United States
Environmental Protection
Agency

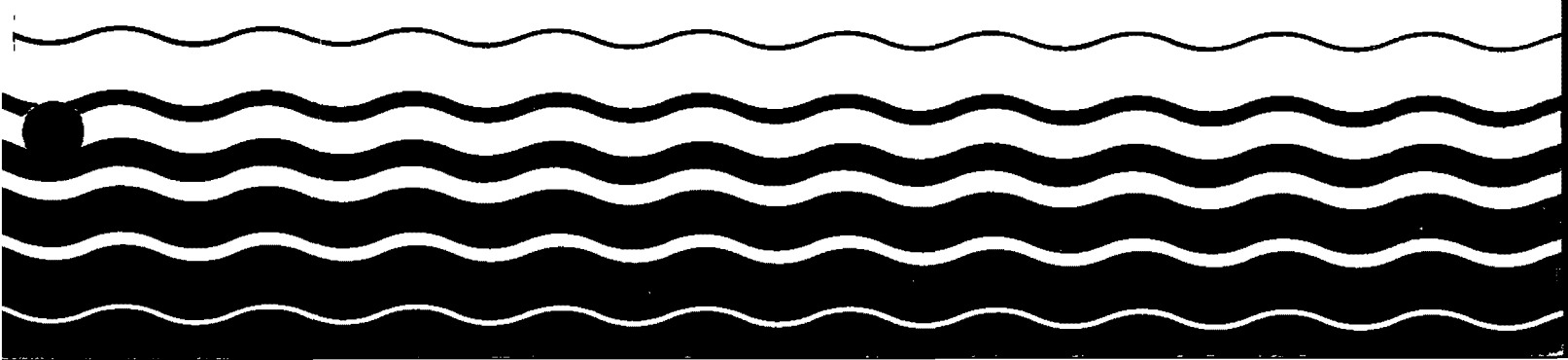
Permits Division
EN-336
Washington, DC 20460

July 1986

Water

EPA

Program Survey - Biological Toxicity Testing in the NPDES Permits Program



PROGRAM SURVEY

BIOLOGICAL TOXICITY TESTING IN THE NPDES PERMITS PROGRAM

JULY 1986

PERMITS DIVISION

OFFICE OF WATER ENFORCEMENT AND PERMITS

U.S. ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D. C. 20460

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
WATER

NOV 17 1986

MEMORANDUM

SUBJECT: Regional and NPDES State Toxicity Program Summary Report

FROM: Martha G. Prothro, Director
Permits Division (EN-336) Martha Prothro

TO: Users of the Document

This report summarizes an informal telephone survey on the use of biological toxicity testing in the NPDES permits program. State and EPA Regional personnel were contacted by CENTEC Corporation during the summer of 1986. The program staffs were asked if biological testing is used to assess and control the discharge of toxic substances from industrial and municipal facilities. Copies of the individual summaries were sent to each Region or State for verification, and should be correct as of July 1986, when it was compiled.

This report highlights how different programs have tackled the effluent toxicity problem. The Permits Division has not independently verified the results of the survey. Nor did we or the contractor look at individual permits, State regulations or procedures referenced in the report. The intent is to give general information on each State's toxic control program.

I hope that you will find this report to be a useful "snap-shot" of NPDES State and Regional efforts to identify and control toxic discharges to our Nation's waters.

TABLE OF CONTENTS

INTRODUCTION

The EPA Office of Water published the Policy for the Development of Water Quality-Based Permit Limitations for Toxic Pollutants on March 9, 1984 (49 Federal Register 9016). An important aspect of this policy is the use of biological testing of effluents to assess and control the discharge of toxic pollutants from industry and publicly owned treatment works (POTWs).

An informal telephone survey of the NPDES States and EPA Regions was conducted in June and early July to determine the current use of biological testing for effluents. To conduct this survey, EPA contracted with CENTEC Corporation. Regions and States were asked the number of NPDES permits they administered, the number of permits with a biological toxicity testing requirement, the number of permits with expressed toxicity limits and with requirements for toxicity reduction evaluations. Regional and State programs were discussed, including the use of biological testing such as acute and chronic bioassay techniques, instream biotic assessments, water quality trend monitoring at fixed locations, aquatic organism flesh analyses for bioaccumulative materials, as well as any other use of biological investigative techniques. This report is a summary of the telephone conversations.

EPA has not independently verified the results of this survey. Nor did EPA or the contractor look at individual permits, State regulations or procedures referenced in the report. The intent of this summary is to give general information on the use of biological testing in Regional and NPDES State toxic control programs.

RESULTS OF THE SURVEY

The use of biological testing to identify toxicity in point source discharges by NPDES delegated authorities must be characterized as "diverse." Programs related to biological effluent testing range from "no current program" through an "emerging program" to a "developing program." To date, few States have a formal written policy or strategy on the use or role of biological testing in their NPDES program. However, many States have developed preliminary policy or strategy documents or are in the process of developing them.

Biological testing methods used to characterize environmental effects of discharges of toxic pollutants take various forms. Generally, biological methods are segregated into two groups: effluent testing and receiving water testing. State permit programs use both methods, but permit-required effluent testing is more prevalent.

This survey focused on bioassays where organisms are exposed in a static or flow-through environment of undiluted or diluted wastewater for 96 hours or less to simulate acute exposure or up to 7 days to simulate chronic exposure. Various organisms are used in effluent bioassays; the EPA published a list of such acceptable organisms in Table 1 of Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms (EPA/600/4-85/013). The EPA publication, Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA/600/4-85/014), provides details for conducting the 7-day chronic bioassays. There are various biological methods appropriate for ambient or receiving water testing and these provide the capability of identifying environmental damage from toxic pollutant to some extent. Methods employed by States include studies and assessments related to macroinvertebrates, fishes, algae, periphyton, protozoa, primary productivity, sediment bioassays, fish flesh tainting, fish and mussel flesh analyses for bioaccumulated substances, caged organism toxicity, fish and invertebrate chronic bioassays, sediment analyses, and fish avoidance reactions.

Several summarizing statistics result from this study:

- 1,802 NPDES permits, 24 percent of the number of major permits, require biological toxicity testing.
- 1,417 industrial permits require effluent biological toxicity testing; this is 79 percent of permits requiring testing and 38 percent of the number of major industrial permits.
- 385 municipal permits require effluent biological toxicity testing; this is 21 percent of permits requiring testing and 11 percent of the number of major municipal permits.
- 37 States require industries to conduct bioassays.
- 27 States require municipalities to conduct bioassays.

- 16 States have toxicity effluent limits in 54 percent of the industrial permits that require biological testing.
- 10 States have toxicity effluent limits in 71 percent of the municipal permits that require biological testing.
- 16 States have a bioassay requirement in industrial permits only.
- 13 States have five or less, but at least one, permits with a biological toxicity testing requirement.
- 8 States do not require effluent biological testing.
- States with more than 50 industrial permits, or more than 50 percent of their number of major industrial permits, which require effluent biological testing include Arkansas, California, Louisiana, Mississippi, New Jersey, Oklahoma, Rhode Island, South Carolina, Texas, Virginia, Washington, West Virginia, and Wisconsin.
- States with more than 50 municipal permits, or more than 50 percent of their number of major municipal permits, which require effluent biological testing include California, Maryland, New Jersey, Rhode Island, and Virginia.
- As an adjunct to permit language, Alabama, North Carolina, and Wisconsin require biological effluent testing via administrative letter or as a condition of permit application.
- Hawaii, Louisiana, Nevada, Oregon, South Carolina, and Virginia require receiving water biotic assessments in some permit language.
- Georgia, Michigan, and New Jersey have new, recently constructed or under construction, toxicity testing stationary laboratories.
- New Jersey, South Carolina, and Utah have State biological laboratory certification programs.
- 23 States conduct static acute bioassays, some as many as 150 per year.
- 20 States conduct 96-hour flow through or 7-day chronic bioassays, generally 2 to 12 per year.
- 29 States conduct receiving water biotic assessments at a combined total of 1000 locations per year.
- 25 States have fish or shellfish flesh analyses programs, which include 1300 locations per year.
- 14 States operate mobile bioassay laboratories.

There are indications that States may be changing their policies regarding potential toxicity problems. These policy shifts will result in more permits requiring effluent biological testing, usually as they are renewed, greater emphasis on chronic rather than acute bioassays, and a greater number of municipal permits containing biological testing language. Presently, six States project programs that might be considered aggressive, and at least 20 additional States have projected significant biological testing program increases.

During the telephone conversations, the following programmatic issues were highlighted:

- o Biological laboratory certification - many States expressed the need for a biological laboratory certification program, but because of size or resources are now incapable of implementing such.

- o Tropical waters testing methods - there is a belief in West Coast States, and in the Islands, that current bioassay methodologies may be inappropriate for tropical and West Coast oceanic waters.

- o Managing municipality toxicity testing - several States asked for information regarding the management of municipality toxicity testing implemented by other States.

- o Evaluating human health concerns - most States now manage human health concerns through chemical specific effluent analyses; some States are experimenting with the Ames test; many States employ ambient water fish flesh analyses for constituents of concern, and some coastal States have mussel watch programs.

A summary of NPDES permit-required testing by State and tests conducted by States in their individual programs is presented in the following table and figures.

SUMMARY OF NPDES REQUIRED AND STATE PROGRAM TESTING

STATES	NPDES PERMITS							STATE PROGRAMS		
	Major Industrial	Industrial with Bioassays 1 With Toxicity Limits		Major Municipal	Municipal with Bioassays 1 With Toxicity Limits		Biotic Assessments Required	Static Bioassays	Flow-through/ Chronic Bioassays	Biotic Assessment Locations
Alabama	82	25	25	85	0	0	0	FEW	10	7
Alaska	308	2	0	19	0	0	0	0	0	0
Arizona*	23	0	0	19	0	0	0	0	0	0
Arkansas	56	34	0	59	0	0	0	12	0	40
California	98	440	440	148	110	110	0	SOME	SOME	0
Colorado	70	0	0	70	8	0	0	2	2	3
Connecticut	130	1	1	68	0	0	0	100	10	6
Delaware	21	5	0	15	1	0	0	0	0	2
D. C.	0	0	0	1	1	0	0	0	0	0
Florida	122	35	35	125	10	10	0	0	0	0
Georgia	60	25	0	120	1	0	0	MANY	12	20
Hawaii	19	2	0	11	1	0	3	0	0	0
Idaho	42	3	0	28	2	0	0	0	0	0
Illinois	104	4	0	175	1	1	0	25	10	30
Indiana	88	6	0	94	0	0	0	15	0	5
Iowa*	34	0	0	62	0	0	0	0	0	2
Kansas*	14	0	0	32	0	0	0	FEW	0	4
Kentucky	205	17	1	56	3	2	0	50	0	12
Louisiana	145	100	0	75	0	0	6	0	0	0
Maine	56	10	8	68	8	5	0	0	0	0
Maryland	52	13	0	35	20	0	0	FEW	FEW	0
Massachusetts	57	10	8	68	8	5	0	0	0	0
Michigan*	122	3	0	95	2	0	0	30	5	50
Minnesota	28	2	0	50	0	0	0	75	2	0
Mississippi	39	20	4	45	0	0	0	15	0	1
Missouri*	70	0	0	70	0	0	2	0	16	200
Montana*	6	2	0	17	0	0	0	10	2	8
Nebraska*	26	0	0	44	0	0	0	0	0	6
Nevada	3	0	0	10	1	1	1	0	0	0
New Hampshire	57	10	8	69	9	5	0	0	0	0
New Jersey	200	118	118	160	111	111	0	5	5	FEW
New Mexico	16	5	0	21	0	0	0	0	0	8
New York	166	10	0	266	10	0	0	0	10	5
North Carolina	94	30	30	121	24	24	0	150	12	50
North Dakota*	7	0	0	15	0	0	0	0	0	0
Ohio*	150	1	0	155	0	0	0	75	10	20
Oklahoma	36	22	0	59	0	0	0	0	0	0
Oregon	23	15	2	36	0	0	1	4	30	15
Pennsylvania*	171	0	0	225	0	0	0	0	0	35
Rhode Island	16	12	0	19	12	0	0	0	0	0
South Carolina	80	55	5	115	5	0	40	100	10	15
South Dakota	4	0	0	29	1	0	0	0	0	16
Tennessee	86	12	5	75	2	0	0	MANY	12	12
Texas	234	133	0	241	0	0	0	0	0	0
Utah	19	0	0	39	14	0	0	0	0	0
Vermont*	8	0	0	31	0	0	0	0	0	0
Virginia	100	120	0	25	25	0	20	36	2	FEW
Washington	45	40	30	45	3	0	0	0	6	0
West Virginia	75	39	39	34	0	0	0	100	0	60
Wisconsin	62	36	0	88	0	0	0	0	0	450
Wyoming	30	0	0	20	2	0	0	0	0	0
TOTALS	3759	1417	759	3652	385	274				
No. of STATES							73	23	20	29

* States with a principally pollutant specific approach for toxics.

1. Numbers may represent major and minor permits.

FIGURE 1. Percentage of Major Industrial Permits with Bioassay Requirements.

