



STATE OF DELAWARE

WATER QUALITY STANDARDS SUMMARY

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U.S. ENVIRONMENTAL
PROTECTION AGENCY

DELAWARE DEPT. OF
NATURAL RESOURCES AND
ENVIRONMENTAL CONTROL

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WATER QUALITY STANDARDS SUMMARY
FOR
INTERSTATE WATERS
IN THE
STATE OF DELAWARE

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SUMMARY OF WATER QUALITY STANDARDS
FOR
INTERSTATE WATERS
OF THE
STATE OF DELAWARE

Introduction

In the Water Quality Act of 1965 Congress authorized the establishment of water quality standards for interstate (including coastal) waters. The purpose of these standards is to protect the public health and welfare and enhance the quality of the Nation's interstate waters to serve a variety of beneficial uses, such as public water supply, recreation, protection of aquatic life, industrial, and agricultural uses. This publication summarizes the standards for the general information of the public and Federal, State, and local officials as to the uses and associated requirements for interstate waterways.

The Act, which amended the Federal Water Pollution Control Act, provided for the States to have the first opportunity to establish standards for their interstate waters, which were then subject to review and approval by the Secretary of the Interior. On December 2, 1970, the responsibility for administering the Water Quality Act of 1965 was transferred to the Administrator, Environmental Protection Agency.

All of the States, the District of Columbia, and the territories of Guam, Puerto Rico, and the Virgin Islands, participated in this landmark effort to set standards. In the course of establishing the standards, public hearings were held by the State and other jurisdictions noted above to give the public an opportunity to participate in setting water quality standards.

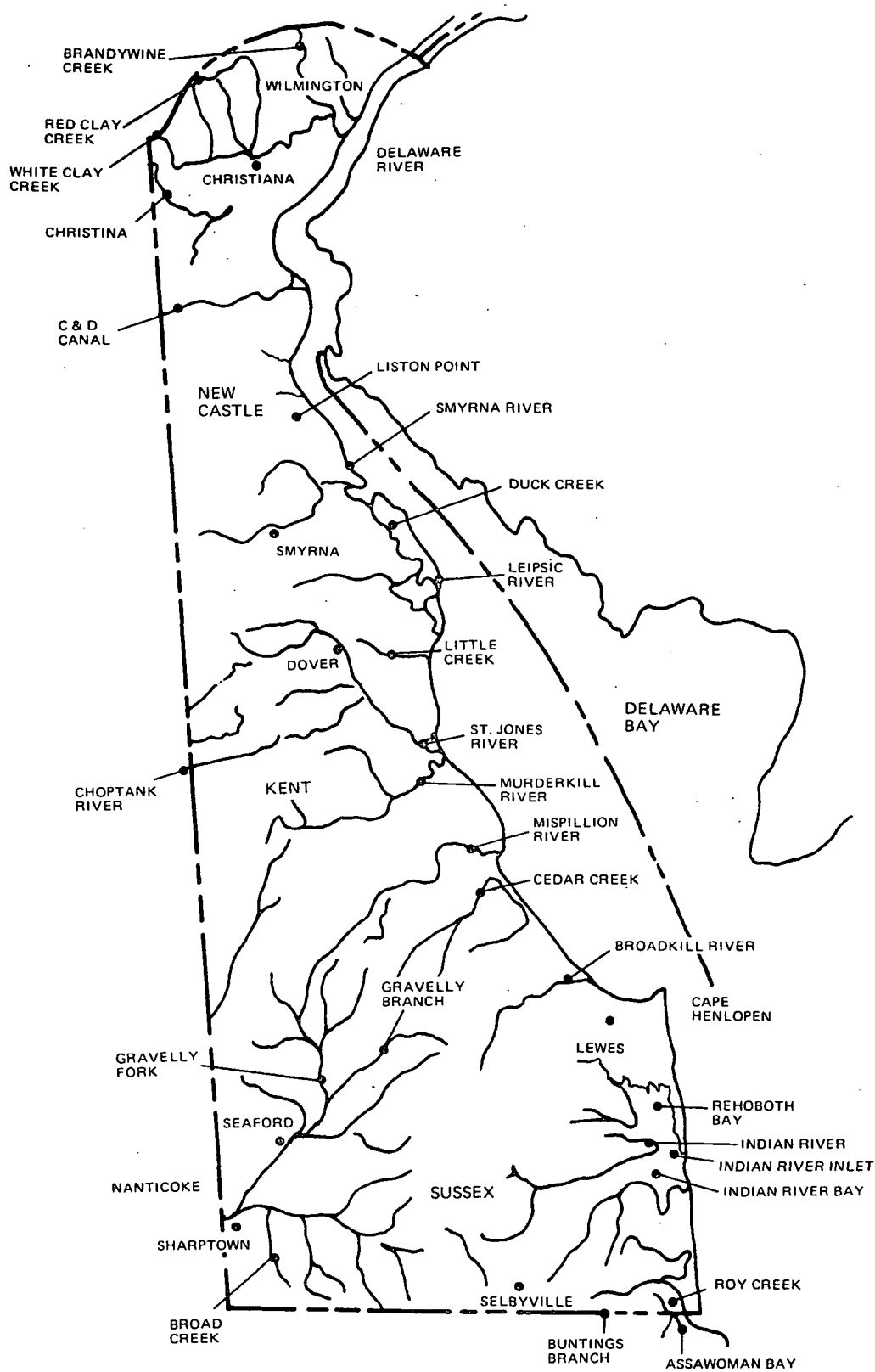
The standards which Delaware adopted for its interstate waters on May 17, 1967, were partially approved by the Secretary of the Interior on March 8, 1968. Subsequently, Delaware adopted a policy to protect its high quality interstate waters, and resolved the criteria previously excepted from approval. On July 30, 1971, the Administrator, Environmental Protection Agency, approved Delaware's water quality standards in their entirety.

The standards consist of three major components: (1) designation of the uses which interstate waters are to serve, (2) specifications of narrative and numerical criteria to protect and enhance water quality, and (3) specification of a plan of implementation and enforcement, including treatment and control requirements for municipal, industrial, and other waste discharged to or affecting interstate waters. These components, all three essential to a complete standards program, are discussed in the following sections.

The standards are now being implemented. However, there will be continuing research on water quality requirements for various beneficial uses and improved collection and evaluation of water quality data. As more information becomes available and experience with implementing the standards is gained, the standards will be refined and improved to reflect this new knowledge.

Should more detailed information be required on any aspect of the standards, it may be obtained from the Delaware Department of Natural Resources, Division of Environmental Control, Legislative Avenue, and Court Street, Dover, Delaware 19901 or the Environmental Protection Agency, Region III, Curtis Building, 6th and Walnut Streets, Philadelphia, Pennsylvania 19106. Delaware has also established water quality standards for its intra-state waters, and information on these standards may also be obtained from the Delaware Department of Natural Resources, Division of Environmental Control.

