STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

January (Month), 19 77

Marshall (Municipality), Michigan

Robert J. Swihart
Superintendent's Signature

ID 1300291 (Plant No.) 01 (Mo) 77 (Yr.) 500 (Sampling Point Code)

DAY	WEATHER		FLOW		RAW SEWAGE QUALITY											REMARKS OR	
	TYPE	PRECIP.	TOTAL	MAX RATE	TEMP	pH	BOD-5		SS		TOTAL-P		VSS	NH_3 N			
1 2	9	14	19	24	29	34	39	44	49	54	59	64	69	74	78	80	9	14
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l		C		
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610		C		
SF																C		
01	5	.02	2.32		51	7.9										C		
02	3		2.44		51	7.8	92	1872	84	1709	3.7	75	72			C		
03	3		2.56		51	7.8	81	1729	108	2306	4.7	100	78			C		
04	3		2.50		51	7.9	96	2001	122	2544	3.9	81	89			C		
05	3		2.48		51	8.0	68	1406	126	2606	4.1	85	76			C		
06	5	.03	2.50		51	8.0	76	1585	110	2294	5.1	106	84			C		
07	5	.02	2.40		51	7.7										C		
08	5	.04	2.34		51	8.0										C		
09	5	.18	2.38		51	8.1	60	1191	70	1389	4.5	89	60			C		
10	5	.03	2.46		50	8.0	81	1662	128	2626	5.0	103	94			C		
11	1		2.44		50	8.1	86	1750	96	1953	4.5	92	84			C		
12	1		2.46	2.70	50	8.0	68	1395	74	1518	4.2	86	50			C		
13	5	.65	2.44	2.80	50	8.2	76	1547	92	1872	4.2	85	72			C		
14	5	.03	2.42	2.90	50	8.2										C		
15	5	.04	2.30	2.80	50	8.1										C		
16	5	.03	2.20	2.70	50	8.1	75	1376	122	2238	3.5	64	100			C		
17	5	.05	2.48	2.80	50	8.3	65	1344	90	1861	3.8	79	64			C		
18	3		2.45	2.80	50	7.8	80	1635	124	2534	3.6	74	64			C		
19	3		2.44	3.00	50	8.1	84	1709	92	1872	4.1	83	64			C		
20	5	.01	2.39	2.80	50	8.0	78	1555	88	1754	4.1	82	58			C		
21	3		2.35	2.60	50	8.1										C		
22	3		2.35	2.70	50	8.1										C		
23	3		2.33	2.60	50	8.1	68	1321	76	1477			68			C		
24	3		2.45	3.00	50	7.8	71	1451	101	2064	3.6	74	62			C		
25	5	.04	2.44	3.50	50	8.0	84	1709	106	2157	3.9	79	80			C		
26	5	.04	2.42	3.20	50	8.0	62	1251	96	1938	3.5	71	62			C		
27	5	.10	2.44	3.20	49	8.1	60	1221	104	2116	4.3	88	88			C		
28	3		2.38	3.00	49	8.1										C		
29	3		2.36	2.80	44	8.0										C		
30	3		2.37	2.90	49	7.9										C		
31	5	.01	2.42	3.20	49	8.1										C		
TL		.72	74.71					30,710		40,828		1596				C		
ME			2.41				76	1536	100	2041	4.1	84	73			C		

EPA Region 5 Records Ctr.
201249

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

January , 19 77
Month

Marshall , Michigan
Municipality

Robert J. Swahnell
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID 130.029 01 77 ...
Plant No Mo. Yr. Sampling Point Code

DAY	BOD-5 9 14		SS 19 24		TOTAL-P 29 34		VSS 39	NH_3-N 44	REMARKS OR OTHER PARAMETERS 49	54	59	64	69	74 78	80	9	14
1 2	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l							C		
PN	00310	85001	00530	85002	00665	85004	00535	00610							C		
SF															C		
01															C		
02															C		
03	56	1196	58	1238	1.0	21	48								C		
04	65	1355	30	626	2.5	52	20								C		
05	44	910	52	1076	1.8	37	24								C		
06	53	1105	60	1251	2.0	42	52								C		
07															C		
08															C		
09	57	1131	74	1469	5.1	101	60								C		
10	80	1641	56	1149	3.9	80	40								C		
11	71	1445	48	977	3.7	75	42								C		
12	43	912	22	451	3.2	66	18								C		
13	50	1017	46	936	3.4	69	28								C		
14															C		
15															C		
16	53	972	56	1027	3.4	62	12								C		
17	45	931	52	1076	3.5	72	24								C		
18	48	981	58	1185	3.1	63	22								C		
19	51	1038	34	773	3.3	67	32								C		
20	53	1056	16	319	3.5	70	10								C		
21															C		
22															C		
23	58	1127	48	933			40								C		
24	47	960	38	776	3.3	67	26								C		
25	47	956	22	448	3.4	69	16								C		
26	36	727	44	888	3.0	61	26								C		
27	38	773	44	895	3.5	71	24								C		
28															C		
29															C		
30															C		
31															C		
TL		20183		17493		1145									C		
ME	52	1062	43	921	3.1	64	30								C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

January (Month), 19 77 — Marshall (Municipality), Michigan — Robert J. Swakwell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
ID 130029 (Plant No.) 01 (Mo) 77 (Yr) .. (Sampling Point Code)

DAY 1 2	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification 14
	Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MLSS 34	MLVSS 39	SETTL. 44	SDI 49	DO 54	Air Applied 59	SS 64	VSS 49	Percent Return 74	80	Waste Sludge 9	
	KCF	KCF	HRS.	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu. Ft.	%	%	%	C	KGal	See Code*
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF											4				C		
01	48		3.7								167			46	C	29	
02			3.5								167			45	C	14	
03			3.4	6.3	.25	2257	1584	22.0	1.03	2.5	163	.84	69	43	C	40	
04			3.4	7.2	.22	2483	1227	20.0	1.24	4.2	164	.87	69	44	C	39	
05			3.5	6.6	.24	2179	1507	20.0	1.09	4.2	164	.76	68	44	C	39	
06			3.4	5.8	.29	2000	1294	19.0	1.05	4.0	159	.75	58	43	C	26	
07			3.6	6.5	.25	2139	1466	20.0	1.07	3.5	165	.78	67	44	C	27	
08			3.7								166			45	C	52	
09			3.6								169			45	C	44	
10			3.5	4.9	.29	1915	1295	17.5	1.09	4.4	155	.70	67	43	C	6	
11			3.5	6.0	.28	2202	1473	20.0	1.10	4.0	151	.81	67	45	C	24	
12			3.5	6.8	.26	2294	1571	21.0	1.04	3.1	145	.84	67	43	C	22	
13			3.5	6.2	.26	2157	1462	23.0	.94	2.7	146	.85	65	45	C	40	
14			3.6	6.6	.24	2230	1514	21.0	1.06	3.5	149	.81	66	45	C	24	
15			3.7								150			47	C	56	
16			3.9								147			50	C	8	
17			3.5	6.4	.20	2230	1983	21.5	1.04	3.3	146	.81	77	44	C	32	
18			3.5	7.1	.26	2319	1453	22.0	1.05	2.3	145	.78	66	44	C	32	
19			3.6	7.3	.23	2276	1538	22.0	1.03	3.6	145	.80	67	45	C	65	
20			3.6	5.8	.25	1953	1313	17.0	1.15	2.9	142	.66	66	48	C	2	
21			3.7	6.4	.23	2161	1440	20.0	1.05	1.6	142	.79	68	45	C	31	
22			3.7								152			47	C	28	
23			3.7								145			46	C	24	
24			3.5								141			44	C	30	
25			3.6	8.2	.23	2171	1488	21.0	1.03	1.8	143	.80	63	45	C	30	
26			3.6	7.4	.25	2143	1327	21.0	1.02	1.0	143	.74	65	45	C	21	
27			3.6	6.7	.21	2256	1504	21.0	1.07	2.6	145	.77	64	44	C	46	
28			3.6								147			50	C	23	
29			3.6								150			51	C	57	
30			3.6								149			51	C	23	
31			3.6								154			44	C	0	
TL															C	915	
ME	48		3.6	6.6	.25	2184	1497	20.5	1.07	3.0	152	.78	67	45	C	30	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

January, 19 77 — Month

Marshall, Michigan — Municipality

Robert J Swahell — Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
ID	130029	0.1	7.7	0.00
	Plant No	Mo	Yr	Sampling Point Code

DAY	BOD-5			SS			TOTAL-P			VSS	NH_3-N	pH	DO	F COLI*		T COLI*	REMARK
	9	14	19	24	29	34	39	44	49	54	59	64	69	74	80	9	14
1 2	mg/l	LBS	% Rem	mg/l	LBS	% Rem	mg/l	LBS	% Rem	mg/l	mg/l	SU	mg/l	#/100 ml	C	#/100 ml	
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 31615	C	31504 31505	
SF															C		
01												7.9			C		
02	17	346	75	20	407	76	.47	9.6	88	13		7.9			C		
03	19	406	62	21	448	81	.93	19.8	79	16		7.9	5.7	22	C		
04	21	438	75	6	125	95	.90	18.8	76	4		7.7	6.1	14	C		
05	8	165	88	12	248	90	.46	9.5	89	2		7.8	6.3	20	C		
06	7	146	91	15	313	86	.34	7.1	93	13		7.8	6.0	24	C		
07												7.7	6.1	28	C		
08												7.8			C		
09	8	159	87	9	179	87	.67	13.3	85	8		7.8			C		
10	20	410	75	9	185	93	.73	14.9	91	5		7.8	7.0	46	C		
11	14	285	84	4	81	96	.60	12.2	87	3		7.9	6.8	28	C		
12	11	226	84	3	62	96	.59	12.1	86	2		8.0	5.7	14	C		
13	12	244	84	6	122	93	.51	10.3	88	5		8.1	5.5	14	C		
14												8.1	6.1	12	C		
15												8.0			C		
16	12	220	84	20	367	83	.55	10.0	84	17		8.1			C		
17	10	207	85	14	290	84	.73	15.0	79	3		8.0	6.0	8	C		
18	8	163	90	16	327	87	.55	11.2	85	4		7.6	5.6	12	C		
19	11	224	87	5	102	95	.60	12.2	85	4		7.9	5.4	10	C		
20	11	219	86	1	20	99	.88	17.5	79	1		7.9	5.8	8	C		
21												8.0	4.9	16	C		
22												7.9			C		
23	22	428	68	3	58	96				2		7.9			C		
24	17	347	76	14	286	86	1.00	20.4	72	6		7.8			C		
25	10	203	88	4	81	96	.61	12.4	84	3		7.8	4.6	16	C		
26	10	202	84	11	222	89	.72	14.3	79	4		7.8	3.8	38	C		
27	6	122	90	10	203	90	.54	10.9	87	12		8.0	5.0	18	C		
28												8.0			C		
29												8.0			C		
30												7.9			C		
31												7.9			C		
TL		5160			4126			2515							C		
ME	13	258	82	10	206	90	.65	13.2	84	6		7.9	5.7	18	C		
WA	14	296	79	13	272	87	.73	14.7	80					26	C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

January, 19 77 (Month) — Marshall, Michigan (Municipality) — Robert J. Swahull (Superintendent's Signature)

1 2	3 8	9 10	11 12	13 15
ID	130029	01	77	
	Plant No	Mo	Yr	Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX FUEL 14 GAS CF	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS	39 $FeCl_3$ LBS	44	49	54	59
PN											
SF		2									
01		116	3240			20	298				
02		106	3360			20	298				
03		96	3600			20	496				
04	2.0	100	3600			30	496				
05	2.0	95	3600			30	596				
06	1.5	104	3600			20	596				
07	1.5	118	3600			20	496				
08	1.0	122	3240			20	298				
09	1.0	133	3480			20	496				
10	1.0	120	3600			20	397				
11	1.0	155	3600			20	397				
12	1.0	126	3720			40	596				
13	1.0	130	3600			20	596				
14	1.0	106	3360			20	397				
15		131	3240			20	199				
16		160	3360			20	298				
17		149	3720			30	596				
18	1.0	121	3480			20	496				
19		124	3600			20	496				
20		110	3480			30	496				
21		101	3240			20	496				
22	1.5	105	3240			20	298				
23	.5	97	3240			20	496				
24	1.0	95	3480			20	397				
25	1.0	106	3480			20	596				
26		119	3480			20	596				
27		124	3720			20	397				
28	1.0	137	3720			40	596				
29	1.0	122	3480			20	397				
30		116	3480			20	298				
31		100	3720			20	496				
TL	21.0	3644	108360			700	14097				
ME	.7	118	3495			22.6	455				

MANPOWER

POSITION TITLE	No Full Time	No. Part Time	Total Hours
TOTAL	4		840
Superintendent	1		168
Asst Supt	1		168
Shift Foreman			
Shift Operator	3		504
Maint Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL

WEEKDAYS 11 HRS

SATURDAYS 4 HRS

SUNDAYS 4 HRS

HOLIDAYS 4 HRS

Digester Volume, ft³
Primary _____
Secondary _____

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MDPH
D-45

Supernatant To _____
Process Pattern _____

MONTH January 1922

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE					DIGESTING SLUDGE						SUPERNATANT								DIGESTED SLUDGE				Gas Produced cu ft X
	Gals. X 100	Total Solids %	Vol. Solids %	Vol. Solids Lbs 1000 c.f. Digester	pH	Temp. °F	pH	Total Solids -	Vol. Solids ~	Vol. Acids Mg/l	Alkalinity Mg/l	Gals X	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	P Mg/l	P Lbs	5 Day BOD Mg/l	Gals. X	Total Solids %	Vol. Solids %	pH	
1	60	2.9	79		6.7																			
2	60	4.5	68		6.8																			
3	60	4.2	62		6.6																			
4	60	4.9	61		7.0																			
5	60	4.4	69		7.1																			
6	60	4.8	66		6.9																			
7	60	4.6	63		7.1																			
8	60	4.5	72		7.2																			
9	60	4.3	61		7.1																			
10	60	4.2	59		7.1																			
11	60	4.4	64		6.9																			
12	60	4.3	65		7.0																			
13	60	3.9	25		7.0																			
14	60	6.1	41		7.0																			
15	60	4.3	69		6.8																			
16	60	4.4	65		6.9																			
17	60	4.7	72		7.0																			
18	60	4.4	69		7.1																			
19	60	4.1	75		7.0																			
20	60	2.9	75		7.0																			
21	60	4.6	66		6.9																			
22	60	4.1	74		7.0																			
23	60	4.7	65		7.0																			
24	60	4.3	70		7.0																			
25	60	4.8	57		7.0																			
26	60	4.8	69		7.2																			
27	60	5.2	64		7.0																			
28	60	4.8	64		6.9																			
29	60	4.6	64		6.8																			
30	60	5.5	58		6.9																			
31	60	4.6	66		6.8																			
TOTAL	1860																							
ARITH MEAN	60	4.5	64																					

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

February (Month), 19 72 — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2 | 3 8 | 9 10 | 11 12 | 13 15
IP | 130029 | 02 | 72 | 500
Plant No. | Mo | Yr | Sampling Point Code

DAY 1 2	WEATHER TYPE 9	WEATHER PRECIP 14	FLOW TOTAL 19	FLOW MAX RATE 24	RAW SEWAGE QUALITY TEMP 29	pH 34	BOD-5 39 44		SS 49 54		TOTAL-P 59 64		VSS 69	NH_3-N 74 78	80	REMARKS OR 9	14
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l	C		
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C		
SF															C		
01	3		2.37	3.10	49	8.2	74	1463	112	2214	3.00	59	94		C		
02	5	.05	2.39	3.20	49	8.1	68	1355	166	3309	5.00	100	138		C		
03	3		2.35	3.10	49	8.1	57	1117	128	2509			80		C		
04	5	.12	2.35	3.10	50	7.6									C		
05	1		2.42	3.10	49	8.0									C		
06	1		2.36	3.00	49	7.7	69	1358	114	2244	3.75	74	94		C		
07	1		2.42	3.20	49	7.9	59	1191	144	2906	3.50	71	66		C		
08	1		2.42	3.10	48	8.0	86	1736	106	2137	4.80	97	78		C		
09	1		2.42	3.20	49	7.9	68	1322	98	1923	3.55	78	52		C		
10	1		2.44	3.20	49	7.7	62	1262	96	1954	3.95	80	76		C		
11	1		2.52	3.20	49	7.2									C		
12	5	.02	2.55	3.10	49	7.1									C		
13	3		2.37	2.90	49	7.0	65	1285	150	3964			134		C		
14	1		2.44	3.30	49	7.9	68	1384	130	2645	4.10	83	102		C		
15	1		2.46	3.30	49	7.8	74	1518	112	2298	3.50	72	78		C		
16	1		2.39	3.20	49	7.8	62	1236	66	1316			54		C		
17	1		2.54	3.50	49	7.7	72	1525	136	2881	3.85	82	92		C		
18	3		2.65	3.40	49	7.8									C		
19	3		2.57	3.20	49	7.7									C		
20	1		2.53	3.00	49	7.4									C		
21	1		2.73	3.60	49	7.8	53	1207	74	1685	2.95	67	64		C		
22	1		2.71	3.60	49	8.0	100	2260	140	3164	3.95	89	98		C		
23	4	.22	2.77	3.70	49	8.0	48	1108	114	2634	3.75	87	84		C		
24	4	.04	2.85	3.80	49	7.9	62	1474	80	1902	3.40	81	48		C		
25	1		2.77	3.80	49	7.9									C		
26	485	.07	2.70	3.20	49	8.0									C		
27	5	.03	2.64	3.20	49	7.7	68	1526	62	1391	2.95	66	50		C		
28	1		2.81	3.60	49	7.7	77	1805	154	3609	4.00	94	78		C		
29															C		
30															C		
31															C		
TL		.55	70.99					27182		45742		1280			C		
ME			2.54				68	1431	115	2407	3.77	80	82		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

February, 19 77
Month

Marshall, Michigan
Municipality

Robert J. Swahull
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID 130029 02 77
Plant No Mo Yr. Sampling Point Code

DAY	BOD-5 9 14		SS 19 24		TOTAL-P 29 34		VSS 39	NH_3-N 44	REMARKS OR OTHER PARAMETERS 49	54	59	64	69	74	78 80	9	14	1
1 2	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l							C			
PN	00310	85001	00530	85002	00665	85004	00535	00610							C			
SF															C			
01	57	1127	50	985	3.40	67	44								C			
02	41	817	50	997	4.60	92	42								C			
03	35	686	72	1411			28								C			
04															C			
05															C			
06	50	984	50	984	3.60	71	36								C			
07	41	827	106	2139	3.40	69	38								C			
08	58	1171	28	565	3.75	76	16								C			
09	50	1004	44	888	3.85	78	26								C			
10	47	954	40	814	3.75	76	32								C			
11															C			
12															C			
13	58	1146	22	435			10								C			
14	51	1038	60	1221	3.75	76	42								C			
15	50	1026	38	780	3.05	62	31								C			
16	45	897	26	518			22								C			
17	33	699	34	720	3.40	72	6								C			
18															C			
19															C			
20															C			
21	35	751	40	911	2.70	61	34								C			
22	42	949	38	859	3.20	72	18								C			
23	36	832	48	1104	2.75	64	26								C			
24	48	1141	26	618	2.50	59	14								C			
25															C			
26															C			
27	32	718	32	718	2.60	58	20								C			
28	60	1406	58	1359	2.90	68	48								C			
29															C			
30															C			
31															C			
TL		18180		18034		1121									C			
ME	46	957	45	949	3.32	70	28								C			

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

February, 19 77
Month

Marshall, Michigan
Municipality

Robert J Swahill
Superintendent's Signature

1 2 | 3 8 | 9 10 | 11 12 | 13 15
ID | 130029 | 02 | 77 | ..
Plant No | Mo. | Yr. | Sampling Point Code

DAY 1 2	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification 14
	Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MLSS 34	MLVSS 39	SETTL. 44	SDI 49	DO 54	Air Applied 59	SS 64	VSS 49	Percent Return 74	80	Waste Sludge 9	
	KCF	KCF	HRS	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu. Ft	%	%	%	C	KGal	See Code*
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF											4				C		
01	48		3.6	9.3	.20	2282	1542	21.0	1.09	2.1	160	.84	67	44	C	35	
02			3.6	8.1	.20	2263	1526	20.0	1.13	1.7	157	.88	66	45	C	33	
03			3.7	7.7	.18	2325	1532	20.5	1.13	2.5	155	.86	65	46	C	37	
04			3.7	7.3	.19	2303	1516	20.0	1.15	2.6	155	.76	64	45	C	53	
05			3.6								164			44	C	52	
06			3.7								160			45	C		
07			3.6	4.3	.25	1727	1144	16.0	1.08	2.9	163	.64	66	45	C		
08			3.6	5.2	.25	2063	1215	19.0	1.00	3.7	162	.73	46	45	C		
09			3.6	5.9	.20	2287	1558	20.0	1.14	3.5	154	.87	67	44	C	11	
10			3.5	6.2	.19	2369	1603	21.0	1.13	2.5	153	.92	63	42	C	14	
11			3.4	7.0	.20	2415	1612	21.0	1.15	2.8	152	.90	65	41	C	37	
12			3.4								144			37	C	101	
13			3.6								155			32	C		
14			3.5	5.0	.28	1695	1134	16.0	1.06	4.5	160	.62	67	43	C		
15			3.5	6.2	.24	2030	1370	19.0	1.07	4.3	167	.74	67	48	C		
16			3.6	9.1	.21	2251	1496	21.0	1.07	3.3	164	.80	65	46	C		
17			3.4	9.0	.20	2423	1599	22.0	1.10	3.2	159	.89	66	46	C	42	
18			3.3	7.9	.22	2226	1483	21.0	1.06	3.3	154	.83	62	40	C	10	
19			3.4								158			42	C	8	
20			3.4								160			42	C	13	
21			3.2								157			39	C	51	
22			3.2	7.3	.23	2045	1358	21.0	.97	3.0	151	.83	65	39	C	39	
23			3.1	7.3	.19	2318	1579	19.0	1.22	2.0	144	.81	66	39	C	14	
24			3.0	8.0	.21	2295	1518	21.0	1.09	3.0	170	.81	65	45	C	26	
25			3.1	9.2	.16	2415	1575	23.0	1.05	2.7	165	.79	66	45	C	40	
26			3.2								162			45	C	5	
27			3.2								162			45	C	1	
28			3.1	7.6	.19	2334	1532	22.0	1.06	3.6	165	.81	65	45	C	36	
29															C		
30															C		
31															C		
TL															C	688	
ME	48		3.4	7.2	.21	2211	1469	19.1	1.09	3.0	158	.81	64	43	C	25	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

February (Month), 19 72 — Marshall (Municipality), Michigan — Robert J. Swahill (Superintendent's Signature)

1 2 | 3 8 | 9 10 | 11 12 | 13 15
ID | 1300279 | 02 | 72 | 000
Plant No. | Mo | Yr. | Sampling Point Code

DAY	BOD-5			SS			TOTAL-P			VSS	NH_3-N	pH	DO	F. COLI*		T. COLI*	REMARKS
1 2	mg/l	LBS	% Rem.	mg/l	LBS	% Rem.	mg/l	LBS	% Rem	mg/l	mg/l	SU	mg/l	# / 100 ml	C	# / 100 ml	
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 ~~31615~~	C	31504 31505	
SF															C		
01	12	237	84	6	119	95	.55	10.8	82	4		7.9	4.2	174	C		
02	8	159	91	7	140	96	.86	17.1	83	5		7.9	4.4	30	C		
03	4	78	93	18	353	86				7		7.x	5.3	40	C		
04												7.7	5.8	12	C		
05												7.x			C		
06	7	138	90	15	295	87	.98	19.2	74	3		7.7			C		
07	8	161	96	36	727	75	.73	14.7	84	5		7.8	7.0	10	C		
08	6	121	93	7	141	93	1.00	20.1	79	3		7.9	6.1	8	C		
09	6	121	91	8	161	93	.70	14.1	82	5		7.9	5.7	6	C		
10	6	122	90	2	41	98	.88	17.9	78	1		7.7	5.2	10	C		
11												7.7	5.8	4	C		
12												7.5			C		
13	10	198	85	10	198	95				8		7.2			C		
14	4	81	94	7	142	95	.86	17.5	79	4		7.2	7.1	18	C		
15	4	82	95	11	226	90	.70	14.3	80	3		7.x	7.1	18	C		
16	5	100	92	4	80	97				2		7.9	5.8	6	C		
17	4	85	94	17	360	88	.79	16.7	79	12		7.8	6.0	14	C		
18												7.8	5.7	10	C		
19												7.5			C		
20												7.7			C		
21	5	114	91	3	68	96	.70	15.9	76	2		7.7			C		
22	7	158	93	6	136	96	.83	18.7	79	1		7.8	6.0	10	C		
23	5	116	96	14	323	88	.77	17.7	79	3		7.8	2.8	4	C		
24	6	143	90	4	95	95	.61	14.4	82	3		7.8	5.7	8	C		
25												7.x	5.8	10	C		
26												7.7			C		
27	8	179	88	8	179	92	.60	13.4	80	6		7.7			C		
28	7	164	91	13	305	92	.79	18.5	80	10		7.7	6.4	14	C		
29															C		
30															C		
31															C		
TL		2257			4084			2610							C		
ME	6	135	91	10	215	91	.77	16.3	80	5		7.7	5.7	12	C		
WA	7	145	90	14	277	89	.86	17.2	79					20	C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

February, 19 77 — Month

Marshall, Michigan — Municipality

Robert J. Swalwell — Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
ID	130029	02	77	
	Plant No	Mo	Yr	Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX. FUEL 14 GAS CF	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS	39 $FeCl_3$ LBS	44	49	54	59
PN											
SF		2									
01	1.5	85	3600			20	496				
02	.5	84	3600			20	596				
03	.5	71	3480			20	496				
04		77	3120			20	298				
05		94	3360			30	397				
06		103	3480			30	298				
07		95	3600			20	596				
08	4.0	79	3600			20	596				
09	1.5	76	3600			20	397				
10		45	3360			20	596				
11	2.0	56	3240			20	397				
12	.5	52	3000			20	397				
13	2.0	53	3120			20	496				
14	.5	77	3720			20	496				
15	1.0	87	3480			20	496				
16	1.0	84	3360			20	397				
17	1.0	68	3360			20	298				
18		60	3360			20	596				
19	1.0	59	3240			20	397				
20	.5	71	3120			20	298				
21	1.0	75	3360			20	496				
22	1.5	28	3480			20	496				
23	1.0	30	3240			20	496				
24	2.0	49	3480			20	496				
25	1.0	52	3600			20	596				
26	1.0	51	3120			20	496				
27	1.5	61	3120			20	596				
28	1.0	72	3720			20	596				
29											
30											
31											
TL	27.5	1884	94920			580	13302				
ME	1.0	67	3390			21	475				

MANPOWER

POSITION TITLE	No Full Time	No. Part Time	Total Hours
TOTAL	5		764
Superintendent	1		152
Asst Supt	1		152
Shift Foreman			
Shift Operator	3		460
Maint. Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL A

WEEKDAYS 11 HRS.

SATURDAYS 4 HRS

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

Digester Volume, ft³
Primary _____
Secondary _____

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MDPH
D 45

Supernatant To _____
Process Pattern _____

MONTH February 1977

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE					DIGESTING SLUDGE						SUPERNATANT								DIGESTED SLUDGE				Gas Produced cu. ft X
	Gals. X 100	Total Solids %	Vol. Solids %	Vol. Solids Lbs 1000 c.f. Digester	pH	Temp. °F	pH	Total Solids %	Vol. Solids %	Vol. Acids Mg l	Alkalinity Mg l	Gals. X	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg l	P Mg l	P Lbs	5-Day BOD Mg l	Gals. X	Total Solids %	Vol. Solids %	pH	
1	60	5.1	76		6.9																			
2	60	4.8	69		7.2																			
3	60	5.5	69		7.2																			
4	60	4.7	68		7.1																			
5	60	4.9	69		7.2																			
6	60	5.3	69		7.0																			
7	60	5.1	65		7.1																			
8	60	4.7	70		7.3																			
9	60	5.6	76		7.1																			
10	60	5.4	66		7.2																			
11	60	5.3	69		7.1																			
12	60	5.3	71		7.3																			
13	60	4.4	64		7.4																			
14	60	4.9	68		7.3																			
15	60	5.0	68		7.3																			
16	60	5.3	73		7.2																			
17	60	5.1	77		7.1																			
18	60	5.4	71		7.2																			
19	60	4.1	58		7.2																			
20	60	5.5	66		7.3																			
21	60	5.0	69		7.0																			
22	60	6.0	61		7.1																			
23	60	5.1	66		7.3																			
24	60	5.0	66		7.5																			
25	60	6.4	67		7.3																			
26	60	6.3	56		7.2																			
27	60	5.5	64		7.1																			
28	60	5.3	65		7.2																			
29																								
30																								
31																								
TOTAL	1680																							
AMTH. MEAN	60	5.3	68																					

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.7

Marshall, MICHIGAN

MONTH February, 1977 — VACUUM FILTER & INCINERATION DATA — OPERATOR R.J. Swalwell

DATE	SLUDGE TO FILTER				CHEMICALS TO FILTER				FILTER		FILTRATE						FILTER CAKE					INCINERATION			REMARKS
	Gal. X 10	Tot. Sol. %	Lbs. Dry Sol. X10	pH	Lbs. Dry X10	R	Lbs. Dry	R	Tot. Hours	Yield	Gal. X 100	pH	Sus. Solids Mg/l	Vol. Susp. Solids %	5 Day BOD Mg/l	P Mg/l	Thou. Lbs. Wet	Tot. Sol. %	Lbs. Tot. Solids X 10	Vol. Sol. %	Lbs. Vol. Solids X 10	Hrs. Opr.	Yield	Fuel BTU	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1	888	5.4	403	6.9	178	44	191	5	8.0	3.4	76	12.2	1584	6	1620		28	18.8	526	45	237				
2	888	4.7	351	7.3	178	51	191	5	8.0	2.9	76	11.3	1152	6	1440		28	21.1	591	46	272				
3	888	4.3	321	6.9	178	55	191	6	8.0	2.7	76	11.2	1064	7	1140		28	19.5	546	43	235				
4																									
5																									
6																									
7	888	4.9	366	7.0	178	49	191	5	8.0	3.1	76	11.3	1240	7	1560		28	21.6	605	39	236				
8	888	4.7	351	7.0	178	51	191	5	8.0	2.9	76	11.2	934	8	1620		28	19.7	552	54	298				
9	888	6.0	448	7.0	178	40	191	4	8.0	3.7	76	11.8	926	5	1380		28	26.2	734	56	411				
10	888	6.5	485	7.0	178	37	191	4	8.0	4.0	76	11.4	960	25	1680		28	21.3	596	45	268				
11	666	5.3	297	7.0	134	45	143	5	6.0	2.3	57	11.2	1362	4	1680		21	19.3	405	43	174				
12																									
13																									
14	888	5.1	380	7.1	178	47	191	5	8.0	3.2	76	11.4	1474	25	1500		28	20.9	585	45	263				
15	888	4.5	336	7.1	178	53	191	6	8.0	2.8	76	10.6	1306	4	1200		28	21.2	594	52	309				
16																									
17																									
18	944	4.0	317	7.0	190	60	202	6	8.5	2.5	81	11.2	1220	6	1300		30	22.0	660	37	244				
19																									
20																									
21																									
22	944	4.9	387	6.9	190	49	202	5	8.5	3.1	81	10.6	1324	8	1920		30	20.0	600	44	264				
23	888	4.3	321	7.0	178	55	191	6	8.0	2.6	76	11.4	986	6	960		28	20.6	577	44	254				
24	888	4.3	321	7.0	178	55	191	6	8.0	2.6	76	10.5	1086	20	1080		28	21.3	596	41	246				
25	888	7.1	530	7.4	178	34	191	4	8.0	4.4	76	11.3	1286	10	1260		28	22.4	627	39	245				
26																									
27																									
28	944	5.4	428	7.2	190	44	202	5	8.5	3.4	81	10.6	1568	10	1560		30	22.3	669	46	308				
29																									
30																									
31																									
Total	14154		6044		2840		3041		127.5		1212						447		9463		4261				
Arith. Means	884	5.1	378		178	48	190		8.0	3.2	76		1217	10	1431		28	21.1	591	45	266				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

March (Month), 19 77 — Marshall (Municipality), Michigan — Robert J. Swihart (Superintendent's Signature)

1 2 IP | 3 8 130.029 (Plant No) | 9 10 03 (Mo) | 11 12 77 (Yr) | 13 15 600 (Sampling Point Code)

DAY 1 2	WEATHER TYPE 9	WEATHER PRECIP 14	FLOW TOTAL 19	FLOW MAX 24 RATE	RAW SEWAGE QUALITY TEMP 29	pH 34	BOD-5 39 44		SS 49 54		TOTAL-P 59 64		VSS 69	NH_3-N 74 78	80	REMARKS OR 9	14
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l	C		
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C		
SF															C		
01	1		2.82	3.10	49	7.6	81	1905	84	1976	4.0	94	68		C		
02	3		2.70	3.50	49	7.7	86	1937	66	1486	2.8	63	54		C		
03	4	.64	2.78	3.50	49	7.7	62	1437	84	1948	3.6	83	70		C		
04	4	.38	2.96	3.60	50	7.7									C		
05	3		2.89	4.06	50	7.8									C		
06	5	.01	2.88	3.50	50	7.8	88	2114	98	2354	3.6	87	28		C		
07	1		2.91	3.60	49	7.7	59	1432	72	1947	4.0	96	58		C		
08	1		2.89	3.50	50	7.7	102	2458	76	1832	3.4	93	54		C		
09	1		2.85	3.60	53	7.5	70	1664	82	1949	3.3	74	46		C		
10	1		2.86	3.40	49	7.7	80	1908	122	2910	4.6	108	84		C		
11	4	.05	2.81	3.60	50	7.7									C		
12	4	.20	2.77	3.50	50	7.7									C		
13	4	.13	2.78	3.30	50	7.7	84	2063	52	1206	3.5	84	42		C		
14	1		2.87	3.60	50	7.7	96	2298	62	1484	4.0	96	50		C		
15	1		2.87	4.60	50	7.7	122	2920	124	2968	4.3	101	92		C		
16	3		2.82	4.00	50	7.6	74	1740	76	1787	3.2	74	52		C		
17	5	.66	2.79	3.80	50	7.8	93	2164	64	1489	3.5	81	26		C		
18	5	.02	2.76	3.40	50	7.8									C		
19	5	.36	2.76	3.40	50	7.9									C		
20	1		2.79	3.40	50	7.7	90	2094	70	1624	4.2	100	42		C		
21	5	.25	2.84	3.60	49	7.7	96	2314	68	1639	3.6	83	52		C		
22	1		2.86	4.00	49	7.7	75	1784	82	1956	3.3	77	70		C		
23	1		2.76	3.50	49	7.6	65	1496	122	2808	4.0	93	74		C		
24	1		2.79	3.50	49	7.6	88	2048	92	2141			40		C		
25	1		2.75	3.60	50	7.8									C		
26	1		2.66	3.50	50	7.8									C		
27	4	.63	2.78	3.40	50	7.5	86	1994	74	1716	3.8	95	72		C		
28	4	.66	2.96	3.50	51	7.5	96	2370	100	2468	3.6	87	80		C		
29	1		2.90	3.50	51	7.5	84	2032	84	2032	3.5	84	76		C		
30	4	.65	2.88	3.60	51	7.5	70	1681	94	2258	3.8	91	72		C		
31	3		2.83	3.60	51	7.5	68	1605	60	1416	3.5	83	42		C		
TL		4.92	87.62					45454		44188		1955			C		
ME			2.83				83	1976	83	1921	3.75	89	58		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

March (Month), 19 77 — Marshall (Municipality), Michigan — Robert J. Swahnll (Superintendent's Signature)

ID 130029 (Plant No) 03 (Mo) 77 (Yr) ... (Sampling Point Code)

DAY	BOD-5		SS		TOTAL-P		VSS	NH_3-N	REMARKS OR OTHER PARAMETERS
1 2	9 14		19 24		29 34		39	44	49 54 59 64 69 74 78 80
	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l	C
PN	00310	85001	00530	85002	00665	85004	00535	00610	C
SF									C
01	33	776	40	941	2.5	56	22		C
02	35	788	30	676	3.4	79	24		C
03	33	765	26	603	3.2	79	14		C
04									C
05									C
06	50	1201	76	1825	3.5	85	30		C
07	27	655	34	825	3.3	80	26		C
08	39	940	26	627	3.4	81	22		C
09	57	1355	48	1141	3.3	79	38		C
10	54	1288	70	1670	3.8	89	30		C
11									C
12									C
13	72	1669	42	974	4.3	103	30		C
14	53	1264	42	1005	2.9	69	32		C
15	62	1484	48	1149	3.4	80	44		C
16	44	1035	48	1129	3.0	70	20		C
17	59	1373	20	464	3.0	69	2		C
18									C
19									C
20	60	1369	46	1070	3.3	79	20		C
21	48	1157	46	1109	3.4	78	40		C
22	45	1073	42	1073	3.1	72	40		C
23	42	967	64	1473	3.7	86	46		C
24	54	1257	26	605			15		C
25									C
26									C
27	58	1345	44	1020	3.8	93	40		C
28	48	1185	34	839	3.4	82	26		C
29	48	1161	20	484	2.8	66	10		C
30	48	1153	46	1105	3.4	80	38		C
31	44	1038	30	708	3.2	75	18		C
TL		26330		22515		1232			C
ME	48	1145	41	979	3.3	78	27		C

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

March (Month), 19 77 — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2 | 3 8 | 9 10 | 11 12 | 13 15
IP | 13.0029 | 03 | 77 | ...
Plant No | Mo | Yr | Sampling Point Code

DAY 1 2	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification 14
	Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MLSS 34	MLVSS 39	SETTL 44	SDI 49	DO 54	Air Applied 59	SS 64	VSS 49	Percent Return 74	80	Waste Sludge 9	
	KCF	KCF	HRS	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu Ft	%	%	%	C	KGal	See Code*
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF											4				C		
01	48		3.1	8.8	.17	2748	1808	22.0	1.24	5.2	168	.80	65	45	C	69	
02			3.2	10.7	.19	2469	1594	19.0	1.27	6.2	165	.68	63	47	C	30	
03			3.1	13.8	.16	2568	1863	20.0	1.28	7.5	148	.89	51	45	C	44	
04			2.9	3.3	.27	1984	1257	18.0	1.10	2.5	151	.62	59	43	C	12	
05			3.0								165			45	C	44	
06			3.0								164			44	C	53	
07			3.0	7.0	.25	1942	1226	17.0	1.14	4.0	163	.67	69	44	C		
08			3.0	10.1	.23	2120	1371	21.0	1.01	2.6	156	.75	64	44	C	22	
09			3.0	6.0	.20	2306	1480	22.0	1.05	2.5	154	.75	62	44	C	30	
10			3.0	4.0	.18	2246	1514	22.0	1.02	3.4	154	.76	65	44	C	35	
11			3.1	7.4	.21	2407	1525	22.0	1.09	2.5	152	.79	61	44	C	26	
12			3.1								149			44	C	32	
13			3.1								153			44	C	42	
14			3.0	6.2	.22	2401	1575	23.0	1.04	2.3	154	.82	63	42	C	34	
15			3.0	6.1	.23	2347	1505	23.0	1.02	2.1	172	.84	63	42	C	41	
16			3.1	6.3	.24	2394	1523	22.0	1.09	3.0	167	.82	64	42	C	45	
17			3.1	14.3	.28	2238	1358	22.0	1.02	4.1	167	.78	63	41	C	25	
18			3.1	6.9	.23	2467	1636	24.0	1.03	2.8	167	.78	65	45	C	50	
19			3.1								172			46	C	19	
20			3.1								171			44	C	40	
21			3.0	6.0	.27	2133	1352	21.0	1.01	3.9	164	.78	61	42	C	23	
22			3.0	7.8	.22	2620	1573	22.0	1.19	2.9	172	.89	59	43	C	24	
23			3.1	11.0	.23	2213	1437	22.0	1.01	3.9	175	.82	63	43	C	26	
24			3.0	12.0	.41	2424	1575	24.0	1.01	3.5	176	.82	64	46	C	43	
25			3.1								172			45	C	28	
26			3.2								168			47	C	35	
27			3.1								157			45	C	34	
28			2.9								154			48	C	41	
29			3.0	14.0	.24	2266	1421	23.0	.98	3.0	157	.78	62	43	C	34	
30			3.0	6.1	.24	2248	1446	23.0	.98	2.7	163	.77	61	44	C	22	
31			3.0	9.7	.24	2308	1407	24.5	.87	3.5	168	.78	64	45	C	29	
TL															C	1039	
ME	48		3.1	8.4	.23	2313	1496	22.0	1.08	3.6	163	.78	62	46	C	35	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

March, 19 77
Month

Marshall, Michigan
Municipality

Robert J. Swahnell
Superintendent's Signature

1 2 | 3 8 | 9 10 | 11 12 | 13 15
ID | 1300219 | 03 | 77 | 000
Plant No | Mo | Yr | Sampling Point Code

DAY	BOD-5			SS			TOTAL-P			VSS	NH_3-N	pH	DO	F. COLI*		T. COLI*	REMARK
	9 14 19			24 29 34			39 44 49			54	59	64	69	74	80	9	14
1 2	mg/l	LBS	% Rem	mg/l	LBS	% Rem	mg/l	LBS	% Rem	mg/l	mg/l	SU	mg/l	#/100 ml	C	#/100 ml	
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 31615	C	31504 31505	
SF															C		
01	4	94	92	12	282	86	.60	14	79	8		7.4	7.0	12	C		
02	3	68	97	3	68	90	.74	17	79	2		7.8	8.2	10	C		
03	5	116	92	5	116	94	.41	10	86	3		7.7	4.5	18	C		
04												7.7	6.1	5	C		
05												7.7			C		
06	5	120	94	16	384	87	.47	11	87	2		7.8			C		
07	5	121	92	2	49	97	.49	12	88	1		7.8	6.5	28	C		
08	4	96	96	3	72	96	.46	11	88	2		8.1	5.4	26	C		
09	4	95	94	2	48	96	.44	10	87	1		7.5	5.3	22	C		
10	6	145	93	7	167	94	.54	13	88	2		7.7	5.8	12	C		
11												7.7	5.1	50	C		
12												7.6			C		
13	12	278	87	3	70	94	.74	18	79	2		7.6			C		
14	6	147	94	10	239	87	.74	18	82	6		7.6	6.4	46	C		
15	7	168	94	9	215	93	.74	17	83	7		7.6	6.0	16	C		
16	6	141	92	8	188	89	.63	13	80	5		7.6	6.9	6	C		
17	12	279	87	2	47	94	.41	9	88	1		7.7	8.0	2	C		
18												7.7	7.1	14	C		
19												7.7			C		
20	21	489	87	2	47	97	.57	14	86	1		7.7			C		
21	6	145	94	13	313	81	.66	15	82	3		7.8	7.9	6	C		
22	4	95	95	12	286	85	.69	16	79	11		7.8	7.3	14	C		
23	7	161	84	8	184	93	.59	14	85	7		7.5	7.6	6	C		
24	10	233	89	1	23	99				1		7.6	8.2	8	C		
25												7.7	7.8	6	C		
26												7.5			C		
27	23	533	73	6	139	92	.49	12	87	4		7.7			C		
28	8	197	92	5	123	95	.23	18	80	3		7.5	7.2	16	C		
29	5	121	94	6	145	97	.50	12	86	2		7.5	7.0	10	C		
30	7	168	90	11	264	88	.74	17	81	4		7.6	6.3	16	C		
31	9	212	87	4	94	93	.70	17	80	3		7.6	6.5	13	C		
TL		4117			3563			310							C		
ME	8	179	91	7	155	92	.60	14	84	4		7.7	7.0	12	C		
WA	12	235	86	8	191	89	.64	15	83					27	C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

March, 19 77 — Month

Marshall, Michigan — Municipality

Robert J. Swalwell — Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
ID	130029	03	77	
	Plant No	Mo	Yr	Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX FUEL 14 GAS	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS	39 $FeCl_3$ LBS	44	49	54	59
PN											
SF		2									
01	1.0	61	3600			20	596				
02	1.0	44	3360			20	596				
03	1.0	42	3480			20	596				
04	1.0	46	3480			20	695				
05	1.0	64	3360			20	496				
06	1.0	45	3360			20	496				
07	1.0	45	3480			20	794				
08	1.0	27	3360			40	596				
09	1.0	26	3240			20	596				
10	.5	25	3240			20	596				
11	.5	8	2640			20	397				
12	1.0	1	2760			20	596				
13	.5	4	3360			20	596				
14	.5	4	3240			20	596				
15	1.0	4	3240			20	695				
16	1.0	9	3360			20	596				
17	.5	33	3480			20	397				
18	.5	45	3240			20	496				
19	1.0	35	3240			20	596				
20	.5	41	3360			20	596				
21	.5	41	3360			20	496				
22	.5	44	3480			10	695				
23	1.5	40	3480			30	596				
24	.5	8	3480			30	397				
25	1.0	48	3120			20	397				
26	1.0	19	3000			20	298				
27	2.0	26	2760			20	496				
28	1.0	4	2880			20	794				
29	1.0	1	3240			20	397				
30	1.0	13	3120			20	496				
31	1.0	28	3360			20	397				
TL	26.5	881	101160			650	17077				
ME	.85	28	3263			21	551				

MANPOWER

POSITION TITLE	No. Full Time	No Part Time	Total Hours
TOTAL	5		920
Superintendent	1		184
Asst Supt	1		184
Shift Foreman			
Shift Operator	3		552
Maint Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL

WEEKDAYS 11 HRS

SATURDAYS 4 HRS

SUNDAYS 4 HRS

HOLIDAYS 4 HRS

Digester Volume, ft³
Primary
Secondary

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MDPH
D-4.5

Supernatant To
Process Pattern

MONTH March 1977

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE					DIGESTING SLUDGE						SUPERNATANT								DIGESTED SLUDGE				Gas Produced cu. ft X
	Gals.	Total Solids	Vol. Solids		pH	Temp.	pH	Total Solids	Vol. Solids	Vol. Acids	Alkalinity	Gals.	pH	Total Solids	Vol. Solids	Susp. Solids	P	P	5-Day BOD	Gals.	Total Solids	Vol. Solids	pH	
	186	%	%	Lbs/1000 c.f. Digester		°F		%	%	Mg/l	Mg/l	X		%	%	Mg/l	Mg/l	Lbs.	Mg/l	X	%	%		
1	74	5.8	65		7.3																			
2	74	6.0	61		7.2																			
3	74	6.0	59		7.1																			
4	74	6.0	68		7.3																			
5	74	6.1	55		7.3																			
6	74	6.3	65		7.3																			
7	74	5.8	61		7.2																			
8	74	6.1	69		7.2																			
9	74	6.3	58		7.0																			
10	74	6.0	61		7.1																			
11	74	6.5	62		7.0																			
12	74	6.1	59		7.0																			
13	74	6.3	63		7.0																			
14	74	6.4	70		6.9																			
15	74	5.8	62		7.0																			
16	74	5.5	67		7.0																			
17	74	5.6	62		7.2																			
18	74	6.0	64		7.2																			
19	74	5.0	76		7.2																			
20	74	4.7	55		7.2																			
21	74	5.4	69		7.1																			
22	74	5.5	71		7.1																			
23	74	6.0	69		7.2																			
24	30	6.0	65		7.2																			
25	62	5.2	66		7.2																			
26	62	5.3	66		7.1																			
27	62	5.3	65		7.0																			
28	62	5.6	70		7.2																			
29	62	5.3	64		7.2																			
30	62	5.5	69		7.2																			
31	62	5.3	73		7.2																			
TOTAL	2166																							
ARITH MEAN	70	5.8																						

MDPH
D-4.7

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH March, 1922 — VACUUM FILTER & INCINERATION DATA — OPERATOR R.J. Swalwell

DATE	SLUDGE TO FILTER				CHEMICALS TO FILTER				FILTER		FILTRATE						FILTER CAKE					INCINERATION			REMARKS
					CaO		FeCl3																		
	Gal. X 100	Tot. Sol. %	Lbs. Dry Sol. X10	pH	Lbs. Dry	R	Lbs. Dry	R	Tot. Hours	Yield	Gal. X 100	pH	Sus. Solids Mg/l	Vol. Susp. Solids %	5 Day BOD Mg/l	P Mg/l	Thou. Lbs. Wet	Tot. Sol. %	Lbs. Tot. Solids X 10	Vol. Sol. %	Lbs. Vol. Solids X 10	Hrs. Opr.	Yield	Fuel BTU	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1	133	5.5	614	7.0	1828	29	202	3	8.5	4.8	81	10.4	1642	7	1500		30	21.3	639	55	351				
2																									
3	125	5.6	588	6.8	1720	29	191	3	8.0	4.9	76	10.5	1292	7	1560		28	19.9	580	42	243				
4	117	4.9	482	7.2	1613	33	179	4	7.5	4.3	71	11.1	1346	6	1440		26	21.7	564	59	332				
5																									
6																									
7	125	5.9	515	7.2	1720	33	191	4	8.0	4.3	76	11.0	1370	13	1200		28	20.7	580	42	243				
8	133	5.6	626	7.2	1828	24	202	3	8.5	4.9	81	11.0	1380	4	2040		30	19.4	582	51	297				
9	133	3.5	391	7.2	1828	46	202	5	8.5	3.3	81	11.0	1220	20	1860		30	19.2	591	50	296				
10	133	4.8	536	7.2	1828	34	202	4	8.5	4.5	81	11.0	1558	7	2400		30	20.1	603	52	314				
11																									
12																									
13																									
14	133	6.2	693	7.2	1828	26	202	3	8.5	5.8	81	11.0	1064	27	1800		30	20.0	600	47	282				
15	125	5.3	557	7.2	1720	31	202	4	8.0	4.6	76	10.5	1772	9	1740		28	21.9	613	66	405				
16	133	5.5	614	7.2	1828	30	202	3	8.5	4.8	81	10.6	1000	6	1800		30	20.3	609	46	280				
17	125	5.3	557	7.0	1720	31	191	3	8.0	4.6	76	10.4	1030	3	2690		28	23.8	571	51	291				
18																									
19																									
20																									
21	133	5.4	592	7.2	1828	31	202	3	8.5	4.6	81	10.5	1474	8	2040		30	21.7	651	41	267				
22	109	5.5	504	7.0	1505	30	167	3	7.0	4.8	67	10.4	864	10	1320		25	20.0	500	45	225				
23	125	5.3	557	7.2	1720	30	191	3	8.0	4.6	76	10.5	964	39	1740		28	19.1	535	54	289				
24	78	4.7	308	8.0	1075	35	119	4	5.0	4.1	48	10.4	1316	9	1980		18	20.4	367	66	242				
25																									
26																									
27																									
28																									
29	125	5.4	567	6.8	1720	30	191	3	8.0	4.7	76	10.5	1282	26	1920		28	20.8	582	42	245				
30	55	6.0	277	6.8	753	27	83	3	3.5	5.2	33	10.6	582	7	1620		12	20.2	242	42	102				
31	125	5.4	567	6.8	1726	30	191	3	8.0	4.7	76	10.5	1200	5	2100		28	19.8	554	43	238				
Total	2040		9545		29782		3310		1385		1318						459		7962		4942				
Arith. Means	113	5.3	530		1655	33	184	3	7.7	4.6	73		1242	12	1723		26	21.0	553	50	275				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

April (Month), 19 77 — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2 | 3 8 | 9 10 | 11 12 | 13 15
ID | 1300129 (Plant No) | 04 (Mo) | 77 (Yr) | 500 (Sampling Point Code)

DAY 1 2	WEATHER TYPE 9	WEATHER PRECIP. 14	FLOW TOTAL 19	FLOW MAX RATE 24	RAW SEWAGE QUALITY TEMP 29	pH 34	BOD-5 39 44		SS 49 54		TOTAL-P 59 64		VSS 69	NH_3-N 74 78	80	REMARKS OI 9	14
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS	mg/l	LBS.	mg/l	LBS	mg/l	mg/l	C		
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C		
SF															C		
01	4	.38	2.59	4.40	51	7.8									C		
02	4	.04	2.64	3.20	51	7.8									C		
03	1		2.65	3.20	51	7.8	83	1834	86	1901	3.95	87	62		C		
04	4 & 5	.60	2.95	3.90	50	7.7	110	2706	156	3838	4.30	106	122		C		
05	5	.03	2.88	3.60	50	7.7	70	1681	78	1873	3.00	72	50		C		
06	5	.02	2.86	3.80	50	7.6	75	1789	58	1383	2.75	66	48		C		
07	1		2.85	3.50	50	7.4									C		
08	1		2.76	3.50	50	7.7									C		
09	4	.01	2.75	3.30	50	7.7									C		
10	1		2.69	3.10	51	7.8	86	1929	72	1615	3.25	84	66		C		
11	1		2.93	4.85	51	7.7	88	2150	86	3102	3.85	94	72		C		
12	1		2.80	3.50	51	7.5	87	2078	106	2475	5.35	125	82		C		
13	4	.01	2.75	3.50	51	7.4	116	2660	94	2156	3.15	72	68		C		
14	1		2.74	3.40	51	7.5	98	2239	84	1920	4.60	105	56		C		
15	1		2.71	3.50	51	7.6									C		
16	4	.12	2.68	3.30	51	7.6									C		
17	1		2.61	3.20	51	7.3	101	2194	76	1654	3.05	66	50		C		
18	1		2.76	5.70	51	7.5	102	2348	148	3407	4.00	92	102		C		
19	4	.28	2.69	3.20	51	7.4	92	2064	76	1705	3.20	72	54		C		
20	4	.11	2.72	3.30	51	7.6	110	2495	138	3131	3.05	69	100		C		
21	4	.26	2.75	5.50	51	7.7	92	2110	98	2248	3.30	76	84		C		
22	4	1.00	2.87	3.30	51	7.6									C		
23	4	.03	2.63	3.20	51	7.7									C		
24	4	.12	2.69	3.00	51	7.7	113	2535	62	1391	3.30	74	50		C		
25	4	.38	2.88	3.60	51	7.8	90	2162	104	2498	3.95	95	62		C		
26	1		2.80	3.40	51	7.9	75	1751	68	1588	3.30	77	42		C		
27	4	.36	2.81	4.20	51	7.8	86	2015	134	3140	3.10	73	82		C		
28	4	.16	2.84	3.30	51	7.2	95	2250	70	1658	3.10	73	62		C		
29	1		2.80	3.40	51	7.5									C		
30	1		2.68	3.40	51	7.4									C		
31															C		
TL		3.91	82.76					40995		41683		1578			C		
ME			2.76				93	2158	94	2194	3.42	83	69		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

April, 1977 — Month

Marshall, Michigan — Municipality

Robert J. Swabell — Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
ID	130029	04	77	..
	Plant No	Mo.	Yr	Sampling Point Code

DAY	BOD-5		SS		TOTAL-P		VSS	NH_3-N	REMARKS OR OTHER PARAMETERS								
	9	14	19	24	29	34	39	44	49	54	59	64	69	74 78	80	9	14
1 2	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l							C		
PN	00310	85001	00530	85002	00665	85004	00535	00610							C		
SF															C		
01															C		
02															C		
03	51	1127	30	663	2.90	64	20								C		
04	54	1329	42	1033	3.50	86	38								C		
05	53	1273	58	1393	3.20	77	36								C		
06	40	954	20	477	2.60	62	2								C		
07															C		
08															C		
09															C		
10	52	1167	54	1211	3.75	84	46								C		
11	80	1955	48	1173	3.85	94	44								C		
12	63	1471	48	1221	4.55	106	40								C		
13	42	963	46	1055	2.80	64	26								C		
14	52	1188	40	914	3.95	90	28								C		
15															C		
16															C		
17	66	1437	38	827	4.40	96	12								C		
18	80	1841	58	1335	3.40	78	42								C		
19	57	1279	70	1570	3.40	76	50								C		
20	56	1270	50	1134	3.20	73	30								C		
21	44	1009	50	1147	2.70	62	44								C		
22															C		
23															C		
24	89	1997	34	763	3.75	84	28								C		
25	74	1777	40	961	3.60	86	16								C		
26	54	1261	24	560	3.30	77	14								C		
27	44	1031	84	1969	2.90	68	40								C		
28	42	995	26	616	2.90	69	22								C		
29															C		
30															C		
31															C		
TL		25324		20022		1496									C		
MF	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]										

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

April (Month), 19 77 — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2 | 3 8 | 9 10 | 11 12 | 13 15
IP | 13.06.29 | 04 | 77 | ...
Plant No. | Mo | Yr. | Sampling Point Code

DAY 1 2	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification 14
	Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MLSS 34	MLVSS 39	SETTL. 44	SDI 49	DO 54	Air Applied 59	SS 64	VSS 49	Percent Return 74	80	Waste Sludge 9	
	KCF	KCF	HRS.	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu. Ft.	%	%	%	C	KGal	See Code*
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF											4				C		
01	48		3.3	9.9	.23	2348	1515	~60	.90	3.0	154	.78	58	46	C	35	
02			3.3								57			47	C	36	
03			3.3								153			47	C	0	
04			2.9	6.9	.30	2200	1373	26.0	.85	3.0	173	.83	55	41	C	26	
05			3.0	7.6	.27	2249	1464	26.0	.87	4.0	197	.83	60	42	C	10	
06			3.0	8.5	.25	2362	1554	27.0	.87	3.4	205	.73	64	47	C	38	
07			3.0	10.2	.23	2848	1666	29.0	.98	3.6	202	.84	60	49	C	55	
08			3.1								207			51	C	68	
09			3.1								200			50	C	40	
10			3.2								186			51	C	38	
11			2.9	6.5	.33	2151	1396	23.5	.92	1.6	185	.75	61	51	C	15	
12			3.1	8.3	.28	2533	1567	27.0	.94	2.4	183	.72	59	55	C	40	
13			3.1	8.6	.25	2576	1692	26.0	.99	3.3	183	.70	63	57	C	53	
14			3.1	7.0	.29	2415	1461	25.0	.97	3.4	190	.69	59	58	C	28	
15			3.2	6.8	.31	2297	1356	25.0	.92	3.5	187	.66	56	58	C	32	
16			3.2								186			60	C	56	
17			3.3								181			61	C	48	
18			3.1	5.6	.21	2152	1402	25.5	.84	2.5	174	.64	65	58	C	0	
19			3.2	6.3	.29	2360	1621	30.0	.79	2.0	179	.68	68	59	C	6	
20			3.2	6.5	.26	2470	1702	30.0	.82	2.1	181	.73	68	58	C	44	
21			3.1	6.3	.28	2434	1587	35.0	.70	2.5	180	.69	63	55	C	50	
22			3.0	5.8	.31	2345	1494	29.0	.81	1.8	188	.70	64	52	C	43	
23			3.3								182			53	C	31	
24			3.2								191			54	C	52	
25			3.0	5.2	.38	2025	1398	26.5	.76	3.0	189	.67	75	52	C	28	
26			3.1	6.3	.33	2264	1544	29.0	.78	1.0	192	.67	68	55	C	31	
27			3.1	5.8	.31	2293	1506	31.0	.74	1.8	185	.68	44	56	C	35	
28			3.0	6.7	.28	2346	1636	29.0	.81	5.0	196	.69	69	54	C	22	
29			3.1	6.8	.29	2329	1550	31.0	.75	4.5	194	.68	66	55	C	66	
30			3.2								192			56	C	0	
31															C		
TL															C	1026	
MS	48		3.1	7.1	.28	2256	1511	28.4	.85	3.0	188	.72	64	53	C	34	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

April, 19 77
Month

Marshall, Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

ID 130029 04 77 000
Plant No Mo Yr. Sampling Point Code

DAY	BOD-5			SS			TOTAL-P			VSS	NH_3-N	pH	DO	F. COLI*		T. COLI*	REMARK
	9 14 19			24 29 34			39 44 49			54	59	64	69	74	80	9	14
1 2	mg/l	LBS	% Rem.	mg/l	LBS.	% Rem	mg/l	LBS.	% Rem.	mg/l	mg/l	SU	mg/l	#/100 ml	C	#/100 ml	
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	(31616)	C	31504 31505	
SF															C		
01												8.0	6.0	14	C		
02												7.9			C		
03	16	354	81	3	66	97	.49	10.8	88	2		8.0			C		
04	6	148	95	2	49	99	.73	17.9	83	1		7.9	6.0	138	C		
05	8	192	89	22	528	72	.55	13.2	82	3		7.9	5.6	30	C		
06	18	429	76	6	143	90	.70	16.6	75	1		7.5	6.3	40	C		
07												7.6	7.3	40	C		
08												7.6			C		
09												7.6			C		
10	21	471	76	4	90	94	.43	9.6	89	3		7.8			C		
11	24	586	73	16	391	81	.98	23.9	75	7		7.6	6.9	154	C		
12	11	257	88	12	280	89	.55	12.8	90	11		7.6	7.2	74	C		
13	5	115	96	3	69	97	.54	12.3	83	2		7.3	7.5	34	C		
14	3	69	97	2	46	94	.67	15.3	85	1		7.3	8.0	97	C		
15												7.4	6.5	26	C		
16												7.4			C		
17	28	609	72	13	283	93	.74	16.1	76	6		7.3			C		
18	31	714	70	13	299	91	.86	19.7	79	4		7.3	6.0	218	C		
19	8	179	91	2	45	97	.56	12.5	83	1		7.4	4.7	178	C		
20	5	113	95	12	272	91	.59	13.3	81	4		7.3	4.9	184	C		
21	3	69	97	12	275	85	.30	6.8	91	9		7.4	6.8	64	C		
22												7.4	5.6	140	C		
23												7.5			C		
24	20	449	82	4	90	94	.55	12.3	83	3		7.5			C		
25	22	528	76	14	336	87	.90	21.6	77	10		7.6	5.8	102	C		
26	7	163	91	7	163	90	.40	9.3	88	3		7.7	4.5	12	C		
27	4	94	95	31	726	77	.41	9.6	87	9		7.5	5.3	14	C		
28	4	95	96	8	189	89	.37	8.7	88	6		7.1	6.2	16	C		
29												7.5	7.2	34	C		
30												7.4			C		
31															C		
TL		5634			4268			2623							C		
ME	13	297	88	10	225	90	.60	13.8	83	5		7.5	6.2	55	C		
WA	18	403	82	13	293	88	.64	16.0	81					108	C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

April (Month), 19 77 — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

ID | 13.00.29 (Plant No.) | 04 (Mo) | 77 (Yr) | (Sampling Point Code)

DAY 1 2	GRIT 9 CF	AUX.FUEL 14	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS	39 $FeCl_3$ LBS.	44	49	54	59
PN											
SF		2									
01	1.0	29	3360			30	596				
02	1.0	31	2040			10	397.				
03	.5	29	3000			20	298.				
04	.5	35	3480			20	397				
05	.1	53	3480			20	546				
06	.5	49	3840			30	794				
07	.5	38	3480			30	596				
08	.5	42	3480			20	794				
09	1.0	38	3120			20	397.				
10	.5	21	3000			20	596.				
11	1.0	1	3000			30	596				
12	.5	3	3120			20	496				
13	.5	2	3000			20	298				
14	.5	1	3120			20	695				
15	.5	1	3120			20	496				
16	.5	2	2760			20	397.				
17	.5	2	2760			20	596.				
18	1.5	2	3240			20	596				
19	1.0	2	3120			20	596				
20	1.0	1	3120			20	596				
21	1.0	2	3240			20	794				
22	.5	2	3120			20	596				
23	1.0	1	3000			20	596.				
24	.5	2	3120			20	397.				
25	.5	30	3600			20	596				
26	1.0	2	3360			30	596				
27	1.0	2	3240			30	596				
28	1.0	2	3360			20	496				
29	1.0	1	3360			20	496				
30	1.0	3	2880			20	397				
31											
TL	22.1	419	94,920			640	16383				
ME	.7	14	3164			21	546				

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL			800
Superintendent	1		160
Asst Supt.	1		160
Shift Foreman			
Shift Operator	3		484
Maint Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL

WEEKDAYS 11 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

Digester Volume, ft³
Primary _____
Secondary _____

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MDPH
D 45

Supernatant To _____
Process Pattern _____

MONTH April 19 77

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE					DIGESTING SLUDGE					SUPERNATANT								DIGESTED SLUDGE				Gas Produced cu ft X
	Gals. X 100	Total Sol ds %	Vol. Solids %	Lbs 1000 c.f. Digester	pH	Temp °F	pH	Total Solids %	Vol Solids %	Vol Acids Mg/l	Alkalinity Mg/l	Gals. X	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg l	P Mg l	P Lbs	5 Day BOD Mg/l	Gals X	Total Solids %	Vol. Solids %	pH	
1	62	5.6	63		7.2																		
2	62	5.5	63		7.2																		
3	62	5.6	64		7.2																		
4	50	6.0	77		7.2																		
5	62	6.4	64		7.2																		
6	50	6.5	64		7.2																		
7	62	6.3	70		7.2																		
8	37	5.4	64		7.2																		
9	62	5.1	60		7.2																		
10	62	5.5	89		7.2																		
11	62	5.4	64		7.2																		
12	62	6.0	68		7.1																		
13	62	6.6	68		7.0																		
14	74	6.6	66		6.7																		
15	62	6.5	61		6.7																		
16	62	5.2	56		6.8																		
17	62		62		7.1																		
18	62	5.6	72		6.8																		
19	62	8.4	66		6.9																		
20	62	6.3	63		6.9																		
21	62	4.6	65		7.1																		
22	62	6.1	67		7.1																		
23	62	6.0	61		7.0																		
24	62	6.3	59		7.1																		
25	62	5.8	66		6.9																		
26	62	6.0	71		6.2																		
27	62	5.7	67		6.3																		
28	62	5.4	68		6.2																		
29	62	5.6	76		6.2																		
30	62	5.8	67		6.3																		
31																							
TOTAL	1811																						
ARITH MEAN	60	6.0	67																				

MDPH
D 47

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH April, 19 77

VACUUM FILTER & INCINERATION DATA

OPERATOR R. J. Swalwell

DATE	SLUDGE TO FILTER				CHEMICALS TO FILTER				FILTER		FILTRATE						FILTER CAKE					INCINERATION			REMARKS
	Gal X 100	Tot Sol. %	Lbs Dry Sol. x 10	pH	Lbs. Dry	R	Lbs Dry	R	Tot. Hours	Yield	Gal. X 100	pH	Sus. Solids Mg/l	Vol. Susp. Solids %	5 Day BOD Mg/l	P Mg/l	Thou. Lbs. Wet	Tot. Sol. %	Lbs. Tot. Solids X 10	Vol Sol %	Lbs. Vol. Solids X 10	Hrs. Opr.	Yield	Fuel BTU	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1	105	5.0	441	6.8					8.0		76	10.6	1510	8	2040		28	19.7	552	42	232				
2																									
3																									
4	99	5.2	432	7.8					7.5		71	10.5	1672	13	1140		26	21.3	554	39	216				
5	105	5.1	450	6.8					8.0		76	10.1	1510	7	1380		28	20.3	568	48	273				
6	105	4.8	435	6.8					8.0		76	10.1	1028	5	3240		28	21.0	588	69	406				
7	105	4.3	379	6.9					8.0		76	10.5	1416	8	2050		28	17.6	493	41	202				
8																									
9																									
10																									
11	103	5.3	467	7.0					8.0		76	10.6	1076	10	3180		28	25.7	667	22	146				
12	92	7.0	540	8.0					7.0		67	11.2	1182	10	2400		25	17.4	435	76	200				
13																									
14	66	5.2	283	6.2					5.0		48	10.7	778	8	1500		15	22.7	340	35	119				
15	53	4.6	203	6.5					4.0		38	10.7	1416	10	2040		14	21.3	305	35	116				
16																									
17																									
18	105	5.3	467	6.6					8.0		76	10.7	1622	8	2760		28	20.3	564	47	267				
19	105	5.0	441	6.6					8.0		76	10.7	1430	5	2700		28	19.0	532	51	271				
20	99	5.0	416	6.5					7.5		71	11.2	1364	8	1800		25	17.5	438	49	214				
21	86	5.2	385	6.8					6.5		62	11.2	1400	14	3660		20	19.2	384	52	206				
22	105	5.4	494	6.8					8.0		76	11.0	1618	5	2580		28	20.6	577	47	271				
23																									
24																									
25	105	5.7	503	7.0					8.0		76	11.2	1320	10	3900		28	20.7	521	50	286				
26	105	5.7	503	6.5					8.0		76	12.5	1342	7	3000		28	20.7	580	47	272				
27	105	5.5	485	6.5					8.0		76	12.6	1096	8	2160		28	20.8	582	43	250				
28	53	5.2	459	6.3					4.0		38	11.9	1100	7	2470		14	20.7	290	46	133				
29	105	4.9	432	6.5					8.0		76	11.8	1564	5	2510		28	21.4	599	44	264				
30																									
31																									
Total	1808		8220						137.5		1383						475		9620		5938				
Arith Means	95	5.2	433						7.2		73		1340	9	2356		25	20.3	506	45	228				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

MAY (Month), 19 77

Marshall (Municipality), Michigan

Robert J Swaboda
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID | 130629 | 05 | 77 | 500
Plant No | Mo | Yr | Sampling Point Code

DAY 1 2	WEATHER TYPE 9	WEATHER PRECIP. 14	FLOW TOTAL 19	FLOW MAX 24 RATE	RAW SEWAGE QUALITY TEMP 29	pH 34	BOD-5 39 44		SS 49 54		TOTAL-P 59 64		VSS 69	NH_3-N 74 78	80	REMARKS OR 9	14
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS.	mg/l	LBS.	mg/l	LBS	mg/l	mg/l	C		
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C		
SF															C		
01	4	.13	2.70	3.40	51	7.4	96	1711	60	1351			46		C		
02	4	.02	2.67	3.80	51	7.4									C		
03	4	.11	2.68	3.26	52	7.4	56	1252	64	1430	3.40	76	40		C		
04	4	.07	2.68	3.50	52	7.1	96	2146	120	2682	3.85	86	94		C		
05	1		2.66	3.40	53	7.2	56	1242	116	2573	4.70	104	54		C		
06	1		2.66	3.30	53	7.3									C		
07	1		2.53	3.33	53	7.3									C		
08	1		2.53	3.16	52	7.2	100	2110	86	1815	3.40	72	76		C		
09	1		2.68	3.46	52	7.3	75	1674	83	1967	3.20	72	66		C		
10	1		2.54	3.50	52	7.3	74	1442	104	2246	4.50	140	54		C		
11	1		2.56	3.40	52	7.3	54	1153	136	2904	4.20	90	125		C		
12	1		2.59	3.56	52	7.3	51	1102	90	1944	3.45	85	82		C		
13	1		2.54	4.00	52	7.3									C		
14	1		2.45	3.20	53	7.3									C		
15	1		2.45	3.00	53	7.3	104	2125	76	1553	4.30	88	54		C		
16	1		2.61	4.00	53	7.6	82	1785	98	2133	3.60	78	78		C		
17	4	.11	2.52	3.40	54	7.3	128	2640	124	2606	4.40	92	94		C		
18	1		2.52	3.30	54	7.7	132	2774	104	2186	3.60	76	66		C		
19			2.51	3.40	54	7.2	94	1963	146	3056			96		C		
20	1		2.51	3.60	54	7.6									C		
21	1		2.43	3.20	54	7.7									C		
22	4	.13	2.73	2.80	54	7.6	130	2960	54	1229	3.20	73	46		C		
23	4	.02	2.59	3.10	54	7.7	104	2246	84	1814	3.30	71	76		C		
24	1		2.51	3.60	54	7.7	102	2135	122	2554			104		C		
25	1		2.44	3.46	54	7.6	80	1661	76	1578	3.50	73	60		C		
26	1		2.47	3.60	56	7.7	82	1689	80	1648	2.80	58	64		C		
27	1		2.41	4.00	55	7.7									C		
28	1		2.31	3.00	56	7.6									C		
29	1		2.30	2.60	56	7.7									C		
30	1		2.30	2.60	56	7.7	102	1957	102	1957	3.50	67	78		C		
31	4	.02	2.48	3.20	55	7.6	118	2441	142	2937	3.75	78	110		C		
TL		1.24	78.66					40465		44163		1474			C		
ME			2.54				90	1927	99	2103	3.84	82	74		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

MAY , 19 77
Month

Marshall , Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

ID 130029 05 77
Plant No Mo Yr Sampling Point Code

DAY	BOD 5		SS		TOTAL-P		VSS	NH_3-N	REMARKS OR OTHER PARAMETERS								
	9 14		19 24		29 34		39	44	49	54	59	64	69	74 78	80	9	14
1 2	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l							C		
PN	00310	85001	00530	85002	00665	85004	00535	00610							C		
SF															C		
01	50	1306	32	720			26								C		
02															C		
03	74	1654	84	1878	3.25	84	48								C		
04	50	1115	66	1472	3.40	76	58								C		
05	36	799	74	1641	3.40	75	26								C		
06															C		
07															C		
08	72	1613	42	971	3.75	79	44								C		
09	48	1073	50	1114	3.40	76	30								C		
10	30	670	58	1253	4.00	130	14								C		
11	22	476	32	1521	4.10	88	68								C		
12	18	334	30	648	3.75	81	24								C		
13															C		
14															C		
15	54	1104	42	858	4.10	84	36								C		
16	59	1241	46	1061	3.50	76	44								C		
17	90	1842	42	883	3.35	81	30								C		
18	54	1135	44	924	3.55	75	38								C		
19	56	1172	80	1675			38								C		
20															C		
21															C		
22	93	2231	40	911	3.45	88	34								C		
23	80	2117	43	907	3.66	78	36								C		
24	102	2135	42	879			36								C		
25	47	976	28	581	4.10	85	10								C		
26	44	906	28	577	3.60	74	24								C		
27															C		
28															C		
29															C		
30	72	1381	44	844	3.30	64	36								C		
31	101	2099	52	1076	3.75	78	44								C		
TL		26844		22352		1472									C		
ME	60	1274	50	1065	3.82	82	34								C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

MAY (Month) 19 77

MARSHALL (Municipality), Michigan

Robert J. Swedlund (Superintendent's Signature)

ID | 1300 9 (Plant No) | 05 (Mo) | 77 (Yr) | ... (Sampling Point Code)

DAY 1 2	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification 14
	Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MLSS 34	MLVSS 39	SETTL 44	SDI 49	DO 54	Air Applied 59	SS 64	VSS 49	Percent Return 74	80 9	Waste Sludge	
	KCF	KCF	HRS	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu Ft	%	%	%	C	KGal	See Code*
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF											4				C		
01	48		3.2								185			55	C	49	
02			3.2	7.2	.29	2213	1524	31.0	.71	3.5	196	.68	67	56	C	24	
03			3.2	7.2	.30	2454	1566	30.0	.81	3.0	196	.71	60	54	C	30	
04			3.2	6.4	.42	2423	1[illegible]0	34.0	.71	1.0	149	.87	39	57	C	39	
05			3.2	5.5	.24	2299	1577	30.0	.76	1.6	120	.67	67	59	C	37	
06			3.2	5.3	.24	2207	[illegible]	30.0	.74	1.3	149	.66	64	53	C	47	
07			3.4								162			55	C	47	
08			3.4								161			55	C	49	
09			3.2	5.5	.24	2350	[illegible]	27.0	.87	2.4	164	.69	6[illegible]	51	C	26	
10			3.3	5.2	.25	2232	1427	29.0	.77	1.5	162	.66	67	57	C	51	
11			3.4	5.7	.17	2350	1530	29.0	.78	1.5	152	.64	67	54	C	42	
12			3.3								155			60	C	29	
13			3.4	6.2	.15	2336	1[illegible]6	30.0	.79	1.5	147	.64	62	54	C	48	
14			3.5								162			64	C	45	
15			3.5								155			64	C	45	
16			3.3	5.5	.20	1946	1434	27.0	.72	2.6	162	.77	72	52	C	1	
17			3.4	6.4	.19	2185	1654	31.0	.70	2.0	[illegible]	.80	56	56	C	24	
18			3.4	7.0	.17	2471	1872	32.0	.77	2.5	[illegible]	.79	75	50	C	42	
19			3.4	6.1	.21	2166	1672	31.0	.70	1.5	[illegible]	.76	72	51	C	8	
20			3.4	6.6	.26	2322	1786	31.0	.75	2.3	[illegible]	.80	76	56	C	21	
21			3.5								183			52	C	33	
22			3.2								183			47	C	23	
23			3.3	6.6	.31	2178	1662	28.0	.78	2.2	[illegible]	.70	71	50	C	33	
24			3.4	6.1	.35	2049	1543	27.0	.76	1.8	154	.63	74	52	C	22	
[illegible]			3.4	6.6	.34	2069	1611	28.0	.74	1.8	[illegible]	.62	74	53	C	6	
26			3.4	7.5	.25	2203	1740	30.0	.73	1.1	[illegible]	.70	74	51	C	45	
27			3.6	7.1	.32	1950	1478	26.0	.75	.9	[illegible]	.67	72	53	C	0	
28			3.7								[illegible]			55	C	28	
29			3.7								[illegible]			56	C	36	
30			3.7								[illegible]			55	C	17	
31			3.5	8.1	.34	2190	1631	26.0	.84	1.0	[illegible]	72	72	50	C	26	
TL															C	98.	
ME	48		3.4	6.4	.26	2125	1574	29.3	.76	1.8	170	.71	68	54	C	32	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

MI [illegible] Michigan

Robert J Swatchell
Superintendent's Signature

ID 1506.9 05 22 6.4

DAY	BOD			SS			TOTAL P			VSS	NH_3N	pH	DO	F COL*		T COLI*	REMARKS
1 2	[illegible]		[illegible]	mg/l	LBS	[illegible]	mg	LBS	Rem	mg/l	mg/l	SU	mg/l	# 100 ml	C	# 100 ml	
PN	00 10	80	81 0	00530	85002	81	00665	85004	81012	00535	00610	00400	00300	(31616) ~~31515~~	C	31504 31505	
SF															C		
01	[illegible]	450	74	2	45	97				1		7.4			C		
02												7.4	6.0		C		
03	24	648	4[illegible]	5	112	92	.81	18	76	3		7.3	6.0	144	C		
04	8	179	92	1[illegible]	358	97	.85	19	79	10		7.3	5.3	234	C		
05	5	111	91	24	523	79	.81	18	83	18		7.2	4.5	260	C		
06												7.2	4.3	112	C		Fecls Wa
07												7.3			C		From Ma
08	1.8	380	85	7	147	92	.40	8	88	5		7.2			C		Tank Wa
09	1.4	338	92	11	246	86	.61	14	91	7		7.3	6.5	150	C		For Re
10	4	86	92	15	324	96	1.46	32	78	9		7.3	4.5	280	C		
11	6	128	89	2[illegible]	535	81	.96	19	79	24		7.3	4.7	50	C		
12	2	43	96	3	65	97	.70	15	83	2		7.3			C		
13												7.4	3.5		C		
14												7.4			C		
15	35	624	6[illegible]	7	143	91	.68	14	84	3		7.3			C		
16	1.6	342	80	10	218	92	.20	15	81	8		7.4	3.0	26	C		
17	13	210	92	9	184	93	.20	15	84	2		7.3	3.0		C		
18	9	185	93	10	210	90	2.15	45	43	9		7.6	3.0		C		
19	9	148	90	24	502	89				2		7.6	4.1	46	C		
20												7.6	3.0	40	C		
21												7.7			C		
22	15	410	86	4	91	93	2.10	48	34	3		7.7			C		
23	20	432	81	6	130	93	1.75	38	47	5		7.6	5.7	32	C		
24	7	147	93	8	167	93				2		7.6	5.8	54	C		
25	6	125	93	6	125	92	2.55	53	27	4		7.7	5.1	30	C		
26	8	165	90	11	227	86	1.55	32	45	4		7.6	5.0	14	C		
27												7.6	5.3	3	C		
28												7.7			C		
29												7.7			C		
30	13	249	87	14	269	86	.98	19	72	7		7.7			C		
31	7	145	94	9	186	94	.40	8	89	7		7.7	4.6	58	C		
TL		5663			4833			430							C		
ME	13	270	85	11	230	90	1.11	24	70	7		7.5	4.6	59	C		
WA	16	350	82	15	324	86	1.69	36	50					154	C		

Digester Volume, ft^3
Primary
Secondary

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D 45

Marshall, MICHIGAN

Supernatant To
Process Pattern

MONTH May 1977

DIGESTER AND SLUDGE DATA

OPERATOR R. J. Swalwell

DATE	RAW SLUDGE Gals X 100	Total Solids %	Vol Solids %	Vol Solids Lbs 1000 c f Digester	pH	DIGESTING SLUDGE Temp. °F	pH	Total Solids %	Vol Solids %	Vol Acids Mg/l	Alkalinity Mg/l	SUPERNATANT Gals X	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	P Mg/l	P Lbs	5 Day BOD Mg/l	DIGESTED SLUDGE Gals X	Total Solids %	Vol Solids %	pH	Gas Produced cu ft X
1	60	6.1	70		6.3																			
2	60	5.8	70		6.1																			
3	60	6.5	68		7.0																			
4	60	5.4	60		6.7																			
5	60	5.8	39		6.1																			
6	60	5.8	62		6.3																			
7	60	5.2	71		6.2																			
8	60	5.0	68		6.5																			
9	60	5.1	92		6.3																			
10	60	4.9	61		6.4																			
11	60	5.5	70		6.1																			
12	60	5.6	65		6.2																			
13	60	5.1	66		6.2																			
14	60	5.8	69		6.2																			
15	60	5.0	71		6.2																			
16	6[illegible]	5.1	67		6.2																			
17	60	5.4	70		6.1																			
18	60	5.8	[illegible]		6.4																			
19	60	6.0	71		6.5																			
20	60	5.[illegible]	[illegible]		6.2																			
21	60	5.5	[illegible]		6.3																			
22	6[illegible]	[illegible]	[illegible]		6.2																			
	[illegible]	[illegible]			6.1																			
24	60	4.3	85		6.1																			
25	60	5.4	69		5.9																			
26																								
27																								
28	60	6.3	[illegible]		[illegible].9																			
29	60	5.5	[illegible]		6.0																			
30																								
31																								
TOTAL	1620																							
AR TH MC	60	5.5	69																					

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH D-47

Marshall, MICHIGAN

MONTH May, 1977 — VACUUM FILTER & INCINERATION DATA — OPERATOR R.J. Swalwell

DATE	SLUDGE TO FILTER: Gal X 100 (1)	Tot Solids % (2)	Lbs. Dry Sol X 10 (3)	pH (4)	CHEMICALS TO FILTER: CaO Lbs. Dry (5)	CaO R (6)	FeCl3 Lbs. Dry (7)	FeCl3 R (8)	FILTER: Tot. Hours (9)	Yield (10)	FILTRATE: Gal. X 100 (11)	pH (12)	Sus. Solids Mg/l (13)	Vol Susp Solids % (14)	5 Day BOD Mg/l (15)	P Mg/l (16)	FILTER CAKE: Thou. Lbs. Wet (17)	Tot Sol. % (18)	Lbs. Tot. Solids X 10 (19)	Vol Sol % (20)	Lbs. Vol. Solids X 10 (21)	INCINERATION: Hrs. Opr (22)	(23)	Fuel BTU (24)	REMARKS (25)
1																									
2	100	5.0	420	6.2	2067		202		8.5	3.3	81	12.4	1564	5	3300		25	20.9	523	47	246				
3	59	4.2	233	6.2	1215		114		5.0	3.1	48	12.3	676	15	2340		15	20.2	303	54	164				
4	94	5.3	418	6.3	1944		191		8.0	3.5	76	12.2	1226	12	2340		24	20.2	485	47	228				
5	100	5.4	454	6.5	2067		202		8.5	3.6	81	12.2	1552	7	1440		25	19.4	485	41	199				
6	100	4.6	463	6.3	2067		202		8.5	3.2	81	12.2	1576	9	1680		25	21.6	540	47	254				
7																									
8																									
9																									
10	100		412	6.3	2067		202		8.5	3.2	81	10.8	1026	5	1260		25	20.6	514	44	224				
11	51		213	6.2	1215		114		5.0	3.6	46	10.6	932	0	780		12	20.0	240	51	133				
12	89	5.0	371	6.2	1803		179		7.5	3.3	71	11.2	1244	8	1440		22	22.5	495	28	138				
13	91	4.6	363	6.1	1944		191		8.0	3.0	76	11.0	1156	15	2760		24	22.7	550	33	181				
14																									
15																									
16		4.5	61	2067		202		8.5	3.5	81	10.0	1112	12	2220		25	23.5	588	37	214				
17	54	5.2	258	6.2	1215		114		5.0	3.4	48	11.1	1056	13	2100		15	24.5	368	24	107				
18	82	5.4	372	6.2	1701		167		7.0	3.3	67	11.0	1280	10	2400		21	24.7	519	28	152				
19	83	4.8	340	6.2	1701		167		7.0	3.1	67	10.6	1510	10	3300		21	25.2	528	33	200				
20	83	4.7	328	6.1	1701		167		7.0	3.1	67	10.5	2198	8	3240		21	24.9	523	33	173				
21																									
22																									
23																									
24																									
25																									
26																									
27	77	4.6	298	6.1	1580		156		6.5	3.1	62	10.8	2056	10	3720		19	20.6	380	41	156				
28																									
29																									
30																									
31	100	5.2	437	6.2	2067		202		8.5	3.4	81	11.0	1810	20	4020		25	18.4	460	53	244				
Total	1380		5848		24841		2787		112		1116						347		7633		2143				
Arith. Means	86	5.0	365		1553		174		7.3	3.3	70		1381	11	2396		22	22.1	477	41	196				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

MAY (Month), 19 77 — Marshall (Municipality), Michigan — Robert J Swabell (Superintendent's Signature)

1,2 ID | 3–8 Plant No 130029 | 9,10 Mo 05 | 11,12 Yr 77 | 13–15 Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX.FUEL 14	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS.	39 $FeCl_3$ LBS.	44	49	54	59
PN											
SF											
01	1.0		3000			20	397				
02	1.0		3120			20	596				
03	.5		3120			20	596				
04	.5		3000			20	397				
05	.5		2880			15	596				
06	.5		2760			20	596				
07	.5		2760			20	397				
08			2760			20	397				
09	.5		2760			20	496				
10	.5		3360			20	596				
11	1.0		3000			20	397				
12	1.0		3000			20	397				
13	1.0		2880			10	397				
14	1.0		2640			20	298				
15	1.0		2760			10	596				
16	.5		2880			20	397				
17	1.0		2880			20	397				
18	1.0		3000			20	397				
19	1.0		3120			20	794				
20	1.0		2880			20					
21	1.0		3040			60					
22	1.0		1560			40					
23	1.0		2880			30					
24	1.0		2640			10					
25	1.0		3000			20					
26	.5		2760			30	596				
27	.5		2880			30	298				
28	.5		2880			30	298				
29	.5		3000			20	397				
30	.5		2760			20	397				
31	.5		3000			20	596				
TL	23		89,760			680	11,716				
ME	.74		2895			22	469				

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	5		844
Superintendent	1		168
Asst. Supt.	1		168
Shift Foreman			
Shift Operator	3		505
Maint. Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL

WEEKDAYS 11 HRS.

SATURDAYS 7 HRS.

SUNDAYS 7 HRS.

HOLIDAYS 4 HRS.

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

June, 19 77 — Month

Marshall, Michigan — Municipality

Robert J. Swahall — Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
ID	130029	06	77	500
	Plant No	Mo	Yr	Sampling Point Code

DAY 1 2	WEATHER TYPE 9	WEATHER PRECIP. 14	FLOW TOTAL 19	FLOW MAX RATE 24	RAW SEWAGE QUALITY TEMP 29	pH 34	BOD-5 39	BOD-5 44	SS 49	SS 54	TOTAL-P 59	TOTAL-P 64	VSS 69	NH_3-N 74 78	80	REMARKS OR 9	14
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l	C		
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C		
SF															C		
01	4	.02	2.47		55	8.7	106	2184	124	2554	3.75	77	104		C		
02	1		2.42		55	8.7	120	2422	158	3189	3.60	73	100		C		
03	1		2.40		55	7.5									C		
04	4	.65	2.30		55	7.2									C		
05	4	.08	2.28		55	7.3	102	1940	88	1673	4.30	82	72		C		
06	4	.02	2.46		55	7.3	102	2093	176	3611	3.95	81	122		C		
07	1		2.39		56	7.3	128	2551	94	1874	3.95	79	82		C		
08	1	.47	2.42		56	7.2	100	2018	88	1776	3.40	69	68		C		
09	1		2.40		56	7.1	128	2562	130	2602	3.30	66	82		C		
10	4	.16	2.32		56	7.2									C		
11	4	.10	2.31		56	7.1									C		
12	4	.10	2.30		55	7.2	88	1688	96	1841	5.50	106	70		C		
13	1		2.40		55	7.3	120	2402	166	3323			126		C		
14	1		2.43		56	7.2	136	2756	126	2554	5.70	116	96		C		
15	1		2.44		56	7.4	93	1893	88	1791	4.10	83	52		C		
16	4	.14	2.44		56	7.5	95	1933	116	2361	3.75	76	80		C		
17	4	.14	2.45		55	7.7									C		
18	1		2.30		56	7.6									C		
19	1		2.29		56	7.5	76	1451	66	1261	3.85	74	56		C		
20	1		2.34		56	7.5	140	2732	112	2186	3.95	77	76		C		
21	1		2.26		56	7.5	124	2337	108	2036	3.70	70	94		C		
22	1		2.25		56	7.5									C		
23	4	.01	2.28		56	7.4									C		
24	4	.08	2.24		56	7.5									C		
25	1		2.17		56	7.4									C		
26	1		2.17		56	7.4	80	1448	100	1810	5.20	94	52		C		
27	1		2.40		57	7.3	88	1761	122	2442	4.30	86	82		C		
28	1		2.35		57	7.5	94	1842	170	3332	4.70	92	90		C		
29	4	.85	2.26		56	7.5	118	2224	128	2413	5.20	98	108		C		
30	4	.89	2.34		56	7.5	72	1405	78	1522	3.75	73	62		C		
31															C		
TL		3.71	70.28					41.642		46.151		1572			C		
ME			2.34				106	2082	117	2308	4.21	83	84		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

June (Month), 19 77

Marshall (Municipality), Michigan

Robert J. Swahill (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
IP | 130029 (Plant No) | 04 (Mo) | 77 (Yr) | .. (Sampling Point Code)

DAY	BOD 5 9 14		SS 19 24		TOTAL P 29 34		VSS 39	NH_3 N 44	REMARKS OR OTHER PARAMETERS 49	54	59	64	69	74 78	80	9	14	1
1 2	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l							C			
PN	00310	85001	00530	85002	00665	85004	00535	00610							C			
SF															C			
01	66	1360	44	906	3.75	77	24								C			
02	64	1292	24	484	3.20	65	14								C			
03															C			
04															C			
05	74	1407	36	685	4.20	80	24								C			
06	104	2134	60	1231	3.45	81	26								C			
07	110	2193	58	1156	3.95	79	44								C			
08	54	1090	42	848	3.30	67	40								C			
09	72	1471	58	1161	3.20	64	30								C			
10															C			
11															C			
12	48	1184	56	1074	4.30	82	40								C			
13	89	1781	54	1081			48								C			
14	120	2432	52	1054	5.20	105	40								C			
15	51	1030	56	1140	4.10	83	30								C			
16	62	1262	44	895	3.60	73	28								C			
17															C			
18															C			
19	62	1184	40	764	4.40	84	26								C			
20	105	2103	52	1015	4.10	80	34								C			
21	118	2224	40	754	3.60	68	30								C			
22															C			
23															C			
24															C			
25															C			
26	68	1231	40	724	4.30	78	26								C			
27	76	1521	58	1161	5.40	108	34								C			
28	72	1411	46	902	3.40	67	12								C			
29	80	1505	48	905	4.60	87	26								C			
30	77	1503	58	1132	4.10	80	48								C			
31															C			
TL		31,309		19072		1508									C			
ME	79	1565	48	954	4.03	79	32								C			

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

June (Month), 19 77 — Marshall (Municipality), Michigan — Robert J Sinclair (Superintendent's Signature)

ID 130029 (Plant No) 06 (Mo.) 77 (Yr) ... (Sampling Point Code)

DAY 1 2	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification 14	
	Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MLSS 34	MLVSS 39	SETTL. 44	SDI 49	DO 54	Air Applied 59	SS 64	VSS 49	Percent Return 74	80	Waste Sludge 9		15
	KCF	KCF	HRS.	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu. Ft.	%	%	%	C	KGal	See Code*	
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889	
SF											3				C			
01	48		3.5	8.6	.30	2366	1771	29.0	.82	1.0	185	.74	74	50	C	30		
02			3.6	9.2	.28	2309	1642	30.0	.77	.9	192	.71	72	54	C	32		
03			3.6	9.1	.27	2428	1703	28.0	.87	1.0	192	.77	64	53	C	37		
04			3.7								185			51	C	74		
05			3.8								181			53	C	1		
06			3.5	7.2	.35	2029	1486	25.0	.81	1.1	194	.78	61	49	C			
07			3.6	8.0	.31	2421	1814	25.0	86	.5	193	.87	67	50	C	32		
08			3.6	10.0	.34	2270	1477	32.0	.60	.1	187	.67	57	51	C	26		
09			3.6	7.9	.30	2410	1735	32.0	.75	1.5	194	.81	70	50	C	29		
10			3.7	8.6	.26	2565	1873	34.0	.75	1.5	188	.87	70	53	C	52		
11			3.7								189			52	C	51		
12			3.7								185			53	C	3		
13			3.6	6.5	.32	2348	1653	27.0	.88	1.5	189	.84	64	51	C	32		
14			3.5	6.9	.32	2553	1817	27.0	.94	.9	185	.86	65	50	C	28		
15			3.5	7.5	.29	2763	1854	29.0	.95	.8	186	.86	64	49	C	48		
16			3.5	6.6	.29	2320	1644	29.0	.80	1.0	180	.77	66	50	C	35		
17			3.5	6.7	.29	2360	1640	24.0	.98	1.0	194	.77	65	50	C	29		
18			3.7								192			53	C	50		
19			3.5								193			54	C	52		
20			3.7	7.0	.30	2312	1658	23.0	1.00	1.0	194	.73	70	53	C	19		
21			3.8	8.3	.30	2503	1838	22.0	.92	1.1	197	.79	70	55	C	11		
22			3.8	8.8	.30	2633	1681	28.0	.94	.8	197	.82	61	57	C	38		
23			3.8	8.3	.30	2513	1824	25.0	1.00	.9	192	.78	64	57	C	44		
24			3.8	8.0	.28	2401	1800	24.0	1.00	2.1	184	.71	65	57	C	33		
25			4.0								190			59	C	30		
26			4.0								191			60	C	35		
27			3.6	7.8	.30	2464	1726	24.0	.95	.8	185	.82	65	53	C	34		
28			3.7	8.5	.29	2563	1831	27.0	.95	.8	189	.78	69	55	C	34		
29			3.8	8.2	.33	2364	1562	26.0	.91	.7	194	.76	63	57	C	37		
30			3.7	8.1	.29	2584	1904	26.0	1.00	1.0	198	.90	73	56	C	34		
31															C			
TL															C	1010		
ME			3.7	8.0	.30	2446	1727	27.8	.89	1.03	190	.80	67	53	C	34		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

June, 19 77 — Month

Marshall, Michigan — Municipality

Robert J Swalwell — Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
ID	130029	06	77	000
	Plant No	Mo	Yr	Sampling Point Code

DAY	BOD-5			SS			TOTAL-P			VSS	NH_3-N	pH	DO	F COLI*		T. COLI*	REMARKS
	9	14	19	24	29	34	39	44	49	54	59	64	69	74	80	9	14
1 2	mg/l	LBS	% Rem	mg/l	LBS	% Rem	mg/l	LBS	% Rem	mg/l	mg/l	SU	mg/l	#/100 ml	C	#/100 ml	
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 ~~31615~~	C	31504 31505	
SF															C		
01	12	247	89	7	144	94	.35	7	91	4		8.6	3.7	38	C		
02	5	101	96	12	242	92	.71	14	80	4		8.7	3.8	24	C		
03												7.2	4.0	46	C		
04												7.0			C		
05	20	380	80	4	76	95	.61	12	86	1		7.3			C		
06	20	410	80	22	451	88	.60	12	85	8		7.2	4.4	54	C		
07	10	199	92	10	199	89	.39	8	90	7		7.2	3.7	10	C		
08	10	202	90	7	141	92	.79	16	77	1		7.2	4.0	100	C		
09	8	160	94	11	220	92	.96	19	71	7		7.0	4.2	52	C		
10												7.0	4.1	92	C		
11												7.1			C		
12	8	153	91	15	288	84	.63	12	89	9		7.0			C		
13	19	380	84	7	140	96				6		7.2	3.9	54	C		
14	12	243	91	8	162	94	2.00	41	65	5		7.0	4.4	26	C		
15	8	163	91	16	326	82	.55	11	87	8		7.1	4.8	20	C		
16	4	81	96	4	81	97	.51	10	86	1		7.3	4.5	12	C		
17												7.5	4.1	32	C		
18												7.4			C		
19	7	134	91	3	57	95	.34	6	91	2		7.3			C		
20	21	410	85	6	117	95	1.98	39	50	3		7.4	5.0	8	C		
21	12	226	90	11	207	90	.93	18	75	7		7.3	4.1	6	C		
22												7.3	4.4	8	C		
23												7.3	5.5	10	C		
24												7.4	4.7	6	C		
25												7.3			C		
26	11	199	86	9	163	91	.46	8	91	5		7.2			C		
27	11	220	88	3	60	98	1.73	35	60	2		6.9	4.2	166	C		
28	10	196	89	12	235	93	.97	19	79	4		7.5	3.7	24	C		
29	11	207	91	2	38	98	.93	18	82	1		7.5	4.7	10	C		
30	11	215	85	7	137	91	.53	10	86	5		7.5	3.4	98	C		
31															C		
TL		4526			3484			315							C		
ME	12	226	89	9	174	92	.84	17	80	5		7.3	4.2	26	C		
WA	14	269	88	11	229	89	.99	20	77					49	C		

Digester Volume, ft³
Primary
Secondary

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MDPH
D 45

Supernatant To
Process Pattern

MONTH June 1977

DIGESTER AND SLUDGE DATA

OPERATOR R. J. Swalwell

DATE	RAW SLUDGE					DIGESTING SLUDGE						SUPERNATANT								DIGESTED SLUDGE				Gas Produced cu ft X
	Gals. X 100	Total Solids %	Vol. Solids %	Vol. Solids Lbs/1000 c.f. Digester	pH	Temp. °F	pH	Total Solids %	Vol. Solids %	Vol. Acids Mg/l	Alkalinity Mg/l	Gals. X	pH	Total Solids %	Vol Solids %	Susp Solids Mg/l	P Mg/l	P Lbs.	5 Day BOD Mg/l	Gals. X	Total Solids %	Vol Solids %	pH	
1																								
2	50	5.9	73		6.6																			
3	60	5.5	71		6.2																			
4	50	5.3	74		6.5																			
5	50	4.3	61		6.3																			
6	40	4.8	81		6.1																			
7	40	5.3	72		5.9																			
8	50	[illegible]	72		6.0																			
9	50	5.1	73		6.1																			
10	50	4.2	62		6.1																			
11	50	5.0	[illegible]		6.1																			
12	50	5.3	63		6.3																			
13	50	5.6	71		6.1																			
14	50	4.9	64		6.1																			
15	50	7.2	[illegible]		6.6																			
16	[illegible]	[illegible]	62		6.1																			
17	50	2.4	16		6.2																			
18	50	6.7	64		6.2																			
19	40	6.5	61		6.1																			
20	50	5.9	63		6.1																			
21																								
22	50	5.9	60		6.0																			
23	50	7.5	73		6.0																			
24	50	6.0	68		6.0																			
25	50	5.8	62		6.1																			
26	50	1.1	18		7.1																			
27	50	6.1	62		6.3																			
28	50	5.8	61		6.6																			
29	50	4.9	59		6.5																			
30	50	6.1	65		6.5																			
31																								
TOTAL	1380																							
ARITH. MEAN	49	5.7	69																					

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.7

Marshall, MICHIGAN

MONTH June, 1977 — VACUUM FILTER & INCINERATION DATA — OPERATOR R. J. Swallwell

DATE	SLUDGE TO FILTER				CHEMICALS TO FILTER				FILTER		FILTRATE						FILTER CAKE					INCINERATION			REMARKS
	Gal X 100	Tot Sol. %	Lbs. Dry Sol.	pH	$C_{12}O$ Lbs. Dry	R	$FeCl_3$ Lbs. Dry	R	Tot. Hours	Yield	Gal. X 100	pH	Sus. Solids Mg/l	Vol. Susp. Solids %	5 Day BOD Mg/l	P Mg/l	Thou. Lbs. Wet	Tot. Sol. %	Lbs. Tot. Solids X 100	Vol. Sol. %	Lbs. Vol. Solids X 100	Hrs. Opr	Yield	Fuel BTU	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1	117	3.1	3047	7.1	1785		270		8.5		81	11.7	1192	13	2460		32	22.5	72	41	30				
2	117	4.9	4816	7.0	1785		270		8.5		81	11.2	1309	12	1080		32	18.4	59	46	27				
3	110	4.7	4343	7.3	1680		254		8.0		76	10.6	1972	7	4020		30	18.3	55	49	27				
4																									
5																									
6	110	4.6	4250	6.3	1680		254		8.0		76	11.0	1546	8	4140		30	19.1	57	55	32				
7	62	5.4	2312	6.2	945		143		4.5		43	10.6	1032	16	4260		17	21.3	36	70	25				
8	90	3.0	2268	6.3	1365		206		6.5		62	10.9	1370	13	3000		25	18.0	45	57	26				
9	117	5.3	5205	6.3	1785		270		8.5		81	10.6	1554	7	1740		32	18.5	59	54	32				
10	104	5.1	4455	6.1	1575		238		7.5		71	11.0	1962	7	3180		29	20.4	57	51	29				
11																									
12																									
13	124	4.8	5000	6.3	1890		286		9.0		86	10.7	1828	7	3240		34	20.1	68	53	36				
14	110	5.1	4712	6.3	1680		254		8.0		76	11.2	1474	12	4200		30	20.0	60	50	30				
15	41	4.6	1584	6.2	630		95		3.0		29	11.1	1254	9	3720		12	19.7	24	44	10				
16	67	4.6	2466	6.1	1050		159		5.0		45	10.3	1974	7	3840		19	19.8	38	42	16				
17	83	4.9	3416	6.2	1260		191		6.0		57						23	19.0	44	51	22				
18																									
19																									
20	124	4.6	4791	6.2	1890		286		9.0		86	10.9	1646	8	4080		34	17.6	60	52	31				
21	117	4.7	4619	6.0	1785		270		8.5		81						32	19.7	63	48	30				
22	97	4.4	3585	6.1	1470		222		7.0		67						27	17.9	48	55	27				
23																									
24																									
25																									
26																									
27	110	4.2	3850	6.3	1680		254		8.0		76	10.8	2108	10	3420		30	17.7	53	48	25				
28	64	4.3	2492	6.4	1050		159		5.0		48	11.1	1694	5	5300		19	16.4	31	52	16				
29	117	4.5	4422	6.1	1785		270		8.5		81	11.5	1602	6	1920		32	19.8	63	42	27				
30	110	4.7	4343	6.1	1680		254		8.0		76	10.4	1430	6	3400		30	17.1	51	55	28				
31																									
Total	2001		76709		30450		4605		145.0		1382						548		1043		526				
Arith. Means	100	4.6	3839		1523		230		7.3		69		1585	9	3240		27	19.0	52	51	26				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

June, 1977 — Month

Marshall, Michigan — Municipality

Robert J. Swalwell — Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
ID	130029	06	77	..
	Plant No	Mo	Yr	Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX. FUEL 14	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS.	39 Fecl3	44	49	54	59
PN											
SF											
01	.5		3000			30	794				
02	.5		3120			40	794				
03	.5		3120			20	596				
04	.5		2640			20	397				
05	.5		2760			20	397				
06	.5		3120			20	794				
07	.5		3000			20	396				
08	.5		3000			20	596				
09	.5		3120			50	695				
10	.5		3000			30	496				
11	.5		2760			40	298				
12	.5		2880			20	496				
13	.5		2760			20	397				
14	.5		3120			30	794				
15	.5		2760			20	397				
16	.5		2640			30	397				
17	.5		2760			20	397				
18	.5		2520			30	397				
19	.5		2520			30	596				
20	.5		2880			30	596				
21	.5		2880			30	596				
22	.5		2760			30	596				
23	.5		2640			20	397				
24	.5		2640			30	397				
25	.5		2520			20	397				
26	.5		2520			30	397				
27	.5		2880			20	794				
28	1.0		2880			20	596				
29	.5		2880			40	794				
30	.5		2760			30	596				
31											
TL	15.5		84840			810	16280				
ME	.5		2828			27	543				

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	5		880
Superintendent	1		176
Asst. Supt.	1		176
Shift Foreman			
Shift Operator	3		528
Maint. Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL AF

WEEKDAYS 11 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

July Month, 19 77 — Marshall Municipality, Michigan — Robert J. Swacha Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
[19] [1300229] [07] [77] [600]
Plant No Mo Yr Sampling Point Code

DAY 1 2	WEATHER TYPE 9	WEATHER PRECIP 14	FLOW TOTAL 19	FLOW MAX 24 RATE	RAW SEWAGE QUALITY TEMP 29	PH 34	BOD-5 39 44		SS 49 54		TOTAL P 59 64		VSS 69	NH_3-N 74 78	80	REMARKS OF 9	14
	See Code*	Inches	MGD	MGD	°F	S.U.	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l	C		
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C		
SF															C		
01	1		2.26		56	7.4									C		
02	1		2.16		57	6.8									C		
03	4	.58	2.19		57	7.1									C		
04	1		2.20		57	7.4	78	1431	64	1174	3.90	72	54		C		
05	1		2.52		58	7.4	64	1345	84	1765	4.10	86	70		C		
06	1		2.47		58	7.1	96	1978	86	1772	5.10	105	56		C		
07	1		2.36		58	7.2	122	2401	104	2046	4.85	95	68		C		
08	1		2.34		58	7.2									C		
09	1		2.18		58	7.6									C		
10	1		2.11		57	7.2	80	1407	90	1553	4.10	72	76		C		
11	1		2.42		57	7.1	92	1857	214	4319	4.75	96	176		C		
12	4	.20	2.34		58	7.0	128	2498	154	3005	4.20	82	108		C		
13	1		2.28		59	7.3									C		
14	1		2.38		58	7.3	134	2660	204	4049	5.85	116	182		C		
15	4	.30	2.37		58	7.1									C		
16	4	.07	2.18		58	7.2									C		
17	1		2.17		58	7.2	84	1520	128	2317	4.10	74	102		C		
18	4	.84	2.46		58	7.3	92	1888	102	2092	4.50		88		C		
19	1		2.34		58	7.3									C		
20	1		2.31		60	8.-	90	1734	62	1194	4.75	92	42		C		
21	4	.04	2.26		59	7.1	84	1583	96	1696	4.40	83	62		C		
22	1		2.27		59	7.2									C		
23	1		2.14		58	7.4									C		
24	4	.40	2.13		58	7.3	96	1705	66	1172	4.60	82	62		C		
25	1		2.35		58	7.1	96	1881	74	1450	3.50	69	52		C		
26	1		2.24		59	7.2	108	2018	118	2204	3.50	65	53		C		
27	1		2.24		59	7.7	96	1793	114	2129	3.90	73	69		C		
28	1		2.29		59	7.6	93	1776	104	1986	3.90	74	68		C		
29	4	.50	2.29		59	7.3									C		
30	1		2.15		59	7.5									C		
31	1		2.10		58	7.3	118	2067	106	1856	4.10	72	90		C		
TL		2.93	70.5					35542		32809		1408			C		
ME			2.27				97	1863	109	2101	4.34	76	60				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

July, 19 77
Month

Marshall, Michigan
Municipality

Robert J Swackhamer
Superintendent's Signature

ID 130029 07 77
Plant No Mo Yr Sampling Point Code

DAY	BOD 5		SS		TOTAL-P		VSS	NH_3-N	REMARKS OR OTHER PARAMETERS								
	9 14		19 24		29 34		39	44	49	54	59	64	69	74	78 80	9	14
1 2	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l							C		
PN	00310	85001	00530	85002	00665	85004	00535	00610							C		
SF															C		
01															C		
02															C		
03															C		
04	60	1100	10	183	3.05	55	ø								C		
05	60	1261	46	967	3.10	65	38								C		
06	78	1607	42	865	4.10	84	34								C		
07	82	1614	48	945	3.85	76	32								C		
08															C		
09															C		
10	74	1302	48	845	4.10	72	24								C		
11	80	1615	64	1292	3.20	65	56								C		
12	84	1634	58	1132	3.95	77	32								C		
13															C		
14	102	2025	48	953	5.35	106	40								C		
15															C		
16															C		
17	77	1394	68	1230	4.10	74	50								C		
18	86	1764	58	1190	3.50	72	52								C		
19															C		
20	63	1214	34	655	2.95	57	24								C		
21	68	1282	30	565	3.20	60	22								C		
22															C		
23															C		
24	77	1365	28	497	3.75	67	16								C		
25	87	1765	22	431	3.75	73	12								C		
26	68	1270	24	448	3.00	56	18								C		
27	57	1064	55	1084	3.30	62	25								C		
28	72	1375	64	1222	3.20	61	36								C		
29															C		
30															C		
31	90	1576	60	1051	3.80	67	52								C		
TL		25875		15555		1249									C		
ME	76	1438	45	864	3.63	69	32								C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

July Month, 19 77 — Marshall Municipality, Michigan — Robert J. Swallow Superintendent's Signature

1 2 [ID] 3 8 [1300329] Plant No — 9 10 [07] Mo — 11 12 [77] Yr — 13 15 [ ] Sampling Point Code

DAY 1 2	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification 14
	Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MLSS 34	MLVSS 39	SETTL 44	SDI 49	DO 54	Air Applied 59	SS 64	VSS 49	Percent Return 74	80	Waste Sludge 9	
	KCF	KCF	HRS	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu Ft	%	%	%	C	KGal	See Code*
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF											4				C		
01	48		3.8	9.1	.35	2479	1322	27.0	.91	1.0	194	.79	81	57	C	29	
02			4.0								200			60	C	57	
03			3.9								196			54	C	34	
04			3.9								191			59	C	21	
05			3.4	7.3	.38	2351	1638	23.0	.98	.8	184	.81	67	51	C	25	
06			3.5	7.7	.29	2339	1536	23.0	1.02	.3	188	.82	69	53	C	23	
07			3.7	8.7	.36	2445	1619	25.5	.96	.8	190	.77	64	56	C	28	
08			3.7	9.5	.40	2652	1783	26.0	1.02	.9	191	.84	65	56	C	63	
09			4.0								197			60	C	31	
10			4.0								196			61	C	63	
11			3.6	7.4	.30	2251	1611	23.0	.98	1.0	190	.76	76	58	C	31	
12			3.7	6.6	.31	2255	1680	25.0	.90	.8	192	.75	73	48	C	27	
13			3.8	7.0	.39	2298	1631	24.0	.96	.7	192	.83	59	50	C	7	
14			3.6	6.9	.43	2569	1864	26.0	.99	1.0	195	.83	68	57	C	49	
15			3.6	6.0	.37	2246	1581	22.0	1.02	.6	203	.67	69	62	C	28	
16			4.0								209			68	C	44	
17			4.0								210			64	C	35	
18			3.5	7.3	.29	2092	1357	22.5	.93	.5	208	.84	63	46	C	47	
19			3.7	7.5	.25	2064	1480	21.5	.96	.5	204	.74	65	47	C	30	
20			3.7	7.8	.28	2019	1443	23.5	.86	.8	208	.74	76	51	C	44	
21			3.8	7.8	.30	1856	1300	21.0	.88	1.0	215	.63	65	52	C	17	
22			3.8	10.9	.37	2369	1532	27.0	.87	.7	216	.69	63	56	C	37	
23			4.0								217			60	C	23	
24			4.0								211			61	C	0	
25			3.7	10.0	.25	1836	1253	22.5	.82	.5	220	.66	68	50	C	11	
26			3.8	13.0	.29	2274	1559	28.5	.80	.5	222	.73	68	52	C	48	
27			3.8	11.5	.38	2316	1630	25.0	1.00	.5	201	.80	66	53	C	50	
28			3.8	10.8	.47	2550	1676	27.0	.94	1.0	193	.80	60	52	C	55	
29			3.8	9.5	.27	2232	1222	23.0	.97	1.3	194	.79	56	50	C	45	
30			4.0								203			57	C	62	
31			4.1								204			57	C	25	
TL															C	1164	
ME	48		3.8	8.6	.33	2268	1521	24.2	.94	.9	202	.76	65	56	C	38	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

July 19 77 — Month

Marshall, Michigan — Municipality

Robert J. Swabell — Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
ID	130029	07	77	000
	Plant No	Mo	Yr	Sampling Point Code

DAY	BOD 5			SS			TOTAL P			VSS	NH_3N	pH	DO	F COLI*		T COLI*	REMAR
	9	14	19	24	29	34	39	44	49	54	59	64	69	74	80	9	14
1 2	mg/l	LBS	% Rem	mg/l	LBS	% Rem	mg/l	LBS	% Rem	mg/l	mg/l	SU	mg/l	# 100 ml	C	#/100 ml	
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 ~~31615~~	C	31504 31505	
SF															C		
01												7.2	4.3	4	C		
02												6.9			C		
03												7.4			C		
04	6	110	92	4	73	94	.61	11	84	3		7.3			C		
05	6	126	91	11	231	87	1.00	21	76	7		7.1	[illegible]	100	C		
06	10	206	90	4	82	95	1.00	21	80	2		7.0	4.5	10	C		
07	16	315	87	5	98	95	.90	18	81	3		7.1	3.9	200	C		
08												7.1	4.0	164	C		
09												6.9			C		
10	19	334	76	10	176	89	.68	12	83	6		7.3			C		
11	14	283	85	12	242	94	.91	18	81	10		7.2	[illegible]	26	C		
12	16	312	88	7	137	95	.98	19	77	5		6.9	3.4	12	C		
13												7.0	4.0	18	C		
14	20	397	85	20	397	90	1.02	20	82	14		7.2	3.4	10	C		
15												7.0	[illegible]	128	C		
16												7.1			C		
17	17	308	80	13	235	90	.66	12	84	4		7.1			C		
18	16	328	83	7	144	93	1.01	21	78	6		7.2	4.3	36	C		
19												7.3	4.8	4	C		
20	14	270	84	11	212	83	.82	16	83	3		7.5	4.7	2	C		
21	18	339	79	14	264	84	.91	17	79	7		7.0	4.3	2	C		
22												7.2	4.3	24	C		
23												7.4			C		
24	21	373	78	4	71	94	.82	15	82	2		7.2			C		
25	6	118	94	4	78	95	.82	16	77	3		7.0	[illegible]	16	C		
26	8	149	93	4	75	97	.51	10	85	3		[illegible]	[illegible]	8	C		
27	6	112	94	9	168	92	.60	11	85	5		7.4	4.5	4	C		
28	11	210	88	10	191	90	.48	9	88	1		7.5	4.5	2	C		
29												7.2	5.4	4	C		
30												7.3			C		
31	20	350	83	14	245	87	.58	10	86	13		7.4			C		
TL		4640			3119			277							C		
ME	14	258	86	9	173	91	.80	15	82	5		7.2	4.2	14	C		
WA	17	325	82	12	233	90	.93	18	81					41	C		

Digester Volume, ft^3
Primary
Secondary

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D 4 5

Marshall, MICHIGAN

Supernatant To
Process Pattern

MONTH JULY 1922

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swelwell

DATE	RAW SLUDGE Gals	Total Solids	Vol Solids	Lbs 1000 c.f. Digester	pH	DIGESTING SLUDGE Temp. F	pH	Total Solids	Vol. Solids	Vol. Acids Mg/l	Alkalinity Mg/l	SUPERNATANT Gals. X	pH	Total Solids	Vol. Solids	Susp. Solids Mg/l	P Mg/l	P Lbs	5 Day BOD Mg	DIGESTED SLUDGE Gals X	Total Solids %	Vol Solids %	pH	Gas Produce cu. ft X
	160																							
1	50	5.9	70		6.1																			
2	50	6.2	61		6.2																			
3	50	4.6	61		6.3																			
4	50	5.0	64		6.2																			
5	40	5.5	62		6.1																			
6	50	5.6	63		6.1																			
7	50	5.0	63		6.1																			
8	50	5.3	55		6.3																			
9	50	1.7	72		6.2																			
10	50	[illegible]	[illegible]		6.2																			
11	50	6.5	67		6.1																			
12	32	5.4	65		6.1																			
13	40	5.4	67		6.0																			
14	40	6.2	70		6.6																			
15	40	5.6	65		6.1																			
16	40	5.8	62		6.2																			
17	40	7.7	73		6.1																			
18	30	5.7	66		5.8																			
19	20	5.8	65		5.9																			
20	40	6.4	66		6.0																			
21	40	6.6	65		6.1																			
22	40	6.2	65		6.3																			
23	40	6.2	67		6.2																			
24	40	6.5	65		6.2																			
25	40	5.8	68		6.1																			
26	40	6.4	57		6.2																			
27	40	6.0	59		6.2																			
28	40	6.1	58		6.5																			
29	40	6.2	65		7.0																			
30	40	5.4	61		6.4																			
31	40	5.7	61		6.2																			
TOTAL	1302																							
AP. H MEAN	42	5.8	64																					

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D 17

Manistique, MICHIGAN

MONTH July 19 71 VACUUM FILTER & INCINERATION DATA OPERATOR R J. Sadwell

DATE	SLUDGE TO FILTER: Gal X 100 (1)	Tot Sol (2)	Lbs Dry Sol (3)	pH (4)	CHEMICALS TO FILTER: CaO Lbs Dry (5)	CaO R (6)	FeCl3 Lbs Dry (7)	FeCl3 R (8)	FILTER: Tot Hours (9)	FILTRATE: Yield (10)	Sp Gr /100 (11)	pH (12)	Sus Solids Mg/l (13)	Vol Susp Solids % (14)	5 Day BOD Mg/l (15)	P Mg/l (16)	FILTER CAKE: Thou Lbs Wet (17)	Tot Sol % (18)	Lbs Tot Solids X 100 (19)	Vol Sol % (20)	Lbs Vol. Solids X 100 (21)	INCINERATION: Hrs Opr (22)	Yield (23)	Fuel BTU (24)	REMARKS (25)
1	62	4.7	2448	6.0	1115		159		5.0		43	11.7	1546	12	3600		17	17.0	32	52	17				
2																									
3																									
4																									
5	81	3.2	2586	6.0	1450		204		6.5		62	11.6	1590	10	3180		25	17.1	44	51	22				
6	106	4.2	3740	6.1	1815		270		8.5		81	11.9	1722	8	3900		32	19.3	60	53	20				
7	106	5.3	4719	6.2	1845		270		8.5		81	11.6	1521	6	2400		32	18.5	54	51	30				
8	87	4.1	2446	6.2	1561		222		7.0		67	11.5	1680				27	19.5	53	50	42				
9																									
10																									
11	106	4.3	3824	6.1	1845		270		8.5		81	11.7	1390	1	3600		32	20.4	65	45	31				
12	106	4.2	3740	6.0	1845		270		8.5		81	11.6	1576	8	3310		32	13.0	42	46	19				
13	106	4.1	3650	6.1	1845		270		8.5		81	11.6	1456	10	1080		32	11.9	38	44	17				
14																									
15	87	4.1	2771	6.0	1561		222		7.0		67	11.2	1976	8	2400		27	12.6	34	48	16				
16																									
17																									
18	106	4.6	4096	6.1	1845		270		8.5		81	11.6	1624	7	3600		32	19.0	61	46	28				
19	94	4.5	3553	6.1	1673		238		7.5		71	11.5	1531	7	2480		28	20.0	56	47	26				
20	106	4.5	4007	6.2	1845		270		8.5		81	10.7	1125	7	2400		32	21.3	68	45	31				
21	106	4.3	3824	6.2	1845		270		8.5		81	11.2	1422	6	2280		32	18.4	60	50	30				
22	64	4.6	2666	6.2	1226		174		5.5		52	10.5	1862	7	4320		21	20.7	43	43	19				
23																									
24																									
25	106	5.3	4719	6.3	1845		270		8.5		81	10.6	1634	9	3660		32	19.9	64	39	25				
26	87	4.3	3142	6.3	1561		222		7.0		67	10.4	1456	9	1140		27	19.4	52	48	25				
27	100	5.6	4704	6.5	1784		254		8.0		76	12.7	1286	6	2000		30	21.6	65	51	33				
28	100	5.2	4368	6.4	1784		254		8.0		76	11.7	1300	6	3486		30	22.1	66	37	25				
29																									
30																									
Tot	1721		65233		30776		4381		138.0		1315						522		1962		456				
Arith Means	96	4.5	3624		1709		243		7.7		73		1542	7	2775		29	18.4	53	48	25				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

July Month, 19 77 — Marshall Municipality, Michigan — Robert J. Swahill Superintendent's Signature

1,2 ID | 3–8 13,0027 Plant No | 9,10 07 Mo | 11,12 77 Yr | 13–15 Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX. FUEL 14	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS.	39 $FeCl_3$ LBS.	44	49	54	59
PN											
SF											
01	.5		2760			30	596				
02	.5		2520			30	397				
03	.5		2520			20	397				
04	.5		2520			20	397				
05	.5		3000			16	596				
06	.5		2760			30	843				
07	.5		2880			40	596				
08	.5		2880			40	695				
09	.5		2640			40	397				
10	.5		2760			40	397				
11	.5		3000			40	596				
12	.5		2760			50	596				
13	.5		2760			50	397				
14	.5		2760			40	397				
15	.5		2760			40	596				
16	.5		2640			40	397				
17	.5		2520			40	596				
18	.5		3000			30	496				
19	.5		2760			30	397				
20	.5		2880			40	596				
21	.5		3000			40	596				
22	.5		2880			40	397				
23	.5		2400			40	397				
24	.5		2640			20	496				
25	.5		2880			30	596				
26	.5		2880			30	596				
27	.5		2760			20	794				
28	.5		2640			20	596				
29	.5		2640			20	194				
30	.5		2640			20	397				
31	.5		2520			20	397				
TL	15.5		84,960			1000	15886				
ME	.5		2740			32	512				

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	5		800
Superintendent	1		160
Asst. Supt.	1		160
Shift Foreman			
Shift Operator	3		480
Maint. Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL

WEEKDAYS 11 HRS.

SATURDAYS 4 HRS

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

August (Month), 19 77 — Marshall (Municipality), Michigan — Robert J. Swabell (Superintendent's Signature)

1,2 | 3–8 | 9,10 | 11,12 | 13–15
10 | 130029 | 08 | 77 | 500
Plant No | Mo | Yr | Sampling Point Code

DAY 1,2	WEATHER TYPE 9	WEATHER PRECIP 14	FLOW TOTAL 19	FLOW MAX RATE 24	RAW SEWAGE QUALITY TEMP 29	pH 34	BOD-5 33 44		SS 49 54		TOTAL-P 59 64		VSS 69	NH_3-N 74 78	80	REMARKS OF 9	14
	See Code*	Inches	MGD	MGD	°F	S.U.	mg/l	LBS	mg/l	LBS	mg/l	LBS.	mg/l	mg/l	C		
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C		
SF															C		
01	1		2.45		58	7.4									C		
02	4	.03	2.28		58	7.4	96	1825	120	2282	4.10	78	86		C		
03	1		2.21		58	7.3	96	1769	104	1916	3.50	65	66		C		
04	4	.16	2.21		59	7.3	66	1216	50	922	3.40	63	40		C		
05	4	.05	2.20		59	7.4	106	1945	110	2018	3.30	61	96		C		
06	4	.10	2.09		59	7.4	118	2552	102	1778			72		C		
07	4	.04	2.02		58	7.3	69	1191	108	1864			82		C		
08	4	.47	2.39		58	7.1	82	1634	86	1714	3.60	72	74		C		
09	4	.43	2.29		58	8.1	92	1757	94	1795	3.20	61	28		C		
10	1		2.36		58	7.5	96	1575	122	2401	3.80	75	94		C		
11	4	.21	2.27		59	7.7	108	2045	126	2385	3.90	74	80		C		
12	1		2.27		58	7.3	114	2158	162	3067	3.80	72	90		C		
13	1		2.14		58	7.3	66	1178	128	2284			96		C		
14	1		2.16		59	7.4	88	1555	124	2234			64		C		
15	1		2.28		59	7.4	104	1978	128	2434	3.60	68	78		C		
16	4	.02	2.30		59	7.4	96	1841	142	2724	3.50	67	120		C		
17	1		2.18		59	7.4	86	1564	92	1673	4.40	80	58		C		
18	1		2.16		58	7.4	84	1513	94	1643	3.40	61	80		C		
19	1		2.16		58	7.5	106	1910	160	2882			138		C		
20	3		2.03		58	7.5	64	1084	98	1659			94		C		
21	4	.34	2.02		58	7.4	38	640	86	1449			76		C		
22	1		2.20		58	7.4	59	1083	156	2863	4.20	77	142		C		
23	4	.13	2.19		58	7.4	114	2082	182	3324	4.10	75	162		C		
24	1		2.13		59	7.3	120	2133	166	2949	4.70	83	110		C		
25	1		2.16		59	7.8	104	1946	182	3279	4.45	80	142		C		
26	4	.01	2.20		59	7.4	122	2238	128	2349	4.30	79	84		C		
27	1		2.17		59	7.5									C		
28	4	.84	2.17		59	7.2	108	1955	126	2280			108		C		
29	1		2.38		59	7.3	146	2898	148	2938	4.80	95	114		C		
30	1		2.20		59	7.4	110	2018	154	2826	4.10	75	116		C		
31	4	.18	2.15		59	7.2	106	1901	92	1650	4.59	82	68		C		
TL		3.06	6826					50718		65631		1543			C		
ME			2.20				95	1749	1.33	2263	3.94	73	92		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

August, 19 77 — Month

Marshall, Michigan — Municipality

Robert J. Swalwell — Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
ID	13.0024	08	77	
	Plant No	Mo	Yr	Sampling Point Code

DAY	BOD 5		SS		TOTAL P		VSS	NH_3-N	REMARKS OR OTHER PARAMETERS								
	9	14	19	24	29	34	39	44	49	54	59	64	69	74	78	80	9	14
	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l										
PN	00310	85001	00530	85002	00665	85004	00535	00610								C		
SF																C		
01																C		
02	76	1445	58	1103	3.80	72	46									C		
03	60	1106	66	1216	3.00	55	52									C		
04	54	995	34	627	3.20	59	32									C		
05	95	1734	112	2055	3.00	55	100									C		
06	76	1325	80	1394			62									C		
07	38	656	66	1139			56									C		
08	65	1296	36	718	3.70	74	30									C		
09	63	1203	64	1222	3.10	59	36									C		
10	64	1260	106	2086	3.40	67	62									C		
11	104	1969	68	1287	3.30	62	58									C		
12	90	1704	70	1325	3.80	72	58									C		
13	58	1035	74	1321			36									C		
14	64	1153	68	1225			42									C		
15	56	1065	58	1103	3.20	61	44									C		
16	66	1151	58	1113	3.80	73	34									C		
17	89	1618	62	1127	3.50	64	44									C		
18	51	919	60	1080	3.00	54	46									C		
19	106	1910	86	1549			72									C		
20	60	1016	90	1524			84									C		
21	22	371	70	1179			66									C		
22	52	954	72	1321	4.30	79	58									C		
23	90	1644	38	694	3.70	68	18									C		
24	86	1528	88	1563	5.30	94	68									C		
25	112	2018	82	1477	4.00	72	74									C		
26	93	1706	90	1651	4.00	73	48									C		
27																C		
28	94	1701	70	1267			60									C		
29	102	2025	64	1270	4.40	87	58									C		
30	111	2037	80	1468	3.85	71	62									C		
31	75	1345	48	861	4.30	77	36									C		
TL		39,884		36,965		1448										C		
ME	75	1375	70	1275	3.70	69	53									C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

August (Month), 19 77 — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1,2 ID | 3–8 Plant No: 130034 | 9,10 Mo: 08 | 11,12 Yr: 77 | 13–15 Sampling Point Code:

DAY 1,2	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification 14
	Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MLSS 34	MLVSS 39	SETTL 44	SDI 49	DO 54	Air Applied 59	SS 64	VSS 49	Percent Return 74	80,9	Waste Sludge	
	KCF	KCF	HRS	DAYS	F/M	mg l	mg/l	%	%	mg/l	Cu Ft	%	%	%	C	KGal	See Code*
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF											4				C		
01	48		3.5	6.5	.27	1976	1386	21.0	.94	1.4	208	.71	62	49	C	4	
02			3.8	8.8	.33	2113	1614	22.0	.84	.8	204	.75	63	54	C	34	
03			3.4	8.0	.35	2332	1585	25.0	95	1.1	202	.79	62	54	C	35	
04			3.9	7.4	.38	2363	1578	23.0	1.02	.8	199	.79	63	52	C	7	
05			3.9	6.5	.42	2526	1847	25.0	1.03	.7	199	.91	71	54	C	24	
06			4.1								198			57	C	47	
07			4.2								195			58	C	53	
08			3.6	5.1	.34	2217	1513	23.0	.96	.6	200	.71	63	52	C	22	
09			3.8	6.2	.41	2592	1716	26.0	1.00	.9	199	.81	64	52	C	38	
10			3.7	5.5	.29	2589	1220	25.5	1.01	.6	199	.84	44	50	C	56	
11			3.8	4.9	.35	2365	1595	24.0	.94	.6	207	.77	65	52	C	52	
12			3.8	5.0	.34	2216	1529	22.0	1.00	.6	205	.72	65	53	C	49	
13			4.0								200			54	C	50	
14			4.0								205			56	C	67	
15			3.8	4.1	.30	1850	1337	18.0	1.03	.8	202	.65	69	53	C		
16			3.7	5.2	.36	2344	1659	22.0	1.07	.7	198	.80	66	50	C	49	
17			4.0	6.0	.37	2336	1661	22.0	1.06	.8	206	.72	69	56	C	37	
18			4.0	6.1	.40	2301	1640	23.0	1.00	1.0	207	.70	69	56	C	47	
19			4.0	5.9	.40	2323	1655	23.0	1.01	1.0	203	.78	67	56	C	38	
20			4.2								201			60	C	47	
21			4.2								197			57	C	64	
22			3.9	4.8	.39	2486	1503	22.5	.93	.6	200	.68	66	55	C	37	
23			3.4	5.3	.49	2252	1615	26.0	.55	.7	200	.74	67	54	C	60	
24			4.0								204			57	C	39	
25			4.0	5.2	.35	2316	1587	22.0	1.07	1.0	202	.73	69	56	C	42	
26			3.4	5.8	.44	2467	2013	23.0	1.16	.8	193	.93	70	55	C	53	
27			4.0								184			53	C	80	
28			4.0								190			56	C	39	
29			3.6	4.7	.28	2248	1660	20.0	1.12	1.0	197	.74	74	51	C	34	
30			3.9	5.8	.32	2515	1901	23.0	1.12	1.0	197	.83	72	56	C	43	
31			4.0	5.9	.34	2472	1945	24.0	1.11	1.0	190	.80	73	57	C	54	
TL															C	1313	
ME	48		3.9	5.9	.36	2348	1629	23.2	1.01	.84	200	.77	66	54	C	44	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

August Month, 19 77 — Marshall Municipality, Michigan — Robert J. Swihart Superintendent's Signature

1,2 ID | 3–8 1300019 Plant No | 9,10 05 Mo | 11,12 77 Yr | 13–15 005 Sampling Point Code

D AY	BOD 5			SS			TOTAL P			VSS	NH_3 N	pH	DO	F COLI*		T COLI*	REMAR
	9 14 19			24 29 34			39 44 49			54	59	64 69		74	80	9	14
1,2	mg/l	LBS	% Rem	mg/l	LBS	% Rem	mg/l	LBS	% Rem	mg/l	mg/l	SU	mg/l	# 100 ml	C	#/100 ml	
	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	(31616) 31615	C	31504 31505	
DF															C		
01												7.3	4.7	126	C		
02	10	195	90	4	76	97	.56	11	86	2		7.4	5.0	4	C		
03	4	74	96	6	111	94	.47	9	87	3		7.2	4.3	4	C		
04	7	124	89	3	55	94	.33	6	93	2		7.3	5.3	2	C		
05	19	349	82	7	128	94	.40	7	91	6		7.3	4.1	16	C		
06	8	139	93	11	192	89				8		7.2			C		
07	5	86	93	5	86	95				3		7.2			C		
08	7	140	91	5	100	94	.35	6	92	4		7.3	5.1	48	C		
09	19	560	79	22	720	77	.14	8	86	15		7.8	4.5	26	C		
10	10	197	86	14	327	91	.53	10	86	15		7.4	4.1	18	C		
11	20	379	81	23	435	82	.62	12	84	14		7.5	4.2	6	C		
12	17	322	85	15	284	91	.43	5	89	10		7.5	4.4	6	C		
13	5	84	92	8	143	94				6		7.3			C		
14	5	90	94	8	144	94				3		7.4			C		
15	8	152	92	7	133	95	.78	15	78	2		7.5	4.3	2	C		
16	8	153	92	6	115	96	.70	13	80	4		7.3	3.6	20	C		
17	18	327	79	8	145	91	.99	18	78	1		7.4	7.0	56	C		
18	6	103	93	7	126	95	.71	13	74	4		7.3	4.3	16	C		
19	8	144	92	7	126	96				4		7.3	3.9	20	C		
20	14	237	78	22	372	78				15		7.4			C		
21	5	97	87	13	219	85				3		7.4			C		
22	8	147	86	7	128	94	1.11	20	74	5		7.3	4.2	4	C		
23	20	365	82	8	146	96	.55	10	87	5		7.3	3.1	22	C		
24	9	120	93	24	426	86	.42	7	91	17		7.3		106	C		
25	4	132	92	3	54	95	.58	10	87	2		7.7	4.2	4	C		
26	13	239	87	11	200	91	.19	4	94	4		7.2	1.8	16	C		
27												7.4			C		
28	19	344	82	2	36	96				1		7.2			C		
29	23	457	84	15	296	90	.91	16	82	10		7.1	4.2	4	C		
30	14	257	87	10	183	94	.95	17	77	2		7.2	4.2	10	C		
31	19	341	82	4	72	96	.47	8	90	1		7.4	4.0	16	C		
TL		4224			5329			233							C		
ME	12	215	88	10	184	92	.60	11	85	6		7.3	4.3	12	C		
WA	15	253	87	15	274	87	.70	14	80					23	C		

Digester Volume, ft³
Primary ___ ___
Secondary ___ ___

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MDPH
D 4 5

Supernatant To ___
Process Pattern ___

MONTH August 19 77

DIGESTER AND SLUDGE DATA

OPERATOR R. J. Sullwell

	RAW SLUDGE			DIGESTING SLUDGE					SUPERNATANT				DIGESTED SLUDGE				Gas Produced cu ft X
	Gallons X 1000	Temp F	Volatile Solids %	Temp F	pH	Total Solids %	Volatile Solids %	Alkalinity Mg/l	Gals X 1000	pH	Total Solids Mg/l	Volatile Solids Mg/l	Suspended Solids Mg/l	pH	BOD mg/l	Total Solids %	Volatile Solids %	pH	
1	40	55	58					61											
2	40	54	63					61											
3	40	57	67					61											
4	30	58	69					60											
5	40	56	69					61											
6	40	55	69					61											
7	40	53	68					62											
8	40	53	65					64											
9	40	53	59					65											
10	40	56	52					65											
11	40	59	67					64											
12	40	59	67					64											
13	30	59	85					63											
14	40	53	42					62											
15	40	56	66					61											
16	40	56	71					62											
	40	43	52					64											
18	43	57	66					61											
19	40	53	38					61											
20	40	71	62					61											
21	40	56	61					60											
22																			
23	40	49	61					70											
24	50	47	70					70											
25	40	51	68					64											
26	40	50	63					63											
27	40	49	64					64											
28	40	54	67					64											
29																			
30	60	54	23					64											
31	60	54	71					64											
TOTAL	1190																		
AVG	41	5.3	66																

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH D-4.7

Marshall, MICHIGAN

MONTH August, 1972 — VACUUM FILTER & INCINERATION DATA — OPERATOR R.J. Swalwell

DATE	SLUDGE TO FILTER				CHEMICALS TO FILTER				FILTER		FILTRATE						FILTER CAKE					INCINERATION			REMARKS
	Gal. X 100	Tot. Sol. %	Lbs. Dry Sol.	pH	C_{20} Lbs. Dry	R	$FeCl_3$ Lbs. Dry	R	Tot. Hours	Yield	Gal. X 100	pH	Sus. Solids Mg/l	Vol. Susp. Solids %	5 Day BOD Mg/l	P Mg/l	Thou. Lbs. Wet	Tot. Sol. %	Lbs. Tot. Solids X 100	Vol. Sol. %	Lbs. Vol. Solids X 100	Hrs. Opr.	Yield	Fuel BTU	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1	106	4.1	3651	6.2	2108		202		8.5		81	12.0	1570	7	1440		32	18.2	58	46	27				
2	106	4.8	4274	6.2	2108		202		8.5		81	12.1	1570	7	1440		32	17.9	57	51	29				
3																									
4	106	4.7	4185	6.2	2108		202		8.5		81	12.3	1516	5	3300		32	19.1	61	48	29				
5	75	4.7	2961	6.2	1487		143		6.0		57	11.6	1768	7	1380		22	18.0	40	50	20				
6																									
7																									
8	81	4.9	3130	6.2	1612		155		6.5		62	11.4	1658	7	2340		24	19.6	47	47	22				
9	106	4.6	4696	6.5	2108		202		8.5		81	11.8	532	8	2220		32	19.9	64	38	24				
10	100	4.3	3612	6.3	1924		191		8.0		76	11.7	1414	8	2440		30	20.1	60	37	22				
11	100	4.6	3864	6.7	1924		191		8.0		76	11.5	1286	15	2520		30	22.3	82	63	52				
12												11.4	1352	8	3600										
13																									
14																									
15	100	5.3	4452	6.5	1981		191		8.0		76	11.4	1556	6	1800		30	19.6	59	44	26				
16	106	4.6	4096	6.8	2108		202		8.5		81	11.5	1336	12	1740		32	18.4	59	46	27				
17	63	4.5	2381	6.6	1240		119		5.0		48	11.5	1564	8	2100		19	19.0	36	43	16				
18																									
19																									
20																									
21																									
22																									
23																									
24	38	4.7	1500	6.4	744		71		3.0		29	11.9	1324	12	540		11	18.2	21	45	9				
25	63	4.8	2540	6.6	1240		119		5.0		48	12.1	886	10	1320		19	19.5	37	45	17				
26																									
27																									
28																									
29	100	4.7	3948	6.6	1924		191		8.0		76	11.7	1430	16	2160		30	18.2	55	43	23				
30	100	4.9	4116	6.6	1924		191		8.0		76	11.6	1312	4	3240		30	17.8	53	52	28				
31	100	5.6	4709	7.1	1924		191		8.0		76	11.2	1536	4	3240		30	17.0	51	47	24				
Total	1455		7516		28168		2765		116		1105						435		740		395				
Arith. Mean	91	4.7	3594		1799		173		7.3		69		1389	8	2225		27	19.3	53	47	25				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

August, 19 77 — Month

Marshall, Michigan — Municipality

Robert J. Swalwell — Superintendent's Signature

ID 30029 (Plant No) 08 (Mo) 77 (Yr) (Sampling Point Code)

DAY 1 2	GRIT 9 CF	AUX FUEL 14	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS	39 $FeCl_3$ LBS	44	49	54	59
PN											
SF											
01	.5		3000			20	794				
02	.5		2880			20	596				
03	.5		2640			20	496				
04	.5		3000			20	794				
05	.5		2880			20	596				
06	.5		2640			20	496				
07	.5		2520			20	199				
08	.5		2880			20	596				
09	.5		3000			20	596				
10	.5		2880			20	794				
11	.5		3000			20	596				
12	.5		3000			20	397				
13	.5		2520			20	397				
14	.5		2640			20	397				
15	.5		3000			20	695				
16	.5		3000			20	695				
17	.5		2760			20	397				
18	1.5		2760			20	496				
19	.5		2760			20	397				
20	.5		2640			20	397				
21	.5		2040			20	298				
22	1.0		2760			20	596				
23	.5		2760			20	496				
24	.5		2640			20	596				
25	.5		2760			20	596				
26	1.0		2880			20	596				
27	.5		2280			20	397				
28	.5		2640			20	397				
29	.5		1800			40	794				
30	.5		2640			20	596				
31	.5		2760			20	695				
TL	17.5		84360			700	16878				
ME	.56		2721			22.5	544				

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	5		920
Superintendent	1		184
Asst. Supt.	1		184
Shift Foreman			
Shift Operator	3		552
Maint. Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL

WEEKDAYS 11 HRS

SATURDAYS 4 HRS

SUNDAYS 4 HRS

HOLIDAYS 4 HRS

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

September, 19 77
Month

Marshall
Municipality

Michigan

Robert J Swalwell
Superintendent s Signature

1 2 3 8 9 10 11 12 13 15
ID 130029 09 77
Plant No Mo Yr Sampling Point Code

DAY	BOD 5 9 14		SS 19 24		TOTAL P 29 34		VSS 39	NH_3 N 44	REMARKS OR OTHER PARAMETERS 49 54 59 64 69 74 78 80 9 14
1 2	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l	
PN	00310	85001	00530	85002	00665	85004	00535	00610	
SF									
01	93	1683	90	1624	6.70	121	64		
02	94	1638	66	1150	3.60	63	44		
03	66	1090	76	1255			50		
04	95	1553							
05	75	1201	46	737			42		
06	93	1668	164	2941	3.95	71	102		
07	64	1145	46	763	3.90	65	26		
08	78	1321	62	1050	4.00	68	20		
09	80	1348	12	202			8		
10	124	1996	112	1803			96		
11	98	1618	36	594			18		
12	90	1561	106	1834			82		
13	80	1361	38	647	4.45	76	16		
14	66	1106	52	872	3.15	53	40		
15	68	1157	60	1021	4.40	75	34		
16	120	1982	46	760	5.40	89	40		
17	134	2146	84	1345			40		
18	93	1497	56	901			42		
19	102	1735	96	1633	6.00	102	88		
20	106	1706	64	1030	4.85	78	52		
21									
22	114	1806	62	982			58		
23	136	2178	108	1729			88		
24	102	1514	82	1217			54		
25	120	1791	32	478			20		
26	148	2555	70	1208	5.50	95	46		
27	64	1619	52	823	4.60	81	40		
28	99	1610	62	1008	4.95	90	44		
29	111	1722	86	1334	5.25	81	56		
30	92	1366	56	831	5.70	85	46		
31									
TL		46073		31787		1293			
ME	97	1589	69	1135	4.78	81	48		

CHANGE ROLL

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

September, 19 77 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

ID 130029 (Plant No) 09 (Mo) 77 (Yr) .. (Sampling Point Code)

DAY 1 2	AERATION SYSTEM: Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MIXED LIQUOR: MLSS 34	MLVSS 39	SETTL 44	SDI 49	DO 54	Air Applied 59	SECONDARY SLUDGE: SS 64	VSS 49	Percent Return 74	80	Waste Sludge 9	Process Modification 14
	KCF	KCF	HRS	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu Ft.	%	%	%	C	KGal	See Code*
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF											4				C		
01	48		4.0	5.6	.31	2530	1803	23.0	1.10	2.3	194	.79	71	57	C	43	
02			4.1	6.2	.34	2616	1874	24.0	1.09	2.3	193	.82	69	57	C	42	
03			4.4								200			65	C	62	
04			4.4								194			65	C	57	
05			4.5								197			65	C	41	
06			4.0	4.1	.28	2010	1394	21.0	.96	3.0	153	.58	68	54	C	27	
07			4.3	4.5	.29	1907	1334	22.0	.87	2.5	166	.67	66	53	C	31	
08			4.2	5.5	.37	2462	1707	24.0	1.03	1.7	168	.80	66	52	C	55	
09			4.2	6.1	.38	2287	1710	22.0	1.04	1.2	170	.80	66	58	C	26	
10			4.5								168			60	C	33	
11			4.4								171			60	C	51	
12			4.1	4.9	.28	2190	1444	23.0	.95	.8	166	.71	63	57	C	22	
13			4.2	7.4	.28	2475	1792	25.0	.99	1.1	164	.81	71	58	C	13	
14			4.3	7.6	.35	2544	1728	27.0	.94	.8	163	.84	74	58	C	69	
15			4.2	6.3	.30	2118	1481	22.0	.96	1.2	168	.65	69	58	C	32	
16			4.4	6.5	.31	2284	1562	24.0	.95	1.1	168	.72	68	59	C	34	
17			4.5								164			59	C	43	
18			4.5								164			59	C	23	
19			4.2	7.2	.32	2545	1744	33.0	.77	1.0	178	.83	68	50	C	54	
20			4.5	6.8	.30	2381	1562	23.0	1.04	.7	194	.78	69	53	C	47	
21			4.6	6.6	.30	2230	1547	25.0	.89	.8	184	.73	70	55	C	43	
22			4.5								184			54	C	43	
23			4.8	6.2	.28	2462	1660	30.0	.82	.7	188	.76	67	51	C	59	
24			4.8								186			54	C	55	
25			4.8								190			55	C	49	
26			4.2								191			47	C	47	
27			4.5	5.9	.22	2115	1290	23.0	.92	3.2	192	.66	63	52	C	33	
28			4.4	6.2	.26	2255	1572	24.0	.94	2.8	193	.79	65	51	C	42	
29			4.6	6.8	.30	2467	1717	33.0	.75	1.4	184	.75	66	53	C	56	
30			4.8	6.5	.26	2016	1370	27.0	.75	1.9	183	.64	63	55	C	26	
31															C		
TL															C	1258	
ME	48		4.4	6.2	.30	2310	1595	25.0	.93	1.6	179	.74	67	56	C	42	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

September, 19 77 — Month

Marshall, Michigan — Municipality

Robert J. Swalwell — Superintendent's Signature

ID 130027 — Plant No; 04 — Mo; 77 — Yr; 000 — Sampling Point Code

DAY	BOD 5			SS			TOTAL P			VSS	NH_3-N	pH	DO	F COLI*		T. COLI*	REMARKS
1 2	mg/l	LBS	% Rem	mg/l	LBS	% Rem	mg/l	LBS	% Rem.	mg/l	mg/l	SU	mg/l	#/100 ml	C	#/100 ml	
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 ~~31615~~	C	31504 31505	
SF															C		
01	11	199	90	17	308	93	.76	14	87	10		7.3	4.0	8	C		
02	13	227	89	10	174	86	.60	10	87	3		7.4	4.6	2	C		
03	12	198	85	10	165	88				6		7.1			C		
04	19	311	84									7.2			C		
05	12	192	85	9	144	91				7		7.1			C		
06	11	197	91	31	556	89	.68	12	83	4		7.1	7.3	6	C		
07	12	199	87	4	66	97	1.02	17	79	3		7.2	6.5	22	C		
08	15	254	85	4	68	97	1.11	19	75	2		7.2	6.0	22	C		
09	15	253	86	3	51	96				1		7.2	[illegible]	14	C		
10	36	579	71	25	402	84				20		7.2			C		
11	20	330	80	6	99	93				3		7.2			C		
12	21	364	85	14	243	95				6		7.2		4	C		
13	9	153	93	7	119	96	1.11	19	80	2		7.2	[illegible]	2	C		
14	10	165	92	4	67	97	.66	11	88	2		7.2	4.4	2	C		
15	17	284	84	4	68	92	.73	12	88	3		7.1	[illegible]	28	C		
16	21	347	85	2	33	99	1.16	19	81	1		7.2	[illegible]	2	C		
17	40	641	65	8	128	95				2		7.2			C		
18	13	209	90	7	113	94				4		7.2			C		
19	15	255	89	20	340	89	1.13	19	82	17		7.1	3.5	2	C		
20	19	306	86	4	64	97	1.16	19	78	3		7.2	3.6	2	C		
21												7.2	3.9	2	C		
22	40	633	69	[illegible]	95	97				2		7.2	6.0	4	C		
23	40	[illegible]	70	15	240	90				9		7.2			C		
24	11	163	89	8	119	93				3		7.3			C		
25	21	314	87	12	179	92				6		7.3			C		
26	44	[illegible]	70	14	242	82	.99	17	83	10		7.1		2	C		
27	12	191	86	15	239	87	1.16	18	75	9		7.2	7.6	2	C		
28	11	179	93	8	130	94	.94	15	82	5		7.2	[illegible]	66	C		
29	12	186	90	5	78	97	1.13	18	77	1		7.2	4.5	10	C		
30	12	178	90	2	30	98	1.07	16	82	1		7.3	4.7	6	C		
31															C		
TL		8916			4560			255							C		
ME	19	307	84	10	163	93	.96	16	82	5		7.2	4.8	5	C		
WA	27	439		12	212									8	C		

Digester Volume, ft³
Primary
Secondary

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MDPH
D 45

Supernatant To
Process Pattern

MONTH September 1972

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Gualwell

DATE	RAW SLUDGE					DIGESTING SLUDGE					SUPERNATANT								DIGESTED SLUDGE				Gas Produc cu. ft X
	Gals. X 100	Total Solids %	Vol. Solids %	Vol. Solids Lbs 1000 c.f. Digester	pH	Temp. °F	pH	Total Solids %	Vol. Solids %	Vol. Acids Mg/l	Alkalinity Mg/l	Gals. X	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	P Mg/l	P Lbs.	5-Day BOD Mg/l	Gals. X	Total Solids %	Vol. Solids %	pH	
1	45	5.3	69		5.9																		
2	45	5.7	68		6.1																		
3	36	5.7	64		6.0																		
4	36	5.3	70		6.3																		
5	36	5.2	67		6.2																		
6	45	5.5	73		5.7																		
7	45	6.1	59		6.0																		
8	45	5.5	67		6.0																		
9																							
10	45	6.3	90		6.0																		
11	45	5.5	69		5.9																		
12	45	6.0	70		6.0																		
13	45	6.5	74		7.2																		
14	45	5.8	67		5.7																		
15	36	6.4	68		5.9																		
16	36	5.7	62		6.1																		
17	45	7.2	61		5.8																		
18	45	5.9	68		5.9																		
19	45	5.9	68		6.0																		
20	45	6.0	68		5.9																		
21	45	5.7	64		5.8																		
22	23	6.0	69		5.8																		
23	36	4.7	26		5.9																		
24	36	5.6	67		6.0																		
25	36	5.7	65		6.3																		
26	36	5.6	67		6.2																		
27	45	6.0	58		6.0																		
28	45	5.8	71		6.1																		
29	45	6.0	67		6.4																		
30	36	6.1	62		5.9																		
	1193																						
	41	5.8	66																				

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.7

Marshall, MICHIGAN

MONTH September, 1972

VACUUM FILTER & INCINERATION DATA

OPERATOR R. J. Swalwell

DATE	SLUDGE TO FILTER				CHEMICALS TO FILTER				FILTER		FILTRATE						FILTER CAKE					INCINERATION			REMARKS
					CaO		FeCl3																		
	Gal. x 10C	Tot. Sol. %	Lbs. Dry Sol.	pH	Lbs. Dry	R	Lbs. Dry	R	Tot. Hours	Yield	Gal. x 10C	pH	Sus. Solids Mg/l	Vol. Susp. Solids %	5 Day BOD Mg/l	P Mg/l	Tnou. Lbs. Wet	Tot. Sol. %	Lbs. Tot. Solids x 100	Vol. Sol. %	Lbs. Vol. Solids x 100	Hrs. Opr.	Yield	Fuel BTU	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1	94	5.0	3948	6.0	1650		179		7.5	11.0	71		1325	10	2100		28	17.7	50	42	21				
2	75	3.7	2331	6.0	1320		143		6.0	11.1	57		2064	11	3120		23	12.6	40	45	18				
3																									
4																									
5																									
6	88	5.0	3696	6.1	1540		167		7.0		67						26	12.7	46	50	23				
7	94	4.2	3316	7.0	1650		179		7.5	11.6	71						28	12.9	50	58	29				
8	94	4.5	3742	6.4	1650		179		7.5	11.1	71		1386	6	3120		28	17.3	48	43	21				
9																									
10																									
11																									
12																									
13	75	3.3	2079	6.0	1320		143		6.0	10.5	57		1130	9	1560		23	18.1	42	37	15				
14																									
15																									
16																									
17																									
18																									
19	100	5.8	4872	6.4	1760		191		8.0	11.1	76		1326	25	1860		30	20.0	60	41	25				
20	94	5.2	4166	6.9	1650		179		7.5	11.4	71		808	18	2640		28	19.8	55	42	23				
21	100	5.4	4536	6.7	1760		191		8.0	11.6	76						30	22.2	67	38	25				
22	100	5.4	4536	6.7	1760		191		8.0	11.2	76		1314	18	2160		30	20.9	63	39	24				
23	100	4.7	3948	6.7	1760		191		8.0	10.9	76		980	30	1980		30	18.9	57	58	33				
24																									
25																									
	94	6.3	4924	6.2	1650		179		7.5	11.1	71		1042	11	2640		28	18.4	52	43	22				
	100	5.4	4536	6.2	1760		191		8.0	11.3	76		1318	13	3060		30	20.7	62	48	30				
	100	6.6	5544	6.1	1760		191		8.0	11.2	76		1031	27	4680		30	22.0	66	48	32				
	56	5.4	2725	6.3	990		107		4.5	11.2	43		1148	8	1980		17	21.3	37	40	15				
Tot	1364		58,739		24680		2661		109		1035						769		795		356				
Aver Mnths	91	5.1	3929		1579		173		7.3	11.2	69		1245	15	2520		27	19.4	53	45	24				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

September, 19 77 — Month

Marshall, Michigan — Municipality

Robert J. Sinclair — Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
ID	130029	09	77	
	Plant No	Mo	Yr	Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX FUEL 14	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS	39 $FeCl_3$ LBS.	44	49	54	59
PN											
SF											
01	.5		2880			30	794				
02	.5		2760			30	695				
03	.5		2760			20	496				
04	.5		2520			30	397				
05	.5		2400			30	397				
06	.5		2520			30	695				
07	5		2520			20	496				
08	5		2640			20	596				
09	.5		2520			20	397				
10	.5		2400			40	496				
11	.5		2400			40	496				
12	.5		2400			40	397				
13	.5		2640			20	596				
14	1.0		2400			30	397				
15	.5		2400			30	298				
16			2400			40	298				
17			2280			40	298				
18			2400			30	596				
19			2640			30	496				
20			2760			30	596				
21			2640			30	596				
22			2640			40	596				
23	22.0		2640			20	596				
24			2280			20	397				
25			2400			20	397				
26	14.0		2640			20	496				
27	14.0		2520			20	496				
28	20.0		2640			40	496				
29	.5		2640			20	496				
30			2640			20	397				
31											
TL	83.5		76326			850	14890				
ME	4.2		2544			28	496				

MANPOWER

POSITION TITLE	No Full Time	No. Part Time	Total Hours
TOTAL	5		840
Superintendent	1		168
Asst Supt	1		168
Shift Foreman			
Shift Operator	3		504
Maint. Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL AF

WEEKDAYS 11 HRS

SATURDAYS 4 HRS

SUNDAYS 4 HRS

HOLIDAYS 4 HRS

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

October, 19 77
Month

Marshall, Michigan
Municipality

Robert J. Swahill
Superintendent's Signature

1 2 | 3 8 | 9 10 | 11 12 | 13 15
ID | 130,429 | 10 | 77 | See
Plant No | Mo | Yr | Sampling Point Code

DAY	WEATHER		FLOW		RAW SEWAGE QUALITY											REMARKS OI
	TYPE	PRECIP	TOTAL	MAX RATE	TEMP	pH	BOD-5		SS		TOTAL-P		VSS	NH_3-N		
1 2	9	14	19	24	29	34	39	44	49	54	59	64	69	74 78	80	9 14
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS	mg/l	LBS.	mg/l	LBS	mg/l	mg/l	C	
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C	
SF															C	
01	4	.06	1.76		58	7.3	156	2290	134	1967			100		C	
02	3		1.54		58	7.4	210	3082	222	3493			122		C	
03	3		1.87		58	7.4	86	1341	150	2340	6.50	101	103		C	
04	4	.02	1.77		58	7.4	132	1949	158	2331	6.30	93	102		C	
05	4	.02	1.90		58	7.3	94	1553	82	1299	5.80	92	62		C	
06	1		1.90		58	7.5	118	1870	94	1490	4.80	76	92		C	
07	4	.48	1.92		58	7.3	140	2242	204	3267	4.70	75	146		C	
08	4	.07	1.86		58	7.3	152	2420	216	3351			152		C	
09	4	.04	1.81		58	7.4									C	
10	4	.12	2.01		57	7.4	102	1710	134	2246			84		C	
11	4	.15	2.02		57	7.3	102	1718	154	2594	5.10	86	112		C	
12	4	.04	2.09		52	7.4	150	2615	164	2854	3.95	69	98		C	
13	1		2.02		57	7.4	129	2123	183	3167	4.80	81	92		C	
14	1		2.03		57	7.3	136	3149	140	2370	3.60	61	106		C	
15	4	.04	2.04		58	7.4									C	
16	1		1.98		57	7.3									C	
17	1		2.16		57	7.4	99	1783	184	3315			178		C	
18	4	.12	2.03		58	7.4	94	1591	106	1795	7.00	119	96		C	
19	1		2.06		57	7.4	154	2732	152	2611	4.30	74	78		C	
20	1		2.08		57	7.5									C	
21	4	.15	2.05		57	7.4	204	3488	226	3864	4.95	85	192		C	
22	4	.11	1.97		57	7.4									C	
23	4	.04	2.14		57	7.5									C	
24	1		2.17		57	7.4	96	1639	98	1724			80		C	
25	3		2.12		57	7.4	93	1733	54	955	5.40	95	47		C	
26	1		2.09		57	7.3	78	1360	148	2580	4.95	86	86		C	
27	1		2.11		57	7.4	84	1478	156	2745	5.40	95	104		C	
28	1		2.07		57	7.4	189	3263	178	3073	6.70	116	146		C	
29	1		2.05		57	7.5									C	
30	1		2.07		56	7.4									C	
31	4	.12	2.20		57	7.4	96	1761	178	3266			156		C	
TL		1.58	61.89					48,930		58752		1404			C	
ME			2.00				130	2127	155	2554	5.27	88	110		C	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

October, 19 77 — Month

Marshall, Michigan — Municipality

Robert J Swalwell — Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
ID	130029	10	77	
	Plant No	Mo	Yr	Sampling Point Code

DAY	BOD 5		SS		TOTAL P		VSS	NH_3-N	REMARKS OR OTHER PARAMETERS								
	9	14	19	24	29	34	39	44	49	54	59	64	69	74 78	80	9	14
1 2	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l							C		
PN	00310	85001	00530	85002	00665	85004	00535	00610							C		
SF															C		
01	180	2642	88	1292			54								C		
02	192	2466	100	1284			72								C		
03	82	1279	86	1341	5.80	90	56								C		
04	94	1388	48	708	5.70	84	32								C		
05	78	1236	36	570	5.80	92	24								C		
06	92	1478	46	729	5.20	82	38								C		
07	150	2402	110	1761	4.45	71	60								C		
08	122	1893	98	1520			58								C		
09															C		
10	109	1734	66	1106			36								C		
11	81	1365	74	1247	4.80	81	52								C		
12	117	2039	68	1185	3.75	65	46								C		
13					4.10	69									C		
14	147	2489	56	948	4.10	70	46								C		
15															C		
16															C		
17	78	1405	38	685			22								C		
18	68	1151	66	1117	5.20	88	60								C		
19	69	1185	58	996	3.40	58	54								C		
20															C		
21	150	2565	120	2052	3.85	66	60								C		
22															C		
23															C		
24	72	1303	68	1231			54								C		
25	72	1273	36	637	4.10	72	24								C		
26	72	1255	62	1081	4.70	82	26								C		
27	64	1126	72	1267	3.50	62	60								C		
28					4.20	73									C		
29															C		
30															C		
31	78	1431	80	1468			64								C		
TL		35105		24225		1205									C		
ME	103	1672	70	1154	4.54	75	48								C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

October, 19 77 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

ID 130029 (Plant No) 10 (Mo) 77 (Yr) (Sampling Point Code)

DAY 1 2	AERATION SYSTEM: Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MIXED LIQUOR: MLSS 34	MLVSS 39	SETTL. 44	SDI 49	DO 54	Air Applied 59	SECONDARY SLUDGE: SS 64	VSS 49	Percent Return 74	8C	Waste Sludge 9	Process Modification 14
	KCF	KCF	HRS.	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu. Ft.	%	%	%	C	KGal	See Code*
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF											4				C		
01	48		4.9								180			56	C	30	
02			5.6								204			56	C	47	
03			4.6	7.4	.35	2352	1642	29.0	.81	1.3	199	.87	68	50	C	32	
04			4.9	8.3	.30	2610	1816	39.0	.67	1.7	196	.85	68	56	C	23	
05			4.5	6.8	.36	2686	1708	49.0	.61	1.8	193	.99	42	52	C	20	
06			4.4	7.4	.32	2934	1862	43.0	.68	1.9	201	.85	66	52	C	76	
07			4.6	5.6	.87	2221	714	28.0	.79	2.2	193	.81	83	52	C	42	
08			4.6								190			53	C	76	
09			4.8								194			54	C	23	
10			4.3	6.7	.44	1942	1404	21.0	.92	1.8	193	.72	70	50	C	24	
11			4.3	6.3	.38	2369	1684	26.0	.91	1.6	198	.80	67	50	C	24	
12			4.1	6.3	.38	2370	1556	26.0	.91	3.0	201	.85	63	48	C	53	
13			4.3	5.5	.41	2137	1412	21.5	.99	3.1	200	.85	66	50	C	46	
14			4.2	5.5	.40	2107	1460	21.0	1.00	2.6	194	.77	64	50	C	47	
15			4.2								197			49	C	60	
16			4.4								203			49	C	36	
17			4.0								193			46	C	39	
18			4.3	5.5	.49	1816	1255	18.0	1.00	2.1	188	.78	64	48	C		
19			4.2	5.2	.44	2181	1451	20.0	1.03	.7	191	.90	56	47	C	52	
20			4.1	5.0	.47	2193	1460	20.0	1.04	.6	192	.91	63	47	C	85	
21			4.1								187			47	C	63	
22			4.4								189			50	C	37	
23			4.0								196			45	C	58	
24			4.0	2.8	.96	1076	600	9.0	1.20	1.5	187	.43	65	45	C		
25			4.1	4.3	.55	1521	999	14.0	1.09	1.3	180	.56	54	46	C		
26			4.1	4.7	.45	1855	1279	17.0	1.09	.7	173	.68	65	48	C		
27			4.1	5.6	.37	2108	1500	20.0	1.05	.8	174	.80	57	47	C	72	
28			4.2	4.2	.42	1957	1337	17.5	1.12	1.0	176	.74	65	47	C		
29			4.2								184			49	C	31	
30			4.2								180			48	C	57	
31			3.9	5.9	.67	2202	722	20.0	1.10	1.0	176	.85	83	45	C	64	
TL															C	1217	
ME	48		4.3	5.8	.48	2540	1361	2389	.95	1.6	190	.79	65	49	C	47	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

October, 19 77 — Month

Marshall, Michigan — Municipality

Robert J. Swalwell — Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
ID	130029	10	77	000
	Plant No	Mo	Yr	Sampling Point Code

DAY	BOD 5			SS			TOTAL P			VSS	NH_3-N	pH	DO	F COLI*		T COLI*	REMAR
	9	14	19	24	29	34	39	44	49	54	59	64	69	74	80	9	14
1 2	mg/l	LBS	% Rem	mg/l	LBS	% Rem	mg/l	LBS	% Rem	mg/l	mg/l	SU	mg/l	#/100 ml	C	#/100 ml	
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616	C	31504 31505	
SF															C		
01	38	558	76	16	235	88				6		7.1			C		
02	10	128	96	9	116	97				6		7.1			C		
03	12	187	86	7	109	95	.62	9.7	90	4		7.1	5.4	36	C		
04	16	236	89	7	103	9[illegible]	.96	14.2	85	2		7.3	5.6	2	C		
05	9	143	91	3	48	96	.91	14.4	84	2		7.2	6.4	8	C		
06	19	301	84	2	32	9[illegible]	1.00	15.8	79	1		7.6	5.3	4	C		
07	29	464	79	13	208	9[illegible]	.90	14.4	81	10		7.1	7.2	134	C		
08	14	217	91	15	233	93				8		7.2			C		
09												7.2			C		
10	22	369	78	14	235	90				4		7.3	5.5	TNTC	C		
11	10	168	90	14	236	91	.96	16.2	81	10		7.2	4.9	8	C		
12	20	349	87	9	157	95	.66	11.5	83	4		7.1	6.2	6	C		
13	20	337	84	4	67	98	.66	11.1	86	3		7.3	7.1	2	C		
14	23	389	90	5	85	96	.56	9.5	84	3		7.2	6.8	2	C		
15												7.4			C		
16												7.5			C		
17	6	108	94	9	162	95				7		7.2			C		
18	7	119	93	3	51	97	.91	15.4	87	2		7.2	4.8	2	C		
19	19	326	88	12	206	92	.74	12.7	83	7		7.8	4.4	2	C		
20												7.2	3.7	10	C		
21	9	154	9[illegible]	29	496	87	.80	13.7	84	14		7.3		TNTC	C		
22												7.3			C		
23												7.2			C		
24	6	109	93	8	145	92				4		7.2	[illegible]	2	C		
25	7	124	93	2	35	96	.70	12.3	87	1		6.7	4.3	28	C		
26	8	139	90	19	331	87	.62	10.8	87	4		7.2	3.8	10	C		
27	6	106	93	16	282	90	.64	11.2	88	8		7.1	3.7	8	C		
28	13	224	92	11	190	94	.60	10.4	91	6		7.1	4.1	4	C		
29												7.3			C		
30												7.2			C		
31	8	147	92	7	128	96				6		7.2	3.4	26	C		
TL		5402			3890			2033							C		
ME	14	235	89	10	169	94	.77	12.7	85	5		7.2	5.2	7	C		
WA	19	285	85	14	241	91	.80	13.9	83					11	C		

Digester Volume, ft³
Primary
Secondary

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MDPH
D 45

Supernatant To
Process Pattern

MONTH October 1972

DIGESTER AND SLUDGE DATA

OPERATOR R. J. Swalwell

DATE	RAW SLUDGE: Gals.	Total Solids	Vol. Solids	Lbs 1000 c.f. Digester	pH	DIGESTING SLUDGE: Temp. °F	pH	Total Solids	Vol. Solids	Vol. Acids	Alkalinity	SUPERNATANT: Gals.	pH	Total Solids	Vol. Solids	Susp. Solids	P	P	5-Day BOD	Gals.	DIGESTED SLUDGE: Total Solids	Vol. Solids	pH	Gas Produced cu. ft
	160							-	-	Mg/l	Mg/l	%		%	%	Mg/l	Mg/l	Lbs.	Mg/l	X	%	%		X
1	40	5.7	70		6.0																			
2	40	5.6	64		5.9																			
3	50	6.3	61		5.4																			
4	50	6.5	65		6.2																			
5	50	6.9	53		6.2																			
6																								
7	40	6.8	54		6.3																			
8	40	6.0	68		6.4																			
9	50	6.1	59		6.1																			
10	50	6.2	54		6.1																			
11	50	6.1	65		6.0																			
12	25	6.2	60		6.1																			
13	60	6.4	56		6.3																			
14	60	5.9	58		6.2																			
15	40	6.6	67		6.2																			
16	40	5.4	59		6.2																			
17	40	6.4	60		6.3																			
18	50	5.8	56		6.2																			
19	50	7.3	51		6.2																			
20	50	6.6	63		6.2																			
21	50	6.7	57		6.3																			
22	40	5.6	67		6.3																			
23	50	6.1	66		6.4																			
24	50	5.8	57		6.2																			
25	50	6.1	64		6.1																			
26	50	5.8	63		6.1																			
27	50	6.0	63		6.2																			
28	50	5.8	68		6.0																			
29	40	6.2	59		6.1																			
30	50	6.0	63		6.0																			
31	50	5.7	67		6.0																			
TOTAL	1405																							
ARITH MEAN	47	6.2	61																					

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4 7

Marshall , MICHIGAN

MONTH October , 1972 — VACUUM FILTER & INCINERATION DATA — OPERATOR R. J. Swidwell

DATE	SLUDGE TO FILTER				CHEMICALS TO FILTER				FILTER		FILTRATE						FILTER CAKE					INCINERATION			REMARKS
	Gal X 100	Tot Sol %	Lbs Dry Sol	pH	CaO Lbs. Dry	CaO R	$FeCl_3$ Lbs. Dry	$FeCl_3$ R	Tot Hours	Yes	Gal X 100	pH	Sus. Solids Mg/l	Vol. Susp. Solids %	5 Day BOD Mg/l	P Mg/l	Thou. Lbs. Wet	Tot. Sol. %	Lbs. Tot. Solids X 100	Vol. Sol %	Lbs. Vol. Solids X 100	Hrs. Opr	Yield	Fuel BTU	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1																									
2																									
3	100	6.1	5124	7.0	1840		191		8.0		76	10.8	868	21	1380		30	21.1	63	45	28				
4	100	6.3	5292	7.0	1840		191		8.0		76	11.0	1040	6	2040		30	19.1	57	44	25				
5	100	5.9	4956	6.9	1840		191		8.0		76	11.2	954	11	1020		30	19.2	58	47	27				
6																									
7	75	5.0	3150	6.6	1380		143		6.0		57	11.3	844	8	1380		23	24.1	55	35	19				
8																									
9																									
10	100	6.2	5203	7.2	1840		191		8.0		76	11.2	1152	7	1260		30	18.6	56	43	24				
11	100	5.6	4704	7.2	1840		191		8.0		76	11.3	880	17	720		30	20.1	60	48	29				
12	100	6.2	5203	7.2	1840		191		8.0		76	11.3	1008	13	1080		30	21.1	63	43	27				
13	100	5.6	4704	7.2	1840		191		8.0		76	11.2	1212	8	820		30	22.2	67	41	27				
14																									
15																									
16																									
17	100	5.6	4704	6.4	1840		191		8.0		76	11.4	1238	8	540		30	19.8	59	50	30				
18	94	5.2	4106	6.5	1725		179		7.5		71	11.2	1372	21	780		28	21.6	60	46	28				
19	100	5.6	4872	6.4	1840		191		8.0		76	11.6	1446	12	780		30	19.0	57	54	31				
20																									
21																									
22																									
23																									
24	94	4.6	3632	6.6	1725		179		7.5		71	11.2	1346	7	600		28	18.0	50	42	21				
25	94	5.8	4585	6.6	1725		179		7.5		71	11.6	916	5	480		28	20.3	57	38	22				
26	94	5.5	4343	6.6	1725		179		7.5		71	11.2	1200	7	1200		28	18.7	53	47	25				
27	75	4.0	3780	7.3	1380		143		6.0		57	11.3	948	6	1380		23	17.8	41	51	21				
28																									
29																									
30																									
31	94	3.7	2922	6.5	1725		179		7.5		71	11.3	1020	8	960		28	19.0	53	43	23				
Total	1520		71285		27945		2900		121.5		1153						456		909		407				
Arith Means	95	5.6	4455		1747		181		7.6		72		1091	11	1026		29	19.9	57	45	25				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

October Month, 19 77 — Marshall Municipality, Michigan — Robert J. Swalwell Superintendent's Signature

1 2 ID | 3 8 130029 Plant No | 9 10 10 Mo | 11 12 77 Yr | 13 15 Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX.FUEL 14	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS.	39 $FeCl_3$	44	49	54	59
PN											
SF											
01			2400			30	298				
02			2520			30	397				
03			2880			20	596				
04			2640			20	794				
05			2880			20	596				
06			2880			30	596				
07			2760			20	199				
08			2520			20	397				
09			2760			30	397				
10			2880			20	397				
11			3000			20	397				
12			3120			30	397				
13			3000			20	794				
14			3000			20	496				
15			2520			20	298				
16			3000			30	397				
17			3120			20	794				
18			3120			20	794				
19			2760			20	596				
20			2760			20	196				
21			2640			20	397				
22			2640			30	397				
23			2760			30	496				
24			2760			20	397				
25			2880			20	645				
26			2760			20	794				
27	3.0		2640			20	596				
28	1.5		2760			20	397				
29	.5		2520			20	397				
30	1.0		2880			20	397				
31			3120			20	596				
TL	6.0		86880			700	15,385				
ME	1.5		2802			22.5	496				

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	5		840
Superintendent	1		168
Asst. Supt.	1		168
Shift Foreman			
Shift Operator	3		504
Maint. Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL

WEEKDAYS 11 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

November, 19 77
Month

Marshall, Michigan
Municipality

R. J. Swalwell
Superintendent's Signature

1 2 | 3 8 | 9 10 | 11 12 | 13 15
ID | 130029 | 11 | 77 | 500
Plant No | Mo | Yr | Sampling Point Code

DAY 1 2	WEATHER TYPE 9	WEATHER PRECIP 14	FLOW TOTAL 19	FLOW MAX RATE 24	RAW SEWAGE QUALITY TEMP 29	pH 34	BOD-5 39 44		SS 49 54		TOTAL-P 59 64		VSS 69	NH_3-N 74 78	80	REMARKS 9 14
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS.	mg/l	LBS.	mg/l	LBS	mg/l	mg/l	C	
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C	
SF															C	
01	4	.07	2.12		57		99	1750	150	2626	5.10	90	128		C	
02	4	.02	2.09		57		90	1569	158	2754	5.20	99	120		C	
03	4	.03	2.20		57		108	1981	166	3046	5.10	94	140		C	
04	3		2.15		57		70	1255	94	1686	4.70	84	72		C	
05	3		2.08		57										C	
06	4	.11	2.14		57										C	
07	4	.09	2.18		57		120	2182	192	3491			156		C	
08	3		2.18		57		79	1418	180	3273			124		C	
09	4	.30	2.14		57		84	1494	120	2142	5.20	93	94		C	
10	4	.03	2.12		57		69	1219	96	1697			86		C	
11	1		2.15		57		81	1452	118	2116	6.70	120	82		C	
12	1		2.15		57										C	
13	1		2.11		57										C	
14	1		2.18		56		72	1309	80	1454	3.75	68	72		C	
15	4	.22	2.10		56	7.4	65	1138	44	771			36		C	
16	4	.04	2.11		56	7.2	76	1337	106	1865	4.30	76	98		C	
17	4	.11	2.18		55										C	
18	1		2.16		55	7.3	96	1729	210	3783			110		C	
19	4	.07	2.10		55										C	
20	4	.30	2.08		55	7.4	120	2082	166	1735	3.85	67	86		C	
21	3		2.16		55										C	
22	3		2.22		55	7.3	102	1884	164	3036	4.30	80	116		C	
23	4	.11	2.15		56		84	1506	94	1686	3.30	54	68		C	
24	5	.22	2.04		56										C	
25	5	.02	2.02		56										C	
26	1		2.15		56										C	
27	5	.25	2.09		56		88	1534	74	1290	4.30	75	58		C	
28	1		2.22		55		93	1722	132	2444	6.85	127	92		C	
29	1		2.17		54	7.6	99	1792	130	2353	3.60	65	94		C	
30	4	.61	2.27		53		81	1533	102	1931	4.20	89	84		C	
31															C	
TL		2.60	64.21					31,846		45197		1286			C	
ME			2.14				89	1595	126	2260	4.76	86	96		C	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

November, 19 77
Month

MARSHALL, Michigan
Municipality

R. J. Swalwell
Superintendent's Signature

ID 13.0029 11 77
Plant No Mo Yr Sampling Point Code

DAY	BOD-5		SS		TOTAL-P		VSS	NH_3-N	REMARKS OR OTHER PARAMETERS									
	9 14		19 24		29 34		39	44	49	54	59	64	69	74 78	80	9	14	
1 2	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l							C			
PN	00310	85001	00530	85002	00665	85004	00535	00610							C			
SF															C			
01	78	1379	64	1132	4.55	80	62								C			
02	98	1708	78	1360	4.95	86	60								C			
03	76	1394	90	1651	3.30	61	80								C			
04	72	1291	78	1399	3.95	71	50								C			
05															C			
06															C			
07	96	1745	85	1545			58								C			
08	69	1255	88	1600			62								C			
09	72	1285	78	1392	4.45	79	62								C			
10	74	1308	116	2051			86								C			
11	105	1883	130	2331	4.10	74	108								C			
12															C			
13															C			
14	90	1636	78	1418	4.30	78	68								C			
15	82	1436	64	1121			52								C			
16	84	1478	86	1513	4.55	80	68								C			
17															C			
18	105	1892	90	1621			64								C			
19															C			
20	102	1769	82	1422	4.20	73	76								C			
21															C			
22	80	1481	109	1926	4.55	84	72								C			
23	65	1166	108	1934	4.10	74	90								C			
24															C			
25															C			
26															C			
27	90	1569	70	1220	3.85	67	66								C			
28	72	1333	80	1481	4.55	84	72								C			
29	68	1231	58	1650	3.95	71	46								C			
30	72	1363	80	1515	4.20	80	72								C			
31															C			
TL		29602		30682		1142									C			
ME	83	1480	85	1534	4.24	76	69								C			

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

November, 19 77 (Month)

MARSHALL (Municipality), Michigan

R. J. Swartwell (Superintendent's Signature)

ID 1300299 (Plant No) 11 (Mo) 77 (Yr) ... (Sampling Point Code)

DAY	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification
	Aeration Volume	Reaeration Volume	Detention Time	Sludge Age	Organic Loading	MLSS	MLVSS	SETTL.	SDI	DO	Air Applied	SS	VSS	Percent Return		Waste Sludge	
	KCF	KCF	HRS.	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu. Ft.	%	%	%	C	KGal	See Code*
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF											4				C		
01	48		4.1	4.2	.39	1797	1260	18.0	1.00	1.0	89	.66	66	44	C		
02			4.1	5.8	.29	2139	1529	20.0	1.06	1.1	87	.80	67	48	C	39	
03			3.9	4.4	.28	2329	1676	21.0	1.10	.7	88	.87	70	46	C	58	
04			4.0	4.2	.32	1947	1421	16.5	1.18	.4	82	.72	69	49	C	21	
05			4.1								77			49	C	48	
06			4.0								73			47	C	63	
07			4.0	4.4	.35	2067	1400	17.0	1.22	.8	71	.39	65	46	C	35	
08			4.0	3.6	.25	2608	1939	18.0	1.45	.6	71	.79	70	49	C	62	
09			4.0	4.3	.36	1747	1343	14.0	1.25	.9	89	.61	74	50	C		
10			4.1	4.6	.31	2130	1528	18.0	1.18	.7	88	.74	71	51	C	37	
11			4.1	3.6	.28	2349	1735	21.0	1.12	.4	95	.85	71	51	C	49	
12			4.1								100			51	C	40	
13			4.1								103			50	C	86	
14			4.0	2.3	.48	1307	1004	11.0	1.18	3.4	101	.50	75	49	C		
15			4.1	4.1	.35	1925	1433	11.0	1.75	.6	96	.62	71	51	C		
16			4.1	4.7	.30	2198	1632	20.0	1.10	1.0	89	.82	69	51	C	40	
17			4.0	4.4	.29	2458	1759	22.0	1.11	.7	93	.88	90	50	C	48	
18			4.0	3.9	.32	2292	1655	21.0	1.09	1.0	93	.75	69	50	C	48	
19			4.1								97			52	C	49	
20			4.1								92			51	C	50	
21			4.1	5.0	.39	1965	1462	18.0	1.09	1.4	100	.66	72	50	C		
22			3.9	3.7	.29	2342	1781	23.0	1.01	1.0	94	.78	76	49	C	61	
23			4.1	4.4	.36	1918	1441	18.0	1.07	2.0	91	.70	72	50	C		
24			4.2								95			50	C	45	
25			4.3								95			52	C	33	
26			4.1								101			50	C	39	
27			4.1								90			51	C	36	
28			3.9	4.3	.32	2215	1604	22.0	1.01	3.0	98	.84	70	50	C	46	
29			4.0	4.6	.34	2269	1528	29.0	.78	3.0	93	.83	63	50	C	49	
30			3.8	5.1	.31	2245	1574	21.0	1.07	1.4	91	.80	70	48	C	46	
31															C		
TL															C	1128	
ME			4.1	4.3	.33	2112	1535	18.8	1.14	1.3	91	.74	71	50	C	47	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

November, 19 77 — Month

Marshall, Michigan — Municipality

R. J. Sunshell — Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
ID	130029	11	77	000
	Plant No	Mo.	Yr	Sampling Point Code

DAY	BOD-5			SS			TOTAL-P			VSS	NH_3-N	pH	DO	F. COLI*		T. COLI*	REMAR
	9	14	19	24	29	34	39	44	49	54	59	64	69	74	80	9	14
1 2	mg/l	LBS	% Rem	mg/l	LBS	% Rem	mg/l	LBS	% Rem.	mg/l	mg/l	SU	mg/l	#/100 ml	C	#/100 ml	
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 ~~31615~~	C	31504 31505	
SF															C		
01	7	124	93	3	53	98	.85	15	83	2		7.3	4.0	20	C		
02	7	122	92	11	192	93	1.00	17	82	7		7.7	3.6	38	C		
03	10	183	91	19	349	89	.74	14	85	14		7.3	3.2	196	C		
04	10	179	86	14	251	85	.63	11	91	4		7.2	3.6		C		
05												7.3			C		
06												7.2			C		
07	19	345	84	16	291	92				3		7.3	4.2	140	C		
08	13	236	83	27	445	85				10		7.2	4.3	148	C		
09	10	181	88	8	214	93	.96	17	82	7		7.2	4.2	6	C		
10	9	161	87	12	212	88				10		7.2	3.6	160	C		
11	6	106	93	24	424	80	1.04	18	84	14		7.3	4.2	4	C		
12												7.2			C		
13												7.4			C		
14	13	236	82	12	218	85	.75	14	80	9		7.3	6.6	18	C		
15	11	193	83	4	70	91				2		7.3	4.2	2	C		
16	13	224	83	11	193	86	1.00	18	77	16		7.4	4.0	4	C		
17												7.4	3.7	2	C		
18	14	252	85	23	414	89				16		7.3	4.1	6	C		
19												7.3			C		
20	15	260	88	12	208	88	1.14	20	70	7		7.3			C		
21												7.2	4.7	20	C		
22	12	222	88	17	315	90	.95	18	78	5		7.2	4.0	4	C		
23	5	90	94	18	323	81	.85	15	74	14		7.3	5.3	4	C		
24												7.4			C		
25												7.4			C		
26												7.5			C		
27	10	174	87	8	139	89	.85	15	80	5		7.4			C		
28	11	204	88	15	278	89	1.08	20	85	13		7.3	5.4	10	C		
29	13	235	77	8	145	94	.86	16	76	4		7.4	6.0	2	C		
30	6	114	93	8	151	92	.56	11	88	5		7.5	5.5	2	C		
31															C		
TL		4141			4885			239							C		
ME	11	207	87	14	244	89	.88	16	81	8		7.3	4.4	12	C		
WA	12	213	86	17	312	87								60	C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

November, 19 77
Month

Marion, Michigan
Municipality

R-J Swalwell
Superintendent's Signature

ID 130019 11 77
Plant No Mo Yr Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX.FUEL 14 Gas	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS	39 $FeCl_3$ LBS	44	49	54	59
PN											
SF		2									
01			2760			20	794				
02			2640			20	596				
03			2640			20	397				
04			2520			30	397				
05			2400			10	194				
06			2160			20	397				
07			2400			30	397				
08			2520			20	397				
09		4	2640			30	397				
10		51	3000			40	397				
11		49	2880			30	194				
12		46	2600			30	194				
13		45	2600			30	397				
14		46	2880			20	397				
15		13	2640			20	397				
16		24	2760			20	397				
17		27	2880			30	397				
18		43	2760			30	194				
19		35	2880			30	194				
20		14	2760			20	194				
21		42	2880			40	194				
22		22	2880			20	397				
23		26	2760			30	397				
24		31	3240			30	397				
25		54	2880			40	397				
26		52	3240			30	397				
27		42	3120			30	397				
28		48	3360			10	596				
29		52	3240			20	596				
30		48	3240			20	596				
31											
TL		814	86160			770	11717				
ME		39	2872			25.6	391				

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	5		808
Superintendent	1		160
Asst. Supt.	1		160
Shift Foreman			
Shift Operator	3		488
Maint. Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL

WEEKDAYS 11 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

Digester Volume, ft³
Primary _____
Secondary _____

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MDPH
D-4.5

Supernatant To _____
Process Pattern _____

MONTH November 1922

DIGESTER AND SLUDGE DATA

OPERATOR R. J. Swalwell

DATE	RAW SLUDGE					DIGESTING SLUDGE						SUPERNATANT								DIGESTED SLUDGE				Gas Produced cu. ft X
	Gals. X 100	Total Solids %	Vol. Solids %	Vol. Solids Lbs/1000 c.f. Digester	pH	Temp. °F	pH	Total Solids %	Vol. Solids %	Vol. Acids Mg/l	Alkalinity Mg/l	Gals. X	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	P Mg/l	P Lbs.	5-Day BOD Mg/l	Gals. X	Total Solids %	Vol. Solids %	pH	
1	50	5.7	65		6.5																			
2	50	6.2	66		6.2																			
3	50	6.3	62		6.1																			
4	50	5.6	68		6.2																			
5	50	6.4	57		6.3																			
6	50	5.8	64		6.2																			
7	50	5.6	56		6.3																			
8	50	6.2	57		6.2																			
9	50	8.7	80		6.0																			
10	50	5.6	68		6.2																			
11	50	6.4	70		6.1																			
12	50	6.2	66		6.1																			
13	50				6.1																			
14	50	7.6	48		6.2																			
15	50	6.4	60		6.2																			
16	50	7.7	70		6.1																			
17	50	6.4	34		6.2																			
18	50	5.8	72		6.1																			
19																								
20	50	5.7	63		6.1																			
21	50	5.6	69		6.1																			
22	40	6.2	61		6.2																			
23	60	5.1	67		6.2																			
24	40	5.4	73		6.2																			
25	60	6.2	57		6.2																			
26	60	5.0	62		6.1																			
27	60	5.8	64		6.1																			
28	60	5.9	62		6.2																			
29	60	4.2	56		6.4																			
30	60	6.2	56		6.3																			
31																								
TOTAL	1500																							
ARITH. MEAN	50	6.3	64																					

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.7

Marshall, MICHIGAN

MONTH November, 19 77

VACUUM FILTER & INCINERATION DATA

OPERATOR R.J. Swalwell

DATE	SLUDGE TO FILTER				CHEMICALS TO FILTER				FILTER		FILTRATE						FILTER CAKE					INCINERATION			REMARKS
	Gal. X 100	Tot. Sol. %	Lbs. Dry Sol.	pH	CaO Lbs. Dry	CaO R	$FeCl_3$ Lbs. Dry	$FeCl_3$ R	Tot. Hours	Yield	Gal. X 100	pH	Sus. Solids Mg/l	Vol. Susp. Solids %	5 Day BOD Mg/l	P Mg/l	Thou. Lbs. Wet	Tot. Sol. %	Lbs. Tot. Solids X 100	Vol. Sol. %	Lbs. Vol. Solids X 100	Hrs. Opr.	Yield	Fuel BTU	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1	94	5.6	4422	7.3	1838		197		7.5		71	11.2	922	7	960		28	19.3	54	44	24				
2	94	5.0	3948	6.9	1838		197		7.5		71	11.4	840	33	960		28	19.1	53	48	26				
3	50	6.0	2520	7.0	980		96		4.0		38	11.1	1032	25	1080		15	18.8	28	42	12				
4																									
5																									
6																									
7	100	5.4	4536	7.0	1960		191		8.0		76	11.2	852	8	1140		30	19.7	59	43	25				
8																									
9	94	5.4	4264	6.9	1838		197		7.5		71	11.7	938	6	1260		28	19.9	56	41	23				
10	62	5.4	2812	7.0	1235		120		5.0		48	11.4	1238	8	1080		19	20.8	40	37	15				
11																									
12																									
13																									
14																									
15																									
16																									
17																									
18																									
19																									
20																									
21																									
22																									
23																									
24																									
25																									
26																									
27																									
28	94	5.1	4027	7.0	1838		197		7.5		71	11.2	1326	7	720		28	20.1	56	53	30				
29	94	6.1	4817	6.7	1838		197		7.5		71	11.4	846	1	960		28	22.1	62	35	22				
30	94	5.0	3948	6.7	1838		197		7.5		71	11.4	1082	26	600		28	21.4	60	39	23				
31																									
Total	776		35294		15193		1589		62.0		588						232		468		200				
Arith Means	86	5.4	3922		1688		177		6.8		65		1008	13	973		26	20.1	52	42	22				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

December (Month), 19 77

Marshall (Municipality), Michigan

Robert J Swahnell
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID | 130629 | 12 | 77 | 500
Plant No | Mo | Yr | Sampling Point Code

DAY 1 2	WEATHER TYPE 9	WEATHER PRECIP. 14	FLOW TOTAL 19	FLOW MAX RATE 24	RAW SEWAGE QUALITY TEMP 29	pH 34	BOD-5 39 44		SS 49 54		TOTAL-P 59 64		VSS 69	NH_3-N 74 78	80	REMARKS OF 9	14
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l	C		
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C		
SF															C		
01	3		2.22		54	7.3	105	1944	126	3254			148		C		
02	1		2.15		54	7.5	94	1686	82	1470			50		C		
03	1		2.15		54	7.4									C		
04	1		2.13		54	7.4									C		
05	5	.02	2.18		54	7.5	180	3273	194	3527			154		C		
06	5	.04	2.22		54	7.2	94	1740	94	1740	6.00	111	78		C		
07	1		2.15		54	7.2	105	1883	104	1865	5.00	90	100		C		
08	5	.56	2.19		54	7.4	99	1808	76	1388	4.10	75	60		C		
09	5	.04	2.23		54	7.2									C		
10	1		2.03		54	7.3									C		
11	3		2.08		54	7.4	66	1145	44	763	4.20	73	34		C		
12	1		2.18		53	7.4	82	1491	90	1636	3.60	65	72		C		
13	4	.20	2.22		53	7.3	94	1740	76	1407	4.20	78	54		C		
14	4	.02	2.23		53	7.3	84	1562	164	3050	4.95	92	128		C		
15	1		2.22		53	7.2									C		
16	1		2.18		53	7.2									C		
17	4	.73	2.29		53	7.3									C		
18	4	.47	2.41		53	7.3	60	1071	54	963			50		C		
19	4	.28	2.40		53	7.4	147	2942	180	3603	3.30	66	128		C		
20	5	.15	2.38		53	7.8	94	1866	52	1032	5.40	107	34		C		
21	5	.06	2.43		53	7.3	92	1864	70	1419	3.60	73	50		C		
22	1		2.36		53	7.4	52	1023	102	2008			74		C		
23	1		2.31		53	7.4	156	3005	90	1734	3.10	60	24		C		
24	5	.03	2.04		53	7.3									C		
25	5	.05	2.28		52	7.2									C		
26	5	.03	2.36		50	7.2	186	3661	112	2204	5.10	1.00	100		C		
27	5	.01	2.36		51	7.3									C		
28	5	.01	2.35		50	7.4	111	2175	100	1960	3.75	73	58		C		
29	1		2.23		50	7.3	94	1748	94	1748	3.50	65	68		C		
30	3		2.33		51	7.3									C		
31	5	.21	2.23		51	7.4									C		
TL		2.85	69.57					38127		36772		1128			C		
ME			2.24				105	2007	103	1935	4.27	81	77		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

December , 19 77
Month

Marshall , Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2 | 3 8 | 9 10 | 11 12 | 13 15
ID | 13.00.29 | 12 | 77 | ...
Plant No | Mo | Yr | Sampling Point Code

DAY	BOD-5 9 14		SS 19 24		TOTAL-P 29 34		VSS 39	NH_3-N 44	REMARKS OR OTHER PARAMETERS 49	54	59	64	69	74 78	80	9	14
1 2	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l							C		
PN	00310	85001	00530	85002	00665	85004	00535	00610							C		
SF															C		
01	78	1444	100	1851			90								C		
02	93	1668	46	825			34								C		
03															C		
04															C		
05	99	1800	106	1927			98								C		
06	44	815	58	1074	4.70	87	42								C		
07	87	1560	44	1686	4.60	82	84								C		
08	70	1279	114	2082	3.60	66	90								C		
09															C		
10															C		
11	63	1093	60	1041	4.55	79	48								C		
12	87	1582	66	1200	4.10	75	60								C		
13	78	1444	70	1296	3.95	73	56								C		
14	60	1116	28	521	5.20	106	24								C		
15															C		
16															C		
17															C		
18	45	803	86	1535			60								C		
19	105	2102	66	1321	3.85	77	50								C		
20	96	1906	76	1506	3.40	67	68								C		
21	78	1581	80	1621	3.50	71	48								C		
22	60	1181	46	905			42								C		
23	106	2042	168	3237	3.30	64	126								C		
24															C		
25															C		
26	93	1830	96	1890	4.30	85	86								C		
27															C		
28	84	1646	52	1019	3.40	67	38								C		
29	80	1488	40	1674	3.10	58	66								C		
30															C		
31															C		
TL		28480		28211		1057									C		
ME	79	1499	79	1485	4.00	76	64								C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

December (Month), 19 77

Marshall (Municipality), Michigan

Robert J. Swahnell (Superintendent's Signature)

ID | 130029 (Plant No) | 12 (Mo) | 77 (Yr) | ... (Sampling Point Code)

DAY 1 2	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification 14
	Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MLSS 34	MLVSS 39	SETTL 44	SDI 49	DO 54	Air Applied 59	SS 64	VSS 49	Percent Return 74	8C	Waste Sludge 9	
	KCF	KCF	HRS	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu Ft	%	%	%	C	KGal	See Code*
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF											4				C		
01			3.4	4.3	.29	2284	1626	19.0	1.20	3.0	194	.75	65	49	C	55	
02			4.0	4.4	.33	2050	1408	12.0	1.20	3.4	195	.70	63	51	C	32	
03			4.0								168			51	C	47	
04			4.0								94			51	C	45	
05			4.0	4.1	.39	1933	1267	19.0	1.00	1.6	185	.71	59	50	C		
06			3.9	4.9	.29	2284	1575	23.5	.97	0.7	191	.80	61	49	C	27	
07			4.0								195			51	C	21	
08			3.9	5.1	.28	2410	1695	24.0	1.00		196	.85	65	47	C	41	
09			3.9	5.0	.29	2373	1688	23.0	1.03	2.9	174	.83	68	47	C	93	
10			4.2								163			51	C		
11			4.1								161			50	C		
12			4.0	4.5	.31	2123	1519	22.0	.96	1.8	150	.74	64	49	C	47	
13			3.9	4.7	.30	2362	1564	25.0	.94	1.8	157	.84	63	49	C	30	
14			3.9	5.8	.26	2501	1671	24.0	1.04	1.2	191	.86	88	49	C	40	
15			3.9	5.8	.27	2489	1632	21.5	1.15	2.4	193	.87	63	49	C	53	
16			4.0	5.2	.27	2226	1579	22.0	1.01	2.9	190	.86	64	45	C	78	
17			3.8								188			48	C	42	
18			3.6								188			47	C	36	
19			3.6	5.0	.32	2341	1542	21.0	1.11	1.5	184	.90	61	45	C	28	
20			3.6	5.1	.45	2218	1104	24.0	.92	1.1	193	.83	63	45	C	38	
21			3.5	5.2	.33	2349	1605	24.0	.98	1.8	193	.89	60	45	C	30	
22			3.7	5.5	.31	2361	1584	22.5	1.04	1.7	193	.91	61	44	C	52	
23			3.7	4.2	.36	2107	1394	20.0	1.05	3.1	193	.77	57	46	C	41	
24			4.1								180			46	C	57	
25			3.8								176			52	C	33	
26			3.7								174			48	C	41	
27			3.7	4.3	.35	2141	1409	21.0	1.02	3.4	176	.90	54	47	C	43	
28			3.7	3.9	.35	2102	1500	21.0	1.00	2.9	173	.80	64	47	C	47	
29			3.9	4.1	.33	2208	1620	21.0	1.05	2.6	164	.81	65	47	C	50	
30			3.7								164			47	C	44	
31			3.9								165			48	C	43	
TL															C	1234	
ME			3.9	4.8	.32	2256	1526	2182	1.04	2.0	178	.82	64	48	C	44	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

December , 19 77
Month

Marshall , Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID | 130029 | 12 | 77 | 040
Plant No | Mo | Yr | Sampling Point Code

DAY	BOD 5			SS			TOTAL P			VSS	NH_3 N	pH	DO	F COLI*		T COLI*	REMARK
	9 14 19			24 29 34			39 44 49			54	59	64	69	74	80	9	14
1 2	mg/l	LBS	% Rem	mg/l	LBS	% Rem	mg/l	LBS	% Rem	mg/l	mg/l	SU	mg/l	#/100 ml	C	#/100 ml	
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	~~31615~~ 31616	C	31504 31505	
SF															C		
01	10	158	90	8	148	95				6		7.4	6.3	2	C		
02	7	126	93	5	90	94				4		7.4	6.9	2	C		
03												7.4	6.9		C		
04												7.4			C		
05	14	255	92	15	273	92				14		7.5	5.9	4	C		
06	14	239	85	30	555	68	.80	15	87	16		7.3	3.9	108	C		
07	13	233	88	31	556	70	.62	11	88	24		7.3			C		
08	14	256	86	17	310	78	1.10	20	70	10		7.4			C		
09												7.5	5.6	8	C		
10												7.4			C		
11	10	173	85	11	191	73	.91	16	78	9		7.4			C		
12	10	182	88	15	273	83	.78	14	78	9		7.5	4.6	62	C		
13	21	389	78	14	259	68	.82	15	80	8		7.4	4.5	6	C		
14	7	130	92	11	205	93	1.00	19	80	10		7.6	4.0	19	C		
15												7.3	5.3	4	C		
16												7.4	6.3	6	C		
17												7.4			C		
18	7	125	88	6	107	89				4		7.5			C		
19	27	540	82	9	180	95	.55	11	83	7		7.3	4.9	4	C		
20	13	258	86	8	159	85	.74	15	86	5		7.5	4.9	40	C		
21	9	182	90	13	263	81	.76	15	74	3		7.5	5.7	6	C		
22	7	138	87	23	453	77				8		7.4	5.5	2	C		
23	19	366	88	6	116	93	.60	12	81	4		7.5	7.3	4	C		
24												7.4			C		
25												7.4			C		
26	12	236	94	6	118	95	.51	10	92	4		7.5			C		
27												7.4	7.4	2	C		
28	12	235	89	3	59	97	.51	10	86	2		7.4	6.9	2	C		
29	8	149	91	5	93	95	.45	8	87	3		7.4	7.1		C		
30												7.4	6.9	2	C		
31												7.4			C		
TL		4390			4408			191							C		
ME	12	231	88	12	232	85	.73	14	83	8		7.4	5.8	6	C		
WA	14	279	86	19	345	76	.86	16	79					11	C		

Digester Volume, ft³
Primary
Secondary

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MDPH
D-45

Supernatant To
Process Pattern

MONTH Dec 1977

DIGESTER AND SLUDGE DATA

OPERATOR K. J. Swalwell

DATE	RAW SLUDGE					DIGESTING SLUDGE						SUPERNATANT								DIGESTED SLUDGE				Gas Produced cu. ft X
	Gals. X 100	Total Solids %	Vol. Solids %	Vol. Solids Lbs/1000 c.f. Digester	pH	Temp. °F	pH	Total Solids %	Vol. Solids %	Vol. Acids Mg/l	Alkalinity Mg/l	Gals. X	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	P Mg/l	P Lbs.	5-Day BOD Mg/l	Gals. X	Total Solids %	Vol. Solids %	pH	
1	60	5.8	65		6.7																			
2	60	5.2	61		6.5																			
3	50	5.8	54		6.5																			
4	60	5.7	67		6.3																			
5	50	5.8	53																					
6	60	4.3	65		6.4																			
7	60	5.4	67		6.3																			
8	50	5.5	62		6.3																			
9	60	5.0	59		6.5																			
10																								
11	40	5.0	63		6.4																			
12	60	5.4	70		6.3																			
13	60	5.9	76		6.5																			
14	60	6.0	66		6.6																			
15	60	5.7	60		7.1																			
16	50	5.3	60		7.1																			
17	60	5.5	66		6.8																			
18	60	5.0	63		6.7																			
19	60	5.4	63		6.6																			
20	60	5.5	59		6.4																			
21	50	5.8	32		6.5																			
22	50	4.4	55		6.4																			
23	50	6.7	59		6.5																			
24	50	4.6	60		6.5																			
25	60	5.5	66		6.5																			
26	60	5.7	61		6.5																			
27	60	5.6	62		6.7																			
28	60	6.1	58		6.6																			
29	60	6.0	63		6.6																			
30	60	4.3	64		6.6																			
31	60	7.8	78		6.6																			
TOTAL	1780																							
APITH. MEAN	57	5.5	62																					

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.7

Marshall, MICHIGAN

MONTH December, 1977 — VACUUM FILTER & INCINERATION DATA — OPERATOR R.J. Swalwell

DATE	SLUDGE TO FILTER				CHEMICALS TO FILTER				FILTER		FILTRATE						FILTER CAKE					INCINERATION			REMARKS
					CaO		FeCl3																		
	Gal. X 100	Tot. Sol. %	Lbs. Dry Sol.	pH	Lbs. Dry	R	Lbs. Dry	R	Tot. Hours	Yield	Gal. X 100	pH	Sus. Solids Mg/l	Vol. Susp. Solids %	5 Day BOD Mg/l	P Mg/l	Thou. Lbs. Wet	Tot. Sol. %	Lbs. Tot. Solids X 100	Vol. Sol. %	Lbs. Vol. Solids X 100	Hrs. Opr.	Yield	Fuel BTU	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1																									
2																									
3																									
4																									
5																									
6	94	5.6	4422	7.1	1975		197		7.5		71	11.4	1104	6	660		28	24.2	68	33	22				
7	94	5.7	4500	7.0	1975		197		7.5		71	12.2	1194	49	2880		28	23.2	65	48	32				
8	94	5.2	4106	6.9	1975		197		7.5		71	11.9	1146	13	960		28	18.8	53	72	38				
9	50	5.5	2310	7.0	1054		96		4.0		38	12.2	1150	12			15	22.4	34	40	13				
10																									
11																									
12	94	5.4	4264	6.4	1975		197		7.5		71	12.1	1196	27	1200		28	21.5	60	39	23				
13	94	8.9	7027	6.9	1975		197		7.5		71	12.2	942	26	1200		28	20.4	57	40	23				
14	75	5.2	3276	6.8	1580		157		6.0		57	12.2	1218	4	840		23	21.0	48	34	16				
15																									
16																									
17																									
18																									
19	160	5.7	4788	7.0	2107		209		8.0		76	11.9	978	21	1740		30	21.1	63	40	25				
20	94	5.5	4343	7.0	1975		197		7.5		71	12.0	1098	20	1320		28	19.9	56	40	22				
21	100	4.9	4116	7.0	2107		209		8.0		76	11.9	1070	1			30	21.3	64	39	25				
22	75	5.7	3541	6.9	1580		157		6.0		57	11.7	1194	4	960		29	20.8	48	38	18				
23																									
24																									
25																									
26																									
27																									
28	62	5.6	2916	7.0	1317		131		5.0		47	10.0	916	2	480		19	22.1	42	40	17				
29																									
30																									
31																									
Total	1026		47854		21595		2141		82.0		777						308		(158)		274				
Arith. Means	86	5.7	3488		1800		178		6.8		65		1150	15	1224		26	22.2	55	42	23				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

December Month, 19 77 — Marshall Municipality, Michigan — Robert J. Swansell Superintendent's Signature

