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JOHN SPELLMAN
Governor

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
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MEMORANDUM
August 1, 1984

To: Gary Bailey, Southwest Regional Office

From: Marc Heffner

Subject: Consolidated Dairy Products, Chehalis (Darigold) Wastewater Treatment Plant Class II Inspection - March 20-21, 1984

INTRODUCTION

The Darigold wastewater treatment plant (WTP) is a secondary treatment plant designed to treat waste flow from the Darigold milk-processing facility in Chehalis, Washington (Figure 1). The WTP facility includes a shock loading tank, an equalization basin, a roughing trickling filter, an orbal activated sludge unit, a final clarifier, and an effluent Parshall flume (Figure 2). Sludge is held in a storage tank before being hauled to one of two local farms for land application. The WTP had been operating for approximately six months at the time of the inspection.

The WTP was being operated for Darigold by Special Products, Inc. (SPI), design consultants for the plant. Frank Klobertanz, the plant operator, is under contract with SPI to operate the plant while his assistant, Ed Evans, is a Darigold employee. The inspection was conducted by Brad Hopkins and Marc Heffner (Washington State Department of Ecology [WDOE], Water Quality Investigations Section).

Discharge from the facility is limited by NPDES permit number WA-003747-8. The permit calls for discharge directly into the Chehalis River between October 15 and June 15 unless the Darigold WTP is upset and cannot meet permit limits. During upset periods, discharge is to be to the headworks of the City of Chehalis WTP. Prior to and during the inspection, all discharge was to the Chehalis WTP headworks.

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The inspection was conducted to:

1. Document operating conditions at the WTP.

2. Review laboratory procedures with the operator, and split samples for analysis by both the WDOE and WTP laboratories.

PROCEDURES

Composite samples were collected by Darigold and WDOE and split for analysis by both laboratories. Darigold samplers collected influent and trickling filter recycle/effluent time-paced composites (approximately 60 mLs of sample every 20 minutes) and a flow-paced final effluent composite sample. Because of the creamy nature of the waste, keeping the influent in-line flow meter operational had not been possible, necessitating the time-paced rather than flow-paced influent composite. The Darigold samplers ran from approximately 0730 hours on March 20 to approximately 0930 hours on March 21.

WDOE samplers collected influent and effluent time-paced composites (approximately 220 mLs of sample every 30 minutes). Because of the existing metering scheme, a WDOE flow meter could not be set up in the effluent channel to allow collection of a flow-paced composite. The WDOE samplers ran from approximately 0930 hours on March 20 to approximately 0930 hours on March 21. The WDOE effluent compositor was observed to be sampling continuously rather than at the set time intervals during the post-inspection cleanup. The total volume of effluent sample collected was greater than expected, and later the difference between analytical results of the WDOE and Darigold effluent samples suggested that the WDOE effluent sampler timer mechanism malfunctioned during the inspection. Thus, the Darigold effluent composite sample may be more representative than the WDOE effluent composite sample. WDOE laboratory results of the composite sample analyses are presented on Table 1.

Table 1. WDOE laboratory results - Darigold, March 1984.

Sample	BOD_5 (mg/L)	Soluble BCD_5 (mg/L)	COD (mg/L)	Solids (mg/L) TS	TNVS	TSS	TNVSS	pH (S.U.)	Conductivity (umhos/cm)	Turbidity (NTU)	Color	Nutrients (mg/L) T. Kjeldahl-N	NH_3-N	NO_2-N	NO_3-N	O-PO_4-P	T-PO_4-P	Alkalinity (mg/L)
Darigold influent	5,000	4,200	6,400	5,000	1,100	1,000	44	9.2	1,720	680			14	<0.10	7.5	13	58	380
Darigold effluent	390	24	1,100	2,100	1,200	740	100	7.9	2,100	280	80		13	<0.10	<0.10	19	40	650
Darigold TF effluent/recycle	1,300	260 est	2,300	2,600	1,000	1,500	230	7.6	1,490	810	230	100	1.4	<0.10	<0.10	17	66	460
WDOE influent	7,000	4,300	7,400	6,400	1,200	920	28	9.4	1,650	810		150	9.1	<0.10	9.7	27	78	360
WDOE effluent	100	34	380	1,300	980	210	10	8.0	1,830	89	76	26	9.6	<0.05	<0.05	12	18	690
Cow water	12		12			<1		7.6	14	1			1.9	<0.02	<0.02	0.05	0.08	
Sludge				17,000	3,600							1,500	55	<5	<5	150	400	

Est = Estimated.

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All composite samples were split for analysis by the WDOE and WTP laboratories. Also, both effluent composite samples were analyzed by the Chehalis WTP laboratory. Darigold WTP effluent samples are routinely split with Chehalis to determine billing rates when the Darigold WTP is discharging to the Chehalis WTP.

Grab samples were collected for field and laboratory analyses (Tables 1 and 2). Also, a sample for sludge metals analysis was collected.

