

INDUSTRIAL WASTE SURVEY AND WATER QUALITY SURVEY

VAHLSING INCORPORATED

AND

PRESTILE STREAM, EASTON, MAINE

SEPTEMBER 29, 1971

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On September 29, 1971, United States Environmental Protection Agency, Region I personnel obtained water quality samples at various locations on the Prestile Stream and the Vahlsing Inc. potato processing plant discharge into Lake Josephine. Lake Josephine is a storage reservoir for Vahlsing's spent process water, which is used for potato field irrigation. Permission to sample the storage reservoir was granted by David Whitney, head chemist, and Vaughn FitzHerbert, quality control engineer.

Plant Description

Vahlsing Inc. packages fresh and frozen potato products. The Vahlsing plant processes french fries, whole potatoes, and various other potato products. The rated capacity is about 385 tons of potatoes per day. Approximately 400 people are employed during the 260 day processing season. Operation of the plant is continuous, with three shifts daily. Figure 1 shows the annual calendar for potato growing and processing.

A water supply of about 1500 gallons per minute is drawn from the Prestile Stream and Lake Christina. A dam across the Prestile Stream, about 100 yards upstream of sampling station PT-02 (see Table 1), diverts a portion of the process water into the plant. Before entering the plant, the water supply is chlorinated. A process flow diagram and subsequent waste products is shown in Figure 2.

Prior to storage the potatoes are sorted for variety, size, quality and color. They are mechanically conveyed to a prewash tank, followed by lye-peeling. The lye-peeling bath loosens the skins which are then removed, along with excess caustic, by mechanical brushing and spraying. The potatoes are then treated with sodium bisulfite, trimmed to remove undesired portions, and passed to a dip tank. The dip tank equalizes the flow of potatoes to the cutting machine. Slivers and other small pieces are separated and processed into molded potato products. The potatoes are inspected again and blanched in three stages, which entails disodium pyrophosphate treatment, cooling to 100°F, and dextrose addition for color control. The potatoes are then fried, degreased, cooled, sized, frozen and packaged. (The above processing information was taken from, "Report on Sewerage and Wastewater Treatment for the Town of Easton, Maine", February, 1970 by Camp, Dresser, and McKee.)

As the spent process water leaves the plant, it enters an A-framed building where the large solids are removed by a vibrating screen and trucked away for animal feed. The liquid waste proceeds through a series of settling lagoons, and is finally discharged to Lake Josephine for storage.

