

**INDUSTRIAL WASTE SURVEY
HOPE VALLEY DYEING CORP.
WEST WARWICK, R. I.**

APRIL 18, 1974

Industrial Waste Survey
Hope Valley Dyeing Corp.
West Warwick, R. I.

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Background

On April 18, 1974, personnel from the Environmental Protection Agency (EPA) Region I, Surveillance and Analysis Division visited Hope Valley Dyeing Corporation (See Figure 1) to collect water samples which would show the discharge of pollutants to the South Branch of the Pawtuxet River. EPA's Enforcement Division requested the sampling because Hope Valley Dyeing Corporation had failed to submit a completed permit application. Therefore, EPA could not process the permit. Furthermore, Hope Valley Dyeing Corporation's failure to furnish the information as requested does not entitle it to the exemption from prosecution under Sections 301, 306 and 402 of the Federal Water Pollution Control Act as amended, 33 U.S.C. § 1342. This failure resulted in EPA's issuing an order on February 28, 1974 instructing them to document to EPA within thirty days the company's intent to join a municipal waste water treatment system. On April 16, 1974, EPA had not received the requested documentation.

Since Hope Valley Dyeing Corporation had been uncooperative and recalcitrant about voluntarily supplying information to EPA in the past, EPA's Enforcement Branch requested a search warrant authorizing EPA personnel to collect evidence of the discharge of pollutants to the South Branch of the Pawtuxet River. On April 16, the search warrant was issued and on April 18, EPA personnel accompanied by a Deputy U. S. Marshall