Table 2. Grab samples results - Darigold, March 1984.

			Field Analysis			Laboratory Analysis		
Sample	Date	Time	Temperature (°C)	pH (S.U.)	Conductivity (umhos/cm)	Fecal Coliform (#/100 mL)	MLSS (mg/L)	MLVSS (mg/L)
Influent	3/20	0940	23.0	4.8	>1,000			
		1300	34.6	6.4	>1,000	190,000		
	3/21	1000	18.7	10.7	950			
		Comp.	3.7	9.5	>1,000			
		1035				360,000		
Equalization Basin	3/21	1115				<3,000		
Trickling Filter recycle/effluent	3/20	1015	19.6	7.4	>1,000			
		1035				31,000		
		1345				48,000		
Outer Orbal Unit	3/20	1035					9,700	8,400
		1345					14,000	12,000
	3/21	1115					9,400	8,100
Inner Orbal Unit	3/20	1035					9,300	8,000
		1345					12,000	10,200
	3/21	1115					7,300	6,300
Effluent	3/20	1000	20.4	7.6	>1,000			
		1035				4,100		
		1345	19.7	7.7	>1,000	2,500		
	3/21	0940	17.3	7.8		1,300		
		Comp	4.9	8.1				

Darigold effluent flow measurements were made using a sonic meter in coordination with a Parshall flume. An instantaneous WDOE flow measurement was made, and the plant meter appeared to be functioning accurately. Loadings are based on the Darigold flow measurement.

DISCUSSION

Data collected during the inspection are compared to the plant NPDES permit limits on Table 3. The discharge was greatly exceeding all limited parameters with the exception of flow and pH during the inspection. Erlan Aboen, production plant manager, noted that during the inspection monterey cheese washing, one of the higher inputs of loads to the WTP, was taking place. The March DMR was reviewed, and although the degree of violation was variable, NPDES permit violations were not uncommon. The DMR noted 22 BOD_5 concentration violations and 22 TSS concentration violations in March (Appendix A).

Table 3. Comparison of inspection data to NPDES permit limits - Darigold, March 1984.

			WDOE Sampler		Darigold Sampler	
Parameter	Daily Average	Daily Maximum	WDOE Analysis	Darigold Analysis	WDOE Analysis	Darigold Analysis
BOD_5 (mg/L)		30	100	77	390	292
(lbs/D)	52		238	183	927	694
TSS (mg/L)		30	210	196	740	815
(lbs/D)	70		499	466	1,759	1,937
Flow (MGD)		0.46				0.285
NH_3-N		1.0 mg/L	9.6		13	
Total PO_4-P (mg/L)	*	*	18		40	
(lbs/D)			43		95	
pH (S.U.)	$6.0 \leq pH \leq 9.0$		7.6-7.8†			

*Permittee shall take all actions deemed appropriate by the WDOE, including the minimization of phosphate-based detergent usage, to reduce the discharge of phosphorus to the Chehalis River.

†Range of three WDOE grab samples (Table 2).

Table 4 compares loadings during the inspection to plant design loadings. The BOD_5 loadings during the inspection exceeded both the average and maximum plant design loading, while the TSS load approximated the average plant design load. BOD_5 loadings calculated using DMR data revealed that the average design loading was exceeded fourteen days and the maximum design loading was exceeded six days during March. Also, the average March BOD_5 load of 5040 lbs/D exceeded average design capacity. The plant is both organically overloaded and failing to meet permit limits, thus reducing the load or increasing plant capacity should be considered.

Table 4. Comparison of inspection data to plant design loadings - Darigold, March 1984.

	Plant Design*		Class II Loading	
	(daily maximum)	(average)	WDOE Sampler†	Darigold Sampler†
BOD5 loading (lbs/D)	7,170	4,815	12,552	8,966
TSS loading (lbs/D)	2,745	1,680	1,650	1,793
Influent flow (gal.)	381,500	282,000		215,000

*From Johnson, 1983.
†WDOE analysis.

Comparison of influent and effluent measurements may be somewhat misleading because the influent is routed through an equalization basin prior to treatment and after sampling. The 95,000-gallon basin both detains loads and reduces the impacts of short-term high and low loads. Based on only one sample, it is difficult to conclude if NO_3-N reduction occurs over the trickling filter and alkalinity increases through the plant, or if these changes are the result of equalization of the flow (Table 1).

Primary problems at the plant during the inspection were associated with the solids generation and capture. Items noted included:

1. The plant orbal unit had two disc aerators in each channel but during the inspection only one aerator per channel was being operated. The operator explained that if both aerators were operated, both the noticeable foaming problem in the unit increased and air became entrained in the sludge, severely limiting sludge settleability. It was unclear if the high loads and/or the nature of the activated sludge was responsible for this problem.

