analyzed:	3/27/1998 10:50AM	

Signature

Lab Director

Peter Dominski

SA = See Attached Report



AQUA PRO-TECH LABORATORIES

CERTIFICATIONS:

NJ DEP # 07066, 16606/NY DOH # 1163

CLIENT : Green Township Environmental
ADDRESS : 17 Indian Terrace, Lafayette, N.J. 07848
SAMPLE LOCATION: Sampling Point #1
DATE SAMPLED : 3-20-98
DATE RECEIVED : 3-20-98
DATE ANALYZED : 3-23-98
DATE COMPLETED : 3-25-98
MATERIAL : One (1) Drinking Water Sample
IDENTIFICATION : 98030574
SUBMITTED FOR : Volatile Organics
METHOD USED : EPA 502.2
ANALYZED BY : Lab # 16606

Parameter	YOUR RESULTS (PPb) (³)	MCL (¹) (PPb)	PQL (²) (PPb)
Benzene	ND	1.0	0.50
Bromobenzene	ND	none	0.50
Bromochloromethane	ND	none	0.50
Bromoform	ND	100. ^^	0.50
Bromomethane	ND	none	0.50
Bromodichloromethane	ND	100. ^^	0.50
n-Butyl Benzene	ND	none	0.50
sec-Butyl Benzene	ND	none	0.50
tert-Butyl Benzene	ND	none	0.50
Carbon Tetrachloride	ND	2.0	0.50
Chlorobenzene	ND	50.	0.50
Chloroethane	ND	none	0.50
Chloroform	ND	100. ^^	0.50
Chloromethane	ND	none	0.50
2-Chloro Toluene	ND	none	0.50
4-Chloro Toluene	ND	none	0.50
1,2-Dibromoethane	ND	none	0.50
Dibromomethane	ND	none	0.50
Dibromochloromethane	ND	100. ^^	0.50
1,2 Dibromo-3-Chloropropane	ND	none	0.50
1,2-Dichlorobenzene	ND	600.	0.50
1,3-Dichlorobenzene	ND	600.	0.50
1,4-Dichlorobenzene	ND	75.	0.50
1,1-Dichloroethane	ND	50. **	0.50
1,2-Dichloroethane	ND	2.	0.50
1,1-Dichloroethene	ND	2.	0.50
cis-1,2 Dichloroethene	ND	70.	0.50
Dichlorodifluoromethane	ND	none	0.50
1,1-Dichloropropene	ND	none	0.50
1,3-Dichloropropene	ND	none	0.50
2,2-Dichloropropene	ND	none	0.50
trans-1,2-Dichloroethene	ND	100.	0.50
1,2-Dichloropropene	ND	5.	0.50
cis-1,3-Dichloropropene	ND	none	0.50
trans-1,3-Dichloropropene	ND	none	0.50



IDENTIFICATION: 98030574

AQUA PRO-TECH LABORATORIES		CERTIFICATIONS:	
Ethyl Benzene	ND	700.	none
Isopropyl Benzene	ND	none	0.50
p-Isopropyltoluene	ND	none	0.50
Methylene Chloride	ND	3.	0.50
Methyl tert-Butyl Ether (MTBE)	ND	70.	0.50
Naphthalene	ND	300.**	0.50
n-Propyl Benzene	ND	none	0.50
Styrene	ND	100.	0.50
1,1,1,2-Tetrachloroethane	ND	none	0.50
1,1,2,2-Tetrachloroethane	ND	1.**	0.50
Tetrachloroethene	ND	1.	0.50
Toluene	ND	1,000.	0.50
1,1,1-Trichloroethane	ND	30.	0.50
1,1,2-Trichloroethane	ND	3.	0.50
1,2,3-Trichloropropane	ND	none	0.50
Trichloroethene	ND	1.	0.50
Trichlorofluoromethane	ND	none	0.50
1,2,3 Trichlorobenzene	ND	none	0.50
1,2,4 Trichlorobenzene	ND	9.	0.50
1,2,4-Trimethyl Benzene	ND	none	0.50
1,3,5-Trimethyl Benzene	ND	none	0.50
Vinyl Chloride	ND	2.	0.50
M&P Xylenes	ND	none	0.50
Ortho Xylenes	ND	none	0.50
Total Xylenes	ND	1000.	0.50

Data Reporting Qualifiers

- (1) MCL Maximum Contaminant Level Allowed as per N.J.A.C.7:10-16.
 (2) PQL Quantitation level that an analyte can be detected with confidence.
 (3) PPb Parts Per Billion or micrograms per liter

ND Indicates that the compound was analyzed for but not detected and was therefore less than the PQL.

* Exceeds Maximum Contaminant Level

** Recommended Concentration Only

^^ These four compounds are known as THM's (Trihalomethanes) and have a combined total MCL of 100. PPb.

J Indicates an estimated value. Could be less than the PQL but greater than zero.

The liability of Aqua Pro-Tech Laboratories shall in no event exceed the amount of the invoice.

We certify that this report is a true report of results obtained from our tests of this material.

