1992 WASTEWATER DISCHARGE DATA

PREPARED BY

OFFICE OF WATERSHED MANAGEMENT

DEPARTMENT OF ENVIRONMENTAL PROTECTION

NORTH GRAFTON, MASSACHUSETTS

1994

INTRODUCTION

Needs for discharge monitoring were quite spread out across the state during 1992. Background information for permit renewal was gathered in the Quaboag, Quinebaug, and Suasco Basins. Sampling was also done in the French, Housatonic, Millers, and Taunton to provide discharge data for river surveys in these basins. In addition, the Ayer Wastewater Treatment Plant (WWTP) was sampled in answer to a request by the Central Regional Office. Most of these facilities were sampled for only two or three days apeice, making it unproductive to write a report for each basin. The only exception was the Housatonic Basin which was sampled on two separate weeks. This basin will be written up in a another report. Facilities sampled by date/basin are: For the Assabet River; Westborough WWTP, Marlborough West WWTP, Hudson WWTP, Maynard WWTP, and MCI Concord WWTP. For the Charles River; Medfield WWTP. For the Sudbury River, Raytheon Equipment Division WWTP, and Marlborough East WWTP. For the Nashua; Ayer WWTP. For the Millers River; Orange WWTP, Athol WWTP, Winchendon WWTP, and Seaman Paper Company WWTP. For the Quaboag River; Warren WWTP. For the Quinebaug River; Sturbridge WWTP, and Southbridge WWTP. For the French River; Leicester WWTP, Oxford-Rochdale WWTP, American Polymers Discharge, and the Webster WWTP. For the Taunton River; Tweave Inc. WWTP, Taunton WWTP, and Middleborough WWTP.

METHODS

Flow weighted composite samples of the effluents of the plants were taken using ISCO 1680 samplers (or in some cases the plants' sampler) and flow data from each plants' meter. Samples were taken from these composites for chemical parameters; (BOD, pH, total alkalinity, total suspended solids, settleable solids, and chloride), nutrients; (ammonia-nitrogen, nitrate-nitrogen, and total phosphorus), and metals; (aluminum, cadmium, chromium, copper, iron, lead, manganese, nickel, and zinc). Grabs were taken for oil and grease, organics, and coliform samples.
All samples were preserved as necessary, iced, and transported to the Wall Experiment Station (WES), for analysis. All samples were analyzed according to American Public Health Association (APHA) approved methods. Data pertaining to quality control procedures are on file at the WES laboratory. The results of the surveys are summarized for each facility.