2. The secondary clarifier was being operated with a thick sludge blanket (approximately two feet of clear water above the blanket). Poor sludge settling and attempting to thicken the sludge somewhat before returning or wasting sludge were causes of the thick blanket. The shallow depth of clear water makes the clarifier prone to solids washout with minor upsets. The operator reported that a solids washout occurred at night during the inspection, and attributed the degree of NPDES permit violation during the inspection in large part to this washout.

3. The capacity of the sludge holding tank to handle the solids being generated was questionable. The 75,000-gallon tank was designed to provide a 32-day holding time for 4 percent solids sludge. Holding tank sludge collected during the inspection was analyzed to be only 1.7 percent solids, thus more than doubling the volume required for the same dry weight of sludge at 4 percent solids. Various flocculants were being tested to dewater the sludge, but none had been successful. The operator indicated that sludge wasting from the secondary clarifier was at times limited by a lack of holding tank capacity.

4. WDOE laboratory analyses included both total and soluble BOD_5 tests (Table 1). The data indicate that the influent BOD_5 was primarily soluble while the tricking filter effluent and final effluent samples were primarily the insoluble BOD_5 fraction. Thus the high TSS concentrations in the effluent appear responsible for both the BOD_5 and TSS permit violations. The relatively low soluble BOD_5 fraction in the trickling filter effluent suggests that solids capture between the trickling filter and orbal unit would substantially reduce both BOD_5 and TSS orbal unit loading.

Phosphorus concentrations in the effluent during the inspection were of some concern. The WDOE effluent sample dissolved orthophosphate-phosphorus (DP) concentration was 12 mg/L, and the total phosphate-phosphorus (TP) concentration was 18 mg/L (Table 1). Concentrations in the Darigold effluent sample were higher. TP analysis of the Darigold effluent should be more regular than the monthly NPDES permit requirement until a loading pattern is established. Weekly testing is thought appropriate to establish a pattern. Because of the difficulties associated with phosphorus analysis, providing an EPA quality control sample for analysis by Darigold early in the monitoring program is suggested.

Fecal coliform analyses were performed on grab samples collected during the inspection (Table 2). Counts decreased through the plant, but effluent counts still ranged from 1,300 to 4,100/100 mL. Based on observation of colony morphology and speciation of selected colonies, *E. coli* appeared to be the predominant coliform organism in the March 20 at 1300 hours influent sample and March 20 at 1345 hours effluent sample. Routine monitoring for fecal coliforms is suggested to determine if fecal coliform discharge limits need to be addressed in the NPDES permit.

DMR treatment plant flows include both a plant and an effluent flow measurement. The effluent figure includes both flows from the waste treatment plant (plant flow) plus waste cow water that joins the WTP after final clarification (Figure 2). Cow water is stored for use in the production plant (principally as cleanup water), with the excess wasted with the WTP effluent. Laboratory analysis of the cow water grab sample found BOD_5 (12 mg/L) and TSS (<1 mg/L) concentrations well below final discharge permit guidelines. The NH_3-N concentration of 1.9 mg/L was greater than the final discharge permit limit (1 mg/L). This suggests that if the WTP were marginally meeting the final discharge NH_3-N concentration limit, addition of cow water might result in a permit violation.

Sludge sample analysis found fairly high nutrient concentrations in the waste sludge (Table 1). Metals concentrations in the sludge were low (Table 5). The selected method of sludge disposal, application to agricultural land, appears reasonable.

Table 5. Metals concentrations in Darigold WTP sludge - Darigold, March 1984.

	Metal in ug/gm dry weight*					
	Cd	Cr	Cu	Pb	Ni	Zn
Darigold Sludge	3	5	24	13	<13	210

*1.6 Percent solids.

LABORATORY DISCUSSION

The laboratory facility at the Darigold WTP is rather limited in size. The primary problem with the laboratory is its location in the same room with process pumps. Communication and concentation were difficult in the building.

The operator's laboratory program included COD, BOD_5, and TSS testing primarily. The operator was knowledgeable about the test procedures, and the analyses were frequently run to collect operational and permit compliance data. The COD test was run using a "Hach" test and was useful as a quick monitor of plant operation. BOD_5 and TSS procedures were reviewed with the operator. Table 6 notes procedural changes that should be made to bring Darigold WTP procedures in conformance with approved procedures. NH_3-N testing was not done at the WTP. A check for quality assurance could be made by providing the test laboratory with an EPA quality control sample for NH_3-N analysis.

Table 7 compares WDOE, Darigold, and Chehalis WTP labortory results of the split samples. Results compared reasonably for the concentrations found in the wastewater.

Table 7. Comparison of laboratory results - Darigold, March 1984.

		BOD_5 (mg/L)			COD (mg/L)		TSS (mg/L)		
Sample	Sampler	WDOE Analysis	Darigold Analysis	Chehalis WTP Analysis	WDOE Analysis	Darigold Analysis	WDOE Analysis	Darigold Analysis	Chehalis WTP Analysis
Influent	WDOE	7,000	5,050		7,400	7,475	920	982	
	Darigold	5,000	4,825		6,400	6,388	1,000	950	
TF Effluent	Darigold				2,300	2,375	1,500	1,625	
Effluent	WDOE	100	77	124	380	282	210	196	214
	Darigold	390	292	430	1,100	1,060	740	815	895

Table 6. Laboratory procedural recommendations - Darigold, March 1984.