1 2 ID | 3 8 Plant No. 13.0029 | 9 10 Mo. 12 | 11 12 Yr. 77 | 13 15 Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX.FUEL 14 925 CF	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS.	39 $FeCl_3$ LBS.	44	49	54	59
PN											
SF		2									
01		51	3120			30	397				
02		43	3240			20	397				
03		43	2760			30	397				
04		42	2520			30	496				
05		49	3240			30	496				
06		45	3480			30	893				
07		45	3360			20	596				
08		63	3360			20	695				
09		65	3480			20	596				
10		58	3360			20	298				
11		83	2640			20	596				
12		77	3120			20	695				
13		35	3000			20	596				
14		49	3000			20	596				
15		41	3000			40	397				
16		18	2880			20	397				
17		26	3000			30	397				
18		26	3000			30	596				
19		27	3120			30	695				
20		62	3480			20	695				
21		66	3360			20	794				
22		49	3360			30	596				
23		37	3240			20	397				
24		42	3000			20	397				
25		50	3240			20	397				
26		53	3120			30	298				
27		64	2280			20	496				
28		89	3480			20	596				
29		85	3240			20	397				
30		36	3240			30	397				
31		47	3120			20	397				
TL		1606	96840			750	16083				
ME		52	3124			24	518				

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	5		848
Superintendent	1		168
Asst. Supt.	1		168
Shift Foreman			
Shift Operator	3		512
Maint. Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL

WEEKDAYS 11 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

January (Month) . 19 79

Marshall (Municipality), Michigan

Robert J. Swalwell
Superintendent's Signature

1 2 | 3 8 | 9 10 | 11 12 | 13 15
ID | 130029 | 01 | 79 | 606
Plant No | Mo. | Yr | Sampling Point Code

DAY 1 2	WEATHER TYPE 9	WEATHER PRECIP 14	FLOW TOTAL 19	FLOW MAX 24 RATE	RAW SEWAGE QUALITY TEMP 29	pH 34	BOD-5 39 44		SS 49 54		TOTAL-P 59 64		VSS 69	NH_3-N 74 78	80	REMARKS OF 9	14
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l	C		
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C		
SF															C		
01	5	.17	2.24		51	7.5	122	2279	46	859	2.10	39	32		C		
02	5	.02	2.22		51	7.7	100	1851	84	1555	2.90	54	64		C		
03	3		2.20		50	7.2	84	1541	88	1615	2.30	42	70		C		
04	5	.02	2.18		50	7.2	86	1564	48	873	2.25	41	30		C		
05	3		2.20		50	7.2									C		
06	1		2.21		50	7.2									C		
07	3		2.36		50	7.4	140	2756	106	2086	2.30	46	64		C		
08	5	.01	2.46		51	7.0	90	1846	70	1436	2.50	51	54		C		
09	3		2.35		50	7.0	126	2469	44	862	2.55	50	20		C		
10	3		2.30		51	7.0	104	1994	66	1266	2.55	49	52		C		
11	5	.02	2.30		51	7.1	80	1534	58	1113	2.55	49	34		C		
12	5	.29	2.32		51	6.5									C		
13	5	1.28	2.25		51	6.7									C		
14	5	.01	2.25		50	6.7	64	1201	72	1351	3.10	58	52		C		
15	5	.16	2.30		50	6.8	84	1611	72	1381	2.25	43	26		C		
16	3		2.40		50	6.8	136	2722	72	1441	2.30	46	68		C		
17	5	.18	2.40		51	7.1	72	1441	134	2682	2.80	56	116		C		
18	3		2.50		50	7.5	76	1585	50	1043	2.40	50	38		C		
19	5	.06	2.32		50	7.4									C		
20	5	.03	2.21		50	7.4									C		
21	5	.03	2.16		50	7.3	68	1225	56	1009	1.95	35	42		C		
22	1		2.32		50	7.5	126	2438	66	1277	2.55	49	48		C		
23	1		2.27		50	6.9	82	1552	90	1704	3.20	61	54		C		
24	5	.09	2.22		50	7.3	72	1333	50	926	2.25	41	34		C		
25	1		2.23		50	7.2	76	1413	58	1079	3.30	61	40		C		
26	1		2.18		50	6.9									C		
27	1		2.11		50	6.9									C		
28	3		2.19		50	7.0	116	2119	60	1096	5.75	105	30		C		
29	5	.01	2.31		50	7.0	84	1618	66	1272	2.10	40	48		C		
30	5	.08	2.21		50	7.0	86	1585	66	1216	2.55	47	54		C		
31	5	.03	2.32		50	6.9	64	1238	78	1509	2.55	49	34		C		
TL		2.49	70.49					40915		30651		1162			C		
ME			2.27				93	1779	70	1333	2.68	50	49		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

January , 19 79
Month

Marshall , Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID | 130029 | 01 | 79 | |
Plant No. Mo. Yr. Sampling Point Code

DAY	BOD-5 9 14		SS 19 24		TOTAL-P 29 34		VSS 39	NH_3-N 44	REMARKS OR OTHER PARAMETERS 49	54	59	64	69	74 78	80	9	14
1 2	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l							C		
PN	00310	85001	00530	85002	00665	85004	00535	00610							C		
SF															C		
01	92	1719	44	822	2.10	39	34								C		
02	68	1259	52	963	2.60	48	42								C		
03	72	1321	54	991	2.20	40	50								C		
04	68	1236	40	727	2.00	36	30								C		
05															C		
06															C		
07	88	1732	38	748	2.00	39	32								C		
08	66	1354	54	1108	2.25	46	52								C		
09	82	1607	44	862	2.50	49	24								C		
10	92	1765	54	1036	2.25	43	40								C		
11	68	1304	48	921	2.60	50	36								C		
12															C		
13															C		
14	50	938	42	788	2.30	43	30								C		
15	40	767	48	921	2.30	44	36								C		
16	106	2122	60	1201	2.50	50	30								C		
17	54	1081	42	841	2.90	58	36								C		
18	60	1251	36	751	2.50	52	26								C		
19															C		
20															C		
21	62	1117	66	1189	2.40	43	46								C		
22	116	2244	50	967	2.25	44	40								C		
23	54	1022	40	757	2.40	45	30								C		
24	66	1222	40	741	2.50	46	24								C		
25	54	1004	60	1116	2.80	52	46								C		
26															C		
27															C		
28	104	1900	84	1534	5.30	97	50								C		
29	66	1272	42	809	2.25	43	36								C		
30	62	1143	54	995	2.40	44	46								C		
31	58	1122	62	1200	2.40	46	54								C		
TL		31502		21988		1097									C		
ME	72	1370	50	956	2.51	48	38								C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

January (Month), 19 79 — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
IP | 130029 (Plant No.) | 01 (Mo) | 79 (Yr.) | .. (Sampling Point Code)

DAY 1 2	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification 14
	Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MLSS 34	MLVSS 39	SETTL. 44	SDI 49	DO 54	Air Applied 59	SS 64	VSS 49	Percent Return 74	8C	Waste Sludge 9	
	KCF	KCF	HRS.	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu. Ft.	%	%	%	C	KGal	See Code*
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF											4				C		
01	48		3.8								198			48	C		
02			3.9	8.1	.37	2197	1540	22.0	1.00	2.8	201	.79	65	50	C	27	
03			3.9	6.5	.32	1912	1376	19.0	.99	3.0	196	.66	70	50	C		
04			4.0	7.9	.38	2202	1524	22.0	1.00	2.5	196	.78	68	50	C	29	
05			3.9	7.3	.34	2035	1389	21.0	.96	3.4	196	.77	61	50	C		
06			3.9								191			50	C	18	
07			3.7								198			47	C	52	
08			3.5	5.9	.26	1891	1345	18.0	1.05	3.6	202	.70	70	45	C		
09			3.7	7.8	.34	2282	1724	23.0	.99	2.0	200	.78	76	47	C	29	
10			3.7	6.9	.32	2028	1600	19.0	1.07	2.4	205	.71	78	48	C	1	
11			3.7	8.0	.35	2323	1704	23.0	1.01	2.0	202	.77	72	48	C	24	
12			3.7	7.1	.32	2077	1584	21.0	.99	2.4	194	.77	72	48	C		
13			3.8								152			49	C	31	
14			3.8								170			50	C		
15			3.7	8.0	.41	2283	1814	23.0	.99	3.3	164	.76	74	49	C	26	
16			3.6	7.0	.34	2238	1617	21.0	1.06	2.7	158	.72	70	46	C	34	
17			3.6	6.2	.32	1993	1501	19.0	1.05	4.5	192	.65	69	41	C		
18			3.4	6.7	.34	2193	1602	21.0	1.04	3.0	194	.75	74	44	C	24	
19			3.7	7.2	.35	2194	1520	20.0	1.10	3.5	183	.75	65	47	C		
20			3.9								180			50	C	25	
21			4.0								179			50	C		
22			3.7	7.3	.35	2325	1573	22.0	1.06	2.3	183	.79	62	47	C	29	
23			3.8	7.2	.32	2227	1436	21.0	1.06	3.9	177	.75	62	48	C	36	
24			3.9	6.8	.30	2002	1395	20.0	1.00	3.0	183	.71	59	50	C	1	
25			3.9	7.7	.37	2291	1523	23.0	1.03	2.3	187	.77	61	49	C	37	
26			4.0	6.8	.32	1968	1315	19.0	.99	3.4	184	.70	63	50	C		
27			4.0								181			52	C		
28			3.9								183			50	C	37	
29			3.7	6.4	.34	2259	1645	21.0	1.21	3.0	188	.79	67	48	C	33	
30			3.9	6.4	.33	2095	1538	19.0	1.10	2.5	186	.70	72	49	C		
31			3.7	6.6	.40	2335	1708	23.0	1.01	2.0	190	.78	69	48	C	1	
TL															C	504	
ME			3.8	7.1	.34	2153	1547	20.9	1.03	2.9	187	.74	68	48	C	27	

Digester Volume, ft³
Primary
Secondary

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MDPH
D-4.5

Supernatant To
Process Pattern

MONTH January 1979

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE					DIGESTING SLUDGE						SUPERNATANT								DIGESTED SLUDGE				Gas Produced cu. ft X
	Gals. X 100	Total Solids %	Vol. Solids %	Vol. Solids Lbs/1000 c.f. Digester	pH	Temp. °F	pH	Total Solids %	Vol. Solids %	Vol. Acids Mg/l	Alkalinity Mg/l	Gals. X	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	P Mg/l	P Lbs.	5-Day BOD Mg/l	Gals. X	Total Solids %	Vol. Solids %	pH	
1	40	4.3	68		6.3																			
2	40	5.6	69		5.9																			
3	40	5.3	68		5.9																			
4	40	5.9	68		5.9																			
5	40	5.5	73		6.0																			
6	40	5.7	72		6.0																			
7	40	5.4	70		5.9																			
8	40	5.1	68		5.8																			
9	40	5.6	74		5.8																			
10	40	5.7	46		5.7																			
11	40	6.2	71		5.8																			
12	40	5.1	70		5.9																			
13	40	5.5	66		5.8																			
14	40	6.0	72		5.7																			
15	40	4.7	71		5.6																			
16	40	4.6	74		5.6																			
17	40	5.1	68		5.7																			
18	40	4.4	71		6.0																			
19	40	8.1	81		6.0																			
20	40	4.6	72		6.0																			
21	40	4.6	76		6.1																			
22	40	4.6	87		6.1																			
23	40	4.6	67		6.3																			
24	35	5.0	68		6.3																			
25	40	5.2	70		5.6																			
26	40	4.7	68		5.4																			
27	40	4.4	72		5.8																			
28	40	4.7	68		5.8																			
29	40	4.8	73		5.8																			
30	40	3.4	53		5.9																			
31	40	4.6	66		5.8																			
TOTAL	1235																							
AVG. MEAN	40	5.1	7.6																					

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.7

Marshall , MICHIGAN

MONTH January , 1979 — VACUUM FILTER & INCINERATION DATA — OPERATOR R. J. Swalwell

DATE	SLUDGE TO FILTER				CHEMICALS TO FILTER				FILTER		FILTRATE						FILTER CAKE					INCINERATION			REMARKS
	Gal. X 100	Tot. Sol. %	Lbs. Dry Sol.	pH	CaO Lbs. Dry	R	FeCl3 Lbs. Dry	R	Tot. Hours	Yield	Gal X 100	pH	Sus. Solids Mg/l	Vol. Susp. Solids %	5 Day BOD Mg/l	P Mg/l	Thou. Lbs. Wet	Tot. Sol. %	Lbs. Tot. Solids X 100	Vol. Sol. %	Lbs. Vol. Solids X 100	Hrs. Opr.	Yield	Fuel BTU	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1																									
2	34	5.3	1514	6.6	720		71		3.0		29	11.3	946	9	2940		7	19.8	14	35	5				
3	84	4.8	3387	6.6	1800		179		7.5		71	11.4	1582	7	3640		28	19.5	55	45	25				
4	84	4.9	3457	6.4	1800		179		7.5		71	11.4	1348	9	4260		28	20.3	57	43	24				
5	79	5.2	3451	6.4	1680		167		7.0		67	12.3	1846	8	3540		35	18.7	65	46	30				
6																									
7																									
8	79	5.2	3451	6.3	1680		167		7.0		67	12.4	1930	5	3060		35	19.6	69	43	29				
9	67	5.1	2870	6.3	1440		143		6.0		57	12.3	1758	6	3780		21	18.9	40	48	19				
10	79	4.9	3252	6.3	1680		167		7.0		67	12.2	1576	5	4800		28	16.8	47	49	23				
11	56	5.0	2352	6.1	1200		119		5.0		48	12.0	1274	6	3540		21	19.0	40	46	18				
12	67	4.6	2589	6.1	1440		143		6.0		57	12.0	1802	5	3920		28	18.0	50	47	24				
13																									
14																									
15																									
16																									
17																									
18	79	5.2	3451	6.2	1680		167		7.0		67	12.1	1636	11	2280		28	20.1	56	36	20				
19	67	5.5	3095	6.2	1440		143		6.0		57	12.3	1984	6	1980		21	19.1	40	46	18				
20																									
21																									
22	79	5.0	3318	6.1	1680		167		7.0		67	12.2	986	13	3540		28	19.0	53	41	22				
23	79	4.0	2654	6.0	1680		167		7.0		67	12.2	1392	15	3720		35	17.4	61	47	29				
24	56	5.0	2352	5.8	1200		119		5.0		48	12.4	1568	8	2700		21	17.5	37	48	18				
25																									
26																									
27																									
28																									
29	84	4.6	3246	5.9	1800		179		7.5		71	11.3	1572	5	3240		35	18.6	65	49	32				
30	84	4.5	3175	5.8	1800		179		7.5		71	12.2	1384	6	1680		35	18.1	65	47	31				
31	79	4.8	3185	5.8	1680		167		7.0		67	11.8	1166	8	2580		35	17.7	62	46	28				
Total	1236		50799		26400		2623		110.		1019						469		876		385				
Arith Means	73	4.9	2988		1553		154		6.5		60		1514	8	3195		28	18.9	51	45	23				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

January (Month), 19 79 — Marshall (Municipality), Michigan — Robert J Swalwell (Superintendent's Signature)

1 2 | 3 8 | 9 10 | 11 12 | 13 15
ID | 130029 | 01 | 79 | ..
Plant No | Mo. | Yr. | Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX.FUEL 14 GAS CF	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS.	39 Ferric LBS	44	49	54	59
PN											
SF		2									
01		93	3000			10	199				
02		109	3240			10	397				
03		112	3120			10	397				
04		101	3420			10	596				
05		109	3420			10	199				
06		84	3120			10	199				
07		78	3120			10	99				
08		100	3240				298				
09		95	3360				199				
10		92	3240				199				
11		95	3360				199				
12		89	3360				199				
13		83	2760				199				
14		74	3240				199				
15		74	3120				596				
16		69	3600				596				
17		92	2400				397				
18		86	3240				596				
19		86	3000				596				
20		77	2880				199				
21		105	3000				397				
22		80	3120				596				
23		84	3240				596				
24		74	2880				596				
25		36	3000				397				
26		106	2880				397				
27		21	2880				397				
28		111	2880				397				
29		117	3120				596				
30		114	3120				596				
31		86	3120				596				
TL		2715	93780			70	12119				
ME		88	3025			10	391				

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	5		884
Superintendent	1		176
Asst. Supt.	1		176
Shift Foreman			
Shift Operator	3		532
Maint. Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL A

WEEKDAYS 11 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

February Month, 19 79

Marshall Municipality, Michigan

Robert J. Swalwell
Superintendent's Signature

1 2 | 3 8 | 9 10 | 11 12 | 13 15
ID | 130029 | 01 | 79 | 500
Plant No | Mo | Yr. | Sampling Point Code

DAY 1 2	WEATHER TYPE 9	WEATHER PRECIP. 14	FLOW TOTAL 19	FLOW MAX RATE 24	RAW SEWAGE QUALITY TEMP 29	pH 34	BOD-5 39 44		SS 49 54		TOTAL-P 59 64		VSS 69	NH_3-N 74 78	80	REMARKS OF 9	14
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l	C		
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C		
SF															C		
01	3		2.33		50	6.8	56	1088	48	932			38		C		
02	3		2.22		50	6.7									C		
03	5	.08	2.24		50	6.7									C		
04	3		2.21		50	6.8	70	1290	108	1991	2.5	46	106		C		
05	3		2.37		50	7.3	68	1344	88	1739	3.4	67	80		C		
06	3		2.28		50	6.6	72	1369	82	1559		<	74		C		
07	5	.01	2.30		50	6.4	88	1688	82	1573	2.6	50	64		C		
08	1		2.45		49	6.8	92	1880	66	1349	2.8	57	64		C		
09	1		2.28		49	6.8									C		
10	5	.03	2.25		49	6.7									C		
11	5	.17	2.25		50	6.2	76	1426	84	1576	2.8	53	78		C		
12	5	.06	2.27		49	6.9									C		
13	3		2.29		50	6.8	78	1490	86	1642	3.1	59	76		C		
14	3		2.23		50	6.8	76	1413	56	1041	2.5	46	44		C		
15	4	.03	2.26		49	6.8	72	1357	60	1131	2.5	47	50		C		
16	1		2.36		49	7.5									C		
17	1		2.19		49	7.1									C		
18	5	.07	2.16		49	6.8									C		
19	3		2.35		49	6.7	82	1607	70	1372	2.8	55	58		C		
20	4	.25	2.25		49	6.7	92	1726	60	1126	2.2	41	48		C		
21	4	.03	2.21		49	6.9	100	1843	60	1106	3.1	57	46		C		
22	4	.48	2.32		49	6.5	90	1741	80	1548	2.8	54	70		C		
23	3		2.39		50	6.5									C		
24	3		2.44		50	6.5									C		
25	3		2.30		50	6.5	88	1688	50	959	2.5	48	42		C		
26	1		2.42		49	6.7	104	2099	86	1736	2.7	54	62		C		
27	1		2.43		49	7.5	82	1662	50	1013	2.2	45	42		C		
28	4	.07	2.40		49	7.7	76	1521	78	1561	2.6	52	56		C		
29															C		
30															C		
31															C		
TL		1.28	64.45					28232		24954		831			C		
ME			2.30				81	1568	72	1386	2.7	52	61		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

February Month, 19 79

Marshall Municipality, Michigan

Robert J. Swalwell
Superintendent's Signature

1 2 ID | 3 8 Plant No 130029 | 9 10 Mo 02 | 11 12 Yr 79 | 13 15 Sampling Point Code

DAY 1 2	BOD-5 9 14		SS 19 24		TOTAL-P 29 34		VSS 39	NH_3-N 44	REMARKS OR OTHER PARAMETERS 49	54	59	64	69	74 78	80	9	14
	mg/l	LBS.	mg/l	LBS	mg/l	LBS	mg/l	mg/l							C		
PN	00310	85001	00530	85002	00665	85004	00535	00610							C		
SF															C		
01	50	972	40	777			30								C		
02															C		
03															C		
04	64	1180	72	1327	2.4	44	70								C		
05	56	1107	64	1265	3.1	61	52								C		
06	52	989	52	989			46								C		
07	68	1304	62	1189	2.6	50	56								C		
08	48	481	48	981	2.8	57	44								C		
09															C		
10															C		
11	74	1389	80	1501	3.0	56	68								C		
12															C		
13	56	1070	44	840	2.2	42	30								C		
14	52	967	60	1116	2.4	45	46								C		
15	60	1131	28	528	2.0	38	18								C		
16															C		
17															C		
18															C		
19	72	1411	56	1098	2.7	53	50								C		
20	88	1651	62	1163	2.6	49	46								C		
21	78	1438	48	884	2.8	52	32								C		
22	76	1471	54	1045	2.5	48	50								C		
23															C		
24															C		
25	72	1381	38	729	2.2	42	28								C		
26	76	1534	40	807	2.1	42	30								C		
27	66	1338	38	770	2.0	41	30								C		
28	64	1281	54	1081	2.3	46	48								C		
29															C		
30															C		
31															C		
TL		22595		18090		766									C		
ME	65	1255	52	1005	2.5	48	43								C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

February (Month), 19 79 — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

ID 1300.29 (Plant No.) 01 (Mo.) 79 (Yr) ... (Sampling Point Code)

DAY	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification
	Aeration Volume	Reaeration Volume	Detention Time	Sludge Age	Organic Loading	MLSS	MLVSS	SETTL.	SDI	DO	Air Applied	SS	VSS	Percent Return		Waste Sludge	
	KCF	KCF	HRS.	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu. Ft.	%	%	%	C	KGal	See Code*
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF											4				C		
01	48		3.7	6.9	.41	2436	1782	24.0	1.02	2.0	193	.83	69	47	C	40	
02			3.9	6.4	.38	2151	1569	19.0	1.13	4.3	192	.77	64	50	C	2	
03			3.8								195			48	C	48	
04			3.9								192			49	C	1	
05			3.6	5.7	.37	2274	1622	20.0	1.14	3.5	194	.76	64	46	C	9	
06			3.8	6.9	.44	2408	1606	21.0	1.15	4.0	188	.82	63	48	C	28	
07			3.7	5.8	.40	2159	1519	19.0	1.14	1.4	188	.73	62	47	C	18	
08			3.5	5.7	.42	2231	1512	20.0	1.12	3.6	194	.74	69	44	C	36	
09			3.8	5.4	.39	1955	1326	18.0	1.09	2.3	195	.66	62	48	C	1	
10			3.8								194			48	C	54	
11			3.8								195			50	C		
12			3.8	5.6	.41	2110	1517	20.0	1.06	2.0	189	.75	70	47	C	20	
13			3.8	5.9	.43	2253	1651	20.0	1.13	2.0	193	.74	70	48	C	29	
14			3.9	5.8	.43	2112	1542	20.0	1.06	1.5	189	.71	68	49	C	5	
15			3.7	6.4	.40	2120	1493	21.0	1.01	1.2	190	.73	65	48	C	24	
16			3.7	6.2	.40	2156	1548	20.0	1.08	1.8	198	.70	68	46	C	25	
17			3.9								189			50	C	2	
18			4.0								181			50	C	18	
19			3.7								181			46	C	46	
20			3.7	6.2	.36	2092	1458	21.0	1.00	1.3	168	.71	64	48	C	21	
21			3.9	6.2	.37	2044	1568	21.0	.97	2.4	168	.70	63	50	C		
22			3.7	7.2	.37	2330	1663	23.0	1.01	1.5	164	.86	61	47	C	25	
23			3.6	6.5	.34	2149	1554	21.0	1.02	1.5	165	.76	68	46	C		
24			3.5								171			44	C	68	
25			3.7								172			47	C	1	
26			3.6	6.5	.30	2075	1498	14.0	1.09	2.0	171	.73	67	45	C		
27			3.6	7.0	.34	2271	1731	22.0	1.03	1.5	164	.80	67	45	C	28	
28			3.6	7.0	.32	2253	1604	22.0	1.02	2.0	166	.77	67	45	C	31	
29															C		
30															C		
31															C		
TL															C	582	
ME			3.7	6.3	.38	2188	1566	20.6	1.07	2.2	183	.75	66	47	C	24	

Digester Volume, ft³
Primary
Secondary

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MDPH
D-4.5

Supernatant To
Process Pattern

MONTH February 19 79

DIGESTER AND SLUDGE DATA

OPERATOR R. J. Swalwell

DATE	RAW SLUDGE					DIGESTING SLUDGE						SUPERNATANT								DIGESTED SLUDGE				Gas Produced cu. ft X
	Gals. X 100	Total Solids %	Vol. Solids %	Vol. Solids Lbs/1000 c.f. Digester	pH	Temp. °F	pH	Total Solids %	Vol. Solids %	Vol. Acids Mg/l	Alkalinity Mg/l	Gals. X	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg l	P Mg/l	P Lbs.	5-Day BOD Mg/l	Gals. X	Total Solids %	Vol. Solids %	pH	
1																								
2	40	6.1	75		5.7																			
3	40	5.4	67		5.8																			
4	40	4.8	70		5.8																			
5	40	5.4	73		5.9																			
6	40	5.5	65		5.7																			
7	40	5.6	72		5.7																			
8	40	5.0	66		5.7																			
9	40	5.2	74		5.7																			
10	40	5.1	81		5.6																			
11	40	4.4	77		5.5																			
12	40	5.4	71		5.5																			
13	40	4.8	76		5.7																			
14	40	4.9	71		5.7																			
15	40	5.2	72		5.7																			
16	40	4.7	76		5.6																			
17	40	5.2	71		5.7																			
18	40	4.7	71		5.7																			
19	40	5.7	71		5.6																			
20	40	5.6	66		5.6																			
21	40	5.6	69		5.8																			
22	40	4.6	66		5.8																			
23	40	4.6	67		5.6																			
24	40	4.7	71		5.5																			
25	40	5.1	72		5.7																			
26	40	5.3	73		5.7																			
27	40	5.8	71		6.2																			
28	40	5.1	83		6.5																			
29																								
30																								
31																								
TOTAL	1080																							
ARITH. MEAN	40	5.2	72																					

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.7

Marshall, MICHIGAN

MONTH February, 19 79

VACUUM FILTER & INCINERATION DATA

OPERATOR R. J. Swalwell

DATE	SLUDGE TO FILTER				CHEMICALS TO FILTER				FILTER		FILTRATE						FILTER CAKE					INCINERATION			REMARKS
	Gal. X 100	Tot. Sol. %	Lbs. Dry Sol.	pH	CaO Lbs. Dry	CaO R	FeCl3 Lbs. Dry	FeCl3 R	Tot. Hours	Yield	Gal. X 100	pH	Sus. Solids Mg/l	Vol. Susp. Solids %	5 Day BOD Mg/l	P Mg/l	Thou. Lbs. Wet	Tot. Sol. %	Lbs. Tot. Solids X 100	Vol. Sol. %	Lbs. Vol. Solids X 100	Hrs. Opr.	Yield	Fuel BTU	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1	84	4.9	3957	6.2	1344		167		7.0		67	11.5	1382	4	2460		35	19.4	68	48	33				
2																									
3																									
4																									
5	84	12.5	8820	6.3	1344		167		7.0		67	11.5	1496	15	4080		21	23.5	49	41	20				
6																									
7	60	4.4	2218	6.1	960		119		5.0		48	11.6	942	10	2700		28	18.9	53	47	25				
8	84	4.6	3246	6.1	1344		167		7.0		67	11.9	1886	7	2700		35	18.7	65	46	30				
9																									
10																									
11	84	4.4	3105	5.8	1344		167		7.0		67	11.5	1496	9	4500		35	19.1	67	50	33				
12																									
13	90	4.7	3553	5.8	1440		179		7.5		71	11.5	890	7	3480		35	18.1	63	52	33				
14	90	5.9	4460	5.6	1440		179		7.5		71	11.8	956	5	1800		35	19.9	70	46	32				
15	84	2.9	2046	5.6	1344		167		7.0		67	11.8	1304	9	2280		35	17.9	63	55	34				
16	84	5.3	3740	5.6	1344		167		7.0		67						35	18.3	64	54	35				
17																									
18																									
19																									
20	72	3.6	2177	5.8	1152		143		6.0		57	11.3	1210	4	2160		28	20.2	57	44	25				
21																									
22	84	5.7	4022	5.9	1344		167		7.0		67	11.4	848	8	2220		35	22.6	79	35	28				
23	72	5.1	3084	5.9	1152		143		6.0		57	11.9	1132	5	4380		28	17.2	48	55	26				
24																									
25																									
26	90	4.4	3326	5.7	1440		179		7.5		71	11.4	860	11	3900		35	19.8	69	47	33				
27	78	5.2	3407	6.2	1248		155		6.5		62	11.2	1030	6	2280		31	19.2	60	49	29				
28	84	6.2	5927	6.2	1344		167		7.0		67	11.9	1022	6	1920		35	22.9	80	47	38				
29																									
30																									
31																									
Total	1224		56588		19584		2433		102.		973						486		955		454				
Arith. Means	82	5.3	3773		1306		162		6.8		65		1175	8	2919		32	19.7	64	48	30				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

February, 19 79 — Month

Marshall, Michigan — Municipality

Robert J. Swalwell — Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
ID	13,0029	02	79	
	Plant No	Mo	Yr.	Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX FUEL 14 GAS CF	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS	39 $FeCl_3$ LBS	44	49	54	59
PN											
SF		2									
01		87	3240				596				
02		102	3000			10	199				
03		187	2880			20	397				
04		264	3000			10	397				
05		127	3120			10	596				
06		77	3120			10					
07		102	3240			10	596				
08		111	3000			10	596				
09		125	3240			10	397				
10		129	3120			10	397				
11		113	3000			10	596				
12		105	3240			10	596				
13		121	3240				596				
14		95	3240				794				
15		142	3240				596				
16		148	3240			10	596				
17		160	3000			10	199				
18		127	3120				397				
19		133	3120			10	397				
20		90	3000			20	397				
21		71	2880			10	397				
22		74	3240			20	397				
23		73	3000			10	596				
24		103	2880			20	397				
25		123	3000			20	397				
26		117	3240			10	794				
27		86	3120			10	596				
28		80	3120			10	596				
29											
30											
31											
TL		3272	86,880			280	13585				
ME		117	3103			12	503				

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	5		764
Superintendent	1		152
Asst. Supt.	1		152
Shift Foreman			
Shift Operator	3		460
Maint Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL A

WEEKDAYS 11 HRS

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

March (Month), 1979 — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
ID | 130029 (Plant No) | 03 (Mo) | 79 (Yr) | 5PP (Sampling Point Code)

DAY 1 2	WEATHER TYPE 9	WEATHER PRECIP. 14	FLOW TOTAL 19	FLOW MAX RATE 24	RAW SEWAGE QUALITY TEMP 29	pH 34	BOD-5 39 44		SS 49 54		TOTAL-P 59 64		VSS 69	NH_3-N 74 78	80	REMARKS OF 9	14
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS.	mg/l	LBS	mg/l	LBS	mg/l	mg/l	C		
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C		
SF															C		
01	1		2.44		48	7.4	70	1424	60	1221	2.0	41	50		C		
02	1		2.37		49	6.8									C		
03	4	.45	2.51		49	6.8									C		
04	1		2.83		49	6.9	90	2124	72	1699	2.1	50	52		C		
05	5	.06	2.91		49	6.9	56	1359	52	1262	2.1	51	40		C		
06	1		2.82		48	6.5	104	2446	92	2164	2.3	54	82		C		
07	1		2.78		48	6.6	66	1530	56	1299	2.1	49	42		C		
08	1		2.75		49	7.0	56	1284	58	1330	2.2	50	36		C		
09	4	.20	2.74		49	7.1									C		
10	5	.03	2.88		48	6.5									C		
11	1		2.87		48	6.4	72	1724	60	1436	2.3	55	48		C		
12	1		2.76		48	6.9	102	2348	82	1888	2.6	60	58		C		
13	3		2.71		48	6.9	88	1989	52	1175	2.3	52	42		C		
14	5	.01	2.81		48	6.8	60	1406	48	1125	2.2	52	32		C		
15	3		2.78		48	6.8	58	1345	62	1437			52		C		
16	1		2.65		48	6.6									C		
17	4	.04	2.59		48	6.7									C		
18	3		2.56		49		110	2349	60	1281	2.3	49	34		C		
19	4	.02	2.66		49	6.5	102	2263	62	1375	2.1	47	44		C		
20	3		2.64		49	6.6	62	1365	62	1365	2.3	51	52		C		
21	1		2.59		48	6.5	70	1512	68	1469	2.6	56	42		C		
22	4	.06	2.60		48	6.5	70	1518	38	824	2.8	61	34		C		
23	4	.10	2.60		48	6.4									C		
24	5	.05	2.51		48	6.4									C		
25	5	.03	2.59		48	6.7	120	2592	84	1814	3.0	65	64		C		
26	3		2.59		48	6.7	68	1469	40	864	2.3	50	32		C		
27	1		2.61		49	7.5	82	1785	86	1872	3.3	72	68		C		
28	4	.13	2.62		48	7.3	112	2447	60	1311	2.5	55	48		C		
29	4	.75	2.68		50	8.1	108	2414	48	1073	2.7	60	40		C		
30	4	.43	2.66		50	7.5									C		
31	3		2.62		49	7.6									C		
TL		2.36	82.23					38693		29284		1080			C		
ME			2.67				82	1843	63	1394	2.4	54	47		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

March Month, 19 79

Marshall Municipality, Michigan

Robert J. Swalwell Superintendent's Signature

1 2 ID | 3 8 Plant No 120029 | 9 10 Mo 03 | 11 12 Yr 79 | 13 15 Sampling Point Code

DAY	BOD-5 9 14		SS 19 24		TOTAL-P 29 34		VSS 39	NH_3-N 44	REMARKS OR OTHER PARAMETERS 49	54	59	64	69	74 78	80	9	14
1 2	mg/l	LBS	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l							C		
PN	00310	85001	00530	85002	00665	85004	00535	00610							C		
SF															C		
01	60	1221	38	773	1.4	28	30								C		
02															C		
03															C		
04	54	1275	66	1558	2.0	47	44								C		
05	48	1165	52	1262	1.8	44	36								C		
06	58	1364	52	1223	2.2	52	46								C		
07	52	1206	22	510	1.7	39	14								C		
08	44	1009	66	1514	2.0	46	42								C		
09															C		
10															C		
11	50	1197	70	1676	2.4	57	54								C		
12	60	1381	62	1427	2.3	53	46								C		
13	54	1220	48	1085	2.1	47	34								C		
14	54	1266	38	891	2.0	47	30								C		
15	48	1113	62	1437			48								C		
16															C		
17															C		
18	70	1495	60	1281	2.3	49	46								C		
19	82	1819	72	1547	2.3	51	46								C		
20	44	969	52	1145	2.1	46	38								C		
21	52	1123	58	1253	2.5	54	36								C		
22	46	997	36	781	2.7	59	28								C		
23															C		
24															C		
25	68	1469	88	1901	2.7	58	42								C		
26	60	1296	44	950	2.1	45	38								C		
27	80	1741	58	1263	3.0	65	44								C		
28	74	1617	46	1005	2.5	55	26								C		
29	66	1475	48	1073	2.3	51	30								C		
30															C		
31															C		
TL		27418		25,605		993									C		
ME	58	1306	54	1219	2.2	50	38								C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

March, 19 79 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

IP | 13.0029 (Plant No.) | 03 (Mo.) | 79 (Yr) | .. (Sampling Point Code)

DAY	Aeration Volume KCF	Reaeration Volume KCF	Detention Time HRS.	Sludge Age DAYS	Organic Loading F/M	MLSS mg/l	MLVSS mg/l	SETTL. %	SDI %	DO mg/l	Air Applied Cu. Ft.	SS %	VSS %	Percent Return %	C	Waste Sludge KGal	Process Modification See Code*
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF											4				C		
01	48		3.5	6.5	.28	1958	1316	19.0	1.03	2.4	177	.72	63	46	C		
02			3.6	8.0	.55	2316	1614	21.0	1.10	2.7	178	.80	66	47	C	27	
03			3.4								171			44	C		
04			3.0								174			39	C	33	
05			3.0	5.7	.31	2173	1580	19.0	1.14	5.2	178	.88	68	38	C	29	
06			3.0	5.3	.27	2039	1297	18.0	1.13	3.0	173	.78	63	42	C	14	
07			3.1	5.8	.33	2081	1446	19.0	1.09	1.6	171	.73	66	44	C		
08			3.1	6.5	.40	2471	1636	23.0	1.07	2.0	171	.91	65	44	C	33	
09			3.1	5.7	.34	2192	1396	19.0	1.15	2.4	176	.74	60	45	C	7	
10			3.0								182			42	C	5	
11			3.0								180			41	C	53	
12			3.1	4.0	.32	1734	1276	16.0	1.08	2.8	178	.33	72	41	C	1	
13			3.2	5.3	.37	2126	1535	18.0	1.18	3.0	169	.84	66	39	C	19	
14			3.1	5.2	.35	2089	1452	19.0	1.09	1.8	182	.77	62	38	C		
15			3.1	5.8	.40	2376	1627	22.0	1.08	1.8	183	.91	67	39	C	33	
16			3.3	5.7	.40	2222	1524	19.0	1.17	2.3	186	.78	69	41	C	31	
17			3.3								181			42	C		
18			3.4								175			43	C		
19			3.2	5.6	.38	2443	1701	23.0	1.06	1.5	178	.90	70	41	C	31	
20			3.3	5.4	.34	2210	1467	20.0	1.11	2.2	179	.84	66	42	C	23	
21			3.3	5.5	.34	2204	1422	20.0	1.10	3.2	180	.86	65	42	C	20	
22			3.3	5.6	.34	2179	1408	19.0	1.14	3.5	200	.85	65	42	C	26	
23			3.3	5.8	.37	2251	1512	20.0	1.13	3.2	196	.85	62	41	C	32	
24			3.4								206			43	C	18	
25			3.3								216			42	C	38	
26			3.3	4.2	.29	1775	1244	16.0	1.10	3.4	218	.66	64	41	C	1	
27			3.3	5.0	.30	2096	1358	20.0	1.05	3.1	218	.76	66	41	C		
28			3.3	5.9	.36	2347	1620	22.0	1.07	1.5	205	.87	66	41	C	30	
29			3.2	5.6	.34	2260	1645	21.0	1.08	1.8	200	.84	70	41	C	34	
30			3.2	5.1	.32	2049	1500	18.0	1.14	2.0	203	.76	70	42	C		
31			3.3								215			43	C	13	
TL															C	551	
ME			3.2	5.6	.35	2163	1481	18.0	1.10	2.6	187	.79	66	42	C	24	

Digester Volume, ft³
Primary
Secondary

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MDPH
D-4.5

Supernatant To
Process Pattern

MONTH March 1979

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE					DIGESTING SLUDGE						SUPERNATANT								DIGESTED SLUDGE				Gas Produced cu. ft X
	Gals. X 100	Total Solids %	Vol. Solids %	Vol. Solids Lbs/1000 c.f. Digester	pH	Temp. °F	pH	Total Solids %	Vol. Solids %	Vol. Acids Mg/l	Alkalinity Mg/l	Gals. X	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg l	P Mg l	P Lbs.	5-Day BOD Mg/l	Gals. X	Total Solids %	Vol. Solids %	pH	
1	40	5.5	71		6.4																			
2	40	5.5	74		6.0																			
3	40	5.0	58		5.9																			
4	40	6.4	74		6.2																			
5	40	6.2	68		5.8																			
6	40	5.6	68		5.7																			
7	40	5.8	67		5.7																			
8	40	5.9	69		5.9																			
9	40	5.4	70		5.8																			
10	40	5.4	71		5.7																			
11	40	6.0	70		5.7																			
12	40	5.2	64		5.8																			
13	40	5.7	69		5.9																			
14	40	6.1	68		5.8																			
15	40	5.1	69		5.7																			
16	40	5.3	70		5.7																			
17	40	5.0	70		5.8																			
18	40	5.3	72		5.7																			
19	40	6.3	69		5.5																			
20	40	3.8	69		5.6																			
21	40	5.1	72		5.6																			
22	40	5.6	70		5.5																			
23	40	7.0	75		5.7																			
24	40	4.4	58		5.5																			
25	40	5.8	67		5.7																			
26	20	4.9	70																					
27																								
28	40	6.1	70		6.1																			
29	40	6.1	68		6.0																			
30	40	5.9	68		6.0																			
31	40	5.4	72		6.1																			
TOTAL	1180																							
ARITH. MEAN	39	5.6	69																					

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.7

Marshall, MICHIGAN

MONTH March, 19 79 — VACUUM FILTER & INCINERATION DATA — OPERATOR R.J. Swalwell

DATE	SLUDGE TO FILTER				CHEMICALS TO FILTER				FILTER		FILTRATE						FILTER CAKE					INCINERATION			REMARKS
					CO_2		$FeCl_3$																		
	Gal. X 100	Tot. Sol. %	Lbs. Dry Sol.	pH	Lbs. Dry	R	Lbs. Dry	R	Tot. Hours	Yield	Gal. X 100	pH	Sus. Solids Mg/l	Vol. Susp. Solids %	5 Day BOD Mg/l	P Mg/l	Thou. Lbs. Wet	Tot. Sol. %	Lbs. Tot. Solids X 100	Vol. Sol. %	Lbs. Vol. Solids X 100	Hrs. Opr.	Yield	Fuel BTU	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1	119	9.3	9296	6.1	1869		167		7.0		70	11.9	920	7	2280		35	23.9	84	44	37				
2																									
3																									
4																									
5	110	4.0	3696	5.9	1736		155		6.5		65	11.6	1156	9	2160		35	17.3	61	48	29				
6	119	4.8	4798	5.9	1869		167		7.0		70	11.3	1346	8	2400		35	19.3	68	55	37				
7	102	3.8	3256	5.8	1602		143		6.0		60	11.6	886	7	2280		28	19.9	56	50	28				
8	68	4.7	2685	5.8	1068		95		4.0		40	11.8	806	14	2400		21	20.3	43	48	21				
9																									
10																									
11																									
12	76	5.6	3575	5.8	1202		107		4.5		45	11.7	972	8	2460		21	18.4	39	50	19				
13																									
14	119	4.0	3998	5.8	1869		167		7.0		70	11.9	994	4	2820		35	19.3	68	50	34				
15	119	4.5	4498	5.8	1869		167		7.0		70	12.0	862	7	1920		35	21.1	74	50	37				
16	119	4.4	4398	5.7	1869		167		7.0		70	12.0	1374	7	2640		35	21.7	76	51	38				
17																									
18																									
19	110	4.9	4528	5.6	1736		155		6.5		65	12.0	896	6	2700		35	21.1	74	54	40				
20	85	6.5	4641	5.6	1335		119		5.0		50	12.0	604	8	2520		28	18.7	52	53	28				
21																									
22																									
23																									
24																									
25																									
26																									
27	119	5.0	4998	5.9	1869		167		7.0		70	11.8	1010	6	2280		35	20.9	73	48	35				
28	119	4.2	4198	6.0	1869		167		7.0		70	11.9	862	6	3180		35	21.1	74	50	37				
29	110	5.4	4990	5.8	1736		155		6.5		65	11.9	792	6	2820		35	19.5	68	47	32				
30	116	4.4	4066	5.8	1736		155		6.5		65	12.1	974	6	2400		35	19.4	68	50	34				
31																									
Total	1604		67321		25288		2253		94.5		945						483		978		486				
Arith. Means	107	5.0	4488		1686		150		6.3		63		964	7	2484		32	20.1	65	50	32				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

March, 19 79 — Month

Marshall, Michigan — Municipality

Robert J. Sandwell — Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
ID	130029	03	79	
	Plant No.	Mo.	Yr.	Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX. FUEL 14 GAS CF	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS.	39 $FeCl_3$ LBS	44	49	54	59
PN											
SF		2									
01		72	3120			10	794				
02		76	2760			10	199				
03		35	2880			10	397				
04		60	2880			10	199				
05		83	3240			10	993				
06		71	3120			10	397				
07		61	3240			10	397				
08		58	3000			10	596				
09		78	3000			10	199				
10		115	2880			20	397				
11		122	3120			10	397				
12		79	3120			10	199				
13		57	2880			10	397				
14		111	3240			10	397				
15		107	3120			20	596				
16		94	3120			10	596				
17		21	2760			10	397				
18		32	2880			10	397				
19		54	3000			10	596				
20		33	3000			10	397				
21		49	2880			10	397				
22		29	2880			10	199				
23		31	2880			10	397				
24		63	2880			20	199				
25		96	3000			20	397				
26		98	3120			10	397				
27		94	3240			10	596				
28		47	3240			10	596				
29		9	3120			10	596				
30		7	3120			10	397				
31		16	2760			10	397				
TL		1958	93480			350	13505				
ME		63	3015			11	436				

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	5		880
Superintendent	1		176
Asst. Supt.	1		176
Shift Foreman			
Shift Operator	3		528
Maint. Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL A

WEEKDAYS 11 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

April Month, 19 79

Marshall Municipality Michigan

Robert J. Swalwell Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
IP | 1300291 | 04 | 79 | 500
Plant No Mo Yr Sampling Point Code

DAY	WEATHER		FLOW		RAW SEWAGE QUALITY											REMARKS OR
	TYPE	PRECIP	TOTAL	MAX RATE	TEMP	pH	BOD-5		SS		TOTAL P		VSS	NH_3 N		
1 2	9	14	19	24	29	34	39	44	49	54	59	64	69	74	78	80
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l		C
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610		C
SF																C
01	4	.33	2.61		49	7.5	68	1480	92	2003	2.1	46	82			C
02	4	.02	2.79		49	7.1	48	1117	90	2094	2.5	58	74			C
03	1		2.23		49	7.1	78	1776	66	1503	2.0	46	50			C
04	4+5	.15	2.72		49	7.9	94	2132	92	2087	2.1	48	66			C
05	4+5	.12	2.76		48	7.0	74	1703	46	1059	2.1	48	40			C
06	1		2.72		48	7.2										C
07	4+5	.08	2.68		48	7.1										C
08	4	.70	2.75		49	7.1	74	1697	64	1468	2.1	48	60			C
09	3		2.96		49	7.4	58	1432	44	1086	2.0	49	30			C
10	1		2.75		49	7.3	92	2110	48	1101	2.8	64	32			C
11	4	.11	2.84		49	7.7	78	1847	80	1895	2.2	52	76			C
12	4	.04	2.78		49	7.5										C
13	1		2.64		49	7.5										C
14	1		2.72		49	7.6										C
15	1		2.59		49	7.3	76	1642	96	2074	2.5	54	72			C
16	1		2.78		49	7.2	66	1530	78	1808	2.3	53	56			C
17	1		2.82		49	7.0	78	1834	52	1223	2.3	54	40			C
18	1		2.73		50	7.0	92	2095	86	1958	3.2	73	58			C
19	1		2.76		50	7.0	72	1657	62	1427	2.2	51	36			C
20	1		2.65		50	7.0										C
21	4	.06	2.45		50	7.0										C
22	1		2.60		50	7.1	74	1605	70	1518	2.6	56	54			C
23	4	.10	2.52		51	7.1			70	1471	2.5	53	60			C
24	4	.67	2.62		50	7.1	94	2054	52	1136	2.2	48	48			C
25	4	.20	2.56		51	7.1	66	1409	52	1110	2.6	43	40			C
26	4	.25	2.57		51	7.1	42	900	50	1072	1.9	42	40			C
27	4	.35	2.61		50	7.0										C
28	4	.05	2.47		51	7.0										C
29	4	.37	2.55		50	7.0	56	1191	56	1191	2.2	47	44			C
30	4	.02	2.62		50	7.0	70	1530	52	1136	1.9	42	30			C
31																C
TL		3.62	80.55					32741		31420		1075				C
ME			2.69				73	1637	67	1496	2.3	51	52			C

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

April, 19 79 — Month

Marshall, Michigan — Municipality

Robert J. Swabwell — Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
ID	130029	04	79	
	Plant No	Mo	Yr	Sampling Point Code

DAY	BOD 5		SS		TOTAL-P		VSS	NH_3-N	REMARKS OR OTHER PARAMETERS								
	9	14	19	24	29	34	39	44	49	54	59	64	69	74	78 80	9	14
1 2	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l							C		
PN	00310	85001	00530	85002	00665	85004	00535	00610							C		
SF															C		
01	44	958	52	1132	2.1	46	40								C		
02	48	1117	40	931	2.3	54	28								C		
03	68	1548	64	1457	2.0	46	56								C		
04	54	1225	52	1180	2.3	52	42								C		
05	76	1749	50	1151	2.1	48	44								C		
06															C		
07															C		
08	62	1422	44	1009	2.1	48	30								C		
09	50	1234	60	1481	2.1	52	40								C		
10	64	1468	62	1422	2.8	64	42								C		
11	68	1610	54	1279	2.3	54	34								C		
12															C		
13															C		
14															C		
15	76	1642	48	1036	2.2	48	34								C		
16	60	1391	58	1345	2.3	53	44								C		
17	62	1458	60	1411	2.3	54	42								C		
18	58	1321	42	956	2.8	64	30								C		
19	58	1335	56	1289	2.5	58	36								C		
20															C		
21															C		
22	50	1084	60	1301	2.0	43	56								C		
23			40	841	2.9	61	28								C		
24	76	1661	40	874	2.0	44	26								C		
25	56	1196	48	1025	1.9	41	34								C		
26	38	814	46	986	1.9	41	24								C		
27															C		
28															C		
29	42	893	52	1106	2.3	49	46								C		
30	62	1355	54	1180	2.0	44	44								C		
31															C		
TL		26481		24320		1064									C		
ME	59	1324	52	1158	2.2	51	38								C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

April (Month), 19 79 — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1,2 IP | 3 ... 8 1,3,0,2,9 (Plant No) | 9,10 04 (Mo.) | 11,12 79 (Yr.) | 13 ... 15 (Sampling Point Code)

DAY 1 2	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification 14
	Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MLSS 34	MLVSS 39	SETTL. 44	SDI 49	DO 54	Air Applied 59	SS 64	VSS 49	Percent Return 74	8C	Waste Sludge 9	
	KCF	KCF	HRS.	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu. Ft.	%	%	%	C	KGal	See Code*
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF											7				C		
01	48		3.3								204			41	C	32	
02			3.1	5.1	.31	2157	1558	19.0	1.13	3.6	209	.82	67	39	C	22	
03			3.2	5.6	.31	2132	1550	20.0	1.07	3.2	208	.80	62	40	C	28	
04			3.2	5.2	.33	2025	1417	18.0	1.13	3.1	212	.77	68	40	C		
05			3.1	5.7	.31	2174	1516	20.0	1.09	2.7	204	.87	63	40	C	13	
06			3.2	5.6	.29	2127	1587	20.0	1.06	3.4	222	.84	65	40	C	3	
07			3.2								216			41	C	38	
08			3.1								212			39	C		
09			2.9	5.1	.32	2167	1536	20.0	1.08	2.6	197	.82	70	36	C	33	
10			3.1	4.9	.33	2009	1450	16.0	1.26	2.6	196	.76	68	39	C	1	
11			3.0	5.1	.32	2215	1601	19.0	1.17	2.5	191	.90	70	40	C	33	
12			3.1	5.0	.33	2122	1534	18.0	1.18	2.5	180	.76	64	42	C	31	
13			3.3								184			43	C		
14			3.2								185			41	C	37	
15			3.3								188			44	C		
16			3.1	5.2	.32	2176	1605	19.0	1.14	2.0	187	.82	73	40	C	23	
17			3.1	5.0	.31	2199	1625	21.0	1.05	1.5	191	.80	72	40	C	34	
18			3.2	4.8	.33	2010	1467	18.0	1.12	2.3	191	.73	70	41	C		
19			3.1	5.3	.31	2212	1561	21.0	1.05	2.0	200	.81	64	42	C	27	
20			3.3	5.2	.31	2074	1533	19.0	1.09	2.1	202	.77	72	43	C		
21			3.3								203			44	C	31	
22			3.3								204			45	C		
23			3.4	5.7	.28	2079	1571	24.0	.86	2.0	196	.80	70	46	C		
24			3.3	6.2	.26	2352	1764	26.0	.90	2.0	197	.83	70	44	C	35	
25			3.4	6.4	.26	2230	1623	25.0	.89	2.0	204	.79	70	46	C	1	
26			3.4	6.6	.25	2228	1619	22.0	1.01	3.0	212	.78	70	45	C	31	
27			3.3	6.5	.25	2211	1632	22.0	1.01	3.0	216	.73	.70	45	C	35	
28			3.5								213			45	C		
29			3.4								211			44	C	10	
30			3.3	5.6	.27	1990	1482	22.0	.90	3.5	219	.70	73	44	C		
31															C		
TL															C	498	
ME	48		3.2	5.5	.30	2144	1561	20.4	1.06	2.6	201	.80	68	42	C	25	

Digester Volume, ft³
Primary
Secondary

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

R 4619
4833-5382

Supernatant To
Process Pattern

MONTH April 19 79

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE					DIGESTING SLUDGE						SUPERNATANT								DIGESTED SLUDGE				Gas Produced cu. ft X
	Gals. X 100	Total Solids %	Vol. Solids %	Vol. Solids Lbs 1000 c.f. Digester	pH	Temp. °F	pH	Total Solids %	Vol. Solids %	Vol. Acids Mg/l	Alkalinity Mg/l	Gals. X	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	P Mg/l	P Lbs.	5-Day BOD Mg/l	Gas X	Total Solids %	Vol. Solids %	pH	
1	40	6.0	69		6.1																			
2	40	6.3	69		5.8																			
3	40	5.5	66		5.8																			
4	40	5.3	64		5.8																			
5	40	5.7	73		5.8																			
6	40	5.6	69		5.9																			
7	40	6.2	67		5.8																			
8	40	5.3	69		5.9																			
9	40	5.2	68		6.0																			
10	40	5.7	68		5.9																			
11	40	5.5	71		5.9																			
12	40	5.6	70		5.7																			
13	40	5.8	71		5.8																			
14	40	6.4	80		5.9																			
15	40	5.9	69		5.8																			
16	40	5.9	68		5.7																			
17	40	5.9	63		5.7																			
18	40	5.7	74		5.8																			
19	40	5.5	62		5.8																			
20	40	3.6	67		5.8																			
21	40	5.5	68		6.0																			
22	40	5.7	70		5.8																			
23	40	5.5	66		5.7																			
24	40	5.4	70		5.8																			
25	40	6.4	65		5.9																			
26	40	6.4	65		5.9																			
27	40	8.6	82		5.8																			
28	40	5.6	65		5.8																			
29	40	5.5	57		5.8																			
30	40	5.5	63		5.7																			
31																								
TOTAL	1200																							
ARITH MEAN	40	5.8	68																					

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.7

Marshall, MICHIGAN

MONTH April, 19 79

VACUUM FILTER & INCINERATION DATA

OPERATOR R. J. Swalwell

DATE	SLUDGE TO FILTER				CHEMICALS TO FILTER				FILTER		FILTRATE						FILTER CAKE					INCINERATION			REMARKS
	Gal. X 100	Tot. Sol. %	Lbs. Dry Sa.	pH	CaO Lbs. Dry	R	Ferric Lbs. Dry	R	Tot. Hours	Yield	Gal. X 100	pH	Sus. Solids Mg/l	Vol. Susp. Solids %	5 Day BOD Mg/l	P Mg/l	Thou. Lbs. Wet	Tot. Sol. %	Lbs. Tot. Solids X 100	Vol. Sol. %	Lbs. Vol. Solids X 100	Hrs. Opr.	Yield	Fuel BTU	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1																									
2	93	3.8	2969	5.9	1771		167		7.0		67	12.1	944	6	1920		35	21.8	76	46	35				
3	93	5.4	4218	5.8	1771		167		7.0		67	12.1	418	7	2400		35	21.5	75	50	38				
4																									
5	93	5.7	4453	5.9	1771		167		7.0		67	12.0	1168	7	2520		35	22.8	80	49	39				
6	80	5.4	3629	5.7	1518		143		6.0		57	12.4	1238	4	2580		28	22.3	62	44	27				
7																									
8																									
9	73	4.7	2882	6.0	1392		131		5.5		52	11.8	1472	2	2580		28	19.2	54	5.3	28				
10	93	5.3	4140	6.0	1771		167		7.0		67	11.9	938	4	2520		35	21.1	74	46	34				
11	93	4.6	3594	5.9	1771		167		7.0		67	11.9	938	9	1980		35	20.5	72	45	32				
12																									
13																									
14																									
15																									
16	93	5.6	4375	5.8	1771		167		7.0		67	12.1	760	8	2760		35	19.7	69	51	35				
17	93	6.9	5390	5.8	1771		167		7.0		67	12.1	764	8	2820		35	21.9	77	46	35				
18	93	9.1	7109	6.4	1771		167		7.0		67	12.1	554	5	1500		35	24.2	85	42	36				
19																									
20	93	8.9	6953	5.9	1771		167		7.0		67	11.8	1060	8	2160		35	23.6	83	44	36				
21																									
22																									
23	80	4.7	3158	5.8	1518		143		6.0		57	11.7	870	6	2400		28	23.4	65	50	33				
24	93	4.8	3750	5.8	1771		167		7.0		67	11.8	862	7	2580		35	20.3	71	49	35				
25	40				759		71		3.0		29						14								
26	93	6.1	4765	5.8	1771		167		7.0		67	12.0	740	8	1980		35	20.1	70	48	34				
27	86	6.8	4912	5.7	1645		155		6.5		62	11.8	1226	6	2400		28	22.4	63	42	26				
28																									
29																									
30	86	4.4	3179	5.7	1645		155		6.5		62	11.6	1000	12	1740		28	19.8	55	51	28				
31																									
Total	1468		68576		27958		2635		110.5		1056						539		(101)		531				
Arith. Means	86	5.8	4286		1645		155		6.5		62		947	7	2303		32	21.5	69	47	33				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

April Month, 19 79 — Marshall Municipality, Michigan — Robert J. Swalwell Superintendent's Signature

1 2 ID | 3 8 Plant No 130029 | 9 10 Mo 04 | 11 12 Yr 79 | 13 15 Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX. FUEL 14 GAS CF	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS.	39 $FeCl_3$ LBS	44	49	54	59
PN											
SF											
01		75	3120			10	397				
02		77	3120			10	596				
03		18	3120			10	397				
04		97	3120			10	596				
05		101	3240			20	397				
06		123	3360			10	596				
07		90	3000			10	298				
08		100	3120			20	298				
09		94	3240			10	596				
10		62	3240			10	596				
11		87	3240			20	596				
12		86	2640			10	199				
13		4	2760			10	397				
14		4	2640			20	199				
15		12	2880			10	397				
16		8	3120			10	596				
17		5	3120			10	596				
18		6	3000			10	596				
19		2	2640			20	397				
20		2	2640			10	397				
21		3	2400			10	397				
22		2	2640			10	298				
23		2	2400			10	596				
24		2	2880			10	496				
25	2160	2	2400			20	397				
26		7	2640			10	596				
27		33	2640			10	596				
28		54	2400			10	397				
29		42	2640			10	298				
30		59	2760			10	496				
31											
TL	2160	1259	86160			360	13704				
ME		42	2872			12	457				

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	5		804
Superintendent	1		160
Asst. Supt.	1		160
Shift Foreman			
Shift Operator	3		484
Maint. Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL

WEEKDAYS 11 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

May (Month), 19 79 — Marshall (Municipality), Michigan — R. J. Swahill (Superintendent's Signature)

1 2 | 3 8 | 9 10 | 11 12 | 13 14 15
ID | 260029 | 05 | 79 | 6.00
Plant No. | Mo. | Yr. | Sampling Point Code

DAY 1 2	WEATHER TYPE 9	WEATHER PRECIP. 14	FLOW TOTAL 19	FLOW MAX RATE 24	RAW SEWAGE QUALITY TEMP 29	pH 34	BOD-5 39 44		SS 49 54		TOTAL-P 59 64		VSS 69	NH_3-N 74 78	80	REMARKS 9	14
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l	C		
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C		
SF															C		
01	1		2.61		50	7.0	46	1001	90	1959	1.55	34	66		C		
02	4	.65	2.72		50	6.9	82	1860	86	1951	2.10	48	76		C		
03	1		2.77		51	7.0	74	1710	56	1294	1.90	44	54		C		
04	1		2.77		51	6.9									C		
05	1		2.71		50	6.6									C		
06	1		2.69		51	6.7	78	1750	78	1750	1.95	44	56		C		
07	1		2.75		51	7.1									C		
08	1		2.72		51	6.9	74	1679	74	1679	2.00	45	56		C		
09	1		2.73		52	6.9			50	1138	2.20	50	40		C		
10	1		2.77		52	6.4	60	1386	76	1756	1.65	38	44		C		
11	4	.10	2.66		52	6.7									C		
12	4	.26	2.52		52	6.7									C		
13	4	.06	2.61		51	6.6	122	2656	60	1306	1.90	41	52		C		
14	4	.16	2.77		51	7.0	76	1756	72	1663	2.00	46	64		C		
15	1		2.71		51	7.3	96	2170	80	1808	2.25	51	78		C		
16	1		2.69		52	7.0	74	1660	64	1436	2.25	50	54		C		
17	1		2.71		51	7.0	80	1808	50	1130	2.00	45	40		C		
18	1		2.66		51	6.8									C		
19	3		2.57		51	6.9									C		
20	4	.04	2.60		51	6.8	134	2906	80	1735	2.10	46	76		C		
21	1		2.70		51	6.7	76	1711	78	1756	2.25	51	64		C		
22	1		2.65		52	6.7	70	1547	78	1724	2.20	49	64		C		
23	4	.05	2.58		52	6.7	78	1678	96	2066	2.30	50	70		C		
24	4	.13	2.59		52	6.7	90	1944	140	3024	2.10	45	100		C		
25	3		2.57		51	6.8									C		
26	3		2.47		51	6.7									C		
27	4	.15	2.49		52	6.7									C		
28	1		2.49		52	6.7	86	1786	80	1661	3.00	62	64		C		
29	1		2.57		53	6.6	72	1543	68	1457	.80	17	44		C		
30	4	.22	2.56		53	6.7	110	2349	106	2263			94		C		
31	4	.04	2.54		53	6.8	82	1737	104	2203			88		C		
TL		1.86	81.95					36637		36759		856			C		
ME			2.64				83	1832	79	1750	2.03	45	64		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

May, 1979 — Month

Marshall, Michigan — Municipality

R. J. Swalwell — Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
ID	130029	05	79	
	Plant No	Mo	Yr.	Sampling Point Code

DAY	BOD-5 9	14	SS 19	24	TOTAL P 29	34	VSS 39	NH_3-N 44	REMARKS OR OTHER PARAMETERS 49	54	59	64	69	74	78	80	9	14
1 2	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l								C		
PN	00310	85001	00530	85002	00665	85004	00535	00610								C		
SF																C		
01	44	958	36	784	1.55	34	20									C		
02	74	1679	44	998	1.70	39	30									C		
03	68	1571	52	1201	1.95	45	48									C		
04																C		
05																C		
06	66	1481	62	1391	2.00	45	56									C		
07																C		
08	90	2042	66	1497	2.70	61	58									C		
09			36	820	2.10	48	20									C		
10	54	1247	68	1571	2.25	52	44									C		
11																C		
12																C		
13	102	2220	54	1175	1.80	39	42									C		
14	90	2079	120	2772	2.70	62	114									C		
15	92	2079	132	2983	2.55	58	122									C		
16	50	1122	94	2109	2.00	45	83									C		
17	76	1718	96	2170	2.30	52	86									C		
18																C		
19																C		
20	92	1995	100	2168	2.25	49	92									C		
21	60	1351	60	1351	1.90	43	44									C		
22	72	1591	62	1370	2.60	57	52									C		
23	70	1506	54	1162	2.00	43	44									C		
24	80	1728	62	1339	2.10	45	46									C		
25																C		
26																C		
27																C		
28	100	2077	84	1744	2.90	60	66									C		
29	68	1457	60	1286	.60	13	40									C		
30			90	1922			70									C		
31																C		
TL		29,901		31,813		890										C		
ME	75	1661	72	1591	2.10	47	59									C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

MAY (Month), 19 79 — Marshall (Municipality), Michigan — R. J. Sundwall (Superintendent's Signature)

1 2 | 3 — 8 | 9 10 | 11 12 | 13 15
ID | 130029 | 05 | 79 | ...
Plant No. | Mo | Yr | Sampling Point Code

DAY 1 2	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification 14
	Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MLSS 34	MLVSS 39	SETTL. 44	SDI 49	DO 54	Air Applied 59	SS 64	VSS 49	Percent Return 74	80	Waste Sludge 9	
	KCF	KCF	HRS	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu Ft	%	%	%	C	KGal	See Code*
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF											4				C		
01	48		3.3	4.2	.27	2014	1488	22.0	.91	3.0	195	.73	70	44	C		
02			3.2	4.5	.26	2017	1419	24.0	.84	2.3	193	.79	67	47	C		
03			3.1	4.4	.27	2313	1597	24.0	.89	2.2	200	.77	68	47	C	25	
04			3.1	4.1	.27	2210	1574	24.0	.92	3.0	205	.76	65	47	C	27	
05			3.2								200			47	C	30	
06			3.2								194			48	C	6	
07			3.1	5.5	.28	2054	1531	22.0	.93	2.4	189	.74	74	49	C		
08			3.2	5.5	.28	2154	1683	26.0	.83	2.3	187	.74	74	50	C	21	
09			3.2	5.3	.29	2179	1623	24.0	.91	2.3	186	.70	69	50	C	21	
10			3.1	5.6	.31	2261	1644	23.0	.98	2.2	190	.71	66	49	C	32	
11			3.2	5.2	.32	2005	1494	20.0	1.00	2.4	195	.69	75	51	C		
12			3.4								201			53	C		
13			3.3								200			54	C	28	
14			3.1	4.6	.34	2304	1746	24.0	.96	3.5	197	.75	75	51	C	41	
15			3.2	3.4	.41	1971	1464	21.0	.94	3.2	201	.62	74	53	C		
16			3.2	3.8	.34	2313	1734	24.0	.96	2.6	199	.70	73	53	C	22	
17			3.2	3.4	.36	2183	1627	23.0	.95	2.3	196	.68	73	53	C	23	
18			3.2	3.7	.33	2336	1756	24.0	.97	2.5	190	.74	75	53	C	20	
19			3.4								193			55	C	8	
20			3.3								195			55	C	21	
21			3.2	3.2	.35	2296	1704	22.0	1.04	2.3	200	.70	74	53	C	23	
22			3.3	3.2	.34	2266	1664	23.0	.99	2.4	196	.71	73	52	C	40	
23			3.3	3.1	.38	1868	1366	19.0	.98	2.7	196	.61	74	54	C		
24			3.3	4.0	.33	2141	1559	23.0	.93	2.8	200	.67	72	54	C	3	
25			3.4	4.2	.31	2264	1647	24.0	.94	2.7	197	.72	72	54	C	23	
26			3.5								195			56	C		
27			3.4								195			55	C	39	
28			3.4								197			55	C	23	
29			3.4	3.9	.36	2044	1477	20.0	1.02	2.5	193	.64	70	54	C		
30			3.4	5.1	.31	2420	1779	24.0	1.01	2.3	196	.83	73	55	C	22	
31			3.4	5.1	.31	2437	1776	22.0	1.10	2.5	190	.75	72	54	C	17	
TL															C	515	
ME			3.3	4.7	.32	2230	1607	22.9	.95	2.6	196	.72	72	52	C	23	

Digester Volume, ft³
Primary
Secondary

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

R 4619
4833-5382

Marshall, MICHIGAN — Supernatant To
Process Pattern

MONTH May 19 79 — DIGESTER AND SLUDGE DATA — OPERATOR R.J. Swalwell

DATE	RAW SLUDGE Gals.	RAW SLUDGE Total Solids %	RAW SLUDGE Vol. Solids %	RAW SLUDGE Vol. Solids Lbs/1000 c.f. Digester	RAW SLUDGE pH	DIGESTING SLUDGE Temp. °F	DIGESTING SLUDGE pH	DIGESTING SLUDGE Total Solids %	DIGESTING SLUDGE Vol. Solids %	DIGESTING SLUDGE Vol. Acids Mg/l	DIGESTING SLUDGE Alkalinity Mg/l	SUPERNATANT Gals. X	SUPERNATANT pH	SUPERNATANT Total Solids %	SUPERNATANT Vol. Solids %	SUPERNATANT Susp. Solids Mg/l	SUPERNATANT P Mg/l	SUPERNATANT P Lbs.	SUPERNATANT 5-Day BOD Mg/l	DIGESTED SLUDGE Gals. X	DIGESTED SLUDGE Total Solids %	DIGESTED SLUDGE Vol. Solids %	DIGESTED SLUDGE pH	Gas Produced cu. ft X
	180																							
1	40	5.3	63		5.9																			
2	40	6.1	63		6.0																			
3	40	4.9	85		5.9																			
4	40	6.2	60		5.6																			
5	40	5.6	69		5.6																			
6	40	5.5	70		5.7																			
7	40	5.6	71		5.8																			
8	40	5.6	64		5.8																			
9	40	5.4	67		5.8																			
10	30	5.8	60		5.7																			
11	50	5.5	73		5.7																			
12	40	5.5	67		5.7																			
13	40	5.6	65		5.8																			
14	40	5.3	69		5.7																			
15																								
16	50	5.3	67		5.6																			
17	40	5.3	65		5.9																			
18	40	5.8	67		5.7																			
19	40	5.2	69		5.7																			
20	40	5.4	70		5.7																			
21	40	5.5	69		5.5																			
22	40	5.9	72		5.5																			
23	40	5.7	72		5.6																			
24	40	5.3	70		5.6																			
25	40	5.4	63		5.7																			
26	40	5.8	89		5.7																			
27	40	5.5	68		5.6																			
28	40	5.4	72		5.6																			
29	40	5.4	71		5.6																			
30	40	5.5	71		5.6																			
31	40	6.1	59		5.7																			
TOTAL	1210																							
ARTH. MEAN	40	5.5	69																					

MDPH
D-4.7

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH May, 19 29 — VACUUM FILTER & INCINERATION DATA — OPERATOR R.J. Swalwell

DATE	SLUDGE TO FILTER				CHEMICALS TO FILTER				FILTER		FILTRATE						FILTER CAKE					INCINERATION			REMARKS
					CaO		Fecl3																		
	Gal. x 100	Tot. Sol. %	Lbs. Dry Sol.	pH	Lbs. Dry	R	Lbs. Dry	R	Tot. Hours	Yield	Gal. x 100	pH	Sus. Solids Mg/l	Vol. Susp. Solids %	5 Day BOD Mg/l	P Mg/l	Thou. Lbs. Wet	Tot. Sol. %	Lbs. Tot. Solids x 100	Vol. Sol. %	Lbs. Vol. Solids x 100	Hrs. Opr.	Yield	Fuel BTU	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1	60	5.3	2671	5.9	1749		155		6.5		52	11.3	944	10	1980		28	25.6	72	34	24				
2	64	8.0	4301	5.7	1883		167		7.0		56	11.5	922	9	2460		28	21.9	61	43	26				
3																									
4																									
5																									
6																									
7	64	4.1	2204	5.7	1883		167		7.0		56						35	19.8	69	53	37				
8	55	6.1	2541	5.7	1614		143		6.0		48	11.3	830	15	2520		28	20.4	57	47	27				
9	64	10.4	5591	5.7	1883		167		7.0		56	11.2	1154	7	2100		35	24.4	85	42	36				
10																									
11																									
12																									
13																									
14	55	4.3	1987	6.1	1614		143		6.0		48	11.5	762	48	1940		28	19.5	55	50	27				
15	64	3.5	1882	5.9	1883		167		7.0		56	12.1	738	34	2340		35	18.3	64	53	34				
16	55	5.1	2356	5.7	1614		143		6.0		48	12.0	652	7	2280		28	18.1	51	50	25				
17	55	2.3	1063	6.1	1614		143		6.0		48	11.3	708	9	2580		28	16.8	47	39	18				
18																									
19																									
20																									
21	55	5.4	2495	5.7	1614		143		6.0		48	11.7	642	24	1740		28	20.7	58	42	24				
22	37	4.6	1430	5.5	1076		95		4.0		32	11.6	696	29	2640		21	19.0	40	50	20				
23																									
24																									
25																									
26																									
27																									
28																									
29																									
30																									
31																									
Total	628		25521		18427		1633		68.5		548						322		659		298				
Arith. Means	57	5.4	2593		1675		148		6.2		50		805	19	2238		29	20.4	60	46	27				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

May Month, 19 79 — Marshall Municipality, Michigan — R. J. Swalwell Superintendent's Signature

1,2 IP | 3–8 Plant No. 13,0,0,2,9 | 9,10 Mo 05 | 11,12 Yr 79 | 13–15 Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX FUEL 14 GAS C F	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 CO_2 LBS.	39 Feels LBS	44	49	54	59
PN											
SF		2									
01		9	2760			10	298				
02		3	2520			10	596				
03		25	2520			10	298				
04		41	2640			20	397				
05			2400			10	298				
06		6	2400			10	397				
07		1	2520			10	495				
08			2400			10	397				
09			2400			10	199				
10			2280			10	397				
11		2	2400			10	397				
12			2520			10	397				
13			2400			20	199				
14			2640			10	397				
15			2640			10	794				
16			2640			10	596				
17			2520			10	794				
18			2400			10	199				
19			2280			20	397				
20			2280			20	397				
21			2640			20	794				
22			2640			10	397				
23			2460			20	397				
24			2400			10	397				
25			2400			10	397				
26			2400			10	199				
27			2400			10	596				
28			2400			10	397				
29			2520			10	298				
30			2400			10	298				
31			2280			10	397				
TL		87	76440			370	13106				
ME		13	2466			12	423				

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	5		884
Superintendent	1		176
Asst. Supt.	1		176
Shift Foreman			
Shift Operator	3		532
Maint. Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL

WEEKDAYS 11 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

June (Month), 19 79 — Marshall (Municipality), Michigan — Robert Swalwell (Superintendent's Signature)

1 2 | 3 8 | 9 10 | 11 12 | 13 15
ID | 1300.29 | 06 | 79 | 5.08
Plant No | Mo | Yr. | Sampling Point Code

DAY 1 2	WEATHER TYPE 9	WEATHER PRECIP. 14	FLOW TOTAL 19	FLOW MAX RATE 24	RAW SEWAGE QUALITY TEMP 29	pH 34	BOD-5 39 44		SS 49 54		TOTAL-P 59 64		VSS 69	NH_3-N 74 78	80	REMARKS OF 9	14
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS.	mg/l	LBS	mg/l	LBS.	mg/l	mg/l	C		
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C		
SF															C		
01	1		2.53		53	6.8									C		
02	1		2.46		53	6.8									C		
03	1		2.47		53	6.8	90	1854	66	1360	1.95	40	48		C		
04	4	.01	2.55		53	6.7	88	1871	82	1744	2.25	48	74		C		
05	1		2.53		53	6.6	94	1983	68	1435	2.00	42	58		C		
06	1		2.48		53	6.8	90	1861	56	1158	1.95	40	26		C		
07	4	.27	2.56		53	6.9	68	1452	86	1836	2.30	49	78		C		
08	4	.02	2.55		54	6.8									C		
09	3		2.52		54	6.7									C		
10	4	.42	2.47		54	6.6	142	2925	90	1854	2.80	58	76		C		
11	1		2.54		53	6.8									C		
12	1		2.56		54	6.7	106	2135	88	1879	2.55	54	68		C		
13	1		2.55		54	7.0	110	2339	102	2169	2.50	53	84		C		
14	1		2.51		54	7.1	112	2345	136	2847	2.40	50	112		C		
15	1		2.57		54	6.8									C		
16	1		2.46		54	6.9									C		
17	4	.01	2.38		55	6.8	124	2461	120	2382	2.20	44	84		C		
18	1		2.43		54	6.8	100	2027	76	1540	2.10	43	62		C		
19	1		2.49		54	6.8	102	2118	74	1537	2.00	42	62		C		
20	4	.48	2.50		54	6.8	82	1710	80	1668	2.25	47	66		C		
21	1		2.54		55	6.9	130	2754	110	2330	2.70	58	102		C		
22	1		2.57		55	6.9									C		
23	1		2.35		55	6.9									C		
24	1		2.35		55	6.8	68	1333	54	1058	2.10	41	42		C		
25	1		2.55		54	6.9			92	1957	2.80	60	70		C		
26	1		2.48		55	6.6	110	2275	110	2275	2.30	48	76		C		
27	4	.65	2.51		55	6.7	92	1926	56	1172	2.10	44	42		C		
28	4	.86	2.58		55	6.7	68	1464	88	1894	2.20	47	78		C		
29	4	.23	2.70		55	6.7									C		
30	4	.20	2.52		55	6.6									C		
31															C		
TL		3.15	7526					36833		34095		908			C		
ME			2.51				98	2046	86	1774	2.29	48	69		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

June, 1979
Month

Marshall, Michigan
Municipality

Robert Swalwell
Superintendent's Signature

ID 130029 06 79 ..
Plant No Mo Yr. Sampling Point Code

DAY	BOD-5		SS		TOTAL-P		VSS	NH_3-N	REMARKS OR OTHER PARAMETERS									
	mg/l	LBS	mg/l	LBS	mg/l	LBS.	mg/l	mg/l								C		
PN	00310	85001	00530	85002	00665	85004	00535	00610								C		
SF																C		
01																C		
02																C		
03	76	1566	14	288	1.60	33	16									C		
04	82	1744	76	1616	2.25	48	68									C		
05	66	1393	68	1435	1.80	38	50									C		
06	66	1365	40	827	2.25	47	26									C		
07	44	939	58	1238	1.90	41	42									C		
08																C		
09																C		
10	106	2184	66	1360	2.40	49	54									C		
11																C		
12	108	2306	88	1879	2.70	58	68									C		
13	86	1829	66	1407	2.70	57	48									C		
14	72	1507	62	1298	2.25	47	52									C		
15																C		
16																C		
17	78	1548	48	953	1.60	32	40									C		
18	94	1905	42	851	2.10	43	30									C		
19	82	1703	68	1412	1.65	34	50									C		
20	66	1376	52	1084	1.70	35	44									C		
21	112	2373	72	1525	2.10	44	54									C		
22																C		
23																C		
24	94	1842	50	980	1.95	38	46									C		
25			72	1531	2.30	49	58									C		
26	88	1820	94	1944	2.55	53	64									C		
27	92	1923	56	1172	2.10	44	44									C		
28	80	1721	78	1678	2.25	48	68									C		
29																C		
30																C		
31																C		
TL		31,044		24478		838										C		
ME	83	1725	62	1288	2.11	44	48									C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

June (Month), 19 79 — Marshall (Municipality), Michigan — Robert Swalwell (Superintendent's Signature)

1 2 | 3 — 8 | 9 10 | 11 12 | 13 15
10 | 13.0.0.39 | 6.6 | 79 | . .
Plant No | Mo. | Yr | Sampling Point Code

DAY 1 2	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification 14
	Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MLSS 34	MLVSS 39	SETTL 44	SDI 49	DO 54	Air Applied 59	SS 64	VSS 49	Percent Return 74	80	Waste Sludge 9	
	KCF	KCF	HRS	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu Ft.	%	%	%	C	KGal	See Code*
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF											4				C		
01	48		3.4	5.6	.30	2420	1772	22.0	1.10	2.0	194	.72	69	53	C	15	
02			3.4								191			57	C	5	
03			3.4								187			56	C	17	
04			3.3	5.2	.33	2349	1739	23.0	1.02	2.0	187	.69	73	55	C	32	
05			3.4	4.9	.32	2272	1696	20.0	1.14	1.8	187	.64	74	55	C	23	
06			3.4	4.7	.35	2026	1511	20.0	1.01	2.0	204	.62	73	57	C		
07			3.3	6.2	.27	2557	1879	23.0	1.11	1.9	200	.80	72	55	C	32	
08			3.3	5.1	.33	2114	1543	20.0	1.06	2.0	200	.34	73	51	C	4	
09			3.4								204			52	C	25	
10			3.4								214			50	C	18	
11			3.4	4.6	.37	1907	1407	18.0	1.06	1.2	214	.64	73	48	C		
12			3.3	5.4	.34	2257	1647	21.0	1.07	1.1	218	.90	66	48	C	34	
13			3.4	4.5	.37	2115	1555	18.0	1.18	2.4	223	.67	73	49	C	20	
14			3.4	4.6	.32	2058	1541	19.0	1.08	2.0	216	.73	73	49	C		
15			3.3	5.0	.33	2282	1640	21.0	1.09	1.2	214	.84	73	48	C	14	
16			3.4								213			50	C	30	
17			3.6								216			51	C	10	
18			3.5	4.8	.40	1999	1417	18.0	1.11	2.2	175	.70	69	51	C		
19			3.4	5.0	.38	2209	1639	21.0	1.05	1.3	159	.80	73	50	C	30	
20			3.4	4.9	.37	2091	1574	18.0	1.16	2.2	155	.75	74	50	C		
21			3.4	5.3	.38	2233	1631	20.0	1.11	1.8	160	.69	72	50	C		
22			3.4	6.0	.31	2554	1969	23.0	1.11	2.0	181	.89	74	49	C	35	
23			3.6								188			54	C	5	
24			3.6								188			54	C		
25			3.4	6.0	.39	2481	1766	21.0	1.18	2.3	182	.82	73	50	C	35	
26			3.4	4.2	.44	1854	1364	16.0	1.18	2.6	180	.62	71	52	C		
27			3.4	5.1	.36	2342	1764	19.0	1.23	2.3	163	.79	72	54	C	17	
28			3.3	4.4	.38	2165	1648	18.0	1.20	2.3	158	.68	75	54	C	21	
29			3.2	4.1	.41	2124	1604	16.0	1.33	1.8	150	.69	75	51	C	15	
30			3.4								152			55	C		
31															C		
TL															C	437	
ME	48		3.4	5.0	.35	2210	1633	19.8	1.12	1.9	189	.72	72	51	C	21	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

June (Month), 19 79

Marshall (Municipality), Michigan

Robert Swalwell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
ID | 1306.29 | 06 | 79 | . .
Plant No | Mo. | Yr. | Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX FUEL 14	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS.	39 $FeCl_3$ LBS	44	49	54	59
PN											
SF											
01			2286			10	298				
02			2280			10	199				
03			22.80			10	298				
04			25.20			10	298				
05			3400			10	298				
06			2640			10	397				
07			2520			10	397				
08			2640			10	298				
09			2406			10	199				
10			2400			20	298				
11			2520	-		10	397				
12			2880	-		10	794				
13			3120	-		10	397				
14			2760	-		10	596				
15			2880	-		10	596				
16			2640			10	397				
17			2520			20	596				
18			2520			10	397				
19			2880	-		10	496				
20			2880	-		10	695				
21			2640	-		10	595				
22			2520	-		10	595				
23			3000			10	298				
24			2640			30	298				
25			2880	-		10	596				
26			2380	-		10	596				
27			2880	-		10	397				
28			2760	-		20	397				
29			2640	-		10	199				
30			2520			20	397				
31											
TL			79,320			340	12,711				
ME			2644			11	424				

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	5		840
Superintendent	1		168
Asst. Supt.			
Shift Foreman	1		168
Shift Operator	3		504
Maint. Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL A

WEEKDAYS 11 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

Digester Volume, ft³
Primary _____
Secondary _____

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

R 4619
4833-5382

Supernatant To _____
Process Pattern _____

MONTH June 1979

DIGESTER AND SLUDGE DATA

OPERATOR R. J. Swalwell

DATE	RAW SLUDGE					DIGESTING SLUDGE						SUPERNATANT								DIGESTED SLUDGE				Gas Produced cu. ft X
	Gals. X 10^0	Total Solids %	Vol. Solids %	Vol. Solids Lbs/1000 c.f. Digester	pH	Temp. °F	pH	Total Solids %	Vol. Solids %	Vol. Acids Mg/l	Alkalinity Mg/l	Gals. X	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	P Mg/l	P Lbs.	5-Day BOD Mg/l	Gals. X	Total Solids %	Vol. Solids %	pH	
1	40	5.4	68		5.7																			
2	40	5.6	74		5.6																			
3	40	6.0	75		5.6																			
4	40	6.0	71		5.6																			
5	40	5.3	66		5.6																			
6	40	5.3	66		5.6																			
7																								
8	30	6.5	66		5.6																			
9	50	6.0	66		5.6																			
10	40	5.6	69		5.7																			
11	40	5.0	69		5.7																			
12	40	5.7	65		5.7																			
13	80	5.0	65		5.7																			
14	80	5.1	65		5.8																			
15	80	5.5	68		5.6																			
16	50	5.0	69		5.7																			
17	50	5.1	68		5.7																			
18	80	5.6	71		5.8																			
19	80	5.2	68		5.6																			
20	80	5.0	68		5.6																			
21	80	5.1	69		5.6																			
22	80	5.1	77		5.6																			
23	60	4.9	55		5.6																			
24	60	4.9	64		5.7																			
25	72	5.4	68		5.7																			
26	70	5.4	68		5.7																			
27	65	5.0	63		5.7																			
28	80	5.0	63		5.7																			
29	80	4.1	63		5.8																			
30	50	5.1	70		5.8																			
31																								
TOTAL	1717																							
ARITH. MEAN	59	5.3	67																					

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.7

Marshall, MICHIGAN

MONTH June, 19 79 — VACUUM FILTER & INCINERATION DATA — OPERATOR R.J. Swalwell

DATE	SLUDGE TO FILTER				CHEMICALS TO FILTER				FILTER		FILTRATE						FILTER CAKE					INCINERATION			REMARKS
	Gal. X 100	Tot. Sol. %	Lbs. Dry Sol.	pH	Lbs. Dry	R	FeCl3 Lbs. Dry	R	Tot. Hours	Yield	Gal. X 100	pH	Sus. Solids Mg/l	Vol. Susp. Solids %	5 Day BOD Mg/l	P Mg/l	Thou. Lbs. Wet	Tot. Sol. %	Lbs. Tot. Solids X 100	Vol. Sol. %	Lbs. Vol. Solids X 100	Hrs. Opr.	Yield	Fuel BTU	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1																									
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11	81	3.9	2154	5.8	1338		143		6.0		57	11.4					28	19.3	54	48	26				
12	101	4.4	3733	5.6	1673		179		7.5		71	11.1	738	11	2100		28	17.0	48	55	26				
13	101	6.1	5175	5.6	1673		179		7.5		71	11.3	676	13	2040		35	19.0	67	46	31				
14	101	5.2	4412	5.8	1673		179		7.5		71	11.8	746	12	1380		35	18.7	65	43	28				
15	94	6.0	4738	5.7	1561		167		7.0		67	11.7	1386	8	2460		35	17.6	62	48	30				
16																									
17																									
18																									
19	108	4.9	4445	5.8	1784		191		8.0		76	11.7	976	12	2160		42	17.2	72	48	35				
20	94	5.2	4106	5.7	1561		167		7.0		67	11.8	800	12	1920		42	17.6	74	56	41				
21	94	4.6	3632	5.7	1561		167		7.0		67	11.4	926	27	2520		35	16.6	58	56	33				
22	88	4.5	3326	5.7	1450		155		6.5		62	11.7	1216	11	2160		35	17.7	62	53	33				
23																									
24																									
25	101	5.2	4412	5.6	1673		179		7.5		71	11.4	918	12			42	17.1	72	51	37				
26	101	3.5	2969	5.7	1673		179		7.5		71	11.3	900	37	1620		42	17.2	72	53	38				
27	94	5.1	4027	5.7	1561		167		7.0		67	11.4	846	25	1680		35	18.4	64	47	30				
28	101	5.4	4581	5.8	1673		179		7.5		71	11.6	754	57	1200		42	17.2	72	49	35				
29	94	5.4	4264	5.7	1561		167		7.0		67	11.6	1168	19	780		35	16.4	57	54	31				
30																									
31																									
Total	1353		54674		22.415		2398		100.5		956						511		899		454				
Arith. Means	97	5.0	3905		1601		171		7.2		68		926	20	1694		37	17.6	64	51	32				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

July (Month), 19 79

Marshall (Municipality), Michigan

Robert J. Swedwell
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID | 13.00.29 | 07 | 79 | 506
Plant No. | Mo | Yr | Sampling Point Code

DAY 1 2	WEATHER TYPE 9	PRECIP. 14	FLOW TOTAL 19	MAX 24 RATE	RAW SEWAGE QUALITY TEMP 29	pH 34	BOD-5 39 44		SS 49 54		TOTAL-P 59 64		VSS 69	NH_3-N 74 78	80	REMARKS OR 9	14
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l	C		
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C		
SF															C		
01	4	.02	2.53		55	6.4	38	802	60	1266	1.90	40	48		C		
02	1		2.65		55	6.6	80	1768	64	1414	1.95	43	54		C		
03	4	1.08	2.56		55	6.9									C		
04	4	.02	2.48		55	6.6	44	910	50	1034	1.90	39	28		C		
05	1		2.65		54	6.6	100	2210	102	2254	2.30	51	66		C		
06	1		2.59		54	6.6									C		
07	1		2.54		54	6.5									C		
08	1		2.52		55	6.6	68	1429	80	1681	2.30	48	76		C		
09	1		2.60		56	6.6	102	2212	74	1605	2.10	46	48		C		
10	1		2.56		56	6.6	64	1366	80	1708	2.20	47	58		C		
11	1		2.63		57	6.4	52	1141	56	1228	2.25	49	44		C		
12	1		2.58		57	6.7	88	1894	162	3486	2.55	55	120		C		
13	1		2.60		57	6.5									C		
14	1		2.46		57	6.5									C		
15	1		2.39		57	6.5	98	1953	48	956	2.30	46	26		C		
16	1		2.51		56	6.4	54	1130	56	1172	2.25	47	32		C		
17	1		2.52		56	6.5	60	1261	82	1723	1.90	40	46		C		
18	1		2.53		56	6.4	68	1435	56	1182	2.40	51	52		C		
19	1		2.48		56	6.3									C		
20	1		2.43		56	6.4									C		
21	1		2.36		56	6.4									C		
22	1		2.45		56	6.4			82	1676	2.40	49	62		C		
23	1		2.49		57	6.6									C		
24	1		2.45		57	6.2	60	1226	70	1430	2.10	43	60		C		
25	4	.01	2.46		57	6.2	60	1231	74	1518	2.30	47	64		C		
26	1		2.40		57	6.4	84	1681	90	1801	2.80	56	66		C		
27	4	.02	2.43		57	6.4									C		
28	4	.08	2.32		57	6.2									C		
29	1		2.32		57	6.2	106	2051	66	1277	2.20	43	54		C		
30	4	1.36	2.51		57	6.4	96	2010	116	2428	2.10	44	96		C		
31	4	.01	2.55		58	6.5	64	1361	70	1489	2.90	62	34		C		
TL		2.60	2255					29071		31788		946			C		
ME			2.50				73	1530	77	1589	2.26	47	57		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

July, 1979 — Month

Marshall, Michigan — Municipality

Robert J. Swalwell — Superintendent's Signature

ID 130029 (Plant No) 07 (Mo) 79 (Yr) Sampling Point Code

DAY	BOD 5 (9–14)		SS (19–24)		TOTAL-P (29–34)		VSS (39)	NH_3-N (44)	REMARKS OR OTHER PARAMETERS (49–78)						(80)	(9)	(14)
1 2	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l							C		
PN	00310	85001	00530	85002	00665	85004	00535	00610							C		
SF															C		
01	30	633	62	1308	1.45	31	40								C		
02	100	2210	58	1282	2.00	44	48								C		
03															C		
04	44	910	52	1076	1.40	29	30								C		
05	100	2210	64	1414	1.90	42	50								C		
06															C		
07															C		
08	32	673	40	841	1.40	29	34								C		
09	120	2602	82	1778	2.20	48	58								C		
10	72	1537	84	1793	2.40	51	60								C		
11	52	1141	70	1535	2.00	44	50								C		
12	104	2238	48	1033	1.80	39	34								C		
13															C		
14															C		
15	60	1196	44	877	1.90	38	30								C		
16	44	921	46	963	.80	17	30								C		
17	50	1051	54	1135	1.25	27	38								C		
18	74	1561	34	717	2.25	47	26								C		
19															C		
20															C		
21															C		
22			44	899	1.95	40	34								C		
23															C		
24	100	2043	52	1063	1.80	37	48								C		
25	80	1641	68	1395	2.50	51	56								C		
26	52	1041	58	1160	2.00	40	36								C		
27															C		
28															C		
29	56	1084	26	503	1.15	22	20								C		
30	76	1591	54	1130	1.95	41	40								C		
31	56	1191	42	893	6.20	132	24								C		
TL		27474		22795		849									C		
ME	69	1446	54	1140	2.02	42	39								C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

July Month, 19 79

Watshtenaw Municipality, Michigan

Robert J Swalwell Superintendent's Signature

1 2 ID | 3 8 1300029 Plant No | 9 10 07 Mo. | 11 12 79 Yr | 13 15 .. Sampling Point Code

DAY 1 2	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification 14
	Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MLSS 34	MLVSS 39	SETTL. 44	SDI 49	DO 54	Air Applied 59	SS 64	VSS 49	Percent Return 74	8C	Waste Sludge 9	
	KCF	KCF	HRS.	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu. Ft.	%	%	%	C	KGal	See Code*
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF											4				C		
01	418		3.4								154			55	C	9	
02			3.3	4.5	.38	2235	1636	18.0	1.24	2.5	151	.97	55	57	C	31	
03			3.4	3.8	.45	1815	1339	14.0	1.30	2.0	161	.58	72	53	C		
04			3.5								149			55	C		
05			3.3	5.6	.29	2719	1935	20.0	1.36	2.5	193	.86	69	51	C	36	
06			3.3	4.2	.37	2003	1473	15.0	1.34	2.8	210	.76	71	46	C		
07			3.4								213			45	C	5	
08			3.4								196			43	C	51	
09			3.3	3.2	.51	1433	1019	11.0	1.30	2.6	201	.57	71	44	C		
10			3.4	4.1	.37	1859	1369	14.0	1.33	2.0	199	.70	71	45	C		
11			3.3	4.8	.34	2232	1613	16.0	1.40	2.4	197	.86	67	44	C	34	
12			3.3	4.1	.41	1867	1319	14.0	1.33	2.5	195	.68	70	45	C		
13			3.3	4.9	.54	2241	1614	16.0	1.40	2.5	193	.82	83	44	C	21	
14			3.5								193			47	C	25	
15			3.6								196			48	C	6	
16			3.4	5.1	.41	2123	1561	16.0	1.33	2.2	197	.77	69	45	C	14	
17			3.4	4.7	.35	1996	1455	16.0	1.25	2.6	202	.66	70	46	C		
18			3.4	5.8	.30	2213	1528	17.0	1.30	2.0	201	.86	70	49	C	22	
19			3.5	5.4	.29	2020	1409	16.0	1.26	2.7	199	.68	68	51	C	2	
20			3.5	5.5	.29	2047	1493	16.0	1.31	3.2	195	.73	73	51	C	8	
21			3.7								196			48	C	9	
22			3.5								191			45	C	96	
23			3.5	2.9	.62	995	723	8.0	1.24	2.7	188	.34	70	45	C		
24			3.5	4.5	.46	1426	1019	11.0	1.29	2.2	187	.47	68	45	C		
25			3.5	5.5	.36	1868	1338	14.0	1.33	2.4	188	.70	73	45	C		
26			3.6	6.0	.29	2040	1478	17.0	1.23	2.2	190	.79	69	46	C		
27			3.5	7.1	.25	2458	1737	18.0	1.37	2.0	195	.92	71	46	C		
28			3.7								190			49	C	27	
29			3.7								155			48	C	23	
30			3.4	7.0	.35	2333	1723	19.0	1.25	1.4	182	.86	69	44	C	19	
31			3.4	6.6	.30	2314	1664	18.0	1.29	2.0	184	.87	70	46	C		
TL															C	433	
ME			3.4	5.0	.38	2016	1388	15.4	1.31	2.4	190	.74	70	47	C	24	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

July, 19 79 — Month

Marshall, Michigan — Municipality

Robert J. Swalwell — Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
10	130029	07	79	..
	Plant No.	Mo.	Yr.	Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX. FUEL 14	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS.	39 $FeCl_3$ LBS	44	49	54	59
PN											
SF											
01	1		2640			20	397				
02	1		3240			10	794				
03	1		2760			10	397				
04	1		2640			10	397				
05	1		2760			10	794				
06	2		2880			10	596				
07	1		2520			10	397				
08	1		2760			30	397				
09	1		2760			10	596				
10	2		2760			10	596				
11	1		2760			10	695				
12	1		2880			20	496				
13	1		2640			10	794				
14	1		2520			10	199				
15	2		2520			10	298				
16	1		2760			10	496				
17	1		2760			10	596				
18	1		2760			30	596				
19	1		2760			20	199				
20	1		2640			10	794				
21	1		2640			10	397				
22	1		2520			10	199				
23	1		2760			10	397				
24	1		2760			10	596				
25	1		2760			10	596				
26	1		2640			10	397				
27	1		2640			10	397				
28	1		2280			20	397				
29	1		2400			10	397				
30	2		2520			10	397				
31	2		2760			20	596				
TL	36		83400			410	15290				
ME	1.2		2690			13	493				

MANPOWER POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL			
Superintendent	1		168
Asst. Supt.			
Shift Foreman	1		168
Shift Operator	3		508
Maint. Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL A

WEEKDAYS 11 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

Digester Volume, ft³
Primary _____
Secondary _____

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

R 4619
4833-5382

Supernatant To _____
Process Pattern _____

MONTH JULY 19 79

DIGESTER AND SLUDGE DATA

OPERATOR R. J. Swalwell

DATE	RAW SLUDGE					DIGESTING SLUDGE						SUPERNATANT								DIGESTED SLUDGE				Gas Produced cu. ft X
	Gals. X 100	Total Solids %	Vol. Solids %	Vol. Solids Lbs/1000 c.f. Digester	pH	Temp °F	pH	Total Solids %	Vol. Solids %	Vol. Acids Mg/l	Alkalinity Mg/l	Gals. X	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	P Mg/l	P Lbs.	5 Day BOD Mg/l	Gals. X	Total Solids %	Vol. Solids %	pH	
1	50	5.1	66		5.5																			
2	75	5.5	64		5.4																			
3	80	5.4	34		5.4																			
4	50	4.9	35		5.4																			
5	80	5.4	63		5.4																			
6	60	6.2	70		5.5																			
7	60	5.6	66		5.4																			
8	60	5.5	64		5.5																			
9	80	5.6	71		5.6																			
10	80	4.8	66		5.6																			
11	60	4.9	60		5.5																			
12	60	5.1	69		5.7																			
13	60	5.2	79		5.8																			
14	50	4.9	69		5.8																			
15	50	4.8	65		5.7																			
16	60	4.8	68		5.6																			
17	40	4.8	67		5.6																			
18	40	4.5	64		5.4																			
19	60	4.8	63		5.6																			
20	60	5.2	70		5.5																			
21																								
22	60	4.9	65		5.6																			
23	60	4.4	63		5.7																			
24	60	4.5	69		5.6																			
25	60	3.5	52		5.7																			
26	50	4.9	62		5.7																			
27	50	4.6	68		5.6																			
28		4.5	69		5.7																			
29	50	5.0	70		5.7																			
30	50	4.9	71		5.4																			
3	50	6.7	92		5.5																			
TOTAL	1755																							
ARITH MEAN	57	5.0	65																					

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.7

Marshall, MICHIGAN

MONTH July, 19 79 — VACUUM FILTER & INCINERATION DATA — OPERATOR R. J. Swalwell

DATE	SLUDGE TO FILTER				CHEMICALS TO FILTER				FILTER		FILTRATE						FILTER CAKE					INCINERATION			REMARKS
					C20		Fe2l3																		
	Gal. X 100	Tot. Sol. %	Lbs. Dry Sol.	pH	Lbs. Dry	R	Lbs. Dry	R	Tot. Hours	Yield	Gal. X 100	pH	Sus. Solids Mg/l	Vol. Susp. Solids %	5 Day BOD Mg/l	P Mg/l	Thou. Lbs. Wet	Tot. Sol. %	Lbs. Tot. Solids X 100	Vol. Sol. %	Lbs. Vol. Solids X 100	Hrs. Opr.	Yield	Fuel BTU	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1																									
2	119	4.0	3998	5.7	1793		179		7.5		71	10.7	926	14	1620		42	17.6	74	48	35				
3	119	4.2	4198	5.8	1793		179		7.5		71	10.4	1074	15	1320		42	17.7	74	51	38				
4																									
5	119	5.2	5198	5.8	1793		179		7.5		71	11.5	774	10	1620		42	18.4	77	50	39				
6	95	5.8	4628	5.8	1434		143		6.0		57	11.8	1144	12	1380		35	18.8	66	53	35				
7																									
8																									
9	119	3.9	3898	5.6	1793		179		7.5		71	11.3	810	18	2100		42	17.9	75	52	39				
10	119	4.5	4498	5.6	1793		179		7.5		71	11.1	812	12	1800		35	17.4	61	50	30				
11	119	5.0	4998	5.6	1793		179		7.5		71	11.7	736	10	1400		42	18.0	77	46	35				
12	95	8.6	6863	6.1	1434		143		6.0		57	11.6	948	13	2220		35	20.8	73	44	32				
13	119	5.5	5498	6.0	1793		179		7.5		71	11.9	1288	9	1620		35	20.6	72	52	37				
14																									
15																									
16																									
17	119	5.1	5098	5.9	1793		179		7.5		71	11.7	1170	10	1740		42	18.5	78	51	40				
18	111	5.1	4755	5.9	1673		167		7.0		67	11.9	968	13	3660		42	18.2	76	57	44				
19																									
20																									
21																									
22																									
23	111	4.3	4009	5.6	1673		167		7.0		67						35	18.1	63	45	29				
24	111	3.6	3357	5.6	1673		167		7.0		67	11.3	992	13	1560		35	18.8	66	41	27				
25	111	5.8	5402	5.8	1673		167		7.0		67	11.4	664	12	1440		35	21.2	74	42	31				
26																									
27																									
28																									
29																									
30																									
31	111	4.5	4196	5.8	1673		167		7.0		67	11.1	1082	16	1140		35	19.2	67	45	30				
Total	1697		70600		25577		2553		107		1017						574		1073		521				
Arith. Means	113	5.0	4706		1705		170		7.1		68		956	13	1759		38	18.7	72	48	35				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

August (Month), 19 79 — Marshall (Municipality), Michigan — Robert J. Swahnell (Superintendent's Signature)

1 2 | 3 8 | 9 10 | 11 12 | 13 15
ID | 130029 | 08 | 79 | 500
Plant No | Mo | Yr | Sampling Point Code

DAY	WEATHER		FLOW		RAW SEWAGE QUALITY											REMARKS OR
	TYPE	PRECIP.	TOTAL	MAX RATE	TEMP	pH	BOD-5		SS		TOTAL-P		VSS	NH_3-N		
1 2	9	14	19	24	29	34	39	44	49	54	59	64	69	74	78	80	9 14
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS.	mg/l	LBS	mg/l	LBS	mg/l	mg/l		C	
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610		C	
SF																C	
01	4	1.04	2.53		56	6.4	60	1266	84	1772	2.00	42	78			C	
02	1		2.52		57	6.5	60	1261	64	1387	2.20	46	56			C	
03	1		2.50		57	6.5										C	
04	4	.35	2.50		57	6.5										C	
05	4	.97	2.50		57	6.5										C	
06	1		2.51		57	6.2	86	1836	92	1964	2.25	48	64			C	
07	1		2.50		58	6.4	96	2002	66	1376	2.30	48	44			C	
08	4	.24	2.51		59	6.5	52	1110	46	982	2.25	48	30			C	
09	4	.40	2.55		58	6.5	62	1318	132	2807	2.25	48	98			C	
10	4	.02	2.57		58	6.2										C	
11	3		2.41		58	6.3										C	
12	3		2.32		58	6.4	52	1006	52	1006	1.95	38	14			C	
13	4	.09	2.47		57	6.6	70	1442	96	1978	2.20	45	66			C	
14	1		2.47		57	6.6	58	1195	72	1483	2.25	46	54			C	
15	1		2.43		57	6.3	68	1378	50	1013	2.25	46	40			C	
16	1		2.44		57	6.3	108	2198	82	1669	2.55	52	72			C	
17	4	1.44	2.52		57	7.6										C	
18	4	.03	2.42		57	7.5										C	
19	4	.17	2.43		57	7.6	64	1297	88	1783	2.00	41	78			C	
20	4	.22	2.53		57	7.6	60	1266	80	1688	2.30	49	72			C	
21	1		2.49		58	7.5	82	1703	100	2077	2.50	52	76			C	
22	4	.02	2.54		59	7.4	110	2330	102	2161	2.55	54	84			C	
23	1		2.52		58	7.3	88	1849	86	1807			78			C	
24	1		2.42		58	7.3										C	
25	1		2.41		58	7.0										C	
26	1		2.37		58	7.2	66	1305	146	2886	2.60	51	120			C	
27	4		2.40		58	7.4	70	1401	96	1922	2.30	46	74			C	
28	3		2.47		58	7.4	112	2307	78	1607	2.40	49	70			C	
29	4	.23	2.40		58	7.2	82	1641	76	1521	2.30	46	68			C	
30			2.55		58	7.4	86	1829	92	1957	2.80	60	88			C	
31	1		2.43		58	7.3										C	
TL		5.22	76.73					32940		36846		955				C	
ME			2.48				76	1569	85	1755	2.31	48	68			C	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

August (Month), 19 79

Marshall (Municipality), Michigan

Robert J. Swalwell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
ID | 130029 | 08 | 79 | ..
Plant No | Mo | Yr | Sampling Point Code

DAY	BOD 5 9 14		SS 19 24		TOTAL P 29 34		VSS 39	NH_3-N 44	REMARKS OR OTHER PARAMETERS 49	54	59	64	69	74 78	80	9	14
1 2	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l							C		
P1	00310	85001	00530	85002	00665	85004	00535	00610							C		
SF															C		
01	31	717	32	675	1.20	25	14								C		
02	56	1177	58	1219	2.00	42	42								C		
03															C		
04															C		
05															C		
06	118	2519	78	1665	2.10	45	36								C		
07	74	1543	94	1960	2.70	56	60								C		
08	69	1452	80	1708	2.70	58	54								C		
09	46	978	118	2510	1.90	40	76								C		
10															C		
11															C		
12	60	1161	46	890	1.25	24	12								C		
13	48	989	58	1195	1.65	34	30								C		
14	40	824	40	824	2.20	45	20								C		
15	46	932	32	649	2.10	43	8								C		
16	72	1465	40	814	2.10	43	32								C		
17															C		
18															C		
19	32	649	44	892	1.80	36	36								C		
20	48	1012	60	1266	2.20	46	52								C		
21	50	1038	58	1204	2.20	46	42								C		
22	130	2754	80	1695	2.70	57	68								C		
23	104	2186	62	1303			60								C		
24															C		
25															C		
26	28	553	38	751	1.15	23	28								C		
27	66	1321	76	1521	2.70	54	62								C		
28	90	1854	56	1154	2.20	45	50								C		
29	102	2042	92	1841	2.80	56	68								C		
30	66	1404	60	1276	2.40	51	48								C		
31															C		
TL		28570		27012		869									C		
ME	66	1360	62	1286	2.10	43	43								C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

August (Month), 19 79 — Marshall (Municipality), Michigan — Robert J. Swahill (Superintendent's Signature)

1 2 ID | 3 8 130029 (Plant No) | 9 10 08 (Mo) | 11 12 79 (Yr) | 13 15 (Sampling Point Code)

DAY 1 2	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification 14
	Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MLSS 34	MLVSS 39	SETTL 44	SDI 49	DO 54	Air Applied 59	SS 64	VSS 49	Percent Return 74	8C 9	Waste Sludge	
	KCF	KCF	HRS	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu Ft	%	%	%	C	KGal	See Code*
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
CF											4				C		
01	48		3.4	6.8	.28	2240	1627	18.0	1.24	2.0	187	.81	70	45	C	31	
02			3.4	5.3	.30	1937	1376	16.0	1.21	2.5	190	.77	76	44	C		
03			3.4	7.3	.23	2435	1725	19.0	1.28	2.2	189	.84	76	47	C	10	
04			3.4								190			47	C	58	
05			3.4								191			48	C		
06			3.4	4.7	.37	1691	1242	14.0	1.21	2.5	201	.65	73	47	C		
07			3.4	5.7	.29	2200	1617	19.0	1.16	2.3	165	.75	72	48	C		
08			3.4	5.1	.29	2300	1710	19.0	1.21	2.3	188	.88	72	55	C	21	
09			3.4	4.2	.29	2160	1605	14.0	1.54	2.3	191	.80	73	44	C		
10			3.4	5.0	.26	2578	1852	22.0	1.17	2.4	194	.74	86	46	C	31	
11			3.6								191			47	C	37	
12			3.7								188			50	C		
13			3.5	3.4	.36	1793	1266	16.0	1.12	1.9	186	.65	68	47	C		
14			3.5	4.4	.28	2182	1606	19.0	1.14	2.6	190	.84	71	48	C	26	
15			3.5	4.0	.30	1803	1251	17.0	1.06	2.5	192	.66	70	50	C		
16			3.5	5.8	.22	2409	1682	20.0	1.20	1.4	177	.83	64	48	C	34	
17			3.4	4.6	.29	1824	1308	16.0	1.14	2.0	169	.63	71	48	C		
18			3.6								163			49	C		
19			3.5								163			49	C	22	
20			3.4	6.5	.23	2105	1503	19.0	1.16	2.5	165	.75	69	47	C	15	
21			3.5	5.4	.24	1970	1366	18.0	1.09	2.0	163	.71	68	48	C		
22			3.3	6.6	.25	2372	1708	22.0	1.08	1.5	157	.86	29	47	C	17	
23			3.4								156			46	C	27	
24			3.6	5.7	.32	2070	1463	18.0	1.15	1.8	161	.74	69	47	C		
25			3.6								162			49	C	43	
26			3.6								161			51	C		
27			3.6	4.5	.30	1923	1441	21.0	.91	2.4	163	.68	74	50	C		
28			3.5	5.1	.33	2144	1556	29.0	.74	2.5	156	.73	71	48	C	28	
29			3.6	4.5	.37	1967	1431	30.0	.98	1.1	154	.68	72	50	C		
30			3.4	4.6	.38	2160	1569	23.0	.94	2.0	156	.81	72	47	C	23	
31			3.5	5.0	.36	2207	1601	22.0	1.00	2.0	154	.65	72	57	C	17	
TL															C	440	
ME			3.5	5.2	.30	2113	1522	19.1	1.12	2.1	175	.75	69	48	C	28	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

AUGUST, 19 79
Month

Marshall, Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2 | 3 8 | 9 10 | 11 12 | 13 15
ID | 13.0029 | 08 | 79 | ..
Plant No | Mo | Yr | Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX.FUEL 14	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS	39 $FeCl_3$ LBS.	44	49	54	59
PN											
SF											
01			2760			20	596				
02			2760			20	794				
03			2640			10	397				
04			2520			10	397				
05			2520			10	397				
06			2760			10	596				
07			2640			10	596				
08			2640			10	596				
09			2640			10	596				
10			2400			20	397				
11			2400			20	199				
12			2400			10	397				
13			2640			20	596				
14			2520			10	199				
15			2400			10	199				
16			2460			10	199				
17			2520			10	794				
18			2520			10	397				
19			2400			0	199				
20			2400			10	397				
21			2520			10	397				
22			2640			0	794				
23			2520			20	596				
24			2400			10	397				
25			2280			10	397				
26			2400			20	199				
27			2520			0	199				
28			2400			10	397				
29			2400			30	397				
30			2520			190	596				
31			2520			100	596				
TL			78000			640	13903				
ME			2516			21	448				

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	5		920
Superintendent	1		184
Asst. Supt.	1		184
Shift Foreman			
Shift Operator	3		552
Maint. Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL A

WEEKDAYS 11 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

Digester Volume, ft³
Primary
Secondary

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MARSHALL, MICHIGAN

R 4619
4833-5382

Supernatant To
Process Pattern

MONTH AUGUST 19 79

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE					DIGESTING SLUDGE						SUPERNATANT								DIGESTED SLUDGE				Gas Produced cu ft X
	Gals. X 100	Total Solids %	Vol Solids %	Vol Solids Lbs/1000 c.f Digester	pH	Temp. °F	pH	Total Solids %	Vol. Solids %	vs Acids Mg	Alkalinity Mg/l	Gals. X	pH	Total Solids %	Vol Solids %	Susp. Solids Mg/l	P Mg/l	P Lbs	5 Day BOD Mg/l	Gals. X	Total Solids %	Vol Solids %	pH	
1	50	4.6	68		5.6																			
2	50	3.5	58		5.6																			
3	50	4.1	57		5.6																			
4	50	4.2	64		5.5																			
5	45	4.4	70		6.0																			
6	50	5.4	65		5.5																			
7	50	5.3	71		5.6																			
8	42	6.1	58		5.5																			
9	50	7.2	69		5.5																			
10	50	5.2	64		5.4																			
11	40	5.1	68		5.5																			
12	40	5.3	54		5.5																			
13	50	5.7	71		5.7																			
14	50	5.7	67		5.5																			
15	50	5.3	40		5.6																			
16	50	5.5	67		5.6																			
17	50	4.4	30		6.2																			
18	50	5.0	67		6.2																			
19	40	5.1	71		6.1																			
20	50	5.3	64		6.1																			
21	50	3.3	59		6.0																			
22	50	5.0	68		5.4																			
23	50	5.6	32		6.0																			
24	50	4.8	63		6.1																			
25	50	5.2	68		6.0																			
26	40	5.1	67		6.0																			
27	40	5.4	67		5.9																			
28	40	3.2	70		6.0																			
29	40	4.7	68		6.0																			
30	40	5.6	63		6.0																			
31	30	5.1	68		6.1																			
TOTAL	1437																							
ARITH. MEAN	46	5.0	63																					

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH D-47

Marshall, MICHIGAN

MONTH August, 19 79 — VACUUM FILTER & INCINERATION DATA — OPERATOR R.J. Swalwell

DATE	SLUDGE TO FILTER: Gal X 100 (1)	Tot. Sol % (2)	Lbs. Dry Sol (3)	pH (4)	CHEMICALS TO FILTER: CaO Lbs. Dry (5)	R (6)	$FeCl_3$ Lbs. Dry (7)	R (8)	FILTER: Tot Hours (9)	Yield (10)	FILTRATE: Gal. X 100 (11)	pH (12)	Sus. Solids Mg/l (13)	Vol. Susp. Solids % (14)	5 Day BOD Mg/l (15)	P Mg/l (16)	FILTER CAKE: Thou. Lbs. Wet (17)	Tot. Sol. % (18)	Lbs. Tot. Solids X 100 (19)	Vol Sol. % (20)	Lbs. Vol. Solids X 100 (21)	INCINERATION: Hrs Opr (22)	Yield (23)	Fuel BTU (24)	REMARKS (25)
1	86	4.5	3251	5.5	1680		143		6.0		57	11.1	888	11	1980		28	20.5	57	42	24				
2	93	4.9	3828	5.9	1820		155		6.5		62	11.2	1040	10	1680		35	18.7	65	42	27				
3	65	5.2	2839	5.9	1260		107		4.5		43	11.4	998	10	1400		21	19.7	41	44	18				
4																									
5																									
6	101	3.7	3139	5.8	1960		167		7.0		67	11.1	1434	10	420		35	19.0	67	39	26				
7	101	5.6	4751	5.8	1960		167		7.0		67	11.4	782	14	1140		28	20.0	56	39	22				
8	65	8.8	2839	5.8	1260		107		4.5		43	11.2	1014	12	1200		21	20.9	44	43	19				
9	86	4.7	3395	5.9	1680		143		6.0		57	11.3	960	14	1140		28	23.5	66	30	20				
10																									
11																									
12																									
13	81	4.8	3468	6.1	1680		143		6.0		57	10.6	864	19	1260		28	24.0	67	40	27				
14																									
15																									
16																									
17	86	4.5	3251	6.1	1680		143		6.0		57	12.3	1332	10	1400		20	18.3	51	40	20				
18																									
19																									
20																									
21	101	5.5	4666	6.0	1960		167		7.0		67	12.2	962	10	1680		35	19.0	67	50	33				
22																									
23	101	5.3	4497	6.1	1960		167		7.0		67	12.0	1018	11	1560		42	17.0	71	45	34				
24																									
25																									
26																									
27																									
28																									
29																									
30	101	5.1	4327	6.3	1960		167		7.0		67	11.6	1346	9	1080		35	17.0	60	50	30				
31	101	5.0	4242	6.3	1960		167		7.0		67	11.8	1380	6	1080		28	18.3	51	44	23				
Total	1173		45493		22820		1943		81.5		778						392		763		323				
Arith Means	90	5.2	3730		1755		149		6.3		60		1078	11	1309		30	19.7	59	42	25				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

September (Month), 19 79

Marshall (Municipality), Michigan

Robert J. Swahill
Superintendent's Signature

1 2 | 3 8 | 9 10 | 11 12 | 13 15
IP | 130.029 | 09 | 79 | 500
Plant No. | Mo. | Yr. | Sampling Point Code

DAY 1 2	WEATHER		FLOW		RAW SEWAGE QUALITY											REMARKS OF
	TYPE 9	PRECIP. 14	TOTAL 19	MAX RATE 24	TEMP 29	pH 34	BOD-5 39 44		SS 49 54		TOTAL-P 59 64		VSS 69	NH_3-N 74 78	80	9 14
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l	C	
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C	
SF															C	
01	1		2.33		58	7.1									C	
02	1		2.35		58	7.2									C	
03	4	.02	2.30		58	7.2	68	1304	66	1266	3.20	61	38		C	
04	3		2.40		58	7.1	92	1841	180	3603	3.60	72	148		C	
05	1		2.47		58	7.0	116	2390	64	1318	2.60	54	54		C	
06	1		2.47		58	7.5	104	2142	92	1895	3.60	74	76		C	
07	1		2.34		57	7.5									C	
08	1		2.32		57	7.5									C	
09	1		2.28		57	7.5	103	1959	92	1749	2.70	51	68		C	
10	1		2.41		57	7.5	104	2090	60	1206	2.50	50	52		C	
11	1		2.33		58	7.3	90	1749	90	1749	2.55	50	82		C	
12	1		2.44		58	7.2	100	2035	88	1791	2.70	55	60		C	
13	1		2.48		58	7.3	180	3723	360	7446	6.40	132	230		C	
14	1		2.32		58	7.1									C	
15	1		2.27		58	7.1									C	
16	1		2.24		58	7.0	112	2092	74	1382	3.60	67	50		C	
17	1		2.36		59	7.3	78	1535	76	1496	2.25	44	60		C	
18	1		2.43		58	6.8	98	1986	132	2675	2.80	46	106		C	
19	1		2.29		58	7.2	84	1604	86	1642	2.70	52	72		C	
20	1		2.38		58	7.7	86	1707	100	1985	2.50	50	74		C	
21	3		2.28		58	7.2									C	
22	1		2.14		58	7.2									C	
23	1		2.28		57	7.4	78	1483	122	2320	2.40	46	102		C	
24	1		2.29		58	7.5	82	1566	146	2788	5.15	98	116		C	
25	1		2.38		58	7.5	94	1866	90	1786	3.50	69	72		C	
26	1		2.21		58	7.3	86	1585	78	1438	2.30	42	62		C	
27	1		2.28		57	7.3	94	1787	107	2035	2.55	48	48		C	
28	1		2.31		5.8	6.9									C	
29	1		2.15		57	7.0									C	
30	1		2.28		57	7.0	58	1103	136	2586	2.50	48	100		C	
31															C	
TL		.02	69.81					37,547		44156		1209			C	
ME			2.33				95	1,877	112	2208	3.11	60	86		C	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

September, 19 79
Month

Marshall, Michigan
Municipality

Robert J. Swakwell
Superintendent's Signature

1 2 | 3 8 | 9 10 | 11 12 | 13 15
ID | 130029 | 09 | 79 | ...
Plant No | Mo. | Yr. | Sampling Point Code

DAY	BOD-5 9 14		SS 19 24		TOTAL-P 29 34		VSS 39	NH_3-N 44	REMARKS OR OTHER PARAMETERS 49	54	59	64	69	74 78	80	9	14
1 2	mg/l	LBS	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l							C		
PN	00310	85001	00530	85002	00665	85004	00535	00610							C		
SF															C		
01															C		
02															C		
03	48	921	68	1304	1.80	35	42								C		
04	48	961	80	1601	2.50	50	74								C		
05	120	2472	54	1112	2.70	56	36								C		
06	76	1566	30	618	1.40	29	24								C		
07															C		
08															C		
09	76	1445	40	761	2.10	40	34								C		
10	77	1548	44	884	1.80	56	34								C		
11	64	1244	66	1283	2.20	43	54								C		
12	128	2605	70	1424	2.55	52	50								C		
13	80	1655	60	1241	2.30	48	58								C		
14															C		
15															C		
16	74	1382	68	1270	2.90	54	48								C		
17	58	1142	42	827	2.25	44	32								C		
18	72	1459	72	1454	2.30	47	62								C		
19	84	1604	92	1754	2.80	53	74								C		
20	70	1389	66	1310	2.55	51	52								C		
21															C		
22															C		
23	36	685	32	608	1.65	31	28								C		
24	54	1031	58	1108	3.20	61	52								C		
25	74	1469	68	1350	2.80	56	58								C		
26	86	1585	74	1364	2.20	41	56								C		
27	88	1673	66	1255	1.90	36	56								C		
28															C		
29															C		
30	40	761	54	1027	1.70	32	30								C		
31															C		
TL		28,596		23,560		915									C		
ME	73	1430	60	1178	2.33	46	48								C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

September, 19 79 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2 IP | 3 8 13D029 (Plant No) | 9 10 09 (Mo.) | 11 12 79 (Yr) | 13 15 (Sampling Point Code)

DAY 1 2	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification 14
	Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MLSS 34	MLVSS 39	SETTL. 44	SDI 49	DO 54	Air Applied 59	SS 64	VSS 49	Percent Return 74	80	Waste Sludge 9	
	KCF	KCF	HRS.	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu Ft.	%	%	%	C	KGal	See Code*
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF											4				C		
01	48		3.7								152			58	C	2	
02			3.7								150			56	C	47	
03			3.7								153			58	C		
04			3.6	4.3	.35	1960	1414	22.0	.89	1.8	155	.55	72	59	C		
05			3.5	5.1	.29	2426	1794	28.0	.87	2.0	152	.66	72	57	C	17	
06			3.5	5.6	.27	2444	1833	34.0	1.01	2.4	153	.89	57	57	C	36	
07			3.7	5.2	.31	2125	1543	18.0	1.18	2.3	192	.53	70	58	C	18	
08			3.7								212			53	C		
09			3.8								202			53	C	6	
10			3.6	7.7	.23	2803	2034	23.0	1.23	2.2	193	.76	72	52	C	38	
11			3.7	5.7	.31	2036	1513	15.0	1.35	3.8	195	.52	75	51	C		
12			3.5	6.5	.31	2440	1838	19.0	1.28	2.5	185	.67	74	49	C	24	
13			3.5	7.0	.32	2498	1886	17.0	1.47	2.5	183	.65	74	53	C	37	
14			3.7	5.3	.42	1748	1370	13.0	1.38	3.0	194	.44	76	55	C		
15			3.8								195			48	C	31	
16			3.8								190			48	C	2	
17			3.7	5.0	.38	1849	1376	13.0	1.42	1.0	185	.90	73	60	C		
18			3.5	7.3	.25	2969	2096	21.0	1.41	3.0	187	.68	69	53	C	40	
19			3.8	4.9	.34	2072	1519	15.0	1.38	3.0	192	.56	73	56	C		
20			3.6	5.6	.29	2495	1846	18.0	1.39	2.5	183	.66	73	55	C	43	
21			3.8	4.2	.38	1785	1353	14.0	1.28	3.3	188	.51	73	58	C	1	
22			4.0								187			57	C		
23			3.8								187			53	C	46	
24			3.8	4.3	.29	1686	1281	12.0	1.41	3.1	180	.48	74	52	C		
25			3.6	5.4	.25	2171	1618	16.0	1.36	3.0	178	.55	73	49	C	34	
26			3.9	3.7	.27	1511	1130	10.0	1.51	3.0	168	.42	74	54	C		
27			3.8	4.9	.27	2001	1510	13.0	1.54	2.2	178	.55	74	53	C		
28			3.7	6.1	.22	2531	1880	17.0	1.49	1.0	164	.74	72	55	C	33	
29			4.0								164			56	C		
30			3.8								164			50	C	47	
31															C		
TL															C	502	
ME			3.7	5.5	.30	2189	1670	17.3	1.30	2.7	179	.62	72	54	C	28	

Digester Volume, ft³
Primary _____
Secondary _____

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

R 4619
4833-5382

Supernatant To _____
Process Pattern _____

MONTH September 1979

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE					DIGESTING SLUDGE						SUPERNATANT								DIGESTED SLUDGE				Gas Produced cu. ft X
	Gals. X 100	Total Solids %	Vol. Solids %	Vol. Solids Lbs/1000 c.f. Digester	pH	Temp. °F	pH	Total Solids %	Vol. Solids %	Vol. Acids Mg/l	Alkalinity Mg/l	Gals. X	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	P Mg/l	P Lbs.	5-Day BOD Mg/l	Gals. X	Total Solids %	Vol. Solids %	pH	
1	50	5.9	71		6.0																			
2	48	5.9	67		6.0																			
3	40	5.7	63		5.9																			
4	50	5.6	65		5.8																			
5	40	5.1	84		5.8																			
6	40	5.2	70		5.8																			
7	30	5.4	62		5.9																			
8	50	5.7	69		5.8																			
9	50	5.6	70		5.8																			
10	60	5.7	70		5.9																			
11	60	5.4	76		5.8																			
12	60	5.9	70		5.7																			
13	50	5.9	74		6.0																			
14	60	6.7	67		5.9																			
15	45	5.8	66		6.0																			
16	45	5.8	62		5.8																			
17	50	5.8	70		5.8																			
18	50	5.9	69		5.7																			
19	50	6.2	66		5.6																			
20	50	5.4	65		5.6																			
21	50	6.0	74		5.9																			
22	50	5.6	68		5.7																			
23	50	7.1	62		5.8																			
24	50	5.8	68		5.9																			
25	50	5.8	76		5.9																			
26	50	5.1	67		5.9																			
27	50	7.0	55		6.0																			
28	50	7.0	78		5.7																			
29	50	4.6	65		5.8																			
30	50	5.5	65		5.8																			
31	.																							
TOTAL	1470																							
ARITH. MEAN	49	5.8	68																					

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.7

Marshall, MICHIGAN

MONTH September, 19 79 — VACUUM FILTER & INCINERATION DATA — OPERATOR R.J. Swalwell

DATE	SLUDGE TO FILTER				CHEMICALS TO FILTER				FILTER		FILTRATE						FILTER CAKE					INCINERATION			REMARKS
					CaO		FeCl3																		
	Gal. X 100	Tot. Sol. %	Lbs. Dry Sol.	pH	Lbs. Dry	R	Lbs. Dry	R	Tot. Hours	Yield	Gal. X 100	pH	Sus. Solids Mg/l	Vol. Susp. Solids %	5 Day BOD Mg/l	P Mg/l	Thou. Lbs. Wet	Tot. Sol. %	Lbs. Tot. Solids X 100	Vol. Sol. %	Lbs. Vol. Solids X 100	Hrs. Opr.	Yield	Fuel BTU	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1																									
2																									
3																									
4																									
5	145	5.0	6090	6.2	2065		167		7.0		67	12.2	1382	7	840		48	17.1	82	58	48				
6	140	4.6	5410	6.2	1918		155		6.5		62	12.0	1140	8	2240		42	17.5	74	52	38				
7	145	4.3	5237	6.3	2065		167		7.0		67	11.0	1396	8	1200		43	16.5	71	47	33				
8																									
9																									
10																									
11																									
12	150	4.9	6174	6.2	2213		179		7.5		71	11.6	1148	13	1980		46	18.4	85	49	41				
13	145	7.2	8770	6.2	2065		167		7.0		67	12.3	1096	9	1320		61	17.7	108	47	51				
14	148	6.5	8081	6.3	2065		167		7.0		67	11.2	1284	10	2940		56	18.2	102	49	50				
15																									
16																									
17																									
18	143	5.4	6486	6.1	2213		179		7.5		71	10.1	988	9	1560		47	18.5	87	46	40				
19	152	5.1	6512	6.1	2213		179		7.5		71	9.8	968	10	900		48	18.2	87	48	42				
20	167	5.7	7517	6.1	2065		167		7.0		67	11.6	782	8	1860		53	18.1	96	46	44				
21																									
22																									
23																									
24																									
25	125	4.6	4830	6.0	2065		167		7.0		67	12.0	1006	10	1320		37	18.7	69	51	35				
26	145	5.4	6577	5.9	2213		179		7.5		71	11.8	864	9	2400		46	19.3	89	46	41				
27	145	14.8	5846	6.1	2065		167		7.0		67	12.2	904	11	2040		41	19.2	79	43	34				
28																									
29																									
30																									
31																									
Total	1740		77548		25,225		2037		85.5		815						568		1029		497				
Arith. Means	145	5.3	6462		2102		170		7.1		68		1080	9	1725		47	18.1	86	49	41				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

September, 19 79
Month

Marshall, Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
IP | 130029 | 09 | 79 | ..
Plant No. Mo. Yr. Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX.FUEL 14	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS.	39 Fe c/s LBS.	44	49	54	59
PN											
SF											
01	1		2280			10	397				
02	1		2280			10	199				
03	1		2280			10	397				
04	1		2400			20	397				
05	1		2640			10	794				
06	1		2520			10	596				
07	1		2520			30	596				
08	1		2280			10	199				
09	1		2520			10	397				
10	1		2400			10	199				
11	1		2400			30	397				
12	1		2640			20	794				
13	1		2640			50	596				
14	1		2520			20	397				
15	1		2400			20	397				
16	1		2520			20	397				
17	1		2640			20	397				
18	1		2520			20	596				
19	1		2740			20	794				
20	1		2520			20	596				
21	1		2520			20	397				
22	1		2400			30	397				
23	1		2400			30	199				
24	1		2520			20	496				
25	1		2520			20	496				
26	1		2400			20	794				
27	1		2400			20	596				
28	1		2400			20	397				
29	1		2160			20	199				
30	1		2400			10	397				
31											
TL	30		73800			580	13,600				
ME	1		2460			19	453				

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	5		764
Superintendent	1		152
Asst. Supt.	1		152
Shift Foreman			
Shift Operator	3		460
Maint. Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL

WEEKDAYS 11 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

October (Month), 19 79 — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2 | 3 8 | 9 10 | 11 12 | 13 15
ID | 130029 | 10 | 79 | 500
Plant No. | Mo. | Yr. | Sampling Point Code

DAY 1 2	WEATHER TYPE 9	WEATHER PRECIP. 14	FLOW TOTAL 19	FLOW MAX RATE 24	RAW SEWAGE QUALITY TEMP 29	pH 34	BOD-5 39 44		SS 49 54		TOTAL-P 59 64		VSS 69	NH_3-N 74 78	80	REMARKS OF 9	14
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS.	mg/l	LBS.	mg/l	LBS	mg/l	mg/l	C		
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C		
SF															C		
01	4	.55	2.22		57	7.3	90	1666	76	1407	2.60	48	56		C		
02	1		2.25		58	7.4	106	1989	112	2102	4.20	79	98		C		
03	4	.03	2.25		58	7.3	134	2515	104	1952	3.90	73	90		C		
04	1		2.41		58	7.3	120	2412	98	1970			74		C		
05	4	.11	2.35		58	7.3									C		
06	4	.43	2.15		58	7.2									C		
07	4	.05	2.16		58	7.2									C		
08	4	.02	2.26		58	7.4	108	2036	112	2111	2.80	53	52		C		
09	4	.22	2.26		57	7.3	90	1696	72	1357	2.10	40	52		C		
10	4	.12	2.36		57	7.2	124	2441	148	2913	3.90	57	60		C		
11	4	.28	2.23		57	7.1	100	1860	62	1153	2.50	46	60		C		
12	4	.07	2.37		57	6.9									C		
13	3		2.20		57	7.0									C		
14	1		2.17		55	7.1	74	1339	72	1303			40		C		
15	1		2.32		56	6.9	104	2012	84	1625	2.50	48	58		C		
16	4	.30	2.26		57	7.3	104	1960	64	1206	2.50	47	64		C		
17	1		2.25		57	7.3	116	2177	76	1426	2.50	47	72		C		
18	4	.14	2.36		57	7.3	108	2126	102	2008	2.60	51	88		C		
19	4	.07	2.24		57	7.0									C		
20	4	.03	2.18		57	7.2									C		
21	3		2.20		57	7.1	102	1871	184	3376	2.30	42	156		C		
22	4	.72	2.34		58	7.2	168	3279	166	3240	2.70	53	126		C		
23	4	.10	2.31		58	7.3	112	2158	106	2042	2.70	52	88		C		
24	4	.02	2.33		56	7.2	68	1321	76	1477	2.20	43	62		C		
25	1		2.30		56	7.3	126	2417	146	2801	3.10	59	124		C		
26	1		2.28		55	7.3									C		
27	1		2.27		56	7.3									C		
28	3		2.18		56	7.2	134	2436	68	1236	2.55	46	54		C		
29	3		2.27		56	7.0	110	2082	136	2575	2.50	47	124		C		
30	1		2.30		56	7.0	78	1496	96	1841	2.50	48	72		C		
31	4	.54	2.35		57	7.1	114	2234	232	4546	3.00	59	186		C		
TL		3.80	7038					45541		45667		1038			C		
ME			227				109	2070	109	2075	2.73	52	84		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

October, 19 79
Month

Marshall, Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID | 1300.29 | 10 | 79 | ...
Plant No | Mo. | Yr | Sampling Point Code

DAY	BOD-5 9 14		SS 19 24		TOTAL-P 29 34		VSS 39	NH_3-N 44	REMARKS OR OTHER PARAMETERS 49	54	59	64	69	74	78 80	9	14	1
1 2	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l							C			
PN	00310	85001	00530	85002	00665	85004	00535	00610							C			
SF															C			
01	82	1518	58	1074	3.40	63	48								C			
02	80	1501	60	1126	3.40	64	50								C			
03	126	2364	66	1238	4.50	84	54								C			
04	92	1849	94	1889			68								C			
05															C			
06															C			
07															C			
08	74	1395	74	1395	2.60	49	46								C			
09	80	1508	36	679	1.40	30	20								C			
10	116	2283	72	1417	2.80	55	64								C			
11	72	1339	93	1730	3.20	60	75								C			
12															C			
13															C			
14	56	1013	52	941			12								C			
15	68	1316	60	1161	2.40	46	52								C			
16	116	2186	38	716	1.80	36	28								C			
17	84	1576	58	1088	1.90	37	40								C			
18	102	2008	74	1456	1.80	35	68								C			
19															C			
20															C			
21	74	1358	68	1248	2.00	37	58								C			
22	128	2498	72	1405	2.50	49	62								C			
23	80	1541	68	1310	2.30	44	50								C			
24	70	1360	76	1477	2.10	41	54								C			
25	80	1535	74	1419	2.10	40	54								C			
26															C			
27															C			
28	84	1527	48	873	2.10	38	32								C			
29	92	1742	60	1136	2.40	45	40								C			
30	82	1573	66	1266	2.25	43	46								C			
31	104	2038	62	1215	2.20		44								C			
TL		37055		27259		896									C			
ME	88	1664	65	1229	1.97	45	48								C			

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

October (Month), 19 79 — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2 | 3 8 | 9 10 | 11 12 | 13 15
IP | 1300029 | 10 | 79 | ...
Plant No. | Mo. | Yr. | Sampling Point Code

DAY 1 2	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification 14
	Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MLSS 34	MLVSS 39	SETTL. 44	SDI 49	DO 54	Air Applied 59	SS 64	VSS 49	Percent Return 74	8C	Waste Sludge 9	
	KCF	KCF	HRS	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu. Ft	%	%	%	C	KGal	See Code*
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF															C		
01	48	4.5	3.9	3.3	.48	1093	866	7.0	1.56	2.3	159	.19	77	55	C		
02			3.8	4.6	.37	1560	1221	10.0	1.56	2.3	161	.43	77	55	C		
03			3.8	5.8	.37	1980	1529	13.0	1.52	2.0	164	.54	72	58	C		
04			3.6								152			54	C	23	
05			3.7					17.0		2.0	170			51	C	30	
06			4.0								169			54	C		
07			4.0								180			54	C		
08			3.8	5.9	.33	2157	1590	16.0	1.35	3.0	198	.62	72	52	C	15	
09			3.8								192			52	C		
10			3.7	5.9	.38	2251	1615	17.0	1.32	2.6	203	.61	70	51	C	22	
11			3.9	6.0	.40	2017	1427	14.0	1.44	3.3	195	.61	69	56	C		
12			3.6	5.1	.34	2398	1732	17.0	1.41	1.7	164	.61	70	52	C	41	
13			3.9								156			47	C		
14			4.0								153			47	C		
15			3.7	5.5	.31	2438	1691	18.5	1.32	2.0	176	.82	69	50	C	48	
16			3.8	5.5	.35	2102	1516	16.0	1.31	1.9	178	.58	71	51	C		
17			3.8	6.7	.30	2438	1755	18.0	1.35	2.0	177	.64	72	54	C		
18			3.7	6.0	.32	2547	1838	20.0	1.27	1.6	186	.80	70	53	C	35	
19			3.8	5.6		2227	1654	18.0	1.24	1.9	183	.73	72	55	C		
20			4.0								182			52	C	10	
21			3.9								180			52	C	10	
22			3.7	6.7	.26	2602	1874	20.0	1.30	2.2	180	.80	70	49	C	12	
23			3.8	8.3	.24	3307	2395	22.0	1.03	2.4	211	.94	71	53	C	21	
24			3.7	7.0	.28	3303	2139	23.0	1.43	2.2	198	1.11	68	49	C	20	
25			3.7	5.7	.31	2828	1978	22.0	1.29	2.0	184	1.05	69	48	C	20	
26			3.8	5.8	.28	2856	1980	22.0	1.30	2.2	190	.96	67	49	C	20	
27			3.8								189			51	C	20	
28			4.0								185			47	C	20	
29			3.8	5.4	.30	2566	1813	22.0	1.17	2.3	190	.99	68	53	C	20	
30			3.8	6.4	.28	3014	2044	29.0	1.04	2.0	187	.95	67	62	C	20	
31			3.7	6.2	.26	3005	2104	25.0	1.20	2.3	169	.85	68	54	C	20	
TL															C	427	
ME			3.8	5.9	.31	2434	1738	1.98	1.32	2.2	180	.74	70	52	C	22	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

October . 19 79
Month

Marshall , Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2 | 3 8 | 9 10 | 11 12 | 13 15
ID | 1300029 | 10 | 79 | ..
Plant No | Mo. | Yr. | Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX.FUEL 14	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS.	39 Fe$_2$(SO$_4$)$_3$	44	49	54	59
PN											
SF											
01			2280			20	298				
02			2640			20	695				
03			2520			10	596				
04			2520			30	397				
05			2400			20	397				
06			2160			30	397				
07			2520			20	397				
08			2520			20	397				
09			2640			20	794				
10			2760			30	596				
11			2520			20	397				
12			2520			20	397				
13			2400			20	397				
14			2280			20	199				
15			2520			10	397				
16			2640			30	596				
17			2640			10	794				
18			2640			10	199				
19			2280			10	596				
20			2400			20	596				
21			2280			10	397				
22			2400			10	397				
23			2640			20	596				
24			3000			20	596				
25			3120			20	596				
26			2880			20	596				
27			2760			10	596				
28			2760			10	397				
29			2640			10	397				
30			2880			10	794				
31			2880			10	596				
TL			80040			540	15,490				
ME			2582			17	500				

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	5		920
Superintendent	1		184
Asst. Supt.	1		184
Shift Foreman			
Shift Operator	3		552
Maint. Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL

WEEKDAYS 11 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

Digester Volume, ft³
Primery
Secondary

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

4833-5382

Supernatant To

Process Pattern

MONTH October 1979

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE					DIGESTING SLUDGE						SUPERNATANT								DIGESTED SLUDGE				Gas Produced cu. ft X
	Gals. X 100	Total Solids %	Vol. Solids %	Vol. Solids Lbs/1000 c.f. Digester	pH	Temp. °F	pH	Total Solids %	Vol. Solids %	Vol. Acids Mg/l	Alkalinity Mg/l	Gals. X	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	P Mg/l	P Lbs.	5-Day BOD Mg/l	Gals. X	Total Solids %	Vol. Solids %	pH	
1	50	6.1	69		6.6																			
2	50	7.4	59		5.8																			
3	50	5.6	67		6.0																			
4	50	5.9	71		6.0																			
5	50	5.9	67		6.0																			
6	50	5.8	71		5.9																			
7	50	5.8	72		5.9																			
8	50	6.1	69		5.7																			
9	50	3.8	69		5.8																			
10	50	5.6	70		5.8																			
11	50	5.3	67		5.9																			
12	50	5.8	71		5.9																			
13	50	5.6	63		5.9																			
14	50	5.2	63		5.9																			
15	50	5.8	70		5.9																			
16	50	4.8	62		6.2																			
17	50	6.2	67		6.9																			
18	50	6.1	59		6.7																			
19	50	6.4	69		6.5																			
20	50	5.7	66		6.0																			
21	50	6.5	59		5.9																			
22	50	6.1	65		5.9																			
23	50	5.7	65		5.8																			
24	50	5.7	69		5.8																			
25	50	6.5	70		5.9																			
26	50	8.6	85		5.9																			
27	50	6.0	74		5.8																			
28	50	5.4	67		5.7																			
29	50	7.1	73		5.7																			
30	50	5.8	73		5.7																			
31	50	5.8	66		5.8																			
TOTAL	1515		—																					
ARITH. MEAN	50	5.9	68																					

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.7

Marshall, MICHIGAN

MONTH October, 1979 — VACUUM FILTER & INCINERATION DATA — OPERATOR R.J. Swalwell

DATE	SLUDGE TO FILTER				CHEMICALS TO FILTER				FILTER		FILTRATE						FILTER CAKE					INCINERATION			REMARKS
					CaO		FeCl3																		
	Gal. X 100	Tot. Sol. %	Lbs. Dry Sol.	pH	Lbs. Dry	R	Lbs. Dry	R	Tot. Hours	Yield	Gal. X 100	pH	Sus. Solids Mg/l	Vol. Susp. Solids %	5 Day BOD Mg/l	P Mg/l	Thou. Lbs. Wet	Tot. Sol. %	Lbs. Tot. Solids X 100	Vol. Sol. %	Lbs. Vol. Solids X 100	Hrs. Opr.	Yield	Fuel BTU	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1																									
2	132	4.5	4990	5.9	2107		167		7.0		67	12.1	998	13	2520		38	18.6	71	50	35				
3	111	5.9	5501	5.9	1806		143		6.0		57	11.6	908	10	2160		37	19.8	73	44	32				
4																									
5																									
6																									
7																									
8																									
9	110	5.7	5267	5.8	2107		167		7.0		67	11.0	936	12	3120		38	19.6	74	51	38				
10	110	5.9	5452	5.8	2107		167		7.0		67	9.5	730	14	2580		39	19.3	75	47	35				
11																									
12																									
13																									
14																									
15																									
16	151	5.8	7230	6.6	2107		167		7.0		67	10.8	750	12	2040		55	17.0	94	43	40				
17	114	6.2	5937	6.2	2107		167		7.0		67	11.9	748	16	1140		45	17.8	80	47	38				
18	114	5.4	5171	6.2	2107		167		7.0		67	10.1			1500		41	17.8	73	50	36				
19																									
20																									
21																									
22																									
23																									
24	130	5.2	5678	6.2	2107		167		7.0		67	11.6	896	10	1866		41	19.0	78	48	37				
25	130	5.7	6234	6.1	2107		167		7.0		67	11.9	862	21	2460		41	20.1	82	42	35				
26	138	5.6	6492	6.2	2107		167		7.0		67	11.8			1620		43	20.0	86	49	42				
27																									
28																									
29																									
30	147	5.3	6544	5.9	2107		167		7.0		67	11.1	720	8	1980		41	21.3	87	48	42				
31	143	5.4	6486	5.8	2107		167		7.0		67	11.3	616	12	2400		41	20.8	85	43	37				
Total	1530		70972		24,983		1980		83.0		794						506		958		447				
Arith. Means	127	5.6	5914		2082		165		6.9		66		816	13	2115		42	19.3	80	47	37				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

November (Month), 19 79

Marshall (Municipality), Michigan

Robert J. Swahnll
Superintendent's Signature

1 2 | 3 8 | 9 10 | 11 12 | 13 15
IP | 130029 | 11 | 79 | 500
Plant No | Mo | Yr. | Sampling Point Code

DAY 1 2	WEATHER TYPE 9	WEATHER PRECIP. 14	FLOW TOTAL 19	FLOW MAX 24 RATE	RAW SEWAGE QUALITY TEMP 29	pH 34	BOD-5 39 44		SS 49 54		TOTAL-P 59 64		VSS 69	NH_3-N 74 78	80	REMARKS OR 9	14
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l	C		
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C		
SF															C		
01	1		2.24		56	6.8	94	1756	72	1345	2.25	42	60		C		
02	1		2.35		55	6.8									C		
03	1		2.27		55	6.9									C		
04	1		2.16		55	6.8	134	2414	100	1801	2.90	52	90		C		
05	4	.04	2.16		55	6.6	96	1729	68	1225	2.25	41	38		C		
06	4	.05	2.22		56	6.4	94	1740	70	1296	2.55	47	44		C		
07	4	.06	2.35		56	6.3	96	1849	138	2659	2.70	52	112		C		
08	4	.04	2.30		55	6.4	132	2532	138	2647	2.90	56	118		C		
09	4	.43	2.31		55	6.3									C		
10	4	.03	2.16		55	6.3									C		
11	1		2.19		55	6.4	124	2265	72	1315	3.20	58	60		C		
12	1		2.26		54	7.5	108	2036	92	1734	3.00	57	74		C		
13	1		2.25		54	7.5	86	1614	88	1651	2.50	47	74		C		
14	1		2.24		54	7.3	110	2055	120	2242	5.15	96	90		C		
15	4	.06	2.19		54	7.4	78	1425	70	1279	2.30	42	50		C		
16	1		2.18		54	7.1									C		
17	1		2.14		54	7.2									C		
18	1		2.17		54	7.2	84	1520	72	1303	2.60	47	52		C		
19	4	.15	2.21		55	7.4	88	1622	70	1290	2.60	48	62		C		
20	4	.29	2.24		54	7.4	102	1906	112	2093	2.80	52	80		C		
21	4	.36	2.27		54	7.5									C		
22	4	.39	2.16		55	7.4									C		
23	4	.04	2.25		54	7.3									C		
24	1		2.22		54	7.3									C		
25	4	.90	2.37		54	7.4	96	1838	66	1305	2.30	45	52		C		
26	3		2.44		54	7.3	84	1709	54	1099	2.20	45	50		C		
27	4	.30	2.42		54	7.2	80	1614	102	2052	2.80	57	86		C		
28	5	.03	2.49		54	7.0	76	1578	68	1412	2.60	54	52		C		
29	5	.05	2.37		53	7.3	140	2767	84	1660	2.30	45	54		C		
30	5	.05	2.35		53	7.4									C		
31															C		
TL		3.27	67.93					35969		31,408		983			C		
ME			2.26				100	1893	87	1653	2.73	52	68		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

November, 19 79 — Month

Marshall, Michigan — Municipality

Robert J. Sealwell — Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
ID	130.029	11	79	
	Plant No	Mo.	Yr	Sampling Point Code

DAY	BOD-5		SS		TOTAL-P		VSS	NH_3-N	REMARKS OR OTHER PARAMETERS									
	9	14	19	24	29	34	39	44	49	54	59	64	69	74	78	80	9	14
1 2	mg/l	LBS	mg/l	LBS.	mg/l	LBS	mg/l	mg/l								C		
PN	00310	85001	00530	85002	00665	85004	00535	00610								C		
SF																C		
01	106	1980	66	1233	2.25	42	46									C		
02																C		
03																C		
04	80	1441	54	973	1.55	28	44									C		
05	80	1441	84	1513	2.50	45	68									C		
06	104	1926	66	1222	2.25	42	38									C		
07	80	1541	80	1541	1.80	35	70									C		
08	100	1918	60	1151	2.20	42	42									C		
09																C		
10																C		
11	84	1534	66	1205	1.55	28	46									C		
12	76	1432	94	1772	3.10	58	56									C		
13	74	1389	74	1389	1.90	36	56									C		
14	70	1308	64	1196	4.70	88	40									C		
15	56	1023	66	1205	2.60	48	52									C		
16																C		
17																C		
18	40	724	54	977	1.80	33	40									C		
19	90	1659	74	1364	2.50	46	58									C		
20	94	1756	60	1120	2.40	45	44									C		
21																C		
22																C		
23																C		
24																C		
25	44	870	38	751	1.40	28	24									C		
26	98	1994	68	1384	2.00	41	62									C		
27	58	1171	78	1574	2.10	42	48									C		
28	72	1495	40	831	2.00	42	32									C		
29	112	2214	66	1304	2.30	45	52									C		
30																C		
31																C		
TL		28,816		23,705		814										C		
ME	80	1517	66	1248	2.26	43	48									C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

November, 19 79
Month

Marshall
Municipality, Michigan

Robert J. Swalwell
Superintendent's Signature

1 2 | 3 8 | 9 10 | 11 12 | 13 15
10 | 130029 | 11 | 79 | ...
Plant No. | Mo. | Yr. | Sampling Point Code

DAY 1 2	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification 14
	Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MLSS 34	MLVSS 39	SETTL. 44	SDI 49	DO 54	Air Applied 59	SS 64	VSS 49	Percent Return 74	80	Waste Sludge 9	
	KCF	KCF	HRS.	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu. Ft.	%	%	%	C	KGal	See Code*
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF											4				C		
01	48		3.8	5.8	.33	2373	1672	19.0	1.25	2.5	176	.88	69	58	C	20	
02			3.7	6.8	.28	2917	2025	23.0	1.27	2.4	181	.87	68	50	C	20	
03			3.8								183			52	C	20	
04			4.0								183			55	C	20	
05			4.0	5.4	.37	2056	1458	16.0	1.29	2.5	178	.59	69	55	C	20	
06			3.9	5.6	.36	2231	1582	19.0	1.17	2.0	183	.71	69	55	C	20	
07			3.7	5.3	.36	2365	1640	20.0	1.18	2.7	180	.77	69	48	C	20	
08			3.7	3.4	.57	1466	1042	12.0	1.22	4.0	181	.49	70	51	C	20	
09			3.7	4.2	.45	1806	1328	15.0	1.20	3.2	180	.64	72	52	C	20	
10			4.0								184			55	C	20	
11			3.9								185			53	C	20	
12			3.8	4.3	.40	1932	1358	16.0	1.21	2.5	185	.67	69	52	C	20	
13			3.8	4.6	.35	2144	1528	18.0	1.19	3.2	185	.72	69	53	C	20	
14			3.8	4.7	.34	2128	1531	18.0	1.18	2.9	183	.70	70	54	C	20	
15			3.9	4.9	.31	2170	1527	18.0	1.21	3.5	181	.68	68	55	C	20	
16			3.9	4.7	.33	2038	1413	17.0	1.20	3.8	182	.67	68	56	C	20	
17			4.0								176			57	C	20	
18			4.0								176			57	C	20	
19			3.9	4.9	.29	2117	1493	18.0	1.18	2.6	173	.67	70	51	C	20	
20			3.8	5.0	.28	2178	1557	19.0	1.15	2.8	177	.81	69	50	C	20	
21			3.8	5.3	.27	2320	1690	19.0	1.22	2.0	174	.72	69	49	C	20	
22			4.0								170			52	C	20	
23			3.8								181			54	C	20	
24			3.9								180			55	C	20	
25			3.6								172			51	C	20	
26			3.5	5.4	.31	2232	1515	19.0	1.17	1.7	176	.81	66	53	C	20	
27			3.6	5.0	.31	2115	1459	19.0	1.11	2.8	179	.71	67	54	C	20	
28			3.5	6.3	.27	2559	1777	22.0	1.16	3.2	185	.83	69	51	C	20	
29			3.6	4.5	.42	1808	1270	15.0	1.21	3.7	183	.58	70	54	C	20	
30			3.7	5.4	.35	2168	1511	18.0	1.20	3.0		.70	70	54	C	20	
31															C		
TL															C	600	
ME			3.8	5.1	.35	2156	1519	18.0	1.20	2.9	174	71	69	53	C	20	

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.7

Marshall, MICHIGAN

MONTH November, 19 79 — VACUUM FILTER & INCINERATION DATA — OPERATOR R.J. Swalwell

DATE	SLUDGE TO FILTER				CHEMICALS TO FILTER				FILTER		FILTRATE						FILTER CAKE					INCINERATION			REMARKS
	Gal. X 100	Tot. Sol. %	Lbs. Dry Sol.	pH	C_2O Lbs. Dry	R	$FeCl_3$ Lbs. Dry	R	Tot. Hours	Yield	Gal. X 100	pH	Sus. Solids Mg/l	Vol. Susp. Solids %	5 Day BOD Mg/l	P Mg/l	Thou. Lbs. Wet	Tot. Sol. %	Lbs. Tot. Solids X 100	Vol. Sol. %	Lbs. Vol. Solids X 100	Hrs. Opr.	Yield	Fuel BTU	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1	124	4.1	4271	5.9	1851		167		7.0		67	11.1	654	9	1680		30	20.1	60	47	28				
2	133	5.8	6480	5.8	1851		167		7.0		67	11.1	844	9	2040		40	20.7	83	46	38				
3																									
4																									
5																									
6																									
7	100	6.7	5628	6.0	1851		167		7.0		67	10.9	1736	12	960		34	27.0	75	43	32				
8	100	5.2	4368	6.8	1851		167		7.0		67	10.5	1736	9	1800		34	18.4	63	41	26				
9	100	5.3	4452	6.7	1851		167		7.0		67	10.7	2092	15	1740		34	18.4	63	44	28				
10																									
11																									
12	141	5.8	6870	6.1	1719		155		6.5		62	12.2	854	7	1800		43	20.0	86	48	41				
13	141	5.4	6396	6.5	1719		155		6.5		62	12.1	1140	7	1620		38	21.6	82	47	39				
14	116	5.9	5749	6.4	1719		155		6.5		62	11.7	958	7	1800		36	21.0	76	44	33				
15																									
16																									
17																									
18																									
19	113	5.5	5221	5.4	1719		155		6.5		62	11.9	978	29	900		34	20.4	69	48	33				
20	113	6.6	6265	5.9	1719		155		6.5		62	12.2	832	9	2580		40	20.0	80	47	38				
21																									
22																									
23																									
24																									
25																									
26	80	5.4	3429	5.7	1851		167		7.0		67	11.6	1002	11	3420		27	20.5	55	49	27				
27	80	5.3	3562	5.7	1851		167		7.0		67	12.0	716	10	600		26	20.7	54	45	24				
28	80	5.3	3562	5.7	1851		167		7.0		67	11.5	804	4	3000		26	19.7	51	47	24				
29																									
30																									
31																									
Total	1421		65488		23403		2111		88.5		846						452		897		411				
Arith. Means	109	5.6	5037		1800		162		6.8		65		1104	11	1842		35	20.3	69	46	32				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

November , 19 79
Month

Marshall , Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2 | 3 8 | 9 10 | 11 12 | 13 15
ID | 130029 | 11 | 79 |
Plant No. | Mo. | Yr. | Sampling Point Code

DAY 1 2	GRIT	AUX. FUEL	POWER CONSUMPTION			CHEMICALS APPLIED					
	9	14	19 #1	24 #2	29 #3	34 Cl_2	39 $FeCl_3$	44	49	54	59
	CF		KWH	KWH	KWH	LBS.	LBS.				
PN											
SF		2									
01			2760			20	596	-			
02			3120			20	596	-			
03			2880			20	596				
04			2760			20	397				
05			2880			10	397				
06			3120			10	397				
07			3120			10	596	-			
08			3360			20	794	-			
09			3120			20	596	-			
10			3000			10	397				
11		15	3120			10	596				
12		87	3120			10	397	-			
13		3	3120			10	794	-			
14			3120			10	596	-			
15			2880			10	397				
16			2760			10	397				
17		3	2640			10	199				
18		3	2520			20	397				
19		3	2760			10	596	-			
20		5	2880			10	596	-			
21		5	2640			20	397				
22		4	2520			10	397				
23		5	2760			10	397				
24		13	2760			10	397				
25		7	2760			10	397				
26		52	3000			20	596	-			
27		72	3000			10	993	-			
28		81	3120			10	596	-			
29		89	3060			10	397				
30		92	2640			10	397				
31											
TL		538	82240			390	15291				
ME		32	2908			13	510				

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	5		808
Superintendent	1		160
Asst. Supt.	1		160
Shift Foreman			
Shift Operator	3		488
Maint. Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL A

WEEKDAYS 11 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

_____ Month , 19 _____ | _____ Municipality , Michigan | _____ Superintendent's Signature

ID Plant No (3–8) | Mo (9 10) | Yr (11 12) | Sampling Point Code (13–15)

20

DAY	19 BOD-5 9–19			19 SS 24–34			19 TOTAL-P 39–49			VSS 54	NH_3-N 59	pH 64	DO 69	F. COLI* 74	80	T. COLI* 9
1 2	mg/l	LBS	% Rem	mg/l	LBS.	% Rem	mg/l	LBS.	% Rem.	mg/l	mg/l	SU	mg/l	#/100 ml	C	#/100 ml
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 31615	C	31504 31505
SF															C	
01	18	318	82	11	205	85	.26	5	88	9		6.6	4.3	2	C	
02												6.5	5.2	14	C	
03												6.5		[illegible]	C	
04	26	468	81	8	144	92	.37	7	87	6		6.5		[illegible]	C	
05	13	234	86	10	180	85	.24	4	89	7		6.3	7.0	2	C	
06	11	204	88	10	185	86	.30	6	88	8		6.4	5.5	2	C	
07	17	328	82	9	174	93	.24	5	91	8		6.3	5.7	2	C	
08	26	499	80	8	153	94	.30	6	90	6		6.7	7.8	2	C	
09												6.3	6.0	4	C	
10												6.4			C	
11	25	457	80	11	201	85	.32	6	90	9		6.4			C	
12	8	151	93	8	151	91	.33	6	89	5		7.5	7.9	4	C	
13	6	113	93	7	131	92	.27	5	89	5		7.3	5.9	2	C	
14	9	168	92	9	168	93	.27	5	95	6		7.2	6.0	2	C	
15	6	110	92	8	146	88	.65	12	72	6		7.1	5.9	2	C	
16												7.2	6.5	2	C	
17												7.2			C	
18	7	127	92	10	181	86	.40	7	85	7		7.2			C	
19	9	166	90	5	92	93	.33	6	87	4		7.2	5.7	2	C	
20	9	168	91	3	56	97	.32	6	89	2		7.2	5.9	2	C	
21												7.1	5.8	2	C	
22												7.3			C	
23												7.2			C	
24												7.2			C	
25	14	277	85	4	79	94	.28	6	88	2		7.3			C	
26	17	346	80	5	102	91	.30	6	86	4		7.3	7.2	2	C	
27	6	121	93	10	202	90	.32	6	89	6		7.1	7.6	2	C	
28	7	145	91	2	42	97	.28	6	89	1		7.2	H.C.	2	C	
29	26	514	81	5	99	94	.24	5	90	3		7.2	7.7	28	C	
30												7.0	5.5	150	C	
31															C	
TL		4914			2691			115							C	
ME	14	259	87	8	142	91	.32	6	88	5		6.9	6.0	3	C	
WA	19	347		9	167									8	C	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

December, 19 79 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2	3 8	9 10	11 12	13 15
ID	130029	12	79	500
	Plant No	Mo	Yr.	Sampling Point Code

DAY 1 2	WEATHER TYPE 9	WEATHER PRECIP. 14	FLOW TOTAL 19	FLOW MAX RATE 24	RAW SEWAGE QUALITY TEMP 29	pH 34	BOD-5 39	BOD-5 44	SS 49	SS 54	TOTAL-P 59	TOTAL-P 64	VSS 69	NH_3-N 74 78	80	REMARKS OR 9	14
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS.	mg/l	LBS.	mg/l	LBS	mg/l	mg/l	C		
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C		
SF															C		
01	5	.01	2.42		53	7.4									C		
02	1		2.36		53	7.2	88	1732	74	1456	3.50	69	56		C		
03	1		2.41		54	7.2	56	1126	66	1327	2.20	44	54		C		
04	1		2.47		53	7.3	68	1401	110	2266	2.50	51	80		C		
05	1		2.46		54	6.9	112	2298	40	821	2.20	45	24		C		
06	4	.07	2.39		54	7.0	60	1196	96	1914	2.40	48	86		C		
07	5	.03	2.44		54	7.0									C		
08	3		2.38		54	7.0									C		
09	1		2.38		54	7.0	48	953	100	1985	2.40	48	86		C		
10	1		2.44		53	7.5	66	1343	68	1384	2.25	46	44		C		
11	4	.30	2.46		53	7.2	102	2093	106	2175	2.30	47	100		C		
12	1		2.45		53	7.3	76	1553	58	1185	2.00	41	36		C		
13	1		2.44		53	7.1	84	1709	76	1547	2.40	49	58		C		
14	1		2.42		53	7.3									C		
15	1		2.36		54	7.2									C		
16	5	.06	2.35		53	7.2	72	1411	80	1568	2.20	43	50		C		
17	1		2.48		52	7.4	90	1861	100	2068	5.60	115	88		C		
18	1		2.49		52	7.3	96	1994	78	1620	3.20	66	72		C		
19	1		2.48		52	7.3	90	1861	128	2647	2.20	46	84		C		
20	1		2.44		52	7.4	82	1669	64	1302	2.10	43	54		C		
21	4	.05	2.40		52	7.3									C		
22	4	.25	2.37		53	7.3									C		
23	4	.52	2.36		53	7.3									C		
24	4	1.06	2.59		54	7.2									C		
25	1		2.42		54	7.2	118	2382	50	1009	1.40	28	42		C		
26	4	.01	2.72		51	7.4	104	2359	62	1406	2.00	45	34		C		
27	1		2.68		51	6.7	90	2012	60	1341	1.95	44	42		C		
28	1		2.60		51	7.3									C		
29	1		2.55		51	7.2									C		
30	1		2.52		51	7.1	108	2270	64	1345	2.00	42	40		C		
31	3		2.56		52	7.1									C		
TL		2.36	76.29					34,223		30,366		960			C		
ME			2.46				85	1801	78	1598	2.46	51	59		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

December , 19 79
Month

Marshall , Michigan
Municipality

Robert J. Swahill
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID | 130029 | 12 | 79 | ...
Plant No Mo Yr Sampling Point Code

DAY	BOD 5 9 14		SS 19 24		TOTAL P 29 34		VSS 39	NH_3-N 44	REMARKS OR OTHER PARAMETERS 49	54	59	64	69	74 78	80	9	14
1 2	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l							C		
PN	00310	85001	00530	85002	00665	85004	00535	00610							C		
SF															C		
01															C		
02	26	512	32	630	.85	17	24								C		
03	48	965	60	1206	1.95	39	42								C		
04	70	1442	62	1277	2.20	45	40								C		
05	120	2462	36	739	2.20	45	24								C		
06	52	1036	70	1395	3.10	62	62								C		
07															C		
08															C		
09	12	238	132	2620	1.65	33	120								C		
10	52	1058	76	1547	2.30	47	52								C		
11	96	1970	56	1149	1.90	39	44								C		
12	76	1553	76	1553	2.30	47	60								C		
13	62	1262	74	1506	2.10	43	56								C		
14															C		
15															C		
16	40	784	66	1294	1.70	33	46								C		
17	98	2027	82	1696	2.25	47	72								C		
18	72	1495	60	1246	2.70	56	50								C		
19	80	1655	92	1903	2.30	48	66								C		
20	74	1506	42	855	2.25	50	28								C		
21															C		
22															C		
23															C		
24															C		
25	44	888	50	1009	1.30	26	42								C		
26	56	1270	52	1180	1.40	32	30								C		
27	64	1430	80	1788	1.45	44	62								C		
28															C		
29															C		
30	74	1555	40	841	1.45	30	24								C		
31															C		
TL		25,108		25,434		783									C		
ME	64	1321	65	1339	1.99	41	50								C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

December , 19 79
Month

Marshall , Michigan
Municipality

Robert J. Swahlen
Superintendent's Signature

1 2 | 3 ... 8 | 9 10 | 11 12 | 13 15
IP | 1300279 | 12 | 79 | ...
Plant No | Mo. | Yr | Sampling Point Code

DAY 1 2	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification 14
	Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MLSS 34	MLVSS 39	SETTL. 44	SDI 49	DO 54	Air Applied 59	SS 64	VSS 49	Percent Return 74	80	Waste Sludge 9	
	KCF	KCF	HRS.	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu. Ft.	%	%	%	C	KGal	See Code*
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF											4				C		
01	48		3.6								163			53	C	10	
02			3.7								162			53	C	10	
03			3.6	5.6	.30	2130	1449	18.0	1.18	3.5	159	.73	67	52	C	10	
04			3.5	5.9	.28	2354	1679	20.0	1.18	2.5	155	.79	70	51	C	10	
05			3.5	6.8	.29	2469	1713	21.0	1.18	2.0	148	.84	69	50	C	10	
06			3.6	5.6	.31	1953	1530	19.0	1.03	1.2	150	.71	69	52	C	10	
07			3.5	6.8	.29	2374	1647	20.5	1.16	1.2	152	.86	68	51	C	10	
08			3.6								160			52	C	10	
09			3.6								155			53	C	10	
10			3.5	4.5	.26	2064	1439	18.0	1.15	3.5	163	.72	67	51	C	10	
11			3.5	4.6	.28	2206	1565	18.0	1.23	2.2	170	.72	70	50	C	10	
12			3.5	4.4	.31	2191	1518	19.0	1.15	3.0	183	.78	70	49	C	10	
13			3.5	4.3	.30	2152	1530	19.0	1.13	2.5	182	.72	69	50	C	10	
14			3.6	4.7	.27	2345	1702	19.0	1.23	3.0	182	.73	69	48	C	10	
15			3.7								176			48	C	10	
16			3.7								187			49	C	10	
17			3.5	3.3	.36	1797	1207	14.0	1.28	4.5	190	.65	70	46	C	10	
18			3.5	3.3	.37	1840	1319	15.0	1.23	2.2	166	.58	71	47	C	10	
19			3.5	4.2	.37	2020	1496	17.0	1.19	2.2	174	.61	73	49	C	10	
20			3.5	3.9	.34	1930	1438	16.0	1.21	2.3	179	.78	72	49	C	10	
21			3.6	4.4	.32	2071	1527	18.0	1.15	2.8	175	.67	71	50	C	10	
22			3.6								168			51	C	10	
23			3.7								166			51	C	10	
24			3.3								162			47	C	10	
25			3.6								173			48	C	10	
26			3.2	3.0	.48	1446	1050	12.0	1.20	4.8	176	.55	71	43	C	10	
27			3.2	3.5	.41	1714	1279	14.0	1.22	2.7	179	.63	73	44	C	10	
28			3.3	3.7	.39	1758	1293	17.0	1.03	2.9	177	.64	70	45	C	10	
29			3.4								178			46	C	10	
30			3.4								180			47	C	10	
31			3.4	3.8	.34	1750	1280	17.0	1.03	3.8	182	.64	70	46	C	10	
TL															C	310	
ME			3.5	4.5	.33	2029	1461	17.4	1.17	2.8	170	.70	70	49	C	10	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

December, 19 79 — Month

Marshall, Michigan — Municipality

Robert J. Swalwell — Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
ID	130029	12	79	..
	Plant No	Mo	Yr	Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX FUEL 14 CF	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS	39 $FeCl_3$ LBS.	44	49	54	59
PN											
SF		2									
01		19	3000			5	397				
02		82	2880			15	397				
03		77	2880			10	397				
04		30	3000			10	596				
05		21	2880				794				
06		61	2880			10	596				
07		51	3000			10	397				
08		84	2880			10	397				
09		75	3000			10	397				
10		27	2880			10	596				
11		9	2760			10	596				
12		87	3120			20	397				
13		81	3120			10	397				
14		74	3120			5	397				
15		62	2880			5	596				
16		97	3000			10	596				
17		122	3240			10	596				
18		89	3240			10	596				
19		63	3240			10	397				
20		62	3360			10	397				
21		37	2880			10	397				
22		37	2880			10	397				
23		33	2640			10	596				
24		42	2640			10	397				
25		103	3240			10	496				
26		64	3240			10	397				
27		68	3240			10	397				
28		63	3000			10	397				
29		60	3000			10	397				
30		50	3120			10	397				
31		35	3000			5	397				
TL		1865	93240			295	14,594				
ME		60	3008			10	471				

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	5		728
Superintendent	1		144
Asst. Supt	1		144
Shift Foreman			
Shift Operator	3		440
Maint Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL A

WEEKDAYS 11 HRS

SATURDAYS 4 HRS

SUNDAYS 4 HRS

HOLIDAYS 4 HRS

Digester Volume, ft³
Primary _____
Secondary _____

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

R 4619
4833-5382

Supernatant To _____
Process Pattern _____

MONTH December 19 79

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE					DIGESTING SLUDGE						SUPERNATANT								DIGESTED SLUDGE				Gas Produced cu. ft X
	Gals. X 100	Total Solids %	Vol. Solids %	Vol. Solids Lbs/1000 c.f. Digester	pH	Temp. °F	pH	Total Solids %	Vol. Solids %	Vol. Acids Mg/l	Alkalinity Mg/l	Gals. X	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg l	P Mg l	P Lbs.	5-Day BOD Mg/l	Gals. X	Total Solids %	Vol. Solids %	pH	
1	50	5.7	61		6.0																			
2	50	5.2	69		5.9																			
3	50	5.1	68		6.0																			
4	50	6.3	65		5.8																			
5	50	5.3	67		5.9																			
6	50	5.8	69		5.9																			
7	60	7.2	82		5.8																			
8	40	5.1	67		5.9																			
9	50	5.2	70		5.9																			
10	50	5.0	70		6.0																			
11	50	5.6	76		5.8																			
12	50	3.5	62		6.2																			
13	26	5.5	70		6.0																			
14	50	4.5	54		5.8																			
15	50	6.0	73		5.9																			
16	50	5.7	73		5.9																			
17	50	5.4	83		6.0																			
18	50	4.6	84		6.2																			
19	40	6.0	66		5.9																			
20	60	5.7	72		5.9																			
21	50	9.6	78		5.9																			
22	50	5.7	60		5.8																			
23	50	5.4	80		5.9																			
24	50	8.0	81		5.7																			
25	50	5.4	72		5.8																			
26	50	4.8	69		6.0																			
27	50	4.9	70		5.8																			
28	50	4.7	73		5.7																			
29	50	4.4	72		5.7																			
30	50	4.9	79		5.6																			
31	50	4.8	61		5.0																			
TOTAL	1526																							
ARITH. MEAN	49	5.5	71																					

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.7

Marshall, MICHIGAN

MONTH December, 19 79 — VACUUM FILTER & INCINERATION DATA — OPERATOR R.J. Swalwell

DATE	SLUDGE TO FILTER				CHEMICALS TO FILTER				FILTER		FILTRATE						FILTER CAKE					INCINERATION			REMARKS
	Gal. x 100	Tot. Sol. %	Lbs. Dry Sol.	pH	CaO Lbs. Dry	CaO R	$FeCl_3$ Lbs. Dry	$FeCl_3$ R	Tot. Hours	Yield	Gal. x 100	pH	Sus. Solids Mg/l	Vol. Susp. Solids %	5 Day BOD Mg/l	P Mg/l	Thou. Lbs. Wet	Tot. Sol. %	Lbs. Tot. Solids x 100	Vol. Sol. %	Lbs. Vol. Solids x 100	Hrs. Opr.	Yield	Fuel BTU	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1																									
2																									
3																									
4	125	5.8	6090	6.0	1680		167		7.0		67	9.4	1092	10	2400		40	19.2	77	52	40				
5	99	5.8	4823	5.7	1680		167		7.0		67	9.3	1078	7	840		38	17.2	65	50	33				
6																									
7	126	5.1	5398	6.0	1680		167		7.0		67	10.2					38	18.8	71	47	34				
8																									
9																									
10																									
11	112	5.1	4798	5.6	1680		167		7.0		67	10.7	888	7	960		34	18.8	64	53	34				
12	112	5.3	4986	5.7	1680		167		7.0		67	12.2	642	8	2520		36	18.3	66	55	36				
13	100	5.5	4620	5.7	1680		167		7.0		67	11.3	940	9	3060		33	19.1	63	53	33				
14	80	5.6	2634	5.6	1680		167		7.0		67	8.6	1028	9	2880		20	21.2	42	54	23				
15																									
16																									
17	80	5.6	3763	5.8	1680		167		7.0		67	11.1	1060	10	1980		28	19.3	54	53	29				
18	80	5.2	3494	6.0	1680		167		7.0		67	9.8	1008	8	2460		24	21.5	52	53	27				
19	80	5.9	3965	6.0	1680		167		7.0		67	9.6	726	10	3060		27	20.9	56	49	28				
20	70	9.1	5351	5.9	1680		167		7.0		67	11.0	416	11	960		30	23.4	70	40	28				
21																									
22																									
23																									
24																									
25																									
26	87	5.2	3800	6.1	1680		167		7.0		67	10.0	1600	10	1860		29	19.2	56	52	29				
27	87	5.7	4166	5.6	1680		167		7.0		67	11.4	1400	7	4140		32	18.2	58	51	30				
28																									
29																									
30																									
31																									
Total	1238		57885		21840		2171		91		871						409		794		404				
Arith. Means	95	5.8	4453		1680		167		7.0		67		990	9	2260		31	19.6	61	51	31				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

_____, 19 _____ Month

_____, Michigan Municipality

_____ Superintendent's Sig

1 2 ID | 3 8 Plant No. | 9 10 Mo. | 11 12 Yr. | 13 15 Sampling Point Code

18

DAY	19 BOD-5			19 SS			19 TOTAL-P			19 VSS	NH_3-N	pH	DO 19	F. COLI*		T
	9	14	19	24	29	34	39	44	49	54	59	64	69	74	80	9
1 2	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	mg/l	SU	mg/l	# /100 ml	C	#
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 31615	C	
SF															C	
01												7.0			C	
02	15	295	83	14	276	81	.22	4	94	12		7.0			C	
03	5	100	91	6	121	91	.33	7	85	2		7.0	6.1	6	C	
04	4	82	94	7	144	94	.32	7	87	5		7.2	5.0	10	C	
05	40	821	64	3	62	93	.35	7	84	2		7.0	4.0	8	C	
06	9	179	85	5	100	95	.33	7	86	4		7.1	4.5	2	C	
07												7.1	3.7	4	C	
08												7.0			C	
09	3	60	94	6	119	94	.42	8	83	5		7.0			C	
10	2	41	97	4	81	94	.23	5	90	2		7.1	5.5	26	C	
11	7	144	93	1	21	99	.27	6	88	1		6.9	5.5	56	C	
12	7	143	91	6	123	90	.37	8	82	5		7.2	4.1	222	C	
13	9	183	89	7	142	91	.21	4	91	3		7.2	5.4	62	C	
14												7.2	5.0	22	C	
15												7.2			C	
16	6	118	92	13	255	84	.40	9	82	9		7.1			C	
17	8	165	91	9	186	91	.28	6	95	6		7.3	6.2	10	C	
18	7	145	93	8	166	90	.45	9	86	5		7.2	3.1	20	C	
19	7	145	92	13	269	90	.45	9	80	8		7.1	6.2	154	C	
20	7	142	91	9	183	86	.37	8	82	5		7.2	3.6	200	C	
21												7.0	4.1	56	C	
22												7.0			C	
23												7.1			C	
24												7.0			C	
25	19	383	84	4	81	92	.22	4	84	3		7.0			C	
26	10	227	90	3	68	95	.33	7	83	2		7.2	8.0	40	C	
27	10	224	89	14	313	77	.23	5	88	8		6.7	4.7		C	
28												6.9	5.6	64	C	
29												7.0			C	
30	14	294	87	6	126	91	.27	6	87	3		7.0			C	
31												7.0	6.5	98	C	
TL		3891			2836			126							C	
ME	10	210	89	7	149	90	.32	7	86	5		7.1	5.1	28	C	
WA	15	295		10	212									54	C	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

January (Month) . 19 81

Marshall (Municipality), Michigan

R. J. Swalwell (Superintendent's Signature)

1 2 | 3 ... 8 | 9 10 | 11 12 | 13 15
ID | 1300139 | 01 | 81 | 500
Plant No. | Mo | Yr | Sampling Point Code

DAY 1 2	WEATHER TYPE 9 See Code*	WEATHER PRECIP 14 Inches	FLOW TOTAL 19 MGD	FLOW MAX 24 RATE MGD	RAW SEWAGE QUALITY TEMP 29 °F	pH 34 SU	BOD-5 39 44 mg/l	BOD-5 LBS.	SS 49 54 mg/l	SS LBS	TOTAL-P 59 64 mg/l	TOTAL-P LBS	VSS 69 mg/l	NH_3-N 74 78 mg/l	80 C	REMARKS OR 9	14
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C		
SF															C		
01	5	.08	2.39		50	7.4	96	1914	74	1475	2.75	55	60		C		
02	5	.02	2.54		50	7.4									C		
03	1		2.51		50	7.4									C		
04	1		2.47		49	7.3	64	1318	78	1607	2.65	55	74		C		
05	1		2.51		50	7.3	102	2135	76	1591	2.30	48	54		C		
06	5	.08	2.53		50	7.3	54	1139	56	1182	2.10	44	50		C		
07	1		2.55		49	7.5	96	2042	68	1446	2.30	49	54		C		
08	1		2.54		50	7.3	58	1229	60	1271			50		C		
09	1		2.47		49	7.3									C		
10	5	.02	2.46		50	7.3									C		
11	5	.02	2.45		50	7.4	106	2166	68	1389	2.30	47	54		C		
12	3		2.50		50	7.6	68	1418	62	1293	3.00	63	58		C		
13	1		2.52		50	7.5	80	1681	66	1387	2.50	53	60		C		
14	1		2.53		50	7.5	54	1139	48	1013	2.90	61	40		C		
15	5	.15	2.51		50	7.4	56	1172	76	1591	4.15	87	68		C		
16	3		2.41		50	7.4									C		
17	1		2.44		49	7.4									C		
18	1		2.41		49	7.4	70	1407	56	1126	2.75	55	48		C		
19	1		2.49		49	7.4	96	1994	74	1537	2.50	52	66		C		
20	1		2.49		49	7.3	56	1163	62	1288	2.30	48	46		C		
21	1		2.48		49	7.2	56	1158	56	1158	2.55	53	46		C		
22	1		2.49		49	7.4	116	2409	74	1537	2.50	52	46		C		
23	1		2.41		49	7.3									C		
24	1		2.39		49	7.3									C		
25	1		2.51		49	7.3	94	1968	70	1465	2.75	58	50		C		
26	3		2.50		49	7.4	70	1460	68	1418	2.50	52	58		C		
27	5	.04	2.47		49	7.4	54	1112	40	824	2.50	51	38		C		
28	5	.03	2.44		49	7.5	72	1465	54	1099	2.05	42	40		C		
29	1		2.41		49	7.3	96	1930	76	1528	5.75	116	64		C		
30	1		2.36		49	7.3									C		
31	5	.22	2.36		49	7.3									C		
TL		.66	76.54					33,419		28225		1141			C		
ME			2.47				77	1591	65	1349	2.61	57	58		C		

76.54

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

January (Month), 19 81

Marshall (Municipality), Michigan

R. J. Swalwell (Superintendent's Signature)

1 2 ID | 3 8 Plant No 130029 | 9 10 Mo. 01 | 11 12 Yr. 81 | 13 15 Sampling Point Code

DAY	BOD-5 3 14		SS 19 24		TOTAL-P 29 34		VSS 39	NH_3-N 44	REMARKS OR OTHER PARAMETERS 49	54	59	64	69	74 78	80	9	14
1 2	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l							C		
Per	00310	85001	00530	85002	00665	85004	00535	00610							C		
SF															C		
01	56	1116	48	957	1.80	36	30								C		
02															C		
03															C		
04	34	700	54	1112	1.75	36	44								C		
05	56	1172	52	1088	2.10	44	36								C		
06	46	971	66	1393	1.60	34	50								C		
07	66	1404	62	1319	2.30	49	52								C		
08	46	974	60	1271			54								C		
09															C		
10															C		
11	46	960	60	1226	1.75	36	50								C		
12	50	1043	68	1418	3.70	77	60								C		
13	66	1387	74	1555	2.75	58	58								C		
14	40	844	50	1055	2.10	44	34								C		
15	48	1005	46	963	1.90	40	26								C		
16															C		
17															C		
18	20	402	24	482	2.20	44	16								C		
19	72	1495	46	955	2.20	46	36								C		
20	44	914	76	1578	1.95	40	62								C		
21	50	1034	56	1159	1.80	37	44								C		
22	102	2118	70	1454	1.90	39	46								C		
23															C		
24															C		
25	78	1633	32	670	1.75	37	24								C		
26	46	959	50	1043	1.95	41	42								C		
27	80	1648	66	1360	2.65	55	58								C		
28	60	1221	68	1384	1.95	40	58								C		
29	56	1126	68	1367	2.75	55	60								C		
30															C		
31															C		
T		29,162		24,764		888									C		
AVE	55	1151	57	1179	2.14	44	45								C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

January (Month), 19 81 — Marshall (Municipality), Michigan — R. J. Swinehart (Superintendent's Signature)

1 2 ID | 3 8 Plant No. 1300029 | 9 10 Mo. 01 | 11 12 Yr. 81 | 13 15 Sampling Point Code

DAY 1 2	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification 14 1
	Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MLSS 34	MLVSS 39	SETTL. 44	SDI 49	DO 54	Air Applied 59	SS 64	VSS 49	Percent Return 74	8C	Waste Sludge 9	
	KCF	KCF	HRS	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu. Ft.	%	%	%	C	KGal	See Code*
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF											4				C		
01	48		3.6			-					156			60	C	15	
02			3.4	4.1	.35	1639	1132	21.6	.78	4.5	169	.49	68	60	C	15	
03			3.4								164			57	C	15	
04			3.5								153			59	C	15	
05			3.4	4.7	.30	1805	1220	22.6	.82	5.3	160	.54	66	59	C	15	
06			3.4	5.0	.26	2009	1340	23.6	.87	3.4	143	.56	64	58	C	15	
07			3.4	5.0	.27	2049	1423	24.0	.85	4.4	143	.61	68	58	C	15	
08			3.4	4.7	.27	2000	1366	23.0	.87	4.0	150	.59	67	59	C	15	
09			3.5	4.9	.25	2022	1400	23.0	.88	4.5	153	.59	65	61	C	15	
10			3.5								155			61	C	15	
11			3.5								154			61	C	15	
12			3.4	4.6	.26	1908	1294	22.0	.87	5.1	149	.57	66	58	C	15	
13			3.4	4.3	.30	1885	1268	21.0	.90	4.1	154	.56	65	56	C	15	
14			3.4	3.9	.31	1708	1161	20.6	.85	4.8	157	.54	66	52	C	15	
15			3.4	4.2	.30	1755	1207	19.0	.92	4.7	161	.55	67	56	C	15	
16			3.6	4.4	.29	1775	1178	19.6	.92	6.0	164	.45	65	58	C	15	
17			3.5								167			55	C	15	
18			3.6								161			54	C	15	
19			3.5	4.1	.34	1521	1002	16.0	.95	5.6	159	.48	64	57	C	15	
20			3.5	4.3	.42	1644	1091	16.0	1.02	4.8	158	.46	66	60	C	15	
21			3.5	4.3	.32	1579	1054	17.0	.93	4.6	158	.51	65	59	C	15	
22			3.5	4.3	.36	1574	1042	17.0	.93	5.2	154	.46	65	58	C	15	
23			3.6	4.3	.35	1537	1037	16.0	.96	4.6	158	.44	66	61	C	15	
24			3.6								156			62	C	15	
25			3.4								147			56	C	15	
26			3.4	4.1	.42	1475	968	15.0	.98	5.5	150	.44	65	54	C	15	
27			3.5	4.1	.41	1601	1132	16.0	1.00	2.6	157	.50	69	57	C	15	
28			3.5	3.9	.41	1585	1098	16.0	.99	5.4	163	.47	68	59	C	15	
29			3.6	4.3	.40	1709	1135	16.0	1.07	4.9	166	47	69	61	C	15	
30			3.7	4.3	.38	1658	1159	16.0	1.04	5.8	167	.45	68	62	C	15	
31			3.7								158			62	C	15	
TL															C	465	
ME			3.5	4.4	.33	1735	1177	19.0	.91	4.8	157	.51	66	58	C	15	

Digester Volume, ft³
Primary _____
Secondary _____

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

R 4619
4833-5382

Supernatant To _____
Process Pattern _____

MONTH January 1981

DIGESTER AND SLUDGE DATA

OPERATOR R. J. Swalwell

DATE	RAW SLUDGE					DIGESTING SLUDGE						SUPERNATANT								DIGESTED SLUDGE				Gas Produc cu. ft X
	Gals. X 100	Total Solids %	Vol. Solids %	Vol. Solids Lbs/ 1000 c.f. Digester	pH	Temp. °F	pH	Total Solids %	Vol. Solids %	Vol. Acids Mg/l	Alkalinity Mg/l	Gals. X	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	P Mg/l	P Lbs.	5-Day BOD Mg/l	Gals. X	Total Solids %	Vol. Solids %	pH	
1	40	3.3	50		6.4																			
2	40	4.3	69		6.3																			
3	40	4.0	68		6.3																			
4	40	4.5	46		6.4																			
5	40	4.1	77		6.2																			
6	40	4.9	68		6.1																			
7	40	4.5	83		6.3																			
8	40	4.6	41		6.5																			
9	40																							
10	40	5.1	73		6.4																			
11	40	4.5	65		6.3																			
12	40	4.4	70		6.4																			
13	40	4.0	68		6.5																			
14	40	4.4	70		6.4																			
15	40	4.4	74		6.5																			
16	40	3.8	64		6.5																			
17	40	4.1	77		6.5																			
18	40	4.2	82		6.6																			
19	45	4.0	64		6.7																			
20	40	4.5	67		6.5																			
21	40	2.9	65		6.5																			
22	40	4.5	78		6.8																			
23	40	4.6	80		6.8																			
24	40	4.5	67		6.8																			
25	40	4.5	78		6.7																			
26	40	2.3	65		6.6																			
27	40	4.9	71		6.7																			
28	50	4.7	75		6.6																			
29	50	5.3	58		6.6																			
30	40	6.1	78		6.6																			
31	40	4.8	69		6.3																			
TOTAL	1265																							
ARITH. MEAN	41	4.6	69																					

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.7

Marshall , MICHIGAN

MONTH January , 19 81 — VACUUM FILTER & INCINERATION DATA — OPERATOR R.J. Swalwell

DATE	SLUDGE TO FILTER				CHEMICALS TO FILTER				FILTER		FILTRATE						FILTER CAKE					INCINERATION			REMARKS
	Gal. X 100	Tot. Sol. %	Lbs. Dry Sol.	pH	C_2O Lbs. Dry	R	$FeCl_3$ Lbs. Dry	R	Tot. Hours	Yield	Gal. X 100	pH	Sus. Solids Mg/l	Vol. Susp. Solids %	5 Day BOD Mg/l	P Mg/l	Thou. Lbs. Wet	Tot. Sol. %	Lbs. Tot. Solids X 100	Vol. Sol. %	Lbs. Vol. Solids X 100	Hrs. Opr.	Yield	Fuel BTU	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1																									
2																									
3																									
4																									
5	115	3.8	3645	6.1	1818		191		8.0		76	12.0	868	6	1800		29	19.1	55	47	26				
6																									
7	115	4.8	4604	6.1	1818		191		8.0		76	12.2	712	13	1800		32	19.8	63	48	30				
8	115	4.6	4412	6.4	1818		191		8.0		76	12.3	776	44	1080		32	19.5	62	43	27				
9																									
10																									
11																									
12																									
13	115	3.2	3069	6.4	1818		191		8.0		76	11.2	850	7	1680		29	16.9	49	52	25				
14	115	3.1	2973	6.2	1818		191		8.0		76	11.7	670	13	720		28	17.4	49	48	23				
15	115	4.3	4124	6.2	1818		191		8.0		76	11.8	746	19	1140		34	17.7	60	47	28				
16																									
17																									
18																									
19																									
20	115	3.7	3549	6.4	1818		191		8.0		76	11.9	696	13	840		31	17.3	54	47	25				
21	115	5.7	5467	6.3	1818		191		8.0		76	9.7	640	10	1800		39	18.8	73	44	32				
22	115	8.5	8152	6.3	1818		191		8.0		76	10.1	794	20	1920		54	18.6	100	45	45				
23																									
24																									
25																									
26																									
27	115	4.9	4699	6.5	1818		191		8.0		76	10.7	748	10	2100		34	19.2	65	49	32				
28	115	5.1	4891	6.5	1818		191		8.0		76	11.3	688	45	1740		35	18.9	66	47	31				
29																									
30																									
31																									
Total	1265		49585		19998		2101		880		836						377		196		324				
Arith. Means	115	4.7	4508		1818		191		8.0		76		744	18	1511		34	18.5	63	47	29				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

January, 19 81
Month

Marshall, Michigan
Municipality

R. J. Swalwell
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID | 130029 | 01 | 81 | ..
Plant No. Mo. Yr. Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX. FUEL 14 625 CF	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS.	39 FeCl3 LBS	44	49	54	59
PN											
SF		2									
01		67	2880			10	397				
02		73	2880			10	397				
03		135	3120			20	397				
04		60	2880			5	397				
05		115	3000			5	397				
06		99	3240			15	596				
07		92	3240			5	794				
08		90	3120			10	596				
09		84	3000			10	397				
10		99	2760			10	397				
11		84	3000			10	397				
12		81	2880			10	397				
13		65	3360			10	794				
14		59	3000			10	794				
15		59	3000			10	695				
16		59	2880			10	397				
17		62	3000			10	397				
18		48	2760			10	496				
19		47	2880			10	496				
20		48	3000			10	596				
21		69	3120			5	596				
22		61	2880			5	794				
23		67	2760			5	397				
24		53	2760			5	199				
25		40	2760			10	397				
26		60	2640			10	397				
27		51	3000			10	397				
28		80	2880			10	794				
29		85	3000			10	298				
30		94	2880			10	298				
31		56	2880			10	397				
TL		2242	91440			290	15188				
ME		72	2950			9	490				

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	5		841
Superintendent	1		168
Asst. Supt.	1		168
Shift Foreman			
Shift Operator	3		508
Maint. Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL A

WEEKDAYS 11 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

_____ Month , 19 _____ _____ Municipality , Michigan _____ Superintendent's Signature

ID Plant No. | Mo. | Yr. | Sampling Point Code

DAY	BOD-5			SS			TOTAL-P			VSS	NH_3-N	pH	DO	F. COLI*		T. COLI*	REMARKS
1 2	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	mg/l	SU	mg/l	#/100 ml	C	#/100 ml	
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 31615	C	31504 31505	
SF				~~7~~		~~94~~									C		
01	5	100	95	7	140	91	.27	5	90	5		7.4			C		
02												7.3	7.1	2	C		
03												7.3			C		
04	20	412	69	15	309	81	.32	7	88	14		7.2			C		
05	5	105	95	3	63	96	.27	6	88	2		7.4	6.6	2	C		
06	5	106	90	8	169	86	.38	8	82	7		7.3	5.8	2	C		
07	5	106	95	16	340	76	.37	8	84	7		7.3	5.4	2	C		
08	5	106	91	7	148	88				5		7.3	5.3	24	C		
09												7.2	6.2	2	C		
10												7.3			C		
11	12	245	89	17	347	75	.32	7	86	11		7.3			C		
12	6	125	91	1	21	98	.35	7	88	1		7.3	6.8	10	C		
13	5	105	94	8	168	88	.32	7	87	7		7.3	5.9	2	C		
14	4	84	93	4	84	92	.30	6	90	1		7.3	5.8	4	C		
15	3	63	95	5	105	93	.61	13	85	3		7.2	6.8	2	C		
16												7.0	7.4	22	C		
17												7.6			C		
18	4	80	94	3	60	95	.25	5	91	2		7.0			C		
19	4	83	96	1	21	99	.23	5	91	1		7.1	7.0	2	C		
20	6	125	89	6	125	90	.25	5	89	3		7.1	6.9	8	C		
21	4	83	93	2	41	96	.25	5	91	1		7.3	6.3	6	C		
22	7	145	94	8	166	89	.25	5	90	4		7.3	6.8	16	C		
23												7.2	6.5	8	C		
24												7.2			C		
25	24	502	74	3	42	97	.29	6	96	1		7.3			C		
26	5	104	93	4	83	94	.32	7	87	2		7.3	6.9	480	C		
27	10	206	81	1	21	98	.32	7	87	1		7.2	6.6	8	C		
28	16	326	78	8	163	85	.32	7	84	2		7.3	6.0	2	C		
29	5	100	96	6	121	92	.38	8	93	4		7.3	7.7	2	C		
30												7.3	7.2	2	C		
31												7.3			C		
TL		3311			2737			134							C		
ME	8	158	90	6	130	90	.32	7	88	4		7.3	6.5	5	C		
WA	~~8~~12	248		10	206									8	C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

February, 19 81
Month

Marshall, Michigan
Municipality

Robert J. Swabell
Superintendent's Signature

1 2 ID | 3 8 Plant No 130029 | 9 10 Mo 02 | 11 12 Yr 81 | 13 15 Sampling Point Code 500

DAY 1 2	WEATHER		FLOW		RAW SEWAGE QUALITY											REMARKS OR		
	TYPE 9	PRECIP 14	TOTAL 19	MAX 24 RATE	TEMP 29	pH 34	BOD-5 39 44		SS 49 54		TOTAL-P 59 64		VSS 69	NH_3-N 74 78	80	9	14	1
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l	C			
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C			
SF															C			
01	5	.10	2.41		49	7.2	42	844	152	3055	3.30	66	112		C			
02	5	.03	2.47		48	6.9	66	1360	52	1071	2.55	53	28		C			
03	5	.02	2.38		48	7.1	86	1707	56	1112	2.20	44	46		C			
04	1		2.46		48	7.6	54	1108	48	985	2.30	47	28		C			
05	3		2.41		48	7.6	64	1287	58	1165	2.50	50	44		C			
06	5	.02	2.35		48	7.6									C			
07	3		2.30		48	7.4									C			
08	5	.06	2.30		48	7.4	68	1304	50	959	2.50	48	28		C			
09	5	.16	2.42		48	7.4	92	1857	68	1372	3.40	69	42		C			
10	475	.87	2.48		48	7.5	30	620	24	496	2.10	43	14		C			
11	5	.02	2.44		48	7.6	68	1384	52	1058	2.10	43	42		C			
12	1		2.44		47	7.4	70	1424	52	1058	2.10	43	40		C			
13	1		2.45		47	7.5									C			
14	1		2.40		47	7.5									C			
15	4	.02	2.46		47	7.4									C			
16	3		2.21		48	7.4									C			
17	1		2.77		48	7.4	38	647	84	1941	2.90	67	64		C			
18	1		2.88		48	7.5	48	1153	48	1153	2.10	50	38		C			
19	1		2.90		48	7.4	44	1064	44	1064	1.90	46	34		C			
20	1		2.86		48	7.3									C			
21	1		2.76		48	7.3									C			
22	4	.15	2.83		48	7.3	56	1322	46	1086	2.20	52	40		C			
23	4	.28	2.86		49	7.2	64	1527	64	1527	2.10	50	56		C			
24	3		2.88		48	7.1	84	2018	144	3459	2.30	55	128		C			
25	1		2.88		48	7.1	54	1297	44	1057	2.10	50	34		C			
26	3		2.81		48	6.8	88	2062	82	1922	2.30	54	70		C			
27	4	.01	2.80		47	7.5									C			
28	3		2.78		47	7.5									C			
29															C			
30															C			
31															C			
TL		1.74	72.89					23985		25540	-	930			C			
ME			2.60				61	1333	65	1419	2.39	52	49		C			

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

February, 19 81
Month

Marshall, Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

ID 13.0.029 02 81
Plant No Mo Yr Sampling Point Code

DAY	BOD-5 9–14		SS 19–24		TOTAL-P 29–34		VSS 39	NH_3-N 44	REMARKS OR OTHER PARAMETERS 49	54	59	64	69	74–78	80
1 2	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l							C
PN	00310	85001	00530	85002	00665	85004	00535	00610							C
SF															C
01	36	724	56	1126	1.60	32	44								C
02	54	1112	46	948	1.75	36	30								C
03	80	1588	76	1509	2.55	51	56								C
04	36	739	46	944	1.40	29	30								C
05	70	1407	72	1447	2.30	46	56								C
06															C
07															C
08	28	537	32	614	1.90	36	20								C
09	52	1050	38	767	2.10	42	22								C
10	18	372	28	579	2.05	42	20								C
11	68	1384	50	1018	1.95	40	42								C
12	72	1465	62	1262	2.40	49	40								C
13															C
14															C
15															C
16															C
17	36	832	62	1432	2.50	58	50								C
18	34	817	26	624	1.70	41	20								C
19	42	1016	18	435	1.75	42	10								C
20															C
21															C
22	28	661	12	283	1.40	33	8								C
23	52	1240	16	382	2.65	63	10								C
24	62	1489	56	1345	2.40	58	50								C
25	48	1153	52	1249	2.50	60	42								C
26	66	1547	48	1125	2.55	60	40								C
27															C
28															C
29															C
30															C
31															C
TL		19133		14089		818									C
ME	49	1063	44	949	2.08	45	33								C

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

February, 1981 (Month)

Marshall (Municipality), Michigan

Robert J. Swalwell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
ID | 1900029 (Plant No) | 02 (Mo.) | 81 (Yr) | (Sampling Point Code)

DAY 1 2	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification 14	19
	Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MLSS 34	MLVSS 39	SETTL 44	SDI 49	DO 54	Air Applied 59	SS 64	VSS 49	Percent Return 74	80 C	Waste Sludge 9		
	KCF	KCF	HRS	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu Ft	%	%	%	C	KGal	See Code*	
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889	
SF											4				C			
01	48		3.6								155			61	C			
02			3.5	4.2	.37	1604	1105	16.0	1.00	5.1	165	.50	68	59	C			
03			3.6	3.8	.36	1527	1071	15.0	1.02	6.6	165	.42	68	61	C			
04			3.5	3.6	.37	1496	1065	15.0	1.00	5.0	166	.47	71	59	C			
05			3.6	3.7	.34	1515	1096	15.0	1.01	5.3	161	.42	71	58	C			
06			3.7	3.9	.33	1570	1106	16.0	.98	5.7	160	.42	70	57	C			
07			3.7								156			57	C			
08			3.7								161			56	C			
09			3.6	4.3	.31	1569	1116	16.0	1.00	5.8	178	.39	70	60	C			
10			3.5	5.2	.26	1734	1272	16.0	1.08	5.3	176	.47	71	56	C			
11			3.5	5.0	.28	1674	1228	16.0	1.04	6.3	198	.49	72	55	C			
12			3.5	5.1	.26	1638	1264	16.0	1.02	6.7	199	.49	71	57	C			
13			3.5	6.0	.24	1930	1407	16.0	1.21	5.3	164	.52	73	58	C			
14			3.6								151			58	C			
15			3.5								142			57	C			
16			3.2								144			51	C			
17			3.1	5.8	.24	2184	1595	21.0	1.04	5.4	140	.63	72	52	C			
18			3.0	6.8	.22	2351	1629	23.0	1.02	6.2	139	.65	73	52	C			
19			3.0	6.9	.23	2288	1576	22.0	1.04	6.4	141	.62	72	52	C			
20			3.0	6.3	.25	2067	1476	20.0	1.04	6.5	144	.62	69	53	C			
21			3.1								143			55	C			
22			3.0								139			54	C			
23			3.0	7.2	.26	1996	1418	18.0	1.11	6.0	184	.56	70	50	C			
24			3.0	6.8	.27	1973	1409	17.0	1.16	6.0	194	.61	70	50	C			
25			3.0	7.2	.25	2037	1374	18.0	1.13	3.6	197	.58	70	50	C			
26			3.1	7.5	.24	1952	1378	18.0	1.08	5.1	200	.58	69	52	C			
27			3.1	7.7	.19	1974	1887	18.0	1.10	5.8	188	.53	69	51	C			
28			3.1								191			53	C			
29															C			
30															C			
31															C			
TL															C			
ME	48		3.3	5.6	.28	1846	1344	17.5	1.06	5.7	166	.52	70	55	C			

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

February, 19 81
Month

Marshall, Michigan
Municipality

Robert J Swalwell
Superintendent's Signature

ID 130029 02 81
Plant No. Mo. Yr. Sampling Point Code

DAY	GRIT	AUX.FUEL	POWER CONSUMPTION			CHEMICALS APPLIED					
1 2	9	14 NGS	19 #1	24 #2	29 #3	34 Cl_2	39 $FeCl_3$	44	49	54	59
	CF	C.F.	KWH	KWH	KWH	LBS.	LBS.				
PM											
SF		2									
01	1	71	2880			10		397			
02	1	108	2880			10		298			
03	1	103	3120			10		298			
04	1	100	3480			10		596			
05	1	79	3240			5		596			
06	1	46	3000			5		199			
07	1	44	2760			10		199			
08	1	62	2760			20		199			
09	1	73	3240			10		199			
10	1	56	3240			10		397			
11	1	101	3360			10		695			
12	1	98	3360			10		496			
13	2	46	3000			10		199			
14	2	65	2760			10		199			
15	2	27	2760			10		199			
16	2	29	2640			0		298			
17	2	27	2880			20		496			
18	2	26	3000			10		596			
19	2	10	2760			10		397			
20	2	29	3000			20		596			
21	2	26	2760			10		397			
22	2	25	2880			10		199			
23	2	30	3000			10		496			
24	2	42	3240			10		596			
25	2	40	3240			10		695			
26	2	52	3120			20		298			
27	2	25	3120			10		397			
28	2	30	3120			20		397			
29											
30											
31											
TL	44	1470	84600			310		11024			
ME	1.6	53	3021			12		394			

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	5	764	
Superintendent	1	152	
Asst. Supt.	1	152	
Shift Foreman			
Shift Operator	3	460	
Maint. Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL A

WEEKDAYS 11 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

Digester Volume, ft³
Primary
Secondary

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

R 4619
4833-5382

Supernatant To
Process Pattern

MONTH February 1981

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE					DIGESTING SLUDGE						SUPERNATANT								DIGESTED SLUDGE				Gas Produced cu. ft X
	Gals. X 100	Total Solids %	Vol. Solids %	Vol. Solids Lbs/1000 c.f. Digester	pH	Temp. °F	pH	Total Solids %	Vol. Solids %	Vol. Acids Mg/l	Alkalinity Mg/l	Gals. X	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	P Mg/l	P Lbs.	5-Day BOD Mg/l	Gals. X	Total Solids %	Vol. Solids %	pH	
1	40	4.9	69		6.2																			
2	50	4.3	78		6.1																			
3	50	5.4	66		6.1																			
4	50	4.7	60		6.5																			
5	50	4.8	68		6.6																			
6	50	4.1	76		6.6																			
7	40	4.7	63		6.5																			
8	40	4.7	71		6.5																			
9	50	4.1	73		6.4																			
10	50	4.8	81		6.2																			
11	50	4.2	78		6.6																			
12	50	4.3	79		6.7																			
13	50	4.5	64		6.7																			
14	40	3.6	83		6.7																			
15	40	3.8	63		6.6																			
16	40	6.2	92		6.7																			
17	45	4.6	87		6.5																			
18	45	4.1	83		6.5																			
19	45	2.7	70		6.5																			
20	45	4.7	68		6.5																			
21	40	3.5	75		6.5																			
22	40	4.4	72		6.4																			
23	45	4.3	78		6.4																			
24																								
25	45	4.3	81		6.1																			
26	45	4.6	69		6.1																			
27	45	4.3	70		6.5																			
28	40	4.2	81		6.4																			
29																								
30																								
31																								
TAL	1220																							
ITH-EAN	45	4.4	74																					

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.7

Marshall, MICHIGAN

MONTH February, 1981

VACUUM FILTER & INCINERATION DATA

OPERATOR Robert J. Swahill

E	SLUDGE TO FILTER				CHEMICALS TO FILTER				FILTER		FILTRATE						FILTER CAKE					INCINERATION			REMARKS
	Gal. X 100	Tot. Sol. %	Lbs. Dry Sol.	pH	CaO Lbs. Dry	R	FeCl3 Lbs. Dry	R	Tot. Hours	Yield	Gal. X 100	pH	Sus. Solids Mg/l	Vol. Susp. Solids %	5 Day BOD Mg/l	P Mg/l	Thou. Lbs. Wet	Tot. Sol. %	Lbs. Tot. Solids X 100	Vol. Sol. %	Lbs. Vol. Solids X 100	Hrs. Opr.	Yield	Fuel BTU	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	100	5.5	4620	6.1	1775		191		8.0		76	11.4	714	7	1800		33	19.3	64	45	29				
	100	3.8	3192	6.3	1775		191		8.0		76	12.3	842	17	1980		28	18.0	50	53	27				
	100	5.2	4368	6.2	1775		191		8.0		76	12.3	864	6	1620		32	19.1	61	44	27				
	100	4.0	3360	6.2	1775		191		8.0		76	11.8	1170	6	1140		28	18.4	52	49	25				
	100	3.6	3024	6.3	1775		191		8.0		76	12.2	732	22	2040		25	19.2	48	40	19				
	100	3.7	3108	6.4	1775		191		8.0		76	11.8	682	6	1140		27	17.9	48	52	25				
	100	3.7	3108	6.2	1775		191		8.0		76	10.3	736	8	900		27	17.8	48	47	23				
	100	4.0	3360	6.0	1775		191		8.0		76	11.5	612	13	1140		27	18.8	51	47	24				
	100	2.4	2016	6.3	1775		191		8.0		76	12.1	574	21	1260		19	19.8	38	47	18				
	100	4.8	4032	6.3	1775		191		8.0		76	11.6	892	14	1320		28	20.7	58	48	28				
	100	4.4	3696	6.1	1775		191		8.0		76	10.0	824	13	1260		27	20.4	55	42	23				
	100	5.5	4620	6.1	1775		191		8.0		76	10.8	688	26	1320		32	20.1	64	43	28				
	1200		42504		21,300		2292		96		912						33		137		296				
s	100	4.2	3542		1775		191		8.0		76		779	13	1410		28	19.1	53	46	25				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

_____ Month , 19 _____ _____ Municipality , Michigan _____ Superintendent's Signature

1 2 ID | 3 8 Plant No | 9 10 Mo. | 11 12 Yr. | 13 15 Sampling Point Code

DAY	BOD-5			SS			TOTAL-P			VSS	NH_3-N	pH	DO	F. COLI*		T. COLI*	REMARKS
	9 14 19			24 29 34			39 44 49			54	59	64	69	74	80	9	14
1 2	mg/l	LBS	% Rem.	mg/l	LBS	% Rem.	mg/l	LBS.	% Rem.	mg/l	mg/l	SU	mg/l	#/100 ml	C	#/100 ml	
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 31615	C	31504 31505	
SF															C		
01	12	241	71	11	221	93	.46	9	86	7		7.3			C		
02	17	350	74	2	41	96	.46	9	82	2		6.7	7.2	14	C		
03	24	496	72	13	258	77	.44	9	80	9		7.1	8.0	2	C		
04	5	103	91	10	205	79	.51	10	78	8		7.4	7.0	6	C		
05	8	161	88	10	201	83	.42	8	83	6		7.5	7.8	10	C		
06												7.5	6.5	6	C		
07												7.3			C		
08	22	422	68	4	77	92	.46	9	82	1		7.3			C		
09	22	444	76	9	182	91	.51	10	85	3		7.4	6.4	8	C		
10	4	83	87	1	21	96	.53	11	74	1		7.4	6.7	8	C		
11	11	81	84	12	244	76	.46	9	78	8		7.6	6.3	6	C		
12	7	142	90	9	183	83	.53	11	75	5		7.5	8.3	8	C		
13												7.2	8.4	2	C		
14												7.4			C		
15												7.3			C		
16												7.4			C		
17	8	185	71	5	116	94	.50	12	.82	3	7.2	[illegible]	6.1	20	C		
18	5	120	90	2	48	96	.48	12	77	1	7.4	[illegible]	7.2	40	C		
19	5	121	89	2	48	95	.43	10	77	1	7.3	[illegible]	5.6	28	C		
20											7.2	[illegible]	6.1	4	C		
21												7.2			C		
22	4	94	93	2	47	96	.35	8	84	1		7.2			C		
23	6	143	91	3	72	95	.30	7	86	2		7.1	6.1	4	C		
24	4	96	95	2	48	99	.32	8	84	1		7.0	6.1	4	C		
25	6	144	89	3	72	93	.29	7	86	2		7.0	4.0	2	C		
26	3	70	97	1	23	99	.27	6	88	1		6.7	5.1	6	C		
27												7.2	7.6	4	C		
28												7.3			C		
29															C		
30															C		
31															C		
TL		3476			2107			165							C		
ME	10	193	84	6	114	91	.43	9	82	3		7.3	6.7	7	C		
WA	13	266		9	185									17	C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

March, 19 81 — Month

Marshall, Michigan — Municipality

Robert J. Swalwell — Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
ID	130029	03	8.1	500
	Plant No.	Mo.	Yr.	Sampling Point Code

DAY 1 2	WEATHER TYPE 9	WEATHER PRECIP. 14	FLOW TOTAL 19	FLOW MAX RATE 24	RAW SEWAGE QUALITY TEMP 29	pH 34	BOD-5 39	BOD-5 44	SS 49	SS 54	TOTAL-P 59	TOTAL-P 64	VSS 69	NH_3-N 74 78	80	REMARKS OF 9	REMARKS OF 14
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l	C		
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C		
SF															C		
01	1		2.74		47	7.5	48	1097	78	1782	2.10	48	66		C		
02	5	.02	2.83		48	7.6	66	1558	56	1322	2.40	57	44		C		
03	5	.02	2.76		48	7.5	86	1980	130	2992	3.10	71	108		C		
04	5	.02	2.75		48	7.5	91	2087	56	1284	2.20	50	44		C		
05	3		2.75		48	7.5	60	1376	50	1147	2.50	57	40		C		
06	5	.01	2.69		48	7.5									C		
07	3		2.70		48	7.5									C		
08	3		2.63		47	7.4	64	1404	162	3553	2.40	53	126		C		
09	3		2.73		48	7.5	80	1821	70	1594	2.30	52	56		C		
10	3		2.73		48	7.5	84	1913	48	1093	2.20	50	34		C		
11	3		2.72		48	7.5	62	1406	44	998	2.30	52	30		C		
12	1		2.75		48	7.4	60	1376	56	1284	2.50	57	44		C		
13	1		2.72		48	7.3									C		
14	1		2.66		48	7.3									C		
15	1		2.66		48	7.4	74	1642	64	1419	2.75	61	50		C		
16	5	.03	2.74		48	7.3	96	2194	62	1417	2.30	53	52		C		
17	1		2.69		48	7.3	76	1705	62	1391	2.10	47	54		C		
18	5	.01	2.73		48	7.5	84	1913	100	2277	2.80	64	66		C		
19	5	.03	2.68		48	7.5	72	1609	46	1028	2.30	51	40		C		
20	3		2.60		48	7.3									C		
21	1		2.63		48	7.4									C		
22	1		2.59		48	7.4	86	1858	106	2290	2.55	55	86		C		
23	1		2.66		48	7.3	56	1242	66	1464	2.30	51	58		C		
24	1		2.64		48	7.4	50	1100	54	1189	1.95	43	34		C		
25	4	.28	2.62		48	7.5	64	1398	56	1224	2.15	47	52		C		
26	4	.23	2.63		48	7.4	68	1492	52	1141	2.60	57	36		C		
27	1		2.54		48	7.4									C		
28	1		2.52		49	7.4									C		
29	4	.06	2.50		49	7.4	80	1668	64	1334	2.25	47	52		C		
30	4	.22	2.56		50	7.4	86	1836	64	1366	2.25	48	52		C		
31	4	.04	2.59		49	7.2	72	1555	62	1339	2.20	48	48		C		
TL		.97	82.74					37236		35,874		1219			C		
ME			2.67				72	1619	70	1560	2.37	53	55		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

March, 1981 — Month

Marshall, Michigan — Municipality

Robert J. Swalwell — Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
ID	130029	03	81	
	Plant No.	Mo.	Yr.	Sampling Point Code

DAY	BOD-5		SS		TOTAL-P		VSS	NH_3-N	REMARKS OR OTHER PARAMETERS									
	9	14	19	24	29	34	39	44	49	54	59	64	69	74	78	80	9	14
1 2	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l								C		
PN	00310	85001	00530	85002	00665	85004	00535	00610								C		
SF																C		
01	40	914	36	823	2.40	55	28									C		
02	48	1133	54	1275	2.80	66	44									C		
03	58	1335	54	1243	2.30	53	50									C		
04	72	1651	54	1238	2.30	53	44									C		
05	44	1009	34	778	2.55	58	24									C		
06																C		
07																C		
08	54	1184	48	1053	2.65	58	42									C		
09	52	1184	48	1093	2.50	57	34									C		
10	50	1138	50	1138	2.50	57	30									C		
11	50	1134	38	862	2.70	61	34									C		
12	50	1147	38	872	2.75	63	32									C		
13																C		
14																C		
15	50	1109	36	799	2.30	51	24									C		
16	58	1325	56	1280	2.20	50	46									C		
17	50	1122	42	942	1.90	43	36									C		
18	62	1412	66	1503	2.50	57	48									C		
19	66	1475	36	805	2.40	54	22									C		
20																C		
21																C		
22	74	1598	58	1253	2.65	57	50									C		
23	50	1109	62	1375	2.55	57	44									C		
24	48	1057	42	925	1.90	42	26									C		
25	64	1398	64	1398	2.00	44	54									C		
26	61	1338	52	1141	2.40	53	38									C		
27																C		
28																C		
29	56	1168	48	1001	2.50	52	42									C		
30	66	1409	46	982	2.20	47	30									C		
31	58	1253	60	1296	2.00	43	48									C		
TL		28602		20575		1231										C		
ME	56	1244	49	895	2.39	54	38									C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

March, 1981
Month

Marshall, Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID | 13.0029 | 03 | 81 | ..
Plant No. Mo. Yr. Sampling Point Code

DAY 1 2	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification 14
	Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MLSS 34	MLVSS 39	SETTL. 44	SDI 49	DO 54	Air Applied 59	SS 64	VSS 49	Percent Return 74	ac	Waste Sludge 9	
	KCF	KCF	HRS.	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu. Ft.	%	%	%	C	KGal	See Code*
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF											4				C		
01	48		3.1								191			53	C	15	
02			3.0	6.3	.29	1918	1323	18.0	1.07	5.5	197	.57	68	51	C	15	
03			3.1	5.6	.29	1922	1334	19.0	1.01	5.0	193	.55	69	53	C	15	
04			3.1	5.1	.31	1994	1392	19.0	1.05	5.3	192	.58	69	52	C	15	
05			3.1	5.5	.27	1993	1415	19.0	1.05	4.9	197	.54	70	52	C	15	
06			3.2	5.6	.29	1976	1410	18.0	1.10	5.1	199	.60	71	53	C	15	
07			3.2								202			53	C	15	
08			3.3								195			53	C	15	
09			3.2	4.8	.33	1697	1224	16.0	1.06	5.8	190	.46	72	51	C	15	
10			3.2	4.9	.35	1730	1186	15.0	1.15	5.3	192	.46	76	51	C	15	
11			3.2	4.5	.31	1611	1198	15.0	1.07	5.3	193	.45	74	51	C	15	
12			3.1	4.7	.35	1585	1145	15.0	1.06	4.8	183	.44	74	60	C	15	
13			3.2	5.0	.36	1658	1120	15.0	1.10	5.0	193	.46	74	53	C	15	
14			3.2								189			53	C	15	
15			3.2								185			53	C	15	
16			3.1	4.9	.33	1688	1194	16.0	1.05	5.1	190	.49	69	51	C	15	
17			3.2	5.3	.31	1735	1230	16.0	1.08	5.2	195	.49	70	52	C	15	
18			3.2	4.9	.31	1760	1287	17.0	1.04	4.8	195	.50	72	52	C	15	
19			3.2	5.4	.32	1814	1283	18.0	1.01	4.9	195	.52	66	53	C	15	
20			3.2	6.0	.28	1942	1444	18.0	1.08	4.8	193	.57	71	50	C	15	
21			3.3								198			54	C	15	
22			3.3								191			54	C	15	
23			3.2	4.6	.34	1740	1279	17.0	1.02	5.1	191	.48	73	53	C	15	
24			3.3	4.8	.32	1837	1337	18.0	1.02	3.0	191	.47	73	53	C	15	
25			3.3	4.4	.34	1743	1262	18.0	.97	3.0	189	.48	72	54	C	15	
26			3.3	4.6	.33	1818	1348	19.0	.96	3.3	187	.55	73	54	C	15	
27			3.4	5.1	.30	1960	1430	20.0	.98	4.5	189	.56	71	56	C	15	
28			3.4								178			56	C	15	
29			3.4								175			56	C	15	
30			3.4	5.3	.30	2008	1426	20.0	1.00	4.1	181	.54	70	55	C	15	
31			3.3	5.2	.29	1968	1434	20.0	.98	3.1	175	.55	70	54	C	15	
TL															C	465	
ME			3.2	5.1	.31	1809	1306	17.5	1.04	4.7	190	.51	71	53	C	15	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

_____ , 19 _____
Month

_____ , Michigan
Municipality

_____
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID [ ] [ ] [ ] [ ]
Plant No. Mo. Yr. Sampling Point Code

DAY	BOD-5			SS			TOTAL-P			VSS	NH_3-N	pH	DO	F. COLI*		T. COLI*	REMA
1 2	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	mg/l	SU	mg/l	#/100 ml	C	#/100 ml	
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 31615	C	31504 31505	
SF															C		
01	4	91	92	2	46	97	.22	5	90	1		7.3			C		
02	4	94	94	3	71	95	.22	5	91	2		7.4	7.1	8	C		
03	4	92	95	3	69	98	.23	5	93	2		7.5	6.6	8	C		
04	7	161	92	3	69	95	.30	7	86	2		7.3	5.9	26	C		
05	4	92	93	2	46	96	.30	7	88	1		7.3	6.2	24	C		
06												7.4	6.7	12	C		
07												7.4			C		
08	16	351	75	6	132	96	.60	13	75	5		7.3			C		
09	5	114	94	7	159	90	.46	10	80	6		7.4	7.7	10	C		
10	7	159	92	6	137	88	.46	10	79	3		7.4	6.9	8	C		
11	5	113	93	3	68	93	.66	14	74	2		7.4	6.5	20	C		
12	5	115	92	2	46	96	.53	12	79	1		7.4	7.4	16	C		
13												7.3	6.3	14	C		
14												7.4			C		
15	5	111	93	2	44	97	.32	7	88	1		7.4			C		
16	5	114	95	5	114	92	.32	7	86	4		7.2	6.8	10	C		
17	5	112	93	4	90	94	.30	7	86	2		7.3	6.8	8	C		
18	6	137	93	7	159	93	.38	9	86	4		7.5	6.0	8	C		
19	8	179	89	2	45	96	.40	9	83	1		7.4	6.0	4	C		
20												7.3	6.6	2	C		
21												7.3			C		
22	6	130	93	2	43	98	.53	11	79	1		7.3			C		
23	6	133	89	13	288	80	.50	11	78	1		7.3	6.1	8	C		
24	8	176	84	3	66	94	.32	7	84	2		7.2	6.4	4	C		
25	6	131	91	14	306	75	.22	5	90	11		7.3	6.4	14	C		
26	7	154	90	3	66	94	.28	6	89	1		7.3	6.5	28	C		
27												7.3	5.6	2	C		
28												7.3			C		
29	5	104	94	4	83	94	.32	7	86	2		7.3			C		
30	10	214	88	5	107	92	.30	6	87	3		7.3	6.2	6	C		
31	5	108	93	2	43	97	.29	6	87	1		7.3	5.5	6	C		
TL		3185			2297			186							C		
ME	6	138	91	4	100	93	.36	8	85	3		7.3	6.5	9	C		
WA	8	175		7	162									14	C		

Digester Volume, ft³
Primary _____
Secondary _____

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

R 4619
4833-5382

Supernatant To _____
Process Pattern _____

ONTH March 19 81

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

ATE	RAW SLUDGE					DIGESTING SLUDGE						SUPERNATANT								DIGESTED SLUDGE				Gas Produced cu. ft X
	Gals. X 100	Total Solids %	Vol. Solids %	Vol. Solids Lbs/ 1000 c.f. Digester	pH	Temp. °F	pH	Total Solids %	Vol. Solids %	Vol. Acids Mg/l	Alkalinity Mg/l	Gals. X	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	P Mg/l	P Lbs.	5-Day BOD Mg/l	Gals. X	Total Solids %	Vol. Solids %	pH	
1	40	3.9	67		6.4																			
2	40	4.2	64		6.4																			
3	45	4.3	65		6.5																			
4	45	4.3	67		6.5																			
5	45	4.3	60		6.2																			
6	45	4.9	66		6.6																			
7	40	4.8	68		6.5																			
8	40	3.6	63		6.5																			
9	45	4.1	83		6.5																			
10	45	4.1	64		6.5																			
11	45	4.4	67		6.5																			
12	45	4.0	65		6.5																			
13	45	4.2	72		6.3																			
14	40	4.2	61		6.2																			
15	40	4.5	75		6.3																			
16	40	4.0	80		6.3																			
17	45	3.9	76		6.3																			
18	45	4.1	57		6.5																			
19	45	4.1	82		6.5																			
20	45	4.3	78		6.4																			
21	40	4.6	65		6.3																			
22	40	4.2	78		6.4																			
23	45	4.0	78		6.3																			
24	45	4.0	83		6.3																			
25	45	3.8	85		6.4																			
26	45	4.0	84		6.5																			
27	40	4.1	78		6.4																			
28	45	4.2	74																					
29					6.4																			
30	40	2.7	67		6.2																			
31	45	5.0	69		6.5																			
TOTAL	1295																							
MONTH. MEAN	43	4.2	71																					

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.7

Marshall, MICHIGAN

MONTH March, 1981 — VACUUM FILTER & INCINERATION DATA — OPERATOR R.J. Swalwell

E	SLUDGE TO FILTER				CHEMICALS TO FILTER				FILTER		FILTRATE						FILTER CAKE					INCINERATION			REMARKS
	Gal. X 100	Tot. Sol. %	Lbs. Dry Sol.	pH	CaO Lbs. Dry	CaO R	FeCl3 Lbs. Dry	FeCl3 R	Tot. Hours	Yield	Gal. X 100	pH	Sus. Solids Mg/l	Vol. Susp. Solids %	5 Day BOD Mg/l	P Mg/l	Thou. Lbs. Wet	Tot. Sol. %	Lbs. Tot. Solids X 100	Vol. Sol. %	Lbs. Vol. Solids X 100	Hrs. Opr.	Yield	Fuel BTU	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	123	4.6	4752	6.5	1754		191		8.0		76	12.3	768	18	1440		35	18.4	64	51	33				
	123	3.1	3203	6.5	1754		191		8.0		76	12.3	836	8	1020		25	20.1	50	48	24				
	123	7.3	7542	6.1	1754		191		8.0		76	11.2	1110	11	2960		45	20.7	93	50	47				
	123	7.5	7749	6.2	1754		191		8.0		76	12.2	760	16	840		40	23.6	94	50	47				
	123	4.4	4546	6.2	1754		191		8.0		76	11.0	1150	14	1920		27	23.7	64	43	28				
	123	5.1	5269	6.2	1754		191		8.0		76	12.2	892	17	2340		36	19.7	71	46	33				
	123	5.0	5166	6.5	1754		191		8.0		76	10.4	732	46	360		35	19.7	69	47	32				
	123	4.1	4236	6.2	1754		191		8.0		76	12.2	814	10	2340		31	19.3	60	45	27				
	123	4.6	4753	6.2	1754		191		8.0		76	12.3	610	5	1980		34	19.1	65	52	34				
	123	5.0	5166	6.2	1754		191		8.0		76	12.4	668	6	1020		35	19.8	69	55	38				
	123	4.6	4753	6.2	1754		191		8.0		76	12.3	682	11	1020		33	19.6	65	60	39				
	123	4.8	4959	6.3	1754		191		8.0		76	12.3	560	13	1860		36	18.6	67	49	33				
	123	4.8	4959	6.1	1754		191		8.0		76	12.4	806	11	2400		33	20.4	67	46	31				
	1599		67053		22,800		2483		104		988						445		898		446				
	123	5.0	5157		1754		191		8.0		76		799	14	1615		34	20.2	69	49	34				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

March, 1981 (Month) — Marshall, Michigan (Municipality) — Robert J. Swalwell (Superintendent's Signature)

1 2	3 8	9 10	11 12	13 15
ID	130029	03	81	
	Plant No.	Mo.	Yr.	Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX. FUEL 14 G2S CF	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl2 LBS.	39 FeCl3 LBS	44	49	54	59
PN											
SF		2									
01	1	28	3000			10	496				
02	1	62	3120			10	397				
03	1	51	3360			15	596				
04	1	34	3120			15	596				
05	1	47	3240			20	596				
06	1	37	3120			10	199				
07	1	45	3120			10					
08	1	34	3120			10	199				
09	1	32	3120			10	298				
10	1	36	3240			20	397				
11	1	60	3240			10	298				
12	1	13	2880			10	199				
13	1	44	3240			20	596				
14	1	29	3120			10	397				
15	1	34	3000			10	397				
16	1	49	3240			20	596				
17	1	52	3240			10	596				
18	1	57	3360			10	794				
19	1	56	3360			10	599				
20	1	33	3120			10	199				
21	1	39	3000			10	199				
22	1	27	3000			10	298				
23	1	11	3120			10	298				
24	1	8	3000			10	397				
25	1	2	3120			10	893				
26	1	7	3000			10	596				
27	1	1	3000			20	298				
28	1	3	2640			10	298				
29	1	1	2520			10	199				
30	1	1	2760			10	397				
31	1	4	2760			10	794				
TL	31	937	95280			370	13112				
ME	1	30	3074			12	423				

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	5		880
Superintendent	1		176
Asst. Supt.	1		176
Shift Foreman			
Shift Operator	3		528
Maint. Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL AF

WEEKDAYS 11 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

April, 19 81 — Month

Marshall, Michigan — Municipality

Robert Swalwell — Superintendent's Signature

ID 130029 — Plant No; 04 — Mo.; 8.1 — Yr.; 500 — Sampling Point Code

DAY	WEATHER TYPE	WEATHER PRECIP	FLOW TOTAL	FLOW MAX RATE	RAW SEWAGE QUALITY TEMP	pH	BOD-5		SS		TOTAL-P		VSS	NH_3-N		REMARKS
1 2	9	14	19	24	29	34	39	44	49	54	59	64	69	74 78	80	9 14
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS.	mg/l	LBS	mg/l	LBS	mg/l	mg/l	C	
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C	
SF															C	
01	1		2.55		49	7.3	64	1361	70	1489	2.50	53	52		C	
02	1		2.61		49	7.4	84	1828	126	2743	2.20	48	110		C	
03	4	.11	2.55		50	7.4									C	
04	3		2.44		50	7.4									C	
05	3		2.42		49	7.4	80	1615	60	1211	1.80	36	44		C	
06	1		2.52		49	7.5	78	1639	52	1093	1.90	40	36		C	
07	1		2.58		50	7.5	78	1678	58	1248	1.90	41	36		C	
08	4	.55	2.61		50	7.4	72	1567	72	1567	2.00	44	60		C	
09	1		2.58		50	7.2	74	1592	60	1291	2.15	46	48		C	
10	4	1.20	2.65		50	7.2									C	
11	4	.12	2.61		49	7.2									C	
12	4	.19	2.73		49	7.4	58	1321	62	1412	2.00	46	54		C	
13	4	.84	2.88		50	7.4	56	1345	54	1297	1.80	43	44		C	
14	1		2.95		50	7.3	60	1476	100	2460	1.80	44	84		C	
15	1		2.93		50	7.3	50	1222	64	1564	1.80	44	48		C	
16	4	.10	2.88		50	7.4									C	
17	4	.41	2.89		50	7.4									C	
18	4	.11	2.92		50	7.3									C	
19	4	.23	2.84		50	7.3	100	2369	88	2084	2.60	62	68		C	
20	1		2.96		50	7.3	76	1876	54	1333	2.20	54	44		C	
21	1		2.92		50	7.2	70	1705	80	1948	1.80	44	40		C	
22	4	1.65	3.09		50	7.1	62	1598	70	1804	2.00	52	54		C	
23	4	.07	3.17		51	7.3	48	1269	42	1110	1.60	42	36		C	
24	4	.02	3.13		51	7.2									C	
25	3		2.99		50	7.2									C	
26	3		3.09		49	7.2	64	2082	52	1691	1.45	47	36		C	
27	4	.08	3.15		50	7.2	54	1419	48	1261	1.75	46	32		C	
28	4	.80	3.17		50	7.3	58	1533	58	1533	1.80	48	36		C	
29	4	.03	3.17		50	7.4	64	1692	46	1216	1.75	46	42		C	
30	4	.02	3.14		50	7.2	52	1362	32	838	1.25	33	18		C	
31															C	
TL		6.53	85.12					33549		32184	.	959			C	
ME			2.84				67	1598	64	1533	1.91	46	49		C	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

April, 19 81
Month

Marshall, Michigan
Municipality

Robert Swalwell
Superintendent's Signature

1 2 ID | 3 8 Plant No 130029 | 9 10 Mo 04 | 11 12 Yr 81 | 13 15 Sampling Point Code ..

