Publication No. 73-e05
WA-04-1115

TO: Stew Messman

FROM: Darrel Anderson

SUBJECT: Diablo STP

DATE: March 19, 1973

State of Washington Department of Ecology

On February 22, 1973, an efficiency survey was conducted at the Diablo STP. The survey period was from 0930 to 1600 hours, compositing every hour. This plant, as well as Newhalem, is owned and operated by Seattle City Light. Plant appearance, housekeeping, and security are very good.

The Diablo STP is also new and has a problem of decreasing population. Definite changes are eminent for the plant because nearly the whole population will be removed in the near future.

Influent samples were difficult to take due to intermittent pump action of holding tank. COD reduction is 48 percent while BOD is 86 percent. PH was high (8.8) during the monitoring and tapered off in the afternoon.

Plant efficiency was generally low and engineering changes are recommended in the near future.

DLA:bj

City Diablo Plant Type Secondary Population Served ≤150 Design Capacity 204 at 120 gpd

Receiving Water Skagit River Engineer Don Simms

Date 2-21-73 Survey Period 0930-1630 Survey Personnel Darrel Anderson

Comp. Sampling Frequency every hour Weather Conditions (last 48 hours) clear, warm

Sampling Aliquot 1000 ml

PLANT OPERATION

Total Flow 1,154.40 g/hr How Measured "V" notch weir

Max. (Flow) 45.0 g/min. Time of Max. 1230 Min. 1.1 g/min. Time of Min. 1500

Pre Cl_2 0 #/day Post Cl_2 1 #/day

FIELD RESULTS

Determinations	Influent Max.	Min.	Mean	Median	Effluent Max.	Min.	Mean	Median
Temp. °C	8	7	7.5	8	7.5	6.0	6.9	7.5
pH	8.8	7.6	8.1	8.2	6.5	6.0	6.3	6.4
Conductivity (umhos/cm)	NOT DETERMINED				NOT DETERMINED			
Settleable Solids	7	2	5	7	4	3	3.6	3

LABORATORY RESULTS ON COMPOSITE IN PPM

Laboratory Number	Influent 73-784	Effluent 73-785	% Reduction
5-Day BOD	252	34	86
COD	310	160	48
T.S.	--*	313	--
T.N.V.S.	--*	180	--
T.S.S.	--*	93	--
N.V.S.S.	--*	18	--
pH	8.2	6.6	--
Conductivity	510	400	--
Turbidity	44	44	--

* Insufficient sample

Diablo STP

BACTERIOLOGICAL RESULTS

$Na_2S_2O_3$ added to sample before sample ~~XXXXX~~ was taken. ~~XXX~~.

LAB #	SAMPLING TIME	COLONIES/100 MLS (MF)	Cl Residual	
			ppm	(after secs)
73-786	0930	20,000	0.15	3 min.
73-787	1130	10,000	0.10	3 min.
73-788	1330	12,000	0.35	3 min.
73-789	1530	2,000	0.35	3 min.

Operator's Name Melvin Mohn Phone # _____

Comments: _____

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

WATER QUALITY LABORATORY

ORIGINAL TO: ..D. Nelson..
COPIES TO: .....
.....
LAB FILES .....

DATA SUMMARY

Source DIABLO STP Collected By D.A.

Date Collected 2-21-73 Goal, Pro./Obj.

Log Number: 73	284	285	286	287	288	289					STORET
Station:	INF	EFF	EFF 0930	EFF 1130	EFF 1330	EFF 1530					
pH	8.2	6.6	-	-	-	-					00403
Turbidity (JTU)	44	44.	-	-		-					00070
Conductivity (μmhos/cm)@25°C	510	400	-	-	-	-					00095
COD	310	160.	-	-		-					00340
BOD (5 day)	252.	34.	-			-					00310
Total Coliform (Col./100ml)	-	-	20,000	10,000	12,000	2,000					31504
Fecal Coliform (Col./100ml)	-	-	<200	<200	200	<200					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	-*	313.		-							00500
Total Non Vol. Solids	-*	150.	-		-	-					
Total Suspended Solids	-*	93		-	-	-					00530
Total Sus. Non Vol. Solids	-*	18.	-		-	-					
Fecal Strep (confirm)	-		200	370	500	110					