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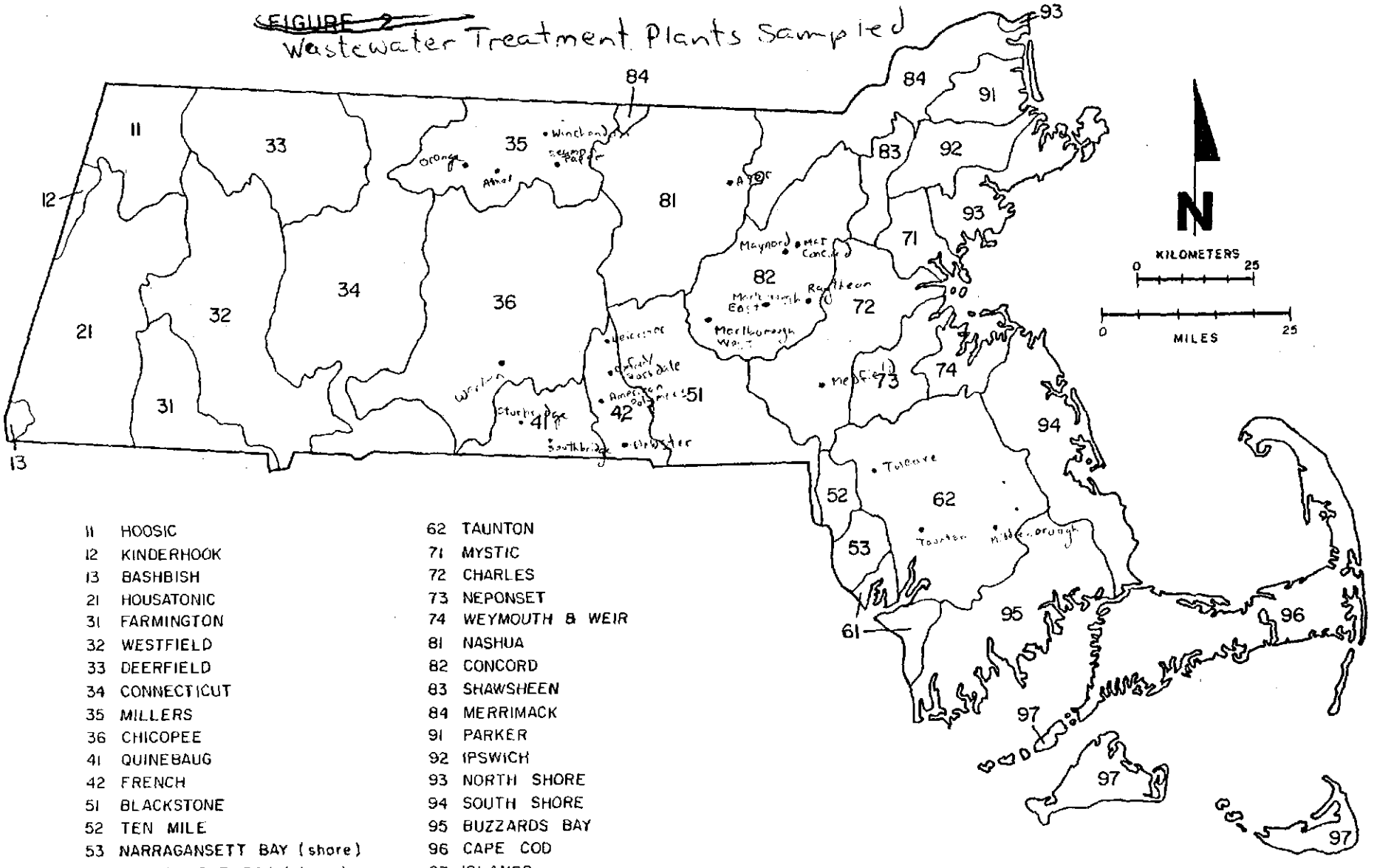
COMMONWEALTH of MASSACHUSETTS

~~RIVER BASINS and COASTAL DRAINAGE AREAS~~

~~FIGURE 2~~ Wastewater Treatment Plants Sampled



11	HOOSIC	62	TAUNTON
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WESTBOROUGH WASTEWATER TREATMENT PLANT

LOCATION: Turnpike Road (Route 9), Westborough

N.P.D.E.S. PERMIT NO.: MA0100412

RECEIVING WATER: Assabet River

DESIGN FLOW: 7.68 MGD

TYPE OF TREATMENT: *Primary; Bar Rack, Aerated Grit Chamber,* Primary Clarifier

Secondary; Multi-channel Oxidation Ditch, Final Clarifiers

Advanced; Rapid Sand Filters, Chlorination/Dechlorination, Reaeration Cascade

SLUDGE HANDLING: Composting has ceased due to odor problems. Liquid sludge is now trucked to NETCO for incineration.

COMMENTS: This plant was monitored from May 11 through May 14, 1992. The sample taken from the plant sampler was split with us and the flows and chlorine residuals were taken from the plant meters. The plant seemed to be running well. The effluent was very clear. Chlorine residuals were so low that they were below the detection limits of our Hach DR100 Colorimeters. The only problem noted was high phosphorus levels.

WESTBOROUGH WWTP EFFLUENT

all parameters in mg/l unless otherwise noted

SAMPLE TYPE	24 HR. COMP.		
DATE	MAY 11-12	MAY 12-13	MAY 13-14
BOD5	8.4	6	9
pH	7.1	7.1	7.5
SUSP. SOLIDS	3	1	***
SETT. SOLIDS ml/l	<0.5	<0.5	***
TURBIDITY NTU	3.3	***	***
AMMONIA-N	2.8	2.1	0.9
NITRATE-N	6.4	8.5	10
TOTAL-P	3.2	3.2	3.5
Chlorine Residual	0.55	0.25	0.35
FECAL COL./100ml	<20	20	20
CADMIUM	<0.02	<0.02	<0.02
CHROMIUM	<0.02	0.02	<0.02
COPPER	<0.02	<0.02	0.07
LEAD	<0.04	<0.04	<0.04
MANGANESE	0.05	<0.03	0.03
NICKEL	<0.03	<0.02	<0.03
ZINC	0.08	0.05	0.08
FLOW	4.000	3.947	3.882

