STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

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GOVERNOR

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July 11, 1972

MEMORANDUM

TO: Tom McCann

FROM: Grover Scott Jeane II

SUBJECT: Evaluation of Industrial Discharges and Their Effect Upon Bear Creek and an Unnamed Tributary

On June 20, 1972, Tom McCann and myself met and reviewed the Universal Manufacturing Corporation.

The following stations were established to analyze the Corporation's effect on local water quality. (See Figure #1)

Station	Location
1	On unnamed tributary to Bear Creek, 25 yards upstream from 144th Ave. N.E.
2	Immediately upstream of 144th Ave. N.E.
3	Overflow from chemical waste septic tank
4	Plant's cooling water effluent
5	Immediately upstream of Bothell-Monroe Road bridge over Bear Creek
6	At first riffle 10 yards downstream from confluence of Bear Creek and unnamed tributary

Station 1 was established as an upstream control. During the survey we realized that the plant's cooling water was leaching into the unnamed tributary did not have an established bed above 144th Ave. N. E. and is probably of intermittent flow.

Evaluation:

The following is based upon field sampling and observations. (See Table 1)

pH - Station 4 was measured at 9.6 units. This is above the 8.5 units acceptable for discharge to a fresh water stream. Due to station location, no statement can be made concerning effect upon the intermittent stream.

Lead - None detectable at any stations

Tin - None detectable at any stations

Total Chromium -

Iron - Highest level observed was at Station 2. This is probably due to leaching from spills. No iron was present in the chemical septic tank overflow sample.

Copper - Stations 3 and 4 had excessive levels of Cu ions. Acceptable levels for aquatic life are 0.02 mg/l. While 0.5 mg/l is used as an algaecide. In soft water this level is toxic to fish.

Fluorides - Stations 3 and 4 were again the most contaminated stations. Several references state 1.5 mg/l as the maximum acceptable limit for higher aquatic life. Why the cooling water (Station 4) is high in fluorides is unknown, unless the company is discharging some waste water into the cooling water effluent.

Aquatic Insects - Because of heavy work loads, the samples were given a preliminary analysis. The samples were separated into similar groups and compared as to abundance. (See Figure 2). At a later date the samples will be reviewed by keying to the family level.

The aquatic insects collected at Stations 5 and 6 on Bear Creek show no significant difference as to variation between sample.

Summary:

At the time of the water quality and aquatic insect survey, the Universal Manufacturing Corporation had no effect upon Bear Creek. However, the plant's chemical waste drainfield system was overflowing toward a small intermittent tributary of Bear Creek. The area draining toward the tributary showed signs of past spills of copper and other heavy metals. If the overflow from the chemical septic tank and other spills continue through the dry season, then runoff from the first rain will wash into the tributary concentrated heavy metals. This concentrated runoff would be detrimental to aquatic life in Bear Creek.

Some attention should be given to the copper, pH, and fluorides present in the cooling water effluent.

During the coming wet season both the chemical and sanitary drainfields should be dye tested for leaching.

GSJ:bj

Table #1

Universal Manufacturing Corporation
Bear Creek and Unnamed Tributary

Parameters	Station 1	2	3	4	5	6
pH	6.8	7.0	8.2	9.8	7.5	7.4
Temp. (°C)	13.8	14.7	---	16.6	13.1	12.9
Chromium, Total (ppm)	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Fluorides (ppm)	0.20	0.36	1.10	0.84	0.06	0.06
Iron (ppm)	0.7	1.7	<0.1	0.2	0.3	0.8
Copper (ppm)	<0.1	0.1	4.5	0.6	<0.1	N.D.
Lead (ppm)	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Tin (ppm)	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.

