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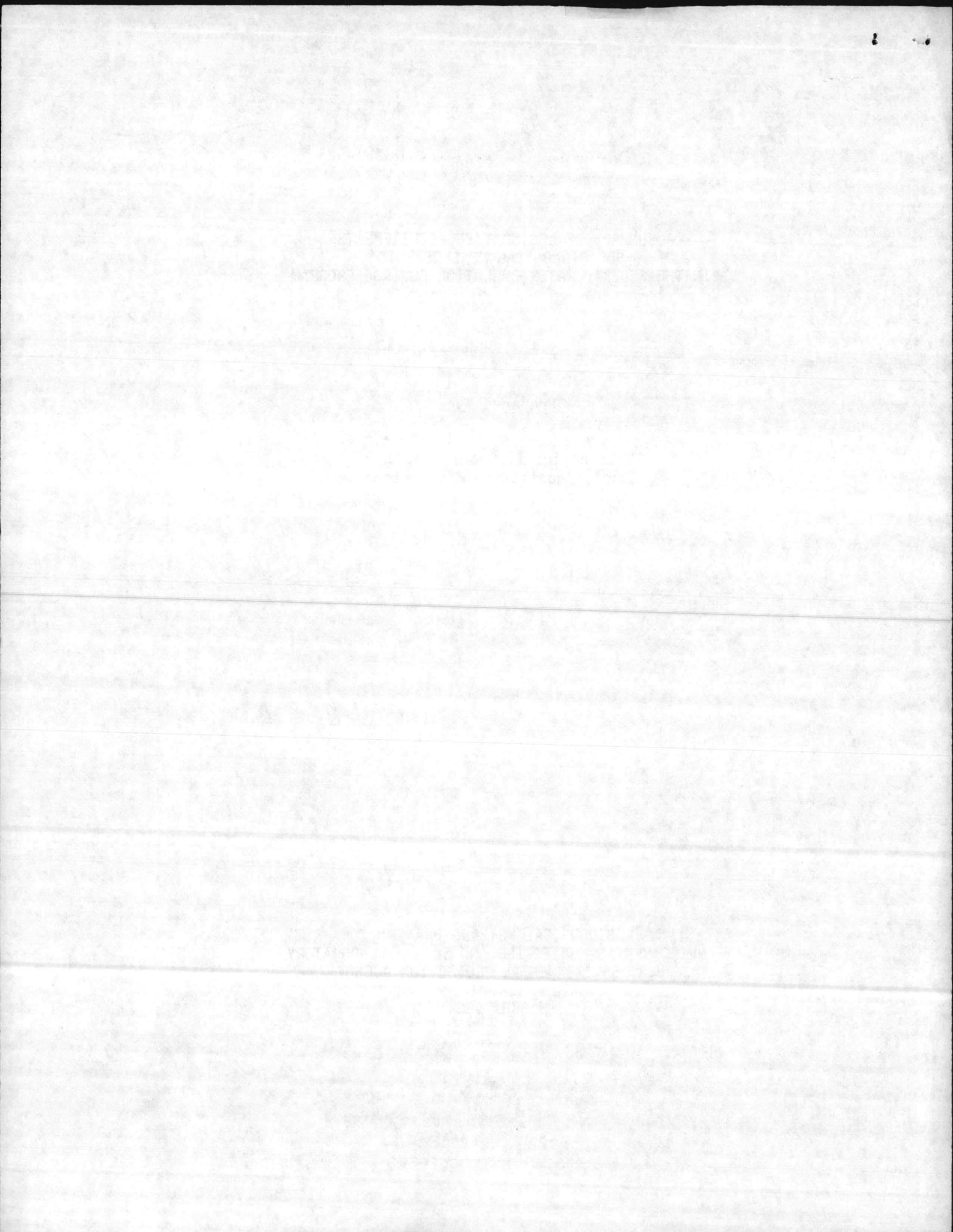
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A SUMMARY OF LEGISLATIVE REQUIREMENTS
FOR BIOLOGICAL MEASUREMENTS
IN THE FEDERAL WATER POLLUTION CONTROL PROGRAM