MARLBOROUGH WEST WASTEWATER TREATMENT PLANT

LOCATION: Boundry Street, Marlborough

N.P.D.E.S. PERMIT NO.: MA0100480

RECEIVING WATER: Assabet River

DESIGN FLOW: 2.89 MGD

TYPE OF TREATMENT: Primary; Bar Rack, Aerated Grit Chamber, Comminutor, Primary Clarifier

Secondary; Mechanical Mix Aeration, Secondary Clarifiers

Advanced; Diffused Air Aeration, Final Clarifiers, Chlorination/Dechlorination

SLUDGE HANDLING: Trucked to the Marlborough East WWTP and composted with sludge from that faclilty.

COMMENTS: This plant was monitored from May 11 through May 14, 1992. The sample taken from the plant sampler was split with us and the flows and chlorine residuals were taken from the plant meters. The plant seemed to be running well. The only problem noted was high phosphorus levels.

MARLBOROUGH WEST WWTP EFFLUENT

all parameters in mg/l unless otherwise noted

TYPE OF SAMPLE	24 HR. COMP.		
DATE	MAY 11-1	MAY 12-13	MAY 13-14
BOD5	12	11	8.0
pH (std. units)	7.4	7.1	7.7
SUSP. SOLIDS	7.0	7.5	3.5
SETT SOLIDS(ml/l)	<0.5	<0.5	<0.5
AMMONIA-N	5.9	3.5	3.7
NITRATE-N	9.7	6.6	1.8
TOT. PHOS.	6.2	11	12
Chlorine Residual	<0.05	<0.05	0.05
FEC. COLI./100ml	<20	<20	<20
CADMIUM	<0.02	<0.02	<0.02
CHROMIUM	<0.02	0.02	<0.02
COPPER	0.02	0.02	0.08
LEAD	<0.04	<0.04	<0.04
MANGANESE	0.03	<0.03	0.04
NICKEL	0.10	0.10	0.05
ZINC	0.06	0.07	0.13
FLOW	1.93	2.09	1.82

HUDSON WASTEWATER TREATMENT PLANT

LOCATION: Municipal Drive, Hudson

N.P.D.E.S. PERMIT NO.: MA0101788

RECEIVING WATER: Assabet River

DESIGN FLOW: 2.6 MGD

TYPE OF TREATMENT: Primary; Aerated Grit Chamber, Cominutor, Primary Clarifiers

Secondary; Trickling Filters, Secondary Clarifiers

Advanced; Aeration Tanks, Final Clarifiers, Chlorination/Dechloronation, Post Aeration

SLUDGE HANDLING: All sludge returned to headworks and removed in the primary clarifier. Polymer addition, Belt Filter Press, Landfilled in Lined Landfill (Leachate trucked back to the plant)

COMMENTS: This plant was monitored from May 11 through May 14, 1992. An ISCO 1680 was set up on the final effluent structure. Flow weighted 24 hour composites were taken. Flow and Chlorine residual readings were taken from the plant meters. Copper and phosphorus values were quite high although there were no permit limits on these parameters at the time of the survey. Limits were subsequently added to the permit issued in 1993.

HUDSON WWTP EFFLUENT

all parameters in mg/l unless otherwise noted

SAMPLE TYPE	24 HR. COMP.		
DATE	MAY 11-12	MAY 12-13	MAY 13-14
BOD5	25	20	15
pH (std. units)	7.3	7.5	7.4
SUSP. SOLIDS	7.5	8.5	7.5
SETT SOLIDS(ml/l)	<0.5	<0.5	<0.5
TURB. (NTU)	8.0	***	***
AMMONIA-N	8.4	4.8	1.6
NITRATE-N	10	18	14
TOT. PHOS.	5.3	5.4	5.6
Chlorine Residual	0.10	0.10	0.12
FEC. COLI./100ml	2400	900	320
CADMIUM	<0.02	<0.02	<0.02
CHROMIUM	<0.02	<0.02	<0.02
COPPER	0.07	0.06	0.10
LEAD	<0.04	<0.04	<0.04
MANGANESE	0.05	0.04	0.04
NICKEL	0.06	<0.02	<0.03
ZINC	0.15	0.15	0.13
FLOW	1.82	1.96	2.02

MAYNARD WASTEWATER TREATMENT PLANT

LOCATION: Pine Hill Road, Maynard

N.P.D.E.S. PERMIT NO.: MA0101001

RECEIVING WATER: Assabet River

DESIGN FLOW: 1.43 MGD

TYPE OF TREATMENT: Primary; Bar Rack, Aerated Grit Chamber, Primary Clarifiers

Secondary; Rotating Biological Contactors (RBC's), Final Clarifiers, Chlorination/Dechlorination, Reaeration

SLUDGE HANDLING: Gravity Thickening, Sludge is trucked to Upper Blackstone Water Pollution Abatement District WWTP for incineration.