DAY	BOD-5 9 14		SS 19 24		TOTAL-P 29 34		VSS 39	NH_3 N 44	REMARKS OR OTHER PARAMETERS 49	54	59	64	69	74 78	80	9	14
1 2	mg/l	LBS.	mg/l	LBS	mg/l	LBS.	mg/l	mg/l							C		
PN	00310	85001	00530	85002	00665	85004	00535	00610							C		
SF															C		
01	50	1063	50	1063	2.20	47	36								C		
02	51	1110	68	1480	2.00	44	60								C		
03															C		
04															C		
05	66	1332	62	1251	1.90	38	44								C		
06	64	1345	52	1093	2.20	46	42								C		
07	76	1635	54	1162	2.10	45	28								C		
08	58	1263	42	914	1.90	41	32								C		
09	56	1205	48	1043	1.70	37	20								C		
10															C		
11															C		
12	44	1002	44	1002	1.90	43	36								C		
13	42	1009	38	913	1.90	46	32								C		
14	42	1033	44	1083	1.70	42	26								C		
15	42	1026	64	1564	1.80	44	44								C		
16															C		
17															C		
18															C		
19	52	1232	62	1469	2.00	47	44								C		
20	54	1333	44	1068	2.25	56	30								C		
21	46	1120	56	1364	1.90	46	26								C		
22	42	1082	54	1392	2.00	52	40								C		
23	36	952	54	1428	1.80	48	42								C		
24															C		
25															C		
26	38	1236	44	1431	2.00	65	30								C		
27	42	1103	52	1366	2.00	53	32								C		
28	48	1269	42	1110	2.20	58	28								C		
29	52	1375	46	1216	1.90	50	42								C		
30	52	1362	44	1152	1.60	42	30								C		
31															C		
TL		25087		25564		990									C		
ME	50	1195	51	1217	1.95	47	35								C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

April (Month), 19 81 — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

ID | 1300.29 (Plant No.) | 04 (Mo) | 81 (Yr) | ... (Sampling Point Code)

DAY	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification
	Aeration Volume	Reaeration Volume	Detention Time	Sludge Age	Organic Loading	MLSS	MLVSS	SETTL.	SDI	DO	Air Applied	SS	VSS	Percent Return		Waste Sludge	
	KCF	KCF	HRS.	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu. Ft.	%	%	%	C	KGal	See Code*
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF											4				C		
01	48		3.4	5.1	.30	1881	1360	21.0	.90	3.2	183	.52	70	54	C	15	
02			3.3	4.8	.30	1940	1392	21.0	.92	3.0	178	.53	70	53	C	15	
03			3.4	5.0	.31	1954	1350	21.0	.93	2.6	173	.55	68	55	C	15	
04			3.5								180			57	C	15	
05			3.6								181			58	C	15	
06			3.4	4.7	.32	1853	1296	20.0	.93	5.2	186	.52	70	55	C	15	
07			3.3	4.6	.33	1854	1338	20.0	.93	3.2	179	.50	72	54	C	15	
08			3.3	4.8	.32	1905	1354	20.0	.95	3.4	176	.49	72	53	C	15	
09			3.3	4.7	.33	1803	1318	20.0	.90	4.7	181	.52	70	54	C	15	
10			3.3	4.7	.31	1886	1406	20.0	.94	4.7	178	.53	69	53	C	15	
11			3.3								172			53	C	15	
12			3.2								181			47	C	15	
13			3.0	4.5	.37	1781	1257	19.0	.90	4.8	176	.52	69	49	C	15	
14			2.9	4.7	.37	1767	1231	18.0	.98	4.3	187	.53	66	47	C	15	
15			2.9	4.4	.34	1761	1231	19.0	.93	4.2	185	.52	69	47	C	15	
16			3.0	4.6	.33	1752	1225	18.0	.97	4.3	175	.53	67	48	C	15	
17			3.0								134			48	C	15	
18			3.0								144			48	C	15	
19			3.0								144			48	C	15	
20			2.9	4.1	.33	1675	1163	18.0	.93	3.4	146	.52	68	46	C	15	
21			3.0	4.2	.31	1722	1202	18.0	.96	4.3	144	.54	68	47	C	15	
22			2.8	4.0	.32	1778	1237	18.0	.99	4.0	172	.57	69	44	C	15	
23			2.8	3.9	.30	1855	1322	18.0	1.03	4.6	180	.60	69	43	C	15	
24			2.7	3.9	.31	1838	1274	18.0	1.02	5.8	186	.57	68	43	C	15	
25			2.9								178			43	C	15	
26			2.8								182			44	C	15	
27			2.7	4.1	.31	1855	1263	18.0	1.03	3.4	177	.57	71	43	C	15	
28			2.7	4.6	.28	1925	1364	18.0	1.07	2.9	176	.61	68	43	C	15	
29			2.7	4.3	.28	1868	1343	19.0	.98	2.5	183	.61	70	42	C	15	
30			2.7	3.8	.27	1933	1409	19.0	1.02	2.6	178	.59	71	43	C	15	
31															C		
TL															C	450	
ME			3.1	4.5	.32	1836	1302	19.0	.96	3.9	173	.54	69	49	C	15	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

_____ Month , 19 _____ _____ Municipality , Michigan _____ Superintendent's Signature

ID Plant No. | Mo. | Yr. | Sampling Point Code

DAY	BOD-5 (2)			SS (2)			TOTAL-P (2)			VSS (2)	NH_3-N	pH	DO (2)	F. COLI* (2)		T. COLI*	REMARKS
1 2	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	mg/l	SU	mg/l	#/100 ml	C	#/100 ml	
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 31615	C	31504 31505	
SF															C		
01	6	128	91	1	21	99	.33	7	87	1		7.2	5.4	28	C		
02	5	109	94	11	239	91	.24	5	89	10		7.2	6.2	10	C		
03												7.4	5.4	26	C		
04												7.4			C		
05	11	222	86	12	242	80	.30	6	83	6		7.3			C		
06	8	168	90	7	149	89	.25	5	87	2		7.4	6.1	12	C		
07	8	172	90	8	172	86	.25	5	87	7		7.5	6.4	8	C		
08	6	131	92	2	44	97	.28	6	86	1		7.4	6.1	6	C		
09	8	172	89	2	43	97	.18	4	92	1		7.4	6.9	12	C		
10												7.3	6.9	10	C		
11												7.3			C		
12	10	228	83	2	46	97	.23	5	89	1		7.3			C		
13	7	168	88	1	24	98	.28	7	84	1		7.3	6.4	36	C		
14	8	197	87	2	49	98	.27	7	85	1		7.3	6.6	18	C		
15	8	195	84	9	220	86	.23	6	87	4		7.3	6.5	40	C		
16												7.3	6.4	58	C		
17												7.3			C	4	
18												7.3			C		
19	18	426	82	3	71	97	.24	6	91	2		7.3			C		
20	10	247	74	1	25	98	.28	7	87	1		7.2	6.2	210	C		
21	7	170	90	2	49	98	.24	6	87	1		7.3	6.7	32	C		
22	14	361	77	5	129	93	.27	7	87	3		7.2	6.2	6	C		
23	8	212	83	4	106	90	.20	5	88	3		7.1	6.6	6	C		
24												7.3	6.9	42	C		
25												7.2			C		
26	9	293	86	4	130	92	.38	12	74	2		7.2			C		
27	9	236	83	2	53	96	.29	8	83	1		7.2	6.5	18	C		
28	9	238	91	2	53	97	.28	7	84	1		6.9	5.7	12	C		
29	12	317	81	2	53	96	.25	7	86	1		7.5	5.6	2	C		
30	15	393	67	1	26	97	.18	5	86	1		7.3	5.9	18	C		
31															C		
TL		4783			1942			133							C		
ME	9	228	85	4	92	94	.26	6	86	2		7.3	6.3	17	C		
WA	11	295		8	169									63	C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

April , 19 81
Month

Marshall , Michigan
Municipality

Robert Swalwell
Superintendent's Signature

1 2 | 3 8 | 9 10 | 11 12 | 13 15
ID | 1300299 | 04 | 81 | ..
Plant No. | Mo. | Yr. | Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX.FUEL 14 GAS CF	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS.	39 FeCl3 LBS.	44	49	54	59
PN											
SF	-	2									
01	-		2880			20	596				
02	-	4	2760			10	794				
03	-	2	2640			10	596				
04		2	2760			10	199-				
05		2	2640			10	397-				
06		2	2880			20	397-				
07	-	2	2880			10	596				
08	-	2	2760			10	397				
09	-	2	2760			10	794				
10		2	2520			10	397-				
11		2	2400			5	199-				
12		1	2880			10	199-				
13			2640			10	397-				
14	-	4	3000			15	397				
15	-	2	2880			10	397				
16		2	2640			10	199-				
17		2	2400			10	298-				
18		3	2400			10	397-				
19		2	2640			10	298-				
20		1	2760			20	397-				
21	-	2	2880			10	397				
22	-	2	2880			20	794				
23		1	2880			20	199-				
24		1	2880			20	199-				
25		4	2760			10	397-				
26		3	2880			10	397-				
27	-		2880			10	596				
28	-	3	2640			15	596				
29	-	1	2880			20	794				
30	-	2	2760			15	794				
31											
TL		58	82,440			380	13477				
ME		2	2748			13	45				

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	5		880
Superintendent	1		176
Asst. Supt.	1		176
Shift Foreman			
Shift Operator	3		528
Maint. Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL

WEEKDAYS 11 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

Digester Volume, ft³
Primary _____
Secondary _____

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

R 4619
4833-5382

Supernatant To _____
Process Pattern _____

MONTH April 1981

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE					DIGESTING SLUDGE						SUPERNATANT								DIGESTED SLUDGE				Gas Produced cu. ft X
	Gals. X 100	Total Solids %	Vol. Solids %	Vol. Solids Lbs/1000 c.f. Digester	pH	Temp. °F	pH	Total Solids %	Vol. Solids %	Vol. Acids Mg/l	Alkalinity Mg/l	Gals. X	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	P Mg/l	P Lbs.	5-Day BOD Mg/l	Gals. X	Total Solids %	Vol. Solids %	pH	
1	45	4.2	68		6.5																			
2	45	5.0	78		6.4																			
3	50	4.5	80		6.3																			
4	40	3.6	86		6.5																			
5	40	4.2	77		6.3																			
6	45	4.2	74		6.3																			
7	45	3.8	80		6.2																			
8	45	4.0	82		6.3																			
9	45	4.4	70		6.4																			
10	45	4.5	68		6.4																			
11	40	4.4	68		6.3																			
12	40	3.9	59		6.3																			
13	45	4.1	75		6.2																			
14	45	3.9	86		6.2																			
15	45	3.7	86		6.2																			
16	45	4.1	76		6.4																			
17	45	4.2	72		6.3																			
18	40	3.6	82		6.4																			
19	40	3.9	75		6.3																			
20	45	3.3	82		6.1																			
21	45	4.3	71		6.1																			
22	45	4.1	76		6.3																			
23	45	4.3	75		6.2																			
24	45	4.9	66		6.1																			
25	40	4.5	63		6.1																			
26	40	4.3	78		6.2																			
27	45	5.0	80		6.0																			
28	45	4.1	83		6.0																			
29	45	4.3	67		6.3																			
30	40	4.1	75																					
31																								
TOTAL	1310																							
MONTH MEAN	44	4.1	75																					

MDPH
D-4.7

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH April, 1981 — VACUUM FILTER & INCINERATION DATA — OPERATOR R.J. Swalwell

	SLUDGE TO FILTER				CHEMICALS TO FILTER				FILTER		FILTRATE						FILTER CAKE					INCINERATION			
E	Gal. X 100	Tot. Sol. %	Lbs. Dry Sol.	pH	C2O Lbs. Dry	R	FeCl3 Lbs. Dry	R	Tot. Hours	Yield	Gal. X 100	pH	Sus. Solids Mg/l	Vol. Susp. Solids %	5 Day BOD Mg/l	P Mg/l	Thou. Lbs. Wet	Tot. Sol. %	Lbs. Tot. Solids X	Vol. Sol. %	Lbs. Vol. Solids X	Hrs. Opr.	Yield	Fuel BTU	REMARKS
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	98	4.6	3787	6.2	1888		191		8.0		76	12.2	558	14	2820		27	21.4	58	42	24				
	98	6.5	5351	6.1	1888		191		8.0		76	11.6	660	13	2700		36	19.7	71	49	35				
	98	4.4	3622	6.2	1888		191		8.0		76	12.1	1530	10	2760		28	19.8	55	54	30				
	98	4.3	3540	6.2	1888		191		8.0		76	11.3	634	18	3600		25	21.7	54	46	25				
	98	3.9	3210	6.2	1888		191		8.0		76	12.2	754	28	3480		26	19.5	51	56	28				
	98	3.4	2799	6.3	1888		191		8.0		76	12.2	636	23	2460		21	22.0	46	56	26				
	98	4.5	3704	6.0	1888		191		8.0		76	12.1	600	5	2340		28	20.3	57	46	26				
	86	3.6	2601	6.0	1652		167		7.0		67	12.3	732	14	3140		23	18.8	43	44	19				
	73	3.7	2269	5.9	1416		143		6.0		57	12.0	624	7	2640		19	19.9	38	44	17				
	73	3.7	2269	6.0	1416		143		6.0		57	10.6	636	15	1980		20	18.5	37	49	18				
	98	3.9	3210	5.7	1888		191		8.0		76	11.8	774	34	1680		29	17.3	50	49	25				
	98	3.3	2717	5.7	1888		191		8.0		76	11.7	746	19	3000		27	16.8	45	48	22				
	98	3.9	3210	5.7	1888		191		8.0		76	11.1	718	9	4320		30	17.0	51	56	29				
	98	3.8	3128	5.6	1888		191		8.0		76	10.3	842	17	3840		28	17.9	50	51	26				
	131				25252		2554		107		1017						367		706		350				
	94	4.1			1804		182		7.6		73		750	16	2841		26	19.3	50	49	25				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

May, 19 81 (Month)

Marshall (Municipality), Michigan

Robert J. Stoehwell (Superintendent's Signature)

ID 13,0,0,2,9 (Plant No) 05 (Mo) 8,1 (Yr) 5,0,0 (Sampling Point Code)

DAY	WEATHER TYPE	WEATHER PRECIP.	FLOW TOTAL	FLOW MAX RATE	RAW SEWAGE QUALITY TEMP	pH	BOD-5		SS		TOTAL-P		VSS	NH_3-N		REMARKS
1 2	9	14	19	24	29	34	39	44	49	54	59	64	69	74	78	80
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l	C	
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C	
SF															C	
01	4	,02	3,06		50	7,2									C	
02	1		2,99		50	7,3									C	
03	1		3,01		50	7,2	58	1456	60	1506	1,70	43	48		C	
04	4	,03	3,06		51	7,2	56	1429	66	1644	1,85	47	48		C	
05	4	,01	3,06		52	6,9	66	1684	70	1786	2,00	51	42		C	
06	1		3,05		51	7,1	54	1374	60	1526	2,10	53	36		C	
07	1		3,03		51	7,2	58	1457	60	1516	2,20	56	50		C	
08	1		2,96		50	7,4									C	
09	4	,40	2,92		50	7,4									C	
10	4	,95	2,97		50	7,3	66	1635	52	1288	1,85	46	46		C	
11	4	,13	3,06		51	7,5	66	1684	46	1174	2,00	51	24		C	
12	1		2,99		51	7,4	84	2095	64	1596	1,70	42	46		C	
13	4	,02	2,92		51	7,4	58	1412	62	1510	2,20	54	42		C	
14	4	,48	2,97		51	7,4	74	1833	58	1437	2,25	56	22		C	
15	1		2,91		51	7,3									C	
16	1		2,87		51	7,2									C	
17	1		2,87		51	7,2	66	1580	56	1340	1,90	45	50		C	
18	1		2,97		52	7,3	78	1932	66	1635	1,70	42	48		C	
19	1		2,91		52	7,3	46	1116	54	1311	1,75	43	44		C	
20	1		2,93		52	7,5	68	1662	56	1368	1,85	45	40		C	
21	1	.	2,88		52	7,3	76	1825	70	1681	2,00	48	36		C	
22	1		2,87		52	7,1									C	
23	1		2,80		52	7,1									C	
24	4	,84	2,80		51	7,2									C	
25	1		2,88		52	7,4	64	1537	76	1825	1,80	43	66		C	
26	4	,11	2,94		52	7,4	98	2403	70	1716	2,10	51	58		C	
27	4	,10	2,94		52	7,3	82	2011	50	1226	2,00	49	34		C	
28	1		2,91		53	7,4	94	2281	56	1359	2,00	48	48		C	
29	4	,77	2,91		53	7,5									C	
30	3		2,84		53	7,4									C	
31	1		2,81		53	7,3	92	2156	60	1406	1,75	41	50		C	
TL		3,86	91,09					34562		29,850	-	954			C	
ME			2,94				70	1728	61	1493	1,94	48	44		C	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

May, 1981
Month

Marshall, Michigan
Municipality

Robert L. Swalwell
Superintendent's Signature

1 2 ID | 3 8 Plant No 1360129 | 9 10 Mo 05 | 11 12 Yr 81 | 13 15 Sampling Point Code

DAY	BOD-5 9 14		SS 19 24		TOTAL-P 29 34		VSS 39	NH_3-N 44	REMARKS OR OTHER PARAMETERS 49	54	59	64	69	74 78	80	9	14
1 2	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l							C		
PN	00310	85001	00530	85002	00665	85004	00535	00610							C		
SF															C		
01															C		
02															C		
03	50	1255	50	1255	1.70	43	35								C		
04	44	1123	32	817	1.90	48	24								C		
05	50	1276	54	1378	2.10	54	42								C		
06	44	1119	54	1374	2.00	51	36								C		
07	46	1162	74	1870	2.20	56	50								C		
08															C		
09															C		
10	44	1090	48	1189	1.75	43	38								C		
11	50	1276	36	919	1.90	48	26								C		
12	52	1296	52	1297	1.75	44	30								C		
13	40	974	22	536	1.75	43	14								C		
14	58	1437	44	1090	1.85	46	22								C		
15															C		
16															C		
17	46	1101	48	1149	1.90	45	40								C		
18	48	1189	72	1783	1.85	46	38								C		
19	38	922	58	1408	1.70	41	48								C		
20	46	1124	52	1271	1.70	42	24								C		
21	54	1297	58	1393	2.00	48	42								C		
22															C		
23															C		
24															C		
25	32	768	54	1297	1.60	38	50								C		
26	76	1863	56	1373	1.20	29	46								C		
27	58	1422	50	1226	1.75	43	26								C		
28	66	1602	48	1165	1.70	41	42								C		
29															C		
30															C		
31	48	1125	54	1266	1.60	37	42								C		
TL		24421		25056		886									C		
ME	50	1221	51	1253	1.80	44	36								C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

May Month, 19 81 — Marshall Municipality, Michigan — Robert J. Swahill Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID | 1300229 | 05 | 81 | . .
Plant No. Mo. Yr. Sampling Point Code

DAY	BOD-5			SS			TOTAL-P			VSS	NH_3-N	pH	DO	F. COLI*		T. COLI*	REMARKS
	9 14 19			24 29 34			39 44 49			54	59	64	69	74	80	9	14 19
1 2	mg/l	LBS	% Rem.	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	mg/l	SU	mg/l	#/100 ml	C	#/100 ml	
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 31615	C	31504 31505	
SF															C		
01												7.2	5.5	70	C		
02												7.2			C		
03	8	201	86	4	100	93	.22	6	87	2		7.2			C		
04	13	332	77	7	179	89	.25	6	86	4		7.1	7.4	40	C		
05	13	332	80	2	51	97	.28	7	86	1		6.9	5.7	36	C		
06	23	585	57	8	203	87	.27	7	87	4		7.1	5.7	10	C		
07	11	278	81	10	253	83	.29	7	87	6		7.1	6.7	8	C		
08												7.3	6.7	4	C		
09												7.4			C		
10	18	446	73	10	248	81	.29	7	84	8		7.2			C		
11	19	485	71	2	51	96	.35	9	83	1		7.4	6.8	68	C		
12	25	623	70	5	125	92	.33	8	81	3		7.4	6.7	8	C		
13	18	438	69	1	24	98	.37	9	83	1		7.3	6.8	22	C		
14	18	446	46	15	372	74	.42	10	81	6		7.3	6.8	18	C		
15												7.3	6.5	2	C		
16												7.3			C		
17	18	431	73	3	72	95	.37	9	81	2		7.4			C		
18	23	570	71	7	173	89	.37	9	78	3		7.3	7.2	44	C		
19	15	364	67	12	291	78	.31	8	82	3		7.3			C		
20	11	269	84	4	98	93	.28	7	85	3		7.4	5.2	10	C		
21	21	504	72	7	168	90	.27	6	87	5		7.3	5.4	8	C		
22							[illegible]		[illegible]			7.1	5.7	36	C		
23												7.1			C		
24												7.2			C		
25	12	288	81	8	192	89	.17	4	91	4		7.2			C		
26	23	564	77	2	49	91	.26	6	88	1		7.2	7.1	38	C		
27	24	588	71	2	49	96	.26	6	87	1		7.4	4.6	26	C		
28	24	582	74	3	73	95	.27	7	87	2		7.4	5.8	24	C		
29												7.4	5.3	50	C		
30												7.4			C		
31	18	422	80	7	164	88	.31	7	82	3		7.4			C		
TL		7848			2935			145							C		
ME	18	392	75	6	147	90	.30	7	85	3		7.3	6.2	19	C		
WA	20	505		8	201									33	C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

May (Month), 19 81 — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2 | 3 8 | 9 10 | 11 12 | 13 15
10 | 1300029 | 05 | 81 | ..
Plant No. | Mo. | Yr. | Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX.FUEL 14	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS.	39 Fe/y LBS.	44	49	54	59
PN											
SF											
01	-		2880			20	596				
02			2760			10	397-				
03			2400			20	397-				
04			2520			10	199-				
05	-		2760			20	794				
06	-		3000			20	794				
07	-		2880			20	596				
08	-		2760			10	596				
09			2520			20	199-				
10			2760			20	596-				
11	-		3120			20	397				
12	-		3000			10	397				
13			2760			10	397-				
14			3000			20	397-				
15			2640			10	199-				
16			2520			10	199-				
17			2640			20	199-				
18	-		2760			20	397				
19	-		2880			10	596				
20	-		2760			20	596				
21			2520			10	397-				
22			2760			20	397-				
23			2520			20	298-				
24			2520			10	199-				
25			2520			10	298-				
26			2640			15	199-				
27	-		2880			15	794				
28	-		2760			5	397				
29	-		2760			10	495				
30			2520			10	199-				
31			2640			15	298-				
TL			84360			460	13109				
ME			2721			15	423				

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	5		804
Superintendent	1		160
Asst. Supt.	1		160
Shift Foreman			
Shift Operator	3		484
Maint. Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL A

WEEKDAYS 11 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

Digester Volume, ft³
Primary _____
Secondary _____

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

R 4619
4833-5382

Supernatant To _____
Process Pattern _____

MONTH May 1981

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE					DIGESTING SLUDGE						SUPERNATANT								DIGESTED SLUDGE				Gas Produced cu. ft X
	Gals. X 100	Total Solids %	Vol. Solids %	Vol. Solids Lbs/1000 c.f. Digester	pH	Temp. °F	pH	Total Solids %	Vol. Solids %	Vol. Acids Mg/l	Alkalinity Mg/l	Gals. X	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	P Mg/l	P Lbs.	5-Day BOD Mg/l	Gals. X	Total Solids %	Vol. Solids %	pH	
1	45	4.1	59		6.0																			
2	40	5.0	64		6.1																			
3	40	4.9	67		6.1																			
4	45	5.3	70		5.9																			
5	45	4.5	79		6.0																			
6	45	4.8	69		6.1																			
7	45	5.0	69		6.1																			
8	45	4.6	76		6.3																			
9	40	4.2	61		6.4																			
10	40	4.5	50		6.3																			
11	45	5.0	69		6.2																			
12	45	4.4	57		6.2																			
13	45	4.7	74		6.0																			
14	45	5.3	70		6.0																			
15	45	4.5	60		6.1																			
16	40	4.5	67		6.0																			
17	40	4.6	68		6.1																			
18	45	4.4	77		6.0																			
19	45	4.2	81		6.0																			
20	45	5.1	71		6.1																			
21	45	4.7	65		6.1																			
22	45	4.0	64		6.2																			
23	40	4.2	64		6.2																			
24	40	4.3	67		6.2																			
25	40	4.8	74		6.2																			
26	45	4.7	67		6.2																			
27	45	4.7	68		6.1																			
28	45	4.0	75		6.4																			
29	45	4.2	64		6.3																			
30	40	4.7	71		6.3																			
31	40	5.0	70		6.3																			
TOTAL	1340																							
ARITH. MEAN	43	4.6	68																					

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.7

Marshall, MICHIGAN

MONTH May, 19 81 — VACUUM FILTER & INCINERATION DATA — OPERATOR R.J. Swalwell

SLUDGE TO FILTER				CHEMICALS TO FILTER				FILTER		FILTRATE						FILTER CAKE					INCINERATION			REMARKS
				C20		FeCl3																		
Gal. X 100	Tot. Sol. %	Lbs. Dry Sol.	pH	Lbs. Dry	R	Lbs. Dry	R	Tot. Hours	Yield	Gal. X 100	pH	Sus. Solids Mg/l	Vol. Susp. Solids %	5 Day BOD Mg/l	P Mg/l	Thou. Lbs. Wet	Tot. Sol. %	Lbs. Tot. Solids X 100	Vol. Sol. %	Lbs. Vol. Solids X 100	Hrs. Opr.	Yield	Fuel BTU	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
103	4.0	3461	5.9	1877		191		8.0		76	11.8	962	12	3660		31	17.5	53	44	23				
103	3.6	3115	5.8	1877		191		8.0		76	11.3	1006	20	2460		28	17.9	50	47	24				
103	3.2	2769	5.8	1877		191		8.0		76	10.8	816	13	4210		26	17.7	46	50	23				
103	4.2	3634	5.8	1877		191		8.0		76	9.9	828	11	3180		29	18.9	55	44	24				
103	4.6	3980	6.1	1877		191		8.0		76	11.9	742	17	1500		27	21.5	58	44	26				
103	3.9	3374	5.9	1877		191		8.0		76	12.0	700	14	2460		29	18.4	53	48	26				
103	5.4	4672	6.2	1877		191		8.0		76	12.0	612	22	3180		35	18.6	65	45	29				
103	5.8	5018	5.9	1877		191		8.0		76	11.9	804	16	2520		34	20.3	69	49	34				
103	4.3	3720	5.8	1877		191		8.0		76	11.9	882	10	2880		31	17.9	55	49	27				
103	4.9	4239	5.9	1877		191		8.0		76	12.0	1802	16	3420		33	18.5	61	51	31				
103	4.3	3720	5.8	1877		191		8.0		76	11.6	840	8	2880		33	17.0	56	48	27				
103	4.2	3634	6.0	1877		191		8.0		76	11.8	806	13	2400		31	18.0	56	44	25				
103	4.9	4239	6.0	1877		191		8.0		76	10.3	1128	17	3360		31	19.8	61	47	29				
1339		49575		24401		2483		104		988						398		738		348				
103	44	3813		1877		191		8.0		76		918	15	2932		31	18.5	57	47	27				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

MAY (Month), 19 81

MARSHALL (Municipality), Michigan

Superintendent's Signature

1 2 ID | 3 8 13,0,0,2,9 Plant No | 9 10 05 Mo | 11 12 8,1 Yr | 13 15 Sampling Point Code

DAY 1 2	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification 14	19
	Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MLSS 34	MLVSS 39	SETTL 44	SDI 49	DO 54	Air Applied 59	SS 64	VSS 49	Percent Return 74	80	Waste Sludge 9		
	KCF	KCF	HRS	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu. Ft.	%	%	%	C	KGal	See Code*	
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889	
SF											4				C			
01	48		2.8	5.0	.32	1994	1432	20.0	1.00	3.0	189	.65	71	44	C	15		
02			2.9								190			44	C	15		
03			2.9								185			44	C	15		
04			2.8	5.3	.29	1988	1404	20.0	.99	4.3	180	.58	69	43	C	15		
05			2.8	5.3	.27	2092	1513	20.0	1.04	3.0	189	.63	71	44	C	15		
06			2.8	5.0	.30	1947	1393	21.0	.93	3.5	192	.59	70	44	C	15		
07			2.9	4.5	.29	1961	1400	20.0	.98	3.7	191	.63	70	44	C	15		
08			2.9	4.8	.28	2007	1416	21.0	.96	3.8	192	.59	70	45	C	15		
09			3.0								193			46	C	15		
10			2.9								197			45	C	15		
11			2.8	4.6	.29	1950	1399	20.0	.98	4.1	200	.64	71	43	C	15		
12			2.9	4.6	.27	2039	1464	21.0	.97	4.2	198	.64	67	45	C	15		
13			3.0	5.6	.24	2240	1599	22.0	1.02	3.3	195	.71	72	46	C	15		
14			2.9	6.1	.23	2377	1700	25.0	.95	3.8	197	.71	70	45	C	15		
15			3.0	6.4	.22	2424	1750	25.0	.97	3.0	197	.74	68	45	C	15		
16			3.0								193			46	C	15		
17			3.0								197			46	C	15		
18			2.9	5.6	.27	2156	1501	24.0	.90	5.0	196	.67	68	55	C	15		
19			3.0								181			56	C	15		
20			2.9	5.7	.24	2325	1628	28.0	.83	3.0	188	.58	67	55	C	15		
21			3.0	4.8	.27	1954	1382	21.0	.93	3.5	184	.50	70	57	C	15		
22			3.0	5.0	.36	2049	1043	24.0	.85	2.0	181	.57	70	57	C	15		
23			3.1								180			58	C	15		
24			3.1								177			60	C	15		
25			3.0								178			59	C	15		
26			2.9	3.6	.31	1681	1290	20.0	.84	4.2	177	.54	71	59	C	15		
27			2.9	4.0	.31	1864	1338	22.0	.85	3.0	180	.50	72	59	C	15		
28			3.0	4.5	.27	1969	1413	24.0	.82	4.4	178	.50	70	60	C	15		
29			3.0	4.7	.28	2071	1508	25.0	.83	4.1	175	.53	70	59	C	15		
30			3.0								181			61	C	15		
31			3.1								182			61	C	15		
TL															C	465		
ME			2.9	5.0	.28	2057	1378	22.3	.93	3.6	188	.61	70	51	C	15		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

June, 1981 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

ID 130029 (Plant No) 06 (Mo) 81 (Yr) 500 (Sampling Point Code)

DAY	WEATHER TYPE	WEATHER PRECIP.	FLOW TOTAL	FLOW MAX RATE	RAW SEWAGE QUALITY TEMP	pH	BOD-5		SS		TOTAL P		VSS	NH_3-N		REMARKS C	
1 2	9	14	19	24	29	34	39	44	49	54	59	64	69	74 78	80	9	14
	See Code*	Inches	MGD	MGD	°F	SU	~ mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l	C		
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C		
SE															C		
01	1		2.92		53	7.2	108	2630	80	1948	2.00	49	58		C		
02	4	.06	2.96		53	7.3	96	2370	60	1481	2.00	49	42		C		
03	4	.02	2.94		54	7.3	134	3286	90	2207	2.60	64	50		C		
04	1		2.92		54	7.3	104	2533	88	2143	2.20	53	84		C		
05	1		2.91		54	7.1									C		
06	1		2.79		54	7.1									C		
07	4	.10	2.90		54	7.3	110	2660	64	1547	2.50	60	40		C		
08	4	.47	2.90		54	7.3	136	3289	62	1500	1.85	45	46		C		
09	4	.07	2.86		54	7.3			64	1527	1.75	42	48		C		
10	1		2.84		54	7.2	128	3032	70	1658	1.75	41	62		C		
11	1		2.78		54	7.3	116	2689	56	1298	1.60	37	46		C		
12	4	.48	2.91		54	7.2									C		
13	4	1.00	2.92		54	7.1									C		
14	4	.36	3.05		54	7.1	116	2951	52	1323	1.60	41	46		C		
15	4	.04	2.93		55	7.3	78	1906	60	1466	1.70	42	50		C		
16	4	.03	2.92		54	7.2	98	2387	54	1315	1.75	43	42		C		
17	1		2.74		54	7.0	106	2422	58	1325	2.00	46	40		C		
18	1		2.66		54	7.3	104	2307	66	1464	2.25	50	56		C		
19	1		2.56		54	7.5									C		
20	4	.08	2.63		54	7.4									C		
21	4	.80	2.72		54	7.3	144	3267	58	1316	1.85	42	42		C		
22	1		2.72		54	7.3	114	2586	68	1543	1.75	40	52		C		
23	1		2.72		54	7.3	126	2858	62	1406	2.00	45	60		C		
24	4	.07	2.69		54	7.5	100	2243	60	1346	2.10	47	34		C		
25	1		2.59		54	7.3	130	2808	34	734	1.90	41	22		C		
26	1		2.54		54	7.3									C		
27	1		2.55		54	7.3									C		
28	1		2.69		54	7.3	122	2737	90	2019	2.00	45	64		C		
29	1		2.61		56	7.4	132	2873	74	1611	2.00	44	54		C		
30	3		2.61		55	7.3	114	2481	60	1306	1.85	40	54		C		
31															C		
TL		3.58	83.48					56,351		33,483		1006			C		
ME			2.78				115	2683	65	1522	1.95	46	50		C		

ESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

R 4608 4/74
4833-5470

e , 19 81 Marshall, Michigan — Municipality

Robert J. Swalwell — Superintendent's Signature

15

]

oling Point Code

SS		TOTAL-P		VSS	NH_3-N	REMARKS OR OTHER PARAMETERS											TRICKLING FILTERS	
	24	29	34	39	44	49	54	59	64	69	74	78	80	9	14	19	Recirc. 24	Vol. in Ser. 29
mg/l	LBS.	mg/l	LBS.	mg/l	mg/l								C				%	KCF
0530	85002	00665	85004	00535	00610								C				81005	80995
													C					
58	1412	1.90	46	36									C					
44	1086	1.85	46	28									C					
16	1128	2.00	49	29									C					
62	1510	2.00	49	56									C					
													C					
													C					
58	1403	1.70	41	38									C					
16	1113	1.70	41	28									C					
62	1479	1.40	33	38									C					
70	1184	1.60	38	46									C					
2	1437	1.50	35	44									C					
													C					
													C					
28	712	1.50	38	20									C					
40	977	1.50	37	34									C					
40	974	1.55	38	28									C					
16	1051	1.70	39	44									C					
54	1198	1.90	42	46									C					
													C					
													C					
42	953	1.60	36	28									C					
0	1361	1.60	36	44									C					
58	1316	1.60	36	42									C					
8	1077	1.85	42	22									C					
14	950	1.85	40	40									C					
													C					
													C					
2	1840	2.75	62	66									C					
8	1480	1.90	41	46									C					
8	1045	2.00	44	42									C					
													C					
	26686		909										C					
2	1213	1.77	41	38									C					

DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

June, 19 81 (Month) — Marshall (Municipality), Michigan — Robert J. Swallow (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15

ID | 130,029 (Plant No) | 06 (Mo) | 81 (Yr) | ... (Sampling Point Code)

DAY 1 2	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification 14
	Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MLSS 34	MLVSS 39	SETTL. 44	SDI 49	DO 54	Air Applied 59	SS 64	VSS 49	Percent Return 74	80	Waste Sludge 9	
	KCF	KCF	HRS	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu. Ft.	%	%	%	C	KGal	See Code*
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF											4				C		
01	48		2.9	4.4	.34	1958	1406	27.0	.73	4.0	179	.52	71	59	C	15	
02			2.9	5.1	.31	2173	1576	28.0	.78	4.9	174	.52	72	67	C	15	
03			2.9	4.3	.39	1817	1324	24.0	.76	4.9	173	.45	73	58	C	15	
04			2.9	3.0	.54	1264	939	17.0	.74	4.7	184	.51	73	32	C	15	
05			3.0	2.9	.56	1212	897	16.0	.76	5.0	181	.49	73	29	C	15	
06			3.1								185			30	C	15	
07			3.0								183			31	C	15	
08			3.0	2.6	.84	875	661	11.0	.80	5.9	180	.62	74	28	C	15	
09			3.0	2.9	.56	1225	983	17.0	.72	3.7	183	.54	71	29	C	15	
10			3.0	3.8	.49	1584	1190	20.0	.79	3.7	185	.57	73	33	C	15	
11			3.1	3.1	.59	1305	953	16.0	.82	5.9	184	.44	73	37	C	15	
12			3.0	2.7	.65	1245	912	15.0	.83	4.8	180	.44	74	37	C	15	
13			3.0								178			35	C	15	
14			2.8								174			35	C	15	
15			2.9	3.0	.76	1209	886	11.0	1.09	4.9	173	.43	73	33	C	15	
16			3.0	3.3	.72	1263	938	11.0	1.15	5.0	182	.39	73	45	C	15	
17			3.1	3.8	.64	1350	972	12.0	1.13	4.5	181	.38	71	49	C	15	
18			3.2	4.6	.52	1566	1130	13.0	1.20	3.2	175	.48	71	52	C	15	
19			3.4	5.5	.44	1807	1298	15.0	1.20	5.2	177	.53	71	52	C	15	
20			3.3								175			53	C	15	
21			3.2								174			54	C	15	
22			3.2	2.6	.94	877	644	7.0	1.25	6.0	180	.26	73	52	C	15	
23			3.2	3.1	.78	1161	757	10.0	1.16	4.5	180	.33	74	51	C	15	
24			3.2	3.6	.57	1359	1006	11.0	1.24	4.7	175	.38	73	51	C	15	
25			3.3	4.3	.51	1572	1165	12.0	1.31	3.9	180	.48	73	51	C	15	
26			3.4	4.7	.49	1666	1200	13.0	1.28	4.5	183	.53	70	53	C	15	
27			3.4								183			55	C	15	
28			3.2								178			55	C	15	
29			3.3	4.6	.46	1894	1363	16.0	1.18	4.4	173	.60	71	51	C	15	
30			3.3	4.8	.39	2045	1462	17.0	1.20	3.8	179	.59	71	52	C	15	
31															C		
TL															C	450	
ME			3.1	3.7	.57	1474	1076	15.4	1.00	4.6	179	.48	72	45	C	15	

Digester Volume, ft³
Primary
Secondary

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

Supernatant To
Process Pattern

R 4619
4833-5382

MONTH June 1981

DIGESTER AND SLUDGE DATA

OPERATOR R. J. Swalwell

DATE	RAW SLUDGE					DIGESTING SLUDGE						SUPERNATANT								DIGESTED SLUDGE				Gas Produced cu. ft X
	Gals. X 100	Total Solids %	Vol. Solids %	Vol. Solids Lbs/1000 c.f. Digester	pH	Temp. °F	pH	Total Solids %	Vol. Solids %	Vol. Acids Mg/l	Alkalinity Mg/l	Gals. X	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	P Mg/l	P Lbs.	5-Day BOD Mg/l	Gals. X	Total Solids %	Vol. Solids %	pH	
1	45	4.2	59		6.0																			
2	45	4.1	78		6.1																			
3																								
4	45	4.4	75		6.2																			
5	45	4.9	67		6.1																			
6	50	5.4	72		6.0																			
7	50	3.6	64		6.0																			
8	80	3.8	82		6.0																			
9	60	3.3	73		6.0																			
10	68	3.0	47		6.1																			
11	66	3.6	62		6.2																			
12	70	4.1	62		6.5																			
13	50	3.7	68		6.3																			
14	50	3.9	85		6.3																			
15	50	4.1	76		6.0																			
16	50	4.3	67		5.9																			
17	50	4.6	75		5.9																			
18	50	4.9	85		5.7																			
19	50	4.6	65		6.0																			
20	50	4.1	67		6.0																			
21	50	4.8	61		6.1																			
22	50	3.8	61		6.3																			
23	50	4.0	80		6.2																			
24	50	4.7	70		6.2																			
25	50	4.2	77		6.2																			
26	50	5.0	65		6.1																			
27	50	4.5	64		6.1																			
28	50	4.5	76		6.1																			
29	50	4.4	80		6.0																			
30	50	4.7	67		6.0																			
31																								
TOTAL	1524																							
ARITH. MEAN	53	4.2	70																					

MDPH
D-4.7

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH June, 1981 — VACUUM FILTER & INCINERATION DATA — OPERATOR R. J. Swalwell

SLUDGE TO FILTER				CHEMICALS TO FILTER				FILTER		FILTRATE						FILTER CAKE					INCINERATION			REMARKS
				CaO		FeCl3																		
Gal. X 100	Tot. Sol. %	Lbs. Dry Sol.	pH	Lbs. Dry	R	Lbs. Dry	R	Tot. Hours	Yield	Gal. X 100	pH	Sus. Solids Mg/l	Vol. Susp. Solids %	5 Day BOD Mg/l	P Mg/l	Thou. Lbs. Wet	Tot. Sol. %	Lbs. Tot. Solids X 100	Vol. Sol. %	Lbs. Vol. Solids X 100	Hrs. Opr.	Yield	Fuel BTU	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	.24	25
95	4.3	3431	6.1	1925		191		8.0		76	11.9	926	8	2820		27	19.7	53	47	25				
95	4.2	3352	6.0	1925		191		8.0		76	11.8	906	10	4560		30	17.6	53	47	25				
95	4.1	3272	6.1	1925		191		8.0		76	11.8	748	18	3900		30	17.3	53	47	25				
95	5.5	4389	6.1	1925		191		8.0		76	11.4	1040	8	4140		31	20.6	64	57	36				
95	3.9	3112	6.0	1925		191		8.0		76	11.7	923	9	2880		30	16.8	50	49	25				
95	3.9	3112	6.0	1925		191		8.0		76	9.7	824	11	3300		30	16.9	51	48	24				
95	3.9	3112	6.1	1925		191		8.0		76	11.8	786	11	3000		30	19.4	58	39	23				
95	3.8	3032	6.1	1925		191		8.0		76	11.7	654	12	2700		29	17.0	49	47	23				
95	4.5	3591	5.9	1925		191		8.0		76	11.7	802	18	2940		31	18.0	56	37	21				
95	3.9	3112	5.9	1925		191		8.0		76	10.6	836	11	2700		30	16.8	50	46	23				
95	3.9	3112	6.0	1925		191		8.0		76	12.1	908	9	3120		30	17.0	51	46	23				
95	3.8	3032	6.0	1925		191		8.0		76	12.0	736	10	3060		28	17.8	50	52	26				
95	3.3	2633	5.9	1925		191		8.0		76	12.0	854	16	3220		27	16.8	45	46	21				
95	3.7	2953	5.9	1925		191		8.0		76	12.0	762	15	3120		29	16.1	48	43	21				
95	2.8	2234	6.0	1925		191		8.0		76	12.0	730	12	3240		28	14.6	41	53	22				
95	4.2	3352	5.8	1925		191		8.0		76	11.9	716	14	3120		30	17.6	53	45	24				
1520		50831		30800		3056		128		1216						470		825		367				
95	4.0	3177		1925		191		8.0		76		822	12	3239		29	17.6	52	47	23				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

June, 19 81
Month

Marshall, Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
ID	130029	06	81	
	Plant No.	Mo.	Yr.	Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX. FUEL 14	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS.	39 $FeCl_3$ LBS	44	49	54	59
PN											
SF											
01			2640			5	199				
02			2760			10	695				
03			2640			20	595				
04			2640			20	794				
05			2640			10	397				
06			2400			20	397				
07			2400			10	199				
08			2520			10	397				
09			2640			30	794				
10			2640			10	596				
11			2640			20	794				
12			2640			10	596				
13			2400			10	199				
14			2280			20	199				
15			2400			20	397				
16			2760			20	794				
17			2760			20	794				
18			2640			10	695				
19			2520			10	596				
20			2400			30	298				
21			2400			20	199				
22			2760			20	397				
23			2640			10	596				
24			2760			20	596				
25			2520			20	596				
26			2520			10	199				
27			2400			15	596				
28			2400			15	397				
29			2520			20	596				
30			2640			20	397				
31											
TL			76920			485	14994				
ME			2564			16	500				

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	5		880
Superintendent	1		176
Asst. Supt.	1		176
Shift Foreman			
Shift Operator	3		528
Maint. Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL

WEEKDAYS 11 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

_____ Month , 19 _____ _____ Municipality , Michigan _____ Superintendent's Signature

1 2 ID | 3 Plant No. 8 | 9 10 Mo. | 11 12 Yr. | 13 15 Sampling Point Code

DAY	BOD-5			SS			TOTAL-P			VSS	NH_3-N	pH	DO	F. COLI*		T. COLI*	REMARKS
1 2	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	mg/l	SU	mg/l	#/100 ml	C	#/100 ml	
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 31615	C	31504 31505	
SF															C		
01	18	438	83	2	49	98	.37	9	82	1		7.2	5.3	24	C		
02	21	518	78	4	99	93	.42	10	79	1		7.3	5.2	16	C		
03	21	515	84	15	368	83	.43	11	83	8		7.3	5.4	116	C		
04	24	584	77	3	73	97	.22	5	90	2		6.9	6.9	26	C		
05												7.2	6.8	12	C		
06												7.2			C		
07	14	339	87	8	193	88	.17	4	93	3		7.1			C		
08	24	580	82	1	24	98	.19	5	90	1		7.2	8.3	2	C		
09				9	214	86	.31	7	82	5		7.4	6.5	8	C		
10	25	592	80	4	95	94	.12	3	93	2		7.1	5.4	14	C		
11	16	371	86	8	185	86	.12	3	93	5		7.4	7.0	10	C		
12												7.2	7.8	2	C		
13												7.2			C		
14	20	509	83	5	127	90	.18	5	89	4		7.1			C		
15	17	415	78	2	49	97	.19	5	89	1		7.2	7.1	4	C		
16	18	438	82	4	97	93	.18	4	90	2		7.0	6.3	10	C		
17	14	320	87	6	137	90	.20	5	90	2		6.7	6.4	2	C		
18	21	466	80	3	67	95	.25	6	89	2		7.2	5.7	10	C		
19												7.4	6.3	16	C		
20												7.4			C		
21	23	522	84	2	45	97	.22	5	88	1		7.3			C		
22	21	476	82	8	181	88	.26	6	85	2		7.2	7.9	18	C		
23	15	340	88	9	204	85	.26	6	87	7		7.4	6.4	4	C		
24	8	179	92	4	90	93	.26	6	88	3		7.3	5.6	2	C		
25	23	497	82	5	108	85	.28	6	85	1		7.3	5.4	46	C		
26												7.3	6.9	2	C		
27												7.4			C		
28	8	179	93	2	45	98	.27	6	87	1		7.2			C		
29	12	261	91	10	218	86	.29	6	86	4		7.2	5.5	8	C		
30	8	174	93	12	261	80	.20	4	89	3		7.2	4.8	4	C		
31															C		
TL		8713			2929			127							C		
ME	18	415	84	6	133	91	.25	6	88	3		7.2	6.3	9	C		
WA	21	507		7	174									27	C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

July 19 81 — Month

Marshall, Michigan — Municipality

Robert J. Swabwell — Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
ID	130029	07	81	500
	Plant No	Mo.	Yr	Sampling Point Code

DAY 1 2	WEATHER TYPE 9	WEATHER PRECIP. 14	FLOW TOTAL 19	FLOW MAX RATE 24	RAW SEWAGE QUALITY TEMP 29	pH 34	BOD-5 39	BOD-5 44	SS 49	SS 54	TOTAL-P 59	TOTAL-P 64	VSS 69	NH_3-N 74 78	80	REMARKS C 9	14
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l	C		
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C		
SF															C		
01	3		2.60		55	7.3	116	2515	52	1128	2.20	48	38		C		
02	3		2.56		55	7.2									C		
03	3		2.49		55	7.2									C		
04	4	.07	2.41		55	7.4									C		
05	1		2.46		55	7.2	130	2667	72	1477	1.70	35	52		C		
06	1		2.61		56	7.3	72	1567	84	1828	1.90	41	74		C		
07	1		2.61		56	7.4	118	2569	74	1611	1.90	41	72		C		
08	1		2.57		57	7.2	118	2529	54	1157	2.30	49	38		C		
09	1		2.59		57	7.4	146	3154	78	1685	3.05	66	64		C		
10	1		2.49		56	7.3									C		
11	1		2.40		56	7.3									C		
12	4	.29	2.39		56	7.3	66	1316	50	997	1.85	37	42		C		
13	1		2.55		57	7.3	90	1914	44	936	2.00	43	42		C		
14	1		2.54		56	7.3	80	1695	28	593	1.90	40	14		C		
15	4	.07	2.49		57	7.2	86	1786	60	1246	1.75	36	50		C		
16	1		2.50		57	7.3	78	1626	30	626	2.10	44	26		C		
17	1		2.54		57	7.2									C		
18	1		2.35		57	7.2									C		
19	4	.56	2.38		57	7.2	72	1429	62	1231	1.90	38	56		C		
20	4	.22	2.48		57	7.3	74	1531	52	1076	1.90	39	44		C		
21	1		2.52		57	7.1	80	1681	64	1345	2.20	46	48		C		
22	1		2.47		57	7.2	86	1772	62	1277	2.10	43	60		C		
23	1		2.45		57	7.3	66	1349	64	1308	2.00	41	48		C		
24	1		2.44		57	7.2									C		
25	4	.34	2.40		57	7.2									C		
26	4	.03	2.41		57	7.2									C		
27	4	1.74	2.50		57	7.4	90	1877	104	2168	2.10	44	86		C		
28	4	.56	2.64		58	7.3	68	1497	80	1761	2.20	48	66		C		
29	1		2.58		57	7.0	68	1463	80	1721	1.90	41	78		C		
30	1		2.59		57	7.0	94	2030	32	691	2.00	43	30		C		
31	1		2.57		57	7.1									C		
TL		3.88	77.58					37967		25862		863			C		
ME			2.50				90	1898	61	1293	2.00	43	51		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

July, 19 81 — Month

Marshall, Michigan — Municipality

Robert J. Swalwell — Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
ID	130029	07	81	
	Plant No	Mo	Yr	Sampling Point Code

DAY	BOD 5		SS		TOTAL-P		VSS	NH_3-N	REMARKS OR OTHER PARAMETERS								
	9	14	19	24	29	34	39	44	49	54	59	64	69	74	78 80	9	14
1 2	mg/l	LBS	mg/l	LBS.	mg/l	LBS	mg/l	mg/l							C		
PN	00310	85001	00530	85002	00665	85004	00535	00610							C		
SF															C		
01	110	2385	46	997	2.20	48	30								C		
02															C		
03															C		
04															C		
05	94	1929	22	451	1.60	33	20								C		
06	24	522	46	1001	1.85	40	36								C		
07	46	1001	38	827	1.90	41	34								C		
08	60	1286	36	772	2.10	45	20								C		
09	114	2462	68	1468	2.30	50	46								C		
10															C		
11															C		
12	36	718	58	1156	1.85	37	32								C		
13	52	1106	38	808	1.70	36	22								C		
14	54	1144	20	424	1.70	36	12								C		
15	54	1121	40	831	1.70	35	34								C		
16	62	1293	44	917	2.25	47	34								C		
17															C		
18															C		
19	46	913	42	834	2.00	40	28								C		
20	54	1117	28	579	1.60	33	20								C		
21	58	1219	42	883	1.50	32	26								C		
22	72	1483	50	1030	1.75	36	42								C		
23	54	1103	46	940	1.60	33	30								C		
24															C		
25															C		
26															C		
27	42	876	48	1001	1.75	36	30								C		
28	46	1013	46	1013	1.85	41	34								C		
29	32	689	44	947	1.70	37	28								C		
30	48	1037	34	734	1.60	35	20								C		
31															C		
TL		24,417		17613		771									C		
ME	58	1221	42	881	1.83	39	29								C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

July Month 19 81 — Marshall Municipality Michigan — Robert J. Sundell Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID 1300029 07 81 ...
Plant No Mo Yr Sampling Point Code

DAY 1 2	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification 14
	Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MLSS 34	MLVSS 39	SETTL 44	SDI 49	DO 54	Air Applied 59	SS 64	VSS 49	Percent Return 74	80	Waste Sludge 9	
	KCF	KCF	HRS	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu. Ft.	%	%	%	C	KGal	See Code*
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF											4				C		
01	48		3.3	5.2	.42	2138	1545	18.0	1.19	3.4	178	.28	72	52	C	15	
02			3.4	5.5	.40	2195	1590	19.0	1.19	3.5	177	.63	71	53	C	15	
03			3.5								173			55	C	15	
04			3.6								172			57	C	15	
05			3.5								173			56	C	15	
06			3.3	4.4	.46	1630	1028	16.0	1.08	4.0	172	.46	69	52	C	15	
07			3.3	4.8	.50	1745	1214	14.0	1.25	4.0	171	.49	68	52	C	15	
08			3.4	5.7	.49	1775	1245	14.0	1.27	3.2	170	.52	70	53	C	15	
09			3.3	7.0	.38	2189	1611	18.0	1.22	2.5	155	.61	73	54	C	15	
10			3.5								170			54	C	15	
11			3.6								172			56	C	15	
12			3.6								168			56	C	15	
13			3.4	5.2	.58	1641	870	13.0	1.26	4.3	171	.46	82	53	C	15	
14			3.4	5.2	.41	1582	1111	12.0	1.25	5.3	175	.46	68	53	C	15	
15			3.5	5.6	.37	1583	1113	13.0	1.22	4.0	174	.47	69	56	C	15	
16			3.4	5.5	.36	1680	1198	13.0	1.29	5.15	173	.46	70	56	C	15	
17			3.4	5.7	.35	1722	1251	14.0	1.23	4.5	171	.48	72	56	C	15	
18			3.7								167			58	C	15	
19			3.6								166			57	C	15	
20			3.5	6.2	.31	1676	1166	14.0	1.20	5.5	168	.47	69	55	C	15	
21			3.4	6.4	.34	1615	1149	13.0	1.24	5.6	172	.48	70	54	C	15	
22			3.5	6.2	.35	1623	1135	14.0	1.16	5.5	185	.46	69	56	C	15	
23			3.5	5.9	.32	1702	1224	15.0	1.13	5.8	184	.50	72	56	C	15	
24			3.5	5.8	.32	1696	1215	15.0	1.13	5.6	181	.48	67	57	C	15	
25			3.6								180			58	C	15	
26			3.6								182			58	C	15	
27			3.4	5.5	.33	1675	1144	14.0	1.20	5.5	182	.48	70	57	C	15	
28			3.3	5.2	.31	1679	1210	14.0	1.20	5.0	180	.60	70	53	C	15	
29			3.3	4.7	.32	1567	1140	13.6	1.21	5.5	182	.44	72	55	C	15	
30			3.3	4.5	.35	1475	1025	13.0	1.13	5.3	180	.43	69	58	C	15	
31			3.4	5.0	.34	1653	1047	12.0	1.38	5.6	178	.57	61	56	C	15	
TL															C	465	
ME			3.5	5.5	.39	1726	1204	14.3	1.21	4.7	174	.49	70	55	C	15	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

July (Month), 19 81 — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2 ID | 3 8 Plant No. 1300029 | 9 10 Mo. 07 | 11 12 Yr 81 | 13 15 Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX. FUEL 14	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS.	39 $FeCl_3$ LBS	44	49	54	59
PN											
SF											
01			2640			15	596				
02			2400			15	397				
03			2400			20	199				
04			2280			10	199				
05			2400			10	199				
06			2760			10	596				
07			2520			20	596				
08			2520			10	794				
09			2520			30	596				
10			2400			20	199				
11			2400			20	199				
12			2400			20	199				
13			2400			10	397				
14			2640			20	596				
15			2640			30	596				
16			2520			20	596				
17			2520			10	199				
18			2160			20	298				
19			2400			20	298				
20			2400			10	100				
21			2640			20	596				
22			2640			20	596				
23			2640			20	794				
24			2640			10	397				
25			2280			20	397				
26			2400			20	298				
27			2400			20	298				
28			2400			30	199				
29			2520			10	199				
30			2400			20	199				
31			2400			10	199				
TL			76,680			540	12021				
ME			2474			17	388				

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	5		884
Superintendent	1		176
Asst. Supt.	1		176
Shift Foreman			
Shift Operator	3		532
Maint. Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL A

WEEKDAYS 11 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

Digester Volume ft³
Primary
Secondary

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

R 4619
4333-5382

Supernatant To
Process Pattern

MONTH July 1981

DIGESTER AND SLUDGE DATA

OPERATOR R. J. Swatwell

DATE	RAW SLUDGE Gals. X 100	Total Solids %	Vol. Solids %	Vol. Solids Lbs 1000 c.f. Digester	pH	DIGESTING SLUDGE Temp. °F	pH	Total Solids %	Vol. Solids %	Vol. Acids Mg/l	Alkalinity Mg/l	SUPERNATANT Gals. X	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	P Mg/l	P Lbs.	5 Day BOD Mg/l	DIGESTED SLUDGE Gals.	Total Solids %	Vol. Solids %	pH	Gas Produced cu ft X
1	50	4.2	82		6.0																			
2	50	4.8	72		6.1																			
3	45	4.4	56		6.0																			
4	45	4.3	65		6.1																			
5	45	3.8	75		6.1																			
6	45	4.5	72		6.1																			
7	46	4.1	81		6.2																			
8	45	4.3	70		6.1																			
9	45	4.0	77		6.3																			
10	40	4.1	79		6.1																			
11	40	4.1	64		6.2																			
12	40	4.2	69		6.1																			
13	45	4.2	77		6.2																			
14	45	4.3	78		6.1																			
15	45	4.3	56		6.0																			
16	45	5.0	70		6.0																			
17	45	4.1	59		6.0																			
18	40	4.6	63		6.2																			
19	40	4.4	59		6.3																			
20	45	4.1	55		6.3																			
21	45	4.4	67		6.3																			
22	45	6.5	75		6.3																			
23	45	4.3	61		6.1																			
24	45	4.0	67		6.1																			
25	40	4.1	71		6.2																			
26	40	2.5	75		6.1																			
27	45	4.8	67		6.2																			
28	45	4.3	76		6.0																			
29	45	4.5	69		6.0																			
30	45	5.8	68		6.0																			
31	45	4.3	70		6.0																			
TOTAL	1371																							
PITH. FAN	44	4.4	69																					

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.7

Marshall, MICHIGAN

MONTH July, 1981 — VACUUM FILTER & INCINERATION DATA — OPERATOR R.J. Swalwell

DATE	SLUDGE TO FILTER				CHEMICALS TO FILTER				FILTER		FILTRATE						FILTER CAKE					INCINERATION			REMARKS
	Gal. X 100	Tot. Sol. %	Lbs. Dry Sol.	pH	C_{20} Lbs. Dry	R	$FeCl_3$ Lbs. Dry	R	Tot. Hours	Yield	Gal. X 100	pH	Sus. Solids Mg/l	Vol. Susp. Solids %	5 Day BOD Mg/l	P Mg/l	Thou. Lbs. Wet	Tot. Sol. %	Lbs. Tot. Solids X 100	Vol. Sol. %	Lbs. Vol. Solids X 100	Hrs. Opr.	Yield	Fuel BTU	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1	102	4.1	3513	5.8	2000		191		8.0		76	12.0	690	17	3300		31	18.0	56	45	25				
2																									
3																									
4																									
5																									
6																									
7	102	4.3	3684	5.8	2000		191		8.0		76	11.9	778	11	3180		30	18.8	56	48	27				
8	102	4.3	3684	5.8	2000		191		8.0		76	11.1	690	17	3480		30	18.8	56	45	25				
9	102	4.3	3684	6.0	2000		191		8.0		76	8.1	756	14	3900		31	18.3	57	59	31				
10																									
11																									
12																									
13																									
14	102	4.1	3513	6.0	2000		191		8.0		76	8.0	926	11	3480		29	19.2	56	51	28				
15	102	4.1	3513	6.0	2000		191		8.0		76	9.6	870	10	3900		30	18.5	56	48	27				
16	102	3.4	2913	6.0	2000		191		8.0		76	10.0	1014	7	4080		28	17.5	49	49	24				
17																									
18																									
19																									
20																									
21	102	5.7	4884	6.1	2000		191		8.0		76	8.1	814	9	2580		36	19.0	68	46	31				
22	102	4.0	3427	6.1	2000		191		8.0		76	8.4	822	10	2220		29	19.0	55	41	23				
23	102	4.0	3427	6.2	2000		191		8.0		76	10.8	756	15	2880		27	19.8	53	47	25				
24	102	4.0	3427	6.2	2000		191		8.0		76	12.1	1334	6	2880		34	16.0	54	49	27				
25																									
26																									
27																									
28																									
29																									
30																									
31																									
Total	1122		39669		22000		2101		88.0		836						335		616		293				
Arith. Means	102	4.2	3606		2000		191		8.0		76		860	12	3262		30	18.4	56	48	27				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

_____ Month , 19 _____ _____ Municipality , Michigan _____ Superintendent's Signature

1 2 ID | 3 8 Plant No. | 9 10 Mo. | 11 12 Yr. | 13 15 Sampling Point Code

DAY	BOD-5			SS			TOTAL-P			VSS	NH_3-N	pH	DO	F. COLI*		T. COLI*	REMARKS
1 2	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	mg/l	SU	mg/l	#/100 ml	C	#/100 ml	
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 31615	C	31504 31505	
SF															C		
01	9	195	92	1	22	98	.150	11	87	1		7.2	3.7	2	C		
02												7.2	5.1	4	C		
03												7.2			C		
04												7.2			C		
05	20	410	85	7	145	90	.131	6	82	4		7.2			C		
06	12	261	83	6	131	93	.133	7	83	4		7.2	6.3	4	C		
07	14	305	88	1	22	99	.132	7	83	1		7.4	6.1	6	C		
08	13	279	89	2	43	96	.128	6	88	1		7.2	4.2	2	C		
09	19	410	87	9	194	88	.131	7	90	7		7.5	3.8	88	C		
10												7.2	5.2	28	C		
11												7.1			C		
12	11	219	83	8	159	84	.135	7	81	5		7.2			C		
13	15	319	83	5	106	88	.135	7	88	3		7.3	6.5	2	C		
14	19	402	76	2	42	93	.137	9	81	1		7.2	6.5	4	C		
15	17	353	80	6	125	90	.131	6	82	5		7.3	5.9	2	C		
16	17	354	78	2	42	93	.127	6	87	1		7.1	6.1	2	C		
17												7.2	6.1	8	C		
18												7.1			C		
19	15	298	79	10	198	83	.127	5	86	6		7.2			C		
20	15	310	80	2	41	96	.131	6	84	1		7.1	6.2	4	C		
21	14	294	83	6	126	91	.137	8	83	2		7.2	6.2	4	C		
22	13	268	85	5	103	92	.127	6	87	4		7.1	5.5	2	C		
23	8	163	88	7	143	89	.119	4	91	5		7.2	6.0	22	C		
24												7.2	5.9	56	C		
25												7.1			C		
26												7.1			C		
27	19	396	79	10	209	90	.126	5	88	5		7.2	6.4	2	C		
28	18	396	74	5	110	94	.141	9	81	3		7.2	6.1	2	C		
29	17	366	75	12	258	85	.138	8	80	11		7.1	5.8	6	C		
30	17	367	82	7	151	78	.140	9	80	5		6.9	6.2	2	C		
31												7.2	6.6	2	C		
TL		6365			2370			139							C		
ME	15	318	82	6	119	91	.131	7	85	4		7.2	5.8	5	C	12	
WA	17	345		9	182									10	C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

AUGUST (Month), 19 81

Marshall (Municipality), Michigan

Robert J. Swalwell
Superintendent's Signature

1 2 | 3 8 | 9 10 | 11 12 | 13 15
ID | 1300299 | 08 | 81 | 500
Plant No. | Mo | Yr | Sampling Point Code

DAY 1 2	WEATHER		FLOW		RAW SEWAGE QUALITY											REMARKS C	
	TYPE 9	PRECIP. 14	TOTAL 19	MAX 24 RATE	TEMP 29	pH 34	BOD-5 39 44		SS 49 54		TOTAL-P 59 64		VSS 69	NH_3-N 74 78	80	9	14
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l	C		
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C		
SF															C		
01	1		2.50		57	7.1									C		
02	4	.24	2.47		57	7.2	60	1236	52	1071	1.90	39	34		C		
03	4	.06	2.60		57	7.2	64	1388	68	1475	1.85	40	52		C		
04	1		2.62		57	7.3	54	1180	68	1486	2.20	48	46		C		
05	1		2.58		57	7.4	62	1334	74	1592	2.10	45	62		C		
06	4	.66	2.64		57	7.4	62	1365	70	1541	2.10	46	50		C		
07	4	.13	2.58		57	7.3									C		
08	4	.15	2.48		57	7.3									C		
09	4	.59	2.52		57	7.3	68	1429	74	1555	2.10	44	66		C		
10	4	.05	2.60		59	7.3	70	1518	78	1691	2.25	49	72		C		
11	4	.08	2.57		58	7.4	74	1586	62	1329	2.10	45	56		C		
12	1		2.60		58	7.4	76	1648	82	1778	2.00	43	62		C		
13	1		2.59		58	7.3	78	1685	78	1685	2.00	43	70		C		
14	4	.13	2.54		58	7.1									C		
15	3		2.45		58	7.3									C		
16	1		2.42		59	7.3	64	1292	68	1372	2.00	40	48		C		
17	1		2.37		57	7.1	102	2186	106	2272	2.10	45	92		C		
18	1		2.53		57	7.4	64	1350	74	1561	2.60	55	60		C		
19	1		2.51		57	7.4	80	1675	74	1549			62		C		
20	1		2.48		57	7.3	54	1117	60	1241	2.25	46	40		C		
21	1		2.47		57	7.2									C		
22	1		2.42		57	7.2									C		
23	1		2.39		58	7.2	106	2113	94	1874	2.25	45	86		C		
24	1		2.40		58	7.2	90	1801	68	1361	2.25	45	58		C		
25	1		2.47		58	7.2	86	1772	68	1401	2.30	47	66		C		
26	4	1.03	2.42		58	7.4	88	1776	80	1615	2.30	46	62		C		
27	4	.66	2.60		58	7.4	112	2429	58	1258	2.20	47	38		C		
28	4	.98	2.62		58	7.5									C		
29	4	.15	2.52		58	7.3									C		
30	4	.83	2.65		59	7.2	66	1459	100	2210	4.45	98	72		C		
31	1		2.75		58	7.4	110	2523	58	1330	1.40	32	38		C		
TL		5.74	7856					35862		34248		988			C		
ME			2.53				77	1630	73	1102	2.22	47	59		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

August, 19 81
Month

Marshall, Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID 1300279 08 81 . .
Plant No. Mo. Yr. Sampling Point Code

DAY	BOD-5 9 14		SS 19 24		TOTAL-P 29 34		VSS 39	NH_3-N 44	REMARKS OR OTHER PARAMETERS 49	54	59	64	69	74 78	80	9	14
1 2	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l							C		
PN	00310	85001	00530	85002	00665	85004	00535	00610							C		
SF															C		
01															C		
02	50	1030	34	700	1.60	33	20								C		
03	26	564	42	911	1.70	37	30								C		
04	42	918	40	874	1.85	40	26								C		
05	38	818	44	947	1.70	37	40								C		
06	40	881	50	1101	2.00	44	40								C		
07															C		
08															C		
09	36	757	40	841	1.60	34	28								C		
10	44	954	50	1084	2.00	43	32								C		
11	50	1072	40	857	1.60	34	36								C		
12	50	1084	46	997	1.55	34	26								C		
13	68	1469	46	994	1.70	37	42								C		
14															C		
15															C		
16	58	1171	36	727	1.70	34	22								C		
17	78	1672	54	1157	1.75	38	44								C		
18	34	717	36	760	1.70	36	28								C		
19	60	1256	48	1005			40								C		
20	50	1034	40	827	1.90	39	24								C		
21															C		
22															C		
23	68	1355	30	598	1.75	35	22								C		
24	56	1121	32	641	1.70	34	24								C		
25	48	989	34	700	1.75	36	22								C		
26	44	888	40	807	1.75	35	34								C		
27	74	1605	34	737	1.85	40	24								C		
28															C		
29															C		
30	52	1149	34	751	1.75	39	26								C		
31	78	1788	26	596	1.75	40	23								C		
TL		24,292		18,609		779									C		
ME	52	1104	40	846	1.75	37	30								C		

DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

AUGUST (Month), 19 81

Marshall (Municipality), Michigan

Robert J. Swahill (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15

ID | 1300294 (Plant No.) | 08 (Mo.) | 81 (Yr.) | .. (Sampling Point Code)

DAY 1 2	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification 14
	Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MLSS 34	MLVSS 39	SETTL. 44	SDI 49	DO 54	Air Applied 59	SS 64	VSS 49	Percent Return 74	80	Waste Sludge 9	
	KCF	KCF	HRS.	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu. Ft.	%	%	%	C	KGal	See Code*
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF											4				C		
01	48		3.4								175			58	C	15	
02			3.5								169			57	C	15	
03			3.3	5.1	.30	1549	1030	12.0	1.29	4.0	168	.43	63	55	C	15	
04			3.3	5.2	.32	1517	1080	12.0	1.26	5.1	170	.39	77	54	C	15	
05			3.3	5.3	.25	1554	1129	14.0	1.11	4.7	172	.45	72	55	C	15	
06			3.3	4.9	.26	1465	1111	15.0	.98	4.0	167	.46	70	53	C	15	
07			3.3	5.5	.29	1633	963	16.0	1.02	3.9	164	.46	70	54	C	15	
08			3.5								167			57	C	15	
09			3.4								166			56	C	15	
10			3.3	4.7	.26	1510	1060	15.0	1.01	3.9	163	.45	70	56	C	15	
11			3.4	5.0	.25	1567	1099	17.0	.92	4.4	162	.45	69	56	C	15	
12			3.3	5.2	.27	1663	1162	18.0	.92	3.6	162	.43	71	56	C	15	
13			3.3	5.1	.29	1658	1176	19.0	.87	3.9	160	.44	71	56	C	15	
14			3.4	5.4	.28	1715	1200	20.0	.86	4.8	160	.47	70	57	C	15	
15			3.5								161			58	C	15	
16			3.6								170			59	C	15	
17			3.4	4.9	.35	1587	1120	18.0	.88	3.1	171	.44	70	56	C	15	
18			3.4	5.1	.32	1589	1176	21.0	.76	3.2	170	.44	74	60	C	15	
19			3.4	5.4	.33	1651	1194	22.0	.75	4.2	167	.44	72	63	C	15	
20			3.5	5.0	.35	1529	1112	19.0	.80	3.7	164	.39	72	62	C	15	
21			3.5	4.8	.37	1459	1057	19.0	.76	3.4	163	.38	48	64	C	15	
22			3.6								162			66	C	15	
23			3.6								157			66	C	15	
24			3.6								156			66	C	15	
25			3.5	6.2	.32	1648	1183	27.0	.61	2.5	158	.43	72	64	C	15	
26			3.6	6.6	.29	1674	1181	30.0	.56	2.8	150	.42	70	62	C	15	
27			3.3	5.5	.37	1469	1112	23.0	.64	2.9	149	.43	71	61	C	15	
28			3.3	5.4	.37	1480	1120	26.0	.57	2.9	149	.40	70	58	C	15	
29			3.4								149			62	C	15	
30			3.3								148			60	C	15	
31			3.1	6.1	.42	1536	1103	25.0	.61	3.2	148	.43	71	57	C	15	
TL															C	465	
ME			3.4	5.3	.31	1570	1118	19.4	.86	3.7	162	.43	70	59	C	15	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

_____ Month , 19 _____ _____ Municipality , Michigan Robert J. Swalwell Superintendent's Signature

ID Plant No | Mo. | Yr. | Sampling Point Code

DAY	BOD-5			SS			TOTAL-P			VSS	NH_3-N	pH	DO	F. COLI*		T. COLI*	REMARKS
	9 14 19			24 29 34			39 44 49			54	59	64	69	74	80	9	14 19
1 2	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	mg/l	SU	mg/l	#/100 ml	C	#/100 ml	
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 31615	C	31504 31505	
SF															C		
01												7.2			C		
02	12	247	80	3	62	94	.31	6	84	2		7.3			C		
03	17	369	73	10	217	85	.68	15	63	3		7.1	5.0	2	C		
04	19	415	65	5	109	93	.36	8	84	3		7.2	5.2	2	C		
05	15	323	76	6	129	92	.31	7	85	5		7.4	3.8	2	C		
06	17	374	73	10	220	86	.33	7	84	4		7.4	5.0	2	C		
07												7.4	4.7	4	C		
08												7.4			C		
09	17	357	75	9	189	88	.37	8	82	8		7.4			C		
10	17	369	76	10	217	87	.33	7	85	5		7.2	6.5	224	C		
11	19	407	74	8	171	87	.31	7	85	6		7.3	5.3	220	C		
12	18	390	76	4	87	95	.31	7	85	2		7.2	4.9	274	C		
13	20	432	74	12	259	85	.27	6	87	10		7.3	4.4	638	C		
14												7.2	4.8	62	C		
15												7.2			C		
16	18	363	72	7	141	90	.28	6	86	2		7.2			C		
17	17	364	83	8	171	92	.32	7	85	7		7.0	6.1	38	C		
18	15	317	77	6	127	92	.25	5	90	3		7.4	4.5	30	C		
19	17	356	79	6	126	92				5		7.3	4.1	10	C		
20	12	248	78	3	62	95	.26	5	88	1		7.2	4.8	6	C		
21												7.1	4.9	26	C		
22												7.2			C		
23	18	359	83	4	80	96	.25	5	89	2		7.1			C		
24	22	440	76	2	40	97	.33	7	85	1		7.2			C		
25	19	391	78	9	185	87	.37	8	84	8		7.2	5.9	10	C		
26	20	404	77	4	81	95	.35	7	85	2		7.4	4.5	8	C		
27	20	433	82	6	130	90	.33	7	85	2		7.3	4.6	14	C		
28												7.2	4.9	44	C		
29												7.2			C		
30	19	420	71	5	110	95	.35	8	92	1		7.2			C		
31	22	505	80	8	183	86	.29	7	79	2		7.3	5.6	94	C		
TL		8283			3096			150							C		
ME	17	377	76	7	141	91	.33	7	84	4		7.2	5.0	21	C		
WA	20	425		9	185									222	C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

August, 19 81 — Month

Marshall, Michigan — Municipality

Robert J. Swahn — Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
ID	130029	08	81	
	Plant No.	Mo.	Yr.	Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX. FUEL 14	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS.	39 $FeCl_3$ LBS.	44	49	54	59
PN											
SF											
01			2280			20	199				
02			2400			20	397				
03			2400			20	199				
04			2760			10	794				
05			2640			10	596				
06			2640			20	596				
07			2640			20	794				
08			2400			10	199				
09			2400				199				
10			2520			10	397				
11			2640			10	794				
12			2640			20	596				
13			2640			20	596				
14			2640			20	596				
15			2280			20	199				
16			2400			20	397				
17			2640			20	794				
18			2760			20	596				
19			2520			10	596				
20			2160			20	397				
21			2520			20	298				
22			2160			20	496				
23			2400			10	199				
24			2280			10	199				
25			2520			20	596				
26			2400			20	596				
27			2640			20	397				
28			2520			20	397				
29			2280			20	199				
30			2280			20	199				
31			2400			10	397				
TL			76800			510	13904				
ME			2477			17	449				

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	5		840
Superintendent	1		168
Asst. Supt.	1		168
Shift Foreman			
Shift Operator	3		504
Maint. Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL

WEEKDAYS 11 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

Digester Volume, ft³
Primary _____
Secondary _____

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

R 4619
4833-5382

Supernatant To _____
Process Pattern _____

MONTH August 1981

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE					DIGESTING SLUDGE						SUPERNATANT								DIGESTED SLUDGE				Gas Produced cu. ft X
	Gals. X 100	Total Solids %	Vol. Solids %	Vol. Solids Lbs/1000 c.f. Digester	pH	Temp. °F	pH	Total Solids %	Vol. Solids %	Vol. Acids Mg/l	Alkalinity Mg/l	Gals. X	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	P Mg/l	P Lbs.	5-Day BOD Mg/l	Gals. X	Total Solids %	Vol. Solids %	pH	
1	40	3.7	77		6.0																			
2	40	3.8	71		6.1																			
3	45	4.8	63		6.1																			
4	45	3.7	80		6.1																			
5	45	4.1	67		6.2																			
6	45	4.2	76		6.4																			
7	45	5.0	70		6.2																			
8	40	3.1	56		6.2																			
9	40	3.5	74		6.1																			
10	45	3.8	83		6.1																			
11	45	4.5	79		6.2																			
12	45	5.3	69		6.1																			
13	45	3.1	80		6.1																			
14	45	5.2	42		6.0																			
15	40	4.4	71		6.1																			
16	40	4.5	64		6.2																			
17	45	4.0	85		6.1																			
18	45	2.9	70		6.1																			
19	45	4.4	32		6.2																			
20	45	4.8	72		6.1																			
21	45	5.2	68		6.0																			
22	40	4.6	76		6.1																			
23	40	4.2	76		5.9																			
24	45	4.7	73		6.1																			
25	45	3.9	83		6.0																			
26	45	4.0	64		6.1																			
27	45	4.2	81		6.0																			
28	45	4.2	75		6.0																			
29	40	2.9	73		6.1																			
30	40	3.7	64		6.1																			
31	45	5.3	70		6.1																			
TOTAL	1345																							
ARITH. MEAN	43	4.2	70																					

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH D-4.7

Marshall, MICHIGAN

MONTH August, 19 81 — VACUUM FILTER & INCINERATION DATA — OPERATOR R. J. Swalwell

DATE	SLUDGE TO FILTER				CHEMICALS TO FILTER				FILTER		FILTRATE						FILTER CAKE					INCINERATION			REMARKS
	Gal. X 100	Tot. Sol. %	Lbs. Dry Sol.	pH	Co2 Lbs. Dry	R	FeCl3 Lbs. Dry	R	Tot. Hours	Yield	Gal. X 100	pH	Sus. Solids Mg/l	Vol. Susp. Solids %	5 Day BOD Mg/l	P Mg/l	Thou. Lbs. Wet	Tot. Sol. %	Lbs. Tot. Solids X 100	Vol. Sol. %	Lbs. Vol. Solids X 100	Hrs. Opr.	Yield	Fuel BTU	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1																									
2																									
3																									
4	115	3.1	2995	6.1	1657		191		8.0		76	12.0	934	25	2280		22	21.5	47	43	20				
5	115	4.0	3869	6.1	1657		191		8.0		76	12.0	854	18	2520		29	18.9	55	47	26				
6	115	2.8	2705	6.3	1657		191		8.0		76	12.1	914	10	1800		25	17.3	43	49	21				
7	115	5.2	5023	6.3	1657		191		8.0		76	12.0	1156	11	2820		38	17.7	67	47	32				
8																									
9																									
10																									
11	115	3.5	3381	6.4	1657		191		8.0		76	11.6	1254	11	2520		26	19.3	50	53	27				
12	115	4.0	3864	6.4	1657		191		8.0		76	12.0	696	13	1920		31	18.1	56	47	26				
13	115	1.4	1352	6.3	1657		191		8.0		76	12.0	1184	10	1380		17	18.0	31	51	16				
14	115	3.6	3478	6.3	1657		191		8.0		76	11.5	806	13	2700		27	18.9	51	48	24				
15																									
16																									
17	115	4.1	3961	6.3	1657		191		8.0		76	11.6	918	37	2580		27	18.2	49	46	23				
18	115	3.3	3188	6.2	1657		191		8.0		76	12.1	952	9	420		31	18.2	56	48	27				
19	115	2.0	1932	6.2	1657		191		8.0		76	11.8	924	10	840		19	19.0	36	45	16				
20																									
21																									
22																									
23																									
24																									
25	115	2.4	2318	5.7	1657		191		8.0		76	11.9	758	10	1260		19	20.6	39	46	18				
26																									
27	115	3.9	3767	5.8	1657		191		8.0		76	12.0	990	12	2820		28	19.5	55	51	28				
28	115	3.3	3188	5.9	1657		191		8.0		76	11.9	1004	16	2760		26	18.9	49	52	26				
29																									
30																									
31	1610		45016		23198		2674		112.		1064						365		(684)		330				
Avgs	115	3.3	3215		1657		191		8.0		76		935	15	2044		26	18.9	49	48	24				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

September, 19 81
Month

Marshall, Michigan
Municipality

Robert J. Swabell
Superintendent's Signature

1 2 | 3 8 | 9 10 | 11 12 | 13 15
ID | 130079 | 09 | 81 | 600
Plant No. | Mo. | Yr. | Sampling Point Code

DAY	WEATHER		FLOW		RAW SEWAGE QUALITY											REMARKS
	TYPE	PRECIP	TOTAL	MAX RATE	TEMP	pH	BOD-5		SS		TOTAL-P		VSS	NH_3-N		
1 2	9	14	19	24	29	34	39	44	49	54	59	64	69	74	78	80	9	14
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l		C		
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610		C		
SF																C		
01	4	.02	2.70		58	7.2	94	2117	62	1396	2.25	51	50			C		
02	4	.01	2.66		58	7.3	98	2174	56	1242	2.25	50	44			C		
03	4	.44	2.63		57	7.3	110	2413	56	1228	1.90	42	44			C		
04	4	.02	2.59		57	7.2										C		
05	3		2.52		57	7.2										C		
06	3		2.45		58	7.2										C		
07	4	.08	2.52		56	7.3	122	2564	102	2144	2.10	44	90			C		
08	3		2.60		58	7.2	98	2125	72	1561	6.00	130	58			C		
09	1		2.61		58	7.2	104	2264	68	1480	2.25	49	48			C		
10	1		2.58		58	7.4	108	2323	76	1635	2.40	52	72			C		
11	1		2.58		58	7.3										C		
12	1		2.48		58	7.3										C		
13	4	.32	2.49		58	7.2	110	2284	126	2617	3.10	64	116			C		
14	1		2.56		58	7.3	98	2092	52	1110	2.00	43	48			C		
15	4	.03	2.62		58	7.3	92	2010	154	3365	3.40	74	104			C		
16	4	.26	2.54		57	7.5	140	2966	116	2457	4.50	95	86			C		
17	4	.19	2.54		58	7.5	90	1906	98	2076	2.50	53	66			C		
18	1		2.44		58	7.4										C		
19	1		2.41		58	7.4										C		
20	1		2.41		58	7.3	74	1487	80	1608	2.00	40	66			C		
21	4	.98	2.57		58	7.4	126	2701	62	1329	1.85	40	56			C		
22	1		2.54		58	7.4	108	2288	56	1186	2.70	57	44			C		
23	1		2.53		57	7.4	102	2152	36	760	2.20	46	30			C		
24	4	.05	2.54		57	7.3	58	1229	42	890	1.85	39	26			C		
25	4	.14	2.51		57	7.3										C		
26	4	.40	2.57		57	7.3										C		
27	1		2.44		57	7.1	96	1954	48	977	2.00	41	46			C		
28	1		2.48		57	7.3	88	1820	66	1365	1.85	38	54			C		
29	4	1.16	2.54		57	7.3	98	2076	66	1398	2.00	42	52			C		
30	4	.71	2.86		57	7.2	60	1431	50	1193	3.55	85	30			C		
31																C		
TL		4.78	76.51					44396		31537		1175				C		
ME			2.55				99	2113	74	1502	2.60	56	59			C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

September, 19 81
Month

Marshall
Municipality, Michigan

Robert F. Swalwell
Superintendent's Signature

ID 130029 09 81 ..
Plant No Mo Yr Sampling Point Code

DAY	BOD 5		SS		TOTAL P		VSS	NH_3-N	REMARKS OR OTHER PARAMETERS									
	9 14		19 24		29 34		39	44	49	54	59	64	69	74	78	80	9	14
1 2	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l								C		
PN	00310	85001	00530	85002	00665	85004	00535	00610								C		
SF																C		
01	56	1261	48	1081	1.85	42	38									C		
02	72	1597	52	1154	1.90	42	44									C		
03	74	1623	52	1141	1.85	41	38									C		
04																C		
05																C		
06																C		
07	60	1261	40	841	1.85	39	34									C		
08	62	1344	36	781	4.20	91	28									C		
09	80	1741	50	1088	2.10	46	32									C		
10	58	1248	46	990	2.00	43	42									C		
11																C		
12																C		
13	70	1454	36	748	1.75	36	26									C		
14	52	1110	34	726	1.60	34	26									C		
15	82	1792	32	699	1.60	35	24									C		
16	62	1313	36	763	1.75	37	24									C		
17	60	1271	44	932	1.55	33	36									C		
18																C		
19																C		
20	58	1229	42	890	1.85	39	36									C		
21	96	2058	34	729	1.55	33	24									C		
22	62	1313	36	763	1.60	34	26									C		
23	70	1477	26	549	1.85	39	16									C		
24	38	805	42	890	1.50	32	30									C		
25																C		
26																C		
27	70	1424	30	610	1.50	31	26									C		
28	68	1406	38	786	1.50	31	26									C		
29	62	1313	38	805	1.60	34	28									C		
30	52	1240	42	1002	1.85	44	28									C		
31																C		
TL		29280		17968		836										C		
ME	65	1394	40	856	1.85	40	30									C		

DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

September, 19 81 (Month) — Marshall (Municipality), Michigan — Robert J. Swihart (Superintendent's Signature)

1 2 | 3 8 | 9 10 | 11 12 | 13 15
ID | 130029 | 09 | 81 | ..
Plant No. | Mo. | Yr. | Sampling Point Code

DAY 1 2	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification 14
	Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MLSS 34	MLVSS 39	SETTL. 44	SDI 49	DO 54	Air Applied 59	SS 64	VSS 49	Percent Return 74	80	Waste Sludge 9	
	KCF	KCF	HRS.	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu. Ft.	%	%	%	C	KGal	See Code*
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF											4				C		
01	48		3.2	5.9	.39	1573	1125	30.0	.52	3.5	145	.45	71	55	C	15	
02			3.2	4.6	.49	1309	903	24.0	.58	4.1	168	.50	71	45	C	15	
03			3.3	6.1	.39	1775	1295	42.0	.42	3.4	171	.52	73	50	C	15	
04			3.3	6.8	.34	1995	1399	36.0	.55	3.9	176	.39	73	48	C	15	
05			3.4								176			49	C	15	
06			3.5								176			51	C	15	
07			3.4								173			57	C	15	
08			3.3	5.2	.44	1550	1093	21.0	.74	3.6	178	.46	69	55	C	15	
09			3.3	5.5	.41	1728	1216	22.0	.79	3.2	176	.48	65	53	C	15	
10			3.3	5.2	.41	1712	1224	23.0	.74	2.1	166	.50	71	52	C	15	
11			3.3								157			52	C	15	
12			3.5								164			54	C	15	
13			3.5								160			53	C	15	
14			3.4	5.2	.42	1560	1133	25.6	6.2	4.3	168	.50	71	52	C	15	
15			3.3	5.2	.47	1475	1060	22.0	6.7	3.2	172	.46	66	53	C	15	
16			3.4	5.5	.41	1556	1156	22.0	.71	3.9	171	.48	71	51	C	15	
17			3.4	5.5	.42	1503	1103	24.0	.63	3.4	173	.43	73	51	C	15	
18			3.5	5.6	.42	1478	1120	26.0	.57	4.1	173	.42	70	56	C	15	
19			3.6								167			56	C	15	
20			3.6								172			56	C	15	
21			3.4	7.6	.34	1988	1434	70.0	.28	2.3	195	.57	71	61	C	15	
22			3.4	8.5	.33	2154	1419	79.0	.27	4.3	209	.55	69	64	C	15	
23			3.4	8.8	.34	2128	1444	48.0	.44	3.6	208	.57	68	64	C	15	
24			3.4	7.6	.34	1915	1310	48.0	.40	3.2	193	.50	69	65	C	15	
25			3.4	7.1	.36	1800	1263	33.0	.55	3.5	184	.45	69	59	C	15	
26			3.4								159			57	C	15	
27			3.5								184			66	C	15	
28			3.5	6.8	.40	1643	1140	26.0	.63	4.2	190	.49	68	60	C	15	
29			3.4	6.4	.43	1607	1104	22.0	.73	4.6	177	.44	67	59	C	15	
30			3.0	6.0	.42	1711	1154	23.0	.74	3.1	165	.50	65	52	C	15	
31															C		
TL															C	450	
ME			3.4			1707	1205	33.3	.58	3.6	175	.48	70	55	C	15	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

September, 19 81 — Month

Marshall, Michigan — Municipality

Robert J. Sunbull — Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
ID	13 00 29	09	81	
	Plant No.	Mo.	Yr.	Sampling Point Code

DAY	BOD-5 (21)			SS (21)			TOTAL-P (21)			VSS (21)	NH_3-N	pH (36)	DO (20)	F. COLI* (18)		T. COLI*	REMAR
	9	14	19	24	29	34	39	44	49	54	59	64	69	74	80	9	14
1 2	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	mg/l	SU	mg/l	#/100 ml	C	#/100 ml	
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 31615	C	31504 31505	
SF															C		
01	22	495	77	8	180	87	.74	17	67	7		7.2	4.8	136	C		
02	21	466	79	20	443	64	.40	9	82	14		7.3	4.8	476	C		
03	22	482	80	9	197	84	.32	7	83	7		7.3	4.4	96	C		
04												7.2	6.0	12	C		
05												7.2			C		
06												7.3			C		
07	24	504	80	8	168	92	.31	7	85	6		7.2			C		
08	16	347	84	7	152	90	2.00	43	67	5		7.1	5.1	90	C		
09	20	435	81	11	239	84	.56	12	75	5		7.2	5.4	182	C		
10	18	387	83	9	194	88	.45	10	81	7		7.4	5.0	100	C		
11												7.3			C		
12												7.3			C		
13	7	145	94	5	104	96	.32	7	90	4		7.4			C		
14	12	256	88	2	43	96	.27	6	87	1		7.3	6.5	86	C		
15	15	328	84	4	87	97	.32	7	91	1		7.4	6.2	140	C		
16	17	360	88	11	233	91	.37	8	92	8		7.4	6.5	12	C		
17	14	297	84	8	196	92	.33	7	87	5		7.4	6.4	T	C		
18												7.3	7.0	48	C		
19												7.4			C		
20	14	281	81	8	161	90	.27	5	87	6		7.4			C		
21	24	514	84	6	129	90	.22	5	88	4		7.3	5.2	14	C		
22	21	445	81	6	127	89	.20	4	93	4		7.2	6.2	4	C		
23	14	295	86	4	84	89	.29	6	87	2		7.3	7.1	22	C		
24	15	318	74	3	64	93	.28	6	85	2		7.3	5.6	6	C		
25												7.3	4.1	34	C		
26												7.3			C		
27	13	265	86	3	61	94	.22	4	89	2		7.2			C		
28	19	393	81	10	207	85	.28	6	90	6		7.1	7.4	86	C		
29	23	487	77	9	191	86	.37	8	82	7		7.2	7.2	240	C		
30	23	549	62	9	215	82	.47	11	87	7		7.2	5.3	T	C		
31															C		
TL		8076			3475			195							C		
ME	18	385	82	8	165	89	.43	9	85	5		7.2	5.9	50	C		
WA	21	487		11	247									93	C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

September, 19 81 (Month) — Marshall (Municipality), Michigan — Robert J. Sunshell (Superintendent's Signature)

1 2 ID | 3 8 130029 (Plant No.) | 9 10 09 (Mo.) | 11 12 81 (Yr.) | 13 15 (Sampling Point Code)

DAY 1 2	GRIT 9 CF	AUX. FUEL 14	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS.	39 $FeCl_3$ LBS.	44	49	54	59
PN											
SF											
01			2520			10	596				
02			2640			30	596				
03			2640			20	397				
04			2400			10	397				
05			2400			20	199				
06			2400			20	397				
07			2400			20	199				
08			2640			20	496				
09			2640			20	695				
10			2640			10	794				
11			2520			20	596				
12			2400			10	199				
13			2280			20	199				
14			2520			10	596				
15			2640			20	596				
16			2520			20	596				
17			2520			20	596				
18			2400			20	397				
19			2280			10	199				
20			2400			20	199				
21			2640			20	596				
22			2520			20	199				
23			2640			10	397				
24			2640			10	397				
25			2400			10	397				
26			2160			10	397				
27			2400			10	199				
28			2520			20	397				
29			2760			10	397				
30			2640			10	794				
31											
TL			75,120			480	13109				
ME			2504			16	437				

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	5		844
Superintendent	1		168
Asst. Supt.	1		168
Shift Foreman			
Shift Operator	3		508
Maint. Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL A

WEEKDAYS 11 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

Digester Volume, ft³
Primary _____
Secondary _____

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

Supernatant To _____
Process Pattern _____

R 4619
4833-5382

MONTH September 1981

DIGESTER AND SLUDGE DATA

OPERATOR R. J. Swalwell

DATE	RAW SLUDGE					DIGESTING SLUDGE						SUPERNATANT								DIGESTED SLUDGE				Gas Produced cu. ft X
	Gals. X 100	Total Solids %	Vol. Solids %	Vol. Solids Lbs/1000 c.f. Digester	pH	Temp. °F	pH	Total Solids %	Vol. Solids %	Vol. Acids Mg/l	Alkalinity Mg/l	Gals. X	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	P Mg/l	P Lbs.	5 Day BOD Mg/l	Gals X	Total Solids %	Vol. Solids %	pH	
1	45	4.2	65		6.0																			
2	45	4.3	79		5.9																			
3	41	5.3	70		5.8																			
4	45	6.1	66		6.0																			
5	50	4.5	76		5.9																			
6	40	4.3	25		6.2																			
7	40	4.3	83		6.1																			
8																								
9	107	8.8	52		5.9																			
10	40	5.9	63		6.2																			
11	20	5.2	68		6.0																			
12	30	5.4	66		6.0																			
13	45	5.3	70		5.9																			
14	45	4.9	60		5.9																			
15	45	4.5	70		5.9																			
16	45	4.2	79		5.9																			
17																								
18	45	5.2	69		5.8																			
19	40	4.5	60		5.9																			
20	40	4.6	59		5.8																			
21	45	5.4	64		5.8																			
22	45	3.0	60		5.8																			
23	45	5.3	68		5.9																			
24	45	5.0	70		5.8																			
25	45	4.6	86		5.9																			
26	40	4.2	80		5.9																			
27	40	4.7	70		5.9																			
28	45	4.6	78		5.7																			
29	45	4.9	65		5.9																			
30	45	4.5	64		5.8																			
31																								
TOTAL	1298																							
MTH. MEAN	46	4.9	67																					

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-47

Marshall , MICHIGAN

MONTH September , 19 81 — VACUUM FILTER & INCINERATION DATA — OPERATOR R. J. Swalwell

SLUDGE TO FILTER				CHEMICALS TO FILTER				FILTER		FILTRATE						FILTER CAKE					INCINERATION			REMARKS
Gal. X 100	Tot. Sol. %	Lbs. Dry Sol.	pH	Lbs. Dry	R	Lbs. Dry	R	Tot. Hours	Yield	Gal. X 100	pH	Sus. Solids Mg/l	Vol. Susp. Solids %	5 Day BOD Mg/l	P Mg/l	Thou. Lbs. Wet	Tot. Sol. %	Lbs. Tot. Solids X 100	Vol. Sol. %	Lbs. Vol. Solids X 100	Hrs. Opr.	Yield	Fuel BTU	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
108	4.2	3810	5.9	1667		191		8.0		76	8.3	936	10	2760		27	20.0	54	48	26				
108	4.3	3900	5.9	1667		191		8.0		76	8.7	968	11	2040		28	19.6	55	42	23				
108	4.9	4445	6.0	1667		191		8.0		76	10.9	804	15	1740		30	20.5	62	41	25				
108	4.0	3629	5.7	1667		191		8.0		76	9.7	940	16	2280		26	20.1	52	48	25				
108	3.8	3447	6.0	1667		191		8.0		76	12.2	772	10	2220		26	20.0	52	44	23				
108	3.9	3538	5.9	1667		191		8.0		76	12.2	688	23	1620		26	20.4	53	44	23				
108	4.5	4082	5.9	1667		191		8.0		76	12.1	850	12	3120		28	20.8	58	44	26				
108	4.2	3810	5.9	1667		191		8.0		76	12.1	880	15	2220		29	18.8	55	48	26				
108	3.8	3447	5.7	1667		191		8.0		76	7.6	858	13	3240		31	16.3	51	42	21				
108	4.5	4082	5.7	1667		191		8.0		76	10.3	658	9	3780		32	17.9	57	50	29				
108	4.5	4082	5.6	1667		191		8.0		76	8.1	758	13	4080		34	16.7	57	51	29				
108	4.5	4082	5.6	1667		191		8.0		76	8.1	778	15	4080		33	17.2	57	48	27				
1296		46354		20004		2292		96		912						350		663		303				
108	4.3	3863		1667		191		8.0		76		824	14	2765		29	19.0	55	46	25				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

October, 1981 — Month

Marshall, Michigan — Municipality

Robert J. Swalwell — Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
ID	130029	10	81	500
	Plant No.	Mo.	Yr.	Sampling Point Code

DAY 1 2	WEATHER TYPE 9	WEATHER PRECIP. 14	FLOW TOTAL 19	FLOW MAX RATE 24	RAW SEWAGE QUALITY TEMP 29	pH 34	BOD-5 39	BOD-5 44	SS 49	SS 54	TOTAL-P 59	TOTAL-P 64	VSS 69	NH_3-N 74 78	80	REMARKS O 9	14
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l	C		
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C		
SF															C		
01	4	.03	2.78		57	7.3	32	742	42	974	2.00	46	36		C		
02	3		2.73		57	7.3									C		
03	4	.02	2.66		57	7.3									C		
04	3		2.63		57	7.2	100	2193	88	1930	1.75	38	72		C		
05	4	.04	2.71		57	7.8	96	2170	58	1311	1.70	38	42		C		
06	4	.02	2.67		57	7.0	80	1781	60	1336	1.90	42	52		C		
07	3		2.66		57	7.3	64	1420	70	1553	1.85	41	52		C		
08	1		2.61		57	7.3	132	2873	66	1437	2.10	46	60		C		
09	1		2.58		57	7.2									C		
10	1		2.49		57	7.3									C		
11	1		2.53		57	7.2	108	2279	64	1350	2.00	42	52		C		
12	1		2.57		57	7.4	84	1800	72	1543	2.10	45	56		C		
13	1		2.55		57	7.3	68	1446	66	1404	2.20	47	44		C		
14	4	.15	2.57		57	7.4	124	2658	48	1029	2.50	54	38		C		
15	1		2.52		57	7.6	108	2270	94	1976	2.30	48	78		C		
16	1		2.50		57	7.4									C		
17	4	1.02	2.50		57	7.3									C		
18	4	.25	2.52		57	7.3	88	1849	54	1135	2.70	57	38		C		
19	3		2.58		56	7.3	66	1420	52	1119	2.25	48	34		C		
20	1		2.61		56	7.4	110	2394	68	1480	2.40	52	52		C		
21	4	.52	2.64		56	7.6	80	1761	66	1453	2.40	53	58		C		
22	4	.04	2.62		56	7.6	112	2447	26	568	2.20	48	38		C		
23	5	.02	2.55		56	7.0									C		
24	1		2.59		56	7.0									C		
25	1		2.51		56	7.3	84	1758	60	1256	2.10	44	44		C		
26	4	.10	2.60		56	7.4	58	1258	46	997	2.00	43	30		C		
27	4	.30	2.67		56	7.4	46	1024	44	980	2.25	50	34		C		
28	1		2.61		56	7.3	58	1263	74	1611	2.40	52	48		C		
29	1		2.62		56	7.0	90	1967	60	1311	2.50	55	30		C		
30	1		2.51		56	7.3									C		
31	1		2.49		56	7.2									C		
TL		2.51	80.38					38773		27753		989			C		
ME			2.59				85	1846	61	1322	2.17	47	47		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

October (Month), 19 81

Marshall (Municipality), Michigan

Robert J. Swalwell
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID | 130029 | 10 | 81 | ..
Plant No. | Mo. | Yr. | Sampling Point Code

DAY	BOD-5 9 14		SS 19 24		TOTAL-P 29 34		VSS 39	NH_3-N 44	REMARKS OR OTHER PARAMETERS 49	54	59	64	69	74 78	80	9	14
1 2	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l							C		
PN	00310	85001	00530	85002	00665	85004	00535	00610							C		
SF															C		
01	38	881	30	696	1.55	36	24								C		
02															C		
03															C		
04	56	1228	44	965	1.55	34	40								C		
05	68	1537	32	723	1.40	32	24								C		
06	52	1158	44	980	1.60	35	26								C		
07	46	1020	32	710	1.50	33	22								C		
08	88	1916	44	958	1.70	37	34								C		
09															C		
10															C		
11	84	1722	40	844	1.55	33	36								C		
12	34	729	52	1115	1.75	38	34								C		
13	52	1106	40	851	1.75	37	24								C		
14	96	2058	38	814	1.85	40	30								C		
15	74	1555	34	715	1.90	40	28								C		
16															C		
17															C		
18	58	1219	32	673	1.75	37	22								C		
19	50	1076	26	559	1.85	40	14								C		
20	100	2177	38	827	1.75	38	24								C		
21	60	1321	40	881	1.85	41	34								C		
22	98	2141	32	699	1.85	40	28								C		
23															C		
24															C		
25	54	1130	28	586	1.60	33	20								C		
26	36	780	38	824	1.75	38	28								C		
27	24	534	48	1069	2.00	46	30								C		
28	46	1001	48	1045	2.00	44	34								C		
29	68	1486	52	1136	2.10	46	26								C		
30															C		
31															C		
TL		27,775		17,670											C		
ME	61	1323	39	841	1.74	38	28								C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

OCTober (Month), 19 81

Marshall (Municipality), Michigan

Robert J. Swalwell
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID | 130029 | 10 | 81 | ...
Plant No. Mo. Yr. Sampling Point Code

DAY 1 2	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification 14
	Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MLSS 34	MLVSS 39	SETTL. 44	SDI 49	DO 54	Air Applied 59	SS 64	VSS 49	Percent Return 74	8C	Waste Sludge 9	
	KCF	KCF	HRS.	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu. Ft.	%	%	%	C	KGal	See Code*
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF											4				C		
01			3.1	7.0	.34	1883	1310	25.0	.75	2.5	168	.54	64	57	C	15	
02			3.2	7.8	.30	2078	1438	31.0	.67	3.0	172	.55	69	58	C	15	
03			3.2								173			60	C	15	
04			3.3								165			58	C	15	
05			3.2	8.3	.28	2269	1614	53.0	.43	3.4	162	.62	70	64	C	15	
06			3.2	8.4	.25	2383	1681	84.0	.28	2.4	167	.58	69	67	C	15	
07			3.2	8.3	.25	2267	1599	26.0	.87	3.2	171	.56	69	55	C	15	
08			3.3	6.9	.25	1910	1650	20.0	.96	4.8	171	.53	69	51	C	15	
09			3.3	6.5	.29	1762	1410	20.0	.88	2.2	169	.52	69	53	C	15	
10			3.5								170			49	C	15	
11			3.4								171			48	C	15	
12			3.4	4.3	.47	1296	937	22.0	.59	5.0	180	.40	71	58	C	15	
13			3.4	8.9	.43	1391	1013	24.0	.63	4.8	182	.37	72	61	C	15	
14			3.4	4.9	.44	1449	1055	24.0	.60	4.6	180	.36	72	60	C	15	
15			3.4	5.3	.43	1502	1108	14.0	1.07	3.9	181	.41	73	62	C	15	
16			3.4	5.2	.45	1441	1049	14.0	1.03	4.9	183	.38	71	63	C		
17			3.4								174			62	C		
18			3.4								182			60	C		
19			3.3	5.1	.47	1375	979	13.0	1.05	4.0	183	.40	71	58	C		
20			3.3	5.8	.42	1616	1140	15.0	1.08	2.9	179	.46	69	57	C		
21			3.3	7.3	.38	1866	1345	18.0	1.04	2.6	186	.54	71	54	C		
22			3.3	8.1	.39	2009	1441	21.0	.96	2.9	187	.56	70	60	C		
23			3.4	8.7	.32	2099	1489	23.0	.91	3.2	191	.57	70	62	C		
24			3.3								198			64	C		
25			3.4								183			57	C		
26			3.3	10.3	.31	2485	1537	21.0	.96	2.4	178	.55	67	74	C	15	
27			3.2	8.8	.29	2242	1565	25.0	.90	3.0	184	.32	70	72	C	15	
28			3.3	8.0	.35	2157	1509	24.0	.90	2.1	184	.53	69	73	C	15	
29			3.3	7.9	.25	2248	1542	27.0	.83	2.2	182	.54	69	74	C	15	
30			3.4	7.6	.26	2168	1508	25.0	.87	2.3	191	.60	70	62	C	15	
31			3.5								194			59	C	15	
TL															C	306	
ME			3.3	7.2	.35	1900	1362	26.0	.83	3.3	179	.50	70	60	C	15	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

_____ Month , 19 _____ _____ Municipality , Michigan _____ Superintendent's Signature

1 2 (ID) 3 · 8 Plant No. 9 10 Mo. 11 12 Yr. 13 15 Sampling Point Code

DAY	BOD-5			SS			TOTAL-P			VSS	NH_3-N	pH	DO	F. COLI*		T. COLI*	REMARKS
	9	14	19	24	29	34	39	44	49	54	59	64	69	74	80	9	14 19
1 2	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	mg/l	SU	mg/l	#/100 ml	C	#/100 ml	
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 31615	C	31504 31505	
SF															C		
01	18	417	44	11	255	74	.40	9	80	6		7.2	6.0		C		
02												7.2	5.8	82	C		
03												7.2			C		
04	20	439	80	14	307	84	.32	7	82	11		7.1			C		
05	15	339	84	4	90	93	.17	4	90	3		7.4	5.5	188	C		
06	23	512	71	8	178	87	.31	7	84	6		7.0	5.1	92	C		
07	17	377	73	2	44	97	.20	4	89	1		7.4	5.5	246	C	99	
08	23	501	83	5	109	92	.30	7	86	3		7.3	6.9	24	C		
09												7.2	3.1	72	C		
10												7.3			C		
11	20	422	81	11	232	83	.33	7	84	9		7.3			C		
12	23	493	73	12	257	83	.32	7	85	5		7.3	7.3	90	C		
13	23	489	66	9	191	86	.37	8	83	4		7.3	6.7	70	C		
14	23	493	79	4	86	92	.37	8	85	3		7.3	5.9	28	C		
15	25	525	77	6	126	94	.38	8	83	5		7.6	6.0	40	C		
16												7.2	6.5	64	C		
17												7.2			C		
18	21	441	76	10	210	81	.50	11	81	4		7.3			C		
19	23	495	65	5	108	90	.39	8	83	1		7.2	6.4	126	C		
20	25	544	77	12	261	82	.58	13	76	5		7.3	4.9	110	C		
21	23	506	71	11	242	83	.49	11	80	8		7.5	4.3	40	C		
22	23	503	79	6	131	88	.81	18	63	2		7.3	4.2	150	C	95	
23												7.1	4.5	92	C		
24												7.0			C		
25	18	377	79	1	21	98	.18	4	91	1		7.1			C		
26	10	217	83	3	65	93	.20	4	90	2		7.3	4.9	36	C		
27	5	111	89	1	22	98	.19	4	92	1		7.4	4.5	118	C		
28	13	283	79	5	109	93	.20	4	92	3		7.2	4.0	24	C		
29	23	503	74	5	109	92	.20	4	92	3		6.8	4.0	14	C		
30												7.3	5.1	12	C		
31												7.1			C		
TL		8987			3153			157							C		
ME	20	428	75	7	150	89	.34	7	84	4		7.2	5.3	61	C		
WA	23	502		9	190									95	C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

October , 19 81
Month

Marshall , Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2 | 3 8 | 9 10 | 11 12 | 13 15
ID | 130029 | 10 | 81 | [ ]
Plant No. | Mo. | Yr. | Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX. FUEL 14	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS.	39 $FeCl_3$ LBS.	44	49	54	59
PN											
SF											
01			2760			20	794				
02			2520			20	596				
03			2520			20	199				
04			2280			10	298				
05			2400			10	397				
06			2640			20	397				
07			2640			30	695				
08			2400			10	397				
09			2520			10	397				
10			2400			20	347				
11			2280			20	446				
12			2520			20	298				
13			2640			20	596				
14			2640			20	596				
15			2520			20	397				
16			2520			20	397				
17			2520			20	199				
18			2400			20	199				
19			2640			20	496				
20			2760			10	596				
21			2760			20	695				
22			2760			20	596				
23			2760			10	298				
24			2760			20	298				
25			2640			10	397				
26			2760			20	596				
27			2640			10	596				
28			2640			10	596				
29			2640			10	596				
30			2520			10	397				
31			2400			10	397				
TL			79800			510	14299				
ME			2574			16	461				

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	5		880
Superintendent	1		176
Asst. Supt.	1		176
Shift Foreman			
Shift Operator	3		528
Maint. Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL A

WEEKDAYS 11 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

GROUNDWATER MONITORING SHEET

August, 19 81 — Month
Marshall — Municipality, MICHIGAN
Robert J. Swahell — Superintendent's Signature

Precipitation for the last 30 days 4.56 inches

Samples Collected By: _____

Samples Analyzed By: _____

1 2 4 9 10 11 12 13 14 15
IG | 1,3,0,0,2,9 | 08 | 24 | 81
Facility No. Mo. Day Year of Sample Collection

WELL NO. 1 3	STATIC WATER ELEVATION Ft. 10	CHLORIDE mg/l 15	SPEC. COND. Umho/cm 20	pH SU 25	T. HARD as $CaCO_3$ mg/l 30	T. ALK. as $CaCO_3$ mg/l 35	NH_3-N mg/l 40	NO_3-N mg/l 45	NO_2-N mg/l 50	TOTAL-P mg/l 55	MBAS mg/l 60	COD mg/l 65	REMARKS OR OTHER PA 70 75 79	80	10 15
P,N,b	72020	00940	00095	00400	00900	00410	00610	00620	00615	00665	38260	00335		C	
S,F,b														C	
		32	625	7.5	341	256	<0.01			<0.06	<0.025	4		C	
														C	
														C	
														C	
														C	
														C	
														C	
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														C	
														C	
														C	

Digester Volume, ft³
Primary
Secondary

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

R 4619
4833-5382

Supernatant To
Process Pattern

MONTH October 1981

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE					DIGESTING SLUDGE						SUPERNATANT								DIGESTED SLUDGE				Gas Produced cu. ft X
	Gals. X 100	Total Solids %	Vol. Solids %	Vol. Solids Lbs/1000 c.f. Digester	pH	Temp. °F	pH	Total Solids %	Vol. Solids %	Vol. Acids Mg/l	Alkalinity Mg/l	Gals. X	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	P Mg/l	P Lbs.	5-Day BOD Mg/l	Gals. X	Total Solids %	Vol. Solids %	pH	
1	45	4.4	65		5.6																			
2	45	4.3	74		5.5																			
3	40	4.6	72		5.4																			
4	40	5.0	66		5.2																			
5	45	4.5	77		5.4																			
6	45	4.2	80		5.8																			
7	45	4.3	67		6.1																			
8	45	4.1	72		6.2																			
9	45	4.4	58		6.3																			
10	40	4.2	61		6.5																			
11	40	5.0	65		6.4																			
12	45	3.2	50		6.4																			
13	45	4.8	79		6.4																			
14	45	4.7	73		6.4																			
15	45	4.6	71		6.5																			
16	45	4.7	81		6.1																			
17	40	4.2	80		6.1																			
18	40	4.4	89		6.1																			
19	45	4.9	65		5.9																			
20	45	4.6	69		5.9																			
21	45	5.9	77		6.1																			
22	45	4.9	71		5.9																			
23	45	5.1	68		5.8																			
24	40	5.5	67		5.6																			
25	40	2.1	82		5.9																			
26																								
27																								
28																								
29	45	5.2	72		6.1																			
30	45	3.7	68		6.3																			
31	40	4.5	65		6.2																			
TOTAL	1215																							
ARITH. MEAN	43	4.5	71																					

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH D-4.7

Marshall, MICHIGAN

MONTH October, 19 81 — VACUUM FILTER & INCIRATION DATA — OPERATOR R.J. Swalwell

TE	SLUDGE TO FILTER				CHEMICALS TO FILTER				FILTER		FILTRATE						FILTER CAKE					INCINERATION			REMARKS
	Gal. X 100	Tot. Sol. %	Lbs. Dry Sol.	pH	CaO Lbs. Dry	R	$FeCl_3$ Lbs. Dry	R	Tot. Hours	Yield	Gal. X 100	pH	Sus. Solids Mg/l	Vol. Susp. Solids %	5 Day BOD Mg/l	P Mg/l	Thou. Lbs. Wet	Tot. Sol. %	Lbs. Tot. Solids X 100	Vol. Sol. %	Lbs. Vol. Solids X 100	Hrs. Opr.	Yield	Fuel BTU	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1	93	4.2	3281	5.5	1538		191		8.0		76	8.1	890	7	2520		27	18.0	49	48	23				
2	93	4.9	3828	5.5	1538		191		8.0		76	8.5	1170	11	2820		29	18.5	54	45	24				
3																									
4																									
5																									
6	93	4.8	3750	5.8	1538		191		8.0		76	12.1	892	12	3960		36	14.8	53	48	26				
7	93	4.7	3672	5.8	1538		191		8.0		76	12.0	976	9	3480		29	17.8	52	54	28				
8																									
9	93	4.2	3281	5.7	1538		191		8.0		76	11.9	1148	17	3600		26	18.6	48	48	33				
10																									
11																									
12																									
13	93	4.3	3359	6.0	1538		191		8.0		76	11.7	770	10	3120		26	19.0	49	50	24				
14	93	4.7	3672	6.1	1538		191		8.0		76	10.9	612	21	2640		26	20.0	52	47	24				
15	93	4.3	3359	6.5	1538		191		8.0		76	12.5	764	20	2700		25	19.3	48	43	21				
16																									
17																									
18																									
19																									
20	93	4.9	3828	5.5	1538		191		8.0		76	9.1	886	12	3480		26	20.6	53	51	27				
21	93	4.0	3125	6.3	1538		191		8.0		76	12.5	822	11	2100		25	18.6	47	46	21				
22	93	5.5	4297	6.0	1538		191		8.0		76	12.3	822	21	2460		31	19.1	59	51	30				
23																									
24																									
25																									
26																									
27	93	4.1	3203	5.8	1538		191		8.0		76	12.0	766	31	900		26	18.3	48	54	26				
28																									
29	93	7.7	6015	6.0	1538		191		8.0		76	12.2	720	8	3120		31	24.0	74	41	31				
30																									
31																									
Total	1209		47870		19994		2483		104		988						363		686		328				
Avg. Days	93	4.8	3744		1538		191		8.0		76		864	15	2838		28	19.0	53	48	25				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

November, 1981 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
ID | 130029 (Plant No.) | 11 (Mo) | 81 (Yr.) | 500 (Sampling Point Code)

DAY 1 2	WEATHER TYPE 9	WEATHER PRECIP. 14	FLOW TOTAL 19	FLOW MAX RATE 24	RAW SEWAGE QUALITY TEMP 29	pH 34	BOD-5 39 44		SS 49 54		TOTAL-P 59 64		VSS 69	NH_3-N 74 78	80	REMARKS 9	14
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l	C		
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C		
SF															C		
01	1		2.49		56	7.2	40	831	40	831	2.40	50	32		C		
02	1		2.58		56	7.2	60	1291	90	1937	2.40	52	76		C		
03	1		2.61		56	7.4	72	1567	54	1175	2.00	44	32		C		
04	4	.10	2.58		55	7.4	110	2367	68	1463	2.95	63	54		C		
05	4	.04	2.55		53	7.4	86	1829	66	1404	2.30	49	62		C		
06	3		2.52		55	7.3									C		
07	1		2.42		55	7.2									C		
08	1		2.43		54	7.3	68	1378	46	932	2.25	46	42		C		
09	1		2.50		54	7.3	60	1251	66	1376	2.25	47	40		C		
10	1		2.51		54	7.4	100	2093	60	1256	2.25	47	40		C		
11	1		2.47		54	7.4	96	1978	64	1318	2.40	49	56		C		
12	1		2.47		54	7.4	86	1772	60	1236	2.40	49	40		C		
13	1		2.41		54	7.3									C		
14	1		2.36		54	7.2									C		
15	1		2.36		54	7.3	66	1299	118	2323	2.70	53	70		C		
16	1		2.46		54	7.6	102	2093	80	1641	2.10	43	74		C		
17	4	.03	2.45		54	7.3	98	2002	132	2697	3.05	62	104		C		
18	4	.07	2.41		54	7.2	80	1608	60	1206	3.40	68	48		C		
19	4+5	.82	2.49		54	7.4	104	2160	48	997	2.60	54	38		C		
20	5	.07	2.51		54	7.4									C		
21	5	.02	2.40		54	7.3									C		
22	1		2.43		53	7.3	104	2108	88	1783	2.25	46	60		C		
23	5	.04	2.57		53	7.5	106	2272	66	1415	2.10	45	48		C		
24	1		2.50		53	7.1	80	1668	60	1251	2.10	44	46		C		
25	3		2.47		53	7.5									C		
26	4	.79	2.37		53	7.4									C		
27	3		2.43		53	7.4									C		
28	3		2.40		52	7.3									C		
29	3		2.44		52	7.3	112	2279	140	2849	2.30	47	106		C		
30	4	.08	2.50		53	7.3	112	2335	52	1084	1.90	40	36		C		
31															C		
TL		2.06	7409					36199		30184		998			C		
ME			2.47				87	1810	73	1509	2.41	50	55		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

November, 19 81 — Month

Marshall, Michigan — Municipality

Robert J. Swalwell — Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
ID	130029	11	81	
	Plant No.	Mo	Yr.	Sampling Point Code

DAY	BOD-5		SS		TOTAL-P		VSS	NH_3-N	REMARKS OR OTHER PARAMETERS								
	9	14	19	24	29	34	39	44	49	54	59	64	69	74	78 80	9	14
1 2	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l							C		
PN	00310	85001	00530	85002	00665	85004	00535	00610							C		
SF															C		
01	32	665	42	872	1.70	35	32								C		
02	34	732	22	473	2.00	43	16								C		
03	58	1263	38	827	1.85	40	26								C		
04	100	2152	50	1076	2.50	54	36								C		
05	68	1446	50	1064	2.00	43	44								C		
06															C		
07															C		
08	48	973	42	851	1.70	40	36								C		
09	40	834	48	1001	2.10	44	34								C		
10	84	1758	22	461	1.90	40	18								C		
11	84	1730	50	1030	2.00	41	40								C		
12	76	1566	60	1236	2.00	41	44								C		
13															C		
14															C		
15	54	1063	54	1063	2.00	39	30								C		
16	80	1641	42	862	1.85	38	34								C		
17	90	1839	56	1144	2.10	43	42								C		
18	52	1045	44	884	3.15	63	36								C		
19	52	1080	38	789	2.30	48	26								C		
20															C		
21															C		
22	74	1500	40	811	2.00	41	30								C		
23	84	1800	52	1115	1.75	38	42								C		
24	60	1251	48	1001	1.90	40	34								C		
25															C		
26															C		
27															C		
28															C		
29	96	1954	42	855	1.75	36	32								C		
30	80	1668	34	709	1.70	35	26								C		
31															C		
TL		27960		18124		842									C		
ME	67	1398	44	906	2.01	42	33								C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

November, 1981 (Month) — Marshall (Municipality), Michigan — Robert J. Swahuk (Superintendent's Signature)

ID 130029 (Plant No) 11 (Mo) 81 (Yr) ... (Sampling Point Code)

DAY 1 2	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification 14
	Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MLSS 34	MLVSS 39	SETTL 44	SDI 49	DO 54	Air Applied 59	SS 64	VSS 49	Percent Return 74	8C	Waste Sludge 9	
	KCF	KCF	HRS	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu Ft	%	%	%	C	KGal	See Code
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF											4				C		
01	48		3.5								191			59	C	15	
02			3.3	6.3	.21	1793	1448	17.0	1.05	4.3	195	52	74	56	C	15	
03			3.3	6.4	.22	1902	1412	17.0	1.12	2.3	196	.56	74	52	C	15	
04			3.3	6.8	.24	2111	1530	18.0	1.17	1.6	189	.57	71	53	C	15	
05			3.4	6.7	.28	2062	1568	18.0	1.15	2.3	190	.56	74	53	C	15	
06			3.4	6.1	.29	1850	1417	16.0	1.16	2.6	198	.51	75	58	C	15	
07			3.6								196			62	C	15	
08			3.5								195			61	C	15	
09			3.4	5.8	.31	1697	1198	16.0	1.06	3.0	203	.47	70	59	C	15	
10			3.4	6.4	.35	1754	1229	15.0	1.17	2.4	174	.55	69	53	C	15	
11			3.5	5.7	.40	1671	1173	14.0	1.19	3.0	175	.49	70	51	C	15	
12			3.5	5.5	.39	1744	1232	15.0	1.16	1.9	176	.50	70	51	C	15	
13			3.6	6.2	.35	1902	1361	16.0	1.19	2.7	176	.56	71	53	C	15	
14			3.7								173			59	C	15	
15			3.7								170			58	C	15	
16			3.5	6.5	.34	1956	1371	17.0	1.15	2.6	169	.59	69	54	C	15	
17			3.5	6.4	.32	2039	1434	16.0	1.27	2.3	168	.57	70	52	C	15	
18			3.6	6.4	.35	2020	1430	17.0	1.19	2.3	166	.56	70	57	C	15	
19			3.5	5.8	.35	1973	1382	17.0	1.16	2.1	167	.53	69	56	C	15	
20			3.4	5.5	.37	1896	1310	15.0	1.26	2.3	174	.55	70	52	C	15	
21			3.6								179			53	C	15	
22			3.5								180			51	C	15	
23			3.4	4.5	.46	1508	1060	12.0	1.26	3.1	175	.47	69	51	C	15	
24			3.4	4.7	.45	1500	1072	12.0	1.26	3.1	177	.45	71	53	C	15	
25			3.5	5.1	.43	1606	1110	15.0	1.07	2.9	174	.47	69	52	C	15	
26			3.6								167			54	C	15	
27			3.5								176			36	C	15	
28			3.6								178			48	C	15	
29			3.5								178			46	C	15	
30			3.4	6.2	.38	1853	1277	18.0	1.03	2.4	172	.51	68	56	C	15	
31															C		
TL															C	450	
ME			3.5	5.9	.34	1835	1317	15.8	1.16	2.6	180	.53	71	54	C	15	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

November, 19 81
Month

Marshall, Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

ID 136029 11 81
Plant No. Mo. Yr. Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX.FUEL 14	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS.	39 FeCl_3 LBS	44	49	54	59
PN											
SF		2									
01			2400			30					
02			2520			20	199				
03			2640			20	496				
04			2640			20	298				
05			2520			20	199				
06			2760			20	397				
07			2520			20	496				
08			2520			20	496				
09			2880			10	596				
10		35	3000			20	794				
11		11	3000			20	596				
12		26	2880			20	794				
13		11	2640			20	298				
14		30	2520			10	298				
15		31	2640			20	199				
16		30	2640			15	397				
17		1	2640			25	596				
18		2	2520			10	298				
19		9	2640			30	397				
20		33	2880			10	496				
21		41	2640			10	199				
22		43	2880			20	397				
23		52	3000			10	596				
24		45	3240			20	695				
25		33	3000			20	397				
26		27	2640			20	298				
27		32	2880			15	596				
28		33	2880			25	397				
29		40	2880			10	397				
30		36	3000			20	397				
31											
TL		601	82440			550	12709				
ME		29	2748			18	438				

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	5		768
Superintendent	1		152
Asst. Supt.	1		152
Shift Foreman			
Shift Operator	3		464
Maint. Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL

WEEKDAYS 11 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

Digester Volume, ft³
Primary
Secondary

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

Supernatant To
Process Pattern

R 4619
4833-5382

MONTH November 1981

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swallwell

DATE	RAW SLUDGE					DIGESTING SLUDGE						SUPERNATANT							DIGESTED SLUDGE				Gas Produce cu. ft X
	Gals. X 100	Total Solids %	Vol. Solids %	Vol. Solids Lbs/ 1000 c.f. Digester	pH	Temp. °F	pH	Total Solids %	Vol. Solids %	Vol. Acids Mg/l	Alkalinity Mg/l	Gals. X	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg	P Mg/l	P Lbs.	5-Day BOD mg/l	Gals. X	Total Solids %	Vol. Solids %	pH	
1	40	4.9	64		6.0																			
2	45	4.7	72		6.0																			
3	45	4.7	68		6.1																			
4	30	5.1	68		6.0																			
5	45	4.4	65		5.9																			
6	45	4.9	77		5.9																			
7	40	4.5	64		5.8																			
8	40	4.8	67		5.8																			
9	45	4.8	73		5.9																			
10	45	4.5	68		6.0																			
11	45	4.4	59		6.0																			
12	45	4.2	85		6.3																			
13	45	5.0	63		6.2																			
14	40	4.3	69		6.2																			
15	40	4.4	75		6.1																			
16	45	4.1	83		6.0																			
17	45	4.7	69		6.0																			
18	45	5.1	67		6.0																			
19	45	4.4	76		6.0																			
20	45	4.7	69		6.1																			
21	40	4.2	76		6.1																			
22	40	4.2	78		6.1																			
23	45	4.5	76		6.1																			
24	45	3.9	79		6.2																			
25	45	4.4	61		6.0																			
26	40	4.5	67		6.0																			
27	40	4.6	58		6.0																			
28	40	4.1	82		6.0																			
29	40	4.5	65		5.9																			
30	45	4.1	57		5.9																			
31																								
TOTAL	1280																							
ARITH. MEAN	43	4.5	70																					

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.7

Marshall, MICHIGAN

MONTH November, 1981 — VACUUM FILTER & INCINERATION DATA — OPERATOR R.J. Swalwell

DATE	SLUDGE TO FILTER				CHEMICALS TO FILTER				FILTER		FILTRATE						FILTER CAKE					INCINERATION			REMARKS
	Gal. X 100	Tot. Sol. %	Lbs. Dry Sol.	pH	C_2O Lbs. Dry	R	$FeCl_3$ Lbs. Dry	R	Tot. Hours	Yield	Gal. X 100	pH	Sus. Solids Mg/l	Vol. Susp. Solids %	5 Day BOD Mg/l	P Mg/l	Thou. Lbs. Wet	Tot. Sol. %	Lbs. Tot. Solids X 100	Vol. Sol. %	Lbs. Vol. Solids X 100	Hrs. Opr.	Yield	Fuel BTU	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1																									
2																									
3	95	7.4	5905	5.9	1520		191		8.0		76	11.7	616	14	2760		39	19.0	74	53	39				
4	95	3.9	3112	6.2	1520		191		8.0		76	12.1	796	17	2880		25	18.2	46	52	24				
5	95	4.6	3671	6.0	1520		191		8.0		76	11.8	654	36	2520		26	19.8	51	52	27				
6																									
7																									
8																									
9																									
10	95	4.6	3671	5.9	1520		191		8.0		76	11.7	926	15	2880		26	19.9	52	53	27				
11	95	4.2	3352	5.9	1520		191		8.0		76	7.6	756	15	2220		26	18.5	48	53	25				
12	95	7.9	6304	5.8	1520		191		8.0		76	11.9	996	13	3180		43	18.0	77	49	38				
13																									
14																									
15																									
16																									
17	95	5.0	3990	5.9	1520		191		8.0		76	12.1	1076	18	3180		30	18.1	54	55	30				
18																									
19																									
20	95	3.6	2873	6.0	1520		191		8.0		76	11.8	968	8	2400		23	19.2	44	51	23				
21																									
22																									
23	95	2.2	1756	6.1	1520		191		8.0		76	11.6	1326	11	3060		12	19.8	34	50	17				
24	95	3.9	3112	6.0	1520		191		8.0		76	11.7	1300	7	2280		23	20.0	46	47	22				
25																									
26																									
27																									
28																									
29																									
30																									
31																									
Total	950		37743		15200		1910		80		760						278		526		272				
Mth. Means	95	4.7	3774		1520		191		8.0		76		941	15	2776		28	19.1	53	52	27				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

_____ Month , 19 _____ _____ Municipality , Michigan _____ Superintendent's Signature

ID Plant No. Mo. Yr. Sampling Point Code 20 19 19

DAY	BOD-5			SS			TOTAL-P			VSS	NH_3-N	pH	DO	F. COLI*		T. COLI*	REMARKS
	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	mg/l	SU	mg/l	#/100 ml	C	#/100 ml	
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 31615	C	31504 31505	
SF															C		
01	12	249	70	12	249	70	.97	20	60	9		7.3			C		
02	14	301	77	1	22	99	1.08	23	55	1		7.3	5.2	240	C		
03	19	414	74	7	152	87	.95	21	58	2		7.4	4.7	106	C		
04	23	495	79	18	387	74	.62	13	79	16		7.3	3.8	70	C		
05	21	447	76	15	319	77	.97	21	58	13		7.3	4.4	76	C		
06												7.3	4.5	70	C		
07												7.2			C		
08	11	223	84	4	81	91	.26	5	88	3		7.1			C		
09	11	229	82	8	167	88	.28	6	88	6		7.1	4.8	18	C		
10	20	419	80	2	42	97	.32	7	86	1		7.2	5.2	8	C		
11	20	412	79	10	206	84	.32	7	87	8		7.3	5.1	8	C		
12	22	453	74	11	227	82	.33	7	86	4		7.2	5.0	20	C		
13												7.1	4.8	22	C		
14												7.1			C		
15	15	295	77	15	295	87	.38	7	86	13		7.2			C		
16	20	410	80	9	185	89	.33	7	84	7		7.3	4.5	192	C		
17	23	470	84	10	204	92	.37	8	88	6		7.2	4.8	14	C		
18	16	322	80	5	100	88	.35	7	90	2		7.1	4.7	24	C		
19	18	374	83	6	125	88	.26	5	90	5		7.3	4.8	18	C		
20												7.2	4.9	28	C		
21												7.3			C		
22	18	365	83	10	203	89	.29	6	87	5		7.2			C		
23	25	536	76	15	322	77	.29	6	86	11		7.3	5.6	68	C		
24	22	459	73	11	229	82	.45	9	79	6		7.3	5.1	32	C		
25												7.4	5.6	44	C		
26												7.2			C		
27												7.1			C		
28												7.2			C		
29	20	407	82	18	366	87	.43	9	81	10		7.1			C		
30	21	438	81	7	146	87	.42	9	78	5		7.1	5.4	72	C		
31															C		
TL		7718			4027			203							C		
ME	19	386	79	10	201	86	.48	10	80	7		7.2	4.9	38	C		
WA	20	408		11	223									99	C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

December (Month), 19 81 — Marshall (Municipality), Michigan

Robert J. Swedlund
Superintendent's Signature

1 2 ID | 3 8 Plant No 130029 | 9 10 Mo 12 | 11 12 Yr 81 | 13 15 Sampling Point Code 500

DAY 1 2	WEATHER TYPE 9	WEATHER PRECIP 14	FLOW TOTAL 19	FLOW MAX RATE 24	RAW SEWAGE QUALITY TEMP 29	pH 34	BOD-5 39	BOD-5 44	SS 49	SS 54	TOTAL-P 59	TOTAL-P 64	VSS 69	NH_3-N 74 78	80	REMARKS 9	REMARKS 14
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS	mg/l	LBS.	mg/l	LBS	mg/l	mg/l	C		
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C		
SF															C		
01	4	.04	2.54		53	7.2	86	1822	88	1864	2.10	44	76		C		
02	4	.02	2.50		53	7.1	74	1543	66	1376	2.00	42	50		C		
03	5	.05	2.50		53	7.2	78	1626	50	1043	2.40	50	34		C		
04	5	.07	2.43		53	7.3									C		
05	3		2.37		53	7.3									C		
06	1		2.41		52	7.2	122	2452	74	1487			64		C		
07	5	.03	2.50		52	7.4	100	2085	94	1960	2.50	52	72		C		
08	1		2.51		52	7.5	64	1340	28	586	2.50	52	14		C		
09	1		2.49		52	7.5	82	1703	76	1578	2.50	52	56		C		
10	1		2.53		52	7.4	112	2363	50	1055	2.20	46	42		C		
11	5	.03	2.45		52	7.4									C		
12	5	.05	2.38		52	7.4									C		
13	3		2.41		52	7.3	94	1889	74	1487	2.10	42	48		C		
14	3		2.53		52	7.5	66	1393	66	1393	2.10	44	58		C		
15	5	.01	2.42		52	7.8	86	1736	56	1130	2.50	50	42		C		
16	5	.05	2.42		51	7.2	138	2782	58	1170	2.30	46	52		C		
17	5	.01	2.47		51	7.3	116	2390	44	906	2.40	49	32		C		
18	3		2.39		51	7.3									C		
19	3		2.29		50	7.3									C		
20	4*5	.16	2.30		50	7.3	66	1266	74	1419	2.25	34	70		C		
21	4*5	.07	2.44		50	7.3	74	1506	80	1628	2.30	47	68		C		
22	5	.67	2.38		51	7.3	76	1509	62	1231	1.90	38	50		C		
23	3		2.31		51	7.2									C		
24	3		2.27		50	7.2									C		
25	1		2.12		51	7.3									C		
26	5	.76	2.29		51	7.4									C		
27	3		2.25		51	7.4	66	1238	100	1877	2.30	43	68		C		
28	5	.02	2.36		50	7.4	72	1417	66	1299	2.00	39	46		C		
29	3		2.41		50	7.4	70	1406	52	1045	2.25	45	44		C		
30	3		2.39		50	7.4	74	1475	44	877	2.25	45	36		C		
31	4	.21	2.43		50	7.5									C		
TL		2.25	74.49					34951		26411		860			C		
ME			2.40				86	1748	65	1321	2.26	45	51		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

December, 19 81 — Marshall, Michigan — Robert J. Swalwell
Month — Municipality — Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID | 130029 | 12 | 81 | ...
Plant No — Mo — Yr — Sampling Point Code

DAY	BOD 5 9 14		SS 19 24		TOTAL-P 29 34		VSS 39	NH_3 N 44	REMARKS OR OTHER PARAMETERS 49	54	59	64	69	74 78	80	9	14
1 2	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l							C		
PN	00310	85001	00530	85002	00665	85004	00535	00610							C		
SF															C		
01	64	1356	62	1313	2.00	42	52								C		
02	58	1209	48	1001	1.75	36	32								C		
03	66	1376	44		2.00	42	32								C		
04															C		
05															C		
06	86	1729	44	884			36								C		
07	60	1251	40	834	1.90	40	28								C		
08	43	900	18	377	2.00	42	6								C		
09	54	1121	48	997	2.20	46	36								C		
10	93	1962	44	928	1.85	39	32								C		
11															C		
12															C		
13	56	1126	52	1045	1.70	34	36								C		
14	42	886	42	886	1.75	37	34								C		
15	40	807	34	686	1.70	34	26								C		
16	106	2139	46	928	1.90	38	40								C		
17	106	2184	42	865	1.90	39	32								C		
18															C		
19															C		
20	38	729	46	882	1.90	36	24								C		
21	54	1099	52	1058	1.85	38	38								C		
22	60	1191	30	595	1.85	36	18								C		
23															C		
24															C		
25															C		
26															C		
27	60	1126	64	1201	2.50	47	48								C		
28	52	1023	36	709	1.70	33	26								C		
29	56	1126	42	844	1.85	37	30								C		
30	70	1395	50	997	1.75	35	44								C		
31															C		
TL		25735		10730		731									C		
ME	63	1267	44	852	1.90	38	33								C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

December 19 81 Marshall, Michigan

Robert L. Swalwell
Superintendent's Signature

Month Municipality

1-2 ID | 3-8 Plant No 130029 | 9 10 Mo 12 | 11 12 Yr 81 | 13 15 Sampling Point Code

DAY 1 2	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification 14
	Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MLSS 34	MLVSS 39	SETTL. 44	SDI 49	DO 54	Air Applied 59	SS 64	VSS 49	Percent Return 74	80	Waste Sludge 9	
	KCF	KCF	HRS	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu Ft.	%	%	%	C	KGal	See Code
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF															C		
01	48		3.4	5.8	.40	1850	1272	17.0	1.09	2.5	167	.52	67	52	C	15	
02			3.4	5.3	.43	1729	1192	15.0	1.15	2.4	173	.52	68	54	C	15	
03			3.4	5.5	.40	1820	1270	18.0	1.01	2.5	173	.53	69	56	C	15	
04			3.5	6.0	.36	1913	1335	18.0	1.06	2.6	175	.51	69	58	C	15	
05			3.6								178			58	C	15	
06			3.6								172			58	C	15	
07			3.4	9.4	.36	2972	1414	21.0	1.41	3.3	169	.57	68	56	C	15	
08			3.4	6.8	.35	1951	1292	20.0	.98	2.0	179	.58	65	43	C	15	
09			3.5	5.7	.39	1707	1184	18.0	.95	3.5	180	.52	66	42	C	15	
10			3.4	6.2	.41	1805	1238	16.0	1.13	4.4	180	.50	68	42	C	15	
11			3.5	6.0	.44	1671	1100	14.0	1.19	3.8	177	.57	68	43	C	15	
12			3.6								178			46	C	15	
13			3.6								178			48	C	15	
14			3.4	5.9	.41	1711	1180	15.0	1.14	3.8	178	.54	68	48	C	15	
15			3.6	6.5	.39	1753	1204	16.0	1.09	3.8	178	.53	68	49	C	15	
16			3.6	6.5	.38	1797	1224	15.0	1.20	4.8	181	.58	65	46	C	15	
17			3.5	6.1	.44	1842	1248	15.0	1.23	4.3	185	.58	66	43	C	15	
18			3.6	6.2	.42	1810	1268	17.0	1.06	3.1	184	.59	68	49	C	15	
19			3.8								184			47	C	15	
20			3.7								183			52	C	15	
21			3.5	6.3	.38	1942	1277	17.0	1.14		175	.61	65	48	C	15	
22			3.6	7.2	.32	2012	1366	18.0	1.12		174	.62	66	49	C	15	
23			3.7	7.6	.30	2068	1398	19.0	1.09		183	.64	67	50	C	15	
24			3.8								183			53	C	15	
25			4.0								178			57	C	15	
26			3.8								176			54	C	15	
27			3.8								178			54	C	15	
28			3.7	5.3	.42	1563	1055	14.0	1.12	3.7	181	.48	66	50	C	15	
29			3.6	4.8	.40	1484	1012	15.0	.99	4.0	187	.45	67	49	C	15	
30			3.6	4.7	.38	1433	992	14.0	1.02	3.8	175	.44	68	49	C	15	
31			3.5	4.7	.36	1471	1040	15.0	.98	3.6	163	.49	70	48	C	15	
TL															C	465	
ME			3.6	6.1	.39	1824	1217	16.5	1.10	3.4	178	.54	67	50	C	15	

Digester Volume, ft³
Primary
Secondary

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

R 4619
4833-5382

Supernatant To
Process Pattern

MONTH December 1981

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE					DIGESTING SLUDGE						SUPERNATANT								DIGESTED SLUDGE				Gas Produced cu. ft X
	Gals. X 10²	Total Solids %	Vol. Solids %	Vol. Solids Lbs. 1000 c.f. Digester	pH	Temp. °F	pH	Total Solids %	Vol. Solids %	Vol. Acids Mg/l	Alkalinity Mg/l	Gals. X	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	P Mg/l	P Lbs.	5-Day BOD Mg/l	Gals. X	Total Solids %	Vol. Solids %	pH	
1	45	4.9	71		6.1																			
2	45	4.1	65		5.9																			
3	45	4.3	68		6.1																			
4	45	4.9	68		6.3																			
5	40	3.9	73		6.3																			
6	40	4.2	65		6.2																			
7	45	4.2	70		6.1																			
8	45	4.3	81		6.2																			
9	45	4.1	76		6.2																			
10	45	4.2	65		6.2																			
11	45	4.3	76		6.0																			
12	40	4.2	79		6.1																			
13	40	4.4	64		6.3																			
14	45	4.6	76		6.3																			
15	45	5.0	67		6.3																			
16	45	5.1	69		6.3																			
17	45	4.7	82		6.3																			
18	45	5.7	73		6.5																			
19	40	4.4	60		6.4																			
20	40	4.3	60		6.4																			
21	45	5.2	73		6.3																			
22	45	4.3	60		6.3																			
23	45	4.5	68		6.3																			
24	40	3.6	74		6.2																			
25	40	3.8	75		6.2																			
26																								
27	50	4.2	69		6.2																			
28	45	4.0	78		6.2																			
29	45	4.2	74		6.2																			
30																								
31	45	6.7	65		6.3																			
TOTAL	1270																							
ARITH. MEAN	44	4.5	70																					

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH D-4.7

MARSHALL, MICHIGAN

MONTH December, 19 81 — VACUUM FILTER & INCINERATION DATA — OPERATOR R. J. Swallwell

DATE	SLUDGE TO FILTER				CHEMICALS TO FILTER				FILTER		FILTRATE						FILTER CAKE					INCINERATION			REMARKS
	Gal. X 100	Tot. Sol. %	Lbs. Dry Sol.	pH	CaO Lbs. Dry	CaO R	FeCl Lbs. Dry	FeCl R	Tot. Hours	Yield	Gal. X 100	pH	Sus. Solids Mg/l	Vol. Susp. Solids %	5 Day BOD Mg/l	P Mg/l	Thou. Lbs. Wet	Tot. Sol. %	Lbs. Tot. Solids X 100	Vol. Sol. %	Lbs. Vol. Solids X 100	Hrs. Opr.	Yield	Fuel BTU	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1	91	3.9	2981	5.9	1686		191		8.0		76	11.9	1052	3	2200		24	19.7	47	40	19				
2	91	3.9	2981	5.9	1686		191		8.0		76	8.9	1052	17	2760		23	20.3	47	47	22				
3	91	3.9	2981	5.9	1686		191		8.0		76	8.2	1186	6	2820		22	20.8	46	51	23				
4																									
5																									
6																									
7																									
8	91	4.5	3440	6.0	1686		191		8.0		76	12.2	344	23	2340		27	19.2	52	49	25				
9	91	3.9	2981	6.0	1686		191		8.0		76	12.1	736	21	2760		25	18.7	47	48	22				
10	91	4.0	3058	6.0	1686		191		8.0		76	12.1	1058	9	3420		23	20.2	46	48	22				
11	91	4.9	3746	6.3	1686		191		8.0		76	12.3	1028	8	2040		24	23.0	55	47	26				
12																									
13																									
14	91	4.3	3287	6.3	1686		191		8.0		76	11.9	718	14	2700		24	21.0	50	49	25				
15																									
16																									
17	91	3.7	2828	6.2	1686		191		8.0		76	11.2	1210	14	2940		22	20.5	45	52	23				
18	91	4.6	3516	6.2	1686		191		8.0		76	11.2	1724	6	2940		25	20.8	52	50	26				
19																									
20																									
21	91	5.6	4281	6.2	1686		191		8.0		76	11.4	986	18	1680		32	18.6	60	54	32				
22	91	4.3	3287	6.4	1686		191		8.0		76	11.3	966	12	2340		27	18.7	50	54	27				
23																									
24																									
25																									
26																									
27																									
28																									
29	91	4.6	3516	6.3	1686		191		8.0		76	11.9	900	11	2760		29	17.9	52	50	26				
30																									
31	91	5.1	3898	6.5	1686		191		8.0		76	12.1	844	6	2340		30	18.9	57	50	28				
Totals	1274		46781		23604		2674		112		1064						357		206		346				
Averages	91	4.4	3342		1686		191		8.0		76		986	12	2574		26	19.9	50	49	25				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

December (Month), 19 81 — Marshall (Municipality), Michigan

Robert J. Swabell
Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
ID	130029	12	81	
	Plant No.	Mo.	Yr.	Sampling Point Code

DAY 1 2	GRIT	AUX. FUEL	POWER CONSUMPTION			CHEMICALS APPLIED					
	9	14	19 #1	24 #2	29 #3	34 Cl_2	39 $FeCl_3$	44	49	54	59
	CF		KWH	KWH	KWH	LBS.					
PN											
SF		2									
01	2	35	3240			10	794				
02	2	56	3120			10	794				
03	2	25	3120			20	596				
04	2	41	2880			20	496				
05	2	35	2880			20	298				
06	2	33	2880			10	397				
07	2	32	3000			20	397				
08	2	59	3120			20	794				
09	2	51	3000			20	794				
10	2	71	3360			10	794				
11	2	43	3120			20	695				
12	2	48	2880			20	496				
13	2	47	2880			20	596				
14	2	63	3120			20	397				
15	2	50	3000			20	397				
16	2	64	3000			10	496				
17	2	64	3360			20	893				
18	2	63	3240				596				
19	2	54	3120			30	496				
20	2	68	3000			20	496				
21	2	53	3000			10	794				
22	2	38	3120			20	695				
23	2	45	3000			10	397				
24	2	55	3000			20	298				
25	2	46	3000			10	298				
26	2	31	3000			20	496				
27	2	39	3000			20					
28	2	67	3000			10	397				
29	2	67	3360			30	695				
30	2	62	3120			10	397				
31	2	42	3120			10	496				
TL	62	1547	95046			510	16675				
ME	2	50	3066			17	556				

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	5		852
Superintendent	1		168
Asst. Supt.	1		168
Shift Foreman			
Shift Operator	3		516
Maint. Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL A

WEEKDAYS 11 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

_____ Month , 19____ _____ Municipality , Michigan _____ Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID [ ] [ ] [ ] [ ]
Plant No Mo Yr Sampling Point Code

DAY	20 BOD-5 9	14	19	20 SS 24	29	34	19 TOTAL-P 39	44	49	VSS 54	NH_3-N 59	pH 64 31	18 DO 69	F. COLI* 74 71	80	T. COLI* 9	REMARKS 14	19
1 2	mg/l	LBS	% Rem	mg/l	LBS	% Rem	mg/l	LBS	% Rem	mg/l	mg/l	SU	mg/l	#/100 ml	C	#/100 ml		
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 31615	C	31504 31505		
SF															C			
01	21	445	76	8	169	91	.27	6	87	2		7.3	4.8	70	C			
02	21	438	72	14	292	79	.40	8	80	10		7.2	4.7	84	C			
03	21	438	73	9	188	82	.37	8	85	6		7.1	5.7	134	C			
04												7.2	4.8	50	C			
05												7.3			C			
06	25	502	80	17	342	77				15		7.1			C			
07	19	396	81	2	42	98	.42	9	83	1		7.2	5.9	60	C			
08	22	461	66	4	84	86	.55	12	78	2		7.4	5.3	38	C			
09	22	457	73	14	291	82	.38	8	85	9		7.4	5.9	20	C			
10	23	485	79	8	169	84	.51	11	77	5		7.2	6.3	20	C			
11												7.3	6.6	26	C			
12												7.2			C			
13	20	402	79	12	241	84	.38	8	82	4		7.3			C			
14	23	485	65	7	147	86	.40	8	81	6		7.3	6.5	30	C			
15	22	444	74	9	182	84	.33	7	87	5		7.1	6.3	20	C			
16	23	464	83	10	202	83	.38	8	83	8		7.2	6.3	12	C			
17	24	494	79	6	124	86	.40	8	83	4		7.3	6.1	18	C			
18												7.1	5.8	14	C			
19												7.1			C			
20	15	287	77	5	96	93	.37	7	84	3		7.2			C			
21	20	407	72	11	224	86	.32	7	86	9		7.2		8	C			
22	19	377	75	3	60	95	.20	4	89	2		7.2		6	C			
23												7.2		2	C			
24												7.1			C			
25												7.2			C			
26												7.4			C			
27	22	413	67	10	188	90	.38	7	83	7		7.3			C			
28	22	433	69	9	177	86	.42	8	79	5		7.4	6.7	2	C			
29	22	442	69	10	201	81	.33	7	85	1		7.4	6.6	4	C			
30	22	439	70	9	179	80	.35	7	84	6		7.4	6.8	12	C			
31												7.5	5.9	14	C			
TL		8709			3598			148							C			
ME	21	435	74	9	180	86	.38	8	83	6		7.3	5.9	18	C			
WA	22	460		10	207									75	C			

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

January, 19 83 — Month

Marshall, Michigan — Municipality

Robert J. Swalwell — Superintendent's Signature

1 2*	3 . 8	9 10	11 12	13 15
ID	130029	01	83	500
	Plant No	Mo.	Yr	Sampling Point Code

DAY 1 2	WEATHER TYPE 9	WEATHER PRECIP. 14	FLOW TOTAL 19	FLOW MAX RATE 24	RAW SEWAGE QUALITY TEMP 29	pH 34	BOD-5 39	BOD-5 44	SS 49	SS 54	TOTAL-P 59	TOTAL-P 64	VSS 69	NH_3-N 74 78	80	REMARKS OR OT 9	14	19
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l	C			
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C			
SF															C			
01	1		2.47		51	7.5									C			
02	1		2.55		50	7.4	48	1021	42	893	1.80	38	34		C			
03	1		2.62		51	7.6	68	1456	48	1049	1.80	39	34		C			
04	1		2.60		51	7.5	62	1344	64	1388	2.30	50	54		C			
05	1		2.54		51	7.4	76	1610	54	1144	2.75	58	48		C			
06	4	.02	2.56		50	7.5	50	1068	28	598	1.80	38	24		C			
07	5	.02	2.51		51	7.5									C			
08	3		2.43		51	7.4									C			
09	4	.16	2.50		51	7.6	62	1293	46	959	2.05	43	42		C			
10	4	.06	2.55		51	7.5	50	1063	34	723	1.90	40	24		C			
11	5	.02	2.56		51	7.4	50	1068	48	1025	2.05	44	32		C			
12	3		2.53		51	7.5	62	1308	48	1013	1.90	40	36		C			
13	3		2.56		51	7.3	40	854	72	1537	1.70	36	64		C			
14	5	.06	2.49		51	7.5									C			
15	1		2.43		50	7.4									C			
16	3		2.45		50	7.4	44	899	72	1471	2.20	45	64		C			
17	1		2.51		50	7.5	42	879	36	754	2.20	46	30		C			
18	1		2.53		50	7.4	62	1308	70	1477	2.30	49	58		C			
19	1		2.57		50	7.5	50	1072	48	1029	2.30	49	38		C			
20	1		2.52		50	7.5	54	1135	44	925	1.95	41	32		C			
21	5	.26	2.50		50	7.5									C			
22	4+5	.28	2.41		50	7.4									C			
23	4	.04	2.45		50	7.4	42	858	40	817	2.20	45	32		C			
24	4	.01	2.51		50	7.4	50	1047	46	963	3.95	83	36		C			
25	5	.01	2.49		50	7.4	50	1038	60	1246	2.55	53	50		C			
26	3		2.43		50	7.4	66	1338	46	932	4.10	83	36		C			
27	1		2.42		50	7.4	76	1534	42	848	2.40	48	34		C			
28	1		2.36		49	7.3									C			
29	4	.28	2.43		49	7.3									C			
30	1		2.38		50	7.4									C			
31	1		2.39		50	7.4	60	1196	50	997	2.20	44	34		C			
TL		1.22	77.25					24389		21,788		1,012			C			
ME			2.49				55	1161	49	1038	2.30	48	40		C			

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

January, 19 83 — Month

Marshall, Michigan — Municipality

Robert J. Swahull — Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
ID	130029	01	83	
	Plant No	Mo	Yr	Sampling Point Code

DAY	BOD-5		SS		TOTAL-P		VSS	NH_3-N	REMARKS OR OTHER PARAMETERS								
	9	14	19	24	29	34	39	44	49	54	59	64	69	74 78	80	9	14
1 2	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l							C		
PN	00310	85001	00530	85002	00665	85004	00535	00610							C		
SF															C		
01															C		
02	30	638	32	681	1.40	30	14								C		
03	56	1224	46	1005	1.50	33	34								C		
04	56	1214	42	911	1.65	36	32								C		
05	52	1102	36	763	2.65	56	30								C		
06	44	939	68	1452	2.45	52	40								C		
07															C		
08															C		
09	44	917	30	626	1.90	40	24								C		
10	44	936	32	681	1.80	38	18								C		
11	40	854	42	897	1.80	38	34								C		
12	40	844	42	886	1.80	38	32								C		
13	40	854	34	726	1.40	30	32								C		
14															C		
15															C		
16	30	613	38	776	1.90	39	24								C		
17	26	544	38	795	1.70	36	36								C		
18	48	1013	62	1308	1.70	36	50								C		
19	40	857	38	814	1.80	39	28								C		
20	50	1051	36	757	1.65	35	22								C		
21															C		
22															C		
23	32	654	30	613	1.80	37	26								C		
24	34	712	34	712	3.30	69	28								C		
25	44	914	34	707	1.95	40	24								C		
26	62	1257	52	1054	3.40	69	44								C		
27	52	1050	30	605	1.80	36	26								C		
28															C		
29															C		
30															C		
31	48	957	32	638	1.70	34	24								C		
TL		19144		17407		861									C		
ME	43	912	39	829	1.95	41	30								C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

January , 19 83
Month

Marshall , Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

ID 13.00.29 01 83 ...
Plant No Mo Yr. Sampling Point Code

DAY	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification	
	Aeration Volume	Reaeration Volume	Detention Time	Sludge Age	Organic Loading	MLSS	MLVSS	SETTL.	SDI	DO	Air Applied	SS	VSS	Percent Return		Waste Sludge		
1 2	9	14	19	24	29	34	39	44	49	54	59	64	49	74	80	9	14	19
	KCF	KCF	HRS.	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu. Ft.	%	%	%	C	KGal	See Code*	
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889	
SF											4				C			
01	48		3.5								146			58	C	12		
02			3.4								150			69	C	19		
03			3.3	3.5	.39	1046	749	9.0	1.16	6.4	150	.29	70	67	C	45		
04			3.3	4.8	.30	1385	996	11.0	1.26	4.4	146	.42	71	55	C			
05			3.4	6.3	.27	1659	1183	15.0	1.11	4.8	159	.47	70	55	C			
06			3.4	4.3	.32	1287	1070	9.0	1.43	5.4	159	.38	75	55	C	27		
07			3.4								131			52	C	32		
08			3.5								165			62	C			
09			3.4								159			59	C	24		
10			3.4	5.2	.30	1531	1097	11.0	1.39	5.0	157	.41	71	56	C	2		
11			3.4	5.0	.35	1518	986	12.0	1.27	4.3	164	.45	71	58	C	16		
12			3.4	4.0	.37	1190	869	9.0	1.32	5.8	166	.34	72	58	C	41		
13			3.4	4.9	.29	1437	1038	9.0	1.60	4.0	163	.41	72	58	C			
14			3.5	5.9	.24	1664	1230	12.0	1.39	3.3	161	.43	70	58	C	3		
15			3.5								120			58	C	2		
16			3.5								163			57	C	7		
17			3.4	4.6	.27	1203	993	11.0	1.09	6.1	171	.46	70	55	C	28		
18			3.4	4.6	.28	1325	947	10.0	1.33	5.7	174	.41	71	55	C	28		
19			3.4	4.7	.26	1573	1050	11.0	1.43	5.3	173	.39	76	54	C	8		
20			3.4	4.9	.28	1419	986	11.0	1.29	5.4	169	.36	70	55	C	18		
21			3.4	4.8	.28	1380	978	11.0	1.25	4.8	165	.35	69	56	C	19		
22			3.6								161			58	C	14		
23			3.5								162			56	C	11		
24			3.4	4.7	.29	1281	903	11.0	1.16	4.5	163	.40	71	58	C	29		
25			3.5	5.7	.25	1534	1063	11.0	1.39	3.2	168	.41	69	57	C			
26			3.5	4.9	.32	1363	944	11.0	1.24	3.2	169	.30	69	56	C	35		
27			3.5	6.1	.30	1482	1027	11.0	1.35	3.8	170	.38	69	58	C			
28			3.7	7.6	.23	1796	1259	14.0	1.28	3.3	165	.49	65	59	C			
29			3.5								161			58	C	10		
30			3.6								163			60	C	17		
31			3.6	6.8	.27	1595	1110	14.0	1.14	5.4	166	.41	68	58	C	10		
TL															C	460		
ME			3.5	5.2	.29	1433	1024	12.9	1.29	4.7	160	.40	70	58	C	19		

Digester Volume, ft³
Primary
Secondary

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

R 4619
4833-5382

Supernatant To
Process Pattern

MONTH January 1983

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE					DIGESTING SLUDGE						SUPERNATANT								DIGESTED SLUDGE				Gas Produced cu. ft X
	Gals. X 100	Total Solids %	Vol. Solids %	Vol. Solids Lbs/1000 c.f. Digester	pH	Temp. °F	pH	Total Solids %	Vol. Solids %	Vol. Acids Mg/l	Alkalinity Mg/l	Gals. X	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	P Mg/l	P Lbs.	5-Day BOD Mg/l	Gals. X	Total Solids %	Vol. Solids %	pH	
1	40	4.6	75		6.5																			
2	40	3.9	47		6.4																			
3	45	4.0	75		6.6																			
4	45	3.4	81		6.6																			
5																								
6	45	4.4	76		6.2																			
7	45	4.3	78		6.2																			
8	40	3.4	74		6.3																			
9	70	4.6	67		6.2																			
10																								
11	40	4.4	78		6.2																			
12	30	4.7	71		6.3																			
13	50	4.1	60		6.1																			
14	30	4.2	63		6.3																			
15	30	4.5	69		6.2																			
16	30	4.4	79		6.1																			
17	45	5.1	45		6.2																			
18	45	6.3	81		6.2																			
19	35	4.5	63		6.1																			
20	45	4.2	63		6.2																			
21	35	4.3	63		6.2																			
22																								
23	40	4.5	62		6.2																			
24	45	4.8	67		6.3																			
25	45	4.9	68		6.3																			
26	15	5.5	70		6.2																			
27	45	5.0	70		6.2																			
28	30	5.0	70		6.3																			
29	30	4.6	70		6.2																			
30	30	4.8	68		6.2																			
31	30	4.4	78		6.2																			
TOTAL	1165																							
ARITH. MEAN	38	4.5	70																					

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.7

Marshall , MICHIGAN

MONTH January , 1983 — VACUUM FILTER & INCINERATION DATA — OPERATOR R.J. Swalwell

DATE	SLUDGE TO FILTER				CHEMICALS TO FILTER				FILTER		FILTRATE						FILTER CAKE					INCINERATION			REMARKS
	Gal. X 100	Tot. Sol. %	Lbs. Dry Sol.	pH	C20 Lbs. Dry	R	FeCl3 Lbs. Dry	R	Tot. Hours	Yield	Gal. X 100	pH	Sus. Solids Mg/l	Vol. Susp. Solids %	5 Day BOD Mg/l	P Mg/l	Thou. Lbs. Wet	Tot. Sol. %	Lbs. Tot. Solids X	Vol. Sol. %	Lbs. Vol. Solids X	Hrs. Opr.	Yield	Fuel BTU	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1																									
2																									
3																									
4	107	4.4	3926	6.6	1360		191		8.0		76	12.2	802	8	2100		28	19.0	5320	56	2979				
5	107	5.5	4908	6.6	1360		191		8.0		76	11.8	800	47	2520		33	19.0	6270	60	3762				
6	107	5.4	4819	6.1	1360		191		8.0		76	12.1	954	9	1980		32	19.2	6144	52	3195				
7																									
8																									
9																									
10																									
11	107	5.1	4551	6.0	1360		191		8.0		76	12.0	1174	13	2040		31	19.3	5983	54	3231				
12																									
13	107	4.4	3926	6.1	1360		191		8.0		76	12.0	954	11	1740		26	20.7	5382	48	2583				
14																									
15																									
16																									
17																									
18	107	5.0	4462	6.0	1360		191		8.0		76	11.9	888	10	960		31	19.0	5890	54	3180				
19																									
20	107	5.1	4551	6.0	1360		191		8.0		76	12.2	670	25	1320		30	19.5	5850	55	3218				
21	107	2.9	2588	6.0	1360		191		8.0		76	12.2	690	14	1320		18	22.2	3996	55	2198				
22																									
23																									
24																									
25	107	5.2	4640	6.0	1360		191		8.0		76	12.2	735	12	1560		28	20.8	5824	51	2970				
26																									
27	107	5.3	4730	6.2	1360		191		8.0		76	11.6	790	15	900		29	20.9	6061	55	3334				
28																									
29																									
30																									
31																									
Total	1070		43101		13600		1910		80.0		760						286		53720		30650				
Mth. Mans	107	4.8	4310		1360		191		8.0		76		844	16	1644		28.6	20.0	5372	54	3065				

January, 1983
(Month)

Marshall, Michigan
(Municipality)

Robert J. Swalwell
(Superintendent's Signature)

State of Michigan
Department of Natural Resources

SLUDGE DISPOSAL SHEET

Mars
Land

Acres This month

DATE	SLUDGE APPLIED: Gallons or Cubic Yards *	% Solids	% VS	Dry Tons per ac	SLUDGE ANALYSIS AND SOIL LOADING RATES: Nitrogen TKN %	Nitrogen NH_4 %	Nitrogen NO_3 %	Nitrogen AVAN lb/ac	Total Phosphorus TP %	Total Phosphorus TP lb/ac	Potassium K %	Potassium K lb/ac	Lead Pb mg/kg	Lead Pb lb/ac	Zinc Zn mg/kg	Zinc Zn lb/ac	Copper Cu mg/kg	Copper Cu lb/ac	Nickel Ni mg/kg	Nickel Ni lb/ac	Cadmium Cd mg/kg	Cadmium Cd lb/ac	mg/kg	lb/ac	mg/kg	lb/ac	Pre
4	28	19.0	56																								Pro
5	33	19.0	60																								CE(
6	32	19.2	52																								pH
11	31	19.3	54																								F
13	26	20.7	48																								N
18	31	19.0	54																								P_2O
20	30	19.5	55																								K_2(
21	18	22.2	55																								A
25	28	20.8	51																								Pb
27	29	20.9	55																								Zn
																											Cu
																											Ni
																											Cd
Average	28.6	20.0	54		3.1	.22	.001		1.9		.10		139		716		489		72		1.0						Cd
TOTALS This Month	286																										RE *
TOTALS This Year	286																										
TOTALS Cumulative																											

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

January (Month), 19 83 — Marshall (Municipality), Michigan — Robert L Swabell (Superintendent's Signature)

1 2 ID | 3–8 Plant No. 130029 | 9 10 Mo. 01 | 11 12 Yr. 83 | 13–15 Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX. FUEL 14 GAS CF	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS.	39 $FeCl_3$ LBS	44	49	54	59
PN											
SF		2									
01		36	2640			20	199				
02		59	2520			20	397				
03		69	2760			20	397				
04		59	2880			30	794				
05		40	2760			20	397				
06		51	2760			20	596				
07		61	2760			30	397				
08		50	2520			10	199				
09		34	2640			40	397				
10		45	2640			30	596				
11		63	2880			30	396				
12		75	2880			20	496				
13		61	2880			30	695				
14		65	2640			20	199				
15		76	2400			20	397				
16		78	2640			40	397				
17		24	2880			20	397				
18		206	3000			20	596				
19		92	2880			30	397				
20		77	3000			20	794				
21		58	2880			10	546				
22		47	2400			50	199				
23		49	2520			20	496				
24		58	2760			30	596				
25		78	2880			30	496				
26		74	2880			20	397				
27		88	3000			40	596				
28		44	2520			20	397				
29		37	2520			20	199				
30		52	2640			30	397				
31		62	2640			20	397				
TL		1968	84600			780	13,900				
ME		63	2729			25	448				

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	5		844
Superintendent	1		168
Asst. Supt.	1		168
Shift Foreman			
Shift Operator	3		508
Maint. Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL AR

WEEKDAYS 11 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

January, 19 83 — Month

Marshall, Michigan — Municipality

Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
ID	130029	01	83	
	Plant No.	Mo.	Yr.	Sampling Point Code

DAY	BOD-5			SS			TOTAL-P			VSS	NH_3-N	pH	DO	F. COLI*		T. COLI*	REMARKS
	9	14	19	24	29	34	39	44	49	54	59	64	69	74 20	80	9	14 19
1 2	mg/l	LBS	% Rem.	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	mg/l	SU	mg/l	#/100 ml	C	#/100 ml	
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 31615	C	31504 31505	
SF															C		
01												7.3			C		
02	8	170	83	7	149	83	.40	9	78	5		7.3			C		
03	10	219	85	12	262	75	.34	7	81	9		7.5	6.9	8	C		
04	8	173	87	8	173	88	.35	8	85	7		7.5	6.0	10	C		
05	7	148	91	8	169	85	.38	8	86	5		7.3	6.3	6	C		
06	6	128	88	2	43	93	.27	6	85	1		7.4	5.8	60	C		
07												7.4			C		
08												7.4			C		
09	14	292	77	2	42	96	.32	7	84	2		7.5			C		
10	6	128	88	2	43	94	.27	6	86	1		7.4	6.0	2	C		
11	4	85	92	5	107	90	.28	6	86	2		7.5	5.3	16	C		
12	5	106	92	5	106	90	.30	6	84	3		7.5	5.8	22	C		
13	6	128	85	10	214	86	.32	7	81	6		7.4	6.5	12	C	25	
14												7.4	5.9	16	C		
15												7.4			C		
16	5	102	89	6	123	92	.40	8	82	5		7.5			C		
17	12	251	71	15	314	58	.56	12	75	14		7.3	6.7	152	C		
18	6	127	90	16	338	77	.42	9	82	9		7.3	6.1	4	C		
19	7	150	86	15	322	69	.47	10	80	7		7.4	6.3	4	C		
20	20	420	63	11	231	75	.41	9	79	9		7.4	6.3	6	C		
21												7.4	6.4	8	C		
22												7.3			C		
23	8	163	81	6	123	85	.50	10	77	4		7.4			C		
24	6	126	88	5	105	89	.74	15	81	3		7.4	6.5	18	C		
25	13	270	74	9	187	85	.80	17	69	6		7.4	6.3	10	C		
26	10	203	85	14	284	70	.74	15	82	10		7.3	5.8	26	C		
27	8	161	89	4	81	90	.46	9	81	3		7.4	7.0	2	C		
28												7.1	6.6	40	C		
29												7.2			C		
30												7.3			C		
31	8	159	87	10	199	80	.38	8	83	3		7.2	7.3	46	C		
TL		3709			3615			192							C		
ME	8	177	84	8	172	83	.43	9	81	5		7.4	6.3	12	C		
WA	11	236		13	266									25	C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

February (Month), 19 83

Marshall (Municipality), Michigan

Robert A. Swalwell (Superintendent's Signature)

IP | 1300391 (Plant No) | 02 (Mo.) | 83 (Yr) | 500 (Sampling Point Code)

DAY	WEATHER		FLOW		RAW SEWAGE QUALITY											REMARKS OR OTH
	TYPE	PRECIP.	TOTAL	MAX RATE	TEMP	pH	BOD-5		SS		TOTAL-P		VSS	NH_3-N		
1 2	9	14	19	24	29	34	39 44		49 54		59 64		69	74 78	80	9 14 19
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l	C	
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C	
SF															C	
01	4	.35	2.45		50	7.4	76	1553	48	981	2.30	47	30		C	
02	4	.17	2.58		49	7.4	54	1162	50	1076	2.30	49	46		C	
03	5	.07	2.46		49	7.2	60	1231	50	1026	2.05	43	38		C	
04	5	.02	2.47		49	7.4									C	
05	1		2.39		49	7.3									C	
06	5	.15	2.39		49	7.4	52	1036	52	1036	1.90	38	44		C	
07	3		2.44		49	7.4	64	1302	60	1220	1.90	39	48		C	
08	5	.02	2.49		49	7.4	68	1412	80	1661	1.95	40	54		C	
09	5	.09	2.42		49	7.4	74	1494	44	888	2.10	42	30		C	
10	3		2.41		49	7.6	76	1528	34	683	2.90	58	20		C	
11	1		2.37		49	7.4									C	
12	1		2.35		49	7.4									C	
13	1		2.35		48	7.3	70	1372	58	1136	1.90	37	42		C	
14	1		2.45		48	7.4									C	
15	1		2.47		49	7.5	64	1318	58	1195	2.16	44	44		C	
16	4	.04	2.47		49	7.5	62	1398	38	782	2.20	45	24		C	
17	1		2.42		49	7.4	58	1171	50	1009	2.75	55	20		C	
18	4	.08	2.46		49	7.4									C	
19	1		2.36		49	7.5									C	
20	3		2.36		50	7.4									C	
21	1		2.50		49	7.4	78	1626	58	1209	2.30	46	50		C	
22	4	.16	2.48		49	7.4	74	1531	46	951	2.30	48	32		C	
23	1		2.53		49	7.5	64	1350	40	844	2.05	43	28		C	
24	5	.03	2.53		49	7.3	74	1561	40	844	2.40	51	28		C	
25	1		2.50		48	7.5									C	
26	1		2.41		48	7.4									C	
27	1		2.44		49	7.4	76	1547	60	1221	1.95	40	42		C	
28	1		2.48		49	7.4	68	1406	58	1200	2.05	42	48		C	
29															C	
30															C	
31															C	
TL		1.18	68.43					24,878		18942		806			C	
ME			2.44				67	1382	60	1052	2.19	45	37		C	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

February, 19 83 — Month

Marshall, Michigan — Municipality

Robert J. Swalwell — Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
ID	130029	02	83	
	Plant No.	Mo.	Yr.	Sampling Point Code

DAY	BOD-5 9	BOD-5 14	SS 19	SS 24	TOTAL-P 29	TOTAL-P 34	VSS 39	NH_3-N 44	REMARKS OR OTHER PARAMETERS 49	54	59	64	69	74 78	80	9	14	19
1 2	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l							C			
PN	00310	85001	00530	85002	00665	85004	00535	00610							C			
SF															C			
01	64	1308	38	776	1.80	37	24								C			
02	50	1076	28	602	1.80	39	18								C			
03	42	862	32	657	1.60	33	22								C			
04															C			
05															C			
06	42	837	66	1316	2.25	45	48								C			
07	44	895	38	773	2.20	45	32								C			
08	48	997	42	872	2.10	44	24								C			
09	42	848	24	484	2.75	55	22								C			
10	48	965	12	241	3.85	77	8								C			
11															C			
12															C			
13	42	823	60	1176	1.80	35	46								C			
14															C			
15	46	948	52	1071	1.70	35	44								C			
16	46	948	18	371	2.30	47	12								C			
17	40	807	42	848	1.90	38	30								C			
18															C			
19															C			
20															C			
21	50	1043	50	1043	2.05	43	32								C			
22	54	1117	32	662	1.70	35	22								C			
23	52	1097	32	675	1.65	35	18								C			
24	48	1013	54	1139	1.80	38	42								C			
25															C			
26															C			
27	58	1180	48	977	1.65	34	32								C			
28	46	951	40	827	1.70	35	38								C			
29															C			
30															C			
31															C			
TL		17,715		14,555		750									C			
ME	48	984	39	808	203	42	29								C			

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

February, 19 83
Month

Marshall, Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID 1300029 02 83 ...
Plant No Mo Yr Sampling Point Code

DAY 1 2	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification 14
	Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MLSS 34	MLVSS 39	SETTL. 44	SDI 49	DO 54	Air Applied 59	SS 64	VSS 49	Percent Return 74	8C	Waste Sludge 9	
	KCF	KCF	HRS.	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu. Ft.	%	%	%	C	KGal	See Code*
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF											4				C		
01	48		3.5	6.4	.30	1570	1084	14.0	1.12	5.2	162	.39	68	59	C	15	
02			3.3	6.8	.31	1644	1177	15.0	1.13	4.3	159	.42	70	56	C	12	
03			3.5	6.7	.32	1601	1130	13.0	1.23	4.0	163	.40	70	59	C	19	
04			3.5	6.1	.34	1477	1033	14.0	1.06	5.5	168	.39	69	58	C	15	
05			3.6								167			58	C	12	
06			3.6								164			61	C	14	
07			3.5	5.9	.32	1484	1032	14.0	1.06	6.7	165	.35	69	59	C	18	
08			3.5	5.8	.30	1577	1125	15.0	1.05	4.2	166	.35	71	57	C	15	
09			3.6	6.2	.28	1569	1116	15.0	1.05	4.4	163	.40	71	57	C	12	
10			3.6	6.4	.28	1493	1068	16.0	.93	5.3	163	.39	71	51	C	16	
11			3.6	6.1	.30	1412	995	14.0	1.00	5.8	162	.40	70	57	C	19	
12			3.7								165			60	C	14	
13			3.7								160			58	C	16	
14			3.5	7.3	.20	1956	1511	14.0	1.40	5.2	155	.30	61	58	C	15	
15			3.5	5.2	.29	1499	1051	13.0	1.15	4.2	147	.31	69	58	C	26	
16			3.5	5.6	.33	1347	934	13.0	1.04	4.5	151	.35	70	50	C	13	
17			3.6	5.9	.30	1441	1016	14.0	1.03	4.8	154	.39	70	43	C	14	
18			3.5	5.4	.33	1328	929	13.0	1.02	4.0	154	.41	69	45	C	18	
19			3.7								152			49	C	16	
20			3.7								149			49	C	15	
21			3.4								151			47	C	16	
22			3.5	5.7	.32	1482	1015	14.0	1.06	4.4	149	.45	68	46	C	12	
23			3.4	5.3	.34	1385	960	13.0	1.07	5.5	151	.40	68	47	C	14	
24			3.4	4.3	.40	1197	843	11.0	1.05	6.3	154	.35	69	47	C	38	
25			3.4	5.2	.33	1450	1012	12.0	1.21	5.8	156	.45	70	44	C		
26			3.6								154			42	C	14	
27			3.5								153			44	C	17	
28			3.5	4.7	.35	1395	986	12.0	1.16	6.0	149	.45	70	44	C	16	
29															C		
30															C		
31															C		
TL															C	441	
ME			3.5	5.8	.31	1492	1054	1.36	1.10	5.1	157	.39	69	53	C	16	

February (Month) 19 83

Marshall (Municipality), Michigan

Robert J. Swalwell (Superintendent's Signature)

State of Michigan
Department of Natural Resources

SLUDGE DISPOSAL SHEET

Marshall Landf...