N.D. = None Detectable

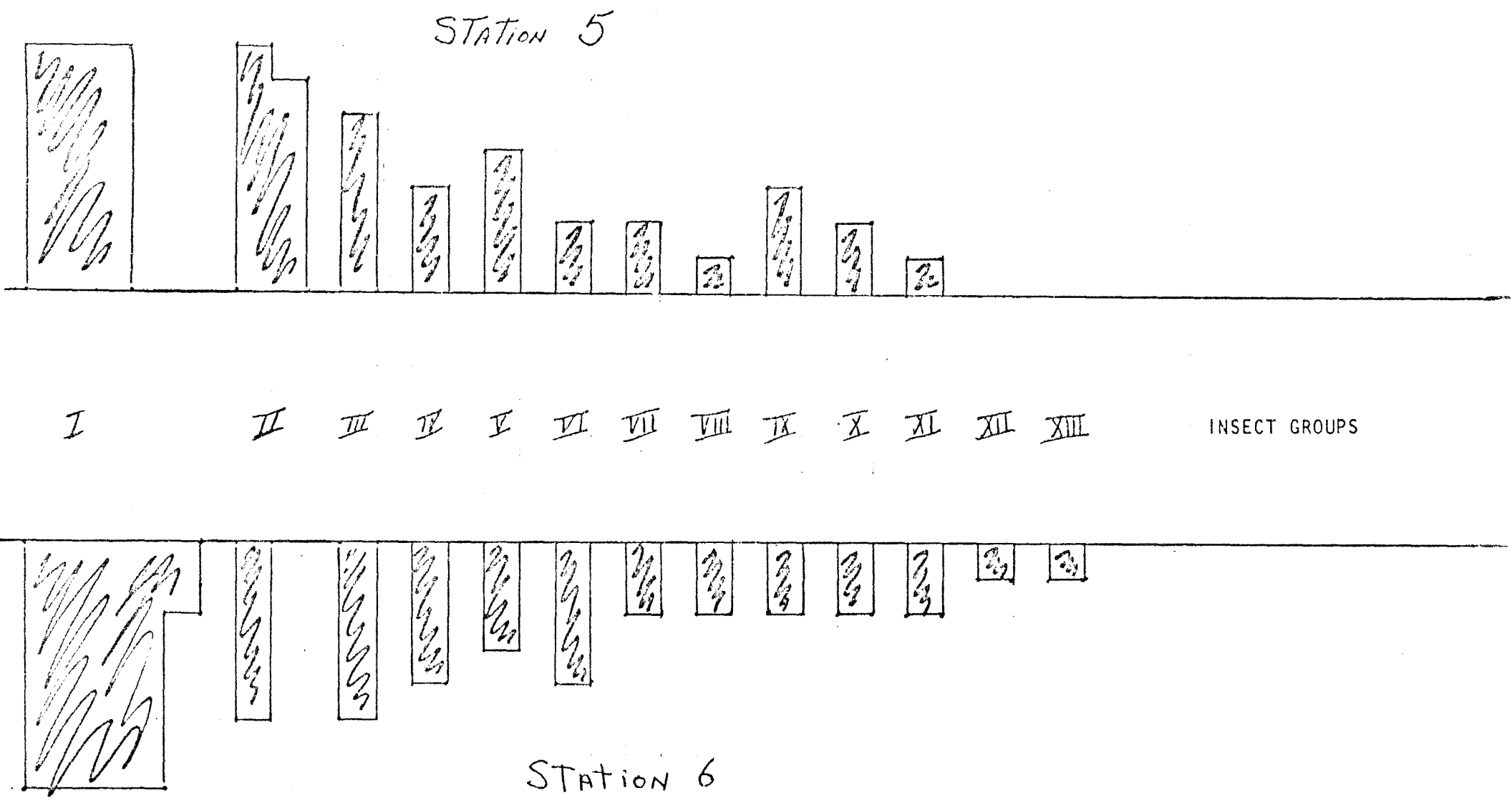


Figure 2

INSECT DIVERSITY BETWEEN STATIONS 5 AND 6 ON BEAR CREEK, 1972.