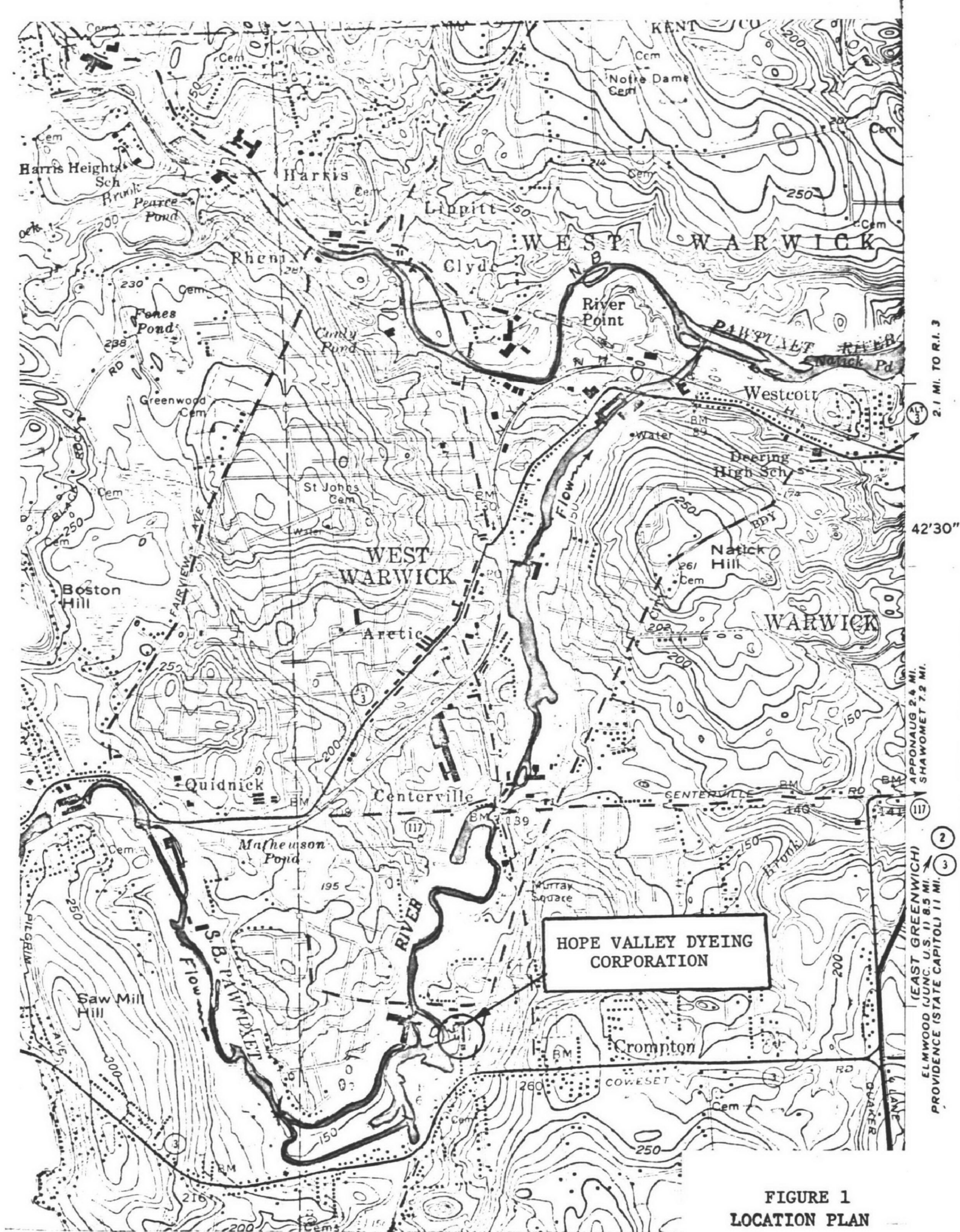


FIGURE 1
LOCATION PLAN

and a representative of the R. I. Department of Public Health entered the premises of Hope Valley Dyeing Corporation for the purpose of collecting the needed evidence. These persons met with Mr. Howard Westerman, Plant Manager. When the EPA representatives stated their purpose for the visit, Mr. Westerman was most cooperative and invited the EPA personnel to collect any samples they wished. Following the receipt of this permission, the (Deputy) U. S. Marshall identified himself and explained that a search warrant had been procured in the event that cooperation had not been received and at that time served the warrant.

In conversations with Mr. Westerman, the sampling crew learned that Hope Valley Dyeing Corporation had received permission from the town of West Warwick to join the municipal sewerage system. The EPA personnel requested that Mr. Westerman supply them with a copy of the town's acceptance letter. Mr. Westerman stated that Mr. Benny DeCarlo, Sanitation Superintendent for the town of West Warwick, had verbally approved the sewer connection, and Hope Valley Dyeing Corporation had not received formal notification, i.e., an acceptance letter. Mr. Westerman had also been told that if the town processed his application and did not return the \$100 application fee, his project was approved and the town does not send acceptance letters. The representative of the R. I. Department of Public Health telephoned Mr. DeCarlo and confirmed Mr. Westerman's statement. In that telephone conversation, Mr. DeCarlo said that they had processed Hope Valley Dyeing Corporation's application for sewage connection and had then requested plans be submitted. The plans were submitted and reviewed by Mr. DeCarlo; he also discussed them with Hope Valley Dyeing Corporation's contractor (Richard F. Dietz, P.E.) and had then given verbal

approval. Mr. Westerman then gave copies of the plans for the proposed sewer connection to EPA personnel. At the request of the R.I. representative, Mr. Westerman provided a guide (identified as Gus, a department supervisor), who conducted the visiting personnel on a plant tour.

Plant Processes

Hope Valley Dyeing Corporation is a textile finishing mill. Gray goods of cotton, nylon and polyester are finished for ultimate use in the garment industry. Operations include scouring, bleaching, dyeing and finishing of fabrics. The corporation's primary product is a light-colored lace, such as that used on ladies' undergarments. Some dark dyeing is done, but this is minimal and primarily on polyester knits. A schematic of the unit processes is shown in Figure 2.

Hope Valley Dyeing Corporation uses approximately 1.5 million gallons of process water per day and draws from two sources-- West Warwick municipal water supply and the South Branch of the Pawtuxet River. Currently, the plant's process water consists of 95% municipal water and 5% river water. The river water is used only in dyeing dark goods and washdown operations.

The municipal water feedline incorporates a Fram liquid filter. The filter is normally bypassed, but may be put in service if the water department is working on the lines. Use of the filter prevents rust and sediment from entering the process area. It is a disposable cartridge-type filter; thus, backwashing is unnecessary.

Water from the river is pumped to a holding reservoir approximately one-half mile from the plant. It is then gravity-fed to the plant on an "as-needed" basis. The reservoir water entering the plant is metered and coagulant aids (soda ash and alum) are proportionately fed to a chemical