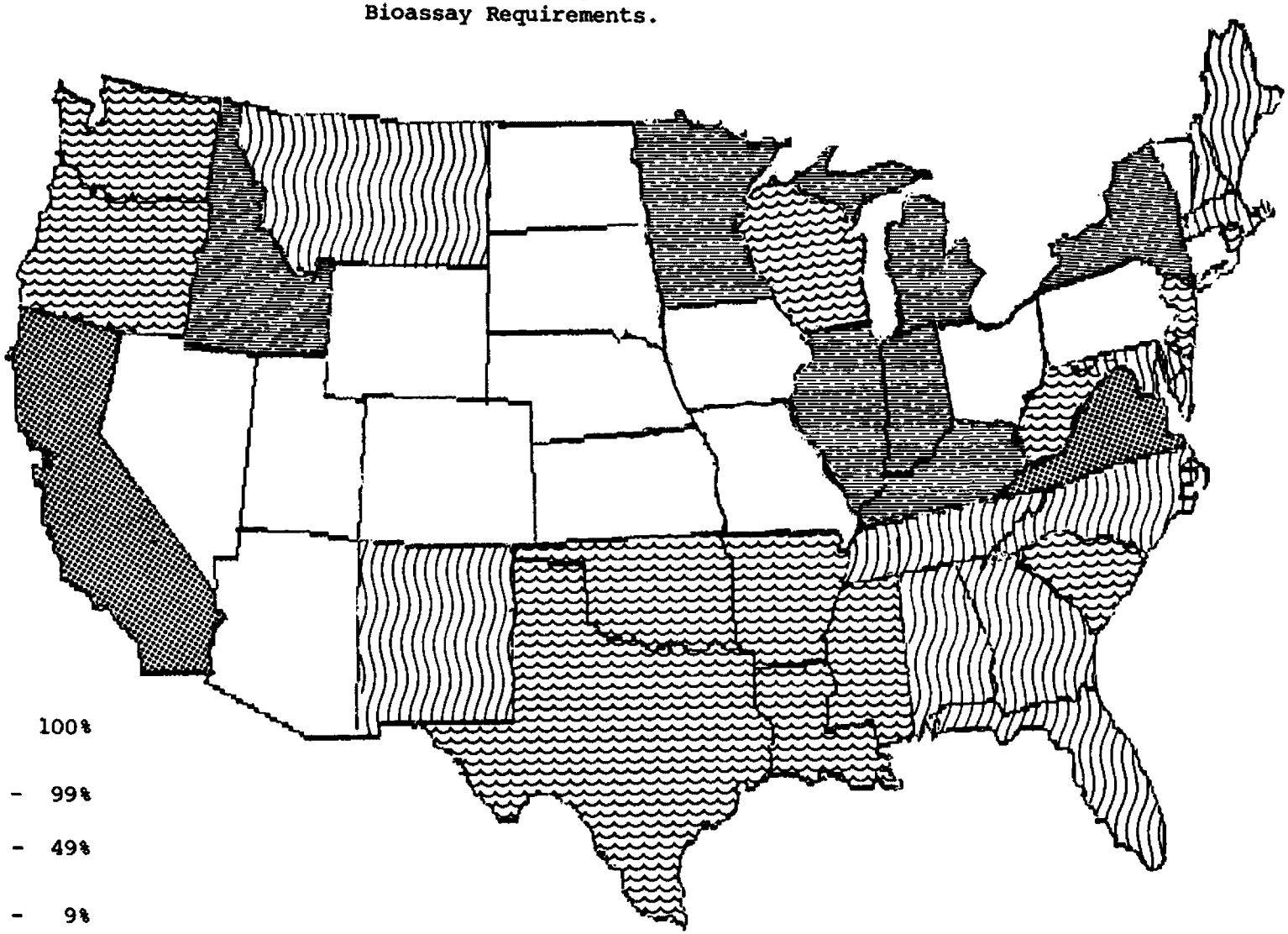
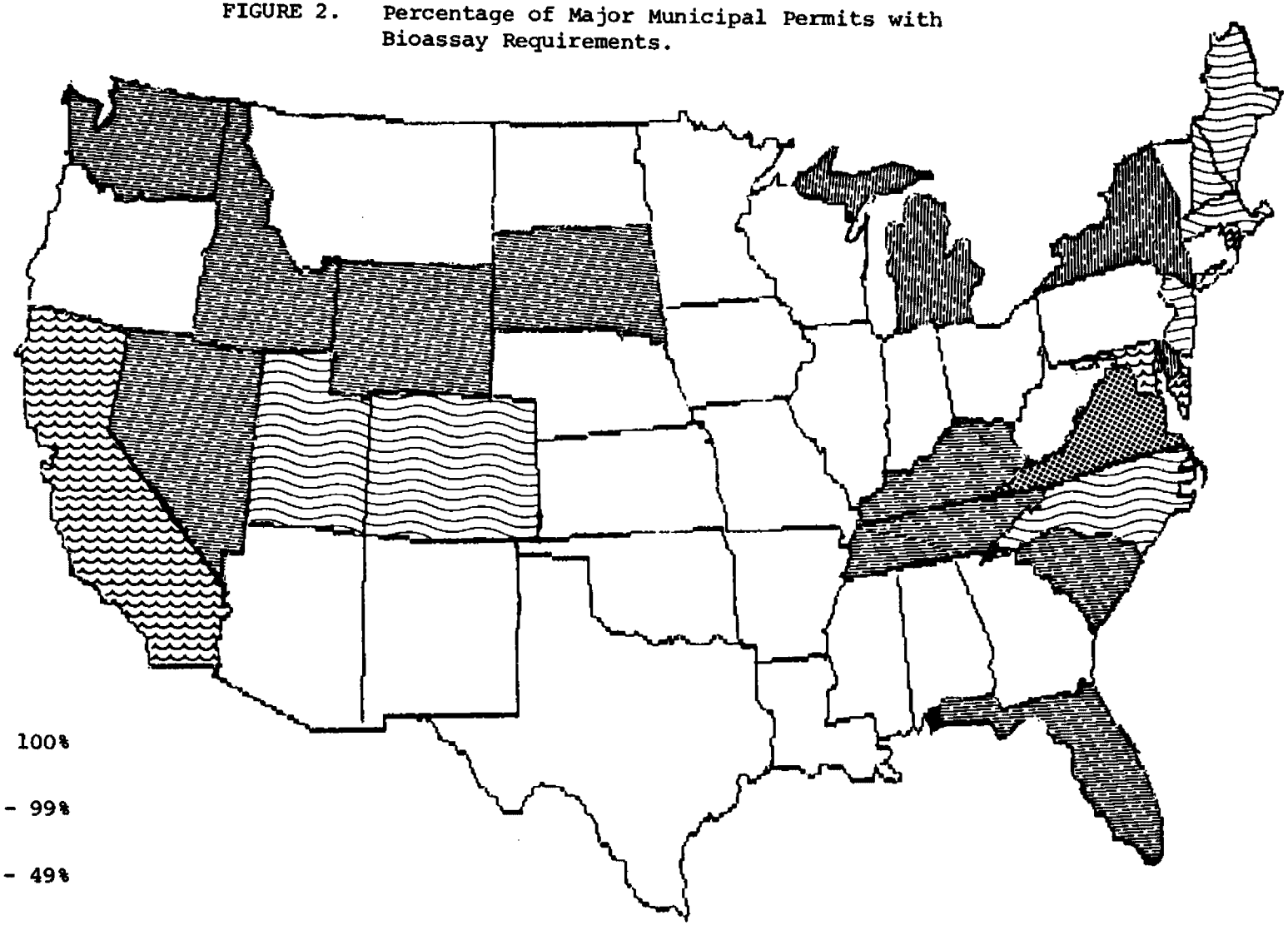


FIGURE 2. Percentage of Major Municipal Permits with Bioassay Requirements.



LEGEND

= 100%

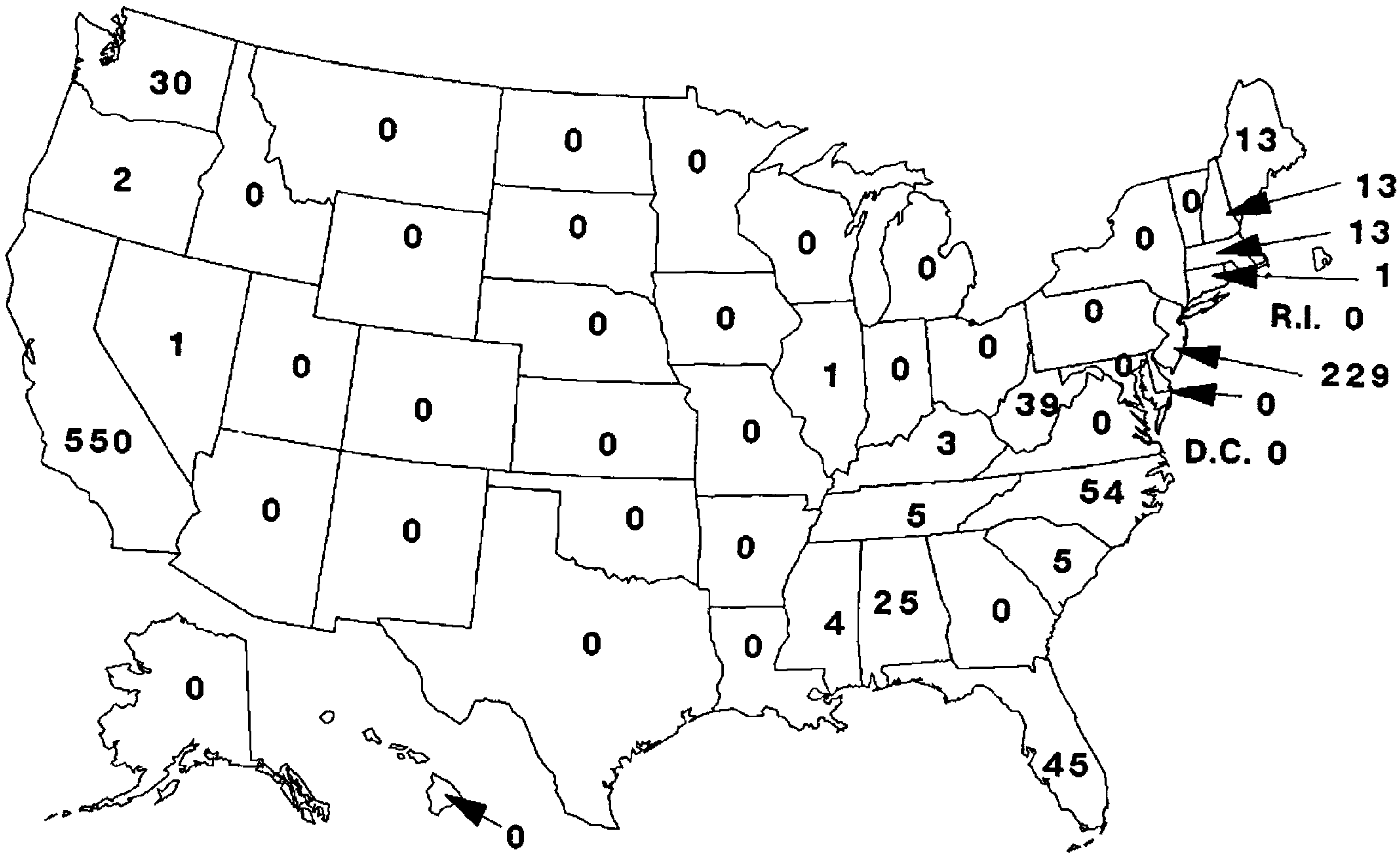
= 50 - 99%

= 10 - 49%

= 1 - 9%

= < 1%

Figure 3. Number of Permits that Have Toxicity Limits



TOTAL FOR ALL STATES = 1033

REGION/STATE: US Environmental Protection Agency, Region I

ADDRESS: John F. Kennedy Federal Building, Room 2203
Boston, MA 02203

CONTACT: Mr. Steve Silva, Chief — Industrial Permits Section
Mr. Clyde Shufelt, Chief — Municipal Permits Section

PHONE: (617) 223-5061 — (617) 223-5470

SUMMARY: The EPA Region I policy on biological toxicity testing is described in detail in the summary for the State of Maine. Biological testing is required for industrial or municipal dischargers scheduled for permit issuance where technology based pollutant limitations diluted by the receiving water (7Q10 for acute toxicity and 30Q2 for chronic toxicity) cannot meet acute or chronic water quality criteria specified in the water quality criteria documents (45 FR 79318, November 29, 1980) or more recently updated drafts of final criteria documents. Discharges containing chemicals for which criteria have not been developed are evaluated on a case-by-case basis to determine the likelihood of water use impairment.

Four acute bioassays using a daphnid and the fathead minnow must be conducted over a 60-day period. Permits containing chemical specific limits based upon biological toxicity testing will include a requirement for a semi-annual or annual acute toxicity test. The permittee may accept water quality criteria-based chemical specific permit limits in lieu of biological toxicity testing if such can be met with available treatment technology. Toxicity Reduction Evaluations may be required to bring an effluent into compliance with Water Quality Standards provisions prohibiting discharges of toxic substances in amounts toxic to human health or aquatic life. The Regional policy currently contains no provisions for testing related to human health.

EPA REGION II

REGION/STATE: US Environmental Protection Agency, Region II

Permit Management Section

ADDRESS: 26 Federal Plaza

New York, NY 10278

CONTACT: Mr. George C. Meyer, P.E., Chief — Mr. Michael Minerva

Permits Management Section — Permits Management Section

PHONE: (212) 264-2911 — (212) 264-1859

SUMMARY: Region II's toxicity testing policy considers all new permit applications and reissuances of prior permits. The Region determines a "toxicity potential assessment" for a permittee which is an evaluation using the following factors:

- o Dilution of effluent by the receiving water
- o Existence of sufficient toxicity testing data to assess potential for instream toxic impacts
- o Classification/Use and importance of receiving water
- o Industrial category and specific processes/products (industrial permits)
- o Percent industrial contribution and industrial categories (municipal permits)
- o Existence of priority pollutants or other toxic chemicals.

Testing is conducted on a two-tier basis. Tier one testing requires 48-hour acute static renewals with at least two species, a vertebrate and an invertebrate using the fathead minnow and Daphnia magna for freshwater discharges and the silverside (Menidia sp.) and Mysidopsis bahia for discharges to saline waters. In an effort to include all processes which occur at the facility, at least four tests are to be conducted over a time period representative of all facility processes. Grab or composite samples are to be used where acute toxicity is of concern.

Tier 2 testing "should be directed at obtaining data necessary to refine the impact assessment." This may include chronic toxicity or instream toxicity tests. Compliance monitoring of the discharge may be required to ensure that the toxicity of the effluent does not change. Toxicity Reduction Evaluations may also be required, followed by a compliance schedule and the imposition of toxicity limits.

Region II's program objective of requiring toxicity testing or limitations in NPDES permits is "to prevent toxics from being discharged in amounts which are acutely and chronically toxic to aquatic organisms." The policy does not address human health effects which the policy states should be addressed through chemical-specific approaches.

REGION/STATE: US Environmental Protection Agency, Region III

ADDRESS: 841 Chestnut Street
Philadelphia, PA 19107

CONTACT: Mr. Dale Wismer, Chief
Water Quality Control Section, Water Management Division

PHONE: (215) 597-8244

SUMMARY: Region III has not developed a formal policy relating to the control of toxic pollutants. All States within the Region have delegated NPDES authority. The Region has relied on EPA Headquarters' guidance, provided each of the States with the Technical Support Document for Water Quality-Based Toxics Control, and asked the States to develop their individual policies based upon such guidance. Most of the Region's States have submitted initial draft policies and all States are in the process of developing final policy statements.

REGION/STATE: US Environmental Protection Agency, Region IV

ADDRESS: 345 Courtland Street, N.E.
Atlanta, GA 30365

CONTACT: Mr. Marshall Hyatt, Environmental Scientist
Facilities Performance Branch, Water Management Division

PHONE: (404) 347-2156

SUMMARY: With the exception of the State of Florida, all of the States within Region IV have delegated NPDES authority. Region IV administers the NPDES program for the State of Florida. For those States with NPDES authority, Region IV has issued guidance in the form of proposed permit toxicity limits and monitoring requirements. This guidance follows that set forth in EPA's 1985 Technical Support Document for Water Quality-Based Toxics Control, in Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms (EPA/600/4-85/013), and in Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA/600/4-85/014). The biomonitoring guidance is summarized as follows:

When instream waste concentration is greater than or equal to one (1) percent at critical low-flow conditions, the permittee shall conduct a 7-day Ceriodaphnia survival and reproduction test and a fathead minnow larval survival and growth test on a 24-hour composite sample on an effluent concentration equivalent to the instream waste concentration with test solutions renewed daily. Toxicity tests shall be conducted every two months for a period of one year following initiation of the tests and once every six months thereafter for the duration of the permit. A permit violation occurs when toxicity is found in the initial and a confirmatory bioassay. Test procedures are those recommended in EPA/600/4-85/014.

