MUNICIPAL WASTE SURVEY
Gilman, Vermont
and
Connecticut River
June 30, 1971

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On June 30, 1971, Ray Thompson, sanitary engineer; Kerry Anderson, aquatic sample collector; Robert Atwood, engineering trainee; and Robert Myers, student aide, collected samples of the sewer outfalls and of the Connecticut River in Gilman, Vermont. Howard Davis was in charge of the mobile field laboratory. Mr. Thompson aided Mr. Davis in the analyses. The location of each sampling station is shown in Figure 1.

Gilman, Vermont

The village of Gilman occupies some 500 acres along the west bank of the Connecticut River. The existing sewer system is composed of some 9,300 feet of pipe discharging approximately 0.065 mgd (million gallons per day) of untreated sewage into the river from a number of outfalls spread over some 1,200 feet along the river bank.

Sampling Information

Figure 1 shows the two municipal outfalls sampled (GMV-1) and (GMV-2) as well as the outfalls of the Georgia-Pacific Corporation located in Gilman and the two river stations (CN-03 and CN-04). Table 1 presents the location of the stations.

The mobile field laboratory crew conducted tests for dissolved oxygen, pH, and bacteria, plus filtered for nonfilterable residue. The remaining samples including the filtered residue samples were returned to the Environmental Protection Agency Laboratory in Needham, Massachusetts, for analyses.

Sampling was done by two different techniques. The first technique used was filling the storage and transport containers directly from the sampling source by dipping the container. This was done at Stations CN-03, GMV-1, and GMV-2. The second method involved using an initially clean 3-liter kemmerer-type sampler. The instrument was first thoroughly washed with sample water prior to sample collection. The sample was transferred to the storage and transport container. This method was used at river Station CN-04.

All stations were sampled three times at approximately two hour intervals starting at 0700 hours. All sample containers were either one gallon or one quart plastic cubitainers except those for bacterial and dissolved oxygen analyses samples. Bacteria sample bottles and DO sample bottles were used respectively for these samples. All samples were preserved according to EPA standard methods.

Sample Identification

Each sample was tagged with one chain of custody tag giving collecting agency, laboratory number, time, date, source of sample, collector's signature and title, and witness's signature and title plus information on the transfer of the sample. In addition, a prenumbered field data card was filled out for each collection time to record weather conditions, the temperature of the sample and the sampling location.

Results

Tables 2 and 3 summarize the results of the laboratory analyses. At the outfall GMV-1, based on a calculated flow rate of 33,200 gallons per day and measured effluent concentrations, the loading rates are 23.2 pounds per day organic matter measured as BOD_5 (5-day biochemical oxygen

demand), 14.7 pounds per day suspended solids measured as total non-filterable residue, and 0.75 pounds per day total phosphorus. This discharge has a total coliform bacterial density ranging from 420,000/100ml to 4,500,000/100ml which is indicative of untreated domestic sewage.

At outfall GMV-2, again based on a calculated flow rate of 34,140 gallons per day and measured effluent concentrations, the loading rates are 42.6 pounds per day BOD_5, 41 pounds per day suspended solids, and 4.15 pounds per day total phosphorus. This discharge also contains a total coliform bacterial density indicative of untreated somestic sewage, i.e., in excess of 16,000,000/100ml.

Stream sample analysis does not indicate the full effect of said discharges to the Connecticut River because of the close proximity of the Gilman Dam. However, an increase in downstream concentrations of the measured parameters can be observed in many cases.

The combined loading rates of these two discharges is:

BOD_5	loading rate	=	65.8	lbs./day
Suspended Solids	" "	=	55.7	lbs./day
Total Phosphorus	" "	=	4.9	lbs./day

Since the village of Gilman discharges untreated domestic wastewater through various other outfalls (Figure 2), it can be said that actual loading rates are in excess of those tabulated.

TABLE 1

SAMPLE STATION IDENTIFICATION

Station	Latitude	Longitude	Description
(River)	° ' "	° ' "	
CN03	44 24 38	71 43 08	Connecticut River just upstream from Gilman Dam.
CN04	44 24 41	71 43 28	Connecticut River just upstream from the Gilman Bridge.
(Outfalls)			
GMV1	44 24 44	71 43 12	First manhole North of Boiler house discharge into 48" pipe
GMV2	44 24 42	71 43 20	Outfall into Conn. R. 200 ft. S.W. of West corner of paper mill