Operator's Method	WDOE Method
BOD_5 Test*	
The day before the test is run, deionized water is made, nutrients are added, and the mixture aerated overnight. Aeration is stopped approximately one hour before use. An initial D.O. of 9.9 mg/L is in the normal range.	De-ionized water should be aged one to two weeks in the dark in containers covered with air-permeable membranes (cotton, sponge, etc.) prior to use. Nutrients should be added between 10 and 60 minutes prior to dilution water use. Initial D.O. should be in the range of 8.3 to 9.2 mg/L. Aeration until one hour prior to deionized water use is acceptable.
The operator seeds the dilution water with 1 mL effluent/L dilution water for all tests. A seed correction is made using the D.O. depletion in the seeded blank test.	An unseeded dilution water blank should be set up instead of, or in addition to, the seeded dilution water blank. The seed correction should be calculated based on a valid BOD_5 of the seed (the effluent test) rather than the seeded blank. The seeded blank is a quality control test, and the D.O. depletion is low (<2.0 mg/L). It therefore does not constitute a valid BOD_5 test and should not be used for seed correction. Seeding the influent sample with effluent is thought to be a good practice due to the wide range of influent pH, and should be continued.
TSS Test**	
The operator was using Schleicher and Schnell filter paper for the test.	An approved filter paper should be used. Approved filters include Whatman 934AH and 984 H, Gelman A/E, and Millipore AP40.

*WDOE method comes from (WDOE, 1977).
**WDOE method comes from (APHA, 1980).

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RECOMMENDATIONS AND CONCLUSIONS

Effluent samples collected during the Class II inspection were in excess of NPDES permit BOD_5, TSS, and NH_3-N limits. Review of the Darigold March DMR data indicated that permit violations occurred frequently, although the extent of violation was variable. During the inspection, the load to the plant approximately equaled the average plant design TSS load, while the BOD_5 load exceeded maximum design capacity. Solids-handling problems including solids escape seemed to be the major operational problem at the plant. Increasing solids-handling capabilities or decreasing plant loads appear necessary in order to consistently meet NPDES permit limits.

Higher than expected total PO_4-P concentrations (approximately 20 mg/L) and fecal coliform counts (approximately 2,500/100 mL) were found in the WTP effluent. Increased self-monitoring (at least weekly) of these parameters is suggested to determine usual effluent concentrations. Because of the sensitivity of the PO_4-P test, analysis of an EPA quality control sample by the Darigold test lab for total PO_4-P is suggested soon after monitoring begins to help assure that analysis is accurate.

Plant laboratory data (BOD_5, COD, and TSS) appeared fairly accurate. Table 6 notes laboratory changes necessary to bring testing procedures into conformance with approved techniques. An EPA quality control sample could be used for NH_3-N analysis quality assurance.

MH:BH:cp

REFERENCES

APHA-AWWA-WPCF, Standard Methods for the Examination of Water and Wastewater, 15th Edition, 1980.

Johnson, B.M., P.E., Engineering Review of Documents Submitted to the Department of Ecology in Support of an Application for a Wastewater Treatment Plant for Consolidated Dairy Products at Chehalis, Washington. Stetson, Johnson & Odell, Inc., January 20, 1983.

WDOE, 1977. Laboratory Test Procedure for Biochemical Oxygen Demand of Water and Wastewater, DOE 77-24, August 1977, revised February 1983.