SIGNIFICANT INTERSTATE WATERS OF THE STATE OF DELAWARE



ENVIRONMENTAL PROTECTION AGENCY
FIGURE 1

WATER QUALITY STANDARDS SUMMARY
FOR
INTERSTATE WATERS
IN THE
STATE OF DELAWARE

Section 1. General

The general aim in designating uses for particular interstate waters is to recognize present uses and practicable future uses, to provide where possible for a variety of uses, and to assure compatibility of standards with Federal, State, and local resource planning. In order to satisfy the intent of the Federal Water Pollution Control Act to enhance water quality, the standards specifically provide that no interstate waters may be used solely or primarily for waste assimilation. All interstate waters must be aesthetically pleasing and this quality is usually protected by narrative criteria preventing unsightly or obnoxious conditions, such as floating debris, oil slicks, unpleasant odors, and colors.

The water quality of other interstate streams (not listed) shall be maintained in a condition suitable to meet the reasonable requirements of the states they flow into.

It is the public policy of the State to maintain within its jurisdiction a reasonable quality of water consistent with public health and public enjoyment thereof, the propagation and protection of fish and wildlife, including birds, mammals, and other terrestrial and aquatic life, and the industrial development of the State.

Where conflicts develop between stated water uses, stream criteria, or discharge criteria, water uses shall be paramount in determining the required stream criteria, which, in turn, shall be the basis of individual discharge limits.

Waters whose existing quality is better than the established standards as of the date on which such standards become effective will be maintained at such high quality unless it has been affirmatively demonstrated to the state that a change is justifiable as a result of necessary economic or social development and will not preclude uses presently possible in such waters. Any industrial, public, or private project or development which would constitute a new source of pollution or an increased source of pollution to high quality waters will be required to provide the highest and best practicable means of waste treatment to maintain high water quality. In implementing this policy, the Administrator of the Environmental Protection Agency will be kept advised and will be provided with such information as he will need to discharge his responsibilities under the Federal Water Pollution Control Act, as amended.

Section 2. Water Uses

The State of Delaware designates the following uses to be protected in various interstate waters. The alphabetical designations are keyed to the table of water uses and stream quality criteria in Section 6A. Reworded uses added by the State subsequent to approval are shown in parenthesis ().

- A. Public Water Supply after reasonable treatment.
- B. Industrial water supply after reasonable treatment.
- C. Recreation
- D. Recreation (non-water contact)
- E-1 Maintenance & propagation of fish & aquatic life & wildlife preservation.
- E-2 Maintenance, propagation of fish, aquatic and wildlife, and passage of anadromous fish.
- E-3 Maintenance of fish, aquatic and wildlife.
- E-4 Maintenance and propagation of fish, aquatic and wildlife.
- E-5 Maintenance of fish and aquatic life.
- E-6 Maintenance of fish, shellfish & aquatic life & wildlife preservation.
- E-7 Wildlife, maintenance of resident fish & other aquatic life, passage of anadromous fish.
- E-8 Wildlife, maintenance and propagation of resident fish and other aquatic life, passage of anadromous fish.
- E-9 Wildlife, maintenance of fish, shellfish and other aquatic life and passage of anadromous fish.
- E-10 Maintenance and propagation of shellfish.
- E-11 Passage of anadromous fish.
- F. Navigation
- G. Agricultural water supply.
- H. Drainage

Section 3. Water Quality Criteria

The protection of water quality and uses requires the establishment of numerical and narrative limits on pollutants which prevent these uses. The water quality criteria in this section reflect the best scientific judgment available as to the water quality requirements for the assigned uses. Numerical criteria are used wherever it is reasonable to do so. However, narrative criteria are also necessary in some cases, particularly with respect to aesthetic considerations.

Some interstate waters have a higher quality than the minimum levels assigned for protection of water uses, and the standards seek to protect this higher quality as much as possible in the face of increasing social and economic development. Scientific knowledge about the exact water quality requirements for uses is limited and by preventing degradation of higher quality waters, the standards seek to assure optimum, not marginal, conditions to protect the uses associated with clean waters.

Inasmuch as possible, the State of Delaware standards tailor water quality criteria to present quality or that quality anticipated to result from installation of the high treatment requirements. These criteria are outlined in Section 6A, Table of Water Uses and Stream Quality Criteria. The Standards also contain general narrative criteria which is shown in Section 4.

Section 4. General Criteria

The following minimum conditions shall be applicable at all times to all Delaware waters:

A. General

In addition to the specific criteria set forth in Section 6, or in the absence thereof, the waters of Delaware shall not contain substances

attributable to municipal, industrial, agricultural, or other discharges in concentrations or amounts sufficient to be adverse or harmful to water uses to be protected, or to human, animal, aquatic, and wildlife. The waters shall be free from unsightly and malodorous nuisances due to floating solids or sludge deposits, debris, oil, and scum.

B. Reservations

Maintenance of stream quality criteria is dependent upon the following conditions:

1. Short transition zones will exist between adjacent zones of varying water quality.
2. The standards proposed are based upon the ability of the Delaware Department of Natural Resources and Environmental Control to measure and to determine compliance. All measurements will be made at selected sampling stations. Such stations will be selected after determining "representatives" of the sample obtained and the nature of the mixing at the station.
3. The quality of tributary streams shall be such that it will not interfere with the attainment of the stream criteria set forth for each interstate stream.

C. Discharge Criteria

1. Debris, oil, scum, other floating materials and substances that settle to form sludge deposits should be substantially removed from all discharges. All materials, including oxygen-consuming materials (carbonaceous, nitrogenous, chemical, or other) shall be reduced to the extent required to meet and sustain stream criteria.
2. All new waste discharges shall receive a minimum of secondary treatment (at least 85 percent removal of 5-day biochemical oxygen demand) or equivalent.
3. All existing waste discharges which do not receive secondary treatment or equivalent shall be upgraded.
4. All waste (exclusive of storm water bypass) containing human excreta or disease producing organisms shall be chlorinated. A free chlorine residual of at least 1 mg/l shall be maintained at all times after at least 30 minutes contact time.
5. Design of waste treatment facilities should be based on maintaining an effluent of such character that the Water Quality Indicators meet the specifications as stated for individual receiving streams during a low-flow period equivalent to the minimum seven consecutive day flow recurring once every ten years.

Section 5. Specific Criteria

Each of the waters for which specific criteria have been established is listed in sub-section 6A through 6N. The alphabetical designator under "column" in the following Standard List of Specific Criteria is keyed to the alphabetical columns in the Water Quality Criteria section of each river basin in sub-sections 6A through 6N. Reworded, slightly altered, and new criteria added by the State subsequent to approval are shown in parenthesis and the source noted below.