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
* Enrichment Sample

Summary By [illegible] Date 2-[illegible]-73

U.S. DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMINISTRATION

SEWAGE TREATMENT PLANT OPERATION AND MAINTENANCE PRACTICES QUESTIONNAIRE

FORM APPROVED
BUDGET BUREAU NO. 42-R1547

CHECK ONE: [X] 1ST AUDIT [ ] RE-AUDIT

DATE OF AUDIT: 2-21-73

PLANT DESIGNATION CODE (For Official Use Only)

A. GENERAL INFORMATION

1. PROJECT (Grant Number)
A-1-WA-276

SCOPE OF PROJECT (new plant, additions, etc.)
P.S.A. PLANT [illegible] C 1971

2. PLANT LOCATION (City, County)
DIABLO, WHATCOM COUNTY

IDENTIFICATION OF AREAS SERVED
[illegible] 45, DIABLO

3. POPULATION

3A. FRACTION OF AREA POPULATION SERVED (%)

3B. PLANT DESIGN (Population equivalent)
204 at 120 gpd per person

3C. SERVED BY PLANT (Domestic) – [illegible]

4. TYPE OF COLLECTION SYSTEM

4A.
[ ] COMBINED [X] SEPARATE [ ] BOTH

4B. ESTIMATE OF FLOW CONTRIBUTED BY SURFACE OR GROUND WATER (Infiltration, I&I)
[illegible]

5. YEAR COMMUNITY BEGAN SEWAGE TREATMENT
[illegible] PLANT 1971

6. YEAR PRESENT SYSTEM PLACED IN OPERATION

6A. SEWER	6B. PLANT	6C. ANCILLARY WORKS
1971	1971	

7A. SIZE OF PLANT SITE (acres)
[illegible] ACRE

7B. APPROXIMATE AREA LEFT FOR EXPANSION (Acres)
[illegible]

8A. IN THE SPACE PROVIDED BELOW FURNISH A SIMPLIFIED FLOW DIAGRAM OR A WRITTEN DESCRIPTION OF THE PLANT UNITS IN THEIR SEQUENCE, INDICATE THE METHOD OF ULTIMATE SLUDGE DISPOSAL, SHOW APPROXIMATE DIMENSIONS OF STABILIZATION PONDS AND NUMBER OF CELLS, AND INDICATE WHETHER FLOW TO AND FROM PLANT IS BY PUMPING OR GRAVITY.

[illegible] DIVIDED INTO 2 RECTANGULAR SETTLING [illegible] TRICKLING BAR, [illegible] A PARALLEL AERATION [illegible] ACTIVATED SLUDGE [illegible] WELL [illegible] A REFLECTIVE BAR, FROM WHERE IT FLOWS [illegible] CHLORINE BAR AT THE SEWAGE PLANT. THE EFFLUENT IS [illegible] CHLORINATED. FROM THE CHLORINE CONTACT TANK, THE EFFLUENT FLOWS [illegible] CHLORINE CONTACT TANK AND IS [illegible] CHLORINATED. FROM THE CHLORINE CONTACT TANK THE EFFLUENT FLOWS TO THE RIVER [illegible] ALREADY CHLORINATED AND NEED NOT BE RECHLORINATED UNTIL SUCH TIME AS IT IS [illegible] CHLORINATED

8B. NOTE ANY SIGNIFICANT OR UNIQUE PROCESSING CONDITIONS
[illegible] THAT ONLY WHEN THE PLANT'S [illegible] THE [illegible] THE TANK

9. RECEIVING STREAM

9A. NAME OF STREAM
[illegible] RIVER

9B. STREAM FLOW IS
[ ] PERENNIAL [X] INTERMITTENT [ ] NATURAL [X] REGULATED [ ] INTERSTATE [ ] INTRASTATE

B. CURRENT PERFORMANCE AND PLANT LOADING (Estimate)

1A. ANNUAL AVERAGE DAILY FLOW RATE (MGD)	1B. PEAK FLOW RATE (MGD)	
[illegible] 24 CFS	DRY WEATHER	WET WEATHER
[illegible]	[illegible]	[illegible]

2. AVERAGE BOD OF RAW SEWAGE (24 hour composite)
[illegible] MG/L

3. AVERAGE SUSPENDED SOLIDS OF RAW SEWAGE (24 hour composite)
[illegible]

4. AVERAGE SUSPENDED SOLIDS OF RAW SEWAGE (Grab)
[illegible] MG/L

5. AVERAGE SOLID WASTE DISPOSAL [illegible]
[illegible]

6A. [illegible]
[illegible]

6B. [illegible]
[illegible]

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7. IS PLANT HAVE STANDBY POWER GENERATION FOR MAJOR PUMPING FACILITIES? [ ] YES [X] NO