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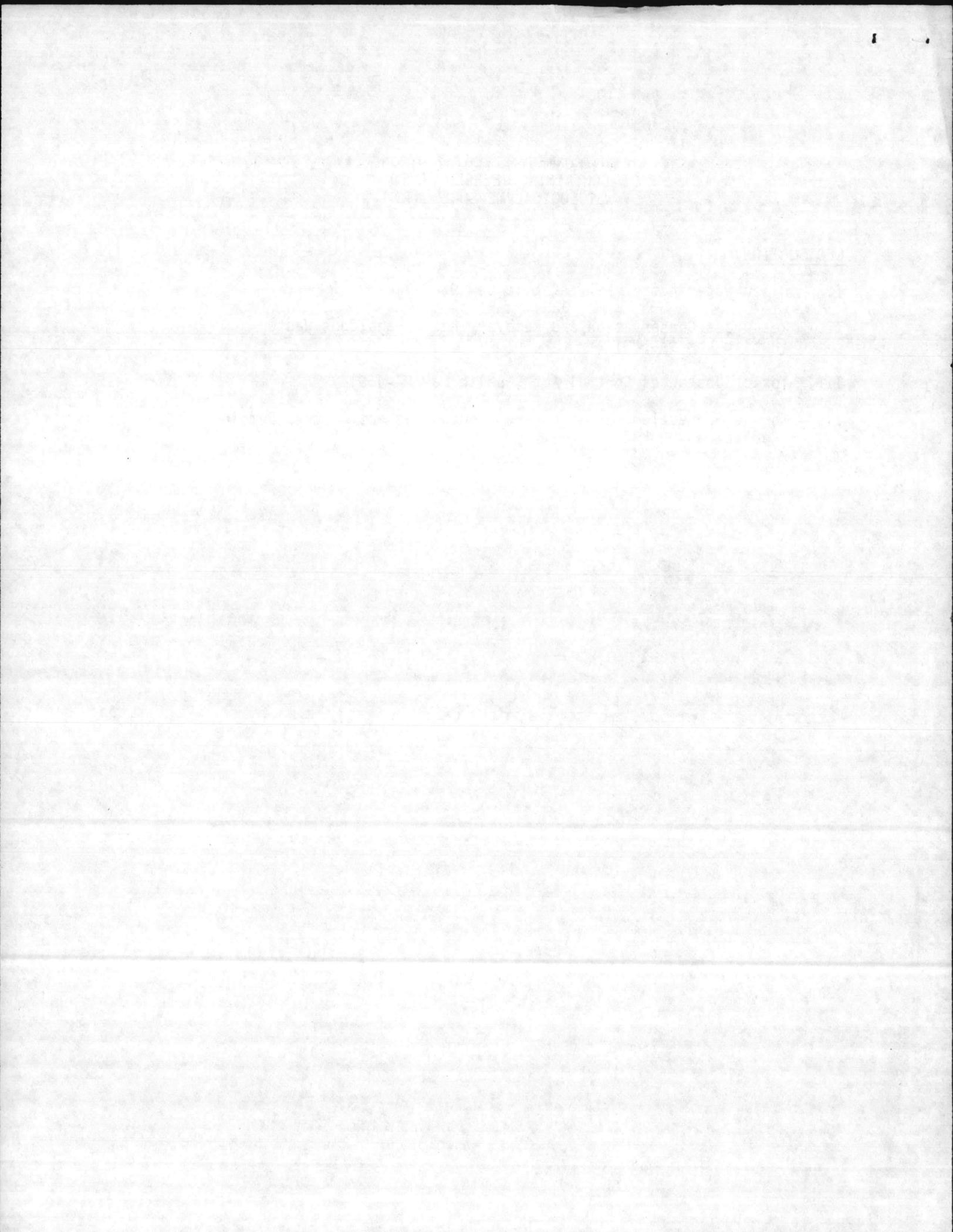
BIOLOGICAL METHODS BRANCH
ENVIRONMENTAL MONITORING AND SUPPORT LABORATORY
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ENVIRONMENTAL LEGISLATION
CONTAINING REFERENCES TO
BIOLOGICAL MEASUREMENTS

LEGISLATION:

- I. Clean Water Act of 1977 (Public Law 95-217)
- II. Resources Conservation and Recovery Act - Hazardous Waste
(Public Law 94-580)
- III. Toxic Substances Control Act (Public Law 94-469)
- IV. Marine Protection, Research and Sanctuaries Act - Ocean Dumping
(Public Law 92-532)



I. FEDERAL WATER POLLUTION CONTROL ACT AMENDMENTS OF 1972 & 1977
(Public Laws 92-500 and 95-217)

A. Section 106(e) - Biological Integrity of Surface Waters - Ambient Monitoring - State Water Monitoring Programs

Types of measurements include those associated with Biological Integrity.