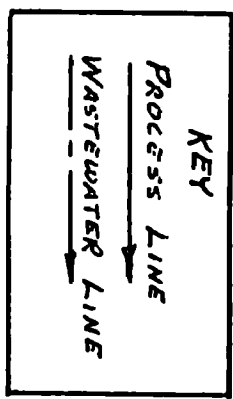
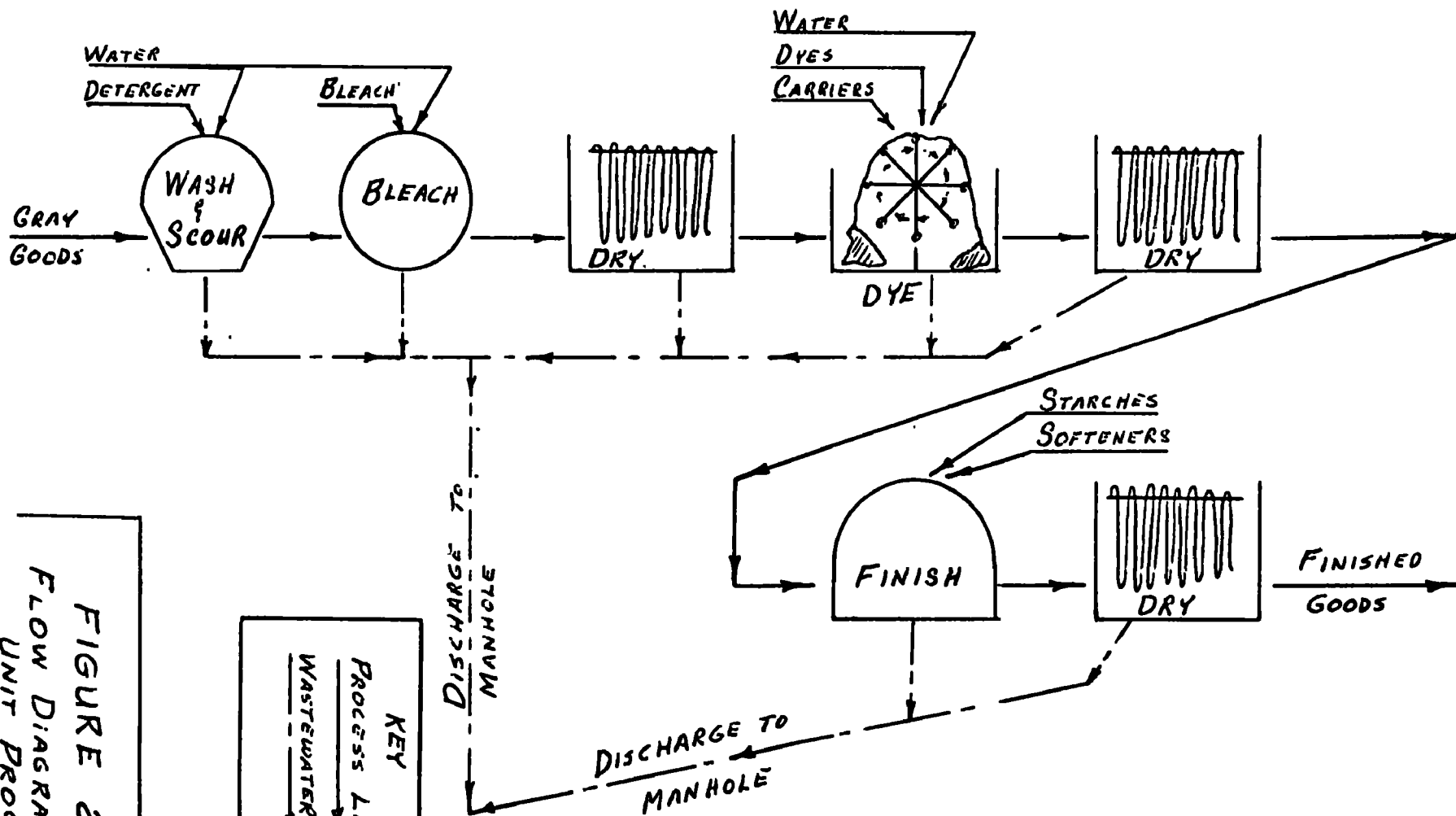


FIGURE 2
FLOW DIAGRAM OF
UNIT PROCESSES
Hope Valley Dyeing Corp
West Warwick, R.I.

reaction chamber. From the reaction chamber, the water passes through rapid sand filters before entering the process line. These sand filters may be operated individually, in series, or in parallel. At the time of the visit, the filters were operating in parallel.

Waste Sources

The waste sources may be generally divided in three broad categories: (1) Sanitary wastes, (2) Filter backwash wastes, and (3) Industrial Process wastes. The sanitary wastes are connected to the municipal sewerage system. The remaining two categories are untreated and discharge to the South Branch of the Pawtuxet River.

The rapid sand filters are backwashed simultaneously twice daily, and accumulated sludge from the chemical reaction chamber is withdrawn once or twice a day. These materials join the industrial process wastes at a manhole outside the southwest corner of the dyehouse. (See Figure 3.) This manhole is the only place where the combined wastes can be sampled before they enter the South Branch of the Pawtuxet River.