Respectfully submitted,

Peter Dominski
Laboratory Director

Int:

QA:



AQUA PRO-TECH LABORATORIES

CERTIFICATIONS:

NJ DEP # 07010/NY DOH # 11634
CT # PH-0233

ANALYTICAL RESULTS SUMMARY

DATE: 3/24/2000

CLIENT: Green Township Environmental
17 Indian Terr.
Lafayette, NJ 07848

LAB ORDER: 98030575

SAMPLES RECIEVED: 3/20/1998 1:30PM

ATTN:

PROJECT:

SITE: Sampling Point #2

Lab Sample ID: 98030575-001
Client Sample ID: Grab
Collect Date: 3/20/1998
Matrix: Drinking Water

TEST:		Result Unit
Alkalinity	18	mg/L
Analyzed:	3/23/1998 1:00PM	
Bicarbonate (HCO ₃)	17.7	mg/L
Analyzed:	4/20/1998 10:00AM	
Carbonate Alkalinity	0.3	mg/L
Analyzed:	4/20/1998 10:00AM	
Alkalinity- Total CO ₂	15.9	mg/L
Analyzed:	4/20/1998 10:00AM	
Aluminum	0.083	mg/L
Analyzed:	3/27/1998 2:00PM	
Ammonia	0.18	mg/L
Analyzed:	3/27/1998 2:45PM	
Arsenic	<0.005	mg/L
Analyzed:	3/25/1998 3:00PM	
Cadmium	<0.0005	mg/L
Analyzed:	3/30/1998 12:30PM	
Chloride	36	mg/L
Analyzed:	3/24/1998 1:45PM	
Chromium (Cr)	<0.01	mg/L
Analyzed:	3/30/1998 10:30AM	
Conductivity	148	µmhos/cm
Analyzed:	3/20/1998 4:20PM	
Copper (Cu)	<0.01	mg/L
Analyzed:	3/23/1998 12:15PM	

Signature

Lab Director

Peter Dominski

SA = See Attached Report



AQUA PRO-TECH LABORATORIES

CERTIFICATIONS:

NJ DEP # 07010/NY DOH # 11634
CT # PH-0233

ANALYTICAL RESULTS SUMMARY

DATE: 3/24/2000

CLIENT: Green Township Environmental
17 Indian Terr.
Lafayette, NJ 07848

LAB ORDER: 98030575

SAMPLES RECIEVED: 3/20/1998 1:30PM

ATTN:

PROJECT:

SITE: Sampling Point #2

Lab Sample ID: 98030575-001
Client Sample ID: Grab
Collect Date: 3/20/1998
Matrix: Drinking Water

TEST:		Result Unit
Depth	1	feet
Analyzed:	3/20/1998 10:40AM	
Dissolved Oxygen	12	mg/L
Analyzed:	3/20/1998 10:00AM	
Iron	<0.01	mg/L
Analyzed:	3/23/1998 1:40PM	
Lead	<0.001	mg/L
Analyzed:	3/25/1998 12:00PM	
Mercury	<0.0005	mg/L
Analyzed:	3/31/1998 3:15PM	
Nitrates	1	mg/L
Analyzed:	3/20/1998 4:30PM	
Nitrites	<0.005	mg/L
Analyzed:	3/20/1998 4:25PM	
pH,Field	8.26	pH Units
Analyzed:	3/20/1998 10:40AM	
Phenol	<0.005	mg/L
Analyzed:	3/24/1998 1:00PM	
Phosphorus, Ortho	<0.05	mg/L
Analyzed:	3/26/1998 4:00PM	
Potassium	2	mg/L
Analyzed:	3/30/1998 12:05PM	
Sodium (Na)	18	mg/L
Analyzed:	3/23/1998 3:40PM	

Signature

Lab Director

Peter Dominski

SA = See Attached Report



AQUA PRO-TECH LABORATORIES

CERTIFICATIONS:

NJ DEP # 07010/NY DOH # 11634
CT # PH-0233

ANALYTICAL RESULTS SUMMARY

DATE: 3/24/2000

CLIENT: Green Township Environmental
17 Indian Terr.
Lafayette, NJ 07848

LAB ORDER: 98030575

SAMPLES RECIEVED: 3/20/1998 1:30PM

ATTN:

PROJECT:

SITE: Sampling Point #2

Lab Sample ID: 98030575-001
Client Sample ID: Grab
Collect Date: 3/20/1998
Matrix: Drinking Water

TEST:		Result Unit
Sulfate	23.4	mg/L
Analyzed:	3/26/1998 1:30PM	
TDS	99	mg/L
Analyzed:	3/26/1998 11:00AM	
Temperature (Thermometric)	20	°F
Analyzed:	3/20/1998 10:40AM	
TKN	0.29	mg/L
Analyzed:	4/1/1998 8:30AM	
TOC	3.2	mg/L
Analyzed:	3/23/1998 10:00AM	
Phosphorus, Total	0.1	mg/L ¹
Analyzed:	4/3/1998 10:30AM	
TS	<0.10	%
Analyzed:	4/1/1998 12:30PM	
Total Suspended Solids (TSS)	<3	mg/L
Analyzed:	3/23/1998 6:00PM	
VO502.2	<3	
Analyzed:		
Zinc	<0.01	mg/L
Analyzed:	3/27/1998 10:50AM	