POTATO

PLANTING

GROWING

HARVESTING

PROCESSING

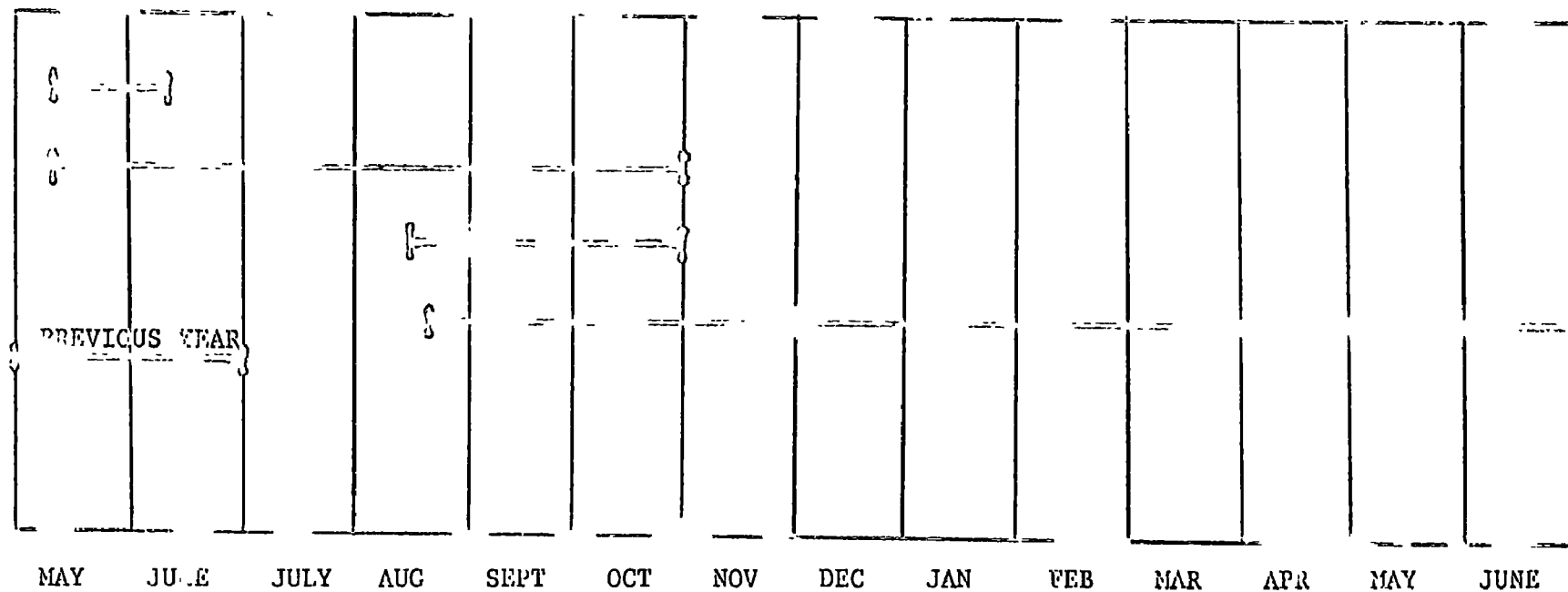


FIG. 1 - YEARLY GROWING & PROCESSING SCHEDULE, VAHLSING INC.

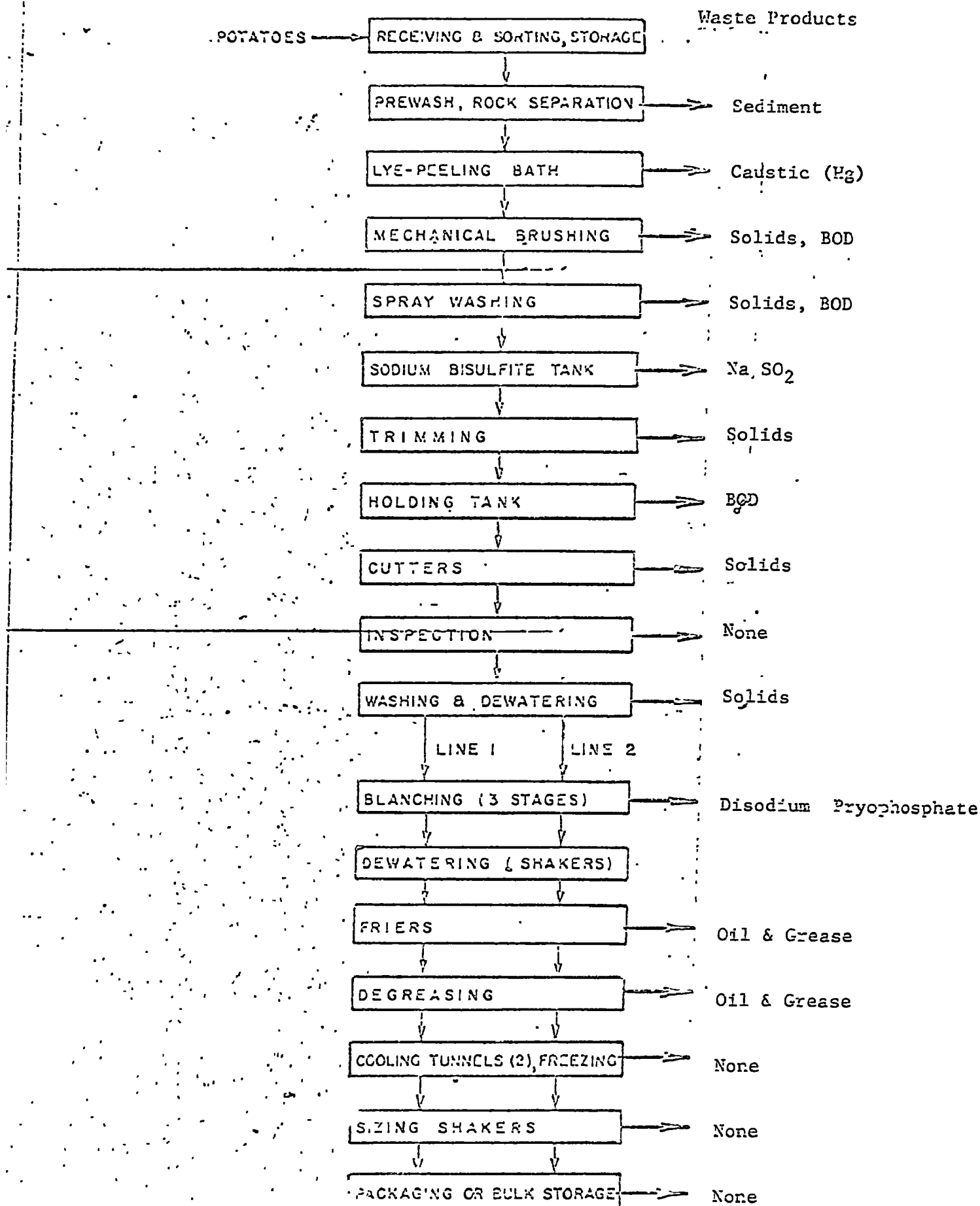


FIG. 2 VAHLSING, INC. FLOW DIAGRAM (POTATO PROCESSING)