Acres This month ____

DATE	SLUDGE APPLIED: Gallons or Cubic Yards X	% Solids	% VS	Dry Tons per ac	SLUDGE ANALYSIS AND SOIL LOADING RATES: Nitrogen TKN %	Nitrogen NH_4 %	Nitrogen NO_3 %	Nitrogen AVAN lb/ac	Total Phosphorus TP %	Total Phosphorus TP lb/ac	Potassium K %	Potassium K lb/ac	Lead Pb mg/kg	Lead Pb lb/ac	Zinc Zn mg/kg	Zinc Zn lb/ac	Copper Cu mg/kg	Copper Cu lb/ac	Nickel Ni mg/kg	Nickel Ni lb/ac	Cadmium Cd mg/kg	Cadmium Cd lb/ac				CF
1	25	19.2	53																							Projec
2	23	20.1	48																							CEC
4	28	19.5	47																							pH
8	21	22.6	50																							Fer
9	30	20.9	54																							N
11	24	21.5	52																							P_2O
16	21	20.7	50																							K_2O
18	25	20.0	52																							Acc
23	24	19.2	52																							Pb
24	22	22.6	53																							Zn
25	20	22.5	49																							Cu
																										Ni
																										Cd
Average	24	20.8	51		3.1	.22	.1001		1.9		.10		139		716		489		72		10					Cu
This Month	263																									REM
This Year	549																									X
Cumulative																										

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

February (Month), 19 83 — Marshall (Municipality), Michigan — Robert J. Swahnell (Superintendent's Signature)

1 2 | 3 8 | 9 10 | 11 12 | 13 15
ID | 130029 (Plant No.) | 02 (Mo.) | 83 (Yr.) | .. (Sampling Point Code)

DAY 1 2	GRIT 9 CF	AUX. FUEL 14 G25 CF	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS.	39 $FeCl_3$ LBS	44	49	54	59
PN											
SF		2									
01		61	3000.			20	596.				
02		50	2760.			30	397				
03		78	2640			20	397				
04		78	3000.			30	596.				
05		73	2520			20	397				
06		58	2640			30	199				
07		74	2640			30	298				
08		75	2880.			30	496.				
09		72	2880.			20	596.				
10		91	2760			30	397				
11		85	3000.			30	496.				
12		65	2640			20	298				
13		54	2640			30	199				
14		62	2880			30	397				
15		45	2640			20	397				
16		52	2520.			40	596.				
17		37	2760			30	397				
18		44	2760.			10	596.				
19		33	2400			10	397				
20		37	2400			10	397				
21		34	2400			20	199				
22		35	2640			30	397				
23		39	2640.			30	199.				
24		68	2760.			30	794.				
25		87	2760			30	596.				
26		47	2520.			20	397				
27		28	2520			20	397				
28		56	2520			40	397				
29											
30											
31											
TL		1635	75,120			400	11915				
ME		58	2683			14	426				

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	5		764
Superintendent	1		152
Asst. Supt.	1		152
Shift Foreman			
Shift Operator	3		460
Maint. Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL ARE

WEEKDAYS 11 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

Digester Volume, ft³
Primary _____
Secondary _____

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

Supernatant To _____
Process Pattern _____

R 4619
4833-5382

MONTH February 1983

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE Gals. X100	RAW SLUDGE Total Solids %	RAW SLUDGE Vol. Solids %	RAW SLUDGE Vol. Solids Lbs/1000 c.f. Digester	RAW SLUDGE pH	DIGESTING SLUDGE Temp. °F	DIGESTING SLUDGE pH	DIGESTING SLUDGE Total Solids %	DIGESTING SLUDGE Vol. Solids %	DIGESTING SLUDGE Vol. Acids Mg/l	DIGESTING SLUDGE Alkalinity Mg/l	SUPERNATANT Gals. X	SUPERNATANT pH	SUPERNATANT Total Solids %	SUPERNATANT Vol. Solids %	SUPERNATANT Susp. Solids Mg/l	SUPERNATANT P Mg/l	SUPERNATANT P Lbs.	SUPERNATANT 5-Day BOD Mg/l	DIGESTED SLUDGE Gals. X	DIGESTED SLUDGE Total Solids %	DIGESTED SLUDGE Vol. Solids %	DIGESTED SLUDGE pH	Gas Produced cu. ft X
1	30	3.0	73		6.2																			
2	30	4.3	55		6.3																			
3	30	4.6	58		6.3																			
4	30	4.8	68		6.3																			
5	30	4.3	64		6.3																			
6	30	4.3	79		6.4																			
7	35	4.3	63		6.4																			
8	35	5.0	68		6.3																			
9	35	4.6	68		6.4																			
10	35	4.5	62		6.4																			
11	35	4.9	67		6.4																			
12	30	4.5	59		6.4																			
13	30	4.4	76		6.3																			
14	35	4.2	71		6.5																			
15	35	4.5	58		6.5																			
16	35	4.1	52		6.6																			
17	35	4.1	65		6.6																			
18	35	4.2	77		6.6																			
19	30	4.2	68		6.6																			
20	30	4.0	74		6.5																			
21	30	4.1	63		6.5																			
22	35	4.6	75		6.6																			
23	35	4.7	69		6.4																			
24	35	4.3	81		6.6																			
25	35	4.6	64		6.7																			
26	30	4.2	67		6.6																			
27	30	4.4	74		6.6																			
28	65	4.8	82		6.6																			
29																								
30																								
31																								
TOTAL	945																							
ARITH. MEAN	34	4.3	68																					

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MDPH D-4.7

MONTH February, 1983 — VACUUM FILTER & INCINERATION DATA — OPERATOR R.J. Swalwell

DATE	SLUDGE TO FILTER				CHEMICALS TO FILTER				FILTER		FILTRATE						FILTER CAKE					INCINERATION			REMARKS
	Gal. x100	Tot. Sol. %	Lbs. Dry Sol.	pH	C20 Lbs. Dry	R	FeCl3 Lbs. Dry	R	Tot. Hours	Yield	Gal. x100	pH	Sus. Solids Mg/l	Vol. Susp. Solids %	5 Day BOD Mg/l	P Mg/l	Thou. Lbs. Wet	Tot. Sol. %	Lbs. Tot. Solids x100	Vol. Sol. %	Lbs. Vol. Solids x100	Hrs. Opr.	Yield	Fuel BTU	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1	86	4.9	3540	6.1	1300		191		8.0		76	9.0	774	19	2070		25	19.2	48	53	25				
2	86	4.9	3540	6.2	1300		191		8.0		76	11.4	612	9	960		23	20.7	48	51	24				
3																									
4	86	5.8	4190	6.1	1300		191		8.0		76	12.0	1044	48	1080		28	19.5	55	47	26				
5																									
6																									
7																									
8	86	4.5	3251	6.4	1300		191		8.0		76	12.1	622	8	1320		21	22.0	46	50	23				
9	86	7.0	5057	6.1	1300		191		8.0		76	11.9	686	7	1140		30	20.9	63	54	34				
10																									
11	86	5.3	3892	6.3	1300		191		8.0		76	11.8	712	11	900		24	21.5	52	52	27				
12																									
13																									
14																									
15																									
16	86	4.3	3106	5.2	1300		191		8.0		76	11.7	676	15	1140		21	20.7	43	50	22				
17																									
18	86	5.1	3684	6.7	1300		191		8.0		76	12.1	680	10	1080		25	20.0	50	52	26				
19																									
20																									
21																									
22																									
23	86	4.6	3323	6.3	1300		191		8.0		76	11.9	496	31	2340		24	19.2	46	52	24				
24	86	5.1	3684	6.3	1300		191		8.0		76	12.2	698	24	1740		22	22.4	50	53	26				
25	86	4.4	3179	6.6	1300		191		8.0		76	12.0	792	7	900		20	22.5	45	49	22				
26																									
27																									
28																									
29																									
30																									
31																									
Total	946		40446		14300		2101		88.		836						263		546		279.				
Mthly Avgs	86	5.1	3677		1300		191		8.0		76		708	17	1252		24	20.8	50	51	25				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

_____ Month , 19 ____ _____ Municipality , Michigan _____ Superintendent's Signature

1 2 ID | 3 8 Plant No | 9 10 Mo | 11 12 Yr | 13 15 Sampling Point Code

DAY	BOD-5			SS			TOTAL-P			VSS	NH_3-N	pH	DO	F. COLI*		T. COLI*	REMARKS
	9 14 19			24 29 34			39 44 49			54	59	64	69	74	80	9	14 19
1 2	mg/l	LBS	% Rem	mg/l	LBS	% Rem	mg/l	LBS	% Rem	mg/l	mg/l	SU	mg/l	#/100 ml	C	#/100 ml	
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 31615	C	31504 31505	
SF															C		
01	18	368	76	2	41	96	.48	9	79	1		7.3	6.7	22	C		
02	8	172	85	3	65	94	.47	10	80	2		7.4	6.0	8	C		
03	5	103	92	6	123	88	.41	8	80	4		7.5	5.5	16	C		
04												7.4	7.0	134	C		
05												7.4			C		
06	6	120	88	3	60	94	.34	7	81	2		7.4			C		
07	21	427	70	7	142	88	.35	7	82	3		7.5	7.6	8	C		
08	8	166	88	9	187	89	.38	8	81	1		7.5	4.8	4	C		
09	7	141	91	3	61	93	.56	11	73	2		7.5	7.2	10	C		
10	8	161	89	1	20	97	.42	8	86	1		7.5	7.5	34	C		
11												7.3	8.2	8	C		
12												7.4			C		
13	21	412	70	12	235	79	.25	5	87	10		7.4			C		
14												7.2	8.1	24	C		
15	21	432	67	10	206	83	.41	8	81	8		7.1	7.1	12	C		
16	11	227	82	6	124	84	.47	10	79	3		7.4	6.7	18	C		
17	14	283	76	11	222	72	.70	14	75	5		7.2	7.2	356	C		
18												7.2	7.0		C		
19												7.2	~~7.4~~		C		
20												7.1			C		
21	24	500	69	9	188	84	.35	7	84	5		7.2			C		
22	26	538	65	5	103	89	.32	7	86	1		7.3	7.1	36	C		
23	8	169	88	8	169	80	.34	7	83	2		7.4	7.2	76	C		
24	20	422	73	10	211	75	.32	4	87	8		7.3	7.4	12	C		
25												7.4	7.6	10	C		
26												7.4	?		C		
27	24	488	68	11	224	82	.32	7	84	6		7.4			C		
28	15	310	78	10	207	83	.34	7	83	7		7.4	7.6	16	C		
29															C		
30															C		
31															C		
TL		5434			2588			147							C		
ME	15	302	79	7	144	86	.40	8	82	4		7.3	7.0	20	C		
WA	20	423		10	197									27	C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

March, 19 83
Month

Marshall, Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

ID | 1306.29 | 03 | 83 | 500
Plant No. | Mo. | Yr. | Sampling Point Code

DAY	WEATHER		FLOW		RAW SEWAGE QUALITY											REMARKS OR C
	TYPE	PRECIP.	TOTAL	MAX RATE	TEMP	pH	BOD-5		SS		TOTAL-P		VSS	NH_3-N		
1 2	9	14	19	24	29	34	39	44	49	54	59	64	69	74 78	80	9 14 19
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l	C	
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C	
SF															C	
01	1		2.45		49	7.5	68	1389	40	817	2.30	47	28		C	
02	1		2.48		49	7.5	74	1530	56	1158	2.05	42	38		C	
03	1		2.45		49	7.5	66	1349	58	1185	2.10	43	38		C	
04	1		2.39		50	7.6									C	
05	4	.12	2.33		50	7.6									C	
06	4	.28	2.38		49	7.6	60	1191	58	1151	2.05	41	54		C	
07	4	.50	2.54		50	7.4	80	1635	70	1430	2.30	47	56		C	
08	4	.31	2.43		50	7.4	76	1667	80	1755	2.40	53	72		C	
09	5	.01	2.56		50	7.4	56	1196	50	1068	1.95	42	46		C	
10	4	.01	2.54		50	7.5	60	1271	116	2459	1.80	38	86		C	
11	3		2.50		50	7.5									C	
12	1		2.46		50	7.5									C	
13	1		2.46		50	7.5	90	1846	26	533	1.95	40	22		C	
14	1		2.56		50	7.4	104	2220	52	1110	2.20	47	36		C	
15	1		2.55		50	7.4	70	1489	68	1446			62		C	
16	1		2.60		50	7.3	78	1691	60	1301	2.40	52	34		C	
17	4	.27	2.61		50	7.3	90	1959	60	1306	2.45	53	58		C	
18	4	.50	2.50		50	7.6									C	
19	1		2.43		50	7.4									C	
20	5	.87	2.50		50	7.4	76	1585	40	834	2.05	43	34		C	
21	5	.09	2.54		50	7.3	64	1356	58	1229	2.05	43	48		C	
22	1		2.57		50	7.3	70	1500	54	1157	1.95	42	36		C	
23	1		2.55		50	7.5	60	1276	60	1276	2.05	44	38		C	
24	1		2.51		50	7.5	54	1130	52	1089	2.10	44	40		C	
25	1		2.52		50	7.4									C	
26	4	.20	2.48		50	7.4									C	
27	4&5	.50	2.62		50	7.4	52	1136	46	1005	1.90	42	34		C	
28	1		2.80		49	7.4	50	1168	46	1074	1.65	39	34		C	
29	1		2.90		49	7.4	70	1643	64	1548	1.65	40	52		C	
30	1		2.89		49	7.4	80	1928	58	1398	2.40	58	50		C	
31	4	.02	2.88		49	7.4									C	
TL		3.88	79.18					33205		27322		940			C	
ME			2.55				70	1509	58	1242	2.08	44	46		C	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

March, 19 83
Month

Marshall, Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2 ID | 3 8 Plant No. 1300027 | 9 10 Mo. 03 | 11 12 Yr. 83 | 13 15 Sampling Point Code

DAY	BOD-5 9	14	SS 19	24	TOTAL-P 29	34	VSS 39	NH_3-N 44	REMARKS OR OTHER PARAMETERS 49	54	59	64	69	74	78 80	9	14
1 2	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l							C		
PN	00310	85001	00530	85002	00665	85004	00535	00610							C		
SF															C		
01	52	1063	20	409	1.80	37	6								C		
02	60	1241	52	1076	1.70	35	30								C		
03	46	940	46	940	1.50	31	32								C		
04															C		
05															C		
06	50	992	43	854	1.60	32	31								C		
07	62	1267	52	1063	2.05	42	40								C		
08	62	1360	54	1184	1.65	36	42								C		
09	34	726	48	1025	1.50	32	32								C		
10	38	805	56	1186	2.05	43	34								C		
11															C		
12															C		
13	54	1108	56	1149	2.10	43	46								C		
14	82	1751	34	726	1.70	36	22								C		
15	56	1191	52	1106			36								C		
16	86	1865	60	1301	1.90	41	52								C		
17	100	2177	56	1219	2.05	45	52								C		
18															C		
19															C		
20	76	1585	48	1001	2.40	50	34								C		
21	50	1059	34	720	1.70	36	32								C		
22	84	1800	52	1115	1.30	28	26								C		
23	70	1489	54	1148	1.65	35	46								C		
24	58	1214	54	1130	1.75	37	36								C		
25															C		
26															C		
27	42	918	52	1136	1.65	36	32								C		
28	40	934	34	794	1.30	30	28								C		
29	68	1645	54	1306	1.40	34	36								C		
30	70	1687	50	1205	1.95	47	38								C		
31															C		
TL		28817		22522		1195									C		
ME	61	1310	48	1024	1.75	38	35								C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

March, 1983
Month

Marshall, Michigan
Municipality

Robert J Swihart
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID 1300029 03 83 ...
Plant No Yr Sampling Point Code

DAY 1 2	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification 14
	Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MLSS 34	MLVSS 39	SETTL. 44	SDI 49	DO 54	Air Applied 59	SS 64	VSS 49	Percent Return 74	80	Waste Sludge 9	
	KCF	KCF	HRS.	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu. Ft.	%	%	%	C	KGal	See Code*
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF											4				C		
01	48		3.5	4.6	.33	1273	888	11.0	1.13	5.8	148	.38	70	43	C	32	
02			3.5	5.5	.33	1530	1099	13.0	1.18	2.7	146	.49	71	43	C		
03			3.5	6.1	.33	1476	1063	12.0	1.23	5.4	143	.56	71	44	C	237	
04			3.6	4.5	.65	690	533	6.0	1.15	6.8	143	.18	76	47	C		
05			3.7								141			44	C		
06			3.6								141			43	C		
07			3.4	5.8	.30	1766	1260	12.0	1.47	1.6	141	.61	70	43	C		
08			3.3	4.7	.36	1523	1088	11.0	1.38	4.3	154	.48	71	41	C	16	
09			3.4	5.2	.30	1675	1214	12.0	1.40	5.6	161	.48	72	47	C	13	
10			3.4	4.3	.32	1510	1101	12.0	1.26	6.0	160	.46	71	48	C	16	
11			3.4	4.5	.32	1568	1098	11.0	1.42	7.8	163	.51	69	42	C	15	
12			3.5								160			42	C	16	
13			3.5								155			48	C	16	
14			3.4	4.2	.38	1452	1043	11.0	1.32	6.8	201	.51	70	42	C	17	
15			3.4	3.6	.35	1583	1117	12.0	1.32	4.6	201	.50	71	43	C	16	
16			3.3	4.4	.36	1640	1184	12.0	1.37	5.4	195	.53	70	41	C	15	
17			3.3	4.3	.39	1452	1208	12.0	1.38	5.5	191	.48	71	41	C	15	
18			3.4	4.4	.37	1431	1214	12.0	1.35	5.7	202	.54	72	43	C	15	
19			3.5								127			33	C	15	
20			3.4								199			45	C	16	
21			3.4	4.5	.49	1542	1113	12.0	1.29	7.0	210	.45	71	45	C	15	
22			3.4	4.2	.56	1432	1043	11.0	1.30	7.0	211	.39	72	49	C	23	
23			3.4	4.1	.50	1502	1099	15.6	1.00	7.0	210	.48	72	45	C	15	
24			3.4	4.2	.52	1490	1082	12.0	1.24	7.0	196	.40	72	45	C	21	
25			3.4	4.3	.50	1541	1120	11.0	1.40	6.5	158	.47	71	44	C	14	
26			3.5								152			42	C	15	
27			3.3								149			38	C	15	
28			3.1	4.1	.46	1498	1092	12.0	1.24	6.1	150	.51	72	35	C	14	
29			3.0	4.1	.51	1589	1063	11.0	1.44	6.8	147	.48	70	37	C	13	
30			3.0	3.9	.53	1550	1079	11.0	1.41	5.9	145	.49	69	39	C	15	
31			3.0	3.6	.54	1463	1038	11.0	1.30	6.0	143	.48	71	37	C	13	
TL															C	643	
ME			3.4	4.5	.42	1501	1081	11.5	1.30	5.8	165	.47	71	43	C	25	

· Digester Volume, ft³
· Primary. _____
Secondary _____

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

R 4619
4833-5382

Supernatant To _____
Process Pattern _____

MONTH March 1983

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE Gals. 100	RAW SLUDGE Total Solids %	RAW SLUDGE Vol. Solids %	RAW SLUDGE Vol. Solids Lbs 1000 c.f. Digester	RAW SLUDGE pH	DIGESTING SLUDGE Temp. °F	DIGESTING SLUDGE pH	DIGESTING SLUDGE Total Solids %	DIGESTING SLUDGE Vol. Solids %	DIGESTING SLUDGE Vol. Acids Mg/l	DIGESTING SLUDGE Alkalinity Mg/l	SUPERNATANT Gals. X	SUPERNATANT pH	SUPERNATANT Total Solids %	SUPERNATANT Vol. Solids %	SUPERNATANT Susp. Solids Mg l	SUPERNATANT P Mg/l	SUPERNATANT P Lbs.	SUPERNATANT 5-Day BOD Mg/l	DIGESTED SLUDGE Gals. X	DIGESTED SLUDGE Total Solids %	DIGESTED SLUDGE Vol. Solids %	DIGESTED SLUDGE pH	Gas Produced cu. ft X
1	35	5.1	74		6.5																			
2	35	4.0	45		6.9																			
3	35	4.5	78		6.6																			
4	45	5.2	86		6.6																			
5	30	2.0	75		6.7																			
6	30	4.7	77		6.6																			
7	35	4.8	72		6.5																			
8	35	5.0	71		6.4																			
9	35	4.5	79		6.4																			
10	35	4.6	75		6.5																			
11	35	4.6	70		6.4																			
12	30	4.4	67		6.5																			
13	30	5.1	67		6.4																			
14	35	4.4	63		6.3																			
15	35	4.9	64		6.4																			
16	35	7.3	68		6.6																			
17	35	4.8	65		6.4																			
18	35	5.5	70		6.6																			
19	30	4.5	70		6.5																			
20	30	4.7	78		6.5																			
21	35	4.9	71		6.5																			
22	35	4.6	68		6.5																			
23	35	4.6	63		6.5																			
24	35	4.6	71		6.6																			
25	35	4.8	83		6.6																			
26	30	4.2	65		6.5																			
27	30	4.6	82		6.5																			
28	35	4.2	74		6.5																			
29	35	4.4	65		6.7																			
30	35	4.5	65		6.5																			
31	35	4.5	x3		6.6																			
TOTAL	1055																							
ARITH. MEAN	34	4.6	71																					

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.7

Marshall , MICHIGAN

MONTH March , 1983 — VACUUM FILTER & INCINERATION DATA — OPERATOR R.J. Swalwell

DATE	SLUDGE TO FILTER				CHEMICALS TO FILTER				FILTER		FILTRATE						FILTER CAKE					INCINERATION			REMARKS
	Gal. x 100	Tot. Sol. %	Lbs. Dry Sol.	pH	CaO Lbs. Dry	R	FeCl3 Lbs. Dry	R	Tot. Hours	Yield	Gal. x 100	pH	Sus. Solids Mg/l	Vol. Susp. Solids %	5 Day BOD Mg/l	P Mg/l	Thou. Lbs. Wet	Tot. Sol. %	Lbs. Tot. Solids x 100	Vol. Sol. %	Lbs. Vol. Solids x 100	Hrs. Opr.	Yield	Fuel BTU	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1	70	4.3	3675	6.4	1421		191		8.0		76	12.2	624	40	1560		21	24.0	50	40	13				
2	70	4.8	3970	6.3	1421		191		8.0		76	11.0	498	25	1800		25	21.7	54	50	27				
3	70	5.5	3321	6.3	1421		191		8.0		76	10.7	574	11	960		22	21.5	47	44	21				
4																									
5																									
6																									
7																									
8	70	4.3	2510	6.5	1421		191		8.0		76	12.4	760	31	1680		19	20.9	40	46	18				
9	70	5.6	3269	6.3	1421		191		8.0		76	12.1	654	12	1040		20	23.2	46	53	25				
10																									
11																									
12																									
13																									
14																									
15	70	5.2	3056	6.2	1421		191		8.0		76	12.2	696	31	1320		22	20.4	45	47	21				
16	70	5.5	3211	6.2	1421		191		8.0		76	12.0	608	24	1800		20	22.6	45	51	23				
17	70	4.3	3678	6.2	1421		191		8.0		76	11.9	492	18	1680		24	21.5	52	45	23				
18																									
19																									
20																									
21																									
22	70	5.0	2919	6.3	1421		191		8.0		76	11.5	770	51	2100		23	18.7	43	53	23				
23	70	4.6	2685	6.5	1421		191		8.0		76	12.2	836	16	1320		18	22.9	41	47	19				
24	70	5.2	3036	6.4	1421		191		8.0		76	12.3	994	22	1320		22	20.4	45	51	23				
25																									
26																									
27																									
28																									
29	70	5.0	2919	6.4	1421		191		8.0		76	12.1	806	9	2220		21	21.0	44	45	20				
30	70	5.0	2919	6.4	1421		191		8.0		76	12.2	648	7	2340		21	21.1	44	50	22				
31	70	4.9	2861	6.6	1421		191		8.0		76	12.2	648	12	1920		19	22.2	42	50	21				
Total	980		43902		19894		2674		112		1064						297		638		299				
Arith. Means	70	5.4	3136		1421		191		8.0		76		683	22	1651		21	21.6	46	48	21				

March (Month) 19 83

Marshall (Municipality) Michigan

Robert J. Swalwell (Superintendent's Signature)

M215.

State of Michigan
Department of Natural Resources

SLUDGE DISPOSAL SHEET

~~Acres~~ This month

DATE	SLUDGE APPLIED: Gallons per Cubic Yards*	% Solids	% VS	Dry Tons per ac	SLUDGE ANALYSIS AND SOIL LOADING RATES: Nitrogen TKN %	Nitrogen NH_4 %	Nitrogen NO_3 %	Nitrogen AVAN lb/ac	Total Phosphorus TP %	Total Phosphorus TP lb/ac	Potassium K %	Potassium K lb/ac	Lead Pb mg/kg	Lead Pb lb/ac	Zinc Zn mg/kg	Zinc Zn lb/ac	Copper Cu mg/kg	Copper Cu lb/ac	Nickel Ni mg/kg	Nickel Ni lb/ac	Cadmium Cd mg/kg	Cadmium Cd lb/ac				
1	21	29.6	40																							
2	25	21.7	56																							
3	22	21.5	44																							
8	19	20.9	46																							
9	20	23.2	53																							
15	22	26.4	47																							
16	20	22.6	51																							
17	24	21.5	45																							
22	23	18.7	53																							
23	18	22.9	44																							
24	22	20.4	51																							
29	21	21.0	45																							
30	21	21.1	50																							
31	19	22.2	50																							
Average	21	21.6	48		3.1	.22	601		1.9		.16		139		716		489		72		10					
TOTALS This Month	297																									
TOTALS This Year	847																									
TOTALS Cumulative																										

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

March, 19 83
Month

Marshall, Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2 | 3 8 | 9 10 | 11 12 | 13 15
ID | 130029 | 03 | 83 |
Plant No. | Mo. | Yr. | Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX. FUEL 14 GAS CF	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS.	39 Fe Cl 3 LBS.	44	49	54	59
PN											
SF		2									
01		31	2640			20	596				
02		33	2520			20	596				
03			2400			20	596				
04		3	2280			30	397				
05		2	2160			10	397				
06		1	2160			20	397				
07		2	2160			30	397				
08		28	2640			40	397				
09		41	2760			30	596				
10		48	2520			30	397				
11		55	2520			10	397				
12		41	2400			30	397				
13		30	2400			30	397				
14		33	2640			20	397				
15		20	2880			30	596				
16		35	2760			30	596				
17		9	2760			20	496				
18		32	2400			26	298				
19		35	2640			40	199				
20		93	2280			50	397				
21		94	2760			20	397				
22		79	3120			30	596				
23		77	2880			30	397				
24		77	2880			20	397				
25		72	2880			20	397				
26		42	2400			30	199				
27		34	2520			30	199				
28		55	2640			20	397				
29		71	2880			30	596				
30		48	2880			20	596				
31		36	2640			20	596				
TL		1267	80400			750	13703				
ME		42	2594			24	442				

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	5		920
Superintendent	1		184
Asst. Supt.	1		184
Shift Foreman			
Shift Operator	3		552
Maint. Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL

WEEKDAYS 11 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

_____ Month , 19 _____ _____ Municipality , Michigan _____ Superintendent's Signature

ID Plant No. | Mo | Yr. | Sampling Point Code

DAY	BOD-5			SS			TOTAL-P			VSS	NH_3-N	pH	DO	F. COLI*		T. COLI*	REMARKS
1 2	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	mg/l	SU	mg/l	#/100 ml	C	#/100 ml	
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 31615	C	31504 31505	
SF															C		
01T	7	143	90	3	61	93	.28	6	88	1		7.4	7.3	18	C		
02W	23	476	70	11	226	80	.30	6	85	5		7.6	6.5	20	C		
03TH	5	102	92	6	123	89	.23	5	89	4		7.3	6.6	12	C		
04F												7.4	9.0	20	C		
05SA												7.3	~~6.5~~		C		
06SU	22	437	63	3	60	95	.19	4	91	1		7.4			C		
07M	11	225	86	3	61	96	.22	4	88	2		7.3	6.5	22	C		
08TU	24	526	68	10	219	88	.27	6	89	7		7.3	5.0	46	C		
09W	6	128	89	12	256	76	.28	6	86	8		7.4	5.9	40	C		
10TH	8	169	87	7	148	94	.18	4	90	4		7.3	7.5	50	C		
11F												7.3	7.4	20	C		
12SA												7.3			C		
13SU	13	263	86	2	41	92	.28	6	86	1		7.4			C		
14M	26	555	75	9	192	83	.26	4	91	5		7.3	8.0	22	C		
15TU	9	191	87	8	176	88				3		7.4	7.9	6	C		
16W	7	152	91	5	108	92	.22	5	91	4		7.3	6.2	6	C		
17	9	196	90	6	131	90	.23	5	91	5		7.3	6.9	16	C		
18												7.3	7.1	12	C		
19												7.4			C		
20	26	542	66	3	63	93	.32	7	84	2		7.3			C		
21	19	402	70	13	275	77	.28	6	86	11		7.3	6.9	10	C		
22	8	171	88	4	192	83	.25	5	87	6		7.3	8.3	10	C		
23	5	106	92	9	191	85	.27	6	87	1		7.4	7.8	14	C		
24	15	314	72	8	167	85	.27	6	87	1		7.4	7.6	12	C		
25												7.4	7.1	22	C		
26												7.3	1		C		
27	23	503	56	10	219	78	.27	6	86	4		7.4			C		
28	8	187	84	7	163	85	.27	6	84	3		7.3	6.8	14	C		
29	9	218	87	10	242	84	.22	5	87	2		7.4	8.0	14	C		
30	11	265	86	7	169	88	.27	7	89	5		7.3	7.1	20	C		
31												7.4	6.5	18	C		
TL		2275			3477			115							C		
ME	13	103	81	7	158	87	.25	5	88	4		7.4	7.2	17	C		
WA	17	353		10	209									33	C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

_____, 19 _____ Month

_____, Michigan Municipality

_____ Superintendent's Signature

ID 1 2 | 3 8 Plant No | 9 10 Mo. | 11 12 Yr. | 13 15 Sampling Point Code

DAY	BOD-5			SS			TOTAL-P			VSS	NH_3-N	pH	DO	F COLI*		T. COLI*	REMARKS	
	9	14	19	24	29	34	39	44	49	54	59	64	69	74	80	9	14	19
1 2	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	mg/l	SU	mg/l	#/100 ml	C	#/100 ml		
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 31615	C	31504 31505		
SF															C			
01 T	7	143	90	3	61	93	.28	6	88	1		7.4	7.3	18	C			
02 W	23	476	70	11	226	80	.30	6	85	5		7.6	6.5	20	C			
03 M	5	102	92	6	123	89	.23	5	89	4		7.3	6.6	12	C			
04 F												7.4	9.0	20	C			
05 SA												7.3	~~6.5~~		C			
06 SU	22	437	63	3	60	95	.19	4	.91	1		7.4			C			
07 M	11	225	86	3	61	96	.22	4	88	2		7.3	6.5	22	C			
08 TU	24	526	68	10	219	88	.27	6	89	7		7.3	5.0	46	C			
09 W	6	128	89	12	256	76	.28	6	86	8		7.4	5.9	40	C			
10 TH	8	169	87	7	148	94	.18	4	90	4		7.3	8.5	50	C			
11 F												7.3	7.4	20	C			
12 SA												7.3			C			
13 SU	13	267	86	2	41	92	.28	6	86	1		7.4			C			
14 M	26	555	75	9	192	83	.20	4	91	5		7.3	8.0	22	C			
15 TU	9	191	87	8	170	88		[illegible]		3		7.4	7.9	6	C			
16 W	7	152	91	5	108	92	.22	5	91	4		7.3	6.2	6	C			
17	9	196	90	6	131	90	.23	5	91	5		7.3	6.9	16	C			
18												7.3	7.1	12	C			
19												7.4			C			
20	26	542	66	3	63	93	.32	7	84	2		7.3			C			
21	19	402	70	13	275	77	.28	6	86	11		7.3	6.9	10	C			
22	8	171	88	9	192	83	.25	5	87	6		7.3	8.3	10	C			
23	5	106	92	9	191	85	.27	6	87	1		7.4	7.8	14	C			
24	15	314	72	8	167	85	.27	6	87	1		7.4	7.6	12	C			
25												7.4	7.1	22	C			
26												7.3			C			
27	23	503	56	10	219	78	.27	6	86	4		7.4			C			
28	8	187	84	7	163	85	.27	6	84	3		7.3	6.8	14	C			
29	9	218	87	10	242	84	.22	5	87	2		7.4	8.0	14	C			
30	11	265	86	7	169	88	.27	7	89	5		7.3	7.1	20	C			
31												7.4	6.5	18	C			
TL		2275			3477			115							C			
ME	13	103	81	7	158	87	.25	5	88	4		7.4	7.2	17	C			
WA	17	353		10	209									33	C			

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

April Month, 1983 — Marshall Municipality, Michigan — Robert J. Swalwell Superintendent's Signature

1 2 | 3 8 | 9 10 | 11 12 | 13 15
IP | 1300279 | 04 | 83 | 500
Plant No | Mo | Yr | Sampling Point Code

DAY 1 2	WEATHER		FLOW		RAW SEWAGE QUALITY											REMARKS OF	
	TYPE 9	PRECIP. 14	TOTAL 19	MAX 24 RATE	TEMP 29	pH 34	BOD-5 39 44		SS 49 54		TOTAL-P 59 64		VSS 69	NH_3-N 74 78	80	9	14
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l	C		
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C		
SF															C		
01	4	.31	3.75		49	7.4									C		
02	4	.55	2.80		50	7.5									C		
03	4	.12	3.29		50	7.5	29	558	54	1257	1.65	38	44		C		
04	3		2.93		49	7.4	72	1759	68	1662	2.55	62	52		C		
05	4	.27	2.93		49	7.4	70	1711	40	977	1.90	46	32		C		
06	4	.41	2.96		49	7.4	62	1531	36	889	1.70	42	28		C		
07	4	.03	2.98		49	7.4	70	1740	40	994	1.80	45	36		C		
08	4	.30	2.92		49	7.6									C		
09	4	.70	3.07		50	7.5									C		
10	4	.17	3.19		49	7.4	58	1543	38	1011	1.90	51	22		C		
11	1		3.17		49	7.4	44	1163	44	1163	1.90	50	12		C		
12	4	.40	3.20		49	7.5	38	1014	40	1068	2.05	55	28		C		
13	4	.80	3.37		49	7.4	76	2136	36	1012	2.05	58	32		C		
14	4	.15	3.47		50	7.4	60	1736	40	1158	2.05	59	38		C		
15	5	.01	3.40		49	7.3									C		
16	5	.12	3.32		49	7.3									C		
17	3		3.25		49	7.4	34	922	30	813	1.65	45	32		C		
18	1		3.35		49	7.4	48	1341	40	1118	1.90	53	28		C		
19	1		3.26		49	7.4	56	1523	40	1088	1.70	46	36		C		
20	1		3.17		49	7.3	48	1269	30	793	1.95	52	24		C		
21	1		3.19		50	7.4	34	905	30	789	1.65	44	22		C		
22	1		3.05		50	7.4									C		
23	1		2.89		50	7.4									C		
24	1		2.94		50	7.4									C		
25	1		3.07		50	7.4	58	1485	50	1280	1.90	49	40		C		
26	1		3.06		50	7.5	44	1123	52	1329	1.90	48	42		C		
27	4	.13	3.00		50	7.4	50	1251	40	1001	1.95	49	32		C		
28	4	.37	2.96		50	7.3	50	1234	40	987	1.90	47	30		C		
29	4	.49	2.96		50	7.3									C		
30	4	.23	2.93		50	7.4									C		
31															C		
TL		5.53	9233					25944		20387		939			C		
ME			3.08				52	1365	41	1073	1.90	49	32		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

April, 1983
Month

Marshall, Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

ID 1300029 04 83 ..
Plant No. Mo. Yr Sampling Point Code

DAY	BOD-5		SS		TOTAL-P		VSS	NH_3-N	REMARKS OR OTHER PARAMETERS								
	9 14		19 24		29 34		39	44	49	54	59	64	69	74 78	80	9	14
1 2	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l							C		
PN	00310	85001	00530	85002	00665	85004	00535	00610							C		
SF															C		
01															C		
02															C		
03	12	279	36	838	1.35	31	24								C		
04	36	880	46	1124	2.05	50	32								C		
05	68	1662	46	1224	1.80	44	30								C		
06	62	1531	42	1037	1.60	39	36								C		
07	74	1839	50	1243	1.70	42	18								C		
08															C		
09															C		
10	46	1224	32	851	1.60	43	16								C		
11	32	846	44	1163	1.70	45	30								C		
12	34	907	38	1014	1.70	45	24								C		
13	74	2080	44	1237	1.80	51	40								C		
14	42	1215	42	1215	1.65	48	38								C		
15															C		
16															C		
17	34	922	42	1138	1.60	43	30								C		
18	42	1173	38	1062	1.40	39	28								C		
19	52	1414	38	1033	1.40	38	32								C		
20	38	1005	46	1216	1.55	44	34								C		
21	44	1171	46	1224	1.60	43	38								C		
22															C		
23															C		
24															C		
25	46	1178	50	1280	1.50	38	40								C		
26	44	1123	52	1327	1.60	41	46								C		
27	50	1251	50	1251	1.35	34	44								C		
28	48	1185	54	1333	1.50	37	42								C		
29															C		
30															C		
31															C		
TL		22885		21855		795									C		
ME	46	1204	44	1150	1.61	42	34								C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

April , 1983
Month

Marshall , Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID 1300299 04 83 ...
Plant No. Mo. Yr. Sampling Point Code

DAY 1 2	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification 14
	Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MLSS 34	MLVSS 39	SETTL. 44	SDI 49	DO 54	Air Applied 59	SS 64	VSS 49	Percent Return 74	80	Waste Sludge 9	
	KCF	KCF	HRS.	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu. Ft.	%	%	%	C	KGal	See Code*
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF											4				C		
01	48		3.1								138			40	C	16	
02			3.1								136			43	C	13	
03			3.1								140			43	C	14	
04			2.9	3.5	.39	1330	981	11.0	1.21	5.3	143	.41	73	38	C	14	
05			2.9	4.0	.33	1463	1187	11.0	1.33	4.4	150	.47	73	39	C	11	
06			2.9	4.1	.38	1490	1110	11.0	1.35	4.5	173	.52	73	40	C	10	
07			2.9	3.6	.45	1359	1027	11.0	1.24	4.6	184	.52	75	38	C	16	
08			3.0	3.5	.46	1305	999	11.0	1.19	5.8	182	.41	76	40	C	12	
09			2.8								182			38	C	15	
10			2.7								177			34	C	14	
11			2.7	2.8	.50	1046	826	8.0	1.31	6.6	182	.40	77	32	C	24	
12			2.7	2.9	.52	1120	859	8.0	1.40	5.0	182	.43	76	36	C	16	
13			2.6	3.7	.63	1476	892	10.0	1.48	4.8	178	.51	84	33	C		
14			2.5	3.1	.53	1243	938	11.0	1.13	4.7	169	.54	74	29	C	24	
15			2.5	4.2	.43	1676	1154	11.0	1.52	3.1	179	.64	72	30	C		
16			2.6								184			33	C	17	
17			2.7								173			35	C	13	
18			2.6	4.2	.36	1555	1100	12.0	1.30	4.3	177	.53	70	35	C	16	
19			2.6	3.8	.40	1425	1004	10.0	1.43	6.0	178	.54	69	36	C	15	
20			2.7	4.0	.38	1454	1039	11.0	1.32	6.3	176	.47	70	39	C	14	
21			2.7	3.6	.44	1351	957	10.0	1.35	5.5	171	.50	68	34	C	20	
22			2.8	3.9	.39	1404	1014	11.0	1.28	4.2	167	.49	71	33	C	14	
23			3.0								164			42	C	14	
24			2.9								156			38	C	15	
25			2.8								164			35	C	13	
26			2.8	3.9	.39	1515	1095	11.0	1.38	4.2	163	.51	71	36	C	13	
27			2.9	3.9	.35	1487	1075	12.0	1.24	3.3	157	.50	72	36	C	14	
28			2.9	3.7	.36	1461	1057	10.0	1.46	4.5	157	.54	70	35	C	13	
29			2.9	4.0	.33	1565	1158	11.0	1.42	4.1	158	.57	73	36	C	11	
30			2.9											37	C	11	
31															C		
TL															C	413	
ME			2.8	3.7	.42	1407	1022	11.0	1.33	4.8	161	.50	73	37	C	15	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

April (Month), 19 83

Marshall (Municipality), Michigan

Robert J. Swalwell (Superintendent's Signature)

ID 130029 (Plant No.) 04 (Mo.) 83 (Yr.) ... (Sampling Point Code)

DAY 1 2	GRIT	AUX. FUEL	POWER CONSUMPTION			CHEMICALS APPLIED					
	9	14 GAS	19 #1	24 #2	29 #3	34 Cl_2	39 Feels	44	49	54	59
	CF	CF	KWH	KWH	KWH	LBS.	LBS.				
PN											
SF		2									
01		27	2520			20	397				
02		30	2520			20	199				
03		30	2640			20	199				
04		42	2520			20	397				
05		40	2880			20	596				
06		34	2880			50	397				
07		33	2880			30	298				
08		6	2520			20	99				
09		14	2520			30					
10		4	2640			10					
11		37	2760			30	397				
12		9	2760			20	496				
13		13	2880			10	794				
14		12	2760			30	596				
15		58	3120			30	794				
16		39	2880			30	397				
17		53	3000			30	397				
18		60	3240			20	496				
19		61	3240			20	843				
20		19	3240			20	794				
21		3	2880			20	596				
22		3	2760			20	794				
23		3	2520			20	397				
24		9	2760			30	596				
25		6	3000			30	794				
26		1	2880			20	893				
27		5	2760			20	893				
28		29	3120			40	794				
29		7	2880			20	397				
30		6	2520			30	397				
31											
TL		692	84480			710	15137				
ME		23	2816			24	541				

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	5		840
Superintendent	1		168
Asst. Supt.	1		168
Shift Foreman			
Shift Operator	3		504
Maint. Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL AR

WEEKDAYS 11 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

April 1983
(Month)
Marshall, Michigan
(Municipality)
Robert J. Swalwell
(Superintendent's Signature)

2nd half

State of Michigan
Department of Natural Resources

SLUDGE DISPOSAL SHEET

Acres This month

DATE	SLUDGE APPLIED: Gallons or Cubic Yards*	% Solids	% VS	Dry Tons per ac	SLUDGE ANALYSIS AND SOIL LOADING RATES: Nitrogen TKN %	Nitrogen NH_4 %	Nitrogen NO_3 %	Nitrogen AVAN lb/ac	Total Phosphorus TP %	Total Phosphorus TP lb/ac	Potassium K %	Potassium K lb/ac	Lead Pb mg/kg	Lead Pb lb/ac	Zinc Zn mg/kg	Zinc Zn lb/ac	Copper Cu mg/kg	Copper Cu lb/ac	Nickel Ni mg/kg	Nickel Ni lb/ac	Cadmium Cd mg/kg	Cadmium Cd lb/ac				
5	22	21.4	56																							
6	19	21.2	49																							
7	22	21.5	53																							
12	22	20.8	51																							
13	19	20.9	48																							
15	24	19.7	40																							
18	17	24.2	48																							
19	22	22.3	48																							
20	21	23.0	43																							
21	27	20.5	54																							
22	20	20.9	43																							
25	29	20.7	52																							
26	37	20.0	52																							
27	32	19.8	48																							
28	30	19.4	54																							
29	35	17.9	52																							
Average	80	20.9	49		3.1	.22	.001		1.9		.10		139		716		489		72		1.0					
TOTALS This Month	398																									
TOTALS This Year	1244																									
TOTALS Cumulative																										

Pr
Ce
pH
F
N
P
K
Pb
Zn
C
Ni
Co
C
R
*

Digester Volume, ft³
Primary _____
Secondary _____

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

R 4619
4833-5382

Supernatant To _____
Process Pattern _____

MONTH April 1983

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE					DIGESTING SLUDGE						SUPERNATANT								DIGESTED SLUDGE				Gas Produced cu. ft X
	Gals. X 100	Total Solids %	Vol. Solids %	Vol. Solids Lbs/1000 c.f. Digester	pH	Temp. °F	pH	Total Solids %	Vol. Solids %	Vol. Acids Mg/l	Alkalinity Mg/l	Gals. X	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	P Mg/l	P Lbs.	5-Day BOD Mg/l	Gals. X	Total Solids %	Vol. Solids %	pH	
1	30	4.3	67		6.6																			
2	30	4.9	70		6.6																			
3	30	4.6	69		6.5																			
4	35	3.2	89		6.6																			
5	35	4.6	70		6.6																			
6	35	4.9	70		6.6																			
7	35	4.8	67		6.6																			
8	35	5.1	70		6.6																			
9	30	4.3	63		6.5																			
10	30	4.7	67		6.6																			
11	45	4.8	71		6.5																			
12	45	4.3	64		6.5																			
13	75	4.2	83		6.5																			
14	80	4.6	93		6.3																			
15	40	4.0	76		6.6																			
16	30	3.8	75		6.6																			
17	30	5.2	68		6.4																			
18	30	5.2	71		6.5																			
19	30	4.4	68		6.6																			
20	30	5.0	73		6.5																			
21	30	4.8	66		6.7																			
22	41	4.7	66		6.7																			
23	30	4.5	63		6.7																			
24	30	4.1	72		6.6																			
25	30	4.1	72		6.6																			
26	30	5.0	68		6.7																			
27	30	4.4	70		6.7																			
28	30	3.5	55		6.7																			
29	55	3.6	73		6.7																			
30	30	4.5	72		6.6																			
31																								
TOTAL	1696																							
ARITH. MEAN	37	4.5	71																					

MDPH
D-4.7

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH April, 19 83

VACUUM FILTER & INCINERATION DATA

OPERATOR R.J. Swalwell

DATE	SLUDGE TO FILTER				CHEMICALS TO FILTER				FILTER		FILTRATE						FILTER CAKE					INCINERATION			REMARKS
	Gal. X 100	Tot. Sol. %	Lbs. Dry Sol.	pH	C20 Lbs. Dry	C20 R	FeCl3 Lbs. Dry	FeCl3 R	Tot. Hours	Yield	Gal. X 100	pH	Sus. Solids Mg/l	Vol. Susp. Solids %	5 Day BOD Mg/l	P Mg/l	Thou. Lbs. Wet	Tot. Sol. %	Lbs. Tot. Solids X 100	Vol. Sol. %	Lbs. Vol. Solids X 100	Hrs. Opr.	Yield	Fuel BTU	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1																									
2																									
3																									
4																									
5	75	5.0	3128	6.5	1565		191		8.0		76	12.0	840	9	1080		22	21.4	478	50	24				
6	75	4.0	2502	6.4	1565		191		8.0		76	11.9	600	20	1320		19	21.2	41	49	20				
7	75	4.9	3065	6.6	1565		191		8.0		76	12.2	600	49	1560		22	21.5	46	53	25				
8																									
9																									
10																									
11																									
12	70	4.7	2744	6.4	1565		191		8.0		76	11.2	628	29	1020		22	20.8	46	51	24				
13	65	4.5	2439	6.3	1565		191		8.0		76	11.8	669	42	1080		19	20.9	40	48	19				
14																									
15	57	6.3	2995	6.5	1760		214		9.0		86	11.7	1280	16	1500		24	19.7	48	40	19				
16																									
17																									
18	52	5.5	2385	6.5	1760		214		9.0		86	12.0	780	37	1200		17	24.2	41	48	20				
19	65	6.0	3253	6.6	1760		214		9.0		86	12.3	860	15	1320		22	22.3	50	48	24				
20	66	5.9	3248	6.6	1760		214		9.0		86	12.4	620	15	600		21	23.0	48	43	21				
21	75	6.0	3753	6.6	1760		214		9.0		86	12.0	574	20	1080		27	20.5	55	54	30				
22	53	5.6	2475	6.6	1760		214		9.0		86	11.9	628	21	1020		20	20.9	42	48	18				
23																									
24																									
25	100	5.2	4337	6.5	1760		214		9.0		86	11.6	598	26	1080		29	20.7	61	52	32				
26	126	5.3	5569	6.6	1760		214		9.0		86	11.7	433	46	1080		37	20.0	73	52	38				
27	104	5.2	4515	6.5	1760		214		9.0		86	12.2	520	27	1560		32	19.8	63	48	30				
28	100	4.4	3670	6.5	1760		214		9.0		86	11.5	536	23	1560		30	19.4	54	54	29				
29	121	4.4	4440	6.7	1760		214		9.0		86	11.3	531	22	780		35	17.9	62	52	32				
30																									
31																									
Total	1279		54513		27185		3309		139		1326						398		817		405				
Arith. Means	80	5.2	3407		1699		207		8.7		83		702	26	1178		25	20.9	51	49	25				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

_____ Month , 19 _____ _____ Municipality , Michigan _____ Superintendent's Signature

ID Plant No. Mo. Yr. Sampling Point Code

DAY	19 BOD-5			19 SS			19 TOTAL-P			19 VSS	NH_3-N	30 pH	19 DO	F. COLI* 19		T. COLI*	REMARKS
	9 14 19			24 29 34			39 44 49			54	59	64	69	74 80		9	14
1 2	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	mg/l	SU	mg/l	#/100 ml	C	#/100 ml	
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 31615	C	31504 31505	
SF															C		
01												7.3			C		
02												7.5			C		
03	2	47	92	4	93	93	.25	6	85	1		7.9			C		
04	7	220	88	7	171	90	.35	9	86	3		7.4	7.3	14	C		
05	8	195	89	6	147	85	.30	7	84	3		7.7	6.1	30	C		
06	14	346	77	7	173	81	.46	11	73	2		7.4	6.7	36	C	26	
07	14	472	73	7	174	83	.46	11	74	4		7.4	7.0	24	C		
08												7.5	8.3 [redacted]	[redacted] 34	C		
09												7.4			C		
10	12	319	79	8	213	79	.71	19	63	1		7.4			C		
11	4	106	91	9	238	80	.38	10	80	3		7.4	7.7	8	C		
12	3	80	92	4	107	90	.19	5	91	2		7.4	6.0	16	C		
13	21	590	72	3	84	92	.23	6	89	2		7.3	6.2	18	C	27	
14	5	145	92	2	58	95	.05	1	98	1		7.4	6.1	62	C		
15												7.2	5.8	92	C		
16												7.3			C		
17	4	108	88	7	190	77	.28	8	83	2		7.3			C		
18	5	140	90	9	251	78	.27	8	86	4		7.3	7.1	6	C		
19	6	163	89	8	218	80	.22	6	87	5		7.3	7.0	4	C		
20	7	185	85	6	159	80	.20	5	90	3		7.3	6.2	4	C		
21	3	80	91	2	53	93	.18	5	95	1		7.3	6.4	12	C		
22												7.3	6.4	4	C		
23												7.4			C		
24												7.3			C		
25	5	128	91	5	128	90	.19	5	90	4		7.4			C		
26	[illegible]	235	[illegible]	[illegible]	209	85	.23	6	86	4		7.4	5.4	4	C		
27	5	125	90	1	25	98	.12	3	94	1		7.3	5.2	10	C		
28	7	173	86	5	123	88	.22	5	88	3		7.3	5.5	10	C		
29												7.4	5.5	64	C		
30												7.3			C		
31															C		
TL		3877			2809			136							C		
ME	8	204	86	6	148	86	.28	7	85	3		7.4	6.4	15	C		
WA	11	310		7	189									27	C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

May, 19 83
Month

Marshall, Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1,2 ID | 3–8 1300024 Plant No | 9,10 05 Mo | 11,12 83 Yr | 13–15 SEP Sampling Point Code

DAY 1 2	WEATHER TYPE 9	WEATHER PRECIP. 14	FLOW TOTAL 19	FLOW MAX 24 RATE	RAW SEWAGE QUALITY TEMP 29	pH 34	BOD-5 39 44		SS 49 54		TOTAL-P 59 64		VSS 69	NH_3-N 74 78		REMARKS OR C 80	9	14	19
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l		C			
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610		C			
SF																C			
01	4	1.41	3.24		50	7.4	38	1027	52	1405	1.95	53	36			C			
02	4	.02	3.43		51	7.4	52	1488	60	1716	1.95	56	52			C			
03	4	.05	3.26		51	7.4	58	1577	34	924	1.70	46	30			C			
04	4	.02	3.24		50	7.4	48	1297	42	1135	2.05	55	36			C			
05	1		3.24		50	7.4	50	1372	44	1207	1.95	53	40			C			
06	4	.08	3.23		50	7.4										C			
07	4	.85	3.19		50	7.4										C			
08	1		3.21		50	7.4	68	1820	72	1928	1.95	52	56			C			
09	1		3.35		50	7.5	55	1536	44	1224	2.10	59	40			C			
10	1		3.38		50	7.5	62	1748	76	2142	2.30	65	46			C			
11	1		3.26		50	7.3	58	1577	60	1631	2.10	57	50			C			
12	1		3.20		51	7.4	56	1494	78	2082	2.05	55	62			C			
13	3		3.20		51	7.4										C			
14	4	.05	3.06		51	7.4										C			
15	1		3.07		50	7.3	50	1380	68	1741	1.95	50	64			C			
16	1		3.24		50	7.3	58	1567	36	973	2.40	65	38			C			
17	3		3.11		50	7.4	52	1349	80	2075	2.16	56	60			C			
18	4	.12	3.19		52	7.5	60	1581	50	1317	2.20	58	46			C			
19	4	.92	3.25		52	7.5	74	2006	50	1355	1.60	43	38			C			
20	1		3.20		52	7.4										C			
21	4	.57	3.10		52	7.4										C			
22	4	.53	3.37		52	7.4	54	1518	64	1799	1.50	42	52			C			
23	1		3.39		52	7.4	60	1696	56	1583	1.95	55	40			C			
24	4	.06	3.30		52	7.5	66	1816	56	1541	1.60	44	42			C			
25	4	.17	3.25		52	7.3	58	1572	64	1735	1.95	53	46			C			
26	1		3.25		52	7.4	54	1464	66	1784	2.05	56	54			C			
27	1		3.15		52	7.4										C			
28	4	.24	3.09		52	7.4										C			
29	4	.13	3.07		52	7.4										C			
30	4	.15	3.11		52	7.4	68	1764	54	1401	1.90	49	38			C			
31	4	.03	3.22		52	7.5	70	1880	80	2148	2.05	55	56			C			
TL		5.40	99.92					34429		34856		1177				C			
ME			3.22				58	1565	58	1584	1.97	54	46			C			

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

May, 19 83 — Month

Marshall — Municipality, Michigan

Robert J. Swalen — Superintendent's Signature

1 2 | 3 8 | 9 10 | 11 12 | 13 15
10 | 1326024 | 05 | 83 | [ ]
Plant No | Mo | Yr | Sampling Point Code

DAY	BOD 5 9 14		SS 19 24		TOTAL-P 29 34		VSS 39	NH_3-N 44	REMARKS OR OTHER PARAMETERS 49	54	59	64	69	74 78	80	9	14	19
1 2	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l							C			
AV	00310	85001	00530	85002	00665	85004	00535	00610							C			
SF															C			
01	28	757	50	1351	1.80	49	40								C			
02	44	1259	62	1774	1.80	51	52								C			
03	40	1083	24	653	1.65	45	18								C			
04	34	919	36	972	1.65	44	24								C			
05	38	1043	30	823	1.70	47	24								C			
06															C			
07															C			
08	46	1231	42	1124	1.80	48	28								C			
09	35	978	34	950	1.80	50	30								C			
10	34	958	40	1128	1.90	53	36								C			
11	44	1196	66	1794	1.95	53	46								C			
12	48	1281	62	1655	1.70	45	44								C			
13															C			
14															C			
15	52	1331	54	1383	1.80	46	50								C			
16	46	1273	36	973	1.90	51	24								C			
17	32	830	32	830	2.05	53	16								C			
18	42	1107	38	1051	1.70	45	24								C			
19	32	867	38	1030	1.15	31	34								C			
20															C			
21															C			
22	33	927	35	983	1.70	39	25								C			
23	38	1074	52	1476	1.50	42	40								C			
24	38	1046	44	1211	1.20	33	36								C			
25	46	1247	50	1355	1.50	41	38								C			
26	40	1084	50	1355	1.70	46	42								C			
27															C			
28															C			
29															C			
30	56	1452	54	1401	1.60	41	34								C			
31	48	1289	60	1611	1.65	44	44								C			
TL		24267		26797		997									C			
ME	41	1100	45	1218	1.68	45	34								C			

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

May , 19 83
Month

Marshall , Michigan
Municipality

Robert J. Swanlund
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID 1300075 05 83 ...
Plant No Mo Yr Sampling Point Code

DAY 1 2	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification 14 19
	Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MLSS 34	MLVSS 39	SETTL 44	SDI 49	DO 54	Air Applied 59	SS 64	VSS 49	Percent Return 74	8C	Waste Sludge 9	
	KCF	KCF	HRS	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu Ft	%	%	%	C	KGal	See Code*
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF											4				C		
01	48		2.7								155			33	C	12	
02			2.6	2.6	.28	1342	1021	10.0	1.34	3.2	156	.52	75	32	C	13	
03			2.6	3.1	.38	1393	1039	10.0	1.39	4.6	161	.54	73	31	C	13	
04			2.7								161			36	C	13	
05			2.6	3.4	.39	1363	950	10.0	1.36	4.1	162	.50	69	36	C	14	
06			2.8	3.5	.36	1412	1003	10.0	1.41	5.4	154	.53	70	36	C	11	
07			2.7								154			36	C	16	
08			2.7								167			36	C	18	
09			2.6	3.5	.39	1319	926	12.0	1.10	5.0	165	.48	69	39	C	13	
10			2.5	5.3	.28	1894	1310	12.0	1.58	4.3	160	.52	69	41	C	22	
11			2.6	4.1	.35	1461	996	12.0	1.23	4.7	157	.58	66	40	C	10	
12			2.7	4.2	.32	1455	1097	14.0	1.18	4.4	153	.54	66	41	C	11	
13			2.7	4.1	.32	1625	1110	12.0	1.35	4.3	149	.53	63	38	C	24	
14			2.8								152			39	C		
15			2.8								160			39	C	8	
16			2.7	4.5	.30	1950	1319	14.0	1.39	4.0	161	.45	67	37	C	8	
17			2.8	4.3	.31	1710	1174	13.0	1.32	3.0	160	.52	68	39	C	20	
18			2.7	2.8	.46	1187	830	11.0	1.08	4.8	154	.40	69	34	C	20	
19			2.7	2.7	.45	1152	841	10.0	1.15	4.5	150	.39	71	35	C	22	
20			2.7	3.8	.33	1580	1137	12.0		3.8	155	.55	71	38	C	1	
21			2.8								149			36	C	11	
22			2.6								149			33	C	11	
23			2.5	3.0	.44	1174	837	10.0	1.17	4.7	155	.52	70	31	C	12	
24			2.6	3.2	.42	1134	808	10.0	1.13	6.6	176	.50	70	32	C	14	
25			2.7	3.6	.44	1346	978	10.0	1.34	4.6	164	.50	72	34	C	15	
26			2.7	3.6	.42	1126	826	10.0	1.13	4.7	164	.53	72	40	C	22	
27			2.7	3.2	.37	1246	903	10.0	1.25	5.0	159	.57	71	41	C	14	
28			2.8								158			39	C	13	
29			2.8								157			38	C	12	
30			2.8								160			39	C	11	
31			2.7	3.2	.39	1389	985	12.0	1.16	5.0	159	.60	69	36	C	19	
TL															C	412	
ME			2.7	3.6	.37	1423	1004	11.2	1.20	4.5	158	.52	70	37	C	14	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

May, 19 83 — Month

Marshall, Michigan — Municipality

Robert J. Swalwell — Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
ID	130029	05	83	
	Plant No	Mo.	Yr.	Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX. FUEL 14	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS.	39 $FeCl_3$ LBS	44	49	54	59
PN											
SF											
01			2760			30	199				
02			3000			30	993				
03			2880			20	794				
04			2760			20	[illegible]				
05			2880			20	993				
06			2760			10	794				
07			2520			40	596				
08			2760			20	199				
09			2880			20	1390				
10			2760			20	794				
11			2760			10	596				
12			2640			20	794				
13			2640			20	596				
14			2520			10	397				
15			2400			20	397				
16			2880			20	794				
17			2640			20	397				
18			2640			20	596				
19			2640			20	596				
20			2760			30	596				
21			2400			20	397				
22			2520			30	298				
23			2640			30	695				
24			2520			10	397				
25			2640			40	397				
26			2640			30	199				
27			2280			10	397				
28			2400			20	596				
29			2400			30	397				
30			2400			30	397				
31			2640			30	397				
TL			81960			710	17,478				
ME			2644			23	564				

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours	No. Vac.
TOTAL	5		848	
Superintendent	1		168	
Asst. Supt.	1		[illegible]	
Shift Foreman				
Shift Operator	3		512	
Maint. Supervisor				
Mechanic				
Chemist				
Lab Technician				
Clerk-Typist				
Other				

GIVE THE HOURS PER DAY PLANT PERSONNEL ARE

WEEKDAYS 11 HRS

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

gester Volume, ft³
Primary
Secondary

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

R 4619
4833-5382

Supernatant To
Process Pattern

MONTH May 1983

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE					DIGESTING SLUDGE						SUPERNATANT								DIGESTED SLUDGE				Gas Produced cu. ft X
	Gals. X 100	Total Solids %	Vol. Solids %	Vol. Solids Lbs 1000 c.f. Digester	pH	Temp. °F	pH	Total Solids %	Vol. Solids %	Vol. Acids Mg/l	Alkalinity Mg/l	Gals. X	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	P Mg/l	P Lbs.	5-Day BOD Mg/l	Gals. X	Total Solids %	Vol. Solids %	pH	
1	30	4.6	67		6.7																			
2	30	4.1	52		6.5																			
3	30	4.2	79		6.6																			
4	20	4.3	77		6.5																			
5	40	5.0	67		6.6																			
6	60	4.4	67		6.6																			
7	30	3.2	44		6.6																			
8	30	4.4	55		6.7																			
9	30	5.9	70		6.7																			
10	15	4.8	64		6.8																			
11	50	4.4	67		6.7																			
12	30	4.1	70		6.7																			
13	30	4.8	74		6.8																			
14	30	4.3	62		6.8																			
15	30	4.6	58		6.8																			
16	30	4.6	58		6.6																			
17	40	5.1	67		6.6																			
18	30	3.9	29		6.8																			
19	30	5.4	51		6.5																			
20	45	4.5	69		6.5																			
21	30	4.6	77		6.5																			
22	30	3.4	86		6.4																			
23	30	4.8	62		6.4																			
24	30	4.6	64		6.7																			
25	30	4.6	61		6.6																			
26	30	4.8	62		6.6																			
27	50	4.4	61		6.5																			
28	30	4.1	77		6.5																			
29	30	4.2	77		6.5																			
30	30	4.2	77		6.5																			
31	40	4.3	53		6.4																			
TOTAL	1050																							
ARITHMEAN	34	4.5	65																					

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.7

Marshall, MICHIGAN

MONTH May, 19 83 — VACUUM FILTER & INCINERATION DATA — OPERATOR R.J. Swalwell

DATE	SLUDGE TO FILTER				CHEMICALS TO FILTER				FILTER		FILTRATE						FILTER CAKE					INCINERATION			REMARKS
					Cao		Fecl3																		
	Gal. X 100	Tot. Sol. %	Lbs. Dry Sol.	pH	Lbs. Dry	R	Lbs. Dry	R	Tot. Hours	Yield	Gal. X 100	pH	Sus. Solids Mg/l	Vol. Susp. Solids %	5 Day BOD Mg/l	P Mg/l	Thou. Lbs. Wet	Tot. Sol. %	Lbs. Tot. Solids X 100	Vol. Sol. %	Lbs. Vol. Solids X 100	Hrs. Opr.	Yield	Fuel BTU	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1																									
2	70	4.0	2335	6.7	1264		191		8.0		76	11.6	524	45	1020		19	18.6	35	52	18				
3	70	4.8	2802	6.6	1264		191		8.0		76	11.7	494	19	960		20	19.9	41	43	17				
4																									
5	70	4.6	2685	6.7	1264		191		8.0		76	11.4	356	48	1200		19	21.1	39	49	19				
6	70	5.3	3094	6.7	1264		191		8.0		76	11.2	626	46	1020		17	20.3	35	43	15				
7																									
8																									
9	70	4.3	2510	6.8	1264		191		8.0		76	10.7	418	10	960		20	18.5	38	52	20				
10	70	5.7	3328	6.7	1264		191		8.0		76	10.8	516	15	960		22	20.5	46	44	20				
11	70	5.1	2977	6.8	1264		191		8.0		76	10.1	434	21	960		20	21.6	42	47	20				
12	70	5.9	3444	6.7	1264		191		8.0		76	11.9	502	43	1020		23	20.5	47	52	24				
13	70	6.7	3911	6.8	1264		191		8.0		76	11.8	690	16	1440		23	22.1	52	55	24				
14																									
15																									
16	70	4.7	2744	6.8	1264		191		8.0		76	11.8	484	38	1320		20	19.7	40	55	22				
17																									
18	70	3.7	2160	6.7	1264		191		8.0		76	11.3	298	19	900		22	15.4	34	55	19				
19																									
20	70	4.3	2510	6.7	1264		191		8.0		76	12.1	820	14	1560		19	19.4	38	53	20				
21																									
22																									
23	70	4.9	2860	6.5	1264		191		8.0		76	12.2	574	15	1080		21	19.7	41	53	22				
24																									
25	70	5.3	3094	6.5	1264		191		8.0		76	12.2	724	32	1320		23	19.3	44	51	22				
26																									
27																									
28																									
29																									
30																									
31																									
Total	980		40454		17696		2674		112		1064						288		530		287				
Average	70	5.0	2890		1264		191		8.0		76		547	27	1123		21	19.8	38	50	21				

May (Month) 1983

Marshall (Municipality), Michigan

Robert J. Swalwell (Superintendent's Signature)

May

State of Michigan
Department of Natural Resources

SLUDGE DISPOSAL SHEET

Acres This month

DATE	SLUDGE APPLIED: ~~Gallons or~~ X ~~Cubic Yards~~	% Solids	% VS	Dry Tons per ac.	SLUDGE ANALYSIS AND SOIL LOADING RATES: Nitrogen TKN %	Nitrogen NH_4 %	Nitrogen NO_3 %	Nitrogen AVAN lb/ac	Total Phosphorus TP %	Total Phosphorus TP lb/ac	Potassium K %	Potassium K lb/ac	Lead Pb mg/kg	Lead Pb lb/ac	Zinc Zn mg/kg	Zinc Zn lb/ac	Copper Cu mg/kg	Copper Cu lb/ac	Nickel Ni mg/kg	Nickel Ni lb/ac	Cadmium Cd mg/kg	Cadmium Cd lb/ac				
2	19	18.6	52																							
3	20	19.9	43																							
5	19	21.1	49																							
6	17	20.3	43																							
9	20	18.5	52																							
10	22	20.5	44																							
11	20	21.6	47																							
12	23	20.5	52																							
13	23	22.1	55																							
16	20	19.7	55																							
18	22	15.4	55																							
20	19	19.4	53																							
23	21	19.7	53																							
25	23	19.3	51																							
Average	21	19.8	50		3.1	.22	.001		1.9		.10		139		716		459		72		1.0					
TOTALS This Month	285																									
TOTALS This Year	1532																									
TOTALS Cumulative																										

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

_____ Month , 19 _____ _____ Municipality , Michigan _____ Superintendent's Signature

ID Plant No | Mo. | Yr | Sampling Point Code

DAY	BOD-5			SS			TOTAL-P			VSS	NH_3-N	pH	DO	F. COLI*		T. COLI*	REMARKS
1 2	mg/l	LBS	% Rem.	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem	mg/l	mg/l	SU	mg/l	#/100 ml	C	#/100 ml	
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 31615	C	31504 31505	
SF	8														C		
01	8	216	79	11	297	79	.46	12	76	7		7.4			C		
02	7	200	87	2	57	97	.22	6	89	1		7.4	5.3	74	C		
03	5	136	91	2	54	94	.22	6	87	1		7.4	6.3	12	C		
04	4	108	92	2	54	95	.22	6	89	1		7.3	6.2	6	C		
05	4	110	92	1	27	98	.13	4	93	1		7.4	5.9	16	C		
06							.15					7.4	6.7	40	C		
07												7.4			C		
08	8	214	88	6	160	92	.22	6	89	2		7.4			C		
09	4	112	95	3	84	93	.13	4	94	5		7.4	6.3	32	C		
10	4	113	94	8	226	89	.17	5	93	2		7.5	7.0	18	C		
11	3	82	95	2	54	97	.12	3	94	1		7.5	5.3	18	C		
12	5	133	91	10	267	87	.17	5	92	7		7.5	5.9	12	C		
13												7.3	5.7	16	C		
14												7.3	—		C		
15	7	179	86	4	102	94	.18	5	91	2		7.4	—		C		
16	7	189	88	2	54	94	.25	7	90	1		7.4	5.4		C		
17	4	104	92	8	207	90	.25	6	88	6		7.4	4.9	50	C		
18	4	105	93	3	79	94	.22	6	90	2		7.5	6.1	16	C		
19	5	135	93	4	108	92	.17	5	89	2		7.3	5.8	52	C		
20												7.3	5.4	40	C		
21												7.4			C		
22	5	141	91	4	112	94	.18	5	88	3		7.4			C		
23	4	113	93	3	85	95	.20	6	90	1		7.4	5.8	76	C		
24	10	275	85	8	220	86	.30	8	81	4		7.4	6.8	64	C		
25	8	217	86	10	271	84	.25	7	87	5		7.4	5.7	18	C		
26	4	108	93	7	190	89	.27	7	87	6		7.4	5.8	18	C		
27												7.4	6.1	50	C		
28												7.3			C		
29												7.4			C		
30	20	519	71	10	259	81	.28	7	85	2		7.4			C		
31	11	295	84	10	268	88	.25	7	88	3		7.3	6.0	56	C		
TL		4021			3335			133							C		
ME	6	183	88	5	147	91	.22	6	89	3		7.4	5.9	27	C		
WA	11	280		9	247									38	C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

June Month, 19 83

Marshall Municipality, Michigan

Robert J. Swahnell Superintendent's Signature

ID 130029 (Plant No.) 06 (Mo.) 83 (Yr.) 500 (Sampling Point Code)

DAY	WEATHER TYPE	WEATHER PRECIP.	FLOW TOTAL	FLOW MAX RATE	RAW SEWAGE QUALITY TEMP	pH	BOD-5		SS		TOTAL-P		VSS	NH_3-N		REMARKS OR OTHER
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l		
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610		
SF																
01	3		3.24		52	7.3	62	1675	60	1621	2.05	55	50			
02	4	.16	3.21		52	7.2	69	1713	54	1496	2.30	62	36			
03	4	.76	3.20		52	7.3										
04	4	.04	3.18		52	7.3										
05	4	.30	3.08		52	7.3	72	1849	60	1541	1.80	46	48			
06	4	.02	3.21		52	7.3	50	1339	66	1767	1.90	51	60			
07	1		3.16		52	7.3	56	1476	64	1687	2.10	55	60			
08	1		2.77		53	7.1	52	1201	60	1386	2.20	51	52			
09	4	.02	3.05		53	7.4	50	1272	36	916	2.20	56	32			
10	1		3.07		53	7.3										
11	1		3.01		53	7.4										
12	1		3.00		53	7.4	62	1551	92	2302	1.70	43	88			
13	1		3.00		54	7.2	64	1601	36	901	2.10	52	16			
14	1		2.98		54	7.3	46	1143	50	1243	1.90	47	34			
15	4	.03	2.98		54	7.3	44	1094	52	1293	2.10	52	38			
16	1		2.98		54	7.2	46	1143	48	1193	2.10	52	36			
17	1		2.97		54	7.3										
18	1		2.87		54	7.3										
19	1		2.85		54	7.4	62	1474	108	2567	2.10	50	98			
20	1		2.97		54	7.2	58	1437	52	1288	2.90	72	38			
21	1		2.93		54	7.3	62	1515	50	1222	2.60	64	36			
22	1		2.91		54	7.4	76	1844	58	1408	2.40	58	40			
23	1		2.87		55	7.4	48	1149	44	1053	2.10	50	42			
24	1		2.80		55	7.4										
25	1		2.72		55	7.4										
26	1		2.69		55	7.4	54	1211	58	1301	2.20	49	52			
27	4	2.38	3.18		55	7.3	70	1856	122	3236	2.60	69	82			
28	4	.20	3.00		55	7.5	88	2202	52	1301	2.10	53	48			
29	4	.03	3.02		55	7.3	52	1310	28	705	2.10	53	24			
30	4	.02	3.04		55	7.3	76	1927	68	1724			64			
31					55											
TL		3.96	89.94					32982		33,100		1140				
ME			3.00				60	1499	60	1505	2.17	52	49			

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

June, 1983
Month

Marshall, Michigan
Municipality

Robert J. Swahn
Superintendent's Signature

ID 130029 06 83
Plant No Mo Yr Sampling Point Code

DAY	BOD-5		SS		TOTAL-P		VSS	NH_3-N	REMARKS OR OTHER PARAMETERS									
	9 14		19 24		29 34		39	44	49	54	59	64	69	74 78	80	9	14	19
1 2	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l							C			
PN	00310	85001	00530	85002	00665	85004	00535	00610							C			
SF															C			
01	54	1454	48	1297	1.60	43	40								C			
02	44	1178	54	1446	1.90	51	36								C			
03															C			
04															C			
05	62	1593	46	1182	1.60	41	34								C			
06	44	1178	44	1178	1.50	40	30								C			
07	42	1107	38	1001	1.70	45	28								C			
08	34	785	40	924	1.90	44	32								C			
09	30	763	26	507	1.60	41	18								C			
10															C			
11															C			
12	44	1101	52	1301	1.40	35	42								C			
13	46	1151	26	651	1.60	40	14								C			
14	36	875	30	745	1.70	42	18								C			
15	32	795	56	1392	1.70	42	40								C			
16	44	1094	42	1044	1.80	45	30								C			
17															C			
18															C			
19	50	1188	64	1521	1.70	40	46								C			
20	60	1486	52	1288	1.70	42	36								C			
21	44	1075	52	1271	2.00	49	36								C			
22	70	1649	56	1359	1.90	46	40								C			
23	36	862	54	1293	1.70	41	44								C			
24															C			
25															C			
26	46	1032	60	1346	2.00	45	52								C			
27	96	2546	82	2175	2.30	61	72								C			
28	74	1851	72	1801	2.10	53	64								C			
29	52	1310	52	1310	1.70	43	44								C			
30	62	1572	56	1420			54								C			
31															C			
TL		27720		27454		929									C			
ME	50	1260	50	1248	1.86	44	39								C			

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

June, 19 83 (Month)

Marshall (Municipality), Michigan

Robert J. Swahlo (Superintendent's Signature)

ID 1300249 (Plant No) 06 (Mo) 83 (Yr) ... (Sampling Point Code)

DAY	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification	RF
	Aeration Volume	Reaeration Volume	Detention Time	Sludge Age	Organic Loading	MLSS	MLVSS	SETTL	SDI	DO	Air Applied	SS	VSS	Percent Return		Waste Sludge		
	KCF	KCF	HRS	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu Ft	%	%	%	C	KGal	See Code*	
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889	
SF											4				C			
01	48		2.7	4.3	.33	1746	1249	13.0	1.36	3.7	159	.70	69	35	C	3		
02			2.7	3.5	.40	1469	1041	12.0	1.22	4.5	157	.71	69	39	C	24		
03			2.7	4.1	.35	1709	1209	13.0	1.31	5.7	154	.64	69	38	C	11		
04			2.7								158			38	C	19		
05			2.8								153			37	C	19		
06			2.7	3.5	.40	1588	1120	11.0	1.44	4.9	155	.61	70	33	C	16		
07			2.7	3.5	.40	1546	1089	12.0	1.28	4.3	160	.60	69	33	C	13		
08			3.1	3.9	.36	1406	995	10.0	1.41	6.2	161	.64	69	37	C	23		
09			2.8	3.3	.42	1246	881	10.0	1.25	5.0	158	.55	70	32	C	34		
10			2.8	4.5	.31	1684	1196	11.0	1.53	5.1	157	.66	70	36	C			
11			2.9								156			34	C	14		
12			2.9								155			33	C	15		
13			2.9	4.2	.34	1507	1068	10.0	1.51	4.4	151	.51	69	39	C	15		
14			2.9	4.0	.35	1289	927	8.0	1.61	3.3	154	.44	70	34	C	22		
15			2.9	4.4	.32	1371	971	10.0	1.37	4.5	156	.48	70	38	C	12		
16			2.9	4.0	.31	1258	1004	10.0	1.26	4.3	173	.39	70	40	C	23		
17			2.9	5.0	.28	1597	1125	10.0	1.60	6.3	175	.52	70	34	C			
18			3.0								174			38	C	12		
19			3.0								174			37	C	14		
20			2.9	4.1	.34	1520	1086	10.0	1.53	4.5	172	.55	70	36	C	12		
21			2.9	3.8	.36	1408	1007	10.0	1.40	3.2	173	.45	71	39	C	13		
22			3.0	3.6	.38	1395	1026	10.0	1.40	3.3	186	.42	72	42	C	12		
23			3.0	3.3	.42	1271	926	10.0	1.27	3.5	188	.39	72	35	C	21		
24			3.1	4.4	.31	1646	1200	11.0	1.50	3.2	190	.59	71	46	C	1		
25			3.2								190			42	C	10		
26			3.2								186			38	C	20		
27			2.7	3.0	.45	1530	1112	11.0	1.39	2.0	190	.69	71	37	C	12		
28			2.9	3.0	.47	1510	1088	12.0	1.26	5.1	195	.55	71	34	C	22		
29			2.8	3.5	.40	1783	1277	14.0	1.27	3.4	193	.65	70	38	C	13		
30			2.8	2.9	.47	1527	1124	11.0	1.39	4.4	188	.57	72	38	C	16		
31															C			
TL															C	443		
ME			2.9	3.8	.37	1501	1078	1.09	1.39	4.3	170	.56	70	37	C	16		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

June, 1983 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

ID 130,029 (Plant No.) 06 (Mo.) 83 (Yr.) .. (Sampling Point Code)

DAY	GRIT	AUX. FUEL	POWER CONSUMPTION			CHEMICALS APPLIED					
1 2	9	14	19 #1	24 #2	29 #3	34 Cl_2	39 $FeCl_3$	44	49	54	59
	CF		KWH	KWH	KWH	LBS.					
PN											
SF											
01			2760			10	993				
02			2640			30	993				
03			2520			30	397				
04			2400			20	397				
05			2400			10	199				
06			2400			30	199				
07			2400			20	397				
08			2400			20	596				
09			2280			10	199				
10			2280			20	199				
11			2400			10	397				
12			2280			20	397				
13			2400			30	397				
14			2280			20	397				
15			2400			30	397				
16			2520			30	397				
17			2400			20	199				
18			2400			20	397				
19			2400			20	199				
20			2400			20	199				
21			2400			30	596				
22			2520			20	199				
23			2400			20	100				
24			2520			20	199				
25			2280			10	298				
26			2400			20	298				
27			2520			30	397				
28			2520			30	199				
29			2520			20	199				
30			2400			20	199				
31											
TL			72,840			640	10629				
ME			2428			21	354				

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours	No. of Vacan
TOTAL	5		880	
Superintendent	1		176	
Asst. Supt.	1		176	
Shift Foreman				
Shift Operator	3		528	
Maint. Supervisor				
Mechanic				
Chemist				
Lab Technician				
Clerk-Typist				
Other				

GIVE THE HOURS PER DAY PLANT PERSONNEL ARE

WEEKDAYS 9 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

Digester Volume, ft³
Primary
Secondary

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

R 4619
4833-5382

Supernatant To
Process Pattern

MONTH June 1983

DIGESTER AND SLUDGE DATA

OPERATOR R. J. Swalwell

DATE	RAW SLUDGE Gals. /.33	RAW SLUDGE Total Solids %	RAW SLUDGE Vol. Solids %	RAW SLUDGE Vol. Solids Lbs/1000 c.f. Digester	RAW SLUDGE pH	DIGESTING SLUDGE Temp. °F	DIGESTING SLUDGE pH	DIGESTING SLUDGE Total Solids %	DIGESTING SLUDGE Vol. Solids %	DIGESTING SLUDGE Vol. Acids Mg/l	DIGESTING SLUDGE Alkalinity Mg/l	SUPERNATANT Gals. X	SUPERNATANT pH	SUPERNATANT Total Solids %	SUPERNATANT Vol. Solids %	SUPERNATANT Susp. Solids Mg/l	SUPERNATANT P Mg/l	SUPERNATANT P Lbs.	SUPERNATANT 5 Day BOD Mg/l	DIGESTED SLUDGE Gals. X	DIGESTED SLUDGE Total Solids %	DIGESTED SLUDGE Vol. Solids %	DIGESTED SLUDGE pH	Gas Produced cu. ft X
1	30	4.4	64		6.4																			
2	30	4.4	75		6.4																			
3	35	4.5	65		6.4																			
4	35	6.3	67		6.3																			
5	35	5.1	66		6.4																			
6	35	4.9	68		6.6																			
7	28	3.6	88		6.5																			
8	28	4.4	75		6.5																			
9	28	4.3	35		6.4																			
10	28	4.6	65		6.5																			
11	28	3.6	91		6.5																			
12	28	4.3	76		6.5																			
13	28	4.6	70		6.4																			
14	28	5.1	76		6.4																			
15	28	4.6	76		6.5																			
16	28	4.4	78		6.4																			
17	28	5.7	60		6.4																			
18	28	4.2	66		6.4																			
19	28	3.4	74		6.4																			
20	28	4.5	60		6.3							11934	11.1	.40										
21	28	5.2	72		6.4																			
22	28	4.8	67		6.7																			
23	28	4.4	70		6.5																			
24	28	4.0	70		6.5																			
25	28	4.3	33		6.3																			
26	28	4.6	66		6.4																			
27	28	4.4	64		6.5							22542	11.2	.66										
28	28	4.1	26		6.6																			
29	28	5.2	68		6.5																			
30	28	4.7	66		6.4																			
31																								
TOTAL	872											34476												
ARITH. MEAN	29	4.6	66									17238		.53										

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

_____, 19 _____ Month

_____, Michigan Municipality

_____ Superintendent

ID 1 2 | 3 8 Plant No | 9 10 Mo | 11 12 Yr | 13 15 Sampling Point Code

DAY	22 BOD-5			22 SS			21 TOTAL-P			VSS	NH_3-N	pH	22 DO	22 F COLI*
	9	14	19	24	29	34	39	44	49	54	59	64	69	74
1 2	mg/l	LBS	% Rem	mg/l	LBS	% Rem	mg/l	LBS	% Rem	mg/l	mg/l	SU	mg/l	#/100 ml
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 31615
SF														
01	7	189	89	6	162	90	.34	9	83	5		7.2	4.0	12
02	6	160	91	6	161	89	.25	7	89	2		7.2	4.7	30
03												7.3	5.5	68
04												7.3		
05	16	411	78	3	77	95	.18	5	90	1		7.3		
06	5	134	90	5	134	94	.17	5	91	3		7.1	5.7	22
07	4	105	93	5	132	92	.19	5	91	4		7.3	6.4	12
08	2	46	96	2	46	97	.13	3	94	1		7.1	6.6	4
09	6	153	88	1	25	97	.20	5	91	1		7.3	6.7	16
10												7.3	6.3	8
11												7.3		
12	6	150	90	2	50	98	.13	3	92	1		7.4		
13	7	175	89	2	50	94	.18	5	91	1		7.3	5.0	14
14	3	75	93	3	75	94	.16	4	92	1		7.2	5.0	2
15	4	99	91	5	124	90	.13	3	94	3		7.2	6.5	10
16	18	447	61	1	25	98	.17	4	92	1		7.2	5.9	8
17												7.1	6.2	8
18												7.2		
19	10	238	87	11	261	80	.12	3	94	8		7.2		
20	8	198	86	3	74	88	.22	5	92	1		7.1	6.1	32
21	6	147	84	10	244	80	.22	5	92	7		7.2	6.0	18
22	21	510	72	4	97	93	.22	5	91	1		7.2	5.4	16
23	7	168	85	3	72	93	.23	6	89	2		7.3	5.8	32
24												7.2	5.1	38
25												7.3		
26	9	202	83	9	202	84	.22	5	90	4		7.4		
27	19	504	73	18	477	85	.66	18	75	13		7.3	6.6	8
28	23	575	74	20	500	62	.23	6	89	17		7.4	6.2	86
29	10	252	81	6	151	79	.28	7	87	1		7.3	5.4	192
30	14	355	82	7	177	90				5		7.3	6.5	52
31														
TL		5293			3316			118						
ME	10	241	84	6	151	89	.22	5.6	90	4		7.3	5.8	18
WA	15	392		12	301									48

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

July Month, 19 83 — Marshall Municipality, Michigan — Robert J. Swahill Superintendent's Signature

ID 1800??? Plant No | 02 Mo | 83 Yr | .. Sampling Point Code

DAY	WEATHER		FLOW		RAW SEWAGE QUALITY										REMARKS OR OT
	TYPE	PRECIP.	TOTAL	MAX RATE	TEMP	pH	BOD-5		SS		TOTAL-P		VSS	NH_3-N	
1 2	9	14	19	24	29	34	39	44	49	54	59	64	69	74 78	80
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l	C
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C
SF															C
01	4	.17	2.96		55	7.4									C
02	1		2.86		55	7.3									C
03	1		2.81		55	7.3									C
04	1		2.84		55	7.3	84	1990	50	1184	1.65	39	42		C
05	1		2.91		55	7.3	84	2039	60	1456	2.05	50	42		C
06	1		2.87		55	7.4	86	2058	62	1484	2.40	57	58		C
07	1		2.88		55	7.4	84	2018	62	1489	2.10	50	44		C
08	1		2.85		55	7.3									C
09	4	.14	2.78		55	7.3									C
10	1		2.75		55	7.3			52	1193	2.05	47	46		C
11	1		2.94		55	7.2	86	2109	102	2501	2.10	51	44		C
12	1		2.83		56	7.3	66	1558	108	2549	2.05	48	102		C
13	1		2.83		56	7.4	78	1841	102	2407	2.40	57	86		C
14	1		2.87		56	7.4	72	1723	76	1819	2.10	50	62		C
15	1		2.80		56	7.4									C
16	1		2.67		56	7.4									C
17	1		2.71		56	7.3	80	1808	72	1622	1.95	44	66		C
18	1		2.85		56	7.4	78	1854	100	2377	2.20	52	84		C
19	1		2.76		56	7.3	70	1611	44	1013	1.90	44	36		C
20	1		2.87		57	7.3	72	1723	84	2011	2.55	61	80		C
21	4	1.52	2.92		56	7.4	88	2143	62	1510	2.30	56	58		C
22	4	.07	2.92		56	7.3									C
23	1		2.79		56	7.4									C
24	1		2.79		56	7.4	80	1861	56	1303	2.10	49	52		C
25	1		2.89		57	7.4	68	1639	60	1446	2.20	53	56		C
26	1		2.91		57	7.4	84	2039	64	1553			54		C
27	1		2.82		58	7.4	74	1858	72	1693	2.40	56	64		C
28	4	.58	2.93		58	7.2	80	1955	70	1710	2.45	89	48		C
29	4	2.43	3.00		58	7.3									C
30	4	.45	3.06		57	7.2									C
31	3		3.08		57	7.3	71	1691	60	1591	1.80	46	56		C
TL		5.36	88.75					35518		33866		999			C
ME			2.86				71	1691	71	1693	2.21	53	62		C

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

July , 19 83
Month

Marshall , Michigan
Municipality

Robert J Swalwell
Superintendent's Signature

ID 1300 29 07 83
Plant No Mo Yr Sampling Point Code

DAY	BOD-5		SS		TOTAL-P		VSS	NH_3-N	REMARKS OR OTHER PARAMETERS										
	9 14		19 24		29 34		39	44	49	54	59	64	69	74 78	80	9	14	19
1 2	mg/l	LBS.	mg/l	LBS	mg/l	LBS.	mg/l	mg/l							C			
PN	00310	85001	00530	85002	00665	85004	00535	00610							C			
SF															C			
01															C			
02															C			
03															C			
04	82	1942	66	1562	1.50	36	48								C			
05	100	2427	48	1165	1.95	47	36								C			
06	68	1628	64	1532	2.20	53	54								C			
07	76	1825	78	1873	1.90	46	66								C			
08															C			
09															C			
10			60	1376	1.80	41	58								C			
11	72	1765	60	1471	1.95	48	54								C			
12	62	1463	64	1511	1.90	45	50								C			
13	74	1747	60	1416	2.05	48	52								C			
14	60	1436	74	1771	1.95	47	60								C			
15															C			
16															C			
17	84	1899	66	1492	2.05	46	62								C			
18	96	2134	60	1426	2.10	50	54								C			
19	80	1841	66	1519	1.90	44	50								C			
20	72	1723	72	1723	2.65	63	70								C			
21	92	2240	54	1315	2.45	60	42								C			
22															C			
23															C			
24	72	1675	76	1768	2.10	49	64								C			
25	82	1976	94	2266	2.55	61	84								C			
26	90	2184	84	2039			68								C			
27	80	1952	66	1552	2.45	58	60								C			
28	88	2150	78	1906	3.85	94	60								C			
29															C			
30															C			
31	84	2058	86	2054	2.30	59	80								C			
TL		36,72		32,737		775									C			
ME	80	1904	69	1637	2.11	52	59								C			

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

July, 19 83 (Month)

Marshall, Michigan (Municipality)

Robert J. Swalwell (Superintendent's Signature)

1,2 ID | 3–8 1300029 Plant No | 9,10 02 Mo | 11,12 83 Yr | 13–15 Sampling Point Code

DAY 1,2	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification 14	19
	Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MLSS 34	MLVSS 39	SETTL 44	SDI 49	DO 54	Air Applied 59	SS 64	VSS 49	Percent Return 74	8C	Waste Sludge 9		
	KCF	KCF	HRS	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu Ft	%	%	%	C	KGal	See Code*	
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889	
SF											4				C			
01	43		2.9	2.7	.51	1410	1041	12.0	1.18	5.6	188	.59	71	39	C	16		
02			3.0								188			37	C	13		
03			3.1								187			37	C	14		
04			3.0								192			37	C	14		
05			3.0	3.0	.52	1526	1132	12.0	1.27	3.6	200	.54	69	36	C	13		
06			3.0	3.1	.53	1570	1145	12.0	1.31	6.2	204	.55	58	35	C	48		
07			3.0								198			34	C	33		
08			3.0	3.0	.52	1464	1119	10.0	1.46	5.1	192	.51	74	34	C	14		
09			3.1								191			36	C	13		
10			3.1								191			39	C	14		
11			2.9	3.0	.53	1501	1130	10.0	1.50	4.2	187	.58	74	34	C	13		
12			3.0	3.1	.51	1520	1150	10.0	1.52	3.9	189	.53	73	37	C	13		
13			3.0	3.2	.51	1570	1185	10.0	1.57	6.2	188	.47	71	38	C	15		
14			3.0	2.9	.50	1541	1168	10.0	1.54	4.8	172	.45	75	37	C	13		
15			3.1			1256	941	9.0	1.40	4.0	167	.42	73	35	C	25		
16			3.2								170			38	C	13		
17			3.2								173			38	C	13		
18			3.0	3.1	.60	1540	1188	10.0	1.54	4.8	169	.55	76	36	C	10		
19			3.1	3.1	.51	1458	1123	10.0	1.46	3.9	168	.50	76	36	C	15		
20			3.0	2.9	.52	1525	1155	11.0	1.39	2.4	171	.58	74	34	C	10		
21			3.0	2.9	.55	1543	1169	10.0	1.54	1.8	170	.57	74	34	C	14		
22			3.0	2.9	.64	1517	1012	10.0	1.52	4.4	172	.50	73	33	C	13		
23			3.1								171			34	C	12		
24			3.1								175			35	C	11		
25			3.0	2.2	.62	1387	1067	9.0	1.54	3.2	174	.49	76	37	C	18		
26			3.0	2.2	.69	1261	971	8.0	1.58	4.3	175	.44	75	38	C	23		
27			3.0	2.7	.54	1559	1194	10.0	1.56	5.9	181	.57	76	44	C			
28			2.9	2.1	.67	1381	1013	9.0	1.53	3.9	177	.39	73	39	C	8		
29			2.9	2.6	.56	1626	1231	10.0	1.63	3.4	161	.52	75	34	C	10		
30			2.8								178			38	C	13		
31			2.8								179			35	C	20		
TL															C	474		
ME			3.0	2.8	.56	1482	1112	1.01	1.48	4.2	181	.51	73	36	C	16		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

July Month, 19 83 — Marshall Municipality, Michigan — Robert J. Swalwell Superintendent's Signature

ID 130039 Plant No. | 07 Mo. | 83 Yr. | Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX. FUEL 14	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS.	39 $FeCl_3$ LBS.	44	49	54	59
PN											
SF											
01			2520			10	397				
02			2400			10	199				
03			2400			10	199				
04			2520			30	199				
05			2400			30	397				
06			2400			30	199				
07			2400			20	199				
08			2400			20	199				
09			2400			20	199				
10			2280			10	397				
11			2400			20	199				
12			2400			10	199				
13			2520			20	199				
14			2400			10	199				
15			2400			30	397				
16			2400			30	199				
17			2400			30	199				
18			2520			10	199				
19			2520			20	397				
20			2400			20	199				
21			2400			20	397				
22			2520			20	199				
23			2400			30	397				
24			2400			20	397				
25			2520			30	174				
26			2400			30	397				
27			2520			20	199				
28			2400			40	397				
29			2400			20	199				
30			2520			20	199				
31			2400			20	397				
TL			illegible			illegible	9347				
ME			2431			21	269				

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours	N Vac
TOTAL	5			
Superintendent	1		160	
Asst. Supt.	1		160	
Shift Foreman				
Shift Operator	3		484	
Maint. Supervisor				
Mechanic				
Chemist				
Lab Technician				
Clerk-Typist				
Other				

GIVE THE HOURS PER DAY PLANT PERSONNEL ARE

WEEKDAYS 9 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS

HOLIDAYS 4 HRS.

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

_____ Month , 19 _____

_____ Municipality , Michigan

Robert J. Swalwell
Superintendent's Signature

ID Plant No | Mo | Yr. | Sampling Point Code

DAY	BOD-5			SS			TOTAL-P			VSS	NH_3-N	pH	DO	F COLI*		T. COLI*	REMARKS
	9 14 19			20 24 29 34			19 39 44 49			20 54	59	64	69	74	80	9	14 19
1 2	mg/l	LBS	% Rem.	mg/l	LBS	% Rem	mg/l	LBS	% Rem	mg/l	mg/l	SU	mg/l	#/100 ml	C	#/100 ml	
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 31615	C	31504 31505	
SF															C		
01												7.2	6.7	80	C		
02												7.3			C		
03												7.3			C		
04	23	545	73	4	95	92	5	.22	87	3		7.4			C		
05	13	316	85	4	47	93	6	.23	89	3		7.4	3.7	TNTC	C		
06	21	503	76	11	263	82	7	.28	88	9		7.4	6.2	34	C		
07	6	144	93	8	192	87	6	.27	87	2		7.4		92	C		
08												7.3	6.5	70	C		
09												7.3			C		
10				2	46	96	6	.27	87	1		7.3			C		
11	21	515	76	8	196	92	8	.34	84	7		7.3	4.4	TNTC	C		
12	18	425	73	6	142	94	5	.28	86	4		7.3	6.2	176	C		
13	7	165	91	9	212	92	8	.34	86	3		7.2	5.8	90	C		
14	17	407	76	8	191	89	9	.37	82	5		7.3	5.8	144	C		
15												7.3	4.3	TNTC	C		
16												7.4			C		
17	21	475	74	9	203	88	6	.27	86	7		7.3			C		
18	15	428	70	6	143	94	9	.37	83	4		7.3	4.4	TNTC	C		
19	7	161	90	3	69	93	6	.28	85	2		7.3	4.2	TNTC	C		
20	20	479	69	3	72	96	3	.12	95	2		7.3	5.1	130	C		
21	20	487	77	4	97	94	10	.41	82	3		7.3	4.9	TNTC	C		
22												7.2	4.2	TNTC	C		
23												7.3			C		
24	20	465	75	4	93	93	5	.23	84	3		7.3			C		
25	6	145	91	12	289	80	8	.34	86	11		7.3	3.2	384	C		
26	18	437	79	5	121	93				4		7.3	4.1	184	C		
27	13	423	77	9	212	88	8	.32	87	8		7.3	6.0	120	C		
28	20	489	75	3	73	96	17	.71	81	2		7.2	4.0	88	C		
29												7.2	4.6	110	C		
30												7.2			C		
31	14	360	80	4	103	93	7	17	85	3		7.2			C		
TL		3369			2909		141								C		
ME	12	345	79	6	145	91	7	.31	89	4		7.3	5.0	1	C		
WA	17	406		8	189									43	C		

Digester Volume, ft³
Primary _____
Secondary _____

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

Supernatant To _____
Process Pattern _____

R 4619
4833-5382

MONTH July 1983

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE					DIGESTING SLUDGE						SUPERNATANT								DIGESTED SLUDGE				Gas Produced cu ft X
	Gals. X 180	Total Solids %	Vol. Solids %	Lbs 1000 c.f. Digester	pH	Temp. °F	pH	Total Solids %	Vol. Solids %	Vol. Acids Mg/l	Alkalinity Mg/l	Gals. X	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	P Mg/l	P Lbs.	5 Day BOD Mg/l	Gals. X	Total Solids %	Vol. Solids %	pH	
1	28	6.1	81		6.4																			
2	28	4.6	58		6.5																			
3	28	3.9	77		6.4																			
4	28	4.1	77		6.4																			
5	28	4.5	59		6.3							13702	11.5	.63	69									
6	28	4.6	64		6.5																			
7	28	3.8	83		6.5																			
8	28	4.7	64		6.5																			
9	28	4.1	84		6.5																			
10	28	4.3	75		6.5																			
11	28	4.5	25		6.5							5304	11.0	.71	67									
12	28	5.1	67		6.5																			
13	28	5.3	52		6.5																			
14	28	5.0	63		6.5																			
15	55	4.7	58		6.5																			
16	28	4.7	32		6.5																			
17	28	4.3	56		6.4																			
18	28	5.2	76		6.5							8840	11.4	.73	74									
19	28	5.1	59		6.6																			
20	28	5.8	60		6.5																			
21	28	5.3	61		6.5																			
22	46	7.2	69		6.5																			
23	28	5.3	67		6.5																			
24	28	4.6	51		6.5																			
25	28	5.5	62		6.5							11056	11.5	.99										
26	28	5.1	66		6.5																			
27	28	5.1	62		6.6																			
28	28	5.3	65		6.5																			
29	53	5.3	[illegible]		6.5																			
30	28	[illegible]	[illegible]		6.5																			
31	28	5.0	55		6.5							6188	11.3	.73										
TOTAL	938											[illegible]												
ARITH MEAN	30	5.0	63									9017		.76										

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

_____ , 19____
Month

_____ , Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID [ ] [ ] [ ] [ ]
Plant No Mo Yr Sampling Point Code

DAY	19 BOD-5			20 SS			19 TOTAL-P			20 VSS	NH_3-N	pH	19 DO	F. COLI*		T. COLI*	REMARKS
	9 14 19			24 29 34			39 44 49			54	59	64	69	74	80	9	14 19
1 2	mg/l	LBS	% Rem	mg/l	LBS.	% Rem	mg/l	LBS.	% Rem	mg/l	mg/l	SU	mg/l	#/100 ml	C	#/100 ml	
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 31615	C	31504 31505	
SF															C		
01												7.2	6.7	80	C		
02												7.3			C		
03												7.3			C		
04	23	545	73	4	95	92	5	.22	87	3		7.4			C		
05	13	316	85	4	47	93	6	.23	89	3		7.4	3.7	~~FAIL~~	C		
06	21	503	76	11	263	82	7	.28	88	9		7.4	6.2	34	C		
07	6	144	93	8	192	87	6	.27	87	2		7.4		92	C		
08												7.3	6.5	70	C		
09												7.3			C		
10				2	46	96	6	.27	87	1		7.3			C		
11	21	515	76	8	196	92	8	.34	84	7		7.3	4.4	~~FAIL~~	C		
12	18	425	73	6	142	94	7	.28	86	4		7.3	6.2	176	C		
13	7	165	91	9	212	92	8	.34	86	3		7.2	5.8	90	C		
14	17	407	76	8	191	89	9	.37	82	5		7.3	5.8	194	C		
15												7.3	4.3	~~FAIL~~	C		
16												7.4			C		
17	21	475	74	9	203	88	6	.27	86	7		7.3			C		
18	18	428	70	6	143	94	9	.37	83	4		7.3	4.4	~~FAIL~~	C		
19	7	161	90	3	69	93	6	.28	85	2		7.3	4.2	~~FAIL~~	C		
20	20	479	69	3	72	96	3	.12	95	2		7.3	5.1	130	C		
21	20	487	77	4	97	94	10	.41	82	3		7.3	4.9	~~FAIL~~	C		
22												7.2	4.2	~~FAIL~~	C		
23												7.3			C		
24	20	465	75	4	93	93	5	.23	89	3		7.3			C		
25	6	145	91	12	289	80	8	.34	86	11		7.3	3.2	280	C		
26	18	437	79	5	121	92				4		7.3	4.1	184	C		
27	18	423	77	9	212	88	8	.32	87	8		7.3	6.0	120	C		
28	20	489	75	3	73	96	17	.71	81	2		7.2	4.0	88	C		
29												7.2	4.6	110	C		
30												7.2			C		
31	14	360	80	4	103	93	7	.27	85	3		7.2			C		
TL		9369			2909		141								C		
ME	16	388	79	6	145	91	7	.31	89	4		7.3	5.0	112	C		
WA	17	406		8	189									143	C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

For AUGUST (Month), 19 83

MARSHALL (Municipality), Michigan

Robert J Swackhamer (Superintendent's Signature)

ID | 130029 (Plant No) | 08 (Mo) | 83 (Yr) | 500 (Sampling Point Code)

DAY	WEATHER		FLOW		RAW SEWAGE QUALITY											REMARKS OR OTH		
	TYPE	PRECIP	TOTAL	MAX RATE	TEMP	pH	BOD-5		SS		TOTAL-P		VSS	NH_3-N				
1 2	9	14	19	24	29	34	39	44	49	54	59	64	69	74	78	80	9	14	19
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS.	mg/l	LBS.	mg/l	LBS	mg/l	mg/l		C			
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610		C			
SF																C			
01	1		3.21		58	7.3	72	1928	60	1606	1.95	52	56			C			
02	1		3.06		57	7.3	84	2144	58	1480	1.80	46	44			C			
03	4	.03	3.04		58	7.1	78	1978	72	1825			64			C			
04	1		2.97		57	7.3	98	2427	60	1486	2.40	59	54			C			
05	1		3.01		57	7.4										C			
06	1		2.78		57	7.4										C			
07	1		2.79		58	7.3	104	2420	54	1256	2.05	48	48			C			
08	1		3.03		57	7.3	100	2527	70	1769	2.20	56	66			C			
09	1		2.80		58	7.3	74	1814	56	1373	2.10	51	54			C			
10	4	1.66	3.03		58	7.4	78	1971	86	2173	2.20	56	84			C			
11	1		3.01		57	7.4	102	2561	58	1456	2.20	55	36			C			
12	1		2.95		57	7.3										C			
13	1		2.81		57	7.3										C			
14	1		2.84		57	7.3	70	1658	104	2463	2.55	60	98			C			
15	1		2.95		57	7.3	88	2165	72	1771	2.45	60	70			C			
16	4	.06	2.93		57	7.4	70	1711	50	1222	2.10	51	42			C			
17	4	.06	2.89		57	7.3	112	2699	70	1687	2.20	53	62			C			
18	1		2.91		58	7.4	124	3009	66	1602	2.85	69	54			C			
19	1		2.86		58	7.4										C			
20	1		2.75		58	7.3										C			
21	4	.32	2.71		57	7.4	78	1763	66	1492	2.30	52	64			C			
22	1		2.85		58	7.3	64	1521	48	1141			44			C			
23	1		2.81		58	7.4	82	1922	68	1594	2.20	52	52			C			
24	1		2.77		57	7.4	82	1894	64	1479	2.40	55	50			C			
25	1		2.82		57	7.4	76	1787	64	1505	2.30	54	50			C			
26	1		2.75		57	7.4										C			
27	3		2.72		58	7.4										C			
28	1		2.68		58	7.3	48	1073	62	1386	2.05	46	58			C			
29	1		2.83		58	7.3	48	1133	56	1322	1.90	45	48			C			
30	4	.10	2.75		59	7.4	42	963	64	1468	1.90	44	56			C			
31	1		2.71		60	7.3	66	1492	58	1311	2.10	47	40			C			
TL		2.23	89.16					44562		35867		1111				C			
ME			2.88				80	1937	65	1559	2.20	53	56			C			

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

AUGUST, 19 83
Month

MARSHALL, Michigan
Municipality

Robert J. Swahnell
Superintendent's Signature

ID 130029 08 83 ...
Plant No Mo Yr Sampling Point Code

DAY	BOD-5		SS		TOTAL-P		VSS	NH_3-N	REMARKS OR OTHER PARAMETERS										
	9 14		19 24		29 34		39	44	49	54	59	64	69	74 78	80	9	14	19	
1 2	mg/l	LBS.	mg/l	LBS	mg/l	LBS.	mg/l	mg/l							C				
PN	00310	85001	00530	85002	00665	85004	00535	00610							C				
SF															C				
01	82	2195	96	2570	2.40	64	92								C				
02	94	2399	72	1837	2.10	54	56								C				
03	66	1673	64	1622			56								C				
04	76	1883	70	1734	2.45	61	64								C				
05															C				
06															C				
07	114	2653	88	2048	2.55	59	70								C				
08	76	1421	80	2022	2.40	61	74								C				
09	60	1471	66	1681	2.20	54	58								C				
10	66	1668	74	1870	2.55	64	68								C				
11	126	3163	80	2008	2.55	64	50								C				
12															C				
13															C				
14	54	1279	88	2084	2.75	65	78								C				
15	80	1961	76	1870	3.30	81	74								C				
16	58	1417	76	1857	2.45	60	66								C				
17	118	3944	82	1976	2.90	70	76								C				
18	130	3155	96	2330	3.30	80	64								C				
19															C				
20															C				
21	74	1773	112	2531	3.20	72	104								C				
22	68	1616	102	2421			98								C				
23	86	2015	104	2437	3.20	75	80								C				
24	84	1991	114	2634	2.40	67	88								C				
25	104	2325	101	2557	3.75	84	83								C				
26															C				
27															C				
28	54	1271	90	1982	2.40	56	72								C				
29	48	1133	88	2077	2.10	50	84								C				
30	54	1238	88	2018	2.45	56	72								C				
31	62	1401	80	1808	1.70	38	46								C				
TL		44274		47877		1335									C				
AVE	80	1925	85	2082	2.65	64	72								C				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

AUGUST, 19 83
Month

MARSHALL, Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2 3 - 8 9 10 11 12 13 15
ID 130079 08 83 ...
Plant No. Mo. Yr. Sampling Point Code

DAY 1 2	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification 14	Re 19
	Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MLSS 34	MLVSS 39	SETTL. 44	SDI 49	DO 54	Air Applied 59	SS 64	VSS 49	Percent Return 74	8C	Waste Sludge 9		
	KCF	KCF	HRS.	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu. Ft.	%	%	%	C	KGal	See Code*	
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889	
SF											4				C			
01	48		2.7	1.8	.47	1329	995	9.0	1.48	3.5	175	.61	73	31	C	16		
02			2.8	1.8	.77	1210	906	8.0	1.51	3.8	173	.51	73	33	C	18		
03			2.8	2.1	.64	1400	1049	9.0	1.56	4.2	176	.58	73	34	C	8		
04			2.9	2.3	.59	1460	1086	10.0	1.46	3.6	171	.56	74	36	C	13		
05			2.9	1.9	.73	1223	899	10.0	1.22	4.3	171	.35	72	37	C	151		
06			3.0								173			41	C			
07			3.1								169			46	C			
08			2.9	2.2	.56	1675	1275	12.0	1.40	2.4	170	.64	75	42	C			
09			2.9	2.16	.59	1622	1126	12.0	1.35	2.5	174	.59	74	40	C	5		
10			2.9	2.4	.59	1487	1132	12.0	1.24	3.6	158	.63	74	35	C	8		
11			2.9	2.1	.75	1296	933	12.0	1.08	4.3	160	.46	72	35	C	8		
12			2.9	2.16	.59	1579	1161	12.0	1.32	3.2	172	.52	72	40	C	9		
13			3.0								169			41	C	7		
14			3.0								168			42	C	7		
15			2.9	2.5	.55	1637	1229	11.0	1.49	3.1	169	.60	74	38	C	9		
16			2.9	2.7	.47	1702	1275	12.0	1.42	2.8	161	.62	74	37	C	7		
17			3.0								169			37	C	7		
18			3.0	2.6	.56	1737	1297	11.0	1.58	3.2	159	.65	74	37	C	6		
19			3.0	2.7	.54	1753	1319	10.0	1.75	3.2	156	.65	75	36	C	11		
20			3.1								163			37	C	8		
21			3.2								159			38	C	8		
22			3.0	2.5	.48	1812	1379	10.0	1.81	3.2	161	.66	75	42	C	16		
23			3.1	2.5	.49	1870	1389	11.0	1.70	3.2	169	.65	74	42	C	11		
24			3.1	2.2	.53	1671	1277	10.0	1.67	3.4	168	.62	76	41	C	12		
25			3.0	1.9	.56	1510	1298	9.0	1.68	2.5	155	.58	76	40	C	17		
26			3.1	1.8	.64	1440	1104	9.0	1.60	2.4	152	.56	76	41	C	14		
27			3.2								154			44	C	9		
28			3.2								154			43	C	16		
29			3.0	1.8	.51	1419	1106	9.0	1.58	3.2	160	.46	78	40	C	7		
30			3.1	1.8	.50	1344	1048	8.0	1.68	2.3	201	.45	77	38	C	13		
31			3.2	1.5	.50	1192	1015	8.0	1.49	2.3	216	.44	77	39	C	16		
TL															C	437		
ME			3.0	2.2	.58	1517	1149	1.02	1.50	3.1	168	.57	74	39	C	16		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

AUGUST, 19 83 — Month

Marshall, Michigan — Municipality

Robert J. Swahell — Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
ID	130029	08	83	
	Plant No.	Mo.	Yr.	Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX. FUEL 14	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS.	39 $FeCl_3$	44	49	54	59
PN											
SF											
01			2400			30	199				
02			2520			30	199				
03			2400			20	397				
04			2520			30	397				
05			2400			40	397				
06			2400			30	199				
07			2400			20	199				
08			2400			40	596				
09			2520			40	199				
10			2520			20	199				
11			2520				199				
12			2400			10	199				
13			2400			10	199				
14			2400			20	397				
15			2400			20	298				
16			2520			10	199				
17			2400			20	397				
18			2520			20	397				
19			2520			15	397				
20			2400			35	199				
21			2400			20	397				
22			2400			30	298				
23			2400			40	298				
24			2400			40	199				
25			2520			40	397				
26			2400			50	199				
27			2280			40	397				
28			2400			30	199				
29			2400			40	397				
30			2520			60	199				
31			2520			30	199				
TL			75,600			880	9041				
ME			2439			29	292				

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours	V
TOTAL	5		920	
Superintendent	1		184	
Asst. Supt.	1		184	
Shift Foreman				
Shift Operator	3		552	
Maint. Supervisor				
Mechanic				
Chemist				
Lab Technician				
Clerk-Typist				
Other				

GIVE THE HOURS PER DAY PLANT PERSONNEL A

WEEKDAYS 9 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

Digester Volume, ft^3
Primary
Secondary

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

R 4619
4833-5382

Marshall, MICHIGAN

Supernatant To
Process Pattern

ONTH August 1983

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

ATE	RAW SLUDGE Gals. x 100	Total Solids %	Vol. Solids %	Vol. Solids Lbs 1000 c.f. Digester	pH	DIGESTING SLUDGE Temp. °F	pH	Total Solids %	Vol. Solids %	Vol. Acids Mg/l	Alkalinity Mg/l	SUPERNATANT Gals. x 100	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	P Mg/l	P Lbs.	5 Day BOD Mg/l	DIGESTED SLUDGE Gals x	Total Solids %	Vol. Solids %	pH	Gas Produced cu. ft x
1	50	6.9	73		6.5																			
2	50	5.4	60		6.5																			
3	50	4.9	66		6.5																			
4	50	5.3	65		6.5																			
5	46	4.5	58		6.5																			
6	32	4.0	60		6.5																			
7	32	4.7	67		6.4																			
8	32	4.4	60		6.6							283	9.0	.15	67									
9	32	4.7	74		6.6																			
10	32	5.5	68		6.5																			
11	32	5.2	61		6.5																			
12	54	7.0	73		6.6																			
13	32	4.7	60		6.5																			
14	32	5.1	62		6.5																			
15	32	4.5	52		6.6							292	9.3	.21	74									
16	32	5.6	59		6.6																			
17	32	4.8	60		6.6																			
18	32	4.7	70		6.6																			
19	42	5.2	59		6.6							212	10.1	.49	62									
20	32	5.6	59		6.6																			
21	32	5.0	7[illegible]		6.6																			
22	32	4.3	57		6.5																			
23	50	5.0	56		6.5																			
24	50	4.9	6[illegible]		6.6																			
25	50	4.8	61		6.6							97	12.0	.57	55									
26	61	[illegible]	[illegible]		6.7																			
27	[illegible]	[illegible]	[illegible]		6.7																			
28	32	4.3	56		6.6																			
29	50	2.9	8[illegible]		6.6																			
30	[illegible]	[illegible]	[illegible]		6.7							53	11.2	.66	69									
31	50	7.7	[illegible]		6.8																			
A	1327											937												
H N	43	4.9	62									187		.42	65									

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

August, 19 83 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2	3 8	9 10	11 12	13 15
ID	130029	08	83	
	Plant No.	Mo.	Yr.	Sampling Point Code

DAY	23 BOD-5			23 SS			21 TOTAL-P			VSS	NH_3-N	pH	DO	18 F. COLI*		T. COLI*	REMARKS
	9	14	19	24	29	34	39	44	49	54	59	64	69 21	74	80	9	14 19
1 2	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	mg/l	SU	mg/l	#/100 ml	C	#/100 ml	
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 31615	C	31504 31505	
SF															C		
01	11	294	85	7	187	88	.25	7	87	7		7.2	5.2	162	C		
02	21	536	75	4	102	93	.20	5	88	3		7.1	5.2	114	C		
03	20	507	74	9	228	88				5		7.2	5.5	92	C	146	
04	21	520	79	2	50	97	.30	7	88	1		7.2	5.1	124	C		
05												7.2	5.0	320	C		
06												7.3			C		
07	22	512	79	5	116	91	.22	5	89	2		7.2			C		
08	11	278	89	12	303	83	.42	11	81	9		7.2	4.2		C		
09	7	172	91	8	196	86	.28	7	87	6		7.3	4.3	X	C		
10	7	177	91	6	152	93	.38	10	83	4		7.2	4.4	188	C		
11	16	402	84	3	75	95	.30	8	86	1		7.3	5.7	168	C		
12												7.3	5.6	86	C		
13												7.3		62	C		
14	3	71	96	2	47	98	.28	7	89	1		7.3			C		
15	9	221	90	5	123	93	.41	10	83	3		7.4	5.1	X	C		
16	7	171	90	2	49	96	.35	9	83	1		7.3	3.8	190	C		
17	21	506	81	7	169	90	.34	8	85	5		7.3		186	C	185	
18	23	558	81	4	97	94	.46	11	84	3		7.3	3.8	178	C		
19												7.2	3.4	X	C		
20												7.2			C		
21	7	158	91	2	45	97	.32	7	86	1		7.2			C		
22	4	95	94	4	95	92				3		7.4	4.0	X	C		
23	8	187	90	5	117	93	.30	7	86	3		7.2	4.2	100	C		
24	8	185	90	3	69	95	.27	6	88	1		7.3	3.8	132	C		
25	10	235	86	3	71	95	.32	8	86	1		7.3	4.6		C		
26												7.2		84	C		
27												7.3			C		
28	7	165	85	10	235	84	.42	10	80	8		7.2			C		
29	4	94	92	7	165	88	.38	9	80	4		7.3	4.6	52	C		
30	6	138	86	9	206	86	.40	9	79	7		7.5	3.0	204	C		
31	16	362	76	5	113	91	.22	5	90	3		7.3	4.1	24	C		
TL		6544			3010			166							C		
ME	12	285	86	5	131	92	.32	8	85	4		7.3	4.5	118	C		
WA	19	474		7	179									185	C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

September, 19 83 (Month) — Marshall, Michigan (Municipality) — Robert J. Swalwell (Superintendent's Signature)

1 2	3 8	9 10	11 12	13 15
ID	130.029	09	83	5.00
	Plant No	Mo.	Yr	Sampling Point Code

DAY 1 2	WEATHER TYPE 9	WEATHER PRECIP. 14	FLOW TOTAL 19	FLOW MAX RATE 24	RAW SEWAGE QUALITY TEMP 29	pH 34	BOD-5 39	BOD-5 44	SS 49	SS 54	TOTAL-P 59	TOTAL-P 64	VSS 69	NH_3-N 74 78	80	REMARKS OR OT 9	14	19
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l	C			
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C			
SF															C			
01	1		2.72		60	7.4	60	1361	62	1406	2.40	54	44		C			
02	1		2.65		60	7.4									C			
03	1		2.61		60	7.4									C			
04	1		2.50		60	7.4									C			
05	4	.46	2.65		60	7.4	60	1326	176	3890	3.40	75	144		C			
06	1	.05	2.72		60	7.4	84	1906	96	2178	2.30	52	72		C			
07	1		2.71		60	7.5	58	1311	74	1673	2.20	50	72		C			
08	1		2.7[illegible]		60	7.5	66	1486	80	1801	3.10	70	74		C			
09	1		2.69		60	7.4									C			
10	4	.17	2.63		60	7.4									C			
11	1		2.62		59	7.4	70	1530	56	1224	2.45	54	54		C			
12	1		2.63		59	7.4	70	1535	60	1316	2.45	54	48		C			
13	1		2.58		59	7.5	60	1291	76	1635	2.65	57	74		C			
14	1		2.60		59	7.4	68	1475	54	1170	2.30	50	44		C			
15	4	.19	2.58		59	7.8	56	1205	66	1420			58		C			
16	4	.12	2.58		58	7.4									C			
17	3		2.49		58	7.4									C			
18	4	.87	2.59		58	7.4	72	1555	78	1685	2.30	50	72		C			
19	3		2.68		60	7.3	54	1207	42	939	2.10	47	36		C			
20	4	.64	2.71		60	7.3	54	1220	70	1582	2.20	50	58		C			
21	4	.22	2.67		59	7.3	52	1158	50	1113	2.75	61	26		C			
22	4	.25	2.64		58	7.5	74	1629	44	969	2.10	46	42		C			
23	1		2.63		58	7.3									C			
24	1		2.56		58	7.4									C			
25	4	.02	2.57		58	7.4	54	1157	50	1072	2.40	51	46		C			
26	1		2.65		58	7.3	54	1193	36	796	3.10	69	26		C			
27	1		2.65		59	7.4	78	1724	144	3183	2.75	61	48		C			
28	1		2.67		59	7.5	70	1559	60	1336	2.10	47	24		C			
29	1		2.60		59	7.5	68	1475	100	2168	2.20	48	78		C			
30	1		2.54		59	7.6									C			
31															C			
TL		2.99	78.82					28303		32501		1046			C			
ME			2.63				64	1415	74	1625	2.49	55	57		C			

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

Im. September, 19 83
Month

Marshall, Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2 | 3 8 | 9 10 | 11 12 | 13 15
10 | 130029 | 09 | 83 | ...
Plant No | Mo | Yr | Sampling Point Code

DAY	BOD 5 9	14	SS 19	24	TOTAL P 29	34	VSS 39	NH_3 N 44	REMARKS OR OTHER PARAMETERS 49	54	59	64	69	74	78 80	9	14	19
	mg l	LBS	mg/l	LBS	mg l	LBS	mg/l	mg l							C			
PV	00310	85001	00530	85002	00665	85004	00535	00610							C			
=															C			
21	52	1180	72	1633	1.70	39	54								C			
22															C			
23															C			
24															C			
25	40	884	54	1193	1.60	35	50								C			
26	48	1089	68	1543	1.65	37	50								C			
27	40	[illegible]	72	[illegible]	1.90	43	64								C			
28	52	1171	66	[illegible]	1.20	27	44								C			
29															C			
30															C			
	74	1617	48	1049	1.70	37	40								C			
32	40	915	44	915	1.15	24	40								C			
3	42	904	80	1721	2.30	49	70								C			
4	50	1084	126	2732	2.40	52	92								C			
5	52	1119	50	1076			38								C			
6															C			
17															C			
8	64	1332	76	1642	1.95	42	68								C			
9	50	1113	34	740	2.05	46	30								C			
10	40	924	54	1220	2.05	46	44								C			
11															C			
12	56	1233	40	881	1.90	42	30								C			
13															C			
14															C			
15	44	971	48	1038	2.05	44	44								C			
	52	[illegible]	32	707	[illegible]	54	34								C			
	50	[illegible]	50	[illegible]	[illegible]	45	30								C			
20	58	1292	50	113	[illegible]	46	26								C			
	50	1051	68	1475	2.10	46	46								C			
23															C			
24															C			
T		[illegible]		[illegible]		[illegible]									C			
ME	50	[illegible]	59	1290	1.98	44	46								C			

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

September, 19 83
Month

Marshall, Michigan
Municipality

Robert J. Swahnell
Superintendent's Signature

ID 13.0029 09 83
Plant No Mo Yr Sampling Point Code

DAY	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification
	Aeration Volume	Reaeration Volume	Detention Time	Sludge Age	Organic Loading	MLSS	MLVSS	SETTL	SDI	DO	Air Applied	SS	VSS	Percent Return		Waste Sludge	
							mg/l	%			Cu Ft	%	%	%	C	KCal	See Code*
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF											4				C		
01	48		3.2	1.5	.53	1188	922	7.0	1.70		218	.43	77	40	C	8	
02			3.3	2.0	.42	1509	1134	10.0	1.51	4.2	176	.52	76	40	C		
03			3.3								215			48	C		
04			3.4								212			49	C	9	
05			3.3								208			44	C	13	
06			3.2	2.3	.38	1342	1025	9.0	1.49	5.0	216	.50	75	42	C	16	
07			3.2	2.2	.39	1257	959	9.0	1.40		220	.48	76	39	C	21	
08			3.2	2.9	.31	1513	1176	10.0	1.58		219	.55	74	39	C		
09			3.2	3.2	.30	1638	1253	10.0	1.64		211	.58	75	41	C	32	
10			3.3								211			41	C		
			3.3								220			40	C	12	
12			3.3	2.9	.35	1375	1051	10.0	1.38		221	.36	75	44	C	19	
			3.3	2.7	.31	1336	1026	10.0	1.31	5.0	228	.44	76	44	C	16	
14			3.3	3.1	.29	1700	1264	13.0	1.31	3.8	229	.57	74	45	C		
15			3.3	3.6	.24	1934	1513	14.0	1.38	3.2	226	.60	76	43	C		
16			3.3	3.1	.27	1653	1230	12.0	1.38	3.7	222	.54	75	43	C	13	
17			3.5								222			45	C	16	
18			3.4								215			41	C	14	
19			3.2	2.8	.63	1468	638	11.0	1.33	4.6	215	.63	88	37	C	10	
20			3.3	2.7	.36	1395	1025	11.0	1.37	4.6	222	.49	72	43	C	17	
21			3.2	1.8	.56	860	639	7.0	1.23	6.4	231	.34	73	42	C	40	
22			3.3	2.3	.44	1093	827	8.0	1.37	6.3	233	.37	75	44	C		
23			3.3	3.0	.35	1420	1048	10.0	1.42	4.3	233	.54	73	41	C		
24			3.4								231			41	C	16	
25			3.4								227			40	C	14	
26			3.3	4.2	.35	1419	1045	10.0	1.42	5.5	225	.57	72	39	C	12	
27			3.3	4.4	.32	1481	1111	10.0	1.48	5.6	223	.46	74	39	C	13	
28			3.2	4.9	.32	1517	1125	10.0	1.52	4.0	222	.57	71	39	C	12	
			3.3	4.4	.32	1483	1111	10.0	1.48	5.3	223	.51	73	43	C	19	
30			3.4	4.8	.29	1605	1185	11.0	1.46	4.7	224	.61	72	44	C	12	
31															C		
TL															C	359	
ME			3.3	3.1	.37	1441	1064	10.1	1.43	4.8	220	.51	75	42	C	16	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

September 19 83
Month

Marshall , Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2 | 3 8 | 9 10 | 11 12 | 13 15
10 | 130029 | 09 | 83 | ..
Plant No | Mo. | Yr | Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX.FUEL 14	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS.	39 $FeCl_3$	44	49	54	59
PN											
SF											
01			2520			50	397				
02			2640			40	199				
03			2520			40	199				
04			2520			50	199				
05			2400			40	397				
06			2640			60	298				
07			2760			40	298				
08			2520			50	199				
09			2520			30	199				
10			2640			40	397				
11			2760			70	199				
12			2640			40	199				
13			2640			40	397				
14			2520			50	397				
15			2520			60	199				
16			2400			40	199				
17			2520			40	199				
18			2400			30	199				
19			2520			40	199				
20			2520			50	199				
21			2640			40	199				
22			2760			70	199				
23			2640			50	199				
24			2520			40	397				
25			2520			50	199				
26			2520			30	199				
27			2520			50	397				
28			2520			40	397				
29			2523			50	199				
30			2400			70	397				
31											
TL			41560			1380	7950				
ME			2552			46	265				

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	5		844
Superintendent	1		168
Asst. Supt.	1		168
Shift Foreman			
Shift Operator	3		508
Maint. Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL

WEEKDAYS 9 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

Digester Volume, ft³
Primary
Secondary

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

R 4619
4833-5382

Supernatant To
Process Pattern

MONTH September 19 23

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE Gals. /100	RAW SLUDGE Total Solids %	RAW SLUDGE Vol. Solids %	RAW SLUDGE Vol. Solids Lbs 1000 c.f. Digester	RAW SLUDGE pH	DIGESTING SLUDGE Temp °F	DIGESTING SLUDGE pH	DIGESTING SLUDGE Total Solids %	DIGESTING SLUDGE Vol. Solids %	DIGESTING SLUDGE Vol. Acids Mg/l	DIGESTING SLUDGE Alkalinity Mg/l	SUPERNATANT Gals. X	SUPERNATANT pH	SUPERNATANT Total Solids %	SUPERNATANT Vol. Solids %	SUPERNATANT Susp. Solids Mg/l	SUPERNATANT P Mg/l	SUPERNATANT P Lbs	SUPERNATANT 5-Day BOD Mg/l	DIGESTED SLUDGE Gals. X	DIGESTED SLUDGE Total Solids %	DIGESTED SLUDGE Vol. Solids %	DIGESTED SLUDGE pH	Gas Produced cu. ft X
1	71	4.3	58		6.7																			
2	50	6.1	72		6.7																			
3	50	3.8	78		6.6																			
4	50	5.1	60		6.6																			
5	4	7.9	64		6.6																			
6																								
7	140	5.1	57		6.7																			
8	140	4.5	56		6.6																			
9	40	4.9	63		6.7																			
10	30	4.5	58		6.6																			
11	75	4.7	71		6.7																			
12	150	5.8	60		6.6																			
13	87	5.2	64		6.6																			
14	60	4.7	69		6.6																			
15	30	5.5	66		6.4																			
16	40	5.3	66		6.4																			
17	40	4.4	67		6.5																			
18	40	4.0	65		6.4																			
19	40	5.7	68		6.4																			
20	40	3.5	79		6.4																			
21	40	4.0	65		6.6																			
22	12	3.7	62		6.5																			
23	50	2.9	63		6.6																			
24	40	3.5	63		6.6																			
25	30	2.9	62		6.5																			
26	30	3.5	61		6.5																			
27	30	3.5	61		6.5																			
28	30	3.5	61		6.5																			
29	30	3.5	62		6.5																			
30	30	3.5	64		6.5																			
31																								
	1545																							
	153	4.5	65									43	11.9	.47										

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

_____ Month , 19 _____ _____ Municipality , Michigan _____ Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID [ ] [ ] [ ] [ ]
Plant No Mo. Yr. Sampling Point Code

DAY	BOD-5 (20)			SS (20)			TOTAL-P (19)			VSS (20)	NH_3-N	pH	DO (16)	F. COLI* (21)		T. COLI*	REMARKS
	9	14	19	24	29	34	39	44	49	54	59	64	69	74	80	9	14 19
1 2	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	mg/l	SU	mg/l	#/100 ml	C	#/100 ml	
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 31615	C	31504 31505	
SF															C		
01	8	181	87	8	181	87	.34	8	86	3		7.4		16	C		
02												7.4	6.0	22	C		
03												7.3			C		
04												7.4			C		
05	4	88	93	3	66	98	.37	8	89	7		7.4			C		
06	5	113	94	2	45	98	.41	9	82	1		7.4	5.8	46	C		
07	4	90	93	4	90	95	.34	8	85	2		7.6		28	C		
08	21	473	68	11	248	86	.38	9	88	8		7.4		50	C		
09												7.3		90	C		
10												7.4			C		
11	20	437	71	3	66	95	.42	9	83	2		7.3			C		
12	5	110	93	1	23	98	.44	10	82	1		7.4		60	C		
13	5	108	92	11	237	86	.41	9	85	9		7.5	6.5	30	C		
14	4	87	94	2	43	96	.53	11	77	1		7.4	4.7	16	C		
15	7	151	88	-13	280	76				7		7.4	5.5	66	C		
16				-								7.3	5.3	64	C		
17				-								7.4			C		
18	4	86	94	-9	194	88	.44	10	81	7		7.4			C		
19	7	156	87	-3	67	93	.35	8	83	2		7.4	4.8	68	C		
20	13	294	76	-8	181	98	.53	12	76	5		7.3	4.9	46	C		
21	8	178	85	-6	134	88	.82	18	70	4		7.4	6.5	24	C		
22	7	154	91	-2	44	95	.53	12	75	1		7.5	6.8	2	C		
23												7.4	6.3	26	C		
24												7.4			C		
25	8	171	85	6	129	88	.27	6	89	5		7.3			C		
26	20	442	63	2	44	94	.48	11	85	1		7.4	6.1	80	C		
27	12	265	85	5	110	97	.30	7	89	4		7.3	4.8	112	C		
28	9	200	87	3	67	95	.22	5	90	2		7.3	4.8	48	C		
29	6	130	76	4	87	96	.22	5	90	3		7.4	5.8	76	C		
30												7.5	5.9	42	C		
31															C		
TL		3914			2336			175							C		
ME	9	196	85	5	117	[redacted]	.41	9	83	4		7.4	5.7	38	C		
WA	11	248		8	171	92								67	C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

October (Month), 19 83

Marshall (Municipality), Michigan

Robert J. Swalwell
Superintendent's Signature

1 2 | 3 8 | 9 10 | 11 12 | 13 15
IP | 1300279 | 10 | 83 | 500
Plant No | Mo | Yr | Sampling Point Code

DAY 1 2	WEATHER		FLOW		RAW SEWAGE QUALITY											REMARKS OR O
	TYPE 9	PRECIP. 14	TOTAL 19	MAX 24 RATE	TEMP 29	pH 34	BOD-5 39 44		SS 49 54		TOTAL-P 59 64		VSS 69	NH_3-N 74 78	80	9 14 19
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l	C	
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C	
SF															C	
01	1		2.44		59	7.4									C	
02	1		2.50		58	7.4	80	1668	76	1585	2.40	50	66		C	
03	4	.03	2.64		59	7.4	72	1585	68	1497	2.10	46	60		C	
04	4	.04	2.55		59	7.4	84	1786	60	1276	1.95	41	38		C	
05	3		2.53		59	7.4	70	1477	66	1393	2.20	46	48		C	
06	4	.01	2.53		58	7.5	68	1435	66	1393	2.40	51	56		C	
07	3		2.49		58	7.3									C	
08	4	.19	2.41		58	7.3									C	
09	1		2.44		58	7.4	62	1262	66	1343	2.30	47	46		C	
10	1		2.55		58	7.3	72	1531	58	1233	1.95	41	54		C	
11	1		2.58		58	7.3	94	2023	136	2926	4.30	93	84		C	
12	4	.56	2.57		58	7.4	90	1929	112	2401	4.30	92	72		C	
13	4	.44	2.60		58	7.5	68	1475	58	1258	2.30	50	36		C	
14	3		2.57		57	7.2									C	
15	1		2.44		57	7.4									C	
16	4	.04	2.48		56	7.5	70	1448	72	1489	2.20	46	68		C	
17	1		2.59		57	7.5	56	1210	60	1296	1.90	41	58		C	
18	1		2.59		57	7.4	66	1426	84	1814	3.50	76	72		C	
19	4	.01	2.58		58	7.3	84	1807	68	1463	2.20	47	60		C	
20	3		2.57		58	7.2	60	1286	60	1286	2.10	45	50		C	
21	4	.33	2.53		58	7.2									C	
22	4	.65	2.54		57	7.3									C	
23	4	.30	2.65		58	7.4	84	1856	58	1281	2.10	46	48		C	
24	4	.03	2.69		58	7.4	82	1840	64	1436	2.65	59	44		C	
25	4	.06	2.61		58	7.4	80	1741	68	1480	2.30	50	58		C	
26	4	.04	2.61		57	7.3	74	1611	70	1524	2.40	52	68		C	
27	1		2.60		52	7.3	82	1778	60	1301	2.45	53	44		C	
28	1		2.60		57	7.4									C	
29	1		2.55		57	7.4									C	
30	1		2.47		57	7.4									C	
31	4	.05	2.52		57	7.3	78	1639	70	1471	2.45	51	58		C	
TL		2.78	79.02					33,813		32146		1123			C	
ME			2.55				75	1610	71	1531	2.50	53	57		C	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

October, 19 83 — Month

Marshall, Michigan — Municipality

Robert J. Swalwell — Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
ID	130029	10	83	
	Plant No.	Mo	Yr.	Sampling Point Code

DAY 1 2	BOD-5 9 mg/l	BOD-5 14 LBS.	SS 19 mg/l	SS 24 LBS.	TOTAL-P 29 mg/l	TOTAL-P 34 LBS.	VSS 39 mg/l	NH_3-N 44 mg/l	REMARKS OR OTHER PARAMETERS 49	54	59	64	69	74 78	80	9	14	19
															C			
PN	00310	85001	00530	85002	00665	85004	00535	00610							C			
SF															C			
01															C			
02	54	1126	42	876	2.20	46	34								C			
03	58	1277	54	1189	2.10	46	46								C			
04	56	1190	46	978	1.90	40	32								C			
05	80	1688	76	1604	2.75	58	66								C			
06	54	1139	38	802	2.10	44	24								C			
07															C			
08															C			
09	60	1221	64	1302	2.10	43	46								C			
10	66	1404	54	1148	1.95	41	50								C			
11	56	1205	62	1334	2.20	47	56								C			
12	56	1200	40	857	2.45	53	32								C			
13	64	1388	68	1475	2.45	53	52								C			
14															C			
15															C			
16	58	1200	88	1820	2.10	43	64								C			
17	54	1166	66	1426	2.10	45	62								C			
18	70	1512	80	1728	3.20	69	66								C			
19	80	1721	64	1377	2.45	53	56								C			
20	62	1329	66	1415	2.10	45	46								C			
21															C			
22															C			
23	80	1768	44	972	2.20	49	38								C			
24	54	1211	76	1705	2.45	55	56								C			
25	60	1306	76	1654	2.55	56	62								C			
26	68	1480	82	1785	2.85	62	78								C			
27	62	1344	84	1821	2.65	57	62								C			
28															C			
29															C			
30															C			
31	70	1471	82	1723	2.75	58	62								C			
TL		28346		28991		1063									C			
ME	63	1350	64	1381	2.36	51	52								C			

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

October (Month), 19 83 — Marshall (Municipality), Michigan — Robert J. Swahull (Superintendent's Signature)

ID 13,00,29 (Plant No.) 10 (Mo.) 83 (Yr) ... (Sampling Point Code)

DAY	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification	
	Aeration Volume	Reaeration Volume	Detention Time	% Sludge Age	Organic Loading	MLSS	MLVSS	SETTL.	SDI	DO	Air Applied	SS	VSS	Percent Return		Waste Sludge		
	KCF	KCF	HRS.	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu. Ft.	%	%	%	C	KGal	See Code*	
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889	
SF											4				C			
01	48		3.5								221			45	C	16		
02			3.4								216			44	C	13		
03			3.3	4.7	.31	1682	1229	11.0	1.53	3.8	214	.52	67	42	C	15		
04			3.4	5.2	.29	1800	1330	11.0	1.64	3.9	219	.60	72	42	C	10		
05			3.4	5.3	.25	2065	1611	18.0	1.15	3.9	222	.68	73	45	C			
06			3.4	5.4	.27	2025	1517	16.0	1.27	2.8	227	.74	73	44	C	14		
07			3.5	7.3	.29	1921	1423	14.0	1.37	2.2	221	.70	73	44	C	17		
08			3.6								230			46	C	17		
09			3.5								231			45	C	18		
10			3.4	3.7	.44	1374	997	9.0	1.53	5.2	227	.48	71	44	C	28		
11			3.3								218			44	C	12		
12			3.4	3.7	.40	1498	1083	9.0	1.41	5.2	223	.52	74	43	C	26		
13			3.3	3.5	.41	1440	1082	9.0	1.60	5.5	192	.47	70	43	C	17		
14			3.4	3.8	.38	1559	1175	11.0	1.41	5.3	192	.51	75	43	C	14		
15			3.5								111			44	C	15		
16			3.5								129			44	C	11		
17			3.3	3.5	.36	1594	1192	14.0	1.14	2.0	133	.68	74	42	C	15		
18			3.3								133			42	C	16		
19			3.3	2.9	.43	1399	1047	11.0	1.27	2.3	133	.42	75	43	C	23		
20			3.4								128			40	C	13		
21			3.4	3.2	.39	1519	1129	13.0	1.17	3.2	127	.56	73	40	C	10		
22			3.4								126			40	C	18		
23			3.3								127			39	C	11		
24			3.2	2.8	.46	1461	1095	12.0	1.21	2.1	112	.63	73	40	C	12		
25			3.3	3.4	.39	1655	1230	13.0	1.27	3.2	131	.53	73	43	C	10		
26			3.3	2.8	.45	1420	1088	11.0	1.29	3.0	140	.51	74	41	C	24		
27			3.3	2.8	.44	1454	1099	11.0	1.32	3.4	136	.50	67	43	C	19		
28			3.3	3.4	.38	1710	1295	13.0	1.32	1.8	136	.36	75	42	C	4		
29			3.4								150			49	C			
30			3.5								141			47	C			
31			3.4	3.7	.31	1910	1470	16.0	1.19	2.5	136	.62	76	46	C			
TL															C	418		
ME			3.4	4.0	.37	1635	1227	12.3	1.35	3.4	170	.56	73	43	C	15		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

_____ Month , 19 _____ _____ Municipality , Michigan _____ Superintendent's Signature

1 2 ID | 3 Plant No. 8 | 9 10 Mo. | 11 12 Yr. | 13 15 Sampling Point Code

DAY	21 BOD-5 9	14	19	21 SS 24	29	34	21 TOTAL-P 39	44	31 49	VSS 54	NH_3-N 59	pH 64	18 DO 69	F. COLI* 74 15	80	T. COLI* 9	REMARKS 14	19
1 2	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	mg/l	SU	mg/l	#/100 ml	C	#/100 ml		
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 31615	C	31504 31505		
SF															C			
01												7.4			C			
02	22	459	73	1	21	99	.25	5	90	1		7.3			C			
03	20	440	72	2	44	97	.27	6	87	1		7.3	5.8	46	C			
04	16	340	81	3	64	95	.27	6	86	2		7.4	4.9	TN	C			
05	17	359	76	8	169	88	.51	11	77	7		7.3	5.1	TN	C			
06	14	295	79	4	84	94	.34	7	86	3		7.4	5.0	TN	C			
07												7.4	5.3	160	C			
08												7.4			C			
09	21	427	66	8	163	89	.46	9	80	4		7.4			C			
10	11	234	84	10	213	83	.40	9	79	9		7.4	6.2	284	C			
11	19	409	80	6	129	96	.38	8	91	4		7.4			C			
12	18	386	80	6	129	95	.37	8	91	4		7.4	5.3	166	C	144		
13	20	434	71	8	173	86	.48	10	79	6		7.4	5.5	84	C			
14												7.4	2.0	108	C			
15												7.4			C			
16	12	248	83	7	145	90	.37	8	83	6		7.4			C			
17	20	432	64	4	86	93	.40	9	79	3		7.3	2.7	216	C			
18	21	454	68	13	281	85	.50	11	86	11		7.3			C	144		
19	20	430	76	14	301	79	.55	12	75	12		7.3	3.2	166	C			
20	20	429	67	13	279	78	.46	10	78	9		7.2			C			
21												7.2	4.8	148	C			
22												7.3		[illegible]	C			
23	20	442	76	2	44	97	.37	8	82	1		7.3		[illegible]	C			
24	7	157	91	7	157	89	.35	8	87	3		7.3	4.3	[illegible]	C	78		
25	20	435	75	11	239	75	.40	9	83	10		7.1	4.1	52	C	[illegible]		
26	11	239	85	9	196	87	.58	13	76	8		7.3	3.5	74	C			
27	7	152	91	7	152	88	.42	9	83	4		7.2	3.9	52	C			
28												7.2	3.5	74	C			
29												7.3			C			
30												7.2			C			
31	11	231	86	14	294	80	.58	12	76	8		7.3	3.5	70	C			
TL		7432			3363			188							C			
ME	17	354	77	7	160	89	.41	9	83	6		7.3	4.4	108	C			
WA	20	437		10	218									174	C			

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

_____ Month , 19 _____ | _____ Municipality , Michigan | _____ Superintendent's Signature

ID Plant No | Mo. | Yr. | Sampling Point Code

DAY	BOD-5			SS			TOTAL-P			VSS	NH_3-N	pH	DO	F. COLI*		T. COLI*	REMARKS
1 2	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	mg/l	SU	mg/l	#/100 ml	C	#/100 ml	
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 31615	C	31504 31505	
SF															C		
01												7.4			C		
02	22	459	73	1	21	99	.25	5	90	1		7.3			C		
03	20	440	72	2	44	97	.27	6	87	1		7.3	5.8	46	C		
04	16	340	81	3	64	95	.27	6	86	2		7.4	4.9	TN	C		
05	17	359	76	8	169	88	.51	11	77	7		7.3	5.1	TN	C		
06	14	295	79	4	84	94	.34	7	86	3		7.4	5.0	TN	C		
07												7.4	5.3	160	C		
08												7.4			C		
09	21	427	66	8	163	89	.46	9	80	4		7.4			C		
10	11	234	84	10	213	83	.40	9	79	9		7.4	6.2	284	C		
11	19	409	80	6	129	96	.38	8	91	4		7.4			C		
12	18	386	80	6	129	95	.37	8	91	4		7.4	5.3	166	C	144	
13	20	434	71	8	173	86	.48	10	79	6		7.4	5.5	84	C		
14												7.4	2.0	108	C		
15												7.4			C		
16	12	248	83	7	145	90	.37	8	83	6		7.4			C		
17	20	432	64	4	86	93	.40	9	79	3		7.3	2.7	216	C		
18	21	454	68	13	281	85	.50	11	86	11		7.3			C	144	
19	20	430	76	14	301	79	.55	12	75	12		7.3	3.2	166	C		
20	20	429	67	13	279	78	.46	10	78	9		7.2			C		
21												7.2	4.8	148	C		
22												7.3		[illegible]	C		
23	20	442	76	2	44	97	.37	8	82	1		7.3		[illegible]	C		
24	7	157	91	7	157	89	.35	8	87	3		7.3	4.3	[illegible]	C	78	
25	20	435	75	11	239	75	.40	9	83	10		7.1	4.1	52	C	[illegible]	
26	11	239	85	9	196	87	.58	13	76	8		7.3	3.5	74	C		
27	7	152	91	7	152	88	.42	9	83	4		7.2	3.9	52	C		
28												7.2	3.5	74	C		
29												7.3			C		
30												7.2			C		
31	11	231	86	14	294	80	.58	12	76	8		7.3	3.5	70	C		
TL		7932			3363			188							C		
NE	17	354	77	7	160	89	.41	9	83	6		7.3	4.4	108	C		
WA	20	437		10	218									174	C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

October (Month), 19 83

Marshall (Municipality), Michigan

Robert J. Swalwell (Superintendent's Signature)

ID 130029 (Plant No.) 10 (Mo.) 83 (Yr.) ... (Sampling Point Code)

DAY 1 2	GRIT 9 CF	AUX.FUEL 14	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS.	39 $FeCl_3$ LBS.	44	49	54	59
PN											
SF											
01			2400			40	397				
02			2380				397				
03			2400				199				
04			2400				397				
05			2520				199				
06			2520			30	199				
07			2520			30	199				
08			2400			30	397				
09			2520			30	199				
10			2640			30	199				
11			2520			30	199				
12			2520			30	199				
13			2520			40	199				
14			2400			40	298				
15			2160			30	298				
16			2160			30	397				
17			2280			30	199				
18			2400			30	199				
19			2400			40	298				
20			2400			30	496				
21			2280			30	199				
22			2280			20	199				
23			2160			40	199				
24			2280			40	199				
25			2280			20	199				
26			2400			40	199				
27			2400			20	199				
28			2520			30	199				
29			2400			40	298				
30			2400			30	298				
31			2400			30	199				
TL			74160			860	7951				
ME			2392			32	256				

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours	Va
TOTAL	5		840	
Superintendent	1		168	
Asst. Supt.	1		168	
Shift Foreman				
Shift Operator	3		504	
Maint. Supervisor				
Mechanic				
Chemist				
Lab Technician				
Clerk-Typist				
Other				

GIVE THE HOURS PER DAY PLANT PERSONNEL ARE

WEEKDAYS 9 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

Digester Volume, ft³
Primary
Secondary

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

R 4619
4833-5382

Supernatant To
Process Pattern

MONTH October 19 83

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE Gals. X100	RAW SLUDGE Total Solids %	RAW SLUDGE Vol. Solids %	RAW SLUDGE Vol. Solids Lbs/1000 c.f. Digester	RAW SLUDGE pH	DIGESTING SLUDGE Temp. °F	DIGESTING SLUDGE pH	DIGESTING SLUDGE Total Solids %	DIGESTING SLUDGE Vol. Solids %	DIGESTING SLUDGE Vol. Acids Mg/l	DIGESTING SLUDGE Alkalinity Mg/l	SUPERNATANT Gals. X	SUPERNATANT pH	SUPERNATANT Total Solids %	SUPERNATANT Vol. Solids %	SUPERNATANT Susp. Solids Mg l	SUPERNATANT P Mg l	SUPERNATANT P Lbs.	SUPERNATANT 5-Day BOD Mg/l	DIGESTED SLUDGE Gals. X	DIGESTED SLUDGE Total Solids %	DIGESTED SLUDGE Vol. Solids %	DIGESTED SLUDGE pH	Gas Produced cu. ft X
1	38	3.0	73		6.5																			
2	38	3.3	85		6.5																			
3	38	3.1	63		6.7							4320	9.4	.24	55									
4	30	3.0	75		6.6																			
5	208	2.6	72		6.5							6711	11.6	.146										
6	58	3.2	69		6.6																			
7	30	3.2	69		6.6							17,680	11.6	.60	64									
8	30	3.4	79		6.5							3000	11.4	.149	62									
9	30	3.3	67		6.6																			
10	30	2.7	70		6.5																			
11	30	3.5	75		6.5																			
12	30	2.8	86		6.4																			
13	30	3.1	75		6.5							10166	9.0	1.43	65									
14	30	3.5	63		6.5																			
15	30	4.0	56		6.5																			
16	30	3.5	59		6.5																			
17	30	3.5	79		6.5																			
18	30	3.3	69		6.6							8840	9.2	.146	73									
19	30	3.4	79		6.5																			
20	30	2.9	81		6.5																			
21	30																							
22	30	3.7	75		6.5																			
23	30	3.2	67		6.5																			
24	30	3.8	67		6.5																			
25	30	3.4	84		6.5																			
26	30	4.7	71		6.5																			
27	30	4.3	64		6.5																			
28	30	3.1	87		6.6																			
29	30	3.3	71		6.6																			
30	30	3.5	59		6.6																			
31	30	3.8	68		6.6																			
TOTAL	1,160											50817												
ARITH. MEAN	37	3.4	72									3487		45	6.4									

September (Month), 1983

City of Marshall (Municipality), Michigan

(Superintendent's Signature)

State of M
Department of Na

SLUDGE DISP

DATE	SLUDGE APPLIED: Gallons or Cubic Yards	% Solids	% VS	Dry Tons per ac	SLUDGE ANALYSIS AND SOIL: Nitrogen TKN %	Nitrogen NH_4 %	Nitrogen NO_3 %	Nitrogen AVAN lb/ac	Total Phosphorus TP %	Total Phosphorus TP lb/ac	Potassium K %	Potassium K lb/ac	Lead Pb mg/kg	Lead Pb lb/ac	Zinc Zn mg/kg	Zinc Zn lb/ac
9-7-83	78,000															
9-8-83	58,500															
9-9-83	32,500															
9-10-83	19,500															
9-12-83	45,500															
9-13-83	58,500															
9-14-83	65,000															
9-15-83	13,000															
Average	370,500	9.7			3.13	.22	.001		1.07		.17		142		777	
TOTALS This Month				3.8				60.8		81		13		1.08		5.9
TOTALS This Year																
TOTALS Cumulative																

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

November, 19 83
Month

Marshall, Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

ID 1300274 11 83 500
Plant No Mo Yr Sampling Point Code

DAY	WEATHER		FLOW		RAW SEWAGE QUALITY											REMARKS OR OT
	TYPE	PRECIP.	TOTAL	MAX RATE	TEMP	pH	BOD-5		SS		TOTAL-P		VSS	NH_3-N		
1 2	9	14	19	24	29	34	39 44		49 54		59 64		69	74 78	80	9 14
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l	C	
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C	
SF															C	
01	4	.18	2.51		57	7.3	78	1633	64	1340	2.40	50	54		C	
02	4	.23	2.54		57	7.4	68	1440	64	1356	2.45	52	42		C	
03	3		2.55		56	7.3	54	1148	56	1191	2.10	45	40		C	
04	1		2.51		51	7.5									C	
05	1		2.43		56	7.4									C	
06	1		2.47		56	7.4	56	1154	68	1401	2.45	50	60		C	
07	1		2.62		56	7.4	60	1311	60	1311	2.05	45	56		C	
08	1		2.54		56	7.3	68	1440	58	1229	2.65	56	36		C	
09	1		2.55		56	7.4	82	1744	52	1106	2.40	51	50		C	
10	5	.13	2.53		56	7.4	86	1815	60	1266	2.10	44	32		C	
11	3		2.53		55	7.4									C	
12	1		2.41		55	7.4									C	
13	1		2.44		54	7.4	66	1343	122	2483	2.40	49	96		C	
14	3		2.56		55	7.4	60	1281	64	1366	2.05	44	50		C	
15	4	.55	2.52		54	7.6	72	1513	90	1892	2.20	46	72		C	
16	4	.02	2.53		54	7.5	60	1266	46	971	2.10	44	38		C	
17	3		2.48		54	7.4	82	1696	68	1406	2.40	50	58		C	
18	4	.19	2.42		54	7.4									C	
19	4	.10	2.45		54	7.4									C	
20	4	.08	2.46		55	7.5	54	1108	60	1231	2.05	42	48		C	
21	1		2.59		55	7.3	70	1512	152	3283	2.45	53	98		C	
22	4	.29	2.55		54	7.4	74	1574	90	1914	2.55	54	72		C	
23	4	.41	2.60		54	7.4									C	
24	1		2.44		54	7.4									C	
25	1		2.52		54	7.4									C	
26	1		2.49		54	7.3									C	
27	4	.81	2.61		54	7.4	34	740	50	1088	2.75	60	36		C	
28	5	.03	2.22		54	7.6	52	1180	62	1406	2.45	56	56		C	
29	5	.02	2.65		54	7.5	64	1414	54	1193	2.20	49	30		C	
30	5	.03	2.53		53	7.4	54	1139	50	1055	2.20	46	38		C	
31															C	
TL		3.07	115.80					27451		29488		986			C	
ME			2.53				65	1373	70	1474	2.32	49	53		C	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

November, 19 83
Month

Marshall, Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2 ID | 3 8 130029 Plant No | 9 10 11 12 11 Mo. | 11 12 83 Yr. | 13 15 ... Sampling Point Code

DAY	BOD-5 9 14		SS 19 24		TOTAL-P 29 34		VSS 39	NH_3-N 44	REMARKS OR OTHER PARAMETERS 49	54	59	64	69	74 78	80 9	14	19
1 2	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l							C		
PN	00310	85001	00530	85002	00665	85004	00535	00610							C		
SF															C		
01	66	1382	86	1800	3.20	67	70								C		
02	68	1440	56	1186	3.30	70	52								C		
03	86	1829	106	2254	3.30	70	54								C		
04															C		
05															C		
06	66	1360	80	1648	3.10	64	78								C		
07	58	1267	78	1704	2.65	58	70								C		
08	66	1398	84	1779	2.05	43	62								C		
09	76	1616	62	1319	2.85	61	48								C		
10	80	1688	90	1899	2.45	52	68								C		
11															C		
12															C		
13	56	1140	74	1506	2.40	49	60								C		
14	88	1879	90	1922	2.65	57	70								C		
15	64	1345	76	1597	2.10	44	66								C		
16	62	1308	72	1519	2.20	46	64								C		
17	70	1448	98	2027	2.45	51	88								C		
18															C		
19															C		
20	66	1354	104	2134	2.30	47	86								C		
21	56	1210	84	1814	2.05	44	68								C		
22	62	1319	86	1824	2.55	54	72								C		
23															C		
24															C		
25															C		
26															C		
27	58	1263	90	1959	2.45	53	74								C		
28	92	2087	84	1906	3.00	68	76								C		
29	62	1370	74	1635	2.30	51	50								C		
30	60	1266	74	1561	2.45	52	62								C		
31															C		
TL		28,969		34,998		1101									C		
ME	68	1448	82	1750	2.59	55	67								C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

November, 19 83
Month

Marshall, Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID | 130029 | 11 | 83 | ..
Plant No. Mo. Yr Sampling Point Code

DAY 1 2	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification 14	F 19
	Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MLSS 34	MLVSS 39	SETTL. 44	SDI 49	DO 54	Air Applied 59	SS 64	VSS 49	Percent Return 74	80	Waste Sludge 9		
	KCF	KCF	HRS.	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu. Ft.	%	%	%	C	KGal	See Code*	
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889	
SF											7				C			
01	48		3.4	3.8	.29	2027	1567	18.0	1.13	2.3	131	.66	77	47	C			
02			3.4	3.3	.32	1804	1409	13.0	1.39	1.8	156	.62	77	42	C	6		
03			3.4	3.3	.35	1911	1481	15.0	1.27	1.3	176	.64	76	45	C			
04			3.4	3.0	.36	1767	1357	12.0	1.47	1.2	174	.62	76	41	C	4		
05			3.5								171			42	C			
06			3.5								168			42	C			
07			3.3	2.6	.41	1534	1206	10.0	1.53	3.2	168	.67	78	42	C	14		
08			3.4	2.9	.38	1701	1299	16.0	1.06	3.1	168	.59	75	43	C	6		
09			3.4	3.3	.36	1836	1378	15.0	1.22	1.6	162	.65	73	42	C	8		
10			3.4	2.9	.43	1599	1164	12.0	1.33	3.0	157	.62	71	42	C	17		
11			3.4	3.3	.36	1860	1388	15.0	1.24	3.9	162	.52	73	40	C	8		
12			3.6								165			41	C	15		
13			3.5								162			41	C	15		
14			3.4	2.5	.46	1440	1089	10.0	1.44	3.2	157	.45	74	40	C	22		
15			3.4	3.5	.34	1918	1448	13.0	1.48	2.6	158	.57	75	40	C			
16			3.4	2.8	.40	1528	1244	10.0	1.53	2.9	158	.52	76	38	C	19		
17			3.5	2.5	.48	1334	1013	9.0	1.48	3.8	168	.43	75	39	C	20		
18			3.6	2.8	.40	1504	1194	10.0	1.50	2.8	164	.45	78	40	C	12		
19			3.6								160			40	C	15		
20			3.5								161			39	C	13		
21			3.3	2.2	.45	1372	1067	9.0	1.52	3.8	163	.42	77	39	C	9		
22			3.4	1.9	.51	1189	933	8.0	1.49	3.2	164	.44	77	39	C	23		
23			3.3	2.5	.40	1563	1221	10.0	1.56	3.1	159	.54	77	39	C	2		
24			3.5								167			44	C	14		
25			3.4								165			42	C	12		
26			3.5								164			43	C	13		
27			3.3								165			40	C	9		
28			3.2	2.3	.44	1511	1159	10.0	1.51	1.8	161	.48	76	37	C	28		
29			3.3	2.1	.48	1353	1043	9.0	1.50	2.5	166	.43	76	40	C	22		
30			3.4	3.1	.32	1859	1430	11.0	1.69	3.7	171	.66	76	42	C			
31															C			
TL															C	324		
ME			3.4	2.8	.40	1631	1255	11.8	1.42	2.7	163	.55	76	41	C	13.5		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

November, 19 83
Month

Marshall, Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2 | 3 8 | 9 10 | 11 12 | 13 15
ID | 130029 | 11 | 83 | ...
Plant No. | Mo. | Yr. | Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX.FUEL 14 GAS CF	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS.	39 FeCl3 LBS	44 WATER CF	49	54	59
PN											
SF		2									
01		1	2640			20	199	140			
02			2280			30	199	190			
03		6	2520			40	199	230			
04		48	2640			30	199	400			
05			2520			20	199	170			
06		56	2400			20	199	210			
07			2520			30	397	490			
08			2520			20	794	460			
09			2400			30	596	560			
10						40	397	280			
11		51				40	397	360			
12		53				40	397	100			
13		42				20	397	240			
14		40				10	199	520			
15		39				30	397	360			
16		51				20	199	220			
17		44				40	397	220			
18		35				20	99	230			
19		27				30	99	280			
20		38				30	99	270			
21		2				30	99	250			
22		3				30	298	260			
23		29				30	298	470			
24		48				30	298	90			
25		36				20	298	260			
26		4				30	199	210			
27		10				30	298	270			
28		32				30	298	2940			
29		70				30	199	460			
30		88				40	397	240			
31											
TL		853	22440			860	8740	10880			
ME		36	2493			29	325	363			

No Meter

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours	N Va
TOTAL	5		808	
Superintendent	1		160	
Asst. Supt.	1		160	
Shift Foreman				
Shift Operator	3		488	
Maint. Supervisor				
Mechanic				
Chemist				
Lab Technician				
Clerk-Typist				
Other				

GIVE THE HOURS PER DAY PLANT PERSONNEL ARE

WEEKDAYS 9 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

Digester Volume, ft³
Primary _____
Secondary _____

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

R 4619
4833-5382

Supernatant To _____
Process Pattern _____

MONTH November 19 83

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE					DIGESTING SLUDGE						SUPERNATANT								DIGESTED SLUDGE				Gas Produced cu. ft X
	Gals. X 100	Total Solids %	Vol. Solids %	Vol. Solids Lbs/1000 c.f. Digester	pH	Temp. °F	pH	Total Solids %	Vol. Solids %	Vol. Acids Mg/l	Alkalinity Mg/l	Gals. 100	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	P Mg/l	P Lbs.	5-Day BOD Mg/l	Gals. X	Total Solids %	Vol. Solids %	pH	
1	30	4.3	65		6.5																			
2	30	4.7	80		6.5																			
3	30	4.8	67		6.6							212	8.7	.40	36									
4	56	3.0	75		6.6																			
5	30	3.6	76		6.6																			
6	30	3.5	67		6.5																			
7	30	3.5	80		6.6																			
8	30	3.5	75		6.5																			
9	30	3.2	80		6.6																			
10	49	3.6	75		6.5																			
11	30	3.1	81		6.6																			
12	30	3.2	86		6.6																			
13	30	3.6	81		6.7																			
14	30	3.9	60		6.7							332	8.8	.39	72									
15	30	3.6	80		6.8																			
16	30	3.6	75		6.7																			
17	30	3.7	62		6.8																			
18	58	4.2	77		6.8																			
19	30	3.6	74		6.8																			
20	30	3.4	69		6.7																			
21	30	3.7	80		6.6																			
22	30	3.8	80		6.6																			
23	51	3.7	57		6.7																			
24	30	3.4	83		6.6																			
25	30	3.9	75		6.5																			
26	30	3.9	85		6.6																			
27	30	3.9	84		6.6																			
28	24	3.9	69		6.7							411	8.8	.37	75									
29	24	4.2	63		6.7																			
30	24	4.1	76		6.7																			
31																								
TOTAL	976											955												
ARITH. MEAN	33	3.7	75									318		.39	61									

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

_____ Month , 19 _____ | _____ Municipality , Michigan | _____ Superintendent's Signature

1 2 ID | 3 8 Plant No. | 9 10 Mo. | 11 12 Yr. | 13 15 Sampling Point Code

DAY	10 BOD-5			20 SS			30 TOTAL-P			40 VSS	NH_3-N	pH	50 DO	60 F. COLI*		T. COLI*	REMARKS
	9 14 19			24 29 34			39 44 49			54	59	64	69	74	80	9	14 19
1 2	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	mg/l	SU	mg/l	#/100 ml	C	#/100 ml	
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 31615	C	31504 31505	
SF															C		
01	12	251	85	12	251	81	.85	18	65	10		7.2	3.2	102	C		
02	10	212	85	7	148	89	.51	11	79	5		7.3	2.4		C		
03	16	340	70	25	532	55	.91	19	57	14		7.3	3.7	88	C		
04												7.4	3.7	60	C		
05												7.3			C		
06	10	206	80	13	268	80	.61	13	75	10		7.4			C		
07	11	240	82	16	351	73	.68	15	67	15		7.3	3.9	50	C		
08	8	169	88	8	169	86	.46	10	83	2		7.4	5.0	26	C		
09	20	425	76	8	170	85	.36	6	88	7		7.3	3.5	26	C		
10	12	253	86	6	127	90	.28	6	87	4		7.3	3.5	34	C		
11												7.3	4.5	32	C		
12												7.3			C		
13	7	142	89	10	203	92	.42	9	83	7		7.4			C		
14	18	384	70	17	363	73	.50	11	76	9		7.5	4.3	64	C		
15	6	126	92	7	147	92	.22	5	90	6		7.4	3.2	8	C		
16	5	106	92	3	63	93	.23	5	90	6		7.4	3.2	10	C		
17	9	186	89	8	165	88	.32	7	87	6		7.4	4.4	16	C		
18												7.4	3.6	12	C		
19												7.4			C		
20	15	308	72	7	144	88	.32	7	84	6		7.4			C		
21	9	194	87	11	238	93	.35	8	86	6		7.3	4.4	20	C		
22	8	170	89	8	170	91	.40	9	84	7		7.3	4.1	42	C		
23												7.3	3.2	14	C		
24												7.4			C		
25												7.3			C		
26												7.4			C		
27	11	239	68	13	283	74	.38	8	86	9		7.4			C		
28	5	113	90	9	204	85	.38	9	84	7		7.5	3.8	186	C		
29	12	265	81	8	177	85	.41	9	81	5		7.4	3.7	130	C		
30	10	211	81	10	211	80	.32	7	85	2		7.3	4.2	62	C		
31															C		
TL		4540			4384			192							C		
ME	11	227	81	10	219	84	.44	10	81	7		7.4	3.8	36	C		
WA	13	275		15	310									114	C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

December, 19 83 — Month

Marshall, Michigan — Municipality

Robert J. Swalwell — Superintendent's Signature

ID 130024 — Plant No. 12 — Mo. 83 — Yr 500 — Sampling Point Code

DAY	WEATHER TYPE	WEATHER PRECIP.	FLOW TOTAL	FLOW MAX RATE	RAW SEWAGE QUALITY TEMP	pH	BOD-5		SS		TOTAL-P		VSS	NH_3-N		REMARKS OR OT-		
1 2	9	14	19	24	29	34	39	44	49	54	59	64	69	74 78	80	9	14	19
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l	C			
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C			
SF															C			
01	3		2.57		52	7.5	64	1372	90	1929	2.65	57	50		C			
02	3		2.53		52	7.3									C			
03	4	.12	2.47		52	7.4									C			
04	1		2.47		52	7.4	56	1154	98	2019	2.55	53	72		C			
05	5	.55	2.59		52	7.5	66	1426	56	1210	1.95	42	50		C			
06	5	.18	2.58		52	7.5	52	1119	56	1205	2.20	47	32		C			
07	1		2.57		51	7.5	68	1457	46	986	2.20	47	36		C			
08	5	.01	2.57		51	7.6	76	1629	46	986	2.55	55	34		C			
09	5	.02	2.54		51	7.3									C			
10	4	.10	2.50		51	7.5									C			
11	4	.42	2.63		52	7.5	58	1272	68	1420	2.65	58	56		C			
12	3		2.77		53	7.6	76	1756	124	2865	3.00	69	98		C			
13	4	.03	2.74		52	7.5	76	1737	52	1188	2.20	50	44		C			
14	5	.01	2.77		52	7.5	72	1663	50	1155	1.95	45	40		C			
15	5	.08	2.74		52	7.3	70	1600	68	1554	2.10	48	66		C			
16	5	.04	2.64		52	7.5									C			
17	5	.02	2.60		51	7.4									C			
18	5	.02	2.61		51	7.3									C			
19	1		2.68		51	7.3	102	2280	50	1140	2.55	58	38		C			
20	3		2.66		51	7.3	82	1819	62	1375	2.20	49	36		C			
21	5	.63	2.63		51	7.5	90	1974	74	1623	2.10	46	56		C			
22	3		2.54		51	7.3									C			
23	5	.02	2.56		51	7.3									C			
24	3		2.51		51	7.3									C			
25	3		2.42		51	7.3									C			
26	5	.02	2.55		50	7.3									C			
27	5	.14	2.23		50	7.3	82	1525	84	1562	2.45	45	30		C			
28	5	.06	2.15		50	7.4	80	1434	48	861	2.05	37	40		C			
29	5	.01	2.14		50	7.5	64	1142	48	857	2.30	41	40		C			
30	3		2.18		50	7.4									C			
31	1		2.21		50	7.4									C			
TL		2.48	78.35					26359		23935		847			C			
ME			2.53				73	1551	66	1408	2.33	50	48		C			

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

December (Month), 1983

Marshall (Municipality), Michigan

Robert J. Swalwell
Superintendent's Signature

1 2 | 3 8 | 9 10 | 11 12 | 13 15
ID | 130029 | 12 | 83 | ..
Plant No. | Mo. | Yr. | Sampling Point Code

DAY	BOD-5 9 14		SS 19 24		TOTAL-P 29 34		VSS 39	NH_3-N 44	REMARKS OR OTHER PARAMETERS 49	54	59	64	69	74 78	80	9	14	19
1 2	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l							C			
PN	00310	85001	00530	85002	00665	85004	00535	00610							C			
SF															C			
01	52	1115	72	1543	2.55	55	60								C			
02															C			
03															C			
04	58	1195	68	1401	2.65	55	48								C			
05	64	1382	76	1642	2.45	53	66								C			
06	54	1162	82	1764	2.65	57	66								C			
07	50	1072	60	1286	2.45	53	48								C			
08	60	1286	66	1415	2.75	59	52								C			
09															C			
10															C			
11	64	1404	86	1886	2.75	60	76								C			
12	108	2495	80	1848	2.55	59	60								C			
13	64	1463	72	1645	2.45	56	60								C			
14	108	2495	94	2172	2.75	64	76								C			
15	60	1371	76	1737	2.40	55	68								C			
16															C			
17															C			
18															C			
19	60	1368	74	1654	2.55	57	50								C			
20	90	1997	76	1686	2.65	59	54								C			
21	80	1755	90	1974	2.75	60	76								C			
22															C			
23															C			
24															C			
25															C			
26															C			
27	66	1227	78	1451	2.30	43	48								C			
28	46	1183	68	1219	2.40	43	58								C			
29	70	1349	78	1392	2.40	43	64								C			
30															C			
31															C			
TL		25219		27715		931									C			
ME	69	1483	76	1630	2.56	55	61								C			

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

December, 19 83 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2	3 8	9 10	11 12	13 15
ID	130039	12	83	
	Plant No	Mo	Yr	Sampling Point Code

DAY 1 2	AERATION SYSTEM 9					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification 14
	Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MLSS 34	MLVSS 39	SETTL 44	SDI 49	DO 54	Air Applied 59	SS 64	VSS 49	Percent Return 74	8C	Waste Sludge 9	
	KCF	KCF	HRS	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu Ft.	%	%	%	C	KGal	See Code*
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF											4				C		
01	48		3.4	2.8	.38	1569	1204	10.0	1.57		170	.60	75	40	C	30	
02			3.4	3.3	.30	1911	1463	12.0	1.59		168	.64	76	42	C		
03			3.5								165			45	C	20	
04			3.5								163			45	C	13	
05			3.3	3.5	.32	1932	1458	12.0	1.61	5.0	163	.64	75	43	C	17	
06			3.3	3.3	.33	1826	1364	12.0	1.52	5.8	167	.61	74	43	C	15	
07			3.4	3.8	.27	1932	1448	12.0	1.61	5.0	174	.69	74	40	C	7	
08			3.4	3.9	.28	1958	1464	13.0	1.51	5.5	172	.64	74	25	C	13	
09			3.4	3.8	.28	1904	1423	12.0	1.59	5.3	172	.65	74	38	C	13	
10			3.4								171			40	C	21	
11			3.3								163			29	C	22	
12			3.1	2.5	.47	1428	1081	9.0	1.59	2.8	166	.60	74	36	C	37	
13			3.1	3.5	.33	2012	1543	12.0	1.68	3.8	165	.74	76	36	C		
14			3.1	3.6	.34	2142	1656	13.0	1.65	2.8	163	.72	76	34	C	17	
15			3.1	3.2	.39	1847	1418	11.0	1.68	2.5	168	.60	76	44	C	27	
16			3.2	3.3	.38	1866	1410	11.0	1.69	4.2	174	.60	74	41	C	15	
17			3.3								177			40	C	14	
18			3.3								181			41	C	20	
19			3.2	3.2	.40	1840	1406	12.0	1.53	5.3	179	.63	75	38	C	16	
20			3.3	3.0	.42	1806	1379	13.0	1.39	5.0	176	.65	76	40	C	17	
21			3.3	3.2	.41	1886	1446	13.0	1.45	3.7	170	.64	76	39	C	17	
22			3.4	3.2	.53	1836	1094	14.0	1.31	4.8	179	.60	87	40	C	14	
23			3.4								182			41	C	15	
24			3.4								179			41	C	15	
25			3.6								181			44	C	15	
26			3.4								175			42	C	15	
27			3.9	2.6	.47	1308	1003	8.0	1.64	5.5	171	.36	76	50	C	27	
28			4.0	3.3	.39	1571	1176	10.0	1.57	6.5	172	.48	74	54	C		
29			4.0	3.4	.36	1579	1172	10.0	1.58	7.3	181	.43	73	43	C	17	
30			3.9								181			43	C	25	
31			3.9								174			43	C		
TL															C	494	
ME			3.4	3.3	.37	1799	1348	11.5	1.57	4.8	172	.61	76	42	C	18	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

December, 19 83 (Month)

Mars Hill (Municipality), Michigan

Robert J Swabell (Superintendent's Signature)

ID 334029 (Plant No.) 12 (Mo.) 83 (Yr.) .. (Sampling Point Code)

DAY	GRIT	AUX.FUEL	POWER CONSUMPTION			CHEMICALS APPLIED					
1 2	9	14 Gas	19 #1	24 #2	29 #3	34 Cl_2	39 Feels	44 Water	49	54	59
	CF	CF	KWH	KWH	KWH	LBS.	LBS.	CF			
PN		2									
SF											
01		77				20	199	410			
02		70				40	298	430			
03		60				30	199	360			
04		47				10	298	390			
05		53				40	199	380			
06		64				20	397	420			
07		87				40	199	510			
08		70				20	397	390			
09		61				30	199	410			
10		58				30	199	350			
11		34				30	298	390			
12		55				30	298	370			
13		44				20	199	440			
14		72				40	298	350			
15		70				30	298	410			
16		82				30	199	620			
17		83				40	199	380			
18		102				30	199	400			
19		35				30	199	300			
20		176				30	397	350			
21		74				30	199	320			
22		98				30	199	400			
23		98				30	199	330			
24		93				40	199	290			
25		93				30	199	300			
26		92				30	199	420			
27		79				20	199	330			
28		78				40	199	320			
29		124				40	199	310			
30		132				30	199	310			
31		109				30	199	360			
TL		2479				990	7357	11,800			
ME		80				50	237	381			

No Meter

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	5		808
Superintendent	1		160
Asst. Supt.	1		160
Shift Foreman			
Shift Operator	3		488
Maint. Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL AR

WEEKDAYS 9 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

Digester Volume, ft³
Primary _____
Secondary _____

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

R 4619
4833-5382

Supernatant To _____
Process Pattern _____

MONTH December 1983

DIGESTER AND SLUDGE DATA

OPERATOR R. J. Swalwell

DATE	RAW SLUDGE					DIGESTING SLUDGE						SUPERNATANT								DIGESTED SLUDGE				Gas Produced
	Gals. X	Total Solids %	Vol. Solids %	Vol. Solids Lbs/1000 c.f. Digester	pH	Temp. °F	pH	Total Solids %	Vol. Solids %	Vol. Acids Mg/l	Alkalinity Mg/l	Gals. X	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	P Mg/l	P Lbs.	5-Day BOD Mg/l	Gals. X	Total Solids %	Vol. Solids %	pH	X
1	30	4.9	69		6.7																			
2	53	4.0	76		6.7																			
3	30	2.9	83		6.8																			
4	30	3.5	81		6.7																			
5	30	3.4	69		6.5																			
6	30	4.0	65		6.6																			
7	30	3.6	63		6.6																			
8	30	3.4	80		6.6																			
9	55	3.9	60		6.5																			
10	30	4.0	64		6.6																			
11	30	4.0	68		6.5																			
12	30	3.8	75		6.6								8.0	.50	69									
13	30	4.1	61		6.6																			
14	30	3.9	61		6.5								8.3	.43	71									
15	46	4.5	65		6.6																			
16	54	4.1	64		6.5																			
17	30	3.8	81		6.5																			
18	30	3.7	73		6.6																			
19	30	4.0	57		6.5																			
20	30	3.6	78		6.5																			
21	30	3.6	77		6.5																			
22	53	4.0	78		6.5																			
23	30	4.1	58		6.4																			
24	30	4.1	75		6.5																			
25	30	3.9	68		6.5																			
26	23	3.9	68		6.5																			
27	30	4.2	73		6.5																			
28	30	4.1	70		6.5																			
29	30	3.9	73		6.5																			
30	30	4.1	64		6.5																			
31	25	3.9	59		6.5																			
TOTAL	1029																							
ARITH. MEAN	33	3.9	70																					

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

December, 19 83 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

ID | 1300629 (Plant No.) | 12 (Mo.) | 83 (Yr.) | .. (Sampling Point Code)

DAY	BOD-5			SS			TOTAL-P			VSS	NH_3-N	pH	DO	F. COLI*		T. COLI*	REMARKS
1 2	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	mg/l	SU	mg/l	#/100 ml	C	#/100 ml	
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 31615	C	31504 31505	
SF															C		
01	11	236	83	10	214	89	.44	9	83	6		7.4		46	C		
02												7.2		82	C		
03												7.3			C		
04	9	185	84	6	124	94	.41	8	84	5		7.3			C		
05	6	130	91	10	216	82	.35	8	82	7		7.4	6.2	18	C		
06	6	129	88	11	237	80	.40	9	82	6		7.4	6.2	28	C		
07	6	129	91	9	193	80	.35	8	84	5		7.4	6.2	52	C		
08	10	214	87	5	107	89	.37	8	85	2		7.4	6.0	12	C		
09												7.4	6.0	26	C		
10												7.4			C		
11	9	197	84	9	197	87	.34	7	87	7		7.4			C		
12	17	393	78	19	439	85	.51	12	83	13		7.5	4.8	212	C		
13	9	206	88	7	160	87	.32	7	85	6		7.3	3.6	122	C		
14	19	439	74	17	393	66	.46	11	76	12		7.4	3.4	32	C		
15	16	366	77	9	206	87	.30	7	86	8		7.3	3.9	20	C		
16												7.4	6.3	20	C		
17												7.4			C		
18												7.4			C		
19	11	246	89	7	156	86	.38	8	85	1		7.4	6.8	40	C		
20	22	488	73	5	111	92	.30	7	86	1		7.3	6.3	18	C		
21	22	483	76	7	154	91	.30	7	86	6		7.3	4.3	14	C		
22												7.3	5.5	20	C		
23												7.3			C		
24												7.4			C		
25												7.5			C		
26												7.4			C		
27	23	428	72	5	93	94	.37	7	85	3		7.5	6.8	4	C		
28	9	161	89	2	36	96	.30	5	85	1		7.4	7.3	2	C		
29	14	250	87	8	143	83	.42	7	82	7		7.5	8.0	2	C		
30												7.4			C		
31												7.4			C		
TL		4680			3179			135							C		
ME	13	275	83	9	187	86	.37	8	84	6		7.4	5.7	22	C		
WA	18	406	~~88~~	12	279									53	C		

December (Month) 1983

City of Marshall (Municipality) Michigan

Robert J. Swalwell (Superintendent's Signature)

State of Michigan
Department of Natural Resources

SLUDGE DISPOSAL SHEET

Jones & C-4-1 (Site)

Acres This month 16 ac

DATE	SLUDGE APPLIED: Gallons or Cubic Yards	% Solids	% VS	Dry Tons per ac	Nitrogen: TKN %	Nitrogen: NH_4 %	Nitrogen: NO_3 %	Nitrogen: AVAN lb/ac	Total Phosphorus TP: %	Total Phosphorus TP: lb/ac	Potassium K: %	Potassium K: lb/ac	Lead Pb: mg/kg	Lead Pb: lb/ac	Zinc Zn: mg/kg	Zinc Zn: lb/ac	Copper Cu: mg/kg	Copper Cu: lb ac	Nickel Ni: mg kg	Nickel Ni: lb/ac	Cadmium Cd: mg/kg	Cadmium Cd: lb ac	Chr mg/kg	Hg lb/ac	Mo mg kg	Se lb/ac
12-15-83	58,500	8.2																								
12-16	45,500																									
12-17	52,000																									
Average	156,000	8.2			3.13	.22	.001		1.07		.17		142		777		488		69		14		2.13	6.2	24.4	1.0
TOTAL This Month	156,000			3.3				520		10.6		11.2		.9		5.1		3.2		.5		.09		.03		3.3
TOTAL This Year	156,000																									
TOTAL Cumulative																										

CROP AND SOIL DATA

Present Crop _____

Projected Crop Corn

CEC 7.3 meq/100g

pH 6.3 SU

Fertilizer Recommendations

N 190 lb/ac

P_2O_5 35 lb/ac

K_2O 50 lb/ac

Acceptable Metal Accumulations

Pb 430 lb/ac

Zn 215 lb/ac

Cu 107 lb/ac

Ni 43 lb/ac

Cd 4.5 lb/ac

_____ lb/ac

_____ lb/ac

Cd 2 lb/ac/yr

REMARKS

PR4630

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

January, 19 85
Month

Marshall, Michigan
Municipality

Robert D. Swartout
Superintendent's Signature

1 2 ID | 3 8 1.3.6.0.3.9 Plant No. | 9 10 01 Mo. | 11 12 85 Yr | 13 15 5.6.0 Sampling Point Code

DAY 1 2	WEATHER TYPE 9	WEATHER PRECIP. 14	FLOW TOTAL 19	FLOW MAX RATE 24	RAW SEWAGE QUALITY TEMP 29	pH 34	BOD-5 39 44		SS 49 54		TOTAL-P 59 64		VSS 69	NH_3-N 74 78	80	REMARKS OR 9	14	1
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l	C			
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C			
SF															C			
01	5	.02	3.05		50	7.4	54	1374	66	1679	1.60	41	60		C			
02	3		3.19		51	7.3	68	1809	48	1277	1.90	51	36		C			
03	1		3.13		51	7.3									C			
04	3		2.98		51	7.4									C			
05	3		2.84		51	7.0									C			
06	4	.02	2.86		51	7.0	92	2194	70	1670	3.00	72	58		C			
07	5	.02	2.89		51	7.3	92	2217	66	1591	3.20	77	26		C			
08	1		2.84		51	7.2	80	1895	69	1516	1.90	45	48		C			
09	5	.03	2.84		51	7.3	72	1705	44	1020	1.65	45	26		C			
10	5	.04	2.78		51	7.4	78	1808	68	1577	1.95	45	50		C			
11	3		2.71		51	7.4									C			
12	3		2.61		51	7.4									C			
13	3		2.70		51	7.4	66	1486	72	1621	2.10	47	58		C			
14	5	.01	2.71		51	7.3	60	1356	80	1808	2.10	47	66		C			
15	3		2.65		51	7.3	46	1017	74	1635	1.90	42	58		C			
16	5	.08	2.62		51	7.5	54	1180	60	1311	2.10	46	42		C			
17	5	.05	2.52		51	7.3	54	1135	62	1303	2.05	43	48		C			
18	5	.13	2.46		51	7.3									C			
19	5	.03	2.45		51	7.3									C			
20	3		2.55		50	7.4	62	1319	64	1361			48		C			
21	5	.06	2.52		50	7.5	52	9864	62	1179	2.20	42	54		C			
22	3		2.56		50	7.3	56	1146	38	811	1.80	38	28		C			
23	5	.01	2.51		50	7.1	74	1549	52	1089	1.80	38	32		C			
24	5	.14	2.43		50	7.3	80	1621	58	1175	2.05	42	46		C			
25	5	.03	2.40		50	7.3									C			
26	3		2.41		50	7.4									C			
27	5	.01	2.54		50	7.4	62	1313	80	1695	2.10	44	66		C			
28	3		2.50		50	7.6	58	1209	42	876	2.45	51	34		C			
29	3		2.55		50	7.4	60	1276	52	1106	1.70	36	42		C			
30	5	.06	2.53		50	7.4	152	3207	92	1941			52		C			
31	3		2.51		50	7.4	72	1507	96	2010	2.75	58	76		C			
TL		.74	82.84					34,362		31,251		950			C			
ME			2.67				70	1562	64	1421	2.12	48	48		C			

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

January , 19 85
Month

Marshall , Michigan
Municipality

Robert J. Swallow
Superintendent's Signature

ID | 1300039 | 01 | 85 | |
Plant No | Mo. | Yr. | Sampling Point Code

DAY	BOD-5		SS		TOTAL-P		VSS	NH_3-N	REMARKS OR OTHER PARAMETERS										
	9 14		19 24		29 34		39	44	49	54	59	64	69	74 78	80	9	14	19
1 2	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l							C			
PN	00310	85001	00530	85002	00665	85004	00535	00610							C			
SF															C			
01	54	865	54	865	1.40	36	26								C			
02	48	1277	48	1277	1.65	44	36								C			
03															C			
04															C			
05															C			
06	78	1860	50	1193	2.55	61	40								C			
07	78	1880	42	1012	2.10	51	12								C			
08	60	1421	44	1042	1.65	39	34								C			
09	57	1350	32	758	1.60	38	16								C			
10	50	1159	34	788	1.60	37	20								C			
11															C			
12															C			
13	40	961	46	1636	1.90	43	38								C			
14	36	814	24	542	1.90	43	18								C			
15	32	767	32	767	1.65	36	20								C			
16	36	787	44	961	1.80	39	30								C			
17	34	715	46	967	1.90	40	38								C			
18															C			
19															C			
20	42	593	44	936			34								C			
21	56	1665	44	837	1.90	36	32								C			
22	58	1238	40	854	1.80	38	34								C			
23	60	1256	68	1423	1.65	35	22								C			
24	64	1297	28	567	1.60	32	24								C			
25															C			
26															C			
27	44	932	36	763	1.65	35	20								C			
28	54	1126	36	751	2.10	44	24								C			
29	50	1663	50	1663	1.60	34	40								C			
30	100	2110	68	1435			46								C			
31	48	1005	50	1047	1.80	38	42								C			
TL		25721		26866		749									C			
ME	53	1169	43	945	1.74	36	29								C			

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

January , 19 85
Month

Marshall , Michigan
Municipality

Robert J Sundell
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID 13.c.29 01 85 . .
Plant No. Mo. Yr. Sampling Point Code

DAY 1 2	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification 14 19
	Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MLSS 34	MLVSS 39	SETTL. 44	SDI 49	DO 54	Air Applied 59	SS 64	VSS 49	Percent Return 74	8C	Waste Sludge 9	
	KCF	KCF	HRS.	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu. Ft.	%	%	%	C	KGal	See Code*
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF															C		
01	48		2.8								173				C	15	
02			2.7	3.4	.46	1566	1126	27.0	.58	4.4	178	.43	71		C	15	
03			2.7	3.7	.37	1661	1197	30.0	.55	3.0	178	.44	71		C	15	
04			2.9	3.7	.37	1553	1136	30.0	.52	2.2	168	.44	72		C	15	
05			3.0								171				C	15	
06			3.0								168				C	15	
07			3.0	4.0	.40	1524	1091	27.0	.56	5.8	170	.46	71		C	19	
08			3.0	4.2	.41	1479	1052	25.0	.59	6.5	174	.44	70		C	28	
09			3.0	4.5	.42	1481	1046	24.0	.62	6.5	178	.44	71		C	36	
10			3.1	4.7	.44	1461	1039	24.0	.61	6.4	179	.43	70		C	48	
11			3.2	5.1	.46	1535	1087	24.0	.64	5.9	178	.43	70		C	15	
12			3.3								177				C	15	
13			3.2								171				C	15	
14			3.2	4.2	.45	1255	951	20.0	.63	5.8	175	.40	70		C	27	
15			3.3	5.2	.38	1376	971	20.0	.69	5.6	179	.39	70		C	15	
16			3.3	5.1	.33	1346	954	19.0	.71	5.5	175	.36	71		C	15	
17			3.3	5.1	.36	1334	941	18.0	.74	5.7	173	.35	70		C	15	
18			3.4	5.3	.29	1344	958	17.0	.79	5.3	171	.37	71		C	15	
19			3.5								167				C	15	
20			3.5								135				C	15	
21			3.4	4.5	.30	1264	906	16.0	.79	4.7	127	.36	71		C	15	
22			3.4	4.7	.32	1295	945	15.0	.86	4.6	126	.35	72		C	15	
23			3.4								147				C	51	
24			3.4	5.2	.34	1580	999	19.0	.83	3.7	146	.42	72		C	15	
25			3.5	5.4	.29	1612	1147	21.0	.76	3.8	151	.43	71		C	61	
26			3.6								153				C	15	
27			3.6								150				C	15	
28			3.4	5.8	.31	1703	1194	21.0	.81	4.5	153	.48	68		C	15	
29			3.4	5.8	.31	1782	1244	20.0	.89	5.5	155	.52	69		C	15	
30			3.4	5.8	.36	1927	1342	24.0	.80	5.5	151	.48	69		C	15	
31			3.4	5.2	.32	1733	1302	22.0	.79	4.7	154	.48	71		C	15	
TL															C	630	
ME			3.2	5.0	.36	1515	1077	22.0	.70	5.1	163	.42	71		C	20	

WASTE NOT 1/29/85

Digester Volume, ft³
Primary _____
Secondary _____

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

R 4619
4833-5382

Supernatant To _____
Process Pattern _____

MONTH January 1985

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE					DIGESTING SLUDGE						SUPERNATANT								DIGESTED SLUDGE				Gas Produced cu. ft X
	Gals. X 100	Total Solids %	Vol. Solids %	Vol. Solids Lbs/1000 c.f. Digester	pH	Temp. °F	pH	Total Solids %	Vol. Solids %	Vol. Acids Mg/l	Alkalinity Mg/l	Gals. X	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	P Mg/l	P Lbs.	5-Day BOD Mg/l	Gals. X	Total Solids %	Vol. Solids %	pH	
1	40	4.4	88		5.7																			
2	40	5.3	71		5.7																			
3	40	5.5	71		5.6																			
4	55	5.0	71		5.9																			
5	40	4.8	77		5.8																			
6	40	4.5	79		5.8																			
7	40	4.9	79		5.7																			
8	40	4.9	68		5.6																			
9	40	4.4	85		5.7																			
10	40	4.7	73		5.7																			
11	57	4.4	71		5.9																			
12	40	4.1	70		5.9																			
13	40	4.0	74		5.8																			
14	40	4.0	68		5.9																			
15	40	4.1	86		6.1																			
16	40	4.3	83		6.1																			
17	40	4.3	70		5.9																			
18	55	4.1	70		5.9																			
19	40	3.9	85		6.0																			
20	40	4.1	84		6.0																			
21	40	4.4	77		5.9																			
22	40	4.3	87		5.9																			
23	40	4.4	70		5.9																			
24	40	4.1	72		5.9																			
25	47	4.4	76		5.8																			
26	40	4.5	74		5.8																			
27	40	4.0	74		5.8																			
28	40	4.8	72		5.8																			
29	40	4.0	76		5.7																			
30	40	4.3	79		5.7																			
31	40	5.2	73		5.9																			
TOTAL	1294																							
ARITH. MEAN	42	4.5	73																					

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

January, 19 85 — Month

Marshall, Michigan — Municipality

Robert J. Swalwell — Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
ID	130629	01	85	
	Plant No.	Mo.	Yr.	Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX. FUEL 14 Gas CF	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS.	39 $FeCl_3$ LBS.	44 Water CF	49	54	59
PN											
SF		2									
01		43	2760				298	470			
02		52	3120				298	400			
03		52	3000				397	550			
04		42	2880				298	620			
05		34	2880				298	420			
06		40	2760				199	630			
07		39	2880				298	640			
08		52	3000				298	770			
09		49	2880				298	670			
10		60	2880				298	730			
11		55	2880				298	680			
12		68	2880				199	700			
13		53	2880				298	740			
14		66	2880				298	670			
15		64	2880				298	690			
16		51	2880				199	530			
17		63	2760				298	590			
18		55	2640				298	710			
19		82	2760				199	580			
20		108	2640				298	650			
21		70	2640				199	590			
22		52	2640				298	670			
23		49	2760				199	710			
24		43	2640				496	690			
25		56	2760				397	660			
26		51	2640				496	580			
27		55	2640				397	640			
28		47	2640				298	990			
29		55	2760				397	710			
30		51	2640				298	630			
31		65	2760				298	660			
TL		1722	86640				9386	19970			
ME		56	2794				302	644			

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours	V
TOTAL	5		884	
Superintendent	1		176	
Asst. Supt.	1		176	
Shift Foreman				
Shift Operator	3		532	
Maint. Supervisor				
Mechanic				
Chemist				
Lab Technician				
Clerk-Typist				
Other				

GIVE THE HOURS PER DAY PLANT PERSONNEL AR

WEEKDAYS 9 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

_____ Month , 19 _____ _____ Municipality , Michigan _____ Superintendent's Signature

ID Plant No. (3–8) Mo. (9 10) Yr. (11 12) Sampling Point Code (13 15)

DAY	BOD-5			SS			TOTAL-P			VSS	NH_3-N	pH	DO	F. COLI*		T. COLI*	REMARK
	9 14 19			24 29 34			39 44 49			54	59	64	69	74	80	9	14
1 2	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	mg/l	SU	mg/l	#/100 ml	C	#/100 ml	
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 31615	C	31504 31505	
SF															C		
01	5	127	91	9	229	86	.19	5	88	8		7.3			C		
02	15	399	78	24	639	56	.84	22	56	20		7.3	5.0		C		
03												7.2	4.0		C		
04												7.4	3.7		C		
05												7.1			C		
06	23	549	75	12	286	83	.46	11	85	10		7.1			C		
07	29	699	68	30	723	55	1.02	25	68	10		7.3	5.3		C		
08	24	568	70	12	284	81	.47	11	75	5		7.3	6.1		C		
09	20	474	72	3	71	93	.18	4	89	2		7.1	6.5		C		
10	14	325	82	4	93	94	.19	4	90	2		7.3	6.1		C		
11												7.4	6.0		C		
12												7.4			C		
13	3	68	95	1	23	99	.22	5	90	1		7.4			C		
14	5	113	92	4	90	95	.27	6	87	2		7.3			C		
15	5	110	89	3	66	96	.27	6	86	1		7.4	7.0		C		
16	9	197	83	7	153	88	.27	6	87	2		7.6	7.7		C		
17	9	189	83	8	168	87	.34	7	83	4		7.3	6.7		C		
18												7.3	6.9		C		
19												7.3			C		
20	10	213	84	12	255	81				6		7.3			C		
21	11	209	79	13	247	79	.46	9	79	11		7.1	7.5		C		
22	12	256	79	8	171	79	.41	9	77	5		7.3	6.9		C		
23	11	230	85	4	84	92	.37	8	79	2		7.5	[illegible]		C		
24	9	182	89	4	81	93	.20	4	96	2		7.1	6.4		C		
25												7.2	5.6		C		
26												7.2			C		
27	6	127	90	2	42	98	.18	4	91	1		7.2			C		
28	8	167	86	2	42	95	.19	4	92	1		7.1	4.6		C		
29	7	149	88	4	85	92	.20	4	88	2		7.3	6.5		C		
30	24	506	84	10	211	89				6		7.2	5.5		C		
31	8	167	89	11	230	89	.23	5	92	7		7.1	4.2		C		
TL		6024			4273			159							C		
ME	12	274	83	9	194	86	.35	8	84	5		7.3	5.4		C		
WA	22	523		20	483										C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

February, 19 ____ (Month) ____ (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2	3 8	9 10	11 12	13 15
ID	130029	02	85	5.00
	Plant No.	Mo.	Yr.	Sampling Point Code

DAY 1 2	WEATHER TYPE 9	WEATHER PRECIP. 14	FLOW TOTAL 19	FLOW MAX RATE 24	RAW SEWAGE QUALITY TEMP 29	pH 34	BOD-5 39	BOD-5 44	SS 49	SS 54	TOTAL-P 59	TOTAL-P 64	VSS 69	NH_3-N 74 78	80	REMARKS OR C 9	14	19
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l	C			
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C			
SF															C			
01	3		2.45		50	7.4									C			
02	1		2.39		50	7.5									C			
03	1		2.48		50	7.4	72	1489	90	1861	2.85	59	66		C			
04	5	.06	2.58		50	7.4	124	2668	68	1463	2.85	61	52		C			
05	5	.02	2.52		50	7.3	72	1513	64	1345	2.20	46	46		C			
06	3		2.53		49	7.4	62	1308	48	1013	2.55	54	40		C			
07	5	.01	2.49		49	7.4	62	1288	24	498	2.05	43	22		C			
08	1		2.44		49	7.2									C			
09	1		2.35		49	7.3									C			
10	5	.34	2.45		49	7.3	100	2043	82	1676	2.45	50	68		C			
11	4+5	.71	2.57		49	7.6	74	1586	70	1500	2.30	49	52		C			
12	5	.21	2.47		49	7.5	62	1277	68	1401	2.05	42	50		C			
13	5	.05	2.44		49	7.5	60	1221	62	1262	2.30	47	46		C			
14	5	.08	2.48		49	7.5	70	1448	46	951	1.80	37	34		C			
15	3		2.43		49	7.6									C			
16	3		2.33		49	7.3									C			
17	3		2.33		49	7.3									C			
18	1		2.52		49	7.3	106	2228	60	1261	1.95	41	36		C			
19	1		2.42		49	7.5	100	2018	62	1251	2.10	42	36		C			
20	3		2.42		49	7.5	100	2018	64	1292	3.20	48	37		C			
21	4	.31	2.57		49	7.5	140	3001	80	1714	3.00	65	68		C			
22	4	.73	2.80		49	7.4									C			
23	4	1.21	3.42		50	7.4									C			
24	4	.04	3.59		50	7.4	117	3503	136	4072	2.45	73	102		C			
25	1		3.49		49	7.3	66	1921	46	1339	1.65	48	38		C			
26	4+5	.10	3.40		49	7.5	61	1730	92	2609	1.70	48	76		C			
27	3		3.36		49	7.5	86	2410	80	2242	2.75	77	52		C			
28	1		3.28		49	7.4	82	2243	54	1477	1.80	49	36		C			
29															C			
30															C			
31															C			
TL		3.87	7500					36,913		36,227		979			C			
ME			2.68				85	1942	68	1591	2.32	51	50		C			

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

February, 19 85 — Month

Marshall, Michigan — Municipality

Robert J. Swalwell — Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
ID	130029	02	85	
	Plant No.	Mo.	Yr.	Sampling Point Code

DAY 1 2	BOD-5 9 mg/l	BOD-5 14 LBS.	SS 19 mg/l	SS 24 LBS.	TOTAL-P 29 mg/l	TOTAL-P 34 LBS.	VSS 39 mg/l	NH_3-N 44 mg/l	REMARKS OR OTHER PARAMETERS 49	54	59	64	69	74 78	80	9	14	19
															C			
PN	00310	85001	00530	85002	00665	85004	00535	00610							C			
SF															C			
01															C			
02															C			
03	50	1034	58	1200	1.90	39	36								C			
04	106	2281	52	1119	2.30	49	36								C			
05	52	1093	52	1093	2.20	46	48								C			
06	50	1055	52	1097	2.05	43	32								C			
07	46	955	20	415	1.95	40	8								C			
08															C			
09															C			
10	56	1144	60	1226	1.95	40	48								C			
11	52	1115	56	1200	1.65	35	36								C			
12	52	1071	54	1112	1.70	35	44								C			
13	50	1017	38	773	2.05	42	30								C			
14	50	1034	40	827	1.65	34	32								C			
15															C			
16															C			
17															C			
18	94	1976	54	1135	1.65	35	30								C			
19	92	1857	40	807	2.05	41	26								C			
20	82	1655	48	969	2.55	51	32								C			
21	106	2272	64	1372	2.45	53	56								C			
22															C			
23															C			
24	90	2695	64	1916	1.65	49	55								C			
25	60	1746	50	1455	1.70	50	40								C			
26	57	1616	50	1418	1.80	51	38								C			
27	66	1849	66	1849	2.30	64	44								C			
28	66	1805	50	1368	1.90	52	34								C			
29															C			
30															C			
31															C			
TL		29,270		22,351		849									C			
ME	67	1541	51	1176	1.97	45	37								C			

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

February , 19 85
Month

Marshall , Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
IP | 136029 | 02 | 85 | ..
Plant No | Mo. | Yr. | Sampling Point Code

DAY 1 2	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification 14 1
	Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MLSS 34	MLVSS 39	SETTL. 44	SDI 49	DO 54	Air Applied 59	SS 64	VSS 49	Percent Return 74	80	Waste Sludge 9	
	KCF	KCF	HRS.	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu. Ft.	%	%	%	C	KGal	See Code*
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF											4				C		
01			3.5	5.4	.30	1462	1365	22.0	.86	4.2	156	.50	70		C	89	
02			3.6								156				C	15	
03			3.5								157				C	15	
04			3.3								153				C	15	
05			3.4	5.7	.31	2083	1491	23.0	91	2.6	152	.53	71		C	15	
06			3.4	5.7	.29	2266	1552	23.0	.96	2.3	154	.55	71		C	54	
07			3.5	6.4	.27	2219	1655	23.0	.96	2.5	157	.58	71		C	15	
08			3.5	6.6	.28	2246	1594	20.0	1.12	3.2	157	.58	70		C	15	
09			3.7								140				C	15	
10			3.5								138				C	15	
11			3.4	5.6	.35	2017	1262	17.0	1.19	3.4	130	.57	82		C	15	
12			3.5	5.7	.29	1931	1464	17.0	1.14	3.4	122	.54	72		C	15	
13			3.5	5.8	.26	1873	1354	16.6	1.17	2.6	131	.49	72		C	15	
14			3.5	5.7	.27	1808	1319	16.0	1.13	3.8	128	.47	72		C	57	
15			3.5	6.0	.27	1867	1295	14.0	1.33	3.4	139	.47	72		C	15	
16			3.7								136				C	15	
17			3.7								138				C	15	
18			3.4								137				C	15	
19			3.6	5.5	.32	1840	1347	14.0	1.31	3.5	141	.49	72		C	33	
20			3.6	5.7	.34	1817	1328	14.0	1.30	3.9	136	.45	73		C	37	
21			3.4	5.3	.41	1809	1323	14.0	1.29	2.3	130	.49	73		C	15	
22			3.1	5.6	.37	2088	1566	13.0	1.61	2.4	130	.53	74		C	15	
23			2.5								126				C	36	
24			2.4								132				C	40	
25			2.5	3.9	.56	1900	1426	13.0	1.46	2.6	133	.64	74		C	15	
26			2.5	4.3	.51	2062	1554	13.0	1.59	2.7	131	.65	75		C	15	
27			2.6	4.3	.46	2152	1608	16.0	1.35	1.0	137	.58	75		C	15	
28			2.6	4.6	.40	2295	1712	16.0	1.43	2.1	130	.60	74		C	15	
29															C		
30															C		
31															C		
TL															C	661	
ME			3.3	5.5	.35	2007	1430	16.9	1.23	2.9	140	54	73		C	24	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

February (Month), 19 85

Marshall (Municipality), Michigan

Robert J Swalwell
Superintendent's Signature

1 2 | 3 8 | 9 10 | 11 12 | 13 15
ID | 13.0639 | 02 | 85 | .
Plant No. | Mo. | Yr. | Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX.FUEL 14 Gas CF	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS.	39 Fe Cl 3 LBS.	44 Water CF	49	54	59
PN											
SF		2									
01		63	2760				397	720			
02		87	2760				298	1CC			
03		77	2880				298	1.6C			
04		65	2760				298	580			
05		68	2760				199	730			
06		66	2760				298	580			
07		76	2760				199	590			
08		78	2880				298	680			
09		55	2640				199	570			
10		51	2760				298	670			
11		38	2640				199	660			
12		47	2640				298	570			
13		51	3000				199	660			
14		78	2280				199	840			
15		82	2640				199	720			
16		55	2520				298	800			
17		52	2640				199	790			
18		47	2640				298	830			
19		57	2640				199	750			
20		62	2640				298	750			
21		20	2520				298	820			
22		29	2640				199	950			
23		25	2520				298	820			
24		34	2760				298	800			
25		23	2640				397	630			
26		36	2640				199	770			
27		64	2760				298	1040			
28		42	2640				298	820			
29											
30											
31											
TL		1,528	75,120				7,453	26100			
ME		55	2683				266	718			

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	5		764
Superintendent	1		152
Asst. Supt.	1		152
Shift Foreman			
Shift Operator	3		460
Maint. Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL AR

WEEKDAYS 9 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

Digester Volume, ft³
Primary
Secondary

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

R 4619
4833-5382

Supernatant To
Process Pattern

MONTH February 1985

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE					DIGESTING SLUDGE						SUPERNATANT								DIGESTED SLUDGE				Gas Produced cu. ft X
	Gals. X 10³	Total Solids %	Vol. Solids %	Vol. Solids Lbs/1000 c.f. Digester	pH	Temp. °F	pH	Total Solids %	Vol. Solids %	Vol. Acids Mg/l	Alkalinity Mg/l	Gals. X	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	P Mg/l	P Lbs.	5-Day BOD Mg/l	Gals. X	Total Solids %	Vol. Solids %	pH	
1	50	4.3	82		6.1																			
2	40	3.9	65		6.0																			
3	40	4.5	68		6.0																			
4	40	4.2	73		5.6								10.2	.62	68									
5	40	4.6	69		5.9																			
6	40	4.5	80		5.9																			
7	40	4.9	72		5.8																			
8	52	4.5	71		6.0																			
9	46	3.9	76		5.9																			
10	40	4.6	79		5.9																			
11	40	4.3	78		6.1																			
12	40	4.3	77		6.2																			
13	10	4.2	70		6.0																			
14	70	4.2	70		6.0																			
15	47	3.8	80		6.0																			
16	40	4.2	65		5.8																			
17	40	3.9	82		5.7																			
18	40	3.8	76		5.7																			
19	40	4.0	71		6.1																			
20	40	4.3	86		6.0																			
21	40	4.4	77		6.1																			
22	54	4.0	79		6.4																			
23	40	4.6	68		6.5																			
24	40	4.8	70		6.4																			
25	40	5.8	68		6.6																			
26	40	5.6	69		6.6																			
27	40	4.0	83		6.5																			
28	60	4.5	65		6.3																			
29																								
30																								
31																								
TOTAL	1183																							
ARITH. MEAN	42	4.3	74																					

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

_____ , 19 _____
Month

_____ , Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID
Plant No. Mo. Yr. Sampling Point Code

DAY	BOD-5			SS			TOTAL-P			VSS	NH_3-N	pH	DO	F. COLI*		T. COLI*	REMARK
	9	14	19	24	29	34	39	44	49	54	59	64	69	74	80	9	14
1 2	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	mg/l	SU	mg/l	#/100 ml	C	#/100 ml	
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 31615	C	31504 31505	
SF															C		
01												7.1	4.3		C		
02												7.1			C		
03	8	165	80	12	248	87	.27	6	91	2		7.2			C		
04	21	452	83	12	258	82	.34	7	88	9		7.3			C		
05	8	168	89	9	189	86	.25	5	89	7		7.3	4.1		C		
06	9	190	85	5	106	90	.25	5	90	3		7.3	4.4		C		
07	8	166	87	2	42	92	.34	7	83	1		7.1	5.2		C		
08												7.4	6.6		C		
09												7.4			C		
10	13	267	87	9	184	89	.27	6	89	7		7.3			C		
11	10	214	86	15	322	79	.38	8	83	7		7.3	5.4		C		
12	11	227	82	9	185	87	.23	5	89	7		7.3	5.0		C		
13	10	203	83	6	122	90	.32	7	86	1		7.4	4.8		C		
14	9	168	87	6	124	87	.38	9	79	4		7.4	5.2		C		
15												7.5	6.0		C		
16												7.3			C		
17												7.1			C		
18	23	483	78	3	63	95	.22	5	89	2		7.1			C		
19	21	424	79	4	81	94	.28	6	87	3		7.4	5.4		C		
20	20	404	80	5	101	92	.30	6	91	2		7.5	5.8		C		
21	19	407	86	7	150	91	.44	9	85	6		7.5	4.4		C		
22												7.4	3.7		C		
23												7.4			C		
24	17	509	85	11	329	92	.20	6	92	7		7.4			C		
25	14	407	79	7	204	85	.30	9	82	6		7.3	4.9		C		
26	12	340	80	4	113	96	.18	5	89	2		7.5	4.6		C		
27	14	392	84	12	336	85	.36	10	87	6		7.5	3.6		C		
28	12	328	85	10	279	81	.34	9	81	6		7.3	3.8		C		
29															C		
30															C		
31															C		
TL		5414			3451			130							C		
ME	14	311	84	8	182	88	.30	7	87	5		7.3	4.8		C		
WA	20	445		9	251										C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

March, 1985
Month

Marshall, Michigan
Municipality

Robert J. Swanson
Superintendent's Signature

1 2 | 3 8 | 9 10 | 11 12 | 13 15
ID | 1,3,0,2,9 | 03 | 85 | 5.0C
Plant No. | Mo. | Yr. | Sampling Point Code