When the instream waste concentration is less than one (1) percent at critical conditions, the permittee shall conduct 48-hour static toxicity tests on three appropriate species including a fish, an invertebrate, and one species selected from EPA 600/4-85/013, Table 1. Tests shall be conducted once every two months on 100 percent effluent for a period of one year following the initiation of the test and once every six months thereafter for the duration of the permit. Four separate grab samples of final effluent shall be collected at evenly spaced intervals over a 24-hour period and used in four separate tests in order to catch any peaks of toxicity and to account for daily variations in effluent quality. Test procedures are those recommended in EPA/600/4-85/013.

REGION/STATE: US Environmental Protection Agency, Region V

ADDRESS: 230 South Dearborn Ave,
Chicago, IL 60604

CONTACT: Mr. James Giattina
Permits Section

PHONE: (312) 353-1869

SUMMARY: Region V is developing a general guidance strategy for its States with regard to integrating chemical specific and toxicity testing techniques into a toxicant control program. All of the Region's States have NPDES delegated authority. Through a combination of Regional and State biomonitoring efforts, and biomonitoring requirements and toxicity limits contained in NPDES permits, all major industrial and municipal discharges for which there is a suspicion of toxicity will be evaluated over a 5 year period. The Region currently conducts acute and chronic bioassays, algal assays and the Ames test on selected discharges at its Central Regional Laboratory. The acute tests are performed most often and consist of the 48-hour acute static test on Daphnia pulex and a 96-hour acute static test on fathead minnows per the EPA Guidance Manual 600/4-85/013. A number of chronic tests are performed each year as well. Regional biomonitoring also includes a special study conducted on the Indiana Harbor/Grand Calumet system involving chronic testing of point source discharges. The Region performs approximately 80 compliance monitoring bioassays per year in addition to the State tests.

The Region encourages the use of the Ames test as a screening tool only.

REGION/STATE: US Environmental Protection Agency, Region VI

ADDRESS: 1201 Elm Street
Dallas, TX 75270

CONTACT: Mr. Craig Weeks
Industrial Permit Writer

PHONE: (214) 767-4381

SUMMARY: Region VI has developed a written toxicity testing policy for its States since none of the States currently has NPDES permitting authority. Under the Region's policy, approximately 300 new and reissued major industrial permits contain standard biomonitoring language which requires a quarterly bioassay to be conducted for at least the first two years of the permit's life. The bioassay required is the "Range-Finding Screening Test" set forth in the EPA guidance document Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms (EPA/600/4-85/013). The required organisms, Daphnia spp. or Mysidopsis spp. (depending on water salinity) must have a survival rate of 80 percent or greater in 100 percent effluent for 24 hours. If at any time during the two year testing period, the organisms do not have an 80 percent survival rate, a replacement static 48 hour median lethal concentration (LC50) test must be conducted on the same species.

Currently, Region VI is compiling the information received from the above-described tests and plans on using the generated data to build a data base upon which to place biomonitoring limits in permits. The Region also intends to use the data to assist States in determining current or potential problems in receiving waters.

There have been approximately 25 evidentiary hearing requests which challenged EPA's authority to require biomonitoring of effluents as opposed to receiving waters in NPDES permits. The hearings were denied by the Region and the denials were upheld by EPA Headquarters.

There are Regional Inspectors who perform periodic compliance inspections around the Region which include sampling and analysis for chemical limits as well as spot-checking bioassays.

REGION/STATE: US Environmental Protection Agency, Region VIII

ADDRESS: One Denver Place

999 18th Street, Suite 1300

Denver, CO 80202-2413

CONTACT: Mr. James Lazorchak

Water Management Division

PHONE: (303) 293-1581 or (303) 236-5088

SUMMARY: Region VIII does not currently have a formal written biomonitoring program. Each of the four delegated States do have some type of program; however, a shortage of manpower and/or expertise in the States has led the Region to solidify a regional program which consists of general policy guidance and technical assistance through the use of its mobile laboratory and in-house laboratory capabilities. In addition, there are Regional Inspectors who assist the States in monitoring compliance.

The general Regional program is based on acute whole effluent bioassays on fish. The program is moving toward using 7-day chronic whole effluent testing on Ceriodaphnia, but the Region has just recently developed the capabilities to conduct such testing. Presently, the testing requirements have been placed only on municipalities; with the exception of mining, few industries exist with significant discharges. However, the Region has begun placing testing requirements on other industrial categories including Air Force Bases and municipal airports.

The criteria upon which a biomonitoring permit condition is based are facility size and/or whether toxic effluent is suspected at the facility. Biomonitoring requirements are assessed to municipalities on a case-by-case basis upon permit reissuance.

Four of the States in the Region are delegated NPDES States but none has pretreatment delegation. The Region is using biomonitoring as a screening tool for determining pretreatment compliance.

When a toxicity problem is found, requirements for a toxicity evaluation plan and a Toxicity Reduction Plan will be considered for implementation.

As mentioned above, Region VIII has a mobile laboratory capable of doing fish flow-through studies; Ceriodaphnia studies are done at a State laboratory. The laboratory equipment is being used to foster the overall program since none of the States outside of Colorado has toxicity testing laboratories.

REGION/STATE: US Environmental Protection Agency, Region VII

ADDRESS: Water Management Division
726 Minnesota Avenue
Kansas City, KS 66101

CONTACT: Mr. John Houlihan
Missouri State Planning Coordinator-Water Management Division

PHONE: (913) 236-2817

SUMMARY: Region VII does not have a formal written policy on toxicity testing. Currently, only two industrial permits in Missouri contain a toxicity testing requirement among the four states in Region VII's jurisdiction. Iowa and Nebraska do not have individual toxicity testing programs so they depend on the Region for guidance and laboratory assistance regarding any type of biomonitoring. Missouri and Kansas environmental agencies do have toxicity testing programs for screening industrial and municipal permit effluents. Additionally, the Region has performed a limited number of static acute bioassays on municipal and industrial discharges. Currently, the Region relies on contract funding to outside labs or assistance from EPA-Duluth in conducting bioassays. Both states and the EPA contract lab use daphia and fathead minnows for acute bioassays using various dilution ratios. The EPA-Duluth lab conducts chronic bioassays. The Region also has been conducting fish tissue surveys checking on bioaccumulation in urban areas because levels of chlordane in fish tissue exceed the FDA "action levels". It is believed these pesticide levels are the result of a non-point source problem.

University labs in Iowa, Kansas, and Missouri have the capability for conducting bioassays and have assisted states or EPA in the past in training or conducting bioassays.

With the exception of the bioaccumulation study discussed above, the Region's current toxicity testing program does not focus on human health aspects.

EPA REGION IX

REGION/STATE: US Environmental Protection Agency, Region IX

ADDRESS: Water Management Division
215 Fremont Street
San Fransisco, CA 94105

CONTACT: Mr. Phil Woods
Water Quality Standards Coordinator

PHONE: (415) 974-8307

SUMMARY: A Regional policy on biological toxicity testing is in the final stages of development. Region IX is pushing toward implementation of the Technical Support Document for Water Quality-Based Toxics Control but has not yet universally translated such concepts into permit language for all permit reissuances. Water quality standards of States within the Region generally express the mandate that the survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors shall not be less than that for the same water body in areas unaffected by the waste discharge.

Many discharges are to the Region's marine and tropical waters. Guidance provided in current bioassay procedural documents is believed to be less than adequate in recommending methodology and test organism species for such waters.

In early February, 1986, Region IX issued a letter to each of the States in the Region that urged them to begin to fully develop the effluent toxicity data base for water bodies where aquatic toxicity problems have been documented or are suspected and to readjust permit requirements accordingly.

REGION/STATE: US Environmental Protection Agency, Region X

ADDRESS: 1200 Sixth Avenue
Seattle, WA 98101

CONTACT: Mr. Roger Mochnick, Chief
Permits Section, Water Division

PHONE: (206) 442-4817

SUMMARY: Region X is in the process of developing a policy related to biological toxicity testing. Currently, the Regional goal is to emphasize a standard chronic bioassay but the commercial laboratories of the area are not yet comfortable with the chronic testing procedures. The Region is moving in the direction of toxicity testing for municipal, as well as industrial discharges. Their toxicity testing program is just emerging.

Support services in the form of a mobile bioassay laboratory equipped for the Ceriodaphnia test from the EPA Environmental Monitoring Systems Laboratory, Las Vegas, NV, will be moving into the Region this summer to begin an effluent testing program. Of the States in the Region, Oregon and Washington have NPDES delegated authority, Alaska and Idaho do not.

REGION/STATE: Alabama Department of Environmental Management

ADDRESS: 1751 Federal Drive

Montgomery, AL 36130

CONTACT: Mr. J. P. Martin, Chief, Industrial Branch, Water Div. — Mr. Curt Johnson, Public Health Engineer

PHONE: (205) 271-7852 — (205) 271-7848

SUMMARY: Toxicity testing on whole effluent is used except where two or fewer toxic pollutants are present in detectable amounts. Where chemical specific procedures are used EPA's Water Quality Criteria are the basis for determining toxicity. The State has 82 major and 468 minor industrial permits and 85 major and 174 minor municipal permits. In addition, there are 4 major and 255 minor semi-public and private permitted facilities. Twenty major and 5 minor industrial permits require toxicity testing and have toxicity effluent limits. The criterion to require testing currently is on a case-by-case basis based upon professional judgment regarding the potential for a toxicity problem or knowledge of prior State testing. Currently the State is in the process of establishing a program for biological toxicity testing of municipal effluents. No human health related testing or instream biotic assessment is now required.

Permit conditions, where applicable, require the permittee to submit a proposed plan of study for conducting bioassays. The types of bioassays required include acute tests on a fish and an invertebrate performed monthly until consistent data are obtained or up to one year. The tier testing principles of the Technical Support Document are followed and more than two species may be required, as well as chronic bioassays on two or more species.

The State policy requires no acute toxicity within the mixing zone and no chronic toxicity outside the mixing zone. When it is determined that the permittee's effluent instream concentration exceeds the no effect level for that effluent, a Toxicity Reduction Evaluation that addresses both the causative nature of the problem and solution must be undertaken, a plan submitted to the Department, and when approved, fully implemented. Permittees are being informed of the probability that toxicity testing will be required in new or reissued permits.

The State does not have a commercial laboratory certification program. The State has been doing about seven instream biotic assessments annually including macroinvertebrate examination and electrofishing for fish population analysis. Fish tissue analyses for metals, PCBs and other organic constituents are undertaken at six State locations annually. The State has performed acute static bioassays with daphnids and fathead minnows, as well as chronic bioassays with Ceriodaphnia. A bioassay mobile laboratory equipped with flow-through dilutors recently was purchased. The State's immediate goal is to conduct 10 instream biotic assessments, fish tissue analyses, and flow-through 96-hour bioassays per year.

REGION/STATE: Alaska - NPDES Authority Not Delegated

ADDRESS: U. S. Environmental Protection Agency - Region X
1200 Sixth Street
Seattle, WA 98101

CONTACT: Mr. Roger Mochnick, Chief
Permits Section, Water Division

PHONE: (206) 442-4817

SUMMARY: The State of Alaska has not been delegated NPDES authority. EPA Region X issues 308 major and 817 minor industrial permits and 19 major and 31 minor municipal permits for the State. Two of the industrial permits require 96-hour acute flow through bioassays using trout and salmon. None of the permits has toxicity effluent limits.

REGION/STATE: Arizona - NPDES Authority Not Delegated

ADDRESS: U. S. Environmental Protection Agency, Region IX
Water Management Division
215 Fremont Street
San Francisco, CA 94105

CONTACT: Mr. Phil Woods
Water Quality Standards Coordinator

PHONE: (415) 974-8307

SUMMARY: The State of Arizona has not been delegated authority to issue NPDES permits. EPA Region IX issues 23 major and 76 minor industrial permits and 19 major and 29 minor municipal permits for the State. State water quality standards provide that the survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors shall not be less than that for the same water body in areas unaffected by the waste discharge. In implementing such standard, the State is using a pollutant specific approach. Arizona has established a policy requiring semi-monthly monitoring of 14 toxic pollutants limited by State water quality standards for all major municipal dischargers. Testing for additional toxic pollutants and testing by other dischargers is required on a case-by-case basis. There are no biological testing requirements in Arizona permits. Water quality criteria are used to determine potential environmental harm from constituent concentrations found in the monitoring program. No particular emphasis is given to human health aspects, but radioactivity determinations are given special attention, especially with respect to the drinking water standards.

Most Arizona waste discharges enter normally dry washes, thus, fish and other organisms living in such environments tend to serve as natural and continuous bioassay organisms.

REGION/STATE: Arkansas Department of Pollution Control
NPDES Authority Not Delegated

ADDRESS: P. O. Box 9583
Little Rock, AK 72219

CONTACT: Mr. Roger Payne, Engineer — NPDES Permits Section
Mr. John Giese — Chief Ecologist

PHONE: (501) 562-7444

SUMMARY: NPDES authority has not been delegated to Arkansas, but the State anticipates receiving delegation soon. According to Mr. Craig Weeks, Industrial Permit Writer, EPA Region VI (214-767-4381), there are 56 major and 396 minor industrial and 59 major and 234 minor municipal permits in the NPDES program. Thirty-four of the industrial permits require biological toxicity testing in the form of an acute daphnid and fathead minnow bioassay. Currently, biological testing is not required of municipal permittees.

The State has an immediate goal of 6 to 12 acute daphnid and bacterial culture bioassays per year. The capability for chronic bioassays is in the developmental stage. The State does not operate a mobile laboratory and there is no biological laboratory certification program.

The macroinvertebrate populations are examined annually at about 40 locations associated with permittee discharges. About 15 of the 40 locations are further assessed by examining fish populations and analyzing fish flesh and sediments. The flesh and sediment analyses include metals, PCBs, pesticides, dioxin, and hexane extractable organic compounds. The State is attempting to develop a more rapid "standard" methodology for collecting benthic macroinvertebrates, e.g. a 5-minute riffle sample with a Surber net, to enlarge the number of annual macroinvertebrate collections. In the past few years, abundant biological data have been collected on undisturbed waterways providing substantial "background" data.