COMMENTS: This plant was monitored from May 11 through May 14, 1992. Samples were taken using the plants automatic samplers on the first and third day, a grab sample was taken the second day. Flow and chlorine residuals were taken from the plant meters. Copper, ammonia, and phosphorus values were quite high although there were no permit limits on these parameters at the time of the survey.

MAYNARD WWTP EFFLUENT

all parameters in mg/l unless otherwise noted

TYPE OF SAMPLE	24HR COMP	GRAB	24HR COMP
DATE	MAY 11-12	MAY 12-13	MAY 13-14
BOD5	22	18	15
pH (std. units)	7.2	7.0	7.3
SUSP. SOLIDS	6.0	8.5	3.5
SETT SOLIDS(ml/l)	<0.5	<0.5	<0.5
TURB. (NTU)	8.0	***	***
AMMONIA-N	7.8	20	11
NITRATE-N	13	1.0	13
TOT. PHOS.	5.3	6.0	5.0
Chlorine Residual	0.02	0.02	0.03
FEC. COLL./100ml	60	80.0	<20
CADMIUM	<0.02	<0.02	<0.02
CHROMIUM	<0.02	<0.02	<0.02
COPPER	0.03	0.06	0.07
LEAD	<0.04	<0.04	<0.04
MANGANESE	0.05	0.07	0.03
NICKEL	<0.03	<0.02	<0.03
ZINC	0.08	0.06	0.07
FLOW	1.176	1.128	1.132

MCI CONCORD WASTEWATER TREATMENT PLANT

LOCATION: Elm Street, Concord

N.P.D.E.S. PERMIT NO.: MA0102245

RECEIVING WATER: Assabet River

DESIGN FLOW: 0.250 MGD

TYPE OF TREATMENT: Primary; Bar Rack

Secondary; Aeration Tank, Clarifiers, Sand Filters, Chlorination

SLUDGE HANDLING: Trucked off site by licenced waste hauler.

COMMENTS: The plant continues to be hydraulically overloaded. In spite of an inadequate facility and faulty equipment, the operator has done an excellent job in trying to maintain effluent quality. This plant was monitored from May 11 through May 14, 1992. An ISCO 1680 sampler was set up on the final effluent. Turbidity in the effluent precluded getting an accurate chlorine reading. High nutrients and possible toxicity are of concern. A new plant was under construction as of September 1993. It is hoped this will eliminate these problems.

MCI CONCORD WWTP EFFLUENT

all parameters in mg/l unless otherwise noted

TYPE OF SAMPLE	24 HR. COMP.		
DATE	MAY 11-12	MAY12-13	MAY 13-14
BOD5	18	16	12
pH (std. units)	6.5	7.0	7.0
SUSP. SOLIDS	20	14	13
SETT SOLIDS(ml/l)	<0.5	<0.5	<0.5
TURB. (NTU)	40	***	***
AMMONIA-N	7.2	4.9	4.4
NITRATE-N	5.6	5.7	2.5
TOT. PHOS.	3.7	3.4	3.0
Chlorine Residual	1.5	1.5	1.5
FEC. COLI./100ml	<20	<20	<20
CADMIUM	<0.02	<0.02	<0.02
CHROMIUM	<0.02	<0.02	<0.02
COPPER	<0.02	0.02	0.03
LEAD	<0.04	<0.04	<0.04
MANGANESE	0.05	0.03	<0.03
NICKEL	<0.03	<0.02	<0.03
ZINC	0.13	0.07	0.12
FLOW	0.215	0.180	0.177

MARLBOROUGH EAST WASTEWATER TREATMENT PLANT

LOCATION: Boston Post Road (Route 20), Marlborough

N.P.D.E.S. PERMIT NO.: MA0100498

RECEIVING WATER: Hop Brook

DESIGN FLOW: 5.5 MGD

TYPE OF TREATMENT: Primary; Cominutor/Bar Rack, Aerated Grit Chamber, Primary Clarifiers