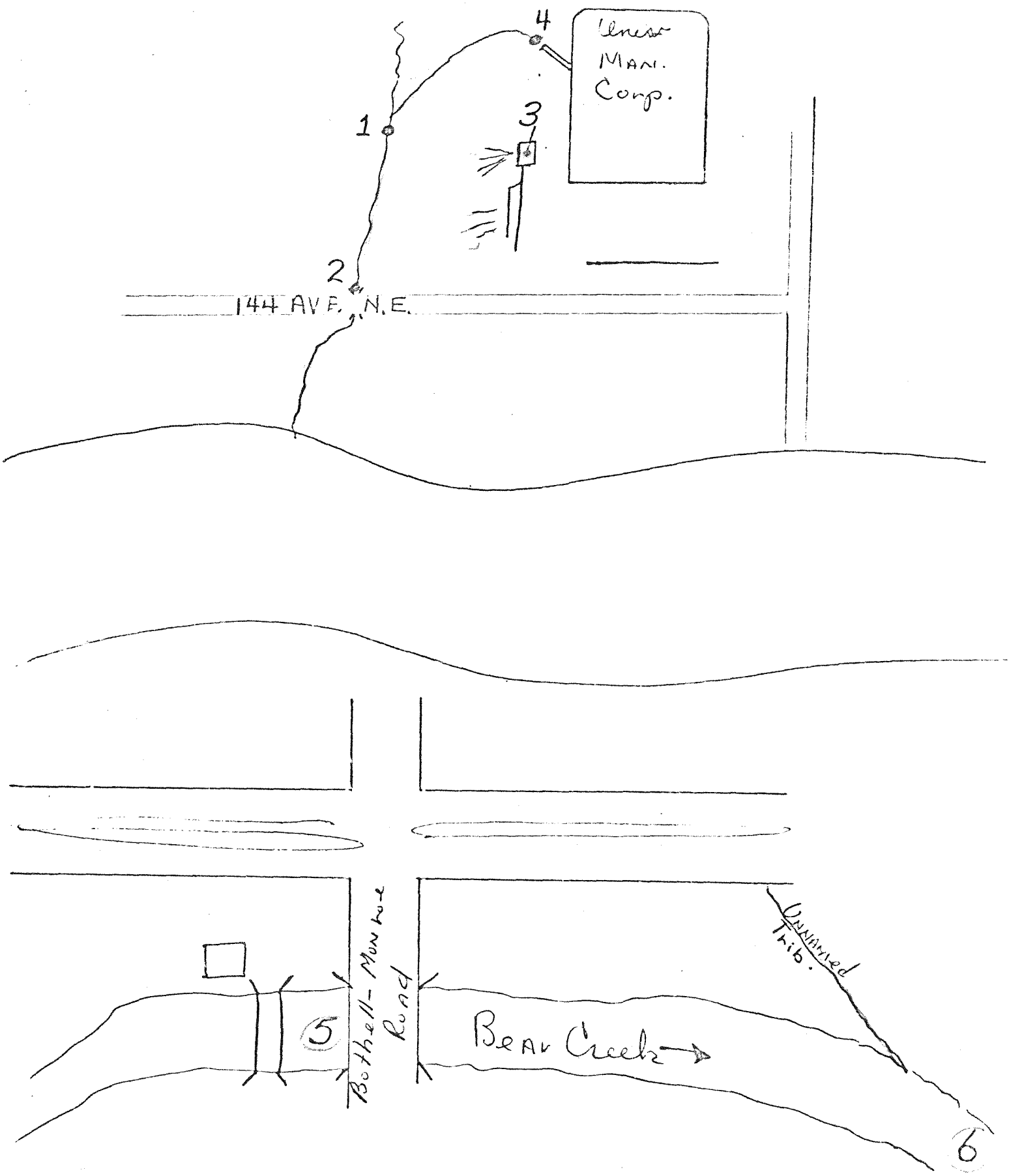
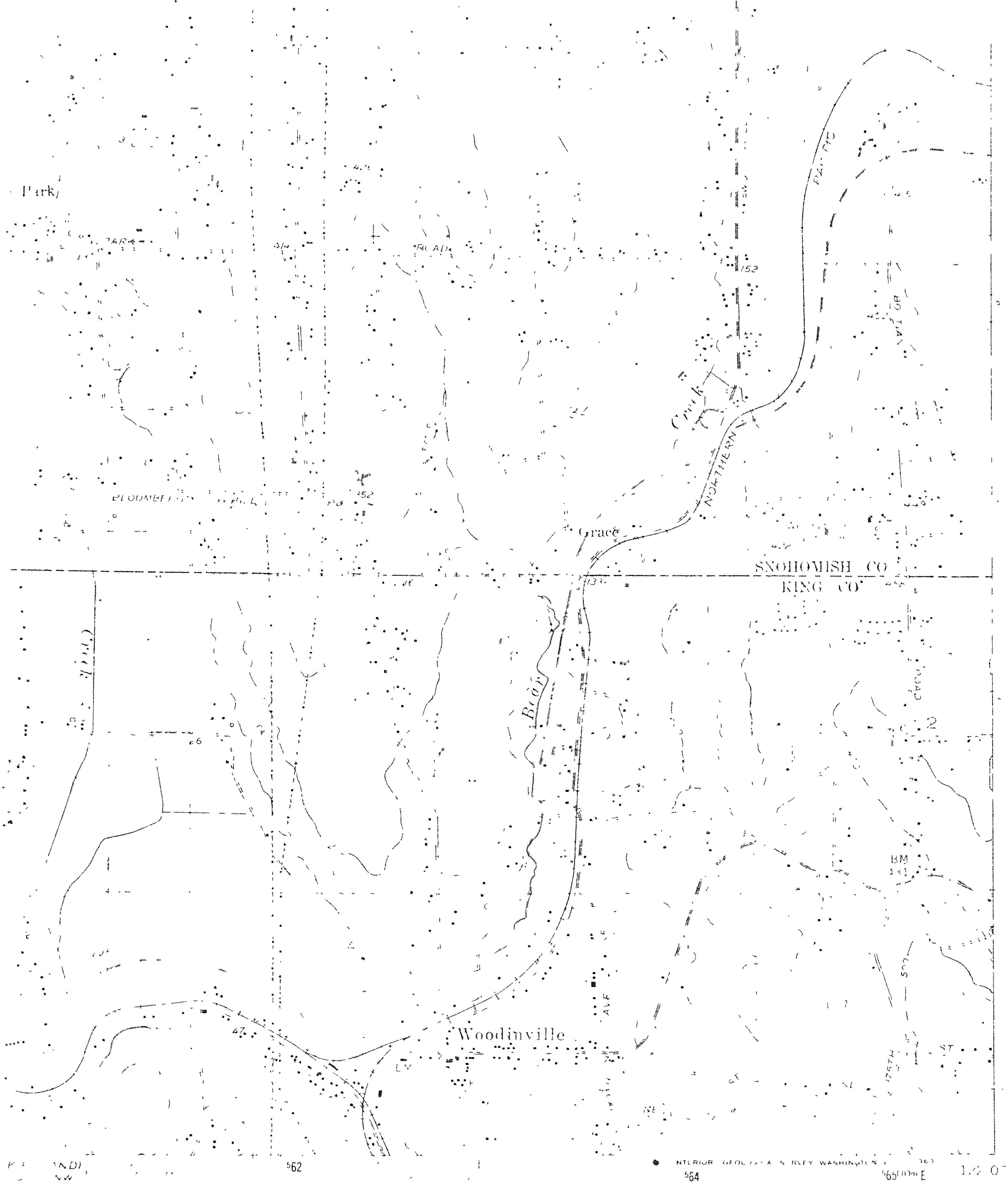