REGION/STATE: California Water Resources Control Board

ADDRESS: 901 P Street

Sacramento, CA 95833

CONTACT: Mr. John Norton, Chief

Water Quality Standards and Policy Unit

PHONE: (916) 322-0211

SUMMARY: The State of California administers a program with 98 major and 943 minor industrial and 148 major and 109 minor municipal NPDES permits. The program is administered through nine Regional Water Quality Control Boards. There are about 550 permits that require biological toxicity effluent testing. (This is a projected number based upon best estimates provided by six of the nine regional Boards.) All permits with a testing requirement also have toxicity effluent limits.

All discharges to the ocean and to the San Fransisco Bay have permits that require effluent toxicity testing. A number of fresh water discharges also have this requirement. The test currently required is a 96-hour static acute bioassay using killifish and threespine stickleback for marine waters and golden shiner, fathead minnow, and juvenile rainbow trout for fresh waters. Waste treatment for freshwater discharges is to a "no measurable effect on aquatic life" level. California water quality standards provide that the survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors shall not be less than that for the same water body in areas unaffected by the waste discharge.

The State is beginning to examine the chronic bioassay tool using three species and the methods employed by EPA in its guidance document (EPA/600/4-85/014). It is expected that within 18 to 24 months there will be an implemented chronic bioassay testing program for all major discharges to the marine environment and for most of the major discharges to fresh water.

The California Fish and Game Department and the University of California at Davis assist with a State program of bioassay effluent and other testing. Extensive biological investigative activities are associated with ocean discharges. There is little field biological activity associated with inland surface waters. Toxic substances are monitored in fish tissues for all major rivers, and there is an extensive mussel watch program for all ocean waters.

There is no biological testing laboratory certification program within the State of California.

REGION/STATE: Colorado Department of Health
Water Quality Control Division

ADDRESS: 4210 E. 11th Avenue
Denver, CO 80220

CONTACT: Mr. David Akers, Public Health Engineer
Mr. Dennis Anderson, Supervising Engineer

PHONE: (303) 320-8333

SUMMARY: There are approximately 70 major and 400 minor industrial and 70 major and 400 minor municipal permits in the State NPDES program. Biological toxicity testing is required of eight municipal permittees where pretreatment programs have been established. There are no toxicity limits in these permits, but if toxicity is indicated in the test, the State expects the municipality to determine the cause. There are no other biological testing requirements within the permit program.

The State operates a mobile bioassay laboratory. Although EPA Region VIII has arranged to have acute and chronic bioassays completed on some effluents, the State also does about two per year including the 7-day Ceriodaphnia test. There are one or two commercial laboratories within the State with toxicity testing capabilities, but there is no laboratory certification program. The State has developed its own guidelines for bioassays which closely parallel the test procedures developed by the EPA.

The State collects fish for fish flesh analyses from about 12 locations annually. Special water quality studies including macroinvertebrate and fish examinations are completed on two or three locations annually. Routine benthic organism monitoring is being established this summer at four or five locations; rock baskets may be the sampling tool used in this assessment.

REGION/STATE: Connecticut Department of Environmental Protection

ADDRESS: 122 Washington Street

Hartford, CT 06115

CONTACT: Mr. Lee Dunbar

Senior Environmental Analyst

PHONE: (203) 566-7049

SUMMARY: The State of Connecticut administers a permit program with 130 major and 650 minor industrial permits and 68 major and 17 minor municipal permits. One permit currently contains biological toxicity testing requirements. However, 10 to 12 permittees have done biological testing in the past, undertaken toxicity evaluations, and have made necessary adjustments which have resulted in permit modifications eliminating any biological testing requirement. Eight or 10 permittees currently have been required by the State to obtain biological test data.

State authorities have estimated that of the 130 major industrial permits issued, 80 to 100 will require some biological testing within the next two years. Most of these will require ongoing monitoring. A strategy for dealing with the municipal water quality based toxics problem is under development. Out of the 130 major municipal permits, it is estimated that about 50 percent will require some type of toxicity evaluation.

Permits do not specify the type of bioassay to be performed. The State has attempted to remain flexible on the type of bioassay conducted by a permittee. Generally, the State has accepted acute static bioassay results using fathead minnows and a daphnid, and mysid shrimp and other appropriate test organisms in the marine environment. There are no commercial biological testing laboratories within Connecticut. There is no State laboratory certification program although the State would support a regional laboratory certification concept.

The State operates a mobile bioassay laboratory equipped with dilutor systems, and has a stationary laboratory in Hartford. On an annual basis, the State conducts 100 static acute fathead minnow and Daphnia pulex bioassays, 8 to 10 flow-through 96-hour bioassays using fish as a test organism, and 2 to 6 instream macroinvertebrate assessments that are oriented toward particular problem areas. The laboratory in Hartford is initiating a chronic bioassay program using the 7-day fathead minnow and 7-day Ceriodaphnia test. These chronic tests are viewed as a tool for ambient water quality monitoring at a number of locations in a river basin survey-type study. There is an ambient monitoring network where the benthic macroinvertebrate community is assessed along with other analyses twice a year at approximately 12 locations. Tissue samples are examined in marine fishes and lobster monthly; in Housatonic River trout for PCBs, in a number of lakes and ponds for heavy metals and pesticides, and in a couple of run-of-the-river impoundments for mercury.

DELAWARE

REGION/STATE: Department of Natural Resources and Environmental Control

ADDRESS: P. O. Box 1401
Dover, DE 19903

CONTACT: Mr. Mark Blosser, Environmental Engineer
Mr. Paul Jones, Environmental Engineer

PHONE: (302) 736-4590
(302) 736-5733

SUMMARY: The State of Delaware administers a permit program consisting of 21 major and 39 minor industrial and 15 major and 25 minor municipal NPDES permits. Five of the industrial permits and one municipal permit require biological toxicity testing. The testing is done on important receiving water resident fish species with whole effluent. Permits require three 48-hour static bioassays per year. If there is less than an 80 percent survival in 100 percent effluent, the permittee must do a 96-hour flow-through or 96-hour static renewal test. If the LC50 is found to occur in less than 50 percent effluent, a toxicity reduction evaluation must be performed. This process has not been formalized in permit language but is a triggering mechanism to require toxicity evaluation and control when toxicity may be a problem. The State has had authority since 1974 to establish toxicity effluent limits based upon bioassay results.

There are no commercial biological laboratories in Delaware and there is no laboratory certification program. EPA personnel from West Virginia have provided technical support in performing acute and chronic bioassays using Ceriodaphnia and fathead minnows. The State expects to establish a facility in 1986 with the capability of performing acute and chronic bioassay testing. It is expected that the bioassays will be used to screen ambient water for toxicity rather than for specific effluent testing. It has not yet been determined whether or not such a facility will become permanent. The State has done macroinvertebrate and fish instream biotic assessments related to wastewater discharges, at a rate of 1 or 2 per year. There are 12 water quality trend monitoring locations which the State services.

REGION/STATE: District of Columbia

NPDES Authority Not Delegated

ADDRESS: US Environmental Protection Agency, Region III

841 Chestnut Street

Philadelphia, PA 19107

CONTACT: Mr. Dale Wismer, Chief

Water Quality Control Section, Water Management Division

PHONE: (215) 597-8244

SUMMARY: The District of Columbia does not have delegated authority for the NPDES permit program. One municipal permit, now in draft, would require chronic bioassay testing using Ceriodaphnia, fathead minnows and Selenastrum. The permit is for the District of Columbia Blue Plains Plant. There are no other discharges of potentially toxic pollutants that have come to the attention of Region III.

FLORIDA

REGION/STATE: US Environmental Protection Agency, Region IV

NPDES authority not delegated

ADDRESS: 345 Courtland Street, N. E.

Atlanta, GA 30365

CONTACT: Mr. Marshall Hyatt, Environmental Scientist

Facilities Performance Branch, Water Management Division

PHONE: (304) 347-2156

SUMMARY: EPA Region IV, administers the NPDES permit program for the State of Florida. There are about 122 major and 670 minor industrial, 125 major and 74 minor municipal, and 3 major and 42 minor Federal facility permits within the State. About 35 industrial and 10 municipal permits currently require biological toxicity testing and these permits have effluent toxicity testing limits.

In a May 5, 1986, EPA memorandum on Whole Effluent Toxicity Testing Policy for Florida, it was stated that whole-waste toxicity limits and biomonitoring requirements will be required in reissued domestic and municipal Florida NPDES permits for all major facilities and for all minor facilities with design flows greater than or equal to 0.5 MGD. Toxicity limits and biomonitoring requirements will be included in other minor facilties where information, including previous bioassays, indicates a potential toxic effluent.

When the instream waste concentration is greater than or equal to one percent at critical low flow conditions, the permittee shall conduct a 7-day Ceriodaphnia survival and reproduction test and a 7-day fathead minnow larval survival and growth test on a 24-hour composite sample on an effluent concentration equivalent to the instream waste concentration with test solutions renewed daily. Toxicity tests shall be conducted every two months for a period of one year following initiation of the test and once every six months thereafter for the duration of the permit. A permit violation occurs when toxicity is found in the initial and a confirmatory bioassay.

When the instream waste concentration is less than one percent at critical conditions, the permittee shall conduct 48-hour static toxicity tests on three appropriate species including a fish, an invertebrate, and one species selected from EPA 600/4-85/013, Table 1. Tests shall be conducted on 100% effluent once every two months for a period of one year following the initiation of the tests and once every six months thereafter for the duration of the permit. Four separate grab samples of final effluent shall be collected at evenly spaced intervals over a 24-hour period and used in four separate tests in order to catch any peaks of toxicity and to account for daily variations in effluent quality. A permit violation occurs when a lethal concentration greater than 50 percent is found in any one of the grab samples within any testing period.

REGION/STATE: Georgia Department of Natural Resources
Environmental Protection Agency

ADDRESS: 205 Butler Street, S.E.
Floyd Towers East
Atlanta, GA 30334

CONTACT: Mr. Ernie Ern, Program Mgr. Mr. William Winn, Program Mgr.
Water Quality Management Program

PHONE: (404) 656-7400

SUMMARY: The State of Georgia administers an NPDES program with 60 major and 500 minor industrial and 120 major and 350 minor municipal permits. Twenty-five industrial permittees and one municipal permittee are required to complete 48-hour acute static bioassays using daphnids and fathead minnows as test organisms. If the screening test is failed, a permittee must complete a 96-hour flow-through test using fathead minnows. If this test is failed, a toxicity reduction evaluation is required. The State is implementing a bioassay program and when toxicity is found through this program, the applicable permits will be modified to incorporate biomonitoring requirements.

The bioassay program in the State of Georgia will be significantly enhanced through two actions. The State recently purchased a mobile bioassay laboratory that is currently being equipped and field tested. In addition, a base laboratory in Atlanta exclusively for use in toxicity testing and aquatic biomonitoring, is in the design stage and is scheduled for completion in late 1986. The State expects to do a large number of static bioassays using Daphnia pulex and fathead minnows, and to complete approximately one 96-hour flow-through bioassay per month. They will screen effluents to determine possible acute toxicity before sending the mobile laboratory on-site for a flow-through test. The State believes that there is a need to determine if there are any acute toxicity problems before attacking the chronic toxicity issue.

The State annually samples 30 locations with chemical analyses and for macroinvertebrates for trend water quality monitoring. Of the 30, 6 locations are sampled for fish. At 20 locations, fish flesh and sediments are examined for heavy metals and selected organic compounds, and at 13 estuarine locations, shellfish are examined for the same constituents. Biological impact studies related to point sources are made at 15 to 20 locations annually where macroinvertebrates are examined.

REGION/STATE: Hawaii Department of Health

ADDRESS: P. O. Box 3378
Honolulu, HI 96801

CONTACT: Mr. Dennis Lau, Chief
Environmental Permits Branch

PHONE: (808) 548-6410

SUMMARY: The State administers an NPDES program that includes 19 major and 55 minor industrial permits and 11 major and 8 minor municipal permits. Two industrial and one municipal renewal permit require acute 96-hour static bioassays using fish as the test organism. Most discharges are to the marine environment and the appropriate aquatic species and type of bioassay remain uncertain. To date, toxic discharges have not been identified, hence there have not been toxicity reduction evaluations. Permittees with a biological testing requirement have completed comprehensive investigations of receiving water environments including coral, benthic organism assessments and fish. The State submits the results of such assessments to the University of Hawaii for assessment, interpretation and recommendations. The State has the capability for very limited biological investigations.

There are no standards for specific toxic pollutants in Hawaii's water quality standards, with the exception of ammonia in marine waters.

REGION/STATE: Idaho - NPDES Authority Not Delegated

ADDRESS: US Environmental Protection Agency, Region
1200 Sixth Avenue
Seattle, WA 98101

CONTACT: Mr. Roger Mochnick, Chief
Permits Section, Water Division

PHONE: (206) 442-4817

SUMMARY: The State of Idaho has not received authority to administer an NPDES permit program. EPA Region X issues 42 major and 273 minor industrial permits and 28 major and 94 minor municipal permits for the State. Three industrial and two municipal permits require chronic bioassay testing either with one or three test organism species. None of the permits has toxicity effluent limits and none currently requires acute bioassay testing. The toxicity testing program is in its infancy and most of the testing is accomplished with inhouse capability by the permittees.

ILLINOIS

REGION/STATE: Illinois Environmental Protection Agency

ADDRESS: 2200 Churchill Road
Springfield, IL 62706

CONTACT: Mr. Tim Kluge, Mgr., Industrial Wastewater Permit Unit
Mr. Jim Whitaker, Aquatic Toxicologist

PHONE: (217) 782 0610

SUMMARY: There are 104 major industrial and 2250 minor non-municipal and 175 major and 750 minor municipal permits in the Illinois NPDES program. Four industrial permits and one municipal permit have biological toxicity testing requirements. The municipal permit has a toxicity effluent limit; the others do not.

The types of bioassays required by the permits include 96-hour acute static tests with fathead minnow, a daphnid and an alga and chronic bioassays that are triggered by the amount of receiving water dilution. Three of the industrial permits and the one municipal permit are now in litigation before the Illinois State Pollution Control Board. The biological testing program is not expected to change until the Board takes action on the litigation.

The State has a stationary laboratory and operates a mobile bioassay laboratory. Approximately 25 fathead minnow and daphnid acute bioassays are completed each year, as well as 10 on-site 96-hour flow through bioassays using fish as the test organism. Both Ames and Microtox tests are conducted on wastewater samples by the State Human Health Toxicology Laboratory in Chicago.

An extensive stream macroinvertebrate investigative program encompasses 30 facility related studies, 15 trend monitoring locations, and 60 intensive basin wide studies annually. The basin wide studies include fish population examination, sediment analyses, and water quality data.

Fish flesh is examined from 72 stream and 18 lake sites annually for PCBs and organochlorine pesticides, and the flesh from 25 of these sites is analyzed for substances on the priority pollutant list. The State does not have a biological testing laboratory certification program.