Applicable documents:

1. Biological Field and Laboratory Methods for Measuring the Quality of Surface Waters and Effluents - 1973
2. Model State Water Monitoring Program - 1975
3. Basic Water Monitoring Program - 1977

B. Section 301(h) - Publically Owned Treatment Works Discharging to the Ocean Section Waivers from Secondary Treatment

1. Applicants must show that a balanced indigenous population of fish, shellfish, and wildlife (aquatic life) can exist in the zone of initial dilution of their waste.
2. The regs will require a combination of acute and chronic toxicity tests and field studies. Applicable methods - Boesch, 1977, EPA Ecol. Res. Ser., 600/3-77-033.
3. Applicants must devise a comprehensive biomonitoring program

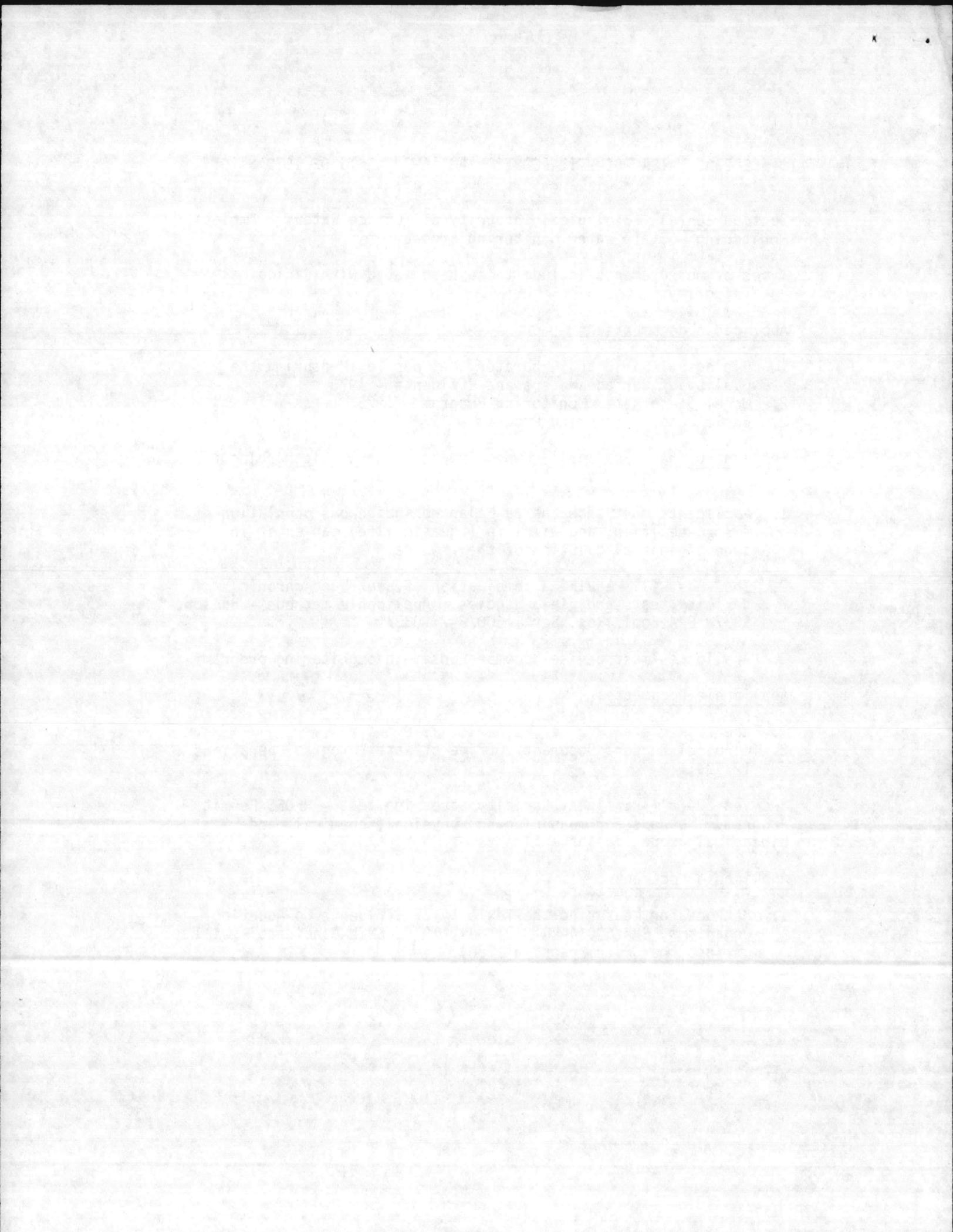
Applicable Documents:

1. Federal Register, Friday, June 15, 1979
2. Technical Support Document, Office of Water Program Operations, 12/79

C. Section 304(h) - Effluent toxicity screening test - NPDES Permit Program. Methods for measuring the physical, chemical, and biological properties of effluents

Applicable Documents:

1. Methods for Measuring the Toxicity of Effluents to Aquatic Organisms, EPA 600/4-78-012, July 1978, EMSL-Cincinnati (Will go into the 304(h) regs in 1980).



II. RESOURCES CONSERVATION AND RECOVERY ACT OF 1976

[Proposed Guidelines: 43 FR 59022-59028, 12/18/78 (Sec. 3001)]

A. Mutagenic Activity

1. Group 1 Test - Point mutation in bacteria
2. Group 2 Test - Mammalian somatic cell mutation
- Fungi mutations
3. Group 3 Test - DNA repair in bacteria
- Unscheduled DNA synthesis in human cells
- Sister-chromatid exchange in mammalian cells

B. Bioaccumulation Potential

1. Partition coefficient vs log retention time

C. Daphnia magna reproduction test

1. Number of young produced in 28 days

D. (Radish) seed germination test

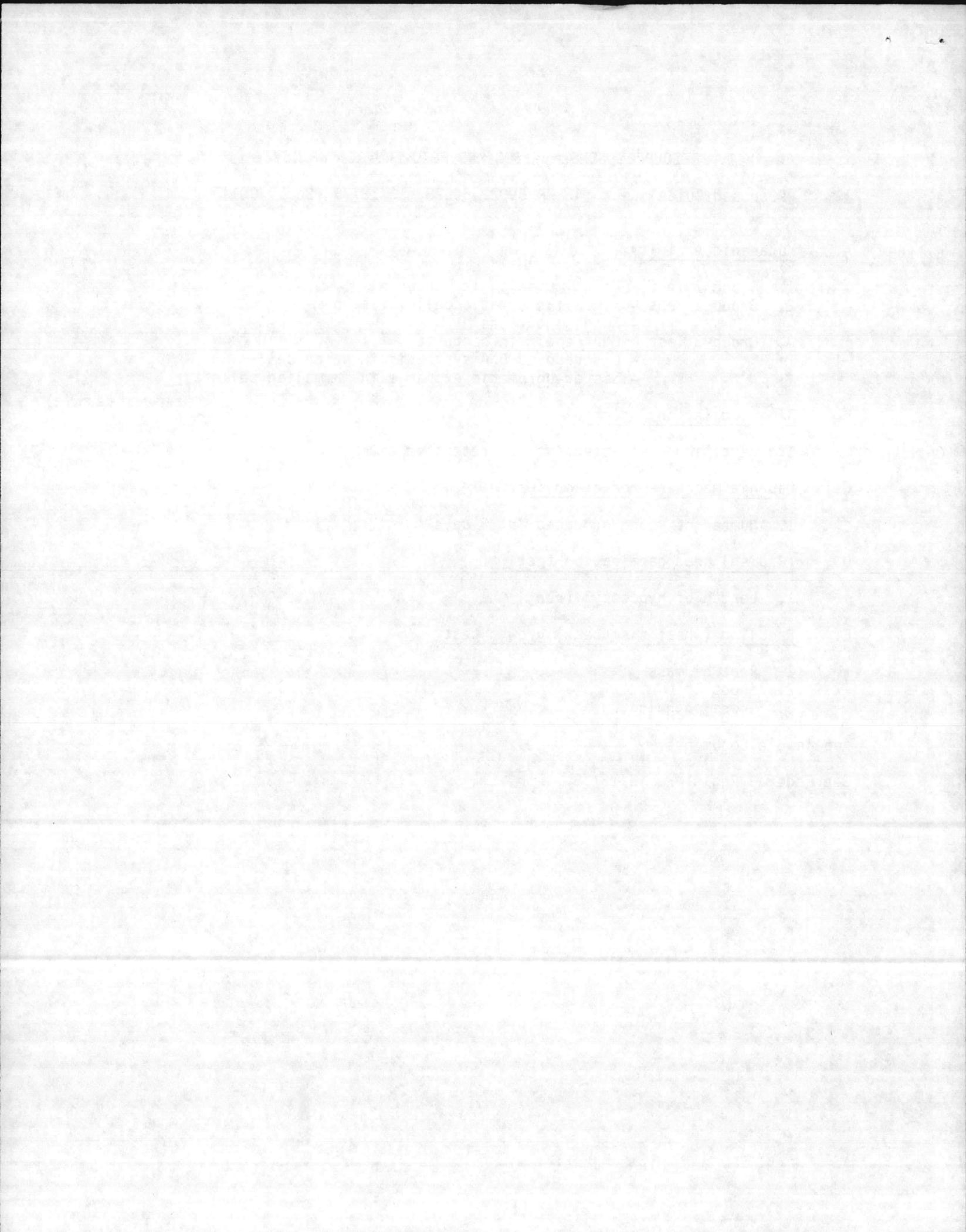
1. Length of hypocotyl (root)