The major waste producing processes are scouring, bleaching, dyeing, rinsing of the fabric, and finishing (softening or starching). Liquid waste from the various vats are discharged to floor trenches. Waste from the finishing operations are separate from the other processes until entering a manhole outside the plant. All liquid industrial wastes combine in this manhole and then discharge to a tailrace which enters the South Branch of the Pawtuxet River. The industrial wastes are characterized by suspended solids, apparent color, organic materials, nutrients, and possibly heavy metals. The effluent flow and characteristics are non-uniform since the scouring, bleaching, rinsing, dyeing and finishing operations are batch processes.

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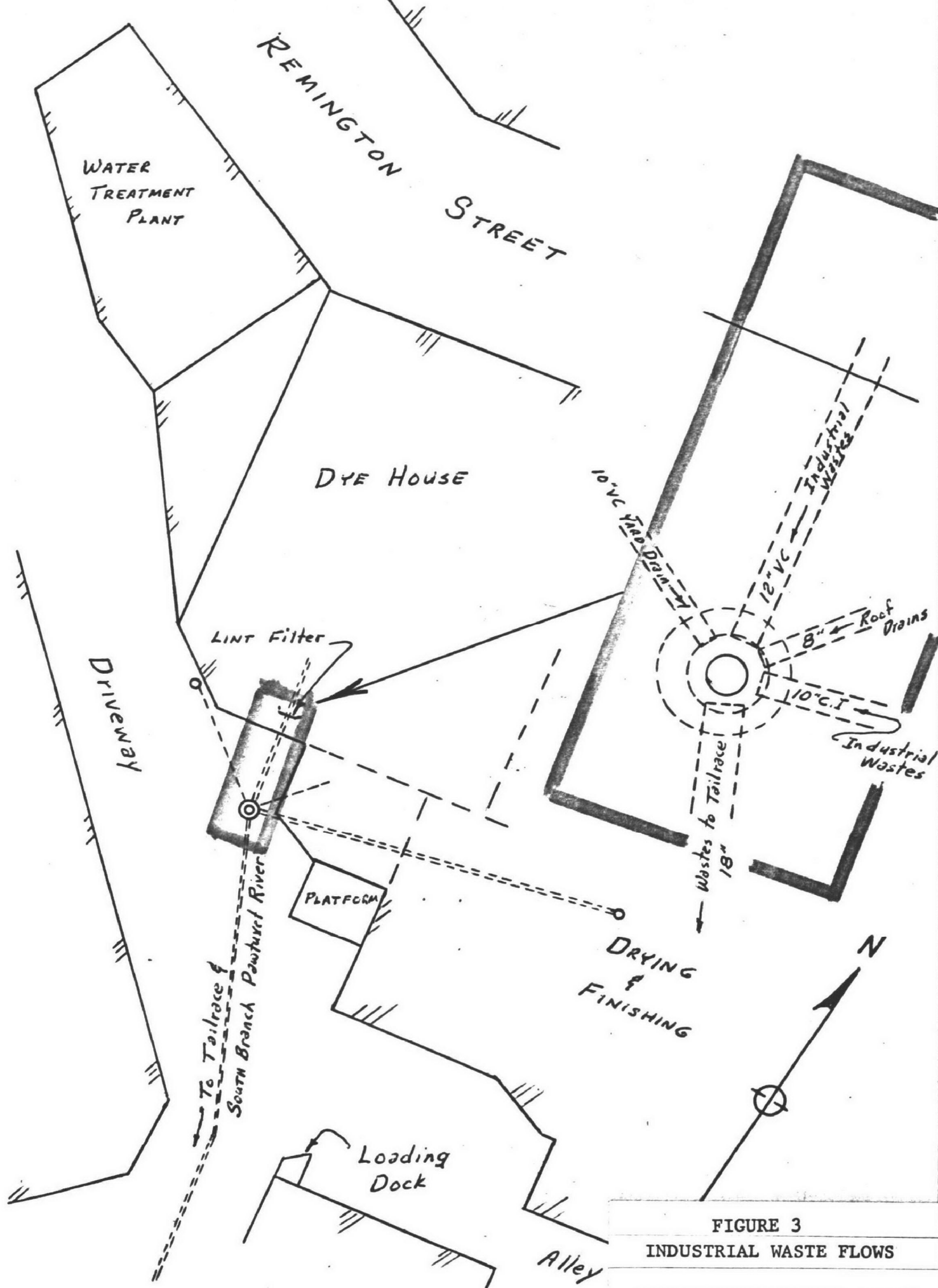


FIGURE 3
INDUSTRIAL WASTE FLOWS

HOPE VALLEY DYEING CORP.,
WEST WARWICK, RHODE ISLAND

Hope Valley Dyeing Corporation
West Warwick, R. I.