REGION/STATE: Indiana Department of Environmental Management
Office of Water Management

ADDRESS: 105 South Meridian Street
Indianapolis, IN 46225

CONTACT: Mr. Joseph Krieger, NPDES Permit Supervisor; Mr. John Winters, Chief, Water Quality Surveillance & Stds Branch

PHONE: (317) 232-8706; (317) 243-5028

SUMMARY: There are 88 major and 650 minor industrial and 94 major and 360 minor municipal permits in the State NPDES program. Six of the industrial permits require biological toxicity testing but currently none has a toxicity limit. The test generally required is an acute static 48-hour daphnid bioassay, but in some permits, the 7-day chronic Ceriodaphnia and embryo-larval fathead minnow bioassays are required.

The State conducts about 15 per year static 48-hour Daphnia magna acute screening tests on major industries. Municipalities recently have been added to this testing regimen. The State currently is developing the capability to conduct the chronic Ceriodaphnia bioassay.

Through use of the Hester-Dendy artificial substrate tool, benthic macroinvertebrates are examined along with fish at 22 core monitoring stations, and at 5 discharge oriented locations annually. Macroinvertebrates only are also assessed at 15 habitat and use evaluation stream locations. Fish tissues are analyzed for PCBs, metals, and selected pesticides at 25 locations annually plus an undetermined number of "hot spot" or special attention areas.

The State owns a mobile bioassay laboratory but currently the mobile laboratory is not in use; it may be considered obsolete if the chronic testing protocols prove to provide more information and be less labor intensive than the 96-hour flow through fish bioassay. There is no biological laboratory certification program.

REGION/STATE: Iowa Department of Natural Resources

ADDRESS: Henry A. Wallace Building
900 East Grand
Des Moines, Iowa 50319

CONTACT: Ms. Monica Wnuk
Environmental Specialist

PHONE: (515) 281-8879

SUMMARY: The State of Iowa has 34 major and 552 minor industries and 62 major and 647 minor municipalities in its NPDES program. There are no permit requirements for biological toxicity testing, and a policy for such is not under development.

The USEPA has provided technical support to the State by performing 4 or 5 bioassays related to permitted effluents. The State has done bioassays, but it is not a common practice. Artificial substrates for macroinvertebrate assessment upstream and downstream from potential pollutant sources are accomplished at approximately two sites annually. Often these studies are associated with advanced secondary treatment assessments. The State participates in the regional ambient fish tissue testing program conducted by EPA Region VII by collecting fish for analysis at 17 locations. In addition, the State examines fish fillets from six locations for metals, PCBs and chlorinated pesticides.

REGION/STATE: Guam/Commonwealth of Northern Mariana Islands
Trust Territory of Pacific Islands/American Samoa
(NPDES authority not delegated)

ADDRESS: US Environmental Protection Agency, Region IX
Water Management Division
215 Fremont Street
San Fransisco, CA 94105

CONTACT: Mr. Phil Woods, Water Quality Standards Coordinator
Water Management Division

PHONE: (415) 974-8307

SUMMARY: The Islands of the Pacific do not have delegated NPDES authority. EPA Region IX administers the permit program that includes a combined 8 major and 24 minor industrial permits for all Islands, and 8 major and 9 minor municipal permits.

All entities have water quality standards which provide that the survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors shall not be less than that for the same water body in areas unaffected by the waste discharge. Provision is made for the implementation of this policy statement through a 96-hour static renewal bioassay as a minimum. Generally, the implementation of the bioassay requirement has not occurred. NPDES permits provide for the chemical analysis of various numbers of specific wastewater constituents.

Biomonitoring has been implemented using coral bioassay programs in Guam, and recently with a few acute bioassays using fish as test organisms. As in other tropical areas, there is a general lack of technical guidance on suitable bioassay organisms and techniques for tropical waters.

KANSAS

REGION/STATE: Kansas Department of Health and Environment

ADDRESS: Forbes Field
Topeka, KS 66620

CONTACT: Mr. Joe Arruda
Water Quality Biologist

PHONE: (913) 862-9360

SUMMARY: Kansas has 14 major and about 400 minor industrial and 32 major and 800 minor municipal permits in its NPDES program. There is no biological testing associated with the permit program, and the State has no plans currently to institute such testing.

The State has a priority list of approximately 18 industries and 24 municipalities whose effluents they are screening for toxicity, using 24-hour Daphnia pulex and fathead minnow bioassays. Approximately 12 of the above group have been screened to date. Further testing may be recommended based upon test results. The EPA laboratory at Duluth MN, through arrangement with the EPA Regional Office, conducted 7-day chronic Ceriodaphnia and larval fathead minnow bioassays on six selected effluents; results are pending at this time.

In related biological testing activities, the State conducts qualitative macroinvertebrate, fish, and periphyton receiving water biotic assessments at three or four locations annually. These assessments are related to specific wastewater discharges. The State believes that toxicity problems can be well identified through such assessments.

There is a network of about 60 water quality trend monitoring locations in Kansas. Fish collected via seining and macroinvertebrates sampled via the kick method are examined annually at these locations. The State participates in the Regional Ambient Fish Tissue analyses program where whole fish collected by the State at 20 locations are analyzed for pollutants by the EPA Region VII annually. The Kansas state laboratory is preparing for fish tissue analyses.

REGION/STATE: Kentucky Dept. of Natural Resources and Env. Protection

ADDRESS: 18 Reilly Road, Ft. Boone Plaza

Frankfort, KY 40601

CONTACT: Dr. Albert Westermann Mr. David A. Rome

Division of Water Supv of Inventory & Data Management

PHONE: (502) 564-3410

SUMMARY: The State of Kentucky currently has 205 major and 2599 minor industrial NPDES permits and 56 major and 214 minor municipal NPDES permits. Currently about 22 permits require some type of biological testing. Of these, 17 industrial and 4 municipal permits require toxicity testing but do not have effluent toxicity limits. One industrial permit has both testing and a limit requirement.

Most of the testing requirements include an acute static bioassay using both the 48-hour daphnid and the 96-hour solution renewal fathead minnow. Eighteen of the permits contain language to mandate toxicity evaluation and a toxicity reduction plan if testing indicates toxicity. Tests are mandated several times throughout a year. For at least two permits, chronic 7-day Ceriodaphnia and 8-day embryo-larval fathead minnow bioassays are required. In some renewal permits currently being drafted, consideration is being given to requiring instream biotic assessment of macroinvertebrates and fish, and fish tissue analysis for constituent content and accumulation. Permit toxicity testing is required on a case-by-case basis where a potential toxicity problem may exist. There have been no legal challenges to the effluent toxicity requirements.

The State currently does not have a commercial laboratory toxicity testing certification program. In addition to EPA's Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms (EPA/600/4-85/013), the State furnishes specific guidelines relating to effluent concentrations to be tested, water quality analyses during testing, and other measures. The state does not operate a mobile laboratory for bioassay testing but occasionally splits samples with commercial laboratories and conducts a bioassay on the split portion.

Routinely, the State conducts acute daphnid and a limited number of chronic embryo-larval fathead minnow bioassays on 25 industrial and municipal effluents annually. In addition, instream biotic assessment of macroinvertebrates and fish, via seining, is accomplished at 12 locations per year. Fish tissues from this effort are analyzed for metals, PCBs and other organic constituents. Basic water quality monthly monitoring is accomplished at 40 locations. Within this program, macroinvertebrate populations are monitored with the use of artificial substrates and fish populations are examined. There are 13 major river basins within the State and the overall strategy in water quality assessment is to focus on 2-3 basins at a time and rotate annually until the cycle has been completed.

REGION/STATE: Louisiana Department of Environmental Quality

NPDES Authority Not Delegated

ADDRESS: P.O. Box 44091

Baton Rouge, LA 70804

CONTACT: Dr. Dick Gregg

Environmental Program Specialist

PHONE: (504)342-6363

SUMMARY: The State of Louisiana has not received NPDES permit delegation. Mr. Craig Weeks, Industrial Permit Writer, EPA Region VI (214) 767-4381 reports that there are 145 major and 881 minor industrial and 75 major and 343 minor municipal NPDES permits. About 100 of the industrial permittees are required to conduct toxicity testing, but there are no toxicity effluent limits. The 48-hour static Daphnia spp. acute bioassay is required; none of the permits has a toxicity limit. Currently there are no biological testing requirements in municipal permits.

The State, in addition, maintains its own discharge permit system. As a result, a discharger must obtain an NPDES permit from EPA Region VI, as well as a State permit to discharge. There is coordination between the two regulatory systems and testing requirements are similar when they apply to both systems.

The State administers a permit system with 50 major and 300 minor industrial and 50 major and 900 minor municipal permits. Currently, about 30 of the industrial permits require toxicity screening using the 48-hour static Daphnia pulex and fathead minnow tests. There are no effluent toxicity limits and there are no testing requirements on municipalities. If greater than 80 percent mortality exists, in 100 percent effluent, the permittee must perform a 96-hour static renewal bioassay using fathead minnows. If this test is failed, there must be a determination of the cause and an identification of appropriate corrective action. In the testing program to date, none has failed the 96-hour test. In addition to the 30 industrial permits that require effluent bioassays, 6 permittees are required to do receiving water biotic assessments upstream and downstream from the discharge using macroinvertebrates and fish in the stream quality assessment.

The State does not maintain a mobile biological laboratory and does not conduct bioassays. There is no commercial laboratory certification program. The State has an active fish flesh analysis program principally for pesticides at 25 to 30 locations, four times per year.

REGION/STATE: Maine, Massachusetts, New Hampshire

NPDES Authority Not Delegated

ADDRESS: US Environmental Protection Agency, Region I

John F. Kennedy Federal Building, Room 2203

Boston, MA 02203

CONTACT: Mr. Steve Silva, Chief, Industrial Permits Section — Mr. Clyde Shufelt, Chief, Industrial Permits Section

PHONE: (617) 223-5061 — (617)-223-5470

SUMMARY: The States of Maine, Massachusetts, and New Hampshire do not have delegated NPDES authority. Their NPDES programs are managed by EPA Region I. Within the combined three states there are 170 major industrial permits and 205 major municipal permits. Toxicity control is managed through a combination of whole effluent toxicity testing and use of the chemical specific approach. Of the 170 major industrial permits, 70 currently have water quality based limits for toxic pollutants. Of these 70, approximately 40 have chemical specific limits based upon meeting receiving water quality criteria, and 30 require biological toxicity testing. Of those requiring toxicity testing, 20 to 25 have toxicity limits within the permits.

Of the 205 major municipal permits, 25 have biological testing requirements and 10 to 15 of these have toxicity effluent limits. An additional 65 municipalities, which are pretreatment communities, will require or have already received a whole effluent bioassay requirement. Those permits that are being reissued will have a bioassay requirement included in the permit. Those communities that are not going to be reissued in the near future will receive Clean Water Act Section 308 letters requiring a bioassay. Other than pretreatment communities, the criterion for requiring biological testing currently is on a case-by-case basis and based on best professional judgment. When toxicity effluent limits are included in municipal permits, generally monthly bioassays are required to evaluate compliance.

State water quality standards prohibit the discharge of toxic pollutants in amounts or combinations that may cause toxicity in the receiving water. To comply with such standards, industrial permit applications are reviewed, toxic pollutants identified, and receiving water dilution is determined. Calculated receiving water pollutant concentrations are compared with water quality criteria. Pollutant levels instream resulting from maximum plant discharge and 7Q10 low flow receiving water conditions are compared with instream acute water quality criteria. Pollutant levels instream resulting from average plant discharges and 30Q2 low flow receiving water conditions are compared against chronic instream criteria. Maine is an exception because of recent state legislation which mandates the use of the 7Q10. Such comparisons will determine whether technology based limitations (BAT) or the criteria-based chemical specific limits would be required in the reissued permit.

MARYLAND

REGION/STATE: Department of Health and Mental Hygiene

ADDRESS: 201 West Preston Street

Baltimore, MD 21201

CONTACT: Mr. John Veil — Chief Industrial Point Source Control Division

Mr. Arcadio Sincero — Chief, Permits Division, Water Management Admin.

PHONE: (301) 225-5678 — (301)-659-1069

SUMMARY: The State of Maryland administers a permit program with approximately 52 major and 520 minor industrial permits and 35 major and 313 minor municipal permits. There are 13 industrial and 20 municipal permits currently that require biological toxicity testing. Approximately six additional draft industrial permits would require biological toxicity testing if they become final. None of these has a toxicity effluent limit. If it appears from the results of the initial bioassay that an effluent is toxic, a repeat bioassay by the permittee or a bioassay conducted by the State laboratory showing confirmatory results could trigger a toxicity reduction evaluation according to a draft State toxics control policy.

Current NPDES permit language requirements being added to permits upon reissuance require a 7-day chronic bioassay to be performed on Ceriodaphnia and fathead minnows once per quarter for the first year of the permit. Concurrently with one of the chronic tests, the permittee is also required to perform a 96-hour static renewal test with a locally important fish and another 96-hour static renewal test with a locally important insect or invertebrate. The 96-hour tests are only required to be performed once. The permit requirements allow the replacement of Ceriodaphnia and fathead minnows with mysid shrimp and sheepshead minnows for estuary waters.

The State has just engaged in a 3-year contract with Johns Hopkins University for the University to serve as the bioassay laboratory for the State. This program has been funded through industrial permit fees. This will substantially increase the States' capability to undertake bioassay assessments of potential toxic effluents using both acute and chronic tests and will serve as a comparison to the results of permittee testing through commercial laboratories.

In related biologic activities, an assessment of benthic macroinvertebrates of the tributaries to the Chesapeake Bay has begun. Biotic assessment of benthic macroinvertebrates has been on-going for a network of trend monitoring locations throughout the State. Receiving stream biotic assessments are rarely made a permit condition.

For the Massachusetts Summary, please see the Maine Summary.

REGION/STATE: Michigan Department of Natural Resources
Surface Water Quality Division

ADDRESS: P. O. Box 30028
Lansing, MI 48909

CONTACT: Mr. William E. McCracken, Chief, Permits Section; Mr. Jim Grant, Supervisor, Water Quality Appraisal Unit

PHONE: (517) 335-4114; (517) 335-3313

SUMMARY: There are 122 major and 745 minor industrial and 95 major and 385 minor municipal permits in the Michigan NPDES program. Three industrial and two municipal permits require bioassays using fish from the receiving water as test organisms. Michigan has not discovered acute toxicity to be a water pollution problem in the past. The States' NPDES program is a chemical specific program. The State water quality standards require that toxicity limits be calculated on specific chemicals and about 50 percent of the permits have chemical specific toxicity limits. Toxicity evaluations and toxicity reduction evaluations are triggered through the chemical specific toxicity limit process.

The goals of the Michigan program are to integrate biomonitoring into the permit program, to implement toxicity based permit limits, and to further develop staff expertise and equipment resources necessary to perform the Ceriodaphina and fathead minnow chronic bioassays.