7B. ADEQUATE ALARM SYSTEM FOR POWER OR EQUIPMENT FAILURE? [ ] YES [ ] NO

8. ARE CHLORINATION FACILITIES PROVIDED? [X] YES [ ] NO
IF YES, ANSWER 8A THRU G

IF YES, IS CHLORINATION CONTINUOUS? [ ] YES [ ] NO
IF NO, EXPLAIN REASON FOR INTERMITTENT CHLORINATION

8A. PURPOSE OF CHLORINATION

DISINFECTING EFFLUENT TO CONFORM WITH
PUBLISHED STANDARDS

8B. TYPE OF CHLORINATOR

ADVANCE FITZHUGH MSP

8C. POINT OF APPLICATION OF CHLORINE

CHLORINE CONTACT TANK

8D. CAN BYPASSED SEWAGE BE CHLORINATED?

[X] YES [ ] NO

8E. AVERAGE FEED RATE OF CHLORINE (lb/day)

8F. CHLORINE RESIDUAL IN EFFLUENT

.5# PPM AT END OF 1 MINUTES

8G. MINIMUM SUPPLY OF CHLORINE STORED ON PREMISES (lb)

ONLY ENOUGH TO MEET SPECIFICATIONS

9. ARE FACILITIES PROVIDED FOR COMPLETE BYPASS OF RAW SEWAGE?

[X] YES [ ] NO IF YES, ANSWER A THRU G BELOW, ANSWER H IN EITHER CASE

9A. FREQUENCY (times per month)

ONCE IN EVERY 4 YEAR

9B. AVERAGE DURATION (hours)

24 - 36 HRS

9C. REASON FOR BYPASSING

EMERGENCY

9D. ESTIMATED FLOW RATE DURING BYPASS IS

[X] WITHIN HYDRAULIC CAPACITY OF PLANT
[ ] BEYOND HYDRAULIC CAPACITY OF PLANT BY

9E. DOES SEWAGE OVERFLOW IN DRY WEATHER?

[ ] YES [X] NO

9F. TYPE OF DIVERSION STRUCTURE

OVERFLOW LINE FROM WET WELL

9G. AGENCIES NOTIFIED OF BYPASS ACTION

SUPERVISOR

9H. DO OPERATORS HAVE OPTION TO BYPASS INDIVIDUAL PLANT UNITS? *(If no, has this caused any operational problems?)*