Standard List of Specific Criteria

Column	Identification	Unit of Measurement	Key	Limits
A	Temperature	°F	1	Shall not exceed 5° F above normal for the section.
			2	Shall not exceed 5° F above normal for the section or a maximum of 85° F.
			3	Shall not exceed 5° F above normal for the section or a maximum of 87° F.
			4	Shall not exceed 5° F above normal for the area or a maximum of 75° F.
			5	*"Artificially induced rise shall not exceed 5° F above the normal for the section or 85°F, whichever is less."
B	Dissolved Oxygen	mg/l	1	Shall not be less than 50% of saturation or 4 mg/l at any time.
			2	Shall not be less than 6.0 mg/l at low water slack (Reedy Point Reference)

* Water Quality Standards for interstate streams, State of Delaware, Department of Natural Resources and Env. Control, Rev. Feb 1972, Sect. 8, Key 1, pg. 5

Column	Identification	Unit of Measurement	Key	Limits
B (continued)				<p>3 The DO concentrations shall not be less than 6.5 mg/l (daily average) in the entire zone between April 1 to June 15 and September 16 to December 31. During the rest of the year, the daily average concentration shall not be less than 3.5 mg/l at River Mile 78.8, 4.5 mg/l at River Mile 70.00, and 6.0 mg/l at River Mile 59.5.</p> <p>4 The daily average shall not be less than 6.0 mg/l.</p> <p>5 Shall not be less than the natural oxygen level of the ocean.</p>
C	Total Alkalinity	mg/l as CaCO_3	<p>1 Between 20 mg/l and 80 mg/l at any time.</p> <p>2 Between 15 mg/l and 120 mg/l at any time.</p> <p>3 Between 20 mg/l and 120 mg/l at any time.</p> <p>4 Shall not be less than 20 mg/l at any time.</p> <p>5 The natural total alkalinity of the ocean shall not be reduced by more than 10/mg/l at any time.</p>	

Column	Identification	Unit of Measurement	Key	Limits
D	Total Acidity	mg/l CaCO_3	1	Shall not exceed the alkalinity by 5 mg/l at any time.
			2	Shall not exceed the alkalinity by 10 mg/l at any time.
			3	Shall not exceed the alkalinity by 20 mg/l at any time.
E	pH	units	1	Shall be between 6.5 and 8.5.
			2	Shall be between 7.0 and 8.5.
F	Synthetic Detergents (MBAS)	mg/l	1	Shall not exceed 0.5 mg/l.
			* 2	Shall not exceed 0.1 mg/l at any time.
G	Alpha Emitters	pc/l	1	Maximum 3 pc/l.
H	Beta Emitters	pc/l	1	Maximum 1,000 pc/l.
I	Total Coliform	Organisms/100 ml		The State Board of Health is responsible for the protection of all public health in recreational waters. In accordance with these recommendations:
			1	For bathing or swimming waters, the monthly arithmetical average "most probable number" of coliform organisms should not exceed 1,000 per 100 ml during any month of the recreation season; nor exceed this number in more than 20% of the samples examined during any such month; nor exceed 2,400 per 100 ml on any day in areas designated by the Commission for water contact recreation.

*Water Quality Standards for interstate streams, State of Delaware, Department of Natural Resources and Env. Control, Rev. FEB 1972, Sect. 8, Key 6, p. 5

Column	Identification	Unit of Measurement	Key	Limits
I	Total Coliform (Continued)		2	For shellfish growing areas, the coliform median MPN of the water should not exceed 70 per 100 ml, and not more than 10% of the samples ordinarily exceed a MPN of 230 per 100 ml for a 5-tube decimal dilution test (or 330 per 100 ml, where the 3-tube decimal dilution test is used) in those portions of the area most probably exposed to fecal contamination during the most unfavorable hydrographic and pollution condition.
			3	Not greater than 70 coliform/100 ml at any time.
			4	Monthly arithmetical average shall be less than 2,400 coliform/100 ml.
			* 5	<p>In order to conform to the requirements in Part One, Sanitation of Shellfish Growing Areas, National Shellfish Sanitation Program Manual of Operations, the following recommended standards of the State Board of Health will govern:</p> <p>The coliform median MPN of the water should not exceed 70 per 100 ml, and not more than 10 percent of the samples ordinarily exceed an MPN of 230 per 100 ml for a 5-tube decimal dilution test (or 330 per 100 ml, where the 3-tube decimal dilution test is used) in those portions of the area most probably exposed to fecal contamination during the most unfavorable hydrographic and pollution conditions in designated shellfish areas.</p>

* Water Quality Standards for interstate streams, State of Delaware, Department of Natural Resources and Env. Control, Rev. FEB 1972, Sect. 8, Key 11-B, p. 6

Column	Identification	Unit of Measurement	Key	Limits
J	Phenols	mg/l	1	Shall not exceed 0.005 mg/l at any time.
K	Turbidity	units	1	Shall not exceed the natural background by 10 units or a maximum of 25 units except following precipitation and the increase shall not be attributed to industrial waste discharge.
L	Toxic Substances	mg/l	1	None in concentrations harmful (synergistically or otherwise) to humans, fish, shellfish, wildlife, and aquatic life.
M	Taste, odor, and Color Causing Substances	mg/l	1	None in concentrations which cause tastes, odors, colors, or impart tastes to fish and other aquatic life.
N	Total Dissolved Solids	mg/l	1	Shall not exceed 250 mg/l of which the sulfate portion shall not be greater than 100 mg/l.
O	Flourides	mg/l	1	Shall not exceed 0.2 mg/l at any time.
P	Actinomycetes	Organisms/100 ml	1	None attributable to waste discharge.
* Q	Ammonia	Amonia - N mg/l	1	Shall not exceed 0.4 mg/l.
* R	Total Nitrogen	mg/l	1	Shall not exceed 3.0 mg/l.