DAY 1 2	WEATHER TYPE 9	WEATHER PRECIP. 14	FLOW TOTAL 19	FLOW MAX 24 RATE	RAW SEWAGE QUALITY TEMP 29	pH 34	BOD-5 39 44		SS 49 54		TOTAL-P 59 64		VSS 69	NH_3-N 74 78	80	REMARKS OR C 9	14	1
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l	C			
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C			
SF															C			
01	4	.01	3.17		49	7.5									C			
02	3		3.07		49	7.5									C			
03	4+5	1.27	3.10		48	7.4	82	2112	56	1448	1.9C	49	40		C			
04	4+5	.27	3.45		48	7.4	88	2532	128	3683	2.30	66	102		C			
05	5	.01	3.37		49	7.5	100	2786	80	2228	3.3C	92	58		C			
06	C1		3.31		48	7.5	74	2043	46	1276	1.90	52	32		C			
07	5	.07	3.30		49	7.4	85	2339	50	1367	2.1C	58	44		C			
08	1		3.37		49	7.4									C			
09	1		3.37		49	7.5									C			
10	4	.15	3.38		49	7.6	89	2508	180	5074	3.4C	96	136		C			
11	4	.03	3.55		48	7.5	84	2487	64	1895	2.1C	62	44		C			
12	1		3.48		48	7.4	112	3251	104	3018	3.1C	90	72		C			
13	4	.03	3.39		48	7.4	92	2601	82	2318	1.6C	45	64		C			
14	1		3.45		48	7.5	80	2301	52	1496	1.7C	49	32		C			
15	1		3.36		48	7.3									C			
16	4	.01	3.28		48	7.3									C			
17	1		3.21		48	7.3	72	1928	44	1178	1.65	44	36		C			
18	4	.01	3.28		49	7.5	76	2079	66	1805	1.8C	49	52		C			
19	4	.02	3.30		49	7.5	72	1982	66	1816	1.65	45	48		C			
20	1		3.28		49	7.5	80	2188	60	1641	2.05	56	46		C			
21	1		3.23		49	7.6	62	1670	26	700	1.65	44	16		C			
22	4	.10	3.18		49	7.6									C			
23	4	.11	3.06		49	7.5									C			
24	3		3.04		48	7.3	70	1775	38	963	1.95	44	28		C			
25	1		3.26		49	7.4	74	2012	74	2012	1.95	53	52		C			
26	1		3.18		49	7.5	72	1910	46	1220	1.6C	42	32		C			
27	4	.69	3.23		49	7.4	82	2209	60	1616	1.8C	48	46		C			
28	4	.89	3.88		49	7.5	8C	2584	94	3042	1.8C	58	68		C			
29	4	.16	3.38		49	7.1									C			
30	4	.25	3.29		49	7.4									C			
31	4	.18	3.35		49	7.4	72	2036	42	1187	1.6C	45	26		C			
TL		4.2C	10259					42,338		40,977		1192			C			
ME			3.31				81	2254	69	1951	2.04	57	51		C			

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

March, 19 85 — Month

Marshall, Michigan — Municipality

Robert J. Swalwell — Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
ID	130079	03	85	
	Plant No.	Mo.	Yr.	Sampling Point Code

DAY	BOD-5		SS		TOTAL-P		VSS	NH_3-N	REMARKS OR OTHER PARAMETERS									
	9	14	19	24	29	34	39	44	49	54	59	64	69	74 78	80	9	14	19
1 2	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l							C			
PN	00310	85001	00530	85002	00665	85004	00535	00610							C			
SF															C			
01															C			
02															C			
03	66	1706	56	1448	1.95	50	42								C			
04	68	1957	48	1381	1.80	52	42								C			
05	70	1950	48	1337	2.05	57	38								C			
06	60	1656	48	1325	1.40	39	32								C			
07	74	2037	38	1046	1.65	45	32								C			
08															C			
09															C			
10	63	1776	46	1297	2.05	58	28								C			
11	66	1954	58	1717	1.95	58	48								C			
12	66	1915	54	1567	1.90	55	36								C			
13	98	2771	54	1527	1.60	45	40								C			
14	66	1899	50	1439	1.65	47	38								C			
15															C			
16															C			
17	62	1660	38	1017	1.60	43	30								C			
18	62	1696	54	1477	1.65	45	40								C			
19	62	1706	40	1101	1.60	44	24								C			
20	56	1532	32	875	1.50	41	24								C			
21	46	1239	26	700	1.70	46	20								C			
22															C			
23															C			
24	52	1318	50	1268	1.95	49	42								C			
25	48	1305	42	1142	1.80	49	34								C			
26	50	1326	40	1061	1.65	44	28								C			
27	64	1724	38	1024	2.30	62	24								C			
28	64	2071	68	2200	1.65	53	40								C			
29															C			
30															C			
31	46	1301	44	1244	1.50	42	32								C			
TL		36,449		27,202		1,042									C			
ME	62	1738	46	1295	1.76	50	34								C			

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

March, 19 85
Month

Marshall, Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID | 1,3,0,6,9,9 | 03 | 85 | ...
Plant No. Mo. Yr. Sampling Point Code

DAY 1 2	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification 14	
	Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MLSS 34	MLVSS 39	SETTL. 44	SDI 49	DO 54	Air Applied 59	SS 64	VSS 49	Percent Return 74	8C	Waste Sludge 9		19
	KCF	KCF	HRS.	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu. Ft.	%	%	%	C	KGal	See Code*	
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889	
SF											4				C			
01	48		2.7	5.0	.35	2450	1833	16.0	1.53	2.9	130	.62	74		C	15		
02			2.8								133				C	15		
03			2.8								126				C	15		
04			2.5	4.7	.35	2523	1895	19.0	1.32	1.9	142	.68	74		C	15		
05			2.6	5.2	.32	2610	1931	18.0	1.45	2.8	153	.68	73		C	15		
06			2.6	5.3	.32	2541	1875	18.0	1.41	2.7	153	.70	73		C	15		
07			2.6	5.3	.36	2465	1730	18.0	1.37	4.3	146	.73	72		C	15		
08			2.6								143				C	42		
09			2.6								144				C	15		
10			2.5								139				C	15		
11			2.4	5.3	.35	2551	1844	16.0	1.59	3.7	134	.74	72		C	15		
12			2.5	5.0	.36	2396	1788	17.0	1.41	2.5	160	.76	74		C	15		
13			2.5	3.9	.50	1812	1352	13.0	1.40	3.9	167	.66	74		C	29		
14			2.5	3.4	.54	1622	1246	12.0	1.35	4.0	167	.56	75		C	15		
15			2.6	3.7	.50	1735	1309	13.0	1.33	4.0	160	.60	75		C	15		
16			2.6								159				C	15		
17			2.7								161				C	13		
18			2.6	3.9	.47	1828	1342	13.0	1.41	3.8	161	.60	73		C	15		
19			2.6	4.3	.43	1985	1476	14.0	1.42	3.0	156	.59	74		C	15		
20			2.6	4.8	.40	2022	1493	15.0	1.34	2.7	161	.64	71		C	15		
21			2.6	4.9	.42	1867	1386	15.0	1.24	3.4	159	.54	74		C	16		
22			2.7	4.5	.48	1676	1212	14.0	1.20	3.6	156	.53	70		C	15		
23			2.8								157				C	15		
24			2.8								159				C	15		
25			2.6	4.1	.46	1483	1078	13.0	1.14	3.8	161	.48	71		C	15		
26			2.7	4.4	.41	1603	1156	12.0	1.34	3.8	152	.45	72		C	15		
27			2.7	4.8	.41	1651	1195	13.0	1.27	4.1	149	.49	72		C	15		
28			2.2	3.8	.47	1734	1235	13.0	1.33	2.5	152	.51	70		C	15		
29			2.5	4.3	.53	1765	945	14.0	1.22	2.7	154	.55	79		C	15		
30			2.6								159				C	15		
31			2.5								155				C	47		
TL															C	539		
ME			2.6	4.5	.42	2013	1469	14.8	1.35	3.3	152	.61	73		C	17		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

March, 19 85
Month

Marshall, Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
ID	130029	03	85	
	Plant No.	Mo.	Yr.	Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX. FUEL 14	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS.	39 $FeCl_3$ LBS	44 Water CF	49	54	59
PN											
SF		2									
01		38	2520				199	1020			
02		40	2640				199	800			
03		51	2640				298	910			
04		41	2760				298	930			
05		62	2760				298	880			
06		49	2760				199	880			
07		31	2640				397	890			
08		6	2640				397	900			
09		1	2520				298	720			
10		2	2400				298	840			
11		2	2520				298	980			
12		25	2760				298	720			
13		50	2880				298	1360			
14		45	3120				298	1130			
15		57	2640				298	830			
16		53	2640				199	780			
17		70	2760				298	710			
18		53	2640				298	660			
19		43	2760				199	770			
20		54	2640				99	730			
21		60	2640				199	730			
22		45	2760				298	730			
23		49	2520				397	650			
24		43	2640				199	670			
25		46	2760				397	560			
26		2	2400				298	560			
27		2	2400				298	670			
28		2	2520				298	830			
29		5	2520				298	570			
30		2	2640					550			
31			2520					760			
TL		1029	81960				8144	24660			
ME		34	2644				281	795			

MANPOWER				
POSITION TITLE	No. Full Time	No. Part Time	Total Hours	V
TOTAL	5		840	
Superintendent	1		168	
Asst. Supt.	1		168	
Shift Foreman				
Shift Operator	3		504	
Maint. Supervisor				
Mechanic				
Chemist				
Lab Technician				
Clerk-Typist				
Other				

GIVE THE HOURS PER DAY PLANT PERSONNEL ARE

WEEKDAYS 9 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

Digester Volume, ft³
Primary
Secondary

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

R 4619
4833-5382

Supernatant To
Process Pattern

MONTH March 1985

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE					DIGESTING SLUDGE						SUPERNATANT								DIGESTED SLUDGE				Gas Produced cu. ft X
	Gals. X	Total Solids %	Vol. Solids %	Vol. Solids Lbs/1000 c.f. Digester	pH	Temp. °F	pH	Total Solids %	Vol. Solids %	Vol. Acids Mg/l	Alkalinity Mg/l	Gals. X	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	P Mg/l	P Lbs.	5-Day BOD Mg/l	Gals. X	Total Solids %	Vol. Solids %	pH	
1	75	4.4	71		6.0																			
2	60	4.5	78		5.9																			
3	60	4.4	68		5.9																			
4	60	4.8	65		5.9																			
5	60	4.9	72		5.9																			
6	60	4.8	65		6.1																			
7	60	4.5	70		6.1																			
8	73	4.2	74		6.1																			
9	60	4.7	67		5.8																			
10	66	4.6	61		5.6																			
11	60	4.9	63		6.0																			
12	60	4.4	60		6.2																			
13																								
14	100	4.1	81		6.4																			
15	412	4.2	79		6.1																			
16	364	3.5	74		6.2																			
17	50	4.0	58		6.2																			
18	50	4.3	70		6.0																			
19	50	4.5	72		6.2																			
20	50	4.7	77		6.0																			
21	50	3.9	71		6.1																			
22	50	6.0	78		5.9																			
23	50	4.0	80		6.0																			
24	50	3.8	81		6.1																			
25	50	4.8	63		6.0																			
26	50	4.0	65		6.0																			
27	50	4.1	80		5.9																			
28	50	4.8	78		5.9																			
29	50	4.2	65		5.7																			
30	50	3.7	65		5.8																			
31	50	4.6	73		5.8																			
TOTAL	2374																							
ARITH. MEAN	79	4.4	71																					

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

_____, 19 _____ Month

_____, Michigan Municipality

_____ Superintendent

ID 1 2 | 3 8 Plant No. | 9 10 Mo. | 11 12 Yr. | 13 15 Sampling Point Code

DAY 1 2	BOD-5 9 mg/l	BOD-5 14 LBS.	BOD-5 19 % Rem.	SS 24 mg/l	SS 29 LBS.	SS 34 % Rem.	TOTAL-P 39 mg/l	TOTAL-P 44 LBS.	TOTAL-P 49 % Rem.	VSS 54 mg/l	NH_3-N 59 mg/l	pH 64 SU	DO 69 mg/l	F. COLI* 74 #/100 ml
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 31615
SF														
01												7.5	4.0	
02												7.5		
03	15	388	81	18	465	68	.41	11	78	10		7.3		
04	16	460	82	16	460	88	.47	14	80	15		7.2	4.5	
05	12	334	88	9	251	89	.41	11	88	6		7.5	4.9	
06	11	304	85	9	248	80	.30	8	84	6		7.5	4.6	
07	14	385	84	8	220	84	.27	7	87	7		7.5	5.5	
08												7.4		
09												7.2		
10	8	223	91	6	169	97	.28	8	92	4		7.1		
11	15	444	82	16	474	75	.47	14	78	12		7.3	4.5	
12	14	406	88	12	348	88	.48	14	85	3		7.3	4.5	
13	23	650	75	5	141	94	.22	6	86	1		7.4	4.1	
14	14	403	83	4	115	92	.19	5	89	1		7.4	5.7	
15												7.2	6.0	
16												7.2		
17	11	294	85	5	134	89	.27	7	84	1		7.2		
18	8	219	89	11	301	83	.27	7	85	5		7.4	5.7	
19	10	275	86	6	165	91	.34	9	79	4		7.4	4.8	
20	10	274	88	4	109	90	.70	19	66	3		7.5	4.5	
21	8	215	87	2	54	92	.47	13	72	1		7.5	5.4	
22												7.5	5.4	
23												7.5		
24	6	152	91	3	76	92	.23	6	88	2		7.5		
25	6	163	92	2	54	97	.25	7	87	1		7.4	6.8	
26	7	186	90	2	53	96	.23	6	86	1		7.3	5.7	
27	14	377	83	2	54	97	.25	7	86	1		7.3	5.3	
28	12	388	85	9	291	90	.22	7	88	6		7.5	5.3	
29												7.3	5.1	
30												7.3		
31	10	283	86	10	283	76	.53	15	67	7		7.3		
TL		6823			4465			201						
ME	12	325	86	8	213	88	.35	10	83	5		7.4	5.1	
WA	15	439		12	329									

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

April, 19 85
Month

Marshall, Michigan
Municipality

Robert J. Sweetwell
Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
ID	130029	04	85	500
	Plant No.	Mo.	Yr.	Sampling Point Code

DAY 1 2	WEATHER TYPE 9	WEATHER PRECIP. 14	FLOW TOTAL 19	FLOW MAX RATE 24	RAW SEWAGE QUALITY TEMP 29	pH 34	BOD-5 39	BOD-5 44	SS 49	SS 54	TOTAL-P 59	TOTAL-P 64	VSS 69	NH_3-N 74 78	80	REMARKS OR O 9	14	19
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l	C			
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C			
SF															C			
01	5	.01	3.49		49	7.3	76	2212	46	1339	1.90	55	36		C			
02	4	.20	3.50		49	7.3	78	2277	42	1226	1.70	50	32		C			
03	4	.01	3.45		49	7.3	64	1841	28	806	1.30	37	20		C			
04	4	.28	3.46		49	7.2									C			
05	4	1.94	4.24		49	7.3									C			
06	4	.02	4.34		49	7.2									C			
07	5	.02	4.20		49	7.2	72	2522	72	2522	1.70	60	58		C			
08	4&5	.06	4.28		49	7.3	68	2427	34	1214	1.50	54	18		C			
09	5	.02	4.12		49	7.3	48	1649	38	1306	1.40	48	16		C			
10	4	.02	3.97		49	7.4	62	2053	44	1457	1.40	46	26		C			
11	1		3.95		49	7.4	62	2042	36	1186	1.30	43	28		C			
12	1		3.77		49	7.6									C			
13	1		3.74		49	7.2									C			
14	4	.48	3.78		49	7.2	58	1828	48	1513	1.90	60	36		C			
15	1		3.86		49	7.3	54	1738	50	1610	1.60	51	42		C			
16	4	.01	3.73		49	7.4	50	1555	42	1307	1.65	51	24		C			
17	1		3.73		49	7.5	50	1555	46	1431	2.85	89	18		C			
18	1		3.67		49	7.4	52	1592	42	1286	1.60	49	34		C			
19	1		3.56		49	7.4									C			
20	1		3.47		49	7.4									C			
21	1		3.55		50	7.4	54	1599	66	1954	1.80	53	62		C			
22	1		3.61		50	7.6	88	2649	76	2288	2.10	63	64		C			
23	1		3.50		50	7.3	60	1751	50	1460	1.40	41	36		C			
24	4	.43	3.48		50	7.4	52	1509	52	1509	1.65	48	40		C			
25	1		3.46		50	7.4	46	1327	46	1327	1.60	46	36		C			
26	1		3.42		50	7.3									C			
27	1		3.20		51	7.3									C			
28	1		3.32		51	7.4	54	1495	68	1832	1.90	51	62		C			
29	1		3.47		51	7.4	56	1621	48	1389	1.80	52	40		C			
30	1		3.42		51	8.2	52	1483	54	1540	1.70	48	42		C			
31															C			
TL		3.50	110.74					38,725		31,520		1095			C			
ME			3.69				60	1844	49	1501	1.70	52	37		C			

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

April, 19 85 — Month

Marshall, Michigan — Municipality

Robert J. Sunderwell — Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
ID	130029	04	85	
	Plant No.	Mo.	Yr.	Sampling Point Code

DAY	BOD-5		SS		TOTAL-P		VSS	NH_3-N	REMARKS OR OTHER PARAMETERS									
	9	14	19	24	29	34	39	44	49	54	59	64	69	74	78	80	9	14
1 2	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l								C		
PN	00310	85001	00530	85002	00665	85004	00535	00610								C		
SF																C		
01	60	1746	38	1106	1.60	47	22									C		
02	56	1635	62	1810	1.70	50	34									C		
03	46	1324	14	403	1.10	32	12									C		
04																C		
05																C		
06																C		
07	42	1471	44	1541	1.35	47	34									C		
08	50	1785	26	928	1.35	48	12									C		
09	34	1168	30	1031	1.30	45	14									C		
10	48	1589	40	1324	1.35	45	26									C		
11	50	1647	30	988	1.30	43	20									C		
12																C		
13																C		
14	42	1324	34	1072	1.35	43	26									C		
15	46	1481	44	1416	1.40	45	36									C		
16	40	1244	44	1369	1.40	44	22									C		
17	44	1369	42	1307	2.65	82	22									C		
18	52	1592	58	1775	1.95	60	46									C		
19																C		
20																C		
21	36	1066	48	1421	1.50	44	38									C		
22	62	1867	54	1626	1.80	54	50									C		
23	44	1284	32	934	1.40	41	24									C		
24	38	1103	48	1393	1.65	48	38									C		
25	38	1097	20	577	1.35	39	20									C		
26																C		
27																C		
28	40	1108	26	700	1.65	44	20									C		
29	34	984	36	1042	1.50	43	26									C		
30	38	1084	36	1027	1.60	46	20									C		
31																C		
TL		28,968		24,790		990										C		
ME	45	1379	38	1180	1.54	47	27									C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

April, 19 85
Month

Marshall, Michigan
Municipality

Robert J. Swahill
Superintendent's Signature

1 2 ID | 3 8 1,3,0,0,2,9 Plant No. | 9 10 04 Mo. | 11 12 85 Yr. | 13 15 Sampling Point Code

DAY 1 2	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification 14
	Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MLSS 34	MLVSS 39	SETTL. 44	SDI 49	DO 54	Air Applied 59	SS 64	VSS 49	Percent Return 74	8C	Waste Sludge 9	
	KCF	KCF	HRS.	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu. Ft.	%	%	%	C	KGal	See Code*
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF											4				C		
01	48		2.5	3.7	.55	1695	1224	14.0	1.21	4.3	162	.54	71		C	15	
02			2.5	3.5	.45	1630	1175	14.0	1.16	4.4	157	.55	71		C	15	
03			2.5	3.8	.44	1635	1185	15.0	1.09	3.2	155	.57	72		C	15	
04			2.5	4.3	.40	1801	1308	16.0	1.13	3.6	153	.60	72		C	15	
05			2.0								155				C	15	
06			2.0								161				C	15	
07			2.0								159				C	15	
08			2.0	3.4	.54	1685	1152	14.0	1.20	5.4	167	.63	67		C	15	
09			2.1	3.7	.51	1581	1086	13.0	1.22	5.6	167	.56	68		C	15	
10			2.2	4.6	.48	1601	1100	12.0	1.33	5.4	154	.54	70		C	15	
11			2.2	4.4	.44	1682	1171	14.0	1.20	4.3	159	.58	69		C	15	
12			2.3	3.9	.41	1426	1200	14.0	1.02	3.9	153	.60	69		C	15	
13			2.3								151				C	15	
14			2.3								152				C	15	
15			2.2	4.7	.39	1777	1234	13.0	1.37	5.6	150	.60	69		C	15	
16			2.3	4.6	.40	1674	1155	13.0	1.29	5.4	156	.58	68		C	16	
17			2.3	4.7	.35	1861	1286	14.0	1.33	6.8	154	.57	68		C	15	
18			2.3	4.3	.36	1861	1294	14.0	1.33	6.8	148	.63	68		C	15	
19			2.4	4.5	.35	1883	1301	14.0	1.35	6.4	149	.42	68		C	15	
20			2.5								150				C	15	
21			2.4								149				C	43	
22			2.4	3.4	.38	1765	1214	13.0	1.36	5.8	149	.62	67		C	15	
23			2.5	3.5	.36	1779	1247	14.0	1.27	4.0	149	.62	69		C	15	
24			2.5	3.7	.33	1900	1334	16.0	1.14	6.4	154	.62	69		C	15	
25			2.5	4.0	.33	1889	1316	15.0	1.26	7.0	154	.60	68		C	15	
26			2.5	4.0	.33	1880	1296	15.0	1.25	7.3	154	.57	69		C	15	
27			2.7								150				C	15	
28			2.6								156				C	15	
29			2.5	4.3	.33	1777	1232	15.0	1.18	6.9	157	.56	68		C	15	
30			2.5	4.6	.31	1865	1291	16.0	1.17	5.3	153	.55	72		C	15	
31															C		
TL															C	479	
ME			2.4	4.0	.40	1745	1229	14.2	1.23	5.4	150	.59	69		C	16	

Aerating Not Working

Digester Volume, ft³
Primary
Secondary

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

R 4619
4833-5382

Supernatant To
Process Pattern

MONTH April 1985

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE					DIGESTING SLUDGE						SUPERNATANT								DIGESTED SLUDGE				Gas Produced cu. ft X
	Gals. X 100	Total Solids %	Vol. Solids %	Vol. Solids Lbs/1000 c.f. Digester	pH	Temp. °F	pH	Total Solids %	Vol. Solids %	Vol. Acids Mg/l	Alkalinity Mg/l	Gals. X	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	P Mg/l	P Lbs.	5-Day BOD Mg/l	Gals. X	Total Solids %	Vol. Solids %	pH	
1	50	4.7	68		6.1																			
2	50	4.5	71		6.1																			
3	50	4.0	67		6.0																			
4	55	4.1	77		5.9																			
5	50	3.9	70		5.9																			
6	50	4.5	65		5.9																			
7	50	4.5	70		5.5																			
8	50	4.5	71		6.0																			
9	50	3.6	68		6.0																			
10	50	4.2	62		6.1																			
11	50	4.4	76		6.3																			
12	58	4.2	67		6.3																			
13	50	1.4	69		6.3																			
14	50	3.8	81		6.3																			
15	56	4.6	71		6.1																			
16	56	4.6	80		6.1																			
17	50	4.2	70		6.3																			
18	50	4.9	68		6.3																			
19	57	4.1	71		6.3																			
20	50	4.4	68		6.2																			
21	50	5.0	77		6.2																			
22	50	4.9	69		6.4																			
23	50	4.8	72		6.3																			
24	50	2.3	74		6.6																			
25	50	4.2	75		6.6																			
26	50	4.9	68		6.7																			
27	50	3.7	74		6.6																			
28	50	3.9	83		6.7																			
29	50	4.2	79		6.5																			
30	50	4.5	72		6.4																			
31																								
TOTAL	1520			-																				
ARITH. MEAN	51	4.2	72																					

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

April , 19 85
Month

Marshall , Michigan
Municipality

Robert J. Swindell
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID 1300129 04 85 ..
Plant No. Mo. Yr. Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX.FUEL 14 GAS CF	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS.	39 $FeCl_3$ LBS	44 WATER CF	49	54	59
PN											
SF		2									
01		70	2760				397	710			
02		40	2640				298	620			
03		50	2640				298	650			
04		35	2640				298	740			
05		46	2760				446	730			
06		53	2880				496	580			
07		54	2760				397	640			
08		73	3000				397	690			
09		70	3000				397	640			
10		16	2640				397	640			
11		1	2640				397	730			
12		1	2400				199	710			
13			2400				397	610			
14			2400				298	710			
15		7	2400				298	640			
16		2	2520				347	720			
17		1	2400				199	610			
18			2400				298	730			
19		1	2400				298	450			
20			2400				298	710			
21			2160				298	760			
22			2520				298	510			
23			2400				298	670			
24			2460				347	420			
25			2400				298	610			
26			2400				298	700			
27			2280				298	870			
28			2400				298	730			
29			2520				397	520			
30			2520				298	770			
31											
TL		520	76080				10128	20070			
ME		33	2536				338	669			

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours	V
TOTAL	5		844	
Superintendent	1		168	
Asst. Supt.	1		168	
Shift Foreman				
Shift Operator	3		508	
Maint. Supervisor				
Mechanic				
Chemist				
Lab Technician				
Clerk-Typist				
Other				

GIVE THE HOURS PER DAY PLANT PERSONNEL AR

WEEKDAYS 9 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

_____ Month , 19 _____ _____ Municipality , Michigan _____ Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID [ ] [ ] [ ] [ ]
Plant No. Mo. Yr. Sampling Point Code

DAY	BOD-5			SS			TOTAL-P			VSS	NH_3-N	pH	DO	F. COLI*		T. COLI*	REMARK
	9 14 19			24 29 34			39 44 49			54	59	64	69	74	80	9	14
1 2	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	mg/l	SU	mg/l	# /100 ml	C	#/100 ml	
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 31615	C	31504 31505	
SF															C		
01	9	262	88	2	58	96	.38	11	80	1		7.2	6.6		C		
02	10	292	87	7	204	83	.34	10	80	3		7.2	5.5		C		
03	8	230	88	3	86	89	.12	4	91	2		7.1	5.6		C		
04												7.0	5.9		C		
05												7.1			C		
06												7.0			C		
07	6	210	92	13	455	82	.27	9	84	8		7.0			C		
08	19	678	72	5	178	85	.41	15	73	1		7.2	6.6		C		
09	8	275	83	6	206	84	.27	9	81	2		7.1	6.9		C		
10	15	497	76	8	265	82	.27	9	81	3		7.4	6.9		C		
11	17	560	73	7	231	81	.32	11	75	3		7.3	5.7		C		
12												7.4	5.4		C		
13												7.1			C		
14	13	409	78	7	221	85	.32	10	83	5		7.1			C		
15	14	451	74	8	258	84	.32	10	80	6		7.2	7.2		C		
16	13	404	74	5	156	88	.25	8	85	3		7.4	6.6		C		
17	14	436	72	10	311	78	.38	12	87	7		7.5	7.4		C		
18	13	398	75	6	184	86	.51	16	68	4		7.3	6.6		C		
19												7.4	7.0		C		
20												7.4			C		
21	14	414	74	9	266	86	.30	9	83	7		7.4			C		
22	22	662	75	16	482	79	.48	14	77	9		7.5	6.4		C		
23	12	350	80	9	263	82	.32	9	77	7		7.3	4.9		C		
24	6	174	88	10	296	81	.25	7	85	8		7.4	6.9		C		
25	8	231	83	2	58	96	.37	11	77	1		7.5	7.4		C		
26												7.5	7.8		C		
27												7.5			C		
28	11	305	80	2	54	97	.27	7	86	1		7.4	~~7.5~~		C		
29	7	203	88	3	87	94	.27	8	85	2		7.3	7.2		C		
30	9	257	83	9	257	83	.27	8	84	3		7.1	6.2		C		
31															C		
TL		7,698			4,576			267							C		
ME	12	367	80	7	218	86	.32	10	81	4		7.3	6.5		C		
WA	15	463		10	301										C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

May , 19 85
Month

Marshall , Michigan
Municipality

Robert J. Swahill
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID | 1300029 | 05 | 85 | 500
Plant No. Mo. Yr. Sampling Point Code

DAY 1 2	WEATHER TYPE 9	PRECIP. 14	FLOW TOTAL 19	MAX RATE 24	RAW SEWAGE QUALITY TEMP 29	pH 34	BOD-5 39 44		SS 49 54		TOTAL-P 59 64		VSS 69	NH_3-N 74 78	80	REMARKS OR 9	14	1
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l	C			
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C			
SF															C			
01	3		3.35		51	7.4	63	1760	78	2179	1.90	53	54		C			
02	1		3.25		51	7.5	56	1565	60	1676	2.40	67	40		C			
03	1		3.31		51	7.4									C			
04	1		3.41		51	7.4									C			
05	4	.78	3.48		51	7.5	60	1741	54	1567	2.55	74	42		C			
06	3		3.54		51	7.4	82	2421	98	2893	2.55	75	82		C			
07	1		3.58		52	7.5	96	2866	66	1971	2.45	73	48		C			
08	1		3.50		52	7.5	88	2569	92	2685	2.90	85	58		C			
09	1		3.58		53	7.3	132	3941	104	3105	3.10	93	74		C			
10	1		3.45		53	7.4									C			
11	3		3.40		53	7.2									C			
12	1		3.46		53	7.2	76	2193	82	2366	2.05	59	68		C			
13	1		3.55		53	7.8	98	2961	122	3612	2.45	73	110		C			
14	4	.80	3.54		53	7.4	60	2008	70	2067	1.70	50	60		C			
15	4	.13	3.53		53	7.4	68	2002	52	1531	1.80	53	44		C			
16	4	.10	3.46		53	7.4	74	2135	68	1962	2.05	59	54		C			
17	4	.02	3.42		53	7.4									C			
18	4	.04	3.34		53	7.2									C			
19	3		3.47		53	7.3	68	1968	76	2199	2.30	67	58		C			
20	4	.14	3.51		53	7.4	62	1815	68	1991	2.05	60	52		C			
21	1		3.48		53	7.4	58	1683	58	1683	1.80	52	48		C			
22	1		3.40		53	7.6	62	1758	58	1645	2.40	68	48		C			
23	1		3.44		53	7.5	66	1894	148	4246	2.30	66	104		C			
24	1		3.32		53	7.5									C			
25	1		3.31		52	7.5									C			
26	4	.62	3.31		53	7.4									C			
27	4	.15	3.39		53	7.2	82	2318	56	1583	3.10	88	46		C			
28	1		3.45		53	7.1	78	2244	58	1669	2.75	79	56		C			
29	1		3.37		53	7.5	62	1743	70	1967	1.90	53	56		C			
30	4	.18	3.42		54	7.5	58	1654	144	4107	2.10	60	78		C			
31	1		3.37		54	7.7									C			
TL		3.46	106.39					45174		48764		1407			C			
ME			3.43				74	2151	80	2319	2.31	67	61		C			

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

May, 1985 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2	3 8	9 10	11 12	13 15
ID	13.00.79	05	85	
	Plant No.	Mo.	Yr.	Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX. FUEL 14	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS.	39 Feels LBS.	44 Water CF	49	54	59
PN											
SF											
01			2400			50	298	610			
02			2400			30	298	600			
03			2400			20	199	690			
04			2280			10		580			
05			2400			10		700			
06			2400			40	298	630			
07			2400			20	298	710			
08			2400			20	397	610			
09			2400				298	620			
10			2400			20	397	750			
11			2400			10	298	570			
12			2400			30	298	710			
13			2400			20	397	570			
14			2520			10	397	560			
15			2400			30	397	700			
16			2520			30	397	640			
17			2520			20	298	670			
18			2400			30	298	550			
19			2520			20	397	630			
20			2400			20	298	560			
21			2520			10	298	560			
22			2400			20	199	560			
23			2400			20	397	80			
24			2400			10	298	200			
25			2400			10	298	540			
26			2400			20	397	530			
27			2520			40	199	540			
28			2400			30	397	750			
29			2520			10	298	1710			
30			2400			10	298	1970			
31			2400			20	298	1740			
TL			75,120			640	9,335	21,840			
ME			2423			21	321	705			

POSITION TITLE	MANPOWER No. Full Time	No. Part Time	Total Hours
TOTAL	5		884
Superintendent	1		176
Asst. Supt.	1		176
Shift Foreman			
Shift Operator	3		532
Maint. Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL AR

WEEKDAYS 9 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

Digester Volume, ft^3
Primary _____
Secondary _____

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

R 4619
4833-5382

Supernatant To _____
Process Pattern _____

MONTH May 1985

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE Gals. X 100	Total Solids %	Vol. Solids %	Vol. Solids Lbs/1000 c.f. Digester	pH	DIGESTING SLUDGE Temp. °F	pH	Total Solids %	Vol. Solids %	Vol. Acids Mg/l	Alkalinity Mg/l	SUPERNATANT Gals. X	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	P Mg/l	P Lbs.	5-Day BOD Mg/l	DIGESTED SLUDGE Gals. X	Total Solids %	Vol. Solids %	pH	Gas Produced cu. ft X
1	50	4.3	59		6.7																			
2	42	3.9	83		6.5																			
3	50	4.5	65		6.6																			
4	50	3.9	68		6.6																			
5	50	3.8	68		6.3																			
6	50	4.2	76		6.4																			
7	50	4.6	67		6.4																			
8	50	4.9	81		6.6																			
9	50	5.1	76		6.4																			
10	58	4.7	78		6.7																			
11	50	4.8	59		6.5																			
12	50	5.0	73		6.5																			
13	50	4.9	61		6.5																			
14	50	4.3	70		6.4																			
15	50	5.1	67		6.3																			
16	15	3.5	60		6.5																			
17	20	4.8	70		6.3																			
18																								
19	40	4.8	77		6.3																			
20																								
21	40	5.8	68		5.8																			
22	20	4.9	76		5.9																			
23																								
24	20	5.7	76		5.9																			
25	20	5.4	74		5.9																			
26	20	4.8	73		5.9																			
27	20	5.5	69		5.8																			
28	100	5.5	67		5.7																			
29	35	4.7	68		5.9																			
30	133	5.1	62		5.7																			
31	200	5.3	79		6.1																			
TOTAL	1433																							
ARITH. MEAN	49	4.6	68																					

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

_____ Month , 19 _____ _____ Municipality , Michigan _____ Superintendent's Signature

1 2 ID | 3 Plant No. 8 | 9 10 Mo. | 11 12 Yr. | 13 Sampling Point Code 15

DAY	BOD-5			SS			TOTAL-P			VSS	NH_3-N	pH	DO	F. COLI*		T. COLI*	REMARK
	9	14	19	24	29	34	39	44	49	54	59	64	69	74	80	9	14
1 2	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem	mg/l	LBS.	% Rem.	mg/l	mg/l	SU	mg/l	#/100 ml	C	#/100 ml	
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 31615	C	31504 31505	
SF															C		
01	9	251	86	16	447	79	.25	7	87	10		7.6	6.0	10	C		
02	12	335	79	10	279	83	.34	9	86	5		7.8	6.4	24	C		
03												7.4	7.3	8	C		
04												7.4			C		
05	8	232	87	5	145	91	.50	15	80	3		7.6			C		
06	17	502	79	6	177	94	.42	12	84	4		7.5	6.3	16	C		
07	20	597	79	8	239	88	.28	8	89	6		7.3	6.4	52	C		
08	16	467	82	5	146	95	.25	7	91	3		7.5	5.7	16	C		
09	20	597	85	3	90	97	.30	9	90	1		7.3	6.5	12	C		
10												7.3	4.6	32	C		
11												7.0			C		
12	14	404	82	3	87	96	.18	5	91	2		7.0			C		
13	10	296	90	3	89	98	.20	6	92	2		7.5	6.3	6	C		
14	12	354	80	5	148	93	.22	6	87	4		7.5	4.4	28	C		
15	9	265	87	6	177	88	.19	6	89	4		7.3	5.5	22	C		
16	8	231	89	2	58	97	.23	7	84	1		7.3	5.8	44	C		
17												7.3	5.5	20	C		
18												7.2			C		
19	9	260	87	3	87	96	.20	6	91	2		7.2			C		
20	9	263	85	2	59	97	.30	9	85	1		7.5	6.3		C		
21	9	261	84	8	232	86	.18	5	90	6		7.4	3.6	42	C		
22	8	227	87	3	85	95	.20	7	92	1		7.4	4.9	34	C	37	
23	8	230	88	6	172	96	.15	4	93	4		7.4	6.3	42	C		
24												7.5	6.0	30	C		
25												7.4			C		
26												7.3			C		
27	22	622	73	5	141	91	.20	6	94	4		7.1			C		
28	8	230	90	7	201	88	.22	6	92	5		7.2	5.1	2	C		
29	7	197	89	7	197	90	.19	5	95	5		7.5	5.1	50	C		
30	11	314	81	9	257	94	.15	4	93	4		7.5	5.1	52	C		
31												7.7	5.4	38	C		
TL		2135			3513			149							C		
ME	12	340	84	6	167	92	.25	7	89	4		7.4	5.7	21	C		
WA	17	513		9	257									37	C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

June, 19 85 (Month) — Marshall, Michigan (Municipality) — Robert J. Sinclair (Superintendent's Signature)

1 2	3 8	9 10	11 12	13 15
ID	130029	06	85	500
	Plant No.	Mo.	Yr.	Sampling Point Code

DAY 1 2	WEATHER TYPE 9	WEATHER PRECIP. 14	FLOW TOTAL 19	FLOW MAX RATE 24	RAW SEWAGE QUALITY TEMP 29	pH 34	BOD-5 20 39	BOD-5 44	SS 49	SS 54	TOTAL-P 59	TOTAL-P 64	VSS 69	NH_3-N 74 78	80	REMARKS OR 9	14	1
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l	C			
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C			
SF															C			
01	1		3.26		53	7.5									C			
02	1		3.29		53	7.6	52	1427	24	659	1.60	44	12		C			
03	1		3.37		53	7.5	64	1799	84	2361	1.95	55	72		C			
04	1		3.35		53	7.5	60	1676	82	2291	1.80	50	64		C			
05	1		3.28		53	7.5	52	1422	52	1422	1.80	49	40		C			
06	1		3.35		54	7.3	50	1397	58	1620	2.45	68	34		C			
07	1		3.37		54	7.4									C			
08	4	.03	3.16		54	7.4									C			
09	1		3.21		54	7.4	54	1446	52	1392	1.90	51	40		C			
10	1		3.28		55	7.4	74	2024	44	1204	3.75	103	26		C			
11	4	.84	3.29		55	7.4	60	1646	80	2195	1.95	54	72		C			
12	4	.01	3.29		54	7.5	78	2140	70	1920	1.95	54	56		C			
13	3		3.29		54	7.5									C			
14	1		3.21		55	7.4									C			
15	4	.46	3.13		53	7.4									C			
16	4	.04	3.17		53	7.3	74	1956	64	1692	2.75	72	44		C			
17	4	.18	3.32		54	7.3	54	1495	52	1440	1.65	46	32		C			
18	3		3.23		54	7.4	38	1052	20	554	1.65	46	36		C			
19	1		3.20		54	7.1	42	1121	48	1281	2.10	56	40		C			
20	1		3.23		54	7.1	62	1670	46	1239	1.65	44	26		C			
21	4	.01	3.15		54	7.5									C			
22	4	.25	3.10		54	7.1									C			
23	4	.10	3.14		54	7.3	58	1519	50	1309	1.95	51	36		C			
24	1		3.23		55	7.5	58	1562	90	2424	1.95	53	72		C			
25	1		3.23		55	7.9	58	1562	112	3017	2.10	57	84		C			
26	1		3.15		55	7.3	74	1944	64	1681	2.65	70	54		C			
27	1		3.15		55	7.5	70	1839	74	1944	1.95	51	60		C			
28	1		3.07		55	7.3									C			
29	1		2.90		55	7.4									C			
30	1		2.96		55	7.3	52	1284	60	1481	2.20	54	50		C			
31															C			
TL		1.92	96.36					31,981		33126		1,128			C			
ME			3.21				59	1599	61	1656	2.08	56	48		C			

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

June, 1985
Month

Marshall, Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

ID 13.6029 06 85 ..
Plant No Mo. Yr. Sampling Point Code

DAY	BOD-5		SS		TOTAL-P		VSS	NH_3-N	REMARKS OR OTHER PARAMETERS										
	9 14		19 24		29 34		39	44	49	54	59	64	69	74 78	80	9	14	1
1 2	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l							C			
PN	00310	85001	00530	85002	00665	85004	00535	00610							C			
SF															C			
01															C			
02	42	1152	32	878	1.40	38	24								C			
03	48	1379	54	1517	1.65	46	40								C			
04	38	1062	36	1006	1.60	45	28								C			
05	36	985	40	1094	1.70	47	32								C			
06	32	894	54	1509	2.10	59	36								C			
07															C			
08															C			
09	24	643	34	910	1.60	43	28								C			
10	42	1144	30	821	3.40	93	14								C			
11	32	878	44	1207	1.65	45	36								C			
12	52	1427	44	1207	1.70	47	30								C			
13															C			
14															C			
15															C			
16	66	1745	46	1216	1.90	50	46								C			
17	36	997	42	1163	1.60	44	26								C			
18	30	831	26	720	1.50	42	18								C			
19	40	1068	66	1761	1.65	44	44								C			
20	50	1347	52	1401	1.60	43	26								C			
21															C			
22															C			
23	42	1100	54	1414	1.80	47	38								C			
24	50	1347	56	1508	1.70	46	44								C			
25	46	1239	66	1778	1.80	48	56								C			
26	42	1103	44	1156	1.70	45	32								C			
27	42	1103	46	1208	1.65	43	38								C			
28															C			
29															C			
30	28	691	48	1185	1.35	33	42								C			
31															C			
TL		22,110		24,659		948									C			
ME	41	1106	46	1233	1.75	47	34								C			

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

June , 19 85
Month

Marshall , Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2 | 3 8 | 9 10 | 11 12 | 13 15
IP | 1306239 | 06 | 85 | ..
Plant No. | Mo. | Yr. | Sampling Point Code

DAY 1 2	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification 14
	Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MLSS 34	MLVSS 39	SETTL. 44	SDI 49	DO 54	Air Applied 59	SS 64	VSS 49	Percent Return 74	80	Waste Sludge 9	
	KCF	KCF	HRS.	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu. Ft.	%	%	%	C	KGal	See Code*
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF											4				C		
01	48		2.7								162			.39	C	15	
02			2.6								163			.38	C	15	
03			2.6	4.0	.37	1757	1233	23.0	.76	5.7	166	.52	69	.37	C	15	
04			2.6	4.6	.36	1665	1178	20.0	.83	4.9	166	.51	70	.37	C	46	
05			2.6	4.3	.36	1688	1166	20.0	.84	4.3	165	.48	71	.37	C	15	
06			2.6	3.9	.35	1549	1096	21.0	.74	5.6	165	.44	70	.36	C	15	
07			2.6	3.8	.35	1526	1081	18.0	.85	5.6	160	.45	69	.38	C	15	
08			2.7								153			.40	C	15	
09			2.7								154			.40	C	15	
10			2.6	4.4	.29	1607	1146	20.0	.80	6.2	160	.48	70	.38	C	15	
11			2.6	4.3	.30	1654	1166	20.0	.83	5.3	165	.49	73	.38	C	15	
12			2.6	4.3	.30	1599	1146	20.0	.80	3.3	164	.44	71	.37	C	15	
13			2.6	4.6	.28	1687	1210	21.0	.80	5.2	162	.46	70	.36	C	15	
14			2.7	4.6	.28	1631	1169	20.0	.82	4.9	159	.47	70	.37	C	57	
15			2.8								159			.38	C	15	
16			2.7								154			.40	C	49	
17			2.6	4.5	.35	1753	1683	21.0	.83	5.5	157	.47	77	.37	C	15	
18			2.7	5.1	.29	1750	1235	24.0	.73	5.6	154	.48	69	.46	C	15	
19			2.7	5.0	.28	1911	1368	25.0	.76	6.1	159	.50	72	.50	C	139	
20			2.7	4.4	.31	1835	1263	25.0	.73	7.1	158	.46	69	.54	C	15	
21			2.7	4.2	.32	1723	1213	23.0	.75	6.5	151	.41	69	.54	C	15	
22			2.8								158			.56	C	3248	
23			2.7								155			.55	C	15	
24			2.7	4.2	.32	1828	1252	24.0	.76	5.6	158	.41	65	.53	C	15	
25			2.7	4.0	.30	1841	1274	24.0	.77	5.2	156	.40	68	.54	C	674	
26			2.7	4.1	.29	1882	1319	22.0	.86	3.5	153	.41	69	.52	C	1187	
27			2.7	3.7	.31	1795	1268	25.0	.72	4.8	155	.41	70	.50	C	15	
28			2.8	4.4	.27	2053	1415	24.0	.86	5.5	154	.41	68	.51	C	15	
29			3.0								153			.53	C	61	
30			2.9								155			.53	C	15	
31															C		
TL															C	5791	
ME			2.7	4.3	.31	1737	1208	22.0	.79	5.3	159	.45	70	.44	C	193	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

June, 1985 (Month) — Marshall, Michigan (Municipality) — Robert J. Swalwell (Superintendent's Signature)

1 2	3 8	9 10	11 12	13 15
ID	130029	06	85	
	Plant No.	Mo.	Yr.	Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX. FUEL 14	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS.	39 $FeCl_3$ LBS.	44 Water C.F.	49	54	59
PN											
SF											
01			2400			20	298	530			
02			2280			20	199	610			
03			2520			20	298	1290			
04			2400			20	298	1590			
05			2520			30	298	2520			
06			2400			10	199	1520			
07			2400			10	397	2040			
08			2400			10	199	1540			
09			2400			30	298	1100			
10			2400			30	298	1310			
11			2400			50	298	570			
12			2400			10	298	760			
13			2520			20	199	440			
14			2280			10	199	650			
15			2520			10	199	630			
16			2280			30	298	520			
17			2400			30	298	550			
18			2280			30	298	810			
19			2400			20	298	740			
20			2280			20	298	630			
21			2400			10	397	690			
22			2400			20	397	630			
23			2280			20	397	680			
24			2520			30	298	1360			
25			2400			10	298	1520			
26			2400			20	397	1690			
27			2400			30	298	2410			
28			2400			20	298	2330			
29			2280			20	199	1330			
30			2400			20	298	1330			
31											
TL			71,760			630	8742	34,320			
ME			2392			21	291	1144			

POSITION TITLE	MANPOWER No. Full Time	No. Part Time	Total Hours
TOTAL	5		808
Superintendent	1		160
Asst. Supt.	1		160
Shift Foreman			
Shift Operator	3		488
Maint. Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL AF

WEEKDAYS 9 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

June, 1985 — Month

Marshall, Michigan — Municipality

Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
ID	130029	06	85	
	Plant No	Mo	Yr	Sampling Point Code

DAY	BOD-5			SS			TOTAL-P			VSS	NH_3-N	pH	DO	F COLI*		T. COLI*	REMARKS
	9	14	19	24	29	34	39	44	49	54	59	64	69	74	80	9	14
1 2	mg/l	LBS	% Rem	mg/l	LBS	% Rem	mg/l	LBS	% Rem	mg/l	mg/l	SU	mg/l	#/100 ml	C	#/100 ml	
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 31615	C	31504 31505	
SF															C		
01												7.5			C		
02	5	137	90	5	137	79	.12	3	93	4		7.5			C		
03	6	169	91	10	281	88	.15	4	92	8		7.4	6.2	16	C		
04	9	251	85	6	168	93	.16	4	91	2		7.4	4.8	36	C		
05	7	191	87	4	109	92	.32	9	82	2		7.4	5.4	20	C		
06	11	307	78	7	196	86	.06	2	98	3		7.4	5.8	14	C		
07												7.3	6.1	12	C		
08												7.3			C		
09	4	107	93	3	80	94	.17	5	91	2		7.4			C		
10	4	109	95	8	219	82	.17	5	95	7		7.4	6.0	6	C		
11	7	192	88	10	274	88	.23	6	88	8		7.5	5.4	34	C		
12	7	192	91	5	137	93	.20	5	90	3		7.3	5.6	16	C		
13												7.2	5.6	16	C		
14												7.2	5.2	62	C	26	
15												7.3			C		
16	9	238	88	6	159	91	.20	5	93	4		7.3			C		
17	9	249	83	6	166	88	.22	6	87	4		7.3	5.7	20	C		
18	11	305	71	4	111	83	.23	6	86	3		7.4	5.2	6	C		
19	11	294	74	23	614	52	.28	7	87	12		7.3	5.6	10	C		
20	4	108	94	7	189	85	.18	5	89	5		7.4	5.9	12	C		
21												7.5	6.2	12	C		
22												7.5			C		
23	7	183	88	4	105	92	.20	5	90	3		7.3			C		
24	8	216	86	9	242	90	.18	5	91	6		7.5	6.9	4	C		
25	9	242	84	12	323	89	.20	5	90	10		7.9	6.2	16	C		
26	10	263	86	6	158	90	.18	5	93	5		7.1	5.4	50	C		
27	10	263	86	9	236	87	.19	5	90	7		7.4	6.1	34	C		
28												7.4	6.1	26	C		
29												7.4			C		
30	16	395	69	9	222	85	.20	5	91	3		7.5			C		
31															C		
TL		4411			4126			102							C		
ME	8	221	85	8	206	86	.19	5	90	5		7.4	5.8	17	C		
WA	11	276		11	295									26	C		

Digester Volume, ft³
Primary
Secondary

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

R 4619
4833-5382

Supernatant To
Process Pattern

MONTH June 1985

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE					DIGESTING SLUDGE						SUPERNATANT								DIGESTED SLUDGE				Gas Produced cu. ft X
	Gals. X 100	Total Solids %	Vol. Solids %	Vol. Solids Lbs/1000 c.f. Digester	pH	Temp. °F	pH	Total Solids %	Vol. Solids %	Vol. Acids Mg/l	Alkalinity Mg/l	Gals. X	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	P Mg/l	P Lbs.	5-Day BOD Mg/l	Gals. X	Total Solids %	Vol. Solids %	pH	
1	30	4.2	76																					
2	30	4.9	72																					
3	40	5.0	62																					
4	40	4.6	79																					
5	40	3.4	73																					
6	40	4.6	69																					
7	40	5.1	68																					
8	40	4.3	75																					
9	40	5.3	80																					
10	40	5.3	68																					
11	50	5.0	67																					
12	40	3.4	67																					
13	40	5.1	71																					
14	40	4.8	70																					
15	40	4.9	73																					
16	40	4.8	71																					
17	40	4.9	69																					
18	40	5.2	78																					
19	40	5.1	67																					
20	40	4.5	81																					
21	40	5.0	66																					
22	40	4.7	65																					
23	40	4.8	73																					
24	40	4.7	79																					
25	40	4.8	68																					
26	40	4.8	69																					
27	40	3.8	74																					
28	45	4.6	69																					
29	40	3.8	68																					
30	40	3.7	78																					
31																								
TOTAL	1195																							
ARITH. MEAN	40	4.6	71																					

May, 1985
(Month)

City of Marshall, Michigan
(Municipality)

Robert J. Swalwell
(Superintendent's Signature)

State of Michigan
Department of Natural Resources

SLUDGE DISPOSAL SHEET

Day MA-28-DD1
(site)

Acres This month 14.4 ac.

DATE	SLUDGE APPLIED: Gallons or Cubic Yards	% Solids	% VS	Dry Tons per ac	SLUDGE ANALYSIS AND SOIL LOADING RATES: Nitrogen TKN %	Nitrogen NH_4^+ %	Nitrogen NO_3 %	Nitrogen AVAN lb/ac	Total Phosphorus TP %	Total Phosphorus TP lb/ac	Potassium K %	Potassium K lb/ac	Lead Pb mg/kg	Lead Pb lb/ac	Zinc Zn mg/kg	Zinc Zn lb/ac	Copper Cu mg/kg	Copper Cu lb/ac	Nickel Ni mg/kg	Nickel Ni lb/ac	Cadmium Cd mg/kg	Cadmium Cd lb/ac	mg/kg	lb/ac	mg/kg	lb/ac
5/29 To 5/31	218,428	7.7																								
Average					1.5	.26	.0005		1.5		.06		151		909		704		90		3.03		151	98	18.2	
TOTALS This Month	218,428																									
TOTALS This Year																										
TOTALS Cumulative																										

CROP AND SOIL DATA

Present Crop Wheat

Projected Crop Corn

CEC 8.6 meq/100g

pH 6.8 S.U.

Fertilizer Recommendations

N 250 lb/ac

P_2O_5 40 lb/ac

K_2O 50 lb/ac

Acceptable Metal Accumulations

Pb 860 lb/ac

Zn 430 lb/ac

Cu 215 lb/ac

Ni 86 lb/ac

Cd 4.5 lb/ac

lb/ac

lb/ac

Cd 2 lb/ac/yr

REMARKS:

PR4630

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

July, 19 85 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2	3 8	9 10	11 12	13 15
ID	13,0029	07	85	500
	Plant No.	Mo.	Yr.	Sampling Point Code

DAY 1 2	WEATHER TYPE 9	WEATHER PRECIP. 14	FLOW TOTAL 19	FLOW MAX RATE 24	RAW SEWAGE QUALITY TEMP 29	pH 34	BOD-5 39	BOD-5 44	SS 49	SS 54	TOTAL-P 59	TOTAL-P 64	VSS 69	NH_3-N 74 78	80	REMARKS OR 9	14
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l	C		
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C		
SF															C		
01	1		3.03		55	6.9	58	1466	60	1516	1.95	49	48		C		
02	1		3.01		55	7.6	142	3565	90	2259	2.85	72	76		C		
03	1		2.90		55	7.6									C		
04	4	.12	2.81		55	7.6	66	1547	44	1031	1.60	37	40		C		
05	4	.05	2.93		55	7.5									C		
06	1		2.88		55	7.6									C		
07	4	.12	2.94		55	7.5	92	2256	116	2844	1.95	48	108		C		
08	1		3.10		56	7.5	142	3671	138	3568	4.70	122	106		C		
09	4	.40	2.98		55	7.4	57	1417	72	1789	2.05	51	62		C		
10	1		3.03		55	7.5	60	1516	80	2021	1.90	48	62		C		
11	4	.06	2.92		55	7.4	60	1461	66	1607	2.20	54	56		C		
12	4	.24	3.02		55	7.5									C		
13	4	1.42	3.10		56	7.4									C		
14	4	.02	3.17		56	7.4	70	1851	58	1533	1.80	48	46		C		
15	4	.13	3.20		57	7.4	58	1548	68	1814	2.05	55	58		C		
16	1		3.16		57	7.5	56	1476	62	1634	1.90	50	52		C		
17	1		3.06		57	7.1	60	1531	78	1991	1.95	50	60		C		
18	1		3.13		57	7.6	64	1671	60	1566	1.95	51	52		C		
19	4	.01	3.03		57	7.5									C		
20	1		2.96		55	7.2									C		
21	1		2.95		57	7.2	44	1082	46	1132	1.95	48	40		C		
22	1		3.08		57	7.4	84	2158	56	1438	2.85	73	46		C		
23	1		3.04		57	7.5	80	2028	60	1521	1.95	49	46		C		
24	1		3.03		57	7.4	64	1617	68	1718	2.40	61	42		C		
25	4	.30	3.03		57	7.5	92	2325	60	1516	2.65	67	48		C		
26	1		2.92		57	7.5									C		
27	1		2.81		57	7.4									C		
28	1		2.93		57	7.5	72	1759	82	2004	2.20	54	72		C		
29	1		3.03		57	7.4	66	1668	108	2729	4.30	109	84		C		
30	4	.07	2.92		57	7.3	80	1948	74	1802	2.45	60	66		C		
31	4	.14	2.94		57	7.2	62	1520	58	1422	2.20	54	54		C		
TL		3.08	93.04					41081		40455		1310			C		
ME			3.00				74	1867	73	1838	2.35	60	60		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

July, 19 85 — Month

Marshall, Michigan — Municipality

Robert J. Swalwell — Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
ID	130029	07	85	
	Plant No.	Mo.	Yr.	Sampling Point Code

DAY	BOD-5		SS		TOTAL-P		VSS	NH_3-N	REMARKS OR OTHER PARAMETERS									
	9	14	19	24	29	34	39	44	49	54	59	64	69	74	78	80	9	14
1 2	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l								C		
PN	00310	85001	00530	85002	00665	85004	00535	00610								C		
SF																C		
01	88	2224	48	1213	1.60	40	34									C		
02	146	3665	60	1506	1.60	40	52									C		
03																C		
04	52	1219	38	891	1.20	28	32									C		
05																C		
06																C		
07	66	1618	46	1128	1.50	37	36									C		
08	88	2275	58	1500	1.90	49	48									C		
09	90	2237	42	1044	1.60	40	30									C		
10	42	1061	60	1516	1.60	40	50									C		
11	42	1023	40	974	1.60	39	32									C		
12																C		
13																C		
14	24	635	34	899	1.40	37	24									C		
15	40	1068	42	1121	1.60	43	32									C		
16	44	1160	44	1160	1.65	43	28									C		
17	44	1123	56	1429	1.80	46	44									C		
18	50	1305	42	1096	1.65	43	30									C		
19																C		
20																C		
21	44	1083	38	935	1.50	37	30									C		
22	54	1387	50	1284	1.65	42	46									C		
23	48	1217	50	1268	2.55	65	42									C		
24	44	1112	46	1162	1.90	48	26									C		
25	60	1516	54	1365	1.70	43	42									C		
26																C		
27																C		
28	50	1222	52	1271	1.80	44	38									C		
29	46	1162	44	1112	3.65	92	36									C		
30	60	1461	54	1315	2.10	51	48									C		
31	44	1079	34	834	1.90	47	28									C		
TL		31,852		26,023		994										C		
ME	58	1448	47	1183	1.79	45	37									C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

July (Month), 19 85 — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

ID 13.0029 (Plant No.) 07 (Mo.) 85 (Yr.) ... (Sampling Point Code)

DAY	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification
	Aeration Volume	Reaeration Volume	Detention Time	Sludge Age	Organic Loading	MLSS	MLVSS	SETTL.	SDI	DO	Air Applied	SS	VSS	Percent Return		Waste Sludge	
	KCF	KCF	HRS.	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu. Ft.	%	%	%	C	KGal	See Code*
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF											4				C		
01	48		2.9	3.4	.32	1737	1234	23.0	.76	4.1	153	.40	70	51	C	15	
02			2.9	3.7	.45	1660	1185	22.0	.75	3.8	151	.38	70	51	C	15	
03			3.0	4.3	.38	1824	1341	27.0	.68	2.2	151	.42	73	53	C	15	
04			3.1								149			54	C	15	
05			2.9	3.9	.45	1601	1155	20.0	80	7.1	149	.40	72	56	C	15	
06			3.0								152			58	C	15	
07			2.9								151			57	C	15	
08			2.8	3.7	.56	1565	1117	19.0	.82	6.0	145	.40	71	55	C	15	
09			2.9	4.4	.51	1787	1310	22.0	.81	4.5	96	.37	73	58	C	15	
10			2.9	3.4	.63	1427	1102	22.0	.65	2.0	167	.40	78	57	C	15	
11			3.0	4.4	.48	1748	1280	20.0	.87	4.3	166	.37	73	59	C	15	
12			2.9	4.0	.52	1681	1213	20.0	.84	5.7	161	.40	72	57	C	15	
13			2.8								158			55	C	15	
14			2.7								158			54	C	15	
15			2.7	2.9	.41	1668	1204	19.0	.88	5.0	164	.38	72	53	C	15	
16			2.7	3.6	.38	1691	1219	18.0	.94	5.0	168	.36	72	53	C	15	
17			2.8	4.4	.33	1682	1203	17.0	.99	5.2	166	.38	72	55	C	15	
18			2.8	4.3	.29	1704	1219	18.0	.95	4.8	164	.36	71	54	C	15	
19			2.9	4.1	.29	1557	1181	18.0	.87	4.0	159	.37	70	55	C	15	
20			2.9								200			58	C	15	
21			2.9								162			58	C	15	
22			2.8	4.4	.31	1669	1183	20.0	85	4.8	169	.36	71	56	C	15	
23			2.8	4.3	.33	1669	1180	20.0	83	5.5	166	.37	71	57	C	15	
24			2.9	4.3	.32	1718	1221	20.0	.86	5.2	158	.36	71	57	C	15	
25			2.9	4.2	.34	1713	1207	20.0	.86	4.8	156	.37	70	58	C	15	
26			3.0	4.7	.31	1834	1298	21.0	.87	4.0	197	.36	71	50	C	15	
27			3.1								201			51	C	15	
28			2.9								204			50	C	15	
29			2.9	3.7	.39	1498	1047	19.0	.78	6.0	200	.37	72	48	C	15	
30			3.0	3.8	.39	1562	1077	19.0	.82	4.9	263	.37	69	48	C	15	
31			2.9	4.0	.37	1574	1095	18.0	.87	4.9	203	.38	73	46	C	15	
TL															C	465	
ME			2.9	4.0	.40	1662	1208	20.0	.83	4.7	166	.38	72	54	C	15	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

July, 19 85 — Month

Marshall, Michigan — Municipality

Robert J. Swalwell — Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
ID	130029	07	85	
	Plant No.	Mo.	Yr.	Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX. FUEL 14	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS.	39 $FeCl_3$ LBS.	44 Water CF	49	54	59
PN											
SF											
01			2400			30	263	1810			
02			2400			20	175	1810			
03			2400			10	263	1200			
04			2400			20	263	580			
05			2280			20	175	530			
06			2280			30	175	770			
07			2400			10	175	690			
08			2400			30	263	1220			
09			1920			10	263	1620			
10			2520			30	175	1730			
11			2520			30	525	1420			
12			2400			10	175	920			
13			2400			20	263	570			
14			2400			20	263	730			
15			2400			40	263	620			
16			2520			20	263	660			
17			2400			20	263	580			
18			2520			10	350	2160			
19			2280			20	175	720			
20			2400			30	263	1510			
21			2280			20	350	420			
22			2520			30	175	2500			
23			2400			20	263	690			
24			2400			10	263	610			
25			2400			30	175	810			
26			2520			30	175	690			
27			2520			10	350	610			
28			2520			20	88	730			
29			2640			30	263	750			
30			2400			20	175	850			
31			2520			30	263	680			
TL			74760			680	7533	31190			
ME			2412			22	243	1006			

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours	V
TOTAL	5		884	
Superintendent	1		176	
Asst. Supt.	1		176	
Shift Foreman				
Shift Operator	3		532	
Maint. Supervisor				
Mechanic				
Chemist				
Lab Technician				
Clerk-Typist				
Other				

GIVE THE HOURS PER DAY PLANT PERSONNEL AR

WEEKDAYS 9 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

Digester Volume, ft³
Primary _____
Secondary _____

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

R 4619
4833-5382

Supernatant To _____
Process Pattern _____

MONTH July 1985

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE					DIGESTING SLUDGE						SUPERNATANT								DIGESTED SLUDGE				Gas Produced cu. ft X
	Gals. X 100	Total Solids %	Vol. Solids %	Vol. Solids Lbs/1000 c.f. Digester	pH	Temp. °F	pH	Total Solids %	Vol. Solids %	Vol. Acids Mg/l	Alkalinity Mg/l	Gals. X	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	P Mg/l	P Lbs.	5-Day BOD Mg/l	Gals. X	Total Solids %	Vol. Solids %	pH	
1	56	3.7	86		6.3																			
2	50	3.4	75		6.5																			
3	50	4.5	70		6.3																			
4	50	3.8	73		6.3																			
5	50	5.4	48		6.4																			
6	50	5.0	71		6.4																			
7	50	4.5	72		6.3																			
8	50	4.3	57		6.3																			
9	50	4.4	67		6.4																			
10	50	4.2	74		6.3																			
11	50	5.0	65		6.3																			
12	50	4.0	64		6.3																			
13	50	4.2	74		6.3																			
14	50	4.2	67		6.3																			
15	50	4.5	63		6.5																			
16	50	3.8	81		6.5																			
17	50	4.9	65		6.4																			
18	50	3.9	80		6.4																			
19	50	4.3	78		6.4																			
20	50	4.1	59		6.4																			
21	50	3.9	70		6.4																			
22	50	4.0	65		6.6																			
23	50	4.3	67		6.5																			
24	50	4.5	72		6.5																			
25	50	4.3	81		6.6																			
26	50	4.3	77		6.5																			
27	50	3.9	57		6.5																			
28	50	3.5	65		6.5																			
29	68	4.1	69		6.5																			
30	50	4.0	58		6.5																			
31	50	3.8	76		6.4																			
TOTAL	1574																							
ARITH. MEAN	51	4.2	69																					

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

_____ Month , 19 _____ _____ Municipality , Michigan _____ Superintendent's Signature

ID Plant No. Mo. Yr. Sampling Point Code

DAY	BOD-5			SS			TOTAL-P			VSS	NH_3-N	pH	DO	F. COLI*		T. COLI*	REMARK
1 2	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	mg/l	SU	mg/l	#/100 ml	C	#/100 ml	
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 31615	C	31504 31505	
SF															C		
01	25	631	57	7	177	88	.30	8	85	2		7.3		22	C		
02	20	502	86	13	326	85	.32	8	89	10		7.4		4	C		
03												7.6	6.7	26	C		
04	14	328	79	7	164	84	.16	4	90	5		7.4	6.3		C		
05												7.4	[illegible]	6	C		
06												7.5			C		
07	14	343	85	5	123	96	.18	4	91	3		7.4			C		
08	19	491	87	5	129	96	.28	7	94	3		7.4	6.3	10	C		
09	17	423	70	9	224	88	.25	6	88	5		7.3	4.8	12	C		
10	14	354	77	12	303	85	.20	5	89	9		7.3	3.1		C		
11	12	292	80	2	49	97	.13	3	94	1		7.4	6.1	8	C		
12												7.2	6.0	4	C		
13												7.1			C		
14	15	397	79	3	79	95	.17	4	91	2		7.2			C		
15	14	374	76	3	80	96	.16	4	92	2		7.3	6.0	80	C		
16	13	343	77	3	79	95	.16	4	92	2		7.4	5.2	6	C		
17	14	357	77	9	230	88	.17	4	92	7		7.5	6.4	16	C		
18	16	418	75	2	52	97	.15	4	92	1		7.6	6.3	2	C		
19												7.3	5.0	6	C		
20												7.1			C		
21	15	369	89	2	49	96	.16	4	92	1		7.1			C		
22	12	308	86	6	154	89	.18	5	94	4		7.5	5.6	14	C		
23	10	254	86	3	76	95	.16	4	92	2		7.4	6.2	12	C		
24	16	404	75	7	177	90	.19	5	92	4		7.3	5.9	10	C		
25	19	480	79	3	76	95	.23	6	91	2		7.4	5.3	18	C		
26												7.5	5.5	22	C		
27												7.4			C		
28	16	391	78	5	122	94	.20	5	91	3		7.4			C		
29	20	505	70	5	126	95	.55	14	87	2		7.3	6.9	18	C		
30	19	463	76	8	195	89	.32	8	87	7		7.3	5.4	74	C		
31	20	490	68	3	74	95	.27	7	88	2		7.3	5.4	44	C		
TL		8917			3064			123							C		
ME	16	405	78	6	139	92	.22	6	91	4		7.4	5.7	13	C		
WA	19	466		8	189									35	C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

August, 19 85 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2	3 8	9 10	11 12	13 15
ID	130029	08	85	500
	Plant No.	Mo.	Yr.	Sampling Point Code

DAY 1 2	WEATHER TYPE 9	WEATHER PRECIP. 14	FLOW TOTAL 19	FLOW MAX RATE 24	RAW SEWAGE QUALITY TEMP 29	pH 34	BOD-5 39	BOD-5 44	SS 49	SS 54	TOTAL-P 59	TOTAL-P 64	VSS 69	NH_3-N 74 78	80	REMARKS OR 9	14
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l	C		
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C		
SF															C		
01	1		2.94		57	7.4	122	2991	156	3825	3.65	89	114		C		
02	1		2.92		57	7.3									C		
03	1		2.79		56	7.2									C		
04	4	.43	2.87		58	7.2	64	1532	50	1197	2.05	49	40		C		
05	4	.34	2.98		57	7.4									C		
06	4	.01	3.04		58	7.4	70	1775	60	1521	2.40	61	46		C		
07	4	.32	2.98		58	7.3	60	1491	109	2709	2.10	52	89		C		
08	1		2.97		58	7.3	80	1982	68	1684	2.30	57	50		C		
09	1		2.93		58	7.4									C		
10	1		2.86		58	7.3									C		
11	1		2.81		58	7.4	68	1594	80	1875	2.90	68	62		C		
12	4	.28	3.07		57	7.3	86	2202	64	1639	2.05	52	46		C		
13	3		2.98		57	7.4	70	1740	72	1789			22		C		
14	4	1.01	3.12		58	7.4	62	1613	80	2082			66		C		
15	4	.20	3.08		58	7.8	76	1952	66	1695			60		C		
16	1		3.02		58	7.4									C		
17	1		2.90		58	7.4									C		
18	1		2.91		57	7.6	52	950	66	1205	1.60	29	56		C		
19	1		2.95		58	7.5	50	1230	66	1624	1.65	41	48		C		
20	3		2.93		58	7.4	60	1466	108	2639	1.70	42	104		C		
21	1		2.93		58	7.3	72	1759	90	2199	1.90	46	62		C		
22	1		2.90		58	7.4	64	1548	68	1645	1.95	47	48		C		
23	4	.02	2.81		58	7.3									C		
24	4	.56	2.77		58	7.4									C		
25	4	.01	2.87		58	7.6	56	1340	106	2537	1.65	39	96		C		
26	3		2.93		59	7.4	78	1906	106	2590	2.90	71	84		C		
27	1		2.94		58	7.5	54	1324	54	1324	1.60	39	44		C		
28	1		2.93		58	7.4	54	1320	60	1466	1.60	39	46		C		
29	4	.41	2.95		58	7.3	66	1624	50	1230	1.95	48	44		C		
30	4	.05	2.84		58	7.3									C		
31	1		2.70		58	7.3									C		
TL		3.64	90.62					33,339		38,475		869			C		
ME			2.92				68	1667	79	1924	2.11	51	61		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

AUGUST, 19 85
Month

Marshall, Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
ID	130029	08	85	
	Plant No.	Mo.	Yr.	Sampling Point Code

DAY	BOD-5		SS		TOTAL-P		VSS	NH_3-N	REMARKS OR OTHER PARAMETERS									
	9	14	19	24	29	34	39	44	49	54	59	64	69	74	78	80	9	14
1 2	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l								C		
PN	00310	85001	00530	85002	00665	85004	00535	00610								C		
SF																C		
01	72	1756	58	1422	2.05	50	48									C		
02																C		
03																C		
04	48	1149	42	1005	1.60	38	32									C		
05																C		
06	56	1420	60	1521	1.80	46	42									C		
07	48	1193	86	2137	1.80	45	52									C		
08	52	1288	55	1362	2.00	50	35									C		
09																C		
10																C		
11	58	1359	42	984	1.40	33	34									C		
12	74	1895	68	1741	1.90	49	58									C		
13	38	944	34	845			16									C		
14	48	1249	60	1561			54									C		
15	40	1027	38	976			30									C		
16																C		
17																C		
18	34	621	58	1059	1.30	24	40									C		
19	38	935	60	1476	1.40	34	48									C		
20	34	831	38	929	1.50	37	30									C		
21	44	1075	54	1320	1.60	39	42									C		
22	52	1258	38	919	1.65	40	22									C		
23																C		
24																C		
25	34	814	44	1053	1.30	31	36									C		
26	40	977	56	1368	1.80	44	42									C		
27	50	1226	40	981	1.40	34	34									C		
28	40	977	44	1075	1.40	34	34									C		
29	46	1132	44	1083	1.40	34	30									C		
30																C		
31																C		
TL		23126		24,817		662										C		
ME	47	1156	51	1241	1.61	39	29									C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

August, 19 85
Month

Marshall, Michigan
Municipality

Robert J. Lundell
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
IP | 130029 | 08 | 85 | . .
Plant No | Mo. | Yr. | Sampling Point Code

DAY 1 2	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification 14
	Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MLSS 34	MLVSS 39	SETTL. 44	SDI 49	DO 54	Air Applied 59	SS 64	VSS 49	Percent Return 74	8C	Waste Sludge 9	
	KCF	KCF	HRS.	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu. Ft.	%	%	%	C	KGal	See Code*
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF											4				C		
01	AB		2.9	3.6	.44	1453	1006	19.0	.76	5.4	199	.36	69	45	C	67	
02			3.0	3.3	.47	1329	935	17.0	.78	4.8	198	.38	70	45	C	15	
03			3.1								198			48	C	15	
04			3.0								196			46	C	15	
05			2.9	3.5	.45	1389	986	16.0	.87	4.2	196	.34	71	43	C	15	
06			2.8	3.4	.44	1429	1031	16.0	.89	4.0	195	.36	72	42	C	15	
07			2.9	3.7	.37	1645	1203	19.0	.87	2.8	193	.42	73	41	C	15	
08			2.9	3.9	.34	1815	1314	22.0	.83	3.4	193	.45	71	41	C	15	
09			2.9	4.2	.31	1931	1413	27.0	.72	2.2	192	.51	72	42	C	15	
10			3.0								195			43	C	15	
11			3.1								195			44	C	15	
12			2.8	4.5	.36	2260	1628	32.0	.70	2.1	191	.54	72	50	C	15	
13			2.9	5.8	.23	2650	1924	37.0	.72	1.5	187	.60	73	50	C	15	
14			2.8	4.7	.27	2361	1685	30.0	.79	2.2	192	.58	70	46	C	15	
15			2.8	4.4	.29	2086	1503	25.0	.83	1.8	194	.53	66	50	C	15	
16			2.9								192			57	C	15	
17			2.9								188			62	C	15	
18			3.0								193			62	C	13	
19			2.9	5.4	.24	2257	1615	30.0	.75	3.5	194	.46	72	60	C	15	
20			2.9	5.1	.23	2103	1468	29.0	.73	3.0	194	.45	69	59	C	15	
21			2.9	5.4	.21	2173	1514	31.0	.70	2.4	194	.45	66	59	C	15	
22			3.0	5.6	.21	2232	1586	30.0	.74	2.8	192	.46	71	59	C	15	
23			3.1	5.7	.20	2209	1572	30.0	.74	2.6	185	.46	71	61	C	15	
24			3.1								187			62	C	15	
25			3.0								191			59	C	15	
26			2.9	5.2	.21	2166	1508	32.0	.68	2.6	173	.47	70	59	C	15	
27			2.9	5.3	.24	2031	1432	30.0	.68	2.2	167	.41	70	59	C	15	
28			2.9	5.3	.25	1953	1367	28.0	.70	2.3	165	.40	70	59	C	15	
29			2.9	4.7	.29	1780	1245	27.0	.66	3.3	162	.38	70	59	C	15	
30			3.0	5.2	.26	1896	1361	25.0	.76	3.0	166	.41	72	61	C	15	
31			3.2								166				C	15	
TL															C	517	
ME			2.9	4.7	.30	1960	1395	26.2	.75	2.9	188	.45	72	52	C	16.6	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

AUGUST, 19 85
Month

MARSHALL, Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
IP | 130029 | 08 | 85 | ..
Plant No. Mo. Yr. Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX. FUEL 14	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS.	39 Poly LBS	44 WATER CF	49	54	59
PN											
SF											
01			2520			20	26.3	2210			
02			2400			20	26.3	2250			
03			2400			20	26.3	1440			
04			2400			20	17.5	1420			
05			2400			20	26.3	960			
06			2400			20	26.3	670			
07			2400			20	17.5	630			
08			2520			20	26.3	1560			
09			2280			20	17.5	540			
10			2400			20	17.5	590			
11			2400			20	26.3	1440			
12			2520			20	17.5	4140			
13			2520			20	17.5	950			
14			2400			15	26.3	620			
15			2400			15	26.3	610			
16			2520			20	17.5	710			
17			2400			20	26.3	610			
18			2400			20	26.3	1070			
19			2400			20	17.5	710			
20			2520			20	17.5	740			
21			2400			20	26.3	860			
22			2520			20	26.3	770			
23			2400			10	17.5	840			
24			2520			20	35.0	1670			
25			2520			30	17.5	820			
26			2400			10	26.3	850			
27			2400			30	17.5	2120			
28			2520			20	17.5	1120			
29			2400			20	17.5	1070			
30			2400			30	17.5	820			
31			2280			20	17.5	860			
TL			75,316			620	1,832	36,160			
ME			2431			20	220	1166			

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	5		784
Superintendent	1		176
Asst. Supt.	1		152
Shift Foreman			
Shift Operator	3		456
Maint. Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL AR

WEEKDAYS 9 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

Digester Volume, ft³
Primary
Secondary

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

R 4619
4833-5382

Supernatant To
Process Pattern

MONTH AUGUST 1985

DIGESTER AND SLUDGE DATA

OPERATOR R. J. Swalwell

DATE	RAW SLUDGE					DIGESTING SLUDGE						SUPERNATANT								DIGESTED SLUDGE				Gas Produced cu. ft X
	Gals. X 100	Total Solids %	Vol. Solids %	Vol. Solids Lbs/1000 c.f. Digester	pH	Temp. °F	pH	Total Solids %	Vol. Solids %	Vol. Acids Mg/l	Alkalinity Mg/l	Gals. X	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	P Mg/l	P Lbs.	5-Day BOD Mg/l	Gals. X	Total Solids %	Vol. Solids %	pH	
1	50	3.6	65		6.5																			
2	57	2.2	63		6.6																			
3	50	5.4	71		6.5																			
4	50	4.1	67		6.5																			
5	50	4.0	61		6.6																			
6	50	4.1	71		6.6																			
7	50	3.9	67		6.5																			
8	50	4.4	61		6.4																			
9	50	4.1	81		6.5																			
10	50	4.7	65		6.5																			
11	22	4.0	72		6.6																			
12	138	4.2	65		6.0																			
13	443	2.6	70		6.3																			
14	49																							
15																								
16	50																							
17	50	4.3	59		6.2																			
18	120	3.1	80		6.3																			
19	76	3.7	76		6.3																			
20	50	4.1	73		6.4																			
21	50	4.5	70		6.4																			
22	50	4.1	74		6.4																			
23	50	3.8	76		6.3																			
24	50	4.2	70		6.4																			
25	50	4.0	73		6.2																			
26	50	3.7	62		6.3																			
27	50	3.2	75		6.4																			
28	50	2.6	85		6.4																			
29	50	3.9	78		6.4																			
30	50	3.7	65		6.4																			
31	50	3.5	77		6.4																			
TOTAL	2049																							
ARITH. MEAN	68	3.8	70																					

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

_____ Month , 19 _____ | _____ Municipality , Michigan | _____ Superintendent's Signature

ID | Plant No | Mo | Yr | Sampling Point Code

DAY	BOD-5			SS			TOTAL-P			VSS	NH_3-N	pH	DO	F COLI*		T COLI*	REMARKS
	9	14	19	24	29	34	39	44	49	54	59	64	69	74	80	9	14
1 2	mg/l	LBS	% Rem	mg/l	LBS	% Rem	mg/l	LBS	% Rem	mg/l	mg/l	SU	mg/l	#/100 ml	C	#/100 ml	
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 31615	C	31504 31505	
SF															C		
01	23	564	81	4	98	97	.25	6	93	2		7.4	5.6	34	C		
02												7.2	5.0		C		
03												7.2			C		
04	15	359	86	3	72	94	.19	5	91	2		7.2			C		
05												7.3	5.2		C		
06	21	532	70	7	177	88	.22	6	91	2		7.3	4.8	24	C		
07	20	497	67	14	348	87	.18	4	91	7		7.2	3.5	26	C		
08	18	446	78	6	148	91	.19	5	92	4		7.2	4.2	20	C		
09												7.3	3.8	32	C		
10												7.3			C		
11	17	398	75	5	117	94	.15	4	95	3		7.3			C		
12	22	563	74	8	205	88	.46	12	78	6		7.4	3.2	22	C		
13	15	373	79	6	149	92	.			3		7.4	2.4	52	C		
14	13	338	79	3	78	96				2		7.4	3.1	36	C		
15	16	411	79	7	180	89				5		7.3	2.9	754	C		
16												7.3			C		
17												7.3			C		
18	10	183	81	5	91	92	.15	3	91	3		7.3			C		
19	18	443	64	16	394	76	.32	8	81	10		7.4	4.2	46	C		
20	9	226	85	3	73	97	.20	5	88	2		7.4	4.3	36	C		
21	8	195	89	5	122	94	.20	5	89	4		7.3	3.9		C		
22	10	292	84	2	48	97	.18	4	91	1		7.3	3.2	2	C		
23												7.3	3.2	4	C		
24												7.3			C		
25	8	191	86	2	48	98	.15	4	91	1		7.3			C		
26	22	538	72	32	782	70	.72	18	75	21		7.4	3.7	18	C		
27	7	172	87	3	74	94	.16	4	90	2		7.4	3.5	26	C		
28	11	269	80	8	195	87	.18	4	89	4		7.3	3.5	16	C		
29	11	271	83	4	98	92	.27	7	86	3		7.3	4.7	12	C		
30												7.3	3.9	18	C		
31												7.3			C		
TL		7205			3447			104							C		
ME	15	360	78	7	175	91	.25	6	88	4		7.3	3.9	24	C		
WA	20	487		9	229									63	C		

August, 1985
(Month)

City of Marshall, Michigan
(Municipality)

(Superintendent's Signature)

State of M
Department of Na

SLUDGE DISP

DATE	SLUDGE APPLIED: Gallons or Cubic Yards	% Solids	% VS	Dry Tons per ac.	SLUDGE ANALYSIS AND SOIL: Nitrogen TKN %	NH_4^+ %	NO_3 %	AVAN lb/ac	Total Phosphorus TP %	TP lb/ac	Potassium K %	K lb/ac	Lead Pb mg/kg	Pb lb/ac	Zinc Zn mg/kg	Zn lb/ac
8/12 To 8/13	185600	6.0														
Average					4.0	.33	.01		1.0		.16		180		580	
TOTALS This Month	185600			388				83.2		77.5		0.4		1.4		4.5
TOTALS This Year																
TOTALS Cumulative																

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

September, 19 85
Month

Marshall, Michigan
Municipality

Robert J. Swalm
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID | 13.0c2.9 | 09 | 85 | 500
Plant No. Mo Yr. Sampling Point Code

DAY 1 2	WEATHER		FLOW		RAW SEWAGE QUALITY											REMARKS OR C
	TYPE 9	PRECIP. 14	TOTAL 19	MAX RATE 24	TEMP 29	pH 34	BOD-5 39 44		SS 49 54		TOTAL-P 59 64		VSS 69	NH_3-N 74 78	80	9 14 19
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS.	mg/l	LBS.	mg/l	LBS	mg/l	mg/l	C	
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C	
SF															C	
01	1		2.76		58	7.3	86	1980	78	1795	1.80	41	64		C	
02	1		2.86		58	7.8	54	1288	62	1479	1.70	41	50		C	
03	1		2.96		58	7.4	104	2567	106	2617	2.40	59	88		C	
04	1		2.91		58	7.4	66	1602	64	1553	1.80	44	52		C	
05	4	.01	2.88		58	7.7	62	1489	124	2978	1.70	41	100		C	
06	4	.01	2.87		58	7.3	70	1676	128	3064	1.80	43	112		C	
07	4	.03	2.83		58	7.1	82	1935	72	1699	1.70	40	62		C	
08	4	1.29	2.90		58	7.1	84	2032	80	1935	1.70	41	72		C	
09	4	.25	2.95		61	7.4	60	1476	66	1624	1.65	41	56		C	
10	4	.04	2.96		60	8.1	80	1975	80	1975	1.90	47	76		C	
11	1		2.94		60	7.4	66	1618	62	1520	3.20	78	30		C	
12	1		2.87		60	7.3	112	2681	146	3495	3.10	74	102		C	
13	1		2.74		60	7.5	68	1553	74	1691	1.90	43	54		C	
14	1		2.77		60	7.6	76	1756	88	2033	2.03	47	71		C	
15	1		2.79		59	7.5	62	1443	62	1443	1.65	38	52		C	
16	1		2.87		59	7.6	76	1819	72	1723	1.90	45	58		C	
17	3		2.81		59	7.6	78	1828	96	2250	1.90	46	62		C	
18	4	.02	2.88		59	7.5	66	1585	66	1585	1.80	43	50		C	
19	1		2.82		59	7.5	66	1552	72	1693	1.65	39	52		C	
20	1		2.80		59	7.5	74	1728	84	1961	1.80	42	71		C	
21	3		2.67		59	7.4	72	1603	88	1960	1.90	42	60		C	
22	4	.01	2.77		59	7.5	64	1479	64	1479	1.95	45	58		C	
23	4	.63	2.59		59	7.8	76	1642	72	1555	1.90	41	58		C	
24	1		2.80		59	7.7	64	1495	80	1868	2.05	48	70		C	
25	4	.17	2.80		59	7.5	72	1681	79	1844	2.00	47	63		C	
26	1		2.49		59	7.5	54	1121	64	1324	1.95	40	60		C	
27	1		2.70		59	7.5	42	946	58	1306	1.95	44	48		C	
28	1		2.61		59	7.1	74	1611	44	958	2.40	52	36		C	
29	4	.02	2.68		59	7.1	64	1430	66	1475	3.00	67	52		C	
30	4	.29	2.77		59	7.6	76	1756	66	1525	1.90	44	42		C	
31															C	
TL		1.77	84.05					50342		55412		1403			C	
ME			2.80				72	1678	79	1847	2.00	47	63		C	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

September, 1985
Month

Marshall, Michigan
Municipality

Robert J. Swahn
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID 130029 09 85 . .
Plant No Mo. Yr. Sampling Point Code

DAY	BOD-5 9 14		SS 19 24		TOTAL-P 29 34		VSS 39	NH_3-N 44	REMARKS OR OTHER PARAMETERS 49 54 59 64 69 74 78 80 9 14 1
1 2	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l	C
PN	00310	85001	00530	85002	00665	85004	00535	00610	C
SF									C
01	52	1197	72	1657	1.50	35	64		C
02	50	1193	34	811	1.50	36	28		C
03	72	1777	64	1580	1.80	44	58		C
04	54	1311	56	1359	1.90	46	48		C
05	46	1105	56	1345	1.65	40	48		C
06	56	1340	90	2154	1.65	39	86		C
07	66	1558	44	1038	1.60	38	38		C
08	54	1306	48	1161	1.65	40	42		C
09	42	1033	44	1083	1.60	39	36		C
10	60	1481	60	1481	2.05	51	50		C
11	86	2109	44	1079	2.55	63	38		C
12	74	1771	62	1484	2.30	55	44		C
13	66	1508	78	1782	2.40	55	62		C
14	60	1386	58	1340	1.86	43	49		C
15	56	1303	38	884	2.05	48	30		C
16	70	1675	74	1771	2.20	53	52		C
17	68	1594	60	1406	1.95	46	46		C
18	48	1153	42	1009	1.80	43	34		C
19	52	1223	56	1317	1.95	46	48		C
20	52	1214	56	1308	1.96	44	48		C
21	54	1262	68	1514	2.10	48	60		C
22	50	1155	52	1201	2.10	49	42		C
23	48	1037	44	950	1.95	42	22		C
24	54	1261	44	1027	1.90	44	28		C
25	56	1308	56	1308	1.40	44	45		C
26	42	872	58	1204	1.80	37	48		C
27	32	721	48	1081	2.10	47	44		C
28	50	1088	52	1132	1.90	41	40		C
29	44	983	54	1207	1.95	44	42		C
30	54	1247	58	1340	1.80	42	32		C
31									C
TL		39,111		39,613		1342			C
ME	56	1304	56	1300	1.91	45	45		C

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

September, 19 85
Month

Marshall, Michigan
Municipality

Robert J Swihell
Superintendent's Signature

1,2 ID | 3 ... 8 13,062,9 Plant No. | 9 10 09 Mo. | 11 12 85 Yr. | 13 15 ... Sampling Point Code

DAY 1 2	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification 14
	Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MLSS 34	MLVSS 39	SETTL. 44	SDI 49	DO 54	Air Applied 59	SS 64	VSS 49	Percent Return 74	80	Waste Sludge 9	
	KCF	KCF	HRS.	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu. Ft.	%	%	%	C	KGal	See Code*
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF															C		
01	48		3.1								163		-	64	C	15	
02			3.0								161			62	C	15	
03			2.9	4.4	.30	1856	1385	24.0	.77	2.0	193	.43	75	59	C	15	
04			3.0	4.9	.27	2035	1531	25.0	.81	1.8	210	.43	75	60	C	15	
05			3.0	5.1	.25	2168	1650	25.0	.87	1.5	208	.44	77	61	C	15	
06			3.0	4.6	.26	2148	1650	25.0	.86	1.7	208	.46	.76	61	C	15	
07			3.0								208			62	C	15	
08			3.0								208			61	C	15	
09			2.9	4.8	.26	2264	1742	26.0	.87	2.9	209	.49	77	59	C	15	
10			2.9	4.5	.27	2116	1634	27.0	.78	2.4	218	.51	76	59	C	27	
11			2.9	5.1	.27	2323	1779	27.0	.86	2.4	223	.49	77	60	C	15	
12			3.0	5.8	.25	2599	2012	30.0	.87	1.5	226	.52	78	61	C	15	
13			3.1	5.6	.27	2328	1820	25.0	.93	2.4	225	.53	78	65	C	15	
14			3.1								221			64	C	15	
15			3.1								217			62	C	15	
16			3.0	4.9	.29	2327	1839	25.0	.93	2.6	212	.55	78	61	C	15	
17			3.1	5.7	.26	2620	2077	29.0	.90	1.5	206	.56	80	61	C	15	
18			3.0	4.8	.29	2267	1755	28.0	.81	2.3	205	.58	82	58	C	33	
19			3.0	4.3	.30	1986	1525	25.0	.79	1.6	203	.43	76	60	C	15	
20			3.1	4.7	.29	2000	1515	25.0	.80	3.2	203	.44	75	62	C	15	
21			3.2								205			66	C	15	
22			3.1								200			64	C	15	
23			3.3	5.1	.26	2001	1476	26.0	.77	2.4	203	.43	74	68	C	15	
24			3.1	4.9	.28	1991	1433	24.0	.83	1.7	213	.41	72	62	C	15	
25			3.1	4.6	.29	1953	1404	24.0	.81	4.0	206	.41	71	62	C	15	
26			3.5	5.3	.25	1485	1437	23.0	.86	3.2	203	.41	72	69	C	15	
27			3.2	4.8	.26	1926	1379	23.0	.84	2.3	194	.41	71	63	C	19	
28			3.3								203			66	C	68	
29			3.2								200			65	C	15	
30			3.1	4.6	.28	1874	1314	21.0	.89	2.6	199	.40	69	62	C	15	
31															C		
TL															C		
ME			3.1	4.9	.27	2138	1617	25.0	.84	2.3	205	.47	75	62	C	20	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

September, 19 85 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2	3 8	9 10	11 12	13 15
ID	130029	09	85	
	Plant No.	Mo.	Yr.	Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX. FUEL 14	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS.	39 $FeCl_3$ LBS.	44 Water C.F.	49	54	59
PN											
SF											
01			2400			20	175	990			
02			2520			20	175	1990			
03			2520			20	175	820			
04			2520			20	175	970			
05			2520			20	175	850			
06			2400			20	175	850			
07			2520			20	175	1030			
08			2520			30	175	950			
09			2400			30	175	930			
10			2400			40	175	990			
11			2640			30	175	1100			
12			2640			20	175	1260			
13			2640			40	175	990			
14			2400			20	175	1000			
15			2400			10	263	1270			
16			2400			20	263	1650			
17			2520			10	175	1170			
18			2400			20	175	1300			
19			2400			30	263	980			
20			2280			20	350	1100			
21			2400			20	263	1030			
22			2280			20	350	1020			
23			2400			40	350	1050			
24			2400			30	263	660			
25			2520			20	175	960			
26			2400			30	483	1050			
27			2280			20	350	1010			
28			2400			20	263	950			
29			2280			10	350	1030			
30			2400			40	350	1020			
31											
TL			73200			710	7136	31,970			
ME			2440			24	237	1065			

MANPOWER POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL			
Superintendent	1		160
Asst. Supt.	1		160
Shift Foreman			
Shift Operator	3		484
Maint. Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL AF

WEEKDAYS 9 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

Digester Volume, ft³
Primary _____
Secondary _____

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MARSHALL, MICHIGAN

R 4619
4833-5382

Supernatant To _____
Process Pattern _____

MONTH September 1985

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE					DIGESTING SLUDGE						SUPERNATANT								DIGESTED SLUDGE				Gas Produced cu. ft X
	Gals. X 10C	Total Solids %	Vol. Solids %	Vol. Solids Lbs/1000 c.f. Digester	pH	Temp. °F	pH	Total Solids %	Vol. Solids %	Vol. Acids Mg/l	Alkalinity Mg/l	Gals. X	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	P Mg/l	P Lbs.	5-Day BOD Mg/l	Gals. X	Total Solids %	Vol. Solids %	pH	
1	50	3.8	75		6.2																			
2	50	4.0	74		6.3																			
3	50	3.9	70		6.2																			
4	50	3.7	81		6.4																			
5	50	4.3	75		6.3																			
6	50	4.4	81		6.1																			
7	50	4.0	6.1		6.1																			
8	50	3.6	78		6.0																			
9	50	3.9	76		6.1																			
10	50	3.9	73		6.1																			
11	50	4.1	6.8		6.2																			
12	50	3.7	76		6.1																			
13	50	4.4	71		6.4																			
14	50	3.9	6.8		6.4																			
15	50	4.3	76		6.3																			
16	164	4.0	34		6.4																			
17	223	4.0	79		6.1																			
18	223	4.2	63		6.3																			
19																								
20	50	3.3	84		6.2																			
21	50	3.0	63		6.1																			
22	50	1.6	80		6.1																			
23	50	2.7	80		6.1																			
24	50	2.6	73		6.2																			
25	50	3.7	86		6.1																			
26	50	3.8	82		6.1																			
27	50	2.7	88		6.2																			
28	50	3.0	80		6.1																			
29	50	3.2	85		6.0																			
30	50	3.2	70		6.1																			
31																								
TOTAL	1910																							
ARITH. MEAN	66	3.6	74																					

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

_____ , 19 _____ (Month) _____ , Michigan (Municipality) _____ (Superintendent's Signature)

ID (1 2) Plant No. (3–8) Mo. (9 10) Yr. (11 12) Sampling Point Code (13–15)

DAY	BOD-5			SS			TOTAL-P			VSS	NH_3-N	pH	DO	F. COLI*		T. COLI*	REMAR
	9 14 19			24 29 34			39 44 49			54	59	64	69	74 (19)	80	9	14
1 2	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	mg/l	SU	mg/l	#/100 ml	C	#/100 ml	
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 31615	C	31504 31505	
SF															C		
01	8	184	91	7	161	91	.35	8	81	5		7.3	4.0 6.7	18	C		
02	8	191	85	2	48	97	.47	11	72	1		7.4	3.9 6.1	10	C		
03	20	494	81	12	296	89	.95	23	60	9		7.3	3.3 6.1	26	C		
04	8	194	88	2	49	97	.18	4	90	1		7.3	3.1 6.3	28	C		
05	8	192	87	3	72	98	.18	4	89	2		7.4	3.0 6.2	22	C		
06	10	239	86	11	263	91	.32	8	82	9		7.2	2.9 6.1	30	C		
07	9	212	89	1	29	99	.41	10	76	1		7.1	3.7 6.1	10	C		
08	8	193	90	3	73	96	.62	15	64	2		7.1	3.7 6.4	4	C		
09	8	197	87	4	98	94	.41	10	75	3		7.3	3.0 6.3	20	C		
10	19	469	76	4	99	95	.78	19	59	3		7.5	2.8 6.1	30	C		
11	22	539	67	9	221	85	.90	22	72	7		7.4	3.4 6.0	20	C		
12	10	239	91	4	96	97	.27	6	91	2		7.4	3.1 6.3	24	C		
13	7	160	90	2	46	97	.13	3	93	1		7.5	3.0 6.3	12	C		
14	11	254	86	5	116	90	.46	11	77	4		7.6	3.8 6.5	18	C		
15	7	163	90	2	47	97	.34	8	79	1		7.6	4.6 6.4	4	C		
16	8	191	84	11	263	85	.71	17	63	8		7.4	3.6 6.1	20	C		
17	23	539	71	35	820	64	.71	17	63	25		7.5	6.0	22	C		
18	22	528	67	14	336	79	.44	11	76	12		7.3	5.0 7.6	TNTC	C		
19	13	306	80	3	71	96	.17	4	90	2		7.3	6.5	12	C		
20	11	257	85	4	93	95	.17	4	91	3		7.3	6.2	10	C		
21	15	334	79	11	245	88	.20	4	89	11		7.3	6.5	8	C		
22	14	323	78	7	162	89	.25	6	87	3		7.2	6.7	8	C		
23	21	454	72	4	86	94	.32	7	83	2		7.4	6.2	12	C		
24	13	304	80	4	93	95	.25	6	88	2		7.5	6.0	18	C		
25	12	280	69	7	163	91	.39	9	81	5		7.4	6.8	18	C		
26	14	291	74	13	264	80	.28	6	86	12		7.5	6.4	12	C		
27	8	180	81	12	276	74	.34	8	83	6		7.3	6.6	8	C		
28	10	218	86	5	109	87	.28	6	88	4		7.2	6.4	6	C		
29	10	224	84	11	246	83	.28	6	93	4		7.0	6.4	2	C		
30	10	231	87	4	208	86	.32	7	83	5		7.6	6.7	26	C		
31															C		
TL		8586			5143			250							C		
ME	12	286	82	7	171	90	.40	9.3	80	5		7.4	6.3	13	C		
WA	17	342		12	284									19	C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

October, 19 85
Month

Marshall, Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
IP | 130029 | 10 | 85 | 500
Plant No. Mo. Yr. Sampling Point Code

DAY 1 2	WEATHER TYPE 9	WEATHER PRECIP. 14	FLOW TOTAL 19	FLOW MAX 24 RATE	RAW SEWAGE QUALITY TEMP 29	pH 34	BOD-5 39	BOD-5 44	SS 49	SS 54	TOTAL-P 59	TOTAL-P 64	VSS 69	NH_3-N 74 78	80	REMARKS OR C 9	14	19
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS.	mg/l	LBS.	mg/l	LBS	mg/l	mg/l	C			
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C			
SF															C			
01	1		2.73		59	7.3	74	1685	72	1639	1.65	38	62		C			
02	1		2.77		59	8.0	90	2079	62	1432	1.20	28	44		C			
03	1		2.75		59	7.2	48	1101	58	1330	1.40	32	56		C			
04	4	.49	2.76		56	7.8	58	1335	56	1289	1.40	32	52		C			
05	4	.01	2.66		56	7.1	60	1331	74	1642	1.65	37	56		C			
06	1		2.77		58	7.6	120	2772	82	1844	1.60	37	74		C			
07	1		2.77		58	7.9	68	1571	62	1432	1.90	44	56		C			
08	4	.30	2.71		58	7.7	80	1808	94	2125	2.10	47	64		C			
09	4	.02	2.64		58	7.6	78	1717	74	1629	1.80	40	68		C			
10	4	.16	2.75		58	7.7	74	1697	74	1697	1.60	37	60		C			
11	4	.12	2.77		56	7.4	62	1432	76	1756	2.05	47	60		C			
12	4	.46	2.73		56	7.4	52	1184	40	911	1.50	34	32		C			
13	4	.03	2.72		58	7.3	82	2549	72	1699	2.55	60	58		C			
14	4	.11	2.83		58	7.5	108	2549	120	2832	3.00	71	110		C			
15	1		2.81		58	7.5	72	1687	70	1640	2.05	48	60		C			
16	1		2.79		57	7.4	98	2280	70	1629	2.20	51	52		C			
17	1		2.78		57	7.6	66	1530	52	1206	1.80	42	48		C			
18	4	2.60	3.08		57	7.5	66	1695	90	2311	1.65	42	68		C			
19	4	.06	3.01		57	6.9	42	1054	38	954	1.30	33	34		C			
20	4	.14	3.06		57	7.0	66	1684	106	2705	1.60	41	90		C			
21	1		3.15		57	7.7	104	2732	96	2522	2.10	55	78		C			
22	1		3.05		57	7.5	56	1424	68	1730	2.10	53	50		C			
23	4	.36	3.06		58	7.5	58	1480	118	3011	1.80	46	94		C			
24	1		3.04		57	7.5	54	1369	70	1775	1.70	43	58		C			
25	1		2.99		57	8.0	64	1596	50	1247	1.95	49	42		C			
26	1		2.89		57	7.3	88	2121	86	2073	1.90	46	78		C			
27	1		2.88		56	7.4	94	2258	94	2258	2.10	50	82		C			
28	1		2.99		58	7.7	60	1496	90	2244	2.20	54	66		C			
29	1		2.96		57	7.5	76	1838	72	1741	1.80	44	52		C			
30	1		2.90		57	7.6	122	2951	108	2612	2.45	59	82		C			
31	4	.02	2.84		57	7.5	62	1469	42	995	1.90	45	30		C			
TL		4.88	88.64					55,474		55,960		1385			C			
ME			2.86				76	1789	75	1805	1.87	45	62		C			

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

October, 19 85 — Month

Marshall, Michigan — Municipality

Robert J. Swalwell — Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
ID	130029	10	85	..
	Plant No.	Mo.	Yr.	Sampling Point Code

DAY	BOD-5		SS		TOTAL-P		VSS	NH_3-N	REMARKS OR OTHER PARAMETERS									
	9	14	19	24	29	34	39	44	49	54	59	64	69	74 78	80	9	14	19
1 2	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l							C			
PN	00310	85001	00530	85002	00665	85004	00535	00610							C			
SF															C			
01	62	1412	54	1229	1.80	41	44								C			
02	66	1525	58	1340	1.60	37	36								C			
03	46	1055	50	1147	1.70	39	38								C			
04	62	1427	48	1105	1.65	38	44								C			
05	52	1154	88	1952	1.50	33	64								C			
06	64	1479	62	1432	1.70	39	52								C			
07	54	1247	74	1710	2.05	47	62								C			
08	70	1582	82	1853	1.90	43	66								C			
09	58	1277	62	1365	2.05	45	48								C			
10	60	1376	64	1468	2.05	47	48								C			
11	54	1248	48	1109	2.20	51	38								C			
12	42	956	48	1093	1.90	43	40								C			
13	66	1558	62	1463	2.30	54	44								C			
14	64	1511	62	1463	2.45	58	50								C			
15	74	1734	62	1453	2.55	60	52								C			
16	68	1582	68	1582	2.45	57	56								C			
17	60	1391	58	1345	2.30	53	46								C			
18	60	1541	82	2106	2.10	54	70								C			
19	50	1255	34	854	1.80	45	28								C			
20	56	1429	52	1327	1.80	46	42								C			
21	72	1892	66	1734	1.90	50	52								C			
22	50	1272	88	2238	1.50	38	68								C			
23	26	664	62	1582	1.80	46	50								C			
24	52	1318	62	1572	1.65	42	52								C			
25	52	1297	58	1446	1.80	45	50								C			
26	58	1398	60	1446	1.90	46	40								C			
27	70	1681	50	1201	1.95	47	40								C			
28	64	1596	56	1396	1.90	47	42								C			
29	68	1645	54	1306	1.65	40	42								C			
30	76	1838	72	1741	1.90	46	50								C			
31	60	1421	78	1847	2.65	63	60								C			
TL		43,761		45,905		1,440									C			
ME	59	1412	62	1481	1.95	46	49								C			

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

October (Month), 19 85

Marshall (Municipality), Michigan

Robert J. Swahill
Superintendent's Signature

1,2 ID | 3–8 Plant No. 130029 | 9,10 Mo. 10 | 11,12 Yr. 85 | 13–15 Sampling Point Code

DAY 1,2	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification 14
	Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MLSS 34	MLVSS 39	SETTL. 44	SDI 49	DO 54	Air Applied 59	SS 64	VSS 49	Percent Return 74	80	Waste Sludge 9	
	KCF	KCF	HRS.	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu. Ft.	%	%	%	C	KGal	See Code*
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF											4				C		
01	48		3.2	4.6	.28	1895	1341	21.0	.90	2.0	209	.40	71	72	C	15	
02			3.1	4.3	.30	1842	1290	21.0	.88	2.3	205	.38	69	62	C	15	
03			3.1	4.8	.29	1951	1343	22.0	.89	1.8	199	.42	69	63	C	15	
04			3.1	5.2	.28	2102	1500	22.0	.96	1.9	193	.47	70	62	C	15	
05			3.2								199			65	C	15	
06			3.1								202			63	C	15	
07			3.1	4.8	.27	2317	1651	28.0	.83	1.6	196	.49	71	62	C	15	
08			3.2	4.8	.26	2374	1704	29.0	.82	1.5	192	.50	72	63	C	15	
09			3.3	5.0	.29	2480	1762	28.0	.89	1.5	194	.54	70	64	C	15	
10			3.1	4.7	.26	2526	1802	31.0	.81	1.5	185	.52	70	61	C	31	
11			3.1	4.5	.27	2397	1680	29.0	.83	1.2	188	.50	70	63	C	15	
12			3.2								188			64	C	15	
13			3.2								187			64	C	15	
14			3.0	5.0	.26	2436	1790	30.0	.81	1.6	182	.51	71	60	C	33	
15			3.1	5.3	.27	2401	1710	30.0	.86	2.0	191	.50	72	61	C	15	
16			3.2	5.1	.28	2361	1672	29.0	.81	2.2	196	.50	70	62	C	15	
17			3.1	5.2	.29	2326	1658	28.0	.83	2.4	189	.49	70	63	C	15	
18			2.8	4.3	.32	2393	1672	26.0	.90	2.1	171	.50	71	55	C	106	
19			2.9								189			58	C	15	
20			2.8								190			57	C	15	
21			2.7	4.2	.35	2215	1575	28.0	.79	2.4	182	.48	71	53	C	40	
22			2.8	4.3	.30	2330	1680	26.0	.90	1.6	180	.51	72	57	C	15	
23			2.8	4.2	.28	2241	1619	26.0	.86	2.1	172	.48	73	57	C	15	
24			2.8	3.9	.28	2133	1579	24.0	.84	2.3	179	.46	74	55	C	140	
25			2.9	3.9	.30	1930	1404	22.0	.88	3.2	186	.38	80	58	C	15	
26			3.0								188			59	C	15	
27			3.0								186			61	C	48	
28			2.9	3.6	.33	1846	1350	22.0	.84	3.4	183	.43	73	57	C	15	
29			2.9	4.1	.34	1915	1370	21.0	.91	2.9	181	.40	72	58	C	15	
30			3.0	3.9	.38	1854	1331	22.0	.85	3.3	177	.41	71	52	C	15	
31			3.0	4.0	.34	1970	1436	23.0	.86	2.5	165	.42	72	59	C	15	
TL															C	773	
ME			3.0	4.5	.29	2182	1562	26.0	.86	2.1	188	.46	71	60	C	25	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

October, 19 85
Month

Marshall, Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2 | 3 8 | 9 10 | 11 12 | 13 15
IP | 1300299 | 10 | 85 | ...
Plant No. | Mo. | Yr. | Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX. FUEL 14	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS.	39 Feelg LBS	44 Water C.F.	49	54	59
PN											
SF											
01			2520			20	263	1010			
02			2520			20	350	1150			
03			2400			20	263	1070			
04			2520			20	263	1080			
05			2520			20	350	1020			
06			2520			20	175	1020			
07			2520			20	350	1350			
08			2520			20	263	1260			
09			2400			20	263	1550			
10			2400			40	263	1100			
11			2400			20	263	1310			
12			2520			10	263	1100			
13			2520			30	263	1090			
14			2520			20	263	1340			
15			2520			30	263	1300			
16			2520			30	263	1450			
17			2520			10	263	1640			
18			2400			10	175	1420			
19			2520			40	263	1380			
20			2640			20	263	1560			
21			2400			40	263	1390			
22			2520			20	263	1450			
23			2400			10	263	1650			
24			2520			30	175	1240			
25			2640			30	263	1980			
26			2520			20	263	1410			
27			2520			20	263	1460			
28			2520			30	175	1470			
29			2640			30	175	1360			
30			2520			20	263	2210			
31			2400			20	175	1460			
TL			77520			700	7886	42280			
ME			2501			23	254	1364			

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	5		920
Superintendent	1		184
Asst. Supt.	1		184
Shift Foreman			
Shift Operator	3		552
Maint. Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL AR

WEEKDAYS 9 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

Digester Volume, ft³
Primary _____
Secondary _____

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

R 4619
4833-5382

Supernatant To _____
Process Pattern _____

MONTH October 1985

DIGESTER AND SLUDGE DATA

OPERATOR R. J. Swalwell

DATE	RAW SLUDGE					DIGESTING SLUDGE						SUPERNATANT								DIGESTED SLUDGE				Gas Produced cu. ft X
	Gals. X 100	Total Solids %	Vol. Solids %	Vol. Solids Lbs/1000 c.f. Digester	pH	Temp. °F	pH	Total Solids %	Vol. Solids %	Vol. Acids Mg/l	Alkalinity Mg/l	Gals. X	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	P Mg/l	P Lbs.	5-Day BOD Mg/l	Gals. X	Total Solids %	Vol. Solids %	pH	
1	50	3.3	72		6.1																			
2	50	3.2	67		6.1																			
3	50	2.7	69		6.2																			
4	50	3.4	89		6.0																			
5	50	3.5	59		6.1																			
6	50	3.1	73		6.2																			
7	50	2.8	86		6.3																			
8	50	3.0	80		6.2																			
9	50	2.8	82		6.0																			
10	50	3.5	75		6.1																			
11	50	3.7	76		6.2																			
12	50	3.7	59		6.2																			
13	50	3.5	71		6.2																			
14	50	2.8	79		6.2																			
15	50	2.6	79		6.4																			
16	50	2.8	79		6.4																			
17	50	2.7	80		6.5																			
18	50	3.0	80		6.2																			
19	50	3.4	63		6.4																			
20	50	3.6	63		6.4																			
21	50	3.9	80		6.4									.53	51									
22	25	3.7	77		6.6																			
23	75	3.9	76		6.5																			
24	75	3.8	76		6.3																			
25	75	3.5	80		6.5																			
26	50	3.4	72		6.4																			
27	50	3.3	67		6.4																			
28	75	3.7	80		6.4																			
29	50	4.1	73		6.5																			
30	73	4.2	80		6.4																			
31	50	3.4	75		6.4																			
TOTAL	1698																							
ARITH. MEAN	55	3.4	7.5																					

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

_____ , 19____ _____ , Michigan _____
Month Municipality Superintendent

1 2 3 8 9 10 11 12 13 15
IP [ ] [ ] [ ] [ ]
Plant No. Mo. Yr. Sampling Point Code

DAY	BOD-5			SS			TOTAL-P			VSS	NH_3-N	pH	DO	F. COLI*
1 2	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	mg/l	SU	mg/l	#/100 ml
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 31615
SF														
01	17	387	77	11	250	85	.27	6	84	6		7.2	6.4	20
02	15	347	83	9	208	85	.18	4	85	7		7.7	7.2	6
03	12	275	75	2	46	97	.20	5	86	1		7.2	7.3	8
04	15	345	74	9	207	84	.19	4	86	8		7.3	6.1	16
05	14	311	77	17	377	77	.15	3	90	12		7.3	6.4	12
06	15	347	88	5	116	94	.12	3	93	3		7.3	6.9	16
07	15	347	78	4	92	94	.13	3	93	3		7.4	6.1	30
08	17	384	79	16	362	83	.12	3	94	8		7.5	6.0	20
09	17	374	78	7	154	91	.13	3	93	5		8.10	6.4	36
10	18	413	76	8	183	89	.18	4	89	4		7.4	6.3	28
11	14	323	77	5	116	93	.15	4	93	2		7.5	6.1	24
12	14	319	73	5	114	88	.13	3	91	3		7.3	6.7	14
13	17	401	79	13	307	82	.35	8	86	8		7.2	6.4	10
14	17	401	84	17	401	86	.27	6	91	13		7.4	6.1	14
15	15	351	79	2	47	97	.17	4	92	1		7.4	6.3	32
16	15	349	85	3	70	96	.24	6	89	2		7.3	6.6	26
17	15	348	77	2	46	96	.22	5	87	1		7.5	6.4	32
18	19	488	71	12	308	87	.30	8	82	9		7.5	6.4	12
19	13	326	69	3	75	92	.18	5	86	1		7.1	4.3	14
20	11	281	83	5	128	95	.15	4	91	3		7.2	6.0	12
21	22	578	79	8	210	92	.62	16	70	2		7.4	6.1	16
22	15	382	73	8	203	88	.18	6	91	5		7.4	6.1	24
23	15	383	74	8	204	93	.16	4	91	2		7.4	6.2	42
24	17	431	69	8	203	86	.20	5	88	6		7.4	6.0	28
25	20	499	64	6	150	88	.22	5	89	4		7.7	6.8	26
26	17	410	81	1	24	99	.22	5	88	1		7.2	7.2	16
27	18	432	81	8	192	91	.27	6	87	7		7.3	7.1	4
28	23	574	62	12	299	87	.25	6	89	5		7.5	7.1	18
29	20	484	74	9	218	88	.23	6	87	3		7.4	6.8	12
30	22	532	82	16	387	85	.48	12	80	9		7.5	6.9	24
31	17	403	73	7	166	88	.17	4	91	5		7.4	6.4	36
TL		12,125			5893			166						
ME	16	391	76	8	190	90	.22	5	88	5		7.4	6.9	18
WA	20	422		10	234									22

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

November, 19 85
Month

Marshall, Michigan
Municipality

Robert J. Swihart
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID | 130029 | 11 | 85 | 500
Plant No. Mo. Yr. Sampling Point Code

DAY 1 2	WEATHER TYPE 9	WEATHER PRECIP. 14	FLOW TOTAL 19	FLOW MAX RATE 24	RAW SEWAGE QUALITY TEMP 29	pH 34	BOD-5 39	BOD-5 44	SS 49	SS 54	TOTAL-P 59	TOTAL-P 64	VSS 69	NH_3-N 74	78	80	REMARKS OR C 9	14	19
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l		C			
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610		C			
SF																C			
01	4	.10	2.82		57	7.6	100	2352	64	1505	2.30	54	44			C			
02	4	.04	2.79		57	7.6	106	2466	92	2141	1.90	44	82			C			
03	3		2.81		56	7.5	80	1875	96	2250	1.90	45	84			C			
04	4	.02	2.86		57	7.6	128	1170	86	2051	2.10	50	64			C			
05	1		2.87		57	7.5	70	1676	66	1580	1.90	45	62			C			
06	4	.08	2.82		57	7.5	66	1552	86	2023	1.95	46	68			C			
07	1		2.80		57	7.5	76	1775	88	2055	1.95	46	78			C			
08	4	.07	2.76		57	7.5	56	1289	58	1335	1.30	30	58			C			
09	4	1.20	2.84		57	7.3	68	1611	34	805	1.40	33	34			C			
10	4	.14	2.86		57	7.0	92	2194	46	1098	1.40	33	42			C			
11	4	.03	2.96		56	7.5	114	2814	90	2222	2.20	54	74			C			
12	4	.17	2.91		56	7.5	96	2330	90	2184	2.45	59	66			C			
13	4	.19	2.94		56	7.4	70	1716	66	1618	1.40	34	56			C			
14	3		2.83		56	7.4	74	1747	80	1888	1.60	38	66			C			
15	4	.52	2.85		56	7.4	62	1474	66	1569	1.20	29	54			C			
16	4	.06	2.84		55	7.5	74	1753	70	1658	1.50	36	60			C			
17	4	.07	2.87		56	7.3	52	1245	48	1149	1.35	32	44			C			
18	4	.65	3.04		56	8.5	104	2637	90	2282	2.40	61	68			C			
19	4	.72	3.19		55	7.5	72	1916	66	1756	1.80	48	58			C			
20	2		3.25		55	7.4	74	2006	66	1789	1.65	48	58			C			
21	5	.18	3.23		55	7.3	72	1940	54	1455	1.40	38	46			C			
22	3		3.11		55	7.5	78	2023	62	1608	1.50	39	56			C			
23	1		3.04		55	7.4	66	1673	48	1217	1.30	33	44			C			
24	1		3.13		55	7.4	86	2245	70	1827	1.90	50	62			C			
25	4	.43	2.92		55	7.4	68	1656	86	2094	2.20	54	68			C			
26	1		2.81		55	7.3	82	1922	70	1640	2.20	52	66			C			
27	5	.19	3.20		55	7.4	44	1174	30	801	1.65	44	26			C			
28	1		3.07		55	7.0	64	1639	34	871	1.10	28	26			C			
29	1		3.09		55	7.2	46	1185	40	1031	1.60	41	18			C			
30	1		3.09		55	6.8	62	1598	54	1392	1.70	44	30			C			
31																C			
TL		4.86	88.60					55,153		48,894		1288				C			
ME			2.95				77	1838	67	1630	1.74	43	55			C			

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

November, 19 85 — Month

Marshall, Michigan — Municipality

Robert J. Swalwell — Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
ID	13.0029	11	85	..
	Plant No	Mo	Yr.	Sampling Point Code

DAY	BOD-5		SS		TOTAL-P		VSS	NH_3-N	REMARKS OR OTHER PARAMETERS									
	9	14	19	24	29	34	39	44	49	54	59	64	69	74 78	80	9	14	19
1 2	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l							C			
PN	00310	85001	00530	85002	00665	85004	00535	00610							C			
SF															C			
01	66	1552	62	1458	1.95	56	52								C			
02	98	2280	94	2187	1.95	45	82								C			
03	66	1547	66	1547	1.80	42	54								C			
04	116	2769	72	1717	2.05	49	60								C			
05	66	1580	64	1532	1.90	45	60								C			
06	60	1411	58	1364	1.35	32	48								C			
07	78	1821	62	1448	1.70	40	44								C			
08	62	1427	28	645	1.60	37	22								C			
09	74	1753	48	1137	1.65	39	46								C			
10	70	1670	42	1001	1.50	36	32								C			
11	88	2172	72	1777	2.05	51	66								C			
12	74	1796	54	1311	1.40	34	42								C			
13	70	1716	66	1618	1.80	44	58								C			
14	78	1841	68	1605	1.60	38	56								C			
15	54	1284	54	1284	1.50	36	52								C			
16	58	1374	60	1421	1.65	39	58								C			
17	52	1245	74	1771	1.60	38	58								C			
18	68	1724	70	1775	2.10	53	50								C			
19	54	1437	54	1437	1.80	48	46								C			
20	60	1626	56	1518	1.70	46	44								C			
21	58	1562	50	1347	1.70	46	38								C			
22	54	1401	52	1349	1.90	49	44								C			
23	70	1775	60	1521	1.80	46	50								C			
24	62	1618	46	1201	2.30	60	38								C			
25	62	1510	74	1802	2.10	51	54								C			
26	58	1359	42	484	2.05	48	34								C			
27	40	1068	30	801	1.50	40	24								C			
28	40	1024	26	666	1.40	36	20								C			
29	56	1443	28	722	1.50	39	20								C			
30	36	928	42	1082	1.70	44	20								C			
31															C			
TL		47713		41028		1307									C			
ME	65	1590	56	1368	1.75	44	46								C			

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

November, 19 85
Month

Marshall, Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

ID 1300339 11 85
Plant No. Mo. Yr. Sampling Point Code

DAY	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification	
	Aeration Volume	Reaeration Volume	Detention Time	Sludge Age	Organic Loading	MLSS	MLVSS	SETTL.	SDI	DO	Air Applied	SS	VSS	Percent Return		Waste Sludge		
	KCF	KCF	HRS.	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu. Ft.	%	%	%	C	KGal	See Code*	
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889	
SF											4				C			
01	48		3.0	4.1	.39	1997	1453	21.0	.95	2.5	159	.44	68	59	C	15		
02			3.1								163			60	C	15		
03			3.1								170			61	C	33		
04			3.0	3.4	.45	1934	1543	23.0	.84	2.5	169	.40	74	60	C	15		
05			3.0	3.8	.42	2213	1641	25.0	.88	2.5	168	.47	70	59	C	15		
06			3.0	3.9	.41	2166	1632	27.0	.80	2.4	165	.46	76	60	C	15		
07			3.1	3.8	.45	2017	1510	27.0	.74	2.9	172	.42	75	61	C	15		
08			3.1	4.3	.43	2076	1557	26.0	.80	2.7	171	.44	69	61	C	28		
09			3.0								163			60	C	15		
10			3.0								171			58	C	15		
11			2.9	4.5	.49	1984	1468	29.0	.68	5.2	168	.44	74	57	C	15		
12			3.0	5.1	.41	2127	1608	28.0	.76	2.4	149	.44	76	59	C	28		
13			2.9	5.2	.40	2241	1668	30.0	.75	2.3	156	.46	75	58	C	15		
14			3.0	5.3	.40	2257	1685	30.0	.75	3.1	163	.46	74	60	C	15		
15			3.0								160			59	C	15		
16			3.0								165			60	C	15		
17			3.0								163			54	C	15		
18			2.8	4.0	.40	2169	1637	29.0	.75	1.1	145	.47	76	61	C	15		
19			2.7	4.0	.38	2280	1640	23.0	.99	2.4	175	.48	75	54	C	15		
20			2.7	3.5	.41	1973	1567	24.0	.82	5.5	148	.43	75	54	C	30		
21			2.7	3.6	.44	1933	1403	24.0	.81	4.5	141	.43	73	54	C	15		
22			2.8	3.8	.40	1925	1414	23.0	.84	4.9	197	.43	72	55	C	31		
23			2.8								193			54	C	15		
24			2.8								200			53	C	15		
25			3.0	4.1	.42	1857	1349	21.0	.88	5.3	195	.40	75	57	C	15		
26			3.1	4.5	.39	1903	1377	19.0	1.06	4.2	191	.43	72	62	C	29		
27			2.7	4.1	.43	1876	1374	19.0	.99	4.1	191	.43	73	54	C	15		
28			2.8								196			56	C	15		
29			2.8								196			42	C	15		
30			2.8								194			41	C	15		
31															C			
TL															C	539		
ME			2.9	4.2	.42	2051	1532	25.0	.84	3.4	175	.44	73	57	C	18		

Digester Volume, ft³
Primary _____
Secondary _____

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

R 4619
4833-5382

Supernatant To _____
Process Pattern _____

MONTH November 1985

DIGESTER AND SLUDGE DATA

OPERATOR _____

DATE	RAW SLUDGE					DIGESTING SLUDGE						SUPERNATANT								DIGESTED SLUDGE				Gas Produced cu. ft X
	Gals. X 100	Total Solids %	Vol. Solids %	Vol. Solids Lbs/ 1000 c.f. Digester	pH	Temp. °F	pH	Total Solids %	Vol. Solids %	Vol. Acids Mg/l	Alkalinity Mg/l	Gals. X	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	P Mg/l	P Lbs.	5-Day BOD Mg/l	Gals. X	Total Solids %	Vol. Solids %	pH	
1	50	3.5	80		6.5																			
2	50	3.6	60		6.3																			
3	50	3.8	65		6.3																			
4	75	3.3	76		6.3																			
5	75	4.2	72		6.5																			
6	75	4.1	71		6.5																			
7	75	3.7	84		6.4																			
8	75	5.1	82		6.3																			
9	50	3.9	85		6.3																			
10	50	3.7	58		6.1																			
11	75	3.7	80		6.3																			
12	75	4.1	64		6.5																			
13	75	4.1	74		6.4																			
14	75	4.6	70		6.4																			
15																								
16	50	4.0	82		6.4																			
17	50	4.3	75		6.3																			
18	50	4.3	74		6.3																			
19	75	4.3	76		6.3																			
20	125	4.3	73		6.4																			
21	112	3.9	67		6.4																			
22	120	4.1	64		6.5																			
23	50	3.7	75		6.3																			
24	50	3.8	85		6.4																			
25	50	3.3	71		6.5																			
26	50	4.3	68		6.4																			
27	50	4.0	65		6.4																			
28	50	3.7	67		6.3																			
29	50	3.6	86		6.4																			
30	50	3.5	60		6.0																			
31																								
TOTAL	1907																							
ARITH. MEAN	66	3.9	73																					

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

November, 19 85
Month

Marshall, Michigan
Municipality

Robert J. Swelwell
Superintendent's Signature

1 2 ID | 3 8 Plant No. 130039 | 9 10 Mo. 11 | 11 12 Yr. 85 | 13 15 Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX.FUEL 14 GAS CF	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS.	39 Feels LBS	44 Water CF	49	54	59
PN											
SF		2									
01			2400				263	1300			
02			2400				175	1170			
03			2520				263	1270			
04			2520				263	1180			
05			2520				175	1340			
06			2520				263	1100			
07			2520				175	1240			
08			2520				263	1290			
09			2520				263	1030			
10			2640				263	1030			
11			2880				175	1340			
12		2	2520				263	1250			
13		2	2400				263	1330			
14		2	2520				175	1260			
15		2	2640				175	1290			
16		6	2520				175	1120			
17		8	2400				263	1280			
18		1	2400				263	1260			
19		2	2400				175	1300			
20		8	2760				263	1220			
21		7	3000				263	1360			
22		72	2760				263	1360			
23		70	2760				175	1130			
24		90	2880				175	1260			
25		81	2760				175	1230			
26		63	2880				263	1380			
27		40	2640				263	1310			
28		24	2880				175	1250			
29		5	2760				88	1180			
30		5	2760					1060			
31											
TL		490	78.100				6396	37.220			
ME		26	2620				221	1241			

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours	Va
TOTAL	5		768	
Superintendent	1		152	
Asst. Supt.	1		152	
Shift Foreman				
Shift Operator	3		464	
Maint. Supervisor				
Mechanic				
Chemist				
Lab Technician				
Clerk-Typist				
Other				

GIVE THE HOURS PER DAY PLANT PERSONNEL ARE

WEEKDAYS 9 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

_____ Month , 19 _____ _____ Municipality , Michigan _____ Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
IP [ ] [ ] [ ] [ ]
Plant No. Mo. Yr. Sampling Point Code

DAY	BOD-5			SS			TOTAL-P			VSS	NH_3-N	pH	DO	F. COLI*		T. COLI*	REMARKS
	9 14 19			24 29 34			39 44 49			54	59	64	69	74	80	9	14 15
1 2	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	mg/l	SU	mg/l	#/100 ml	C	#/100 ml	
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 31615	C	31504 31505	
SF															C		
01	20	470	80	4	94	94	.18	4	92	2		7.5	6.4		C		
02	21	489	80	9	209	90	.22	5	88	7		7.5	6.6		C		
03	17	398	79	7	164	93	.17	4	91	5		7.5	6.4		C		
04	23	549	82	11	262	87	.70	17	67	6		7.2	3.7		C		
05	20	479	71	10	239	85	.76	18	60	6		7.4	3.3		C		
06	23	541	65	24	564	72	.82	19	58	21		7.3	3.3		C		
07	13	304	83	6	140	93	.12	3	94	4		7.4	3.4		C		
08	17	391	70	3	64	95	.15	3	88	2		7.4	3.4		C		
09	16	380	76	3	71	91	.12	3	91	2		7.1	[illegible]	3.6	C		
10	15	358	84	2	48	96	.12	3	91	1		6.9	[illegible]	3.8	C		
11	19	469	83	4	99	96	.35	9	84	3		7.4	5.0		C		
12	19	461	80	6	146	94	.20	5	93	4		7.5	3.2		C		
13	20	490	71	8	196	75	.22	5	84	7		7.2	3.3		C		
14	21	496	73	6	142	93	.22	5	86	5		7.3	3.4		C		
15	17	404	72	13	309	80	.15	4	90	10		7.3	3.4		C		
16	23	545	69	29	687	54	.87	21	42	21		7.4	4.3		C		
17	21	503	60	24	574	71	.53	13	60	8		7.3	5.3		C		
18	21	532	80	21	532	77	.78	20	68	12		7.8	3.8		C		
19	20	532	72	7	186	89	.20	5	89	5		7.4	2.8		C		
20	15	407	80	11	298	83	.20	5	88	9		7.3	5.0		C		
21	22	593	69	8	215	85	.27	7	81	6		7.3	4.7		C		
22	23	597	71	10	359	84	.27	7	82	8		7.4	5.4		C		
23	20	507	70	13	330	73	.30	8	77	11		7.3	5.6		C		
24	20	522	77	11	287	84	.32	8	83	9		7.3	5.7		C		
25	18	438	74	19	462	78	.38	9	83	12		7.4	5.9		C		
26	22	516	73	16	234	86	.40	9	82	7		7.3	4.6		C		
27	19	507	57	14	374	53	.23	6	86	11		7.3	4.6		C		
28	17	435	73	9	230	74	.28	7	75	8		7.1	3.9		C		
29	18	464	61	11	283	73	.50	13	69	8		7.4	4.6		C		
30	17	438	73	12	309	78	.71	18	58	4		7.0	4.3		C		
31															C		
TL		14115			8012			263							C		
ME	19	471	74	11	267	83	.36	9	79	7		7.3	4.4		C		
WA	21	526		16	400										C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

December , 19 85
Month

Marshall , Michigan
Municipality

Robert J. Swallow
Superintendent's Signature

1 2 | 3 8 | 9 10 | 11 12 | 13 15
ID | 1300299 | 12 | 85 | 500
Plant No. | Mo. | Yr. | Sampling Point Code

DAY 1 2	WEATHER		FLOW		RAW SEWAGE QUALITY											REMARKS OR (		
	TYPE 9	PRECIP. 14	TOTAL 19	MAX 24 RATE	TEMP 29	pH 34	BOD-5 39 44		SS 49 54		TOTAL-P 59 64		VSS 69	NH_3-N 74 78	80	9	14	1
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l	C			
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C			
SF															C			
01	5	.33	3.23		54	7.1	78	2101	66	1778	1.80	48	42		C			
02	5	.02	3.14		54	7.4	78	2043	94	2462	2.05	54	78		C			
03	3		3.18		55	7.3	72	1910	106	2811	2.20	58	90		C			
04	5	.01	3.15		55	7.3	90	2364	96	2522	2.20	58	86		C			
05	5	.34	3.09		55	7.3	68	1752	56	1443	3.30	85	42		C			
06	3		3.04		55	7.4	70	1775	34	862	1.60	41	28		C			
07	3		3.04		55	7.3	72	1835	58	1471	2.10	53	44		C			
08	3		3.02		52	7.1	74	1864	44	1108	1.60	40	36		C			
09	4	.10	3.15		53	7.2	68	1786	66	1734	1.80	47	54		C			
10	5	.12	3.14		53	7.2	74	1938	52	1362	1.90	50	46		C			
11	5	.15	3.07		53	7.3	84	2151	60	1536	2.55	65	54		C			
12	3		3.10		53	7.2	88	2275	74	1913	2.10	54	62		C			
13	5	.03	3.04		53	7.3	96	2434	102	2586	2.05	52	92		C			
14	5	.01	3.00		53	7.3	78	1952	84	2102	1.65	41	74		C			
15	5	.03	3.04		52	7.4	78	1978	60	1521	1.80	46	48		C			
16	5	.08	3.11		52	7.3	76	1971	60	1556	1.70	44	54		C			
17	5	.02	3.06		53	7.2	84	2144	60	1531	1.80	46	56		C			
18	5	.02	3.03		53	7.4	74	1870	90	2274	1.95	49	64		C			
19	5	.02	3.06		53	7.4	70	1786	64	1633	1.80	46	60		C			
20	5	.04	2.92		53	7.4	66	1607	70	1704	1.70	41	62		C			
21	5	.07	2.42		53	7.3	94	1897	90	1816	2.30	46	84		C			
22	3		2.71		53	7.2	80	1808	74	1673	1.65	37	56		C			
23	5	.09	2.91		51	7.4	76	1844	76	1844	1.65	40	62		C			
24	1		2.90		51	7.3	86	2080	84	2032	1.70	41	60		C			
25	5	.02	2.83		51	7.2	62	1463	58	1369	2.20	52	42		C			
26	5	.10	2.84		51	7.4	76	1800	50	1184	1.90	45	44		C			
27	5	.04	2.80		51	7.4	74	1728	64	1495	1.70	40	48		C			
28	3		2.84		51	7.3	86	2037	90	2132	2.65	63	70		C			
29	3		2.83		51	7.3	76	1794	56	1322	1.80	42	50		C			
30	1		2.92		51	7.3	66	1607	54	1315	2.10	51	48		C			
31	5	.01	2.88		51	7.4	72	1729	66	1585	1.70	41	53		C			
TL		1.65	92.49					59,313		53676		1516			C			
ME			2.98				77	1913	70	1731	1.97	49	58		C			

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

December, 19 85
Month

Marshall, Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID 1300229 12 85 . .
Plant No Mo Yr Sampling Point Code

DAY	BOD-5 9 14		SS 19 24		TOTAL-P 29 34		VSS 39	NH_3-N 44	REMARKS OR OTHER PARAMETERS 49	54	59	64	69	74 78	80	9	14	1
1 2	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l							C			
PN	00310	85001	00530	85002	00665	85004	00535	00610							C			
SF															C			
01	52	1400	60	1616	2.10	57	34								C			
02	72	1886	58	1519	1.95	51	46								C			
03	56	1485	60	1591	2.10	56	46								C			
04	76	1997	60	1576	2.65	70	52								C			
05	64	1649	66	1701	2.55	66	42								C			
06	62	1572	32	811	2.40	61	26								C			
07	64	1623	52	1318	2.10	53	44								C			
08	64	1612	56	1410	2.10	53	46								C			
09	54	1419	46	1208	2.40	63	40								C			
10	90	2357	56	1467	2.75	72	50								C			
11	56	1434	54	1383	2.55	65	46								C			
12	60	1551	54	1396	2.75	71	44								C			
13	56	1419	86	2180	2.45	62	84								C			
14	56	1401	82	2052	2.30	58	66								C			
15	56	1420	44	1116	2.40	61	34								C			
16	52	1349	52	1349	2.40	62	46								C			
17	68	1735	58	1480	2.55	65	48								C			
18	50	1264	82	2072	2.55	64	56								C			
19	56	1429	74	1889	2.40	61	66								C			
20	54	1315	64	1559	2.40	58	24								C			
21	64	1292	52	1050	2.40	48	48								C			
22	62	1401	60	1356	2.40	54	44								C			
23	64	1553	76	1844	1.60	39	62								C			
24	66	1596	74	1790	1.65	40	64								C			
25	50	1180	50	1180	1.30	31	38								C			
26	64	1516	52	1232	1.60	38	38								C			
27	56	1308	52	1214	1.40	33	42								C			
28	58	1374	54	1279	1.65	39	36								C			
29	58	1369	50	1180	1.60	38	40								C			
30	60	1461	48	1169	1.80	44	46								C			
31	50	1201	56	1345	1.50	36	50								C			
TL		46568		45332		1669									C			
ME	60	1502	59	1462	2.15	54	47								C			

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

December, 19 85
Month

Midland, Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

ID 13.06.29 12 85
Plant No. Mo. Yr. Sampling Point Code

DAY	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification
	Aeration Volume	Reaeration Volume	Detention Time	Sludge Age	Organic Loading	MLSS	MLVSS	SETTL.	SDI	DO	Air Applied	SS	VSS	Percent Return		Waste Sludge	
	KCF	KCF	HRS.	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu. Ft.	%	%	%	C	KGal	See Code*
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF											4				C		
01	48		2.7								194			38	C	21	
02			2.7	4.4	.37	1594	1142	15.0	1.06	4.2	201	.47	74	38	C	15	
03			2.7	4.3	.35	1658	1258	14.0	1.18	2.8	188	.45	76	39	C	15	
04			2.7	3.9	.38	1656	1265	15.0	1.10	2.4	185	.47	76	30	C	15	
05			2.8	3.3	.44	1511	1143	15.0	1.01	2.2	188	.58	74	28	C	15	
06			2.8	3.6	.40	1665	1271	15.0	1.11	2.4	185	.78	74	29	C	15	
07			2.8								186			28	C	15	
08			2.9								182			29	C	15	
09			2.8	3.7	.45	1741	1216	16.0	1.08	4.6	184	.57	74	31	C	15	
10			2.7	3.7	.42	1721	1259	19.0	.90	3.9	180	.57	73	31	C	15	
11			2.8	4.2	.40	1860	1375	20.0	.93	1.8	181	.60	74	31	C	15	
12			2.8	4.0	.44	1734	1258	21.0	.83	3.4	184	.57	72	36	C	15	
13			2.8	3.8	.40	1841	1343	21.0	.88	3.1	186	.52	73	40	C	15	
14			2.9								187			41	C	15	
15			2.8								183			37	C	18	
16			2.8	3.3	.41	1773	1275	19.0	.93	5.4	185	.51	71	36	C	15	
17			2.8	3.2	.40	1690	1220	18.0	.93	4.1	189	.51	72	36	C	15	
18			2.9	3.0	.40	1651	1201	18.0	.92	4.8	190	.51	73	36	C	15	
19			2.8	3.9	.30	2256	1553	18.0	1.25	4.3	190	.53	68	37	C	32	
20			3.0	3.5	.33	1839	1376	14.0	.97	4.3	187	.55	82	45	C	15	
21			3.6								187			44	C	15	
22			3.2								177			40	C	15	
23			3.0	3.5	.35	1924	1386	18.0	1.07	4.0	174	.55	72	32	C	15	
24			3.0								185			32	C	15	
25			3.0								193			33	C	15	
26			3.0	3.5	.41	1680	1186	17.0	.99	6.4	181	.53	71	32	C	15	
27			3.1	3.7	.40	1692	1197	16.0	1.06	5.5	186	.55	71	32	C	15	
28			3.0								186			31	C	15	
29			3.0								186			31	C	15	
30			3.0	3.3	.46	1441	1050	13.0	1.10	5.3	179	.52	72	29	C	40	
31			3.0	3.7	.43	1526	1114	13.0	1.17	4.5	183	.54	73	29	C	15	
TL															C	516	
ME			2.9	3.7	.40	1723	1257	17.0	1.02	4.0	186	.54	73	34	C	17	

Digester Volume, ft³
Primary _____
Secondary _____

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

R 4619
4833-5382

Supernatant To _____
Process Pattern _____

MONTH December 19 85

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE					DIGESTING SLUDGE						SUPERNATANT								DIGESTED SLUDGE				Gas Produced cu. ft X
	Gals. X 100	Total Solids %	Vol. Solids %	Vol. Solids Lbs/ 1000 c.f. Digester	pH	Temp. °F	pH	Total Solids %	Vol. Solids %	Vol. Acids Mg/l	Alkalinity Mg/l	Gals. X	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	P Mg/l	P Lbs.	5-Day BOD Mg/l	Gals. X	Total Solids %	Vol. Solids %	pH	
1	50	2.3	71		6.2																			
2	50	4.5	70		6.1																			
3	50	3.8	82		6.3																			
4	50	3.8	71		6.3																			
5	50	4.2	76		6.1																			
6	50	4.1	70		6.2																			
7	50	3.7	70		6.0																			
8	50	3.7	80		5.9																			
9	65	4.1	64		6.1																			
10	50	4.6	76		6.0																			
11	50	3.8	79		6.1																			
12	50	3.6	84		6.1																			
13	50	3.9	80		6.0																			
14	50	3.1	79		6.0																			
15	50	3.9	68		5.8																			
16	50	3.9	73		6.1																			
17	50	3.7	84		6.1																			
18	50	4.3	80		6.0																			
19	50	3.8	70		5.9																			
20	50	3.8	84		5.9																			
21	50	3.5	84		5.7																			
22	50	4.1	62		6.0																			
23	50	3.5	71		5.9																			
24	50	3.4	80		5.8																			
25	50	3.8	73		5.9																			
26	50	3.8	81		6.0																			
27	50	3.6	82		5.9																			
28	50	3.6	79		5.9																			
29	50	3.4	72		6.0																			
30	50	3.0	93		6.0																			
31	50	3.6	72		6.0																			
TOTAL	1565																							
ARITH. MEAN	50	3.7	76																					

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

December , 19 85
Month

MARSHALL , Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID 130029 12 85
Plant No. Mo. Yr. Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX.FUEL 14 GAS CF	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS.	39 $FeCl_3$ LBS	44 WATER CF	49	54	59
PN											
SF		2									
01		13	2760					1140			
02		86	2880					1100			
03		102	2880				263	1170			
04		97	2640				263	1140			
05		71	2760					740			
06		44	2640					1050			
07		68	2760				350	740			
08		42	2520				350	830			
09		8	2760				350	830			
10		60	2640				350	710			
11		58	2640				350	770			
12		23	2880				350	1040			
13		72	2760				350	1410			
14		102	2760				263	890			
15		110	2760				263	930			
16		88	2880				350	1010			
17		105	2760				350	1900			
18		37	2520				263	880			
19		109	2880				263	980			
20		123	2880				350	960			
21		114	2880				263	920			
22		100	2640				263	910			
23		68	2640				350	1630			
24		32	2760				350	900			
25		107	2880				350	900			
26		136	2760				350	890			
27		102	2760				350	820			
28		106	2760				175	750			
29		108	2760				263	815			
30		96	2640				175	815			
31		72	2760				88	810			
TL		2549	85,200				8055	30,430			
ME		82	2748				298	982			

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	5		808
Superintendent	1		160
Asst. Supt.	1		160
Shift Foreman			
Shift Operator	3		488
Maint. Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL AR

WEEKDAYS 9 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

Dec (Month), 19__ | _____ (Municipality), Michigan | _____ (Superintendent's Signature)

ID: Plant No. | Mo. | Yr. | Sampling Point Code

DAY	BOD-5			SS			TOTAL-P			VSS	NH_3-N	pH	DO	F. COLI*		T. COLI*	REMARK
	9 14 19			24 29 34			39 44 49			54	59	64	69	74	80	9	14
1 2	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	LBS.	% Rem.	mg/l	mg/l	SU	mg/l	#/100 ml	C	#/100 ml	
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 31615	C	31504 31505	
SF															C		
01	22	593	72	17	458	74	1.00	27	44	12		7.3	4.4		C		
02	23	602	71	25	655	73	.90	24	56	19		7.2	5.2	5.2	C		
03	23	610	68	18	477	83	.56	15	75	15		7.3	4.1		C		
04	23	604	74	21	551	78	.66	17	70	17		7.3	4.1		C		
05	23	593	66	16	412	40	.68	18	79	11		7.2	3.2		C		
06	23	583	67	8	203	76	.51	13	68	6		7.4	3.5		C		
07	24	608	76	11	279	81	.34	9	84	8		7.1	3.7		C		
08	20	504	73	10	252	77	.32	8	80	8		7.0	3.8		C		
09	20	525	71	8	210	88	.28	7	88	6		7.3	4.3		C		
10	23	602	69	9	236	83	.51	13	73	6		7.2	4.0		C		
11	21	538	75	9	230	85	.27	7	89	7		7.1	3.1		C		
12	24	620	73	9	233	88	.30	8	86	7		7.3	3.6		C		
13	21	532	78	20	507	80	.30	8	85	18		7.2	3.6		C		
14	24	600	69	25	626	76	.35	9	79	23		7.3	3.5		C		
15	24	608	69	12	304	80	.42	11	77	9		7.3	5.4		C		
16	24	622	68	16	415	73	.44	11	74	10		7.3	5.4		C		
17	23	587	73	17	434	72	.46	12	74	13		7.2	5.0		C		
18	23	581	69	22	536	76	.46	12	76	12		7.3	5.1		C		
19	22	561	69	23	638	61	.47	12	74	18		7.2	5.0		C		
20	24	584	64	22	536	69	.44	11	74	12		7.4	4.8		C		
21	16	323	83	9	182	90	.25	5	89	5		7.0	5.1		C		
22	24	542	70	15	339	80	.42	9	75	11		7.0	4.9		C		
23	24	582	68	7	170	91	.27	6	84	5		7.3	4.3		C		
24	23	556	73	24	580	71	.35	8	79	20		7.0	4.9		C		
25	20	472	68	20	472	66	.37	9	83	15		7.0	4.9		C		
26	23	545	70	15	355	70	.37	9	81	9		7.3	6.6		C		
27	22	514	70	21	490	67	.32	7	81	13	4.6	7.2	5.7		C		
28	16	379	81	11	261	83	.32	8	88	9		7.0	6.4		C		
29	19	448	75	9	212	84	.32	8	82	4		7.0	5.8		C		
30	21	511	68	8	195	85	.30	7	86	5	3.4	7.3	5.7		C		
31	17	408	76	12	288	82	.41	10	76	9	3.7	7.4	4.7		C		
TL		16637			11756			338							C		
ME	22	537	71	15	379	77	.43	11	78	11		7.2	4.6		C		
WA	23	599		20	501										C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

January Month, 19 87

Marshall Municipality, Michigan

Robert J. Swahill Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID 13aa39 01 87 500
Plant No Mo Yr Sampling Point Code

DAY 1 2	WEATHER TYPE 9	WEATHER PRECIP. 14	FLOW TOTAL 19	FLOW MAX 24 RATE	RAW SEWAGE QUALITY TEMP 29	pH 34	BOD-5 39 44		SS 49 54		TOTAL-P 59 64		VSS 69	NH_3-N 74 78	80	REMARKS OR OT 9	14	19
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS.	mg/l	LBS.	mg/l	LBS.	mg/l	mg/l	C			
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C			
SF															C			
01	3		2.80		51	7.3	64	1495	62	1448	1.95	46	48		C			
02	5	.02	2.87		51	7.3	56	1340	56	1346	1.65	39	42		C			
03	1		2.82		51	7.4	66	1553	40	941	1.70	40	30		C			
04	1		2.43		51	7.3	72	1753	64	1559	4.30	105	56		C			
05	1		3.05		52	7.3	88	2238	68	1730	2.40	61	50		C			
06	3		2.90		52	7.8	62	1500	76	1838	2.05	50	54		C			
07	4	.03	2.88		52	7.5	80	1921	80	1921	2.90	70	60		C			
08	3		2.89		52	7.3	88	2121	82	1976	3.10	75	70		C			
09	5	.57	2.82		52	7.7	66	1553	54	1270	2.30	54	64		C			
10	5	.04	2.78		52	7.8	52	1206	34	788	1.65	38	28		C			
11	3		2.83		52	7.4	64	1511	58	1369	1.80	42	50		C			
12	1		2.89		52	7.5	68	1634	80	1928	2.45	59	70		C			
13	1		2.90		52	7.3	76	1838	76	1838	2.75	67	31		C			
14	4	.14	2.89		51	7.4	62	1494	62	1444	1.90	46	48		C			
15	1		2.91		51	7.1	76	1844	64	1553	1.95	47	48		C			
16	1		2.91		51	7.3	64	1553	70	1699	4.30	104	24		C			
17	5	.28	2.90		51	7.2	108	2612	74	1790	3.85	93	60		C			
18	1		2.92		50	7.5	118	2874	64	1559	1.40	46	46		C			
19	5	.55	2.99		51	7.5	136	3335	126	3089	1.70	42	102		C			
20	5	.01	2.98		51	7.3	72	1789	60	1491	3.40	85	50		C			
21	5	.02	3.02		51	7.4	88	2216	84	2116	2.85	72	60		C			
22	1		2.97		51	7.5	100	2477	92	2279	2.55	63	54		C			
23	5	.02	2.99		51	7.5	74	1845	64	1596	2.65	66	52		C			
24	3		2.86		51	7.5	86	2051	72	1717	2.10	50	66		C			
25	1		2.85		51	7.4	74	1759	56	1331	2.10	50	52		C			
26	1		2.99		51	7.3	116	2893	110	2743	1.95	49	92		C			
27	5	.01	2.98		51	7.4	120	2982	66	1640	2.65	66	56		C			
28	1		3.00		51	7.2	80	2001	54	1351	4.80	120	42		C			
29	5	.35	2.99		51	7.4	136	3391	132	3292	4.30	107	78		C			
30	5	.02	3.00		51	7.2	26	1651	30	751	2.45	61	20		C			
31	1		2.84		51	7.4	72	1705	58	1374	2.55	60	48		C			
TL		2.05	90.32					62,138		52,811		1973			C			
ME			2.91				82	2004	70	1704	2.61	64	53		C			

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

January, 19 87 — Month

Marshall, Michigan — Municipality

Robert J. Sunshell — Superintendent's Signature

1 2	3 8	9 10	11 12	13 15
ID	130029	01	87	
	Plant No	Mo	Yr	Sampling Point Code

DAY	BOD-5		SS		TOTAL-P		VSS	NH_3-N	REMARKS OR OTHER PARAMETERS									
	9	14	19	24	29	34	39	44	49	54	59	64	69	74	78	80	9	14
1 2	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l								C		
PN	00310	85001	00530	85002	00665	85004	00535	00610								C		
SF																C		
01	82	1915	38	887	1.70	40	30									C		
02	46	1101	46	1101	1.60	38	38									C		
03	50	1176	28	659	1.40	33	22									C		
04	56	1364	50	1218	3.75	91	38									C		
05	68	1730	52	1323	2.30	59	36									C		
06	42	1016	60	1451	1.70	41	42									C		
07	66	1585	46	1105	2.65	64	40									C		
08	76	1834	52	1253	2.55	61	46									C		
09	60	1411	44	1035	1.95	46	36									C		
10	36	835	38	881	1.35	31	28									C		
11	44	1038	44	1038	1.50	35	36									C		
12	48	1157	48	1157	1.90	46	38									C		
13	54	1306	50	1209	2.40	58	42									C		
14	38	916	44	1061	1.70	41	38									C		
15	50	1213	48	1165	1.80	44	36									C		
16	44	1068	52	1262	3.50	85	30									C		
17	70	1693	62	1500	3.65	88	42									C		
18	66	1607	48	1169	1.90	46	28									C		
19	84	2060	58	1422	1.40	34	48									C		
20	52	1292	44	1094	2.75	68	34									C		
21	50	1259	62	1562	1.90	48	62									C		
22	60	1486	54	1338	1.70	42	36									C		
23	42	1047	60	1496	1.80	45	52									C		
24	60	1431	60	1431	1.35	32	52									C		
25	50	1188	38	903	1.35	32	34									C		
26	62	1546	54	1347	1.70	42	42									C		
27	84	2088	52	1292	1.65	41	48									C		
28	60	1501	58	1451	3.40	85	50									C		
29	78	1945	62	1546	1.80	45	48									C		
30	54	1351	46	1151	1.65	41	32									C		
31	52	1232	54	1279	1.40	33	42									C		
TL		43,391		37,786		1535										C		
ME	58	1400	50	1219	2.04	50	40									C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

January, 19 87 (Month) — Marshall (Municipality), Michigan — Robert J. Sandwell (Superintendent's Signature)

1 2	3 8	9 10	11 12	13 15
ID	13.0029	01	87	
	Plant No	Mo.	Yr	Sampling Point Code

DAY 1 2	AERATION SYSTEM: Aeration Volume 9	Reaeration Volume 14	Detention Time 19	Sludge Age 24	Organic Loading 29	MIXED LIQUOR: MLSS 34	MLVSS 39	SETTL. 44	SDI 49	DO 54	Air Applied 59	SECONDARY SLUDGE: SS 64	VSS 49	Percent Return 74	80	Waste Sludge 9	Process Modification 14
	KCF	KCF	HRS.	DAYS	F/M	mg/l	mg/l	%	%	mg/l	Cu. Ft.	%	%	%	C	KGal	See Code*
PN	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF											4				C		
01	48		3.1								204			103	C		
02			3.0	3.5	.43	1317	1067	15.0	.88	5.2	208	.23	75	101	C		
03			3.0								212			103	C		
04			3.0								210			100	C		
05			2.8	3.9	.45	1447	1051	14.0	1.03	4.1	208	.29	71	96	C		
06			2.9	4.3	.39	1576	1163	15.0	1.05	3.6	199	.28	73	102	C		
07			3.0	3.6	.46	1335	1021	14.0	.95	5.6	206	.26	70	102	C		
08			3.0	4.0	.41	1555	1143	15.0	1.04	5.5	206	.29	73	101	C		
09			3.0	4.0	.44	1464	1068	15.0	.98	3.2	208	.29	73	103	C		
10			3.1								198			106	C		
11			3.0								205			103	C		
12			3.0	3.7	.42	1403	1014	13.0	1.08	7.1	208	.26	73	98	C		
13			3.0	3.6	.4[illegible]	1342	972	13.0	1.03	5.1	206	.32	73	103	C		
14			3.0	3.5	.43	1312	953	12.0	1.09	6.1	200	.35	72	101	C		
15			3.0	4.0	.36	1460	1056	14.0	1.04	6.1	208	.34	71	103	C		
16			3.0	4.2	.33	1563	1119	14.0	1.11	6.0	212	.30	68	98	C		
17			3.0								207			96	C		
18			3.0								208			102	C		
19			2.9	3.4	.46	1430	1016	14.0	1.02	5.2	189	.28	70	92	C		
20			2.9	3.6	.44	1512	1101	14.0	1.08	3.0	141	.30	67	89	C		
21			2.9	3.4	.46	1526	1085	15.0	1.02	2.7	132	.32	67	86	C		
22			2.9	3.1	.51	1382	987	14.0	.99	2.7	130	.36	71	63	C		
23			2.9	3.7	.41	1705	1222	18.0	.95	1.4	123	.38	71	87	C		
24			3.0								115			92	C		
25			3.0								111			92	C		
26			2.9	3.1	.45	1400	1004	16.0	.88	2.4	114	.28	69	87	C		
27			2.9	3.0	.49	1363	990	16.0	.85	3.5	112	.36	72	87	C		
28			2.9	3.1	.49	1404	1032	16.0	.88	.7	112	.32	73	86	C		
29			2.9	3.2	.49	1443	1042	16.0	.90	2.0	155	.28	72	86	C		
30			2.9	3.3	.50	1463	1068	17.0	.86	3.5	167	.36	72	87	C		
31			3.0								168			92	C		
TL															C		
ME			3.0	3.6	.44	1448	1056	14.8	.99	4.0	177	.31	71	95	C		

Digester Volume, ft³
Primary _____
Secondary _____

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

Supernatant To _____
Process Pattern _____

R 4619
4833-5382

MONTH January 1987

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE					DIGESTING SLUDGE						SUPERNATANT								DIGESTED SLUDGE				Gas Produced cu. ft X
	Gals. X 100	Total Solids %	Vol. Solids %	Lbs/ 1000 c.f. Digester	pH	Temp. °F	pH	Total Solids %	Vol. Solids %	Vol. Acids Mg/l	Alkalinity Mg/l	Gals. X	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	P Mg/l	P Lbs.	5-Day BOD Mg/l	Gals. X	Total Solids %	Vol. Solids %	pH	
1	40	4.9	70		6.0																			
2																								
3																								
4																								
5																								
6	100	5.0	73		6.0																			
7	80	5.1	81		6.0																			
8	20	4.2	75		6.0																			
9	140	4.7	70		6.3																			
10	60	3.9	75		6.0																			
11	45	4.3	70		5.6																			
12	60	4.3	73		6.4																			
13	60	4.1	74		6.3																			
14	60	4.5	71		6.2																			
15	60	4.5	77		6.1																			
16	60	4.0	75		6.1																			
17	50	4.3	80		6.0																			
18	40	3.9	79		6.1																			
19	60	4.1	77		6.0																			
20	60	4.1	81		6.1																			
21	60	4.3	73		6.0																			
22	60	4.0	68		6.3																			
23	60	4.4	77		6.2																			
24	45	4.3	82		6.2																			
25	45	3.7	84		6.0																			
26	60	4.5	70		6.2																			
27	60	4.8	80		6.2																			
28	60	5.8	84		6.3																			
29	60	5.6	55		6.2																			
30	60	6.0	78		6.2																			
31	50	4.9	82		6.2																			
TOTAL	1615																							
ARITH. MEAN	60	4.5	74																					

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

January, 19 87 (Month) — Marshall, Michigan (Municipality) — Robert J. Swalwell (Superintendent's Signature)

1 2	3 8	9 10	11 12	13 15
ID	1340029	01	87	
	Plant No.	Mo.	Yr.	Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX. FUEL 14 GAS CF	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS.	39 $FeCl_3$ LBS.	44 Water CF	49	54	59
PN											
SF		2									
01		34	2880				298	370			
02		6	3360				397	390			
03		36	2760				298	360			
04		34	3000				298	360			
05		40	3120				298	420			
06		33	3000				298	450			
07		51	3120				397	440			
08		50	3120				298	380			
09		58	3240				298	520			
10		44	2880				298	360			
11		54	3120				298	450			
12		55	3000				298	370			
13		40	2880				298	500			
14		41	2880				298	500			
15		56	2880				298	350			
16		63	3000				298	520			
17		60	3000				397	370			
18		63	2880				496	420			
19		65	2880				496	410			
20		73	2760				496	520			
21		129	2760				397	340			
22		10	2520				397	390			
23		14	2760				397	460			
24		15	2520				496	360			
25		83	2520				397	420			
26		87	2760				397	400			
27		73	2640				496	350			
28		61	2520				397	460			
29		56	2880				397	470			
30		41	2880				496	550			
31		45	2760				397	240			
TL		1570	89280				11,515	12,900			
ME		51	2880				371	416			

MANPOWER			
POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	5		844
Superintendent	1		168
Asst. Supt.	1		168
Shift Foreman			
Shift Operator	3		508
Maint. Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL AF

WEEKDAYS 9 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

PERMITTEE NAME/ADDRESS (Include Facility Name/Location if different)
NAME Marshall W.W.T.P.
ADDRESS 801 West Pearl St.
Marshall Mi. 49068

FACILITY City of Marshall
LOCATION Marshall Mi. 49068

MICHIGAN DEPARTMENT OF NATURAL RESOURCES
DISCHARGE MONITORING REPORT
DAILY MONITORING

PERMIT NUMBER	DISCHARGE NUMBER
MI0023546	001A

MONITORING PERIOD

	YEAR	MO	DAY		YEAR	MO	DAY
FROM	87	01	01	TO	87	01	31

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AN FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON MY INQUI THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMAT BELIEVE THE SUBMITTED INFORMATION IS TRUE ACCURATE AND COMPLETE I AM A THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCL THE POSSIBLITY OF FINE AND IMPRISONMENT SEE 18 U S C § 1001 AND 33 U S C (Penalties under these statutes may include fines up to $10,000 and or maximum imprison between 6 months and 5 years)

Robert J. Swalwell
SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT

NAME/TITLE PRINCIPAL EXECUTIVE C
Robert J. Swalwell
TYPED OR PRINTED

DAY	PAR #	80082	91014	91267	00530	85002	81011	00665	00400	00300
	PARA-METER	B.O.D.-5 Carbon	B.O.D. Carbon	BOD Remov.	Solids Suspended	S.S. LBS	S.S. Remov.	Phosphorus-total	P.H.	D.O.
	LIMIT	MG/L 25/7-D 40	LBS. 626/7-D1001	Percent 85	MG/L 30/7-D 45	751/7-D1126	Percent 85	MG/L <1.0	9.0 - 6.0	MG/L >3.0
	UNITS									
01		7	163	89	5	117	92	.35	7.3	5.7
02		7	168	88	7	167	88	.27	7.4	7.1
03		10	235	85	3	71	93	.32	7.2	6.8
04		8	195	89	3	73	95	.66	7.3	6.7
05		17	432	81	15	383	78	.80	7.3	5.7
06		8	193	87	13	314	83	.42	7.6	5.5
07		8	192	90	6	144	93	.40	7.3	6.8
08		6	145	93	5	121	93	.51	6.9	6.5
09		10	235	85	5	118	91	.42	7.6	6.9
10		5	116	90	5	116	85	.27	7.4	7.3
11		7	165	89	9	213	84	.32	7.4	7.3
12		7	169	90	8	193	90	.32	7.4	7.9
13		7	169	91	13	314	83	.42	7.3	6.9
14		8	193	87	11	265	82	.41	7.3	5.9
15		10	243	87	14	340	78	.34	7.2	6.8
16		7	170	89	11	267	84	.32	7.3	6.5
17		20	483	81	7	169	91	.98	7.2	6.2
18		10	244	91	4	97	94	.47	7.2	6.4
19		11	270	92	13	319	90	.37	7.3	7.2
20		11	273	85	9	224	85	.30	7.0	5.4
21		9	227	90	11	272	87	.28	7.3	5.0
22		12	297	88	11	272	88	.27	7.2	4.4
23		13	324	82	17	424	73	.35	7.2	4.4
24		13	310	85	18	429	75	.32	7.2	4.3
25		12	285	84	6	143	84	.19	7.2	5.2
26		14	439	88	7	175	94	.17	7.1	5.5
27		14	348	88	8	192	88	.18	7.3	5.5
28		15	375	81	13	300	78	.37	7.1	4.5
29		19	474	86	12	299	91	.32	7.1	5.0
30		8	200	88	7	175	77	.18	7.1	5.7
31		8	184	89	7	166	87	.17	7.4	5.6
	TOTAL	321.[1]	7831			6885				
	AVERAGE	10	253	87	9	222	86	.37	7.3	6.0

PR46

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT - PLANT No. 130029
FEBRUARY 1987 PLANT INFLUENT SHEET - SAMPLING POINT CODE 500

	----Weather-----		Inf. Flow	Inf. Temp	Inf. pH	Inf. BOD	Inf. BOD	Inf. SS	Inf. SS	Inf. Phos.	Inf. Phos.	Inf. VSS	Inf. NH3-N	--Remarks or Other Parameters--
	Type	Precip.	MGD	F	SU	mg/L	Lbs.	mg/L	Lbs.	mg/L	Lbs.	mg/L	mg/L	
PN-	^00033	^00045	^50050	^00011	^00400	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	
Day														
1	1		2.91	51	7.4	74	1,796	68	1,650	3.95	96	54		
2	3		2.97	51	7.4	94	2,328	72	1,783	2.55	63	60		
3	1		2.99	50	7.4	76	1,895	52	1,297	2.20	55	42		
4	1		2.98	50	7.3	82	2,038	70	1,740	2.75	68	56		
5	1		3.03	50	7.3	114	2,881	112	2,830	3.10	78	58		
6	1		2.91	50	7.3	80	1,942	70	1,699	3.40	83	62		
7	4	0.04	2.83	50	7.4	102	2,407	80	1,888	2.10	50	68		
8	1		2.88	50	7.5	78	1,873	68	1,633	1.95	47	62		
9	1		3.01	50	7.4	68	1,707	60	1,506	1.30	33	48		
10	1		2.96	50	7.5	86	2,123	54	1,333	1.65	41	40		
11	1		3.00	50	7.4	108	2,702	84	2,102	2.75	69	36		
12	1		2.92	51	7.5	132	3,215	108	2,630	1.60	39	88		
13	5	0.02	2.83	51	7.2	60	1,416	46	1,086	2.45	58	42		
14	1		2.77	51	7.2	60	1,386	32	739	1.50	35	30		
15	1		2.74	51	7.1	48	1,097	28	640	1.40	32	16		
16	1		2.92	51	7.3	86	2,094	80	1,948	1.80	44	60		
17	1		2.84	50	7.3	92	2,179	78	1,847	1.65	39	58		
18	1		2.83	50	7.5	72	1,699	60	1,416	1.90	45	50		
19	1		2.63	50	7.2	68	1,492	56	1,228	1.50	33	52		
20	1		2.66	49	7.6	60	1,331	70	1,553	1.65	37	54		
21	3		2.72	49	7.6	60	1,361	70	1,588	2.10	48	50		
22	1		2.78	49	7.5	92	2,133	70	1,623	1.70	39	40		
23	1		2.76	50	7.6	112	2,578	92	2,118	2.10	48	70		
24	1		2.60	50	7.6	84	1,821	70	1,518	2.10	46	50		
25	1		2.44	50	7.6	56	1,140	44	895	1.80	37	22		
26	1		2.55	50	7.5	80	1,701	58	1,233	2.75	58	40		
27	4	0.01	2.76	50	7.6	82	1,888	58	1,335	1.80	41	52		
28	4	0.68	2.76	50	7.6	70	1,611	82	1,888	1.70	39	68		
29														
30														
31														
Total	45	0.75	78.98	1,404	207.8	2,276	53,835	1,892	44,748	59.20	1,399	1,428		
Max.	5	0.68	3.03	51	7.6	132	3,215	112	2,830	3.95	96	88		
Min.	1	0.01	2.44	49	7.1	48	1,097	28	640	1.30	32	16		
Avg.	2	0.19	2.82	50	7.4	81	1,923	68	1,598	2.11	50	51		

Robert J. Swalwell
Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT - PLANT No. 130029
FEBRUARY 1987 PRIMARY EFFLUENT SHEET

	P Eff. BOD mg/L	P Eff. BOD Lbs.	P Eff. SS mg/L	P. Eff. SS Lbs.	P Eff. Phos. mg/L	P Eff. Phos. Lbs.	P Eff. VSS mg/L	P Eff. NH3-N mg/L	--Remarks or Other Parameters-- Flow MGD
PN-	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	^50050
Day									
1	62	1,505	68	1,650	2.45	59	60		2.91
2	80	1,982	64	1,585	2.10	52	54		2.97
3	56	1,396	46	1,147	1.35	34	28		2.99
4	60	1,491	58	1,441	1.50	37	40		2.98
5	68	1,718	96	2,426	2.10	53	52		3.03
6	64	1,553	54	1,311	3.20	78	46		2.91
7	70	1,652	50	1,180	2.55	60	48		2.83
8	72	1,729	54	1,297	1.80	43	52		2.88
9	70	1,757	60	1,506	2.05	51	50		3.01
10	76	1,876	60	1,481	2.10	52	46		2.96
11	92	2,302	66	1,651	3.20	80	46		3.00
12	94	2,289	92	2,240	2.45	60	78		2.92
13	50	1,180	40	944	1.95	46	36		2.83
14	54	1,247	46	1,063	1.90	44	32		2.77
15	34	777	28	640	1.50	34	14		2.74
16	46	1,120	52	1,266	1.65	40	44		2.92
17	54	1,279	50	1,184	1.65	39	30		2.84
18	80	1,888	60	1,416	1.95	46	48		2.83
19	46	1,009	54	1,184	1.65	36	48		2.63
20	46	1,020	56	1,242	1.50	33	40		2.66
21	50	1,134	56	1,270	1.50	34	36		2.72
22	58	1,345	46	1,067	1.65	38	36		2.78
23	70	1,611	58	1,335	1.90	44	48		2.76
24	92	1,995	62	1,344	1.95	42	50		2.60
25	86	1,750	46	936	1.90	39	30		2.44
26	60	1,276	60	1,276	2.55	54	44		2.55
27	82	1,888	50	1,151	1.90	44	38		2.76
28	70	1,611	64	1,473	1.70	39	54		2.76
29									
30									
31									
Total	1,842	43,383	1,596	37,710	55.65	1,313	1,228		78.98
Max.	94	2,302	96	2,426	3.20	80	78		3.03
Min.	34	777	28	640	1.35	33	14		2.44
Avg.	66	1,549	57	1,347	1.99	47	44		2.82

Robert J. Swalwell
Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT - PLANT No. 130029
FEBRUARY 1987 ACTIVATED SLUDGE SHEET

	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading #/m	Mix Liq SS mg/L	Mix Liq VSS mg/L	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mg/L	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mg/l	PE SS mg/L
PN-	^80993	^81001	^80990	^80992	^70323	^70324	^81004	^81007	^00300	^81000	^81006	^70325	^81014	^80991	^50050	^00310	^00530
Day																	
1	48	3.0								167			90		2.91	62	68
2		2.9	2.9	0.47	1,938	1,395	20.0	0.97	5.7	165	0.32	0.23	87		2.97	80	64
3		2.9	3.9	0.36	1,828	1,309	17.0	1.08	5.5	169	0.30	0.22	86		2.99	56	46
4		2.9	2.8	0.49	1,406	1,009	16.0	0.88	5.3	175	0.24	0.17	87		2.98	60	58
5		2.8	2.3	0.62	1,309	929	16.0	0.82	4.1	174	0.33	0.23	86		3.03	68	96
6		3.0	2.9	0.49	1,486	1,053	14.0	1.06	2.9	170	0.40	0.28	85		2.91	64	54
7		3.0								165			89		2.83	70	50
8		3.0								177			86		2.88	72	54
9		2.9	2.6	0.57	1,512	1,034	17.0	0.89	4.3	174	0.29	0.21	81		3.01	70	60
10		2.9	2.2	0.62	1,396	1,016	15.0	0.93	4.3	172	0.27	0.20	84		2.96	76	60
11		2.9	2.0	0.68	1,528	1,126	18.0	0.85	4.1	168	0.30	0.22	82		3.00	92	66
12		3.0	1.9	0.68	1,480	1,124	17.0	0.87	2.9	171	0.28	0.22	85		2.92	94	92
13		3.0	3.8	0.34	1,508	1,169	18.0	0.84	1.2	171	0.28	0.22	88		2.83	50	40
14		3.1								178			92		2.77	54	46
15		3.1								180			91		2.74	34	28
16		3.0								176			85		2.92	46	52
17		3.0	3.6	0.36	1,556	1,188	20.0	0.78	5.4	173	0.30	0.23	86		2.84	54	50
18		3.0	2.1	0.64	1,332	990	17.0	0.78	5.8	172	0.27	0.20	86		2.83	80	60
19		3.3	4.2	0.31	1,412	1,083	17.0	0.83	2.2	173	0.25	0.10	94		2.63	46	54
20		3.2	3.7	0.36	1,257	940	17.0	0.74	5.7	171	0.25	0.19	95		2.66	46	56
21		3.2								166			88		2.72	50	56
22		3.1								169			87		2.78	58	46
23		3.1	2.6	0.53	1,374	1,011	17.0	0.81	4.9	169	0.27	0.20	87		2.76	70	58
24		3.3	2.2	0.61	1,450	1,086	18.0	0.81	2.4	169	0.31	0.23	84		2.60	92	62
25		3.5	2.7	0.48	1,606	1,217	21.0	0.76	1.3	170	0.36	0.28	95		2.44	86	46
26		3.4	4.2	0.32	1,771	1,350	24.0	0.74	1.1	168	0.36	0.28	91		2.55	60	60
27		3.1	2.8	0.47	1,777	1,343	24.0	0.74	1.4	169	0.32	0.24	84		2.76	82	50
28		3.1								165			84		2.76	70	64
29																	
30																	
31																	
otal	48	0.1	55.5	9.40	28,926	21,372	343.0	16.17	70.5	4,786	5.70	4.15	2,445		78.98	1,842	1,596
ax.	48	3.5	4.2	0.68	1,938	1,395	24.0	1.08	5.8	180	0.40	0.28	95		3.03	94	96
in.	48	2.8	1.9	0.31	1,257	929	14.0	0.74	1.1	165	0.24	0.10	81		2.44	34	28
/g.	48	3.1	2.9	0.49	1,522	1,125	18.1	0.85	3.7	171	0.30	0.22	87		2.82	66	57

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT
MISCELLANEOUS & SLUDGE SHEET - FEBRUARY 1987

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	Other	Raw Sludge Gals.	Raw Sludge Total Solids Percent	Raw Sludge Vol. Solids Percent	Raw Sludge pH
1	3,500	2,880	410		397		4,500	5.1	73	6.2
2	4,500	2,880	370		596		6,000	4.9	80	6.2
3	4,500	2,640	510		397		6,000	4.8	71	6.3
4	5,600	3,000	380		496		6,000	5.0	65	6.3
5	5,500	2,880	480		397		6,000	4.3	65	6.4
6	3,900	2,880	490		496		6,000	3.4	55	6.5
7	3,100	2,880	370		397		6,000	4.6	66	6.4
8	7,100	2,880	420		496		4,000	4.2	81	6.5
9	6,100	3,000	360		298		6,000	5.0	73	6.5
10	4,700	2,880	360		298		6,000	4.9	69	6.5
11	3,700	2,760	370		298		6,000	4.4	73	6.5
12	5,200	3,000	470		298		6,000	3.9	64	6.5
13	5,400	2,760	720		199		6,000	5.0	68	6.4
14	5,400	2,880	350		298		6,000	4.1	67	6.3
15	6,200	2,880	420		298		5,000	4.5	65	6.2
16	6,500	2,760	390		298		5,000	4.2	81	6.3
17	6,200	2,880	360		199		6,000	4.5	78	6.2
18	6,200	2,880	470		199		6,000	4.7	79	6.2
19	4,800	2,760	420		298		6,000	5.3	71	6.2
20	4,400	2,760	440		298		7,000	5.2	71	6.3
21	3,000	2,640	340		199		4,000	4.4	76	6.4
22	3,600	2,640	380		199		4,000	4.1	74	6.3
23	4,400	2,760	330		298		6,000	3.8	68	6.2
24	4,000	2,640	320		298		6,000	4.6	71	6.3
25	3,800	2,640	350		199		5,000	4.1	65	6.3
26	5,600	2,640	270		199		3,000	4.5	83	6.2
27	2,600	2,640	310		199		3,000	4.5	72	6.2
28	3,800	2,520	280		199		3,000	5.1	75	6.3
29										
30										
31										
Total	133,300	78,240	11,140		8,741		149,500	127.1	1,999	177.1
Max.	7,100	3,000	720		596		7,000	5.3	83	6.5
Min.	2,600	2,520	270		199		3,000	3.4	55	6.2
Avg.	4,761	2,794	398		312		5,339	4.5	71	6.3

Manpower & Hours

	Total Hr
Superintendent 1	^168
Asst. Supt. 1	^168
Operators 3	^520
Total	^856

Robert J. Swalwell
Superintendent

MARSHALL WWTP 801 W. PEARL ST., MARSHALL MI 49068 - PERMIT No. MI0023540
FEBRUARY 1987 DISCHARGE MONITORING REPORT - DISCHARGE No. 001A

	D.O. mg/L	pH SU	SS mg/L	SS Lbs.	Total-P mg/L	Flow MGD	Chlorine mg/L	BOD mg/L	BOD Lbs.	NH3 as N mg/L	NH3-N Lbs.	F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %
Limit-	>4.0	6 & 9	30 & 45	751 & ^1,126	<1.0			20 & 30	500 & ^751	<11.0	7 Day ^275	200 & 400	>85%	>85%	
PN-	^00300	^00400	^00530	^00530	^00665	^50050	^50060	^80082	^80082	^00610	^00610	^31616	^81011	^91267	^81012
Day															
1	7.6	7.3	5	121	0.19	2.91		8	194				93	89	95
2	5.8	7.3	8	198	0.25	2.97		15	372				88	84	90
3	6.6	7.2	12	299	0.12	2.99		6	150				77	92	95
4	7.4	7.0	13	323	0.13	2.98		9	224				81	89	95
5	6.2	7.2	16	404	0.15	3.03		10	253				86	91	95
6	6.1	7.1	8	194	0.22	2.91		10	243				89	88	94
7	6.4	7.3	7	165	0.16	2.83		19	448				91	81	92
8	6.0	7.4	8	192	0.27	2.88		13	312				88	83	86
9	7.6	7.1	12	301	0.19	3.01		9	226				80	87	85
10	6.1	7.0	5	123	0.13	2.96		6	148				91	93	92
11	5.9	7.3	14	350	0.28	3.00		13	325				83	88	90
12	6.0	7.3	17	414	0.19	2.92		7	170				84	95	88
13	3.5	7.4	3	71	0.17	2.83		4	94				93	93	93
14	4.2	7.2	8	185	0.25	2.77		10	231				75	83	83
15	5.2	7.1	2	46	0.27	2.74		5	114				93	90	81
16	6.5	7.2	7	170	0.37	2.92		8	195				91	91	79
17	7.6	7.1	12	284	0.34	2.84		10	237				85	89	79
18	7.1	7.4	8	189	0.38	2.83		13	307				87	82	80
19	4.9	7.1	8	175	0.16	2.63		7	154				86	90	96
20	6.8	7.5	16	355	0.22	2.66		10	222				77	83	81
21	6.8	7.6	20	454	0.22	2.72		11	250				71	82	90
22	6.9	7.5	8	185	0.20	2.78		11	255				89	88	88
23	7.2	7.4	9	207	0.19	2.76		8	184				90	93	91
24	5.2	7.4	12	260	0.28	2.60		17	369				83	80	87
25	4.2	7.4	7	142	0.28	2.44		6	122				84	89	84
26	3.6	7.3	13	276	0.30	2.55		10	213				77	88	89
27	4.0	7.3	9	207	0.34	2.76		20	460				84	75	81
28	3.7	7.3	13	299	0.19	2.76		18	414				84	74	88
29															
30															
31															
Total	165.1	203.7	280	6,594	6.44	78.98		293	6,885				2,380	2,430	2,467
Max.	7.6	7.6	20	454	0.38	3.03		20	460				93	95	96
Min.	3.5	7.0	2	46	0.12	2.44		4	94				71	74	79
Avg.	5.9	7.3	10	235	0.23	2.82		10	246				85	87	88

Robert J. Swalwell
Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT - PLANT No. 130029
MARCH 1987 PLANT INFLUENT SHEET - SAMPLING POINT CODE 500

	Weather		Inf. Flow	Inf. Temp	Inf. pH	Inf. BOD	Inf. BOD	Inf. SS	Inf. SS	Inf. Phos.	Inf. Phos.	Inf. VSS	Inf. NH3-N	--Remarks or Other Parameters--
	Type	Precip.	MGD	F	SU	mg/L	Lbs.	mg/L	Lbs.	mg/L	Lbs.	mg/L	mg/L	
PN-	^00033	^00045	^50050	^00011	^00400	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	
Day														
1	4&5	0.05	2.85	49	7.5	90	2,139	56	1,331	1.65	39	46		
2	1		2.95	50	7.6	104	2,559	76	1,870	1.70	42	56		
3	1		2.98	50	7.5	98	2,436	77	1,914	1.90	47	55		
4	5	0.10	2.99	50	7.6	90	2,244	74	1,845	2.40	60	54		
5	1		3.03	50	7.6	94	2,375	74	1,870	2.75	69	54		
6	1		2.97	50	7.6	74	1,833	56	1,387	2.30	57	36		
7	1		2.90	50	7.4	62	1,500	32	774	2.30	56	28		
8	1		2.95	50	7.4	62	1,525	82	2,017	1.90	47	64		
9	1		3.03	50	7.7	62	1,567	54	1,365	1.95	49	50		
10	1		3.02	50	7.6	62	1,562	50	1,259	1.65	42	44		
11	1		3.04	50	7.7	54	1,369	64	1,623	1.70	43	54		
12	1		3.02	50	7.7	76	1,914	50	1,259	2.40	60	42		
13	5	0.38	2.91	50	7.7	82	1,990	68	1,650	2.20	53	50		
14	5	0.20	2.88	50	7.6	78	1,873	48	1,153	2.30	55	36		
15	1		2.94	50	7.6	70	1,716	48	1,177	1.35	33	28		
16	1		3.13	50	7.8	108	2,819	80	2,088	2.10	55	74		
17	1		3.05	50	7.6	84	2,137	74	1,882	2.05	52	54		
18	1		3.07	51	7.6	92	2,356	76	1,946	1.90	49	58		
19	1		3.10	51	7.7	80	2,068	90	2,327	2.55	66	80		
20	1		3.04	50	7.5	80	2,028	74	1,876	2.85	72	66		
21	1		2.90	50	7.7	66	1,596	32	774	1.95	47	26		
22	1		2.92	51	7.7	64	1,559	58	1,412	1.90	46	48		
23	1		3.04	50	7.7	86	2,180	59	1,496	2.65	67	40		
24	4	0.03	2.95	51	7.7	94	2,313	86	2,116	2.75	68	66		
25	4	0.10	2.86	51	7.6	48	1,145	68	1,622	1.80	43	64		
26	4	0.02	2.84	51	7.6	68	1,611	54	1,279	1.90	45	32		
27	4	0.02	2.84	51	7.6	36	853	38	900	1.70	40	14		
28	1		2.80	51	7.6	40	934	40	934	1.65	39	32		
29	4	0.15	2.87	51	7.5	66	1,580	72	1,723	2.45	59	52		
30	1		3.06	51	7.6	70	1,786	94	2,399	2.85	73	72		
31	3		2.95	51	7.7	72	1,771	78	1,919	2.20	54	54		
Total	59	1.05	91.88	1,560	236.0	2,312	57,339	1,982	49,189	65.70	1,627	1,529		
Max.	5	0.38	3.13	51	7.8	108	2,819	94	2,399	2.85	73	80		
Min.	1	0.02	2.80	49	7.4	36	853	32	774	1.35	33	14		
Avg.	2	0.12	2.96	50	7.6	75	1,850	64	1,587	2.12	52	49		

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT - PLANT No. 130029
MARCH 1987 PRIMARY EFFLUENT SHEET

	P Eff. BOD mgIL	P Eff. BOD Lbs.	P Eff. SS mgIL	P. Eff. SS Lbs.	P Eff. Phos. mgIL	P Eff. Phos. Lbs.	P Eff. VSS mgIL	P Eff. NH3-N mgIL	--Remarks or Other Parameters-- Flow MGD
PN-	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	^50050
Day									
1	78	1,854	44	1,046	1.65	39	34		2.85
2	84	2,067	56	1,378	1.65	41	44		2.95
3	71	1,765	53	1,317	1.80	45	38		2.98
4	19	474	46	1,147	2.10	52	36		2.99
5	102	2,578	58	1,466	2.55	64	44		3.03
6	52	1,288	36	892	2.10	52	18		2.97
7	62	1,500	28	677	2.10	51	20		2.90
8	66	1,624	52	1,279	1.80	44	44		2.95
9	46	1,162	34	859	1.35	34	28		3.03
10	36	907	40	1,007	1.35	34	32		3.02
11	46	1,166	42	1,065	1.60	41	32		3.04
12	52	1,310	40	1,007	1.90	48	36		3.02
13	62	1,505	48	1,165	1.95	47	34		2.91
14	62	1,489	38	913	1.60	38	34		2.88
15	46	1,128	36	883	1.15	28	26		2.94
16	66	1,723	38	992	1.70	44	30		3.13
17	56	1,424	52	1,323	1.90	48	42		3.05
18	48	1,229	52	1,331	1.50	38	38		3.07
19	42	1,086	46	1,189	1.80	47	40		3.10
20	52	1,318	50	1,268	2.40	61	42		3.04
21	44	1,064	42	1,016	1.90	46	34		2.90
22	42	1,023	40	974	1.60	39	32		2.92
23	44	1,116	56	1,420	1.70	43	30		3.04
24	58	1,427	66	1,624	2.30	57	58		2.95
25	42	1,002	42	1,002	1.35	32	38		2.86
26	36	853	38	900	1.35	32	18		2.84
27	30	711	24	568	1.65	39	22		2.84
28	28	654	32	747	1.40	33	10		2.80
29	42	1,005	52	1,245	1.95	47	34		2.87
30	60	1,531	56	1,429	2.40	61	52		3.06
31	66	1,624	40	984	2.40	59	18		2.95
Total	1,640	40,604	1,377	34,113	55.95	1,385	1,038		91.88
Max.	102	2,578	66	1,624	2.55	64	58		3.13
Min.	19	474	24	568	1.15	28	10		2.80
Avg.	53	1,310	44	1,100	1.80	45	33		2.96

Robert J. Swalwell
Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT - PLANT No. 130029
MARCH 1987 ACTIVATED SLUDGE SHEET

	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading flm	Mix Liq SS mgIL	Mix Liq VSS mgIL	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mgIL	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mgIl	PE SS mgIL
PN-	^80993	^81001	^80990	^80992	^70323	^70324	^81004	^81007	^00300	^81000	^81006	^70325	^81014	^80991	^50050	^00310	^00530
Day																	
1	48	3.0								180			82		2.85	78	44
2		2.9	2.3	0.58	1,611	1,199	21.0	0.77	5.2	189	0.32	0.24	78		2.95	84	56
3		2.9	2.7	0.49	1,587	1,191	20.0	0.79	5.4	193	0.32	0.23	78		2.98	71	53
4		2.9	10.1	0.13	1,595	1,176	20.0	0.80	4.9	190	0.32	0.24	77		2.99	19	46
5		2.8	1.9	0.73	1,603	1,183	20.0	0.80	4.5	191	0.33	0.24	76		3.03	102	58
6		2.9	3.8	0.38	1,654	1,146	21.0	0.79	1.4	183	0.32	0.24	78		2.97	52	36
7		3.0								178			81		2.90	62	28
8		2.9								177			68		2.95	66	52
9		2.8	3.7	0.36	1,425	1,072	20.0	0.71	4.0	193	0.28	0.21	76		3.03	46	34
10		2.9	4.6	0.31	1,391	976	20.0	0.70	7.4	192	0.24	0.17	78		3.02	36	40
11		2.8	3.7	0.37	1,435	1,062	20.0	0.72	6.8	189	0.29	0.21	76		3.04	46	42
12		2.9	3.5	0.40	1,512	1,104	22.0	0.69	6.1	189	0.31	0.23	76		3.02	52	40
13		3.0	3.1	0.44	1,571	1,155	22.0	0.71	6.3	187	0.30	0.22	79		2.91	62	48
14		3.0								191			80		2.88	62	38
15		2.9								189			79		2.94	46	36
16		2.8	2.9	0.49	1,640	1,164	22.0	0.75	6.2	189	0.34	0.24	74		3.13	66	38
17		2.8	3.4	0.40	1,637	1,194	22.0	0.74	4.2	186	0.40	0.25	76		3.05	56	52
18		2.8	4.0	0.26	1,650	1,591	22.0	0.75	5.3	184	0.43	0.31	74		3.07	48	52
19		2.8	4.7	0.30	1,722	1,229	21.0	0.82	4.5	183	0.36	0.25	74		3.10	42	46
20		2.8	3.9	0.36	1,724	1,240	22.0	0.78	6.8	185	0.35	0.25	76		3.04	52	50
21		3.0								184			80		2.90	44	42
22		3.0								184			79		2.92	42	40
23		2.8	5.0	0.28	1,873	1,345	22.0	0.85	5.7	181	0.37	0.27	78		3.04	44	56
24		2.9	1.7	0.82	808	581	9.0	0.90	5.8	176	0.16	0.10	81		2.95	58	66
25		3.0	3.6	0.38	1,207	873	14.0	0.86	3.6	181	0.23	0.17	83		2.86	42	42
26		3.0	5.3	0.26	1,503	1,114	16.0	0.94	4.5	179	0.29	0.22	84		2.84	36	38
27		3.0	7.1	0.19	1,687	1,254	19.0	0.89	3.7	180	0.40	0.29	82		2.84	30	24
28		3.1								180			83		2.80	28	32
29		3.0								178			81		2.87	42	52
30		2.8	3.0	0.45	1,525	1,129	15.0	1.02	4.3	186	0.39	0.28	75		3.06	60	56
31		2.9	3.0	0.45	1,604	1,193	19.0	0.84	2.0	182	0.32	0.24	78		2.95	66	40
Total	48	90.2	87.0	8.81	33,964	25,171	429.0	17.62	108.6	5,729	7.07	5.10	2,420		91.88	1,640	1,377
Max.	48	3.1	10.1	0.82	1,873	1,591	22.0	1.02	7.4	193	0.43	0.31	84		3.13	102	66
Min.	48	2.8	1.7	0.13	808	581	9.0	0.69	1.4	176	0.16	0.10	68		2.80	19	24
Avg.	48	2.9	4.0	0.40	1,544	1,144	19.5	0.80	4.9	185	0.32	0.23	78		2.96	53	44

Robert J. Swalwell
Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT
MISCELLANEOUS & SLUDGE SHEET - MARCH 1987

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	Other	Raw Sludge Gals.	Raw Sludge Total Solids Percent	Raw Sludge Vol. Solids Percent	Raw Sludge pH
1	4,400	2,640	420		298		3,000	4.1	80	6.4
2	4,200	2,760	190		199		5,000	4.7	79	6.3
3	4,700	2,760	480		298		5,000	4.9	71	6.0
4	3,700	2,760	430		199		5,000	4.4	86	6.3
5	3,700	2,760	310		298		3,300	4.4	81	6.2
6	2,300	2,640	350		298		6,000	4.3	80	6.1
7	2,200	2,520	350		199		4,000	4.8	77	6.3
8	2,600	2,520	360		298		4,000	4.6	73	6.1
9	6,300	2,880	310		298		6,000	5.1	43	6.2
10	7,500	2,880	410		298		6,000	4.9	69	6.2
11	5,300	2,880	290		199		6,000	4.3	65	6.2
12	4,200	2,760	310		298		5,000	4.6	71	6.1
13	3,600	2,760	430		199		5,000	4.2	76	6.3
14	3,600	2,760	290		298		4,000	4.8	65	6.2
15	3,500	2,760	330		298		4,000	4.1	76	6.2
16	4,800	2,760	430		298		5,500	3.8	76	6.2
17	4,400	2,880	250		298		6,000	4.6	71	6.3
18	3,800	2,640	350		199		6,000	4.0	67	6.2
19	4,200	2,760	400		298		5,000	4.1	67	6.2
20	2,700	2,520	440		298		5,000	4.2	64	6.2
21	3,000	2,640	170		199		4,000	4.1	76	6.2
22	3,700	2,640	360		298		4,000	4.0	82	6.1
23	800	2,640	340		298		5,000	4.2	63	6.3
24	300	2,400	270		199		6,000	3.8	74	6.5
25	400	2,640	220		298		6,000	4.0	83	6.5
26	300	2,520	210		199		5,000	2.6	78	6.5
27	2,200	2,640	260		298		5,000	3.8	64	6.2
28	2,800	2,640	260		298		5,000	4.2	80	6.3
29	5,100	2,520	200		397		4,000	4.1	65	6.3
30	4,300	2,880	300		298		6,000	5.8	89	6.4
31	7,000	2,760	210		397		6,000	4.2	70	6.3
Total	111,600	83,520	9,930		8,545		154,800	133.7	2,261	193.8
Max.	7,500	2,880	480		397		6,000	5.8	89	6.5
Min.	300	2,400	170		199		3,000	2.6	43	6.0
Avg.	3,600	2,694	320		276		4,994	4.3	73	6.3

Manpower & Hours

	Total Hr
Superintendent 1	^176
Asst. Supt. 1	^176
Operators 3	^528
Total	^880

Robert J. Swalwell
Robert J. Swalwell
Superintendent

MARSHALL WWTP 801 W. PEARL ST., MARSHALL MI 49068 - PERMIT No. MI0023540
MARCH 1987 DISCHARGE MONITORING REPORT - DISCHARGE No. 001A

	D.O. mg/L	pH SU	SS mg/L	SS Lbs.	Total-P mg/L	Flow MGD	Chlorine mg/L	BOD mg/L	BOD Lbs.	NH3 as N mg/L	NH3-N Lbs.	F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %
Limit-	>4.0	6 & 9	30 & 45	751 & ^1,126	<1.0			20 & 30	500 & ^751	<11.0	7 Day ^275	200 & 400	>85%	>85%	
PN-	^00300	^00400	^00530	^00530	^00665	^50050	^50060	^80082	^80082	^00610	^00610	^31616	^81011	^91267	^81012
Day															
1	4.5	7.4	3	71	0.23	2.85		22	523				95	76	86
2	6.7	7.3	13	320	0.19	2.95		25	615				83	76	89
3	7.2	7.4	10	249	0.22	2.98		17	423				87	83	90
4	6.8	7.4	6	150	0.25	2.99		19	474				92	79	90
5	5.9	7.4	17	430	0.53	3.03		13	329				77	86	81
6	6.1	7.3	2	50	0.35	2.97		11	272				96	85	85
7	4.8	7.3	3	73	0.46	2.90		8	193				91	87	80
8	4.0	7.4	6	148	0.27	2.95		12	295				93	81	91
9	7.6	7.5	8	202	0.38	3.03		11	278				85	82	81
10	8.1	7.5	9	227	0.30	3.02		18	453				82	71	82
11	8.0	7.5	10	254	0.28	3.04		14	355				84	74	84
12	7.5	7.5	11	277	0.34	3.02		8	201				78	89	86
13	7.0	7.5	7	170	0.30	2.91		11	267				90	87	86
14	6.7	7.5	3	72	0.27	2.88		16	384				94	79	88
15	6.8	7.5	4	98	0.22	2.94		7	172				92	90	84
16	8.0	7.7	3	78	0.32	3.13		7	183				96	94	85
17	7.2	7.5	12	305	0.28	3.05		9	229				84	89	86
18	7.6	7.4	15	384	0.32	3.07		7	179				80	92	83
19	7.5	7.5	11	284	0.35	3.10		7	181				88	91	86
20	6.2	7.4	9	228	0.34	3.04		5	127				87	94	91
21	6.2	7.5	3	73	0.42	2.90		8	193				91	88	78
22	6.7	7.5	7	170	0.37	2.92		9	219				87	86	81
23	6.6	7.5	15	380	0.34	3.04		10	254				80	88	87
24	8.2	7.6	13	320	0.41	2.95		9	221				85	90	85
25	6.4	7.4	3	72	0.27	2.86		7	167				96	85	85
26	6.7	7.5	7	166	0.27	2.84		5	118				87	93	86
27	7.4	7.5	3	71	0.28	2.84		1	24				92	97	84
28	7.5	7.5	10	234	0.25	2.80		2	47				75	95	85
29	7.3	7.4	9	215	0.27	2.87		5	120				88	92	89
30	6.3	7.4	7	179	0.43	3.06		7	179				93	90	83
31	4.7	7.4	18	443	0.34	2.95		5	123				77	93	85
Total	208.2	231.1	257	6,390	9.85	91.88		315	7,798				2,705	2,682	2,642
Max.	8.2	7.7	18	443	0.53	3.13		25	615				96	97	91
Min.	4.0	7.3	2	50	0.19	2.80		1	24				75	71	78
Avg.	6.7	7.5	8	206	0.32	2.96		10	252				87	87	85

Robert J. Swalwell
Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT - PLANT No. 130029
APRIL 1987 PLANT INFLUENT SHEET - SAMPLING CODE 500

	----Weather-----		Inf. Flow	Inf. Temp	Inf. pH	Inf. BOD	Inf. BOD	Inf. SS	Inf. SS	Inf. Phos.	Inf. Phos.	Inf. VSS	Inf. NH3-N	--Remarks or Other Farameters--
	Type	Precip.	MGD	F	SU	mgIL	Lbs.	mgIL	Lbs.	mgIL	Lbs.	mgIL	mgIL	
PN-	^00033	^00045	^50050	^00011	^00400	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	
Day														
1	5	0.38	3.02	51	7.5	79	1,990	60	1,511	2.65	67	50		
2	5	0.03	3.03	51	7.7	60	1,516	66	1,668	2.75	69	62		
3	3		2.87	51	7.5	72	1,723	78	1,867	2.40	57	64		
4	4	0.11	2.85	49	7.6	75	1,783	60	1,426	1.70	40	46		
5	4	0.04	2.82	49	7.5	68	1,599	70	1,646	1.90	45	56		
6	3		2.98	50	7.4	67	1,665	62	1,541	2.20	55	40		
7	1		2.99	50	7.7	62	1,546	60	1,496	3.20	80	42		
8	1		2.97	51	7.6	84	2,081	57	1,412	2.90	72	52		
9	1		2.90	51	7.6	56	1,354	62	1,500	1.95	47	48		
10	1		2.89	51	7.6	56	1,350	78	1,880	1.95	47	68		
11	4	0.38	2.72	51	7.6	64	1,452	54	1,225	2.05	47	44		
12	4	0.03	2.79	51	7.9	62	1,443	64	1,489	2.20	51	52		
13	4	0.04	3.00	51	7.6	102	2,552	86	2,152	2.75	69	58		
14	4	0.54	3.02	51	7.6	60	1,511	70	1,763	2.10	53	50		
15	4	0.17	3.03	51	7.6	76	1,921	56	1,415	2.45	62	46		
16	1		2.90	51	7.7	50	1,209	52	1,258	2.20	53	40		
17	1		2.87	51	7.5	60	1,436	52	1,245	2.75	66	42		
18	1		2.89	51	7.6	62	1,494	60	1,446	2.10	51	40		
19	1		2.85	51	7.5	72	1,711	98	2,329	2.05	49	92		
20	1		3.05	52	7.6	70	1,781	80	2,035	2.40	61	64		
21	1		3.05	52	7.6	124	3,154	64	1,628	2.75	70	44		
22	4	0.11	3.01	52	7.6	108	2,711	92	2,310	2.55	64	74		
23	1		2.99	53	7.6	98	2,444	50	1,247	2.05	51	40		
24	3		2.97	53	7.6	120	2,972	96	2,378	2.85	71	86		
25	1		2.85	52	7.6	76	1,806	134	3,185	2.45	58	110		
26	1		2.85	52	7.5	102	2,424	70	1,664	2.90	69	60		
27	4	0.04	3.04	53	7.7	92	2,333	92	2,333	2.05	52	58		
28	1		3.02	53	7.7	114	2,871	52	1,310	2.30	58	42		
29	1		3.12	53	7.7	95	2,472	65	1,691	2.30	60	44		
30	1		3.01	53	7.6	106	2,661	68	1,707	4.30	108	56		
31														
Total	71	1.87	88.35	1,541	228.1	2,392	58,967	2,108	51,756	73.15	1,801	1,670		
Max.	5	0.54	3.12	53	7.9	124	3,154	134	3,185	4.30	108	110		
Min.	1	0.03	2.72	49	7.4	50	1,209	50	1,225	1.70	40	40		
Avg.	2	0.17	2.95	51	7.6	80	1,966	70	1,725	2.44	60	56		

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT - PLANT No 130029
APRIL 1987 PRIMARY EFFLUENT SHEET

	P Eff. BOD mgIL	P Eff. BOD Lbs.	P Eff. SS mgIL	P. Eff. SS Lbs.	P Eff. Phos. mgIL	P Eff. Phos. Lbs.	P Eff. VSS mgIL	P Eff. NH3-N mgIL	--Remarks or Other Parameters-- Flow MGD
PN-	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	^50050
Day									
1	56	1,410	38	957	2.40	60	30		3.02
2	54	1,365	40	1,011	2.55	64	38		3.03
3	54	1,293	34	814	2.20	53	26		2.87
4	59	1,402	26	618	1.65	39	16		2.85
5	45	1,058	52	1,223	1.70	40	44		2.82
6	36	895	50	1,243	1.80	45	30		2.98
7	50	1,247	46	1,147	2.75	69	36		2.99
8	58	1,437	42	1,040	2.75	68	30		2.97
9	46	1,113	49	1,185	1.85	45	33		2.90
10	36	868	54	1,302	1.90	46	42		2.89
11	38	862	34	771	2.05	47	28		2.72
12	50	1,163	44	1,024	2.10	49	26		2.79
13	86	2,152	76	1,902	2.55	64	56		3.00
14	62	1,562	50	1,259	1.95	49	32		3.02
15	54	1,365	36	910	1.95	49	30		3.03
16	36	871	46	1,113	1.95	47	36		2.90
17	42	1,005	38	910	2.55	61	28		2.87
18	46	1,109	46	1,109	1.80	43	34		2.89
19	46	1,093	42	998	1.90	45	34		2.85
20	48	1,221	56	1,424	2.10	53	34		3.05
21	68	1,730	56	1,424	2.45	62	38		3.05
22	90	2,259	76	1,908	2.55	64	72		3.01
23	88	2,194	48	1,197	2.20	55	38		2.99
24	88	2,180	60	1,486	2.20	54	54		2.97
25	62	1,474	46	1,093	1.80	43	40		2.85
26	98	2,329	44	1,046	2.75	65	36		2.85
27	82	2,079	66	1,673	2.20	56	38		3.04
28	106	2,670	36	907	2.45	62	30		3.02
29	84	2,186	48	1,249	2.20	57	33		3.12
30	82	2,058	50	1,255	3.95	99	40		3.01
31									
Total	1,850	45,648	1,429	35,198	67.20	1,654	1,082		88.35
Max.	106	2,670	76	1,908	3.95	99	72		3.12
Min.	36	862	26	618	1.65	39	16		2.72
Avg.	62	1,522	48	1,173	2.24	55	36		2.95

Robert J. Swalwell
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Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT - PLANT No. 130029
APRIL 1987 ACTIVATED SLUDGE SHEET

	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading f/m	Mix Liq SS mg/L	Mix Liq VSS mg/L	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mg/L	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mg/l	PE SS mg/L
PN-	^80993	^81001	^80990	^80992	^70323	^70324	^81004	^81007	^00300	^81000	^81006	^70325	^81014	^80991	^50050	^00310	^00530
Day																	
1	48	2.9	3.1	0.44	1,461	1,081	17.0	0.86	4.0	182	0.29	0.22	76		3.02	56	38
2		2.8	2.9	0.47	1,332	962	15.0	0.89	5.0	189	0.27	0.20	76		3.03	54	40
3		3.0	2.9	0.47	1,258	919	15.0	0.84	4.8	183	0.29	0.22	79		2.87	54	34
4		3.0								183			82		2.85	59	26
5		3.1								186			83		2.82	45	52
6		2.9	4.4	0.32	1,319	938	15.0	0.88	6.8	182	0.26	0.19	78		2.98	36	50
7		2.9	3.2	0.44	1,314	951	16.0	0.82	5.5	180	0.27	0.19	78		2.99	50	46
8		2.9	2.8	0.50	1,345	957	15.0	0.90	5.8	183	0.27	0.19	78		2.97	58	42
9		3.0	3.8	0.37	1,408	1,010	16.0	0.88	6.2	182	0.28	0.20	79		2.90	46	49
10		3.0	4.9	0.29	1,428	1,015	16.0	0.89	6.3	178	0.28	0.20	76		2.89	36	54
11		3.2								182			85		2.72	38	34
12		3.1								184			84		2.79	50	44
13		2.9	2.0	0.70	1,415	1,033	17.0	0.83	2.3	179	0.32	0.24	79		3.00	86	76
14		2.9	3.6	0.38	1,864	1,383	20.0	0.93	1.7	177	0.37	0.27	78		3.02	62	50
15		2.8	4.4	0.31	2,005	1,486	22.0	0.91	1.9	177	0.39	0.29	77		3.03	54	36
16		3.0	6.9	0.20	1,993	1,478	26.0	0.77	2.4	178	0.39	0.29	81		2.90	36	46
17		3.0	5.9	0.23	1,981	1,465	26.0	0.76	5.3	177	0.36	0.30	82		2.87	42	38
18		3.0								175			82		2.89	46	46
19		3.0								175			83		2.85	46	42
20		2.8	4.0	0.35	1,615	1,182	20.0	0.81	4.9	195	0.31	0.23	77		3.05	48	56
21		2.8	2.9	0.48	1,652	1,202	18.0	0.92	3.2	206	0.32	0.23	77		3.05	68	56
22		2.9	2.2	0.61	1,693	1,240	19.0	0.89	2.7	208	0.32	0.24	78		3.01	90	76
23		2.9	2.5	0.54	1,807	1,368	22.0	0.82	2.8	209	0.35	0.27	78		2.99	88	48
24		2.9	2.4	0.56	1,721	1,292	25.0	0.69	2.6	214	0.30	0.22	80		2.97	88	60
25		3.0								213			84		2.85	62	46
26		3.0								208			83		2.85	98	44
27		2.8	3.3	0.42	2,258	1,649	32.0	0.71	1.7	211	0.43	0.31	78		3.04	82	66
28		2.9	2.6	0.52	2,320	1,699	34.0	0.68	1.8	211	0.45	0.33	78		3.02	106	36
29		2.8	3.5	0.38	2,559	1,927	36.0	0.71	0.9	205	0.49	0.37	73		3.12	84	48
30		2.9	3.3	0.42	2,244	1,639	32.0	0.70	1.4	210	0.49	0.36	75		3.01	82	50
31																	
Total	48	87.9	77.2	9.37	37,992	27,876	474.0	18.09	80.0	5,722	7.50	5.56	2,377		88.35	1,850	1,429
Max.	48	3.2	6.9	0.70	2,559	1,927	36.0	0.93	6.8	214	0.49	0.37	85		3.12	106	76
Min.	48	2.8	2.0	0.20	1,258	919	15.0	0.68	0.9	175	0.26	0.19	73		2.72	36	26
Avg.	48	2.9	3.5	0.43	1,727	1,267	21.5	0.82	3.6	191	0.34	0.25	79		2.95	62	48

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT
MISCELLANEOUS & SLUDGE SHEET - APRIL 1987

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	Other	Raw Sludge Gals.	Raw Sludge Total Solids Percent	Raw Sludge Vol. Solids Percent	Raw Sludge pH
1		2,760	390		298		6,000	5.9	54	6.4
2		2,880	300		298		6,000	4.2	83	6.5
3		2,760	280		397		6,000	4.1	76	6.4
4		2,760	330		298		4,000	4.5	83	6.4
5		2,760	250		298		4,000	5.2	79	6.3
6		2,760	220		397		6,000	4.8	71	6.1
7		2,520	310		199		5,500	4.4	80	6.4
8		2,640	250		397		5,500	4.6	77	6.4
9		2,520	310		298		5,000	4.7	70	6.4
10		2,280	240		298		5,500	4.1	80	6.4
11		2,520	260		397		4,000	4.6	71	6.5
12		2,400	300		298		4,000	6.1	74	6.5
13		2,520	230		397		4,000	4.1	73	6.4
14		2,400	270		397		5,500	4.5	81	6.2
15		2,520	190		298		5,000	4.5	81	6.2
16		2,520	210		298		5,000	4.6	69	6.5
17		2,400	290		298		4,000	4.5	73	6.4
18		2,400	310		397		4,000	4.0	79	6.4
19		2,400	340		298		4,000	4.4	69	6.4
20		2,520	190		298		4,000	4.8	84	6.4
21		2,520	260		199		6,000	4.8	72	6.4
22		2,640	-280		199		4,500	4.4	76	6.3
23		2,640	230		397		5,000	4.7	70	6.2
24		2,760	300		397		5,000	5.2	69	6.2
25		2,640	250		298		3,000	5.3	80	6.1
26		2,520	700		397		4,000	4.3	76	6.1
27		2,640	560		298		4,000	4.4	80	6.2
28		2,520	280		397		3,500	5.1	77	6.2
29		2,520	260		298		1,000	4.9	71	6.1
30		2,520	270		298		18,500	4.7	76	5.8
31										
Total		77,160	8,300		9,732		151,500	140.4	2,254	189.2
Max.		2,880	700		397		18,500	6.1	84	6.5
Min.		2,280	-280		199		1,000	4.0	54	5.8
Avg.		2,572	277		324		5,050	4.7	75	6.3