Secondary; Mechanical Mix Aeration, Secondary Clarifiers

Advanced; Mechanical Mix Aeration, Final Clarifiers, Chlorination/Dechlorination, Post Aeration

SLUDGE HANDLING: Belt Filter Press, Onsite Composting

COMMENTS: This plant was monitored from May 26 through May 28, 1992. An ISCO 1680 discrete base sampler was setup after chlorination/reaeration. All parameters were consistant with permit values, with the exception of phosphorus which was slightly higher than permitted.

MARLBOROUGH EAST WWTP EFFLUENT

all parameters in mg/l unless otherwise noted

TYPE OF SAMPLE	24 HR. COMP	
DATE	MAY 26-27	MAY 27-28
BOD5	6.3	7.2
pH (std. units)	7.4	7.9
TOT. ALK.	***	82
SUSP. SOLIDS	<1.0	<1.0
SETT. SOLIDS (ml/l)	<0.5	<0.5
AMMONIA-N	0.28	0.17
NITRATE-N	20	16
TOT. PHOS.	1.3	1.6
Chlorine Residual	<0.01	<0.01
FEC. COLI./100ml	20	20
ALUMINUM	0.38	0.25
CADMIUM	<0.02	<0.02
CHROMIUM	<0.02	<0.02
COPPER	0.03	0.03
LEAD	<0.03	<0.03
MANGANESE	0.11	0.15
NICKEL	<0.03	<0.03
ZINC	0.05	0.03
FLOW	2.429	2.326

MARLBOROUGH EAST WWTP SLUDGE

all parameters in mg/kg unless otherwise noted

TYPE OF SAMPLE	GRAB
DATE	5/27/92
VOLATILE SOLIDS %	64
pH (std. units)	5.5
TOTAL SOLIDS %	51
TOTAL KJELDAHL-N %	2.0
TOTAL-P %	2.4
ALUMINUM	10,900
BORON	15
CADMIUM	2.5
CHROMIUM	125
COPPER	300
LEAD	47
MERCURY	0.942
MOLYBDENUM	7.5
NICKEL	50
POTASSIUM	1800
ZINC	290

RAYTHEON CORPORATION WASTEWATER TREATMENT PLANT

LOCATION: Boston Post Road (Route 20), Marlborough

N.P.D.E.S. PERMIT NO.: MA0001511

RECEIVING WATER: Sudbury River

DESIGN FLOW: Electroplating Process Wastewater; 0.025 MGD

Sanitary Wastewater; 0.065 MGD

Cooling Tower Blowdown; 0.0008 MGD

Boiler Blowdown; 0.00003 MGD

TYPE OF TREATMENT: Primary; Chemical Addition, Bar Racks, Primary Clarifier

Secondary; Aeration Tank, Secondary Clarifiers, pH Adjustment, Chlorination

SLUDGE HANDLING: Hauled away by a licenced hauler.

COMMENTS: This plant was monitored from May 26 through May 28, 1992. An ISCO 1680 discrete base sampler was setup before chlorination. All parameters were consistant with the permit with the exception of an unexplained high coliform the first day.

RAYTHEON-WAYLAND WWTP EFFLUENT

all parameters in mg/l unless otherwise noted

TYPE OF SAMPLE	12 HR. COMP.	
DATE	MAY 26-27	MAY 27-28
BOD5	8.4	4.5
pH	6.6	6.6
TOT. ALK.	40	26
Turbidity (NTU)	14	1.5
SUSP. SOLIDS	<1.0	<1.0
SETT. SOLIDS	<0.5	<0.5
AMMONIA-N	0.43	0.60
NITRATE-N	12	12
TOT. PHOSPHORUS	6.0	7.3
Chlorine Residual	0.3	0.2
FECAL COLI./100ml	1720	20
FLUORIDE	<0.1	***
ALUMINUM	<0.05	<0.05
CADMIUM	<0.02	<0.02
CHROMIUM	<0.02	<0.02
COPPER	0.16	0.17
IRON	0.13	0.07
LEAD	<0.03	<0.03
MANGANESE	***	0.11
MERCURY	<0.0002	***
NICKEL	<0.03	<0.03
ZINC	0.11	0.14
FLOW	0.0219	0.0216