The State of Michigan has just completed a new stationary bioassay laboratory. The State has operated a mobile bioassay laboratory since the early 1960's. Annually the State has been performing, and will continue to perform, approximately 5 flow-through 96-hour bioassays using fathead minnows, and 30 in-laboratory 48-hour static acute screening bioassays using Daphnia magna. The 7-day Ceriodaphnia and fathead minnow chronic bioassays are expected to be added to the testing list. The State has been performing reference testing with these species to gain experience.

About 40 to 50 effluent-oriented stream biotic evaluations are conducted annually using macroinvertebrates; occasionally fish are collected for flesh analyses for mercury, pesticides and selected organic compounds. There is no certification program for commercial biological testing laboratories.

REGION/STATE: Minnesota Pollution Control Agency

ADDRESS: 1935 W. County Road B2
Roseville, MN 55113

CONTACT: Mr. Doug Hall, Supervisor, Permit Unit; Mr. Marvin Hora, Head, Ambient & Intensive Monitoring Unit

PHONE: (612) 297-1832; (612) 296-7215

SUMMARY: The State of Minnesota has an NPDES program with 28 major and 450 minor industrial permits and 50 major and 650 minor municipal permits. Two of the industrial permits require 24-hour static bioassays using fathead minnows. It is expected that the program will continue without substantial alteration in the near future. Most of the toxicity currently encountered is with ammonia and chlorine.

The State operates a mobile bioassay laboratory. There is no certification program for commercial biological testing laboratories. The State conducts 50 to 75 acute static 24-hour daphnid and fathead minnow bioassays; one or two 96-hour flow through bioassays with fathead minnows and 96-hour static renewal bioassays with Daphnia magna annually. The State is just initiating the use of the 7-day Ceriodaphnia test. Recently the State completed 317 screening bioassays on all (254) municipal dischargers with mechanical treatment.

An extensive fish tissue analyses program is conducted annually in which fish from 30 to 40 lakes are analyzed for mercury, from 100 locations for PCBs, and from 30 to 40 locations for dioxin. In addition, fish flavor impairment studies are conducted with in situ caged organisms.

REGION/STATE: Mississippi-Department of Natural Resources
Bureau of Pollution Control

ADDRESS: P.O. Box 10385
Jackson, Mississippi 39209

CONTACT: Mr. Jerry Cain, Chief
Industrial Wastewater Control Section

PHONE: (601) 961-5073

SUMMARY: The permit program in the State of Mississippi consists of approximately 39 major and 493 minor industrial and 45 major and 255 minor municipal permits. About 15 to 20 of the industrial permits have requirements for biological toxicity testing; none of the municipal permits requires such testing. Of the 15 to 20 permits requiring testing, a minority have toxicity effluent limits; these represent those permittees that demonstrated toxicity in effluents during acute bioassay examination. In the past, about 50 industrial permits required acute bioassays. There was an escape clause to the effect that when toxicity was not determined through acute bioassay, the permit testing program could be discontinued. When effluent toxicity was indicated in the bioassay, and confirmed in a repeat bioassay, a toxicity reduction evaluation was triggered.

In the near-future, 50 or more permittees will be required to complete chronic bioassay testing quarterly during the first year and every six months thereafter for the life of the permit. The permittees must perform the 7-day Ceriodaphnia and larval fathead minnow procedures for chronic bioassays, alternating between the two species on every other test occurrence. There are two commercial biological testing laboratories within the State but there is no biological laboratory certification program. It is not anticipated that the biological testing program will become associated with the municipal permit program. All pretreatment permits are issued at the State level, thus, the State, through a chemical specific assessment, believes that they will be able to control potential toxic components of municipal discharges.

The State completes 24-hour screening and, later, a 48-hour Daphnia pulex static bioassay on 12 to 15 effluents annually as part of its testing program. Ambient monitoring of fish flesh analyses for metals and chlorinated hydrocarbons are completed annually at 30 locations. There are 15 State trend monitoring locations where macroinvertebrates and periphyton are examined and 30 locations where fish populations are assessed. The State is purchasing a biological mobile laboratory, which will have the capability to conduct both acute and chronic bioassays. There are plans to add a biologist to the staff specifically for bioassay activities.

REGION/STATE: Missouri Department of Natural Resources

ADDRESS: P.O. Box 1368

Jefferson City, Missouri 65102

CONTACT: Mr. John Ford

Water Quality Specialist

PHONE: (314) 751-7626

SUMMARY: The State of Missouri administers a permit program with 70 major and 2100 minor non-municipal permits and 70 major and 750 minor municipal permits. None of the permits in the NPDES program has a requirement for biological toxicity testing; the program can be characterized as being virtually chemical specific. Five or six of the permittees have, in the past, been required to perform an instream biotic assessment of receiving waters with macroinvertebrates with the focus on one location upstream from a source and one or two locations downstream. Generally, an initial macroinvertebrate study is all that has been required of permittees. A few permittees are performing bioassays routinely that are not required under permit conditions.

The State is in the initial phase of a chronic bioassay program related to effluents. Through a contract with the US Fish and Wildlife Service's Columbia National Fish Research Laboratory, Columbia, MO, State and Laboratory personnel are conducting chronic Ceriodaphnia and fathead minnow bioassays on 16 municipal effluents over a 2-year period. Twelve of the municipal effluents have been examined. When this contractual program has been completed, the State's testing program will be shifted to the State Laboratory at Jefferson City where the State will continue to check four to six effluents annually. This is essentially a compliance monitoring program. The State anticipates requiring toxicity testing and possibly attaching toxicity limits in applicable permits if toxicity is discovered in the effluents.

The State does not operate a mobile laboratory. There is no State laboratory certification program for biological testing laboratories, nor is there a trend monitoring program where biological techniques are employed. The State collects fish annually at 22 locations for the Regional Ambient Fish Tissue analyses program where EPA Region VII analyzes whole fish for pollutants. The Missouri Department of Conservation analyzes fish flesh for chlordane, PCBs, and other pesticides in an extensive fish sampling program as well.

The State completes qualitative benthological investigations using macroinvertebrates in receiving water streams in the vicinity of 200 facilities annually. These specific locations change annually as the State's investigative universe of about 1,000 facilities is completed in a 5-year period. In addition, more intensive instream biotic assessments are completed in four to six stream reaches annually.

MONTANA

REGION/STATE: Montana State Department of Health and Environmental Sciences

Water Quality Bureau

ADDRESS: Cogswell Building, Room A-206

Helena, MT 59620

CONTACT: Mr. Loren Bahls, Supervisor

Water Quality Management Section

PHONE: (406) 444-2406

SUMMARY: There are 19 major and 166 minor industrial and 26 major and 68 minor municipal permits in Montana's NPDES program. Virtually a chemical specific program, there is no requirement for effluent toxicity testing. There are, however, two permits that require receiving water biomonitoring.

The State has developed the capability to perform the 7-day chronic Ceriodaphnia bioassay and has performed such at two locations. Screening bioassays have been done on 10 effluents using a 7-day static renewal Ceriodaphnia test. The State does not operate a mobile laboratory. More biological testing will likely be required when permits are scheduled for renewal. Presently, there appear to be two candidates for toxicity testing permit requirements.

The State conducts six to eight instream biotic assessment studies annually, many of which are associated with upgraded sewage treatment plants. Algae, primary productivity, chlorophyll a and macroinvertebrates are examined. Trend water quality monitoring is undertaken at 30 locations where macroinvertebrates and algae are included in the examination.

There are no commercial laboratories known to have bioassay capability but there are several consultants that sample and identify macroinvertebrates and fish. There is no biological testing laboratory certification program.

REGION/STATE: Nebraska Department of Environmental Control
Water Quality Division

ADDRESS: P.O. Box 94877
Lincoln, NE 68509

CONTACT: Mr. Steve Walker
Environmental Specialist

PHONE: (402) 471-2186

SUMMARY: The NPDES program for the State of Nebraska includes 26 major and 201 minor industrial and 44 major and 299 minor municipal permits. There are no requirements for biological testing in the permits and the program is operated on a pollutant specific basis. There are no current plans to institute biomonitoring activities into the program.

The EPA currently is testing about six facilities annually for the State using static renewal acute bioassays on effluents using daphnids and fathead minnows as test organisms. This program currently meets the bioassay needs of the State. If toxicity is found through bioassay testing, an instream biotic assessment is completed by the State, and if toxicity is apparent, then the State will seek appropriate action by the permittee to rectify the problem.

Approximately two years ago, the State completed about six instream biotic assessment studies. No water quality problems were encountered so the receiving water biotic assessment program is not conducted on a regular basis. The State participates in the Regional Ambient Fish Tissue analyses program where fish are collected at 15 locations and whole fish are analyzed by EPA Region VII.

In related activities, fish fillets are examined for chlordane and other pesticides at about 20 locations by the State. As part of the ongoing water quality management program, the State examines 3 of the 13 river basins or approximately 100 locations per year for immature aquatic insects and fish in an effort to develop a usable biotic index for the area. The most pristine stream reaches are chosen for this effort.

REGION/STATE: Nevada Division of Environmental Protection

ADDRESS: 201 South Fall Street
Carson City, NV 89710

CONTACT: Mr. Wendell McCurry
Water Quality Office

PHONE: (702) 885-4670

SUMMARY: The State of Nevada has 3 major and 20 minor industrial NPDES permits and 10 major and 15 minor municipal permits. One of the major industrial permits is for stormwater and the other two are for once-through cooling water. The one permit with biological testing is a municipality with advanced waste treatment. The requirement is for quarterly 96-hour static renewal bioassays using trout as the test organism. Although not a condition of the permit, the municipality maintains a tank stocked with fish through which the treated effluent passes prior to discharge to receiving waters. In addition, the permit requires periphyton and macroivertebrate assessments at several locations in the receiving water. The permit conditions were the result of a settlement agreement with an Indian tribe.

The State predominantly uses a chemical specific approach in its permit program. The use of biological testing is not foreseen in the near future. The State does not undertake biological studies related to the permit program.

For the New Hampshire Summary, please see the Maine Summary.

REGION/STATE: New Jersey Department of Environmental Protection

ADDRESS: P.O. Box CN 029

Trenton, NJ 08625

CONTACT:	Steven Lubow, Env. Scientist Bur. Water Quality Stds & Ana. Div. of Water Res.	Alfred Korndoerfer Super. Env. Spec. Div. of Water Res.	George Caporale Chief, Bur. of Permits Admin.
PHONE:	(609) 633-7020	(609) 292-0427	(609) 984-4428

SUMMARY: New Jersey issues 200 major and 780 minor industrial permits and 160 major and 310 minor municipal permits. Effluent toxicity limits and toxicity testing are conditions in 118 industrial and 111 municipal permits. Permit limits require compliance either with a specified test organism LC50 or with a requirement that there be no measurable acute toxicity using a designated test organism.

Permits issued to date require acute static renewal or flow-through bioassays using fish in freshwater and shrimp (Mysid or Paleomanetes) or fish in marine waters; there are two permits which have chronic bioassay requirements. Quarterly testing is the standard testing frequency with the possibility of test frequency adjustment based upon review of the test data. Where ongoing violation(s) of the toxicity limits occur, a toxicity reduction program is mandated. The current State goal is to include toxicity limits and testing requirements in all industrial permits and in permits for selected municipal dischargers. This goal is being implemented by incorporating toxicity limits and testing requirements into permits as they are issued or come up for renewal. A longer term goal of the State is to expand acute testing to cover fish and invertebrates (in fresh and saline waters) and to add chronic testing with various organisms to the permit program.

The State has developed regulations governing toxicity testing (Regulations Governing Laboratory Certification and Standards of Performance). EPA toxicity testing guidance manuals were used in conjunction with other references (eg. Standard Methods for the Examination of Water and Wastewater) in developing the State regulations.

The State has a laboratory certification program and accepts data only from State-certified laboratories for use in its permit program. Additionally, the State operates a mobile laboratory for bioassay and other testing. Currently, about 5 discharges are studied per year using flow-through toxicity testing with fish as the test organism. A new State laboratory is being constructed which should substantially expand the State's testing capabilities.

Instream biotic assessments are now performed which incorporate phytoplankton, periphyton, macroinvertebrate, sediment and fish examinations. Ocean discharge monitoring is also performed. The State investigative program is flexible, covering a range from watershed specific to discharge specific. The number of studies varies from year to year. Fish flesh and sediments are analyzed for PCBs, pesticides, and other organic constituents, as required. Ames testing is being used on a limited basis to gather data. After enough data have been gathered and evaluated, this test may be incorporated into the State's regulatory program.

REGION/STATE: New Mexico Health and Environmental Dept., Environmental Improvement Div., NPDES Authority Not Delegated

ADDRESS: P.O. Box 968
Santa Fe, NM 87504-0968

CONTACT: Mr. Glenn Saums, Prog. Mgr. — Surface Water Section; Mr. Dave Tague — Surveillance & Standards Sect.

PHONE: (505) 827-0020; (505) 827-2822

SUMMARY: NPDES authority has not been delegated to New Mexico. The State has 16 major and 134 minor industrial and 21 major and 25 minor municipal permits in the NPDES program, according to Mr. Craig Weeks, Industrial Permit Writer, EPA Region VI (214) 767-4381. Five of the major industrial permits require acute static bioassay testing using a daphnid. None of the permits has a toxicity effluent limit. The State performs about eight water quality stream studies annually. Macroinverterbrates are examined in some of these studies. No State bioassays are performed and there is no fish tissue examination.

NEW YORK

REGION/STATE: New York State Dept. of Environmental Conservation
Division of Water

ADDRESS: 50 Wolf Road
Albany, NY 12233

CONTACT: Mr. Daniel Halton, Dir. Bureau of Wastewater Facilities Design; Mr. Ed Kuzia, Research Scientist

PHONE: (518) 457-1067; (518) 457-3495

SUMMARY: There are 166 major and 861 minor industrial permits and 266 major and 300 minor municipal permits in the New York NPDES program. Approximately 10 industrial and 10 municipal permits currently require biological toxicity testing; none has a toxicity effluent limit. The State plans to increase toxicity testing requirements to include approximately 50 industrial and municipal permits within the next year or 18 months. The findings of the permit biological testing program will determine toxicity effluent limits to be placed in permits later. The current testing program requires four acute static renewal bioassays annually using fathead minnows and daphnids and is oriented more toward chemical specificity than toward biological testing; there are about 100 specific chemicals in the permit regulatory program. There is a mechanism for requiring a toxicity reduction evaluation in the event that the initial and a repeat bioassay demonstrate significant toxicity.

The State is implementing a bioassay program that will involve use of the 7-day Ceriodaphnia and fathead minnow chronic tests on ambient receiving waters. Use of these tests at about 10 locations per year is projected. The State operates a mobile bioassay laboratory but currently it is being used by the State fish and wildlife personnel in the lamprey eel control program. There are about nine commercial laboratories in the State that have the capability of conducting toxicity testing but, as yet there is no laboratory certification program. The State has its own guidance document for toxicity testing and it conforms to the EPA guidance documents in procedural language.