Manpower & Hours

	Total Hr
Superintendent 1	^176
Asst. Supt. 1	^176
Operators 3	^528
Total	^880

Robert J. Swalwell
Robert J. Swalwell
Superintendent

MARSHALL WWTP 801 W. PEARL ST., MARSHALL MI 49068 - PERMIT No. MI0023540
APRIL 1987 DISCHARGE MONITORING REPORT - DISCHARGE No. 001A

	D.O. mg/L	pH SU	SS mg/L	SS Lbs.	Total-P mg/L	Flow MGD	Chlorine mg/L	BOD mg/L	BOD Lbs.	NH3 as N mg/L	NH3-N Lbs.	F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %
Limit-	>4.0	6 & 9	30 & 45	751 & ^1,126	<1.0			20 & 30	500 & ^751	<11.0	7 Day ^275	200 & 400	>85%	>85%	
PN-	^00300	^00400	^00530	^00530	^00665	^50050	^50060	^80082	^80082	^00610	^00610	^31616	^81011	^91267	^81012
Day															
1	7.0	7.4	7	176	0.32	3.02		10	252				88	85	88
2	7.6	7.5	5	126	0.35	3.03		7	177				92	88	87
3	7.8	7.4	11	263	0.40	2.87		14	335				86	81	83
4	7.1	7.5	10	238	0.32	2.85		10	238				83	87	81
5	7.0	7.6	12	282	0.25	2.82		6	141				83	91	87
6	8.5	7.3	8	199	0.18	2.98		5	124				87	82	92
7	8.2	7.5	7	175	0.25	2.99		14	349				88	77	92
8	7.6	7.4	9	223	0.41	2.97		20	495				86	76	86
9	8.1	7.4	9	218	0.28	2.90		10	242				85	82	86
10	8.3	7.4	9	217	0.27	2.89		10	241				88	82	86
11	8.1	7.5	5	113	0.30	2.72		10	227				91	84	85
12	6.1	7.6	7	163	0.34	2.79		14	326				89	77	85
13	6.5	7.4	11	275	0.30	3.00		12	300				87	88	89
14	4.7	7.5	12	302	0.30	3.02		16	403				83	73	86
15	3.9	7.3	5	126	0.22	3.03		10	253				91	87	91
16	4.1	7.4	11	266	0.30	2.90		9	218				79	82	86
17	4.5	7.4	4	96	0.41	2.87		12	287				92	80	85
18	6.7	7.4	6	145	0.30	2.89		10	241				90	84	86
19	6.1	7.4	8	190	0.27	2.85		7	166				92	90	87
20	6.0	7.5	13	331	0.35	3.05		11	280				84	84	85
21	5.9	7.4	6	153	0.32	3.05		5	127				91	96	88
22	5.2	7.4	17	427	0.35	3.01		7	176				82	94	86
23	5.3	7.5	3	75	0.35	2.99		15	374				94	85	83
24	5.4	7.5	8	198	0.22	2.97		11	272				92	91	92
25	5.3	7.5	12	285	0.32	2.85		13	309				91	83	87
26	4.8	7.5	9	214	0.28	2.85		12	285				87	88	90
27	4.0	7.5	19	482	0.32	3.04		15	380				79	84	84
28	4.5	7.5	9	227	0.58	3.02		10	252				83	91	75
29	4.1	7.5	8	208	0.42	3.12		8	208				88	92	82
30	4.3	7.5	13	326	0.71	3.01		10	251				81	91	83
31															
Total	182.7	223.6	273	6,719	9.99	88.35		323	7,930				2,612	2,555	2,583
Max.	8.5	7.6	19	482	0.71	3.12		20	495				94	96	92
Min.	3.9	7.3	3	75	0.18	2.72		5	124				79	73	75
Avg.	6.1	7.5	9	224	0.33	2.95		11	264				87	85	86

Robert J. Swalwell
Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT - PLANT No. [illegible]
MAY 1987 PLANT INFLUENT SHEET - SAMPLING CODE 500

	----Weather-----		Inf. Flow	Inf. Temp	Inf. pH	Inf. BOD	Inf. BOD	Inf. SS	Inf. SS	Inf. Phos.	Inf. Phos.	Inf. VSS	Inf. NH3-N	--Remarks or Other Parameters--
	Type	Precip.	MGD	F	SU	mgIL	Lbs.	mgIL	Lbs.	mgIL	Lbs.	mgIL	mgIL	
PN-	^00033	^00045	^50050	^00011	^00400	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	
Day														
1	4	0.20	2.86	53	7.7	48	1,145	70	1,670	2.30	55	60	11	
2	4	0.19	2.85	52	7.7								6	
3	4	0.33	2.86	52	7.7	64	1,527	90	2,147	2.30	55	70	7	
4	1		2.93	53	7.7	78	1,906	60	1,466	3.85	94	54	11	
5	1		3.02	53	7.7	72	1,813	68	1,713	3.10	78	54	10	
6	1		2.93	53	7.6	72	1,759	80	1,955			54	9	
7	1		2.91	53	7.6	60	1,456	72	1,747	1.95	47	52	8	
8	1		2.84	53	7.2	62	1,469	62	1,469	2.10	50	50	8	
9	1		2.73	53	7.6	52	1,184	36	820	2.05	47	32	9	
10	4	0.03	2.78	53	7.6	60	1,391	44	1,020	2.30	53	38	6	
11	4	0.02	2.93	53	7.5	66	1,613	74	1,808	2.20	54	66	7	
12	1		2.86	53	7.6	64	1,527	70	1,670	2.10	50	50	10	
13	1		2.87	53	7.4	80	1,915	74	1,771	2.20	53	64	8	
14	4	0.66	2.90	53	7.4	68	1,645	96	2,322	2.85	69	78	8	
15	1		2.79	53	7.2	52	1,210	58	1,350	1.95	45	54	7	
16	1		2.75	53	8.1	50	1,147	72	1,651	2.05	47	58	6	
17	4	0.12	2.80	52	8.6	54	1,261	64	1,495	2.20	51	56	7	
18	4	0.59	2.96	54	7.4	86	2,123	76	1,876	2.40	59	64	8	
19	4	0.27	2.91	54	7.4	54	1,311	70	1,699	3.40	83	60	9	
20	1		2.94	54	7.4	102	2,501	128	3,139	5.70	140	122	10	
21	4	0.02	3.02	54	7.1	104	2,619	180	4,534	2.55	64	146	6	
22	1		2.84	54	7.2	56	1,326	116	2,748	2.20	52	88	7	
23	4	0.01	2.65	54	7.5	48	1,061	84	1,856	1.80	40	60	8	
24	1		2.71	53	7.3	56	1,266	88	1,989	2.45	55	70	7	
25	4	0.03	2.76	53	7.7	56	1,289	66	1,519	2.30	53	60	8	
26	1		2.95	55	7.3	108	2,657	74	1,821	3.40	84	68	8	
27	1		2.91	54	7.4	88	2,136	88	2,136	2.40	58	76	7	
28	1		2.84	55	7.4	54	1,279	78	1,847	2.30	54	64	10	
29	1		2.87	55	7.6	48	1,149	86	2,058	1.65	39	76	6	
30	4	0.19	2.74	54	8.4	56	1,280	70	1,600	1.80	41	60	7	
31	1		2.74	54	8.8	68	1,554	72	1,645	1.80	41	60	7	
Total	70	2.66	88.45	1,655	235.8	1,986	47,517	2,366	56,539	71.65	1,712	1,964	247	
Max.	4	0.66	3.02	55	8.8	108	2,657	180	4,534	5.70	140	146	11	
Min.	1	0.01	2.65	52	7.1	48	1,061	36	820	1.65	39	32	6	
Avg.	2	0.20	2.85	53	7.6	66	1,584	79	1,885	2.47	59	65	8	

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT - PLANT No. 130029
MAY 1987 PRIMARY EFFLUENT SHEET

	P Eff. BOD mg/L	P Eff. BOD Lbs.	P Eff. SS mg/L	P. Eff. SS Lbs.	P Eff. Phos. mg/L	P Eff. Phos. Lbs.	P Eff. VSS mg/L	P Eff. NH3-N mg/L	--Remarks or Other Parameters-- Flow MGD
PN-	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	^50050
Day									
1	38	906	48	1,145	2.20	52	38	11.0	2.86
2									2.85
3	48	1,145	38	906	2.05	49	36	6.6	2.86
4	48	1,173	50	1,222	2.40	59	46	6.6	2.93
5	52	1,310	50	1,259	2.90	73	44	6.6	3.02
6									2.93
7	38	922	48	1,165	2.20	53	40	8.2	2.91
8	50	1,184	44	1,042	2.30	54	36	7.1	2.84
9	38	865	20	455	1.95	44	14	6.8	2.73
10	42	974	40	927	2.20	51	28	6.0	2.78
11	44	1,075	38	929	2.10	51	36	5.0	2.93
12	44	1,050	40	954	2.20	52	30	6.7	2.86
13	60	1,436	50	1,197	2.10	50	40	7.0	2.87
14	56	1,354	52	1,258	3.00	73	46	7.7	2.90
15	42	977	40	931	2.30	54	36	7.3	2.79
16	42	963	60	1,376	2.30	53	46	6.4	2.75
17	42	981	42	981	2.45	57	36	5.6	2.80
18	52	1,284	46	1,136	2.40	59	40	6.1	2.96
19	48	1,165	56	1,359	2.90	70	42	6.5	2.91
20	68	1,667	48	1,177	4.95	121	44	7.6	2.94
21	104	2,619	58	1,461	6.01	151	34	8.6	3.02
22	50	1,184	48	1,137	2.85	68	32	6.1	2.84
23	42	928	74	1,635	2.40	53	62	6.9	2.65
24	36	814	52	1,175	1.70	38	38	6.4	2.71
25	42	967	44	1,013	2.20	51	36	7.8	2.76
26	82	2,017	48	1,181	2.45	60	38	7.5	2.95
27	54	1,311	40	971	3.40	83	40	6.7	2.91
28	44	1,042	54	1,279	2.65	63	64	9.0	2.84
29	48	1,113	62	1,437	2.45	57	52	6.2	2.78
30	48	1,097	52	1,188	1.65	38	44	6.2	2.74
31	50	1,155	48	1,109	1.65	38	42	7.0	2.77
Total	1,452	34,679	1,390	33,005	74.31	1,777	1,160	203.2	88.39
Max.	104	2,619	74	1,635	6.01	151	64	11.0	3.02
Min.	36	814	20	455	1.65	38	14	5.0	2.65
Avg.	50	1,196	48	1,138	2.56	61	40	7.0	2.85

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT - PLANT No. 130029
MAY 1987 ACTIVATED SLUDGE SHEET

	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading f/m	Mix Liq SS mg/L	Mix Liq VSS mg/L	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mg/L	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mg/l	PE SS mg/L
PN-	^80993	`81001	^80990	^80992	^70323	^70324	^81004	^81007	300.0	^81000	^81006	`70325	^81014	^80991	^50050	^00310	^00530
Day																	
1	48	3.0	7.2	0.20	2,177	1,543	29.0	0.75	1.2	208	0.43	0.31	78		2.86	38	48
2		3.0								210			82		2.85		
3		3.0								215			81		2.86	48	38
4		2.9	5.3	0.26	2,091	1,503	26.0	0.80	3.6	212	0.45	0.32	76		2.93	48	50
5		2.9	4.5	0.31	1,947	1,404	23.0	0.85	3.7	210	0.37	0.26	76		3.02	52	50
6		2.9			1,916	1,362	25.0	0.77	2.4	207	0.37	0.27	78		2.93		
7		3.0	6.7	0.21	2,060	1,472	26.0	0.79	2.4	216	0.38	0.27	78		2.91	38	48
8		3.0	4.9	0.30	1,932	1,334	25.0	0.77	4.2	216	0.32	0.21	81		2.84	50	44
9		3.2								211			86		2.73	38	20
10		3.1								209			81		2.78	42	40
11		2.9	5.0	0.28	1,801	1,276	22.0	0.82	1.4	205	0.30	0.22	76		2.93	44	38
12		3.0	4.0	0.35	1,411	991	18.0	0.78	2.3	219	0.28	0.20	82		2.86	44	40
13		3.0	3.3	0.43	1,570	1,117	17.0	0.92	4.5	212	0.30	0.22	83		2.87	60	50
14		3.0	4.4	0.32	2,001	1,401	25.0	0.80	2.2	211	0.43	0.30	80		2.90	56	52
15		3.1	6.4	0.22	2,089	1,491	26.0	0.80	1.9	214	0.46	0.33	83		2.79	42	40
16		3.1								214			85		2.75	42	60
17		3.1								210			84		2.80	42	42
18		2.9	5.0	0.29	2,135	1,490	25.0	0.85	2.1	214	0.44	0.30	79		2.96	52	46
19		3.0	5.4	0.26	2,108	1,476	23.0	0.92	3.1	215	0.42	0.29	80		2.91	48	56
20		2.9	3.8	0.38	2,104	1,454	24.0	0.88	1.4	204	0.43	0.29	79		2.94	68	48
21		2.9	2.5	0.58	2,175	1,514	25.0	0.87	1.2	206	0.44	0.30	77		3.02	104	58
22		3.0	5.7	0.25	2,262	1,587	27.0	0.84	1.2	210	0.34	0.24	82		2.84	50	48
23		3.3								219			88		2.65	42	74
24		3.2								217			86		2.71	36	52
25		3.1								211			86		2.76	42	44
26		2.9	3.4	0.42	2,302	1,622	30.0	0.77	2.4	204	0.43	0.30	79		2.95	82	48
27		3.0	5.3	0.26	2,338	1,674	36.0	0.65	2.1	203	0.42	0.30	79		2.91	54	40
28		3.0	6.0	0.24	2,076	1,472	33.0	0.63	1.4	218	0.37	0.27	82		2.84	44	54
29		3.1	5.6	0.25	2,069	1,466	31.0	0.67	2.6	224	0.39	0.28	85		2.78	48	62
30		3.1								227			86		2.74	48	52
31		3.1								225			86		2.77	50	48
Total	48	93.8	94.4	5.81	40,564	28,649	516.0	15.93	347.3	6,596	7.77	5.48	2,524		88.39	1,452	1,390
Max.	48	3.3	7.2	0.58	2,338	1,674	36.0	0.92	300.0	227	0.46	0.33	88		3.02	104	74
Min.	48	2.9	2.5	0.20	1,411	991	17.0	0.63	1.2	203	0.28	0.20	76		2.65	36	20
Avg.	48	3.0	5.0	0.31	2,028	1,432	25.8	0.80	16.5	213	0.39	0.27	81		2.85	50	48

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT
MISCELLANEOUS & SLUDGE SHEET - MAY 1987

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	Other	Raw Sludge Gals.	Raw Sludge Total Solids Percent	Raw Sludge Vol. Solids Percent	Raw Sludge pH
1		2,640	450	10	298		6,000	4.4	60	6.1
2		2,520	180	30	199		5,500			
3		2,640	240	30	397		5,000	4.2	63	6.0
4		2,640	210	20	199		5,000	3.7	75	5.9
5		2,520	480	10	397		15,400	4.0	70	6.1
6		2,640	180	20	298		1,000	4.8	64	5.9
7		2,400	450	30	397		1,000	4.5	64	5.9
8		2,640	200	30	298		11,600	4.8	70	5.7
9		2,400	160	10	298		1,000	5.0	68	5.9
10		2,520	200	20	298		1,000	5.1	71	5.7
11		2,520	1,550	20	397		12,200	5.0	69	5.7
12		2,640	1,800	30	397		1,000	6.0	78	5.6
13		2,400	1,330	10	397		1,000	4.4	79	6.0
14		2,640	1,610	20	298		1,800	5.0	70	5.6
15		2,760	910	30	397		12,700	4.0	84	6.0
16		2,520	460	20	298		1,000	7.4	73	6.2
17		2,520	470	10	298		1,000	5.2	75	6.2
18		2,640	410	20	397		5,000	4.7	77	5.4
19		2,760	630	20	298		3,500	4.9	70	5.3
20		2,280	570	10	298		16,200	4.3	74	5.2
21		2,640	380	20	397		1,000	4.7	67	5.1
22		2,520	570	20	298		9,700	4.1	70	5.1
23		2,520	390	30	298		1,000	4.6	70	5.4
24		2,520	390	20	397		1,000	4.8	76	5.4
25		2,520	440	10	199		4,000	3.6	70	5.5
26		2,640	920	20	397		4,400	3.6	66	5.8
27		2,520	780	10	298		11,700	5.2	69	5.5
28		2,520	340	20	298		2,000	2.9	69	7.1
29		2,640	2,420	20	397		15,000	5.0	67	5.7
30		2,520	990	20	298		1,000	4.5	83	6.4
31		2,640	800	20	298		10,500	3.6	87	5.2
Total		79,440	20,910	610	10,129		169,200	138.0	2,148	172.6
Max.		2,760	2,420	30	397		16,200	7.4	87	7.1
Min.		2,280	160	10	199		1,000	2.9	60	5.1
Avg.		2,563	675	20	327		5,458	4.6	72	5.8

Manpower & Hours

	Total Hr
Superintendent 1	^160
Asst. Supt. 1	^160
Operators 3	^484
Total	^804

Robert J. Swalwell
Superintendent

MARSHALL WWTP 801 W. PEARL ST., MARSHALL MI 49068 - PERMIT No. MI0023540
MAY 1987 DISCHARGE MONITORING REPORT - DISCHARGE No. 001A

	D.O. mgIL	pH SU	SS mgIL	SS Lbs.	Total-P mgIL	Flow MGD	Chlorine mgIL	BOD mgIL	BOD Lbs.	NH3 as N mgIL	NH3-N Lbs.	F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %
Limit-	>4.0	6 & 9	30 & 45	751 & ^1,126	<1.0			20 & 30	500 & ^751	<11.0	7 Day ^275	200 & 400	>85%	>85%	
PN-	^00300	^00400	^00530	^00530	^00665	^50050	^50060	^80082	^80082	^00610	^00610	^31616	^81011	^91267	^81012
Day															
1	4.1	7.5	9	215	0.42	2.86		7	167	10.0	239	440	87	85	82
2	5.6	7.6				2.85						8			
3	7.1	7.7	8	191	0.37	2.86		4	95	5.8	138	2	91	94	84
4	7.6	7.7	8	195	0.38	2.93		4	98	5.7	139	12	87	95	90
5	8.0	7.7	2	50	0.32	3.02		4	101	4.9	123	4	97	94	90
6	7.3	7.6	4	98		2.93		2	49	5.6	137	40	95	97	
7	7.1	7.7	6	146	0.25	2.91		2	49	5.2	126	24	92	97	87
8	7.9	7.6	2	47	0.22	2.84		2	47	4.4	104	4	97	97	90
9	6.2	7.5	2	46	0.25	2.73		1	23	4.4	100	6	94	98	88
10	5.5	7.5	1	23	0.22	2.78		2	46	3.6	83	2	98	97	90
11	7.1	7.4	2	49	0.20	2.93		3	73	3.2	78	18	97	95	91
12	7.0	7.5	2	48	0.18	2.86		3	72	4.3	103	22	97	95	91
13	7.8	7.6	2	48	0.30	2.87		2	48	3.6	86	22	97	96	86
14	7.3	7.5	5	121	0.30	2.90		4	97	5.1	123	18	95	94	89
15	6.9	7.2	6	140	0.27	2.79		2	47	4.7	109	24	90	96	86
16	7.4	8.2	12	275	0.27	2.75		3	69	3.8	87	40	83	94	87
17	7.0	8.6	5	117	0.25	2.80		3	70	3.5	82	42	89	94	87
18	7.0	7.4	8	197	0.27	2.96		3	74	3.4	84	66	89	94	89
19	7.3	7.6	7	170	0.27	2.91		3	73	4.0	97	56	90	94	92
20	6.6	7.1	8	196	0.97	2.94		5	123	6.8	167		94	95	83
21	6.1	7.2	9	227	0.71	3.02		5	126	7.2	181	96	95	95	72
22	5.9	7.0	6	142	0.34	2.84		4	95	6.1	144	84	95	93	85
23	6.2	7.2	7	155	0.44	2.65		2	44	6.2	137	36	92	96	76
24	6.7	7.1	9	203	0.34	2.71		2	45	4.9	111	34	90	96	86
25	6.5	7.9	3	69	0.27	2.76		2	46	4.9	113	16	95	96	88
26	6.7	7.2	7	172	0.42	2.95		7	172	6.7	165	16	97	94	88
27	5.7	7.4	3	73	0.44	2.91		5	121	7.1	172		97	94	82
28	6.0	7.4	7	166	0.22	2.84		3	71	5.6	133	122	92	94	90
29	6.4	7.4	11	255	0.22	2.78		2	46	7.8	181	44	87	96	86
30	6.0	8.1	6	137	0.22	2.74		2	46	3.7	85	24	91	96	88
31	6.3	8.0	6	139	0.16	2.77		2	46	5.4	125	22	92	97	91
Total	206.3	234.1	173	4,109	9.49	88.39		95	2,278	157.6	3,753	1,344	2,782	2,848	2,514
Max.	8.0	8.6	12	275	0.97	3.02		7	172	10.0	239	440	98	98	92
Min.	4.1	7.0	1	23	0.16	2.65		1	23	3.2	78	2	83	85	72
Avg.	6.7	7.6	6	137	0.33	2.85		3	76	5.3	125	23	93	95	87

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT
JUNE 1987 PLANT INFLUENT SHEET - SAMPLING CODE 500

	----Weather-----		Inf. Flow	Inf. Temp	Inf. pH	Inf. BOD	Int. BOD	Inf. SS	Inf. SS	Inf. Phos.	Inf. Phos.	Inf. VSS	Inf. NH3-N	--Remarks or Other Parameters--
	Type	Precip.	MGD	F	SU	mgIL	Lbs.	mgIL	Lbs.	mgIL	Lbs.	mgIL	mgIL	
PN-	^00033	^00045	^50050	^00011	^00400	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	
Day														
1	4	0.04	2.87	55	7.8	90	2,154	76	1,819	2.85	68	52	7	
2	4	0.63	2.85	55	7.5	96	2,282	92	2,187	2.05	49	58	9	
3	1		2.86	55	7.7	140	3,339	84	2,004	2.40	57	52	8	
4	1		2.80	55	7.8	60	1,401	52	1,214	1.95	46	48	5	
5	4	0.03	2.77	56	7.5	42	970	24	554	1.15	27	18	7	
6	1		2.70	55	7.2	46	1,036	32	721	2.45	55	12	7	
7	1		2.83	55	7.4	76	1,794	74	1,747	2.10	50	52	8	
8	4	0.06	2.90	55	7.4	76	1,838	78	1,887	1.95	47	52	8	
9	1		2.80	56	8.0	62	1,448	84	1,962	2.55	60	52	7	
10	1		2.81	55	7.6	82	1,922	74	1,734	2.30	54	54	7	
11	4	0.17	2.80	56	7.5	64	1,495	150	3,503	1.90	44	100	6	
12	4	0.01	2.82	57	7.6	92	2,164	92	2,164	2.45	58	58	11	
13	1		2.73	56	8.0	72	1,639	74	1,685	5.70	130	54	9	
14	1		2.72	56	7.4	66	1,497	80	1,815	1.00	23	64	5	
15	1		2.88	56	7.7	86	2,066	84	2,018	1.90	46	48	7	
16	1		2.83	57	7.7	80	1,888	74	1,747	3.10	73	58	9	
17	1		2.84	57	7.6	78	1,847	84	1,990	2.10	50	54	6	
18	1		2.86	58	7.5	70	1,670	104	2,481	2.10	50	84	7	
19	1		2.83	58	7.7	48	1,133	28	661	1.35	32	20	6	
20	4	0.19	2.72	58	7.4	54	1,225	32	726	1.50	34	14	6	
21	4	0.73	2.78	57	7.5	86	1,994	170	3,941	2.40	56	108	7	
22	1		2.93	57	7.9	86	2,102	66	1,613	2.90	71	54	7	
23	1		2.86	57	7.6	66	1,574	54	1,288	1.90	45	30	7	
24	1		2.85	57	7.4	64	1,521	74	1,759	1.95	46	68	7	
25	4	0.03	2.83	58	7.4	50	1,180	60	1,416	2.05	48	48	6	
26	1		2.76	58	7.3	50	1,151	68	1,565	1.70	39	50	6	
27	1		2.65	57	7.2	50	1,105	50	1,105	1.65	36	30	6	
28	1		2.66	57	7.2	68	1,509	48	1,065	2.40	53	30	8	
29	4	0.40	2.88	58	7.3	120	2,882	77	1,849	2.65	64	75	7	
30	4	0.09	2.83	59	7.3	142	3,352	78	1,841	2.05	48	74	7	
31														
Total	63	2.38	84.25	1,696	226.1	2,262	53,177	2,217	52,058	66.50	1,558	1,571	213	
Max.	4	0.73	2.93	59	8.0	142	3,352	170	3,941	5.70	130	108	11	
Min.	1	0.01	2.65	55	7.2	42	970	24	554	1.00	23	12	5	
Avg.	2	0.22	2.81	57	7.5	75	1,773	74	1,735	2.22	52	52	7	

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT - PLANT No. 130029
June 1987 PRIMARY EFFLUENT SHEET

	P Eff. BOD mg/L	P Eff. BOD Lbs.	P Eff. SS mg/L	P. Eff. SS Lbs.	P Eff. Phos. mg/L	P Eff. Phos. Lbs.	P Eff. VSS mg/L	P Eff. NH3-N mg/L	--Remarks or Other Parameters-- Flow MGD
PN-	310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	^50050
Day									
1	94	2,250	48	1,149	2.55	61	34	6.3	2.87
2	58	1,379	52	1,236	2.10	50	28	8.7	2.85
3	120	2,862	50	1,193	2.40	57	30	5.7	2.86
4	54	1,261	14	327	1.90	44	10	4.5	2.80
5	42	970	24	554	1.15	27	22	6.6	2.77
6	44	991	22	495	3.30	74	16	5.6	2.70
7	72	1,699	54	1,275	2.30	54	36	7.6	2.83
8	58	1,403	52	1,258			42	6.8	2.90
9	48	1,121	56	1,308	1.90	44	24	6.7	2.80
10	80	1,875	46	1,078	2.40	56	30	7.4	2.81
11	64	1,495	72	1,681	2.10	49	24	6.0	2.80
12	86	2,023	74	1,740	1.80	42	42	11.4	2.82
13	66	1,503	52	1,184	2.10	48	34	8.6	2.73
14	42	953	34	771	2.75	62	26	5.5	2.72
15	52	1,249	46	1,105	0.80	19	14	6.9	2.88
16	72	1,699	42	991	1.80	42	28	8.6	2.83
17	44	1,042	52	1,232	2.45	58	42	6.5	2.84
18	56	1,336	42	1,002	2.10	50	28	7.4	2.86
19	38	897	20	472	1.90	45	14	5.7	2.83
20	42	953	16	363	1.35	31	12	5.7	2.72
21	52	1,206	72	1,669	1.60	37	32	6.2	2.78
22	74	1,808	38	929	2.05	50	34	5.6	2.93
23	40	954	22	525	2.85	68	16	7.9	2.86
24	40	951	30	713	1.90	45	24	6.2	2.85
25	34	802	32	755	1.65	39	30	5.8	2.83
26	48	1,093	80	1,821	1.95	44	30	5.8	2.73
27	44	972	36	796	1.50	33	32	6.2	2.65
28	58	1,287	26	577	1.35	30	22	7.3	2.66
29	116	2,786	34	817	1.80	43	24	6.0	2.88
30	112	2,643	44	1,038	2.65	63	42	6.9	2.83
31					1.90				
Total	2,160	43,462	1,282	30,054	60.35	1,368	822	202.1	84.22
Max.	310	2,862	80	1,821	3.30	74	42	11.4	2.93
Min.	34	802	14	327	0.80	19	10	4.5	2.65
Avg.	70	1,449	43	1,002	2.01	47	27	6.7	2.81

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT - PLANT No. 130029
JUNE 1987 ACTIVATED SLUDGE SHEET

	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading f/m	Mix Liq SS mg/L	Mix Liq VSS mg/L	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mg/L	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mg/l	PE SS mg/L
PN-	^80993	`81001	^80990	^80992	^70323	`70324	^81004	^81007	^00300	`81000	`81006	70325	`81014	`80991	^50050	^00310	^00530
Day																	
1	48	3.0	2.9	0.49	2,168	1,545	30.0	0.72	2.4	227	0.42	0.31	82		2.87	94	48
2		3.0	4.7	0.30	2,148	1,520	32.0	0.67	0.5	227	0.40	0.28	82		2.85	58	52
3		3.0	2.3	0.65	2,234	1,477	28.0	0.80	1.7	229	0.43	0.30	83		2.86	120	50
4		3.1	5.4	0.25	2,270	1,661	34.0	0.67	1.6	237	0.41	0.30	83		2.80	54	14
5		3.1	6.9	0.19	2,233	1,670	32.0	0.70	1.6	230	0.41	0.30	84		2.77	42	24
6		3.2								229			87		2.70	44	22
7		3.0								227			84		2.83	72	54
8		3.0	4.8	0.29	2,255	1,604	30.0	0.75	1.2	227	0.40	0.29	81		2.90	58	52
9		3.1	6.0	0.24	2,256	1,581	33.0	0.68	1.8	236	0.45	0.16	83		2.80	48	56
10		3.1	3.5	0.43	2,217	1,452	28.0	0.79	2.7	236	0.41	0.29	85		2.81	80	46
11		3.1	4.6	0.31	2,319	1,631	34.0	0.68	2.2	224	0.44	0.30	83		2.80	64	72
12		3.1	3.4	0.41	2,312	1,646	34.0	0.68	1.8	222	0.43	0.15	82		2.82	86	74
13		3.2								223			86		2.73	66	52
14		3.2								223			86		2.72	42	34
15		3.0	4.7	0.29	1,947	1,415	30.0	0.65	1.5	224	0.39	0.28	83		2.88	52	46
16		3.0	3.4	0.40	1,955	1,402	27.0	0.72	1.2	225	0.37	0.24	85		2.83	72	42
17		3.0	6.7	0.21	2,329	1,694	43.0	0.54	1.1	227	0.35	0.26	84		2.84	44	52
18		3.0	4.6	0.30	2,045	1,511	30.0	0.68	1.3	222	0.43	0.32	82		2.86	56	42
19		3.0	7.1	0.18	2,139	1,665	30.0	0.71	2.2	219	0.40	0.30	85		2.83	38	20
20		3.2								225			89		2.72	42	16
21		3.1								223			87		2.78	52	72
22		2.9	3.1	0.45	1,884	1,328	25.0	0.75	0.8	224	0.32	0.24	82		2.93	74	38
23		3.0	6.3	0.22	1,992	1,454	26.0	0.77	0.5	236	0.35	0.24	84		2.86	40	22
24		3.0	6.0	0.23	1,912	1,372	25.0	0.76	3.3	241	0.36	0.26	85		2.85	40	30
25		3.0	6.9	0.20	1,842	1,315	23.0	0.80	1.6	238	0.35	0.25	86		2.83	34	32
26		3.1	4.9	0.29	1,813	1,285	22.0	0.82	2.5	245	0.35	0.25	88		2.76	48	80
27		3.3								250			93		2.65	44	36
28		3.2								244			93		2.66	58	26
29		3.0	2.0	0.71	1,899	1,306	22.0	0.86	0.4	227	0.35	0.24	85		2.88	116	34
30		3.0	2.1	0.66	1,897	1,334	24.0	0.79	1.4	232	0.35	0.24	85		2.83	112	44
31																	
Total	48	92.1	102.5	7.71	46,066	32,868	642.0	16.02	35.3	6,899	8.57	5.80	2,547		84.25	1,850	1,282
Max.	48	3.3	7.1	0.71	2,329	1,694	43.0	0.86	3.3	250	0.45	0.32	93		2.93	120	80
Min.	48	2.9	2.0	0.18	1,813	1,285	22.0	0.54	0.4	219	0.32	0.15	81		2.65	34	14
Avg.	48	3.1	4.7	0.35	2,094	1,494	29.2	0.73	1.6	230	0.39	0.26	85		2.81	62	43

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT
MISCELLANEOUS & SLUDGE SHEET - JUNE 1987

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	Other	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	pH
	4									
1		2,640	490	10	298		3,000	3.9	65	6.3
2		2,640	480	30	298		2,500	3.4	65	7.3
3		2,640	450	20	397		13,000	2.1	59	7.3
4		2,640	830	20	397		2,900			
5		2,640	1,630	20	298		10,000	3.6	68	5.8
6		2,520	420	20	298		1,000	4.8	81	5.8
7		2,640	1,450	10	298		1,000	5.4	83	5.5
8		2,640	500	30	397		16,000	3.5	61	
9		2,640	810	20	298		1,800	5.9	79	6.3
10		2,640	1,440	30	298		2,500	4.4	87	5.8
11		2,640	1,460	10	298		14,100	3.2	69	5.2
12		2,640	1,270	10	298		1,800	7.2	74	5.7
13		2,520	560	20	298		13,500	3.1	65	
14		2,520	1,320	10	298		1,500	7.3	74	5.5
15		2,520	1,200	10	298		15,300	2.8	68	5.7
16		2,640	3,630	10	397		14,000	8.9	64	5.7
17		2,640	420	10	298		500	10.1	51	6.0
18		2,640	1,760	20	397		6,000	3.6	67	
19		2,520	1,820		298		13,000	3.3	65	6.0
20		2,640	1,010		298		8,700			
21		2,520	410		298					
22		2,640	620	20	397		12,600	3.6	69	
23		2,640	1,290	10	298		6,100			
24		2,640	2,300		298					
25		2,640	1,680	10	397		13,500	4.2	59	
26		2,760	2,720	20	298		2,000	6.1	44	
27		2,640	1,310	30	298		1,000	8.6	64	5.9
28		2,520	1,190	10	298					5.7
29		2,760	1,500	20	298		13,000	3.9	59	5.6
30		2,640	620	20	397		400			
31										
Total	4	78,600	36,590	450	9,732		190,700	112.9	1,540	107.1
Max.	4	2,760	3,630	30	397		16,000	10.1	87	7.3
Min.	4	2,520	410	10	298		400	2.1	44	5.2
Avg.	4	2,620	1,220	17	324		7,063	4.9	67	6.0

Manpower & Hours

	Total Hr
Superintendent 1	^176
Asst. Supt. 1	176
Operators 3	528
Total	880
	1,584
	880
	176
	528

Robert J. Swalwell
Superintendent

MARSHALL WWTP 801 W. PEARL ST., MARSHALL MI 49068 - PERMIT No. MI0023540
JUNE 1987 DISCHARGE MONITORING REPORT - DISCHARGE No. 001A

	D.O. mg/L	pH SU	SS mg/L	SS Lbs.	Total-P mg/L	Flow MGD	Chlorine mg/L	BOD mg/L	BOD Lbs.	NH3 as N mg/L	NH3-N Lbs.	F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %
Limit-	>4.0	6 & 9	30 & 45	751 & ^1,126	<1.0			20 & 30	500 & ^751	<11.0	7 Day ^275	200 & 400	>85%	>85%	
PN-	^00300	^00400	^00530	^00530	^00665	^50050	^50060	^80082	^80082	^00610	^00610	^31616	^81011	^91267	^81012
Day															
1	7.6	7.8	4	96	0.25	2.87		4	96	4.6	110	26	95	96	91
2	6.2	7.6	7	166	0.32	2.85		4	95	6.3	150		92	96	84
3	6.6	7.7	16	382	0.51	2.86		7	167	2.2	52	174	81	88	79
4	6.5	7.8	3	70	0.22	2.80		4	93	2.0	47	106	88	93	89
5	7.4	7.4	5	116	0.15	2.77		5	116	4.0	92	26	79	88	87
6	7.1	7.5	1	23	0.25	2.70		2	45	3.6	81	6	97	96	90
7	6.0	7.3	3	71	0.27	2.83		3	71	5.4	127	14	96	96	87
8	7.0	7.2	8	193	0.27	2.90		3	73	4.1	99	86	90	97	86
9	7.8	7.9	4	93	0.41	2.80		2	47	4.3	100	32	95	97	84
10	7.9	7.5	5	117	0.30	2.81		2	47	5.4	127	36	93	98	87
11	7.5	7.4	'11'	'257'	0.19	2.80		2	47	3.9	91	54	93	98	90
12	7.3	7.3	5	118	0.35	2.82		'10'	'235'	8.3	195	54	95	89	86
13	7.0	7.5	13	296	0.76	2.73		10	228	7.5	171		82	86	87
14	6.5	7.7	8	181	0.05	2.72		5	113	2.8	64	34	90	92	95
15	7.4	7.4	10	240	0.18	2.88		2	48	4.0	96	108	88	98	91
16	7.3	7.5	5	118	0.35	2.83		5	118	6.4	151	24	93	94	89
17	6.4	7.5	(8)	(189)	0.34	2.84		3	71	3.4	81		90	96	83
18	7.3	7.4	8	191	0.23	2.86		(2)	(48)	4.8	114	858	92	97	89
19	7.3	7.5	4	94	0.25	2.83		2	47	3.9	92	450	86	96	81
20	6.3	7.4	4	91	0.44	2.72		3	68	3.9	88		88	94	71
21	6.4	7.6	17	394	0.40	2.78		4	93	5.4	125		90	95	83
22	7.3	7.7	8	195	0.38	2.93		7	171	5.0	122		88	92	87
23	6.9	7.5	6	143	0.25	2.86		2	48	6.9	(165)	'417'	98	97	87
24	7.1	7.6	3	71	0.27	2.85		2	48	4.9	116	460	96	97	86
25	6.8	7.4	7	165	0.23	2.83		2	47	4.7	111	88	88	96	87
26	6.1	7.4	12	276	0.25	2.76		2	46	5.2	120	90	82	96	85
27	6.2	7.4	4	88	0.22	2.65		2	44	5.9	130	46	92	96	87
28	6.2	7.5	1	22	0.23	2.66		4	89	6.1	135	600	98	94	90
29	6.3	7.3	5	120	0.46	2.88		10	240	5.2	(125)	(176)	94	92	83
30	7.4	7.4	3	71	0.32	2.83		4	94	6.4	151		96	97	84
31															
Total	207.1	225.1	198	4,649	9.10	84.25		119	2,792	146.5	3,430	3,365	2,725	2,837	2,585
Max.	7.9	7.9	17	394	0.76	2.93		10	240	8.3	195	858	98	98	95
Min.	6.0	7.2	1	22	0.05	2.65		2	44	2.0	47	6	79	86	71
Avg.	6.9	7.5	7	155	0.30	2.81		4	93	4.9	114	81	91	95	86
			9	200				6	123		129	185			

Robert J. Swalwell
Superintendent

MAREHALL MIDDLE WASTEWATER TREATMENT PLANT
JULY 1987 PLANT INFLUENT SHEET - SAMPLING CODE SW

	----weather------		Inf. Flow	Inf. Temp	Inf. pH	Inf. BOD	Inf. BOD	Inf. SS	Inf. SS	Inf. Phos.	Inf. Phos.	Inf. VSS	Inf. NH3-N	--Remarks or Other Parameters--
	Type	Precip.	MGD	F	SU	mgIL	Lbs.	mgIL	Lbs.	mgIL	Lbs.	mgIL	mgIL	
PN-	00033	00045	50050	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	
Day														
1	1		2.83	58	7.2	92	2,171	60	1,416	1.65	39	38	8.2	
2	1		2.84	57	7.6	92	2,179	64	1,516			44	8.5	
3	4	0.23	2.66	57	7.2	104	2,307	70	1,553	1.90	42	44	6.8	
4	1		2.61	57	7.1	94	2,046	42	914	1.60	35	38	6.3	
5	4	0.49	2.66	57	7.1	94	2,085	88	1,952	1.95	43	68	6.4	
6	4	0.18	2.92	58	6.9	118	2,874	98	2,387	5.70	139	74	6.2	
7	1		2.90	59	6.8	94	2,273	92	2,225	3.00	73	60	7.9	
8	1		2.88	59	7.4	78	1,873	96	2,306	1.95	47	64	6.4	
9	4	0.10	2.85	59	7.4	72	1,711	98	2,329	2.20	52	64	5.5	
10	1		2.80	59	7.5	68	1,588	80	1,868	2.10	49	76	6.4	
11	1		2.71	59	7.4	97	2,192	98	2,215	1.90	43	70	6.0	
12	1		2.69	58	7.5	50	1,122	66	1,481	1.95	44	62	6.6	
13	4	0.09	2.83	59	7.4	78	1,841	86	2,030	6.95	164	80	5.9	
14	1		2.77	59	7.8	72	1,663	70	1,617	6.90	159	52	7.2	
15	4	0.50	2.82	59	7.5	70	1,646	68	1,599	2.75	65	54	9.0	
16	1		2.82	59	7.5	66	1,552	80	1,882	1.80	42	60	8.4	
17	1		2.77	58	7.5	62	1,432	78	1,802	1.70	39	58	6.3	
18	1		2.66	58	7.6	54	1,198	68	1,509	1.60	35	46	6.1	
19	1		2.69	58	7.5	64	1,436	66	1,481	2.75	62	62	5.4	
20	4	0.13	2.89	59	7.4	80	1,928	78	1,880	2.90	70	56	5.8	
21	1		2.76	59	7.5	78	1,795	68	1,565	3.95	91	64	6.9	
22	1		2.79	59	6.8	68	1,582	114	2,653	2.05	48	88	9.2	
23	1		2.74	59	7.3	58	1,325	90	2,057	2.20	50	68	5.4	
24	4	0.95	2.84	59	7.3	104	2,463	108	2,558	3.75	89	78	6.3	
25	4	0.09	2.65	59	7.3	48	1,061	108	2,387	3.40	75	86	5.5	
26	1		2.69	59	7.3	52	1,167	78	1,750	1.80	40	66	5.6	
27	1		2.77	59	7.3	72	1,663	100	2,310	1.95	45	68	6.1	
28	1		2.72	59	7.3	66	1,497	104	2,359	2.55	58	82	6.5	
29	1		2.71	59	7.6	84	1,899	98	2,215	2.45	55	78	8.0	
30	1		2.72	59	7.4	136	3,085	112	2,541	4.95	112	96	10.4	
31	4	0.09	2.71	59	7.4	60	1,356	72	1,627	2.10	47	52	17.3	
Total	61	2.85	85.70	1,815	227.8	2,425	56,014	2,598	59,983	84.40	1,953	1,996	222.5	
Max.	4	0.95	2.92	59	7.8	136	3,085	114	2,653	6.95	164	96	17.3	
Min.	1	0.09	2.61	57	6.8	48	1,061	42	914	1.60	35	38	5.4	
Avg.	2	0.29	2.76	59	7.3	78	1,807	84	1,935	2.81	65	64	7.2	

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT - PLANT No. 26125
JULY 1987 PRIMARY EFFLUENT SHEET

	P Eff. BOD mg/L	P Eff. BOD Lbs.	P Eff. SS mg/L	P. Eff. SS Lbs.	P Eff. Phos. mg/L	P Eff. Phos. Lbs.	P Eff. VSS mg/L	P Eff. NH3-N mg/L	--Remarks or Other Parameters-- Flow MGD
PN-	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	^50050
Day									
1	96	2,266	48	1,133	1.70	40	32	6.0	2.83
2	78	1,847	48	1,137			34	6.5	2.84
3	86	1,908	30	666	1.70	38	22	5.9	2.66
4	64	1,393	24	522	1.35	29	18	5.5	2.61
5	68	1,509	36	799	1.70	38	30	5.6	2.66
6	98	2,387	62	1,510	5.10	124	58	5.3	2.92
7	76	1,838	36	871	3.50	85	16	7.0	2.90
8	64	1,537	72	1,729	1.90	46	60	6.6	2.88
9	54	1,284	60	1,426	2.10	50	30	5.4	2.85
10	50	1,168	66	1,541	2.20	51	48	5.9	2.80
11	60	1,356	54	1,220	1.70	38	46	5.8	2.71
12	38	853	36	808	1.90	43	26	5.3	2.69
13	58	1,369	44	1,038	6.35	150	32	5.5	2.83
14	54	1,247	36	832	6.70	155	30	6.6	2.77
15	76	1,787	22	517	2.85	67	16	8.0	2.82
16	46	1,082	44	1,035	1.80	42	38	6.5	2.82
17	44	1,016	48	1,109	1.65	38	36	5.8	2.77
18	38	843	38	843	1.65	37	28	5.8	2.66
19	42	942	46	1,032	2.45	55	36	5.3	2.69
20	60	1,446	46	1,109	3.00	72	40	5.4	2.89
21	44	1,013	40	921	3.40	78	34	6.0	2.76
22	42	977	28	652	2.20	51	26	6.0	2.79
23	44	1,005	48	1,097	1.95	45	42	5.4	2.74
24	60	1,421	54	1,279	3.75	89	42	5.8	2.84
25	42	928	46	1,017	2.85	63	32	5.7	2.65
26	36	808	28	628	1.65	37	26	5.9	2.69
27	56	1,294	54	1,247	1.95	45	42	5.4	2.77
28	46	1,044	40	907	2.40	54	22	6.4	2.72
29	62	1,401	36	814	2.30	52	26	6.9	2.71
30	74	1,679	38	862	4.10	93	28	9.8	2.72
31	56	1,266	52	1,175	1.80	41	38	13.6	2.71
Total	1,812	41,914	1,360	31,476	79.65	1,846	1,034	196.6	85.70
Max.	98	2,387	72	1,729	6.70	155	60	13.6	2.92
Min.	36	808	22	517	1.35	29	16	5.3	2.61
Avg.	58	1,352	44	1,015	2.66	62	33	6.3	2.76

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT - PLANT NO. 170 29
JULY 1987 ACTIVATED SLUDGE SHEET

	Aerat Volume CF	Deten. Time Hrs.	Sludge Age Days	Organic Loading #/M	M. Liq SS mg/L	M. Liq VSS mg/L	M. Liq Settl. %	M. Liq SDI %	M. L. C DO mg/L	Air Cu Ft. X 1000	Return SS %	Return VSS %	Return %	Waste Sludge #Gal	Daily Flow MGD	FE BOD mg/l	PE SS mg/L
PN-	80992	81001	80990	80992	70323	70324	81004	81017	00300	81000	81006	70325	81014	80991	50050	00710	00530
Day																	
1	48	3.0	5.0	0.56	1,882	1,352	23.0	0.82	0.9	229	0.34	0.24	86		2.83	96	48
2		3.0	5.1	0.45	1,951	1,376	25.0	0.78	2.9	227	0.33	0.23	87		2.84	78	48
3		3.2								228			92		2.66	86	30
4		3.3								230			95		2.61	64	24
5		3.2								226			92		2.66	68	36
6		3.0	3.9	0.59	1,959	1,346	22.0	0.89	1.2	227	0.34	0.24	84		2.92	98	62
7		3.0	7.4	0.41	2,153	1,511	27.0	0.80	0.7	225	0.40	0.28	85		2.90	76	36
8		3.0	4.3	0.29	2,482	1,750	32.0	0.78	0.3	224	0.45	0.31	82		2.88	64	72
9		3.0	4.8	0.26	2,309	1,661	34.0	0.68	0.8	221	0.41	0.30	84		2.85	54	60
10		3.1	4.1	0.27	2,136	1,469	28.0	0.76	1.6	222	0.40	0.27	84		2.80	50	66
11		3.2								221			91		2.71	60	54
12		3.2								221			91		2.69	38	36
13		3.0	5.3	0.35	1,843	1,320	25.0	0.74	1.8	228	0.31	0.22	87		2.83	58	44
14		3.1	6.9	0.32	1,907	1,293	24.0	0.79	1.0	231	0.34	0.23	89		2.77	54	36
15		3.1	11.1	0.44	1,926	1,344	26.0	0.74	3.0	236	0.33	0.23	88		2.82	76	22
16		3.1	5.7	0.27	1,953	1,356	26.0	0.75	2.4	230	0.33	0.23	88		2.82	46	44
17		3.1	5.6	0.24	2,071	1,442	30.0	0.69	1.8	224	0.37	0.27	88		2.77	44	48
18		3.2								226			95		2.66	38	38
19		3.2								223			93		2.69	42	46
20		3.0	5.7	0.34	2,118	1,437	31.0	0.68	1.2	223	0.37	0.25	86		2.89	60	46
21		3.1	6.3	0.26	1,929	1,317	34.0	0.57	2.1	226	0.41	0.28	87		2.76	44	40
22		3.1	8.5	0.25	1,852	1,301	28.0	0.66	1.1	222	0.35	0.23	89		2.79	42	28
23		3.1	4.9	0.27	1,790	1,251	31.0	0.58	3.0	224	0.32	0.23	90		2.74	44	48
24		3.0	4.0	0.40	1,718	1,175	28.0	0.61	2.6	222	0.31	0.21	88		2.84	60	54
25		3.3								225			94		2.65	42	46
26		3.2								230			95		2.69	36	28
27		3.1	4.2	0.36	1,757	1,187	30.0	0.59	2.3	228	0.31	0.21	91		2.77	56	54
28		3.2	6.8	0.24	2,052	1,428	38.0	0.54	1.8	227	0.36	0.23	92		2.72	46	40
29		3.2	7.5	0.33	2,038	1,398	55.0	0.37	2.2	231	0.26	0.18	91		2.71	62	36
30		3.2	7.2	0.39	2,067	1,434	55.0	0.38	1.8	231	0.36	0.27	90		2.72	74	38
31		3.2	5.0	0.31	1,966	1,346	42.0	0.47	0.8	227	0.34	0.25	92		2.71	56	52
Total	48	96.7	129.3	7.60	43,859	30,494	694.0	14.66	37.3	7,015	7.74	5.39	2,767		85.70	1,812	1,360
Max.	48	3.3	11.1	0.59	2,482	1,750	55.0	0.89	3.0	236	0.45	0.31	95		2.92	98	72
Min.	48	3.0	3.9	0.24	1,718	1,175	22.0	0.37	0.3	221	0.26	0.18	83		2.61	36	22
Avg.	48	3.1	5.9	0.35	1,994	1,386	31.5	0.67	1.7	226	0.35	0.25	89		2.76	58	44

Robert J. Swalwell
Superintendent

MARSHALL WWTP 801 W PEARL ST.,MARSHALL MI 49068 - PERMIT No. MI0023540
JULY 1987 DISCHARGE MONITORING REPORT - DISCHARGE No. 001A

	D.O. mg/L	pH SU	SS mg/L	SS Lbs.	Total-P mg/L	Flow MGD	Chlorine mg/L	BOD mg/L	BOD Lbs.	NH3 as N mg/L	NH3-N Lbs.	F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %
Limit-	≥4.0	6 & 9	30 & 45	751 & ≤1,126	≤1.0		Average	20 & 30	500 & ≤751	≤11.0	7 Day ≤275	200 & 400	≥85%	≥85%	
PN-	^00300	^00400	^00530	^00530	^00665	^50050	^50060	^80082	^80082	^00610	^00610	^31616	^81011	^91267	^81012
Day															
1	6.5	7.3	9	212	0.25	2.83	0.70	3	71	4.9	116	130	85	97	85
2	6.2	7.3	7	166	0.23	2.84	0.70	2	47	4.9	116	84	89	98	88
3	7.1	7.1	6	133	0.23	2.66	0.70	2	44	4.3	95	76	91	98	88
4	7.4	7.1	2	44	0.22	2.61	0.70	1	22	4.0	87	60	95	99	86
5	7.6	7.2	4	89	0.27	2.66	0.70	2	44	4.7	104	96	95	98	76
6	6.9	6.9	8	195	0.64	2.92	0.60	7	170	4.5	110	124	92	94	89
7	5.7	6.8	6	145	0.80	2.90	0.60	9	218	6.0	145	600	93	90	73
8	5.4	7.5	14	336	0.51	2.88	0.50	4	96	7.2	173	440	85	95	76
9	6.2	7.5	9	214	0.34	2.85	0.70	4	95	3.8	90	188	91	94	85
10	6.2	7.6	6	140	0.91	2.80	0.60	3	70	4.3	100	4	93	96	56
11		7.4	10	226	0.55	2.71	0.60	2	45	3.7	84	38	90	97	71
12		7.7	4	90	0.32	2.69	0.60	2	45	3.8	85	50	94	96	84
13	6.6	7.5	3	71	0.78	2.83	0.65	2	47	4.3	101	174	97	97	89
14	6.5	7.5	2	46	0.87	2.77	0.47	3	69	5.4	125	166	97	96	87
15	6.7	7.5	2	47	0.91	2.82	0.60	2	47	6.7	158	132	97	97	67
16	7.0	7.5	5	118	0.46	2.82	0.63	2	47	5.7	134	64	96	97	74
17	6.7	7.5	3	69	0.34	2.77	0.60	2	46	4.5	104	76	96	97	80
18	6.5	7.3	6	133	0.85	2.66	0.60	2	44	4.3	95	22	91	96	46
19	6.2	7.5	5	112	0.38	2.69	0.80	2	45	4.2	94	34	92	97	86
20	6.1	7.6	4	96	0.68	2.89	0.54	3	72	4.6	111	182	95	96	77
21	6.1	7.5	2	46	0.50	2.76	0.60	2	46	5.2	120	60	97	97	87
22	6.0	6.7	14	326	0.82	2.79	0.60	2	47	3.9	91	70	88	97	60
23	6.7	7.5	5	114	0.35	2.74	0.60	3	69	3.5	80	74	94	95	84
24	6.9	7.3	6	142	0.32	2.84	0.65	2	47	3.9	92	106	94	98	91
25	6.1	7.4	4	88	1.08	2.65	0.70	2	44	3.7	82	50	96	96	68
26	6.2	7.3	9	202	0.50	2.69	0.63	2	45	3.2	72	40	88	96	72
27	6.8	7.4	5	116	0.30	2.77	0.70	2	46	3.2	74	164	95	97	85
28	6.3	7.5	7	159	0.35	2.72	0.60	2	45	4.2	95	94	93	97	86
29	6.5	7.3	7	158	0.55	2.71	0.60	9	203	4.3	97	66	93	89	78
30	6.4	7.2	13	295	0.90	2.72	0.64	3	68	8.3	188	294	83	98	82
31	6.0		19	429	0.78	2.71	0.44	5	113	6.8	154	600	74	92	63
Total	187.5	220.4	206	4,758	16.99	85.70	19.35	93	2,160	146.0	3,373	4,358	2,849	2,977	2,419
Max.	7.6	7.7	19	429	1.08	2.92	0.80	9	218	8.3	188	600	97	99	91
Min.	5.4	6.7	2	44	0.22	2.61	0.44	1	22	3.2	72	4	74	89	46
Avg.	6.5	7.3	7	153	0.55	2.76	0.62	3	70	4.7	109	92	92	96	78

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT
MISCELLANEOUS & SLUDGE SHEET - JULY 1987

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	Other	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	pH
1		2,640	560	20	199		2,500	9.5	61	5.6
2		2,640	760	20	298		8,900	3.7	63	5.6
3		2,520	430	20	298		800	7.5	73	5.6
4		2,520	370	20	397		1,000	9.5	71	5.4
5		2,640	500	10	298		11,000	3.3	70	5.5
6		2,520	440	20	397		1,200	7.5	78	5.1
7		2,640	440	10	298		1,200	5.4	71	6.1
8		2,640	480	10	298		1,000	8.4	80	5.4
9		2,640	1,330	30	298		15,000	4.2	68	6.8
10		2,640	1,620	10	397		2,500	7.3	74	5.8
11		2,520	510	20	298		15,400	3.7	66	7.2
12		2,520	440	10	298		2,500	6.3	77	5.7
13		2,640	1,450	10	397		1,200	8.6	75	5.3
14		2,640	2,280	30	298		13,600	3.2	65	7.3
15		2,760	620	30	397		3,000	7.0	75	5.8
16		2,520	1,390	10	298		14,500	6.3	77	5.6
17		2,640	620	10	298		1,400	3.6	66	7.2
18		2,520	310	10	298		1,000	6.6	74	5.9
19		2,520	370	20	397		1,200	6.1	78	5.8
20		2,640	430	10	199		10,000	2.3	63	5.5
21		2,640	640	20	397		1,500	6.4	78	5.8
22		2,640	1,730	10	298		14,000	3.3	67	6.5
23		2,520	1,690	30	298		1,500	7.5	70	5.9
24		2,520	1,770	10	298		11,700	3.4	66	7.2
25		2,640	440	20	298		1,200	6.9	68	6.0
26		2,640	470	20	397		1,300	6.5	70	5.9
27		2,640	530	10	298		2,000	7.4	69	5.7
28		2,640	550	20	298		13,000	3.0	65	7.3
29		2,640	1,480	20	298		1,000	6.9	71	5.5
30		2,640	1,810	10	298		1,800	9.3	70	5.5
31		2,640	1,760	20	397		13,400	2.9	68	7.1
Total		80,760	28,220	520	9,931		171,300	183.5	2,187	186.6
Max.		2,760	2,280	30	397		15,400	9.5	80	7.3
Min.		2,520	310	10	199		800	2.3	61	5.1
Avg.		2,605	910	17	320		5,526	5.9	71	6.0

Manpower & Hours

	Total Hr
Superintendent 1	176
Asst. Supt. 1	176
Operators 3	532
Total	884

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
AUGUST 1987 PLANT INFLUENT SHEET - SAMPLING CODE 50

	----Weather----		Influent Flow	Influent Temp	Influent pH	Influent BOD	Influent BOD	Influent SS	Influent SS	Influent Phos.	Influent Phos.	Influent VSS	Influent NH3-N	--Remarks or Other Parameters--
	Type	Precip.	MGD	F	SU	mg/L	Lbs.	mg/L	Lbs.	mg/L	Lbs.	mg/L	mg/L	
PN-	00033	00045	50050	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	
Day														
1	4	0.02	2.63	59	7.4	62	1,360	82	1,799	2.10	46	66	5.8	
2	1		2.63	59	7.4	50	1,097	102	2,237	2.05	45	76	6.9	
3	4	0.33	2.74	59	7.4	100	2,285	88	2,011	2.10	48	78	6.3	
4	1		2.75	60	7.4	92	2,110	78	1,789	2.40	55	72	5.3	
5	1		2.69	60	7.4	86	1,929	82	1,840	1.95	44	66	9.0	
6	1		2.74	60	7.4	76	1,737	60	1,371	4.10	94	54	5.9	
7	1		2.63	60	7.4	100	2,193	100	2,193	2.20	48	78	8.0	
8	4	0.41	2.47	59	7.5	62	1,277	76	1,566	1.90	39	60	9.2	
9	4	0.02	2.55	59	7.5	70	1,489	84	1,786	1.95	41	70	6.6	
10	1		2.80	60	7.3	92	2,148	114	2,662	2.65	62	106	6.1	
11	1		2.76	60	7.5	80	1,841	82	1,888	1.80	41	70	7.3	
12	1		2.67	60	7.3	70	1,559	76	1,692	4.10	91	58	5.5	
13	1		2.73	59	7.4	80	1,821	76	1,730	2.20	50	56	7.3	
14	4	0.04	2.69	60	7.6	56	1,256	82	1,840	1.70	38	52	8.3	
15	1		2.55	60	7.5	66	1,404	76	1,616	1.80	38	74	6.8	
16	4	0.98	2.65	60	7.6	58	1,282	80	1,768	1.90	42	66	6.6	
17	1		2.69	60	7.4	80	1,795	98	2,199	2.10	47	72	7.0	
18	1		2.69	60	7.5	86	1,929	82	1,840	2.85	64	74	7.3	
19	4	0.04	2.61	60	7.4	78	1,698	82	1,785	2.45	53	72	10.7	
20	4	1.12	2.66	60	7.4	64	1,420	82	1,819	2.40	53	68	7.3	
21	1		2.66	60	7.5	56	1,242	75	1,664	2.75	61	62	7.6	
22	1		2.50	60	7.2	62	1,293	30	626	4.95	103	24	7.6	
23	1		2.58	61	7.4	74	1,592	84	1,807	2.40	52	66	7.0	
24	4	0.15	2.62	61	7.5	68	1,486	92	2,010	2.30	50	78	7.6	
25	4	2.70	2.59	61	7.5	62	1,339	60	1,296	3.00	65	56	10.7	
26	4	0.13	2.85	60	7.4	72	1,711	86	2,044	2.90	69	64	7.2	
27	4	0.13	2.83	60	7.5	58	1,369	54	1,275	2.45	58	52	7.8	
28	4	0.03	2.76	60	7.5	62	1,427	60	1,381	2.85	66	56	8.0	
29	1		2.64	60	7.5	44	969	56	1,233	1.95	43	54	5.5	
30	4	0.37	2.76	58	7.5	52	1,197	66	1,519	1.95	45	64	5.9	
31	1		2.82	60	7.5	70	1,646	92	2,164	1.90	45	72	8.6	
Total	73	6.47	82.94	1,855	230.7	2,188	48,903	2,437	54,449	76.10	1,697	2,036	226.8	
Max.	4	2.70	2.85	61	7.6	100	2,285	114	2,662	4.95	103	106	10.7	
Min.	1	0.02	2.47	58	7.2	44	969	30	626	1.70	38	24	5.3	
Avg.	2	0.46	2.68	60	7.4	71	1,578	79	1,756	2.45	55	66	7.3	

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT - PLANT No. 130 29
AUGUST 1987 PRIMARY EFFLUENT SHEET

	P Eff. BOD mg/L	P Eff. BOD Lbs.	P Eff. SS mg/L	P. Eff. SS Lbs.	P Eff. Phos. mg/L	P Eff. Phos. Lbs.	P Eff. VSS mg/L	P Eff. NH3-N mg/L	Flow MGD	--Remarks or Other Parameters--
PN-	00310	85001	00530	85002	00665	85004	00535	00610	50050	
Day										
1	32	702	40	877	1.90	42	30	6.0	2.63	
2	34	746	50	1,097	1.70	37	46	5.6	2.63	
3	80	1,828	34	777	1.90	43	26	5.5	2.74	
4	86	1,972	40	917	2.90	67	36	4.7	2.75	
5	66	1,481	44	987	1.95	44	34	7.5	2.69	
6	60	1,371	42	960	2.45	56	38	6.4	2.74	
7	70	1,535	62	1,360	2.20	48	48	6.8	2.63	
8	56	1,280	52	1,188	1.80	41	42	8.6	2.74	
9	62	1,319	46	978	1.65	35	40	5.6	2.55	
10	92	2,148	50	1,168	2.65	62	42	5.9	2.80	
11	66	1,519	52	1,197	1.80	41	40	8.0	2.76	
12	46	1,024	32	713	2.05	46	24	5.7	2.67	
13	50	1,138	40	911	2.10	48	28	6.3	2.73	
14	44	987	34	763	1.60	36	24	6.4	2.69	
15	38	808	40	851	1.80	38	38	6.6	2.55	
16	42	928	36	796	1.50	33	28	6.2	2.65	
17	58	1,301	56	1,256	1.80	40	46	6.1	2.69	
18	62	1,391	56	1,256	2.45	55	46	7.4	2.69	
19	56	1,219	42	914	1.95	42	36	9.3	2.61	
20	52	1,154	40	887	2.10	47	32	7.6	2.66	
21	56	1,242	41	910	2.75	61	29	7.6	2.66	
22	64	1,334	32	667	5.50	115	18	7.6	2.50	
23	56	1,205	50	1,076	2.65	57	30	7.6	2.58	
24	44	961	58	1,267	2.30	50	46	6.6	2.62	
25	44	950	50	1,080	1.95	42	48	7.3	2.59	
26	42	998	48	1,141	2.55	61	38	4.9	2.85	
27	44	1,038	34	802	2.30	54	32	7.3	2.83	
28	36	802	50	1,113	1.65	37	46	6.4	2.67	
29	34	749	34	749	1.35	30	30	5.6	2.64	
30	34	783	38	875	1.60	37	32	5.8	2.76	
31	60	1,411	34	800	1.65	39	24	6.4	2.82	
Total	1,666	37,327	1,357	30,333	66.50	1,484	1,097	205.3	83.12	
Max.	92	2,148	62	1,360	5.50	115	48	9.3	2.85	
Min.	32	702	32	667	1.35	30	18	4.7	2.50	
Avg.	54	1,204	44	978	2.15	48	35	6.6	2.68	

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT - PLANT NO. 17[illegible]29
AUGUST 1987 ACTIVATED SLUDGE SHEET

	Aerat Volume MG	Deter. Time Hrs.	Sludge Age Days	Organic Loading #/M	Mix Liq SS mg/L	Mix Liq VSS mg/L	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mg/L	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge #Gal	Daily Flow MGD	PE BOD mg/l	PE SS mg/L
PN-	80993	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	80991	50050	00310	00530
Day																	
1	48	3.3								230			94		2.63	32	40
2		3.3								229			94		2.63	34	50
3		3.1	7.0	0.45	1,824	1,349	47.0	0.39	2.9	225	0.32	0.24	96		2.74	80	34
4		3.1	6.6	0.45	2,008	1,462	80.0	0.25	0.3	231	0.32	0.24	94		2.75	86	40
5		3.2	5.4	0.37	1,789	1,328	55.0	0.33	2.1	234	0.30	0.22	98		2.69	66	44
6		3.1	6.3	0.31	2,029	1,498	76.0	0.27	1.8	232	0.32	0.24	95		2.74	60	42
7		3.3	4.6	0.33	2,067	1,533	80.0	0.26	1.3	230	0.34	0.25	97		2.63	70	62
8		3.5								232			105		2.47	56	52
9		3.4								231			102		2.55	62	46
10		3.1	5.1	0.49	2,000	1,451	83.0	0.24	2.0	232	0.33	0.24	102		2.80	92	50
11		3.1	4.4	0.39	1,775	1,292	50.0	0.36	2.2	250	0.38	0.20	113		2.76	66	52
12		3.2	8.3	0.23	1,986	1,483	86.0	0.23	0.3	254	0.40	0.22	115		2.67	46	32
13		3.2	6.7	0.26	2,032	1,482	89.0	0.23	2.0	222	0.30	0.22	85		2.73	50	40
14		3.2	7.0	0.26	1,779	1,252	56.0	0.32	2.7	223	0.32	0.23	75		2.69	44	34
15		3.4								219			78		2.55	38	40
16		3.3								221			75		2.65	42	36
17		3.2	4.0	0.37	1,688	1,174	63.0	0.27	0.6	227	0.35	0.28	75		2.69	58	56
18		3.2	4.5	0.35	1,880	1,314	65.0	0.29	2.5	235	0.39	0.28	77		2.69	62	56
19		3.3	6.0	0.31	1,842	1,327	71.0	0.26	2.5	241	0.37	0.27	76		2.61	56	42
20		3.2	6.9	0.27	2,045	1,439	73.0	0.28	2.4	236	0.31	0.22	74		2.66	52	40
21		3.2	6.3	0.31	1,916	1,323	73.0	0.26	2.4	202	0.32	0.23	71		2.66	56	41
22		3.4								185			78		2.50	64	32
23		3.3								189			74		2.58	56	50
24		3.3	4.3	0.24	1,825	1,321	75.0	0.24	1.3	186	0.37	0.27	74		2.62	44	58
25		3.3	5.6	0.22	2,026	1,461	88.0	0.23	2.9	185	0.34	0.24	77		2.59	44	50
26		3.0	5.4	0.22	2,042	1,485	83.0	0.25	2.3	186	0.39	0.29	69		2.85	42	48
27		3.0	6.3	0.29	1,689	1,206	42.0	0.40	0.9	186	0.30	0.21	69		2.83	44	34
28		3.2	4.5	0.22	1,673	1,210	44.0	0.38	2.1	183	0.34	0.24	74		2.67	36	50
29		3.3								183			75		2.64	34	34
30		3.1								183			71		2.76	34	38
31		3.1	7.0	0.35	1,878	1,335	45.0	0.42	2.4	196	0.29	0.21	71		2.82	60	34
Total	48	100.1	122.3	6.71	39,793	28,725	1424.0	6.14	39.9	6,698	7.11	5.04	2,623		82.85	1,666	1,357
Max.	48	3.5	8.3	0.49	2,067	1,533	89.0	0.42	2.9	254	0.40	0.29	115		2.85	92	62
Min.	48	3.0	4.0	0.22	1,673	1,174	42.0	0.23	0.3	183	0.29	0.20	69		2.47	32	32
Avg.	48	3.2	5.8	0.32	1,895	1,368	67.8	0.29	1.9	216	0.34	0.24	85		2.67	54	44

Robert J. Swalwell
Superintendent

MARSHALL WWTF 201 W. PEARL ST., MARSHALL MI 49068 - PERMIT No. MI0023540
AUGUST 1997 DISCHARGE MONITORING REPORT - DISCHARGE No. 001A

	D.O. mg/L	pH SU	SS mg/L	SS Lbs.	Total-P mg/L	Flow MGD	Chlorine mg/L	BOD mg/L	BOD Lbs.	NH3 as N mg/L	NH3-N Lbs.	F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %
Limit-	>4.0	6 & 9	30 & 45	751 & ^1,126	<1.0			20 & 30	500 & ^751	<11.0	7 Day ^275	200 & 400	>85%	>85%	
PN-	^00300	^00400	^00530	^00530	^00665	^50050	^50060	^80082	^80082	^00610	^00610	^31616	^81011	^91267	^81012
Day															
1	6.1	7.3	18	395	0.40	2.63	0.50	3	66	5.9	129	120	64	95	81
2	5.1	7.5	17	373	1.00	2.63	0.50	7	154	3.0	66	78	84	86	51
3	5.6	7.4	13	297	1.00	2.74	0.48	8	183	3.9	89	82	85	92	52
4	2.1	7.4	18	413	1.00	2.75	0.52	11	252	3.4	78	600	77	88	71
5	4.7	7.4	8	179	0.53	2.69	0.40	3	67	6.2	139	80	90	97	73
6	6.0	7.4	11	251	0.47	2.74	0.56	2	46	5.5	126	600	82	97	89
7	5.7	7.5	11	241	0.61	2.63	0.48	3	66	6.0	132	116	89	97	72
8	5.9	7.2	11	227	0.35	2.47	0.67	2	41	8.0	165	26	86	97	82
9	5.8	7.3	9	191	0.35	2.55	0.70	2	43	4.7	100	24	89	97	82
10	5.5	7.4	18	420	0.78	2.80	0.60	23	537	5.4	126	162	84	75	70
11	5.7	7.4	13	299	0.51	2.76	0.30	5	115	7.2	166	600	84	94	72
12	5.4	7.3	18	401	0.91	2.67	0.52	9	200	5.0	111	110	76	87	78
13	5.5	7.4	9	205	0.48	2.73	0.40	3	68	4.3	98	600	88	96	78
14	6.1	7.3	13	292	0.28	2.69	0.70	2	45	6.7	150	68	84	96	84
15	6.1	7.3	8	170	0.35	2.55	0.57	2	43	5.4	115	70	89	97	81
16	6.8	7.5	11	243	0.40	2.65	0.60	3	66	5.5	122	22	86	95	79
17	6.9	7.4	9	202	0.27	2.69	0.70	2	45	5.6	126	168	91	98	87
18	6.5	7.5	9	202	0.32	2.69	0.58	3	67	6.7	150	70	89	97	89
19	6.5	7.5	8	174	0.34	2.61	0.57	2	44	7.8	170	144	90	97	86
20	6.7	7.5	7	155	0.44	2.66	0.50	2	44	7.1	158	104	91	97	82
21	6.5	7.5	6	133	0.82	2.66	0.50	3	67	6.7	149	104	89	95	70
22	5.7	7.4	3	63	0.91	2.50	0.70	10	209	6.5	136	3	90	84	82
23	6.0	7.3	18	387	0.91	2.58	0.70	16	344	7.3	157	145	79	78	62
24	5.8	7.4	21	459	0.62	2.62	0.66	4	87	5.4	118	600	77	94	73
25	5.5	7.4	15	324	0.99	2.59	0.75	6	130	6.7	145	600	75	90	67
26	5.5	7.4	27	642	0.68	2.85	0.70	11	261	4.6	109	440	68	85	77
27	6.2	7.5	9	212	0.80	2.83	0.70	11	260	6.8	160	312	83	81	67
28	6.1	7.5	13	289	0.76	2.67	0.65	4	89	5.6	125	36	78	94	73
29	6.3	7.4	6	132	0.46	2.64	0.80	2	44	4.8	106	22	89	95	76
30	6.2	7.8	8	184	0.41	2.76	0.80	2	46	5.0	115	22	88	96	79
31	6.5	7.5	8	188	0.35	2.82	0.75	2	47	6.0	141	10	91	97	82
Total	181.0	230.0	373	8,345	18.50	82.85	18.56	168	3,775	178.7	3,975	6,138	2,605	2,864	2,347
Max.	6.9	7.8	27	642	1.00	2.85	0.80	23	537	8.0	170	600	91	98	89
Min.	2.1	7.2	3	63	0.27	2.47	0.30	2	41	3.0	66	3	64	75	51
Avg.	5.8	7.4	12	269	0.60	2.67	0.60	5	122	5.8	128	113	84	92	76
			16	349				9	197		149				

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
MISCELLANEOUS & SLUDGE SHEET - AUGUST 1987

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	Other	Raw Sludge Gals.	Raw Sludge Total Solids Percent	Raw Sludge Vol. Solids Percent	pH
1		2,640	420	10	199		1,200	6.5	72	5.9
2		2,520	450	20	298		1,000	7.6	73	5.4
3		2,760	730	20	298		12,500	4.6	74	6.5
4		2,880	1,720	20	397		1,500	7.4	75	5.9
5		2,760	450	20	298		1,300	6.7	74	5.9
6		2,760	1,690	20	298		12,800	3.4	72	6.5
7		2,760	1,520	20	397		3,500	8.0	72	5.8
8		2,640	480	10	199		13,000	2.0	65	7.2
9		2,760	580	20	298		1,500	6.1	74	5.8
10		2,880	910	20	397		14,600	4.5	72	6.5
11		2,880	700	20	298		3,500	6.9	75	5.5
12		2,880	1,930	10	695		2,000	5.9	77	6.2
13		2,640	1,370	20	993		6,000	3.9	75	6.7
14		2,520	1,470	10	397		4,000	5.9	76	6.0
15		2,640	460	20	298		2,500	6.5	70	5.9
16		2,520	520	20	397		3,000	3.9	77	6.1
17		2,640	550	25	397		3,500	6.5	71	5.8
18		2,640	530	25	397		14,000	4.9	72	6.8
19		2,640	620	20	298		7,000	7.6	73	5.5
20		2,760	360	20	199		14,000	2.3	67	7.3
21		2,400	420	17	397		3,000	8.4	68	5.6
22		2,400	390	18	298		1,500	7.1	83	5.2
23		2,520	1,430	20	298		1,500	7.2	73	5.4
24		2,400	550	20	199		6,500	5.0	75	6.2
25		2,400	390	20	298		10,000	2.6	66	7.5
26		2,400	480	20	298		3,000	6.6	75	5.8
27		2,520	440	22	298		3,000	6.7	76	5.6
28		2,520	660	20	397		15,500	4.1	73	6.6
29		2,400	430	10	199		3,000	5.1	76	5.6
30		2,280	480	20	298		1,500	7.4	73	5.5
31		2,640	470	18	298		2,000	6.6	74	5.5
Total		81,000	23,600	575	10,726		172,900	177.9	2,268	187.7
Max.		2,880	1,930	25	993		15,500	8.4	83	7.5
Min.		2,280	360	10	199		1,000	2.0	65	5.2
Avg.		2,613	761	19	346		5,577	5.7	73	6.1

Manpower & Hours

	Total Hr
Superintendent 1	168
Asst. Supt. 1	168
Operators 3	520
Total	856

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
SEPTEMBER 1987 PLANT INFLUENT SHEET - SAMPLING CODE 500

	----Weather----		Inf. Flow	Inf. Temp	Inf. pH	Inf. BOD	Inf. BOD	Inf. SS	Inf. SS	Inf. Phos.	Inf. Phos.	Inf. VSS	Inf. NH3-N	--Remarks or Other Parameters--
	Type	Precip.	MGD	F	SU	mg/L	Lbs.	mg/L	Lbs.	mg/L	Lbs.	mg/L	mg/L	
PN-	00033	00045	50050	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	
Day														
1	4	0.10	2.77	60	7.4	66	1,525	82	1,894	2.45	57	66	8.6	
2	1		2.79	59	7.5	92	2,141	82	1,908	2.65	62	66	8.8	
3	1		2.76	59	7.5	86	1,980	116	2,670	2.45	56	96	9.8	
4	1		2.75	59	7.5	60	1,376	90	2,064	1.90	44	70	9.3	
5	1		2.59	59	7.5	62	1,339	66	1,426	1.60	35	44	7.1	
6	1		2.58	59	7.5	62	1,334	96	2,066	1.90	41	88	5.8	
7	4	0.10	2.68	60	7.5	48	1,073	78	1,743	2.45	55	68	6.7	
8	4	0.31	2.81	60	7.3	58	1,359	84	1,969	2.40	56	68	8.5	
9	1		2.83	59	7.4	52	1,227	65	1,534	1.95	46	54	7.7	
10	4	1.95	3.03	59	7.3	68	1,718	102	2,576	3.00	76	70	9.8	
11	1		3.07	61	7.3	56	1,434	74	1,895	2.10	54	64	8.1	
12	4	0.16	2.93	60	7.3	104	2,541	58	1,417	6.85	167	48	6.9	
13	4	0.05	2.88	58	7.3	74	1,777	64	1,537	2.45	59	52	15.6	
14	4	0.65	2.92	60	7.3	72	1,753	90	2,192	2.45	60	78	9.3	
15	4	0.16	2.97	59	7.2	86	2,130	88	2,180	2.90	72	76	9.7	
16	4	0.11	2.94	59	7.0	76	1,863	98	2,403	1.95	48	78	9.6	
17	4	0.46	2.95	60	7.3	88	2,165	134	3,297	2.75	68	116	5.7	
18	4	0.06	2.93	60	7.0	54	1,320	60	1,466	1.95	48	46	8.0	
19	3		2.91	58	7.2	40	971	38	922	1.70	41	28	5.4	
20	4	0.58	2.85	58	7.1	70	1,664	98	2,329	1.95	46	76	4.9	
21	4	0.13	2.97	58	7.1	66	1,635	54	1,338	2.45	61	44	6.3	
22	4	0.02	2.91	59	7.3	56	1,359	92	2,233	2.40	58	78	5.8	
23	1		2.93	59	7.3	46	1,124	66	1,613	2.10	51	46	6.1	
24	1		2.80	59	7.2	52	1,214	50	1,168	1.90	44	46	5.6	
25	1		2.94	59	7.0	78	1,913	96	2,354	4.95	121	86	7.8	
26	1		2.90	59	7.1	68	1,645	68	1,645	2.65	64	58	10.0	
27	1		2.87	58	7.4	46	1,101	68	1,628	1.70	41	62	7.4	
28	4	0.93	2.93	59	7.1	82	2,004	84	2,053	2.20	54	70	5.3	
29	4	0.11	2.85	60	7.2	76	1,806	78	1,854	2.45	58	58	6.7	
30	4	0.08	2.88	59	7.1	78	1,873	78	1,873	5.50	132	66	7.0	
31														
Total	83	5.96	85.92	1,775	218.2	2,022	48,365	2,397	57,247	78.10	1,874	1,966	233.3	
Max.	4	1.95	3.07	61	7.5	104	2,541	134	3,297	6.85	167	116	15.6	
Min.	1	0.02	2.58	58	7.0	40	971	38	922	1.60	35	28	4.9	
Avg.	3	0.35	2.86	59	7.3	67	1,612	80	1,908	2.60	62	66	7.8	

Robert J. Swalwell
Superintendent

[illegible] WASTEWATER TREATMENT PLANT [illegible]
SEPTEMBER 1987 PRIMARY EFFLUENT SHEET

	P Eff. BOD mg/L	P Eff. BOD Lbs.	P Eff. SS mg/L	P Eff. SS Lbs.	P Eff. Phos. mg/L	P Eff. Phos. Lbs.	P Eff. VSS mg/L	P Eff. NH3-N mg/L	Flow MGD
PN-	00310	85001	00530	85002	00665	85004	00535	00610	50050
Day									
1	52	1,201	40	924	2.20	51	30	6.4	2.77
2	86	2,001	36	838	2.45	57	28	7.1	2.79
3	56	1,289	38	875	1.70	39	28	8.5	2.76
4	54	1,238	56	1,284	2.05	47	44	6.9	2.75
5	38	821	28	605	1.95	42	20	6.5	2.59
6	34	732	38	818	2.05	44	34	6.7	2.58
7	34	760	38	849	2.20	49	30	6.1	2.68
8	42	994	48	1,125	2.30	54	32	6.9	2.81
9	28	661	38	897	1.90	45	28	6.8	2.83
10	42	1,061	42	1,061	2.55	64	32	7.7	3.03
11	48	1,229	30	768	2.40	61	26	7.5	3.07
12	32	782	26	635	1.90	46	20	6.6	2.93
13	52	1,249	42	1,009	1.95	47	36	6.8	2.88
14	54	1,315	48	1,169	1.80	44	36	6.8	2.92
15	62	1,536	44	1,090	2.85	71	38	7.4	2.97
16	50	1,226	46	1,128	1.95	48	40	7.1	2.94
17	60	1,476	70	1,722	2.65	65	66	5.7	2.95
18	46	1,124	42	1,026	2.10	51	36	7.7	2.93
19									2.91
20	18	428	40	951	1.70	40	34	6.2	2.85
21	46	1,139	34	842	2.20	54	26	5.6	2.97
22	32	777	24	582	2.05	50	18	5.5	2.91
23	26	635	42	1,026	1.80	44	24	5.6	2.93
24	40	934	24	560	1.70	40	20	6.9	2.80
25	64	1,569	46	1,128	4.30	105	40	8.9	2.94
26	50	1,209	36	871	3.10	75	32	6.6	2.90
27	28	670	52	1,245	1.60	38	44	5.0	2.87
28	72	1,759	54	1,320	2.10	51	44	6.5	2.93
29	64	1,521	42	998	2.30	55	32	7.3	2.85
30	64	1,537	48	1,153	4.95	119	40	7.3	2.88
31									
Total	1,374	32,866	1,192	28,499	66.75	1,598	958	196.2	85.92
Max.	86	2,001	70	1,722	4.95	119	66	8.9	3.07
Min.	18	428	24	560	1.60	38	18	5.0	2.58
Avg.	47	1,133	41	983	2.30	55	33	6.8	2.86

--Remarks or Other Parameters--

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT - PLANT NO. 00 00
SEPTEMBER 1987 ACTIVATED SLUDGE SHEET

	Aerat Volume CF	Deten. Time Hrs.	Sludge Age Days	Organic Loading #/M	Mix Liq SS mg/L	Mix Liq VSS mg/L	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mg/L	Air Cu Ft. X 1000	Return SS %	Return VSS %	Return %	Waste Sludge #Gal	Daily Flow MGD	PE BOD mg/l	PE SS mg/L
PN=	81053	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	80991	50050	00310	00530
Day																	
1	48	3.1	6.8	0.26	2,113	1,526	68.0	0.31	1.4	177	0.38	0.27	80		2.77	52	40
2		3.1	7.2	0.47	2,018	1,435	62.0	0.33	1.0	177	0.34	0.25	82		2.79	86	36
3		3.1	6.8	0.30	1,987	1,439	59.0	0.34	0.9	175	0.36	0.26	82		2.76	56	38
4		3.1	4.5	0.30	1,937	1,392	56.0	0.35	1.1	176	0.33	0.23	81		2.75	54	56
5		3.3								172			88		2.59	38	28
6		3.3								171			86		2.58	34	38
7		3.2								170			86		2.68	34	38
8		3.1	5.0	0.25	1,876	1,341	40.0	0.47	0.5	170	0.35	0.24	68		2.81	42	48
9		3.0	4.9	0.21	1,462	1,038	29.0	0.50	1.0	171	0.31	0.22	70		2.83	28	38
10		2.6	4.7	0.30	1,657	1,168	24.0	0.69	1.2	171	0.30	0.21	54		3.03	42	42
11		2.8							1.2	172			53		3.07	48	30
12		2.9							1.4	172			55		2.93	32	26
13		3.0								176			55		2.88	52	42
14		3.0	4.6	0.38	1,780	1,167	25.0	0.71	1.4	171	0.36	0.25	55		2.92	54	48
15		2.9	4.6	0.42	1,691	1,216	23.0	0.74	1.8	173	0.42	0.30	56		2.97	62	44
16		2.9	4.4	0.33	1,649	1,229	22.0	0.75	1.8	171	0.34	0.23	55		2.94	50	46
17		2.9	2.7	0.42	1,579	1,164	21.0	0.75	0.7	165	0.33	0.24	55		2.95	60	70
18		2.9	4.6	0.32	1,575	1,170	21.0	0.75	0.6	171	0.40	0.29	58		2.93	46	42
19		3.0								172			56		2.91		
20		3.0								174			58		2.85	18	40
21		2.9	6.1	0.31	1,710	1,239	22.0	0.78	1.3	173	0.27	0.20	55		2.97	46	34
22		3.0	8.7	0.20	1,685	1,305	21.0	0.80	1.8	176	0.27	0.17	55		2.91	32	24
23		2.9	4.5	0.20	1,545	1,087	19.0	0.81	3.1	174	0.28	0.20	54		2.93	26	42
24		3.1	7.6	0.31	1,417	997	17.0	0.83	2.3	175	0.23	0.16	56		2.80	40	24
25		2.9	4.8	0.40	1,821	1,295	22.0	0.83	0.8	173	0.31	0.22	55		2.94	64	46
26		3.0								175			55		2.90	50	36
27		3.0								173			56		2.87	28	52
28		2.9	3.4	0.54	1,502	1,079	19.0	0.79	1.7	165	0.39	0.28	54		2.93	72	54
29		3.0	4.2	0.51	1,410	1,001	18.0	0.78	1.5	172	0.40	0.28	57		2.85	64	42
30		3.0	4.8	0.39	1,833	1,327	24.0	0.76	1.3	176	0.29	0.21	54		2.88	64	48
31																	
Total	48	90.4	104.9	6.82	34,247	24,615	612.0	13.07	29.8	5,179	6.66	4.71	1,886		85.92	1,374	1,192
Max.	48	3.3	8.7	0.54	2,113	1,526	68.0	0.83	3.1	177	0.42	0.30	88		3.07	86	70
Min.	48	2.8	2.7	0.20	1,410	997	17.0	0.31	0.5	165	0.23	0.16	53		2.58	18	24
Avg.	48	3.0	5.2	0.34	1,712	1,231	30.6	0.65	1.4	173	0.33	0.24	63		2.86	47	41

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
MISCELLANEOUS & SLUDGE SHEET - SEPTEMBER 1987

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	Other	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	pH
1		2,400	530	16	298		12,500	3.4	70	7.0
2		2,400	710	18	298		2,200	7.1	75	5.6
3		2,400	670	20	298		13,000	3.7	72	6.9
4		2,280	620	18	298		2,900	7.2	74	5.8
5		2,400	490	20	298		3,000	3.8	77	6.4
6		2,400	400	15	298		3,000	5.1	76	6.4
7		2,160	500	24	199		2,000	3.6	75	6.4
8		2,400	570	15	397		15,000	2.9	68	7.3
9		2,520	530	20	298		3,500	4.0	73	6.1
10		2,520	520	22	298		15,500	2.5	69	7.2
11		2,400	450	20	298		5,000	6.0	73	5.8
12		2,400	420	21	298		1,000	5.6	74	5.9
13		2,400	340	18	298		1,000	4.9	76	6.0
14		2,400	580	17	298		13,500	4.8	66	7.0
15		2,400	280	17	298		4,000	5.4	73	5.3
16		2,400	460	17	199		2,000	5.8	75	5.1
17		2,400	340	17	99		14,800	5.2	71	6.6
18		2,400	580	17	496		5,000	5.8	73	5.5
19		2,640	480	18	298		1,500	6.5	75	5.3
20		2,280	420	20	298		1,500	5.8	78	5.4
21		2,400	510	20	496		13,100	4.3	70	6.8
22		2,400	470	20	397		4,000	6.6	73	5.5
23		2,280	530	15	298		2,000	5.2	79	5.6
24		2,400	470	19	397		3,500	5.7	75	5.3
25		2,280	570	18	397		14,300	4.4	71	6.8
26		2,400	400	20	397		1,500	6.0	72	5.6
27		2,280	430	20	298		1,500	8.2	71	5.5
28		2,280	780	23	397		15,700	3.6	67	6.8
29		2,400	510	18	496		3,000	7.3	72	5.5
30		2,280	440	20	298		3,000	5.1	79	5.6
31										
Total		71,400	15,000	563	9,731		183,500	155.5	2,192	182.0
Max.		2,640	780	24	496		15,700	8.2	79	7.3
Min.		2,160	280	15	99		1,000	2.5	66	5.1
Avg.		2,380	500	19	324		6,117	5.2	73	6.1

Manpower & Hours

	Total Hr
Superintendent 1	184
Asst. Supt. 1	184
Operators 3	556
Total	924

Robert J. Swalwell
Superintendent

MARSHALL WWTP 810 W. PEARL ST., MARSHALL, MI 49068 - PERMIT NO. MI0022764
SEPTEMBER 1987 DISCHARGE MONITORING REPORT - DISCHARGE NO. 01A

	D.O. mg/L	pH SU	SS mg/L	SS Lbs.	Total-P mg/L	Flow MGD	Chlorine mg/L	BOD mg/L	BOD Lbs.	NH3 as N mg/L	NH3-N Lbs.	F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %
Limit-	>4.0	6 & 9	30 & 45	751 & 1,126	<1.0			20 & 30	500 & >751	<11.0	7 Day 275	200 & 400	>85%	>85%	
PN-	^00300	>00400	00530	>00530	00665	50050	^50060	80082	80082	00610	^00610	>31616	^81011	^91267	^81012
Day															
1	6.4	7.5	6	139	0.64	2.77		3	69	6.0	139	82	93	95	74
2	6.0	7.5	8	186	1.00	2.79		8	186	6.8	158	84	90	91	60
3	5.7	7.5	6	138	0.35	2.76		4	92	8.6	198	144	95	95	86
4	6.1	7.4	7	161	0.27	2.75		4	92	6.2	142	94	92	93	85
5	5.3	7.5	4	86	0.20	2.59		3	65	5.2	112	96	94	95	75
6	6.0	7.3	5	108	0.27	2.58		2	43	4.8	103	36	95	97	86
7	6.2	7.4	5	112	0.38	2.68		2	45	4.8	107	20	94	96	84
8	6.0	7.3	10	234	0.42	2.81		1	23	5.7	134	52	88	98	82
9	5.8	7.4	7	165	0.35	2.83		2	47	5.8	137	48	90	96	82
10	6.4	7.3	7	177	0.50	3.03		3	76	7.1	179	62	93	96	83
11	6.1	7.2	3	77	0.37	3.07		4	102	7.1	182	108	96	93	82
12	6.2	7.3	3	73	0.19	2.93		1	24	7.2	176	58	97	99	97
13	6.1	7.3	2	48	0.22	2.88		2	48	5.7	137	58	92	97	91
14	5.6	7.2	5	122	0.22	2.92		3	73	6.4	156	96	94	96	91
15	5.2	7.3	4	99	0.44	2.97		3	74	7.9	196	106	91	96	85
16	5.9	7.2	5	123	0.47	2.94		4	98	7.5	184	122	95	95	76
17	5.6	7.2	5	123	0.76	2.95		8	197	5.5	135	600	96	91	72
18	5.3	7.0	4	98	0.42	2.93		7	171	6.9	169	600	93	87	78
19	5.1	7.2	7	170	0.19	2.91		4	97	6.2	150	132	82	90	89
20	5.8	7.0	5	119	0.10	2.85		4	95	4.0	95	30	95	94	95
21	6.3	7.0	7	173	0.17	2.97		2	50	4.2	104	84	87	97	93
22	6.5	7.2	3	73	0.16	2.91		2	49	4.7	114	24	97	96	93
23	7.1	7.2	5	122	0.20	2.93		2	49	4.5	110	18	92	96	90
24	6.9	7.2	3	70	0.22	2.80		2	47	5.1	119	26	94	96	88
25	6.0	7.0	6	147	0.71	2.94		4	98	6.7	164	8	94	95	86
26	6.3	7.1	5	121	0.85	2.90		5	121	8.8	213	40	93	93	68
27	5.9	7.1	6	144	0.18	2.87		7	168	8.3	199	8	91	85	89
28	6.8	7.2	3	73	0.25	2.93		3	73	4.2	103	38	96	96	89
29	6.9	7.1	8	190	0.20	2.85		5	119	7.2	171	22	90	93	92
30	6.3	7.1	6	144	0.97	2.88		8	192	6.6	159	54	92	89	82
31															
Total	181.8	217.2	160	3,814	11.67	85.92		112	2,683	185.7	4,445	2,952	2,781	2,826	2,524
Max.	7.1	7.5	10	234	1.00	3.07		8	197	8.8	213	600	97	99	97
Min.	5.1	7.0	2	48	0.10	2.58		1	23	4.0	95	8	82	85	60
Avg.	6.1	7.2	5	127	0.39	2.86		4	89	6.2	148	51	93	94	84

Robert J. Swalwell
Superintendent

MARE-ALL, MICHIGAN WASTEWATER TREATMENT PLANT
OCTOBER, 1987 PLANT INFLUENT SHEET - SAMPLING CODE 500

	----Weather----		Inf. Flow	In-. Temp	Inf. oH	Inf. BOD	In+. BOD	Inf. SS	In+. SS	Inf. Phos.	In-. Phos.	Inf. VSS	Inf. NH3-N	--Remar.s or Other Parameters--
	Type	Precip.	MGD	F	SU	mgIL	Lbs.	mgIL	Lbs.	mgIL	Lbs.	mgIL	mgIL	
PN-	00011	00045	50050	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	
Day														
1	4	0.04	2.83	59	7.2	98	2,313	118	2,785	3.40	80	104		
2	4	0.06	2.82	59	7.1									
3	1		2.71	59	7.1	92	2,079	46	1,040	1.60	36	76		
4	1		2.78	59	7.0	68	1,577	80	1,855	1.70	39	66		
5	4	0.07	2.67	59	7.6	76	1,819	72	1,723	2.30	55	68		
6	4	0.03	2.88	59	7.4	98	2,354	86	2,066	2.25	54	78		
7	4	0.05	2.89	59	7.4	40	964	68	1,639	2.10	51	54		
8	4	0.03	2.87	59	7.5	98	2,346	160	3,830	2.05	49	122		
9	4	0.02	2.73	59	7.7	68	1,548	114	2,596	1.90	43	88		
10	4	0.18	2.63	58	7.6	72	1,579	82	1,799	6.15	135	60		
11	1		2.71	56	7.6	86	1,944	110	2,486	4.30	97	70		
12	1		2.74	58	7.5	70	1,600	76	1,737	2.55	58	62		
13	1		2.69	58	7.4	88	1,974	62	1,391	2.65	59	46		
14	1		2.69	58	7.4	80	1,795	94	2,109	2.20	49	74		
15	1		2.66	58	7.5	74	1,642	92	2,041	2.20	49	68		
16	4	0.13	2.68	58	7.4	84	1,878	92	2,056	2.85	64	72		
17	4	0.04	2.64	58	7.5	68	1,497	58	1,277	1.80	40	48		
18	1		2.62	56	7.4	62	1,355	62	1,355	2.05	45	52		
19	4	0.41	2.79	57	7.5	80	1,861	76	1,768	2.05	48	64		
20	4	0.33	2.73	57	7.4									
21	4	0.08	2.71	57	7.5	90	2,034	90	2,034	2.05	46	48		
22	4	0.19	2.75	57	7.5	82	1,881	88	2,018	1.70	39	72		
23	4	0.13	2.73	57	7.4	72	1,639	62	1,412	2.65	60	52		
24	4	0.27	2.63	56	7.4	60	1,316	70	1,535	1.60	35	52		
25	1		2.83	55	7.5	60	1,416	52	1,227	1.95	46	40		
26	4	0.38	2.87	56	7.4	30	718	80	1,915	2.20	53	78		
27	4	0.02	2.82	57	7.5	84	1,976	52	1,223	2.75	65	36		
28	4	0.02	2.81	57	7.5	82	1,922	82	1,922	2.40	56	64		
29	1		2.80	57	7.4	80	1,868	62	1,448	2.20	51	50		
30	1		2.70	57	7.4	52	1,171	56	1,261	1.95	44	38		
31	4	0.20	2.68	57	7.4	50	1,118	34	760	3.40	76	16		
Total	91	2.70	85.29	1,786	230.1	2,144	49,182	2,276	52,307	70.95	1,623	1,778		
Max.	4	0.41	2.89	59	7.7	98	2,354	160	3,830	6.15	135	122		
Min.	1	0.02	2.62	55	7.0	30	718	34	760	1.60	35	16		
Avg.	3	0.14	2.75	58	7.4	74	1,696	78	1,804	2.45	56	61		

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT - PLANT No. [illegible] 29
OCTOBER, 1987 PRIMARY EFFLUENT SHEET

	F Eff. BOD mg/L	F Eff. BOD Lbs.	F Eff. SS mg/L	F. Eff. SS Lbs.	F Eff. Phos. mg/L	F Eff. Phos. Lbs.	F Eff. VSS mg/L	F Eff. NH3-N mg/L	Flow MGD	--Remarks or Other Parameters--
PN-	00310	85001	00530	85002	00665	85004	00535	00610	50050	
Day										
1	80	1,888	44	1,038	3.85	91	36		2.83	
2									2.82	
3	78	1,763	40	904	1.90	43	30		2.71	
4	56	1,298	50	1,159	1.70	39	42		2.78	
5	66	1,580	50	1,197	2.05	49	44		2.87	
6	90	2,162	46	1,105	2.05	49	42		2.88	
7	40	964	44	1,061	2.05	49	28		2.89	
8	82	1,963	48	1,149	1.65	39	42		2.87	
9	58	1,321	22	501	1.80	41	14		2.73	
10	54	1,184	46	1,009	3.50	77	24		2.63	
11	68	1,537	26	588	3.75	85	8		2.71	
12	60	1,371	56	1,280	2.75	63	48		2.74	
13	66	1,481	44	987	2.55	57	36		2.69	
14	60	1,346	68	1,526	2.20	49	44		2.69	
15	58	1,287	52	1,154	2.05	45	34		2.66	
16	72	1,609	38	849	2.90	65	32		2.68	
17	56	1,233	44	969	1.90	42	40		2.64	
18	50	1,093	38	830	1.65	36	30		2.62	
19	62	1,443	44	1,024	2.05	48	40		2.79	
20									2.73	
21	54	1,220	52	1,175	1.50	34	36		2.71	
22	64	1,468	52	1,193	1.35	31	36		2.75	
23	70	1,594	56	1,275	2.40	55	46		2.73	
24	58	1,272	58	1,272	1.80	39	40		2.63	
25	54	1,275	40	944	1.50	35	28		2.83	
26	54	1,293	42	1,005	1.90	45	38		2.87	
27	62	1,458	50	1,176	2.20	52	38		2.82	
28	56	1,312	50	1,172	2.05	48	42		2.81	
29	70	1,635	46	1,074	2.10	49	28		2.80	
30	52	1,171	48	1,081	2.20	50	16		2.70	
31	50	1,118	42	939	2.75	61	22		2.68	
Total	1,800	41,337	1,336	30,635	64.10	1,468	984		85.29	
Max.	90	2,162	68	1,526	3.85	91	48		2.89	
Min.	40	964	22	501	1.35	31	8		2.62	
Avg.	62	1,425	46	1,056	2.21	51	34		2.75	

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT - PLANT No. 30029
October, 1967 ACTIVATED SLUDGE SHEET

	Aerat Volume CF	Deten. Time Hrs.	Sludge Age Days	Organic Loading #/m	Mix Liq SS mg/L	Mix Liq VSS mg/L	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mg/L	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge #Gal	Daily Flow MGD	PE BOD mg/l	PE SS mg/L
PN-	80993	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	80991	50050	00310	00530
Day																	
1	46	3.0	4.7	0.56	1,627	1,119	19.0	0.86	1.3	172	0.43	0.31	55		2.83	80	44
2		3.1			1,472	1,047	17.0	0.87	1.3	174	0.39	0.28	56		2.82		
3		3.2								182			57		2.71	78	40
4		3.1								176			57		2.78	56	50
5		3.0	4.4	0.43	1,740	1,228	23.0	0.76	2.6	170	0.46	0.33	55		2.87	66	50
6		3.0	4.7	0.64	1,728	1,135	22.0	0.79	2.0	176	0.42	0.30	54		2.88	90	46
7		3.0	5.4	0.23	1,917	1,388	25.0	0.77	1.0	178	0.50	0.35	58		2.89	40	44
8		3.0	4.1	0.58	1,576	1,126	20.0	0.79	1.1	178	0.40	0.28	56		2.87	82	48
9		3.2	10.3	0.38	1,727	1,148	22.0	0.79	0.9	172	0.36	0.27	62		2.73	58	22
10		3.3								182			62		2.63	54	46
11		3.2								182			61		2.71	68	26
12		3.1	4.0	0.37	1,728	1,254	28.0	0.62	1.2	177	0.34	0.24	59		2.74	60	56
13		3.2	5.2	0.41	1,716	1,221	26.0	0.66	1.5	180	0.39	0.30	58		2.69	66	44
14		3.2	3.2	0.43	1,608	1,054	22.0	0.73	1.8	179	0.27	0.18	58		2.69	60	68
15		3.2	4.8	0.33	1,853	1,292	25.0	0.74	2.3	203	0.41	0.30	60		2.66	58	52
16		3.2	7.3	0.36	2,060	1,491	28.0	0.74	2.2	211	0.47	0.34	60		2.68	72	38
17		3.3								221			60		2.64	56	44
18		3.3								218			61		2.62	50	38
19		3.1	6.5	0.30	2,218	1,586	28.0	0.79	4.1	218	0.51	0.36	58		2.79	62	44
20		3.2			2,501	1,760	38.0	0.66	4.0	222	0.59	0.42	58		2.73		
21		3.2	5.5	0.28	2,144	1,480	28.0	0.77	4.4	223	0.31	0.35	60		2.71	54	52
22		3.1	6.0	0.30	2,388	1,639	33.0	0.72	4.3	225	0.56	0.39	57		2.75	64	52
23		3.2	4.8	0.36	2,043	1,460	28.0	0.73	4.0	225	0.50	0.34	59		2.73	70	56
24		3.3								225			61		2.63	58	58
25		3.0								236			59		2.83	54	40
26		3.0	7.6	0.25	2,547	1,750	51.0	0.50	2.3	217	0.44	0.30	54		2.87	54	42
27		3.1	5.4	0.33	2,120	1,470	29.0	0.73	1.6	217	0.41	0.29	57		2.82	62	50
28		3.1	6.1	0.26	2,377	1,670	35.0	0.68	2.2	222	0.44	0.30	58		2.81	56	50
29		3.1	6.0	0.37	2,156	1,479	30.0	0.72	1.6	222	0.52	0.36	59		2.80	70	46
30		3.2	6.3	0.25	2,261	1,539	31.0	0.73	3.4	219	0.51	0.35	61		2.70	52	48
31		3.2								220			62		2.68	50	42
Total	48	97.2	112.1	7.42	43,507	30,336	608.0	16.12	51.1	6,222	9.63	6.94	1,812		85.29	1,800	1,336
Max.	48	3.3	10.3	0.64	2,547	1,760	51.0	0.87	4.4	236	0.59	0.42	62		2.89	90	68
Min.	48	3.0	3.2	0.23	1,472	1,047	17.0	0.50	0.9	170	0.27	0.18	54		2.62	40	22
Avg.	48	3.1	5.6	0.37	1,978	1,379	27.6	0.73	2.3	201	0.44	0.32	58		2.75	62	46

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
MISCELLANEOUS & SLUDGE SHEET - OCTOBER, 1987

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	Other	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	pH
1		2,400	420	12	397		4,500	3.6	77	5.6
2		2,520	500	18	397		15,000	3.9	67	6.7
3		2,400	380	19	298		1,500	4.3	73	6.1
4		2,400	400	19	298		1,500	4.6	75	5.6
5		2,400	500	18	397		10,000	4.2	70	6.8
6		2,400	350	20	298		2,000	4.9	79	5.8
7		2,520	370	20	397		1,000	5.8	75	5.9
8		2,520	400	13	397		3,200	6.5	76	5.7
9		2,640	540	14	298		13,400	4.0	69	7.1
10		2,520	250	19	397		1,500	6.2	75	5.8
11		2,520	380	21	397		1,500	5.4	76	5.6
12		2,520	420	19	298		10,000	3.9	70	7.1
13		2,520	410	22	397		1,000	5.7	75	5.9
14		2,400	360	26	397		1,000	6.7	72	5.8
15		2,400	360	20	298		1,000	6.5	73	5.8
16		2,520	560	15	298		14,000	4.4	69	7.1
17		2,520	330	14	397		4,000	6.0	79	6.1
18		2,400	360	16	298		1,000	5.6	76	6.0
19		2,640	340	18	397					
20		2,760	440	19	397		2,000			
21		2,760	260	28	298		14,600	3.2	64	7.3
22		2,880	650	10	298		3,000	7.3	77	5.7
23		2,760	360	17	298		3,000	4.9	78	5.9
24		2,760	320	17	397		1,800	5.0	76	6.0
25		2,760	390	20	298		2,100	7.7	75	5.9
26		2,760	300	21	298		2,000	6.4	76	6.1
27		2,760	360	19	397		14,000	3.3	69	7.1
28		2,760	450	20	397		4,000	5.5	73	6.1
29		2,760	410	20	199		4,000	4.1	72	6.2
30		2,760	420	10	397		4,000	5.3	75	6.1
31		2,520	480	18	298		3,000	4.3	71	6.1
Total		80,160	12,470	560	10,723		144,600	149.2	2,132	179.0
Max.		2,880	650	28	397		15,000	7.7	79	7.3
Min.		2,400	250	10	199		1,000	3.2	64	5.6
Avg.		2,586	402	18	346		4,820	5.1	74	6.2

Manpower & Hours

	Total Hr
Superintendent 1	176
Asst. Supt. 1	176
Operators 3	528
Total	880

Robert J. Swalwell
Superintendent

[illegible] MARSHALL [illegible] E. MICHIGAN AVE., MARSHALL, MI 49068 [illegible] NO. MI [illegible]
[illegible] DISCHARGE MONITORING REPORT - DISCHARGE NO. 01A

	D.O. mg/L	pH SU	SS mg/L	SS Lbs.	Total-P mg/L	Flow MGD	Chlorine mg/L	BOD mg/L	BOD Lbs.	NH3 as N mg/L	NH3-N Lbs.	F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %
Limit-	4.0	6 & 9	30 & 45	751 & 1,126	1.0			20 & 30	500 & 751	11.0	7 Day 275	200 & 400	>85%	>85%	
PN-	[illegible]00300	00400	[illegible]00530	00530	00665	50050	[illegible]50060	80082	80082	00610	00610	31616	81011	81267	[illegible]81012
Day															
1	6.4	7.1	9	212	0.82	2.83		8	189			96	92	92	76
2	6.1	6.9				2.82						100			
3	5.8	7.1	3	68	0.27	2.71		10	226			22	93	89	83
4	5.7	7.0	8	185	0.22	2.78		5	116			24	90	93	87
5	6.2	7.6	6	144	0.41	2.87		6	144			66	92	92	82
6	5.6	7.5	13	312	0.40	2.88		11	264			34	85	89	81
7	5.1	7.3	12	289	0.70	2.89		6	145			300	82	85	67
8	5.5	7.4	12	287	0.48	2.87		12	287			600	92	88	77
9	4.5	7.4	7	159	0.35	2.73		14	319			52	94	79	82
10	5.1	7.3	9	197	0.44	2.63		8	175			28	89	89	93
11	5.5	7.5	12	271	0.53	2.71		8	181			600	89	91	88
12	6.2	7.4	19	434	0.62	2.74		9	206			54	75	87	76
13	5.9	7.4	10	224	0.30	2.69		7	157			54	84	92	90
14	6.7	7.4	19	426	0.22	2.69		5	112			122	80	94	90
15	6.3	7.4	14	311	0.25	2.66		6	133			138	85	92	89
16	6.6	7.4	10	224	0.38	2.68		6	134			94	89	93	87
17	6.0	7.4	6	132	0.32	2.64		6	132			102	89	91	82
18	6.3	7.6	9	197	0.27	2.62		5	109			10	85	92	87
19	6.2	7.6	6	140	0.27	2.79		6	140			16	92	93	87
20	6.7	7.6				2.73						22			
21	7.2	7.6	9	203	0.27	2.71		3	68			10	90	97	87
22	7.1	7.5	13	298	0.22	2.75		3	69			10	85	96	87
23	7.4	7.4	8	182	0.18	2.73		5	114			12	87	93	93
24	6.9	7.4	10	219	0.27	2.63		3	66			20	86	95	83
25	6.8	7.5	10	236	0.30	2.83		3	71			28	81	95	85
26	6.3	7.4	6	144	0.35	2.87		4	96			108	93	87	84
27	6.8	7.5	6	141	0.28	2.82		3	71			24	88	96	90
28	6.3	7.5	10	234	0.30	2.81		3	70			26	88	96	88
29	5.4	7.4	4	93	0.22	2.80		3	70			48	94	96	90
30	6.2	7.4	8	180	0.41	2.70		2	45			44	86	96	79
31	6.1	7.3	3	67	0.32	2.68		2	45			38	91	96	91
Total	190.9	229.2	271	6,212	10.37	85.29		172	3,952			2,902	2,547	2,664	2,461
Max.	7.4	7.6	19	434	0.82	2.89		14	319			600	94	97	93
Min.	4.5	6.9	3	67	0.18	2.62		2	45			10	75	79	67
Avg.	6.2	7.4	9	214	0.36	2.75		6	136			48	88	92	85

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
NOVEMBER, 1987 - PLANT INFLUENT SHEET - SAMPLING CODE 500

	Weather		Inf. Flow	Inf. Temp	Inf. pH	Inf. BOD	Inf. BOD	Inf. SS	Inf. SS	Inf. Phos.	Inf. Phos.	Inf. VSS	Inf. NH3-N	--Remarks or Other Parameters--
	Type	Precip.	MGD	F	SU	mg/L	Lbs.	mg/L	Lbs.	mg/L	Lbs.	mg/L	mg/L	
PN-	00033	00045	50050	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	
Day														
1	4	0.05	2.75	57	7.4	64	1,466	64	1,466	1.90	44	44		
2	1		2.83	57	7.4	74	1,747	92	2,171	2.65	63	72		
3	1		2.85	57	7.2	84	1,997	80	1,902	3.00	71	64		
4	1		2.83	57	7.5	80	1,888	80	1,888	2.60	61	64		
5	1		2.46	57	7.4	72	1,477	58	1,190	2.65	54	40		
6	1		2.70	56	7.4	86	1,982	98	2,207	2.65	60	94		
7	4	0.03	2.66	56	7.6	86	1,908	94	2,085	2.75	61	80		
8	4	0.12	2.66	56	7.5	66	1,464	52	1,154	2.10	47	42		
9	1		2.75	56	7.5	74	1,697	64	1,468	2.75	63	48		
10	1		2.56	56	7.5	68	1,452	76	1,623	2.75	59	58		
11	1		2.65	56	7.7	76	1,680	82	1,812	2.40	53	70		
12	1		2.75	56	7.5	114	2,615	102	2,339	2.65	61	84		
13	3		2.71	56	7.7	116	2,622	74	1,673	2.75	62	54		
14	1		2.65	56	7.6	120	2,652	70	1,547	3.40	75	58		
15	1		2.65	55	7.8	68	1,503	68	1,503	2.20	49	54		
16	4	0.03	2.74	56	7.4	76	1,737	66	1,508	2.05	47	56		
17	4	0.13	2.71	56	7.4	94	2,125	72	1,627	2.20	50	66		
18	4	0.03	2.70	56	7.7	138	3,107	94	2,117	3.10	70	78		
19	5	0.02	2.68	56	7.5	108	2,414	80	1,788	2.75	61	68		
20	5	0.02	2.62	56	7.4	94	2,054	50	1,093	2.05	45	34		
21	3		2.54	55	7.6	64	1,356	58	1,229	1.95	41	40		
22	4	0.02	2.57	54	7.5	80	1,715	72	1,543	1.90	41	64		
23	3		2.68	56	7.5	80	1,788	68	1,520	1.90	42	56		
24	4	0.75	2.79	56	7.5	80	1,855	66	1,530	2.40	56	48		
25	4	0.57	2.85	56	7.5	66	1,569	70	1,664	2.05	49	60		
26	4	0.02	2.65	55	7.5	70	1,547	68	1,503	1.50	33	52		
27	4	0.02	2.70	54	7.6	68	1,531	52	1,171	1.90	43	40		
28	4	0.38	2.73	54	7.6	64	1,457	84	1,913	1.80	41	76		
29	4	0.15	2.81	54	7.5	110	2,578	48	1,125	3.40	80	38		
30	5	0.12	2.84	55	7.7	106	2,558	70	1,658	2.55	60	25		
31														
Total	87	2.46	81.06	1,673	225.6	2,550	57,540	2,172	49,017	72.70	1,640	1,727		
Max.	5	0.75	2.85	57	7.8	138	3,107	102	2,339	3.40	80	94		
Min.	1	0.02	2.46	54	7.2	64	1,356	48	1,093	1.50	33	25		
Avg.	3	0.15	2.70	56	7.5	85	1,918	72	1,634	2.42	55	58		

Robert J. Swalwell
Superintendent

HARBERT, MICHIGAN WASTEWATER TREATMENT PLANT - PLANT NO. 13 (29
NOVEMBER, 1987 - PRIMARY EFFLUENT SHEET

	P E++. BOD mg/L	P E++. BOD Lbs.	P E++. SS mg/L	P. Eff. SS Lbs.	P Eff. Phos. mg/L	P E++. Phos. Lbs.	P E++. VSS mg/L	P E++. NH3-N mg/L	--Reserve or Other Parameters-- Flow MGD
PA-	00310	85001	00530	85002	00665	85004	00535	00610	50050
Da,									
1	52	1,193	46	1,055	1.70	39	38		2.75
2	72	1,699	60	1,416	2.40	57	48		2.83
3	78	1,854	54	1,284	2.55	61	36		2.85
4	68	1,605	36	897	1.95	46	34		2.83
5	60	1,271	44	903	2.45	50	36		2.46
6	60	1,351	48	1,081	2.30	52	46		2.70
7	56	1,242	52	1,154	2.65	60	38		2.66
8	50	1,109	26	577	1.95	43	26		2.66
9	52	1,193	32	734	2.55	58	24		2.75
10	50	1,066	34	726	2.85	61	26		2.56
11	58	1,282	46	1,017	2.40	53	46		2.65
12	78	1,739	64	1,468	2.10	48	52		2.75
13	86	1,944	54	1,220	3.30	75	32		2.71
14	94	2,077	50	1,105	2.75	61	38		2.65
15	46	1,017	40	884	2.30	51	30		2.65
16	46	1,051	52	1,188	1.90	43	44		2.74
17	60	1,356	42	949	2.10	47	40		2.71
18	86	1,937	52	1,171	2.75	62	42		2.70
19	98	2,190	56	1,296	2.90	65	56		2.68
20	76	1,661	42	918	2.10	46	30		2.62
21	58	1,229	46	974	2.30	49	28		2.54
22	62	1,329	38	814	1.90	41	32		2.57
23	60	1,341	44	983	1.95	44	36		2.68
24	64	1,484	36	835	2.30	53	28		2.78
25	58	1,379	42	998	1.95	46	34		2.85
26	54	1,193	36	796	1.35	30	28		2.65
27	48	1,081	38	856	1.90	43	26		2.70
28	54	1,229	42	956	1.65	38	38		2.73
29	50	1,172	48	1,125	1.90	45	38		2.81
30	74	1,753	52	1,232	2.30	54	44		2.84
31									
Total	1,908	43,038	1,356	30,611	67.65	1,523	1,094		81.06
Max.	98	2,190	64	1,468	3.30	75	56		2.85
Min.	46	1,017	26	577	1.35	30	24		2.46
Avg.	64	1,435	45	1,020	2.26	51	36		2.70

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT - PLANT No. 170 29
NOVEMBER, 1967 - ACTIVATED SLUDGE SHEET

	Aerat Volume CF	Deten. Time hrs.	Sludge Age Days	Organic Loading #/m	Mix Liq SS mg/L	Mix Liq VSS mg/L	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mg/L	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge K.Gal	Daily Flow MGD	PE BOD mg/l	PE SS mg/L
PA-	80,997	9.001	80990	8 992	70323	70324	81004	81007	00300	81009	81006	70325	81014	82991	50050	00310	00530
Day																	
1	48	3.1								219			60		2.75	52	46
2		3.0	4.3	0.41	2,012	1,380	24.0	0.84	2.7	212	0.47	0.32	60		2.83	72	60
3		3.0	5.3	0.35	2,292	1,607	30.0	0.76	2.4	205	0.52	0.36	58		2.85	78	54
4		3.0	8.1	0.32	2,413	1,668	31.0	0.78	2.2	215	0.51	0.38	67		2.83	68	38
5		3.5	7.2	0.27	2,162	1,512	29.0	0.75	2.4	226	0.47	0.33	60		2.46	60	44
6		3.2	6.3	0.30	2,272	1,485	31.0	0.73	2.5	220	0.42	0.30	60		2.70	60	48
7		3.2								220			60		2.66	56	52
8		3.2								221			58		2.66	50	26
9		3.1	8.5	0.26	2,081	1,533	27.0	0.77	3.8	228	0.48	0.34	62		2.75	52	32
10		3.4	9.5	0.23	2,312	1,580	31.0	0.75	3.4	226	0.56	0.38	62		2.56	50	34
11		3.3	6.6	0.28	2,253	1,520	30.0	0.75	4.4	227	0.51	0.35	59		2.65	58	46
12		3.1	4.5	0.38	2,225	1,568	28.0	0.79	2.0	220	0.52	0.38	60		2.75	78	64
13		3.2	6.0	0.40	2,426	1,638	32.0	0.76	1.8	216	0.54	0.38	62		2.71	86	54
14		3.3								222			62		2.65	94	50
15		3.3								219			66		2.65	46	40
16		3.1	5.4	0.23	2,135	1,552	37.0	0.58	2.2	208	0.41	0.29	73		2.74	46	52
17		3.2	6.7	0.30	2,114	1,530	35.0	0.60	2.4	216	0.46	0.33	74		2.71	60	42
18		3.2	4.5	0.52	1,742	1,240	29.0	0.60	3.8	227	0.42	0.31	73		2.70	86	52
19		3.2	4.6	0.52	1,991	1,413	35.0	0.57	3.2	220	0.36	0.26	75		2.68	98	58
20		3.3	7.1	0.35	2,184	1,604	40.0	0.55	3.2	230	0.45	0.33	78		2.62	76	42
21		3.4								230			76		2.54	58	46
22		3.4								221			76		2.57	62	38
23		3.2	6.2	0.31	2,042	1,444	36.0	0.57	5.3	221	0.44	0.32	73		2.68	60	44
24		3.1	7.1	0.36	1,968	1,382	34.0	0.58	5.8	291	0.41	0.29	69		2.78	64	36
25		3.0	6.6	0.29	2,211	1,587	39.0	0.57	6.0	290	0.49	0.35	75		2.85	58	42
26		3.3								291			74		2.65	54	36
27		3.2								291			70		2.70	48	38
28		3.2								291			66		2.73	54	42
29		3.1								291			67		2.81	50	48
30		3.0	5.1	0.39	2,105	1,485	29.0	0.73	2.9	279	0.48	0.34	67		2.84	74	52
31																	
Total	48	95.8	119.5	6.50	40,940	28,728	607.0	13.01	62.4	7,093	8.92	6.34	2,002		81.06	1,908	1,356
Max.	48	3.5	9.5	0.52	2,426	1,668	40.0	0.84	6.0	291	0.56	0.38	78		2.85	98	64
Min.	48	3.0	4.3	0.23	1,742	1,240	24.0	0.55	1.8	205	0.36	0.26	58		2.46	46	26
Avg.	48	3.2	6.3	0.34	2,155	1,512	31.9	0.68	3.3	236	0.47	0.33	67		2.70	64	45

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
MISCELLANEOUS & SLUDGE SHEET - NOVEMBER, 1987

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	Other	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	pH
1	2,600	2,760	250		397		3,000	4.0	72	6.1
2		2,400	490		397		2,000	5.4	71	6.1
3		2,520	580		298		18,100	4.4	71	6.9
4		2,520	520		298		4,000	5.9	74	6.0
5	3,100	2,880	610		298		6,000	5.7	75	5.9
6	3,100	2,640	420		298		17,700	5.1	70	6.2
7	2,700	2,640	310		298		5,000	5.3	75	5.9
8	3,000	2,640	410		397		2,000	4.7	77	5.8
9	5,100	2,880	360		298		2,000	4.2	77	5.7
10	6,700	2,880	430		397		14,300	3.7	68	7.1
11	4,500	3,000	360		298		2,700	4.8	76	5.7
12	3,500	2,760	390		397		3,000	5.7	76	5.8
13	3,000	2,760	550		397		13,500	3.4	63	7.3
14	2,800	2,760	310		397		2,000	5.0	73	6.2
15	2,600	2,640	450		397		1,500	3.4	79	6.2
16	2,400	2,520	470		199		13,500	4.9	73	7.1
17	2,700	2,640	350		298		1,600	4.6	78	6.0
18	4,400	2,880	350		298		1,500	5.7	77	5.9
19	3,000	2,760	440		298		12,500	4.3	72	7.0
20	7,500	3,000	340		199		1,500	5.8	75	5.8
21	6,000	2,880	300		397		1,500	5.9	76	5.6
22	3,200	2,760	350		298		1,500	4.9	77	5.5
23	3,000	2,880	400		199		1,500	6.7	78	5.8
24	3,500	3,120	580		298		15,500	4.1	72	7.0
25	3,800	3,240	440		298		5,000	6.1	77	5.7
26	3,400	3,120	330		397		1,400	3.0	81	5.8
27	3,400	3,120	290		199		1,000	4.7	80	5.8
28	2,700	3,000	400		397		1,500	4.9	81	5.9
29	3,300	3,120	280		298		1,500	5.6	76	5.8
30	4,400	3,000	710		298		16,300	4.1	70	7.3
31										
Total	99,400	84,720	12,470		9,633		168,100	146.0	2,232	185.1
Max.	7,500	3,240	710		397		16,300	6.7	81	7.3
Min.	2,400	2,400	250		199		1,000	3.0	63	5.5
Avg.	3,681	2,824	416		321		5,603	4.9	74	6.2

Manpower & Hours

	Total Hr
Superintendent 1	152
Asst. Supt. 1	152
Operators 3	464
Total	768

Robert J. Swalwell

[illegible] NOVEMBER, 1987 - DISCHARGE MONITORING REPORT - DISCHARGE NO. 001A

	D.O. mg/L	pH SU	SS mg/L	SS Lbs.	Total-P mg/L	Flow MGD	Chlorine mg/L	BOD mg/L	BOD Lbs.	NH3 as N mg/L	NH3-N Lbs.	F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %
Limit-	4.0	6 & 9	30 & 45	751 & 1,126	1.0			20 & 30	500 & 751	11.0	7 Day 275	200 & 400	85%	85%	
PN-	00300	00400	00530	00530	00665	50050	50060	80082	80082	00610	00610	31616	81011	81267	81012
Day															
1	6.3	7.4	5	115	0.22	2.75		3	69				92	95	88
2	6.4	7.4	4	94	0.22	2.83		3	71				96	96	92
3	6.5	7.4	8	190	0.42	2.85		6	143				90	93	86
4	6.7	7.4	4	94	0.27	2.83		4	94				95	95	90
5	6.3	7.4	8	164	0.35	2.46		5	103				66	94	87
6	6.5	7.5	14	315	0.46	2.70		3	68				86	97	83
7	6.6	7.5	10	222	0.34	2.66		2	44				89	98	88
8	6.5	7.4	5	111	0.35	2.66		4	89				90	94	83
9	6.4	7.4	10	229	0.37	2.75		3	69				84	96	87
10	7.2	7.4	10	214	0.50	2.56		2	43				87	97	82
11	7.1	7.4	14	309	0.56	2.65		3	66				83	96	77
12	4.6	7.4	14	321	0.42	2.75		5	115				86	96	84
13	4.1	7.3	10	226	0.70	2.71		7	158				86	94	75
14	4.0	7.5	13	287	0.68	2.65		6	133				81	95	80
15	4.2	7.5	14	309	0.15	2.65		6	133				79	91	77
16	6.2	7.6	9	206	0.38	2.74		8	183				86	89	81
17	4.7	7.4	7	158	0.30	2.71		3	68				90	97	86
18	6.3	7.5	10	225	0.51	2.70		6	135				89	96	84
19	5.9	7.4	10	224	0.55	2.68		6	134				88	94	80
20	6.0	7.4	11	240	0.61	2.62		10	219				78	89	70
21	6.1	7.4	10	212	0.85	2.54		6	127				83	91	56
22	6.9	7.4	8	171	0.62	2.57		6	129				89	93	67
23	7.9	7.5	6	134	0.47	2.68		4	89				91	95	75
24	7.8	7.5	11	255	0.48	2.78		5	116				83	94	80
25	7.7	7.5	4	95	0.38	2.85		3	71				94	95	81
26	7.9	7.5	8	177	0.23	2.65		3	66				88	96	85
27	8.1	7.5	6	135	0.28	2.70		3	68				88	96	85
28	7.9	7.5	12	273	0.40	2.73		4	91				86	94	78
29	7.5	7.5	15	352	0.44	2.81		5	117				69	95	87
30	6.9	7.5	15	355	0.55	2.84		7	166				79	94	78
31															
Total	193.2	223.4	285	6,414	13.06	81.06		141	3,174				2,591	2,835	2,432
Max.	8.1	7.6	15	355	0.85	2.85		10	219				96	98	92
Min.	4.0	7.3	4	94	0.15	2.46		2	43				69	89	56
Avg.	6.4	7.4	10	214	0.44	2.70		5	106				86	95	81
			13	271				6	135						

Robert J. Swalwell
Superintendent

	Waste Type	Waste Prec.	Influent Flow MGD	Influent Temp F	Influent pH SU	Influent BOD mg/L	Influent BOD lbs	Influent SS mg/L	Influent SS lbs.	Influent Phos mg/L	Influent Phos. lbs.	Influent VSS mg/L	Influent V-Tss mg/L	--Remarks or Other Parameters--
AN-	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Day														
1	5	[illegible]	2.84	54	7.7	94	2,226	67	1,421	2.55	60	49		
2	5	[illegible]	[illegible]	55	7.5	97	2,[illegible]	56	1,[illegible]	2.45	57	46		
3	5	[illegible]	2.90	55	7.5	92	1,987	5	1,481	1.95	47	44		
4	[illegible]		2.87	54	7.4	94	1,9[illegible]	46	1,074	2.10	49	34		
5	1		2.76	54	7.4	84	1,473	50	1,15[illegible]	1.90	44	42		
6	5	[illegible]	2.82	54	7.4	76	1,794	[illegible]	2,[illegible]	1.50	35	119		
7	4	0.22	2.95	54	7.4	82	2,267	84	2,[illegible]	2.45	60	56		
8	4	0.46	2.92	55	7.4	78	1,857	68	1,[illegible]	2.05	50	58		
9	4	0.03	2.97	55	7.4	82	2,031	68	1,684	2.20	54	54		
10	1		2.91	55	7.4	64	1,553	48	1,165	1.65	40	40		
11	4	0.21	2.85	55	7.4	64	1,521	64	1,521	1.70	40	44		
12	7		2.79	55	7.5	64	1,489	62	1,443	1.70	40	50		
13	1		2.85	52	7.6	66	1,569	82	1,949	1.65	39	70		
14	4	1.05	3.06	54	7.4	68	1,735	68	1,735	1.70	43	58		
15	4&5	0.32	3.19	55	7.3	114	3,033	70	1,862	2.05	55	54		
16	3		3.15	53	7.4	88	2,312	52	1,366	2.10	55	40		
17	3		3.20	53	7.4	94	2,509	108	2,882	2.05	55	100		
18	3		3.13	53	7.5	74	1,932	72	1,880	2.05	54	60		
19	4	0.74	3.16	53	7.6	50	1,318	44	1,160	1.90	50	40		
20	3		3.28	53	7.5	64	1,751	70	1,915	1.80	49	64		
21	1		3.35	53	7.5	74	2,067	68	1,900	1.95	54	58		
22	4	0.04	3.25	53	7.4	64	1,735	60	1,626	1.50	41	44		
23	4	0.08	3.17	53	7.5	64	1,692	60	1,586	1.80	48	52		
24	7		3.07	53	7.3	54	1,383	40	1,024	1.60	41	30		
25	3		2.91	53	7.4	52	1,262	52	1,262	1.70	41	46		
26	1		3.00	52	7.6	62	1,551	42	1,051	2.55	64	32		
27	5	0.01	3.02	52	7.5	62	1,562	64	1,612	1.50	38	50		
28	5	0.56	3.06	52	7.4	82	2,093	70	1,786	2.30	59	60		
29	1		3.08	52	7.4	84	2,158	80	2,055	2.65	68	68		
30	1		3.04	52	7.5	64	1,623	66	1,673	1.80	46	42		
31	3		3.02	52	7.4	62	1,562	74	1,864	1.70	43	66		
Total	94	4.01	93.31	1,656	231.0	2,274	57,092	2,040	51,246	60.55	1,519	1,668		
Max.	5	1.05	3.35	55	7.7	114	3,033	132	3,115	2.65	68	118		
Min.	1	0.01	2.76	52	7.3	50	1,262	40	1,024	1.50	35	30		
Avg.	3	0.27	3.01	53	7.5	73	1,842	66	1,653	1.95	49	54		

Robert J. Swalwell
Superintendent

[illegible] WASTEWATER [illegible]
DECEMBER, [illegible] - PRIMARY [illegible] SHEET

	P Eff. BOD mgIL	P Eff. BOD Lbs.	P Eff. SS mgIL	P. Eff. SS Lbs.	P Eff. Phos. mgIL	P Eff. Phos. Lbs.	P Eff. VSS mgIL	P Eff. NH3-N mgIL	Flow MGD	--Remarks on Other Parameters--
Pr-	00310	85001	00530	85002	[illegible]	85004	00535	[illegible]	5 50	
Day										
1	76	1,800	44	1,042	2.45	58	38		2.94	
2	70	1,629	44	[illegible]	[illegible]	54	40		2.79	
3	66	1,596	42	1,016	2.10	51	34		2.90	
4	62	1,448	36	841	2.40	56	24		2.80	
5	54	1,243	34	783	1.90	44	26		2.76	
6	66	1,558	54	1,275	2.10	50	42		2.83	
7	70	1,722	52	1,279	2.55	63	30		2.95	
8	64	1,564	62	1,515	2.10	51	46		2.93	
9	74	1,833	48	1,189	2.20	54	36		2.97	
10	64	1,553	38	922	2.20	57	32		2.91	
11	55	1,307	45	1,070	2.05	49	35		2.85	
12	58	1,350	46	1,070	1.70	40	36		2.79	
13	58	1,379	34	808	1.70	40	26		2.85	
14	60	1,531	48	1,225	1.70	43	42		3.06	
15	98	2,607	66	1,756	1.95	52	50		3.19	
16	68	1,786	34	893	1.95	51	28		3.15	
17	64	1,708	46	1,228	1.65	44	38		3.20	
18	52	1,357	44	1,149	1.70	44	34		3.13	
19	46	1,212	32	843	1.95	51	24		3.16	
20	48	1,313	46	1,258	1.50	41	40		3.28	
21	54	1,509	38	1,062	1.80	50	34		3.35	
22	38	1,030	34	922	1.35	37	24		3.25	
23	38	1,005	32	846	1.40	37	22		3.17	
24	38	973	18	461	1.30	33	12		3.07	
25	34	825	30	728	1.10	27	22		2.91	
26	38	951	46	1,151	1.50	38	28		3.00	
27	38	957	44	1,108	1.10	28	40		3.02	
28	52	1,327	44	1,123	1.70	43	34		3.06	
29	44	1,130	32	822	1.90	49	22		3.08	
30	34	862	34	862	1.35	34	22		3.04	
31	50	1,259	48	1,209	1.40	35	40		3.02	
Total	1,731	43,325	1,295	32,479	56.05	1,400	1,001		93.31	
Max.	98	2,607	66	1,756	2.55	63	50		3.35	
Min.	34	825	18	461	1.10	27	12		2.76	
Avg.	56	1,398	42	1,048	1.81	45	32		3.01	

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT - PLANT No. 130029
DECEMBER, 1997 - ACTIVATED SLUDGE SHEET

	Aerat Volume- KCF	Deten. Time Hrs.	Sludge Age— Days	Organic Loading f/m	Mix Liq SS mg/L	Mix Liq - VSS mg/L	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mg/L	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge kGal	Daily Flow MGD	PE BOD mg/l	PE SS mg/L
PN-	`80993	`81001	`80990	`80992	`70323	`70324	81004	81007	00300	81000	81006	`70325	`81014	`80991	50050	00310	`00570
Day																	
1	48	3.0	7.1	0.28	2,416	1,648	32.0	0.73	7.5	288	0.54	0.39	65		2.84	59	43
2		3.1	6.5	0.31	2,161	1,526	31.0	0.70	7.7	289	0.54	.24	68		2.79	61	47
3		3.0	5.6	0.35	2,000	1,439	29.0	0.69	4.2	287	.45	0.32	66		2.90	67	44
4		3.1	6.0	0.35	2,066	1,444	29.0	0.71	5.1	234	0.46	0.32	67		2.80	65	44
5		3.1							4.0	227			69		2.76	65	43
6		3.0							4.8	226			66		2.83	67	44
7		2.9	5.6	0.36	2,025	1,424	29.0	0.70	3.0	221	0.46	0.23	64		2.95	66	44
8		2.9	5.4	0.36	2,07	1,462	30.	.68	2.9	218	.45	.22	64		2.97	65	46
9		2.9	5.3	0.38	1,961	1,425	27.	.77	2.9	215	0.41	.22	67		2.97	65	47
10		2.9	5.1	0.38	1,916	1,410	27.	0.7	3.	217	.42	.22	65		2.91	65	46
11		3.0	5.6	0.37	2,116	1,549	31.0	0.68	1.9	219	.47	0.24	66		2.85	64	48
12		3.1								218			67		2.79	64	49
13		3.0								220			67		2.85	67	46
14		2.8	5.	.37	1,985	1,421	31.	.68	7.	22	.45	.22	62		2.76	62	46
15		2.7	5.0	0.41	2,059	1,468	32.0	0.64	7.1	224	0.48	.23	59		2.79	63	46
16		2.7	6.3	.34	2,425	1,716	45.	.64	2.7	224	.55	.24	59		2.85	66	44
17		2.7	5.4	0.37	2,228	1,590	38.0	.69	1.6	2	0.52	0.27	57		3.20	56	46
18		2.8	5.7	0.37	2,098	1,525	37.	.67	1.7	220	0.49	.26	62		3.17	65	45
19		2.7								35			59		3.1	62	47
20		2.8								22			57		3.28	62	45
21		2.8	7.7	0.45	1,618	1,177	25.0	.68	2.5	33	.4	.23	56		3.75	51	44
22		2.7	4.9	.35	1,736	1,247	28.	.62	2.3	232	.42	.24	58		3.25	57	39
23		2.7	5.1	.35	1,757	1,229	29.	0.6	3.9	229	.42	.23	6		3.17	49	39
24		2.8	5.2	0.39	1,847	1,247			5.	22			62		3.4	45	45
25		2.8	7.1	0.25	1,887	1,356			4.9	230			65		2.9	42	44
26		2.8	5.2	.41	1,840	1,3				22			22			4	46
27		2.8	5.4	.44	1,849	1,3				2			57		3	4	46
28		2.8	5.8	.37	1,736	1,2	24.	.70	4.2	22			61		3.6	46	46
29		2.8	6.4	.37	1,890	1,276	27.0	.7	2.4	27	.4	2	6		3.3	4	45
30		2.8	5.	.41	1,771	1,248	28.	.7	2.7	230	22	2	6		3.4	4	46
31		2.9	5.2	0.37	1,747	1,224	24.	.4	4.	27	42	.29	62		3.02	4	4
Total	48	89.	1.6	5.49	48,227	34,422	37	.65		6,6	1.2	1.6	22		97.7	776	1
Max.	48	3.1	7.	.48	2,425	1,716	45	0.77	7.7	289	.55	4	24		3.28	67	49
Min.	48	2.7	4.9	.25	1,618	1.	24.	.62	1.	22	0.4	.22	4		2.75	46	39
Avg.	48	2.9	5.8	0.34	1,940	1,377	31.	.67	3.8	224	46	22	3		3.	57	42

[illegible]

	D.O mg/L	pH S.U.	SS mg/L	SS Lbs.	Total-P mg/L	Flow MGD	Chlorine mg/L	BOD mg/L	BOD Lbs.	NH3-N as N mg/L	NH3-N Lbs.	% Ch. per [illegible]	SS Rem. %	BOD Rem. %	Total-P Rem. %
Limits	4.0	6.0 - 9.0	30 & 45	751 & 1,126	1.0			20 & 30	500 & 751	11.0	7 Day 1275	200 % Min.	85%	85%	
Avg.	[illegible]	[illegible]	[illegible]	10530	10665	50150	15060	81082	80082	[illegible]	10610	71616	81011	91287	81012
Day															
1	5.6	7.4	14	333	.51	2.84		8	142				77	94	80
2	5.7	7.4	8	186	.51	2.79		7	167				86	92	79
3	6.8	7.4	18	425	0.58	2.90		9	218				71	89	70
4	7.0	7.7	9	210	0.56	2.80		6	140				80	93	69
5	5.0	7.3	15	345	0.74	2.76		5	132				7.	91	61
6	5.4	7.4	18	425	.54	2.87		8	189				8e	89	65
7	4.2	7.4	16	394	0.64	2.95		8	197				81	91	74
8	4.4	7.7	10	218	0.42	2.92		5	122				81	93	8[illegible]
9	4.7	7.7	6	149	0.34	2.97		5	124				91	93	85
10	4.0	7.4	19	461	0.55	2.91		8	194				60	88	67
11	4.4	7.7	21	475	0.50	2.85		5	119				69	92	71
12	4.1	7.7	20	465	.45	2.79		6	140				68	91	74
13	6.2	7.4	11	261	0.42	2.85		6	143				86	91	75
14	6.1	7.4	18	459	0.41	3.06		6	153				74	91	76
15	5.4	7.4	13	346	0.51	3.19		7	186				81	94	75
16	4.7	7.4	5	131	0.46	3.15		6	158				90	93	78
17	4.2	7.4	21	560	0.51	3.20		7	187				81	93	75
18	4.6	7.7	15	392	0.27	3.17		4	104				79	95	87
19	4.3	7.5	11	290	0.27	3.16		4	105				75	92	86
20	4.5	7.4	12	328	0.30	3.28		4	109				83	94	83
21	4.4	7.4	12	335	0.40	3.35		6	168				82	92	82
22	6.1	7.3	10	271	0.38	3.25		4	108				83	94	75
23	6.1	7.3	17	449	0.35	3.17		7	79				72	95	81
24	5.8	7.4	4	102	0.32	3.07		3	77				90	94	71
25	5.9	7.4	10	243	0.27	2.91		4	97				81	92	84
26	6.1	8.0	12	300	0.56	3.00		5	125				71	92	87
27	6.0	8.0	9	227	0.27	3.02		4	101				86	94	82
28	6.4	7.4	13	332	0.35	3.06		6	153				81	93	85
29	5.7	7.4	13	334	0.48	3.08		6	154				84	93	82
30	8.1	7.4	14	355	0.42	3.04		5	127				79	92	77
31	8.4	7.3	19	479	0.40	3.02		5	126				74	92	76
Total	169.9	230.1	415	10,390	13.89	93.31		174	4,346				2,451	2,862	2,392
Max.	8.4	8.0	21	560	0.74	3.35		9	218				91	95	87
Min.	4.0	7.3	4	102	0.27	2.76		3	77				60	88	61
Avg.	5.5	7.4	13	335	0.45	3.01		6	140				79	92	77

Robert J. Swalwell

[illegible]

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	Other	Gals.	Raw Sludge Total Solids Percent	Raw Sludge Vol. Solids Percent	pH
1	5,800	3,240	440		397		1,800	4.5	--	5.9
2	5,700	3,120	390		298		1,200	5.1	77	5.8
3	5,500	3,120	350		298		1,700	4.6	78	5.6
4	5,600	3,000	420		298		14,300	7.4	69	7.1
5	6,700	2,760	700		298		1,200	5.0	75	5.7
6	6,000	3,000	320		797		1,200	5.7	78	5.4
7	4,600	2,880	460		298		1,700	6.3	78	5.7
8	3,200	2,760	510		298		13,900	4.5	74	7.1
9	3,200	2,880	450		199		2,000	5.0	77	6.0
10	4,400	2,880	620		397		2,000	5.0	78	5.8
11	3,600	2,640	570		397		10,200	3.9	71	7.0
12	4,200	3,120	440		298		0			
13	4,400	2,760	540		298		0			
14	4,600	3,000	360		298		0			
15	5,800	3,000	550		298		0			
16	5,600	3,000	560		397		0			
17	7,800	2,880	740		199		21,000	4.9	53	6.4
18	6,500	2,880	830		797		14,500	5.3	81	5.7
19	4,500	2,880	470		298		1,500	3.9	81	6.0
20	5,700	2,760	450		298		1,500	4.9	75	5.9
21	6,000	2,880	700		298		15,400	8.1	85	7.0
22	5,700	2,880	730		596		6,000	3.9	73	6.1
23	6,000	2,880	530		199		6,000	4.9	76	6.0
24	3,900	2,640	530		496		6,000	4.2	74	6.1
25	5,800	2,880	650		397		6,000	4.0	76	6.1
26	7,200	2,880	600		397		6,000	3.6	74	6.2
27	6,500	2,760	650		298		6,000	4.6	75	6.2
28	7,100	2,760	510		298		6,000	3.6	76	6.1
29	8,700	2,880	460		298		6,000	3.6	79	6.0
30	7,400	2,880	540		298		6,000	3.6	74	6.2
31	8,000	3,000	590		298		6,000	3.7	75	6.2
Total	175,700	89,880	16,260		10,229		164,800	119.8	1,962	159.3
Max.	8,700	3,240	830		596		21,000	8.1	85	7.1
Min.	3,200	2,640	300		199		0	3.4	53	5.4
Avg.	5,668	2,899	525		330		5,316	4.6	75	6.1

Manpower & Hours

	Total Hr
Superintendent 1	168
Asst. Supt. 1	168
Operators 3	512
Total	848

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
JANUARY, 1989 - PLANT INFLUENT SHEET - SAMPLING CODE 500

	----Weather-----		Inf. Flow	Inf. Temp	Inf. pH	Inf. BOD	Inf. BOD	Inf. SS	Inf. SS	Inf. Phos.	Inf. Phos.	Inf. VSS	Inf. NH3-N	--Remarks or Other Parameters--
	Type	Precip.	MGD	F	SU	mg/L	Lbs.	mg/L	Lbs.	mg/L	Lbs.	mg/L	mg/L	
PN-	^00033	^00045	^50050	^00011	^00400	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	
Day														
1	1		2.88	51	7.5	60	1,441	58	1,393	2.40	58	40		
2	1		3.08	51	7.5	90	2,312	60	1,541	2.45	63	40		
3	5	0.08	3.24	51	7.2	88	2,378	74	2,000	2.10	57	48		
4	1		3.16	51	7.2	80	2,108	62	1,634	1.90	50	32		
5	5	0.19	3.12	51	7.6	70	1,821	60	1,561	2.10	55	32		
6	4	0.02	3.04	52	7.3	58	1,471	66	1,673	1.95	49	64		
7	4	0.34	3.03	51	7.6	52	1,314	46	1,162	1.15	29	40		
8	5	0.01	3.15	50	7.6	64	1,681	50	1,314	1.20	32	40		
9	3		3.18	51	7.5	60	1,591	52	1,379	1.60	42	46		
10	1		3.19	51	7.6	58	1,543	132	3,512	1.80	48	118		
11	4	0.04	3.22	51	7.4	76	2,041	60	1,611	1.90	51	52		
12	1		3.21	51	7.4	60	1,606	84	2,249	2.05	55	76		
13	1		3.18	51	7.5	44	1,167	54	1,432	1.70	45	44		
14	5	0.15	3.10	50	7.5	60	1,551	46	1,189	4.30	111	38		
15	1		3.19	50	7.5	58	1,543	36	958	3.20	85	28		
16	1		3.22	51	7.5	68	1,826	52	1,396	2.05	55	44		
17	1		3.14	51	7.3	58	1,519	54	1,414	2.45	64	48		
18	1		3.15	51	7.4	82	2,154	60	1,576	2.05	54	52		
19	5	0.02	3.12	51	7.5	66	1,717	64	1,665	2.20	57	56		
20	1		3.30	51	7.5	64	1,761	62	1,706	1.80	50	52		
21	1		3.08	50	6.8	62	1,593	66	1,695	1.70	44	54		
22	1		2.95	50	7.5	72	1,771	68	1,673	1.60	39	60		
23	1		2.95	51	7.5	80	1,968	52	1,279	1.90	47	46		
24	1		3.01	51	7.5	104	2,611	62	1,556	2.10	53	54		
25	4	0.15	3.10	51	7.4	86	2,223	60	1,551	2.10	54	48		
26	1		3.29	51	7.6	62	1,701	80	2,195	1.95	54	64		
27	1		2.93	51	7.4	68	1,662	60	1,466	1.65	40	52		
28	4	0.06	2.94	50	7.7	76	1,863	58	1,422	1.65	40	56		
29	4	0.12	3.09	49	7.4	58	1,495	84	2,165	1.65	43	64		
30	1		3.17	51	7.3	60	1,586	62	1,639	2.45	65	58		
31	1		2.92	51	7.3	94	2,289	58	1,412	1.95	47	54		
Total	71	1.18	96.33	1,574	230.5	2,138	55,310	1,942	50,422	63.05	1,635	1,600		
Max.	5	0.34	3.30	52	7.7	104	2,611	132	3,512	4.30	111	118		
Min.	1	0.01	2.88	49	6.8	44	1,167	36	958	1.15	29	28		
Avg.	2	0.11	3.11	51	7.4	69	1,784	63	1,627	2.03	53	52		

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
JANUARY, 1989 - PRIMARY EFFLUENT SHEET

	P Eff. BOD mg/L	P Eff. BOD Lbs.	P Eff. SS mg/L	P. Eff. SS Lbs.	P Eff. Phos. mg/L	P Eff. Phos. Lbs.	P Eff. VSS mg/L	P Eff. NH3-N mg/L	Flow MGD	BOD Pri. Removal %	SS Pri. Removal %	P Pri. Removal %
PN-	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	^50050			
Day												
1	36	865	36	865	2.55	61	24		2.88	40	38	0
2									3.08			
3	56	1,513	55	1,486	1.80	49	34		3.24	36	26	14
4	48	1,265	42	1,107	2.05	54	22		3.16	40	32	2
5	64	1,665	42	1,093	2.10	55	28		3.12	8	30	0
6	42	1,065	36	913	1.90	48	34		3.04	28	45	14
7	34	859	34	859	1.30	33	30		3.03	35	26	0
8	40	1,051	46	1,208	1.20	32	34		3.15	38	8	0
9	50	1,326	30	796	1.50	40	26		3.18	17	42	6
10	38	1,011	38	1,011	1.70	45	28		3.19	34	71	6
11	64	1,719	24	645	1.80	48	16		3.22	16	60	5
12	42	1,124	38	1,017	1.90	51	30		3.21	30	55	7
13	44	1,167	34	902	1.70	45	28		3.18	0	37	0
14	80	2,068	36	931	3.75	97	26		3.10	0	22	13
15	66	1,756	30	798	2.75	73	20		3.19	0	17	14
16	44	1,182	30	806	1.80	48	20		3.22	35	42	12
17	54	1,414	30	786	1.95	51	18		3.14	7	44	20
18	54	1,419	34	893	2.05	54	28		3.15	34	43	0
19	52	1,353	44	1,145	2.45	64	36		3.12	21	31	0
20	34	936	28	771	1.80	50	26		3.30	47	55	0
21	32	822	34	873	1.65	42	30		3.08	48	48	3
22	44	1,083	30	738	1.65	41	26		2.95	39	56	0
23	42	1,033	34	837	2.05	50	28		2.95	48	35	0
24	80	2,008	48	1,205	2.20	55	46		3.01	23	23	0
25	64	1,655	42	1,086	2.20	57	32		3.10	26	30	0
26	36	988	38	1,043	1.95	54	32		3.29	42	53	0
27	40	977	42	1,026	1.70	42	30		2.93	41	30	0
28	46	1,128	42	1,030	1.65	40	34		2.94	39	28	0
29	36	928	38	979	1.40	36	30		3.09	38	55	15
30	34	899	36	952	1.90	50	30		3.17	43	42	22
31	68	1,656	30	731	1.95	47	24		2.92	28	48	0
Total	1,464	37,934	1,101	28,529	58.35	1,512	850		96.33	881	1,172	153
Max.	80	2,068	55	1,486	3.75	97	46		3.30	48	71	22
Min.	32	822	24	645	1.20	32	16		2.88	0	8	0
Avg.	49	1,264	37	951	1.95	50	28		3.11	29	39	5

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
JANUARY, 1989 - ACTIVATED SLUDGE SHEET

	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading flm	Mix Liq SS mgIL	Mix Liq VSS mgIL	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mgIL	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mgIl	PE SS mgIL
PN-	^80993	^81001	^80990	^80992	^70323	^70324	^81004	^81007	^00300	^81000	^81006	^70325	^81014	^80991	^50050	^00310	^00530
Day																	
1	48	3.0	4.8		1,395					209			52	36	2.88	36	36
2		2.8			1,390					213			50	36	3.08		
3		2.7	2.8	0.51	1,374	1,000	16.0	0.86	6.2	214	0.37	0.27	45	36	3.24	56	55
4		2.7	3.6	0.43	1,335	986	15.0	0.89	6.5	217	0.40	0.30	47	32	3.16	48	42
5		2.8	3.8	0.52	1,400	1,077	15.0	0.93	6.4	207	0.37	0.28	51	35	3.12	64	42
6		2.8	4.8	0.32	1,465	1,113	16.0	0.92	6.2	167	0.39	0.30	52	35	3.04	42	36
7		2.8	5.3		1,529					162			53	36	3.03	34	34
8		2.7	4.0		1,611					170			51	43	3.15	40	46
9		2.7	5.6	0.40	1,483	1,115	17.0	0.87	6.0	168	0.37	0.28	51	43	3.18	50	30
10		2.7	4.1	0.32	1,380	1,058	16.0	0.86	6.8	166	0.40	0.30	50	43	3.19	38	38
11		2.7	6.3	0.55	1,363	1,047	16.0	0.85	6.3	163	0.39	0.29	50	43	3.22	64	24
12		2.7	4.1	0.35	1,379	1,082	16.0	0.86	5.7	161	0.39	0.30	48	46	3.21	42	38
13		2.7	4.6	0.37	1,378	1,042	16.0	0.86	6.6	168	0.36	0.28	48	46	3.18	44	34
14		2.8	4.4		1,367					163			50	46	3.10	80	36
15		2.7	5.3		1,400					166			48	46	3.19	66	30
16		2.7	5.0	0.39	1,349	1,002	16.0	0.84	6.3	159	0.39	0.29	46	46	3.22	44	30
17		2.7	5.2	0.46	1,376	1,018	16.0	0.86	6.9	159	0.38	0.28	47	46	3.14	54	30
18		2.7	4.4	0.49	1,306	973	16.0	0.82	6.7	160	0.37	0.27	47	46	3.15	54	34
19		2.8	3.5	0.46	1,334	983	17.0	0.78	4.9	159	0.39	0.27	47	46	3.12	52	44
20		2.6	5.1	0.32	1,318	982	17.0	0.78	5.5	172	0.34	0.25	44	46	3.30	34	28
21		2.8	4.3		1,252					169			47	40	3.08	32	34
22		2.9	5.1		1,247					161			51	40	2.95	44	30
23		2.9	4.5	0.37	1,246	921	16.0	0.78	6.9	157	0.35	0.26	53	40	2.95	42	34
24		2.9	3.3	0.68	1,315	980	17.0	0.77	5.8	154	0.34	0.26	51	40	3.01	80	48
25		2.8	3.9	0.53	1,400	1,040	18.0	0.78	5.5	159	0.38	0.29	48	40	3.10	64	42
26		2.6	4.0	0.31	1,410	1,054	18.0	0.78	5.5	162	0.38	0.28	46	40	3.29	36	38
27		2.9	4.0	0.32	1,382	1,028	18.0	0.77	6.1	160	0.39	0.29	51	40	2.93	40	42
28		2.9	4.0		1,376					158			53	40	2.94	46	42
29		2.8	4.3		1,420					158			50	40	3.09	36	38
30		2.7	4.2	0.29	1,351	1,024	17.0	0.79	5.4	157	0.36	0.27	49	40	3.17	34	36
31		3.0	5.6	0.54	1,365	1,019	16.0	0.85	5.4	147	0.40	0.30	53	40	2.92	68	30
otal	48	86.1	133.9	8.94	42,696	21,544	345.0	17.52	127.6	5,265	7.91	5.91	1,529	1,272	96.33	1,464	1,101
lax.	48	3.0	6.3	0.68	1,611	1,115	18.0	0.93	6.9	217	0.40	0.30	53	46	3.30	80	55
lin.	48	2.6	2.8	0.29	1,246	921	15.0	0.77	4.9	147	0.34	0.25	44	32	2.88	32	24
vg.	48	2.8	4.5	0.43	1,377	1,026	16.4	0.83	6.1	170	0.38	0.28	49	41	3.11	49	37

Robert J. Swalwell
Superintendent

MARSHALL WWTP 801 W. PEARL ST. MARSHALL MI 49068 - PERMIT No. MI0023540
JANUARY, 1989 - DISCHARGE MONITORING REPORT - DISCHARGE No. 001A

	D.O. mg/L	pH SU	SS mg/L	SS Lbs.	Total-P mg/L	Flow MGD	Chlorine mg/L	BOD mg/L	BOD Lbs.	NH3 as N mg/L	NH3-N Lbs.	F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %
Limit-	>4.0	6 & 9	30 & 45	751 & ^1,126	<1.0			20 & 30	500 & ^751	<11.0	7 Day ^275	200 & 400	>85%	>85%	
PN-	^00300	^00400	^00530	^00530	^00665	^50050	^50060	^80082	^80082	^00610	^00610	^31616	^81011	^91267	^81012
Day															
1	5.7	7.2	7	168	0.51	2.88		4	96				87	93	79
2	6.0	7.2	7	180	0.35	3.08		8	205				88	91	86
3	6.4	7.2	11	297	0.53	3.24		8	216				85	91	75
4	6.4	7.3	15	395	0.46	3.16		6	158				76	93	76
5	6.6	7.2	20	520	0.55	3.12		9	234				67	87	74
6	5.2	7.1	18	456	0.34	3.04		6	152				73	90	83
7	5.2	7.2	12	303	0.64	3.03		5	126				74	90	44
8	5.2	7.3	16	420	0.61	3.15		8	210				68	88	49
9	6.7	7.3	15	398	0.44	3.18		8	212				71	87	73
10	6.0	7.4	16	426	0.41	3.19		6	160				88	90	77
11	6.2	7.4	10	269	0.40	3.22		7	188				83	93	79
12	5.9	7.3	10	268	0.28	3.21		4	107				88	93	86
13	6.2	7.4	7	186	0.35	3.18		5	133				87	89	79
14	6.2	7.4	7	181	0.91	3.10		9	233				85	85	79
15	6.2	7.8	7	186	0.87	3.19		8	213				81	86	73
16	6.8	7.3	13	349	0.46	3.22		5	134				75	93	70
17	6.6	7.4	10	262	0.55	3.14		6	157				81	90	77
18	6.0	7.3	7	184	0.30	3.15		5	131				88	94	85
19	4.8	7.4	10	260	0.46	3.12		5	130				84	92	79
20	6.2	7.5	10	275	0.44	3.30		4	110				84	94	76
21	6.6	7.4	7	180	0.32	3.08		5	128				89	92	81
22	6.4	7.4	7	172	0.38	2.95		5	123				88	93	76
23	6.0	7.3	7	172	0.28	2.95		4	98				86	95	85
24	4.6	7.3	9	226	0.37	3.01		6	151				85	94	82
25	5.6	7.4	9	233	0.34	3.10		5	129				85	94	84
26	5.4	7.3	11	302	0.37	3.29		5	137				86	92	81
27	6.2	7.4	14	342	0.40	2.93		6	147				77	91	76
28	5.1	7.7	11	270	0.34	2.94		5	123				81	93	79
29	5.0	7.5	10	258	0.30	3.09		4	103				88	93	82
30	6.0	7.4	9	238	0.40	3.17		4	106				85	93	84
31	5.9	7.4	7	170	0.40	2.92		4	97				88	96	79
Total	183.3	228.1	329	8,546	13.76	96.33		179	4,649				2,551	2,835	2,388
Max.	6.8	7.8	20	520	0.91	3.30		9	234				89	96	86
Min.	4.6	7.1	7	168	0.28	2.88		4	96				67	85	44
Avg.	5.9	7.4	11	276	0.44	3.11		6	150				82	91	77
			16	417				7	187						

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
JANUARY, 1989 - MISCELLANEOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	Other	Raw Sludge Gals.	Raw Sludge Total Solids Percent	Raw Sludge Vol. Solids Percent	Raw Sludge pH
1	8,200	2,880	710		199		4,000	4.0	74	6.0
2	10,900	2,880	780		298		4,000	4.0	76	5.9
3	6,900	3,000	690		298		6,000	4.6	68	6.0
4	10,300	2,880	810		298		6,000	4.0	77	5.9
5	7,800	3,000	800		298		6,000	3.9	75	5.9
6	7,400	2,760	860		298		6,000	4.1	78	5.8
7	5,500	2,640	700		298		4,000	3.8	80	5.9
8	10,400	2,640	750		298		4,000	4.0	75	6.1
9	10,400	2,880	810		298		6,000	4.2	77	5.9
10	7,700	2,880	770		397		6,000	4.3	75	6.2
11	6,500	2,760	780		397		6,000	4.3	80	6.1
12	7,400	2,760	810		397		6,000	4.0	78	6.1
13	8,500	2,880	950		298		6,000	4.4	71	6.3
14	8,200	2,880	740		298		4,000	4.6	75	6.3
15	7,300	2,640	940		298		4,000	3.7	78	6.3
16	8,000	2,760	920		298		6,000	3.9	77	6.1
17	5,100	2,760	850		397		6,000	4.2	75	6.3
18	6,400	2,760	780		298		6,000	3.9	75	6.4
19	5,800	2,640	930		298		6,000	4.0	75	6.3
20	7,000	2,760	800		298		6,000	4.1	75	6.3
21	8,500	2,760	790		298		4,000	3.9	72	6.2
22	6,100	2,760	750		298		4,000	4.2	78	6.2
23	4,900	2,640	680		298		6,000	4.2	75	6.0
24	5,600	2,640	700		298		6,000	4.0	74	6.2
25	6,000	2,760	820		298		6,000	4.1	79	6.1
26	7,100	2,640	650		298		6,000	3.7	74	6.0
27	6,800	2,760	850		298		6,000	3.9	76	6.3
28	5,200	2,640	720		397		4,000	3.6	78	6.6
29	5,600	2,640	770		199		4,000	3.8	73	6.3
30	6,600	2,640	750		298		6,000	4.2	76	6.1
31	3,400	2,520	760		298		6,000	3.7	72	6.2
Total	221,500	85,440	24,420		9,535		166,000	125.3	2,341	190.3
Max.	10,900	3,000	950		397		6,000	4.6	80	6.6
Min.	3,400	2,520	650		199		4,000	3.6	68	5.8
Avg.	7,145	2,756	788		308		5,355	4.0	76	6.1

Manpower & Hours

	Total Hr
Superintendent 1	^168
Asst. Supt. 1	^168
Operators 3	^508
Total 5	^844

Robert J. Swalwell
Superintendent

pg

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
FEBRUARY, 1989 - PLANT INFLUENT SHEET - SAMPLING CODE 500

	----Weather----		Inf. Flow	Inf. Temp	Inf. pH	Inf. BOD	Inf. BOD	Inf. SS	Inf. SS	Inf. Phos.	Inf. Phos.	Inf. VSS	Inf. NH3-N	--Remarks or Other Parameters--
	Type	Precip.	MGD	F	SU	mg/L	Lbs.	mg/L	Lbs.	mg/L	Lbs.	mg/L	mg/L	
PN-	^00033	^00045	^50050	^00011	^00400	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	
Day														
1	4	0.02	2.94	51	7.6	66	1,618	64	1,569	1.95	48	48		
2	4	0.02	2.90	50	7.4	74	1,790	60	1,451	2.30	56	50		
3	3		2.80	50	7.4	84	1,962	50	1,168	2.45	57	36		
4	5	0.13	2.72	50	7.5	64	1,452	56	1,270	2.55	58	34		
5	5	0.14	2.83	50	7.7	66	1,558	60	1,416	2.10	50	44		
6	5	0.02	2.98	50	7.5	100	2,485	66	1,640	2.90	72	52		
7	5	0.02	2.92	50	7.4	94	2,289	62	1,510	3.75	91	48		
8	5	0.02	2.92	50	7.4	78	1,900	52	1,266	2.90	71	36		
9	5	0.02	2.96	50	7.5	92	2,271	62	1,531	2.45	60	40		
10	3		2.92	51	7.5	84	2,046	72	1,753	2.75	67	56		
11	1		2.84	50	7.6	88	2,084	62	1,469	2.55	60	30		
12	5	0.05	2.80	50	7.6	112	2,615	46	1,074	1.90	44	26		
13	5	0.03	2.92	49	7.4	74	1,802	48	1,169	1.90	46	40		
14	1		2.94	49	7.4	80	1,962	64	1,569	1.80	44	56		
15	5	0.06	2.96	49	7.4	104	2,567	80	1,975	2.10	52	72		
16	1		2.88	51	7.5	80	1,922	58	1,393	2.45	59	46		
17	1		2.86	50	7.6	72	1,717	64	1,527	2.20	52	52		
18	5	0.01	2.74	50	7.5	88	2,011	62	1,417	2.55	58	34		
19	5	0.01	2.72	50	7.4	82	1,860	44	998	2.50	57	34		
20	5	0.35	2.86	50	7.4	84	2,004	72	1,717	2.90	69	60		
21	1		2.90	50	7.5	100	2,419	64	1,548	2.65	64	46		
22	1		2.88	50	7.5	76	1,825	60	1,441	2.40	58	48		
23	1		2.76	49	7.4	76	1,749	60	1,381	2.30	53	56		
24	1		2.80	49	7.4	76	1,775	62	1,448	2.45	57	58		
25	1		2.78	49	7.2	102	2,365	58	1,345	2.20	51	46		
26	5	0.09	2.78	49	7.5	58	1,345	62	1,437	1.80	42	52		
27	3		2.78	49	7.3	66	1,530	50	1,159	2.05	48	38		
28	5	0.02	2.78	49	7.4	80	1,855	60	1,391	2.75	64	52		
29														
30														
31														
Total	96	1.01	79.87	1,394	208.9	2,300	54,777	1,680	40,033	67.55	1,608	1,290		
Max.	5	0.35	2.98	51	7.7	112	2,615	80	1,975	3.75	91	72		
Min.	1	0.01	2.72	49	7.2	58	1,345	44	998	1.80	42	26		
Avg.	3	0.06	2.85	50	7.5	82	1,956	60	1,430	2.41	57	46		

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
FEBRUARY, 1989 - PRIMARY EFFLUENT SHEET

	P Eff. BOD mg/L	P Eff. BOD Lbs.	P Eff. SS mg/L	P. Eff. SS Lbs.	P Eff. Phos. mg/L	P Eff. Phos. Lbs.	P Eff. VSS mg/L	P Eff. NH3-N mg/L	Flow MGD	BOD Pri. Removal %	SS Pri. Removal %	P Pri. Removal %
PN-	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	^50050			
Day												
1	42	1,030	42	1,030	1.95	48	36		2.94	36	34	0
2	46	1,113	24	580	1.65	40	16		2.90	38	60	28
3									2.80			
4	44	998	38	862	1.70	39	30		2.72	31	32	33
5	34	802	48	1,133	1.65	39	36		2.83	48	20	21
6	78	1,939	42	1,044	2.10	52	36		2.98	22	36	28
7	44	1,072	38	925	1.95	47	28		2.92	53	39	48
8	48	1,169	20	487	2.10	51	12		2.92	38	62	28
9	50	1,234	44	1,086	2.05	51	30		2.96	45	29	16
10	74	1,802	50	1,218	2.55	62	40		2.92	12	31	7
11	64	1,516	50	1,184	2.10	50	36		2.84	27	19	18
12	82	1,915	36	841	1.90	44	28		2.80	27	22	0
13	56	1,364	46	1,120	1.70	41	38		2.92	24	4	11
14	66	1,618	56	1,373	1.40	34	50		2.94	18	13	22
15	66	1,629	54	1,333	1.95	48	48		2.96	37	33	7
16									2.88			
17	76	1,813	52	1,240	2.65	63	44		2.86	0	19	0
18	66	1,508	66	1,508	2.20	50	42		2.74	25	0	14
19	96	2,178	60	1,361	2.10	48	52		2.72	0	0	16
20	86	2,051	66	1,574	2.55	61	56		2.86	0	8	12
21	86	2,080	70	1,693	3.30	80	56		2.90	14	0	0
22	80	1,922	62	1,489	2.65	64	44		2.88	0	0	0
23	82	1,888	80	1,841	2.20	51	76		2.76	0	0	4
24	62	1,448	38	887	2.20	51	30		2.80	18	39	10
25									2.78			
26	54	1,252	58	1,345	2.05	48	50		2.78	7	6	0
27	62	1,437	46	1,067	2.20	51	36		2.78	6	8	0
28	60	1,391	56	1,298	2.30	53	44		2.78	25	6	16
29												
30												
31												
Total	1,604	38,168	1,242	29,521	53.15	1,266	994		79.87	551	520	339
Max.	96	2,178	80	1,841	3.30	80	76		2.98	53	62	48
Min.	34	802	20	487	1.40	34	12		2.72	0	0	0
Avg.	64	1,527	50	1,181	2.13	51	40		2.85	22	21	14

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
FEBRUARY, 1989 - ACTIVATED SLUDGE SHEET

	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading #/m	Mix Liq SS mg/L	Mix Liq VSS mg/L	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mg/L	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mg/l	PE SS mg/L
PN-	^80993	^81001	^80990	^80992	^70323	^70324	^81004	^81007	^00300	^81000	^81006	^70325	^81014	^80991	^50050	^00310	^00530
Day																	
1	48	2.9	4.1	0.33	1,395	1,028	16.0	0.87	5.3	161	0.36	0.26	53	40	2.94	42	42
2		3.0	7.1	0.37	1,367	1,013	17.0	0.80	5.5	162	0.36	0.27	54	43	2.90	46	24
3		3.1			1,372	1,028	17.0	0.81	6.1	169	0.36	0.27	55	43	2.80		
4		3.2	4.8		1,387					173			57	43	2.72	44	38
5		3.0	3.5		1,333					172			54	43	2.83	34	48
6		2.9	3.7	0.71	1,300	914	16.0	0.81	5.8	169	0.36	0.27	50	43	2.98	78	42
7		3.0	4.4	0.36	1,368	1,000	16.0	0.86	4.9	165	0.37	0.27	54	43	2.92	44	38
8		3.0	8.5	0.39	1,382	1,010	16.0	0.86	6.0	163	0.38	0.28	54	43	2.92	48	20
9		2.9	3.7	0.43	1,339	968	16.0	0.84	5.9	178	0.38	0.28	52	43	2.96	50	44
10		3.0	3.4	0.59	1,379	1,021	16.0	0.86	5.7	187	0.38	0.28	48	43	2.92	74	50
11		3.0	3.8		1,505					162			55	43	2.84	64	50
12		3.1	5.5		1,540					163			56	49	2.80	82	36
13		3.0	3.8	0.42	1,432	1,097	21.0	0.68	3.5	155	0.40	0.30	54	52	2.92	56	46
14		2.9	3.2	0.49	1,462	1,104	20.0	0.73	4.0	160	0.38	0.29	54	52	2.94	66	56
15		2.9	3.3	0.49	1,454	1,109	20.0	0.73	4.4	165	0.38	0.29	53	52	2.96	66	54
16		3.0			1,329	1,117	21.0	0.63	4.5	172	0.37	0.28	54	52	2.88		
17		3.0	3.5	0.54	1,441	1,116	20.0	0.72	4.9	172	0.38	0.29	54	50	2.86	76	52
18		3.1	2.9		1,480					166			56	52	2.74	66	66
19		3.2	3.2		1,433					162			57	52	2.72	96	60
20		3.0	2.8		1,457					159			55	52	2.86	86	66
21		3.0	2.6	0.61	1,467	1,132	17.0	0.86	3.9	168	0.39	0.30	54	52	2.90	86	70
22		3.0	3.0	0.57	1,471	1,127				183	0.41	0.32	54	52	2.88	80	62
23		3.1	2.3	0.57	1,442	1,099	16.0	0.90	3.9	170	0.38	0.29	54	52	2.76	82	80
24		3.1	4.8	0.44	1,420	1,098	16.0	0.89	4.8	157	0.38	0.29	55	52	2.80	62	38
25		3.1			1,495					150			55	52	2.78		
26		3.1	3.4		1,522					153			56	52	2.78	54	58
27		3.1	3.8	0.46	1,362	1,051	15.0	0.91	3.3	153	0.36	0.28	56	53	2.78	62	46
28		3.1	3.1	0.45	1,350	1,028	15.0	0.90	4.6	150	0.37	0.24	56	54	2.78	60	56
29																	
30																	
31																	
Total	48	84.6	98.1	8.21	39,684	20,060	311.0	14.67	87.0	4,619	7.15	5.35	1,519	1,352	79.87	1,604	1,242
Max.	48	3.2	8.5	0.71	1,540	1,132	21.0	0.91	6.1	187	0.41	0.32	57	54	2.98	96	80
Min.	48	2.9	2.3	0.33	1,300	914	15.0	0.63	3.3	150	0.36	0.24	48	40	2.72	34	20
Avg.	48	3.0	3.9	0.48	1,417	1,056	17.3	0.81	4.8	165	0.38	0.28	54	48	2.85	64	50

Robert J. Swalwell
Superintendent

MARSHALL WWTP 801 W. PEARL ST. MARSHALL MI 49068 - PERMIT No. MI0023540
FEBRUARY, 1989 - DISCHARGE MONITORING REPORT - DISCHARGE No. 001A

	D.O. mg/L	pH SU	SS mg/L	SS Lbs.	Total-P mg/L	Flow MGD	Chlorine mg/L	BOD mg/L	BOD Lbs.	NH3 as N mg/L	NH3-N Lbs.	F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %
Limit-	>4.0	6 & 9	30 & 45	751 & ^1,126	<1.0			20 & 30	500 & ^751	<11.0	7 Day ^275	200 & 400	>85%	>85%	
PN-	^00300	^00400	^00530	^00530	^00665	^50050	^50060	^80082	^80082	^00610	^00610	^31616	^81011	^91267	^81012
Day															
1	5.0	7.3	10	245	0.41	2.94		4	98				85	94	79
2	5.1	7.4	6	145	0.37	2.90		5	121				90	93	84
3	5.1	7.5	7	163	0.37	2.80		4	93				86	95	85
4	5.5	7.4	12	272	0.34	2.72		7	159				79	89	87
5	5.2	7.6	10	236	0.34	2.83		4	94				83	94	84
6	6.6	7.2	6	149	0.32	2.98		5	124				91	95	89
7	6.2	7.2	8	195	0.35	2.92		7	170				87	93	91
8	6.1	7.4	6	146	0.38	2.92		4	97				88	95	87
9	6.3	7.3	9	222	0.35	2.96		5	123				85	95	86
10	5.7	7.3	7	170	0.40	2.92		7	170				90	92	85
11	6.0	7.3	4	95	0.27	2.84		5	118				94	94	89
12	6.9	7.4	4	93	0.25	2.80		6	140				91	95	86
13	4.1	7.2	4	97	0.32	2.92		8	195				92	89	83
14	4.2	7.2	8	196	0.19	2.94		6	147				88	93	89
15	4.2	7.2	8	197	0.34	2.96		8	197				90	92	84
16	4.1	7.4	8	192	0.25	2.88		7	168				86	91	90
17	4.8	7.3	6	143	0.34	2.86		6	143				91	92	85
18	5.1	7.3	10	229	0.32	2.74		7	160				84	92	87
19	4.2	7.3	3	68	0.35	2.72		7	159				93	91	86
20	4.0	7.2	10	239	0.44	2.86		7	167				86	92	85
21	4.3	7.1	7	169	0.41	2.90		20	484				89	80	85
22	4.4	7.2	9	216	0.38	2.88		8	192				85	89	84
23	4.3	7.3	9	207	0.32	2.76		7	161				85	91	86
24	4.2	7.2	9	210	0.34	2.80		7	163				85	91	86
25	4.0	7.1	7	162	0.58	2.78		10	232				88	90	78
26	3.7	7.1	9	209	0.34	2.78		7	162				85	88	81
27	5.1	7.1	7	162	0.32	2.78		7	162				86	89	84
28	4.3	7.3	12	278	0.34	2.78		8	185				80	90	87
29															
30															
31															
Total	138.7	203.8	215	5,109	9.73	79.87		193	4,589				2,442	2,564	2,392
Max.	6.9	7.6	12	278	0.58	2.98		20	484				94	95	91
Min.	3.7	7.1	3	68	0.19	2.72		4	93				79	80	78
Avg.	5.0	7.3	8	182	0.35	2.85		7	164				87	92	85
			9	206				9	222						

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
FEBRUARY, 1989 - MISCELLANEOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	Other	Raw Sludge Gals.	Raw Sludge Total Solids Percent	Raw Sludge Vol. Solids Percent	Raw Sludge pH
1	6,500	2,760	840		298		6,000	3.7	75	6.2
2	9,400	2,760	810		397		6,000	3.9	77	6.3
3	9,400	2,880	710		397		6,000	4.2	75	6.1
4	11,300	2,760	620		298		4,000	3.6	74	6.4
5	10,400	2,880	780		298		4,000	3.7	75	6.3
6	11,500	2,760	710		298		6,000	4.4	75	6.1
7	11,000	2,760	780		397		6,000	2.3	75	6.2
8	11,600	3,000	650		298		6,000	4.2	74	6.0
9	11,900	2,880	760		397		6,000	4.2	72	6.2
10	9,700	2,760	790		397		6,000	4.1	77	6.3
11	8,500	2,760	630		199		4,000	4.2	73	6.2
12	8,600	2,640	710		298		4,000	4.0	75	6.2
13	7,100	2,760	750		397		6,000	4.2	74	6.1
14	6,400	2,760	640		397		6,000	4.3	74	6.1
15	7,800	2,760	790		397		6,000	4.5	77	6.0
16	9,600	2,760	810		199		6,000	4.7	73	6.0
17	9,700	2,880	760		397		6,000	3.0	75	6.1
18	9,200	2,760	720		298		4,000	4.4	76	6.1
19	7,700	2,640	680		298		4,000	4.7	77	6.1
20	7,100	2,760	770		298		4,000	4.4	76	6.0
21	8,400	2,760	700		397		6,000	4.3	76	5.8
22	11,300	2,880	770		397		6,000	4.9	80	5.8
23	12,100	2,880	900		298		6,000	4.5	77	5.8
24	9,700	2,760	810		298		6,000	4.6	75	5.8
25	7,300	2,640	720		298		4,000	4.5	75	5.9
26	9,800	2,760	790		298		4,000	4.3	79	5.9
27	8,300	2,760	820		298		6,000	4.5	76	5.9
28	9,200	2,640	820		397		6,000	4.3	75	5.9
29										
30										
31										
Total	260,500	77,760	21,040		9,334		150,000	116.6	2,112	169.8
Max.	12,100	3,000	900		397		6,000	4.9	80	6.4
Min.	6,400	2,640	620		199		4,000	2.3	72	5.8
Avg.	9,304	2,777	751		333		5,357	4.2	75	6.1

Manpower & Hours

	Total Hr
Superintendent 1	^152
Asst. Supt. 1	^152
Operators 3	^460
Total	^764

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
MARCH, 1989 - PLANT INFLUENT SHEET - SAMPLING CODE 500

	----Weather----		Inf. Flow	Inf. Temp	Inf. pH	Inf. BOD	Inf. BOD	Inf. SS	Inf. SS	Inf. Phos.	Inf. Phos.	Inf. VSS	Inf. NH3-N	--Remarks or Other Parameters--
	Type	Precip.	MGD	F	SU	mgIL	Lbs.	mgIL	Lbs.	mgIL	Lbs.	mgIL	mgIL	
PN-	^00033	^00045	^50050	^00011	^00400	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	
Day														
1	3		2.78	49	7.4	56	1,298	70	1,623	2.55	59	58		
2	5	0.04	2.96	49	7.4	62	1,531	72	1,777	2.75	68	62		
3	4	0.45	2.74	49	7.4	92	2,102	68	1,554	2.30	53	50		
4	4	0.04	2.72	49	7.4	70	1,588	64	1,452	2.55	58	48		
5	5	0.02	2.76	49	7.4	74	1,703	56	1,289	1.70	39	34		
6	1		2.80	49	7.5	62	1,448	64	1,495	2.55	60	50		
7	1		2.78	49	7.9	62	1,437	64	1,484	4.30	100	60		
8	1		2.78	49	7.3	54	1,252	56	1,298	2.20	51	40		
9	1		2.96	49	7.4	56	1,382	90	2,222	2.40	59	88		
10	1		2.98	49	7.5	76	1,889	48	1,193	4.70	117	30		
11	1		2.98	49	7.5	124	3,082	84	2,088	3.75	93	66		
12	1		2.89	49	7.4	80	1,928	72	1,735	2.75	66	58		
13	1		2.81	49	7.7	66	1,547	50	1,172	3.95	93	32		
14	4	0.30	2.86	49	7.5	64	1,527	62	1,479	3.30	79	48		
15	1		2.90	49	7.6	70	1,693	70	1,693	3.00	73	62		
16	1		2.84	49	7.4	60	1,421	86	2,037	2.65	63	76		
17	4	1.46	3.00	49	7.4	56	1,401	72	1,801	2.40	60	44		
18	5	0.03	3.01	49	7.5	46	1,155	56	1,406	2.30	58	32		
19	5	0.03	3.10	49	7.7	84	2,172	60	1,551	2.30	59	40		
20	5	0.15	3.20	49	7.4	66	1,761	60	1,601	2.90	77	44		
21	1		3.24	49	7.4	94	2,540	72	1,946	2.55	69	62		
22	1		3.18	49	7.4	70	1,856	48	1,273	2.20	58	36		
23	1		3.18	49	7.3	66	1,750	100	2,652	2.05	54	82		
24	1		3.02	49	7.5	54	1,360	64	1,612	1.80	45	54		
25	1		3.01	50	7.7	68	1,707	62	1,556	2.10	53	48		
26	1		2.94	50	7.4	90	2,207	116	2,844	2.45	60	70		
27	1		3.18	50	7.8	94	2,493	60	1,591	3.50	93	50		
28	4	0.54	3.02	50	7.5	84	2,116	132	3,325	3.85	97	86		
29	1		2.68	50	7.5	80	1,788	60	1,341	3.30	74	46		
30	1		3.14	50	7.6	74	1,938	76	1,990	2.90	76	60		
31	1		3.02	49	7.5	74	1,864	50	1,259	3.20	81	42		
Total	68	3.06	91.46	1,525	232.3	2,228	54,937	2,164	53,340	87.20	2,143	1,658		
Max.	5	1.46	3.24	50	7.9	124	3,082	132	3,325	4.70	117	88		
Min.	1	0.02	2.68	49	7.3	46	1,155	48	1,172	1.70	39	30		
Avg.	2	0.31	2.95	49	7.5	72	1,772	70	1,721	2.81	69	53		

Robert J. Swalwell

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
MARCH, 1989 - PRIMARY EFFLUENT SHEET

	P Eff. BOD mg/L	P Eff. BOD Lbs.	P Eff. SS mg/L	P. Eff. SS Lbs.	P Eff. Phos. mg/L	P Eff. Phos. Lbs.	P Eff. VSS mg/L	P Eff. NH3-N mg/L	Flow MGD	BOD Pri. Removal %	SS Pri. Removal %	P Pri. Removal %
PN-	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	^50050			
Day												
1	42	974	58	1,345	2.45	57	50		2.78	25	17	4
2	50	1,234	58	1,432	2.40	59	52		2.96	19	19	13
3	56	1,280	42	960	2.10	48	20		2.74	39	38	9
4	28	635	58	1,316	1.95	44	42		2.72	60	9	24
5	56	1,289	44	1,013	1.65	38	32		2.76	24	21	3
6	46	1,074	44	1,027	2.40	56	36		2.80	26	31	6
7	38	881	56	1,298	3.10	72	48		2.78	38	13	28
8	34	788	44	1,020	2.30	53	40		2.78	37	21	0
9	40	987	50	1,234	2.30	57	40		2.96	29	44	4
10	50	1,243	34	845	3.75	93	24		2.98	34	29	20
11	80	1,988	41	1,019	3.60	89	35		2.98	35	51	4
12	60	1,446	72	1,735	3.30	80	52		2.89	25	0	0
13	52	1,219	66	1,547	3.95	93	52		2.81	21	0	0
14	56	1,336	58	1,383	3.85	92	46		2.86	13	6	0
15	84	2,032	52	1,258	3.40	82	42		2.90	0	26	0
16	46	1,090	44	1,042	3.20	76	36		2.84	23	49	0
17	38	951	60	1,501	2.40	60	38		3.00	32	17	0
18									3.01			
19	30	776	40	1,034	2.10	54	28		3.10	64	33	9
20	50	1,334	44	1,174	2.55	68	36		3.20	24	27	16
21	78	2,108	54	1,459	2.65	72	46		3.24	17	25	0
22	38	1,008	38	1,008	3.00	80	32		3.18	46	21	0
23	44	1,167	44	1,167	2.05	54	34		3.18	33	56	0
24	30	756	44	1,108	1.50	38	36		3.02	44	31	17
25	32	803	34	854	1.60	40	18		3.01	53	45	24
26	26	638	30	736	1.20	29	20		2.94	71	74	51
27	72	1,910	68	1,803	3.85	102	62		3.18	23	0	0
28	78	1,965	48	1,209	2.90	73	44		3.02	7	64	25
29	78	1,743	64	1,430	3.65	82	48		2.68	3	0	0
30	58	1,519	42	1,100	3.40	89	34		3.14	22	45	0
31	64	1,612	32	806	3.30	83	26		3.02	14	36	0
Total	1,534	37,784	1,463	35,864	81.85	2,013	1,149		91.46	901	848	257
Max.	84	2,108	72	1,803	3.95	102	62		3.24	71	74	51
Min.	26	635	30	736	1.20	29	18		2.68	0	0	0
Avg.	51	1,259	49	1,195	2.73	67	38		2.95	30	28	9

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
MARCH,1989 - ACTIVTED SLUDGE SHEET

	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading flm	Mix Liq SS mgIL	Mix Liq VSS mgIL	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mgIL	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mgIl	PE SS mgIL
PN-	^80993	^81001	^80990	^80992	^70323	^70324	^81004	^81007	^00300	^81000	^81006	^70325	^81014	^80991	^50050	^00310	^00530
Day																	
1	48	3.1	3.0	0.32	1,332	1,018	14.0	0.95	3.9	154	0.35	0.28	55	55	2.78	42	58
2		2.9	2.7	0.42	1,290	979	13.0	0.99	5.6	153	0.36	0.28	52	55	2.96	50	58
3		3.1	3.9	0.52	1,245	828	12.0	1.04	5.9	150	0.35	0.26	55	40	2.74	56	42
4		3.2	3.0		1,310					148			56	40	2.72	28	58
5		3.1	3.9		1,330					155			57	40	2.76	56	44
6		3.1	3.9	0.35	1,355	1,017	12.0	1.13	5.8	154	0.37	0.28	55	43	2.80	46	44
7		3.1	3.1	0.29	1,361	1,002	12.0	1.13	5.8	157	0.37	0.27	55	43	2.78	38	56
8		3.1	4.0	0.26	1,358	1,010	12.0	1.13	6.3	155	0.38	0.27	55	43	2.78	34	44
9		2.9	3.3	0.33	1,355	1,011	13.0	1.04	6.3	154	0.36	0.27	52	43	2.96	40	50
10		2.9	4.8	0.42	1,344	980	13.0	1.03	5.1	148	0.38	0.28	52	43	2.98	50	34
11		2.9	4.3		1,479					142			52	43	2.98	80	41
12		3.0	2.8		1,632					148			53	52	2.89	60	72
13		3.1	3.0	0.35	1,526	1,168	14.0	1.09	3.1	211	0.42	0.31	55	55	2.81	52	66
14		3.0	3.4	0.38	1,561	1,187	13.0	1.20	3.7	204	0.41	0.31	54	55	2.86	56	58
15		3.0	3.5	0.60	1,489	1,130	13.0	1.15	5.7	222	0.38	0.29	53	55	2.90	84	52
16		3.0	4.1	0.34	1,437	1,080	12.0	1.20	7.3	178	0.39	0.30	54	55	2.84	46	44
17		2.9	2.8	0.31	1,387	1,014	12.0	1.16	6.6	176	0.38	0.28	51	50	3.00	38	60
18		2.9			1,380					183			51	43	3.01		
19		2.8	4.1		1,400					178			49	43	3.10	30	40
20		2.7	3.5	0.45	1,376	983	12.0	1.15	6.4	174	0.40	0.29	48	43	3.20	50	44
21		2.7	2.9	0.69	1,390	1,024	12.0	1.16	7.1	177	0.39	0.28	47	43	3.24	78	54
22		2.7	4.3	0.32	1,444	1,065	13.0	1.11	5.1	177	0.42	0.31	47	43	3.18	38	38
23		2.7	3.7	0.37	1,434	1,062	13.0	1.10	6.2	172	0.40	0.30	47	49	3.18	44	44
24		2.9	3.8		1,419					167			51	49	3.02	30	44
25		2.9	5.0		1,423					163			51	49	3.01	32	34
26		2.9	5.7		1,406					162			52	46	2.94	26	30
27		2.7	2.3	0.62	1,386	1,024	13.0	1.07	6.0	155	0.39	0.29	48	46	3.18	72	68
28		2.9	3.8	0.55	1,553	1,183	14.0	1.11	2.5	229	0.43	0.32	51	49	3.02	78	48
29		3.2	3.3	0.49	1,581	1,198	14.0	1.13	5.7	262	0.44	0.33	57	52	2.68	78	64
30		2.7	4.2	0.45	1,527	1,138	13.0	1.17	7.1	259	0.43	0.33	49	52	3.14	58	42
31		2.9	5.5	0.47	1,481	1,139	13.0	1.14	7.1	267	0.41	0.32	50	52	3.02	64	32
Total	48	90.8	111.6	9.29	43,991	23,240	282.0	24.38	124.3	5,534	8.61	6.45	1,614	1,469	91.46	1,534	1,463
Max.	48	3.2	5.7	0.69	1,632	1,198	14.0	1.20	7.3	267	0.44	0.33	57	55	3.24	84	72
Min.	48	2.7	2.3	0.26	1,245	828	12.0	0.95	2.5	142	0.35	0.26	47	40	2.68	26	30
Avg.	48	2.9	3.7	0.42	1,419	1,056	12.8	1.11	5.7	179	0.39	0.29	52	47	2.95	51	49

Robert J. Swalwell
Superintendent

MARSHALL WWTP 801 W. PEARL ST. MARSHALL MI 49068 - PERMIT No. MI0023540
MARCH,1989 - DISCHARGE MONITORING REPORT - DISCHARGE No. 001A

	D.O. mg/L	pH SU	SS mg/L	SS Lbs.	Total-P mg/L	Flow MGD	Chlorine mg/L	BOD mg/L	BOD Lbs.	NH3 as N mg/L	NH3-N Lbs.	F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %
Limit-	>4.0	6 & 9	30 & 45	751 & ^1,126	<1.0			20 & 30	500 & ^751	<11.0	7 Day ^275	200 & 400	>85%	>85%	
PN-	^00300	^00400	^00530	^00530	^00665	^50050	^50060	^80082	^80082	^00610	^00610	^31616	^81011	^91267	^81012
Day															
1	4.3	7.1	14	325	0.37	2.78		7	162				80	88	85
2	5.8	7.2	16	395	0.46	2.96		8	197				78	87	83
3	5.6	7.3	10	229	0.41	2.74		7	160				85	92	82
4	5.8	7.4	9 10	204 1646	0.27	2.72		5	113				86	93	89
5	6.0	7.5	7	161	0.32	2.76		7	161				88	91	81
6	5.6	7.2	8	187	0.35	2.80		5	117				88	92	86
7	6.4	7.2	6	139	0.53	2.78		4	93				91	94	87
8	6.3	7.1	5	116	0.98	2.78		3	70				91	94	55
9	6.1	7.2	8	197	0.34	2.96		3	74				91	95	86
10	6.0	7.2	6	149	0.87	2.98		6	149				88	92	81
11	5.7	7.5	13	323 51	0.76	2.98		22	547				85	82	80
12	5.2	7.9	16	386 1651	0.76	2.89		13	313 1672				78	84	72
13	4.2	7.2	9	211	0.71	2.81		13 19	305				82	80	82
14	4.5	7.4	6	143	0.76	2.86		5	119				90	92	77
15	6.0	7.5	10	242	0.71	2.90		5	121				86	92	76
16	6.5	7.4	6	142	0.71	2.84		5	118				93	92	73
17	6.8	7.5	6	150	0.51	3.00		5	125				92	91	79
18	7.2	7.5	7	176	0.50	3.01		5	126				88	89	78
19	7.0	7.4	6	155	0.30	3.10		4	103				90	95	87
20	6.2	7.4	8	214	0.55	3.20		6	160				87	91	81
21	6.8	7.3	8	216	0.53	3.24		9	243				89	90	79
22	5.9	7.4	7	186	0.38	3.18		7	186				85	89	82
23	5.9	7.3	6	159	0.27	3.18		4	106				94	94	87
24	6.1	7.3	5	126	0.22	3.02		5	126				92	91	89
25	6.4	7.5	8	201	0.20	3.01		8	201				87	88	90
26	5.4	7.2	5	123	0.17	2.94		4	98				96	96	94
27	5.0	7.3	3	80	0.46	3.18		8	212				95	91	87
28	3.7	7.3	5	126	0.42	3.02		8	201				96	90	89
29	4.1	7.5	9	201	0.70	2.68		8	179				85	90	79
30	4.6	7.3	7	183	0.78	3.14		6	157				91	92	73
31	7.4	7.4	5	126	0.95	3.02		9	227				90	88	70
Total	178.5	227.9	244	5,969	16.25	91.46		214	5,270				2,737	2,805	2,519
Max.	7.4	7.9	16	395	0.98	3.24		22	547				96	96	94
Min.	3.7	7.1	3	80	0.17	2.68		3	70				78	80	55
Avg.	5.8	7.4	8	193	0.52	2.95		7	170				88	90	81

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MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
MARCH, 1989 - MISCELLANEOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	Other	Raw Sludge Gals.	Raw Sludge Total Solids Percent	Raw Sludge Vol. Solids Percent	Raw Sludge pH
1	10,500	2,880	750		298		6,000	4.4	78	5.9
2	9,500	2,760	910		397		8,000	4.3	77	6.0
3	8,400	2,640	800		397		8,000	4.1	78	6.1
4	6,400	2,640	510		298		4,000	4.1	79	6.0
5	9,800	2,760	590		298		4,000	4.3	77	5.9
6	10,400	2,760	500		298		7,500	4.2	77	5.9
7	11,400	2,880	520		397		7,000	4.2	78	5.9
8	6,100	2,760	820		298		7,000	4.1	74	6.0
9	7,300	2,640	590		298		7,000	3.6	77	6.1
10	4,100	2,760	560		397		7,000	4.0	74	6.2
11	4,200	2,640	550		298		4,000	3.8	74	6.3
12	6,800	2,640	550		397		4,000	4.5	71	6.2
13	6,000	2,880	610		397		6,000	4.4	78	5.9
14	3,100	2,640	550		199		6,000	4.2	75	6.2
15	8,000	3,000	670		397		6,000	4.3	75	6.2
16	6,300	2,760	630		298		6,000	4.4	76	6.2
17	7,600	2,880	630		298		6,000	4.2	72	6.2
18	9,700	2,760	520		397		4,000	4.2	70	6.1
19	7,300	2,760	590		199		4,000	4.4	71	6.3
20	7,900	2,880	520		397		6,000	4.6	71	6.2
21	8,400	2,760	650		298		6,000	4.4	70	6.2
22	7,100	2,880	620		397		6,000	4.6	73	6.2
23	4,600	2,740	750		397		6,000	4.3	71	6.1
24	3,400	2,640	520		397		4,000	4.2	75	6.0
25	3,700	2,400	560		397		4,000	4.5	76	6.1
26	2,700	2,640	650		397		4,000	4.6	70	6.2
27	100	2,400	510		298		6,000	4.5	71	6.2
28	200	2,520	600		397		6,000	4.5	72	6.1
29	3,300	3,000	610		199		5,000	4.6	73	6.2
30	4,800	3,000	760		298		6,000	4.5	81	6.1
31	6,600	2,760	630		199		6,000	4.6	71	6.2
Total	195,700	85,060	19,230		10,327		176,500	133.6	2,305	189.4
Max.	11,400	3,000	910		397		8,000	4.6	81	6.3
Min.	100	2,400	500		199		4,000	3.6	70	5.9
Avg.	6,313	2,744	620		333		5,694	4.3	74	6.1

Manpower & Hours

	Total Hr
Superintendent 1	^176
Asst. Supt. 1	^176
Operators 3	^532
Total	^884

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
APRIL, 1989 - PLANT INFLUENT SHEET - SAMPLING CODE 500

	----Weather-----		Inf. Flow	Inf. Temp	Inf. pH	Inf. BOD	Inf. BOD	Inf. SS	Inf. SS	Inf. Phos.	Inf. Phos.	Inf. VSS	Inf. NH3-N	--Remarks or Other Parameters--
	Type	Precip.	MGD	F	SU	mgIL	Lbs.	mgIL	Lbs.	mgIL	Lbs.	mgIL	mgIL	
PN-	^00033	^00045	^50050	^00011	^00400	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	
Day														
1	1		2.78	49	7.6	56	1,298	58	1,345	2.20	51	44		
2	4	0.66	2.98	49	7.7	50	1,243	50	1,243	1.50	37	44		
3	4	0.29	3.06	50	7.6	82	2,093	52	1,327	1.70	43	28		
4	4	0.07	3.10	50	7.5	118	3,051	72	1,861	3.10	80	68		
5	1		3.08	50	7.3	72	1,849	40	1,027	3.20	82	38		
6	4	0.03	3.06	50	7.3	70	1,786	38	970	1.70	43	24		
7	3		3.18	49	7.2	68	1,803	58	1,538	1.90	50	46		
8	3		2.96	49	7.5	56	1,382	44	1,086	1.50	37	34		
9	5	0.10	3.02	48	7.5	78	1,965	44	1,108	1.60	40	38		
10	3		3.10	49	7.4	54	1,396	54	1,396	3.10	80	38		
11	3		3.14	50	8.6	70	1,833	78	2,043	3.85	101	70		
12	4	0.07	3.05	50	7.4	74	1,882	52	1,323	2.45	62	44		
13	3		3.08	50	7.4	70	1,798	60	1,541	1.90	49	52		
14	4	0.07	3.00	50	7.5	66	1,651	50	1,251	2.40	60	42		
15	1		2.90	50	7.7	66	1,596	64	1,548	6.15	149	52		
16	4	0.05	2.86	50	7.7	60	1,431	58	1,383	2.45	58	48		
17	4	0.08	3.04	50	7.5	114	2,890	78	1,978	2.75	70	68		
18	1		3.04	50	7.4	132	3,347	94	2,383	2.45	62	86		
19	1		3.02	50	7.4	52	1,310	76	1,914	2.75	69	60		
20	4	0.07	3.02	50	7.6	54	1,360	64	1,612	2.85	72	52		
21	1		2.94	51	7.4	58	1,422	50	1,226	2.40	59	38		
22	1		2.86	50	7.4	46	1,097	34	811	2.75	66	26		
23	1		2.94	51	7.3	76	1,863	52	1,275	2.30	56	44		
24	4	0.22	2.96	51	7.6	110	2,716	76	1,876	3.95	98	58		
25	4	0.04	3.08	51	7.6	78	2,004	90	2,312	3.95	101	72		
26	1		2.96	51	7.5	40	987	52	1,284	1.90	47	42		
27	1		2.92	51	7.4	72	1,753	50	1,218	1.95	47	30		
28	3		2.83	51	7.3	68	1,605	44	1,038	1.90	45	34		
29	3		2.83	51	7.8	70	1,652	48	1,133	2.20	52	42		
30	1		2.74	50	7.4	70	1,600	134	3,062	1.90	43	112		
31														
Total	81	1.75	89.53	1,501	225.5	2,150	53,666	1,814	45,113	76.70	1,912	1,474		
Max.	5	0.66	3.18	51	8.6	132	3,347	134	3,062	6.15	149	112		
Min.	1	0.03	2.74	48	7.2	40	987	34	811	1.50	37	24		
Avg.	3	0.15	2.98	50	7.5	72	1,789	60	1,504	2.56	64	49		

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
APRIL , 1989 - PRIMARY EFFLUENT SHEET

	P Eff. BOD mg/L	P Eff. BOD Lbs.	P Eff. SS mg/L	P. Eff. SS Lbs.	P Eff. Phos. mg/L	P Eff. Phos. Lbs.	P Eff. VSS mg/L	P Eff. NH3-N mg/L	Flow MGD	BOD Pri. Removal %	SS Pri. Removal %	P Pri. Removal %
PN-	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	^50050			
Day												
1	14	325	18	417	1.30	30	14		2.78	68	69	41
2	28	696	42	1,044	1.65	41	36		2.98	44	16	0
3	70	1,786	52	1,327	1.80	46	28		3.06	15	0	0
4	124	3,206	66	1,706	2.10	54	62		3.10	0	8	32
5	58	1,490	32	822	2.75	71	26		3.08	19	20	14
6	56	1,429	30	766	2.40	61	28		3.06	20	21	0
7	42	1,114	38	1,008	1.90	50	28		3.18	38	34	0
8	24	592	28	691	1.35	33	26		2.96	57	36	10
9	56	1,410	46	1,159	1.30	33	30		3.02	28	0	19
10	40	1,034	34	879	1.80	47	22		3.10	26	37	42
11	34	890	34	890	3.40	89	28		3.14	51	56	12
12	104	2,645	88	2,238	4.95	126	70		3.05	0	0	0
13	54	1,387	44	1,130	2.20	57	38		3.08	23	27	0
14	46	1,151	38	951	2.45	61	30		3.00	30	20	0
15	46	1,113	30	726	2.90	70	16		2.90	30	40	53
16	38	906	36	859	1.40	33	34		2.86	37	38	43
17	66	1,673	48	1,217	2.45	62	36		3.04	42	38	11
18	88	2,231	54	1,369	2.75	70	44		3.04	33	42	0
19	32	806	34	856	1.80	45	26		3.02	38	55	35
20	34	856	48	1,209	2.40	60	38		3.02	37	25	16
21	38	932	32	785	2.85	70	22		2.94	34	36	0
22	38	906	28	668	1.95	47	20		2.86	17	18	29
23	30	736	26	638	1.30	32	18		2.94	61	50	43
24	108	2,666	42	1,037	2.85	70	32		2.96	2	45	28
25	66	1,695	40	1,027	3.20	82	28		3.08	15	56	19
26	36	889	58	1,432	2.20	54	46		2.96	10	0	0
27	54	1,315	34	828	1.80	44	26		2.92	25	32	8
28	48	1,133	32	755	1.70	40	26		2.83	29	27	11
29	36	850	18	425	1.65	39	12		2.83	49	63	25
30	46	1,051	32	731	1.35	31	20		2.74	34	76	29
31												
Total	1,554	38,915	1,182	29,590	65.90	1,649	910		89.53	912	985	520
Max.	124	3,206	88	2,238	4.95	126	70		3.18	68	76	53
Min.	14	325	18	417	1.30	30	12		2.74	0	0	0
Avg.	52	1,297	39	986	2.20	55	30		2.98	30	33	17

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
APRIL, 1989 - ACTIVATED SLUDGE SHEET

	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading flm	Mix Liq SS mgIL	Mix Liq VSS mgIL	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mgIL	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mgIl	PE SS mgIL
PN-	^80993	^81001	^80990	^80992	^70323	^70324	^81004	^81007	^00300	^81000	^81006	^70325	^81014	^80991	^50050	^00310	^00530
Day																	
1	48	3.1	10.9		1,516					257			52	52	2.78	14	18
2		2.9	4.4		1,519					267			50	52	2.98	28	42
3		2.8	3.2	0.54	1,432	1,105	13.0	1.10	7.0	263	0.38	0.29	48	52	3.06	70	52
4		2.8	2.4	1.02	1,360	1,049	13.0	1.05	6.3	246	0.38	0.29	49	50	3.10	124	66
5		2.8	5.5	0.42	1,504	1,189	13.0	1.16	2.0	249	0.41	0.31	50	55	3.08	58	32
6		2.8	5.7	0.42	1,458	1,136	14.0	1.04	5.2	249	0.40	0.31	50	52	3.06	56	30
7		2.7	4.0	0.35	1,353	1,068	13.0	1.04	7.0	249	0.36	0.28	48	46	3.18	42	38
8		2.9	5.7		1,311					252			52	46	2.96	24	28
9		2.9	3.2		1,232					255			50	55	3.02	56	46
10		2.8	4.0	0.40	1,162	866	10.0	1.16	6.6	255	0.32	0.24	49	29	3.10	40	34
11		2.7	4.1	0.32	1,223	932	10.0	1.22	6.6	251	0.33	0.25	49	14	3.14	34	34
12		2.8	1.9	0.83	1,418	1,066	12.0	1.18	4.3	251	0.37	0.27	50	40	3.05	104	88
13		2.8	3.6	0.45	1,360	1,025	11.0	1.24	7.2	250	0.37	0.27	49	40	3.08	54	44
14		2.9	4.1	0.40	1,291	952	11.5	1.12	6.9	249	0.38	0.28	50	40	3.00	46	38
15		3.0	5.4		1,303					250			54	40	2.90	46	30
16		3.0	4.8		1,375					246			54	40	2.86	38	36
17		2.8	3.4	0.56	1,382	1,000	14.0	0.99	6.0	248	0.37	0.27	50	40	3.04	66	48
18		2.8	3.1	0.70	1,436	1,068	15.0	0.96	3.5	251	0.40	0.30	49	49	3.04	88	54
19		2.9	5.7	0.22	1,620	1,251	16.0	1.01	2.7	249	0.45	0.34	49	49	3.02	32	34
20		2.9	3.6	0.26	1,473	1,102	16.0	0.92	5.1	247	0.38	0.29	49	55	3.02	34	48
21		2.9	5.2	0.31	1,350	1,010	15.0	0.90	5.4	248	0.38	0.28	52	55	2.94	38	32
22		3.0	5.7		1,266					251			54	35	2.86	38	28
23		2.9	6.2		1,319					251			53	32	2.94	30	26
24		2.9	3.9	0.89	1,335	1,004	17.0	0.79	5.9	247	0.36	0.27	52	32	2.96	108	42
25		2.8	4.5	0.50	1,529	1,131	19.0	0.80	4.9	242	0.41	0.31	51	40	3.08	66	40
26		2.9	3.3	0.25	1,562	1,175	20.0	0.78	3.5	243	0.41	0.31	52	49	2.96	36	58
27		3.0	5.5	0.38	1,510	1,157	20.0	0.76	6.2	239	0.40	0.31	53	49	2.92	54	34
28		3.0	5.6	0.35	1,407	1,067	20.0	0.70	4.9	238	0.37	0.28	55	49	2.83	48	32
29		3.0	9.9		1,400					241			56	46	2.83	36	18
30		3.1	5.5		1,344					240			57	46	2.74	46	32
31																	
Total	48	86.7	143.6	9.56	41,750	21,353	292.5	19.92	107.2	7,474	7.63	5.75	1,536	1,329	89.53	1,554	1,182
Max.	48	3.1	10.9	1.02	1,620	1,251	20.0	1.24	7.2	267	0.45	0.34	57	55	3.18	124	88
Min.	48	2.7	1.9	0.22	1,162	866	10.0	0.70	2.0	238	0.32	0.24	48	14	2.74	14	18
Avg.	48	2.9	4.8	0.48	1,392	1,068	14.6	1.00	5.4	249	0.38	0.29	51	44	2.98	52	39