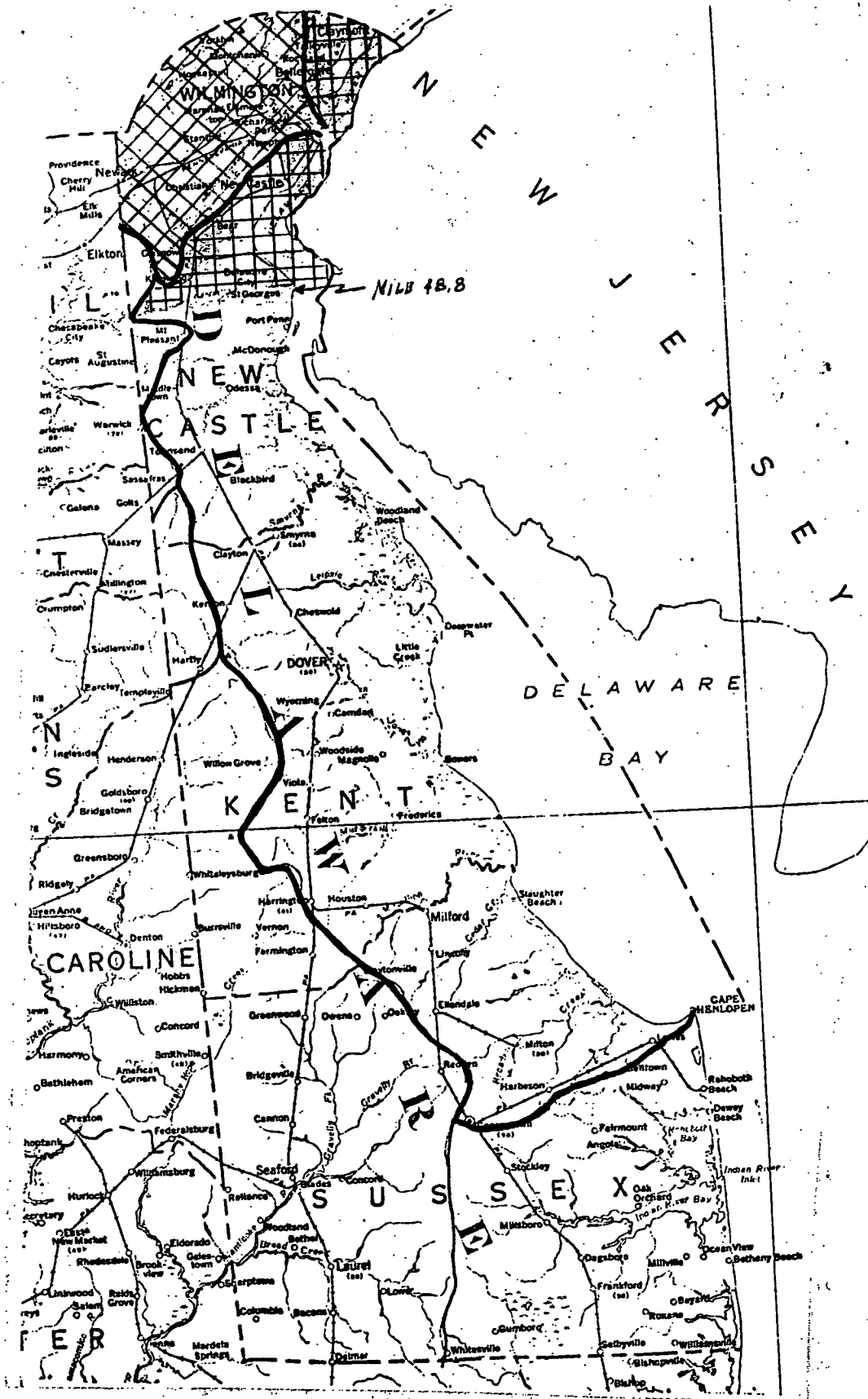
Section 6. Designated Water Uses and Water Quality Criteria

Through the public hearing process, the State of Delaware has adopted the designated water uses and water quality criteria assigned to the individual streams listed in this section.

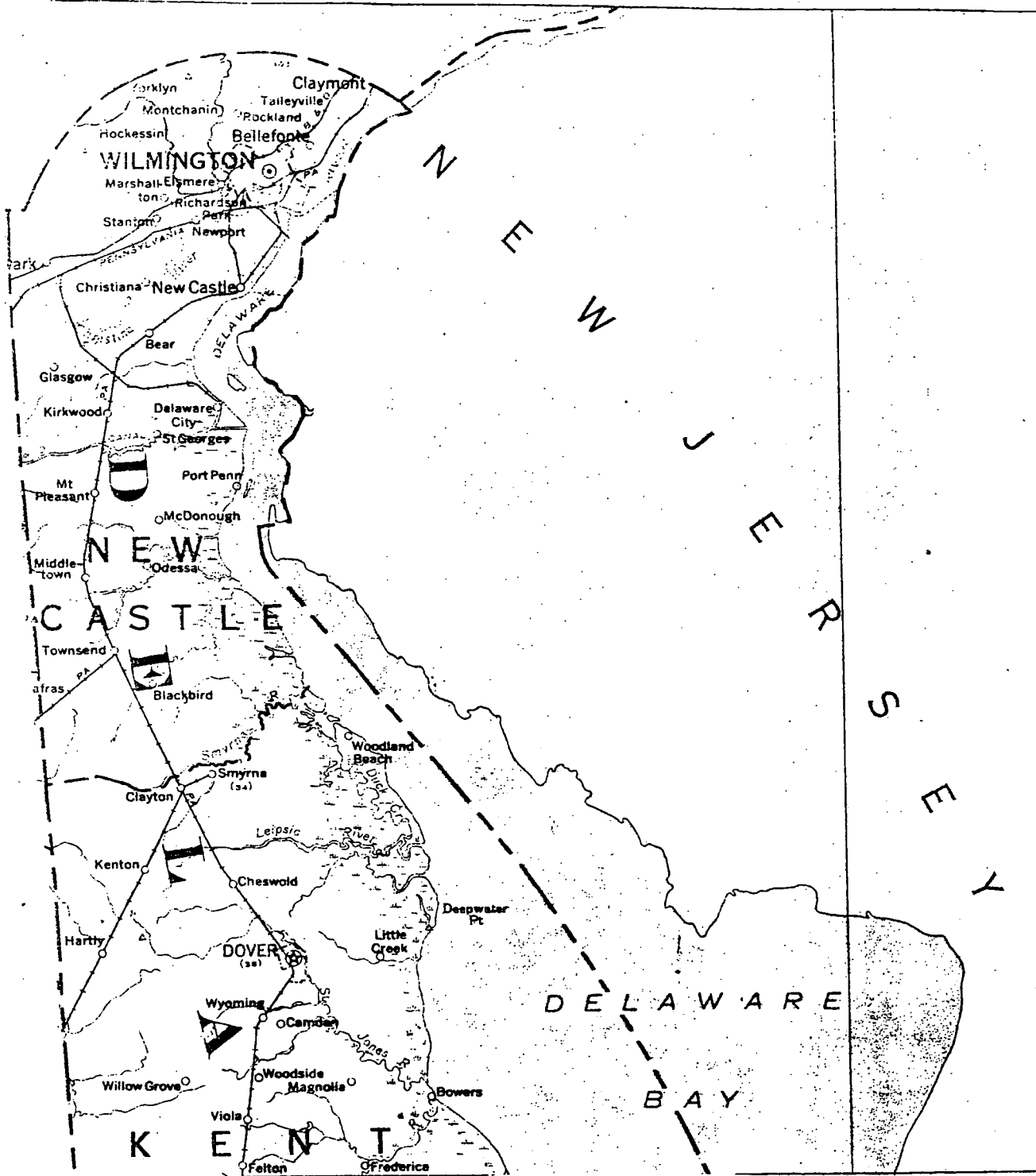
Subsections 6A through 6N include the water uses keyed to Section 2 and the specific criteria keyed to Section 5.

