MEMORANDUM

Department of Ecology
P. O. Box 829
OLYMPIA, WASHINGTON
98504

Publication No. 72-e05

TO: Stu Messman

DATE: April 7, 1972

FROM: Ron Devitt RCD

SUBJECT: Borden Chemical Company-Kent

On February 29, 1972, samples were taken at Borden Chemical Company at Kent to provide data to:

1. Determine the efficiency of the settling units.

2. Characterize the effluent which is discharged to Metro's domestic system.

3. Characterize industrial discharge to the city's storm sewer system.

Scott Jeane sampled the Storm Sewer. Stations 3, 5 and 6 were located as designated by the attached map. Data obtained from field and laboratory analyses are attached on Data Report Form No. 1. While sampling Station 6, there was a large increase in flow, thought to be associated with a cooling water discharge. Station No. 4 was not sampled. It is doubtful that the city storm sewer trunk or lateral system flows as indicated by the map.

Stations 1 and 2 were respectively settling unit influent and effluent. The influent was diverted from the south cell to the north cell at 1200 hours. Simultaneously the effluent which had been discharging from the north lagoon was terminated. After 1200 hours, the effluent was discharging from the south cell. Consequently, two separate composites were taken of the effluent. This redirection of flow was necessary because the level of the south lagoon was causing overflow into the north lagoon (see picture 1). At this time, there was a very narrow margin of safety which prevented overflow to the domestic sewage system (see pictures 2 and 3). These pictures demonstrate the need for dike maintenance. Higher dikes would also reduce wind and wave action which was observed to interfere with the settling of solids on the day of the survey.

The influent to the system was composited at 1000 mls per sample each time the lift pump initiated. The fall in water level and the dimensions of the sump were determined to estimate flow. Two thousand gallons in 2 hours and 40 minutes representes the minimum flow as it neglects the flow to the sump the pump was pumping. The discharge rate from the cells was estimated to be 3 to 5 gallons per minute by an industrial representative. If this were so, the

gallons discharged would be a maximum of 800 gallons, giving a net increase of 1200 gallons during the survey period.

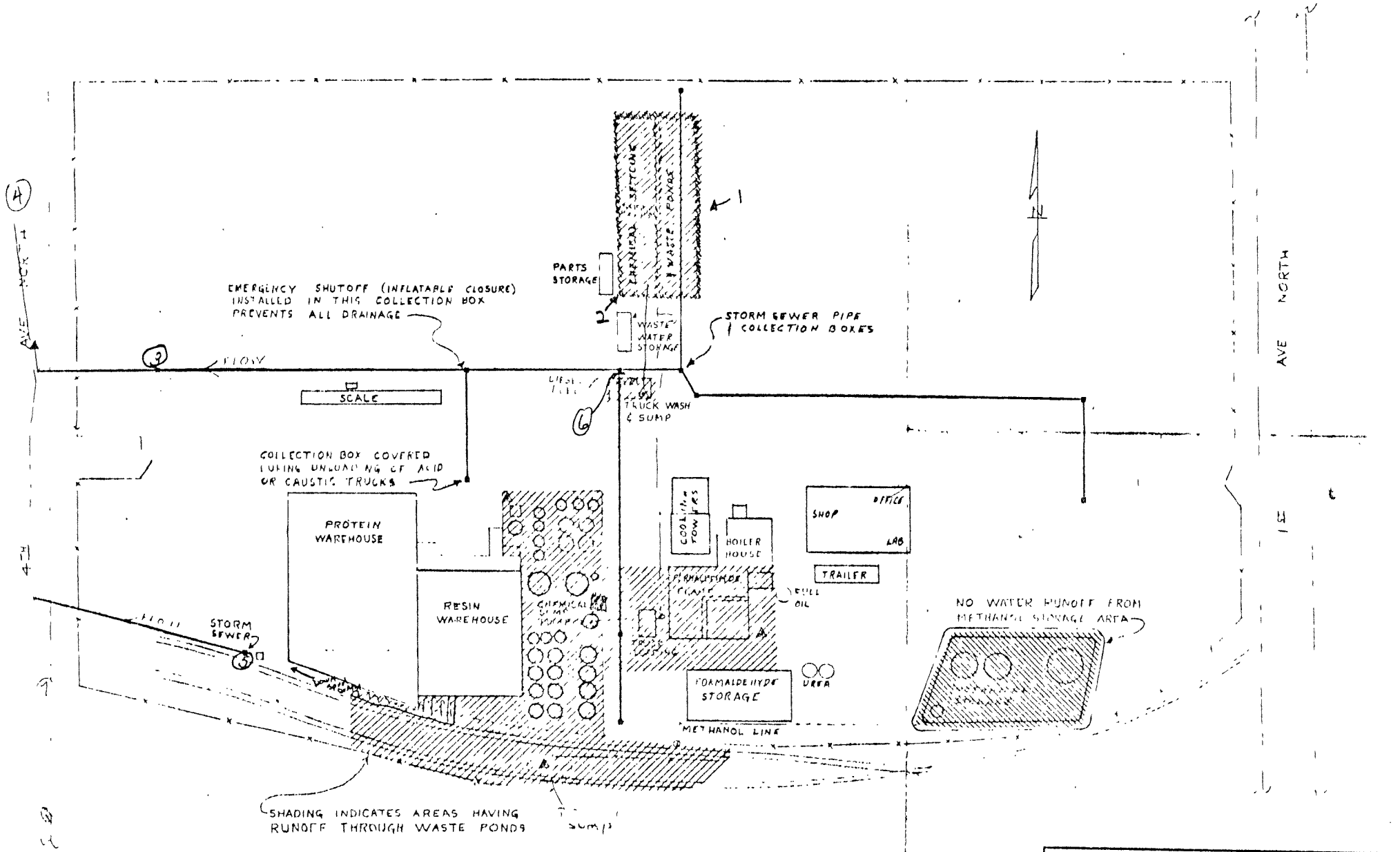
Field testing data (Data Form 2) indicate that the influent varies greatly depending on various production, maintenance and clean-up activities. Cooling water discharges, rinsing the ion exchanger and clean out of the resin line were observed to change the influent characteristics drastically.