[ ] YES [X] NO NO PROBLEMS

10A. ARE BACK FLOW DEVICES PROVIDED AT ALL CONNECTIONS TO CITY WATER SUPPLY? *(If no, explain)*

[ ] YES [ ] NO NO DIRECT CONNECTIONS

10B. CHECK TYPE OF BACK FLOW PREVENTION DEVICE

[ ] DOUBLE CHECK VALVE [ ] PRESSURE OPERATED [ ] PHYSICAL DISCONNECT [ ] OTHER *(specify)*

11. USES OF TREATMENT PLANT EFFLUENT

NO USES

12. USES OF RECEIVING STREAM WITHIN 10 MILES OF OUTFALL

RICE IRRIGATION, FISHING

13. HAVE THERE BEEN ANY ODOR COMPLAINTS BEYOND THE PLANT PROPERTY? *(If yes, explain)*

[ ] YES [X] NO

14. OBSERVED APPEARANCE AND CONDITION OF EFFLUENT, RECEIVING STREAM, OR DRAINAGE WAY

WATER CLEAR

STABILIZATION PONDS

B. EMERGENT AND VEGETATIVE GROWTH IN PONDS ELIMINATED? ☐ YES ☐ NO

B. BANKS AND DIKES MAINTAINED (erosion etc.)? ☐ YES ☐ NO

C. FENCING AND WARNING – POLLUTED WATER SIGNS PRESENT AND IN GOOD REPAIR? ☐ YES ☐ NO

D. FREQUENCY OF INSPECTION BY OPERATOR

E. WATER DEPTH (feet) ____ HIGH ____ LOW ____ MEDIUM

F. ADEQUATE CONTROL OF DEPTH? ☐ YES ☐ NO

G. SEEPAGE REPORTED? ☐ YES ☐ NO

H. ANY REPORTS OF GROUND WATER CONTAMINATION FROM POND (If yes, give details)? ☐ YES ☐ NO

I. MOSQUITO BREEDING PROBLEM? ☐ YES ☐ NO IF YES, NAME OF SPECIES IF KNOWN

J. CAN SURFACE RUN-OFF ENTER POND? ☐ YES ☐ NO

C. SUPERVISORY SERVICES

1. IS A CONSULTING ENGINEER RETAINED OR AVAILABLE FOR CONSULTATION ON OPERATING AND MAINTENANCE PROBLEMS?

☒ YES ☐ NO IF YES IS IT ON: ☐ CONTINUING BASIS OR ☒ UPON REQUEST BASIS

IF CONTINUING BASIS, WHAT IS THE FREQUENCY OF VISITS

2. DO OPERATORS AND OTHER PERSONNEL ROUTINELY ATTEND SHORT COURSES, SCHOOLS OR OTHER TRAINING ACTIVITIES?

☐ YES ☒ NO

IF YES, CITE COURSE SPONSOR AND DATE OF LAST COURSE ATTENDED

IF NO, DO YOU KNOW OF ANY COURSES AVAILABLE TO SERVE THIS AREA?

NOT AT PRESENT

3A. ARE ALL EQUIPMENT AND PARTS OF THE PRESENT PLANT STILL IN OPERATION? ☐ YES ☐ NO (If no, explain)

B. ARE PROCESSING UNITS OPERATING AT DESIGN EFFICIENCY? ☒ YES ☐ NO (If no, explain)

AT PRESENT, THE CHLORINE RATES A QUALIFIED YES [illegible] BUT WILL BE A FEASIBLE REDUCTION IN THE FUTURE

4. HAVE THERE BEEN ANY DIFFICULTIES WITH THE SEWAGE TREATMENT PLANT?

A. STRUCTURAL ☐ YES ☒ NO (If yes explain)

B. MECHANICAL ☐ YES ☒ NO (If yes, explain)

C. OPERATIONAL ☐ YES ☒ NO (If yes, explain)

D. BASED ON OPERATING EXPERIENCE TO DATE WHAT IF ANY CHANGES WOULD YOU RECOMMEND TO IMPROVE OPERATION OF THE PLANT?

TO DATE, BUT AS THE POPULATION INCREASES, THERE MIGHT BE CHANGES [illegible]

4. EXPLANATION OF LOGS MAINTAINED? [X] YES [ ] NO
If maintained, check general items included

RECORDS KEPT? [X] YES [ ] NO
TO SHOW?

FREQUENCY	WEATHER	FLOW	SLUDGE HANDLED	CHEMICALS USED	DIGESTER	GRIT HANDLED	ELEC USED	COST DATA	AIR USED	MAINTENANCE	OTHER
DAILY	X									X	
WEEKLY											
MONTHLY											
ANNUALLY											

6. ARE LABORATORY RECORDS MAINTAINED? *(check appropriate box)*

[ ] NOT AT ALL [X] DAILY [ ] WEEKLY [ ] MONTHLY [ ] ANNUALLY

IF MAINTAINED CHECK FORM OF RECORD BELOW:

[X] LOG BOOK [ ] TABULAR SHEET [ ] SEPARATE BY OPERATION [ ] CONTROL CHARTS [ ] GRAPHS

WHAT PLANT AND/OR LABORATORY EQUIPMENT, GAGES AND METERS ARE CALIBRATED PERIODICALLY?

7. IS LABORATORY TESTING ADEQUATE FOR THE CONTROL REQUIRED FOR THIS SIZE AND TYPE OF PLANT?

[X] YES [ ] NO *(If no, explain)*

8. INDUSTRIAL WASTES DISCHARGED TO MUNICIPAL SYSTEM

A. NUMBER AND TYPES OF INDUSTRIES DISCHARGING TO SYSTEMS
[illegible]

B. POPULATION EQUIVALENT *(BOD)* OF INDUSTRIAL WASTES *(pe)*

C. POPULATION EQUIVALENT (SS) OF INDUSTRIAL WASTES *(pe)*

D. VOLUME OF INDUSTRIAL WASTES *(mgd)*

E. COMPOSITION AND CHARACTERISTICS OF INDUSTRIAL WASTES

F. MAIN DIFFICULTY EXPERIENCED WITH INDUSTRIAL WASTE *(explain)*

G. HAVE INDUSTRIAL EFFLUENT PROBLEMS BEEN SOLVED? [ ] YES [ ] NO *(If yes, how?)*

9A. METHOD OR METHODS USED TO ASSESS INDUSTRIAL WASTE TREATMENT COST *(check appropriate box)*