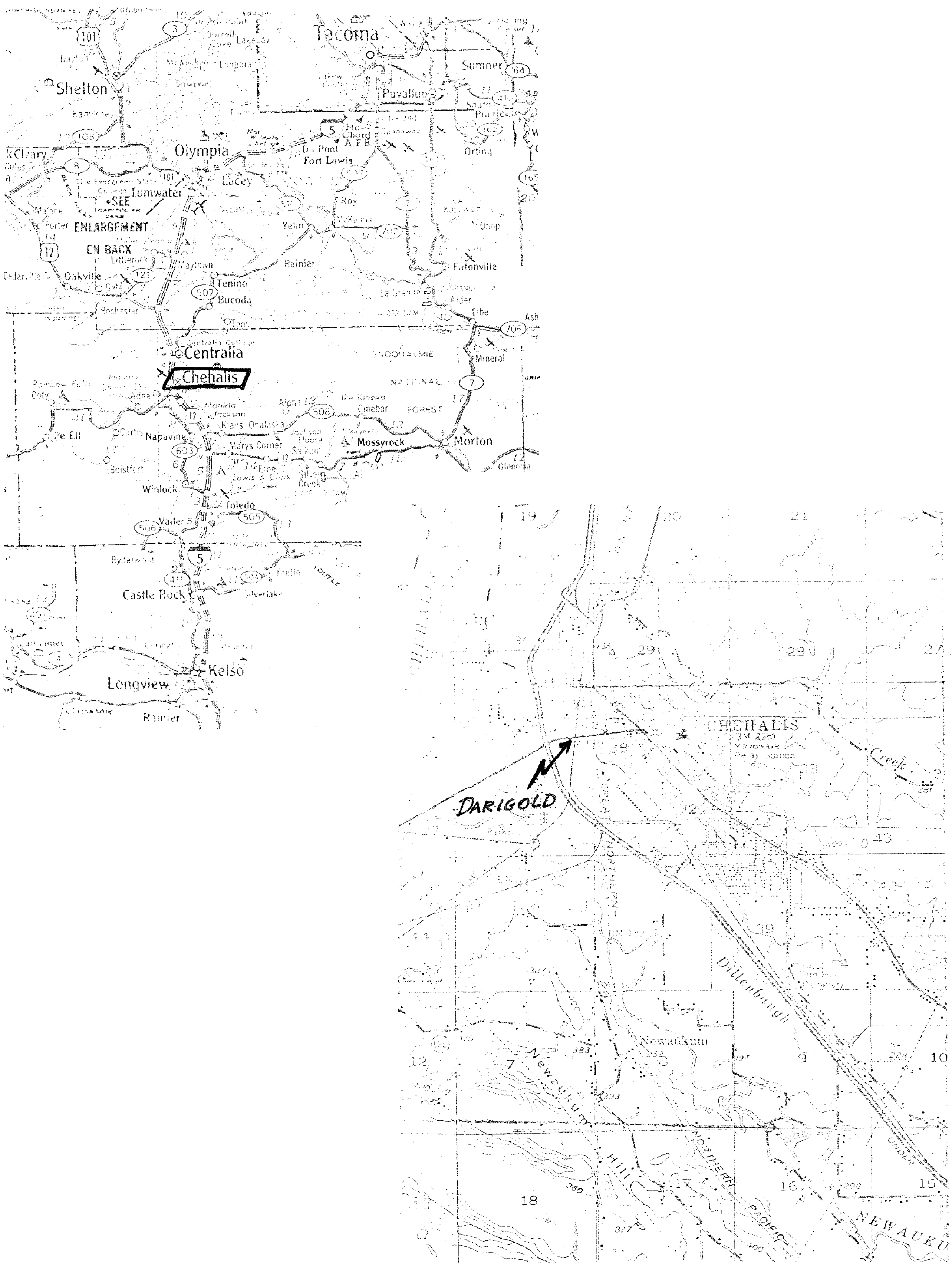

Figure 1. Darigold plant location - Darigold, March 1984.