The uses and criteria presented in the State of Delaware, Department of Natural Resources and Environmental Control publication "Water Quality Standards for Interstate Streams", revised February 1972, are slightly different than the federally approved set. The information contained in the State document is included in Subsections 6A through 6N, follows the zone to which it applies, and is identified by reference to the footnote at the bottom of the page.

*Water Quality Standards for interstate streams, State of Delaware, Department of Natural Resources and Env. Control, Rev. FEB 1972, Sect. 8, Keys 7 & 8, p. 5



6A-1 Delaware River Drainage Basin



6A Delaware River Drainage Basin

Basin Description & Zone Limits	Water Uses Sect. 2		Stream Quality Criteria (Section 5)																	
	Present	Future	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
The Delaware River Basin, extending from River Mile 78.8 (Pennsylvania-Delaware Line) to River Mile 70.0.	B C F E7	B C F E7	2	3	4	3	1	1	1	1	1,2	1		1	1					
Delaware River (See Note 1)	B C E-11 G	B C E-11 G	5	3	4	3	1	1	1	1	1	1		1	1					
Delaware River Basin, extending from River Mile 70.0 to River Mile 48.2 (Liston Point) including tidal portions of the tributary streams, except the Christina River.	B E8 C F	B C F E8	2	3	4	3	1	1	1	1	1,2	1		1	1					
Delaware River (See Note 1)	B C E-1 E-11 G	B C E-1 E-11 G	5	3	4	3	1	1	1	1	1	1		1	1					
The Delaware Bay Drainage Basin, extending from River Mile 48.2 (Liston Point) to River Mile 0.00 (Atlantic Ocean) including tidal portions of the following tributary streams: Appoquinimink, Lelapsic, Smyrna, Little Creek, St. Jones, Murderkill, Mispillion, Broadkill.	B C F E9	B C F E9	2	4	4	3	1	1	1	1	1,2	1		1	1					
Delaware Bay (See Note 1)	B C E-1 E-10 E-11 G	B C E-1 E-10 E-11 G	5	4	4	3	1	1	1	1	1,5	1		1	1					
The Ped Clay Creek, extending from the Pennsylvania-Delaware line to its confluence with White Clay Creek.	A B C E1	A B C E1	1	1	1	1	1	1	1	1	1	1	1	1	1	1				
(See Note 1)	A B C E1	A B C E1	5	1	4	3	1	1	1	1	1	1	1	1	1	1				

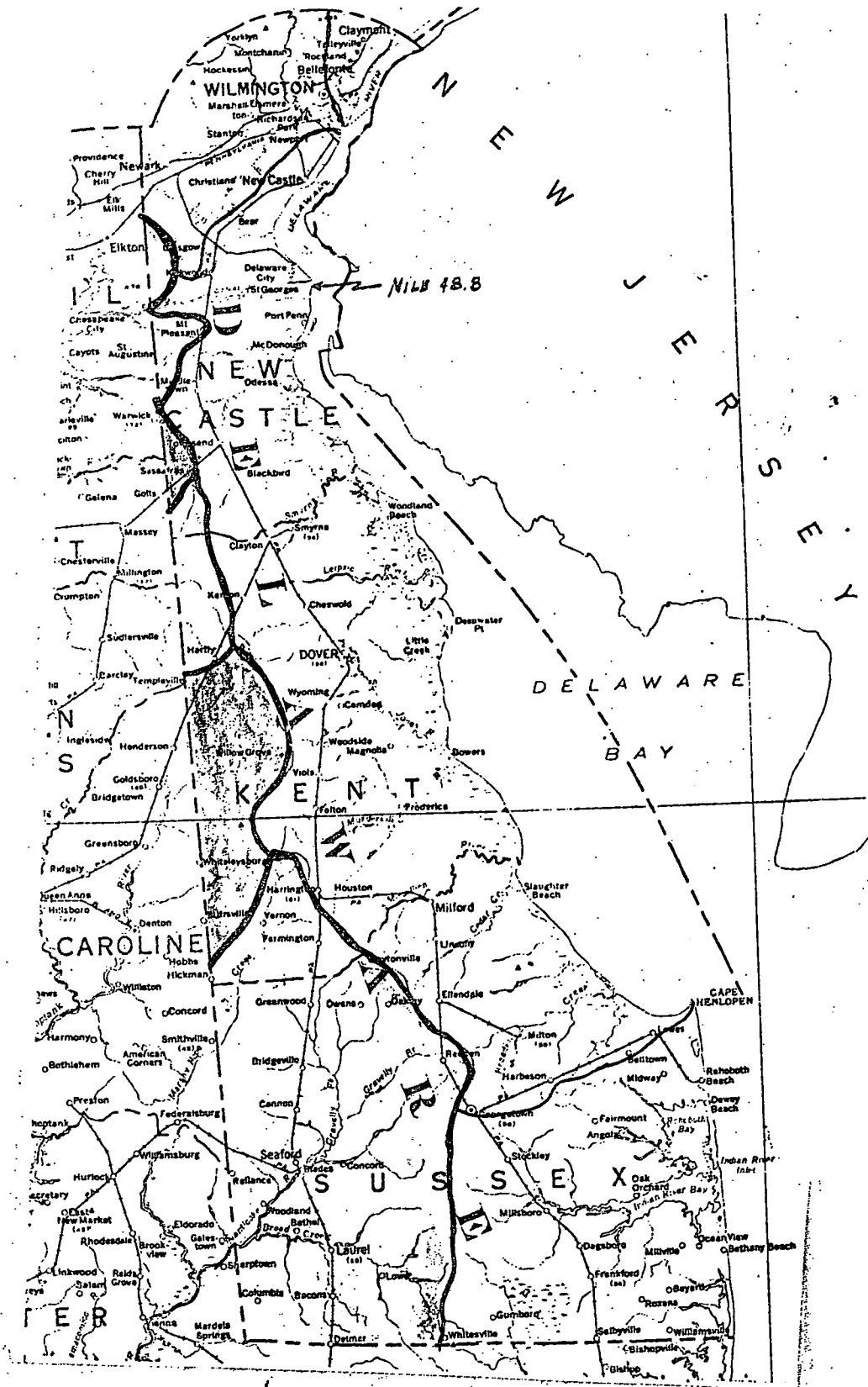
NOTE 1: Information developed from the State of Delaware Department of Natural Resources and Environmental Control Document titled "Water Quality Standards for Interstate Streams", revised February 1972. The document, prepared subsequent to Federal approval of Delaware's Water Quality Standards, reflects the uses and criteria which the State currently employs in the zone described immediately above. Federally approved uses and criteria have not been amended. However, where applicable, enforcement of the more stringent use or criteria is generally encouraged.