Robert J. Swalwell
Superintendent

MARSHALL WWTP 801 W. PEARL ST. MARSHALL MI 49068 - PERMIT No. MI0023540
APRIL, 1989 - DISCHARGE MONITORING REPORT - DISCHARGE No. 001A

	F.Eff. D.O. mg/L	F.Eff. pH SU	F.Eff. SS mg/L	F.Eff. SS Lbs.	F.Eff. Total-P mg/L	Flow MGD	F.Eff. Chlorine mg/L	F.Eff. BOD mg/L	F.Eff. BOD Lbs.	F.Eff. NH3 as N mg/L	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %
Limit-	>4.0	6 & 9	30 & 45	751 & ^1,126	<1.0			20 & 30	500 & ^751	<11.0	7 Day ^275	200 & 400	>85%	>85%	
PN-	^00300	^00400	^00530	^00530	^00665	^50050	^50060	^80082	^80082	^00610	^00610	^31616	^81011	^91267	^81012
Day															
1	6.1	7.5	5	116	1.00	2.78		10	232				84	82	55
2	6.0	7.5	9	224	0.46	2.98		4	99				82	92	69
3	6.2	7.5	9	230	0.37	3.06		6	153				83	93	78
4	6.4	7.3	9	233	0.61	3.10		7	181				89	94	80
5	3.6	7.3	4	103	1.00	3.08		7	180				90	90	69
6	5.5	7.3	9	230	0.62	3.06		6	153				76	91	64
7	6.6	7.3	13	345	0.55	3.18		5	133				78	93	71
8	6.3	7.6	7	173	0.61	2.96		6	148				84	89	59
9	7.1	7.8	6	151	0.47	3.02		8	201				86	90	71
10	7.2	7.5	9	233	0.66	3.10		6	155				83	89	79
11	7.3	7.6	5	131	1.00	3.14		5	131				94	93	74
12	5.3	7.4	12	305	1.00	3.05		5	127				77	93	59
13	6.6	7.5	10	257	0.62	3.08		5	128				83	93	67
14	6.6	7.4	7	175	0.53	3.00		5	125				86	92	78
15	6.9	7.4	9	218	0.62	2.90		4	97				86	94	90
16	7.1	7.4	7	167	0.53	2.86		5	119				87	92	78
17	6.3	7.4	7	177	0.58	3.04		6	152				91	95	80
18	6.3	7.4	8	203	0.56	3.04		8	203				91	94	77
19	3.2	7.3	8	201	0.42	3.02		5	126				89	90	85
20	5.6	7.3	6	151	0.56	3.02		5	126.52				91	91	80
21	5.9	7.4	5	123	0.75	2.94		5	123				90	91	68
22	5.3	7.4	6	143	0.44	2.86		5	119				82	89	84
23	6.5	7.4	4	98	0.37	2.94		6	147				92	92	84
24	6.0	7.5	6	148	0.85	2.96		9	222				92	92	78
25	4.2	7.4	6	154	0.90	3.08		7	180				93	91	77
26	5.4	7.4	5	123	0.42	2.96		5	123				90	88	78
27	5.8	7.5	8	195	0.40	2.92		5	122				84	93	79
28	5.8	7.3	9	212	0.66	2.83		7	165				80	90	65
29	6.6	7.7	2	47	0.47	2.83		5	118				96	93	79
30	6.1	7.5	5	114	0.32	2.74		6	137				96	91	83
31															
Total	179.8	223.2	215	5,380	18.35	89.53		178	4,427				2,605	2,740	2,238
Max.	7.3	7.8	13	345	1.00	3.18		10	232				96	95	90
Min.	3.2	7.3	2	47	0.32	2.74		4	97				76	82	55
Avg.	6.0	7.4	7	179	0.61	2.98		6	148				87	91	75
			9	228				6.4	152						

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
APRIL, 1989 - MISCELLOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	Other	Raw Sludge Gals.	Raw Sludge Total Solids Percent	Raw Sludge Vol. Solids Percent	Raw Sludge pH
1	4,800	2,880	570		298		4,000	4.6	75	5.9
2	3,000	3,000	600		199		4,000	4.9	70	6.2
3	4,500	2,880	610		199		6,000	4.9	70	6.3
4	400	2,760	630		199		6,000	4.5	75	6.2
5	5,300	2,760	600		298		6,000	4.5	75	6.0
6	5,300	2,880	650		199		6,000	4.5	76	6.0
7	5,900	2,880	770		199		6,000	3.9	79	6.2
8	6,500	2,880	600		199		4,000	4.0	81	6.1
9	8,400	2,880	650		298		4,000	4.0	79	6.0
10	8,200	3,120	630		298		6,000	4.4	77	6.0
11	5,800	2,760	600		199		7,000	4.3	80	6.1
12	6,300	3,000	550		199		6,000	4.4	78	6.0
13	4,800	2,760	750		298		6,000	4.1	68	6.0
14	3,600	2,760	620		298		6,000	4.0	75	6.0
15	3,600	2,760	570		199		4,000	3.9	76	6.1
16	2,600	2,640	580		298		4,000	3.9	78	6.0
17	3,700	2,760	560		199		6,000	4.0	75	6.1
18	6,600	2,760	600		199		6,000	3.0	76	6.1
19	1,100	2,760	630		298		6,000	4.0	79	6.0
20	100	2,640	590		298		7,000	4.1	78	5.8
21	100	2,640	620		199		6,500	3.9	78	6.2
22	0	2,760	490		298		4,000	3.8	75	5.9
23	0	2,640	550		298		4,000	4.0	76	5.8
24	200	2,640	590		298		6,000	4.2	76	6.0
25	0	2,520	600		199		9,000	4.2	78	6.1
26	0	2,640	730		298		9,000	3.8	76	6.0
27	0	2,640	540		298		7,000	3.8	76	6.0
28	0	2,640	690		298		9,000	3.9	71	6.0
29	0	2,520	500		298					
30	0	2,520	540		199		5,000	3.7	78	6.2
31										
Total	90,800	82,680	18,210		7,554		169,500	119.2	2,204	175.3
Max.	8,400	3,120	770		298		9,000	4.9	81	6.3
Min.	0	2,520	490		199		4,000	3.0	68	5.8
Avg.	3,027	2,756	607		252		5,845	4.1	76	6.0

Manpower & Hours

	Total Hr
Superintendent 1	^160
Asst. Supt. 1	^160
Operators 3	^480
Total 5	^800

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
MAY, 1989 - PLANT INFLUENT SHEET - SAMPLING CODE 500

	----Weather-----		Inf. Flow	Inf. Temp	Inf. pH	Inf. BOD	Inf. BOD	Inf. SS	Inf. SS	Inf. Phos.	Inf. Phos.	Inf. VSS	Inf. NH3-N	--Remarks or Other Parameters--
	Type	Precip.	MGD	F	SU	mgIL	Lbs.	mgIL	Lbs.	mgIL	Lbs.	mgIL	mgIL	
PN-	^00033	^00045	^50050	^00011	^00400	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	
Day														
1	1		2.89	51		62	1,494	118	2,844	2.10	51	96	10.8	
2	4	0.26	2.89	51	7.4	134	3,230	62	1,494	2.45	59	52	11.6	
3	1		2.90	51	7.5	100	2,419	94	2,273	2.65	64	84	8.9	
4	4	0.05	2.90	52	7.6	82	1,983	90	2,177	3.10	75	84	9.1	
5	1		2.84	52	7.6	108	2,558	76	1,800	2.30	54	60	9.4	
6	4	0.03	2.64	51	7.5	70	1,541	58	1,277	3.30	73	46	9.7	
7	1		2.70	51	7.4	68	1,531	48	1,081	1.20	27	32	7.8	
8	4	0.03	2.92	52	7.3	102	2,484	86	2,094	2.05	50	74	9.9	
9	4	0.05	2.90	52	7.6	78	1,887	70	1,693	2.20	53	52	9.2	
10	1		2.89	53	7.5	88	2,121	96	2,314	3.30	80	82	9.6	
11	1		2.87	53	7.7	102	2,441	70	1,676	2.40	57	58	9.0	
12	4	0.45	2.83	53	7.8	120	2,832	68	1,605	2.05	48	46	9.8	
13	4	0.03	2.70	53	7.6	86	1,937	66	1,486	1.65	37	52	11.0	
14	4	0.13	2.77	52	7.6	98	2,264	74	1,710	1.70	39	64	12.4	
15	4	0.04	2.91	53	7.4	86	2,087	74	1,796	2.75	67	64	9.7	
16	1		2.91	53	7.6	110	2,670	96	2,330	2.45	59	74	10.9	
17	1		2.87	54	7.7	70	1,676	66	1,580	1.70	41	44	12.3	
18	4	0.17	2.79	54	7.4	92	2,141	52	1,210	2.40	56	44	8.7	
19	4	0.43	2.85	54	7.4	84	1,997	68	1,616	2.90	69	58	10.9	
20	3		2.81	52	7.2	128	3,000	94	2,203	2.65	62	78	9.2	
21	1		2.78	52	7.8	80	1,855	70	1,623	2.55	59	60	8.7	
22	1		2.95	54	7.5	90	2,214	72	1,771	2.10	52	60	8.0	
23	1		2.91	54	7.5	82	1,990	70	1,699	2.75	67	58	7.2	
24	4	0.92	3.00	54	7.5	120	3,002	86	2,152	2.45	61	56	7.4	
25	4	0.10	2.95	54	7.4	70	1,722	54	1,329	1.95	48	44	6.8	
26	1		2.89	54	7.2	92	2,217	74	1,784	2.20	53	54	9.5	
27	1		2.67	53	7.3	48	1,069	62	1,381	1.70	38	44	7.8	
28	1		2.64	52	7.3	100	2,202	47	1,035	1.95	43	38	7.5	
29	4	0.30	2.73	52	8.0	68	1,548	70	1,594	1.95	44	52	9.6	
30	4	3.55	3.47	54	7.3	92	1,895	82	1,689	2.85	59	66	7.1	
31	4	1.23	3.81	55	7.4	54	1,716	56	1,779	2.10	67	48	4.6	
Total	81	7.77	88.58	1,635	225.0	2,764	65,723	2,269	54,094	71.85	1,712	1,824	284.1	
Max.	4	3.55	3.81	55	8.0	134	3,230	118	2,844	3.30	80	96	12.4	
Min.	1	0.03	2.47	51	7.2	48	1,069	47	1,035	1.20	27	32	4.6	
Avg.	3	0.49	2.86	53	7.5	89	2,120	73	1,745	2.32	55	59	9.2	

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
MAY, 1989 - PRIMARY EFFLUENT SHEET

	P Eff. BOD mg/L	P Eff. BOD Lbs.	P Eff. SS mg/L	P. Eff. SS Lbs.	P Eff. Phos. mg/L	P Eff. Phos. Lbs.	P Eff. VSS mg/L	P Eff. NH3-N mg/L	Flow MGD	BOD Pri. Removal %	SS Pri. Removal %	P Pri. Removal %
PN-	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	^50050			
Day												
1	62	1,494	40	964	1.35	33	28	9.1	2.89	0	66	36
2	52	1,253	52	1,253	2.45	59	44	12.5	2.89	61	16	0
3	54	1,306	60	1,451	2.65	64	52	10.1	2.90	46	36	0
4	54	1,306	50	1,209	2.40	58	42	8.1	2.90	34	44	19
5	78	1,847	54	1,279	2.05	49	44	9.2	2.84	28	29	11
6	64	1,409	46	1,013	2.45	54	30	9.4	2.64	9	21	26
7	48	1,081	38	856	1.40	32	24	8.4	2.70	29	26	0
8	90	2,192	54	1,315	2.20	54	44	9.9	2.92	12	37	0
9	70	1,693	56	1,354	2.10	51	40	9.8	2.90	10	20	5
10	66	1,591	44	1,061	2.55	61	34	9.6	2.89	25	54	0
11	96	2,298	48	1,149	2.55	61	40	10.0	2.87	6	31	0
12	86	2,030	50	1,180	2.10	50	36	9.7	2.83	28	26	0
13	54	1,216	48	1,081	1.90	43	40	11.4	2.70	37	27	0
14	74	1,710	54	1,247	1.70	39	48	11.3	2.77	24	41	0
15	66	1,602	48	1,165	2.10	51	38	10.3	2.91	23	35	24
16	92	2,233	62	1,505	2.30	56	52	11.8	2.91	16	35	6
17	84	2,011	42	1,005	1.65	39	28	11.7	2.87	0	36	3
18	90	2,094	38	884	1.95	45	30	10.2	2.79	2	27	19
19	52	1,236	60	1,426	2.75	65	48	12.4	2.85	38	12	5
20	72	1,687	58	1,359	2.75	64	54	12.3	2.81	44	38	0
21	62	1,437	50	1,159	2.75	64	38	9.0	2.78	22	29	0
22	66	1,624	54	1,329	3.50	86	50	8.3	2.95	27	25	0
23	60	1,456	42	1,019	2.65	64	36	7.7	2.91	27	40	4
24	96	2,402	58	1,451	2.45	61	42	9.2	3.00	20	33	0
25	66	1,624	48	1,181	2.30	57	40	7.4	2.95	6	11	0
26	66	1,591	80	1,928	2.45	59	60	9.0	2.89	29	0	0
27	62	1,381	66	1,470	2.40	53	46	8.1	2.67	0	0	0
28	52	1,145	42	925	2.45	54	34	8.2	2.64	48	11	0
29	44	1,002	56	1,275	2.30	52	46	9.9	2.73	35	20	0
30	58	1,195	64	1,318	2.45	50	52	7.5	2.47	37	22	14
31	34	1,080	42	1,335	1.95	62	32	5.6	3.81	37	25	7
Total	2,070	49,225	1,604	38,147	71.00	1,691	1,272	297.1	88.58	760	873	179
Max.	96	2,402	80	1,928	3.50	86	60	12.5	3.81	61	66	36
Min.	34	1,002	38	856	1.35	32	24	5.6	2.47	0	0	0
Avg.	67	1,588	52	1,231	2.29	55	41	9.6	2.86	25	28	6

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
MAY, 1989 - ACTIVATED SLUDGE SHEET

	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading f/m	Mix Liq SS mg/L	Mix Liq VSS mg/L	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mg/L	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mg/l	PE SS mg/L
PN-	^80993	^81001	^80990	^80992	^70323	^70324	^81004	^81007	^00300	^81000	^81006	^70325	^81014	^80991	^50050	^00310	^00530
Day																	
1	48	3.0	4.0	0.51	1,294	979	20.0	0.65	4.9	202	0.33	0.25	54	37	2.89	62	40
2		3.0	3.3	0.39	1,393	1,071	20.0	0.70	6.2	207	0.36	0.27	54	37	2.89	52	52
3		3.0	3.0	0.41	1,444	1,073	21.0	0.69	6.3	202	0.35	0.26	54	40	2.90	54	60
4		3.0	3.8	0.38	1,539	1,157	24.0	0.64	4.6	196	0.36	0.27	54	46	2.90	54	50
5		3.0	3.6	0.52	1,527	1,187	25.0	0.61	5.1	198	0.37	0.28	56	57	2.84	78	54
6		3.3	4.7		1,579					208			55	63	2.64	64	46
7		3.2	5.3		1,504					206			58	63	2.70	48	38
8		3.0	3.1	0.71	1,356	1,037	21.0	0.65	5.8	206	0.33	0.25	53	63	2.92	90	54
9		3.0	3.0	0.54	1,352	1,048	21.0	0.64	4.9	219	0.32	0.25	53	55	2.90	70	56
10		3.0	3.9	0.51	1,370	1,052	22.0	0.62	6.5	226	0.34	0.27	53	55	2.89	66	44
11		3.0	3.4	0.76	1,291	1,005	19.0	0.68	6.1	226	0.32	0.25	53	55	2.87	96	48
12		3.0	3.3	0.61	1,319	1,106	19.0	0.69	6.1	215	0.35	0.27	54	55	2.83	86	50
13		3.2	3.7		1,342					215			57	55	2.70	54	48
14		3.1	3.4		1,398					213			56	49	2.77	74	54
15		3.0	3.4	0.52	1,335	1,032	18.0	0.74	6.0	212	0.34	0.27	53	49	2.91	66	48
16		3.0	2.8	0.68	1,404	1,100	18.0	0.78	3.9	209	0.36	0.28	53	49	2.91	92	62
17		3.0	4.3	0.61	1,444	1,094	20.0	0.72	3.7	207	0.37	0.27	53	52	2.87	84	42
18		3.1	4.7	0.66	1,392	1,064	21.0	0.66	2.7	205	0.35	0.27	57	52	2.79	90	38
19		3.0	3.0	0.40	1,430	1,029	20.0	0.72	5.9	204	0.37	0.27	55	52	2.85	52	60
20		3.1	3.2		1,455					208			57	52	2.81	72	58
21		3.1	3.8		1,474					208			56	55	2.78	62	50
22		2.9	3.1	0.51	1,385	1,059	19.0	0.73	6.1	204	0.36	0.27	50	55	2.95	66	54
23		3.0	4.3	0.43	1,459	1,133	19.0	0.77	4.5	204	0.37	0.29	53	55	2.91	60	42
24		2.9	2.9	0.70	1,429	1,147	20.0	0.71	3.1	201	0.37	0.29	51	55	3.00	96	58
25		2.9	3.6	0.48	1,413	1,123	20.0	0.71	3.9	199	0.37	0.30	51	55	2.95	66	48
26		3.0	2.2	0.47	1,418	1,132	19.0	0.75	4.0	208	0.38	0.31	54	50	2.89	66	80
27		3.2	2.8		1,395					215			57	49	2.67	62	66
28		3.3	4.4		1,355					213			57	43	2.64	52	42
29		3.2	3.0		1,294					207			57	39	2.73	44	56
30		3.5	3.0	0.38	1,311	1,063	15.0	0.87	5.3	197	0.36	0.29	44	40	2.47	58	64
31		2.3	3.3	0.31	1,463	1,155	16.0	0.91	3.5	195	0.46	0.37	39	40	3.81	34	42
Total	48	93.9	109.3	11.48	43,564	23,846	437.0	15.64	109.1	6,435	7.89	6.10	1,661	1,572	88.58	2,070	1,604
Max.	48	3.5	5.3	0.76	1,579	1,187	25.0	0.91	6.5	226	0.46	0.37	58	63	3.81	96	80
Min.	48	2.3	2.2	0.31	1,291	979	15.0	0.61	2.7	195	0.32	0.25	39	37	2.47	34	38
Avg.	48	3.0	3.5	0.52	1,405	1,084	19.9	0.71	5.0	208	0.36	0.28	54	51	2.86	67	52

Robert J. Swalwell
Superintendent

MARSHALL WWTP 801 W. PEARL ST. MARSHALL MI 49068 - PERMIT No. MI0023540
MAY, 1089 - DISCHARGE MONITORING REPORT - DISCHARGE No. 001A

	F.Eff. D.O. mgIL	F.Eff. pH SU	F.Eff. SS mgIL	F.Eff. SS Lbs.	F.Eff. Total-P mgIL	Flow MGD	F.Eff. Chlorine Max. mg/L	F.Eff. BOD mgIL	F.Eff. BOD Lbs.	F.Eff. NH3 as N mgIL	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %
Limit-	>4.0	6 & 9	30 & 45	751 & ^1,126	<1.0			20 & 30	500 & ^751	<11.0	7 Day ^275	200 & 400	>85%	>85%	
PN-	^00300	^00400	^00530	^00530	^00665	^50050	^50060	^80082	^80082	^00610	^00610	^31616	^81011	^91267	^81012
Day			X	X				X	X		X				
1	7.6	7.4	9	217	0.27	2.89	0.40	5	121	7.9	190	400	92	92	87
2	7.4	7.3	8	193	0.37	2.89	0.43	4	96	8.6	207	96	87	97	85
3	7.3	7.3	8	193	0.44	2.90	0.40	6	145	7.8	189	108	91	94	83
4	6.9	7.3	5	121	0.37	2.90	0.46	3	73	7.7	186	102	94	96	88
5	6.7	7.5	4	95	0.55	2.84	0.42	3	71	9.0	213	30	95	97	76
6	6.0	7.2	10	220	0.48	2.64	0.44	4	88	7.6	167	8	83	94	85
7	6.1	7.3	2	45	0.34	2.70	0.37	4	90	7.4	167	16	96	94	72
8	7.8	7.5	6	146	0.30	2.92	0.33	5	122	7.7	188	40	93	92	85
9	7.2	7.3	8	193	0.34	2.90	0.45	4	97	9.2	223	18	89	95	85
10	7.8	7.6	2	48	0.41	2.89	0.31	4	96	8.6	207	24	98	95	88
11	7.8	7.6	6	144	0.53	2.87	0.44	5	120	10.0	239	30	91	95	79
12	7.6	7.6	6	142	0.38	2.83	0.35	6	142	8.7	205	40	92	95	81
13	7.7	7.6	4	90	0.35	2.70	0.35	4	90	9.8	221	34	94	95	79
14	7.8	7.1	5	116	0.29	2.77	0.33	5	116	10.0	231 232	12	93	95	83
15	7.6	7.5	10	243	0.32	2.91	0.27	5	121	9.5	231	274	86	94	88
16	7.1	7.4	12	291	0.48	2.91	0.31	6	146 125	9.8	238	108	88	95	80
17	6.9	7.4	3	72	0.22	2.87	0.25	5	120	10.8	259	278	95	93	87
18	7.1	7.2	3	70	0.34	2.79	0.29	4	93	7.7	179	62	94	96	86
19	7.7	7.3	5	119	0.50	2.85	0.41	4	95	10.8	257	28	93	95	83
20	7.0	7.6	9	211	0.66	2.81	0.34	8	187	10.8	253	6	90	94	75
21	4.9	7.5	2	46	0.44	2.78	0.49	3	70	7.2	167	14	97	96	83
22	6.8	7.5	6	148	0.32	2.95	0.40	5	123	6.1	150	232	92	94	85
23	6.7	7.4	4	97	0.56	2.91	0.38	4	97	5.8	141	104	94	95	80
24	6.2	7.4	5	125	0.75	3.00	0.20	4	100	6.6	165	144	94	97	69
25	6.2	7.3	3	74	0.82	2.95	0.20	4	98	5.1	125	206	94	94	58
26	6.8	7.2	14	337	0.82	2.89	0.16	6	145	6.7	161	204	81	93	63
27	6.9	7.4	9 33	200 119	0.75	2.67	0.35	5	111	6.1	136	48 121	85	90	56
28	6.7	7.8	7 8	154	0.70	2.64	0.40	5	110 118	7.0	154	30	87	95	64
29	6.9	7.3	7	159	0.53	2.73	0.41	4	91	8.9	203	46	90	94	73
30	7.0	7.3	9	185	0.82	2.47	0.28	7	144	7.4	152	400	89	92	71
31	5.9	7.3	4	127	0.32	3.81	0.18	4	127	4.3	137	346	93	93	85
Total	216.1	229.4	195	4,622	14.77	88.58	10.80	145	3,444	250.6	5,941	3,488	2,830	2,926	2,442
Max.	7.8	7.8	14	337	0.82	3.81	0.49	8	187	10.8	259	400	98	97	88
Min.	4.9	7.1	2	45	0.22	2.47	0.16	3	70	4.3	125	6	81	90	56
Avg.	7.0	7.4	6	149	0.48	2.86	0.35	5	111	8.1	192	61	91	94	79
			8	177				5	125		232	121			

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
MAY, 1989 - MISCELLOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	Other	Raw Sludge Gals.	Raw Sludge Total Solids Percent	Raw Sludge Vol. Solids Percent	Raw Sludge pH
1		2,640	650	15	199		8,000	3.9	74	6.0
2		2,760	580	15	397		7,000	4.6	73	6.0
3		2,400	600	15	199		7,000	4.7	72	6.1
4		2,520	740	15	199		7,000	4.4	76	5.8
5		2,400	580	15	298		7,000	5.0	72	6.2
6		2,520	500	15	199		4,000	4.2	74	6.0
7		2,520	640	15	298		4,000	4.6	74	6.0
8		2,640	500	15	199		6,000	4.8	72	6.0
9		2,640	530	15	298		5,000	4.1	72	5.9
10		2,640	500	15	298		6,000	4.5	67	6.0
11		2,640	650	15	199		7,000	4.3	74	6.0
12		2,640	730	15	99		6,000	4.0	72	5.9
13		2,520	510	15	397		4,000	4.3	74	6.0
14		2,520	590	15	298		4,000	4.6	78	6.0
15		2,400	620	15	199		7,000	4.1	76	6.1
16		2,640	640	15	199		6,000	4.3	74	5.9
17		2,520	520	15	199		6,000	4.5	74	6.0
18		2,520	630	15	298		6,000	4.3	76	5.8
19		2,640	670	15	298		7,000	5.0	73	5.9
20		2,520	460	15	199		6,000	5.4	82	6.0
21		2,520	640	15	199		6,000	4.0	74	6.0
22		2,520	670	15	199		9,000	4.0	74	6.1
23		2,640	550	15	99		7,000	3.8	77	5.9
24		2,640	770	15	199		7,000	4.2	75	5.9
25		2,520	490	15	0		3,000	4.2	76	5.9
26		2,520	590	15	199		3,000	4.4	73	5.7
27		2,520	490	15	0		2,000	4.4	77	5.9
28		2,520	490	15	0		2,000	4.3	74	5.7
29		2,520	660	15	0		2,000	3.8	78	6.2
30		2,640	470	15	298		11,000	3.9	80	5.9
31		2,760	650	15	298		13,000	5.3	69	5.6
Total		79,560	18,310	465	6,460		185,000	135.9	2,306	184.4
Max.		2,760	770	15	397		13,000	5.4	82	6.2
Min.		2,400	460	15	0		2,000	3.8	67	5.6
Avg.		2,566	591	15	208		5,968	4.4	74	5.9

Manpower & Hours

	Total Hr
Superintendent 1	^176
Asst. Supt. 1	^176
Operators 3	^532
Total 5	^884

Robert J. Swalwell

MARSHALL, MICHIGAN WASTRWATER TREATMENT PLANT
JUNE, 1989 - PLANT INFLUENT SHEET - SAMPLING CODE 500

	----Weather-----		Inf. Flow	Inf. Temp	Inf. pH	Inf. BOD	Inf. BOD	Inf. SS	Inf. SS	Inf. Phos.	Inf. Phos.	Inf. VSS	Inf. NH3-N	--Remarks or Other Parameters--
	Type	Precip.	MGD	F	SU	mgIL	Lbs.	mgIL	Lbs.	mgIL	Lbs.	mgIL	mgIL	
PN-	^00033	^00045	^50050	^00011	^00400	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	
Day														
1	4	0.15	3.80	55	7.5	68	2,155	34	1,078	1.70	54	26	4.4	
2	1		3.75	54	7.1	50	1,564	46	1,439	1.70	53	18	5.0	
3	4	0.30	3.71	54	7.2	44	1,361	22	681	1.60	50	18	4.2	
4	1		3.73	54	7.4	62	1,929	46	1,431	1.40	44	36	5.0	
5	1		3.69	56	7.3	48	1,477	62	1,908	2.10	65	52	4.0	
6	1		3.70	55	7.3	46	1,419	54	1,666	3.80	117	50	5.5	
7	1		3.51	55	7.4	70	2,049	54	1,581	2.80	82	46	6.9	
8	1		3.43	55	7.5	46	1,316	64	1,831	2.10	60	56	7.9	
9	3		3.40	55	7.5	62	1,758	32	907	2.50	71	20	6.7	
10	1		3.26	53	7.4	70	1,903	46	1,251	2.40	65	36	6.7	
11	1		3.23	53	7.4	62	1,670	72	1,940	2.50	67	64	9.5	
12	4	0.46	3.38	55	7.4	60	1,691	74	2,086	4.95	140	58	6.6	
13	4	0.11	3.45	55	7.4	98	2,820	62	1,784	4.00	115	52	8.0	
14	4	0.47	3.27	55	7.5	64	1,745	68	1,854	2.90	79	60	10.6	
15	4	0.02	3.27	55	7.4	50	1,364	64	1,745	2.60	71	54	9.0	
16	1		3.24	55	7.4	60	1,621	56	1,513	2.70	73	36	6.2	
17	4	0.07	3.06	55	7.5	66	1,684	78	1,991	2.90	74	68	8.4	
18	1		3.08	55	7.4	56	1,438	58	1,490	2.05	53	38	6.8	
19	4	0.40	3.18	55	7.5	92	2,440	46	1,220	1.70	45	36	8.1	
20	1		3.18	55	7.3	54	1,432	50	1,326	1.80	48	38	5.5	
21	4	0.02	3.19	55	7.4	46	1,224	58	1,543	2.30	61	50	6.1	
22	4	0.04	3.16	55	7.3	50	1,318	46	1,212	1.90	50	40	6.4	
23	1		3.12	56	7.4	62	1,613	48	1,249	1.65	43	44	6.5	
24	1		3.00	54	7.4	62	1,551	68	1,701	1.50	38	44	5.2	
25	1		3.04	54	7.5	66	1,673	74	1,876	1.50	38	64	6.6	
26	4	0.93	3.23	55	7.3	64	1,724	70	1,886	3.40	92	62	7.4	
27	4	0.09	3.21	55	7.4	52	1,392	56	1,499	2.20	59	52	9.4	
28	1		3.16	57	7.4	48	1,265	68	1,792	1.40	37	60	8.1	
29	1		3.09	57	7.4	52	1,340	46	1,185	1.15	30	40	8.0	
30	1		3.06	57	7.4	48	1,225	44	1,123	1.35	34	40	7.0	
31														
Total	68	3.06	99.58	1,649	221.7	1,778	49,164	1,666	45,788	68.55	1,906	1,358	205.7	
Max.	4	0.93	3.80	57	7.5	98	2,820	78	2,086	4.95	140	68	10.6	
Min.	1	0.02	3.00	53	7.1	44	1,224	22	681	1.15	30	18	4.0	
Avg.	2	0.26	3.32	55	7.4	59	1,639	56	1,526	2.29	64	45	6.9	

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
JUNE, 1989 - PRIMARY EFFLUENT SHEET

	P Eff. BOD mg/L	P Eff. BOD Lbs.	P Eff. SS mg/L	P. Eff. SS Lbs.	P Eff. Phos. mg/L	P Eff. Phos. Lbs.	P Eff. VSS mg/L	P Eff. NH3-N mg/L	Flow MGD	BOD Pri. Removal %	SS Pri. Removal %	P Pri. Removal %
PN-	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	^50050			
Day												
1	36	1,141	32	1,014	1.90	60	30	1.9	3.80	47	6	0
2	40	1,251	24	751	1.70	53	10	1.7	3.75	20	49	0
3	20	619	18	557	1.30	40	14	1.3	3.71	54	18	19
4	36	1,120	54	1,680	1.60	50	52	1.6	3.73	42	0	0
5	32	985	32	985	1.70	52	24	1.7	3.69	33	48	19
6	28	864	28	864	2.90	89	26	2.9	3.70	39	30	24
7	34	995	50	1,464	2.55	75	46	2.6	3.51	51	7	9
8	34	973	40	1,144	2.10	60	36	2.1	3.43	26	38	0
9	32	907	32	907	2.40	68	24	2.4	3.40	48	0	4
10	38	1,033	22	598	2.20	60	14	2.2	3.26	46	52	8
11	26	700	36	970	1.95	53	30	2.0	3.23	58	50	22
12	44	1,240	54	1,522	2.20	62	44	2.2	3.38	27	27	56
13	28	806	30	863	2.65	76	24	2.7	3.45	71	52	34
14	48	1,309	46	1,255	2.75	75	38	2.8	3.27	25	32	5
15	32	873	34	927	2.30	63	28	2.3	3.27	36	47	12
16	36	973	30	811	2.10	57	26	2.1	3.24	40	46	22
17	40	1,021	40	1,021	2.90	74	32	2.9	3.06	39	49	0
18	36	925	32	822	2.10	54	22	2.1	3.08	36	45	0
19	34	902	36	955	2.05	54	28	2.1	3.18	63	22	0
20	60	1,591	26	690	2.10	56	16	2.1	3.18	0	48	0
21	32	851	42	1,117	2.05	55	32	2.1	3.19	22	28	11
22	28	738	26	685	1.95	51	22	2.0	3.16	44	43	0
23	40	1,041	24	624	1.40	36	18	1.4	3.12	35	50	15
24	34	851	50	1,251	1.15	29	38	1.2	3.00	45	26	23
25	34	862	20	507	1.30	33	16	1.3	3.04	48	73	13
26	50	1,347	56	1,509	2.30	62	46	2.3	3.23	22	20	32
27	38	1,017	42	1,124	1.70	46	38	1.7	3.21	26	25	23
28	30	791	28	738	1.50	40	20	1.5	3.16	37	59	0
29	46	1,185	32	825	1.00	26	28	1.0	3.09	12	30	13
30	30	766	26	664	1.20	31	22	1.2	3.06	38	41	11
31												
Total	1,076	29,676	1,042	28,843	59.00	1,639	844	59.0	99.58	1,130	1,061	375
Max.	60	1,591	56	1,680	2.90	89	52	2.9	3.80	71	73	56
Min.	20	619	18	507	1.00	26	10	1.0	3.00	0	0	0
Avg.	36	989	35	961	1.97	55	28	2.0	3.32	38	35	13

Robert J. Swalwell
Superintendent

R 141

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
JUNE, 1989 - ACTIVATED SLUDGE SHEET

	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading f/m	Mix Liq SS mg/L	Mix Liq VSS mg/L	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mg/L	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mg/l	PE SS mg/L
PN-	^80993	^81001	^80990	^80992	^70323	^70324	^81004	^81007	^00300	^81000	^81006	^70325	^81014	^80991	^50050	^00310	^00530
Day																	
1	48	2.3	4.3	0.31	1,455	1,233	16.0	0.91	4.8	196	0.51	0.39	40	49	3.80	36	32
2		2.3	5.5	0.40	1,391	1,043	16.0	0.87	5.7	197	0.49	0.38	40	49	3.75	40	24
3		2.3	7.3		1,363					200			41	49	3.71	20	18
4		2.3	2.6		1,459					201			41	43	3.73	36	54
5		2.3	3.8	0.35	1,235	934	14.0	0.88	6.2	200	0.40	0.30	41	46	3.69	32	32
6		2.3	4.2	0.29	1,206	1,005	13.5	0.89	5.0	198	0.39	0.29	42	43	3.70	28	28
7		2.5	2.6	0.35	1,286	959	13.5	0.95	5.6	193	0.40	0.30	43	43	3.51	34	50
8		2.5	3.4	0.34	1,307	966	14.0	0.93	5.7	196	0.42	0.30	46	43	3.43	34	40
9		2.5	4.2	0.33	1,281	928	14.0	0.92	6.4	200	0.37	0.27	44	32	3.40	32	32
10		2.6	6.8		1,366					181			47	32	3.26	38	22
11		2.7	4.2		1,357					205			46	35	3.23	26	36
12		2.5	2.6	0.42	1,334	986	14.0	0.95	6.1	203	0.40	0.29	45	35	3.38	44	54
13		2.5	4.8	0.32	1,395	841	15.0	0.93	4.0	201	0.41	0.35	43	35	3.45	28	30
14		2.6	3.2	0.44	1,356	1,002	15.0	0.90	4.8	203	0.38	0.28	46	40	3.27	48	46
15		2.6	4.4	0.29	1,364	994	14.0	0.97	5.4	205	0.42	0.30	46	40	3.27	32	34
16		2.7	4.9	0.34	1,331	968	14.0	0.95	5.7	208	0.39	0.28	47	23	3.24	36	30
17		2.8	4.2		1,420					204			50	50	3.06	40	40
18		2.8	5.1		1,389					203			49	40	3.08	36	32
19		2.7	4.3	0.31	1,366	984	13.5	1.01	6.6	203	0.36	0.27	48	40	3.18	34	36
20		2.7	5.8	0.55	1,339	965	13.5	0.99	5.3	202	0.37	0.26	48	29	3.18	60	26
21		2.7	3.9	0.30	1,437	943	13.5	1.06	5.2	200	0.38	0.27	48	43	3.19	32	42
22		2.7	5.7	0.26	1,305	937	13.5	0.97	5.0	198	0.35	0.25	50	40	3.16	28	26
23		2.8	6.3	0.37	1,310	928	14.0	0.94	5.0	196	0.35	0.25	49	40	3.12	40	24
24		2.9	3.2		1,344					198			50	40	3.00	34	50
25		2.8	7.8		1,317					198			50	40	3.04	34	20
26		2.7	2.6	0.49	1,289	916	14.0	0.92	5.0	195	0.36	0.25	48	36	3.23	50	56
27		2.7	3.8	0.34	1,409	995	15.5	0.91	4.4	199	0.38	0.28	48	43	3.21	38	42
28		2.7	5.5	0.25	1,351	1,042	15.5	0.87	5.9	204	0.41	0.29	49	43	3.16	30	28
29		2.8	5.1	0.40	1,392	982	16.0	0.87	5.7	207	0.37	0.26	51	43	3.09	46	32
30		2.8	6.3	0.26	1,388	989	16.0	0.87	6.2	204	0.39	0.27	50	43	3.06	30	26
31																	
Total	48	78.3	138.3	7.71	40,542	21,540	318.0	20.48	119.7	5,998	8.70	6.38	1,386	1,207	99.58	1,076	1,042
Max.	48	2.9	7.8	0.55	1,459	1,233	16.0	1.06	6.6	208	0.51	0.39	51	50	3.80	60	56
Min.	48	2.3	2.6	0.25	1,206	841	13.5	0.87	4.0	181	0.35	0.25	40	23	3.00	20	18
Avg.	48	2.6	4.6	0.35	1,351	979	14.5	0.93	5.4	200	0.40	0.29	46	40	3.32	36	35

Robert J. Swalwell
Superintendent

MARSHALL WWTP 801 W. PEARL ST. MARSHALL MI 49068 - PERMIT No. MI0023540
JUNE, 1989 - DISCHARGE MONITORING REPORT - DISCHARGE No. 001A

	F.Eff. D.O. mg/L	F.Eff. pH SU	F.Eff. SS mg/L	F.Eff. SS Lbs.	F.Eff. Total-P mg/L	Flow MGD	F.Eff. Chlorine mg/L	F.Eff. BOD mg/L	F.Eff. BOD Lbs.	F.Eff. NH3 as N mg/L	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %
Limit-	>4.0	6 & 9	30 & 45	751 & ^1,126	<1.0			20 & 30	500 & ^751	<11.0	7 Day ^275	200 & 400	>85%	>85%	
PN-	^00300	^00400	^00530	^00530	^00665	^50050	^50060	^80082	^80082	^00610	^00610	^31616	^81011	^91267	^81012
Day															
1	4.9	7.4	2	63	0.48	3.80	0.30	5	158	4.1	130	600	94	93	72
2	7.0	7.3	4	125	0.40	3.75	0.27	3	94	4.7	147	600	91	94	76
3	6.1	7.1	1	31	0.32	3.71	0.26	3	93	4.1	127	122	95	93	80
4	6.3	7.3	4	124	0.34	3.73	0.13	4	124	4.3	134	506	91	94	76
5	7.0	7.4	7	215	0.40	3.69	0.17	3	92	4.8	148	600	89	94	81
6	6.6	7.4	5	154	0.68	3.70	0.14	3	93 113	5.3	164	600 484	91	93	82
7	6.3	7.4	8	234	0.85	3.51	0.10	5 4	146	5.3	155	600	85	93	70
8	6.8	7.5	4	114	0.80	3.43	0.04	4	114	6.5	186	572	94	91	62
9	7.0	7.5	3	85	0.80	3.40	0.44	4	113	5.5	156	600	91	94	68
10	7.1	7.5	3	82	0.76	3.26	0.26	4	109	6.2	169	166	93	94	68
11	7.0	7.4	7	189	0.53	3.23	0.26	3	81	7.8	210	180	90	95	79
12	7.1	7.4	10	282	0.55	3.38	0.49 .25	3	85	6.2	175	600	86	95	89
13	6.9	7.4	6	173 176	0.70	3.45 3.41	0.25	4	115	6.0	173 180	600	90	96	83
14	7.2	7.4	8	218	0.90	3.27	0.25	3	82	6.8	185	496 426	88	95	69
15	7.4	7.5	4	109	0.56	3.27	0.27	3	82	6.9	188	600	94	94	78
16	7.4	7.4	4	108	0.81	3.24	0.29	3	81	5.9	159	220	93	95	70
17	7.3	7.4	6	153	0.95	3.06	0.30	4	102	6.5	166	460	92	94	76
18	7.4	7.3	3	77	0.28	3.08	0.23	3	77	6.4	164	144	95	95	86
19	6.8	7.4	2	53	0.34	3.18	0.25	5	133	9.0	239	600	96	95	80
20	6.8	7.4	3	80	0.27	3.18	0.26	3	80	5.3	141	600	94	94	85
21	6.8	7.4	8	213	0.40	3.19	0.31	3	80	5.6	149	600	86	93	83
22	6.8	7.4	1	26	0.32	3.16	0.37	3	79	5.9	155	220	98	94	83
23	6.8	7.3	2	52	0.22	3.12	0.49	3	78	5.5	143	112	96	95	87
24	7.0	7.3	4	100	0.32	3.00	0.46	3	75	4.8	120	78	94	95	79
25	6.9	7.5	2	51	0.17	3.04 3.12	0.47 .42	4	101	4.9	124	114	97	94	89
26	6.9	7.4	12	323	0.27	3.23	0.43	3	81	6.4	172	96 129	83	96	92
27	6.0	7.3	2	54	0.25	3.21	0.34	3	80	6.8	182	132	96	94	89
28	6.6	7.4	3	79	0.19	3.16	0.31	3	79	6.6	174	176	96	94	86
29	7.1	7.4	2	52	0.12	3.09	0.48	3	77	10.0	258	196	96	94	90
30	7.3	7.4	4	102	0.16	3.06	0.41	3	77	5.9	151	100	91	94	88
31															
Total	204.6	221.6	134	3,722	14.14	99.58	9.03	103	2,861	180.0	4,943	11,290	2,765	2,824	2,396
Max.	7.4	7.5	12	323	0.95	3.80	0.49	5	158	10.0	258	600	98	96	92
Min.	4.9	7.1	1	26	0.12	3.00	0.04	3	75	4.1	120	78	83	91	62
Avg.	6.8	7.4	4	124	0.47	3.32	0.30	3	95	6.0	165	297	92	94	80
			6	176				4	113		180				

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
JUNE, 1989 - MISCELLOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	Other	Raw Sludge Gals.	Raw Sludge Total Solids Percent	Raw Sludge Vol. Solids Percent	Raw Sludge pH
1		2,760	900	17	397		13,000	4.7	69	5.6
2		2,760	980	17	298		12,000	4.2	74	5.9
3		2,520	570	17	298		4,000	3.9	71	6.1
4		2,880	790	17	397		4,000	4.3	68	6.8
5		2,640	810	17	199		8,000	4.5	71	6.1
6		2,640	970	17	298		8,000	4.1	70	6.0
7		2,640	860	17	298		8,000	4.0	71	6.1
8		2,640	780	17	298		6,000	4.6	74	6.3
9		2,640	1,230	17	298		10,000	4.2	70	6.1
10		2,640	730	17	298		4,000	4.0	72	6.0
11		2,520	810	17	298		3,000	4.1	71	6.3
12		2,640	760	17	298		3,000	4.6	69	6.0
13		2,520	810	17	298		5,000	4.3	75	6.0
14		2,640	790	17	298		5,000	4.2	70	5.9
15		2,640	880	17	397		6,000	4.3	70	6.1
16		2,520	780	22	298		6,000	4.2	72	6.0
17		2,640	700	10	298		3,000	4.3	74	6.0
18		2,520	780	15	298		4,000	4.8	68	6.0
19		2,640	740	15	298		6,000	4.3	73	5.9
20		2,640	700	12	397		6,000	4.3	73	5.9
21		2,640	710	11	397		7,000	4.1	74	5.9
22		2,520	480	17	298		7,000	4.2	71	5.9
23		2,640	660	20	397		6,000	4.3	72	5.9
24		2,640	520	19	298		4,000	4.2	73	6.1
25		2,520	550	19	298		4,000	4.1	73	6.1
26		2,640	510	20	397		7,000	4.2	71	6.0
27		2,640	660	20	397		7,000	4.2	70	6.2
28		2,640	580	20	496		7,000	4.5	70	6.0
29		2,640	1,070	20	397		7,000	4.4	73	6.1
30		2,640	600	20	397		7,000	4.4	69	6.2
31										
Total		78,840	22,710	515	10,029		187,000	128.5	2,141	181.5
Max.		2,880	1,230	22	496		13,000	4.8	75	6.8
Min.		2,520	480	10	199		3,000	3.9	68	5.6
Avg.		2,628	757	17	334		6,233	4.3	71	6.1

Manpower & Hours

	Total Hr
Superintendent 1	^176
Asst. Supt. 1	^176
Operators 3	^528
Total	^880

Robert J. Swalwell
Superintendent

MSRSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
JULY, 1989 - PLANT INFLUENT SHEET - SAMPLING CODE 500

	Weather		Inf. Flow	Inf. Temp	Inf. pH	Inf. BOD	Inf. BOD	Inf. SS	Inf. SS	Inf. Phos.	Inf. Phos.	Inf. VSS	Inf. NH3-N	--Remarks or Other Parameters--
	Type	Precip.	MGD	F	SU	mgIL	Lbs.	mgIL	Lbs.	mgIL	Lbs.	mgIL	mgIL	
PN-	^00033	^00045	^50050	^00011	^00400	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	
Day														
1	1		2.93	55	7.3	54	1,320	52	1,271	1.60	39	48	7.8	
2	4	0.30	2.90	56	7.3	42	1,016	54	1,306	1.60	39	50	5.9	
3	1		2.93	56	7.3	42	1,026	48	1,173	1.35	33	40	5.9	
4	1		2.90	56	7.4	46	1,113	54	1,306	1.30	31	50	6.4	
5	1		3.13	56	7.3	88	2,297	106	2,767	2.45	64	54	11.0	
6	1		3.09	56	7.2	74	1,907	84	2,165	2.10	54	76	9.2	
7	1		3.02	56	7.2	64	1,612	66	1,662	1.65	42	62	5.9	
8	4	0.18	2.81	55	7.4	54	1,266	78	1,828	1.35	32	54	4.9	
9	1		2.89	55	7.3	52	1,253	56	1,350	1.20	29	52	4.8	
10	1		3.29	57	7.3	78	2,140	66	1,811	1.90	52	50	7.0	
11	4	0.03	3.17	59	7.5	118	3,120	72	1,904	2.45	65	56	7.6	
12	4	0.08	3.11	58	7.4	52	1,349	70	1,816	2.45	64	60	8.9	
13	4	0.55	3.15	58	7.3	92	2,417	88	2,312	2.40	63	76	6.1	
14	4	0.14	3.09	58	7.4	70	1,804	52	1,340	2.30	59	44	8.6	
15	1		2.84	56	7.3	70	1,658	38	900	1.80	43	30	7.7	
16	1		2.78	56	7.3	70	1,623	66	1,530	1.50	35	54	6.1	
17	1		3.12	58	7.4	124	3,227	90	2,342	1.90	49	76	7.9	
18	4	0.06	3.13	58	7.5	78	2,036	64	1,671	2.40	63	54	7.2	
19	4	0.38	3.11	59	7.5	106	2,749	76	1,971	2.10	54	68	6.9	
20	4	0.68	3.24	59	7.4	76	2,054	84	2,270	2.05	55	76	7.1	
21	4	0.24	3.21	59	8.4	90	2,409	174	4,658	2.40	64	82	6.7	
22	4	0.02	3.10	59	7.7	94	2,430	72	1,861	1.65	43	46	4.9	
23	1		2.94	56	7.3	46	1,128	120	2,942	1.40	34	108	6.5	
24	4	0.02	3.33	58	7.4	48	1,333	104	2,888	2.45	68	90	7.2	
25	4	0.10	3.14	59	7.4	98	2,566	70	1,833	4.45	117	58	13.6	
26	4	0.02	3.14	59	7.2	62	1,624	90	2,357	2.10	55	82	9.7	
27	4	0.05	3.19	58	7.3	100	2,660	112	2,980	4.30	114	88	9.7	
28	1		3.04	58	7.3	104	2,637	94	2,383	2.75	70	68	8.6	
29	4	0.60	2.91	58	7.4	80	1,942	74	1,796	3.00	73	60	7.7	
30	4	0.07	2.86	58	7.3	62	1,479	80	1,908	1.65	39	70	6.8	
31	1		3.14	57	7.3	70	1,833	168	4,400	2.90	76	154	8.7	
Total	82	4.52	94.63	1,776	229.0	2,304	59,027	2,522	64,700	66.90	1,718	2,036	233.0	
Max.	4	0.68	3.33	59	8.4	124	3,227	174	4,658	4.45	117	154	13.6	
Min.	1	0.02	2.78	55	7.2	42	1,016	38	900	1.20	29	30	4.8	
Avg.	3	0.21	3.05	57	7.4	74	1,904	81	2,087	2.16	55	66	7.5	

Robert J. Swalwell

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
JULY, 1989 - PRIMARY EFFLUENT SHEET

	P Eff. BOD mgIL	P Eff. BOD Lbs.	P Eff. SS mgIL	P. Eff. SS Lbs.	P Eff. Phos. mgIL	P Eff. Phos. Lbs.	P Eff. VSS mgIL	P Eff. NH3-N mgIL	Flow MGD	BOD Pri. Removal %	SS Pri. Removal %	P Pri. Removal %
PN-	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	^50050			
Day												
1	32	782	32	782	1.30	32	28	7.3	2.93	41	38	19
2	32	774	28	677	1.10	27	24	6.1	2.90	24	48	31
3	10	244	46	1,124	1.00	24	40	6.1	2.93	76	4	19
4	28	677	28	677	1.15	28	24	5.9	2.90	39	48	12
5	58	1,514	46	1,201	1.80	47	44	6.0	3.13	34	57	26
6	52	1,340	26	670	2.30	59	24	6.4	3.09	30	69	0
7	56	1,410	40	1,007	1.50	38	38	5.8	3.02	13	36	9
8	34	797	50	1,172	1.15	27	48	4.7	2.81	37	40	15
9	42	1,012	34	819	1.15	28	30	4.4	2.89	19	39	4
10	54	1,482	56	1,537	1.70	47	26	6.1	3.29	31	15	11
11	100	2,644	44	1,163	2.30	61	34	6.5	3.17	15	39	6
12	42	1,089	56	1,452	1.90	49	46	6.9	3.11	19	20	22
13	74	1,944	50	1,314	1.90	50	40	6.6	3.15	20	43	21
14	50	1,289	42	1,082	1.50	39	32	8.5	3.09	29	19	35
15	50	1,184	28	663	2.20	52	24	6.7	2.84	29	26	0
16	56	1,298	46	1,067	1.35	31	38	7.0	2.78	20	30	10
17	86	2,238	58	1,509	2.30	60	46	7.7	3.12	31	36	0
18	60	1,566	52	1,357	2.20	57	46	8.8	3.13	23	19	8
19	86	2,231	48	1,245	2.20	57	42	7.3	3.11	19	37	0
20	44	1,189	56	1,513	1.95	53	52	8.5	3.24	42	33	5
21	54	1,446	52	1,392	1.70	46	32	7.3	3.21	40	70	29
22	80	2,068	50	1,293	1.40	36	32	5.0	3.10	15	31	16
23	46	1,128	46	1,128	1.30	32	40	7.5	2.94	0	61	7
24	34	944	48	1,333	1.90	53	38	6.9	3.33	29	54	22
25	62	1,624	62	1,624	4.30	113	56	10.2	3.14	37	11	6
26	46	1,205	74	1,938	1.95	51	62	8.9	3.14	26	18	7
27	82	2,182	52	1,383	3.50	93	42	5.9	3.19	18	55	18
28	114	2,890	78	1,978	2.75	70	52	8.6	3.04	0	17	0
29	70	1,699	80	1,942	3.50	85	62	8.0	2.91	13	0	0
30	50	1,193	56	1,336	1.70	41	44	7.0	2.86	19	18	0
31	50	1,309	78	2,043	2.65	69	66	7.9	3.14	29	54	9
Total	1,734	44,392	1,542	39,421	60.60	1,553	1,252	216.5	94.63	817	1,085	367
Max.	114	2,890	80	2,043	4.30	113	66	10.2	3.33	76	70	35
Min.	10	244	26	663	1.00	24	24	4.4	2.78	0	0	0
Avg.	56	1,432	50	1,272	1.95	50	40	7.0	3.05	26	35	12

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
JULY, 1989 - ACTIVATED SLUDGE SHEET

	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading flm	Mix Liq SS mgIL	Mix Liq VSS mgIL	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mgIL	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mgIl	PE SS mgIL
PN-	^80993	^81001	^80990	^80992	^70323	^70324	^81004	^81007	^00300	^81000	^81006	^70325	^81014	^80991	^50050	^00310	^00530
Day																	
1	48	2.9	5.5		1,433					201			52	43	2.93	32	32
2		3.0	5.9		1,324					199			53	49	2.90	32	28
3		2.9	3.3	0.09	1,250	895	16.0	0.78	7.0	199	0.33	0.23	52	43	2.93	10	46
4		3.0	5.5		1,255					201			54	43	2.90	28	28
5		2.8	3.3	0.53	1,340	962	16.0	0.84	5.8	198	0.36	0.25	50	37	3.13	58	46
6		2.8	5.5	0.52	1,223	856	17.0	0.72	5.9	197	0.32	0.22	50	37	3.09	52	26
7		2.9	4.3	0.45	1,448	1,057	20.0	0.72	4.1	199	0.54	0.25	50	40	3.02	56	40
8		3.1	3.6		1,420					199			53	43	2.81	34	50
9		3.0	5.0		1,382					195			52	45	2.89	42	34
10		2.6	2.5	0.52	1,296	951	18.0	0.72	5.8	192	0.36	0.26	47	36	3.29	54	56
11		2.7	3.6	0.86	1,405	1,024	20.0	0.70	5.1	198	0.36	0.26	48	40	3.17	100	44
12		2.8	3.1	0.33	1,502	1,093	23.0	0.65	2.8	202	0.38	0.28	49	49	3.11	42	56
13		2.7	3.3	0.60	1,468	1,090	21.0	0.70	4.9	202	0.37	0.28	48	49	3.15	74	50
14		2.8	3.8	0.42	1,368	1,019	21.0	0.65	4.0	202	0.34	0.25	51	58	3.09	50	42
15		3.0	6.8		1,512					204			55	49	2.84	50	28
16		3.1	4.0		1,422					203			56	55	2.78	56	46
17		2.8	2.6	0.77	1,322	970	21.0	0.63	5.4	200	0.32	0.24	48	50	3.12	86	58
18		2.8	3.0	0.52	1,347	1,004	22.0	0.61	4.7	196	0.33	0.25	49	55	3.13	60	52
19		2.8	3.3	0.73	1,352	1,024	21.0	0.64	4.0	199	0.32	0.24	50	55	3.11	86	48
20		2.7	2.6	0.39	1,330	1,013	21.0	0.63	4.5	201	0.34	0.26	48	50	3.24	44	56
21		2.7	2.9	0.47	1,369	1,022	21.0	0.65	4.6	196	0.33	0.25	48	50	3.21	54	52
22		2.8	3.2		1,403					201			50	50	3.10	80	50
23		2.9	3.6		1,364					201			53	50	2.94	46	46
24		2.6	2.8	0.35	1,245	892	19.0	0.66	5.1	197	0.33	0.24	46	50	3.33	34	48
25		2.7	2.3	0.58	1,261	936	19.0	0.66	4.5	197	0.32	0.23	48	50	3.14	62	62
26		2.7	2.2	0.38	1,395	1,049	22.0	0.63	0.9	235	0.34	0.26	48	50	3.14	46	74
27		2.7	3.1	0.65	1,423	1,113	24.0	0.59	1.9	239	0.37	0.29	48	55	3.19	82	52
28		2.8	2.1	0.90	1,418	1,071	21.0	0.68	3.9	246	0.36	0.27	50	57	3.04	114	78
29		3.0	2.3		1,507					245			53	63	2.91	70	80
30		3.0	3.4		1,497					248			54	63	2.86	50	56
31		2.7	2.1	0.40	1,400	1,083	20.0	0.70	5.5	240	0.38	0.30	49	63	3.14	50	78
Total	48	87.7	110.7	10.48	42,681	20,124	403.0	13.58	90.4	6,432	7.10	5.11	1,562	1,527	94.63	1,734	1,542
Max.	48	3.1	6.8	0.90	1,512	1,113	24.0	0.84	7.0	248	0.54	0.30	56	63	3.33	114	80
Min.	48	2.6	2.1	0.09	1,223	856	16.0	0.59	0.9	192	0.32	0.22	46	36	2.78	10	26
Avg.	48	2.8	3.6	0.52	1,377	1,006	20.2	0.68	4.5	207	0.36	0.26	50	49	3.05	56	50

Robert J. Swalwell
Superintendent

MARSHALL WWTP 801 W. PPEARL ST. MARSHALL MI. 49068 - PERMIT No.MI0023540
JULY 1989 - DISCHARGE MONITORING REPORT - DISCHARGE No. 001A

	F.Eff. D.O. mg/L	F.Eff. pH SU	F.Eff. SS mg/L	F.Eff. SS Lbs.	F.Eff. Total-P mg/L	Flow MGD	F.Eff. Chlorine mg/L	F.Eff. BOD mg/L	F.Eff. BOD Lbs.	F.Eff. NH3 as N mg/L	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %
Limit-	>4.0	6 & 9	30 & 45	751 & ^1,126	<1.0			20 & 30	500 & ^751	<11.0	7 Day ^275	200 & 400	>85%	>85%	
PN-	^00300	^00400	^00530	^00530	^00665	^50050	^50060	^80082	^80082	^00610	^00610	^31616	^81011	^91267	^81012
Day															
1	6.4	7.3	3	73	0.27	2.93	0.33	4	98	7.3	178	68	94	93	83
2	6.3	7.3	2	48	0.12	2.90	0.23	3	73	5.8	140	52	96	93	93
3	7.5	7.4	5	122	0.15	2.93	0.49	2	49	5.7	139	50	90	95	89
4	6.3	7.5	2	48	0.15	2.90	0.45	3	73	5.2	126	26	96	93	88
5	7.2	7.4	3	78	0.13	3.13	0.43	3	78	5.0	131	22	97	97	95
6	6.8	7.3	2	52	0.17	3.09	0.39	4	103	5.0	129	80	98	95	91
7	6.7	7.3	9	227	0.27	3.02	0.35	4	101	3.3	83	52	86	94	83
8	6.7	7.5	4	94	0.16	2.81	0.39	3	70	3.9	91	22	95	94	88
9	7.0	7.4	3	72	0.16	2.89	0.39	3	72	3.4	82	16	95	94	87
10	6.7	7.2	3	82	0.13	3.29	0.32	4	110	4.5	123	68	95	95	93
11	6.4	7.3	2	53	0.28	3.17	0.35	5	132	4.4	116	240	97	96	89
12	6.4	7.2	7	182	0.37	3.11	0.44	4	104	4.7	122	64	90	92	85
13	6.1	7.3	5	131	0.30	3.15	0.44	5	131	4.4	116	146	94	95	88
14	6.3	7.3	2	52	0.38	3.09	0.35	4	103	7.6	196	46	96	94	83
15	6.2	7.3	1	24	0.23	2.84	0.27	3	71	5.4	128	8	97	96	87
16	6.2	7.4	5	116	0.22	2.78	0.33	4	93	10.1	234	14	92	94	85
17	6.2	7.4	11	286	0.19	3.12	0.47	4	104	8.0	208	102	88	97	90
18	5.9	7.4	6	157	0.32	3.13	0.35	4	104	7.2	188	10	90	95	87
19	5.8	7.5	7	182	0.40	3.11	0.37	6	156	7.0	182 191	24	91	94	81
20	6.2	7.5	7	189	0.35	3.24	0.22	4	108	7.0	189	96	92	95	83
21	6.0	7.5	6	161	0.44	3.21	0.22	5	134	7.6	203	2	98	94	82
22	5.8	7.8	6	155	0.32	3.10	0.48	3	78	5.2	134	2	92	97	81
23	5.8	7.4	2	49	0.22	2.94	0.30	3	74	7.7	189	46	98	93	84
24	5.7	7.4	3	83	0.28	3.33	0.35	2	56	7.4	206	56	97	96	88
25	6.0	7.4	3	79	0.62	3.14	0.40	7	183	8.9	233	46 78	96	93	86
26	5.0	7.3	9	236	0.58	3.14	0.30	5	131	6.9	181	172	90	92	72
27	5.6	7.3	3	80 182	0.56	3.19	0.31	5 6	133	4.3	114	526	97	94	86
28	6.3	7.4	6 7	152	0.70	3.04	0.43	5	127 145	7.0	177	40	94	95	75
29	5.9	7.3	11	267	0.82	2.91	0.27	7	170	6.8	165	40	85	91	73
30	6.1	7.3	6	143	0.41	2.86	0.44	8	191	7.5	179	38	93	87	75
31	6.4	7.4	12	314	0.48	3.14	0.41	3	79	6.1	160	56	93	96	83
Total	193.9	228.7	156	3,986	10.18	94.63	11.27	129	3,286	190.3	4,843	2,230	2,902	2,919	2,633
Max.	7.5	7.8	12	314	0.82	3.33	0.49	8	191	10.1	234	526	98	97	95
Min.	5.0	7.2	1	24	0.12	2.78	0.22	2	49	3.3	82	2 nd dat	85	87	72
Avg.	6.3	7.4	5	129	0.33	3.05	0.36	4	106	6.1	156	78	94	94	85

40-30day

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
JULY , 1989 - MISCELLOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	Other	Raw Sludge Gals.	Raw Sludge Total Solids Percent	Raw Sludge Vol. Solids Percent	Raw Sludge pH
1		3,000	500	20	298		4,000	4.4	72	6.2
2		2,640	590	20	397		4,000	4.3	71	6.4
3		2,640	490	23	397		6,000	4.5	71	6.3
4		2,520	610	18	397		5,000	4.5	71	6.4
5		2,640	950	24	199		7,000	4.0	70	6.6
6		2,640	1,530	12	298		6,000	4.1	70	6.4
7		2,640	1,060	18	298		6,000	4.0	70	6.7
8		2,520	760	18	397		4,000	4.4	67	6.2
9		2,640	680	20	199		4,000	4.1	72	6.3
10		2,640	1,070	24	397		6,000	3.9	72	6.1
11		2,640	1,040	20	298		7,000	4.3	70	6.0
12		2,640	1,730	23	298		7,000	4.4	72	6.0
13		2,640	1,340	24	298		7,000	4.2	73	6.4
14		2,640	540	19	298		5,000	4.6	72	5.9
15		2,400	680	17	298		4,000	4.7	70	5.9
16		2,640	630	21	298		4,000	4.6	73	6.0
17		2,520	1,290	24	298		6,000	4.4	71	5.9
18		2,640	2,000	22	298		6,000	4.6	70	5.9
19		2,640	670	18	298		7,000	4.7	71	5.9
20		2,520	540	15	298		7,000	4.4	73	6.0
21		2,760	590	20	397		7,000	4.6	72	5.9
22		2,520	500	17	199		4,000	7.1	42	6.3
23		2,520	550	22	298		7,000	7.7	49	5.9
24		2,760	540	18	397		7,000	8.3	56	5.7
25		2,640	890	22	298		6,000	5.9	60	6.1
26		2,640	660	25	298		6,000	6.0	61	5.7
27		2,880	450	26	298		6,000	5.5	65	5.6
28		2,640	720	21	397		7,000	5.6	67	5.7
29		2,640	660	24	199		4,000	5.1	71	5.7
30		2,760	500	26	298		4,000	3.5	74	5.8
31		2,760	800	24	298		7,000	5.0	70	5.8
Total		81,960	25,560	645	9,634		177,000	151.4	2,108	187.7
Max.		3,000	2,000	26	397		7,000	8.3	74	6.7
Min.		2,400	450	12	199		4,000	3.5	42	5.6
Avg.		2,644	825	21	311		5,710	4.9	68	6.1

Manpower & Hours

	Total Hr
Superintendent 1	^160
Asst. Supt. 1	^160
Operators 3	^484
Total 5	^804

Robert J. Swalwell

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
AUGUST, 1989 - PLANT INFLUENT SHEET - SAMPLING CODE 500

	----Weather-----		Inf. Flow	Inf. Temp	Inf. pH	Inf. BOD	Inf. BOD	Inf. SS	Inf. SS	Inf. Phos.	Inf. Phos.	Inf. VSS	Inf. NH3-N	--Remarks or Other Parameters--
	Type	Precip.	MGD	F	SU	mgIL	Lbs.	mgIL	Lbs.	mgIL	Lbs.	mgIL	mgIL	
PN-	^00033	^00045	^50050	^00011	^00400	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	
Day														
1	1		3.22	59	7.3	80	2,148	62	1,665	2.65	71	52	7.6	
2	1		3.14	59	7.3	124	3,247	112	2,933	2.90	76	80	7.0	
3	4	0.22	3.14	59	7.4	98	2,566	132	3,457	2.90	76	118	7.1	
4	4	0.78	3.28	59	7.2	58	1,587	72	1,970	2.20	60	60	7.0	
5	4	0.02	3.09	59	7.3	64	1,649	74	1,907	2.45	63	58	4.4	
6	1		2.93	58	7.4	44	1,075	58	1,417	2.45	60	12	6.5	
7	1		3.14	59	7.3	58	1,519	104	2,724	5.10	134	94	6.9	
8	1		3.12	59	7.6	110	2,862	66	1,717	3.50	91	62	6.5	
9	1		3.05	59	7.3	104	2,645	96	2,442	2.10	53	60	3.5	
10	1		3.14	59	7.4	88	2,305	92	2,409	3.10	81	90	7.9	
11	4	0.02	3.12	60	7.4	92	2,394	78	2,030	2.75	72	66	5.8	
12	4	0.23	2.99	58	7.2	98	2,444	72	1,795	1.90	47	54	5.2	
13	1		2.88	58	7.3	86	2,066	68	1,633	2.65	64	52	10.6	
14	4	0.01	3.16	60	7.3	120	3,163	76	2,003	2.20	58	60	11.0	
15	4	0.18	3.19	60	7.1	126	3,352	100	2,660	2.90	77	88	10.1	
16	1		3.17	60	7.1	122	3,225	96	2,538	2.30	61	74	8.6	
17	1		3.06	59	7.4	104	2,654	108	2,756	3.40	87	90	8.7	
18	1		3.03	59	7.5	122	3,083	76	1,921	3.10	78	66	9.2	
19	4	0.37	2.84	59	7.6	98	2,321	84	1,990	2.40	57	74	8.2	
20	4	0.02	2.90	58	7.5	118	2,854	84	2,032	1.80	44	76	7.9	
21	4	0.07	3.13	58	7.4	122	3,185	72	1,880	2.30	60	40	7.5	
22	4	0.05	3.08	59	7.5	112	2,877	58	1,490	2.30	59	48	7.5	
23	1		3.05	59	7.5	98	2,493	68	1,730	2.10	53	50	8.1	
24	1		3.06	60	7.5	112	2,858	60	1,531	2.30	59	42	6.8	
25	1		2.95	59	7.4	118	2,903	58	1,427	4.80	118	50	7.8	
26	1		2.85	59	7.4	120	2,852	60	1,426	2.40	57	48	6.2	
27	1		2.90	59	7.3	120	2,902	72	1,741	2.05	50	64	5.3	
28	4	0.23	3.02	60	7.4	122	3,073	58	1,461	2.20	55	50	6.4	
29	4	0.48	3.12	60	7.4	96	2,498	82	2,134	2.85	74	62	6.1	
30	1		3.14	60	7.5	120	3,143	88	2,305	2.65	69	78	7.3	
31	4	1.23	3.12	60	7.5	116	3,018	68	1,769	1.65	43	66	6.7	
Total	73	3.91	95.01	1,833	228.7	3,170	80,962	2,454	62,892	82.35	2,107	1,984	225.4	
Max.	4	1.23	3.28	60	7.6	126	3,352	132	3,457	5.10	134	118	11.0	
Min.	1	0.01	2.84	58	7.1	44	1,075	58	1,417	1.65	43	12	3.5	
Avg.	2	0.28	3.06	59	7.4	102	2,612	79	2,029	2.66	68	64	7.3	

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
AUGUST, 1989 - PRIMARY EFFLUENT SHEET

	P Eff. BOD mgIL	P Eff. BOD Lbs.	P Eff. SS mgIL	P. Eff. SS Lbs.	P Eff. Phos. mgIL	P Eff. Phos. Lbs.	P Eff. VSS mgIL	P Eff. NH3-N mgIL	Flow MGD	BOD Pri. Removal %	SS Pri. Removal %	P Pri. Removal %
PN-	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	^50050			
Day												
1	68	1,826	64	1,719	2.45	66	56	8.2	3.22	15	0	7
2	120	3,143	86	2,252	2.65	69	68	7.3	3.14	3	23	9
3	108	2,828	90	2,357	3.00	79	80	7.4	3.14	0	32	0
4	60	1,641	54	1,477	2.30	63	42	7.5	3.28	0	25	0
5	60	1,546	64	1,649	2.40	62	60	4.8	3.09	6	14	2
6	44	1,075	62	1,515	2.45	60	48	5.9	2.93	0	0	0
7	54	1,414	82	2,147	4.45	117	80	8.1	3.14	6	21	13
8	104	2,706	48	1,249	3.95	103	40	8.4	3.12	5	27	0
9	100	2,544	82	2,086	2.40	61	50	3.5	3.05	4	15	0
10	84	2,200	66	1,728	2.85	75	56	8.3	3.14	4	28	8
11	68	1,769	56	1,457	3.10	81	48	7.6	3.12	26	28	0
12	78	1,945	66	1,646	2.20	55	56	5.8	2.99	20	8	0
13	84	2,018	56	1,345	2.20	53	50	12.5	2.88	2	18	17
14	120	3,163	60	1,581	2.10	55	54	7.9	3.16	0	21	5
15	126	3,352	70	1,862	2.75	73	62	12.6	3.19	0	30	5
16	112	2,961	66	1,745	3.20	85	56	8.5	3.17	8	31	0
17	68	1,735	60	1,531	2.90	74	54	9.0	3.06	35	44	14
18	94	2,375	72	1,819	3.10	78	68	10.5	3.03	23	5	0
19									2.84			
20	118	2,854	68	1,645	2.10	51	54	9.7	2.90	0	19	0
21	120	3,133	50	1,305	2.10	55	28	7.4	3.13	1	31	9
22	90	2,312	40	1,027	2.05	53	36	7.4	3.08	20	31	11
23	40	1,017	22	560	2.20	56	14	7.2	3.05	59	68	0
24	94	2,399	48	1,225	2.05	52	38	7.3	3.06	16	20	11
25	54	1,329	56	1,378	4.30	106	46	7.7	2.95	54	3	10
26	106	2,520	42	998	2.10	50	34	6.4	2.85	12	30	13
27	102	2,467	46	1,113	1.65	40	36	5.2	2.90	15	36	20
28	104	2,619	38	957	1.65	42	30	5.8	3.02	15	34	25
29	48	1,249	46	1,197	2.45	64	40	6.5	3.12	50	44	14
30	42	1,100	36	943	2.55	67	26	7.7	3.14	73	59	4
31	78	2,030	38	989	1.60	42	34	6.1	3.12	33	44	3
Total	2,548	65,270	1,734	44,503	77.25	1,983	1,444	228.2	95.01	505	789	200
Max.	126	3,352	90	2,357	4.45	117	80	12.6	3.28	73	68	25
Min.	40	1,017	22	560	1.60	40	14	3.5	2.84	0	0	0
Avg.	85	2,176	58	1,483	2.58	66	48	7.6	3.06	17	26	7

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
AUGUST, 1989 - ACTIVATED SLUDGE SHEET

	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading flm	Mix Liq SS mgIL	Mix Liq VSS mgIL	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mgIL	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mgIl	PE SS mgIL
PN-	^80993	^81001	^80990	^80992	^70323	^70324	^81004	^81007	^00300	^81000	^81006	^70325	^81014	^80991	^50050	^00310	^00530
Day																	
1	48	2.7	2.4	0.57	1,364	1,070	23.0	0.59	5.5	256	0.35	0.27	48	65	3.22	68	64
2		2.7	2.0	0.88	1,504	1,188	24.0	0.63	3.3	256	0.36	0.29	49	65	3.14	120	86
3		2.7	1.9	0.78	1,524	1,211	24.0	0.64	3.2	252	0.34	0.27	48	72	3.14	108	90
4		2.6	3.1	0.45	1,520	1,210	23.0	0.66	3.5	254	0.40	0.30	46	72	3.28	60	54
5		2.8	2.6		1,407					254			50	72	3.09	60	64
6		2.9	2.9		1,455					261			53	58	2.93	44	62
7		2.7	1.9	0.43	1,389	1,111	19.0	0.73	5.0	262	0.33	0.27	49	65	3.14	54	82
8		2.8	3.3	0.86	1,378	1,054	17.0	0.81	4.2	259	0.36	0.27	50	63	3.12	104	48
9		2.8	1.9	0.83	1,324	1,022	14.5	0.91	5.4	261	0.32	0.24	51	63	3.05	100	82
10		2.7	2.2	0.74	1,281	988	15.0	0.85	4.3	254	0.34	0.25	47	63	3.14	84	66
11		2.8	2.7	0.52	1,335	1,143	17.0	0.79	3.7	258	0.37	0.29	50	58	3.12	68	56
12		2.9	2.6		1,413					257			51	58	2.99	78	66
13		3.0	3.3		1,477					259			53	55	2.88	84	56
14		2.7	2.6	1.03	1,353	1,026	18.0	0.75	3.5	254	0.34	0.26	48	62	3.16	120	60
15		2.7	2.1	1.08	1,329	1,034	20.0	0.66	3.6	256	0.35	0.28	48	60	3.19	126	70
16		2.7	2.4	0.88	1,402	1,120	20.0	0.70	3.1	258	0.35	0.28	48	65	3.17	112	66
17		2.8	2.8	0.50	1,453	1,160	21.0	0.69	3.4	258	0.37	0.29	50	65	3.06	68	60
18		2.8	2.4	0.69	1,436	1,145	21.0	0.68	2.4	259	0.35	0.28	50	65	3.03	94	72
19		3.0			1,390					258			55	65	2.84		
20		3.0	2.6		1,416					255			55	65	2.90	118	68
21		2.8	3.0	1.03	1,300	1,012	17.0	0.76	6.0	254	0.31	0.23	51	65	3.13	120	50
22		2.8	3.7	0.81	1,255	956	18.0	0.70	5.2	253	0.32	0.24	52	63	3.08	90	40
23		2.8	6.4	0.38	1,201	906	16.0	0.75	5.1	257	0.30	0.23	52	63	3.05	40	22
24		2.8	2.7	1.00	1,113	800	14.0	0.80	5.3	258	0.29	0.20	52	63	3.06	94	48
25		2.9	2.4	0.56	1,093	792	12.5	0.87	6.3	259	0.27	0.19	50	55	2.95	54	56
26		3.0	3.5		1,162					259			52	55	2.85	106	42
27		3.0	2.9		1,086					257			54	55	2.90	102	46
28		2.9	3.6	1.12	1,152	780	12.0	0.96	5.6	255	0.31	0.25	53	55	3.02	104	38
29		2.8	2.9	0.48	1,172	865	12.0	0.98	4.9	256	0.31	0.23	50	46	3.12	48	46
30		2.7	3.9	0.41	1,226	893	12.0	1.02	2.5	257	0.32	0.23	49	46	3.14	42	36
31		2.8	3.8	0.72	1,255	937	12.0	1.05	5.5	254	0.33	0.24	50	50	3.12	78	38
Total	48	87.3	86.5	16.77	41,165	23,423	402.0	17.99	100.5	7,960	7.69	5.88	1,564	1,892	95.01	2,548	1,734
Max.	48	3.0	6.4	1.12	1,524	1,211	24.0	1.05	6.3	262	0.40	0.30	55	72	3.28	126	90
Min.	48	2.6	1.9	0.38	1,086	780	12.0	0.59	2.4	252	0.27	0.19	46	46	2.84	40	22
Avg.	48	2.8	2.9	0.73	1,328	1,018	17.5	0.78	4.4	257	0.33	0.26	50	61	3.06	85	58

Robert J. Swalwell
Superintendent

MARSHALL WWTP 801 W. PEARL ST. MARSHALL MI. 49068 - PERMIT No. MI0023540
AUGUST, 1989 - DISCHARGE MONITORING REPORT - DISCHARGE No. 001A

	F.Eff. D.O. mgIL	F.Eff. pH SU	F.Eff. SS mgIL	F.Eff. SS Lbs.	F.Eff. Total-P mgIL	Flow MGD	F.Eff. Chlorine mgIL	F.Eff. BOD mgIL	F.Eff. BOD Lbs.	F.Eff. NH3 as N mgIL	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %
Limit-	>4.0	6 & 9	30 & 45	751 & ^1,126	<1.0			20 & 30	500 & ^751	<11.0	7 Day ^275	200 & 400	>85%	>85%	
PN-	^00300	^00400	^00530	^00530	^00665	^50050	^50060	^80082	^80082	^00610	^00610	^31616	^81011	^91267	^81012
Day			X	/				X	X	X	X	X			
1	5.4	7.4	1	27	0.34	3.22	0.48	7	188	7.1	191	204	98	91	87
2	5.8	7.4	7	183	0.38	3.14	0.26	3	79	6.3	165	210	94	98	87
3	5.7	7.4	8	210	0.70	3.14	0.16	5	131	7.2	189	400	94	95	76
4	5.7	7.4	4	109	0.48	3.28	0.27	3	82	5.9	161	110	94	95	81
5	5.9	7.3	7	180	0.38	3.09	0.42	3	77	3.3	85	50	91	95	84
6	5.9	7.3	8	195	0.38	2.93	0.44	3	73	5.7	139	84	86	93	84
7	6.6	7.4	3	79	0.80	3.14	0.32	4	105	7.6	199	122	97	93	84
8	6.5	7.2	5	130	0.82	3.12	0.27	4	104	9.6	250	86	92	96	77
9	6.5	7.2	14	356	0.58	3.05	0.42	4	102	3.3	84	14	85	96	72
10	6.2	7.4	6	157	0.58	3.14	0.26	5	131	10.0	262	48	93	98	81
11	6.0	7.3	4	104	0.82	3.12	0.28	5	130	6.8	177	34	95	95	70
12	5.8	7.2	5	125	0.44	2.99	0.28	5	125	6.0	150	62	93	95	78
13	5.7	7.3	6	144	0.30	2.88	0.27	4	96	8.0	192	28	91	95	89
14	5.8	7.1	6	158	0.35	3.16	0.39	8	211	6.8	179	400	92	93	84
15	5.8	7.2	2	53	0.51	3.19	0.25	6	160	7.9	210	192	98	95	82
16	6.0	7.2	7	185	0.44	3.17	0.32	5	132	7.0	185	36	93	96	81
17	6.2	7.5	4	102	0.46	3.06	0.36	4	102	6.3	161	78	96	96	86
18	6.0	7.5	5	126	0.51	3.03	0.42	7	177	7.4	187	160	93	94	84
19	6.2	7.5	12	284	0.50	2.84	0.26	4	95	7.2	171	82	86	96	79
20	6.0	7.3	4	97	0.22	2.90	0.28	4	97	9.7	235	74	95	97	88
21	6.7	7.4	2	52	0.22	3.13	0.47	7	183	6.9	180	70	97	94	90
22	6.5	7.4	3	77	0.22	3.08	0.33	7	180	6.9	177	64	95	94	90
23	6.5	7.4	3	76	0.18	3.05	0.41	3	76	6.1	155	64	96	95	91
24	6.5	7.4	2	51	0.19	3.06	0.49	3	77	6.1	156	52	97	97	92
25	7.1	7.5	6	148	1.00	2.95	0.32	4	98	7.0	172	96	90	97	79
26	7.0	7.3	2	48	0.85	2.85	0.27	5	119	5.9	140	50	97	96	65
27	7.1	7.4	3	73	0.30	2.90	0.30	4	97	4.7	114	34	96	97	85
28	6.8	7.4	6	151	0.35	3.02	0.37	4	101	5.3	133	60	90	97	84
29	6.2	7.5	6	156	0.32	3.12	0.23	4	104	5.6	146	156	93	96	89
30	6.0	7.6	4	105	0.64	3.14	0.39	4	105	7.1	186	66	95	97	76
31	6.3	7.4	4	104	0.40	3.12	0.49	4	104	5.8	151	36	94	96	76
Total	192.4	228.2	159	4,046	14.66	95.01	10.48	142	3,639	206.5	5,281	3,222	2,896	2,958	2,551
Max.	7.1	7.6	14	356	1.00	3.28	0.49	8	211	10.0	262	400	98	98	92
Min.	5.4	7.1	1	27	0.18	2.84	0.16	3	73	3.3	84	14	85	91	65
Avg.	6.2	7.4	5	131	0.47	3.06	0.34	5	117	6.7	170	78	93	95	82
			7	180				5	143	7.5	194	138			

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
AUGUST, 1989 - MISCELLOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	Other	Raw Sludge Gals.	Raw Sludge Total Solids Percent	Raw Sludge Vol. Solids Percent	Raw Sludge pH
1		2,760	780	25	298		7,000	4.8	74	5.9
2		2,760	750	23	397		12,000	5.0	72	5.8
3		2,760	570	12	199		8,000	4.7	76	5.8
4		2,640	630	18	298		6,000	5.4	71	5.9
5		2,760	420	17	298		4,000	4.9	69	5.7
6		2,640	510	18	298		4,000	5.9	75	5.7
7		2,760	550	22	397		6,000	5.2	73	5.6
8		2,760	480	17	298		6,000	4.6	72	6.8
9		2,640	450	20	298		6,000	4.4	75	5.8
10		2,760	600	25	298		6,000	4.6	71	5.8
11		2,760	790	29	298		6,000	4.5	71	5.7
12		2,640	450	18	298		4,000	4.3	69	6.8
13		2,640	500	18	298		4,000	4.2	76	5.7
14		2,760	490	21	199		7,000	4.0	75	5.9
15		2,760	660	26	397		7,000	3.8	77	5.9
16		2,760	470	17	298		7,000	4.2	74	5.5
17		2,640	730	23	199		7,000	4.2	76	5.8
18		2,640	830	12	99		7,000	4.3	74	5.8
19		2,640	430	16	397		4,000	4.0	77	5.9
20		2,520	500	20	496		4,000	4.0	74	5.9
21		2,640	490	14	397		6,000	4.3	74	5.8
22		2,640	840	20	298		7,000	4.1	76	5.9
23		2,640	540	26	596		8,000	4.0	74	5.9
24		2,760	600	18	298		8,000	3.9	77	5.9
25		2,520	860	27	298		8,000	4.3	73	6.0
26		2,640	430	16	298		4,000	3.4	77	6.0
27		2,640	500	19	397		8,700	4.0	72	6.0
28		2,640	560	20	199		4,000	4.1	75	6.1
29		2,640	500	20	397		7,500	4.1	74	6.0
30		2,640	410	10	199		6,000	4.1	74	5.9
31		2,520	630	22	298		8,000	4.0	72	6.1
Total		82,920	17,950	609	9,733		197,200	135.3	2,289	183.3
Max.		2,760	860	29	596		12,000	5.9	77	6.8
Min.		2,520	410	10	99		4,000	3.4	69	5.5
Avg.		2,675	579	20	314		6,361	4.4	74	5.9

Manpower & Hours

	Total Hr
Superintendent 1	^184
Asst. Supt. 1	^184
Operators 3	^552
Total	^920

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
SEPTEMBER, 1989 - PLANT INFULENT SHEET - SAMPLING CODE 500

	Weather		Inf. Flow	Inf. Temp	Inf. pH	Inf. BOD	Inf. BOD	Inf. SS	Inf. SS	Inf. Phos.	Inf. Phos.	Inf. VSS	Inf. NH3-N	--Remarks or Other Parameters--
	Type	Precip.	MGD	F	SU	mgIL	Lbs.	mgIL	Lbs.	mgIL	Lbs.	mgIL	mgIL	
PN-	^00033	^00045	^50050	^00011	^00400	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	
Day														
1	3		3.05	59	7.3	110	2,798	84	2,137	2.05	52	68	7.1	
2	1		2.77	58	7.5	96	2,218	78	1,802	2.10	49	66	5.3	
3	1		2.79	58	7.4	94	2,187	48	1,117	2.45	57	38	5.7	
4	1		2.91	59	7.4	96	2,330	62	1,505	2.65	64	46	7.0	
5	1		3.24	61	7.4	138	3,729	94	2,540	3.00	81	80	5.8	
6	4	0.64	3.34	59	7.6	132	3,677	90	2,507	2.30	64	78	6.6	
7	4	0.11	3.20	60	7.5	88	2,349	80	2,135	2.30	61	70	6.6	
8	4	0.23	3.08	61	7.5	128	3,288	74	1,901	2.30	59	62	8.7	
9	4	0.12	3.20	59	7.3	134	3,576	116	3,096	4.45	119	98	8.7	
10	1		3.00	59	7.5	130	3,253	70	1,751	1.90	48	52	7.2	
11	1		3.17	60	7.3	92	2,432	86	2,274	2.75	73	74	8.3	
12	4	0.02	3.23	60	7.4	132	3,556	88	2,371	3.20	86	76	9.4	
13	4	0.33	3.24	60	7.3	90	2,432	104	2,810	2.90	78	94	10.1	
14	4	0.13	3.13	60	7.4	64	1,671	60	1,566	2.20	57	48	9.1	
15	1		3.15	59	7.4	100	2,627	84	2,207	2.85	75	66	11.0	
16	4	0.23	2.98	59	7.4	126	3,132	90	2,237	3.00	75	76	8.5	
17	1		2.96	57	7.6	42	1,037	76	1,876	1.80	44	66	7.0	
18	1		3.12	60	7.4	94	2,446	78	2,030	2.75	72	74	6.4	
19	1		3.16	59	7.4	90	2,372	80	2,108	3.40	90	62	8.8	
20	1		3.24	60	7.4	90	2,432	78	2,108	4.30	116	68	8.0	
21	1		3.32	61	7.3	90	2,492	114	3,157	2.55	71	96	14.5	
22	3		3.07	60	7.2	138	3,533	88	2,253	2.65	68	78	14.9	
23	3		2.90	57	7.4	98	2,370	78	1,887	2.30	56	52	8.5	
24	1		2.84	57	7.4	84	1,990	84	1,990	1.80	43	64	8.0	
25	1		3.30	59	7.4	70	1,927	104	2,862	3.50	96	96	12.1	
26	1		3.15	60	7.3	108	2,837	76	1,997	2.85	75	66	12.0	
27	1		3.04	60	7.3	86	2,180	70	1,775	2.10	53	68	10.1	
28	1		2.98	59	7.1	124	3,082	72	1,789	3.00	75	60	12.6	
29	1		3.01	60	7.5	128	3,213	78	1,958	2.85	72	50	10.0	
30	1		2.99	59	7.1	140	3,491	88	2,194	5.70	142	76	7.2	
31														
Total	60	1.81	92.56	1,779	221.4	3,132	80,656	2,472	63,938	83.95	2,169	2,068	265.2	
Max.	4	0.64	3.34	61	7.6	140	3,729	116	3,157	5.70	142	98	14.9	
Min.	1	0.02	2.77	57	7.1	42	1,037	48	1,117	1.80	43	38	5.3	
Avg.	2	0.23	3.09	59	7.4	104	2,689	82	2,131	2.80	72	69	8.8	

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
SEPTEMBER, 1989 - PRIMARY EFFLUENT SHEET

	P Eff. BOD mgIL	P Eff. BOD Lbs.	P Eff. SS mgIL	P. Eff. SS Lbs.	P Eff. Phos. mgIL	P Eff. Phos. Lbs.	P Eff. VSS mgIL	P Eff. NH3-N mgIL	Flow MGD	BOD Pri. Removal %	SS Pri. Removal %	P Pri. Removal %
PN-	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	^50050			
Day												
1	104	2,645	50	1,272	1.95	50	44	7.4	3.05	5	40	5
2	82	1,894	44	1,016	2.05	47	24	5.3	2.77	15	44	2
3	72	1,675	46	1,070	2.45	57	34	5.2	2.79	23	4	0
4	60	1,456	32	777	2.20	53	24	6.1	2.91	38	48	17
5	52	1,405	52	1,405	2.45	66	42	5.9	3.24	62	45	18
6	70	1,950	54	1,504	2.05	57	46	5.9	3.34	47	40	11
7	54	1,441	52	1,388	2.10	56	44	7.1	3.20	37	35	9
8	118	3,031	50	1,284	2.65	68	40	8.6	3.08	8	32	0
9	128	3,416	72	1,922	3.75	100	66	8.0	3.20	4	38	16
10	120	3,002	68	1,701	3.50	88	60	7.9	3.00	8	3	0
11	54	1,428	60	1,586	2.05	54	50	7.3	3.17	41	30	26
12	118	3,179	66	1,778	2.90	78	56	8.3	3.23	11	25	9
13	56	1,513	66	1,783	3.30	89	52	8.9	3.24	38	37	0
14	42	1,096	60	1,566	2.10	55	46	6.5	3.13	34	0	5
15	54	1,419	62	1,629	2.75	72	56	9.6	3.15	46	26	4
16	104	2,585	70	1,740	3.65	91	62	8.9	2.98	21	22	0
17	26	642	64	1,580	2.10	52	62	6.2	2.96	9	16	0
18	54	1,405	54	1,405	1.95	51	48	6.0	3.12	42	31	29
19	56	1,476	58	1,529	3.30	87	48	7.4	3.16	38	28	3
20	58	1,567	44	1,189	4.10	111	42	7.0	3.24	36	44	5
21	56	1,551	56	1,551	2.55	71	50	11.8	3.32	38	51	0
22	136	3,482	62	1,587	2.40	61	58	14.8	3.07	1	30	9
23	78	1,887	42	1,016	2.45	59	34	10.0	2.90	20	46	0
24	62	1,469	46	1,090	1.70	40	40	6.4	2.84	26	45	6
25	70	1,927	58	1,596	2.75	76	56	9.7	3.30	0	44	21
26	108	2,837	68	1,786	3.30	87	62	10.5	3.15	0	11	0
27	76	1,927	64	1,623	2.20	56	60	8.8	3.04	12	9	0
28	124	3,082	54	1,342	2.75	68	48	9.3	2.98	0	25	8
29	108	2,711	70	1,757	2.40	60	60	8.8	3.01	16	10	16
30	126	3,142	72	1,795	3.40	85	60	6.8	2.99	10	18	40
31												
Total	2,426	62,240	1,716	44,268	79.25	2,045	1,474	240.4	92.56	686	877	259
Max.	136	3,482	72	1,922	4.10	111	66	14.8	3.34	62	51	40
Min.	26	642	32	777	1.70	40	24	5.2	2.77	0	0	0
Avg.	81	2,075	57	1,476	2.64	68	49	8.0	3.09	23	29	9

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
SEPTEMBER, 1989 - ACTIVATED SLUDGE SHEET

	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading #/m	Mix Liq SS mg/L	Mix Liq VSS mg/L	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mg/L	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mg/l	PE SS mg/L
PN-	^80993	^81001	^80990	^80992	^70323	^70324	^81004	^81007	^00300	^81000	^81006	^70325	^81014	^80991	^50050	^00310	^00530
Day																	
1	48	2.8	2.8	1.03	1,186	855	12.0	0.99	5.2	260	0.31	0.22	51	46	3.05	104	50
2		3.1	3.5		1,189					259			55	37	2.77	82	44
3		3.1	3.3		1,178					261			55	37	2.79	72	46
4		3.0	4.6		1,195					261			53	43	2.91	60	32
5		2.7	2.4	0.58	1,115	803	12.0	0.93	5.1	255	0.31	0.22	47	43	3.24	52	52
6		2.6	2.5	0.70	1,268	927	13.0	0.98	3.2	254	0.37	0.27	46	43	3.34	70	54
7		2.7	3.1	0.45	1,417	1,079	16.0	0.89	1.0	252	0.38	0.29	47	49	3.20	54	52
8		2.8	3.3	0.93	1,427	1,090	19.0	0.75	3.0	253	0.39	0.29	50	63	3.08	118	50
9		2.7	2.2		1,412					256			48	65	3.20	128	72
10		2.9	2.5		1,447					259			51	58	3.00	120	68
11		2.7	2.6	0.44	1,386	1,087	20.0	0.69	5.1	258	0.36	0.28	49	59	3.17	54	60
12		2.7	2.4	0.95	1,414	1,119	21.0	0.67	3.1	260	0.34	0.27	47	59	3.23	118	66
13		2.7	2.5	0.43	1,477	1,187	23.5	0.63	1.8	261	0.38	0.31	48	65	3.24	56	66
14		2.8	2.9	0.30	1,506	1,211	23.0	0.65	3.9	259	0.38	0.30	49	65	3.13	42	60
15		2.7	2.5	0.43	1,381	1,104	19.0	0.73	4.1	260	0.37	0.29	49	65	3.15	54	62
16		2.9	2.5		1,437					263			52	65	2.98	104	70
17		2.9	2.7		1,405					262			52	65	2.96	26	64
18		2.8	2.7	0.48	1,265	969	17.0	0.74	5.5	259	0.33	0.26	49	58	3.12	54	54
19		2.7	2.7	0.45	1,364	1,090	17.5	0.78	4.3	260	0.37	0.29	50	65	3.16	56	58
20		2.7	3.4	0.50	1,331	1,038	17.0	0.78	5.7	255	0.35	0.29	47	65	3.24	58	44
21		2.6	2.4	0.52	1,261	989	15.0	0.84	5.4	256	0.35	0.27	51	58	3.32	56	56
22		2.8	2.6	1.12	1,355	1,040	15.0	0.90	5.1	262	0.36	0.27	49	60	3.07	136	62
23		3.0	4.2		1,423					274			53	66	2.90	78	42
24		3.0	4.1		1,474					273			54	58	2.84	62	46
25		2.6	2.4	0.65	1,278	994	16.0	0.80	5.9	265	0.37	0.28	47	58	3.30	70	58
26		2.7	2.5	0.85	1,465	1,114	20.0	0.73	3.3	270	0.38	0.28	50	58	3.15	108	68
27		2.8	2.8	0.55	1,527	1,166	21.0	0.73	2.2	270	0.37	0.28	52	65	3.04	76	64
28		2.9	3.3	0.91	1,476	1,129	20.0	0.74	5.9	264	0.38	0.28	51	65	2.98	124	54
29		2.9	2.5	0.79	1,494	1,146	20.0	0.75	4.1	268	0.36	0.27	51	65	3.01	108	70
30		2.9	2.5		1,524					266			52	69	2.99	126	72
31																	
Total	48	84.0	86.3	13.07	41,077	21,137	357.0	15.70	82.9	7,835	7.21	5.51	1,505	1,737	92.56	2,426	1,716
Max.	48	3.1	4.6	1.12	1,527	1,211	23.5	0.99	5.9	274	0.39	0.31	55	69	3.34	136	72
Min.	48	2.6	2.2	0.30	1,115	803	12.0	0.63	1.0	252	0.31	0.22	46	37	2.77	26	32
Avg.	48	2.8	2.9	0.65	1,369	1,057	17.9	0.78	4.1	261	0.36	0.28	50	58	3.09	81	57

Robert J. Swalwell
Superintendent

MARSHALL WWTP 801 W. PEARL ST. MARSHALL MI. 49068- PERMIT No. MI0023540
SEPTEMBER, 1989 - DISCHARGE MONITORING REPORT - DISCHARGE No. 001A

	F.Eff. D.O. mgIL	F.Eff. pH SU	F.Eff. SS mgIL	F.Eff. SS Lbs.	F.Eff. Total-P mgIL	Flow MGD	F.Eff. Chlorine mgIL	F.Eff. BOD mgIL	F.Eff. BOD Lbs.	F.Eff. NH3 as N mgIL	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %
Limit-	>4.0	6 & 9	30 & 45	751 & ^1,126	<1.0			20 & 30	500 & ^751	<11.0	7 Day ^275	200 & 400	>85%	>85%	
PN-	^00300	^00400	^00530	^00530	^00665	^50050	^50060	^80082	^80082	^00610	^00610	^31616	^81011	^91267	^81012
Day			X	X				X	X		X				
1	6.3	7.3	3	76	0.30	3.05	0.49	4	102	6.1	155	68	96	96	85
2	6.0	8.1	4	92	0.38	2.77	0.50	5	116	4.5	104	14	95	95	82
3	5.8	7.6	2	47	0.35	2.79	0.45	4	93	4.9	114	60	96	96	86
4	5.7	7.6	5	121	0.37	2.91	0.32	4	97	4.4	107	20	92	96	90
5	6.6	7.4	6	162	0.48	3.24	0.26	5	135	5.8	157	52	94	96	84
6	6.3	7.2	7	195	0.53	3.34	0.47	3	84	4.6	128	60	92	98	77
7	5.8	7.2	7	187	0.27	3.20	0.36	10	267	4.9	131	62	91	88	88
8	5.7	7.3	5	128	0.35	3.08	0.47	6	154	6.7	172	70	93	95	85
9	5.6	7.3	9	240	0.91	3.20	0.45	6	160	7.0	187	64	92	96	80
10	5.6	7.4	6	150	0.78	3.00	0.42	5	125	5.2	130	12	91	96	59
11	6.0	7.3	9	238	0.46	3.17	0.33	4	106	6.7	177	320	90	96	83
12	5.8	7.4	6	162	0.46	3.23	0.18	6	162	6.9	186	92	93	95	86
13	5.6	7.4	11	297	0.97	3.24	0.37	6	162	7.4	200	320	89	93	66
14	5.7	7.4	17	444	0.78	3.13	0.47	6	157	5.6	146	62	72	91	65
15	5.3	7.5	13	342	0.50	3.15	0.30	4	105	6.9	181	30	85	96	84
16	5.5	7.4	6	149	0.97	2.98	0.25	6	149	6.5	162	78	93	95	68
17	6.2	7.5	9	222	0.50	2.96	0.42	1	25	5.2	128	20	88	98	72
18	5.9	7.4	5	130	0.32	3.12	0.37	3	78	5.1	133	16	94	97	88
19	6.2	7.3	5	132	0.70	3.16	0.40	3	79	5.5	145	24	94	97	79
20	6.3	7.4	2	54	0.91	3.24	0.32	4	108	5.8	157	60	97	96	79
21	6.3	7.2	5	138	0.89	3.32	0.31	4	111	9.4	260	26	96	96	65
22	5.7	7.3	7	179	0.51	3.07	0.18	8	205	10.3	264	56	92	94	81
23	5.0	7.6	10	242	0.71	2.90	0.50	7	169	10.1	244	16	87	93	69
24	6.1	7.4	11	261	0.41	2.84	0.30	4	95	5.2	123	16	87	95	78
25	6.5	7.5	7	193	0.28	3.30	0.25	4	110	7.9	217	54	93	96	92
26	6.0	7.2	4	105	0.35	3.15	0.46	4	105	7.6	200	34	95	97	88
27	6.1	7.3	9	228	0.38	3.04	0.45	5	127	6.3	160	80	87	94	82
28	6.6	7.3	2	50	0.58	2.98	0.47	6	149	6.8	169	32	97	95	81
29	6.0	7.2	6	151	0.46	3.01	0.43	6	151	6.7	168	60	92	95	84
30	5.9	7.3	6	150	0.95	2.99	0.38	8	199	4.0	100	84	93	94	83
31															
Total	178.1	221.7	204	5,265	16.81	92.56	11.33	151	3,883	190.0	4,904	1,962	2,746	2,855	2,389
Max.	6.6	8.1	17	444	0.97	3.34	0.50	10	267	10.3	264	320	97	98	92
Min.	5.0	7.2	2	47	0.27	2.77	0.18	1	25	4.0	100	12	72	88	59
Avg.	5.9	7.4	7	175	0.56	3.09	0.38	5	129	6.3	163	46	92	95	80
			10	268				6	162		210				

Robert J. Swalwell
Superintendent

MARSHALL , MICHIGAN WASTEWATER TREATMENT PLANT
SEPTEMBER, 1989 - MISCELLOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	Other	Raw Sludge Gals.	Raw Sludge Total Solids Percent	Raw Sludge Vol. Solids Percent	Raw Sludge pH
1		2,640	500	22	298		7,000	4.4	68	6.0
2		2,640	430	16	199		5,000	3.8	72	6.2
3		2,760	420	15	298		5,000	3.6	74	6.1
4		2,520	730	18	298		4,000	3.7	72	6.0
5		2,640	380	19	298		6,000	3.8	74	6.0
6		2,640	540	18	199		6,000	3.9	73	5.9
7		2,640	490	20	298		6,000	4.4	71	5.7
8		2,640	560	20	298		6,000	4.2	75	5.9
9		2,640	410	20	298		4,000	3.6	72	5.8
10		2,520	500	24	298		4,000	4.2	77	5.7
11		2,640	460	14	199		7,000	4.3	73	5.8
12		2,640	1,550	17	298		7,000	4.0	76	5.8
13		2,760	480	25	298		7,000	4.5	71	6.0
14		2,640	480	22	298		7,000	4.9	74	5.0
15		2,640	530	26	298		7,000	4.8	72	5.6
16		2,640	480	19	298		4,000	5.1	77	5.8
17		2,640	460	23	298		4,000	4.4	75	5.8
18		2,640	530	15	199		6,000	4.3	73	5.8
19		2,640	590	22	298		7,000	5.1	71	5.6
20		2,760	730	19	199		7,000	5.1	78	5.8
21		2,640	720	25	298		8,000	4.3	75	5.7
22		2,880	600	24	298		8,000	3.7	76	5.8
23		2,640	480	26	397		4,000	3.6	76	5.6
24		2,640	540	25	199		4,000	3.9	75	6.1
25		2,760	300	29	794		14,200	3.8	78	5.7
26		2,760	430	22	397		6,000	4.2	75	6.4
27		2,880	510	28	298		6,000	4.4	78	6.1
28		2,760	460	30	298		12,000	4.5	70	5.9
29		2,640	340	27	199		4,500	4.3	74	5.9
30		2,640	450	15	397		4,000	4.8	77	5.7
31										
Total		80,160	16,080	645	9,040		186,700	127.6	2,222	175.2
Max.		2,880	1,550	30	794		14,200	5.1	78	6.4
Min.		2,520	300	14	199		4,000	3.6	68	5.0
Avg.		2,672	536	22	301		6,223	4.3	74	5.8

Manpower & Hours

	Total Hr
Superintendent 1	^160
Asst. Supt. 1	^160
Operators 3	^484
Total	^804

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
OCTOBER, 1989 - PLANT INFLUENT SHEET - SAMPLING CODE 500

	Weather		Inf. Flow	Inf. Temp	Inf. pH	Inf. BOD	Inf. BOD	Inf. SS	Inf. SS	Inf. Phos.	Inf. Phos.	Inf. VSS	Inf. NH3-N	--Remarks or Other Parameters--
	Type	Precip.	MGD	F	SU	mgIL	Lbs.	mgIL	Lbs.	mgIL	Lbs.	mgIL	mgIL	
PN-	^00033	^00045	^50050	^00011	^00400	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	
Day														
1	4	0.02	2.80	58	7.7	74	1,728	74	1,728	5.70	133	66		
2	4	0.03	3.05	59	7.4	118	3,002	72	1,831	3.50	89	68		
3	1		3.06	60	7.5	102	2,603	96	2,450	2.90	74	78		
4	1		2.91	59	7.2	106	2,573	68	1,650	2.20	53	62		
5	4	0.22	2.98	60	7.2	96	2,386	78	1,939	3.50	87	68		
6	1		2.88	59	7.3	118	2,834	100	2,402	3.65	88	86		
7	1		2.92	58	7.3	122	2,971	106	2,581	2.75	67	90		
8	3		2.77	58	7.6	104	2,403	74	1,710	2.20	51	46		
9	4	0.22	3.17	59	7.8	108	2,855	60	1,586	3.30	87	58		
10	1		2.96	60	7.2	120	2,962	68	1,679	2.75	68	62		
11	1		3.00	59	7.1	60	1,501	62	1,551	4.30	108	48		
12	1		3.04	58	7.4	120	3,042	88	2,231	4.30	109	76		
13	1		3.00	58	7.3	120	3,002	84	2,102	2.55	64	70		
14	1		2.98	57	7.5	120	2,982	92	2,286	4.45	111	72		
15	1		2.78	59	7.2	90	2,087	70	1,623	6.00	139	58		
16	4	0.04	3.10	59	7.3	104	2,689	108	2,792	2.75	71	96		
17	4	0.05	3.12	59	7.3	72	1,873	76	1,978	4.80	125	62		
18	5	0.22	3.02	59	7.2	180	4,534	114	2,871	2.40	60	98		
19	5	0.40	3.08	59	7.4	198	5,086	108	2,774	3.20	82	94		
20	4	0.25	3.10	59	7.1	108	2,792	128	3,309	3.65	94	88		
21	3		3.01	58	7.3	156	3,916	120	3,012	2.85	72	80		
22	1		2.80	58	7.2	118	2,756	94	2,195	2.75	64	72		
23	1		3.14	58	7.4	93	2,435	112	2,933	2.65	69	90		
24	1		3.15	59	7.3	136	3,573	110	2,890	3.50	92	98		
25	1		3.04	58	7.3	144	3,651	94	2,383	2.90	74	84		
26	1		2.99	58	7.3	87	2,169	72	1,795	2.40	60	68		
27	1		2.98	59	7.3	122	3,032	74	1,839	2.45	61	58		
28	1		2.63	56	7.5	130	2,851	52	1,141	2.65	58	32		
29	1		2.81	56	7.4	63	1,476	66	1,547	1.90	45	52		
30	4	0.16	3.06	59	7.2	92	2,348	68	1,735	1.95	50	52		
31	4	0.02	3.04	59	7.9	90	2,282	60	1,521	2.75	70	48		
Total	70	1.63	92.37	1,814	228.1	3,471	86,396	2,648	66,066	99.60	2,474	2,180		
Max.	5	0.40	3.17	60	7.9	198	5,086	128	3,309	6.00	139	98		
Min.	1	0.02	2.63	56	7.1	60	1,476	52	1,141	1.90	45	32		
Avg.	2	0.15	2.98	59	7.4	112	2,787	85	2,131	3.21	80	70		

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
OCTOBER, 1989 - PRIMARY EFFLUENT SHEET

	P Eff. BOD mg/L	P Eff. BOD Lbs.	P Eff. SS mg/L	P. Eff. SS Lbs.	P Eff. Phos. mg/L	P Eff. Phos. Lbs.	P Eff. VSS mg/L	P Eff. NH3-N mg/L	Flow MGD	BOD Prı. Removal %	SS Prı. Removal %	P Prı. Removal %
PN-	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	^50050			
Day												
1	72	1,681	58	1,354	4.95	116	40		2.80	3	22	13
2	104	2,645	58	1,475	3.85	98	54		3.05	12	19	0
3	90	2,297	76	1,940	3.00	77	58		3.06	12	21	0
4	102	2,475	52	1,262	2.45	59	46		2.91	4	24	0
5	68	1,690	76	1,889	3.65	91	66		2.98	29	3	0
6	112	2,690	72	1,729	3.10	74	64		2.88	5	28	15
7	82	1,997	64	1,559	3.10	75	44		2.92	33	39	0
8									2.77			
9	88	2,327	54	1,428	3.20	85	50		3.17	19	10	3
10	116	2,864	54	1,333	2.85	70	50		2.96	3	18	0
11	40	1,001	40	1,001	2.75	69	30		3.00	33	29	36
12	114	2,890	62	1,572	4.45	113	52		3.04	5	30	0
13	84	2,102	64	1,601	3.10	78	50		3.00	30	24	0
14	112	2,784	72	1,789	3.20	80	56		2.98	7	22	28
15	76	1,762	50	1,159	4.55	105	42		2.78	16	29	24
16	100	2,585	72	1,861	5.70	147	62		3.10	4	33	0
17	36	937	46	1,197	5.50	143	34		3.12	50	39	0
18	120	3,022	52	1,310	2.55	64	42		3.02	33	54	0
19	134	3,442	86	2,209	2.90	74	72		3.08	32	20	9
20	84	2,172	94	2,430	3.40	88	84		3.10	22	27	4
21	156	3,916	80	2,008	2.65	67	44		3.01	0	33	7
22	60	1,401	64	1,495	2.75	64	50		2.80	49	32	0
23	68	1,781	88	2,305	2.40	63	78		3.14	27	21	9
24	64	1,681	60	1,576	3.20	84	52		3.15	53	45	9
25	102	2,586	64	1,623	3.10	79	54		3.04	29	32	0
26	62	1,546	62	1,546	2.30	57	58		2.99	29	14	4
27	118	2,933	64	1,591	3.20	80	48		2.98	3	14	10
28	120	2,632	54	1,184	2.30	50	46		2.63	8	0	13
29	38	891	48	1,125	1.90	45	38		2.81	40	27	0
30	118	3,011	84	2,144	2.75	70	48		3.06	0	0	0
31	134	3,397	44	1,116	2.65	67	34		3.04	0	23	5
Total	2,774	69,139	1,914	47,811	97.45	2,432	1,546		92.37	590	732	189
Max.	156	3,916	94	2,430	5.70	147	84		3.17	53	54	36
Mın.	36	891	40	1,001	1.90	45	30		2.63	0	0	0
Avg.	92	2,305	64	1,594	3.25	81	52		2.98	20	24	6

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
OCTOBER, 1989 - ACTIVATED SLUDGE SHEET

	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading #/m	Mix Liq SS mg/L	Mix Liq VSS mg/L	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mg/L	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mg/l	PE SS mg/L
PN-	^80993	^81001	^80990	^80992	^70323	^70324	^81004	^81007	^00300	^81000	^81006	^70325	^81014	^80991	^50050	^00310	^00530
Day																	
1	48	3.1	3.4		1,690					263			56	69	2.80	98	63
2		2.8	2.9	0.69	1,556	1,269	20.0	0.78	4.4	267	0.42	0.33	52	69	3.05	103	63
3		2.8	2.6	0.77	1,420	1,104	18.0	0.79	4.9	270	0.39	0.30	50	69	3.06	100	65
4		3.0	2.7	0.79	1,388	1,062	18.0	0.77	5.4	269	0.37	0.28	53	65	2.91	104	63
5		2.9	2.4	0.79	1,305	1,012	16.0	0.82	5.5	265	0.34	0.26	52	65	2.98	96	66
6		3.0	2.6	0.71	1,365	1,078	17.5	0.78	2.5	267	0.40	0.31	54	65	2.88	96	66
7		3.0	2.7		1,405					272			53	65	2.92	90	65
8		3.1	3.0		1,481					273			57	69	2.77	90	65
9		2.7	2.2	0.83	1,257	977	16.0	0.79	6.5	269	0.34	0.25	48	69	3.17	92	65
10		2.9	2.5	0.78	1,307	990	15.0	0.87	5.1	264	0.39	0.29	51	69	2.96	94	64
11		2.9	2.7	0.71	1,312	1,018	15.0	0.87	4.8	262	0.35	0.27	51	69	3.00	87	59
12		2.8	2.4	0.79	1,231	950	14.0	0.88	5.4	267	0.34	0.26	52	58	3.04	89	60
13		2.9	2.8	0.73	1,339	1,039	15.0	0.89	4.1	264	0.33	0.26	51	58	3.00	91	58
14		2.9	2.9		1,379					262			51	65	2.98	91	58
15		3.1	3.5		1,556					263			54	65	2.78	90	57
16		2.8	2.7	0.74	1,372	1,072	15.0	0.91	3.0	263	0.34	0.27	49	75	3.10	92	59
17		2.8	2.4	0.69	1,230	1,006	14.0	0.88	4.9	272	0.32	0.25	48	75	3.12	80	58
18		2.9	2.3	0.93	1,150	831	13.0	0.88	4.3	272	0.31	0.23	51	55	3.02	92	60
19		2.8	2.3	0.84	1,246	975	13.5	0.92	3.4	271	0.33	0.24	49	55	3.08	95	63
20		2.8	2.6	0.69	1,511	1,192	17.0	0.89	2.4	270	0.42	0.33	51	72	3.10	95	67
21		2.9	2.8		1,612					272			53	75	3.01	101	69
22		3.1	2.3		1,260					272			57	86	2.80	99	71
23		2.7	2.2	0.75	1,374	1,093	18.0	0.76	5.2	264	0.35	0.28	50	86	3.14	94	73
24		2.7	2.1	0.77	1,396	1,115	17.0	0.82	4.2	266	0.35	0.28	52	88	3.15	98	75
25		2.8	2.0	0.71	1,315	1,138	15.0	0.88	4.1	267	0.35	0.27	50	86	3.04	95	77
26		2.9	2.0	0.77	1,194	920	13.0	0.92	6.5	266	0.31	0.23	51	75	2.99	85	73
27		2.9	2.0	0.83	1,151	898	13.0	0.89	4.6	267	0.32	0.25	51	66	2.98	90	69
28		3.3	2.7		1,291					271			58	52	2.63	85	65
29		3.1	2.6		1,303					281			57	55	2.81	82	63
30		2.8	2.3	0.80	1,215	947	12.5	0.97	6.5	263	0.34	0.27	52	55	3.06	89	62
31		2.8	2.6	0.83	1,314	1,012	13.0	1.01	5.2	271	0.33	0.25	52	55	3.04	99	60
Total	48	89.8	79.0	16.96	41,925	22,698	338.5	18.97	102.9	8,305	7.74	5.96	1,616	2,100	92.37	2,882	2,001
Max.	48	3.3	3.5	0.93	1,690	1,269	20.0	1.01	6.5	281	0.42	0.33	58	88	3.17	104	77
Min.	48	2.7	2.0	0.69	1,150	831	12.5	0.76	2.4	262	0.31	0.23	48	52	2.63	80	57
Avg.	48	2.9	2.5	0.77	1,352	1,032	15.4	0.86	4.7	268	0.35	0.27	52	68	2.98	93	65

Robert J. Swalwell
Superintendent

MARSHALL WWTP 801 W. PEARL ST. MARSHALL MI. 49068 - PERMIT No. MI0023540
OCTOBER, 1989 - DISCHARGE MONITORING REPORT - DISCHARGE No. 001A

	F.Eff. D.O. mgIL	F.Eff. pH SU	F.Eff. SS mgIL	F.Eff. SS Lbs.	F.Eff. Total-P mgIL	Flow MGD	F.Eff. Chlorine mgIL	F.Eff. BOD mgIL	F.Eff. BOD Lbs.	F.Eff. NH3 as N mgIL	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %
Limit-	>4.0	6 & 9	30 & 45	751 & ^1,126	<1.0			20 & 30	500 & ^751	<11.0	7 Day ^275	200 & 400	>85%	>85%	
PN-	^00300	^00400	^00530	^00530	^00665	^50050	^50060	^80082	^80082	^00610	^00610	^31616	^81011	^91267	^81012
Day			X	X				X	X			X			
1	6.0	7.1	11	257	1.00	2.80	0.36	6	140			300	85	92	82
2	6.0	7.4	5	127	0.80	3.05	0.49	5	127			360	93	96	77
3	6.2	7.2	15	383	0.90	3.06	0.43	6	153			216	84	94	69
4	6.8	7.4	11	267	0.55	2.91	0.42	6	146			268	84	94	75
5	6.5	7.4	8	199	0.78	2.98	0.31	4	99			150	90	96	78
6	5.4	7.2	9	216	0.85	2.88	0.35	5	120			284	91	96	77
7	5.7	7.3	4	97	0.42	2.92	0.44	6	146			118	96	95	85
8	5.6	7.1	15	347	0.76	2.77	0.38	8	185			288	80	92	65
9	5.0	7.4	11	291	0.62	3.17	0.40	7	185			84	82	94	81
10	4.3	7.2	5	123	0.90	2.96	0.10	7	173			80	93	94	67
11	6.1	7.3	12	300	0.47	3.00	0.17	5	125			100	81	92	89
12	6.2	7.3	9	228	0.82	3.04	0.24	6	152			62	90	95	81
13	5.3	7.2	2	50	0.97	3.00	0.30	5	125			70	98	96	62
14	6.0	7.1	4	99	0.97	2.98	0.40	8	199			52	96	93	78
15	6.0	7.5	10	232	1.00	2.78	0.19	8	185			38	86	91	83
16	5.9	7.2	8	207	0.87	3.10	0.41	5	129			212	93	95	68
17	6.4	7.3	8	208	0.58	3.12	0.37	5	130			106	89	93	88
18	6.5	7.3	14	353	0.48	3.02	0.22	6	151			160	88	97	80
19	6.3	7.2	17	437	0.79	3.08	0.30	13	334			110	84	93	76
20	5.2	7.3	17	440	0.47	3.10	0.12	14	362			360	87	87	87
21	5.4	7.3	18	452	0.37	3.01	0.08	14	351			200	85	91	87
22	5.1	7.8	8	187	0.19	2.80	0.49	7	163			14	91	94	93
23	6.5	7.3	6	157	0.28	3.14	0.47	3	79			48	95	97	89
24	7.4	7.2	8	210	0.56	3.15	0.36	5	131			86	93	96	84
25	6.8	7.2	5	127	0.85	3.04	0.30	5	127			162	95	97	71
26	6.8	7.4	8	199	0.46	2.99	0.30	4	100			360	89	95	81
27	6.7	7.2	6	149	0.46	2.98	0.30	8	199			94	92	93	81
28	6.3	7.5	4	88	0.42	2.63	0.40	6	132			64	92	95	84
29	6.6	7.5	10	234	0.37	2.81	0.40	3	70			6	85	95	81
30	6.8	7.3	3	77	0.27	3.06	0.45	3	77			18	96	97	86
31	6.3	7.3	4	101	0.47	3.04	0.40	7	177			100	93	92	83
Total	188.1	226.4	275	6,842	19.70	92.37	10.35	200	4,973			4,570	2,776	2,917	2,468
Max.	7.4	7.8	18	452	1.00	3.17	0.49	14	362			360	98	97	93
Min.	4.3	7.1	2	50	0.19	2.63	0.08	3	70			6	80	87	62
Avg.	6.1	7.3	9	221	0.64	2.98	0.33	6	160			227	90	94	80
			13	333				9	235						

Robert J. Swalwell

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
OCTOBER, 1989 - MISCELLOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	Other	Raw Sludge Gals.	Raw Sludge Total Solids Percent	Raw Sludge Vol. Solids Percent	Raw Sludge pH
1		2,640	360	20	298		4,000	4.9	78	5.7
2		2,640	440	22	199		6,000	4.7	79	5.4
3		2,880	430	21	298		15,000	4.6	77	5.9
4		2,760	410	21	298		7,000	4.9	76	5.9
5		2,760	380	21	199		7,000	4.1	78	5.8
6		2,760	440	19	298		16,300	2.9	75	5.8
7		2,760	310	16	397		4,000	4.1	76	5.7
8		2,880	400	18	298		4,000	4.7	77	5.6
9		2,880	430	26	298		4,000	4.1	76	5.7
10		2,880	420	16	199		15,000	4.0	75	5.7
11		2,760	390	21	199		5,000	4.1	79	5.6
12		2,760	410	26	298		6,000	4.1	82	5.6
13		2,760	470	24	298		16,000	4.3	83	5.5
14		2,640	420	9	199		4,000	3.8	79	5.7
15		2,640	400	18	199		4,000	4.2	80	5.7
16		2,760	450	18	199		15,000	3.9	73	5.5
17		3,000	440	22	298		6,000	4.4	81	5.5
18		3,120	490	21	298		5,000	4.7	82	5.6
19		3,000	410	25	298		3,000	4.1	81	5.8
20		3,000	490	40	298		12,400	4.0	74	6.6
21		3,000	430	26	397		4,000	4.2	76	5.8
22		2,760	370	31	298		4,000	4.2	77	5.7
23		2,880	690	32	397		17,000	3.9	76	5.8
24		2,760	310	23	298		6,000	4.4	73	5.8
25		2,760	540	23	397		5,500	4.2	76	5.6
26		2,640	570	22	298		16,000	3.2	77	5.7
27		2,760	450	21	298		5,000	4.7	77	5.7
28		2,520	460	25	397		5,000	5.0	75	5.8
29		2,640	540	19	199		5,000	4.9	63	5.8
30		2,760	540	23	298		12,500	5.9	76	5.7
31		2,760	480	20	298		2,500	4.7	75	5.6
Total		86,520	13,770	689	8,941		241,200	133.9	2,382	177.3
Max.		3,120	690	40	397		17,000	5.9	83	6.6
Min.		2,520	310	9	199		2,500	2.9	63	5.4
Avg.		2,791	444	22	288		7,781	4.3	77	5.7

Manpower & Hours

	Total Hr
Superintendent 1	^176
Asst. Supt. 1	^176
Operators 3	^528
Total	^880

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
NOVEMBER, 1989 - PLANT INFLUENT SHEET - SAMPLING CODE 500

	----Weather----		Inf. Flow	Inf. Temp	Inf. pH	Inf. BOD	Inf. BOD	Inf. SS	Inf. SS	Inf. Phos.	Inf. Phos.	Inf. VSS	Inf. NH3-N	--Remarks or Other Parameters--
	Type	Precip.	MGD	F	SU	mg/L	Lbs.	mg/L	Lbs.	mg/L	Lbs.	mg/L	mg/L	
PN-	^00033	^00045	^50050	^00011	^00400	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	
Day														
1	4	0.08	2.96	59	7.1	78	1,926	68	1,679	1.95	48	64		
2	5	0.02	3.02	58	7.4	117	2,947	74	1,864	2.55	64	62		
3	1		2.95	58	7.3	174	4,281	80	1,968	3.40	84	64		
4	1		2.63	59	7.2	51	1,119	46	1,009	2.40	53	40		
5	4	0.15	2.71	58	7.1	80	1,808	74	1,673	1.95	44	66		
6	4	0.33	3.01	57	7.2	62	1,556	80	2,008	2.40	60	66		
7	4	0.20	3.05	58	7.5	120	3,052	80	2,035	2.65	67	70		
8	4	0.03	3.13	58	7.4	102	2,663	114	2,976	2.85	74	84		
9	4	0.12	3.01	58	7.3	159	3,991	56	1,406	2.65	67	48		
10	1		3.01	57	7.4	94	2,360	68	1,707	2.75	69	58		
11	4	0.12	2.64	57	7.9	70	1,541	74	1,629	2.45	54	54		
12	1		2.73	55	7.4	93	2,117	130	2,960	1.90	43	110		
13	1		2.99	57	7.3	144	3,591	68	1,696	2.90	72	58		
14	4	1.45	3.25	57	7.4	75	2,033	86	2,331	3.00	81	74		
15	4&5	0.74	3.29	57	7.3	177	4,857	82	2,250	2.90	80	66		
16	5	0.05	3.29	57	7.4	123	3,375	120	3,293	1.95	54	96		
17	5	0.10	3.18	57	7.3	69	1,830	88	2,334	2.30	61	72		
18	5	0.04	2.80	57	8.2	66	1,541	94	2,195	1.95	46	76		
19	1		2.90	54	7.3	90	2,177	40	967	1.65	40	32		
20	5	0.02	3.20	56	7.3	84	2,242	84	2,242	2.20	59	48		
21	3		3.12	57	7.3	112	2,914	76	1,978	2.45	64	66		
22	3		2.99	56	7.2	102	2,544	68	1,696	2.05	51	50		
23	3		2.69	54	7.2	76	1,705	52	1,167	2.10	47	42		
24	3		2.72	54	7.1	66	1,497	70	1,588	1.65	37	62		
25	3		2.75	54	7.5	102	2,339	66	1,514	1.70	39	48		
26	1		2.83	53	7.1	66	1,558	60	1,416	1.80	42	50		
27	4	0.12	3.19	56	7.3	112	2,980	68	1,809	2.30	61	58		
28	3		3.08	56	7.3	99	2,543	62	1,593	2.30	59	52		
29	3		3.01	56	7.3	102	2,561	72	1,807	3.00	75	62		
30	3		3.00	56	7.7	62	1,551	76	1,902	2.40	60	60		
31														
Total	92	3.57	89.13	1,696	220.7	2,927	73,198	2,276	56,689	70.50	1,756	1,858		
Max.	5	1.45	3.29	59	8.2	177	4,857	130	3,293	3.40	84	110		
Min.	1	0.02	2.63	53	7.1	51	1,119	40	967	1.65	37	32		
Avg.	3	0.24	2.97	57	7.4	98	2,440	76	1,890	2.35	59	62		

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
NOVEMBER, 1989 - PRIMARY EFFLUENT SHEET

	P Eff. BOD mg/L	P Eff. BOD Lbs.	P Eff. SS mg/L	P. Eff. SS Lbs.	P Eff. Phos. mg/L	P Eff. Phos. Lbs.	P Eff. VSS mg/L	P Eff. NH3-N mg/L	Flow MGD	BOD Pri. Removal %	SS Pri. Removal %	P Pri. Removal %
PN-	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	^50050			
Day												
1	72	1,777	48	1,185	1.90	47	44		2.96	8	29	2
2	126	3,174	54	1,360	2.30	58	46		3.02	0	27	10
3	126	3,100	58	1,427	3.30	81	52		2.95	26	29	3
4	30	658	42	921	2.75	60	34		2.63	37	9	0
5									2.71			
6	122	3,063	60	1,506	2.30	58	28		3.01	0	25	4
7	122	3,103	46	1,170	2.85	72	38		3.05	0	43	0
8	114	2,976	48	1,253	2.55	67	38		3.13	0	58	11
9	122	3,063	48	1,205	2.55	64	42		3.01	23	14	4
10	80	2,008	60	1,506	2.90	73	42		3.01	15	12	0
11	54	1,189	62	1,365	2.65	58	38		2.64	23	16	0
12	122	2,778	48	1,093	1.95	44	30		2.73	0	63	0
13	128	3,192	66	1,646	2.85	71	60		2.99	11	5	2
14	82	2,223	60	1,626	2.65	72	52		3.25	0	30	8
15	118	3,238	48	1,317	3.00	82	46		3.29	33	41	0
16	96	2,634	72	1,976	2.05	56	48		3.29	22	40	0
17	38	1,008	64	1,697	2.30	61	52		3.18	45	27	0
18	116	2,709	74	1,728	2.65	62	60		2.80	0	21	0
19	104	2,515	48	1,161	2.05	50	40		2.90	0	0	0
20	102	2,722	52	1,388	2.10	56	26		3.20	0	38	0
21	122	3,175	56	1,457	2.40	62	54		3.12	0	26	2
22	112	2,793	48	1,197	2.30	57	40		2.99	0	29	0
23	52	1,167	32	718	2.05	46	24		2.69	32	38	0
24	58	1,316	46	1,044	1.90	43	42		2.72	12	35	0
25	96	2,202	54	1,238	1.65	38	46		2.75	6	23	3
26	94	2,219	28	661	1.70	40	20		2.83	0	53	0
27	116	3,086	42	1,117	2.55	68	34		3.19	0	38	0
28	78	2,004	47	1,207	2.40	62	36		3.08	21	24	0
29	64	1,607	52	1,305	2.40	60	38		3.01	37	28	20
30	74	1,851	66	1,651	2.55	64	50		3.00	0	13	0
31												
Total	2,740	68,547	1,529	38,127	69.55	1,733	1,200		89.13	351	834	69
Max.	128	3,238	74	1,976	3.30	82	60		3.29	45	63	20
Min.	30	658	28	661	1.65	38	20		2.63	0	0	0
Avg.	94	2,364	53	1,315	2.40	60	41		2.97	12	29	2

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
NOVEMBER, 1989 - ACTIVATED SLUDGE SHEET

	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading #/m	Mix Liq SS mg/L	Mix Liq VSS mg/L	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mg/L	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mg/l	PE SS mg/L
PN-	^80993	^81001	^80990	^80992	^70323	^70324	^81004	^81007	^00300	^81000	^81006	^70325	^81014	^80991	^50050	^00310	^00530
Day																	
1	48	2.9	3.4	0.57	1,344	1,045	13.5	1.00	4.5	271	0.33	0.26	52	60	2.96	72	48
2		2.9	2.8	1.19	1,275	892	13.0	0.98	5.5	272	0.33	0.25	52	60	3.02	126	54
3		2.9	2.7	1.01	1,300	1,023	13.0	1.00	5.3	271	0.35	0.28	51	59	2.95	126	58
4		3.3	4.7		1,457					272			58	59	2.63	30	42
5		3.2			1,281					269			58	72	2.71		
6		2.9	2.3	1.14	1,163	899	12.5	0.93	5.5	268	0.32	0.24	51	55	3.01	122	60
7		2.8	3.3	1.03	1,278	1,009	13.0	0.98	4.9	268	0.35	0.28	50	55	3.05	122	46
8		2.8	3.2	0.97	1,326	1,028	13.5	0.98	4.3	270	0.37	0.28	56	55	3.13	114	48
9		2.9	3.1	1.03	1,266	990	13.5	0.94	4.8	266	0.29	0.23	55	55	3.01	122	48
10		2.9	2.6	0.66	1,289	1,020	14.0	0.92	3.2	271	0.34	0.27	54	60	3.01	80	60
11		3.3	2.9		1,319					272			60	60	2.64	54	62
12		3.2	3.3		1,215					273			57	60	2.73	122	48
13		2.9	2.0	1.22	1,121	874	13.0	0.86	6.3	262	0.29	0.22	52	60	2.99	128	66
14		2.7	2.2	0.77	1,210	960	13.5	0.90	5.2	262	0.33	0.26	48	60	3.25	82	60
15		2.6	2.7	1.16	1,204	930	13.5	0.89	4.2	267	0.33	0.28	47	60	3.29	118	48
16		2.6	1.9	0.93	1,223	941	15.0	0.82	4.5	273	0.37	0.28	48	60	3.29	96	72
17		2.7	2.0	0.39	1,158	869	14.0	0.83	4.6	275	0.30	0.23	49	50	3.18	38	64
18		3.1	2.0		1,157					279			55	50	2.80	116	74
19		3.0	3.0		1,174					271			52	50	2.90	104	48
20		2.7	2.3	1.14	1,073	801	14.5	0.74	6.0	270	0.33	0.24	49	43	3.20	102	52
21		2.8	2.4	1.22	1,163	870	16.0	0.73	2.9	276	0.33	0.25	49	43	3.12	122	56
22		2.9	3.4	0.99	1,349	946	17.0	0.79	5.7	277	0.35	0.26	52	49	2.99	112	48
23		3.2	5.2		1,243					279			58	49	2.69	52	32
24		3.2	3.3		1,133					274			57	40	2.72	58	46
25		3.1	2.7		1,104					272			56	40	2.75	96	54
26		3.0	5.1		1,128					274			54	40	2.83	94	28
27		2.7	2.9	1.26	1,085	817	15.5	0.70	6.2	265	0.32	0.24	48	35	3.19	116	42
28		2.8	3.1	0.71	1,243	936	17.0	0.73	6.8	267	0.37	0.28	51	35	3.08	78	47
29		2.9	3.0	0.53	1,327	1,016	19.0	0.70	5.7	275	0.38	0.29	51	40	3.01	64	52
30		2.9	2.4	0.59	1,349	1,040	20.0	0.67	5.1	274	0.40	0.31	52	49	3.00	74	66
31																	
Total	48	87.4	86.1	18.51	36,957	18,906	294.0	17.09	101.2	8,135	6.78	5.23	1,582	1,563	89.13	2,740	1,529
Max.	48	3.3	5.2	1.26	1,457	1,045	20.0	1.00	6.8	279	0.40	0.31	60	72	3.29	128	74
Min.	48	2.6	1.9	0.39	1,073	801	12.5	0.67	2.9	262	0.29	0.22	47	35	2.63	30	28
Avg.	48	2.9	3.0	0.93	1,232	945	14.7	0.85	5.1	271	0.34	0.26	53	52	2.97	94	53

Robert J. Swalwell
Superintendent

MARSHALL WWTP 801 W. PEARL ST. MARSHALL MI. 49068 - PERMIT No. MI0023540
NOVEMBER, 1989 - DISCHARGE MONITORING REPORT - DISCHARGE No. 001A

	F.Eff. D.O. mg/L	F.Eff. pH SU	F.Eff. SS mg/L	F.Eff. SS Lbs.	F.Eff. Total-P mg/L	Flow MGD	F.Eff. Chlorine mg/L	F.Eff. BOD mg/L	F.Eff. BOD Lbs.	F.Eff. NH3 as N mg/L	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %
Limit-	>4.0	6 & 9	30 & 45	751 & ^1,126	<1.0			20 & 30	500 & ^751	<11.0	7 Day ^275	200 & 400	>85%	>85%	
PN-	^00300	^00400	^00530	^00530	^00665	^50050	^50060	^80082	^80082	^00610	^00610	^31616	^81011	^91267	^81012
Day															
1	3.8	7.1	9	222	0.46	2.96		5	123				87	94	76
2	4.9	7.3	14	353	0.50	3.02		10	252				81	91	80
3	4.9	7.3	17	418	0.74	2.95		10	246				79	94	78
4	3.2	7.1	8	175	0.80	2.63		7	154				83	86	67
5	4.0	7.2	6	136	0.42	2.71		5	113				92	94	78
6	6.0	7.1	11	276	0.56	3.01		6	151				86	90	77
7	5.0	7.3	12	305	0.61	3.05		5	127				85	96	77
8	4.8	7.2	10	261	0.58	3.13		8	209				91	92	80
9	5.4	7.3	9	226	0.80	3.01		6	151				84	96	70
10	4.6	7.2	9	226	0.78	3.01		5	126				87	95	72
11	5.2	7.2	13	286	0.82	2.64		7	154				82	90	67
12	5.4	7.3	11	250	0.91	2.73		10	228				92	89	53
13	6.1	7.4	6	150	0.40	2.99		5	125				91	97	83
14	5.0	7.3	10	271	0.68	3.25		6	163				88	92	77
15	5.1	7.3	7	192	0.53	3.29		7	192				91	96	81
16	5.1	7.3	12	329	0.50	3.29		8	220				90	93	76
17	5.3	7.4	10	265	0.70	3.18		5	133				87	93	70
18	6.1	7.6	7	163	0.62	2.80		8	187				93	88	68
19	6.0	7.4	7	169	0.64	2.90		7	169				83	92	61
20	6.0	7.4	6	160	0.46	3.20		5	133				93	94	79
21	5.6	7.4	11	286	0.97	3.12		10	260				86	91	60
22	4.5	7.1	9	224	0.71	2.99		8	199				87	92	65
23	5.1	7.2	11	247	0.58	2.69		5	112				79	93	72
24	5.7	7.4	9	204	0.46	2.72		4	91				87	94	83
25	5.2	7.4	9	206	0.48	2.75		5	115				86	95	72
26	6.4	7.1	8	189	0.46	2.83		5	118				87	92	74
27	6.1	7.2	6	160	0.48	3.19		9	239				91	92	79
28	6.0	7.3	9	231	0.66	3.08		8	205				85	92	71
29	5.9	7.2	12	301	0.64	3.01		5	126				83	95	79
30	4.8	7.5	9	225	0.62	3.00		3	75				86	95	74
31															
Total	157.2	218.5	287	7,109	18.57	89.13		197	4,894				2,602	2,783	2,199
Max.	6.4	7.6	17	418	0.97	3.29		10	260				93	97	83
Min.	3.2	7.1	6	136	0.40	2.63		3	75				79	86	53
Avg.	5.2	7.3	10	237	0.62	2.97		7	163				87	93	73

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
NOVEMBER, 1989 - MISCELLOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	Other	Raw Sludge Gals.	Raw Sludge Total Solids Percent	Raw Sludge Vol. Solids Percent	Raw Sludge pH
1	3,600	2,880	510		397		3,000	4.4	76	5.6
2	6,300	3,000	510		298		2,000	4.7	78	5.7
3	6,500	2,880	580		298		16,500	4.7	71	5.6
4	5,000	2,880	430		298		2,000	4.8	75	5.5
5	3,300	2,760	570		298		4,000	4.8	77	5.4
6	4,700	2,880	540		199		15,000	4.6	76	5.5
7	5,100	2,880	460		397		3,500	5.0	78	5.7
8	4,300	2,880	490		199		1,700	4.9	75	5.7
9	5,300	3,000	430		397		2,000			
10	5,600	2,880	690		199		3,000	4.8	69	6.2
11	5,300	2,760	300		298		3,000	4.8	76	5.5
12	5,700	2,880	460		199		3,000	5.0	75	5.6
13	1,500	2,760	420		298		5,000	4.4	75	5.6
14	900	2,760	520		298		15,500	4.1	77	5.7
15	5,600	2,880	430		298		10,000	4.6	74	5.7
16	7,400	3,000	520		397		4,000	4.4	70	5.7
17	8,800	3,120	470		298		4,000	4.5	73	5.7
18	9,900	3,000	390		298		2,000	4.8	77	5.8
19	5,900	2,880	420		298		2,000	4.0	74	5.8
20	6,000	3,000	560		199		14,000	4.2	76	5.6
21	8,300	3,000	570		298		12,000	4.1	75	5.7
22	9,100	3,120	620		397		16,000	4.0	73	5.7
23	9,400	3,000	560		199		10,000	3.7	74	5.9
24	7,000	3,000	450		298		9,000	3.7	76	5.8
25	5,100	2,880	540		298		7,000	3.2	72	6.2
26	5,000	2,880	490		298		6,000	3.3	76	6.2
27	4,000	2,880	560		298		6,000	3.8	78	6.0
28	8,000	3,120	520		397		5,000	3.7	78	6.1
29	8,700	3,000	480		298		6,000	3.8	75	6.0
30	7,400	3,000	310		298		2,500	4.2	78	5.8
31										
Total	178,700	87,840	14,800		8,940		194,700	125.0	2,177	167.0
Max.	9,900	3,120	690		397		16,500	5.0	78	6.2
Min.	900	2,760	300		199		1,700	3.2	69	5.4
Avg.	5,957	2,928	493		298		6,490	4.3	75	5.8

Manpower & Hours

	Total Hr
Superintendent 1	^160
Asst. Supt. 1	^160
Operators 3	^488
Total	^808

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
DECEMBER , 1989 - PLANT INFLUENT SHEET - SAMPLING CODE 500

	----Weather----		Inf. Flow	Inf. Temp	Inf. pH	Inf. BOD	Inf. BOD	Inf. SS	Inf. SS	Inf. Phos.	Inf. Phos.	Inf. VSS	Inf. NH3-N	--Remarks or Other Parameters--
	Type	Precip.	MGD	F	SU	mgIL	Lbs.	mgIL	Lbs.	mgIL	Lbs.	mgIL	mgIL	
PN-	^00033	^00045	^50050	^00011	^00400	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	
Day														
1	1		2.97	55	7.4	122	3,022	82	2,031	2.40	59	72		
2	5	0.04	2.72	56	7.3	82	1,860	88	1,996	2.45	56	80		
3	5	0.03	2.77	54	7.4	174	4,020	84	1,941	2.20	51	70		
4	1		3.08	56	7.3	63	1,618	82	2,106	2.55	66	72		
5	1		3.05	56	7.1	80	2,035	82	2,086	3.20	81	70		
6	1		3.00	56	7.3	69	1,726	80	2,002	2.75	69	66		
7	1		2.98	56	7.5	171	4,250	76	1,889	3.30	82	62		
8	1		2.99	56	7.5	81	2,020	82	2,045	3.85	96	70		
9	1		2.72	55	7.3									
10	5	0.02	2.75	54	7.6	57	1,307	60	1,376	2.05	47	52		
11	5	0.01	2.91	54	7.4	90	2,184	82	1,990	2.85	69	70		
12	5	0.02	3.03	55	8.4	114	2,881	86	2,173	3.00	76	64		
13	5	0.03	2.91	55	7.4	135	3,276	72	1,747	3.20	78	52		
14	5	0.01	2.99	55	7.3	90	2,244	88	2,194	2.40	60	78		
15	5	0.02	3.00	54	7.4	120	3,002	82	2,052	4.20	105	54		
16	3		2.68	53	7.5	66	1,475	82	1,833	2.30	51	60		
17	5	0.01	2.75	52	7.4	66	1,514	54	1,238	1.70	39	44		
18	5	0.08	3.02	55	7.4	63	1,587	92	2,317	2.20	55	84		
19	5	0.03	2.87	55	7.5	87	2,082	76	1,819	3.75	90	70		
20	5	0.04	2.91	54	7.5	96	2,330	72	1,747	3.20	78	62		
21	1		2.91	54	7.4	126	3,058	98	2,378	6.85	166	80		
22	1		2.97	53	7.6	126	3,121	104	2,576	3.50	87	82		
23	1		2.65	53	7.5	58	1,282	64	1,414	3.20	71	54		
24	5	0.01	2.54	52	7.4	84	1,779	64	1,356	2.45	52	50		
25	5	0.10	2.57	51	7.4	54	1,157	74	1,586	1.80	39	58		
26	5	0.03	2.68	51	7.4	87	1,945	64	1,430	1.65	37	54		
27	5	0.03	2.70	51	7.3	57	1,284	66	1,486	2.05	46	54		
28	1		2.71	51	7.4	90	2,034	68	1,537	2.20	50	56		
29	5	0.22	2.66	51	7.6	66	1,464	64	1,420	2.30	51	62		
30	4	0.38	2.65	50	7.3	102	2,254	60	1,326	2.05	45	56		
31	5	0.04	2.67	50	7.3	57	1,269	60	1,336	1.90	42	58		
Total	108	1.15	87.81	1,663	230.5	2,733	65,082	2,288	54,430	83.50	1,993	1,916		
Max.	5	0.38	3.08	56	8.4	174	4,250	104	2,576	6.85	166	84		
Min.	1	0.01	2.54	50	7.1	54	1,157	54	1,238	1.65	37	44		
Avg.	3	0.06	2.83	54	7.4	91	2,169	76	1,814	2.78	66	64		

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
DECEMBER, 1989 - PRIMARY EFFLUENT SHEET

	P Eff. BOD mgIL	P Eff. BOD Lbs.	P Eff. SS mgIL	P. Eff. SS Lbs.	P Eff. Phos. mgIL	P Eff. Phos. Lbs.	P Eff. VSS mgIL	P Eff. NH3-N mgIL	Flow MGD	BOD Pri. Removal %	SS Pri. Removal %	P Pri. Removal %
PN-	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	^50050			
Day												
1	106	2,626	56	1,387	2.45	61	50		2.97	13	32	0
2	86	1,951	50	1,134	2.10	48	46		2.72	0	43	14
3	104	2,403	60	1,386	2.65	61	40		2.77	40	29	0
4	48	1,233	50	1,284	2.20	57	48		3.08	24	39	14
5	46	1,170	62	1,577	2.55	65	50		3.05	43	24	20
6	54	1,351	56	1,401	2.90	73	48		3.00	22	30	0
7	122	3,032	72	1,789	2.75	68	64		2.98	29	5	17
8	60	1,496	58	1,446	3.40	85	48		2.99	26	29	12
9									2.72			
10	42	963	50	1,147	2.45	56	42		2.75	26	16	0
11	48	1,165	70	1,699	2.85	69	60		2.91	47	15	0
12	76	1,921	68	1,718	2.90	73	54		3.03	33	21	3
13	74	1,796	76	1,844	3.30	80	62		2.91	45	0	0
14	72	1,795	78	1,945	2.90	72	70		2.99	20	11	0
15	102	2,552	80	2,002	3.75	94	60		3.00	15	2	11
16									2.68			
17	54	1,238	68	1,560	2.45	56	60		2.75	18	0	0
18	100	2,519	68	1,713	2.45	62	54		3.02	0	26	0
19	60	1,436	70	1,676	3.30	79	64		2.87	31	8	12
20	64	1,553	78	1,893	3.00	73	66		2.91	33	0	6
21	90	2,184	68	1,650	3.10	75	58		2.91	29	31	55
22	90	2,229	78	1,932	2.90	72	72		2.97	20	25	17
23	50	1,105	66	1,459	2.05	45	60		2.65	14	0	39
24	98	2,076	58	1,229	3.00	64	52		2.54	0	9	0
25	36	772	62	1,329	1.90	41	54		2.57	33	16	0
26	58	1,296	66	1,475	1.95	44	50		2.68	33	0	0
27	44	991	76	1,711	2.30	52	58		2.70	23	0	0
28	74	1,673	58	1,311	2.30	52	48		2.71	18	15	0
29	72	1,597	72	1,597	2.65	59	68		2.66	0	0	0
30	86	1,901	76	1,680	1.90	42	74		2.65	16	0	7
31	56	1,247	54	1,202	1.80	40	52		2.67	2	10	5
Total	2,072	49,271	1,904	45,177	76.20	1,816	1,632		87.81	653	436	232
Max.	122	3,032	80	2,002	3.75	94	74		3.08	47	43	55
Min.	36	772	50	1,134	1.80	40	40		2.54	0	0	0
Avg.	71	1,699	66	1,558	2.63	63	56		2.83	23	15	8

Robert J. Swalwell
Superintendent

MARSHALL,MICHIGAN WASTEWATER TREATMENT PLANT
DECEMBER , 1989 - ACTIVATED SLUDGE SHEET

	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading #/M	Mix Liq SS mg/L	Mix Liq VSS mg/L	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mg/L	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mg/l	PE SS mg/L
PN-	^80993	^81001	^80990	^80992	^70323	^70324	^81004	^81007	^00300	^81000	^81006	^70325	^81014	^80991	^50050	^00310	^00530
Day																	
1	48	2.9	3.6	0.67	1,441	1,111	22.0	0.66	3.8	272	0.39	0.30	51	58	2.97	90	49
2		3.2	3.9		1,433					276			57	58	2.72	88	49
3		3.1	3.1		1,271					279			57	60	2.77	90	53
4		2.8	2.4	0.72	1,105	951	17.0	0.65	6.3	228	0.33	0.25	51	58	3.08	80	54
5		2.8	2.4	0.72	1,158	887	17.0	0.68	4.9	225	0.34	0.26	51	50	3.05	75	57
6		2.9	2.6	0.63	1,259	976	17.5	0.72	4.8	228	0.36	0.28	51	50	3.00	74	57
7		2.9	2.7	0.67	1,302	1,007	18.0	0.72	3.0	230	0.35	0.27	52	50	2.98	81	58
8		2.9	2.9	0.54	1,419	1,134	21.0	0.68	3.1	230	0.38	0.30	52	60	2.99	74	58
9		3.2	3.3		1,437					227			57	60	2.72	74	58
10		3.1	2.9		1,268					227			56	72	2.75	68	58
11		3.0	2.3	0.41	1,134	1,188	17.0	0.67	6.0	226	0.31	0.24	54	63	2.91	60	60
12		2.8	2.4	0.55	1,246	978	16.0	0.78	4.7	229	0.37	0.29	51	52	3.03	64	62
13		3.0	2.7	0.51	1,386	1,086	16.0	0.87	3.5	227	0.36	0.29	53	55	2.91	68	64
14		2.9	2.6	0.50	1,476	1,180	16.5	0.89	3.5	280	0.40	0.32	53	58	2.99	71	67
15		2.9	2.6	0.51	1,521	1,122	16.0	0.95	6.0	278	0.38	0.31	54	69	3.00	68	69
16		3.2	3.0		1,556					282			58	72	2.68	68	69
17		3.1	2.7		1,467					288			57	79	2.75	67	70
18		2.9	2.0	0.66	1,223	956	11.5	1.06	7.5	234	0.33	0.26	52	79	3.02	75	73
19		3.0	2.0	0.67	1,190	925	10.5	1.13	6.5	233	0.29	0.23	54	79	2.87	77	73
20		3.0	2.1	0.63	1,260	970	11.0	1.15	3.3	234	0.37	0.28	51	55	2.91	75	74
21		3.0	2.4	0.58	1,400	1,079	12.0	1.17	3.2	229	0.36	0.28	53	50	2.91	77	73
22		2.9	2.5		1,495					233			52	46	2.97	76	73
23		3.3	3.0		1,557					238			58	58	2.65	73	71
24		3.4	2.9		1,423					247			61	65	2.54	79	69
25		3.4	2.7		1,329					241			60	65	2.57	70	69
26		3.2	2.4	0.56	1,212	915	11.0	1.10	7.3	246	0.29	0.22	57	58	2.68	69	68
27		3.2	2.5	0.51	1,257	968	11.0	1.14	6.9	244	0.28	0.21	57	58	2.70	66	68
28		3.2	2.3	0.55	1,125	884	10.0	1.13	7.2	242	0.30	0.24	61	58	2.71	64	66
29		3.2	2.7	0.48	1,289	962	11.0	1.17	7.2	242	0.27	0.21	62	46	2.66	62	65
30		3.3	2.7		1,313					241			62	46	2.65	67	67
31		3.2	2.7		1,323					241			63	46	2.67	61	66
Total	48	94.6	82.8	11.06	41,275	19,279	282.0	17.31	98.7	7,577	6.46	5.04	1,718	1,833	87.81	2,251	1,987
Max.	48	3.4	3.9	0.72	1,557	1,188	22.0	1.17	7.5	288	0.40	0.32	63	79	3.08	90	74
Min.	48	2.8	2.0	0.41	1,105	884	10.0	0.65	3.0	225	0.27	0.21	51	46	2.54	60	49
Avg.	48	3.1	2.7	0.58	1,331	1,015	14.8	0.91	5.2	244	0.34	0.27	55	59	2.83	73	64

Robert J. Swalwell
Superintendent

MARSHALL WWTP 801 W. PEARL ST. MARSHALL MI. 49068 - PERMIT No.MI0023540
DECEMBER, 1989 - DISCHARGE MONITORING REPORT - DISCHARGE No. 001A

	F.Eff. D.O. mg/L	F.Eff. pH SU	F.Eff. SS mg/L	F.Eff. SS Lbs.	F.Eff. Total-P mg/L	Flow MGD	F.Eff. Chlorine mg/L	F.Eff. BOD mg/L	F.Eff. BOD Lbs.	F.Eff. NH3 as N mg/L	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %
Limit-	>4.0	6 & 9	30 & 45	751 & ^1,126	<1.0			20 & 30	500 & ^751	<11.0	7 Day ^275	200 & 400	>85%	>85%	
PN-	^00300	^00400	^00530	^00530	^00665	^50050	^50060	^80082	^80082	^00610	^00610	^31616	^81011	^91267	^81012
Day															
1	5.3	7.2	8	198	0.41	2.97		6	149				90	95	83
2	5.5	7.2	8	181	0.38	2.72		5	113				91	93	84
3	6.0	7.5	9	208	0.74	2.77		5	116				89	97	66
4	5.1	7.2	12	308	0.66	3.08		5	128				85	92	74
5	5.1	7.2	10	254	0.58	3.05		4	102				88	95	82
6	5.0	7.1	10	250	0.71	3.00		5	125				88	93	74
7	4.9	7.1	6	149	0.80	2.98		9	224				92	95	76
8	4.7	7.3	20	499	0.70	2.99		13	324				76	84	82
9	4.9	7.2				2.72									
10	4.5	7.3	7	161	0.66	2.75		7	161				88	88	66
11	4.4	7.3	12	291	0.66	2.91		7	170				85	92	77
12	4.7	7.2	9	227	0.48	3.03		8	202				90	93	84
13	3.7	7.4	10	243	0.90	2.91		8	194				86	94	72
14	3.5	7.2	11	274	0.61	2.99		9	224				88	90	75
15	6.4	7.2	13	325	0.64	3.00		8	200				84	93	85
16	4.1	7.6	11	246	0.78	2.68		10	224				87	85	66
17	4.1	7.8	18	413	0.62	2.75		5	115				67	92	64
18	6.4	7.3	18	453	0.48	3.02		7	176				80	89	78
19	6.1	7.3	23	551	0.64	2.87		8	191				70	91	83
20	4.4	7.2	16	388	0.64	2.91		7	170				78	93	80
21	4.1	7.1	15	364	0.42	2.91		7	170				85	94	94
22	4.4	7.2	18	446	0.51	2.97		7	173				83	94	85
23	4.7	7.2	10	221	0.32	2.65		8	177				84	86	90
24	4.5	7.2	7	148	0.42	2.54		6	127				89	93	83
25	4.3	7.4	11	236	0.40	2.57		6	129				85	89	78
26	7.2	7.4	8	179	0.41	2.68		6	134				88	93	75
27	6.0	7.4	7	158	0.42	2.70		6	135				89	89	80
28	5.6	7.4	14	316	0.40	2.71		7	158				79	92	82
29	6.0	7.5	11	244	0.50	2.66		7	155				83	89	78
30	5.6	7.3	8	177	0.47	2.65		8	177				87	92	77
31	5.7	7.3	13	289	0.35	2.67		6	134				88	89	82
Total	156.9	226.2	353	8,399	16.71	87.81		210	4,977				2,542	2,744	2,355
Max.	7.2	7.8	23	551	0.90	3.08		13	324				92	97	94
Min.	3.5	7.1	6	148	0.32	2.54		4	102				67	84	64
Avg.	5.1	7.3	12	280	0.56	2.83		7	166				85	91	79
			17	406				8	196						

Robert J. Swalwell

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
DECEMBER, 1989 - MISCELLOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferrous Chloride Lbs.	Other	Raw Sludge Gals.	Raw Sludge Total Solids Percent	Raw Sludge Vol. Solids Percent	Raw Sludge pH
1	6,400	3,000	560		175		6,000	4.4	76	5.7
2	8,900	3,000	370		117		4,000	4.5	78	5.8
3	10,400	3,000	410		233		4,000	4.4	79	5.9
4	9,100	2,760	380		175		6,000	4.3	78	5.7
5	7,900	2,760	500		233		6,000	4.5	77	5.7
6	9,200	2,760	350		175		6,000	4.3	75	5.6
7	10,900	2,760	510		175		6,000	4.2	78	5.6
8	10,800	2,760	460		175		6,000	4.4	78	5.7
9	9,000	2,760	400		175		4,000	4.4	76	5.7
10	8,600	2,760	470		175		4,000	4.4	79	5.7
11	8,700	2,760	480		175		6,000	4.6	80	5.7
12	13,600	2,880	530		175		6,000	4.6	76	5.7
13	9,100	2,760	450		233		6,000	3.3	80	5.7
14	12,200	3,240	460		175		6,000	5.1	79	5.6
15	14,900	3,240	670		233		6,000	4.8	78	5.7
16	13,300	3,120	440		175		4,000	4.0	73	5.8
17	13,700	3,240	510		175		4,000	4.7	79	5.7
18	12,600	2,880	530		291		6,000	4.9	79	5.5
19	11,400	2,880	590		291		6,000	4.7	78	5.6
20	13,400	2,880	370		291		6,000	5.1	77	5.7
21	15,100	2,760	580		233		6,000	5.0	80	5.6
22	14,300	2,880	440		233		4,000	5.0	79	5.6
23	14,200	2,880	530		233		4,000	4.3	80	5.6
24	13,700	2,880	540		233		4,000	4.8	81	5.5
25	11,700	2,880	510		175		4,000	5.1	83	5.6
26	11,500	2,880	540		233		6,000	4.8	77	5.5
27	10,800	2,880	550		291		6,000	4.8	79	5.7
28	9,000	2,880	530		233		6,000	3.9	77	5.7
29	9,100	2,880	490		233		6,000	4.9	78	5.8
30	7,500	2,880	520		233		4,000	4.5	70	5.9
31	8,800	2,760	430		291		4,000	4.5	76	5.8
Total	339,800	89,640	15,100		6,643		162,000	141.2	2,413	176.1
Max.	15,100	3,240	670		291		6,000	5.1	83	5.9
Min.	6,400	2,760	350		117		4,000	3.3	70	5.5
Avg.	10,961	2,892	487		214		5,226	4.6	78	5.7

Manpower & Hours

	Total Hr
Superintendent 1	^144
Asst. Supt. 1	^144
Operators 3	^444
Total	^732

Robert J. Swalwell
Superintendent

JANUARY, 1991 - INFLUENT SHEET - SAMPLING CODE 500

	----Weather-----		Inf. Flow	Inf. Temp	Int. pH	Inf. BOD	Inf. BOD	Inf. SS	Inf. SS	Inf. Phos.	Inf. Phos.	Int. VSS	Int. NH3-N	--Remarks or Other Parameters--
	Type	Precip.	MGD	F	SU	mgIL	Lbs.	mgIL	Lbs.	mgIL	Lbs.	mgIL	mgIL	
PN-	^00033	^00045	`50050	^00011	^00400	^00310	^85001	^00530	^85002	^00665	^85004	`00535	`00610	
Day														
1	1		2.34	51	7.5	171	3,337	64	1,249			50		
2	5	0.04	2.41	51	7.6	114	2,291	110	2,211	3.85	77	88		
3	3		2.32	52	7.4	105	2,032	104	2,012			92		
4	5	0.02	2.24	51	8.3	186	3,475	92	1,719			74		
5	5	0.16	1.98	51	7.5	126	2,081	74	1,222			60		
6	1		2.00	50	7.4	72	1,201	78	1,301			62		
7	1		2.21	51	7.5	117	2,156	88	1,622			84		
8	1		2.13	53	7.5	96	1,705	90	1,599	4.10	73	68		
9	5	0.02	2.06	51	7.3	78	1,340	104	1,787			86		
10	5	0.04	2.09	51	7.3	123	2,144	82	1,429			76		
11	5	0.52	2.04	51	7.3	96	1,633	92	1,565			74		
12	5	0.01	1.88	50	7.2	117	1,834	66	1,035			48		
13	1		1.95	50	7.3	105	1,708	90	1,464			78		
14	1		2.14	51	7.4	102	1,820	100	1,785	5.70	102	70		
15	4	0.13	2.05	51	7.3	111	1,898	92	1,573			70		
16	4	0.23	2.03	51	7.3	111	1,879	82	1,388			66		
17	5	0.03	2.05	51	7.4	114	1,949	88	1,505			64		
18	3		2.02	51	7.4	117	1,971	84	1,415			76		
19	1		1.88	51	7.5	90	1,411	94	1,474			86		
20	5	0.03	1.91	52	7.4	66	1,051	82	1,306	2.10	33	68		
21	1		2.14	51	7.9	114	2,035	108	1,928			92		
22	3		2.00	51	7.6	111	1,851	126	2,102			104		
23	3		2.03	51	7.4	87	1,473	94	1,591			84		
24	5	0.01	2.07	50	7.4	105	1,813	80	1,381			62		
25	1		1.94	50	7.2	99	1,602	140	2,265			120		
26	1		1.89	51	7.5	111	1,750	106	1,671			90		
27	5	0.02	1.88	50	7.5	81	1,270	84	1,317	2.40	38	60		
28	1		2.07	50	7.4	111	1,916	96	1,657			68		
29	5	0.06	2.07	50	7.5	81	1,398	88	1,519			62		
30	5	0.13	1.98	50	7.4	93	1,536	80	1,321			72		
31	1		1.98	50	7.3	108	1,783	84	1,387			74		
Total	97	1.45	63.78	1,575	230.9	3,318	57,345	2,842	48,800	18.15	323	2,328		
Max.	5	0.52	2.41	53	8.3	186	3,475	140	2,265	5.70	102	120		
Min.	1	0.01	1.88	50	7.2	66	1,051	64	1,035	2.10	33	48		
Avg.	3	0.10	2.06	51	7.4	107	1,850	92	1,574	3.63	65	75		

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
JANUARY, 1991 - PRIMARY EFFLUENT SHEET

	P Eff. BOD mg/L	P Eff. BOD Lbs.	P Eff. SS mg/L	P. Eff. SS Lbs.	P Eff. Phos. mg/L	P Eff. Phos. Lbs.	P Eff. VSS mg/L	P Eff. NH3-N mg/L	Flow MGD	BOD Pri. Removal %	SS Pri. Removal %	P Pri. Removal %
PN-	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	^50050			
Day												
1	174	3,396	64	1,249			48		2.34	0	0	
2	81	1,628	80	1,608	2.65	53	66		2.41	29	26	31
3	78	1,509	88	1,703			82		2.32	26	25	
4	171	3,195	90	1,681			78		2.24	8	0	
5	87	1,437	58	958			48		1.98	31	0	
6	63	1,051	68	1,134			50		2.00	13	19	
7	87	1,604	90	1,659	4.10	76	88		2.21	26	1	
8	75	1,332	90	1,599			80		2.13	22	17	0
9	66	1,134	106	1,821			94		2.06	15	37	
10	81	1,412	92	1,604			86		2.09	34	1	
11	78	1,327	94	1,599			82		2.04	23	15	
12	93	1,458	74	1,160			54		1.88	21	0	
13	80	1,301	75	1,220			60		1.95	24	11	
14	78	1,392	82	1,464	2.75	49	62		2.14	24	23	52
15	141	2,411	86	1,470			60		2.05	0	0	
16	102	1,727	106	1,795			88		2.03	8	0	
17	117	2,000	110	1,881			96		2.05	0	0	
18	114	1,921	70	1,179			64		2.02	3	0	
19	90	1,411	80	1,254			70		1.88	0	4	
20	66	1,051	60	956	2.10	33	50		1.91	0	20	0
21	111	1,981	102	1,820			92		2.14	3	0	
22	108	1,801	82	1,368			70		2.00	3	14	
23	90	1,524	84	1,422			78		2.03	0	4	
24	138	2,382	104	1,795			94		2.07	0	0	
25	69	1,116	78	1,262			70		1.94	30	51	
26	84	1,324	78	1,229			66		1.89	24	21	
27	72	1,129	82	1,286	3.20	50	64		1.88	11	14	0
28	153	2,641	94	1,623			66		2.07	0	0	
29	117	2,020	100	1,726			76		2.07	0	0	
30	132	2,180	82	1,354			76		1.98	0	0	
31	96	1,585	100	1,651			84		1.98	11	0	
Total	3,092	53,380	2,649	45,531	14.80	262	2,242		63.78	389	303	83
Max.	174	3,396	110	1,881	4.10	76	96		2.41	34	51	52
Min.	63	1,051	58	956	2.10	33	48		1.88	0	0	0
Avg.	100	1,722	85	1,469	2.96	52	72		2.06	13	10	17

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
JANUARY, 1991 - ACTIVATED SLUDGE SHEET

	Aerat Volume kCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading #/M	Mix Liq SS mg/L	Mix Liq VSS mg/L	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mg/L	Air Cu Ft. x 10000	Return SS %	Return VSS %	Return %	Waste Sludge gal	Daily Flow MGD	PE BOD mg/l	PE SS mg/L
PN-	^80993	^81001	^80990	^80992	^70323	^70324	^81004	^81007	^00300	^81000	^81006	^70325	^81014	^80991	^50050	^00310	^00530
Day																	
1	48	3.7	3.4		1,693					109			67	50	2.34	158	77
2		3.6	3.4	0.72	1,699	1,302	26.0	0.65	3.8	111	0.36	0.28	64	48	2.41	140	75
3		3.7	3.8	0.62	1,862	1,430	28.0	0.67	3.2	114	0.42	0.32	67	48	2.32	137	75
4		3.8	4.1	0.58	1,921	1,474	27.0	0.71	3.8	111	0.37	0.29	68	48	2.24	138	76
5		4.4	4.7		1,962					110			79	48	1.98	126	75
6		4.3	4.3		1,838					113			78	58	2.00	123	77
7		3.9	3.6	0.50	1,719	1,299	26.0	0.66	5.1	114	0.37	0.28	70	55	2.21	106	77
8		4.0	3.8	0.38	1,837	1,422	27.0	0.68	2.5	110	0.41	0.32	72	65	2.13	92	81
9		4.2	3.8	0.37	1,834	1,409	25.0	0.73	1.2	112	0.43	0.33	75	65	2.06	90	84
10		4.1	3.5	0.38	1,733	1,365	25.0	0.69	2.1	112	0.36	0.28	74	65	2.09	90	85
11		4.2	3.7	0.33	1,775	1,339	25.0	0.71	1.9	139	0.38	0.32	77	65	2.04	78	85
12		4.6	3.8		1,774					165			83	65	1.88	78	88
13		4.4	3.5		1,716					160			80	65	1.95	80	89
14		4.0	3.1	0.37	1,636	1,259	22.0	0.74	5.8	156	0.36	0.28	73	65	2.14	79	88
15		4.2	3.4	0.39	1,706	1,297	23.0	0.74	4.8	156	0.36	0.27	77	69	2.05	88	87
16		4.2	3.5	0.40	1,732	1,315	21.0	0.82	4.3	156	0.37	0.28	76	69	2.03	93	87
17		4.2	3.3	0.42	1,710	1,335	20.0	0.86	4.9	160	0.38	0.29	77	69	2.05	98	90
18		4.3	3.6	0.43	1,757	1,363	20.0	0.88	4.0	160	0.33	0.25	78	69	2.02	104	86
19		4.6	3.9		1,794					154			83	69	1.88	103	87
20		4.5	3.8		1,715					163			82	69	1.91	101	85
21		4.0	3.0	0.53	1,551	1,196	18.0	0.86	6.5	170	0.34	0.26	73	66	2.14	106	88
22		4.3	3.2	0.47	1,560	1,200	17.0	0.92	6.1	166	0.36	0.29	78	65	2.00	101	87
23		4.2	3.4	0.44	1,605	1,272	16.0	1.00	5.6	164	0.36	0.29	76	65	2.03	99	84
24		4.2	3.4	0.45	1,616	1,298	15.0	1.08	6.1	170	0.35	0.28	74	58	2.07	102	83
25		4.4	3.7	0.39	1,655	1,346	15.0	1.10	5.7	171	0.33	0.27	78	58	1.94	96	83
26		4.6	3.7		1,634					167			79	58	1.89	95	85
27		4.6	3.8		1,664					162			79	58	1.88	96	83
28		4.2	3.4	0.46	1,623	1,289	14.0	1.16	6.7	162	0.37	0.29	68	46	2.07	102	84
29		4.2	3.6	0.36	1,792	1,670	15.5	1.16	4.2	165	0.40	0.31	68	46	2.07	103	87
30		4.4	3.8	0.42	1,827	1,438	15.0	1.22	5.8	166	0.42	0.33	74	46	1.98	109	87
31		4.4	4.0	0.39	1,913	1,552	16.0	1.20	5.1	170	0.39	0.31	73	46	1.98	109	87
Total	48	130.3	113.1	9.80	53,853	29,870	456.5	19.24	99.2	4,518	8.22	6.42	2,320	1,836	63.78	3,220	2,592
Max.	48	4.6	4.7	0.72	1,962	1,670	28.0	1.22	6.7	171	0.43	0.33	83	69	2.41	158	90
Min.	48	3.6	3.0	0.33	1,551	1,196	14.0	0.65	1.2	109	0.33	0.25	64	46	1.88	78	75
Avg.	48	4.2	3.6	0.45	1,737	1,358	20.8	0.87	4.5	146	0.37	0.29	75	59	2.06	104	84

Robert J. Swalwell
Superintendent

MARSHALL WWTP 601 W. PEARL ST. MARSHALL MI. 49068 - PERMIT No. MI0023540
JANUARY, 1991 - DISCHARGE MONITORING REPORT - DISCHARGE No. 001A

	F.Eff. D.O. mgIL	F.Eff. pH SU	F.Eff. SS mgIL	F.Eff. SS Lbs.	F.Eff. Total-P mgIL	Flow MGD	F.Eff. Chlorine mgIL	F.Eff. BOD mgIL	F.Eff. BOD Lbs.	F.Eff. NH3 as N mgIL	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %
Limit-	>4.0	6 & 9	30 & 45	751 & ^1,126	<1.0			20 & 30	500 & ^751	<11.0	7 Day ^275	200 & 400	>85%	>85%	
PN-	^00300	^00400	^00530	^00530	^00665	^50050	^50060	^80082	^80082	^00610	^00610	^31616	^81011	^91267	^81012
Day															
1	7.0	7.2	9	176		2.34	0.00	7	137			14	86	96	
2	7.2	7.3	18	362	0.66	2.41	0.00	17	342			66	84	85	83
3	7.0	7.2	18	348		2.32	0.00	19	368			136	83	82	
4	6.8	7.1	22	411		2.24	0.00	13	243			4	76	93	
5	7.2	7.5	10 17	165 318		1.98	0.00	11	182 359			8	86	91	
6	6.9	7.2	15	250		2.00	0.00	8	133			28	81	89	
7	6.9	7.2	20	369		2.21	0.01	15	276			30	77	87	
8	6.7	7.2	18	320	0.82	2.13	0.00	15	266			600	80	84	80
9	6.7	7.1	17 17	292		2.06	0.00	21	361			248	84	59	
10	6.8	7.0	19	331		2.09	0.00	14.5	244			48	77	90	
11	6.5	7.1	17	289		2.04	0.00	13	221			120 89	82	86	
12	6.3	7.3	14	220		1.88	0.00	13	204			60	79	89	
13	7.2	7.1	10	163		1.95	0.01	14	228			16	89	87	
14	8.0	7.2	13	232	0.62	2.14	0.00	13	232			52	87	87	89
15	7.0	7.2	11	188		2.05	0.00	14	239			116	88	87	
16	6.8	7.3	14	237		2.03	0.00	12	203			208	83	89	
17	6.7	7.3	15	256		2.05	0.00	18	308			112	83	84	
18	7.1	7.2	13	219		2.02	0.00	14	236			64	85	88	
19	7.0	7.1	12	188		1.88	0.00	14	220			86	87	96	
20	7.3	7.2	6	96	0.32	1.91	0.00	9	143			4	93	86	85
21	8.0	7.5	17	303		2.14	0.01	12	214			6	84	89	
22	7.2	7.5	13	217		2.00	0.00	13	217			132	90	88	
23	7.1	7.4	13	220		2.03	0.00	11	186			34	86	87	
24	6.8	7.6	7	121		2.07	0.00	14	242			88	91	87	
25	7.6	7.5	13	210		1.94	0.00	9	146			112	91	91	
26	7.8	7.2	7	110		1.89	0.00	6	95			4	93	95	
27	7.7	7.2	10	157	0.48	1.88	0.00	7	110			4	88	91	80
28	7.9	7.3	12	207		2.07	0.00	12	207			4	88	89	
29	7.0	7.3	5	86		2.07	0.00	9	155			88	94	89	
30	7.3	7.4	6	99		1.98	0.00	7	116			4	93	92	
31	7.4	7.3	11	182		1.98	0.00	12	198			28	87	88	
Total	220.9	225.2	405	7,024	2.90	63.78	0.02	386	6,670			2,524	2,655	2,721	417
Max.	8.0	7.6	22	411	0.82	2.41	0.01	21	368			600	94	96	89
Min.	6.3	7.0	5	86	0.32	1.88	0.00	6	95			4	76	59	80
Avg.	7.1	7.3	13	227	0.58	2.06	0.00	12	215			36	86	88	83
7 Day			17	318				15	359			89			

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
JANUARY, 1991 - MISCELLOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	SO2 Lbs.	Lime Lbs.	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	PH	Lbs. of Lime per lb. of Dry Solids
1	9,200	2,400	290	24	298	20	333	4,700	5.4	70	6.1	0.16
2	9,700	2,520	310	26	298	6	333	6,000	5.8	69	5.9	0.11
3	11,400	2,400	380	24	298	18	333	6,000	5.8	74	6.0	0.11
4	10,700	2,280	350	22	298	19	333	6,000	5.7	72	6.2	0.12
5	8,700	2,160	310	33	298	20	333	4,000	5.3	72	6.0	0.19
6	9,500	2,400	140	27	298	14	333	4,000	5.1	72	6.0	0.19
7	10,900	2,280	240	26	298	18	333	6,000	5.5	74	6.1	0.12
8	9,700	2,400	350	28	397	18	333	6,000				
9	7,600	2,280	270	23	199	18	316	6,000	5.5	73	6.0	0.11
10	9,400	2,280	260	25	298	20	549	6,000	5.1	76	6.0	0.21
11	8,900	2,640	300	25	298	20	333	6,000	6.0	75	5.9	0.11
12	9,100	2,640	180	23	397	21	200	4,000	4.8	80	6.1	0.12
13	8,600	2,520	250	23	298	21	199	4,000	4.9	70	6.0	0.12
14	7,500	2,640	260	25	298	20	333	6,000	5.1	78	6.1	0.13
15	6,700	2,760	490	25	298	17	266	6,000	4.9	74	6.4	0.11
16	7,900	2,640	210	37	298	19	333	6,000	5.4	73	6.7	0.12
17	8,900	2,760	400	22	397	19	250	6,000	5.2	78	6.5	0.10
18	8,700	2,760	270	24	298	20	250	5,000	4.7	77	6.3	0.13
19	6,300	2,760	240	26	298	20	433	3,000	4.5	77	6.3	0.38
20	10,400	2,640	320	27	298	20	67	3,000	4.8	76	6.1	0.06
21	11,600	2,400	270	27	298	25	333	6,000	5.3	76	6.1	0.12
22	11,500	2,880	290	22	0	15	249	4,000	4.9	76	6.5	0.15
23	11,300	2,760	470	22	0	10	183	4,000	5.5	77	5.9	0.10
24	10,900	2,880	260	23	0	18	233	4,000	5.0	78	6.0	0.14
25	11,800	2,880	430	25	99	18	167	4,000	5.1	78	6.1	0.10
26	11,400	2,760	180	24	199	20	167	3,000	5.0	77	6.0	0.13
27	10,500	2,760	330	27	199	20	100	2,500	4.3	77	6.0	0.11
28	8,900	2,760	200	28	298	18	249	4,000	5.5	78	5.5	0.13
29	9,100	2,760	330	21	199	20	233	4,000	4.9	78	5.9	0.14
30	10,300	2,760	210	26	199	14	300	6,000	5.0	77	5.8	0.12
31	11,100	2,880	300	26	0	16	250	4,000	4.8	78	5.8	0.16
Total	298,200	80,640	9,090	786	7,649	562	8,657	149,200	154.8	2,260	182.3	4.11
Max.	11,800	2,880	490	37	397	25	549	6,000	6.0	80	6.7	0.38
Min.	6,300	2,160	140	21	0	6	67	2,500	4.3	69	5.5	0.06
Avg.	9,619	2,601	293	25	247	18	279	4,813	5.2	75	6.1	0.14

Manpower & Hours

	Total Hr
Superintendent 1	^168
Asst. Supt. 1	^168
Operators 3	^520
Total	^856

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
FEBRUARY, 1991 - INFLUENT SHEET - SAMPLING CODE 500

	----Weather----- Type	Precip.	Inf. Flow MGD	Inf. Temp F	Inf. pH SU	Inf. BOD mgIL	Inf. BOD Lbs.	Inf. SS mgIL	Inf. SS Lbs.	Inf. Phos. mgIL	Inf. Phos. Lbs.	Inf. VSS mgIL	Inf. NH3-N mgIL	--Remarks or Other Parameters--
PN-	^00033	^00045	50050	^00011	^00400	^00310	^85001	^00530	^85002	^00665	^85004	^00535	00610	
Day														
1	1		1.99	51	7.8	165	2,738	110	1,826	4.95	82	96		
2	1		1.95	51	7.8	108	1,756	98	1,594			76		
3	1		1.96	51	7.3	105	1,716	90	1,471			72		
4	1		2.25	51	7.8	156	2,927	130	2,439			102		
5	1		2.26	51	7.6	147	2,771	94	1,772			72		
6	3		2.22	51	7.4	123	2,277	88	1,629			66		
7	3		2.15	50	7.5	147	2,636	88	1,578	4.70	84	68		
8	1		2.04	51	7.5	117	1,991	94	1,599			60		
9	1		1.92	50	7.5	150	2,402	78	1,249			62		
10	1		1.95	50	7.4	132	2,147	94	1,529			66		
11	3		2.04	51	7.4	102	1,735	88	1,497			64		
12	3		2.03	51	7.5	132	2,235	96	1,625			72		
13	5	0.11	1.97	51	7.4	177	2,908	106	1,742	3.50	58	102		
14	5	0.16	1.95	51	7.4	153	2,488	94	1,529			70		
15	5	0.02	1.93	51	7.4	192	3,090	94	1,513			80		
16	3		1.80	50	7.4	174	2,612	100	1,501			96		
17	5	0.01	1.86	50	7.6	147	2,280	130	2,017			104		
18	4	0.20	2.00	51	7.6	162	2,702	66	1,101	3.65	61	60		
19	3		1.93	51	7.3	159	2,559	120	1,932			96		
20	1		2.04	51	7.4	177	3,011	112	1,906			86		
21	1		2.05	51	7.7	210	3,590	92	1,573			82		
22	1		2.01	51	7.3	270	4,526	106	1,777			86		
23	1		1.91	50	7.9	228	3,632	140	2,230			100		
24	1		1.81	49	7.9	192	2,898	120	1,811	4.95	75	84		
25	1		2.03	50	7.2	195	3,301	98	1,659			80		
26	5	0.03	1.96	51	7.3	192	3,139	106	1,733			84		
27	5	0.02	1.96	51	7.3	162	2,648	102	1,667			70		
28	1		2.04	51	7.4	174	2,960	80	1,361			74		
29														
30														
31														
Total	67	0.55	56.01	1,419	210.0	4,548	75,679	2,814	46,859	21.75	360	2,230		
Max.	5	0.20	2.26	51	7.9	270	4,526	140	2,439	4.95	84	104		
Min.	1	0.01	1.80	49	7.2	102	1,716	66	1,101	3.50	58	60		
Avg.	2	0.08	2.00	51	7.5	162	2,703	101	1,674	4.35	72	80		

Robert J. Swalwell
Superintendent

FEBRUARY, 1991 - PRIMARY EFFLUENT SHEET

	P Eff. BOD mg/L	P Eff. BOD Lbs.	P Eff. SS mg/L	P. Eff. SS Lbs.	P Eff. Phos. mg/L	P Eff. Phos. Lbs.	P Eff. VSS mg/L	P Eff. NH3-N mg/L	Flow MGD	BOD Pri. Removal %	SS Pri. Removal %	P Pri. Removal %
PN-	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	^50050			
Day												
1	99	1,643	84	1,394	5.50	91	76		1.99	40	24	0
2	81	1,317	64	1,041			56		1.95	25	35	
3	147	2,403	92	1,504			78		1.96	0	0	
4	153	2,871	164	3,077			136		2.25	2	0	
5	180	3,393	84	1,583			68		2.26	0	11	
6	117	2,166	112	2,074			84		2.22	5	0	
7	96	1,721	92	1,650	5.70	102	80		2.15	35	0	0
8	105	1,786	76	1,293			40		2.04	10	19	
9	159	2,546	88	1,409			80		1.92	0	0	
10	123	2,000	104	1,691			76		1.95	7	0	
11	123	2,093	120	2,042			96		2.04	0	0	
12	129	2,184	92	1,558			64		2.03	3	4	
13	123	2,021	120	1,972	4.45	73	116		1.97	31	0	0
14	180	2,927	148	2,407			124		1.95	0	0	
15	156	2,511	128	2,060			96		1.93	19	0	
16	123	1,846	112	1,681			104		1.80	29	0	
17	108	1,675	116	1,799			104		1.86	27	11	
18	162	2,702	120	2,002	4.55	76	112		2.00	0	0	0
19	129	2,076	112	1,803			100		1.93	19	7	
20	183	3,113	108	1,837			92		2.04	0	4	
21	210	3,590	124	2,120			96		2.05	0	0	
22	240	4,023	180	3,017			132		2.01	11	0	
23	246	3,919	140	2,230			108		1.91	0	0	
24	216	3,261	132	1,993	5.58	84	116		1.81	0	0	0
25	198	3,352	156	2,641			140		2.03	0	0	
26	204	3,335	180	2,942			148		1.96	0	0	
27	192	3,139	132	2,158			128		1.96	0	0	
28	222	3,777	160	2,722			156		2.04	0	0	
29												
30												
31												
Total	4,404	73,392	3,340	55,701	25.78	427	2,806		56.01	263	115	0
Max.	246	4,023	180	3,077	5.70	102	156		2.26	40	35	0
Min.	81	1,317	64	1,041	4.45	73	40		1.80	0	0	0
Avg.	157	2,621	119	1,989	5.16	85	100		2.00	9	4	0

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
FEBRUARY, 1991 - ACTIVATED SLUDGE SHEET

	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading flm	Mix Liq SS mgIL	Mix Liq VSS mgIL	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mgIL	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge kGal	Daily Flow MGD	PE BOD mgIl	PE SS mgIL
PN-	^80993	^81001	^80990	^80992	^70323	^70324	^81004	^81007	^00300	^81000	^81006	^70325	^81014	^80991	^50050	^00310	^00530
Day																	
1	48	4.3	4.0	0.39	1,950	1,548	15.5	1.26	4.5	163	0.46	0.37	73	49	1.99	108	89
2		4.4	4.6		2,155					160			74	55	1.95	107	87
3		4.4	4.5		2,150					159			74	55	1.96	118	88
4		3.8	3.4	0.46	2,081	1,620	17.0	1.22	4.1	152	0.45	0.35	65	58	2.25	118	98
5		3.8	3.6	0.47	2,146	1,695	16.0	1.34	2.1	173	0.46	0.36	66	65	2.26	127	96
6		3.9	3.3	0.49	2,015	1,580	15.0	1.34	3.7	177	0.48	0.37	68	65	2.22	125	100
7		4.0	3.3	0.48	1,970	1,554	15.0	1.31	3.6	175	0.44	0.34	69	65	2.15	125	99
8		4.2	3.3	0.50	1,829	1,434	14.0	1.31	4.8	171	0.43	0.33	73	65	2.04	126	98
9		4.5	3.4		1,849					176			77	65	1.92	137	101
10		4.4	3.2		1,782					180			76	65	1.95	134	103
11		4.2	3.2	0.54	1,750	1,364	14.0	1.25	4.8	182	0.39	0.30	73	65	2.04	129	97
12		4.2	3.2	0.49	1,791	1,408	14.0	1.28	4.4	177	0.41	0.32	68	65	2.03	122	98
13		4.4	3.4	0.46	1,868	1,472	14.0	1.33	3.6	174	0.44	0.34	70	65	1.97	123	99
14		4.4	3.2	0.49	1,875	1,491	15.0	1.25	3.5	180	0.47	0.37	70	65	1.95	135	107
15		4.5	3.0	0.49	1,831	1,550	14.5	1.26	1.5	191	0.45	0.36	71	65	1.93	142	114
16		4.8	3.4		1,990					184			76	65	1.80	137	118
17		4.6	3.2		1,945					179			75	65	1.86	135	119
18		4.3	3.0		1,995					173			69	65	2.00	140	119
19		4.5	3.1	0.46	2,011	1,638	16.0	1.26	3.4	178	0.42	0.34	71	65	1.93	140	122
20		4.2	2.8	0.54	1,942	1,558	15.0	1.29	4.9	197	0.46	0.37	67	65	2.04	149	121
21		4.2	3.0	0.55	1,974	1,586	14.5	1.36	5.5	191	0.42	0.34	66	65	2.05	153	117
22		4.3	2.8	0.48	1,952	1,576	15.0	1.30	4.1	202	0.49	0.40	65	61	2.01	135	125
23		4.5	3.0		2,093					202			68	61	1.91	183	129
24		4.8	2.9		1,923					201			71	65	1.81	198	132
25		4.2	2.6	0.71	1,994	1,583	14.0	1.42	8.0	204	0.45	0.36	64	65	2.03	199	136
26		4.4	2.6	0.69	2,086	1,669	15.0	1.39	4.0	203	0.51	0.40	65	69	1.96	210	146
27		4.4	2.6	0.68	2,115	1,705	15.5	1.36	6.1	202	0.43	0.35	65	69	1.96	211	149
28		4.2	2.5	0.68	2,153	1,749	16.0	1.35	3.5	191	0.55	0.45	64	69	2.04	210	154
29																	
30																	
31																	
Total	48	121.0	89.8	10.04	55,215	29,780	285.0	24.90	80.1	5,097	8.61	6.82	1,953	1,781	56.01	4,076	3,161
Max.	48	4.8	4.6	0.71	2,155	1,749	17.0	1.42	8.0	204	0.55	0.45	77	69	2.26	211	154
Min.	48	3.8	2.5	0.39	1,750	1,364	14.0	1.22	1.5	152	0.39	0.30	64	49	1.80	107	87
Avg.	48	4.3	3.2	0.53	1,972	1,567	15.0	1.31	4.2	182	0.45	0.36	70	64	2.00	146	113

Robert J. Swalwell
Superintendent

FEBRUARY , 1991 - DISCHARGE MONITORING REPORT - DISCHARGE No. 001H

	F.Eff. D.O. mg/L	F.Eff. pH SU	X F.Eff. SS mg/L	X F.Eff. SS Lbs.	F.Eff. Total-P mg/L	Flow MGD	F.Eff. Chlorine mg/L	X F.Eff. BOD mg/L	X F.Eff. BOD Lbs.	F.Eff. NH3 as N mg/L	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %
Limit-	>4.0	6 & 9	30 & 45	751 & ^1,126	<1.0			20 & 30	500 & ^751	<11.0	7 Day ^275	200 & 400	>85%	>85%	
PN-	^00300	^00400	^00530	^00530	^00665	^50050	^50060	^80082	^80082	^00610	^00610	^31616	^81011	^91267	^81012
Day															
1	7.1	7.3	18	299	1.02	1.99	0.00	10	166			66	84	94	79
2	6.4	7.0	9	146		1.95	0.00	8	130			4	91	93	
3	6.0	7.0	9	147		1.96	0.00	8	131			2	90	92	
4	6.4	7.2	13	244		2.25	0.00	15	281			6	90	90	
5	6.6	7.4	14	264		2.26	0.00	16	302			488	85	89	
6	6.7	7.1	10	185		2.22	0.00	13	241			10	89	89	
7	7.0	7.2	7	126	0.97	2.15	0.00	11	197			10	92	93	
8	7.3	7.2	14	238		2.04	0.01	12	204			4	85	90	79
9	7.2	7.4	4	64		1.92	0.00	14	224			4	95	91	
10	7.2	7.4	8	130		1.95	0.00	8	130			2	91	94	
11	7.4	7.3	10	170		2.04	0.00	8	136			2	89	92	
12	7.3	7.1	8	135		2.03	0.00	10	169			2	92	92	
13	6.5	7.3	13	214	0.90	1.97	0.00	13	214			2	88	93	
14	6.5	7.2	25	407		1.95	0.00	16	260			8	73	90	74
15	6.1	7.3	24	386		1.93	0.00	16	258			400	74	92	
16	6.6	7.2	21	315		1.80	0.00	16	240			400	79	91	
17	6.6	7.2	15	233		1.86	0.00	12	186			14	88	92	
18	6.2	7.3	14	234	1.05	2.00	0.00	18	300			20	79	89	71
19	4.2	7.2	11	177		1.93	0.00	15	241			10	91	91	
20	7.7	7.2	12	204		2.04	0.00	17	289			6	89	90	
21	8.0	7.5	11	188		2.05	0.00	20	342			2	88	90	
22	8.0	7.3	16	268		2.01	0.00	21	352			18	85	92	
23	7.8	7.5	16	255		1.91	0.01	20	319			44	89	91	
24	8.1	7.6	12	181	1.00	1.81	0.01	12	181			70	90	94	80
25	9.0	7.4	28	474		2.03	0.00	18	305			20	71	91	
26	8.0	7.1	16	262		1.96	0.01	17	278			150	85	91	
27	8.1	7.4	13	213		1.96	0.00	18	294			264	87	89	
28	6.6	7.3	22	374		2.04	0.00	19	323			162	73	89	
29															
30															
31															
Total	196.6	203.6	393	6,532	4.94	56.01	0.03	401	6,694			2,190	2,402	2,554	383
Max.	9.0	7.6	28	474	1.05	2.26	0.01	21	352			488	95	94	80
Min.	4.2	7.0	4	64	0.90	1.80	0.00	8	130			2	71	89	71
Avg.	7.0	7.3	14	233	0.99	2.00	0.00	14	239			16	86	91	77
7dayavg			18	290				18	296			76			

Robert J. Swalwell
Superintendent

[illegible] WATER TREATMENT PLANT
FEBRUARY, 1991 - MISCELLEOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power kWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	SO2 Lbs.	Lime Lbs.	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	PH	Lbs. of Lime per lb. of Dry Solids
1	7,800	2,520	270	24	298	17	200	4,000	4.8	80	5.6	0.12
2	500	2,640	180	28	397	19	167	4,000	4.8	76	6.3	0.10
3	300	2,640	230	25	596	20	183	4,000	5.0	76	5.9	0.11
4	4,400	2,520	260	20	199	20	316	6,000	5.1	77	5.8	0.12
5	5,900	2,760	560	23	298	18	233	6,000	5.9	77	6.0	0.08
6	6,100	2,640	330	24	298	22	333	6,000	5.6	76	5.8	0.12
7	7,300	2,760	360	26	298	10	467	6,000	5.5	74	5.8	0.17
8	6,000	2,640	280	26	298	14	383	6,000	5.8	75	5.9	0.13
9	7,000	2,760	290	31	298	16	233	4,000	5.0	75	6.0	0.14
10	8,400	2,760	360	25	298	20	216	4,000	4.9	73	6.0	0.13
11	10,500	3,000	330	23	199	18	383	6,000	5.9	76	5.8	0.13
12	8,900	2,760	330	27	298	18	283	5,000	5.4	75	5.8	0.12
13	7,900	2,760	370	28	298	20	267	5,000	5.3	76	5.9	0.12
14	10,000	2,760	280	26	298	20		5,500	5.5	73	5.9	
15	12,200	2,760	200	21	298	19		4,000	5.6	74	5.9	
16	10,200	2,760	160	20	199	20		4,000	4.9	76	5.9	
17	7,400	2,640	170	25	298	19		4,000	4.8	78	5.9	
18	6,100	2,640	200	24	298	18		4,000	5.4	76	5.8	
19	7,000	2,640	280	24	298	18		4,000	5.6	77	5.9	
20	6,300	2,760	260	27	298	20		6,000	5.8	79	5.7	
21	4,400	2,760	390	33	199	20	500	4,000	6.1	76	5.8	0.24
22	8,400	2,640	360	10	298	20	33	4,000	5.8	77	5.8	0.02
23	8,600	3,000	160	24	298	20	167	4,000	5.3	76	5.6	0.09
24	8,700	2,880	300	26	199	20	183	4,000	5.5	74	6.7	0.10
25	9,800	2,880	340	25	199	20	350	5,000	5.9	73	5.7	0.14
26	9,800	2,880	390	27	298	15	383	5,500	6.2	78	5.8	0.13
27	9,200	3,000	260	28	298	18	400	6,000	5.9	79	6.1	0.13
28	6,300	2,760	330	28	199	12	333	4,000	5.6	78	6.0	0.18
29												
30												
31												
Total	205,400	76,920	8,230	698	8,048	511	6,013	134,000	152.9	2,130	165.1	2.64
Max.	12,200	3,000	560	33	596	22	500	6,000	6.2	80	6.7	0.24
Min.	300	2,520	160	10	199	10	33	4,000	4.8	73	5.6	0.02
Avg.	7,336	2,747	294	25	287	18	286	4,786	5.5	76	5.9	0.13

Manpower & Hours

	Total Hr
Superintendent 1	^152
Asst. Supt. 1	^152
Operators 3	^460
Total	^764

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
MARCH , 1991 - INFLUENT SHEET - SAMPLING CODE 500

	----Weather----		Inf. Flow	Inf. Temp	Inf. pH	Inf. BOD	Inf. BOD	Inf. SS	Inf. SS	Inf. Phos.	Inf. Phos.	Inf. VSS	Inf. NH3-N	--Remarks or Other Parameters--
	Type	Precip.	MGD	F	SU	mgIL	Lbs.	mgIL	Lbs.	mgIL	Lbs.	mgIL	mgIL	
PN-	^00033	^00045	^50050	^00011	^00400	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	
Day														
1	4	0.40	1.98	51	7.6	240	3,963	146	2,411			132		
2	4&5	0.10	1.91	51	7.5	318	5,066	104	1,657			90		
3	3		1.92	50	7.5	306	4,900	86	1,377	3.20	51	64		
4	1		2.03	50	7.4	120	2,032	94	1,591			82		
5	1		2.05	51	7.4	120	2,052	88	1,505			78		
6	4	0.08	1.97	51	7.6	222	3,647	110	1,807			98		
7	1		2.04	51	7.2	210	3,573	106	1,803			90		
8	3		1.92	50	7.4	348	5,572							
9	3		1.86	50	7.6	372	5,771	124	1,924			104		
10	1		1.76	51	7.2	132	1,938	80	1,174	3.20	47	70		
11	1		1.94	51	7.3	168	2,718	88	1,424			78		
12	1		2.05	51	7.4	138	2,359	84	1,436			72		
13	1		1.98	51	7.3	144	2,378	88	1,453			70		
14	1		1.96	50	7.4	120	1,962	80	1,308			70		
15	1		1.92	50	8.0	390	6,245	116	1,857			84		
16	1		1.76	50	7.1	174	2,554	134	1,967	3.20	47	108		
17	4	0.65	1.86	51	7.6	126	1,955	86	1,334			66		
18	4	0.03	2.04	51	7.4	162	2,756	108	1,837			96		
19	1		1.98	51	7.6	186	3,071	100	1,651			88		
20	1		1.96	51	7.4	156	2,550	90	1,471			72		
21	1		2.00	51	7.2	150	2,502	98	1,635			82		
22	4	0.12	1.95	51	7.2	138	2,244	112	1,821			102		
23	4	0.27	1.76	50	7.5	132	1,938	74	1,086	4.10	60	60		
24	1		1.76	50	7.6	90	1,321	84	1,233			74		
25	1		1.96	50	7.2	144	2,354	94	1,537			86		
26	4	0.49	2.01	50	7.3	168	2,816	106	1,777			96		
27	4	0.65	2.04	50	7.6	168	2,858	126	2,144			106		
28	4	0.14	1.99	50	7.4	123	2,041	102	1,693			88		
29	1		1.98	50	7.5	87	1,437	84	1,387	2.45	40	76		
30	1		1.96	50	7.7	108	1,765	84	1,373			70		
31	4	0.05	1.90	50	7.5	84	1,331	94	1,490			74		
Total	66	2.98	60.20	1,565	230.6	5,544	89,669	2,970	48,164	16.15	246	2,526		
Max.	4	0.65	2.05	51	8.0	390	6,245	146	2,411	4.10	60	132		
Min.	1	0.03	1.76	50	7.1	84	1,321	74	1,086	2.45	40	60		
Avg.	2	0.27	1.94	50	7.4	179	2,893	99	1,605	3.23	49	84		

Robert J. Swalwell
Superintendent

MARSHALL , MICHIGAN WASTEWATER TREATMENT PLANT
MARCH , 1991 - PRIMARY EFFLUENT SHEET

	P Eff. BOD mgIL	P Eff. BOD Lbs.	P Eff. SS mgIL	P. Eff. SS Lbs.	P Eff. Phos. mgIL	P Eff. Phos. Lbs.	P Eff. VSS mgIL	P Eff. NH3-N mgIL	Flow MGD	BOD Pri. Removal %	SS Pri. Removal %	P Pri. Removal %
PN-	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	^50050			
Day												
1	192	3,171	156	2,576			144		1.98	20	0	
2	228	3,632	76	1,211			56		1.91	28	26	
3	330	5,284	128	2,050	3.85	62	116		1.92	0	0	0
4	150	2,540	152	2,573			112		2.03	0	0	
5	150	2,565	120	2,052			104		2.05	0	0	
6	222	3,647	132	2,169			116		1.97	0	0	
7	210	3,573	168	2,858			152		2.04	0	0	
8	354	5,669							1.92	0		
9	330	5,119	116	1,799			104		1.86	11	6	
10	126	1,849	100	1,468	3.57	52	76		1.76	4	0	0
11	150	2,427	88	1,424			60		1.94	11	0	
12	120	2,052	92	1,573			60		2.05	13	0	
13	108	1,783	104	1,717			76		1.98	25	0	
14	96	1,569	96	1,569			76		1.96	20	0	
15	318	5,092	104	1,665			72		1.92	18	10	
16	78	1,145	98	1,438	3.40	50	56		1.76	55	27	0
17	96	1,489	108	1,675			72		1.86	24	0	
18	120	2,042	84	1,429			72		2.04	26	22	
19	144	2,378	92	1,519			72		1.98	23	8	
20	126	2,060	84	1,373			64		1.96	19	7	
21	120	2,002	100	1,668			84		2.00	20	0	
22	102	1,659	72	1,171			64		1.95	26	36	
23	96	1,409	80	1,174	2.90	43	76		1.76	27	0	29
24	60	881	56	822			44		1.76	33	33	
25	96	1,569	76	1,242			56		1.96	33	19	
26	108	1,810	32	536			24		2.01	36	70	
27	81	1,378	70	1,191			60		2.04	52	44	
28	60	996	50	830			44		1.99	51	51	
29	57	941	46	760	1.20	20	38		1.98	34	45	51
30	54	883	48	785			38		1.96	50	43	
31	72	1,141	40	634			20		1.90	14	60	
Total	4,554	73,753	2,768	44,952	14.92	226	2,208		60.20	673	507	80
Max.	354	5,669	168	2,858	3.85	62	152		2.05	55	70	51
Min.	54	881	32	536	1.20	20	20		1.76	0	0	0
Avg.	147	2,379	92	1,498	2.98	45	74		1.94	22	17	16

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
MARCH, 1991 - ACTIVATED SLUDGE SHEET

	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading flm	Mix Liq SS mgIL	Mix Liq VSS mgIL	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mgIL	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mgIl	PE SS mgIL
PN-	^80993	^81001	^80990	^80992	^70323	^70324	^81004	^81007	^00300	^81000	^81006	^70325	^81014	^80991	^50050	^00310	^00530
Day																	
1	48	4.4	2.7	0.61	2,268	1,892	14.0	1.62	1.0	184	0.53	0.44	66	69	1.98	210	151
2		4.5	3.0		2,276					196			68	69	1.91	207	142
3		4.5	2.7		2,028					2			68	58	1.92	224	141
4		4.2	2.5	0.73	2,026	1,680	15.0	1.35	5.0	198	0.49	0.40	64	58	2.03	217	141
5		4.2	2.8	0.70	2,091	1,703	16.0	1.31	4.5	188	0.49	0.40	64	58	2.05	209	132
6		4.4	3.0	0.66	2,197	1,781	16.0	1.37	4.3	193	0.55	0.44	65	58	1.97	213	132
7		4.2	2.9	0.69	2,176	1,742	18.5	1.18	3.3	200	0.50	0.39	63	58	2.04	211	132
8		4.5	3.1	0.72	2,184	1,744	20.0	1.09	1.4	198	0.51	0.40	67	50	1.92	235	132
9		4.6	3.3		2,147					197			69	50	1.86	249	127
10		4.9	3.3		2,105					201			73	52	1.76	220	130
11		4.4	2.9	0.80	1,934	1,483	22.0	0.88	4.3	201	0.43	0.33	66	52	1.94	220	125
12		4.2	2.8	0.85	1,903	1,447	23.0	0.83	2.0	197	0.44	0.33	62	52	2.05	216	117
13		4.4	3.0	0.79	1,859	1,396	21.0	0.89	3.2	194	0.45	0.34	64	52	1.98	200	114
14		4.4	3.3	0.69	1,943	1,455	21.0	0.93	3.7	196	0.45	0.33	65	52	1.96	183	109
15		4.5	3.5	0.68	1,875	1,406	20.0	0.94	5.9	199	0.43	0.32	66	52	1.92	178	100
16		4.9	4.1		1,959					199			71	52	1.76	142	97
17		4.6	3.6		1,854					195			68	58	1.86	138	99
18		4.2	3.2	0.58	1,784	1,318	20.5	0.87	6.6	195	0.27	0.15	61	58	2.04	134	98
19		4.4	3.2	0.59	1,754	1,288	20.0	0.88	4.2	191	0.42	0.31	66	58	1.98	137	98
20		4.4	3.3	0.60	1,692	1,265	20.0	0.85	4.3	186	0.40	0.30	67	58	1.96	140	95
21		4.3	3.1	0.65	1,642	1,233	19.0	0.86	3.8	183	0.38	0.27	66	58	2.00	143	96
22		4.4	3.4	0.49	1,657	1,234	19.0	0.87	2.0	221	0.39	0.29	68	58	1.95	112	91
23		4.9	3.6		1,554					230			75	58	1.76	115	89
24		4.9	2.0		790					237			76	43	1.76	110	81
25		4.4	0.7		294					228			59	43	1.96	106	80
26		4.3	2.6	0.66	1,047	854	11.0	0.95	7.4	225	0.25	0.20	56	144	2.01	101	71
27		4.2	2.1	0.82	820	660	8.5	0.96	7.4	221	0.20	0.17	63	0	2.04	95	69
28		4.3	3.0	0.57	1,045	841	11.5	0.91	7.5	235	0.29	0.23	67	0	1.99	86	62
29		4.4	3.7		1,203					242			66	29	1.98	80	59
30		4.4	4.1		1,198					242			67	29	1.96	74	54
31		4.5	4.4		1,213					238			69	29	1.90	75	52
Total	48	137.8	94.8	12.87	52,518	26,422	336.0	19.53	81.8	6,212	7.87	6.04	2,055	1,615	60.20	4,980	3,216
Max.	48	4.9	4.4	0.85	2,276	1,892	23.0	1.62	7.5	242	0.55	0.44	76	144	2.05	249	151
Min.	48	4.2	0.7	0.49	294	660	8.5	0.83	1.0	2	0.20	0.15	56	0	1.76	74	52
Avg.	48	4.4	3.1	0.68	1,694	1,391	17.7	1.03	4.3	200	0.41	0.32	66	52	1.94	161	104

Robert J. Swalwell
Superintendent

MARSHALL WWTP 801 W. PEARL ST. MARSHALL MI. 49068 - PERMIT No. MI0023540
MARCH, 1991 - DISCHARGE MONITORING REPORT - DISCHARGE No. 001A