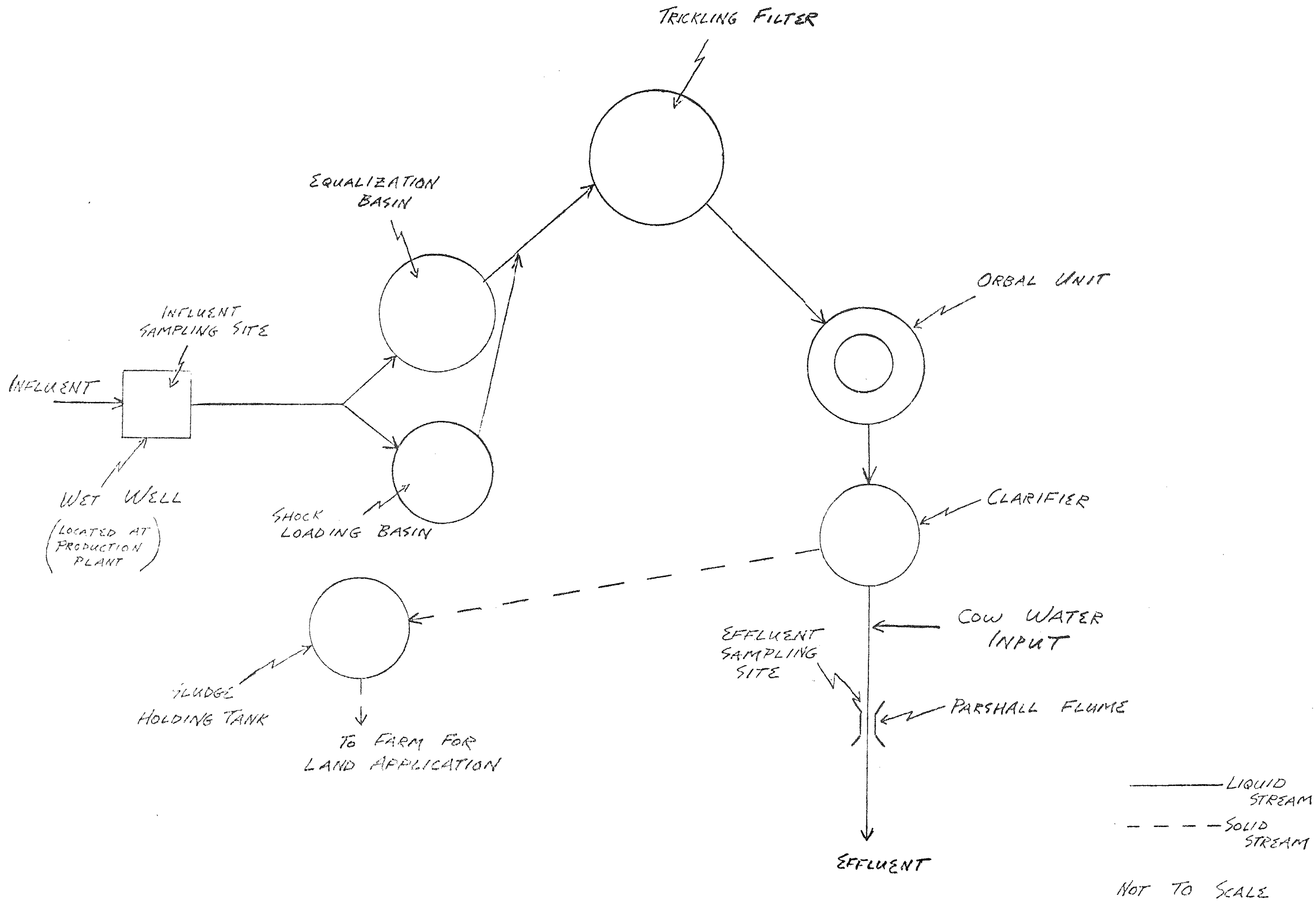

Figure 2. Darigold WTP flow scheme - Darigold, March 1984.

APPENDIX A

WASTEWATER TREATMENT PLANT MONITORING REPORT 1/3

FOR Consolidated Dairy Products (Dairigold) Chehalis, Wa. (ENTITY) Lewis (COUNTY) MONTH March '84

POPULATION SERVED 0.0 NPDES PERMIT NO. WA-003747-B

DATE	FLOW MGD EFF.	FLOW MGD PLANT	PLANT INFLUENT pH Range	BOD (MG/l)	SUSP. SOLIDS (MG/L)	TEMPERATURE (°F)	COD mg/1	PLANT EFFLUENT pH	DO (MG/l)	BOD (MG/l)	% BOD REMOVAL	LBS. BOD DISCHARGED	SUSP. SOLIDS (MG/l)	% SUSP SOLIDS REMOVAL	LBS. SUSP SOLIDS DISC	COD mg/1	NH_3-N mg/1	Total-P mg/1	Turb mg/1
1	.238	.238	4-11	4280	1647	31	9100	7.3	0.9	330	92	655	640	49	1270	990			
2	.395	.32	3-11	2960	865	45	5800	7.3	1.8	405	86	1334	675	22	2230	1120			
3	.318	.24	2-12	3260	1075	29	6400	7.3	1.6	84	97	223	107	90	284	240			
4	.194	.160	1-10	2065	1045	31	4050	7.2	1.4	70	97	113	93	91	150	200			
5	.274	.274	2-12	975	377	43	1875	7.3	1.6	56	94	128	48	87	109	170			
6	.285	.215	2-11	1730	425	24	3200	7.3	1.8	38	98	90	42	90	100	105			
7	.281	.224	2-12	1220	615		8600	7.3	1.4	24	99	57	19	97	45	85			
8	.243	.243	3-11	3875	975	24	8000	7.4	1.2	67	98	135	40	96	81	200			
9	.316	.226	3-12	3300	4310		7650	7.3	1.4	47	99	124	73	98	192	130			
10	.309	.229		1650	628	19	2975	7.2	1.6	61	96	157	87	86	224	160			
11	.236	.200	2-12	3725	776	24	7500	7.3	1.2	46	99	91	72	91	142	132			
12	.314	.244	4-11	1325	497	39	2450	7.3	1.4	144	89	377	345	31	903	440			
13	.231	.18	2-11	3075	926	27	6400	7.4	1.0	54	98	107	63	93	121	143			
2050 14	.325	.25	4-8	2200	394	29	4000	7.4	1.3	154	95	417	235	41	637	260			