6A Delaware River Drainage Basin

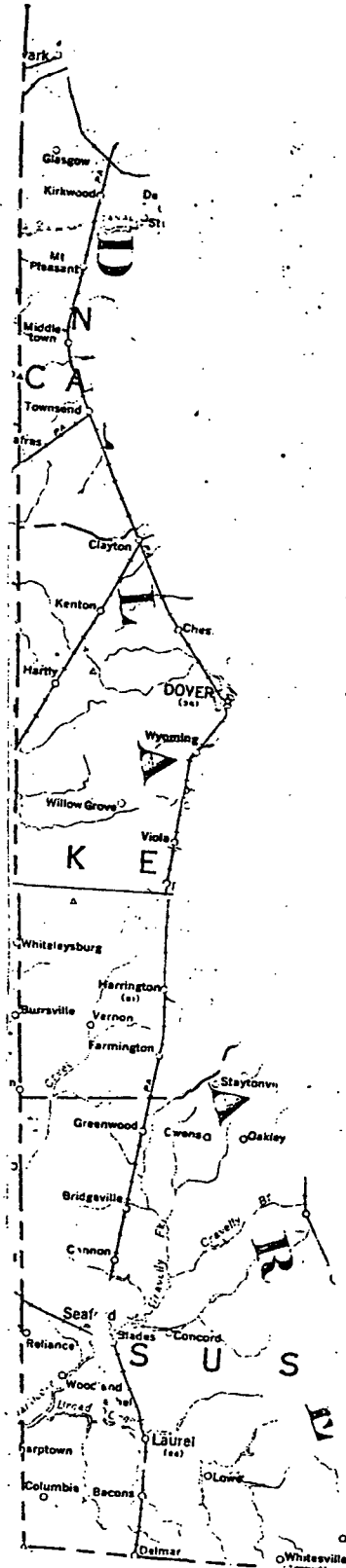
Basin Description & Zone Limits	Water Uses Sect. 2		Stream Quality Criteria (Section 5)																	
	Present	Future	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
The White Clay Creek, extending from the Pennsylvania-Delaware line to its confluence with the Christina River. (See Note 1)	A B C E1	A B C E1	1	1	1	1	1	1	1	1	1	1	1	1	1	1				
The Brandywine River, extending from the Pennsylvania-Delaware line to Market Street (Wilmington) Bridge. (See Note 1)	A B C E1	A B C E1	5	1	4	3	1	1	1	1	1	1	1	1	1	1	1			
The Brandywine River, extending from Market Street (Wilmington) Bridge to its confluence with the Christina River. (See Note 1)	B C E1	B C E1	2	1	1	1		1	1	1	1		1	1	1	1	1	1		
The Christina River, extending from the Maryland-Delaware line to its confluence with the Delaware River is considered two zones.																				
1. Upper Zone Extends from the Maryland-Delaware line to Smalley's Pond. (See Note 1)	A C E3 G	A C E3 G	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
2. Lower Zone Extends from Smalley's Pond to the Delaware River. (See Note 1)	B E3 F C	B C E3 F	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
The Chesapeake and Delaware Canal, extending from the Maryland-Delaware line to Reedy Point, Delaware. (See Note 1)	D E3 F	D E3 F	2	2	2	2	1	1	1	1	1			1	1					
	D E1 F	D E1 F	5	2	2	2	1	1	1	1	1			1	1					

NOTE 1: Information developed from the State of Delaware Department of Natural Resources and Environmental Control Document titled "Water Quality Standards for Interstate Streams", revised February 1972. The document, prepared subsequent to Federal approval of Delaware's Water Quality Standards, reflects the uses and criteria which the State currently employs in the zone described immediately above. Federally approved uses and criteria have not been amended. However, where applicable, enforcement of the more stringent use or criteria is generally encouraged.