The State maintains about 50 long-term trend monitoring locations where stream macroinvertebrates are examined. It also analyzes fish flesh for PCBs, pesticides, and metals from a similar number of locations. Approximately five special studies are completed annually, which assess effects of ambient water quality on macroinvertebrate populations.

REGION/STATE: North Carolina Department of Natural Resources and Community Development, Division of Environmental Management

ADDRESS: P.O. Box 27687
Raleigh, NC 27611

CONTACT: Mr. Bob Deweese, Facility Performance Unit; Mr. Ken Eagleson, Sup., Biological Services Unit

PHONE: (919) 733-5083

SUMMARY: The State of North Carolina administers an NPDES program with 94 major and 2060 minor industrial and 121 major and 184 minor municipal permits. One permit has a requirement for biological toxicity testing. However, through the mechanism of administrative letters, many more permittees are required to conduct a monitoring program.

Based on the administrative letter, 29 industries and 24 municipalities currently complete monthly acute static daphnid bioassays. Six of the above permittees are required to substitute 7-day Ceriodaphnia chronic testing for acute bioassays. Lethal concentration limits are associated with this testing program and if evidence of toxicity exists, a toxicity reduction evaluation must be instituted. Currently, there are 10 other permittees, 6 municipal and 4 industrial, who are potential canidates for the testing program; these, also, will have toxicity limits when testing is initiated. As permits are reissued, the potential for toxicity is assessed and the effluent volume associated with available low flow receiving water volume is a determining factor in deciding whether testing will be required and whether it is of the acute or chronic nature.

The State has both a mobile and stationary biological testing laboratory. During 1984 and 1985, acute Daphnia pulex bioassays were completed at 330 facilities, which represents 558 bioassays on permitted discharges. The mobile laboratory is equipped for on-site toxicity evaluation including 96-hour flow-through bioassays, 7-day chronic Ceriodaphnia and Daphnia pulex acute bioassays, in-stream macroinvertebrate biotic assessment, and fish sampling by electrofishing. The State completes about 12 flow-through bioassays and about 50 multiple-station in-stream macroinvertebrate assessments annually. In addition, about 50 to 60 trend monitoring locations are examined annually for benthic macroinvertebrates and phytoplankton. Fish tissue is examined at these locations for the presence of heavy metals and pesticides.

REGION/STATE: North Dakota Department of Health
Water Supply and Pollution Control
ADDRESS: 1200 Missouri Avenue
Bismarck, ND 58501

CONTACT: Ms. Sheila McClenathan
Environmental Scientist
PHONE: (701) 224-2345

SUMMARY: North Dakota has 7 major and 70 minor industrial and 15 major and 300 minor municipal permits in its NPDES program. The program is managed in a chemical specific manner; no effluent bioassays are required in the permit program.

The EPA Laboratory, Denver, CO, has provided technical assistance in performing one or two acute and chronic bioassays on effluents as a demonstration project. The State is giving strong consideration to initiating a bioassay program and targeting seven or eight acute fish and daphnid bioassays per year.

REGION/STATE: Ohio Environmental Protection Agency

ADDRESS: P.O. Box 1049
Columbus, OH 43216

CONTACT: Mr. Robert Phelps, Chief — Div. of Industrial Wastewater
Mr. Charles Webster — Bioassay Eval. Group Leader

PHONE: (614) 466-2390 — (614) 294-5841

SUMMARY: The State of Ohio operates a virtual chemical specific NPDES program. There are 150 major and 1350 minor industrial and 155 major and 900 minor municipal permits in the program. Currently, one industrial permit requires a biological test.

The State has been doing acute static 48-hour Ceriodaphnia and fathead minnow bioassays three times per year on 18 to 20 effluents. This effort will, when completed, involve about 75 bioassays. An evaluation of the results of this study will determine State action to place additional toxicity testing and toxicity limits into appropriate permits; it may also determine action on toxicity reduction evaluations. The State also completes 7-day Ceriodaphnia and fathead minnow chronic bioassays on an "as needed" basis and anticipates a work load of 7 to 10 such bioassays per year. The State does not operate a mobile bioassay laboratory and there is no biological laboratory certification program.

The receiving waters of the 18 to 20 effluent locations are also being examined three times annually using Hester-Dendy multiple plate samplers for macroinvertebrates, and electrofishing or seining techniques to sample fish populations. Fish tissue and sediments are analyzed through contract support.

REGION/STATE: Oklahoma Department of Health, Water Resources Board

NPDES Authority Not Delegated

ADDRESS: 1000 NE 10th Street

Oklahoma City, OK 73152

CONTACT: Mr. David Dimick

Environmental Engineer

PHONE: (405) 271-7326

SUMMARY: NPDES permitting authority has not been delegated to Oklahoma. According to Mr. Craig Weeks, Industrial Permit Writer, EPA Region VI (214)-767-4381, there are 36 major and 361 minor industrial and 59 major and 742 minor municipal permits in the NPDES program. Twenty-two of the industrial permits require an acute 48-hour bioassay using a daphnid. Presently, biological testing is not required of municipal permittees.

The Oklahoma State laboratory has conducted an effluent screening of about 35 permittees with a 24-hour static *Daphnia magna* bioassay.

REGION/STATE: Oregon Department of Environmental Quality
Water Quality Division

ADDRESS: P.O. Box 1760
Portland, OR 97207

CONTACT: Mr. Kent Ashbaker, Manager, Industrial Waste Section — Mr. Jerry Bell, Aquatic Toxicologist

PHONE: (503) 229-5325 — (503) 229-5983

SUMMARY: There are approximately 23 major and 551 minor industrial and 36 major and 198 minor municipal permits in the Oregon NPDES program. Fifteen of the industrial permits, mostly pulp and paper mills and metals facilities, require 96-hour static bioassays annually using salmonids as test organisms. No biological testing of municipal permittees is required. There are toxicity effluent limits in two metals facilities permits. The mechanism to require a toxicity reduction evaluation exists but such has not been put into formal permit language. Generally tests have shown a 100 percent survival of test organisms in 100 percent effluent. One permit requires an instream biotic assessment.

The State expects in the near future to focus on municipalities in the toxicity testing area, especially those municipalities which receive large proportions of industrial wastes. There are three commercial laboratories in Oregon that perform acute bioassays but none currently performs chronic bioassays. There is no certification of biological testing laboratories. The State must be comfortable with a test in its own laboratory before others are asked to complete it.

The State does a number of different biological tests. Three or four acute static renewal 96-hour bioassays using salmonids are completed per year. Invertebrate 96-hour bioassays are done with Gammarus or Hyallela. Twenty to thirty 15-day chronic bioassays using Daphnia magna are performed annually. A similar number of 14-day algal assays using Selenastrum are completed. Sediment bioassays using Hexagenia are completed in minimal numbers, and sediments are examined to determine inhibitions to germination of field seeds in relation to land waste application practices. It is estimated that 12 to 24 receiving water studies where macroinvertebrates and periphyton are assessed are completed annually. Caged salmonid fishes or caged invertebrates placed upstream and downstream from a potential pollution source are used in one or two studies per year.

REGION/STATE: Pennsylvania Department of Environmental Resources

ADDRESS: P.O. Box 2063

Harrisburg, PA 17120

CONTACT: Mr. James Ulanoski, Chief

Standards Units, Bureau of Water Quality Management

PHONE: (717) 787-9637

SUMMARY: Pennsylvania has 171 major and 1050 minor industrial permittees and 225 major and 2080 minor municipal permittees. Pennsylvania's toxicity testing program is based on chemical specific testing. None of the State's permits requires whole effluent biological toxicity testing. However, within the next few months, State personnel will be examining the whole effluent biological toxicity testing concept to determine how it might be useful to the State's current program.

Chemical specific limits are made a part of a permit based upon an industry's declaration in the NPDES application of constituents probably occurring in the effluent. The declared constituents are compared with those constituents associated with various industrial effluents discovered by EPA in its testing of particular industrial processes for toxic constituents. If differences occur between an industry's declaration of constituents in an effluent and the findings by EPA of constituents in pertinent industrial processes, a formal effort is made to ensure that all potentially toxic pollutants have been identified in the permit.

To determine the level or concentration of an identified toxic pollutant that is regulated by the permit, the State uses human health or aquatic life water quality criteria. For many effluent constituents, human health concerns provide a more stringent permit limit than does aquatic life toxicity. To challenge a non-human health permit limit, an industry may provide bioassay data for a particular chemical constituent using the particular receiving water as a diluent. If the proposed permit limits are too stringent to be attained through current treatment technology, the industry must undertake a toxics reduction evaluation. The purpose of a Toxicity Reduction Evaluation is to develop acceptable methods of achieving the reduction of toxics in waste effluents. This evaluation encourages the use of in-plant management and control techniques to reduce, or perhaps eliminate, the generation and discharge of toxic pollutants, as an alternative to expensive end-of-pipe treatment.

In its water pollution control program, the State conducts 30 to 35 comprehensive instream biotic assessments and approximately 200 less comprehensive "upstream and downstream" biotic stream assessments annually. Fish and macroinvertebrates are examined in these studies. Fish flesh analyses are performed at 25 to 30 selected locations to determine pollutant bioaccumulations. The State program does not include bioassay testing. In addition, there are over 200 network "trend monitoring" locations where monthly or quarterly analyses are made. Many of these locations require examination of benthic macroinvertebrates and fish.

REGION/STATE: Puerto Rico

NPDES Permitting Authority Not Delegated

ADDRESS: US Environmental Protection Agency, Region II

26 Federal Plaza

New York, NY 10278

CONTACT: Michael Minerva, Permits Management Section

PHONE: (212) 264-1859

SUMMARY: Puerto Rico does not have delegated authority to issue NPDES permits. The Island's permitting program is managed by Region II. Puerto Rico has 89 major and 146 minor industrial and 36 major and 93 minor municipal permits in its NPDES program. There have been two permits issued by the Region that have contained biomonitoring. Through the Region, Puerto Rico is considering requiring biomonitoring at municipal facilities with significant industrial inflow.

REGION/STATE: Rhode Island Division of Water Resources

ADDRESS: 83 Park Street
Providence, RI 02903

CONTACT: Mr. Raymond Aldrich
Principal Sanitary Engineer

PHONE: (401) 277-3961

SUMMARY: The State of Rhode Island is in the intitial phase of a toxicity effluent testing program. With 16 major and 81 minor industrial permits and 19 major and 13 minor municipal permits, State permits require effluent toxicity testing on 12 industrial and 12 municipal discharges. There are no permit specified toxicity effluent limits. The specified effluent test is a 48-hour daphnid and a 96-hour fathead minnow static bioassay. A 96-hour flow-through fish test is an alternative for the latter if the waste is not compatible with static testing. Tests are performed on whole effluent. The State views this initial program as a toxicity screening endeavor with testing requirements designated on a case-by-case basis but including those specific industries with known or suspected toxic substances in effluent.

There is no toxicity testing laboratory certification program and currently there are no laboratories in Rhode Island equipped for aquatic biological testing.

Rhode Island does not conduct a permit oriented toxicity testing program. The State conducts trend stream monitoring at approximately 10 locations using artificial substrates and macroinvertebrates as criteria of water quality. Shellfish meats are routinely examined for contaminants also, but this human health test is not permit associated.

REGION/STATE: South Carolina Department of Health and Environmental Control

ADDRESS: 2600 Bull Street

Columbia, SC 29201

CONTACT: Mr. Russ Sherer, Director

Division of Water Quality Assessment and Enforcement

PHONE: (803) 734-5300

SUMMARY: On a case-by-case basis, the State of South Carolina requires permittees to conduct biological toxicity testing; in addition, the State itself conducts a program of biological toxicity testing. An estimated 80 major and 200 minor industrial permits and 115 major and 300 minor municipal permits have been issued.

Existing permits require approximately 10 flow-through 96-hour bioassays using fish and 10 static 48-hour screening tests using daphnids or mysid shrimp on whole effluents. Any such permit may require more than one test annually at a particular facility. In addition, approximately 40 permittees are required to conduct receiving stream biotic assessments, 2 permittees are required to conduct fish flesh tainting testing, and 2 permittees are required to conduct fish avoidance studies. Of the 60 existing permits requiring toxicity testing, 5 industrial permits have toxicity effluent limits, 55 industrial permits require testing but have no effluent limits, and 5 municipal permits require toxicity testing but have no effluent toxicity limits. Under a State laboratory certification program, testing data are accepted from a state-certified biological testing laboratory only. About 25 percent of the industrial permits require a Toxics Reduction Plan. The criterion to mandate effluent toxicity or other testing, or plan preparation is: (a) failure to pass a previous State or permit-imposed biological effects test, or (b) best professional judgment regarding potential environmental effects from a particular discharge.

Although toxicity evaluations are not required as a permit condition, the intent of the toxicity testing program is to determine and correct the cause of toxicity through State-permittee negotiations or via the permit reopener clause. Human health aspects are considered in 2 permits that require tissue testing for certain metals and in the 10 fish bioaccumulation studies conducted annually by the State.

Through operation of a State-maintained mobile laboratory, the State testing program includes a projected 10 flow-through 96-hour bioassays using fish as the test organism and 50 to 100 static 48-hour screening tests using Ceriodaphnia or mysid shrimp on whole effluent on an annual basis. In addition, 15 stream biotic assessment studies and 10 fish bioaccumulation studies are conducted annually.

SOUTH DAKOTA

REGION/STATE: South Dakota Dept. of Water and Natural Res. ,Office of Water Quality NPDES Authority has not been delegated.

ADDRESS: Joe Foss Building
Pierre, SD 57501

CONTACT: Mr. Dennis Rounds
Natural Resources Engineer

PHONE: (605) 773 3351

SUMMARY: South Dakota has 4 major and 56 minor industrial and 29 major and 283 minor municipal permits in the NPDES program. NPDES authority has not been delegated and the permit program is administered by EPA Region VIII. One municipal permit with combined industrial and domestic wastes has a requirement for a static and flow-through salmonid bioassay. There are no biological testing requirements for industrial permittees. Two or three additional municipalities probably will be required to conduct effluent bioassays in the near future.

The State may become more involved with bioassays activities but will probably keep most of the bioassay responsibility with the permittees. There are no commercial biological testing laboratories within the State and there is no laboratory certification program.

The State conducts 12 to 16 macroinvertebrate and fish biotic stream assessments annually. Fish flesh from two or three locations, usually in the Black Hills area is analyzed for pesticides, metals, and selected organic contaminants annually. In addition, trend water quality monitoring including macroinvertebrates and fish is performed annually at about 20 sampling locations.