Figure 1

STATION LOCATIONS



1:24 000

1 MILE

FEET

ROAD CLASSIFICATION

Heavy duty — Light duty

Medium duty — Unimproved dirt

State Route

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

WATER QUALITY LABORATORY

ORIGINAL TO: S. Jeane

COPIES TO:

LAB FILES

DATA SUMMARY

Source Universal Mfg. Co. Collected By S. Jeane

Date Collected 6-20-72 # P./Obj.

Log Number: 7222 -	09	10	11	12	13	14	STORET
Station	1	2	3	4	5	6	
pH	7.0	7.6	7.4	9.6	7.8	7.6	
Turbidity							00070
Conductivity (umhos/cm)@25°C							00095
COD							00340
BOD (5 day)							00310
Total Coliform (Col./100ml)							31504
Fecal Coliform (Col./100ml)							31616
NO3-N (Filtered)							00620
NO2-N (Filtered)							00615
NH3-N (Unfiltered)							00610
T. Kjeldahl-N (Unfiltered)							00625
O-PO4 P (Filtered)							00671
Total Phos -P (Unfiltered)							00665
Total Solids							00500
Total Non Vol. Solids							
Total Suspended Solids							00530
~~Total Sus. Non Vol. Solids~~ Chromium* (TOTAL)	ND	ND	ND	ND	ND	ND	
Fluorides	0.20	0.36	1.10	0.84	0.06	0.06	
Iron	0.7	1.7	<0.1	0.2	0.3	0.8	
Copper	<0.1	0.1	45	0.6	<0.1	ND	
Lead	ND	ND	ND	ND	ND	ND	
Tin	ND	ND	ND	ND	ND	ND	

Note. All results are in PPM unless otherwise specified. ND is "None Detected"
Convert those marked with a * to PPB (PPM X 10^3) prior to entry into STORET

* Since there was no detectable TOTAL Cr then Cr^{++} can also be assumed to be the same

Summary By Stephen D. Bell Date 7-6-72

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

P. Hildebrandt, R. Pine, J.R. Raymond and File — May 4, 1972

Thomas J. McCann

SURVEY OF UNNAMED TRIBUTARY TO BEAR CREEK (Universal Manufacturing Corp.)

OBJECTIVE:

To determine the effect of industrial waste discharges from a circuit board manufacturer on the insect population in an unnamed tributary to Bear Creek and in Bear Creek.

DESCRIPTION: (attached sketch)

1. Two drain fields, one for sewage and one for contaminated rinse waters, are located between the building and 144th Avenue N. E. Puddles above the drain field receiving rinse waters contain high concentrations of iron and copper. The ditch on the east side of 144th Avenue N. E. collects the run off and discharges it to the stream that originates at the base of the hill to the east of the plant.

2. Cooling water and rinse water from an aluminum process line (Cr^{+6}) is discharged on the north side of the building and drains to the stream.