6B Chesapeake Bay Drainage Basin



6B-1 Chesapeake Bay Drainage Basin

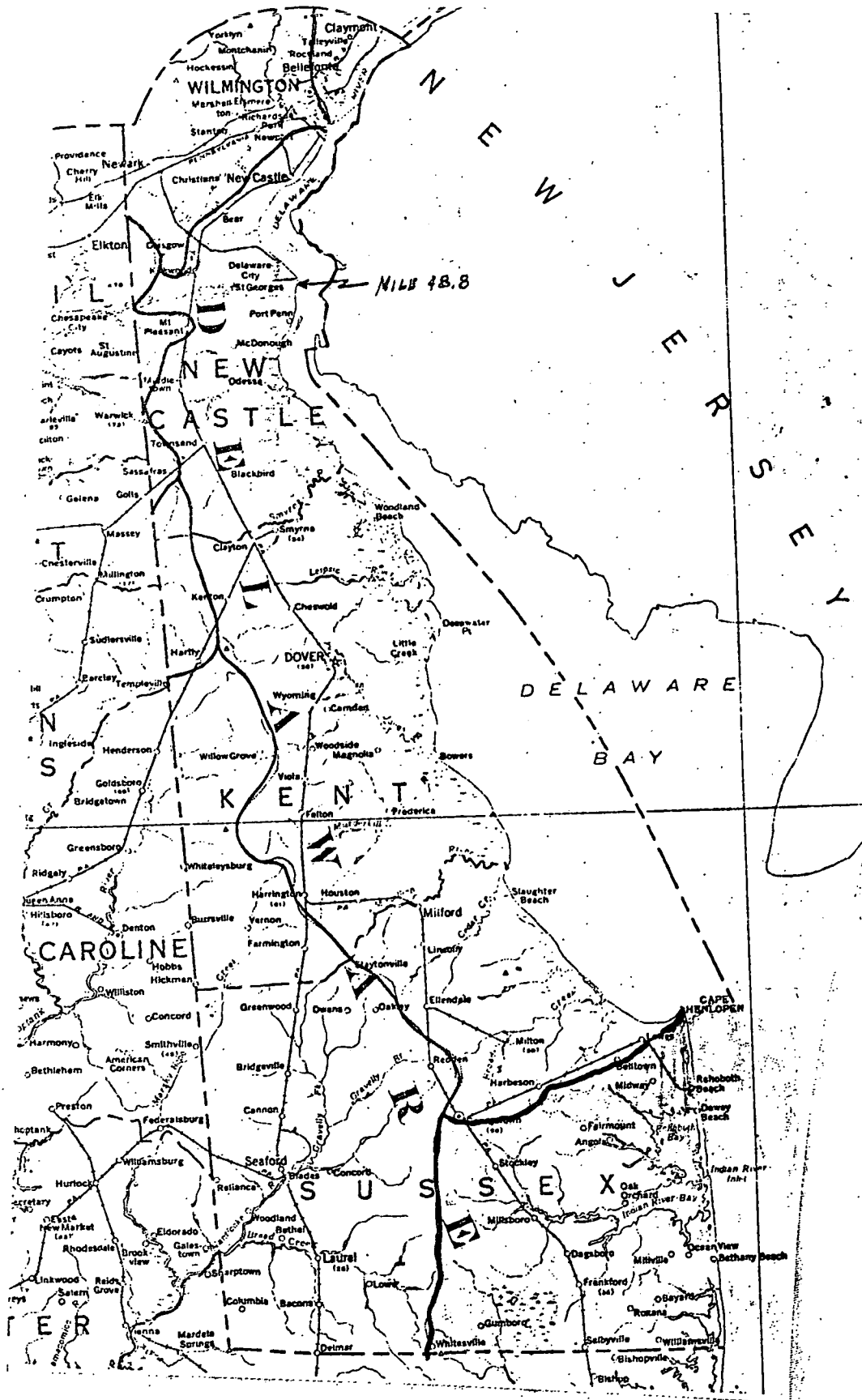


6B Chesapeake Bay Drainage Basin

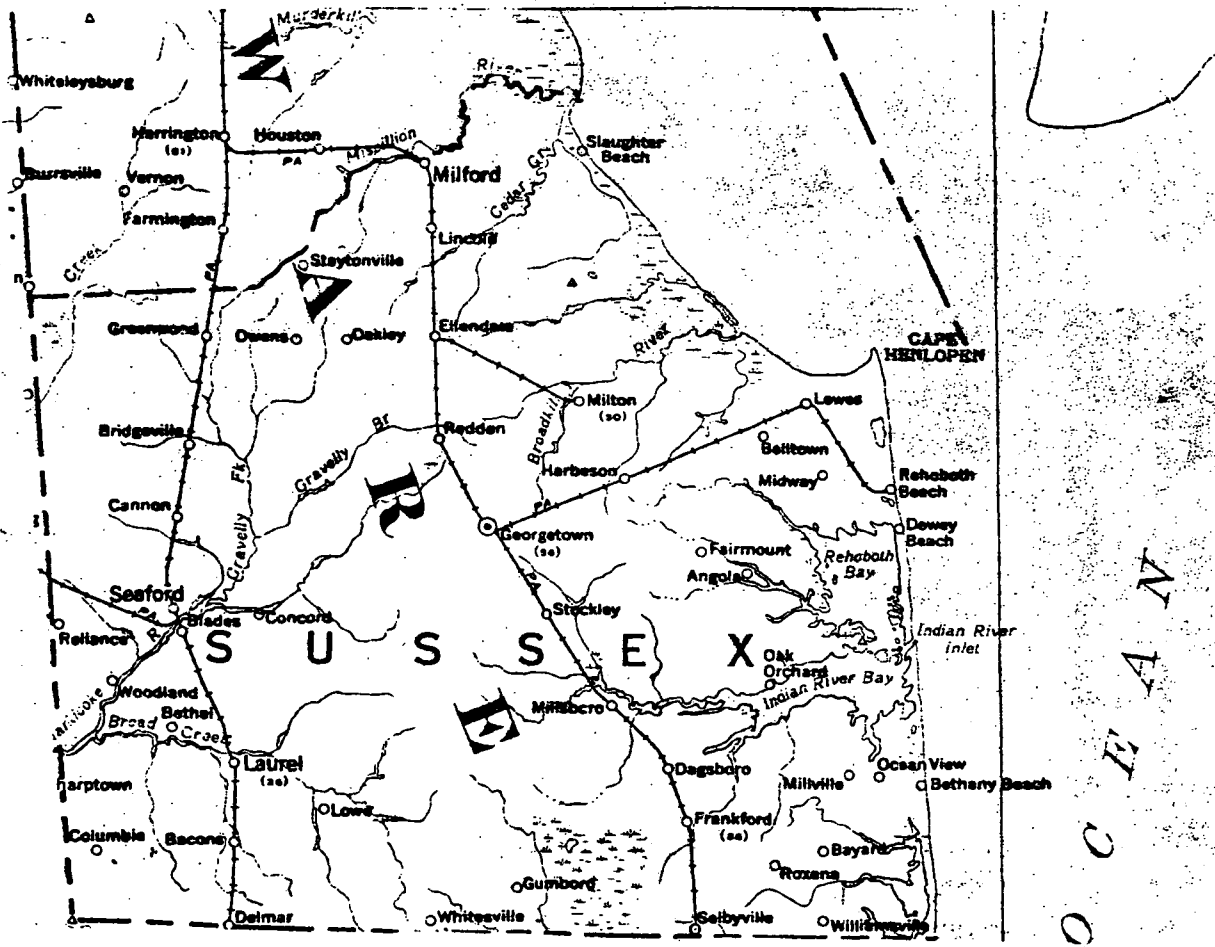
Basin Description & Zone Limits	Water Uses Sect. 2		Stream Quality Criteria (Section 5)																			
	Present	Future	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R		
The Nanticoke River, extending from the Maryland-Delaware line (near Sharptown, Maryland) to Williams Pond, (Seaford), Delaware.	B C E4	B C E4	2	1	1	1	1	1	1	1	1			1	1							
(See Note 1)	B C E1	B C E1	5	1	4	3	1	1	1	1	1			1	1							
The Choptank River, extending from the Maryland-Delaware line to its confluence with Mud Mill Pond.	C E4 G	C E4 G	1	1	1	1	1	1	1	1	1			1	1							
(See Note 1)	C E1 G	C E1 G	5	1	4	3	1	1	1	1	1			1	1							

NOTE 1: Information developed from the State of Delaware Department of Natural Resources and Environmental Control Document titled "Water Quality Standards for Interstate Streams", revised February 1972. The document, prepared subsequent to Federal approval of Delaware's Water Quality Standards, reflects the uses and criteria which the State currently employs in the zone described immediately above. Federally approved uses and criteria have not been amended. However, where applicable, enforcement of the more stringent use or criteria is generally encouraged.

6C Atlantic Ocean Drainage Basin



6C-1 Atlantic Ocean Drainage Basin



6C Atlantic Ocean Drainage Basin

Basin Description & Zone Limits	Water Uses Sect. 2		Stream Quality Criteria (Section 5)																			
	Present	Future	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R		
The Rehoboth Bay, including the entire Lewes and Rehoboth Canal and the tidal portions of all tributaries and lagoons. (See Note 1)	C E F	C E F	3	1	3	1	1	1	1	1	1,2			1	1							
The Indian River Bay, including tidal portions of Indian River and all tributaries and lagoons. (See Note 1)	C E F	C E F	3	1	3	1	1	1	1	1	1,2			1	1							
The Assawoman Bay, including Roy Creek and Little Assawoman Bay. (See Note 1)	C E F	C E F	3	1	3	1	1	1	1	1	1,2			1	1							
The Buntings Branch Creek, extending from Selbyville, Delaware to the Maryland-Delaware line. (See Note 1)	E5 H	E5 H	1	1	3	1	1	1	1	1	1,2			1	1							
The Atlantic Ocean, extending longitudinally from Cape Henlopen, Delaware to the Delaware- Maryland State line at Fenwick Island and laterally up to the declared legal limits of the United States including tidal portions of all tributaries. (See Note 1)	C E F	C E F	4	5	5		2	1	1	1	1,2			1	1							

NOTE 1: Information developed from the State of Delaware Department of Natural Resources and Environmental Control Document titled "Water Quality Standards for Interstate Streams", revised February 1972. The document, prepared subsequent to Federal approval of Delaware's Water Quality Standards, reflects the uses and criteria which the State currently employs in the zone described immediately above. Federally approved uses and criteria have not been amended. However, where applicable, enforcement of the more stringent use or criteria is generally encouraged.