Table 1

Location¹ and Description of Sampling Stations

<u>Station</u>	<u>Description</u>
HVDE	Manhole located outside southwest corner of the dyeing room. All industrial wastes, filter backwash, and roof drainage meet here.
HVDIRR	Sampling point for unfiltered reservoir water. A faucet located next to chemical feed pump on southeast wall of water treatment plant.
HVDIR	Sampling point for filtered reservoir process water. A washdown hose located in the center of the dyeing room.
HVDIM	Sampling point for municipal process water. A "make-up" water line feeding dyeing vat on most easterly dyeing line.

1. Hope Valley Dyeing Corporation's industrial wastes ultimately discharge to the South Branch of the Pawtuxet River at latitude 41°-41'-10" and longitude 71°-32'-01".

The Sampling Program

The purpose of the sampling program was to show the discharge of pollutants to the South Branch of the Pawtuxet River; therefore, the sampling stations were selected to compare the water quality of the effluent with the quality of the influent process water.

Four stations were selected:

1. The municipal process water.
2. The influent reservoir water before filtration.
3. The reservoir water after filtration.
4. The final combined effluent.

Table 1 locates and describes the selected stations. Except for the unfiltered reservoir water, all others were sampled three times. The unfiltered reservoir water was sampled once. On every run, samples were collected for five-day biochemical oxygen demand, total suspended solids (fixed and volatile), total organic carbon, total phosphorus, and metals analyses.

Analytical Results

The metals analyses were scans using X-ray spectrofluorometry techniques. Analyses were conducted first on the effluent samples. These showed copper, zinc and iron to be sometimes present. The concentrations detected were approximately 2.0 mg/l. These concentrations are not considered significant enough to warrant further scans on the influent samples. The results of these scans are shown in Table 2 and the other analyses in Table 3.

Table 2

Hope Valley Dyeing Corporation

April 18, 1974

Metal Analyses at Station HVDE

<u>Lab. Number</u>	<u>Time</u>	<u>Total Metals</u>	<u>Dissolved Metals</u>
38717	1325	Copper \approx 2 mg/l Zinc* Iron*	Copper* Zinc*
38723	1350	Zinc \approx 2 mg/l Copper*	Zinc \approx 2 mg/l
38726	1410	Copper \approx 2 mg/l Zinc*	Copper \approx 2 mg/l

* Trace detected

Important to note is that the effluent samples collected at 1325 hours and 1410 hours were very hot. The field crew were unable to hold the filled sample containers bare handed. Although temperatures were not measured in the field, laboratory temperature measurements at approximately 1630 hours recorded 38°C and 46°C for the respective samples. The sample collected at 1350 hours did not seem unusually warm. Laboratory temperature measurement was 25°C.

Table 3

Analytical Results

Hope Valley Dyeing Corporation
West Warwick, R. I.

	<u>Time (Hours)</u>	<u>BOD₅ mg/l</u>	<u>TOC mg/l</u>	<u>Total P mg/l</u>	<u>Total Residue mg/l</u>	<u>Total Filt. Residue mg/l</u>	<u>Total Vol. Residue mg/l</u>
HVDE	1325	580	291	119	880	880	360
	1350	60	76.8	3.11	270	230	50
	1410	400	351	154	1400	970	510
HVDIM	1305	K1.1	53.5	0.07	150	-	20
	1340	K1.1	33.7	0.13	160	140	50
	1400	K1.1	43.0	0.05	130	130	20
HVDIR	1315	1.4	49.1	0.11	130	130	5
	1345	2.8	19.7	0.14	150	120	20
	1405	2.7	44.7	0.11	160	140	50
HVDIRR	1215	6.2	91.0	0.05	90	-	70

SAMPLE ANALYSES

Abbreviations and Unit of Measurements

<u>Analyses Reported</u>	<u>Description</u>	<u>Measured In</u>
Total Metals	Elemental Metals (Total)	Milligrams per liter (mg/l)
Dissolved Metals	Elemental Metals (Dissolved)	mg/l
BOD ₅	5-day Biochemical Oxygen Demand Incubated at 20° Centigrade	mg/l
TOC	Total Organic Carbon	mg/l
Total P	Total Phosphorus	mg/l
Total Residue	Total Residue (Solids)	mg/l
Total Filt. Residue	Total Filterable Residue (Dissolved Solids)	mg/l
Total Vol. Residue	Total Volatile Residue (Solids)	mg/l