It is suggested that if a more accurate characterization of the influent to the lagoon is desired, a 24-hour composite sampler be located in the chemical sump. This composite, however, would not be suitable for sampling greases or phenols. A level recorder could also be installed to give a more detailed water usage. Because of the holding time before discharge and the mixing occurring in the lagoon, a long term composite of the effluent seems unncessary. The effluent from the north cell was very similar to effluent from the south cell in field parameters. The low pH indicates that either inadequate mixing was taking place and/or more probably, that excess acid was being used in neutralization attempts.

Data Report Form No. 3 lists laboratory results on the influent and the two effluent composites.

RD:mh
B/11

cc: Ron Pine



BORDEN CHEMICAL, INC. KL

SCALE 1" = 50'

DATE OCT 16, 77

APPROVED BY

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REVISED

SITE DRAINAGE PLAN

DATA REPORT FORM #1

Location: Borden Chemical, Kent
Station and Log number

Field Results *	Sta. 3	Sta. 5	Sta. 6	Sta. 7
Time	1130	1240	1200	1330
T	7.3	5.8	13.7	10.0
pH	6.5	6.8	6.8	7.4
Cond. μmhos/cm	700	450	450	280
Lab Results				
COD	130	30	160	90
pH	6.5	---	6.4	7.1
BOD	60	---	115	3
Grease	ND	ND	2	1
Total Phenols	.219	.018	.038	---
Total Kjeldahl N	4.44	23.8	---	---
NO_3-N	.74	.02	---	---
NO_2-N	.97	.02	---	---
TS	469	---	384	112
TNVS	319	---	140	29
TSS	114	---	139	21
TSNVS	72	---	31	6
TSVS	42	---	108	15

* All but pH in ppm

ND = None Detected

DATA REPORT FORM #2

Location: Borden Chemical, Kent
Station and Log number

Field Results	Influent			Effluent		
Time	°C T.	pH	μ mhos/cm² Cond.	°C T.	pH	μ mhos/cm² Cond.
	Influent to south			Effluent from North		
1110	26.7	10.0	7500	7.4	4.4	2000
1125	35.0	9.8	1350	6.6	4.5	2000
1200	28.2	9.7	1350	6.9	4.5	1900
Changed flow	Influent switched to north			Discharge from south		
1230				8.2	5.2	1850
1300	25.6	8.0	---	8.4	5.2	1900
1330	14.5	8.6	4200	9.4	5.2	1450
1350	11.5	8.1	400	9.4	5.3	1600

DATA REPORT FORM #3

Location: Borden Chemical, Kent

	Station and Log number		
Lab. Results	Influent	1230-1350 So. Effluent	1110-1200 No. Effluent
COD	10,300	6,400	7,700
BOD	1,670	3,920	2,990
Grease	2	---	N.D.
Total Phenols	337	246	258
pH	9.8	4.4	3.7
TS	10,152	2,422	2,700
TNVS	864	1,023	935
TSS	1,817	442	43
TSNVS	19	77	5
TSVS	1,798	365	38

N.D. = None Detectable

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M E M O R A N D U M

TO: Pete Hildebrandt, Ron Pine, Bob McCormick & Files

FROM: Stew Messman

SUBJECT: Survey Scoping - Borden Chemical Company
421 First Avenue North
Kent

DATE: January 11, 1972

OBJECTIVE: To determine the effectiveness of the plant waste treatment lagoon and the proper collection of contaminated storm run-off

Borden Chemical Company produces formaldehyde, synthetic resins and protein adhesives from raw materials received at the plant by rail and motor transport. These raw materials include methanol, acids, sodium hydroxide and protein compounds like animal blood. Although some processes and recovery systems (i.e. ion exchange units) contribute waste flows to the treatment lagoon, the bulk of the volume of contaminated water is from collection of storm run-off from selected areas below plant processes and material unloading ramps.

The batch treatment lagoon uses neutralization and settling to remove most contaminants including phenol bodies prior to discharge to the sanitary sewer. The effectiveness of this treatment is questionable and subject to variation based on waste loading and run-off quantities. The discharge of free phenols to the sanitary sewer is undesirable. The company intends to modify the treatment process in the coming year to maintain closer control on effluent quality.

There have been severe stormwater contamination problems at the plant in the past years, ~~that~~ that have resulted in high pH and phenol concentrations in the storm sewer adjacent to the plant on 4th Avenue. However, these should now be eliminated through major improvements in contaminated water collection and new loading procedures.

Information Desired:

The analysis of the efficiency of the waste treatment lagoon is of paramount importance. The influent and effluent should be sampled for BOD, COD, free phenols, total phenols, formaldehyde, hexane extractable material, pH and solids.

The storm sewer on plant property, the storm sewer on 4th Avenue and several selected "uncontaminated" run-off points should be grab sampled for BOD, free phenols, total phenols, hexane extractable materials and pH.

Recommended sampling points:

1. Lagoon influent

2. Lagoon effluent

3. Borden storm sewer manhole west of treatment lagoon

4. City storm sewer on 4th Avenue

5. Surface water collection point at west end of loading dock

6. Surface water collection point at east end of railroad gate

7. Surface water collection from east side of formaldehyde plant

Time Schedule: Late January 1972.

SAM:lg

cc: Jim Baumer, Olympia Airport