4000 15	.214	.19	4-9	3325	987	34	6100	7.4	0.9	30	99	54	28	93	50	90			
3867 16	.224	.196	4-10	2600	1055	24	5750	7.4	1.5	45	99	84	44	96	82	145			
3750 17	.335	.200	3-9	2850	1040	23	6000	7.6	1.4	31	99	87	72	95	201	122			
1783 18	.284	.184	6-8	2025	655	27	3100	7.5	1.6	20	99	47	18	97	43	65			
19	.26	.185	4-9	1725	277	39	2150	7.4	1.2	30	98	65	29	90	63	90			
20	.248	.182	2-10	1418	340	23	2125	7.4	1.2	96	93	199	182	47	376	220			
21	.285	.215	4-9	4825	950	21	6388	7.4	0.8	292	94	694	865	9	2056	1060			
22	.257	.232	2-10	2650	715	23	5000	7.4	0.9	135	95	289	268	63	574	380			
23	.313	.223	3-12	3600	1490	30	6950	7.5	1.4	27	99	70	26	98	68	102			
24	.32	.245	3-11	2775	1590	44	5100	7.8	1.6	65	98	173	101	94	269	180			
25	.234	.171	2-12	2318	2575	24	3825	7.6	1.8	17	99+	33	14	99	27	60			
26	.282	.188	3-12	2770	1450	27	4900	7.6	1.4	9	99+	21	18	99	42	78			
27	.237	.197	3-10	4390	1966	29	8200	7.6	1.9	45	99	89	38	98	75	135			
28	.518	.16		2145	690	24	*3900	7.6	2.1	20	99+	86	7	99	30	90			
29	.199	.186	4-10	3220	376	31	*5550	7.6	1.9	5	99+	8	6	99	10	92			
30	.228	.165	2-12	3150	865	24	6200	7.3	1.4	200	94	380	443	49	842	570			
31	.295	.160	2-12	3820	755	27	7450	7.5	1.4	325	96	553	438	42	1078	675			
TOT.	8.7	6.522										6940			12374				
MAX	.518	.32	12	4825	4310	45	9100	7.6	2.1	405	99+	1334	865	99	2230	1120			
MIN	.194	.16	2	975	277	19	1875	7.2	0.8	5	86	8	6	9	10	60			
AVG	.28	.21		2817	1030		5377					223			412	275			
PERM. EFFLUENT LIMITATIONS WEEKLY																			
PERM. EFFLUENT LIMITATIONS MONTHLY																			