APPENDIX

IMPLEMENTATION PLAN

IMPLEMENTATION PLAN

The "action" plan of the standards is the plan of implementation and enforcement. This plan sets forth the requirements for treatment and/or control of all conventional municipal and industrial waste discharges in the State of Delaware which affect interstate waters, specifies the time within which this is to be accomplished, and contains programs for dealing with other water pollution control problems. In general, the standards call for installation of secondary treatment or the equivalent, or higher, for all significant municipal and industrial wastes by August 1971. Information on the requirements for any particular discharge may be obtained from the Delaware Water and Air Resources Commission.

Five other types of waste problems are present in the State of Delaware. Storm water run off is of particular importance in the City of Wilmington. There exists an immediate need to control and disinfect discharges from combined sewer storm water overflow and measures taken for eventual elimination of combined sewers.

In Sussex County (the southern third of the state) septic tank discharges are infiltrating into the coastal plain aquifer and endangering the source of water supply. A comprehensive plan is underway for collection and disposal of sewage which will keep the sewage out of this valuable water resources.

Pollution caused by raw discharge from commercial navigation is also present in Delaware. The extent of pollution from the source is as yet undefined.

Pesticide residues are causing water quality problems at Dover Air Force Basin and in farming areas. Evaluation of the various pesticides and a resultant selective usage may alleviate this problem.

Oil spills, from both shore and commercial navigation sources, have at times been of concern to the State of Delaware. Delaware is currently participating with Federal agencies in the Regional Contingency Plan for Oil and Other Hazardous Materials.

At the present time there are no programs for control of pollution from agricultural runoff, land erosion, and water from vessels, boats, ships, etc. However, efforts are being made to minimize combined sewer overflows by the construction of holding basins for treatment after the storm. Additional Federal aid for complete separation will induce several small towns to take this approach. As a general policy, no new combined sewers are allowed.

The Commission is considering the adoption of regulations for control of waste from boats, vessels, etc. As technology advances and

feasible methods for nutrient removal become available, the sources contributing nutrients will be required to remove them to the extent desirable.

The Commission has good laboratory facilities (including visible range, ultraviolet, and infrared spectrophotometers, gas chromatographs, atomic absorption spectrophotometers, auto analyzers, etc.) for the analysis of all waste water samples, stream samples, etc. During Fiscal Year 1968 the frequency of sampling of all interstate streams and significant waste sources will be increased to a monthly basis. Further increase in the frequency is planned pending availability of personnel and funds.

GLOSSARY OF TERMS

Advanced Waste Treatment - Refers to methods and processes that will remove more contaminants from wastewater than are usually removed in present day conventional treatment plants. The processes may be physical, chemical, or biological. Examples of advanced waste treatment are carbon columns, electrolytic coagulation, reverse osmosis, electrodialysis, and ion exchange.

Bacteria - A group of test organisms which are used as indicators of the sanitary quality of the water. Fecal coliform bacteria is the specific test organism selected by the State of Delaware for this purpose. Bacterial concentrations originate primarily from municipal waste treatment plants, sanitary and combined sewers, storm drains, vessels and agricultural wastes.

Biochemical Oxygen Demand (BOD) - The quantity of oxygen utilized in the biochemical oxidation of organic matter in a specified time and at a specified temperature. Waste discharges containing high levels of BOD will deplete oxygen supplies in receiving waters.

Disinfection - The killing of the larger portion (but not necessarily all) of the harmful and objectionable micro-organisms in, or on, a medium by means of chemicals, heat, ultraviolet light, etc. Chlorination is the method commonly employed in sewage treatment processes.

Dissolved Oxygen (D.O.) - The oxygen dissolved as a gas in sewage, water, or other liquid usually expressed in milligrams per liter (mg/l), parts per million (ppm), or percent saturation. Adequate dissolved oxygen levels are necessary in waters to protect fish and other aquatic life and to prevent offensive odors. Low dissolved oxygen concentrations are generally due to excessive organic solids discharged as a result of inadequately treated waste (having high BOD); excessive algal growths may cause vastly fluctuating dissolved oxygen levels, and other factors such as temperature and water movement have an impact on dissolved oxygen levels.

Interstate Waters - Under the Federal Water Pollution Control Act, interstate waters are defined as:

1. Rivers, lakes, and other waters which flow across or form a part of State or international boundaries;
2. Waters of the Great Lakes;
3. Coastal Waters - whose scope has been defined to include ocean waters seaward to the territorial limits and waters along the coastline (including inland streams) that are influenced by the rise and fall of the tide.

pH - The index of hydrogen ion activity, used as an indication of acidity or alkalinity in waters. The pH of most waters ranges from 6.5 to 8.5, and most uses of water, such as aquatic life propagation, prosper at these levels. In most cases, a pH outside this range is due to discharge of industrial wastes or decaying organic vegetation.

Pollution - The addition of sewage, industrial wastes or other harmful or objectionable material to water at a concentration or in sufficient quantity to result in measurable degradation of water quality.

Recreation - The streams in Delaware are generally small, shallow, and murky. Water contact recreation (swimming, water skiing, etc.) is, therefore, quite limited. However, other recreation such as picnicking, hiking, fishing, etc., are feasible. In order to assure safe usage, all municipal, domestic, and industrial waste discharges contributing coliforms to the stream will be controlled to the extent required.

Secondary Treatment - May be defined as that process or group of processes capable of removing virtually all floating and settleable solids, generally from 80 to 95 percent of the 5-day biochemical oxygen demand, and a similar level of removal of suspended solids in untreated waste. The equivalent treatment may generally be defined as that process or group of processes achieving maximum practicable removal of solids, oils, grease, acids, alkalis, toxic materials, bacteria, taste and odor causing materials, color and any other objectionable constituents contained in untreated waste to produce an effluent equivalent to that obtained from secondary treatment facilities in current use for any specific category of industrial waste.

Sewage - (1) The water supply of a community after it has been used and discharged into a sewer, (2) wastewater from the sanitary conveniences of dwellings, business buildings, factories and other institutions.

Sewage, Combined - A sewage containing both sanitary sewage and surface or storm water with or without industrial wastes.

Sewer, Combined - A sewer which carries both sanitary sewage and storm drainage. Where combined sewers are used, the capacity is usually exceeded at times of heavy rainfall and the sewers overflow, discharging combined sewage directly into streams without treatment of any kind.

Temperature - The normal temperature of a section is the daily average temperature for the month.

Toxic Materials - Materials which are harmful to human, plant, animal and aquatic life. These may include hundreds of compounds present in various waters such as industrial waste discharges or runoff from where pesticides have been applied.

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