E. Seedling (wheat a soybean) growth test

1. Root biomass
2. Shoot "
3. Gross pathology

Applicable Documents:

See Federal Register, 12/18/78.



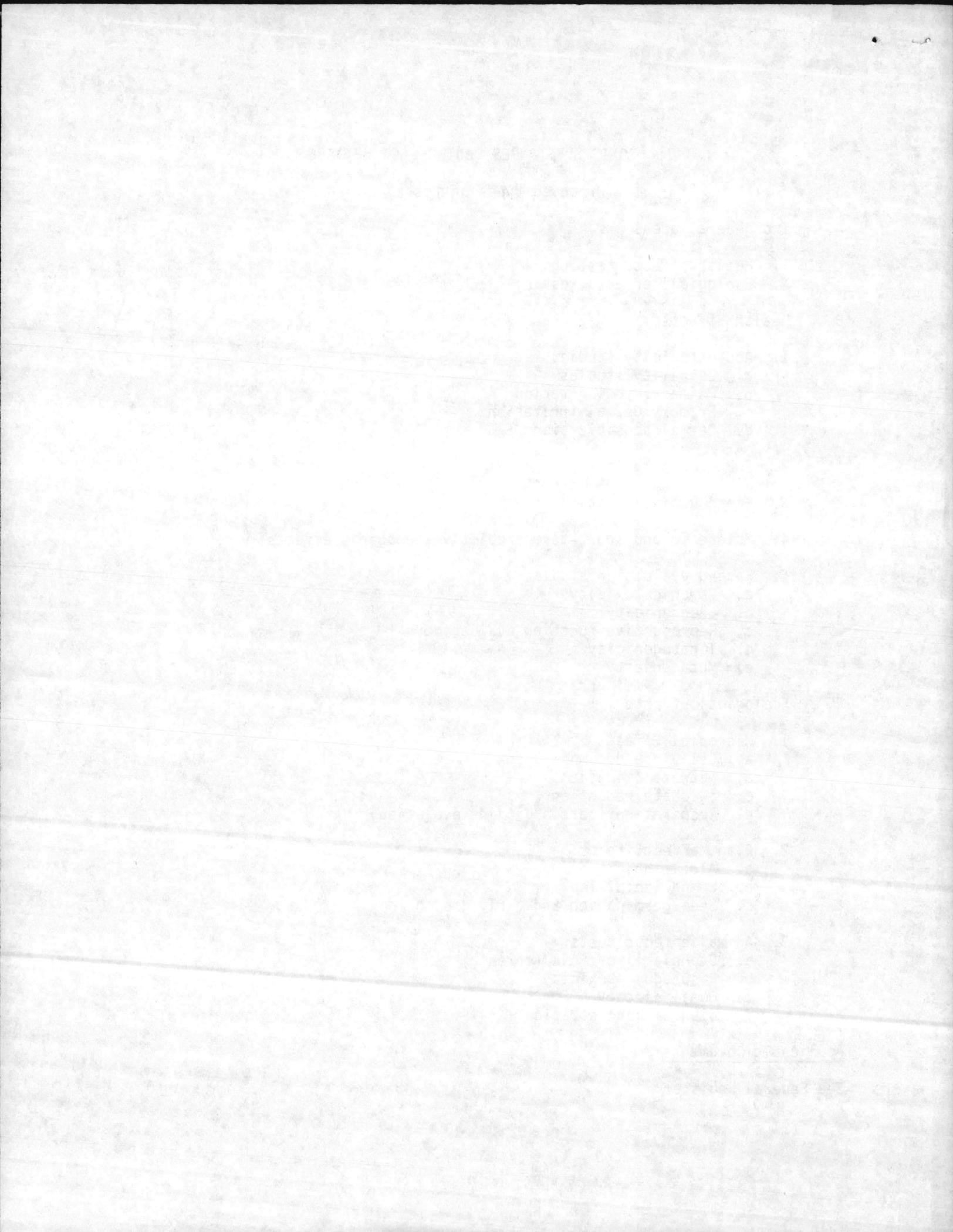
III. TOXIC SUBSTANCES CONTROL ACT OF 1976