[ ] NO CHARGE BY CITY [ ] PROPERTY TAX [ ] WATER USE ASSESSMENT [ ] CHARGE BASED ON FLOW
[ ] CHARGED BASED ON BOD [ ] CHARGE BASED ON SS [ ] OTHER METHODS *(describe)*

COMMENT ON HOW CHARGE IS COLLECTED *(fixed charge, sliding scale, etc.)*

9B. IS INDUSTRIAL WASTE ORDINANCE IN EFFECT AND ENFORCED? [ ] YES [ ] NO

10. WHO PROVIDED INITIAL INSTRUCTION IN THE OPERATION OF THE PLANT?
[illegible]

11. IS A MANUAL OF PRACTICE OR INSTRUCTIONS AVAILABLE?
[X] YES [ ] NO

IF YES, WHO WROTE AND PROVIDED IT?
[illegible]

12. ESTIMATE OF MAN-HOURS PER WEEK DEVOTED TO LABORATORY WORK AND MAINTENANCE OF RECORDS AND REPORTS
[illegible]

D. PLANT PERSONNEL *(Annual Average Staff for Most Recent Year Reported in Section [illegible])*

JOB CATEGORY	NUMBER	TOTAL MAN-HOURS PER WEEK	TOTAL NUMBER CERTIFIED OR LICENSED	NUMBER IN EACH CATEGORY EMPLOYED PART-TIME	NUMBER IN EACH CATEGORY EMPLOYED FULL-TIME ON OTHER WORK
1. SUPERINTENDENT					
2. OPERATORS					
3. LABORATORY TECHNICIANS					
4. LABORERS					
5. PART-TIME EMPLOYEES					
6. TOTAL					

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E. LABORATORY CONTROL

Enter test codes opposite appropriate items. If any of the below tests are used to monitor industrial wastes place an "X" in addition to the test code.

CODES

1 – 7 or more per week
2 – 4, 5 or 6 per week
3 – 1, 2, or 3 per week
4 – as required
5 – 2 or 3 per month
6 – 1 per month
7 – Quarterly
8 – Semi-Annually
9 – Annually

ITEM	RAW	PRIMARY EFFLUENT	MIXED LIQUOR	FINAL	SLUDGE		DIGESTOR	RECEIVING STREAM
					RAW	SUPER-NATANT		
1. BOD								
2. SUSPENDED SOLIDS								
3. SETTLEABLE SOLIDS			3	3				
4. SUSPENDED VOLATILE								
5. DISSOLVED OXYGEN			4					
6. TOTAL SOLIDS								
7. VOLATILE SOLIDS								
8. pH				3				
9. TEMPERATURE			3					
10. COLIFORM DENSITY								
11. RESIDUAL CHLORINE				3				
12. VOLATILE ACIDS								
13. M. O. STABILITY								
14. ALKALINITY								
15.								
16.								
17.								
18.								
19.								

F. OPERATION AND MAINTENANCE COST FOR PLANT

YEAR OF OPERATION	SALARIES/WAGES	ELECTRICITY	CHEMICALS	MAINTENANCE	OTHER ITEMS	TOTAL
MOST CURRENT YEAR 19						
PRIOR YEAR 19						
PRIOR YEAR 19						
PRIOR YEAR 19						

EVALUATION PERFORMED BY	TITLE	ORGANIZATION

INFORMATION FURNISHED BY	TITLE	ORGANIZATION	DATE

6. NOTATIONS BY EVALUATOR

1. ADDITIONAL REMARKS: *(If remarks refer to a particular item, identify by number)*

2. GENERAL COMMENTS ON HOUSEKEEPING AND MAINTENANCE

3. REQUIREMENTS OF HIGHER AUTHORITY

3A. DOES THE PLANT PROVIDE THE DEGREE OF TREATMENT PRESENTLY REQUIRED BY THE STATE? *(If no, explain)*

☐ YES ☐ NO

3B. ARE THERE ANY PENDING ACTIONS *(enforcement conferences, change in water quality standards, etc.)* THAT WOULD REQUIRE UPGRADING OF TREATMENT BY THIS PLANT?

☐ YES ☐ NO *(If yes, explain)*

3C. NUMBER OF STATE INSPECTIONS OF PRESENT PLANT TO DATE:

4. IS ANY FOLLOW-THRU ACTION REQUIRED TO (1) CORRECT DEFICIENCIES IN THE PLANT OR ITS OPERATION OR (2) RESOLVE INDUSTRIAL WASTE PROBLEMS? *(If yes, describe required corrective action)* ☐ YES ☐ NO