Signature

Lab Director

Peter Dominski

SA = See Attached Report



AQUA PRO-TECH LABORATORIES

CERTIFICATIONS:

NJ DEP # 07066, 16606/NY DOH # 11634

CLIENT : Green Township Environmental
ADDRESS : 17 Indian Terrace, Lafayette, N.J. 07848
SAMPLE LOCATION: Sampling Point #2
DATE SAMPLED : 3-20-98
DATE RECEIVED : 3-20-98
DATE ANALYZED : 3-23-98
DATE COMPLETED : 3-25-98
MATERIAL : One (1) Drinking Water Sample
IDENTIFICATION : 98030575
SUBMITTED FOR : Volatile Organics
METHOD USED : EPA 502.2
ANALYZED BY : Lab # 16606

Parameter	YOUR RESULTS (PPb) (3)	MCL (1) (PPb)	POL (2) (PPb)
Benzene	ND	1.0	0.50
Bromobenzene	ND	none	0.50
Bromochloromethane	ND	none	0.50
Bromoform	ND	100. ^^	0.50
Bromomethane	ND	none	0.50
Bromodichloromethane	ND	100. ^^	0.50
n-Butyl Benzene	ND	none	0.50
sec-Butyl Benzene	ND	none	0.50
tert-Butyl Benzene	ND	none	0.50
Carbon Tetrachloride	ND	2.0	0.50
Chlorobenzene	ND	50.	0.50
Chloroethane	ND	none	0.50
Chloroform	ND	100. ^^	0.50
Chloromethane	ND	none	0.50
2-Chloro Toluene	ND	none	0.50
4-Chloro Toluene	ND	none	0.50
1,2-Dibromoethane	ND	none	0.50
Dibromomethane	ND	none	0.50
Dibromochloromethane	ND	100. ^^	0.50
1,2 Dibromo-3-Chloropropane	ND	none	0.50
1,2-Dichlorobenzene	ND	600.	0.50
1,3-Dichlorobenzene	ND	600.	0.50
1,4-Dichlorobenzene	ND	75.	0.50
1,1-Dichloroethane	ND	50.**	0.50
1,2-Dichloroethane	ND	2.	0.50
1,1-Dichloroethene	ND	2.	0.50
cis-1,2 Dichloroethene	ND	70.	0.50
Dichlorodifluoromethane	ND	none	0.50
1,1-Dichloropropene	ND	none	0.50
1,3-Dichloropropene	ND	none	0.50
2,2-Dichloropropene	ND	none	0.50
trans-1,2-Dichloroethene	ND	100.	0.50
1,2-Dichloropropene	ND	5.	0.50
cis-1,3-Dichloropropene	ND	none	0.50
trans-1,3-Dichloropropene	ND	none	0.50



IDENTIFICATION: 98030575

AQUA PRO-TECH LABORATORIES		CERTIFICATIONS:	
Ethyl Benzene	ND	700.	0.50
Isopropyl Benzene	ND	none	0.50
p-Isopropyltoluene	ND	none	0.50
Methylene Chloride	ND	3.	0.50
Methyl tert-Butyl Ether (MTBE)	ND	70.	0.50
Naphthalene	ND	300.**	0.50
n-Propyl Benzene	ND	none	0.50
Styrene	ND	100.	0.50
1,1,1,2-Tetrachloroethane	ND	none	0.50
1,1,2,2-Tetrachloroethane	ND	1.**	0.50
Tetrachloroethene	ND	1.	0.50
Toluene	ND	1,000.	0.50
1,1,1-Trichloroethane	ND	30.	0.50
1,1,2-Trichloroethane	ND	3.	0.50
1,2,3-Trichloropropane	ND	none	0.50
Trichloroethene	ND	1.	0.50
Trichlorofluoromethane	ND	none	0.50
1,2,3 Trichlorobenzene	ND	none	0.50
1,2,4 Trichlorobenzene	ND	9.	0.50
1,2,4-Trimethyl Benzene	ND	none	0.50
1,3,5-Trimethyl Benzene	ND	none	0.50
Vinyl Chloride	ND	2.	0.50
M&P Xylenes	ND	none	0.50
Ortho Xylenes	ND	none	0.50
Total Xylenes	ND	1000.	0.50

Data Reporting Qualifiers

- (1) MCL Maximum Contaminant Level Allowed as per N.J.A.C.7:10-16.
 (2) PQL Quantitation level that an analyte can be detected with confidence.
 (3) PPb Parts Per Billion or micrograms per liter

ND Indicates that the compound was analyzed for but not detected and was therefore less than the PQL.

* Exceeds Maximum Contaminant Level


** Recommended Concentration Only

^^ These four compounds are known as THM's (Trihalomethanes) and have a combined total MCL of 100. PPb.


J Indicates an estimated value. Could be less than the PQL but greater than zero.

The liability of Aqua Pro-Tech Laboratories shall in no event exceed the amount of the invoice.

We certify that this report is a true report of results obtained from our tests of this material.

Respectfully submitted,


Peter Dominski
 Laboratory Director

Int: 
 QA: 