Sampling Information

Dissolved oxygen (DO), temperature, pH, chlorine residual, and turbidity were determined by field analysis. Alkalinity, 5-day BOD, total mercury, total phosphorus, non-filterable residue (total and fixed) and oil and grease samples were shipped to the U.S. E.P.A. Region I, New England Regional Laboratory for analysis. Figure 3 shows all sampling locations.

Dissolved oxygen was determined with a Y.S.I. probe and meter and checked by the Winkler Method. One liter of stable water was drawn from a five gallon carboy into a graduated cylinder, the DO was measured, first with the Y.S.I. probe, and second by the Winkler Method. If the DO's were consistent, the DO in the stream was obtained with the Y.S.I. probe. The probe was washed in soapy water and compared to the Winkler Method again (same procedure as above). If the DO's were still consistent, the probe DO of the stream was recorded. The temperature was also recorded from the Y.S.I. probe.

All samples were obtained by hand dipping the appropriate container into the stream. Turbidity, non-filterable residue, alkalinity, 5-day BOD, total mercury, and total phosphorus samples were placed in plastic containers. Oil and grease samples were placed in glass bottles, covered by aluminum foil and capped with metal screw-on covers. The flow at each station was measured with a pygmy current meter.

The pH and chlorine residual tests (determined by a color chlorine comparator) were run in the field. A Hach 2100 turbidimeter was used to determine the turbidity. The non-filterable residue samples were filtered in the motel room and returned to the laboratory for weighing. The alkalinity, 5-day BOD, total mercury, total phosphorus, and oil and grease samples were preserved according to Environmental Protection Agency Standard Methods, packed with ice in insulated boxes, and shipped by Aroostock Airlines to Boston. The samples were transported from Boston to NERL for analysis by E.P.A. personnel. Complete E.P.A. Region I chain of custody procedures were maintained at all times.

General Observations

During a reconnaissance survey of the Vahlsing plant on July 28, 1971, a significant discharge into the Prestile Stream was observed. This discharge was located on the Prestile Stream side of the most southeasterly lagoon. According to Mr. Whitney, the plant was not in operation nor discharging to the Prestile Stream. On September 29, 1971, the same Mr. Whitney was questioned about this discharge. He indicated this discharge was from their boilers. Mr. Whitney also commented on the fact that this same lagoon had ruptured during the spring of 1971.

Below the Vahlsing plant a large amount of aquatic growth was present at the various sampling stations on the Prestile Stream. At station PT-01, just below Lake Christina and above the Vahlsing plant, less aquatic growth was present. A large amount of bottom sediment seemed to be present at all Prestile Stream sampling stations.

Results

Table 2 contains the results of the sample analysis. The 5-day BOD concentration in the storage reservoir was 118 milligrams per liter indicating a high organic content in the facility's wastewater. An increase in the 5-day BOD concentration from less than 1.2 milligrams per liter at the upstream station (PT-01) to 4.4 milligrams per liter at the downstream station (PT-02) of the Prestile Stream may indicate seepage from the lagoon system and storage reservoir.

Present in the storage reservoir are excessively high concentrations of both total and fixed residue, total phosphorus, and alkalinity. A marked increase in the stream total and fixed residues, total phosphorus, and alkalinity concentrations were observed between stations PT-01 and PT-02. This reach of the river passes the Vahlsing Incorporated plant.