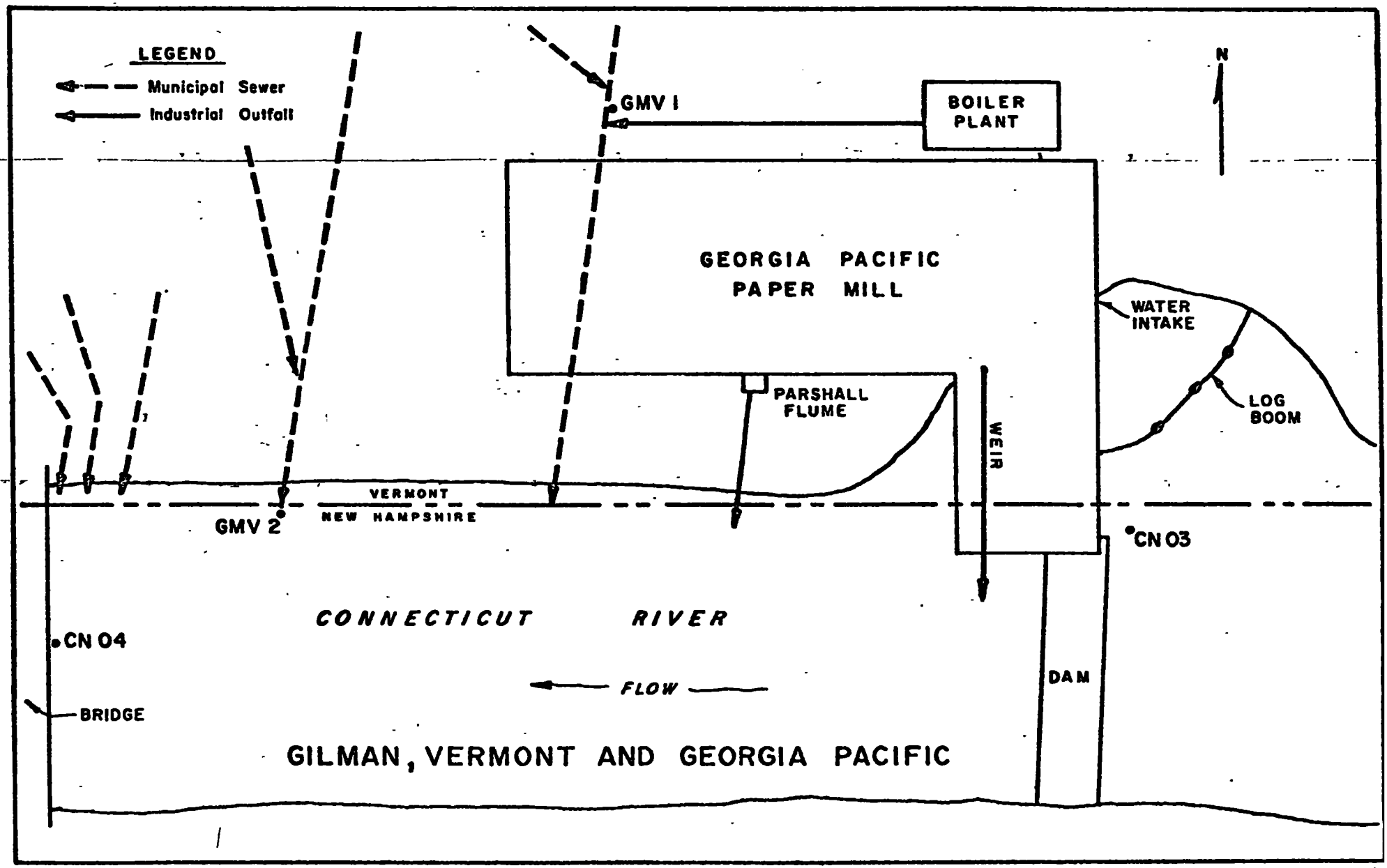
LEGEND
Municipal Sewer
Industrial Outfall
GMV 1
BOILER PLANT
N
GEORGIA PACIFIC PAPER MILL
WATER INTAKE
LOG BOOM
PARSHALL FLUME
WEIR
VERMONT
NEW HAMPSHIRE
GMV 2
CN 03
CONNECTICUT RIVER
CN 04
FLOW
DAM
BRIDGE
GILMAN, VERMONT AND GEORGIA PACIFIC

FIGURE 1

TABLE 2
SUMMARY SHEET
CONNECTICUT RIVER
GILMAN, VERMONT
JUNE 30, 1971

Station	Time	Temp (°C)	Depth (ft.)	DO (mg/l)	Total Coliform (/100ml)	Fecal Coliform (/100 ml)	BOD_5 (mg/l)	Total N.F. Residue (mg/l)*	Total P (mg/l)	Turbidity (JTU)	pH	Lab No.
CNO3	0815	23.0	1.0	1.2	19,000	K100	6.0	13.5	.28	4	6.4	27252
CNO4	0830	-	2.0	1.8	15,000	40	-	16.0	.38	5	6.4	27253
CNO3	1050	21.5	-	0.7	7,000	K100	6.3	16.0	.24	4	6.4	27260
CNO4	1110	22.0	2.0	1.1	17,000	110	6.0	18.8	.34	7	6.5	27261
CNO3	1445	23.0	2.0	0.7	13,000	K100	-	14.8	.36	5	6.0	27270
CNO4	1515	22.5	2.0	0.7	9,700	60	J4.0	14.0	.02	9	6.8	27271

*Nonfilterable Residue is a measure of suspended solids
K - Actual Value is known to be less than value given
J - Estimated value is known not to be accurate

TABLE 3
Summary Sheet
Municipal Outfalls
Gilman, Vermont
June 30, 1971

Station	Time	Temp (°C)	DO (mg/l)	Total Coliform (/100 ml)	Fecal Coliform (/100 ml)	BOD_5 (mg/l)	Total N.F. Residue (mg/l)*	Total P (mg/l)	Turbidity (JTU)	pH	Lab No.
GMV1	0730	-	2.9	420,000	K10,000	-	24.0	-	24	6.6	27258
GMV2	0815	-	5.0	16,000,000	40,000	-	112.4	9.28	38	7.3	27259
GMV1	0945	18.0	3.0	4,500,000	20,000	140	71.6	3.2	32	6.2	27267
GMV2	1030	16.5	5.4	27,000,000	320,000	210	157.6	32.0	160	6.9	27268
GMV1	-	19.5	4.4	2,100,000	10,000	28	63.8	2.2	25	6.8	27277
GMV2	1420	15.5	4.0	36,000,000	130,000	89	163.2	2.7	90	7.0	27278

* Nonfilterable residue is a measure of suspended solids
K - Actual value is known to be less than value given