REGION/STATE: Tennessee Division of Water Pollution Control

ADDRESS: 150 Ninth Avenue, North

Nashville, TN 37219-5404

CONTACT: Mr. Rich Sinclair, Manager

NPDES Permit Program

PHONE: (615) 741-7883

SUMMARY: The State of Tennessee issues 86 major and 960 minor non-municipal permits plus an estimated 400 mining permits, and 75 major and 166 minor municipal permits. Of these, there are seven industrial permits that require effluent toxicity testing but have no toxicity effluent limits, and five industrial permits that require effluent testing and have effluent toxicity limits. Two municipal permits require effluent toxicity testing with no specified effluent limits. Stated another way, four of the permits require static acute bioassays using fathead minnows or bluegill sunfish, five require chronic static bioassays using Ceriodaphnia and embryo-larval fathead minnows, four require 96-hour flow-through tests using fathead minnows, and one permit allows a municipality, which has inhouse capability, to perform a microbacterial assay.

Approximately 12 of the industrial permits contain language that mandates toxicity evaluations and toxicity reduction plan development when there is a showing of toxicity through the testing process. The criterion for requiring toxicity testing is on a case-by-case basis resulting from a previous stream biotic assessment conducted by the State or on knowledge of probable toxic constituents within effluents.

It is estimated that approximately 70 percent of the permittees employ consultants to complete toxicity testing requirements and that the remainder perform such activities inhouse. The State currently does not have a commercial laboratory certification program. In addition to the effluent testing requirements, two permits require fish flesh analyses for PCBs and other organic constituents from fish in receiving waterways. No legal challenges to the toxicity testing requirements or to associated limits have been initiated since the State began its case-by-case with justification approach for toxicity limits and testing.

The State operates a mobile bioassay laboratory and performs approximately 12 flow-through 96-hour bioassays annually with fish as a test organism. Concurrent with the flow-through test, an instream biotic assessment is made at the 12 sites being studied. Benthic macroinvertebrates are examined, as well as a qualitative fish analysis through electrofishing or riffle areas. The State cultures its own organisms for bioassay activities and screens all permit renewals with static acute bioassays on effluents using fathead minnows or chronic daphnid bioassays using Ceriodaphnia. In addition, to obtain water quality information the State has a program to analyze all water bodies for 5 metals and 20 organic constituents at 120 locations. That program is presently being completed.

REGION/STATE: Texas Water Commission
NPDES Authority not Delegated

ADDRESS: P.O. Box 13087
Capital Station
Austin, TX 78711

CONTACT: Mr. Robert Silbus, Chief, Industrial Wastewater Permits
Mr. Jack Davis, Water Quality Standards Unit

PHONE: (512) 463-8203
(512) 463-8475

SUMMARY: NPDES permitting authority has not been delegated to the State of Texas. According to Mr. Craig Weeks, Industrial Permit Writer, EPA Region VI (214-767-4381), there are 234 major and 1548 minor industrial and 241 major and 836 minor municipal permits in the State NPDES program. Biological toxicity testing is being required in 133 of the industrial permits. The biological test is an acute static 48-hour daphnid bioassay. No testing requirements appear in municipal permits.

Texas had an existing discharge permitting program when the NPDES program was initiated. The State has continued that program and, by agreement, prepares draft NPDES permits for issuance by the EPA concurrent with preparation of permits under the State system. In the State system there are 12 or less special effluent situations where biological stream monitoring with macroinvertebrates or other biological testing and toxicity evaluations are required.

The State currently does not conduct bioassay testing and does not operate a mobile bioassay laboratory. There is no biological laboratory certification program. The State expects to implement an effluent bioassay program, at least to verify data presented by contract laboratories. The State completes about 6 intensive water quality investigations per year that are oriented toward discrete discharges.

REGION/STATE: United States Virgin Islands

US Environmental Protection Agency, Region II

ADDRESS: 26 Federal Plaza

New York,NY 10278

CONTACT: Michael Minerva, Permits Management Section

USEPA - Region II, 26 Federal Plaza, New York, NY 10278

PHONE: (212) 264-1859

SUMMARY: The Virgin Islands have 5 major and 20 minor industrial and 2 major and 8 minor municipal permits in the NPDES program. There are no permits with biomonitoring requirements.

REGION/STATE: Utah Department of Health, Water Pollution Control
NPDES Authority Not Delegated

ADDRESS: 4108 State Office Building
P.O. Box 45500
Salt Lake City, UT 84145

CONTACT: Mr. Fred Pehrson, Chief
Permits & Compliance Section

PHONE: (801) 533-6164

SUMMARY: There are 19 major and 150 minor industrial and 39 major and 43 minor municipal permits in the State NPDES program. Fourteen of the municipal permits require 48-hour acute static daphnid bioassays. There are no biological testing requirements in industrial permits and there are no toxicity effluent limits in the permit program. It is anticipated that the requirement for toxicity testing will be placed in additional permits.

The State does not have a mobile laboratory. There is no commercial biological testing laboratory within the State, but there is a laboratory certification program. The State presently does not have capability for conducting bioassays. EPA Region VIII has performed one or two acute and/or chronic bioassays for the State.

There are 10 to 20 special studies annually to determine beneficial use criteria and to identify water quality impairment. In addition, there are 125 to 150 routine trend monitoring locations. No fish flesh analyses is done.

REGION/STATE: Vermont Agency of Environmental Conservation
Department of Natural Resources

ADDRESS: Six Baldwin Street
Montpelier, VT 05602

CONTACT: Mr. Douglas Burnham
Supervisor, Special Studies & Surveillance

PHONE: (802) 828-3369

SUMMARY: The State of Vermont has 8 major and 72 minor industrial and 31 major and 28 minor municipal permits in its NPDES program. There are no requirements for biological toxicity testing in the permit program.

The State believes that there are 6 to 12 discharges with potential toxicity impact on the receiving waters. Currently, potential toxicity is controlled through a chemical specific program in which environmental effects literature for those substances known to be discharged is used to estimate potential environmental harm.

Although the State is not conducting bioassays currently, their strategy is to be responsible for the initital acute screening of effluents for toxicity. The screening test would include both a 48-hour Daphnia pulex and a 7-day chronic Ceriodaphnia bioassay. When potential toxicity is determined in the screening process, the industry would be responsible for conducting 7-day chronic Ceriodaphnia and larval fathead minnow bioassays. With the testing program, the State would establish toxicity effluent limits; if such were violated, a toxicity reduction evaluation would be triggered.

There is one commercial biological testing laboratory within the State; there is no laboratory certification program. The State would support an EPA regional laboratory certification program.

In associated biological investigative activities, the State has an ambient stream monitoring program with 30 locations where macroinvertebrates are sampled through use of the Surber Sampler. There are six locations where fish populations are examined to monitor long-term effects of stream acidification on headwater fish population. A fish flesh analyses program is scheduled to begin in the fall of 1986.

REGION/STATE: Virginia Water Control Board

ADDRESS: 2107 North Hamilton Street

Richmond, VA 23230

CONTACT: Mr. David Paylor

Water Resources Ecologist

PHONE: (804) 257-6709

SUMMARY: The State of Virginia administers an NPDES permit program with 100 major and 125 minor industrial permits and 25 major municipal permits. Biological toxicity testing is required in 120 industrial and all major municipal treatment systems with treatment capacity of over 5 MGD or with pretreatment programs.

There are no toxicity limits in any permits but there is a reopener clause. Further toxicity testing may be required if toxicity is discovered as a result of the bioassays and a toxicity reduction plan may be required when toxicity is confirmed. Some industries currently are preparing toxicity reduction plans.

Generally, the types of bioassays required in permits include a 96-hour static renewal fathead minnow and 48-hour static daphnid bioassay. In some permits, trout are the required test organism in trout waters, and mysid shrimp and salt water fish in salt waters. One or two permits allow the use of mayfly nymphs as the invertebrate test organism. In about 15 permits, chronic tests with Ceriodaphnia are used in conjunction with the 7-day fathead minnow bioassay. Four of these 15 permits allow the use of the 21-day Daphnia magna chronic bioassay. These 15 permits generally are associated with industrial process changes, significant production increases, new sites, and effluents discharging to the James River.

There is no State biological testing laboratory certification program. The State approves a test plan, which includes the laboratory performing the test, prior to the testing process. There are no human health associated test requirements although consideration has been given to the concept. About 20 permittees are required to complete biotic macroinvertebrate receiving water assessments associated with effluents. These may be qualitative or quantitative assessments. In one case, based upon a benthic macroinvertebrate assessment and other monitoring, a toxicity reduction plan was required without further testing.

The State operates a mobile biological laboratory. Generally at two multiple-source, suspected toxicity sites annually, static bioassays with two species along with 7-day Ceriodaphnia and 7-day fathead minnow bioassays are performed on effluents. In addition, macroinvertebrate assessments are made on receiving waters along with an artificial substrate protozoan test. In the State stationary laboratory, two-species static bioassays using daphnids and fathead minnows along with a bacterial culture bioassay are completed on 24 to 36 effluent samples annually.

REGION/STATE: Washington Department of Ecology

ADDRESS: Mail Stop PV-11
Olympia, WA 98504

CONTACT: Mr. Stan Springer
Supervisor of Enforcement and Program Coordination Section

PHONE: (206) 459-6042

SUMMARY: Washington has 45 major and 475 minor industrial permits and 45 major and 235 minor municipal permits in its NPDES program. Approximately 40 of the industrial permits require biological toxicity testing and, of these, about 30 have toxicity effluent limits. The type of test required is an acute, static 96-hour bioassay using salmonids as test organisms. The toxicity limits specify 80 percent survival of test organisms in 65 percent effluent using the receiving waters as dilution waters. Upon failing the test, corrective actions including a determination of the cause of the toxicity are mandated. Most of the permittees have inhouse capability to accomplish biological testing requirements. Currently, in a couple of permit reissuances, consideration is being given to requiring instream biologic evaluations.

The State currently is in the process of revising its water quality standards; developing a strategy or policy on effluent toxicity testing and evaluating its water quality monitoring program. The State is also evaluating the applicability of EPA's recommended acute and chronic bioassays to the various industries within the State and to the marine environment. The State believes that it should not begin a required testing program by permittees until the State is comfortable with the testing techniques. The State believes, further, that it is headed toward a chronic bioassay program and that toxicity testing with limits will encompass a larger number of permits. Currently, the State does not operate a mobile bioassay laboratory and there is no certification of biological testing laboratories.

The State will investigate six effluents this year including both fresh-water and marine dischargers with chronic bioassay techniques using three species of test organisms including fish, invertebrate and algae. The six dischargers have been selected to include the major potential problem dischargers. These include: pulp and paper; wood treating and aluminum industries; municipalities with industrial waste contributions and municipalities without industrial waste contributions. Concurrent with the chronic testing approach, a matrix is being developed that will include the 50 most common chemicals potentially being discharged associated with appropriate management or control language that may be incorporated in permits.

REGION/STATE: West Virginia

Division of Water Resources

ADDRESS: 1201 Greenbriar Street

Charleston, WV 25311

CONTACT: Randy Sovic, Head — Industrial Waste Section

Janis E. Fisher — Biology Section Leader

PHONE: (304) 348-8855

(304) 755-9141

SUMMARY: West Virginia has been performing various forms of toxicity testing for approximately eight years. In the past, efforts have focused on comprehensive studies of macroinvertebrates in a 42-station network.

Presently, benthic studies are performed on about 20 specific facilities per year. Recently the State has been incorporating toxicity testing requirements into major industrial permits which are suspected of having toxics or organics in their discharge as they become eligible for reissuance on a case-by-case basis. The standard permit language requires a 48-hour static LC50 test on fathead minnows and Daphnia pulex and follows the procedures for acute toxicity testing set forth in EPA 600/4-85/013. Should the bioassay results indicate toxicity, further biomonitoring requirements and/or a toxicity reduction plan may be required.

Currently there are 39 permits which contain this biomonitoring requirement. The State performs approximately 100 bioassays a year as a part of its compliance inspection program; the tests are conducted in their stationary laboratory. There is no State laboratory certification program.

REGION/STATE: Wisconsin Department of Natural Resources

ADDRESS: P. O. Box 7921
Madison, WI 53707

CONTACT: Mr. Stanton Kleinert, Chief, Pretreatment & Fees Section
Mr. Joe Ball, Biological Coordinator

PHONE: (608) 266-7721

SUMMARY: The State of Wisconsin has 62 major and 731 minor industrial and 88 major and 507 minor municipal permits in its NPDES program. As a part of the permit application process, pulp and paper mills are required to submit results of 7-day chronic Ceriodaphnia and fathead minnow bioassays on effluents. Thus, there are 36 industrial permittees that are required to conduct chronic bioassays as their respective permits expire and requests are made for renewal.

The State expects to require toxicity testing of some municipalities in the future. The use of toxicity reduction evaluations is just beginning to be addressed. Testing for metals and the priority pollutants are required in permits of municipalities with treatment plants exceeding 5 mgd design capacity. Toxics limits have been included in one municipal permit and will be evaluated as municipal permits come up for reissuance.

Currently, the State does not operate a mobile bioassay laboratory. There is no certification program for commercial biological laboratories. The majority of the pulp and paper mill bioassays is being performed by the Institute of Paper Chemistry located at Appleton, WI. There is no State toxicity testing capability but it is expected that the capability for chronic toxicity testing will be developed within the next 12 to 18 months.

The State has received a grant to study the applicability of the Ames test to water pollution control testing. The mouse test for toxic algae is also being investigated further. There is an extensive macroinvertebrate sampling program involving 450 samples but the thrust of this program is toward nonpoint source pollution. There are 40 to 50 trend monitoring locations where macroinvertebrates, zooplankton, phytoplankton, and chorophyll a are examined.

Wisconsin has an extensive fish and wildlife tissue examination program where last year 525 flesh samples were examined for PCBs, 45 for chlordane and dieldrin, 12 for toxaphene, 880 for total mercury, and 85 for methyl mercury. Some of the samples were examined for more than one of the above mentioned constituents.

REGION/STATE: Wyoming Department of Environmental Quality
Water Quality Division

ADDRESS: Herschler Building, 4th Floor West
Cheyenne, WY 82002

CONTACT: Mr. John Wagner
Technical Supervisor

PHONE: (307) 777-7781

SUMMARY: Wyoming administers a permit program consisting of 30 major and 770 minor industrial and 20 major and 80 minor municipal NPDES permits. Of these, two municipalities are required to complete acute 48-hour daphnid bioassays on a quarterly schedule. There is no toxicity testing required of industry, but industrial activities generally are confined to resource extraction such as coal mining and oil production, and complex industrial wastewaters are rare. Although a strategy on the control of toxic pollutants has not been prepared by the State, bioassay requirements may become a more frequent evaluation tool in the future.

Bioassays are not performed by the State Water Quality Division, and very little water pollution related biological assessment of any kind is undertaken by the agency. There is no biological laboratory certification program.