TABLE 1
STATION LOCATION
INDUSTRIAL WASTE SURVEY AND WATER QUALITY SURVEY
VAHLSING INCORPORATED
AND
PRESTILE STREAM, EASTON, MAINE

<u>Station</u>	<u>Longitude</u> ° ' "	<u>Latitude</u> ° ' "	<u>Description of Station</u> (See Appendix for photograph of each station)
PT-01	67 53 16	46 41 15	Prestile Stream, upstream side of bridge, just downstream of Lake Christina (Easton, Maine)
PT-02	67 53 51	46 39 46	Prestile Stream, just downstream of Vahlsing Inc. (Easton, Maine)
PT-2A	67 54 40	46 38 28	Upstream side of Rt. 10 bridge over Prestile Stream (Easton, Maine)
PT-03	67 55 11	46 34 15	Upstream side of Westfield bridge over Prestile Stream (Westfield, Maine)
PT-04	67 52 01	46 31 05	Just upstream of the Mars Hill Dam on the Prestile Stream, (Mars Hill, Maine)
VAL.1	67 53 59	46 39 55	Lake Josephine storage reservoir, for Vahlsing Inc.'s waste. (on bank of reservoir, about 10 feet from submerged discharge) (Easton, Maine)

**PAGE NOT
AVAILABLE
DIGITALLY**

SAMPLE ANALYSES

ABBREVIATIONS AND UNITS OF MEASURE

<u>Analyses Reported</u>	<u>Description</u>	<u>Measured In</u>
Flow	Flow of the stream at the given sampling station	Cubic feet per second (cfs)
Temperature	Sample temperature	Degree centigrade (°C)
pH	Hydrogen ion concentration	Standard units S.U.
Turbidity	Turbidity	Jackson Candle Turbidity Units JTU
DO	Dissolved oxygen	Milligrams per liter (mg/l)
BOD 5-day	5-day biochemical oxygen demand, incubated at 20°C	mg/l
Total nonfilterable residue	Total suspended solids	mg/l
Fixed nonfilterable residue	Inorganic suspended solids	mg/l
Oil and grease	Hexane extractables oil and grease	mg/l
Chlorine residual		mg/l
Alkalinity	Capacity for neutralizing acids	mg/l as Calcium Carbonate (CaCO ₃)
Total mercury		ug/l as mercury
Total phosphorus		mg/l as phosphorus

Letters preceeding a reported value denote the following:

K - less than

TABLE 2
SUMMARY OF RESULTS
INDUSTRIAL WASTE SURVEY AND WATER QUALITY SURVEY
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Station	Lab Code No.	Time	Temp (°C)	Flow (cfs)	Field DO (mg/l)	BOD 5-day (mg/l)	Turbidity (JTU)	Nonfilterable Residue Total (mg/l)	Fixed (mg/l)
PT-01	27183	1015	12.5	4.32	7.4	K1.2	3	16.6	6.0
PT-02	27181	1050	11.5	3.40	9.5	4.4	16	19.0	7.7
PT-2A	27184	1420	12.0	-	11.2	-	-	-	-
PT-03	27180	0720	7.0	10.20	10.0	K1.2	1	12.0	4.7
PT-04	27185	1500	-	-	11.2	-	-	-	-
VAL1	27182	0915	11.5	-	1.2	118.0	45	57.4	20.4

Station	Lab Code No.	Field Chlorine Residual (mg/l)	Total Mercury (ug/l)	Total Phosphorus (mg/l)	Oil & Grease (mg/l)	Field pH (S.U.)	Alkalinity (mg/l)
PT-01	27183	0	K0.5	.06	152.0	8.0	120.0
PT-02	27181	0	K0.5	.58	115.3	8.0	146.0
PT-2A	27184	-	-	-	-	-	-
PT-03	27180	0	K0.5	.26	10.9	8.2	159.9
PT-04	27185	-	-	-	-	-	-
VAL1	27182	0	K0.5	13.12	2.2	8.0	449.0

Note: All samples were taken on September 29, 1971, at a depth of 1.0 feet.

Presale River Water
Quality Sampling Stations

STATION PTO1
Bridge just down stream of
Lake Christina,
Easton, Maine

Looking downstream at
STATION PTO2, just below the
Vahlsing Inc. plant
Easton, Maine

Look downstream from
STATION PTO2

Loc downstream at
STATION PT2A, Old dam in
Easton, Maine

Looking downstream at
STATION PT03, Westfield Bridge
Westfield, Maine

Looking upstream from
STATION PT03

Looking downstream from
STATION PT03

D.O. sampling at STATION PTO4
Mars Hill Dam,
Mars Hill, Maine

Looking Northwest from
STATION PTO4

Looking upstream from
STATION PTO4

Wahlberg & Sons
System at Wahlberg Inc.,
Easton, Maine

Looking at STATION VAL 1.
Wahlberg Inc. discharge into
Lake Josephine, Easton, Maine

Looking south at Wahlberg Inc
settling lagoons,
Easton, Maine

Looking south at Wahlberg Inc.
plant and settling lagoons