I CERTIFY THAT I AM FAMILIAR WITH THE INFORMATION CONTAINED IN THIS REPORT AND THAT TO THE BEST OF MY KNOWLEDGE SUCH INFORMATION IS TRUE, COMPLETE AND ACCURATE.

Francis J. Klobertanz
NAME AND TITLE

[signature]
SIGNATURE

WASTEWATER TREATMENT PLANT PROCESS CONTROL REPORT

2/3

PLANT TYPE Activated Sludge

OPERATOR(S) Francis J. Klobertanz

RECEIVING STREAM Chehalis River (via STP)

Eldon Evens

CERTIFICATION GRADE II

TK. FILTER				AERATION BASIN — CHANNEL #1						CHANNEL #2							CLARIFER			
D.O. mg/l	pH	Eff. COD mg/l	Total S.S. mg/l	D.O. mg/l	Temp. C	pH	MLSS mg/l	Sett ml/l	TF Sol COD	D.O. mg/l	pH	MLSS mg/l	Sett ml/l	S.A./MCRT	SVI	F/M	D.O. mg/l	RSS gpm	RSS S.S. mg/l	Vol. (gal.) Wasted
5.4	7.8	2375	650	0.3	17	7.5	6160	600		0.3	7.4	7800	800	16/7	98	.13	0.4	150	11940	2500
4.9	7.6	1600	500	1.7	18	7.4	5380	550		3.8	7.3	6120	575	13/7	99	.14	0.9	156	12280	1100
6.8	7.9	1650	710	0.6	18	7.3	5560	600		2.9	7.3	6100	650	13/30	107	.11	0.3	150	11080	5000
5.6	7.6	925	367	2.4	18	7.4	4140	500	6920	3.4	7.3	6340	675	31/53	106	.05	0.3	180	9040	3000
4.4	7.9	1190	720	0.8	17	7.4	5200	475	6800	3.8	7.3	6360	675	10/24	96	.09	0.5	180	8100	12000
5.2	6.6	1750	1180	0.4	16	7.4	5460	650		1.8	7.3	6860	650	25/24	110	.10	0.6	160	8340	13200
0.3	7.9	5330	1380	0.5	17	7.4	5840	625	580	1.1	7.3	6640	700	7/40	106	.16	0.4	160	8300	8000
0.1	7.2	5050	1100	0.1	18	7.5	5800	725	505	0.2	7.4	6900	875	9/24	125	.31	0.2	160	9240	12000
0.2	7.6	6200	3820	1.0	20	7.3	7260	800	300	1.2	7.2	6540	700	3/21	107	.28	0.3	160	10880	12000
4.9	7.9	2400	1900	2.0	20	7.3	6200	600	200	2.1	7.3	5940	625	5/24	105	.11	0.4	180	10240	9000
0.6	7.7	2650	2070	0.2	19	7.4	7280	825	325	0.05	7.3	7220	625	6/17	102	.11	0.3	180	9480	19700
3.4	8.3	1950	1220	0.7	18	7.5	6380	775	455	0.2	7.4	6760	775	8/14	118	.11	0.4	160	9200	12000
0.4	8.1	2700	2370	0.2	17	7.4	6680	925	325	0.8	7.4	7200	820	6/26	129	.11	0.3	160	9180	11000
0.3	8.0	4250	1820	0.4	20	7.4	6580	775	420	0.8	7.4	6680	700	5/15	114	.25	0.2	160	10820	13000
0.6	7.9	2850	1640	0.1	19	7.4	6920	770	420	0.6	7.4	6760	775	8/18	112	.12	0.2	160	9860	11000
1.2	8.1	3100	2070	0.4	18	7.6	7260	675	685	1.9	7.4	7700	675	7/19	90	.13	0.4	150	10600	16000
4.0	8.2	2250	1710	0.8	17	7.6	7080	725	215	1.4	7.6	7660	700	8/34	91	.07	0.2	160	9560	8000
		3400		0.2	19.5	7.5	7100	925		0.2	7.5	7560	875	22/27	116	.12	0.2	160	10020	10000
				0.3	21	7.4	8060	950		0.3	7.4	7560	900	57/24	117	.08	0.2	160	10420	14000
4.5	8.1	3125	3320	0.2	21	7.3	7300	800	925	0.4	7.4	8340	785	5/14	115	.14	0.3	160	10460	14000
4.1	7.8	2375	1625	0.1	18	7.3	8900	925	925	0.3	7.4	8700	895	9/28	101	.04	0.3	160	11060	18000
2.5	8.0	2050	1400	0.2	19	7.4	6340	675	470	1.3	7.4	6700	700	7/17	104	.11	0.2	160	10440	12000
0.6	8.9	3625	2100	0.3	19	8.1	7280	850	850	0.8	7.8	7000	725	6/24	104	.17	0.2	160	9800	11700
4.2	8.0	2150	1360	0.2	18	7.8	6120	850	430	1.1	7.8	7400	875	7/19	122	.13	0.5	160	10440	19000
	7.7			0.4	21	7.6	7640	800		1.3	7.6	7860	700	7/19	89	.13	0.3	160	9200	10800
5.0	8.6	1900	1440	0.2	20	7.8	6900	900	420	0.6	7.7	7280	900	10/24	124	.11	0.3	180	10,000	13200
5.8	8.3	1525	920	0.9	19	7.6	7040	810	370	1.4	7.6	8900	725	16/17	81	.06	0.6	180	10,300	12000
4.5	7.8	1220	750	2.2	18	7.4	7380	750	250	3.2	7.6	7720	760	21/25	117	0.05	0.6	170	9780	11000
0.6	7.4	3350	2280	0.2	18	7.6	5890	875	850	0.6	7.6	6700	875	5/23	140	0.15	0.7	170	4560	18000
4.4	7.9	5550	5400	0.8	18	7.5	7120	775	760	1.4	7.5	7560	750	5/14	99	0.19	0.2	170	9780	14500
4.5	8.1	5500	3000	0.8	18.5	7.5	6580	750	600	1.1	7.5	6800	725	5/12	107	0.20	0.3	170	9140	14000
6.8	8.9	4200	3820	2.4	21	8.1	8900	500		3.8	7.8	8900	575	51/53	81	.31	.7	180	12280	18700
0.1	6.6	925	367	0.1	16	7.3	4140	950		0.2	7.3	5940	900	3/7	125	.05	.2	150	8100	2500

REMARKS INF. SS 56,025 lb. INF BOD 156,506 lb. X̄ 5048 lb/da.

TF BOD 13 March 1850 14 March 2225 15 March 1675 16 March 1560 17 March 1660

TF Sol BOD 8 March 217; 9 March 168, 10 March ~~108~~ 102, 14 March 15 March 224

16 March 310 17 March 66 20 March 23 March 317

WASTEWATER TREATMENT PLANT PROCESS CONTROL REPORT

March 84

				AEROBIC DIJESTER										SLUDGE HAULING				
				D.O. mg/l	pH	MLSS mg/l	MLVSS mg/l	T.S. mg/l	Vol. ft.					Amount Haul. gal.	S.S. mg/l	V.S. mg/l	T.S. mg/l	
														6600			12800	
														6600		14320	17920	
														6600			1830	
														—			—	
														6600			14900	
														13000			15600	
														13000			14300	
														6600			17000	
														13000			18100	
														6500		14340	17420	
														—			—	
														13000			17180	
														13000			17660	
														—			—	
														6600			17600	
														6600			17300	
														6500			16180	
														—			—	
														—			—	
														19800			15700	
														—			—	
														—			—	
														6500		15420	18780	
														—		—	—	
														—		—	—	
														19800			18400	
														6500		14300	17820	
														19800		13700	17700	
														6600		11,000	14240	
														19,500		11,000	14050	
														222,800				
													$\bar{x}$	7200				

MAIL TO: APPROPRIATE REGIONAL OFFICE, DEPARTMENT OF ECOLOGY