3. Spent copper etch solutions are pumped to a Lideon portable tank on the north side of the building. Ferric chloride etch solutions have been recently replaced by ammonium persulfate etch solutions. Traces of spills of both etchants are still visible near the portable tank.

4. Universal Manufacturing Corporation is currently debugging a new electroplating facility (copper, tin and lead-tin).

EXPECTED RESULTS

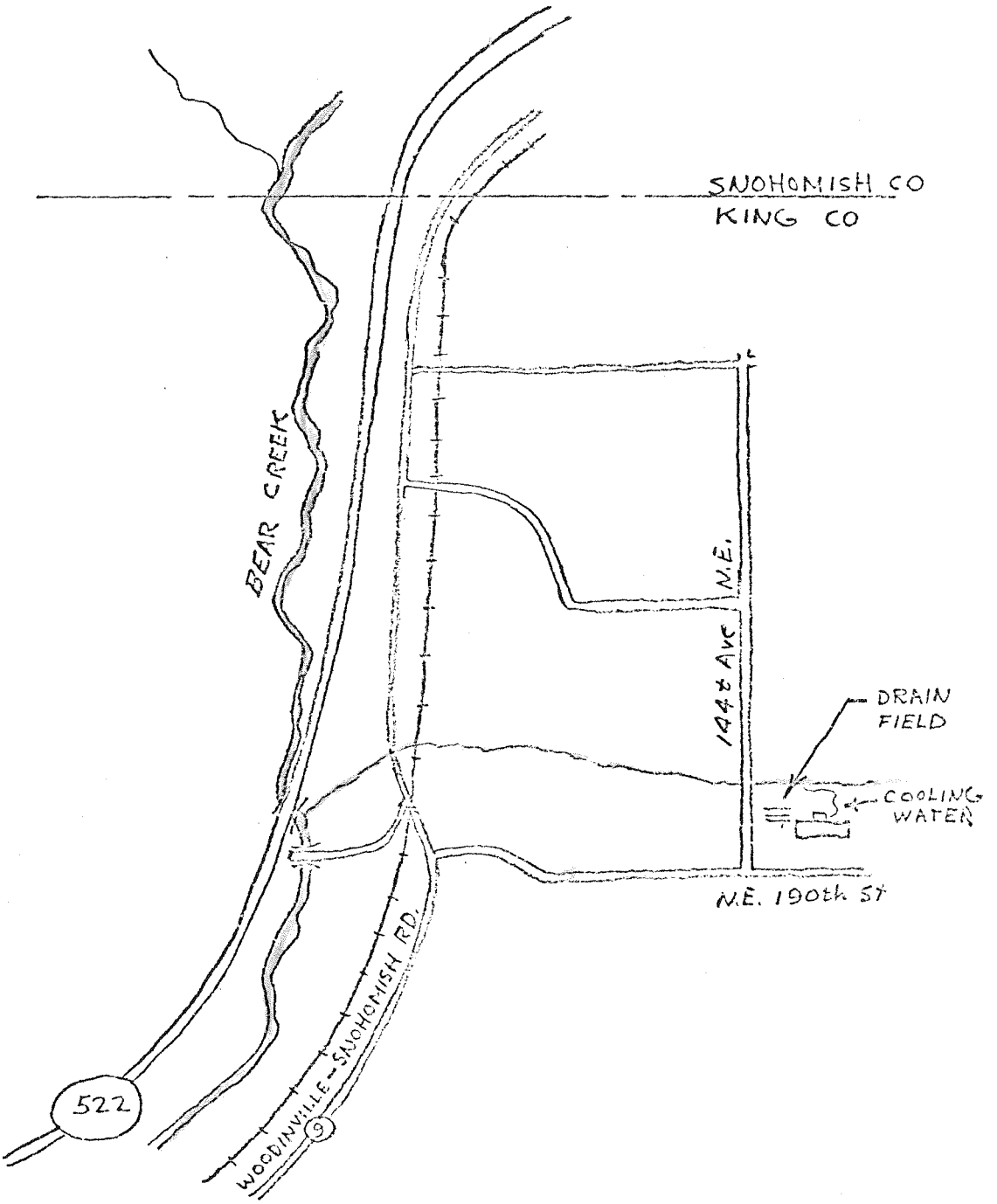
1. Temperature and pH change in the small stream.
2. Insect species change in areas of the small stream and possibly Bear Creek related to heavy metal concentrations.

TIME SCHEDULE

Late May or early June, 1972. Universal Manufacturing Corporation is operating without a waste discharge permit.

TJM/dp

5-9-72 (dt)



SURVEY OF UNIVERSAL MFG. CO., WOODINVILLE

7.5' QUADRANGLE (BOTHELL)