(Proposed types of tests)

- A. Two general areas
 - 1. Health effects testing
 - 2. Ecological effects testing
- B. Health Effects
 - 1. Acute toxicity studies
 - a. Lethality studies
 - b. Primary eye irritation
 - c. Primary dermal irritation
 - d. Dermal sensitization
 - 2. Subchronic toxicity
 - 3. Reproductive function effects
 - 4. Mutagenic and short-term predictive oncogenic effects
 - 5. Hazard evaluation studies
 - a. Chronic toxicity
 - b. Oncogenicity
 - c. Reproductive function evaluation
 - d. Teratogenicity
 - e. Mutagenicity
- C. Ecological Effects
 - 1. Microbial Effects
 - a. Cellulose decomposition
 - b. Nitrate oxidation
 - c. Sulphate reduction
 - d. Respiration (carbon dioxide evolution)
 - 2. Plant effects tests
 - a. Algal inhibition
 - b. Lemna inhibition
 - c. Seed germination and early growth
 - 3. Animal effects tests
 - a. Daphnia life cycle (chronic)
 - b. Fish acute toxicity
 - c. Quail dietary LC50
 - d. Fish bioconcentration

Applicable Documents:

See Federal Register



IV. MARINE PROTECTION, RESEARCH AND SANCTUARIES ACT OF 1972

[Final Regulations: 42 FR 2426-2490, 1/11/77 (Sec. 3001)]

A. Section 102 - Ocean Disposed Wastes

1. Requires that the disposal will present:
 - a. No unacceptable adverse effects on human health or the environment
 - b. No unacceptable adverse effects on the marine ecosystem
 - c. No unacceptable adverse persistent or permanent effects
 - d. No unacceptable adverse effect on the ocean
2. Requires that the waste will not cause unreasonable acute or chronic toxicity based on bioassay results using appropriate sensitive marine organisms

Applicable Documents:

1. Bioassay Procedures for the Ocean Disposal Program, EPA-600/9-78-010, March 1978. This bioassay manual was prepared for the program by the EPA Gulf Breeze Marine Research Laboratory, and contains methods for:

Phytoplankton	Oysters	Copepods
Mysid shrimp	Grass shrimp	Fish
Acetylcholine esterase in fish brain		

B. Section 103 - Disposal of dredged materials in the oceanApplicable Documents:

Ecological Evaluation of Proposed Discharge of Dredged Material into Ocean Waters, July 1977, U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency.

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