	F.Eff. D.O. mgIL	F.Eff. pH SU	F.Eff. SS mgIL	F.Eff. SS Lbs.	F.Eff. Total-P mgIL	Flow MGD	F.Eff. Chlorine mgIL	F.Eff. BOD mgIL	F.Eff. BOD Lbs.	F.Eff. NH3 as N mgIL	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %
Limit-	94.0	6 & 9	30 & 45	751 & ^1,126	<1.0			20 & 30	500 & ^751	<11.0	7 Day ^275	200 & 400	>85%	>85%	
PN-	^00300	^00400	^00530	^00530	^00665	^50050	^50060	^80082	^80082	^00610	^00610	^31616	^81011	^91267	^81012
Day															
1	6.1	7.5	23	380		1.98	0.00	19	314			400	84	92	
2	6.5	7.1	18	287		1.91	0.00	19	303			400	83	94	
3	7.4	7.2	16	256	0.51	1.92	0.00	23	368			112	81	92	84
4	8.0	7.4	17	288		2.03	0.00	19	322			86	82	84	
5	7.6	7.3	12	205		2.05	0.00	21	359			6	86	83	
6	7.9	7.2	14	230		1.97	0.00	21	345			4	87	91	
7	7.2	7.0	34	578		2.04	0.00	39	664			68	68	81	
8	7.2	7.2				1.92	0.00	43	689 524			400		88	
9	7.0	7.4	22	341		1.86	0.00	40 33	620			400	82	89	
10	7.0	6.9	18	264	0.78	1.76	0.00	28	411			18	78	79	76
11	7.0	7.1	9	146		1.94	0.00	33	534			22	90	80	
12	6.8	7.1	10	171		2.05	0.00	26	445			148	88	81	
13	7.4	7.0	21	347		1.98	0.00	20	330			400	76	86	
14	7.4	7.2	9	147		1.96	0.00	25	409			236	89	79	
15	8.2	7.5	20	320		1.92	0.00	36	576			224	83	91	
16	6.9	7.0	21	308	1.00	1.76	0.00	19	279			400	84	89	69
17	7.9	7.4	15	233		1.86	0.02	15	233			364	83	88	
18	7.9	7.3	10	170		2.04	0.00	31	527			400	81	81	
19	7.9	7.3	18	297		1.98	0.00	37	611			400	82	80	
20	7.3	7.2	14	229		1.96	0.00	28	458			400	84	82	
21	7.0	7.1	18	300		2.00	0.00	23	384			190	82	85	
22	7.4	7.1	11	179		1.95	0.01	20	325			270	90	86	
23	7.5	7.4	19	279	2.22	1.76	0.00	15	220			400	74	89	46
24	7.6	7.5	14	205		1.76	0.00	7	103			400	83	92	
25	8.0	7.2	12	196		1.96	0.00	10	163			114	87	93	
26	8.0	7.3	13	218		2.01	0.02	26	436			26	88	85	
27	8.2	7.3	8	136		2.04	0.00	11	187			24	94	93	
28	8.5	7.2	7	116		1.99	0.00	4	66			4	93	97	
29	8.3	7.2	9	149	0.35	1.98	0.00	7	116			4	89	92	86
30	8.5	7.4	9	147		1.96	0.00	4	65			2	89	96	
31	8.7	7.8	5	79		1.90	0.00	6	95			2	97	93	
Total	328.3 87	224.8	446	7,202	4.86	60.20	0.05	675	10,956			6,324	2,537	2,711	361
Max.	~~94.0~~	7.8	34	578	2.22	2.05	0.02	43	689			400	97	97	86
Min.	6.1	6.9	5	79	0.35	1.76	0.00	4	65			2	68	79	46
Avg.	~~10.3~~ 7.6	7.3	15 19	240 318	0.97	1.94	0.00	22 33	353 529			~~204~~ 337 81	85	87	72

Robert J. Swalwell
Superintendent

MARSHALL , MICHIGAN WASTEWATER TREATMENT PLANT
MARCH , 1991 - MISCELLOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	SO2 Lbs.	Lime Lbs.	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	PH	Lbs. of Lime per lb. of Dry Solids
	5											
1	3,200	2,640	290	26	298	19	50	1,800	5.6	77	5.9	0.06
2	5,200	2,760	170	24	298	18	250	4,000	5.3	77	5.9	0.14
3	11,000	2,880	250	24	298	22	233	2,400	5.8	76	5.8	0.20
4	8,000	2,760	290	26	298	18	350	5,300	5.7	76	5.8	0.14
5	4,100	2,640	640	26	298	18	416	6,000	5.9	75	5.6	0.14
6	6,900	2,880	250	26	199	5	333	5,000	6.0	76	5.6	0.13
7	9,400	2,760	430	24	298	17	333	5,000	5.9	74	5.4	0.13
8	7,100	2,880	360	24	199	18	100	2,000	5.6	76	6.0	0.11
9	6,700	2,760	180	39	397	18	150	2,500	5.2	75	5.9	0.14
10	7,300	2,760	350	41	199	20	250	5,500	5.5	76	5.7	0.10
11	8,200	2,880	230	20	298	16	283	5,000	5.3	76	5.8	0.13
12	8,100	2,760	310	21	397	20	550	4,500	5.7	78	6.3	0.26
13	7,700	2,880	180	25	298	21	250	4,000	7.0	76	5.9	0.11
14	6,600	2,760	290	26	298	16	250	5,000	5.6	77	5.6	0.11
15	6,000	2,760	230	24	298	19	250	4,000	5.5	79	5.7	0.14
16	5,400	2,640	170	28	199	17	233	4,000	4.8	75	5.8	0.14
17	6,100	2,880	250	26	298	19	217	3,500	5.6	76	5.9	0.13
18	5,500	2,760	210	22	298	20	400	6,000	5.4	74	5.9	0.15
19	3,500	2,640	420	24	397	19	400	6,000	5.5	76	6.0	0.14
20	2,200	2,640	410	32	298	19	400	6,000	5.8	76	6.0	0.14
21	1,700	2,520	480	30	298	21	450	9,000	5.5	77	5.8	0.11
22	1,900	2,640	500	24	397	15	600	9,000	4.8	75	5.9	0.17
23	3,200	2,760	310	18	596	18	416	12,000	4.1	70	6.4	0.10
24	4,100	2,880	280	30	496	19	466	10,000	3.6	70	6.5	0.15
25	2,200	2,760	1,090	14	496	19	850	15,800	4.0	70	6.4	0.16
26	2,400	2,640	1,050	36	397	19						
27	200	2,760	390	26	397	21	400	4,700	4.0	74	6.8	0.25
28	5,000	2,760	400	29	496	21	250	4,000	4.7	70	6.7	0.16
29	7,400	3,000	150	25	397	3	233	3,000	4.7	72	6.7	0.20
30	7,100	2,880	150	25	496	25	200	3,000	4.1	70	6.8	0.19
31	6,100	2,880	230	27	298	19	133	3,000	4.4	70	6.7	0.12
Total	169,500	85,800	10,940	812	10,625	559	9,696	161,000	156.6	2,239	181.2	4.33
Max.	11,000	3,000	1,090	41	596	25	850	15,800	7.0	79	6.8	0.26
Min.	200	2,520	150	14	199	3	50	1,800	3.6	70	5.4	0.06
Avg.	5,468	2,768	353	26	343	18	323	5,367	5.2	75	6.0	0.14

Manpower & Hours

	Total Hr
Superintendent 1	^160
Asst. Supt. 1	^160
Operators 3	^484
Total	^804

Robert J. Swalwell
Superintendent

MARSHALL , MICHIGAN WASTEWATER TREATMENT PLANT
APRIL, 1991 - INFLUENT SHEET - SAMPLING CODE 500

	Weather		Inf. Flow	Inf. Temp	Inf. pH	Inf. BOD	Inf. BOD	Inf. SS	Inf. SS	Inf. Phos.	Inf. Phos.	Inf. VSS	Inf. NH3-N	--Remarks or Other Parameters--
	Type	Precip.	MGD	F	SU	mgIL	Lbs.	mgIL	Lbs.	mgIL	Lbs.	mgIL	mgIL	
PN-	^00033	^00045	^50050	^00011	^00400	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	
Day														
1	1		2.06	50	7.2	87	1,495	106	1,821			98		
2	1		2.03	51	7.7	81	1,371	84	1,422			74		
3	1		2.05	50	7.4	99	1,693	90	1,539			72		
4	4	0.31	2.05	51	7.4	126	2,154	96	1,641	2.45	42	84		
5	1		2.04	51	7.4	123	2,093	110	1,871			96		
6	1		1.87	50	7.2	123	1,918	70	1,092			52		
7	1		1.96	50	7.2	87	1,422	74	1,210			70		
8	4	0.06	2.08	51	7.4	96	1,665	70	1,214			62		
9	4	0.31	2.05	51	7.7	117	2,000	106	1,812			92		
10	1		2.06	51	7.4	126	2,165	76	1,306	3.00	52	64		
11	1		2.04	51	7.3	111	1,889	70	1,191			56		
12	1		1.98	51	7.4	78	1,288	106	1,750			94		
13	4	0.05	1.85	50	7.4	81	1,250	101	1,558			76		
14	4	1.06	2.02	50	7.4	75	1,264	70	1,179			64		
15	4	0.17	2.18	51	7.5	138	2,509	80	1,454			66		
16	1		2.18	51	7.7	126	2,291	98	1,782	2.20	40	82		
17	1		2.17	52	7.4	156	2,823	68	1,231			58		
18	1		2.21	52	7.2	129	2,378	74	1,364			64		
19	4	0.76	2.20	52	7.6	162	2,972	96	1,761			88		
20	4	0.04	2.14	51	7.6	118	2,106	60	1,071			54		
21	4	0.02	2.21	50	7.4	93	1,714	70	1,290			54		
22	1		2.28	51	7.3	105	1,997	78	1,483	2.85	54	74		
23	4	0.38	2.31	52	7.3	159	3,063	104	2,004			94		
24	1		2.27	52	7.3	111	2,101	82	1,552			68		
25	1		2.22	52	7.4	108	2,000	74	1,370			60		
26	1		2.17	52	7.4	156	2,823	66	1,194			52		
27	4	0.72	2.15	52	7.3	129	2,313	70	1,255			54		
28	4	0.02	2.21	52	7.3	99	1,825	90	1,659	4.45	82	76		
29	4	0.09	2.41	53	7.5	111	2,231	90	1,809			76		
30	4	0.09	2.38	53	7.3	72	1,429	86	1,707			72		
31														
Total	72	4.08	63.83	1,536	222.0	3,382	60,241	2,515	44,594	14.95	270	2,146		
Max.	4	1.06	2.41	53	7.7	162	3,063	110	2,004	4.45	82	98		
Min.	1	0.02	1.85	50	7.2	72	1,250	60	1,071	2.20	40	52		
Avg.	2	0.29	2.13	51	7.4	113	2,008	84	1,486	2.99	54	72		

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
APRIL, 1991 - PRIMARY EFFLUENT SHEET

	P Eff. BOD mgIL	P Eff. BOD Lbs.	P Eff. SS mgIL	P. Eff. SS Lbs.	P Eff. Phos. mgIL	P Eff. Phos. Lbs.	P Eff. VSS mgIL	P Eff. NH3-N mgIL	Flow MGD	BOD Pri. Removal %	SS Pri. Removal %	P Pri. Removal %
PN-	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	^50050			
Day												
1	54	928	44	756			42		2.06	38	58	
2	51	863	40	677			38		2.03	37	52	
3	54	923	46	786			36		2.05	45	49	
4	69	1,180	48	821	1.20	21	44		2.05	45	50	51
5	93	1,582	38	647			34		2.04	24	65	
6	63	983	32	499			28		1.87	49	54	
7	54	883	36	588			28		1.96	38	51	
8	60	1,041	40	694			32		2.08	38	43	
9	69	1,180	48	821			40		2.05	41	55	
10	66	1,134	36	618	2.45	42	30		2.06	48	53	18
11	66	1,123	48	817			34		2.04	41	31	
12	51	842	40	661			34		1.98	35	62	
13	45	694	44	679			32		1.85	44	60	
14	48	809	34	573			30		2.02	36	51	
15	105	1,909	60	1,091			50		2.18	24	25	
16	81	1,473	36	655	1.15	21	26		2.18	36	63	47
17	75	1,357	40	724			34		2.17	52	41	
18	93	1,714	38	700			30		2.21	28	49	
19	90	1,651	40	734			32		2.20	29	58	
20	84	1,499	38	678			18		2.14	29	37	
21	60	1,106	36	664			28		2.21	35	49	
22	66	1,255	34	647	1.50	29	28		2.28	37	56	47
23	78	1,503	40	771			34		2.31	51	62	
24	66	1,249	36	682			26		2.27	41	56	
25	69	1,278	40	741			32		2.22	36	59	
26	84	1,520	34	615			30		2.17	46	48	
27	54	968	42	753			28		2.15	58	40	
28	57	1,051	40	737	2.85	53	26		2.21	42	43	36
29	60	1,206	32	643			24		2.41	46	64	
30	42	834	32	635			24		2.38	42	64	
31												
Total	2,007	35,737	1,192	21,105	9.15	165	952		63.83	1,191	1,548	199
Max.	105	1,909	60	1,091	2.85	53	50		2.41	58	65	51
Min.	42	694	32	499	1.15	21	18		1.85	24	25	18
Avg.	67	1,191	40	703	1.83	33	32		2.13	40	52	40

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
APRIL, 1991 - ACTIVATED SLUDGE SHEET

	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading flm	Mix Liq SS mgIL	Mix Liq VSS mgIL	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mgIL	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mgIl	PE SS mgIL
PN-	^80993	^81001	^80990	^80992	^70323	^70324	^81004	^81007	^00300	^81000	^81006	^70325	^81014	^80991	^50050	^00310	^00530
Day																	
1	48	4.2	4.3	0.43	1,172	914	14.0	0.84	8.0	241	0.29	0.23	64	29	2.06	69	47
2		4.2	4.2	0.38	1,153	915	13.5	0.85	8.0	240	0.26	0.21	64	29	2.03	61	48
3		4.2	4.8	0.34	1,224	967	12.5	0.98	8.0	233	0.25	0.21	63	33	2.05	57	45
4		4.2	4.4	0.34	1,140	981	11.5	0.99	7.3	227	0.26	0.22	63	33	2.05	59	45
5		4.2	5.1	0.38	1,234	957	12.0	1.03	6.6	223	0.29	0.24	64	22	2.04	64	43
6		4.6	6.0		1,287					209			66	22	1.87	65	41
7		4.4	5.8		1,309					218			66	22	1.96	63	41
8		4.1	6.2	0.35	1,441	1,051	13.5	1.07	6.6	162	0.32	0.25	62	29	2.08	63	40
9		4.2	5.8	0.36	1,357	1,042	14.0	0.97	5.3	152	0.32	0.22	63	29	2.05	66	41
10		4.2	5.9	0.37	1,360	1,051	15.0	0.91	5.3	160	0.33	0.25	63	36	2.06	68	40
11		4.2	5.8	0.38	1,318	1,002	15.0	0.88	5.2	160	0.32	0.24	63	36	2.04	67	40
12		4.4	5.9	0.34	1,277	992	15.0	0.85	5.9	157	0.30	0.23	65	36	1.98	61	39
13		4.7	6.2		1,286					156			70	36	1.85	59	40
14		4.3	5.7		1,280					148			66	36	2.02	58	40
15		4.0	4.7	0.40	1,232	982	14.5	0.85	3.7	149	0.31	0.25	61	35	2.18	64	43
16		4.0	4.8	0.41	1,250	972	15.5	0.81	3.7	149	0.31	0.24	61	35	2.18	66	43
17		4.0	4.8	0.43	1,208	940	14.5	0.83	5.0	151	0.30	0.23	61	35	2.17	67	42
18		3.9	4.5	0.49	1,168	897	13.0	0.90	6.4	150	0.31	0.24	60	35	2.21	71	42
19		3.9	4.7	0.52	1,170	902	13.5	0.87	5.0	152	0.31	0.24	60	35	2.20	77	41
20		4.0	4.7		1,149					155			61	32	2.14	82	41
21		3.9	4.6		1,103					152			59	29	2.21	76	39
22		3.8	4.3	0.56	1,068	833	13.0	0.82	6.3	147	0.29	0.23	57	29	2.28	74	39
23		3.7	4.6	0.55	1,101	863	12.5	0.88	5.1	146	0.30	0.23	57	29	2.31	74	37
24		3.8	4.8	0.50	1,133	885	13.0	0.87	6.3	150	0.30	0.23	58	29	2.27	70	37
25		3.9	4.9	0.56	1,111	744	12.5	0.89	5.7	147	0.28	0.21	58	29	2.22	67	37
26		4.0	5.1	0.48	1,101	844	13.0	0.85	5.1	145	0.30	0.23	58	29	2.17	67	36
27		4.0	5.2		1,120					143			60	29	2.15	66	36
28		3.9	5.0		1,138					143			58	29	2.21	65	37
29		3.6	4.7	0.48	1,136	886	13.0	0.87	6.2	140	0.31	0.24	53	29	2.41	63	36
30		3.6	5.1	0.40	1,223	968	14.0	0.87	4.0	144	0.32	0.26	54	29	2.38	59	36
31																	
Total	48	122.0	152.8	9.45	36,249	20,588	298.0	19.67	128.7	5,049	6.58	5.13	1,838	925	63.83	1,988	1,212
Max.	48	4.7	6.2	0.56	1,441	1,051	15.5	1.07	8.0	241	0.33	0.26	70	36	2.41	82	48
Min.	48	3.6	4.2	0.34	1,068	744	11.5	0.81	3.7	140	0.25	0.21	53	22	1.85	57	36
Avg.	48	4.1	5.1	0.43	1,208	936	13.5	0.89	5.9	168	0.30	0.23	61	31	2.13	66	40

Robert J. Swalwell
Superintendent

MARSHALL WWTP 801 W. PEARL ST.MARSHALL MI. 49068 - PERMIT No. MI0023540
APRIL, 1991 - DISCHARGE MONITORING REPORT - DISCHARGE No. 001A

	F.Eff. D.O. mgIL	F.Eff. pH SU	F.Eff. SS mgIL	F.Eff. SS Lbs.	F.Eff. Total-P mgIL	Flow MGD	F.Eff. Chlorine mgIL	F.Eff. BOD mgIL	F.Eff. BOD Lbs.	F.Eff. NH3 as N mgIL	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %
Limit-	>4.0	6 & 9	30 & 45	751 & ^1,126	<1.0			20 & 30	500 & ^751	<11.0	7 Day ^275	200 & 400	>85%	>85%	
PN-	^00300	^00400	^00530	^00530	^00665	^50050	^50060	^80082	^80082	^00610	^00610	^31616	^81011	^91267	^81012
Day			X	X				X	X						
1	9.0	7.3	11	189		2.06	0.00	17	292			20	90	80	
2	8.8	7.7	13	220		2.03	0.00	8	135			58	85	90	
3	8.9	7.3	11	188		2.05	0.02	7	120			38	88	93	
4	8.6	7.5	6	103	0.35	2.05	0.00	6 11	103 142			36	94	95	86
5	7.9	7.3	10	170		2.04	0.00	14	238			34	91	89	
6	7.6	7.2	5	78		1.87	0.00	6	94			2	93	95	
7	7.0	7.3	1	16		1.96	0.00	18	294			2	99	79	
8	7.5	7.3	1	17		2.08	0.00	5	87			4	99	95	
9	6.9	7.5	10	171		2.05	0.00	10	171			2	91	91	
10	7.3	7.3	9	155	0.41	2.06	0.00	7	120			2	96	94	86
11	7.5	7.3	10	170		2.04	0.00	7	119			2	86	94	
12	7.5	7.4	40	66		1.98	0.00	5	83			2	96	94	
13	7.4	7.3	16	247		1.85	0.00	5	77			2	84	94	
14	7.3	7.3	2	34		2.02	0.00	5	84			2	97	93	
15	7.2	7.4	10	182		2.18	0.00	8	145			2	88	94	
16	7.0	7.6	5	91	0.30	2.18	0.00	8	145			2	95	94	86
17	7.4	7.2	9	163		2.17	0.00	5	90			2	87	97	
18	7.5	7.2	7	129		2.21	0.00	5	92			2	91	96	
19	7.6	7.3	8	147		2.20	0.00	6	110			2	92	96	
20	7.9	7.5	4	71		2.14	0.00	6	107			2	93	95	
21	7.9	7.3	5	92		2.21	0.00	6	111			2	93	94	
22	8.0	7.3	6	114	0.51	2.28	0.00	5	95			2	92	95	82
23	6.7	7.3	11	212		2.31	0.00	6	116			4	89	96	
24	8.0	7.3	8	151		2.27	0.00	7	133			2	90	94	
25	7.8	7.4	8	148		2.22	0.00	6	111			2	89	94	
26	7.9	7.4	9	163 145		2.17	0.00	3	54			2	86	98	
27	7.4	7.2	6	108	1.00	2.15	0.00	8	143			4	91	94	
28	7.4	7.3	6	111		2.21	0.00	17	313			2	93	83	77
29	7.2	7.4	6	121		2.41	0.00	6	121			6	93	95	
30	7.3	7.2	4	79		2.38	0.00	4	79			2	95	94	
31															
Total	229.4	220.3	221	3,905	2.57	63.83	0.02	226	3,983			246	2,746	2,785	417
Max.	9.0	7.7	16	247	1.00	2.41	0.02	18	313			58	99	98	86
Min.	6.7	7.2	1	16	0.30	1.85	0.00	3	54			2	84	79	77
Avg.	7.6	7.3	7	130	0.51	2.13	0.00	8	133			4	92	93	83
			9	145				11	182						

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
APRIL, 1991 - MISCELLOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	SO2 Lbs.	Lime Lbs.	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	PH	Lbs. of Lime per lb. of Dry Solids
1	7,000	2,880	290	30	496	22	349	6,000	4.5	71	6.5	0.15
2	5,500	2,880	240	28	496	22	498	8,000	4.5	70	6.5	0.16
3	3,900	2,760	290	18	397	27	166	5,000	4.0	70	6.8	0.10
4	2,000	2,760	280	35	397	19	349	6,000	4.0	71	6.5	0.17
5	2,300	2,520	540	21	298	18	150	5,000	3.5	70	6.5	0.10
6	1,400	2,400	140	20	298	16	166	3,000	4.5	69	6.6	0.15
7	100	2,640	110	24	397	18	183	3,000	3.9	73	6.6	0.19
8	100	2,040	890	22	397	22	349	5,000	5.0	74	6.6	0.17
9	100	2,040	110	24	397	18	232	5,000	4.8	70	6.6	0.12
10	4,500	2,400	560	29	298	20	332	5,000	4.8	70	6.5	0.16
11	5,300	2,280	390	23	298	20	232	6,000	5.3	75	6.5	0.09
12	3,300	2,160	310	24	298	22	116	5,000	4.9	72	6.6	0.06
13	3,900	2,280	410	18	397	21	249	4,000	4.3	71	6.6	0.17
14	2,700	2,040	450	34	397	12	249	4,000	4.0	83	6.5	0.19
15	2,900	2,280	320	28	298	17	382	6,000	5.0	73	6.3	0.15
16	4,100	2,160	330	18	298	18	398	6,000	4.7	71	6.4	0.17
17	1,400	2,040	390	21	397	18	332	4,000	4.6	70	6.5	0.21
18	0	2,160	460	21	298	26	166	6,000	4.3	73	6.4	0.08
19	5,300	2,280	430	22	298	12	266	4,500	4.5	71	6.6	0.16
20	5,100	2,280	280	23	397	20	199	3,000	4.8	71	6.5	0.16
21	5,100	2,280	330	23	298	21	183	3,000	4.4	72	6.5	0.17
22	2,800	2,160	300	23	298	15	398	6,000	4.8	72	6.4	0.16
23	2,400	2,160	520	29	298	18	382	6,000	5.2	74	6.4	0.15
24	3,800	2,280	340	22	298	18	294	6,000	4.5	71	6.4	0.13
25	1,500	2,160	390	25	397	18	299	6,000	4.3	70	6.3	0.14
26	100	1,920	440	23	99	19	365	6,000	4.5	70	6.2	0.16
27	100	1,920	270	25	397	18	215	4,000	4.3	70	6.3	0.15
28	200	2,040	340	25	298	21	215	4,000	4.1	72	6.4	0.16
29	100	2,040	360	18	298	20	365	6,000	4.0	70	6.3	0.18
30	100	1,920	450	18	298	16	382	6,000	4.6	72	6.3	0.16
31												
Total	77,100	68,160	10,960	714	10,226	572	8,461	152,500	134.6	2,151	194.1	4.46
Max.	7,000	2,880	890	35	496	27	498	8,000	5.3	83	6.8	0.21
Min.	0	1,920	110	18	99	12	116	3,000	3.5	69	6.2	0.06
Avg.	2,570	2,272	365	24	341	19	282	5,083	4.5	72	6.5	0.15

Manpower & Hours

	Total Hr
Superintendent 1	^176
Asst. Supt. 1	^176
Operators 3	^528
Total	^880

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
MAY, 1991 - INFLUENT SHEET - SAMPLING CODE 500

	----Weather----		Inf. Flow	Inf. Temp	Inf. pH	Inf. BOD	Inf. BOD	Inf. SS	Inf. SS	Inf. Phos.	Inf. Phos.	Inf. VSS	Inf. NH3-N	--Remarks or Other Parameters--
	Type	Precip.	MGD	F	SU	mgIL	Lbs.	mgIL	Lbs.	mgIL	Lbs.	mgIL	mgIL	
PN-	^00033	^00045	^50050	^00011	^00400	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	
Day														
1	4	0.06	2.41	53	7.4	105	2,110	78	1,568			68	10.5	
2	1		2.44	53	7.3	135	2,747	78	1,587	3.50	71	66	7.7	
3	1		2.28	54	7.5	147	2,795	94	1,787			64	6.9	
4	3		2.08	53	7.4	87	1,509	64	1,110			48	7.9	
5	4	0.50	2.11	52	7.4	90	1,584	90	1,584			64	9.6	
6	4	0.02	2.38	53	7.3	96	1,906	90	1,786			70	12.9	
7	3		2.30	53	7.4	126	2,417	100	1,918			92	10.1	
8	4	0.03	2.25	53	7.3	144	2,702	78	1,464			60	11.3	
9	1		2.39	55	7.3	123	2,452	92	1,834	5.85	117	78	9.8	
10	1		2.09	53	7.2	126	2,196	74	1,290			60	8.5	
11	1		2.03	52	7.6	108	1,828	98	1,659			82	8.3	
12	4	0.03	2.04	52	7.4	75	1,276	54	919			44	9.1	
13	4	0.23	2.28	54	7.6	99	1,883	86	1,635			82	8.5	
14	1		2.30	55	7.3	87	1,669	74	1,419	4.10	79	60	9.3	
15	1		2.23	55	7.5	114	2,120	74	1,376			70	9.7	
16	4	0.95	2.29	55	7.3	153	2,922	124	2,368			98	8.8	
17	1		2.08	55	7.3	102	1,769	120	2,082			110	8.8	
18	4	0.02	1.92	53	7.3	81	1,297	92	1,473			74	9.2	
19	1		1.99	52	7.2	84	1,394	118	1,958			100	10.7	
20	1		2.22	55	7.4	117	2,166	176	3,259	4.45	82	156	14.3	
21	1		2.23	55	7.3	72	1,339	94	1,748			86	10.5	
22	1		2.23	56	7.3	75	1,395	102	1,897			98	8.2	
23	4	0.27	2.27	57	7.3	111	2,101	90	1,704			84	10.1	
24	4	0.25	2.17	56	7.2	78	1,412	70	1,267			68	7.9	
25	4	0.25	1.97	55	7.4	69	1,134	72	1,183			66	6.6	
26	4	0.01	1.93	54	7.4	75	1,207	86	1,384	2.20	35	80	7.2	
27	1		2.00	54	7.4	63	1,051	72	1,201			68	7.4	
28	1		2.18	57	7.3	114	2,073	92	1,673			82	9.7	
29	1		2.20	57	7.3	120	2,202	86	1,578			74	12.7	
30	4	0.73	2.23	57	7.7	102	1,897	80	1,488			70	10.4	
31	4	0.04	2.16	57	7.3	78	1,405	152	2,738			138	9.7	
Total	77	3.39	67.68	1,685	228.3	3,156	57,959	2,850	51,938	20.10	384	2,460	292.3	
Max.	4	0.95	2.44	57	7.7	153	2,922	176	3,259	5.85	117	156	14.3	
Min.	1	0.01	1.92	52	7.2	63	1,051	54	919	2.20	35	44	6.6	
Avg.	2	0.24	2.18	54	7.4	102	1,870	92	1,675	4.02	77	79	9.4	

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
MAY, 1991 - PRIMARY EFFLUENT SHEET

	P Eff. BOD mg/L	P Eff. BOD Lbs.	P Eff. SS mg/L	P. Eff. SS Lbs.	P Eff. Phos. mg/L	P Eff. Phos. Lbs.	P Eff. VSS mg/L	P Eff. NH3-N mg/L	Flow MGD	BOD Pri. Removal %	SS Pri. Removal %	P Pri. Removal %
PN-	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	^50050			
Day												
1	60	1,206	42	844			34	8.5	2.41	43	46	
2	75	1,526	48	977	2.65	54	38	8.2	2.44	44	38	24
3									2.28			
4	78	1,353	52	902			50	7.8	2.08	10	19	
5	63	1,109	58	1,021			46	8.6	2.11	30	36	
6	54	1,072	50	992			36	10.4	2.38	44	44	
7	78	1,496	68	1,304			52	9.4	2.30	38	32	
8	90	1,689	34	638			30	9.3	2.25	38	56	
9	81	1,615	60	1,196	4.55	91	52	8.4	2.39	34	34	22
10	84	1,464	58	1,011			50	8.3	2.09	33	22	
11	66	1,117	54	914			40	8.1	2.03	39	45	
12	57	970	44	749			36	8.2	2.04	24	19	
13	63	1,198	48	913			22	8.4	2.28	36	44	
14	48	921	60	1,151	2.65	51	52		2.30	45	19	35
15	66	1,227	64	1,190			54	8.7	2.23	42	14	
16	105	2,005	80	1,528			66	9.7	2.29	31	35	
17	60	1,041	48	833			44	9.0	2.08	41	60	
18	51	817	70	1,121			48	7.7	1.92	37	24	
19									1.99			
20	57	1,055	72	1,333	2.55	47	62	9.9	2.22	51	59	43
21	54	1,004	56	1,041			52	9.6	2.23	25	40	
22	48	893	54	1,004			52	8.1	2.23	36	47	
23	57	1,079	66	1,249			64	9.5	2.27	49	27	
24	57	1,032	62	1,122			58	9.2	2.17	26	11	
25	51	838	40	657			36	7.8	1.97	26	44	
26	63	1,014	50	805	1.35	22	40	8.7	1.93	16	42	39
27	48	801	60	1,001			58	7.2	2.00	23	17	
28	66	1,200	68	1,236			64	8.1	2.18	42	26	
29	81	1,486	68	1,248			60	10.0	2.20	33	21	
30	90	1,674	72	1,339			64	8.6	2.23	12	10	
31	45	811	22	396			14	7.0	2.16	42	85	
Total	1,896	34,712	1,628	29,716	13.75	264	1,374	242.4	67.68	990	1,016	163
Max.	105	2,005	80	1,528	4.55	91	66	10.4	2.44	51	85	43
Min.	45	801	22	396	1.35	22	14	7.0	1.92	10	10	22
Avg.	65	1,197	56	1,025	2.75	53	47	8.7	2.18	34	35	33

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
MAY, 1991 - ACTIVATED SLUDGE SHEET

	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading flm	Mix Liq SS mgIL	Mix Liq VSS mgIL	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mgIL	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mgIl	PE SS mgIL
PN-	^80993	^81001	^80990	^80992	^70323	^70324	^81004	^81007	^00300	^81000	^81006	^70325	^81014	^80991	^50050	^00310	^00530
Day																	
1	48	3.6	5.1	0.42	1,266	984	15.0	0.84	5.6	148	0.35	0.27	53	29	2.41	61	37
2		3.5	4.7	0.42	1,243	998	15.0	0.83	5.6	152	0.33	0.26	55	29	2.44	62	39
3		3.8	5.0	0.39	1,246	1,009	15.0	0.83	5.7	149	0.32	0.25	57	29	2.28	62	39
4		4.1	6.0		1,426					151			64	35	2.08	61	41
5		4.1	5.5		1,391					147			63	35	2.11	62	43
6		3.6	4.4	0.39	1,303	1,053	14.0	0.93	4.0	151	0.37	0.30	56	35	2.38	62	45
7		3.7	4.2	0.37	1,354	1,103	15.0	0.90	5.6	152	0.35	0.28	58	35	2.30	64	50
8		3.8	4.4	0.40	1,374	1,117	18.0	0.76	4.8	151	0.38	0.29	59	35	2.25	71	50
9		3.6	3.8	0.45	1,340	1,106	16.5	0.81	5.0	146	0.34	0.28	56	43	2.39	74	53
10		4.1	4.6	0.36	1,456	1,224	18.0	0.81	2.2	146	0.36	0.30	64	43	2.09	75	54
11		4.2	4.6		1,425					144			65	43	2.03	74	55
12		4.2	4.5		1,370					142			65	43	2.04	73	53
13		3.8	4.0	0.42	1,317	1,108	18.0	0.73	5.1	142	0.33	0.28	58	43	2.28	74	52
14		3.7	4.1	0.40	1,344	1,126	19.0	0.71	3.6	142	0.34	0.28	58	43	2.30	70	51
15		3.9	3.8	0.37	1,310	1,099	19.0	0.69	2.4	136	0.32	0.27	59	43	2.23	66	55
16		3.8	3.6	0.40	1,331	1,116	19.0	0.70	3.6	129	0.33	0.27	58	43	2.29	70	58
17		4.1	4.3	0.32	1,412	1,193	21.0	0.67	2.8	138	0.35	0.30	64	43	2.08	66	57
18		4.5	4.4		1,402					142			69	43	1.92	64	59
19		4.3	4.1		1,343					139			66	43	1.99	64	59
20		3.9	3.3	0.37	1,303	1,068	20.0	0.65	5.8	136	0.33	0.27	59	43	2.22	64	63
21		3.9	3.4	0.35	1,349	1,124	21.0	0.64	3.3	134	0.34	0.28	58	43	2.23	63	64
22		3.9	3.4	0.36	1,329	1,093	21.0	0.63	4.4	132	0.32	0.28	59	43	2.23	63	63
23		3.8	3.4	0.34	1,376	1,139	22.0	0.63	4.7	132	0.33	0.27	59	49	2.27	62	64
24		4.0	3.7	0.29	1,365	1,134	22.5	0.61	2.6	131	0.32	0.27	62	49	2.17	55	61
25		4.4	4.0		1,305					131			68	49	1.97	54	60
26		4.5	4.3		1,323					124			65	49	1.93	55	57
27		4.3	4.7		1,436					132			66	49	2.00	54	55
28		4.0	3.7	0.31	1,272	1,089	25.0	0.51	2.0	128	0.30	0.26	61	52	2.18	56	57
29		3.9	3.5	0.34	1,277	1,090	26.0	0.49	3.4	127	0.30	0.25	60	52	2.20	60	59
30		3.9	3.4	0.39	1,250	1,047	25.0	0.50	2.5	128	0.27	0.23	59	52	2.23	65	60
31		4.0	3.9	0.36	1,272	1,062	27.0	0.47	3.1	128	0.31	0.26	60	52	2.16	63	54
Total	48	122.9	129.9	8.21	41,510	24,082	432.0	15.35	87.8	4,310	7.29	6.00	1,883	1,317	67.68	1,989	1,667
Max.	48	4.5	6.0	0.45	1,456	1,224	27.0	0.93	5.8	152	0.38	0.30	69	52	2.44	75	64
Min.	48	3.5	3.3	0.29	1,243	984	14.0	0.47	2.0	124	0.27	0.23	53	29	1.92	54	37
Avg.	48	4.0	4.2	0.37	1,339	1,095	19.6	0.70	4.0	139	0.33	0.27	61	42	2.18	64	54

Robert J. Swalwell
Superintendent

MAY, 1991 - DISCHARGE MONITORING REPORT - DISCHARGE No. 001A

	F.Eff. D.O. mg/L	F.Eff. pH SU	F.Eff. SS mg/L	F.Eff. SS Lbs.	F.Eff. Total-P mg/L	Flow MGD	F.Eff. Chlorine mg/L	F.Eff. BOD mg/L	F.Eff. BOD Lbs.	F.Eff. NH3 as N mg/L	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %
Limit-	>4.0	6 & 9	30 & 45	751 & ^1,126	<1.0			20 & 30	500 & ^751	<11.0	7 Day ^275	200 & 400	>85%	>85%	
PN-	^00300	^00400	^00530	^00530	^00665	^50050	^50060	^80082	^80082	^00610	^00610	^31616	^81011	^91267	^81012
Day															
1	7.7	7.2	17	342		2.41	0.00	7	141	7.3	147	4	78	93	
2	8.3	7.4	8	163	0.92	2.44	0.01	4	81	6.9	140	4	89	97	72
3	7.9	7.3	8	152		2.28	0.00	10	190	4.8	91	12	91	93	
4	7.3	7.0	3	52		2.08	0.00	9	156	6.6	114	2	95	90	
5	5.6	7.2	6	106		2.11	0.01	6	106	8.3	146	2	93	93	
6	7.0	7.4	7	139		2.38	0.01	12	238	8.4	167	2	92	88	
7	6.5	7.4	15	288		2.30	0.00	17	326	6.3	121	4	85	87	
8	7.0	7.4	4	75		2.25	0.01	14	263	7.6	143	2	95	90	
9	6.7	7.2	5	100	1.02	2.39	0.01	8	159	5.6	112	4	95	93	83
10	6.3	7.2	3	52		2.09	0.00	6	105	5.8	101	8	96	95	
11	6.5	7.3	6	102		2.03	0.00	5	85	5.6	95	2	94	95	
12	6.4	7.2	2	34		2.04	0.00	4	68	6.3	107	2	96	95	
13	6.8	7.5	5	95		2.28	0.01	5	95	6.2	118	2	94	95	
14	6.4	7.2	4	77	1.02	2.30	0.00	5	96	6.0	115	54	95	94	75
15	6.7	7.2	6	112		2.23	0.00	6	112	8.4	156	4	92	95	
16	6.0	7.3	13	248		2.29	0.01	9	172	7.4	141	20	90	94	
17	6.0	7.3	2	35		2.08	0.00	7	121	6.6	114	124	98	93	
18	6.0	7.3	11	176		1.92	0.00	5	80	4.1	66	26	88	94	
19	6.0	7.2	9	149		1.99	0.00	6	100	9.4	156	4	92	93	
20	7.4	7.4	5	93	0.74	2.22	0.01	4	74	8.3	154	40	97	97	83
21	6.2	7.3	3	56		2.23	0.00	7	130	7.5	139	426	96	90	
22	6.0	7.3	3	56		2.23	0.00	5	93	6.5	121	172	97	93	
23	6.0	7.3	4	76		2.27	0.00	6	114	8.7	165	96	96	95	
24	6.4	7.4	2	36		2.17	0.00	5	90	6.0	109	184	97	94	
25	5.5	7.3	7	115		1.97	0.00	6	99	7.7	127	32	90	91	
26	5.5	7.4	7	113	0.62	1.93	0.00	11	177	7.2	116	44	92	85	72
27	5.3	7.4	6	100		2.00	0.00	6	100	7.6	127	6	92	90	
28	6.1	7.3	1	18		2.18	0.00	14	255	8.1	147	188	99	88	
29	6.2	7.3	3	55		2.20	0.00	11	202	8.0	147	42	97	91	
30	6.0	7.4	4	74		2.23	0.00	8	149	7.0	130	22	95	92	
31	6.2	7.5	2	36		2.16	0.00	4	72	7.0	126	8	98	95	
Total	199.9	226.5	181	3,323	4.32	67.68	0.08	232	4,247	217.2	3,957	1,542	2,894	2,868	385
Max.	8.3	7.5	17	342	1.02	2.44	0.01	17	326	9.4	167	426	99	97	83
Min.	5.3	7.0	1	18	0.62	1.92	0.00	4	68	4.1	66	2	78	85	72
Avg.	6.4	7.3	6	107	0.86	2.18	0.00	7	137	7.0	128	13	93	93	77
			9	177				11	205			96			

Robert J. Swalwell
Superintendent

MAY, 1991 - MISCELLOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	SO2 Lbs.	Lime Lbs.	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	PH	Lbs. of Lime per lb. of Dry Solids
1		2,160	450	22	298	21	333	6,000	4.6	72	6.3	0.14
2		2,040	360	20	298	14	317	5,000	5.1	75	6.4	0.15
3		2,040	150	20	298	11	300	5,000	4.6	73	6.3	0.16
4		1,920	280	20	298	14	200	4,000	4.5	73	6.2	0.13
5		1,920	310	22	199	14	200	4,000	4.1	73	6.1	0.15
6		2,280	450	25	298	14	350	5,000	4.5	74	6.2	0.19
7		2,160	310	21	298	16	250	4,000	4.3	76	6.2	0.17
8		2,160	370	21	298	14	383	6,000	4.7	74	6.1	0.16
9		2,040	340	22	298	14	333	6,000	4.6	75	6.0	0.14
10		2,040	300	21	298	15	383	6,000	4.9	73	6.0	0.16
11		1,920	170	22	298	15	250	4,000	4.5	74	6.2	0.17
12		2,040	330	22	298	4	233	4,000	4.1	74	6.2	0.17
13		2,040	100	18	298	3	350	5,500	4.8	63	5.9	0.16
14		2,040	400	10	298	6	383	6,000	4.9	74	6.1	0.16
15		2,160	730	13	298	6	366	6,000	7.6	64	5.9	0.10
16		2,040	310	15	298	5	366	6,000	4.7	74	6.3	0.15
17		2,040	250	13	298	6	233	6,000	4.8	71	6.3	0.10
18		2,040	180	15	298	6	300	4,000	4.7	71	6.5	0.19
19		2,040	260	16	298	6	316	4,000	4.8	72	6.0	0.20
20		2,040	260	16	298	4	400	6,000	5.0	74	6.0	0.16
21		2,160	380	16	298	8	400	6,000	4.9	74	6.3	0.16
22		2,040	260	16	298	7	400	6,000	4.7	72	6.4	0.17
23		2,040	350	16	298	6	383	6,000	4.7	73	6.4	0.16
24		2,040	240	14	298	7	400	6,000	4.8	75	6.1	0.17
25		2,160	280	15	298	6	283	4,000	4.5	74	6.4	0.19
26		1,920	260	15	298	6	317	4,000	4.6	73	6.2	0.21
27		2,040	370	15	298	8	300	4,000	4.8	73	6.3	0.19
28		2,040	330	15	199	5	400	6,000	4.5	74	6.2	0.18
29		2,040	410	18	397	7	350	5,000	4.8	73	6.3	0.17
30		2,040	190	16	199	7	350	5,000	4.9	73	6.1	0.17
31		2,040	680	22	397	6	350	6,000	4.9	72	6.1	0.14
Total		63,720	10,060	552	9,139	281	10,179	160,500	147.9	2,255	192.0	4.98
Max.		2,280	730	25	397	21	400	6,000	7.6	76	6.5	0.21
Min.		1,920	100	10	199	3	200	4,000	4.1	63	5.9	0.10
Avg.		2,055	325	18	295	9	328	5,177	4.8	73	6.2	0.16

Manpower & Hours

	Total Hr
Superintendent 1	^176
Asst. Supt. 1	^176
Operators 3	^532
Total 5	^884

Robert J. Swalwell
Superintendent

MARSHALL , MICHIGAN WASTEWATER TREATMENT PLANT
JUNE, 1991 - PLANT INFULENT SHEET - SAMPLING CODE 500

	----Weather-----		Inf. Flow	Inf. Temp	Inf. pH	Inf. BOD	Inf. BOD	Inf. SS	Inf. SS	Inf. Phos.	Inf. Phos.	Inf. VSS	Inf. NH3-N	--Remarks or Other Parameters--
	Type	Precip.	MGD	F	SU	mgIL	Lbs.	mgIL	Lbs.	mgIL	Lbs.	mgIL	mgIL	
PN-	^00033	^00045	^50050	^00011	^00400	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	
Day														
1	4	0.29	2.04	56	7.6	84	1,429	78	1,327			68	6.8	
2	4	0.01	2.07	57	7.4	84	1,450	80	1,381	2.20	38	70	7.0	
3	1		2.25	57	7.4	99	1,858	72	1,351			56	8.1	
4	1		2.18	57	7.5	111	2,018	80	1,454			66	8.1	
5	1		2.16	57	7.4	72	1,297	62	1,117			52	8.2	
6	1		2.21	58	7.5	84	1,548	80	1,475			70	9.8	
7	1		2.15	58	7.6	93	1,668	78	1,399			68	8.1	
8	1		1.97	57	7.4	87	1,429	98	1,610	2.65	44	68	9.3	
9	1		2.07	57	7.4	84	1,450	102	1,761			88	7.3	
10	4	0.32	2.26	58	7.4	117	2,205	84	1,583			67	8.0	
11	4	0.82	2.42	59	7.4	105	2,119	96	1,938			88	11.2	
12	1		2.26	58	7.3	90	1,696	96	1,809			72	8.7	
13	1		2.23	58	7.2	87	1,618	90	1,674			78	7.2	
14	1		2.31	59	7.4	126	2,427	162	3,121	2.20	42	124	7.9	
15	4	0.35	2.03	57	7.5	90	1,524	82	1,388			72	8.5	
16	1		2.05	57	7.4	99	1,693	82	1,402			68	10.1	
17	1		2.37	58	7.8	90	1,779	98	1,937			94	10.1	
18	1		2.30	59	7.2	72	1,381	96	1,841			88	8.5	
19	1		2.27	59	7.3	108	2,045	94	1,780			78	7.1	
20	1		2.22	59	7.9	165	3,055	96	1,777	5.10	94	76	8.5	
21	1		2.05	59	7.4	111	1,898	114	1,949			100	7.7	
22	4	0.42	1.93	58	7.4	180	2,897	82	1,320			70	8.5	
23	1		1.92	58	7.5	99	1,585	106	1,697			92	8.5	
24	1		2.26	59	7.3	135	2,545	146	2,752			134	8.8	
25	1		2.12	59	7.2	108	1,910	104	1,839			88	9.4	
26	1		2.18	60	7.4	120	2,182	100	1,818			78	9.1	
27	1		2.13	60	7.3	126	2,238	92	1,634	3.00	53	76	7.9	
28	1		2.09	60	7.3	150	2,615	130	2,266			108	10.4	
29	1		1.94	60	7.2	141	2,281	94	1,521			86	10.9	
30	1		1.90	59	7.3	84	1,331	80	1,268			76	8.5	
31														
Total	48	2.21	64.34	1,747	222.3	3,201	57,171	2,854	51,190	15.15	272	2,419	258.2	
Max.	4	0.82	2.42	60	7.9	180	3,055	162	3,121	5.10	94	134	11.2	
Min.	1	0.01	1.90	56	7.2	72	1,297	62	1,117	2.20	38	52	6.8	
Avg.	2	0.37	2.14	58	7.4	107	1,906	95	1,706	3.03	54	81	8.6	

Robert J. Swalwell
Superintendent

MARSHALL , MICHIGAN WASTEWATER TREATMENT PLANT
JUNE , 1991 - PRIMARY EFFLUENT SHEET

	P Eff. BOD mg/L	P Eff. BOD Lbs.	P Eff. SS mg/L	P. Eff. SS Lbs.	P Eff. Phos. mg/L	P Eff. Phos. Lbs.	P Eff. VSS mg/L	P Eff. NH3-N mg/L	Flow MGD	BOD Pri. Removal %	SS Pri. Removal %	P Pri. Removal %
PN-	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	^50050			
Day												
1	69	1,174	50	851			44	6.7	2.04	18	36	
2	66	1,139	72	1,243	1.35	23	62	6.3	2.07	21	10	38
3	75	1,407	68	1,276			58	8.2	2.25	24	5	
4	81	1,473	80	1,454			70	7.6	2.18	27	0	
5	54	973	84	1,513			22	7.8	2.16	25	0	
6	63	1,161	76	1,401			30	9.1	2.21	25	5	
7	69	1,237	78	1,399			72	8.3	2.15	26	0	
8	60	986	66	1,084	1.90	31	58	7.1	1.97	31	33	28
9	57	984	66	1,139			58	6.8	2.07	32	35	
10	66	1,244	54	1,018			52	7.0	2.26	44	36	
11	75	1,514	58	1,171			46	8.5	2.42	28	40	
12	57	1,074	62	1,169			46	7.4	2.26	37	35	
13	39	725	40	744			32	7.5	2.23	55	55	
14	60	1,156	54	1,040	1.15	22	50	7.5	2.31	52	67	48
15									2.03			
16	66	1,128	68	1,163			66	6.2	2.05	33	17	
17	66	1,305	62	1,225			56	7.5	2.37	27	37	
18	36	691	44	844			42	8.2	2.30	50	54	
19	57	1,079	38	719			34	7.2	2.27	47	60	
20	120	2,222	54	1,000	3.30	61	48	6.6	2.22	27	44	35
21	66	1,128	32	547			26	7.7	2.05	41	72	
22	114	1,835	26	419			20	7.5	1.93	37	68	
23	60	961	60	961			50	7.8	1.92	39	43	
24	81	1,527	52	980			40	7.8	2.26	40	64	
25	39	690	50	884			44	7.8	2.12	64	52	
26	63	1,145	54	982			52	8.2	2.18	48	46	
27	91	1,617	70	1,243	2.20	39	62	7.2	2.13	28	23	27
28	171	2,981	66	1,150			54	7.4	2.09	0	49	
29	69	1,116	48	777			42	9.0	1.94	51	49	
30	63	998	58	919			54	9.5	1.90	25	28	
31												
Total	2,053	36,670	1,690	30,315	9.90	177	1,390	221.4	64.34	1,002	1,063	176
Max.	171	2,981	84	1,513	3.30	61	72	9.5	2.42	64	72	48
Min.	36	690	26	419	1.15	22	20	6.2	1.90	0	0	27
Avg.	71	1,264	58	1,045	1.98	35	48	7.6	2.14	35	37	35

Robert J. Swalwell
Superintendent

MARSHALL , MICHIGAN WASTEWATER TREATMENT PLANT
JUNE ,1991 - ACTIVATED SLUDGE SHEET

	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading #/#m	Mix Liq SS mg/L	Mix Liq VSS mg/L	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mg/L	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mg/l	PE SS mg/L
PN-	^80993	^81001	^80990	^80992	^70323	^70324	^81004	^81007	^00300	^81000	^81006	^70325	^81014	^80991	^50050	^00310	^00530
Day																	
1	48	4.2	3.9		1,237					131			64	52	2.04	66	56
2		4.2	3.5		1,204					132			63	52	2.07	66	59
3		3.8	3.1	0.45	1,161	985	20.0	0.58	6.0	131	0.31	0.26	58	52	2.25	70	60
4		4.0	3.2	0.43	1,193	1,013	24.0	0.50	4.4	134	0.58	0.49	60	52	2.18	72	62
5		4.0	3.1	0.41	1,189	996	22.0	0.54	2.2	134	0.29	0.24	59	52	2.16	68	64
6		3.9	2.9	0.40	1,176	997	20.0	0.59	4.8	132	0.29	0.25	58	52	2.21	65	65
7		4.0	2.7	0.41	1,192	991	21.5	0.55	1.0	133	0.28	0.24	60	52	2.15	68	73
8		4.4	2.9		1,205					133			65	52	1.97	66	75
9		4.2	2.7		1,145					132			62	52	2.07	66	74
10		3.8	2.4	0.46	1,075	877	19.5	0.55	5.2	130	0.29	0.24	57	36	2.26	64	72
11		3.6	2.5	0.44	1,151	963	21.0	0.55	3.1	131	0.28	0.23	53	36	2.42	63	69
12		3.8	3.0	0.39	1,263	1,041	19.0	0.66	1.3	130	0.32	0.26	56	36	2.26	64	66
13		3.9	3.3	0.35	1,265	1,050	23.0	0.55	2.6	133	0.33	0.27	57	36	2.23	60	61
14		3.7	3.4	0.37	1,255	1,028	24.0	0.52	3.1	128	0.31	0.25	55	36	2.31	59	57
15		4.2	4.3		1,383					133			62	36	2.03	60	57
16		4.2	4.4		1,420					133			62	36	2.05	60	57
17		3.6	3.4	0.38	1,264	1,059	31.0	0.41	4.2	131	0.30	0.25	54	36	2.37	61	57
18		3.7	3.7	0.34	1,300	1,087	31.0	0.42	2.1	131	0.31	0.26	57	36	2.30	57	55
19		3.8	3.9	0.31	1,322	1,091	35.0	0.38	2.2	132	0.33	0.27	58	36	2.27	54	53
20		3.9	4.3	0.38	1,349	1,064	35.0	0.39	2.3	130	0.35	0.28	64	43	2.22	66	51
21		4.2	5.2	0.34	1,489	1,130	28.0	0.53	1.5	131	0.30	0.23	73	52	2.05	67	50
22		4.5	5.7		1,409					137			77	52	1.93	74	46
23		4.5	5.3		1,276					135			77	52	1.92	73	45
24		3.8	4.2	0.54	1,172	913	24.0	0.49	5.1	131	0.26	0.20	66	52	2.26	79	44
25		4.1	4.3	0.49	1,140	924	24.0	0.48	3.1	127	0.25	0.21	70	43	2.12	76	45
26		4.0	4.0	0.44	1,146	929	23.0	0.50	2.5	129	0.29	0.24	68	43	2.18	68	47
27		4.0	4.1	0.42	1,206	1,009	24.0	0.50	1.0	191	0.25	0.21	62	43	2.13	72	49
28		4.1	3.9	0.46	1,221	1,007	20.0	0.61	4.6	193	0.31	0.25	63	43	2.09	80	54
29		4.4	3.8		1,180					193			67	43	1.94	82	57
30		4.5	3.7		1,124					197			69	43	1.90	79	57
31																	
Total	48	121.0	111.0	8.22	37,112	20,154	489.0	10.29	62.3	4,198	6.23	5.13	1,876	1,337	64.34	2,025	1,737
Max.	48	4.5	5.7	0.54	1,489	1,130	35.0	0.66	6.0	197	0.58	0.49	77	52	2.42	82	75
Min.	48	3.6	2.4	0.31	1,075	877	19.0	0.38	1.0	127	0.25	0.20	53	36	1.90	54	44
Avg.	48	4.0	3.7	0.41	1,237	1,008	24.5	0.51	3.1	140	0.31	0.26	63	45	2.14	68	58

Robert J. Swalwell
Superintendent

MARSHALL WWTP 801 W. PEARL ST. MARSHALL MI. 49068 - PERMIT NO. MI0022540

JUNE, 1991 - DISCHARGE MONITORING REPORT - DISCHARGE No. 001A

	F.Eff. D.O. mg/L	F.Eff. pH SU	F.Eff. SS mg/L	F.Eff. SS Lbs.	F.Eff. Total-P mg/L	Flow MGD	F.Eff. Chlorine mg/L	F.Eff. BOD mg/L	F.Eff. BOD Lbs.	F.Eff. NH3 as N mg/L	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %
Limit-	>4.0	6 & 9	30 & 45	751 & ^1,126	<1.0			20 & 30	500 & ^751	<11.0	7 Day ^275	200 & 400	>85%	>85%	
PN-	^00300	^00400	^00530	^00530	^00665	^50050	^50060	^80082	^80082	^00610	^00610	^31616	^81011	^91267	^81012
Day															
1	6.5	7.5	6	102		2.04	0.00	5	85	5.7	97	26	92	94	
2	6.7	7.3	11	190	0.50	2.07	0.00	9	155	5.7	98	14	86	89	77
3	6.8	7.5	2	38		2.25	0.00	10	188	6.8	128	194	97	90	
4	6.5	7.4	11	200		2.18	0.00	10	182	6.8	124	168	86	91	
5	7.2	7.4	11	198		2.16	0.00	8	144	6.0	108	46	82	89	
6	7.5	7.4	10	184		2.21	0.00	8	147	7.8	144	62	88	90	
7	6.9	7.3	14	251		2.15	0.00	11	197	7.3	131	58	82	88	
8	6.0	7.3	6	99	0.43	1.97	0.00	8	131	6.3	104	100	94	91	84
9	6.0	7.3	7	121		2.07	0.00	5	86	5.8	100	4	93	94	
10	6.2	7.4	8	151		2.26	0.00	10	188	6.0	113	136	90	91	
11	5.7	7.4	5	101		2.42	0.00	11	222	8.4	170	62	95	90	
12	6.1	7.3	9	170		2.26	0.00	10	188	6.9	130	274	91	89	
13	5.6	7.3	9	167		2.23	0.00	10	186	6.4	119	166	90	88	
14	5.7	7.3	17	328	0.34	2.31	0.00	13	250	6.0	116	400	90	90	85
15	5.5	7.3	12	203		2.03	0.00	11	186	5.5	93	400	85	88	
16	5.1	7.2	9	154		2.05	0.00	8	137	6.0	103	212	89	92	
17	6.0	7.6	11	217 (195)		2.37	0.01	12	237	7.4	146	392	88	87	
18	5.9	7.3	8	153		2.30	0.00	7	134	6.7	129	462	92	90	
19	6.3	7.3	9	170		2.27	0.01	9	170	5.9	112	72	90	92	
20	6.1	7.2	20	370	0.80	2.22	0.00	13	241	7.1	131	400	79	92	84
21	6.4	7.2	5	85		2.05	0.00	13	222	7.1	121	400	96	88	
22	6.3	7.3	4	64		1.93	0.00	13	209	6.1	98	400	95	93	
23	6.3	7.3	4	64		1.92	0.00	8	128	6.1	98	218	96	91	
24	7.0	7.3	5	94		2.26	0.00	11	207	6.1	115	2	97	92	
25	6.0	7.2	6	106		2.12	0.00	14	248	6.9	122	16	94	87	
26	6.1	7.4	6	109		2.18	0.00	8	145	5.9	107	6	94	93	
27	5.5	7.1	14	249	0.85	2.13	0.00	12	213	4.5	80	4	85	90	72
28	6.2	7.3	16	279		2.09	0.00	13	227	6.3	110	16	88	91	
29	6.6	7.2	18	291		1.94	0.00	11	178	6.3	102	4	81	92	
30	6.9	7.3	10	158		1.90	0.00	11	174	7.5	119	16	88	87	
31															
Total	187.6	219.6	283	5,068	2.92	64.34	0.02	302	5,409	193.3	3,466	4,730	2,693	2,709	402
Max.	7.5	7.6	20	370	0.85	2.42	0.01	14	250	8.4	170	462	97	94	85
Min.	5.1	7.1	2	38	0.34	1.90	0.00	5	85	4.5	80	2	79	87	72
Avg.	6.3	7.3	9	169	0.58	2.14	0.00	10	180	6.4	116	64	90	90	80
			12	228				12	204			291			

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
JUNE, 1991 - MISCELLOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	SO2 Lbs.	Lime Lbs.	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	PH	Lbs. of Lime per lb. of Dry Solids
1		1,920	180	16	199	7	200	3,000	4.7	72	6.5	0.17
2		2,040	240	17	298	7	200	3,000	5.5	71	6.7	0.14
3		2,040	290	6	397	7	266	4,000	4.8	74	6.0	0.16
4		2,040	370	14	298	6	233	4,000	5.0	72	5.9	0.14
5		1,920	250	13	298	8	200	3,000	5.3	73	6.0	0.15
6		2,040	360	16	397	8	350	6,000	5.3	74	6.3	0.13
7		2,040	250	15	298	8	350	5,000	5.1	74	5.9	0.16
8		1,920	190	15	397	6	233	4,000	5.1	70	6.1	0.14
9		2,040	260	16	397	4	250	4,000	5.2	72	5.8	0.14
10		2,040	230	16	298	6	400	6,000	5.1	72	6.1	0.16
11		1,920	390	15	298	5	400	6,000	5.3	70	6.4	0.15
12		2,040	450	15	298	7	350	6,000	5.3	71	6.1	0.13
13		2,040	140	16	397	6	133	2,000	5.4	74	6.1	0.15
14		1,920	300	15	298	5	450	5,500	5.2	71	6.0	0.19
15		2,040	290	17	298	6	266	4,000	5.0	73	5.9	0.16
16		1,920	470	14	298	7	283	4,000	5.2	73	5.9	0.16
17		1,920	190	16	397	7	150	2,000	5.6	69	6.0	0.16
18		2,040	1,690	16	298	7	367	5,500	5.5	72	6.4	0.14
19		2,040	1,940	20	298	8	383	5,000	5.4	72	6.1	0.17
20		1,920	1,690	20	397	11	233	4,000	5.5	71	6.2	0.13
21		2,160	1,690	19	199	13	233	3,000	5.5	73	5.7	0.17
22		1,920	170	15	297	14	200	3,000	5.2	72	5.9	0.15
23		2,040	220	16	297	14	133	3,000	4.9	74	5.9	0.11
24		2,040	410	24	297	18	400	4,000	5.2	73	6.0	0.23
25		1,920	220	23	297	8	449	15,500	4.1	76	6.6	0.08
26		2,040	1,500	25	297	16	300	2,000	4.9	71	6.0	0.36
27		2,520	1,640	26	297	16	300	4,000	5.6	74	5.6	0.16
28		2,400	1,880	26	297	17	300	3,000	5.0	76	5.8	0.24
29		2,640	660	22	199	18	166	4,000	4.8	73	5.7	0.10
30		2,400	610	26	297	19	250	4,000	4.5	74	5.7	0.17
31												
Total		61,920	19,170	530	9,328	289	8,428	131,500	154.2	2,176	181.3	4.80
Max.		2,640	1,940	26	397	19	450	15,500	5.6	76	6.7	0.36
Min.		1,920	140	6	199	4	133	2,000	4.1	69	5.6	0.08
Avg.		2,064	639	18	311	10	281	4,383	5.1	73	6.0	0.16

Manpower & Hours

	Total Hr
Superintendent 1	^160
Asst. Supt. 1	^160
Operators 3	^480
Total 5	^800

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT
JULY, 1991 - PLANT INFLUENT SHEET - SAMPLING CODE 500

	----Weather-----		Inf. Flow	Inf. Temp	Inf. pH	Inf. BOD	Inf. BOD	Inf. SS	Inf. SS	Inf. Phos.	Inf. Phos.	Inf. VSS	Inf. NH3-N	--Remarks or Other Parameters--
	Type	Precip.	MGD	F	SU	mgIL	Lbs.	mgIL	Lbs.	mgIL	Lbs.	mgIL	mgIL	
PN-	^00033	^00045	^50050	^00011	^00400	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	
Day														
1	4	1.23	2.15	59	7.2	99	1,775	116	2,080			98	8.0	
2	4	0.16	2.05	60	7.4	111	1,898	84	1,436			76	7.6	
3	4	0.09	2.02	60	7.5	162	2,729	118	1,988			104	9.8	
4	4	0.05	1.77	58	7.4	75	1,107	80	1,181			78	6.9	
5	1		1.96	58	7.2	111	1,814	96	1,569			76	7.6	
6	1		1.89	58	7.3	75	1,182	82	1,293			78	6.9	
7	4	0.76	1.94	58	7.5	105	1,699	150	2,427			140		
8	1		2.15	60	7.3	102	1,829	80	1,434			68	9.5	
9	1		2.22	60	7.3	108	2,000	110	2,037	6.00	111	94	9.9	
10	1		2.17	61	7.6	129	2,335	94	1,701			74	9.5	
11	1		2.17	60	7.3	159	2,878	190	3,439			150	6.5	
12	4	0.75	2.13	60	7.3	129	2,292	136	2,416			132	10.0	
13	4	0.03	1.87	60	7.3	129	2,012	90	1,404			82	9.3	
14	1		1.91	59	7.5	84	1,338	92	1,466			78	10.0	
15	1		2.27	60	7.3	129	2,442	196	3,711			168	7.8	
16	1		2.30	61	7.3	93	1,784	148	2,839	3.30	63	100	7.5	
17	1		2.26	61	7.4	105	1,979	78	1,470			76	6.8	
18	1		2.21	60	7.3	72	1,327	98	1,806			68	7.5	
19	1		2.17	60	7.3	135	2,443	78	1,412			54	8.8	
20	1		2.06	59	7.3	93	1,598	84	1,443			58	7.3	
21	4	0.50	2.07	59	7.3	84	1,450	76	1,312	2.70	47	62	7.3	
22	4	0.77	2.20	60	7.3	78	1,431	72	1,321			64	7.1	
23	1		2.24	60	7.4	93	1,737	116	2,167			88	10.4	
24	1		2.10	61	7.3	108	1,892	76	1,331			48	9.7	
25	1		2.03	60	7.4	117	1,981	68	1,151			56	10.5	
26	1		1.61	61	7.4	126	1,692	76	1,020			56	13.1	
27	1		1.44	61	7.2	96	1,153	112	1,345	3.00	36	78	11.4	
28	4	0.03	1.46	59	7.5	93	1,132	114	1,388			104	15.9	
29	4	0.53	1.58	63	7.3	90	1,186	110	1,449			100	14.5	
30	1		1.53	63	7.8	90	1,148	102	1,302			94	17.6	
31	1		1.51	63	7.4	93	1,171	100	1,259			92	15.8	
Total	64	4.90	61.44	1,862	228.3	3,273	54,434	3,222	53,597	15.00	257	2,694	290.5	
Max.	4	1.23	2.30	63	7.8	162	2,878	196	3,711	6.00	111	168	17.6	
Min.	1	0.03	1.44	58	7.2	72	1,107	68	1,020	2.70	36	48	6.5	
Avg.	2	0.45	1.98	60	7.4	106	1,756	104	1,729	3.75	64	87	9.7	

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT
JULY, 1991 - PRIMARY EFFLUENT SHEET

	P Eff. BOD mg/L	P Eff. BOD Lbs.	P Eff. SS mg/L	P. Eff. SS Lbs.	P Eff. Phos. mg/L	P Eff. Phos. Lbs.	P Eff. VSS mg/L	P Eff. NH3-N mg/L	Flow MGD	BOD Pri. Removal %	SS Pri. Removal %	P Pri. Removal %
PN-	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	^50050			
Day												
1	75	1,345	66	1,183			60	7.5	2.15	24	57	
2	72	1,231	46	786			38	7.7	2.05	35	45	
3	96	1,617	82	1,381			74	7.7	2.02	41	31	
4	63	930	32	472			28	6.4	1.77	16	60	
5	69	1,128	64	1,046			50	7.4	1.96	38	33	
6	57	898	48	757			42	6.5	1.89	24	41	
7	66	1,068	36	582			32		1.94	37	76	
8	39	699	34	610			26	8.8	2.15	62	58	
9	66	1,222	48	889	5.40	100	40	9.0	2.22	39	56	10
10	84	1,520	50	905			44	10.0	2.17	35	47	
11	72	1,303	62	1,122			46	7.9	2.17	55	67	
12	87	1,545	64	1,137			62	12.0	2.13	33	53	
13	63	983	60	936			56	14.0	1.87	51	33	
14	72	1,147	56	892			50	13.0	1.91	14	39	
15	69	1,306	80	1,515			68	10.0	2.27	47	59	
16	69	1,324	90	1,726	2.70	52	76	8.2	2.30	26	39	18
17	78	1,470	44	829			42	7.3	2.26	26	44	
18	57	1,051	54	995			50	7.6	2.21	21	45	
19	63	1,140	46	832			34	8.8	2.17	53	41	
20	60	1,031	66	1,134			42	7.3	2.06	35	21	
21	42	725	22	380	0.95	16	18	8.2	2.07	50	71	65
22	51	936	24	440			22	6.2	2.20	35	67	
23	78	1,457	26	486			24	8.8	2.24	16	78	
24	66	1,156	38	666			30	8.8	2.10	39	50	
25	69	1,168	42	711			34	9.0	2.03	41	38	
26	135	1,813	32	430			28	11.7	1.61	0	58	
27	66	793	50	600	1.40	17	26	11.5	1.44	31	55	53
28	51	621	48	584			40	12.0	1.46	45	58	
29	132	1,739	46	606			42	13.5	1.58	0	58	
30	51	651	38	485			32	12.6	1.53	43	63	
31	54	680	36	453			28	10.5	1.51		64	
Total	2,172	35,697	1,530	25,572	10.45	185	1,284	279.9	61.44	1,012	1,605	146
Max.	135	1,813	90	1,726	5.40	100	76	14.0	2.30	62	78	65
Min.	39	621	22	380	0.95	16	18	6.2	1.44	0	21	10
Avg.	70	1,152	49	825	2.61	46	41	9.3	1.98	34	52	37

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT
JULY, 1991 - ACTIVATED SLUDGE SHEET

	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading f/m	Mix Liq SS mg/L	Mix Liq VSS mg/L	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mg/L	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mg/l	PE SS mg/L
PN-	^80993	^81001	^80990	^80992	^70323	^70324	^81004	^81007	^00300	^81000	^81006	^70325	^81014	^80991	^50050	^00310	^00530
Day																	
1	48	4.0	2.6	0.52	1,040	865	14.0	0.74	6.0	196	0.26	0.21	62	36	2.15	75	66
2		4.2	4.2	0.46	1,105	902	15.0	0.74	4.8	194	0.25	0.21	65	36	2.05	72	46
3		4.3	2.7	0.54	1,228	994	15.0	0.82	4.8	193	0.33	0.27	65	36	2.02	96	82
4		4.9	8.2		1,300					198			75	36	1.77	63	32
5		4.4	3.4	0.39	1,203	970	15.0	0.80	4.8	197	0.28	0.22	68	36	1.96	69	64
6		4.6	4.8		1,220					193			70	36	1.89	57	48
7		4.4	6.1		1,194					195			68	36	1.94	66	36
8		4.0	5.7	0.25	1,170	945	16.0	0.73	5.3	198	0.25	0.20	61	36	2.15	39	34
9		3.9	4.2	0.41	1,237	1,004	18.0	0.69	4.0	201	0.32	0.26	59	36	2.22	66	48
10		4.0	4.3	0.49	1,312	1,044	18.0	0.73		198	0.28	0.23	61	36	2.17	84	50
11		4.0	3.7	0.39	1,384	1,108	19.0	0.73	2.4	197	0.30	0.24	61	32	2.17	72	62
12		4.0	4.0	0.42	1,508	1,215	20.0	0.75	2.1	196	0.32	0.26	62	32	2.13	87	64
13		4.6	4.9		1,535					203			71	40	1.87	63	60
14		4.5	4.8		1,427					202			69	43	1.91	72	56
15		3.8	2.6	0.40	1,330	1,093	17.0	0.78	3.5	200	0.32	0.26	58	43	2.27	69	80
16		3.7	2.4	0.39	1,412	1,145	19.0	0.74	0.5	198	0.37	0.30	58	43	2.30	69	90
17		3.8	5.2	0.43	1,434	1,152	19.0	0.75	2.6	196	0.38	0.28	59	50	2.26	78	44
18		3.9	4.0	0.33	1,319	1,066	16.0	0.82	4.2	194	0.35	0.29	61	50	2.21	57	54
19		4.0	4.4	0.38	1,217	1,000	15.0	0.81	3.3	194	0.27	0.22	62	50	2.17	63	46
20		4.2	3.3		1,238					195			65	43	2.06	60	66
21		4.2	9.5		1,199					198			64	43	2.07	42	22
22		3.9	7.5	0.34	1,110	917	14.0	0.79	4.4	186	0.26	0.21	61	43	2.20	51	24
23		3.8	7.0	0.52	1,128	939	13.0	0.87	5.8	199	0.25	0.20	63	30	2.24	78	26
24		4.1	5.0	0.43	1,120	901	13.0	0.86	6.4	201	0.25	0.20	67	36	2.10	66	38
25		4.2	4.6	0.44	1,092	879	12.0	0.91	6.4	205	0.24	0.20	64	29	2.03	69	42
26		5.4	7.2	0.74	1,035	817	12.0	0.86	6.9	210	0.24	0.19	73	29	1.61	135	32
27		6.0	5.5		1,100					210			78	26	1.44	66	50
28		5.9	5.9		1,142					209			76	26	1.46	51	48
29		5.5	5.8	0.63	1,165	922	13.0	0.90	5.3	207	0.25	0.19	69	26	1.58	132	46
30		5.6	7.5	0.22	1,208	988	14.0	0.86	4.6	209	0.23	0.18	71	26	1.53	51	38
31		5.7	7.8	0.24	1,185	948	14.0	0.85	5.4	205	0.27	0.22	71	26	1.51	54	36
Total	48	137.4	158.8	9.35	38,297	21,814	341.0	17.55	93.5	6,177	6.27	5.04	2,037	1,126	61.44	2,172	1,530
Max.	48	6.0	9.5	0.74	1,535	1,215	20.0	0.91	6.9	210	0.38	0.30	78	50	2.30	135	90
Min.	48	3.7	2.4	0.22	1,035	817	12.0	0.69	0.5	186	0.23	0.18	58	26	1.44	39	22
Avg.	48	4.4	5.1	0.42	1,235	992	15.5	0.80	4.5	199	0.29	0.23	66	36	1.98	70	49

Robert J. Swalwell
Superintendent

JULY, 1991 - DISCHARGE MONITORING REPORT - DISCHARGE No. 001A

	F.Eff. D.O. mg/L	F.Eff. pH SU	F.Eff. SS mg/L	F.Eff. SS Lbs.	F.Eff. Total-P mg/L	Flow MGD	F.Eff. Chlorine mg/L	F.Eff. BOD mg/L	F.Eff. BOD Lbs.	F.Eff. NH3 as N mg/L	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %
Limit-	>4.0	6 & 9	30 & 45	751 & ^1,126	<1.0			20 & 30	500 & ^751	<11.0	7 Day ^275	200 & 400	>85%	>85%	
PN-	^00300	^00400	^00530	^00530	^00665	^50050	^50060	^80082	^80082	^00610	^00610	^31616	^81011	^91267	^81012
Day															
1	7.1	7.6	13	233		2.15	0.00	6	108	6.6	118	2	89	94	
2	6.4	7.5	9	154		2.05	0.00	7	120	6.4	109	12	89	94	
3	6.1	7.5	19	320		2.02	0.00	10	168	6.3	106	26	84	94	
4	5.4	7.3	7	103		1.77	0.00	3	44	6.5	96	20	91	96	
5	7.1	7.3	5	82		1.96	0.00	4	65	7.2	118	4	95	96	
6	6.9	7.3	6	95		1.89	0.00	4	63	7.1	112	2	93	95	
7	6.8	7.5	1	16		1.94	0.00	5	81			2	99	95	
8	6.8	7.3	2	36		2.15	0.00	4	72	7.6	136	4	98	96	
9	6.2	7.3	3	56	0.80	2.22	0.00	5	93	7.0	130	6	97	95	87
10	6.2	7.3	5	90		2.17	0.00	8	145	8.9	161	4	95	94	
11	6.0	7.2	4	72		2.17	0.00	3	54	5.9	107	4	98	98	
12	6.2	7.2	9	160		2.13	0.00	4	71	10.9	194	6	93	97	
13	6.0	7.3	4	62		1.87	0.00	3	47	11.0	172	4	96	98	
14	6.3	7.4	3	48		1.91	0.00	8	127	10.0	159	4	97	90	
15	6.2	7.3	5	95		2.27	0.00	4	76	10.0	189	10	98	97	
16	6.5	7.1	7	134	0.98	2.30	0.00	7	134	6.0	115	2	95	92	70
17	7.1	7.3	3	57		2.26	0.00	4	75	6.3	119	6	96	96	
18	7.5	7.4	2	37		2.21	0.00	6	111	5.1	94	4	98	92	
19	7.1	7.3	2	36		2.17	0.00	6	109	8.6	156	2	97	96	
20	7.1	7.3	7	120		2.06	0.00	3	52	7.6	131	2	92	97	
21	6.9	7.3	1	17	0.97	2.07	0.00	3	52	7.3	126	8	99	96	64
22	7.6	7.4	1	18		2.20	0.00	6	110	6.0	110	6	99	92	
23	7.6	7.4	2	37		2.24	0.00	4	75	8.8	164	6	98	96	
24	7.4	7.4	3	53		2.10	0.00	3	53	8.1	142	22	96	96	
25	7.5	7.4	3	51		2.03	0.00	2	34	10.7	181	8	96	98	
26	6.9	7.4	4	54		1.61	0.00	4	54	11.0	148	12	95	97	
27	6.9	7.3	4	48	0.55	1.44	0.00	3	36	12.5	150	4	96	97	82
28	7.2	7.6	3	37		1.46	0.01	5	61	13.6	166	2	97	95	
29	6.2	7.3	3	40		1.58	0.00	4	53	12.5	165	6	97	96	
30	6.8	7.4	2	26		1.53	0.00	4	51	16.2	207	4	98	96	
31	7.1	7.4	2	25		1.51	0.00	3	38	17.5	220	2	98		
Total	209.1	228.0	144	2,411	3.30	61.44	0.01	145	2,429	269.2	4,300	206	2,959	2,861	303
Max.	7.6	7.6	19	320	0.98	2.30	0.01	10	168	17.5	220	26	99	98	87
Min.	5.4	7.1	1	16	0.55	1.44	0.00	2	34	5.1	94	2	84	90	64
Avg.	6.7	7.4	5	78	0.83	1.98	0.00	5	78	9.0	143	5	95	95	76

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT
JULY, 1991 - MISCELLANEOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	SO2 Lbs.	Lime Lbs.	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	PH	Lbs. of Lime per lb. of Dry Solids
1		2,640	680	24	298	19	306	5,000	4.7	73	5.9	0.16
2		2,520	630	28	298	19	306	5,000	4.7	75	5.9	0.16
3		2,520	980	25	298	18	306	7,000	4.7	73	5.8	0.11
4		2,520	730	20	298	8	459	4,000	4.4	76	5.8	0.31
5		2,520	890	23	298	16	459	7,000	4.1	73	5.8	0.19
6		2,520	790	22	298	16	280	4,000	4.1	74	5.9	0.20
7		2,400	800	24	298	17	280	4,000	4.0	73	5.9	0.21
8		2,520	780	24	298	17	391	6,000	4.3	70	5.9	0.18
9		2,640	530	24	397	19	476	6,000	4.3	70	5.7	0.22
10		2,640	570	20	298	19	340	6,000	4.2	71	5.8	0.16
11		2,520	480	32	298	20	340	3,000	3.4	70	5.9	0.40
12		2,400	500	22	199	20	340	5,000	4.5	72	5.8	0.18
13		2,520	220	26	199	10	238	4,000	4.3	73	5.8	0.16
14		2,520	810	18	199	16	221	4,000	4.1	72	5.8	0.16
15		2,520	180	18	397	17	400	6,000	4.2	73	5.8	0.19
16		2,640	320	24	298	17	400	6,000	6.4	56	5.9	0.12
17		2,520	300	18	298	17	374	6,000	6.8	59	5.7	0.11
18		2,520	340	18	298	19	374	6,000	6.5	62	5.6	0.11
19		2,400	240	16	298	17	510	9,600	5.4	65	5.7	0.12
20		2,520	160	20	298	19	535	4,000			5.8	
21		2,520	330	21	298	18	535	4,000	4.9	69	5.9	0.33
22		2,400	440	20	397	10	750	17,000	4.5	69	6.0	0.12
23		2,640	510	19	298	10	374	8,000	4.4	68	6.4	0.13
24		2,520	330	19	298	10	425	7,000	5.0	64	6.2	0.14
25		2,520	420	18	397	11	238	5,000	4.4	66	6.2	0.13
26		2,520	330	23	199	13	204	2,400	5.8	73	6.1	0.17
27		2,520	270	18	298	11	280	4,000	5.4	59	6.1	0.15
28		2,280	240	20	298	13	280	4,000	5.2	62	6.0	0.16
29		2,280	830	20	397	16	442	5,200	4.9	64	5.9	0.21
30		2,280	320	24	298	12	323	3,900	4.7	67	5.9	0.21
31		2,280	490	20	298	11	204	2,400	4.9	66	5.9	0.21
Total		77,280	15,440	668	9,337	475	11,390	170,500	143.2	2,057	182.8	5.41
Max.		2,640	980	32	397	20	750	17,000	6.8	76	6.4	0.40
Min.		2,280	160	16	199	8	204	2,400	3.4	56	5.6	0.11
Avg.		2,493	498	22	301	15	367	5,500	4.8	69	5.9	0.18

Manpower & Hours

	Total Hr
Superintendent 1	^176
Asst. Supt. 1	^ 72
Operators 3	^532
Total	^780

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
AUGUST, 1991 - PLANT INFLUENT SHEET - SAMPLING CODE 500

	----Weather-----		Inf. Flow	Inf. Temp	Inf. pH	Inf. BOD	Inf. BOD	Inf. SS	Int. SS	Inf. Phos.	Inf. Phos.	Inf. VSS	Inf. NH3-N	--Remarks or Other Parameters--
	Type	Precip.	MGD	F	SU	mgIL	Lbs.	mgIL	Lbs.	mgIL	Lbs.	mgIL	mgIL	
PN-	^00033	^00045	^50050	^00011	^00400	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	
Day														
1	1		1.53	62	7.3	129	1,646	168	2,144	3.20	41	136	13.7	
2	4	0.28	1.44	62	7.4	96	1,153	144	1,729			138	14.8	
3	1		1.36	61	7.5	87	987	100	1,134			92	14.5	
4	4	0.11	1.35	61	7.5	129	1,452	126	1,419			114	13.4	
5	1		1.55	62	7.4	141	1,823	122	1,577			110	15.8	
6	1		1.57	61	7.4	97	1,270	132	1,728			113	18.1	
7	1		1.52	61	7.5	117	1,483	94	1,192			78	17.6	
8	4	1.77	1.61	62	7.5	108	1,450	110	1,477	5.90	79	92	11.0	
9	1		1.55	61	7.4	108	1,396	116	1,500			102	15.4	
10	1		1.41	61	7.4	102	1,199	182	2,140			146	14.7	
11	1		1.42	60	7.7	81	959	118	1,397			102	10.7	
12	1		1.63	62	7.4	99	1,346	132	1,794			114	12.0	
13	1		1.67	63	7.6	120	1,671	130	1,811	4.60	64	112	11.5	
14	1		1.66	62	7.4	147	2,035	144	1,994			126	12.1	
15	4	0.18	1.62	63	7.4	87	1,175	114	1,540			96	12.1	
16	4	0.16	1.63	62	7.4	84	1,142	344	4,676			324	13.3	
17	4	0.12	1.55	62	7.5	120	1,551	140	1,810			128	13.9	
18	4	0.09	1.37	62	7.4	78	891	98	1,120			86	14.1	
19	4	0.97	1.58	63	7.3	93	1,225	110	1,449			90	13.1	
20	1		1.57	62	7.4	117	1,532	140	1,833	4.80	63	118	11.2	
21	1		1.55	62	7.3	138	1,784	130	1,681			114	11.3	
22	1		1.53	62	7.5	99	1,263	116	1,480			110	11.6	
23	1		1.57	62	7.6	150	1,964	160	2,095			128	11.2	
24	1		1.46	60	7.3	90	1,096	114	1,388			76	11.2	
25	1		1.47	64	7.4	93	1,140	94	1,152	3.10	38	80	10.2	
26	1		1.66	62	7.4	114	1,578	112	1,551			112	9.3	
27	1		1.72	62	7.9	93	1,334	124	1,779			118	9.9	
28	1		1.79	64	7.9	111	1,657	116	1,732			114	9.5	
29	1		1.77	63	7.4	159	2,347	120	1,771			118	10.4	
30	1		1.64	63	7.5	108	1,477	122	1,669			106	11.8	
31	1		1.41	62	7.5	96	1,129	140	1,646			124	12.8	
Total	55	3.68	48.16	1,921	231.5	3,391	44,159	4,112	53,408	21.60	285	3,617	392.2	
Max.	4	1.77	1.79	64	7.9	159	2,347	344	4,676	5.90	79	324	18.1	
Min.	1	0.09	1.35	60	7.3	78	891	94	1,120	3.10	38	76	9.3	
Avg.	2	0.46	1.55	62	7.5	109	1,424	133	1,723	4.32	57	117	12.7	

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
AUGUST, 1991 - PRIMARY EFFLUENT SHEET

	P Eff. BOD mgIL	P Eff. BOD Lbs.	P Eff. SS mgIL	P. Eff. SS Lbs.	P Eff. Phos. mgIL	P Eff. Phos. Lbs.	P Eff. VSS mgIL	P Eff. NH3-N mgIL	Flow MGD	BOD Pri. Removal %	SS Pri. Removal %	P Pri. Removal %
PN-	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	^50050			
Day												
1	51	651	54	689	1.40	18	46	12.4	1.53			
2	54	649	34	408			32	12.1	1.44			
3	72	817	52	590			48	11.6	1.36			
4	138	1,554	38	428			36	11.8	1.35			
5	78	1,008	52	672			46	12.5	1.55			
6	63	825	62	812			52	12.8	1.57			
7	78	989	62	786			44	12.5	1.52			
8	76	1,020	51	685	6.40	86	45	10.2	1.61			
9	42	543	50	646			42	13.2	1.55			
10	105	1,235	60	706			48	12.9	1.41			
11	48	568	68	805			52	7.7	1.42			
12	57	775	72	979			60	13.2	1.63			
13	66	919	74	1,031	3.40	47	62	13.9	1.67			
14	90	1,246	74	1,024			66	15.4	1.66			
15	60	811	40	540			32	14.4	1.62			
16	66	897	72	979			58	15.1	1.63			
17	120	1,551	96	1,241			84	17.1	1.55			
18	72	823	40	457			78		1.37			
19	69	909	88	1,160			74	15.5	1.58			
20	84	1,100	82	1,074	5.30	69	70	14.6	1.57			
21	105	1,357	90	1,163			82	15.3	1.55			
22	92	1,174	96	1,225			88	15.9	1.53			
23	120	1,571	104	1,362			86	13.2	1.57			
24	78	950	106	1,291			82	14.1	1.46			
25	81	993	100	1,226	3.90	48	94	13.4	1.47			
26	99	1,371	82	1,135			78	13.3	1.66			
27	78	1,119	96	1,377			92	13.0	1.72			
28	126	1,881	98	1,463			94	12.3	1.79			
29	132	1,949	90	1,329			86	12.5	1.77			
30	105	1,436	90	1,231			84	12.5	1.64			
31	96	1,129	94	1,105			82	13.8	1.41			
Total	2,601	33,819	2,267	29,619	20.40	268	2,023	398.2	48.16			
Max.	138	1,949	106	1,463	6.40	86	94	17.1	1.79			
Min.	42	543	34	408	1.40	18	32	7.7	1.35			
Avg.	84	1,091	73	955	4.08	54	65	13.3	1.55			

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
AUGUST, 1991 - ACTIVATED SLUDGE SHEET

	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading #/m	Mix Liq SS mg/L	Mix Liq VSS mg/L	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mg/L	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mg/l	PE SS mg/L
PN-	^80993	^81001	^80990	^80992	^70323	^70324	^81004	^81007	^00300	^81000	^81006	^70325	^81014	^80991	^50050	^00310	^00530
Day																	
1	48	5.6	5.3	0.23	1,218	964	14.0	0.87	5.3	205	0.22	0.18	72	26	1.53	51	54
2		6.0	9.3	0.22	1,272	1,004	17.0	0.75	3.8	201	0.25	0.20	78	26	1.44	54	34
3		6.3	6.6		1,307					207			82	29	1.36	72	52
4		6.4	9.2		1,316					208			88	29	1.35	138	38
5		5.6	5.8	0.33	1,305	1,017	19.0	0.69	4.8	211	0.30	0.24	72	29	1.55	78	52
6		5.5	5.1	0.26	1,370	1,073	20.0	0.69	4.8	210	0.30	0.24	70	29	1.57	63	62
7		5.7	5.2	0.30	1,370	1,087	20.0	0.69	5.2	208	0.31	0.24	71	36	1.52	78	62
8		5.4	6.3	0.30	1,438	1,140	22.0	0.65	5.2	210	0.31	0.19	68	36	1.61	76	51
9		5.6	6.8	0.15	1,476	1,193	24.0	0.62	2.8	206	0.31	0.25	70	43	1.55	42	50
10		6.1	6.2		1,470					209			77	50	1.41	105	60
11		6.1	5.1		1,373					210			76	50	1.42	48	68
12		5.3	3.9	0.25	1,286	1,038	21.0	0.61	4.8	208	0.25	0.21	70	50	1.63	57	72
13		5.2	3.8	0.29	1,303	1,076	22.0	0.59	2.5	205	0.26	0.22	69	50	1.67	66	74
14		5.2	3.9	0.38	1,324	1,086	23.5	0.56	2.3	208	0.27	0.22	60	55	1.66	90	74
15		5.3	8.0	0.23	1,442	1,153	17.0	0.85	2.1	207	0.28	0.22	61	65	1.62	60	40
16		5.3	4.4	0.26	1,454	1,139	28.0	0.52	3.0	206	0.31	0.24	60	65	1.63	66	72
17		5.6	3.5		1,461					209			63	69	1.55	120	96
18		6.3	10.4		1,593					209			72	69	1.37	72	40
19		5.5	4.0	0.26	1,559	1,175	27.0	0.58	4.2	210	0.30	0.23	62	72	1.58	69	88
20		5.5	4.2	0.33	1,515	1,128	29.0	0.52	2.3	210	0.28	0.21	62	72	1.57	84	82
21		5.6	3.9	0.39	1,530	1,156	30.0	0.51	2.4	208	0.25	0.22	68	72	1.55	105	90
22		5.6	3.7	0.34	1,528	1,151	26.0	0.59	1.6	207	0.31	0.24	68	79	1.53	92	96
23		5.5	3.2	0.48	1,466	1,103	23.0	0.64	2.2	209	0.32	0.24	65	79	1.57	120	104
24		5.9	3.6		1,543					211			74	86	1.46	78	106
25		5.9	3.5		1,426					209			74	86	1.47	81	100
26		5.2	3.6	0.46	1,361	1,004	18.0	0.76	4.9	206	0.30	0.22	65	86	1.66	99	82
27		5.0	2.9	0.36	1,345	1,025	18.5	0.73	3.4	206	0.28	0.21	64	79	1.72	78	96
28		4.8	2.8	0.59	1,375	1,062	18.0	0.76	2.6	205	0.31	0.24	61	79	1.79	126	98
29		4.9	3.2	0.60	1,400	1,078	18.0	0.78	2.5	205	0.29	0.22	65	86	1.77	132	90
30		5.3	3.4	0.45	1,384	1,057	17.0	0.81	1.7	204	0.30	0.23	73	86	1.64	105	90
31		6.1	2.8		1,027					212			84	86	1.41	96	94
Total	48	172.9	153.8	7.46	43,237	23,909	472.0	14.75	74.4	6,439	6.31	4.91	2,164	1,854	48.16	2,601	2,267
Max.	48	6.4	10.4	0.60	1,593	1,193	30.0	0.87	5.3	212	0.32	0.25	88	86	1.79	138	106
Min.	48	4.8	2.8	0.15	1,027	964	14.0	0.51	1.6	201	0.22	0.18	60	26	1.35	42	34
Avg.	48	5.6	5.0	0.34	1,395	1,087	21.5	0.67	3.4	208	0.29	0.22	70	60	1.55	84	73

Robert J. Swalwell
Superintendent

MARSHALL WWTP 801 W. PEARL ST. MARSHALL MI 49068 - PERMIT No. MI0023540
AUGUST, 1991 - DISCHARGE MONITORING REPORT - DISCHARGE No. 001A

	F.Eff. D.O. mgIL	F.Eff. pH SU	F.Eff. SS mgIL	F.Eff. SS Lbs.	F.Eff. Total-P mgIL	Flow MGD	F.Eff. Chlorine mgIL	F.Eff. BOD mgIL	F.Eff. BOD Lbs.	F.Eff. NH3 as N mgIL	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %
Limit-	>4.0	6 & 9	30 & 45	751 & ^1,126	<1.0			20 & 30	500 & ^751	<11.0	7 Day ^275	200 & 400	>85%	>85%	
PN-	^00300	^00400	^00530	^00530	^00665	^50050	^50060	^80082	^80082	^00610	^00610	^31616	^81011	^91267	^81012
Day															
1	6.5	7.4	4	51	0.42	1.53	0.00	2	26	12.8	163	4	98	98	87
2	6.3	7.5	4	48		1.44	0.00	1	12	10.8	130	2	97	99	
3	6.2	7.4	4	45		1.36	0.00	2	23	12.4	141	4	96	98	
4	6.6	7.5	1	11		1.35	0.00	4	45	10.8	122	192	99	97	
5	6.7	7.6	3	39		1.55	0.00	3	39	14.8	191	40	98	98	
6	6.6	7.5	4	52		1.57	0.00	4	52	12.4	162	24	97	96	
7	7.2	7.5	3	38		1.52	0.00	5	63	11.3	143	24	97	96	
8	6.5	7.3	5	67	0.48	1.61	0.00	5	67	8.9	120	44	95	95	92
9	6.8	7.3	1	13		1.55	0.00	3	39	11.9	154	90	99	97	
10	6.5	7.2	3	35		1.41	0.00	3	35	10.8	127	60	98	97	
11	5.2	7.4	4	47		1.42	0.00	2	24	7.1	84	8	97	98	
12	6.3	7.5	5	68		1.63	0.00	3	41	10.7	145	24	96	97	
13	6.3	7.4	6	84	0.97	1.67	0.00	5	70	10.6	148	148	95	96	79
14	6.1	7.5	5	69		1.66	0.00	7	97	11.4	158	220	97	95	
15	6.2	7.2	9	122		1.62	0.00	9	122	10.8	146	656	92	90	
16	6.4	7.3	8	109		1.63	0.00	6	82	12.0	163	612	98	93	
17	6.2	7.2	8	103		1.55	0.00	8	103	11.7	151	564	94	93	
18	6.5	7.1	8	91		1.37	0.00	11	126	10.2	117	400	92	86	
19	5.9	7.5	8	105		1.58	0.00	9	119	11.3	149	34	93	90	
20	6.1	7.2	8	105	0.44	1.57	0.00	10	131	9.3	122	62	94	91	91
21	6.4	7.2	10	129		1.55	0.00	13	168	11.1	143	330	92	91	
22	7.0	7.4	11	140		1.53	0.00	14	179	11.5	147	36	91	86	
23	6.7	7.4	6	79		1.57	0.00	15	196	10.7	140	12	96	90	
24	6.6	7.4	9	110		1.46	0.00	13	158	9.6	117	14	92	86	
25	6.4	7.2	7	86	0.90	1.47	0.00	14	172	8.1	99	2	93	85	
26	6.8	7.3	8	111		1.66	0.00	15	208	10.2	141	2	93	87	
27	6.9	7.6	13	186		1.72	0.00	14	201	10.3	148	2	90	85	
28	6.8	7.3	10	149		1.79	0.00	14	209	9.6	143	2	91	87	
29	6.7	7.4	17	251		1.77	0.00	13	192	9.6	142	6	86	92	
30	6.8	7.3	11	150		1.64	0.00	14	191	9.9	135	6	91	87	
31	6.7	7.3	11	129		1.41	0.00	13	153	8.8	103	10	92	86	
Total	200.9	228.3	214	2,825	3.21	48.16	0.00	254	3,341	331.4	4,294	3,634	2,929	2,862	349
Max.	7.2	7.6	17	251	0.97	1.79	0.00	15	209	14.8	191	656	99	99	92
Min.	5.2	7.1	1	11	0.42	1.35	0.00	1	12	7.1	84	2	86	85	79
Avg.	6.5	7.4	7	91	0.64	1.55	0.00	8	108	10.7	139	28	94	92	87

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
AUGUST, 1991 - MISCELLANEOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	SO2 Lbs.	Lime Lbs.	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	PH	Lbs. of Lime per lb. of Dry Solids
1		2,160	260	16	298	8	374	5,000	5.3	67	5.9	0.17
2		2,280	520	8	298	7	391	5,000	5.1	70	6.0	0.18
3		2,160	230	12	298	8	102	1,500	4.7	67	5.8	0.17
4		2,280	210	13	298	10	204	3,000	8.8	84	5.9	0.09
5		2,280	1,210	14	298	3	408	5,500	4.3	69	6.0	0.21
6		2,160	990	15	298	7	340	5,000	4.6	69	5.7	0.18
7		2,280	690	16	298	7	408	6,000	4.7	70	5.7	0.17
8		2,280	430	12	298	8	374	5,000	4.1	69	5.6	0.22
9		2,160	230	15	298	6	238	6,000	3.9	72	5.8	0.12
10		2,160	210	15	298	7	221	4,000	4.3	71	5.8	0.15
11		2,280	280	18	298	7	238	4,000	3.8	71	6.0	0.19
12		2,160	1,110	22	298	7	459	6,000	4.0	72	5.9	0.23
13		2,280	600	12	298	8	459	6,000	4.9	71	5.8	0.19
14		2,280	1,000	13	199	6	459	6,000	4.0	68	5.8	0.23
15		2,160	1,090	15	298	7	357	4,500	5.5	53	5.6	0.17
16		2,280	800	18	298	13	272	6,000	4.0	72	5.6	0.13
17		2,160	220	20	298	14	306	4,000	4.0	76	5.6	0.23
18		2,160	650	22	298	17	255	4,000	3.9	71	5.6	0.19
19		2,160	510	18	199	22	357	4,800	4.2	76	5.6	0.21
20		2,280	520	22	199	32	374	5,000	4.8	73	5.6	0.19
21		2,280	630	20	397	14	357	5,000	4.5	74	5.6	0.19
22		2,160	1,060	35	298	27	357	5,000	4.7	72	5.6	0.18
23		2,280	470	39	298	34	374	6,000	4.5	73	5.7	0.16
24		2,280	1,080	36	298	32	306	4,000	4.7	72	5.7	0.19
25		2,160	1,160	44	199	22	255	4,000	4.7	72	5.7	0.16
26		2,280	420	29	298	20	408	5,200	4.6	73	5.6	0.20
27		2,280	1,920	41	298	26	408	5,200	4.6	72	5.7	0.20
28		2,280	330	39	199	24	425	5,200	4.7	72	5.8	0.21
29		2,280	1,630	26	199	24	391	5,200	4.5	72	5.8	0.20
30		2,640	400	29	298	8	357	7,000	4.7	71	5.8	0.13
31		2,400	420	28	298	26	306	4,000	4.5	73	5.9	0.20
Total		69,720	21,280	682	8,743	461	10,540	152,100	143.6	2,207	178.2	5.65
Max.		2,640	1,920	44	397	34	459	7,000	8.8	84	6.0	0.23
Min.		2,160	210	8	199	3	102	1,500	3.8	53	5.6	0.09
Avg.		2,249	686	22	282	15	340	4,906	4.6	71	5.7	0.18

Manpower & Hours

	Total Hr
Superintendent 1	^176
Asst. Supt. 1	^176
Operators 2	^356
Total	^708

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
SEPTEMBER, 1991 - PLANT INFLUENT SHEET - SAMPLING CODE 500

	----Weather------		Inf. Flow	Inf. Temp	Inf. pH	Inf. BOD	Inf. BOD	Inf. SS	Inf. SS	Inf. Phos.	Inf. Phos.	Inf. VSS	Inf. NH3-N	--Remarks or Other Parameters--
	Type	Precip.	MGD	F	SU	mgIL	Lbs.	mgIL	Lbs.	mgIL	Lbs.	mgIL	mgIL	
PN-	^00033	^00045	^50050	^00011	^00400	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	
Day														
1	1		1.30	62	7.6	108	1,171	104	1,128			94	14.1	
2	1		1.43	61	7.7	135	1,610	158	1,884			136	9.4	
3	4	0.47	1.68	63	7.5	159	2,228	170	2,382			150	12.1	
4	1		1.57	63	7.5	129	1,689	122	1,597			106	11.2	
5	1		1.61	63	7.6	117	1,571	144	1,934			102	13.7	
6	1		1.65	64	7.4	141	1,940	150	2,064			146	12.6	
7	1		1.49	61	7.6	108	1,342	136	1,690	6.10	76	128	14.9	
8	3		1.48	62	7.6	117	1,444	108	1,333			94	11.8	
9	4	0.45	1.71	63	7.5	135	1,925	114	1,626			108	11.8	
10	1		1.68	63	7.5	138	1,934	116	1,625			106	14.0	
11	4	0.04	1.64	64	7.5	210	2,872	146	1,997			130	15.8	
12	4	0.45	1.61	63	7.7	150	2,014	134	1,799	4.70	63	108	12.9	
13	1		1.54	62	7.7	216	2,774	136	1,747			114	12.4	
14	4	0.03	1.41	62	7.6	153	1,799	148	1,740			138	12.4	
15	1		1.39	62	7.6	156	1,808	112	1,298			108	11.4	
16	1		1.67	64	7.4	180	2,507	108	1,504			96	12.9	
17	3		1.58	64	7.4	165	2,174	128	1,687			106	13.9	
18	4	0.06	1.55	64	7.2	165	2,133	188	2,430	4.50	58	162	15.6	
19	4	0.03	1.56	62	7.6	210	2,732	128	1,665			110	11.1	
20	1		1.41	63	7.5	156	1,834	98	1,152			86	16.8	
21	1		1.37	63	7.5	171	1,954	116	1,325			96	13.7	
22	4	0.51	1.32	62	7.4	135	1,486	106	1,167			76	13.4	
23	1		1.63	63	7.3	165	2,243	112	1,523			96	12.2	
24	4	0.04	1.52	63	7.3	192	2,434	142	1,800			132	12.1	
25	4	0.19	1.60	63		174	2,322	130	1,735	5.00	67	110	10.8	
26	1		1.65	62	7.6	168	2,312	110	1,514			106	9.5	
27	3		1.50	62	7.3	156	1,952	106	1,326			94	13.5	
28	1		1.48	60	7.7	144	1,777	128	1,580			104	11.2	
29	1		1.34	60	7.5	135	1,509	130	1,453			122	12.4	
30	1		1.52	62	7.4	165	2,092	104	1,318			84	11.7	
31														
Total	66	2.27	45.89	1,875	217.7	4,653	59,583	3,832	49,024	20.30	264	3,348	381.3	
Max.	4	0.51	1.71	64	7.7	216	2,872	188	2,430	6.10	76	162	16.8	
Min.	1	0.03	1.30	60	7.2	108	1,171	98	1,128	4.50	58	76	9.4	
Avg.	2	0.23	1.53	63	7.5	155	1,986	128	1,634	5.08	66	112	12.7	

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
SEPTEMBER, 1991 - PRIMARY EFFLUENT SHEET

	P Eff. BOD mgIL	P Eff. BOD Lbs.	P Eff. SS mgIL	P. Eff. SS Lbs.	P Eff. Phos. mgIL	P Eff. Phos. Lbs.	P Eff. VSS mgIL	P Eff. NH3-N mgIL	Flow MGD	BOD Pri. Removal %	SS Pri. Removal %	P Pri. Removal %
PN-	^00310	^85001	^00530	^85002	^00665	^85004	`00535	^00610	^50050			
Day												
1	103	1,117	88	954			78		1.30			
2	93	1,109	104	1,240			90	11.7	1.43	31	34	
3	117	1,639	102	1,429			90	14.3	1.68	26	40	
4	111	1,453	84	1,100			76	14.4	1.57	14	31	
5	117	1,571	94	1,262			78	16.4	1.61	0	35	
6	120	1,651	82	1,128			76	15.5	1.65	15	45	
7	111	1,379	78	969	6.80	85	68	15.1	1.49	0	43	0
8	114	1,407	74	913			66	15.5	1.48	3	31	
9	123	1,754	96	1,369			84	14.8	1.71	9	16	
10	120	1,681	78	1,093			72	14.6	1.68	13	33	
11	132	1,805	92	1,258			82	13.4	1.64	37	37	
12	129	1,732	122	1,638	5.40	73	102	14.7	1.61	14	9	0
13	195	2,505	86	1,105			72	14.2	1.54	10	37	
14	165	1,940	80	941			78	14.0	1.41	0	46	
15	144	1,669	86	997			82	14.2	1.39	8	23	
16	168	2,340	96	1,337			82	14.8	1.67	7	11	
17	153	2,016	126	1,660			110	15.6	1.58	7	1	
18	162	2,094	112	1,448	5.50	71	98	15.1	1.55	2	40	0
19	180	2,342	126	1,639			112	11.4	1.56	14	2	
20	156	1,834	110	1,294			96	19.5	1.41	0	0	
21	162	1,851	108	1,234			88	14.7	1.37	5	7	
22	138	1,519	122	1,343			102	12.4	1.32	0	0	
23	150	2,039	111	1,509			96		1.63		0	
24	165	2,092	134	1,699			128	12.8	1.52	14	6	
25	150	2,002	140	1,868	5.10	68	118	11.2	1.60	14	0	0
26	144	1,982	116	1,596			108	10.9	1.65	14	0	
27	135	1,689	66	826			52	13.1	1.50	13	38	
28	138	1,703	74	913			56	11.5	1.48	4	42	
29	117	1,308	126	1,408			114	11.5	1.34	13	3	
30	144	1,825	120	1,521			100	12.0	1.52	13	0	
31												
Total	4,156	53,050	3,033	38,693	22.80	296	2,654	389.3	45.89	300	610	0
Max.	195	2,505	140	1,868	6.80	85	128	19.5	1.71	37	46	0
Min.	93	1,109	66	826	5.10	68	52	10.9	1.30	0	0	0
Avg.	139	1,768	101	1,290	5.70	74	88	13.9	1.53	11	21	0

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
SEPTEMBER, 1991 - ACTIVATED SLUDGE SHEET

	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading #/m	Mix Liq SS mg/L	Mix Liq VSS mg/L	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mg/L	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge kGal	Daily Flow MGD	PE BOD mg/l	PE SS mg/L
PN-	^80993	^81001	^80990	^80992	^70323	^70324	^81004	^81007	^00300	^81000	^81006	^70325	^81014	^80991	^50050	^00310	^00530
Day																	
1	48	6.6	4.1		1,300					215			92	72	1.30	103	88
2		6.0	3.1		1,295					210			84	72	1.43	93	104
3		5.1	2.7	0.56	1,301	975	15.0	0.87	5.2	205	0.27	0.20	71	72	1.68	117	102
4		5.5	3.8	0.46	1,380	1,061	16.0	0.86		209	0.32	0.24	76	72	1.57	111	84
5		5.4	3.1	0.55	1,312	961	16.0	0.82	2.4	209	0.30	0.23	75	72	1.61	117	94
6		5.2	3.8	0.51	1,422	1,089	16.0	0.89	2.7	208	0.36	0.27	73	72	1.65	120	82
7		5.8	4.7		1,537					207			81	72	1.49	111	78
8		5.8	4.9		1,490					206			81	72	1.48	114	74
9		5.0	3.2	0.52	1,456	1,117	18.0	0.81	4.9	202	0.26	0.20	70	72	1.71	123	96
10		5.1	4.2	0.49	1,520	1,140	18.0	0.84	2.2	205	0.35	0.27	71	79	1.68	120	78
11		5.3	3.5	0.54	1,491	1,124	17.0	0.88	2.7	207	0.35	0.27	73	79	1.64	132	92
12		5.4	2.8	0.51	1,514	1,142	17.0	0.89	2.0	208	0.34	0.25	75	79	1.61	129	122
13		5.6	3.9	0.77	1,434	1,081	17.0	0.84	3.2	206	0.26	0.20	78	86	1.54	195	86
14		6.1	4.5		1,414					203			85	86	1.41	165	80
15		6.2	4.0		1,346					201			86	86	1.39	144	86
16		5.2	3.0	0.76	1,328	1,035	15.0	0.89	6.1	207	0.27	0.21	72	86	1.67	168	96
17		5.5	2.4	0.66	1,332	1,027	15.0	0.89	3.8	210	0.26	0.20	76	86	1.58	153	126
18		5.6	2.7	0.68	1,319	1,024	14.0	0.94	4.9	216	0.29	0.22	77	86	1.55	162	112
19		5.5	2.3	0.79	1,283	992	15.0	0.86	4.0	219	0.31	0.23	77	86	1.56	180	126
20		6.1	3.2	0.56	1,390	1,085	16.0	0.87	2.8	220	0.30	0.24	85	86	1.41	156	110
21		6.3	3.2		1,335					216			88	86	1.37	162	108
22		6.5	3.0		1,352					210			91	86	1.32	138	122
23		5.3	2.7	0.65	1,352	1,047	16.0	0.85	5.0	213	0.24	0.19	74	86	1.63	150	111
24		5.7	2.6	0.61	1,447	1,144	17.0	0.85	2.6	216	0.24	0.20	79	89	1.52	165	134
25		5.4	2.3	0.61	1,413	1,099	16.0	0.88	2.3	208	0.30	0.23	75	89	1.60	150	140
26		5.2	2.6	0.59	1,405	1,114	15.0	0.94	3.7	212	0.28	0.22	73	89	1.65	144	116
27		5.7	4.7	0.55	1,297	1,024	14.0	0.93	4.6	215	0.28	0.22	80	89	1.50	135	66
28		5.8	4.0		1,225					217			81	89	1.48	138	74
29		6.4	2.6		1,236					211			90	89	1.34	117	126
30		5.7	2.3	0.68	1,173	900	13.0	0.90	4.1	203	0.24	0.19	79	79	1.52	144	120
31																	
Total	48	170.0	100.0	12.04	41,099	21,181	316.0	17.49	69.2	6,294	5.82	4.48	2,368	2,444	45.89	4,156	3,033
Max.	48	6.6	4.9	0.79	1,537	1,144	18.0	0.94	6.1	220	0.36	0.27	92	89	1.71	195	140
Min.	48	5.0	2.3	0.46	1,173	900	13.0	0.81	2.0	201	0.24	0.19	70	72	1.30	93	66
Avg.	48	5.7	3.3	0.60	1,370	1,059	15.8	0.87	3.6	210	0.29	0.22	79	81	1.53	139	101

Robert J. Swalwell
Superintendent

MARSHALL WWTP 801 INDUSTRIAL RD. MARSHALL MI 49068 - PERMIT # MI0022540
SEPTEMBER, 1991 - DISCHARGE MONITORING REPORT - DISCHARGE NO. 001A

	F.Eff. D.O. mg/L	F.Eff. pH SU	F.Eff. SS mg/L	F.Eff. SS Lbs.	F.Eff. Total-P mg/L	Flow MGD	F.Eff. Chlorine mg/L	F.Eff. BOD mg/L	F.Eff. BOD Lbs.	F.Eff. NH3 as N mg/L	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %
Limit-	>4.0	6 & 9	30 & 45	751 & ^1,126	<1.0			20 & 30	500 & ^751	<11.0	7 Day ^275	200 & 400	>85%	>85%	
PN-	^00300	^00400	^00530	^00530	^00665	^50050	^50060	^80082	^80082	^00610	^00610	^31616	^81011	^91267	^81012
Day															
1	6.4	7.4	6	65		1.30	0.00	15	163	10.1	110	2	95	86	
2	6.4	7.4	9	107		1.43	0.00	14	167	7.6	91	2	94	90	
3	6.4	7.4	17	238		1.68	0.00	15	210	10.5	147	2	90	91	
4	6.7	7.4	10	131		1.57	0.00	14	183	10.4	136	2	92	89	
5	6.7	7.5	14	188		1.61	0.00	18	242	11.6	156	4	90	85	
6	6.6	7.3	19	261		1.65	0.00	9	124	12.7	175	2	87	94	
7	6.0	7.3	8	99	1.16	1.49	0.00	16	199	12.4	154	4	95	85	81
8	6.3	7.4	13	160		1.48	0.00	15	185	11.1	137	2	88	87	
9	6.5	7.4	21	299		1.71		19	271	12.0	171	2	82	86	
10	6.8	7.3	14	196		1.68	0.00	13	182	12.6	177	350	88	91	
11	6.7	7.3	14	191		1.64	0.00	14	191	11.5	157	2	90	93	
12	6.8	7.3	20	269	0.79	1.61	0.00	8	107	10.9	146	4	85	95	83
13	6.7	7.4	12	154		1.54	0.00	23	295	11.0	141	380	91	89	
14	6.6	7.4	7	82		1.41	0.00	21	247	10.9	128	34	95	86	
15	6.8	7.5	5	58		1.39	0.00	22	255	10.2	118	4	96	86	
16	7.2	7.5	11	153		1.67	0.00	22	306	11.1	155	4	90	88	
17	6.9	7.3	18	237		1.58	0.00	20	264	9.5	125	2	86	88	
18	7.0	7.3	24	310	1.00	1.55	0.00	23	297	11.8	153	2	87	86	78
19	6.8	7.3	30	390		1.56	0.00	27	351	8.8	114	52	77	87	
20	6.8	7.3	25	294		1.41	0.00	23	270	13.0	153	38	74	85	
21	6.3	7.5	34	388		1.37	0.00	24	274	10.5	120	600	71	86	
22	6.3	7.3	28	308		1.32	0.00	25	275			20	74	81	
23	6.5	7.3	18	245		1.63	0.00	29	394	10.3	140	172	85	82	
24	6.6	8.3	28	355		1.52	0.00	32	406	9.0	114	2	80	83	
25			32	427	0.97	1.60	0.00	28	374	8.0	107	2	77	84	81
26	6.9	7.3	36	495		1.65	0.00	27	372	8.7	120		67	84	
27	6.7	7.3	28	350		1.50	0.00	31	388	11.1	139	4	74	80	
28	6.8	7.4	25	309		1.48	0.00	23	284	10.6	131	2	80	84	
29	6.5	7.3	15	168		1.34	0.00	21	235	9.3	104	2	88	84	
30		7.4	26	330		1.52	0.00	26	330	10.9	138	2	75	84	
31															
Total	185.7	214.5	567	7,261	3.92	45.89	0.00	617	7,842	308.1	3,956	1,698	2,543	2,599	323
Max.	7.2	8.3	36	495	1.16	1.71	0.00	32	406	13.0	177	600	96	95	83
Min.	6.0	7.3	5	58	0.79	1.30	0.00	8	107	7.6	91	0	67	80	78
Avg.	6.6	7.4	19	242	0.98	1.53	0.00	21	261	10.6	136	7	85	87	81

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
SEPTEMBER, 1991 - MISCELLANEOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	SO2 Lbs.	Lime Lbs.	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	PH	Lbs. of Lime per lb. of Dry Solids
1		2,400	450	28	298	22	255	4,000	3.0	73	5.8	0.25
2		2,400	150	31	199	16	238	4,000	4.3	73	5.8	0.16
3		2,400	400	33	298	20	323	5,000	4.5	72	6.2	0.17
4		2,400	350	24	298	21	340	5,000	4.6	72	5.7	0.18
5		2,400	350	26	298	19	340	5,000	4.7	72	5.6	0.17
6		2,400	520	28	298	20	391	5,000	4.4	73	5.7	0.21
7		2,400	210	27	298	18	289	4,000	4.4	72	5.7	0.20
8		2,400	270	25	397	18	221	4,000	4.4	73	5.7	0.15
9		2,520	320	20	298	12	408	5,200	4.5	73	5.9	0.21
10		2,400	400	20	199	15	459	5,000	4.7	68	5.8	0.23
11		2,280	300	25	298	15	646	10,500	4.8	71	5.8	0.15
12		2,280	530	23	298	18	833	13,500	4.7	71	5.7	0.16
13		2,280	550	22	199	17	663	11,000	4.5	59	5.7	0.16
14		2,280	420	27	298	17	306	4,000	4.7	68	5.7	0.19
15		2,280	320	33	199	18	255	4,000	4.8	71	5.8	0.16
16		2,160	390	22	199	19	357	5,000	4.5	72	5.7	0.19
17		2,280	450	22	298	13	289	5,000	4.7	72	5.5	0.15
18		2,280	880	19	298	8	391	5,000	4.5	69	5.5	0.21
19		2,400	280	21	199	8	374	5,500	4.7	73	5.7	0.17
20		2,280	390	24	298	10	612	8,000	4.7	70	5.8	0.19
21		2,280	240	21	298	10	238	4,000	4.8	70	5.5	0.15
22		2,280	330	17	298	10	255	4,000	4.5	73	5.6	0.17
23		2,280	370	17	298	12	391	6,000	5.9	65	5.6	0.13
24		2,280	410	17	199	10	425	6,000	5.4	68	5.6	0.16
25		2,280	690	20	298	16	357	6,000	5.5	66	5.9	0.13
26		2,280	560	20	199	13	340	6,000	5.3	66	5.5	0.13
27		2,400	410	20	397	13	102	6,000	5.3	67	5.6	0.04
28		2,280	410	20	199	16	170	5,000	4.7	72	5.7	0.09
29		2,160	420	15	298	14	85	5,000	4.6	70	5.5	0.04
30		2,280	400	30	199	15	204	6,000	4.8	71	5.5	0.08
31												
Total		69,720	12,170	697	8,148	453	10,557	171,700	140.9	2,105	170.8	4.77
Max.		2,520	880	33	397	22	833	13,500	5.9	73	6.2	0.25
Min.		2,160	150	15	199	8	85	4,000	3.0	59	5.5	0.04
Avg.		2,324	406	23	272	15	352	5,723	4.7	70	5.7	0.16

Manpower & Hours

	Total Hr
Superintendent 1	^160
Asst. Supt. 1	^152
Operators 2	^332
Total	^644

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
OCTOBER, 1991 - PLANT INFLUENT SHEET - SAMPLING CODE 500

	----Weather-----		Inf. Flow	Inf. Temp	Inf. pH	Inf. BOD	Inf. BOD	Inf. SS	Int. SS	Inf. Phos.	Inf. Phos.	Int. VSS	Inf. NH3-N	--Remarks or Other Parameters--
	Type	Precip.	MGD	F	SU	mgIL	Lbs.	mgIL	Lbs.	mgIL	Lbs.	mgIL	mgIL	
PN-	^00033	^00045	^50050	^00011	^00400	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	
Day														
1	1		1.55	62	7.4	150	1,939	120	1,551			104	10.8	
2	4	1.40	1.58	61	7.3	147	1,937	124	1,634			100	11.4	
3	4	0.84	1.64	63	7.8	132	1,805	96	1,313			80	10.9	
4	4	0.44	1.67	63	7.3	168	2,340	126	1,755	3.80	53	100	12.7	
5	4	0.09	1.60	60	7.5	177	2,362	144	1,922			116	11.4	
6	4	0.27	1.45	60	7.6	132	1,596	100	1,209			86	11.2	
7	1		1.69	62	7.7	129	1,818	108	1,522			88	11.3	
8	1		1.64	61	7.7	144	1,970	156	2,134			134	13.2	
9	4	0.08	1.61	61	7.6	141	1,893	94	1,262			82	9.6	
10	4	0.09	1.72	61	7.5	186	2,668	122	1,750	3.20	46	106	8.3	
11	4	0.10	1.56	59	7.4	171	2,225	142	1,847			118	12.8	
12	3		1.47	60	7.5	156	1,913	146	1,790			116	12.6	
13	4	0.05	1.42	60	7.5	135	1,599	116	1,374			102	11.4	
14	4	0.33	1.64	61	7.8	201	2,749	138	1,888			134	12.5	
15	4	0.06	1.64	60	7.5	177	2,421	116	1,587			112	10.8	
16	1		1.49	59	7.4	183	2,274	134	1,665	5.10	63	112	14.1	
17	1		1.59	59	7.4	213	2,825	172	2,281			148	12.2	
18	4	0.35	1.55	59	7.5	219	2,831	162	2,094			142		
19	3		1.28	58	7.4	138	1,473	108	1,153			92		
20	1		1.26	58	7.6	120	1,261	106	1,114			96	13.6	
21	1		1.47	59	7.4	189	2,317	136	1,667			116	12.5	
22	1		1.38	58	7.3	201	2,313	166	1,911	4.80	55	134	13.4	
23	1		1.42	60	7.5	213	2,523	154	1,824			146	12.2	
24	4	0.13	1.51	60	7.6	180	2,267	120	1,511			106		
25	4	3.47	1.69	60	7.6	225	3,171	198	2,791			176	10.6	
26	4	0.68	1.58	59	7.6	147	1,937	112	1,476			100		
27	3		1.45	59	7.7	138	1,669	126	1,524			96		
28	1		1.63	60	7.5	174	2,365	98	1,332	3.10	42	96	11.6	
29	4	0.15	1.71	59	7.6	207	2,952	120	1,711			104	12.7	
30	4	0.28	1.61	59	7.8	210	2,820	144	1,934			128	14.6	
31	1		1.53	60	7.6	207	2,641	174	2,220			150	16.6	
Total	88	8.81	48.03	1,860	233.6	5,310	68,874	4,078	52,745	20.00	260	3,520	315.0	
Max.	4	3.47	1.72	63	7.8	225	3,171	198	2,791	5.10	63	176	16.6	
Min.	1	0.05	1.26	58	7.3	120	1,261	94	1,114	3.10	42	80	8.3	
Avg.	3	0.52	1.55	60	7.5	171	2,222	132	1,701	4.00	52	114	12.1	

Robert J. Swalwell
Superintendent

MARSHALL, WASTEWATER TREATMENT PLANT
OCTOBER, 1991 - PRIMARY EFFLUENT SHEET

	P Eff. BOD mg/L	P Eff. BOD Lbs.	P Eff. SS mg/L	P. Eff. SS Lbs.	F Eff. Phos. mg/L	P Eff. Phos. Lbs.	P Eff. VSS mg/L	F Eff. NH3-N mg/L	Flow MGD	BOD Pri. Removal %	SS Pri. Removal %	P Pri. Removal %
PN-	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	^50050			
Day												
1	138	1,784	108	1,396			98		1.55	10	8	
2	120	1,581	104	1,370			76		1.58	16	18	
3	114	1,559	80	1,094			64		1.64	58	14	
4	105	1,462	86	1,198	2.80	39	80		1.67	32	38	75
5	117	1,561	90	1,201			80		1.60	38	34	
6	81	980	56	677			46		1.45	44	39	
7	78	1,099	44	620			34		1.69	59	40	
8	102	1,395	44	602			44		1.64	72	29	
9	84	1,128	62	832			46		1.61	34	40	
10	126	1,807	48	689	2.70	39	34		1.72	61	32	53
11	117	1,522	38	494			26		1.56	73	32	
12	102	1,250	38	466			28		1.47	74	35	
13	84	995	28	332			20		1.42	76	38	
14	120	1,641	46	629			40		1.64	67	40	
15	99	1,354	44	602			38		1.64	62	44	
16	108	1,342	68	845	2.90	36	54		1.49	49	41	91
17	123	1,631	64	849			54		1.59	63	42	
18	141	1,823	82	1,060			70		1.55	49	36	
19	99	1,057	48	512			60		1.28	56	28	
20	105	1,103	72	757			70		1.26	32	13	
21	126	1,545	78	956			58		1.47	43	33	
22	126	1,450	82	944	2.90	33	70		1.38	51	37	90
23	138	1,634	82	971			80		1.42	47	35	
24	141	1,776	68	856			60		1.51	43	22	
25	123	1,734	88	1,240			78		1.69	56	45	
26	102	1,344	72	949			70		1.58	36	31	
27	87	1,052	56	677			44		1.45	56	37	
28	117	1,591	60	816	1.70	23	58		1.63	39	33	84
29	141	2,011	50	713			48		1.71	58	32	
30	150	2,014	88	1,182			70		1.61	39	29	
31	132	1,684	78	995			60		1.53	55	36	
Total	3,546	45,911	2,052	26,525	13.00	170	1,758		48.03			
Max.	150	2,014	108	1,396	2.90	39	98		1.72			
Min.	78	980	28	332	1.70	23	20		1.26			
Avg.	114	1,481	66	856	2.60	34	57		1.55			

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER PLANT
OCTOBER, 1951 - ACTIVATED SLUDGE SHEET

	Aerat Volume M.CF	Deten. Time Hrs.	Sludge Age Days	Organic Loading f/m	Mix Liq SS mg/L	Mix Liq VSS mg/L	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mg/L	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mg/l	PE SS mg/L
PN-	^80993	^81001	^80990	^80992	^70323	^70324	^81004	^81007	^00300	^81000	^81006	^70325	^81014	^80991	^50050	^00310	^00530
Day																	
1	48	5.6	2.7	0.63	1,268	948	0.15	84.53	2.8	204	0.27	0.22	74	72	1.55	138	108
2		5.5	3.0	0.41	1,384	1,289	0.17	81.41	1.2	203	0.28	0.17	75	72	1.58	120	104
3		5.3	8.4	0.43	1,538	1,203	0.17	90.47	1.0	204	0.31	0.24	73	79	1.64	114	40
4		5.2	3.5	0.43	1,413	1,125	0.14	100.93	2.4	205	0.32	0.25	71	79	1.67	105	86
5		5.4								213			73	72	1.60	117	90
6		5.9								217			79	72	1.45	81	56
7		5.1	2.6	0.83	538	445	0.05	107.60		211	0.10	0.09	78	0	1.69	78	44
8		5.3	2.7	1.06	545	441	0.05	109.00	6.4	202	0.11	0.09	89	0	1.64	102	44
9		5.4	2.3	0.70	652	537	0.07	93.14	6.1	202	0.14	0.10	90	0	1.61	84	62
10		5.0	3.4	0.97	771	621	0.07	110.14	6.0	204	0.16	0.13	81	0	1.72	126	48
11		5.5	5.8	0.66	964	774	0.10	96.40	3.9	205	0.22	0.16	88	0	1.56	117	38
12		5.9								212			78	0	1.47	102	38
13		6.1								212			79	0	1.42	84	28
14		5.3	6.7	0.49	1,404	1,119	0.16	87.75	4.8	205	0.34	0.27	67	29	1.64	120	46
15		5.3	7.6	0.37	1,534	1,230	0.19	80.74	1.7	212	0.38	0.31	67	29	1.64	99	44
16		5.8	5.7	0.35	1,606	1,277	0.22	73.00	4.7	210	0.35	0.27	73	36	1.49	108	68
17		5.4	5.8	0.37	1,656	1,483	0.42	39.43	4.7	201	0.43	0.37	73	43	1.59	123	64
18		5.6	4.6	0.55	1,642	1,100	0.22	74.64	1.1	207	0.33	0.22	77	50	1.55	141	82
19		6.7								217			89	58	1.28	99	48
20		6.8								210			96	58	1.26	105	72
21		5.9	4.2	0.47	1,347	1,099	0.21	64.14	6.0	204	0.25	0.21	82	58	1.47	126	78
22		6.2	4.5	0.42	1,425	1,152	0.19	75.00	2.6	201	0.32	0.26	87	58	1.38	126	82
23		6.1	4.3	0.48	1,400	1,144	0.17	82.35	2.5	201	0.27	0.22	84	58	1.42	138	82
24		5.7	4.9	0.51	1,408	1,174	0.17	82.82	1.0	200	0.29	0.24	79	58	1.51	141	68
25		5.1	3.3	0.51	1,385	1,146	0.16	86.56	4.4	202	0.26	0.22	69	50	1.69	123	88
26		5.5								210			76	43	1.58	102	72
27		5.9								211			79	36	1.45	87	56
28		5.3	4.8	0.46	1,316	1,156	0.15	87.73	5.6	209	0.26	0.26	70	29	1.63	117	60
29		5.0	5.9	0.57	1,407	1,182	0.16	87.94	3.9	206	0.25	0.25	64	29	1.71	141	50
30		5.4	4.2	0.48	1,647	1,404	0.18	91.50	1.8	211	0.35	0.35	68	29	1.61	150	88
31		5.6	5.0	0.40	1,678	1,421	0.19	88.32	1.2	218	0.29	0.29	70	36	1.53	132	78
Total		173.4	106.3	12.53	29,928	24,470	3.76	1975.55	75.8	6,429	6.28	5.19	2,398	1,233	48.03	3,546	2,012
Max.		6.8	8.4	1.06	1,678	1,483	0.42	110.14	6.4	218	0.43	0.37	96	79	1.72	150	108
Min.		5.0	2.3	0.35	538	441	0.05	39.43	1.0	200	0.10	0.09	64	0	1.26	78	28
Avg.		5.6	4.6	0.54	1,301	1,064	0.16	85.89	3.4	207	0.27	0.23	77	40	1.55	114	65

Robert J. Swalwell
Superintendent

MARSHALL WWTF 801 INDUSTRIAL RD. MARSHALL MI 49068 - PERMIT # MI0023540
OCTOBER, 1991 - DISCHARGE MONITORING REPORT - DISCHARGE No. 001A

	F.Eff. D.O. mg/L	F.Eff. pH SU	F.Eff. SS mg/L	F.Eff. SS Lbs.	F.Eff. Total-P mg/L	Flow MGD	F.Eff. Chlorine mg/L	F.Eff. BOD mg/L	F.Eff. BOD Lbs.	F.Eff. NH3 as N mg/L	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %
Limit-	>4.0	6 & 9	30 & 45	751 & ^1,126	<1.0			20 & 30	500 & ^751	<11.0	7 Day ^275	200 & 400	>85%	>85%	
PN-	^00300	^00400	^00530	^00530	^00665	^50050	^50060	^80082	^80082	^00610	^00610	^31616	^81011	^91267	^81012
Day															
1	6.4	7.4	12	155		1.55	0.00	20	259			94	90	87	
2	6.4	7.3	24	316		1.58	0.00	23	303			4	81	84	
3	6.2	7.3	20	274		1.64	0.00	23	315			60	79	83	
4	6.8	7.2	34	474	0.95	1.67	0.00	17	237			400	73	90	75
5	6.1	7.3	44	587		1.60	0.00	12	160			640	69	93	
6	6.5	7.3	20	242		1.45	0.00	12	145			616	80	91	
7	6.4	7.2	19	268		1.69	0.00	15	211			56	82	88	
8	6.6	7.4	16	219		1.64	0.00	22	301			10	90	85	
9	6.9	7.3	26	349		1.61	0.00	4	54			4	72	97	
10	6.9	7.4	22	316	1.50	1.72	0.00	18	258			20	82	90	53
11	6.2	7.2	24	312		1.56	0.00	15	195			38	83	91	
12	6.3	7.1	20	245		1.47	0.00	13	159			10	86	92	
13		7.3	4	47		1.42	0.00	9	107			2	97	93	
14	7.1	7.3	16	219		1.64	0.00	14	191			4	88	93	
15	6.6	7.2	10	137		1.64	0.00	13	178			296	91	93	
16	6.8	7.3	7	87	0.47	1.49	0.00	7	87			7	95	96	91
17	6.6	7.2	16	212		1.59	0.00	13	172			14	91	94	
18	6.2	7.2	21	271		1.55	0.00	12	155			156	87	95	
19	5.8	7.2	9	96		1.28	0.00	13	139			252	92	91	
20	6.0	7.8	9	95		1.26	0.00	14	147			178	92	88	
21	7.3	7.3	12	147		1.47	0.00	11	135			156	91	94	
22	6.4	7.1	17	196	0.48	1.38	0.00	16	184			280	90	92	90
23	6.6	7.3	15	178		1.42	0.00	14	166			420	90	93	
24	6.0	7.5	12	151		1.51	0.00	13	164			370	90	93	
25	6.0	7.6	19	268		1.69	0.00	8	113			2	90	96	
26	6.7	7.3	14	184		1.58	0.00	13	171			2	88	91	
27	6.4	7.4	16	193		1.45	0.00	12	145			4	87	91	
28	7.5	7.6	14	190	0.49	1.63	0.00	12	163			2	86	93	
29	6.4	7.5	20	285		1.71	0.00	12	171			2	83	94	84
30	6.1	7.5	28	376		1.61	0.00	16	215			64	81	92	
31	5.9	7.5	26	332		1.53	0.00	17	217			170	85	92	
Total	194.1	227.5	566	7,421	3.89	48.03	0.00	433	5,617			4,333	2,661	2,835	393
Max.	7.5	7.8	44	587	1.50	1.72	0.00	23	315			640	97	97	91
Min.	5.8	7.1	4	47	0.47	1.26	0.00	4	54			2	69	83	53
Avg.	6.5	7.3	18	239	0.78	1.55	0.00	14	181			34	86	91	79

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
OCTOBER, 1991 - MISCELLANEOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	SO2 Lbs.	Lime Lbs.	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	PH	Lbs. of Lime per lb. of Dry Solids
1		2,280	420	17	298	12	357	6,000	4.8	71	5.5	0.15
2		2,280	790	20	199	7	51	2,000	5.2	71		0.06
3		2,280	780	22	298	10	969	18,132	4.1	72	5.4	0.16
4		2,280	430	19	298	12	306	2,300	5.2	70		0.30
5		2,280	230	22	298	10	221	3,000	4.2	71	6.4	0.21
6		2,400	270	21	199	13	187	3,000	4.5	70	6.1	0.16
7		2,280	360	21	397	17	306	6,000	6.4	68	5.8	0.09
8		2,400	360	22	199	20	272	6,500	6.1	70	5.7	0.08
9		2,280	330	22	298	20	153	3,000	4.5	72	6.0	0.13
10		2,400	450	25	199	20	221	3,000	6.1	70	6.4	0.14
11		2,280	420	25	397	10	68	2,300	5.7	71	5.8	0.06
12		2,280	370	25	298	13	153	3,000	7.5	60	6.2	0.08
13		2,160	330	30	298	17	170	3,000	5.7	72	5.9	0.12
14		2,400	310	25	496	17	204	3,000	4.3	80	6.0	0.19
15		2,400	400	25	496	20	136	3,000	6.8	54	6.0	0.08
16		2,400	390	25	498	17	153	3,000	6.0	71	5.9	0.10
17		2,280	520	28	498	21	272	5,500	5.0	73	5.7	0.12
18		2,280	350	28	199	19	306	5,000	5.2	74	5.8	0.14
19		2,280	360	23	199	21	255	4,000	4.6	77	5.8	0.16
20		2,280	450	21	298	20	255	4,000	5.0	74	5.7	0.15
21		2,040	510	24	298	15	204	6,000	5.1	70	5.6	0.08
22		2,160	410	25	298	17	391	6,000	4.9	75	5.5	0.16
23		2,280	560	25	199	17	374	5,500	4.9	73	5.7	0.17
24		2,280	530	31	298	22	391	5,500	5.0	75	5.8	0.17
25		2,280	480	33	199	26	425	5,500	4.7	75	5.7	0.20
26		2,280	240	32	397	28	238	4,000	5.0	76	5.6	0.14
27		2,280	350	20	298	10	221	4,000	4.8	75	5.7	0.14
28		2,280	640	22	298	8	238	4,000	5.1	75	5.6	0.14
29		2,520	390	22	298	11	204	3,000	5.1	74	5.6	0.16
30		2,400	440	21	298	11	306	5,000	5.2	75	5.5	0.14
31		2,400	380	17	298	12	306	5,000	5.2	72	5.8	0.14
Total		71,400	13,250	738	9,539	493	8,313	142,232	161.9	2,226	168.2	4.32
Max.		2,520	790	33	498	28	969	18,132	7.5	80	6.4	0.30
Min.		2,040	230	17	199	7	51	2,000	4.1	54	5.4	0.06
Avg.		2,303	427	24	308	16	268	4,588	5.2	72	5.8	0.14

Manpower & Hours

	Total Hr
Superintendent 1	^168
Asst. Supt. 1	^176
Operators 3	^352
Total	^696

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
NOVEMBER, 1991 - PLANT INFLUENT SHEET - SAMPLING CODE 500

	----Weather----		Inf. Flow	Inf. Temp	Inf. pH	Inf. BOD	Inf. BOD	Inf. SS	Inf. SS	Int. Phos.	Inf. Phos.	Inf. VSS	Inf. NH3-N	--Remarks or Other Parameters--
	Type	Precip.	MGD	F	SU	mgIL	Lbs.	mgIL	Lbs.	mgIL	Lbs.	mgIL	mgIL	
PN-	`00033	^00045	^50050	`00011	`00400	^00310	^85001	^00530	`85002	^00665	^85004	^00535	^00610	
Day														
1	4	0.35	1.59	58	7.5	183	2,427	124	1,644			108		
2	3		1.39	57	7.6	159	1,843	114	1,322			106		
3	5	0.01	1.40	56	7.7	189	2,207	132	1,541			128		
4	3		1.51	59	7.6	198	2,493	168	2,116			134		
5	4	0.02	1.59	58	7.5	189	2,506	130	1,724	3.30	44	108		
6	1		1.52	57	7.8	167	2,117	368	4,665			344		
7	1		1.55	57	7.5	129	1,668	110	1,422	3.00	39	90		
8	1		1.44	57	7.4	168	2,018	142	1,705			114		
9	1		1.38	56	7.7	138	1,588	112	1,289			88		
10	1		1.38	55	7.7	159	1,830	116	1,335			98		
11	4	0.03	1.61	57	7.6	159	2,135	146	1,960			136		
12	4	0.03	1.53	58	7.6	176	2,246	110	1,404			130		
13	1		1.58	58	8.0	195	2,570	132	1,739			110		
14	4	0.33	1.59	57	7.7	207	2,745	144	1,910			126		
15	4	0.07	1.56	57	7.5	165	2,147	138	1,795	5.00	65	126		
16	1		1.46	57	7.7	165	2,009	130	1,583			100		
17	4	0.01	1.35	56	7.8	135	1,520	118	1,329			98		
18	4	0.12	1.47	56	7.5	234	2,869	230	2,820			212		
19	4	1.08	1.59	57	7.6	189	2,506	136	1,803			120		
20	4	0.20	1.50	56	7.8	156	1,952	94	1,176			60		
21	1		1.61	57	7.7	228	3,061	123	1,652	4.10	55	86		
22	1		1.52	57	7.5	213	2,700	214	2,713			196		
23	5	0.12	1.57	56	7.6	189	2,475	98	1,283			94		
24	5	0.05	1.45	55	7.5	168	2,032	138	1,669			132		
25	5	0.02	1.47	56	7.4	156	1,913	166	2,035			134		
26	3		1.52	56	7.9	192	2,434	126	1,597	4.80	61	98		
27	5	0.07	1.42	56	7.5	96	1,137	134	1,587			124		
28	4	1.00	1.30	54	7.6	129	1,399	122	1,323			116		
29	4	0.63	1.40	53	7.6	141	1,646	128	1,495			98		
30	3		1.41	54	7.5	135	1,588	92	1,082			90		
31														
Total	94	4.14	44.66	1,693	228.6	5,107	63,778	4,235	52,717	20.20	263	3,704		
Max.	5	1.08	1.61	59	8.0	234	3,061	368	4,665	5.00	65	344		
Min.	1	0.01	1.30	53	7.4	96	1,137	92	1,082	3.00	39	60		
Avg.	3	0.24	1.49	56	7.6	170	2,126	141	1,757	4.04	53	123		

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
NOVEMBER, 1991 - PRIMARY EFFLUENT SHEET

	P Eff. BOD mg/L	P Eff. BOD Lbs.	P Eff. SS mg/L	P. Eff. SS Lbs.	P Eff. Phos. mg/L	P Eff. Phos. Lbs.	P Eff. VSS mg/L	P Eff. NH3-N mg/L	Flow MGD	BOD Pri. Removal %	SS Pri. Removal %	P Pri. Removal %
PN-	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	^50050			
Day												
1	117	1,551	82	1,087			78		1.59	36	34	
2	123	1,426	88	1,020			76		1.39	23	23	
3	120	1,401	72	841			70		1.40	33	45	
4	141	1,776	82	1,033			54		1.51	29	51	
5	120	1,591	60	796	2.20	29	48		1.59	37	54	33
6	130	1,648	80	1,014			54		1.52	22	78	
7	90	1,163	86	1,112	1.80	23	60		1.55	30	22	40
8	105	1,261	88	1,057			66		1.44	38	38	
9	96	1,105	84	967			60		1.38	30	25	
10	96	1,105	76	875			64		1.38	40	34	
11	96	1,289	88	1,182			88		1.61	40	40	
12	108	1,378	70	893			66		1.53	39	36	
13	123	1,621	68	896			58		1.58	37	48	
14	111	1,472	66	875			54		1.59	46	54	
15	105	1,366	80	1,041	2.50	33	74		1.56	36	42	50
16	114	1,388	92	1,120			82		1.46	31	29	
17	111	1,250	74	833			66		1.35	18	37	
18	171	2,096	126	1,545			124		1.47	27	45	
19	120	1,591	76	1,008			66		1.59	37	44	
20	111	1,389	88	1,101			74		1.50	29	6	
21	150	2,014	92	1,235	2.90	39	76		1.61	34	25	29
22	144	1,825	90	1,141			86		1.52	32	58	
23	132	1,728	78	1,021			70		1.57	30	20	
24	108	1,306	92	1,113			80		1.45	36	33	
25	114	1,398	102	1,250			78		1.47	27	39	
26	156	1,978	88	1,116	3.60	46	76		1.52	19	30	25
27	78	924	100	1,184			86		1.42	19	25	
28	87	943	88	954			74		1.30	33	28	
29	87	1,016	68	794			56		1.40	38	47	
30	108	1,270	78	917			60		1.41	20	15	
31												
Total	3,472	43,270	2,502	31,020	13.00	170	2,124		44.66	946	1,105	177
Max.	171	2,096	126	1,545	3.60	46	124		1.61	46	78	50
Min.	78	924	60	794	1.80	23	48		1.30	18	6	25
Avg.	116	1,442	83	1,034	2.60	34	71		1.49	32	37	35

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
NOVEMBER, 1991 - ACTIVATED SLUDGE SHEET

	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading #/M	Mix Liq SS mg/L	Mix Liq VSS mg/L	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mg/L	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mg/l	PE SS mg/L
PN-	^80993	^81001	^80990	^80992	^70323	^70324	^81004	^81007	^00300	^81000	^81006	^70325	^81014	^80991	^50050	^00310	^00530
Day																	
1	48	5.4	4.8	0.37	1,732	1,404	19.0	0.91	2.2	216	0.31	0.27	68	43	1.59	117	82
2		6.2								229			91	43	1.39	123	88
3		6.2								230			890	35	1.40	120	72
4		5.7	4.2	0.49	1,432	1,217	15.0	0.95	5.9	228	0.31	0.26	83	27	1.51	141	82
5		5.4	5.6	0.43	1,485	1,225	14.0	1.06	5.5	183	0.31	0.26	79	29	1.59	120	60
6		5.7	4.7	0.42	1,599	1,310	16.0	1.00	2.0	184	0.32	0.26	83	29	1.52	130	80
7		5.6	4.5	0.28	1,677	1,380	17.0	0.99	2.5	187	0.37	0.31	79	36	1.55	90	86
8		6.0	4.6	0.32	1,607	1,326	16.0	1.00	3.6	189	0.30	0.24	82	36	1.44	105	88
9		6.2								183			86	36	1.38	96	84
10		6.2								180			85	36	1.38	96	76
11		5.4	3.9	0.34	1,541	1,266	16.0	0.96	4.1	200	0.31	0.25	73	29	1.61	96	88
12		5.6	5.6	0.33	1,660	1,398	16.0	1.04	4.7	204	0.36	0.30	76	29	1.53	108	70
13		5.5	5.7	0.38	1,715	1,411	17.0	1.01	2.4	200	0.37	0.31	74	29	1.58	123	68
14		5.4	6.3	0.33	1,827	1,511	18.0	1.02	2.2	195	0.39	0.32	73	29	1.59	111	66
15		5.5	5.6	0.28	1,962	1,626	20.0	0.98	0.1	219	0.44	0.37	76	36	1.56	105	80
16		5.9								237			80	36	1.46	114	92
17		6.4								231			86	36	1.35	111	74
18		5.9	3.7	0.44	1,930	1,601	20.0	0.97	4.7	218	0.40	0.33	79	36	1.47	171	126
19		5.4	6.1	0.32	2,069	1,638	20.0	1.03	2.1	217	0.47	0.40	72	43	1.59	120	76
20		5.7	5.5	0.28	2,037	1,681	20.0	1.02	2.2	229	0.43	0.35	76	43	1.50	111	88
21		5.4	4.9	0.40	2,021	1,688	20.0	1.01	1.6	217	0.44	0.36	71	43	1.61	150	92
22		5.7	5.4	0.36	2,062	1,712	21.0	0.98	0.0	213	0.40	0.34	77	43	1.52	144	90
23		5.5								218			70	43	1.57	132	78
24		5.9								223			74	43	1.45	108	92
25		5.9	4.6	0.29	1,942	1,617	20.0	0.97	4.5	228	0.39	0.32	76	43	1.47	114	102
26		5.7	5.3	0.42	1,980	1,572	20.0	0.99	5.2	224	0.41	0.33	75	43	1.52	156	88
27		6.1	5.1	0.18	2,025	1,710	19.0	1.07	5.4	216	0.37	0.29	79	43	1.42	78	100
28		6.6								216			86	43	1.30	87	88
29		6.2								204			81	43	1.40	87	68
30		6.1								217			80	43	1.41	108	78
31																	
Total	48	174.2	96.2	6.65	34,303	28,293	344.0	18.96	60.9	6,335	7.10	5.87	3,160	1,126	44.66	3,472	2,502
Max.	48	6.6	6.3	0.49	2,069	1,712	21.0	1.07	5.9	237	0.47	0.40	890	43	1.61	171	126
Min.	48	5.4	3.7	0.18	1,432	1,217	14.0	0.91	0.0	180	0.30	0.24	68	27	1.30	78	60
Avg.	48	5.8	5.1	0.35	1,805	1,489	18.1	1.00	3.2	211	0.37	0.31	105	38	1.49	116	83

Robert J. Swalwell
Superintendent

MARSHALL WWTF 801 INDUSTRIAL RD. MARSHALL MI 49068 - PERMIT # MI0022540
NOVEMBER, 1991 - DISCHARGE MONITORING REPORT - DISCHARGE No. 001A

	F.Eff. D.O. mg/L	F.Eff. pH SU	F.Eff. SS mg/L	F.Eff. SS Lbs.	F.Eff. Total-P mg/L	Flow MGD	F.Eff. Chlorine mg/L	F.Eff. BOD mg/L	F.Eff. BOD Lbs.	F.Eff. NH3 as N mg/L	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %
Limit-	>4.0	6 & 9	30 & 45	751 & ^1,126	<1.0			20 & 30	500 & ^751	<11.0	7 Day ^275	200 & 400	>85%	>85%	
PN-	^00300	^00400	^00530	^00530	^00665	^50050	^50060	^80082	^80082	^00610	^00610	^31616	^81011	^91267	^81012
Day															
1	5.9	7.4	34	451		1.59	0.00	24	318			100	73	87	
2	6.4	7.5	30	348		1.39	0.00	20	232			4	74	87	
3	6.6	7.7	36	420		1.40	0.00	21	245			10	73	89	
4	7.0	7.5	24	302		1.51	0.00	23	290			8	86	88	
5	7.6	7.5	20	265	0.93	1.59	0.00	24	318			10	85	87	72
6	7.2	7.4	36	456		1.52	0.00	23	292			4	90	86	
7	7.1	7.4	40	517	0.94	1.55	0.00	17	220			12	64	87	69
8	7.3	7.4	30	360		1.44	0.00	15	180			2	79	91	
9	6.5	7.5	20	230		1.38	0.00	19	219			2	82	86	
10	6.8	7.5	18	207		1.38	0.00	14	161			2	84	91	
11	7.2	7.5	34	457		1.61	0.00	14	188			8	77	91	
12	7.5	7.5	18	230		1.53	0.00	13	166			4	84	93	
13	7.0	7.5	20	264		1.58	0.00	21	277			18	85	89	
14	7.0	7.4	10	133		1.59	0.00	11	146			8	93	95	
15	6.4	7.4	12	156	1.24	1.56	0.00	9	117			48	91	95	75
16	7.2	7.6	18	219		1.46	0.00	6	73			12	86	96	
17	6.8	7.5	10	113		1.35	0.00	8	90			2	92	94	
18	7.3	7.5	10	123		1.47	0.00	7	86			2	96	97	
19	6.3	7.5	6	80		1.59	0.00	14	186			10	96	93	
20	6.2	7.4	14	175		1.50	0.00	8	100			4	85	95	
21	6.8	7.3	11	148	0.49	1.61	0.00	12	161			4	91	95	88
22	6.4	7.4	19	241		1.52	0.00	22	279			850	91	90	
23	6.4	7.2	17	223		1.57	0.00	18	236			258	83	90	
24	6.5	7.1	12	145		1.45	0.00	11	133			16	91	93	
25	6.8	7.3	15	184		1.47	0.00	8	98			2	91	95	
26	6.9	7.4	11	139	0.34	1.52	0.00	7	89			2	91	96	93
27	5.8	7.3	12	142		1.42	0.00	4	47			2	91	96	
28	7.2	7.4	11	119		1.30	0.00	5	54			8	91	96	
29	6.6	7.4	11	128		1.40	0.00	4	47			8	91	97	
30	6.0	7.5	6	71		1.41	0.00	6	71			4	93	96	
31															
Total	202.7	222.9	565	7,045	3.94	44.66	0.00	408	5,117			1,424	2,579	2,761	397
Max.	7.6	7.7	40	517	1.24	1.61	0.00	24	318			850	96	97	93
Min.	5.8	7.1	6	71	0.34	1.30	0.00	4	47			2	64	86	69
Avg.	6.8	7.4	19	235	0.79	1.49	0.00	14	171			8	86	92	79

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
NOVEMBER, 1991 - MISCELLANEOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	SO2 Lbs.	Lime Lbs.	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	PH	Lbs. of Lime per lb. of Dry Solids
1	5,100	2,520	450	19	397	18	136	5,000	4.9	75	5.6	0.07
2	8,600	2,520	400	23	298	20	255	4,000	4.7	74	5.8	0.16
3	9,600	2,520	420	20	199	15	255	4,000	4.7	76	5.6	0.16
4	9,700	2,640	410	21	298	15	340	5,000	5.1	75	5.7	0.16
5	7,700	2,760	620	18	298	12	544	8,000	5.1	76	5.7	0.16
6	8,500	2,640	420	20	397	14	816	13,000	5.0	75	5.6	0.15
7	10,500	2,520	460	20	298	12	459	8,500	4.6	73	6.0	0.14
8	8,100	2,640	510	25	298	10	408	6,000	4.7	72	6.1	0.17
9	9,000	2,520	450	20	199	10	238	4,000	4.3	74	6.0	0.16
10	7,800	2,400	450	19	298	12	221	4,000	4.0	75	6.0	0.16
11	6,900	2,520	430	22	199	10	357	6,000	4.8	71	6.1	0.15
12	7,800	2,400	450	21	199	13	408	6,000	5.1	75	5.7	0.16
13	3,200	2,520	670	24	298	13	204	4,000	4.4	75	5.7	0.14
14	2,600	2,400	420	20	298	12	306	5,000	4.3	75	5.9	0.17
15	3,000	2,520	430	15	298	12	306	5,000	4.6	74	6.0	0.16
16	6,300	2,520	420	20	397	12	187	3,000	4.1	72	5.8	0.18
17	4,100	2,640	400	18	397	13	170	3,000	4.5	75	5.6	0.15
18	2,600	2,400	380	18	298	15	340	6,000	4.5	76	5.8	0.15
19	2,400	2,280	520	20	298	15	357	5,000	4.5	76	5.8	0.19
20	3,500	2,520	370	19	496	13	357	5,000	5.6	77	5.6	0.15
21	4,200	2,520	340	18	397	8	323	5,000	5.1	75	5.9	0.15
22	4,400	2,400	680	18	397	9	289	5,000	4.7	76	5.9	0.15
23	7,300	2,520	310	24	397	10	221	4,000	4.9	78	5.9	0.13
24	6,900	2,760	210	25	397	18	204	4,000	4.7	80	5.8	0.13
25	8,300	2,640	330	26	397	19	323	6,000	5.1	73	5.8	0.13
26	8,400	2,640	510	25	397	20	289	6,000	4.8	76		0.12
27	4,800	2,640	330	29	397	23	306	6,000	5.1	75	5.7	0.12
28	6,000	2,520	350	22	397	15	204	4,000	4.4	78	5.8	0.14
29	3,100	2,520	320	16	397	13	187	4,000	4.8	76	5.9	0.12
30	4,400	2,520	320	18	298	5	221	4,000	5.0	76	5.8	0.13
31												
Total	184,800	76,080	12,780	623	10,029	406	9,231	157,500	142.1	2,254	168.6	4.40
Max.	10,500	2,760	680	29	496	23	816	13,000	5.6	80	6.1	0.19
Min.	2,400	2,280	210	15	199	5	136	3,000	4.0	71	5.6	0.07
Avg.	6,160	2,536	426	21	334	14	308	5,250	4.7	75	5.8	0.15

Manpower & Hours

	Total Hr
Superintendent 1	^144
Asst. Supt. 1	^164
Operators 2	^380
Total	^688

Robert J. Swalwell
Superintendent

MARSHALL, MICXHIGAN WASTEWATER TREATMENT PLANT
DECEMBER, 1991 - PLANT INFLUENT SHEET - SAMPLING CODE 500

	----Weather----		Inf. Flow	Inf. Temp	Inf. pH	Inf. BOD	Inf. BOD	Inf. SS	Inf. SS	Inf. Phos.	Inf. Phos.	Inf. VSS	Inf. NH3-N	--Remarks or Other Parameters--
	Type	Precip.	MGD	F	SU	mgIL	Lbs.	mgIL	Lbs.	mgIL	Lbs.	mgIL	mgIL	
PN-	^00033	^00045	^50050	^00011	^00400	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	
Day														
1	1		1.47	54	7.7	141	1,729	84	1,030			70		
2	5	0.33	1.61	55	7.5	198	2,659	130	1,746			118		
3	5	0.11	1.53	56	7.5	186	2,373	130	1,659			124		
4	5	0.05	1.53	55	7.3	159	2,029	114	1,455			96		
5	5	0.02	1.48	55	7.4	156	1,926	122	1,506	4.60	57	106		
6	1		1.50	55	7.4	183	2,289	134	1,676			106		
7	3	0.02	1.50	54	7.7	207	2,590	148	1,851			128		
8	3	0.64	1.61	54	7.5	150	2,014	100	1,343			86		
9	1		1.69	55	7.4	135	1,903	120	1,691			86		
10	1		1.76	55	7.5	225	3,303	146	2,143			122		
11	1		1.64	55	7.6	195	2,667	124	1,696			108		
12	3	0.73	1.73	54	7.4	189	2,727	124	1,789	3.60	52	104		
13	3	0.02	1.60	54	7.3	132	1,761	120	1,601			102		
14	5	0.02	1.38	54	7.3	142	1,634	114	1,312			92		
15	5	0.03	1.44	51	7.2	123	1,477	104	1,249			82		
16	1		1.59	54	7.5	210	2,785	134	1,777			118		
17	5	0.02	1.46	54	7.3	180	2,192	148	1,802			132		
18	1		1.47	55	7.4	213	2,611	144	1,765	4.10	50	108		
19	2		1.51	54	7.6	240	3,022	120	1,511			94		
20	3	0.25	1.48	53	7.6	201	2,481	110	1,358			90		
21	2		1.48	54	7.5	186	2,296	104	1,284			86		
22	3	0.06	1.47	53	7.6	195	2,391	102	1,250			88		
23	1		1.50	54	7.7	246	3,077	125	1,564			94		
24	1		1.36	54	7.6	150	1,701	168	1,906			144		
25	1		1.25	53	7.6	123	1,282	112	1,168			90		
26	1		1.48	52	7.6	171	2,111	120	1,481			98		
27	1		1.47	53	7.5	177	2,170	132	1,618			108		
28	5	0.42	1.43	53	7.6	153	1,825	106	1,264	2.90	35	94		
29	5	0.08	1.43	52	7.6	153	1,825	120	1,431			96		
30	2		1.49	53	7.6	155	1,926	112	1,392			98		
31	1		1.43	53	7.6	228	2,719	162	1,932			138		
Total	82	2.80	46.77	1,670	232.6	5,502	69,495	3,833	48,250	15.20	194	3,206		
Max.	5	0.73	1.76	56	7.7	246	3,303	168	2,143	4.60	57	144		
Min.	1	0.02	1.25	51	7.2	123	1,282	84	1,030	2.90	35	70		
Avg.	3	0.19	1.51	54	7.5	177	2,242	124	1,556	3.80	48	103		

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
DECEMBER, 1991 - PRIMARY EFFLUENT SHEET

	P Eff. BOD mg/L	P Eff. BOD Lbs.	P Eff. SS mg/L	P. Eff. SS Lbs.	P Eff. Phos. mg/L	P Eff. Phos. Lbs.	P Eff. VSS mg/L	P Eff. NH3-N mg/L	Flow MGD	BOD Pri. Removal %	SS Pri. Removal %	P Pri. Removal %
PN-	^00310	^85001	^00530	^85002	^00665	^85004	^00535	^00610	^50050			
Day												
1	117	1,434	76	932			66		1.47	17	10	
2	147	1,974	82	1,101			64		1.61	26	37	
3	126	1,608	84	1,072			84		1.53	32	35	
4	129	1,646	90	1,148			82		1.53	19	21	
5	132	1,629	100	1,234	4.10	51	92		1.48	15	18	11
6	147	1,839	116	1,451			96		1.50	20	13	
7	135	1,689	90	1,126			88		1.50	34	39	
8	132	1,772	122	1,638			88		1.61	12	0	
9	132	1,860	116	1,635			92		1.69	2	3	
10	168	2,466	108	1,585			96		1.76	25	26	
11	168	2,298	104	1,422			80		1.64	14	16	
12	135	1,948	76	1,097	3.30	48	60		1.73	29	39	8
13	153	2,042	104	1,388			98		1.60	0	13	
14	129	1,485	88	1,013			74		1.38	9	23	
15	117	1,405	86	1,033			68		1.44	5	17	
16	174	2,307	94	1,246			86		1.59	17	30	
17	153	1,863	98	1,193			84		1.46	15	34	
18	117	1,434	88	1,079	4.10	50	62		1.47	45	39	0
19	210	2,645	124	1,562			108		1.51	13	0	
20	177	2,185	120	1,481			100		1.48	12	0	
21	165	2,037	132	1,629			104		1.48	11	0	
22	168	2,060	108	1,324			88		1.47	14	0	
23	189	2,364	124	1,551			92		1.50	23	3	
24	147	1,667	96	1,089			76		1.36	2	43	
25	111	1,157	108	1,126			84		1.25	10	4	
26	144	1,777	124	1,531			104		1.48	16	0	
27	120	1,471	104	1,275			88		1.47	32	21	
28	156	1,860	100	1,193	3.30	39	92		1.43	0	6	0
29	135	1,610	128	1,527			92		1.43	12	0	
30	84	1,044	120	1,491			116		1.49	46	0	
31	162	1,932	120	1,431			112		1.43	29	26	
Total	4,479	56,509	3,230	40,603	14.80	188	2,716		46.77	556	516	19
Max.	210	2,645	132	1,638	4.10	51	116		1.76	46	43	11
Min.	84	1,044	76	932	3.30	39	60		1.25	0	0	0
Avg.	144	1,823	104	1,310	3.70	47	88		1.51	18	17	5

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
DECEMBER, 1991 - ACTIVATED SLUDGE SHEET

	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading flm	Mix Liq SS mgIL	Mix Liq VSS mgIL	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mgIL	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mgIl	PE SS mgIL
PN-	^80993	^81001	^80990	^80992	^70323	^70324	^81004	^81007	^00300	^81000	^81006	^70325	^81014	^80991	^50050	^00310	^00530
Day	48																
1		5.9								221			77	43	1.47	117	76
2		5.4	5.0	0.45	1,850	1,460	19.0	0.97	5.3	218	0.37	0.30	71	43	1.61	147	82
3		5.6	5.6	0.33	2,020	1,619	20.0	1.01	1.2	219	0.35	0.27	76	43	1.53	126	84
4		5.6	5.4	0.32	2,074	1,694	22.0	0.94	1.9	211	0.44	0.36	71	43	1.53	129	90
5		5.8	5.1	0.33	2,094	1,671	22.0	0.95	2.0	199	0.44	0.35	72	50	1.48	132	100
6		5.7	4.3	0.36	2,091	1,687	22.0	0.95	1.0	202	0.41	0.32	70	58	1.50	147	116
7		5.7								202			69	58	1.50	135	90
8		5.4								213			65	58	1.61	132	122
9		5.1	3.4	0.41	1,855	1,520	18.0	1.03	2.3	207	0.38	0.31	63	58	1.69	132	116
10		4.9	3.4	0.57	1,825	1,452	17.0	1.07	1.6	205	0.40	0.31	59	50	1.76	168	108
11		5.3	3.9	0.50	1,860	1,538	17.0	1.09	2.8	206	0.42	0.35	65	50	1.64	168	104
12		5.0	5.1	0.42	1,879	1,536	16.0	1.17	3.5	196	0.41	0.34	61	43	1.73	135	76
13		5.4	4.0	0.46	1,833	1,481	15.0	1.22	3.4	215	0.33	0.27	67	36	1.60	153	104
14		6.2								228			75	29	1.38	129	88
15		6.0								209			70	22	1.44	117	86
16		5.4	5.3	0.44	2,189	1,744	20.0	1.09	2.1	203	0.44	0.35	64	22	1.59	174	94
17		5.9	6.4	0.31	2,538	2,035	23.0	1.10	1.9	211	0.48	0.37	67	29	1.46	153	98
18		5.9	6.1	0.28	2,208	1,734	19.0	1.16	3.3	204	0.41	0.32	71	29	1.47	117	88
19		5.7	5.4	0.40	2,821	2,184	25.0	1.13	2.2	196	0.45	0.35	71	43	1.51	210	124
20		5.8	5.8	0.33	2,848	2,218	26.0	1.10	2.7	194	0.58	0.44	73	58	1.48	177	120
21		5.8								195			72	58	1.48	165	132
22		5.9								187			73	58	1.47	168	108
23		5.7	4.9	0.39	2,514	2,024	23.0	1.09	2.2	227	0.43	0.34	71	50	1.50	189	124
24		6.3	7.0	0.27	2,558	2,060	22.0	1.16	2.0	216	0.43	0.34	77	50	1.36	147	96
25		6.9								210			83	43	1.25	111	108
26		5.8	4.5	0.32	2,322	1,852	18.0	1.29	5.4	205	0.42	0.33	71	36	1.48	144	124
27		5.9	5.7	0.25	2,441	1,938	19.0	1.28	2.8	209	0.42	0.33	71	36	1.47	120	104
28		6.0								202			73	36	1.43	156	100
29		6.0								204			74	36	1.43	135	128
30		5.8	5.1	0.20	2,543	1,735	25.0	1.02	3.6	210	0.45	0.36	70	43	1.49	84	120
31		6.0	5.1	0.32	2,431	2,042	25.0	0.97	4.8	208	0.42	0.36	72	50	1.43	162	120
Total	48	177.9	106.6	7.67	46,794	37,224	433.0	22.83	58.0	6,432	8.88	7.07	2,184	1,361	46.77	4,479	3,230
Max.	48	6.9	7.0	0.57	2,848	2,218	26.0	1.29	5.4	228	0.58	0.44	83	58	1.76	210	132
Min.	48	4.9	3.4	0.20	1,825	1,452	15.0	0.94	1.0	187	0.33	0.27	59	22	1.25	84	76
Avg.	48	5.7	5.1	0.37	2,228	1,773	20.6	1.09	2.8	207	0.42	0.34	70	44	1.51	144	104

Robert J. Swalwell
Superintendent

MARSHALL WWTP 801 INDUSTRIAL RD. MARSHALL MI 49068 - PERMIT # MI0023540
DECEMBER, 1991 - DISCHARGE MONITORING REPORT - DISCHARGE No. 001A

	F.Eff. D.O. mgIL	F.Eff. pH SU	F.Eff. SS mgIL	F.Eff. SS Lbs.	F.Eff. Total-P mgIL	Flow MGD	F.Eff. Chlorine mgIL	F.Eff. BOD mgIL	F.Eff. BOD Lbs.	F.Eff. NH3 as N mgIL	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %
Limit-	>4.0	6 & 9	30 & 45	751 & ^1,126	<1.0			20 & 30	500 & ^751	<11.0	7 Day ^275	200 & 400	>85%	>85%	
PN-	^00300	^00400	^00530	^00530	^00665	^50050	^50060	^80082	^80082	^00610	^00610	^31616	^81011	^91267	^81012
Day															
1	6.8	7.5	6	74		1.47	0.00	6	74			2	93	96	
2	8.0	7.4	11	148		1.61	0.00	10	134			2	92	95	
3	6.5	7.3	16	204		1.53	0.00	16	204			1,890	88	91	
4	6.4	7.3	16	204		1.53	0.00	11	140			14	86	93	
5	6.3	7.2	22	272	0.84	1.48	0.00	10	123			22	82	94	82
6	6.2	7.3	23	288		1.50	0.00	13	163			70	83	93	
7	6.1	7.1	14	175		1.50	0.00	13	163			1,000	91	94	
8	6.1	7.4	18	242		1.61	0.00	19	255			470	82	87	
9	6.6	7.3	15	209		1.67	0.00	16	223			2	88	88	
10	7.0	7.3	20	294		1.76	0.00	25	367			2	86	89	
11	7.1	7.2	27	369		1.64	0.00	19	260			2	78	90	
12	6.9	7.4	13	188	0.99	1.73	0.00	14	202			118	90	93	73
13	6.7	7.2	15	200		1.60	0.00	17	227			3	88	87	
14	6.1	7.2	17	196		1.38	0.00	14	161			22	85	90	
15	7.5	7.2	12	144		1.44	0.00	10	120			14	88	92	
16	7.9	7.3	13	172		1.59	0.00	13	172			63	90	94	
17	6.5	7.2	16	195		1.46	0.00	19	231			41	89	89	
18	7.1	7.2	16	196	0.88	1.47	0.00	14	172			88	89	93	79
19	6.9	7.4	22	277		1.51	0.00	20	252			114	82	92	
20	6.9	7.3	16	197		1.48	0.00	18	222			84	85	91	
21	6.9	7.4	27	333		1.48	0.00	19	235			380	74	90	
22	6.8	7.4	18	221		1.47	0.00	18	221			107	82	91	
23	6.6	7.3	15	188		1.50	0.00	17	213			48	88	93	
24	6.6	7.3	16	181		1.36	0.00	9	102			48	90	94	
25	6.7	7.3	11	115		1.25	0.00	9	94			15	90	93	
26	7.9	7.5	9	111		1.48	0.00	9	111			20	93	95	
27	6.5	7.4	10	123		1.47	0.00	5	61			47	92	97	
28	6.4	7.3	10	119	0.51	1.43	0.00	6	72			72	91	96	82
29	6.6	7.3	9	107		1.43	0.00	9	107			36	93	94	
30	6.9	7.4	8	99		1.49	0.00	9	112			120	93	94	
31	7.3	7.4	10	119		1.43	0.00	9	107			79	94	96	
Total	210.8	226.7	471	5,960	3.22	46.75	0.00	416	5,300			4,995	2,715	2,864	316
Max.	8.0	7.5	27	369	0.99	1.76	0.00	25	367			1,890	94	97	82
Min.	6.1	7.1	6	74	0.51	1.25	0.00	5	61			2	74	87	73
Avg.	6.8	7.3	15	192	0.81	1.51	0.00	13	171			G 37	88	92	79

G - geometric mean

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT
DECEMBER, 1991 - MISCELLANEOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	SO2 Lbs.	Lime Lbs.	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	PH	Lbs. of Lime per lb. of Dry Solids
1	6,000	2,520	410	18	397	12	238	4,000	4.9	76	5.8	0.14
2	6,600	2,760	410	18	397	16	357	6,000	4.9	77	5.8	0.14
3	5,800	2,640	270	26	397	16	323	6,000	5.2	77	5.9	0.12
4	5,700	2,640	320	24	397	20	287	5,000	5.0	77	5.8	0.14
5	8,300	2,520	670	28	298	20	238	5,000	5.2	75	5.7	0.11
6	7,500	2,520	410	26	298	20	272	6,000	5.3	74	6.4	0.10
7	5,100	2,520	180	24	397	22	204	3,000	7.6	84	5.8	0.11
8	2,500	2,400	220	32	298	28	170	3,000	5.0	76	5.8	0.13
9	6,000	2,520	280	34	298	16	340	6,000	5.5	76	5.5	0.12
10	5,700	2,520	210	34	397	24	340	6,000	5.4	74	5.6	0.12
11	5,700	2,520	350	28	397	22	357	6,000	5.5	76	5.7	0.13
12	3,900	2,520	320	20	397	20	374	6,000	5.8	75	5.8	0.13
13	5,800	2,400	310	24	298	19	306	6,000	5.6	75	5.8	0.11
14	8,100	2,520	200	24	298	20	187	4,000	5.4	76	5.6	0.10
15	10,200	2,640	230	24	397	17	340	3,000	5.5	76	5.5	0.25
16	10,000	2,640	420	26	298	10	306	5,000	5.2	77	5.7	0.14
17	6,400	2,520	300	29	397	12	357	6,000	5.1	78	5.5	0.14
18	10,000	2,640	290	25	298	15	289	4,500	5.0	78	5.5	0.15
19	9,600	2,640	240	24	298	18	272	5,000	4.5	80	5.6	0.14
20	6,900	2,520	470	26	298	17	425	7,000	4.8	77	5.6	0.15
21	7,000	2,520	330	28	397	20	238	5,000	4.4	77	5.8	0.13
22	7,100	2,400	330	25	298	20	170	3,000	4.9	78	5.7	0.14
23	7,300	2,520	240	20	397	20	340	5,000	5.3	76	5.6	0.15
24	7,300	2,640	290	23	298	20	272	5,000	5.5	77	5.7	0.12
25	8,600	2,520	150	25	298	14	170	3,000	5.1	77	5.7	0.13
26	4,300	2,640	290	17	298	16	255	6,000	5.4	77	5.7	0.09
27	7,600	2,400	320	24	397	20	306	5,000	4.9	78	5.6	0.15
28	6,800	2,520	190	24	298	18	170	3,000	5.1	78	5.6	0.13
29	6,900	2,520	220	28	298	20	136	3,000	5.1	78	5.6	0.11
30	7,200	2,640	290	26	298	20	357	6,000	5.3	78	5.5	0.13
31	7,600	2,520	250	26	298	20	204	6,000	4.7	77	5.7	0.09
Total	213,500	78,960	9,410	780	10,525	572	8,600	152,500	162.1	2,385	176.6	4.06
Max.	10,200	2,760	670	34	397	28	425	7,000	7.6	84	6.4	0.25
Min.	2,500	2,400	150	17	298	10	136	3,000	4.4	74	5.5	0.09
Avg.	6,887	2,547	304	25	340	18	277	4,919	5.2	77	5.7	0.13

Manpower & Hours

	Total Hr
Superintendent 1	168
Asst. Supt. 1	162
Operators 2	297
Total	627

Robert J. Swalwell
Superintendent

[illegible]

[illegible] - DAILY PLANT SHEET

	Weather		Inf. Flow	Inf Temp	Inf. pH	Inf. BOD	Inf. BOD	Inf. SS	Inf. SS	Inf. Phos.	Inf. Phos.	Inf. VSS	Inf. NH3-N	--Remarks or Other Parameters--				
	Type	Precip.	MGD	F	SU	mg/L	Lbs.	mg/L	Lbs.	mg/L	Lbs.	mg/L	mg/L					
PM-																		
Day																		
1	Snow	0.01	1.40	50	7.5	114	1,331	82	957			64						
2	Rain	0.12	1.41	50	7.7	114	1,341	114	1,341			98						
3	Rain	0.96	1.50	49	7.3	108	1,351	114	1,426			94						
4	Rain	0.55	1.86	51	7.6	129	2,001	104	1,613			86						
5	Rain	0.02	1.84	50	7.7	129	1,930	104	1,596			80						
6			1.90	51	7.2	156	2,472	96	1,521	4.60	73	84						
7	Snow	0.08	1.68	50	7.5	102	1,429	80	1,121			64						
8			1.58	51	7.7	132	1,739	136	1,792			136						
9	Snow	0.18	1.45	50	7.5	108	1,306	118	1,427			118						
10	Snow	0.04	1.43	49	7.5	101	1,216	94	1,121	3.10	37	94						
11			1.55	50	7.7	126	1,629	104	1,344			90						
12	Snow	0.58	1.58	51	7.4	111	1,463	100	1,318			92						
13	Snow	0.09	1.50	51	7.7	147	1,839	116	1,451			104						
14	Snow	0.02	1.54	51	7.5	210	2,697	186	2,389	4.30	55	164						
15	Snow	0.02	1.48	51	7.5	204	2,518	143	1,827			148						
16			1.38	50	7.1	114	1,312	106	1,220			100						
17	Snow	0.01	1.40	50	7.4	126	1,471	64	747			54						
18			1.59	50	7.6	170	2,254	104	1,379			78						
19			1.67	51	8.0	234	3,259	148	2,061			116						
20	Rain	0.47	1.67	51	7.9	228	3,176	126	1,755			108						
21	Rain	0.12	1.70	50	7.8	197	2,793	110	1,560			100						
22			1.56	50	8.0	168	2,186	118	1,535			104						
23	Snow	0.01	1.41	50	7.7	126	1,482	118	1,388			82						
24			1.45	50	7.8	138	1,669	104	1,258			80						
25			1.46	51	7.6	135	1,644	98	1,193			74						
26			1.50	49	7.9	114	1,426	100	1,251			90						
27	Snow	0.07	1.48	49	7.9					3.40	42							
28			1.51	50	7.5	132	1,662	90	1,133			84						
29			1.55	49	7.7	120	1,551	116	1,500			116						
30			1.54	49	7.8	129	1,657	156	2,004			156						
31			1.56	48	7.8	135	1,756	128	1,665	4.00	52	128						
Total	0	3.35	48.13	1,552	236.5	4,258	55,610	3,382	43,893	19.40	259	2,986						
Max.	0	0.96	1.90	51	8.0	234	3,259	186	2,389	4.60	73	164						
Min.	0	0.01	1.38	48	7.1	102	1,216	64	747	3.10	37	54						
Avg.	0	0.20	1.55	50	7.6	142	1,854	113	1,463	3.88	52	100						
Count	17	17.00	31.00	31	31.0	30	30	30	30	5.00	5	30						

Robert J. Swalwell
Superintendent

	P Eff. BOD mgIL	P Eff. BOD Lbs.	P Eff. SS mgIL	P Eff. SS Lbs.	P Eff. Phos. mgIL	P Eff. Phos. Lbs.	P Eff. VSS mgIL	P Eff. NH3-N mgIL	Flow MGD	BOD Rem. Removal %	SS Rem. Removal %	P Rem. Removal %
PM-												
Day												
1	57	666	62	724			56		1.40	50	24	
2	63	741	70	820			60		1.41	45	39	
3	42	525	52	651			46		1.50	61	54	
4	66	1,024	60	931			50		1.86	49	42	
5	60	921	46	706			32		1.84	53	56	
6	84	1,331	64	1,014	5.00	79	54		1.90	46	33	-9
7	54	757	56	785			42		1.68	47	30	
8	51	672	36	474			28		1.56	61	74	
9	33	399	36	435			26		1.45	69	69	
10			94	1,121			94		1.43		0	
11			73	944			70		1.55		30	
12	48	633	80	1,054			60		1.58	57	20	
13	75	938	84	1,051			80		1.50	49	28	
14	114	1,464	76	976	2.60	33	66		1.54	46	59	40
15	138	1,703	72	889			70		1.48	32	51	
16	93	1,070	76	875			68		1.38	28	28	
17	78	911	46	537			44		1.40	38	28	
18	99	1,313	38	504			30		1.59	42	63	
19	129	1,797	74	1,031			64		1.67	45	50	
20	168	2,340	76	1,059			74		1.67	26	40	
21	183	2,595	58	822			60		1.70	7	47	
22	144	1,873	124	1,613			112		1.56	14	-5	
23	111	1,305	92	1,082			72		1.41	12	22	
24	129	1,560	120	1,451			102		1.45	7	-15	
25	111	1,352	112	1,364			98		1.46	18	-14	
26	123	1,539	112	1,401			104		1.50	-8	-12	
27									1.48			
28	102	1,285	54	680			54		1.51	23	40	
29	99	1,280	84	1,086			84		1.55	18	28	
30	108	1,387	78	1,002			78		1.54	16	50	
31	87	1,132	76	989	3.70	48	76		1.56	36	41	8
Total	2,649	34,511	2,181	28,072	11.30	161	1,992		48.13	977	1,000	39
Max.	183	2,595	124	1,613	5.00	79	112		1.90	69	74	40
Min.	33	399	36	435	2.60	33	30		1.38	-8	-15	-9
Avg.	95	1,233	73	936	3.77	54	66		1.55	35	33	13
Count	28	28	30	30	3.00	3	30		31.00	28	30	3

Robert J. Swalwell
Superintendent

	Aerat Volume KCF	Deten. Time hrs.	Sludge Age Days	Organic Loading f/m	Mix Liq SS mg/L	Mix Liq VSS mg/L	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mg/L	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mg/l	PE SS mg/L
PM-																	
Day																	
1	48	6.2								248			105	35	1.40	57	62
2		6.1								245			104	36	1.41	63	70
3		5.7								222			98	35	1.50	42	52
4		4.6		0.20	1,787	1,465	70.0	0.26	4.5	213	0.37	0.31	81	36	1.86	66	60
5		4.7		0.21	1,769	1,460	89.0	0.20	3.6	233	0.33	0.28	82	36	1.84	60	46
6		4.5		0.32	1,741	1,438	85.0	0.20	4.2	234	0.36	0.30	79	36	1.90	84	64
7		5.1		0.18	1,715	1,435	79.0	0.22	3.4	235	0.36	0.30	89	29	1.68	54	56
8		5.5		0.15	1,867	1,543	94.0	0.20	4.5	240	0.34	0.28	92	22	1.58	51	36
9		5.9								242			103	22	1.45	33	36
10		6.0								244			104	22	1.43		94
11		5.6		0.00	1,980	1,646	95.0	0.21	5.8	160	0.39	0.32	99	22	1.55		73
12		5.5		0.13	1,950	1,641	86.0	0.23	5.1	150	0.36	0.30	98	40	1.58	48	80
13		5.7		0 19	1,990	1,680	83.0	0.24	3.6	95	0.37	0.31	101	40	1.50	75	84
14		5.6		0.31	1,844	1,574	96.0	0.19	2.9	114	0.35	0.29	101	40	1.54	114	76
15		5.8		0.36	1,820	1,560	95.0	0.19	1.3	114	0.34	0.30	102	40	1.48	138	72
16		6.2								112			108	40	1.38	93	76
17		6.2								120			104	40	1.40	78	46
18		5.4		0.27	1,900	1,642	95.0	0.20	2.7	120	0.31	0.27	95	40	1.59	99	38
19		5.2		0.37	1,855	1,618	95.0	0.20	2.3	103	0.31	0.27	90	40	1.67	129	74
20		5.2		0.43	2,028	1,799	93.0	0.22	1.5	154	0.35	0.30	89	40	1.67	168	76
21		5.1		0.44	2,294	1,984	95.0	0.24	1.1	161	0.42	0.36	88	48	1.70	183	58
22		5.5		0.30	2,442	2,037	93.0	0.26	1.3	217	0.42	0.37	96	58	1.56	144	124
23		6.1								215			105	65	1.41	111	92
24		5.9								223			101	65	1.45	129	120
25		5.9		0.24	2,281	1,859	96.0	0.24	7.2	228	0.38	0.31	101	65	1.46	111	112
26		5.7		0.28	2,193	1,822	85.0	0.26	8.2	181	0.38	0.30	97	65	1.50	123	112
27		5.8		0.00	2,150	1,750	63.0	0.34	7.0	176	0.38	0.30	97	65	1.48		73
28		5.7		0.25	2,120	1,699	56.0	0.38	6.6	154	0.35	0.29	94	65	1.51	102	54
29		5.6		0.26	2,060	1,645	50.0	0.41	6.4	158	0.36	0.31	91	65	1.55	99	84
30		5.6								152			91	65	1.54	108	78
31		5.5								146			89	65	1.56	87	76
Total	48	173.2	133.1	4.91	39,786	33,347	1693.0	4.88	81.2	5,609	7.23	6.07	2,974	1,384	48.13	2,649	2,254
Max.	48	6.2	11.8	0.44	2,442	2,087	96.0	0.41	8.2	248	0.42	0.37	108	65	1.90	183	124
Min.	48	4.5	4.5	0.00	1,715	1,435	50.0	0.19	1.1	95	0.31	0.27	79	22	1.38	33	36
Avg.	48	5.6	6.7	0.25	1,989	1,667	84.7	0.24	4.1	181	0.36	0.30	96	45	1.55	95	73
Count	1	31.0	20.0	20.00	20	20	20.0	20.00	20.0	31	20.00	20.00	31	31	31.00	28	31

Robert J. Swalwell
Superintendent

[illegible] - DISCHARGE MONITORING REPORT - DISCHARGE NO. 001A

Day	F.Eff D.O. mg/L	F Eff pH SU	F.Eff. SS mg/L	F.Eff. SS Lbs.	F.Eff Total-P mg/L	Flow MGD	F Eff. Chlorine mg/L	F Eff. BOD mg/L	F.Eff. BOD Lbs.	F.Eff. NH3 as N mg/L	F Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %	Mercury mg/L
1	7.0	7.4	5	58		1.40	0.000	4	47			2	94	96		
2	8.1	7.6	8	94		1.41	0.000	5	59			220	93	96		
3	7.5	7.1	6	75		1.50	0.002	4	50			63	95	96		
4	7.4	7.4	5	78		1.86	0.000	5	78			80	95	95		
5	7.2	7.4	10	153		1.84	0.000	5	77			170	90	96		
6	7.6	7.4	10	158	1.20	1.90	0.000	4	63			160	90	97	76	<0.0005
7	7.1	7.4	6	84		1.68	0.000	5	70			10	93	96		
8	7.7	7.3	8	105		1.58	0.000	4	53			30	94	97		
9	8.0	7.5	7	85		1.45	0.000	3	36			30	94	97		
10	8.2	7.4	6	72	0.40	1.43	0.000	2	24			10	94	98	87	<0.0005
11	7.8	7.4	5	65		1.55	0.000	3	39			6	95	98		
12	7.6	7.5	12	145		1.58	0.000	6	79			334	89	95		
13	7.1	7.3	13	163		1.50	0.000	8	100			280	89	95		
14	7.3	7.3	12	154	1.70	1.54	0.000	16	205			200	94	92	60	<0.0005
15		7.1	26	321		1.48	0.000	16	197			815	82	92		
16	7.7	7.0	26	299		1.38	0.000	14	161			240	75	88		
17	7.8	7.2	24	280		1.40	0.000	21	245			360	63	83		
18	7.4	7.1	22	292		1.59	0.000	23	305			190	79	86		
19	7.4	7.4	33	460		1.67	0.000	17	237			160	78	93		<0.0005
20	7.1	7.3	13	181		1.67	0.000	19	265			325	90	92		
21	6.8	7.4	26	369		1.70	0.000	29	411			180	76	85		
22	7.4	7.5	22	286		1.56	0.000	21	273			180	81	88		
23	7.0	7.3	24	282		1.41	0.001	17	200			650	80	87		
24	7.2	7.4	10	121		1.45	0.001	15	181			142	85	89		
25	8.3	7.5	14	170		1.46	0.000	14	170			70	86	90		
26	8.6	7.6	11	138		1.50	0.000	10	125			3	89	91		
27	8.5	7.6			0.82	1.48	0.000					1			76	
28	8.3	7.4	10	126		1.51	0.000	13	164			3	89	90		
29	8.8	7.4	7	90		1.55	0.000	9	116			28	94	93		
30	8.8	7.5	8	103		1.54	0.000	9	116			2	95	93		
31	8.0	7.8	15	195	0.68	1.56	0.000	10	130			18	88	93	83	
Total	230.7	228.9	403	5,202	4.80	48.13	0.003	331	4,277			4,962	2,629	2,776	382	<0.0005
Max.	8.8	7.8	33	460	1.70	1.90	0.001	29	411			815	95	98	87	<0.0005
Min.	6.8	7.0	5	58	0.40	1.38	0.000	2	24			1	63	83	60	<0.0005
Avg.	7.7	7.4	13	173	0.96	1.55	0.000	11	143			G 55	88	93	76	<0.0005
Count	30.0	31.0	30	30	5.00	31.00	31.000	30	30			31	30	30	5	4

G = Geometric Mean

Sample of January 6, 1993 - Copper <0.01 mg/l & Zinc 0.06 mg/l

Robert J. Swalwell
Superintendent

[illegible] TREATMENT PLANT

[illegible] - MONTHLY SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect Power kWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	SO2 Lbs	Lime Lbs.	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	PH	Lbs. of Lime per lb. of Dry Solids
1	100	2,880	160	27	0	21	221	4,000	4.6	67	6.2	0.14
2	82	3,000	280	28	199	20	238	4,000	4.0	69	5.8	0.18
3	45	2,400	190	23	298	18	204	4,000	4.2	71	5.9	0.14
4	45	2,760	260	26	298	16	357	7,000	4.4	68	6.0	0.14
5	76	3,000	210	26	199	16	340	8,000	4.2	70	5.9	0.12
6	97	2,880	140	38	397	28	306	7,000	4.1	70	5.9	0.13
7	61	2,880	260	32	298	30	340	8,000	4.1	71	5.8	0.12
8	91	2,880	230	30	298	24	238	6,000	4.3	70	5.9	0.11
9	107	3,000	80	35	298	18	170	4,000	3.8	75	5.9	0.13
10	96	2,880	70	35	199	24	170	4,000	3.8	70	5.9	0.13
11	86	2.640	80	33	298	15	136	14,000	3.7	71	5.8	0.03
12	75	2,520	270	35	298	14	272	6,000	3.9	71	5.8	0.14
13	78	2,400	440	32	397	31	408	6,000	4.0	69	5.9	0.20
14	85	2,520	340	37	298	33	374	12,000	4.0	70	5.9	0.09
15	96	2,400	230	35	298	31	272	9,500	3.8	72	5.7	0.09
16	79	2,280	90	31	397	22	153	4,000	3.7	72	5.9	0.12
17	100	2,400	230	29	298	28	153	4,000	3.9	73	5.8	0.12
18	106	2,400	110	33	298	30	306	6,000	4.1	73	5.9	0.15
19	91	2,520	330	33	199	17	357	8,000	4.1	73	6.0	0.13
20	86	2,760	160	32	298	10	340	8,000	4.6	69	6.0	0.11
21	64	2,760	250	30	199	10	357	8,000	4.4	72	5.9	0.12
22	76	2,880	530	33	199	8	340	6,000	4.2	72	5.9	0.16
23	63	2,760	140	35	199	12	187	4,000	3.9	75	5.8	0.14
24	71	2,880	160	34	298	5	170	4,000	3.8	74	5.9	0.13
25	109	3,000	1,420	37	199	25	255	6,500	4.5	68	5.5	0.10
26	90	2,760	260	25	199	34	306	8,000	4.1	71	5.9	0.11
27	63	2,760	850	31	199	35	289	8,000	4.2	73	5.9	0.10
28	82	2,760	150	31	298	36	340	8,000	3.9	74	5.7	0.13
29	103	2,760	470	34	298	30	238	6,000	4.0	73	5.9	0.12
30	91	2,640	240	32	199	32	153	4,000	3.9	73	5.9	0.12
31	61	2,520	240	30	199	35	170	4,000	3.4	71	6.0	0.15
Total	2,555	83,880	8,870	982	8,049	718	8,160	200,000	125.6	2,210	182.2	3.92
Max.	109	3,000	1,420	38	397	36	408	14,000	4.6	75	6.2	0.20
Min.	45	2,280	70	23	0	5	136	4,000	3.4	67	5.5	0.03
Avg.	82	2,706	286	32	260	23	263	6,452	4.1	71	5.9	0.13

Manpower

Superintendent	1
Asst. Supt.	1
Operators	2
Total	4

Manpower
4
4
4
4

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT

FEBRUARY 1993 - PLANT INFLUENT SHEET

PN-Day	Weather Type	Weather Precip.	Inf. Flow MGD	Inf. Temp F	Inf. pH SU	Inf. BOD mgIL	Inf. BOD Lbs.	Inf. SS mgIL	Inf. SS Lbs.	Inf. Phos. mgIL	Inf. Phos. Lbs.	Inf. VSS mgIL	Inf. NH3-N mgIL	--Remarks or Other Parameters--
1			1.73	49	7.8	210	3,030	154	2,222			128		* BOD Incubator heating unit
2			1.60	49	7.5	158	2,108	98	1,308	4.50	60	78		failed. All BOD bottles froze &
3			1.62	49	7.5	143	1,932	118	1,594			116		broke. No results for 5 days.
4			1.60	49	8.1	*	0	136	1,815			132		
5			1.57	50	7.9	*	0	122	1,597			88		
6			1.45	49	7.5	*	0	66	798			56		
7			1.51	49	7.8	*	0	70	882			54		
8			1.58	48	7.7	*	0	160	2,108	3.40	45	140		
9			1.54	48	7.9	168	2,158	172	2,209			152		
10			1.56	50	7.6	144	1,873	88	1,145			78		
11	Snow	0.16	1.52	50	7.9	150	1,902	114	1,445	4.60	58	106		
12	Snow	0.09	1.47	49	7.7	138	1,692	112	1,373			78		
13			1.42	49	7.7	114	1,350	106	1,255			98		
14	Snow	0.02	1.41	49	7.6	120	1,411	108	1,270			82		
15	Snow	0.12	1.43	49	7.6	162	1,932	90	1,073			80		
16	Snow	0.02	1.48	49	8.0	152	1,876	98	1,210	4.80	59	86		
17	Snow	0.01	1.49	49	7.6	147	1,827	108	1,342			94		
18	Snow	0.02	1.49	48	7.8	180	2,237	122	1,516			110		
19			1.48	48	7.7	138	1,703	108	1,333			80		
20	Snow	0.14	1.42	49	7.7	210	2,487	178	2,108			142		
21	Snow	0.23	1.40	47	7.7	186	2,172	258	3,012			246		
22	Snow	0.09	1.51	48	7.5	144	1,813	106	1,335			100		
23	Snow	0.03	1.52	49	7.6	140	1,775	104	1,318			92		
24	Snow	0.01	1.48	49	7.6	143	1,765	110	1,358			104		
25	Snow	0.01	1.52	48	7.6	191	2,421	160	2,028			154		
26			1.53	48	7.8	176	2,246	212	2,705			166		
27			1.44	48	7.5	165	1,982	188	2,258			162		
28			1.46	49	7.5	194	2,362	200	2,435			166		
29														
30														
31														
Total	0	0.95	42.23	1,365	215.4	3,673	46,054	3,666	46,054	17.30	222	3,168		
Max.	0	0.23	1.73	50	8.1	210	3,030	258	3,012	4.80	60	246		
Min.	0	0.01	1.40	47	7.5	114	1,350	66	798	3.40	45	54		
Avg.	0	0.07	1.51	49	7.7	160	2,002	131	1,645	4.33	56	113		
Count	13	13.00	28.00	28	28.0	23	23	28	28	4.00	4	28		

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT

FEBRUARY 1993 - PRIMARY EFFLUENT SHEET

PN- Day	P Eff. BOD mgIL	P Eff. BOD Lbs.	P Eff. SS mgIL	P. Eff. SS Lbs.	P Eff. Phos. mgIL	P Eff. Phos. Lbs.	P Eff. VSS mgIL	P Eff. NH3-N mgIL	Flow MGD	BOD Pri. Removal %	SS Pri. Removal %	P Pri. Removal %
1	165	2,381	82	1,183			68		1.73	21	47	
2	150	2,002	108	1,441	5.30	71	90		1.60	5	-10	-18
3	135	1,824	84	1,135			84		1.62	6	29	
4			124	1,655			122		1.60		9	
5			132	1,728			80		1.57		-8	
6			124	1,500			104		1.45		-88	
7			108	1,360			92		1.51		-54	
8			108	1,423	4.00	53	98		1.58		33	-18
9	165	2,119	112	1,438			96		1.54	2	35	
10	141	1,834	100	1,301			90		1.56	2	-14	
11	150	1,902	106	1,344	4.90	62	106		1.52	0	7	-7
12	150	1,839	130	1,594			110		1.47	-9	-16	
13	153	1,812	116	1,374			112		1.42	-34	-9	
14	138	1,623	112	1,317			108		1.41	-15	-4	
15	129	1,538	76	906			68		1.43	20	16	
16	120	1,481	64	790	4.50	56	60		1.48	21	35	6
17	150	1,864	106	1,317			94		1.49	0	2	
18			118	1,466			114		1.49		3	
19	162	2,000	140	1,728			100		1.48	-17	-30	
20	147	1,741	104	1,232			84		1.42	30	42	
21	156	1,821	134	1,565			128		1.40	-81	48	
22	159	2,002	112	1,410			104		1.51	-10	-6	
23	168	2,130	120	1,521			108		1.52	-20	-15	
24	171	2,111	108	1,333			88		1.48	-20	2	
25	225	2,852	140	1,775			132		1.52	-18	13	
26	204	2,603	160	2,042			144		1.53	-16	25	
27	186	2,234	136	1,633			120		1.44	-13	28	
28	168	2,046	136	1,656			124		1.46	13	32	
29												
30												
31												
Total	3,492	43,758	3,200	40,167	18.70	241	2,828		42.23	-133	152	-37
Max.	225	2,852	160	2,042	5.30	71	144		1.73	30	48	6
Min.	120	1,481	64	790	4.00	53	60		1.40	-81	-88	-18
Avg.	159	1,989	114	1,435	4.68	60	101		1.51	-6	5	-9
Count	22	22	28	28	4.00	4	28		28.00	22	28	4

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT

OCTOBER 1992 - ACTIVATED SLUDGE SHEET

PN-Day	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading flm	Mix Liq SS mgIL	Mix Liq VSS mgIL	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mgIL	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mgIl	PE SS mgIL
1	48	5.0	4.9	0.51	1,950	1,563	33.0	0.59	5.9	146	0.37	0.30	77	65	1.73	165	82
2		5.4	4.4	0.52	2,131	1,297	33.0	0.65	2.0	145	0.41	0.33	80	50	1.60	150	108
3		5.3	5.9	0.33	2,254	1,819	50.0	0.45	1.7	141	0.38	0.31	79	50	1.62	135	84
4		5.4	4.3	0.00	2,353	1,917	37.0	0.64	2.1	144	0.44	0.36	80	50	1.60		124
5		5.5	4.2	0.00	2,419	1,992	36.0	0.67	1.0	184	0.42	0.34	80	43	1.57		132
6		5.9								200			79	43	1.45		124
7		5.7								192			75	43	1.51		108
8		5.5	5.4	0.00	2,555	2,090	36.0	0.71	5.8	195	0.44	0.36	71	43	1.58		108
9		5.6	5.3	0.33	2,550	2,168	37.0	0.69	6.5	190	0.50	0.40	72	43	1.54	165	112
10		5.5	6.2	0.28	2,690	2,202	38.0	0.71	5.8	190	0.55	0.45	71	36	1.56	141	100
11		5.7	6.1	0.27	2,734	2,314	35.0	0.78	6.7	195	0.47	0.36	64	36	1.52	150	106
12		5.9	5.0	0.29	2,675	2,151	33.0	0.81	5.5	185	0.49	0.40	67	36	1.47	150	130
13		6.1								180			70	36	1.42	153	116
14		6.1								180			71	36	1.41	138	112
15		6.0								178			69	36	1.43	129	76
16		5.8	11.3	0.21	2,975	2,403	34.0	0.88	3.4	179	0.54	0.44	68	36	1.48	120	64
17		5.8	7.2	0.24	3,181	2,557	42.0	0.76	5.2	184	0.57	0.46	70	43	1.49	150	106
18		5.8	6.4	0.00	3,140	2,520	78.0	0.40	5.7	188	0.58	0.46	69	43	1.49		118
19		5.8	5.6	0.26	3,214	2,585	36.0	0.89	4.7	185	0.64	0.51	66	43	1.48	162	140
20		6.1								178			73	43	1.42	147	104
21		6.2								180			73	43	1.40	156	134
22		5.7	6.4	0.27	3,024	2,435	37.0	0.82	4.5	177	0.56	0.45	69	43	1.51	159	112
23		5.7	6.0	0.29	3,051	2,464	33.0	0.92	2.9	182	0.65	0.52	68	36	1.52	168	120
24		5.8	7.0	0.28	3,122	2,562	33.0	0.95	2.5	173	0.60	0.49	70	36	1.48	171	108
25		5.7	5.3	0.37	3,120	2,569	32.0	0.98	2.5	184	0.59	0.48	68	36	1.52	225	140
26		5.6	4.8	0.31	3,270	2,783	31.0	1.05	1.0	180	0.68	0.56	68	43	1.53	204	160
27		6.0								183			73	43	1.44	186	136
28		5.9								183			71	43	1.46	168	136
29																	
30																	
31																	
Total	48	160.3	111.7	4.75	52,408	42,391	724.0	14.34	75.4	5,001	9.88	7.98	2,011	1,177	42.23	3,492	3,200
Max.	48	6.2	11.3	0.52	3,270	2,783	78.0	1.05	6.7	200	0.68	0.56	80	65	1.73	225	160
Min.	48	5.0	4.2	0.00	1,950	1,297	31.0	0.40	1.0	141	0.37	0.30	64	36	1.40	120	64
Avg.	48	5.7	5.9	0.25	2,758	2,231	38.1	0.75	4.0	179	0.52	0.42	72	42	1.51	159	114
Count	1	28.0	19.0	19.00	19	19	19.0	19.00	19.0	28	19.00	19.00	28	28	28.00	22	28

Robert J. Swalwell
Superintendent

MARSHALL WWTP 801 INDUSTRIAL RD. MARSHALL MI 49068 - PERMIT MI0023540

OCTOBER 1992 - DISCHARGE MONITORING REPORT - DISCHARGE NO. 001A

Day	F.Eff. D.O. mgIL	F.Eff. pH SU	F.Eff. SS mgIL	F.Eff. SS Lbs.	F.Eff. Total-P mgIL	Flow MGD	F.Eff. Chlorine mgIL	F.Eff. BOD mgIL	F.Eff. BOD Lbs.	F.Eff. NH3 as N mgIL	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %	Mercury mgIL
1	8.6	7.5	16	231		1.73	0.00	11	159			2	90	95		
2	7.0	7.2	14	187	1.20	1.60	0.00	13	173			22	86	92	73	<0.0005
3	7.4	7.3	21	284		1.62	0.00	17	230			30	82	88		
4	7.2	7.4	20	267		1.60	0.00					60	85			
5	6.6	7.4	18	236		1.57	0.00					640	85			
6	7.0	7.3	22	266		1.45	0.00					2	67			
7	7.7	7.5	10	126		1.51	0.00					2	86			
8	8.2	7.5	9	119	0.40	1.58	0.00					3	94		88	<0.0005
9	8.5	7.4	8	103		1.54	0.00	12	154			2	95	93		
10	8.2	7.4	8	104		1.56	0.00	11	143			5	91	92		
11	8.5	7.5	10	127	0.73	1.52	0.01	13	165			4	91	91	84	<0.0005
12	7.7	7.5	9	110		1.47	0.00	12	147			60	92	91		
13	7.2	7.5	10	118		1.42	0.01	11	130			7	91	90		
14	7.5	7.5	16	188		1.41	0.00	9	106			46	85	93		
15	7.6	7.4	9	107		1.43	0.02	12	143			68	90	93		
16	7.7	7.6	13	160	0.71	1.48	0.00	14	173			30	87	91	85	<0.0005
17	8.3	7.5	11	137		1.49	0.00	12	149			35	90	92		
18	8.3	7.4	15	186		1.49	0.00	11	137			8	88	94		
19	8.1	7.5	7	86		1.48	0.00	5	62			35	94	96		
20	7.5	7.4	11	130		1.42	0.00	8	95			24	94	96		
21	7.1	7.6	8	93		1.40	0.00	10	117			2	97	88		
22	7.9	7.2	10	126		1.51	0.00	12	151			2	91	92		
23	6.9	7.3	17	216		1.52	0.00	15	190			108	84	89		
24	6.9	7.1	18	222		1.48	0.00	14	173			2	84	90		
25	7.1	7.5	20	254		1.52	0.00	29	368			132	88	85		
26	6.8	7.5	20	255		1.53	0.00	34	434			320	91	81		
27	7.4	7.2	20	240		1.44	0.00	19	228			272	89	88		
28	7.3	7.2	18	219		1.46	0.00	25	304			204	91	87		
29																
30																
31																
Total	212.2	207.3	388	4,898	3.04	42.23	0.04	329	4,130			2,127	2,478	2,087	330	<0.0005
Max.	8.6	7.6	22	284	1.20	1.73	0.02	34	434			640	97	96	88	<0.0005
Min.	6.6	7.1	7	86	0.40	1.40	0.00	5	62			2	67	81	73	<0.0005
Avg.	7.6	7.4	14	175	0.76	1.51	0.00	14	180			199	89	91	83	<0.0005
Count	28.0	28.0	28	28	4.00	28.00	28.00	23	23			28	28	23	4	4

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT

FEBRUARY 1993 - MISCELLANEOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	SO2 Lbs.	Lime Lbs.	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	PH	Lbs. of Lime per lb. of Dry Solids
1	10,000	2,640	70	33	298	33	340	8,000	4.7	70	5.8	0.11
2	8,500	2,760	300	35	199	30	323	8,000	4.1	74	5.8	0.12
3	7,100	2,640	510	42	199	35	204	5,000	4.1	73	5.8	0.12
4	6,100	2,520	450	33	199	33	306	8,000	3.9	74	6.0	0.12
5	6,600	2,880	250	35	199	34	255	6,000	4.2	74	6.0	0.12
6	8,700	2,880	330	32	199	32	374	4,000	4.0	76	5.8	0.28
7	7,700	2,760	220	38	298	26	153	4,000	4.2	74	5.8	0.11
8	8,100	2,880	190	38	199	25	255	6,000	4.8	68	5.8	0.11
9	7,100	2,760	270	37	199	32	374	5,500	4.1	75	5.6	0.20
10	6,500	2,880	190	39	199	32	340	8,000	3.9	76	5.7	0.13
11	8,600	2,880	240	41	298	31	357	8,000	4.0	75	5.9	0.13
12	8,600	2,760	400	27	199	30	272	6,000	4.0	75	5.9	0.13
13	7,700	2,640	270	32	199	24	187	4,000	3.9	76	5.8	0.14
14	7,700	2,640	360	36	199	26	187	4,000	3.9	75	5.7	0.14
15	8,000	2,640	370	33	298	29	170	4,000	3.9	75	5.9	0.13
16	9,000	2,760	320	37	298	31	391	8,000	4.1	75	6.2	0.14
17	10,700	2,880	280	35	199	28	357	8,000	4.0	74	6.1	0.13
18	11,400	2,760	310	36	199	23	340	8,000	3.9	74	6.1	0.13
19	10,800	2,880	520	39	199	24	289	6,000	4.0	75	5.8	0.14
20	8,700	2,640	180	36	199	25	170	4,000	3.9	74	5.8	0.13
21	9,000	2,640	190	30	298	28	170	4,000	4.0	74	5.9	0.13
22	10,100	2,880	250	34	199	28						
23	10,600	2,760	300	35	99	26	323	7,000	4.6	72	5.8	0.12
24	11,000	2,760	350	35	99	28	272	7,000	4.1	73	6.0	0.11
25	10,100	2,760	380	38	0	30	272	6,000	4.3	72	5.9	0.13
26	10,500	3,000	330	38	199	30	204	6,000	4.5	72	5.8	0.09
27	9,200	2,640	240	38	199	34	144	4,000	4.1	74	5.8	0.10
28	8,500	2,760	200	38	397	30	170	4,000	4.3	74	5.9	0.12
29												
30												
31												
Total	246,600	77,280	8,270	1,000	5,965	817	7,199	160,500	111.5	1,993	158.4	3.56
Max.	11,400	3,000	520	42	397	35	391	8,000	4.8	76	6.2	0.28
Min.	6,100	2,520	70	27	0	23	144	4,000	3.9	68	5.6	0.09
Avg.	8,807	2,760	295	36	213	29	267	5,944	4.1	74	5.9	0.13

Manpower

Superintendent	1
Asst. Supt.	1
Operators	2
Total	4

Total	4
Max.	4
Min.	4
Avg.	4

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT

MARCH 1993 - PLANT INFLUENT SHEET

PN-Day	Weather Type	Weather Precip.	Inf. Flow MGD	Inf. Temp F	Inf. pH SU	Inf. BOD mgIL	Inf. BOD Lbs.	Inf. SS mgIL	Inf. SS Lbs.	Inf. Phos. mgIL	Inf. Phos. Lbs.	Inf. VSS mgIL	Inf. NH3-N mgIL	--Remarks or Other Parameters--
1			1.58	49	7.6	180	2,372	204	2,688			170		
2			1.56	50	7.9	201	2,615	230	2,992			212		
3			1.59	50	7.7	258	3,421	198	2,626	4.30	57	190		
4	Snow	0.10	1.50	50	7.8	192	2,402	226	2,827			210		
5			1.49	50	7.7	216	2,684	310	3,852			284		
6			1.46	49	7.8	191	2,326	204	2,484			184		
7	Rain	0.02	1.48	49	7.7	189	2,333	204	2,518			188		
8	R&S	0.06	1.54	50	7.7	176	2,260	388	4,983			360		
9	Snow	0.05	1.56	48	7.6	170	2,212	268	3,487			254		
10	Snow	0.30	1.54	48	7.6	170	2,183	254	3,262			228		
11			1.52	48	7.7	223	2,827	264	3,347	3.60	46	244		
12			1.56	48	7.7	201	2,615	162	2,108			148		
13			1.44	47	7.7	185	2,222	286	3,435			268		
14			1.43	47	7.8	167	1,992	250	2,982			236		
15	Rain	0.02	1.57	47	7.6	182	2,383	204	2,671			180		
16	Rain	0.30	1.60	47	7.6	166	2,215	178	2,375	4.70	63	160		
17			1.59	48	7.7	192	2,546	242	3,209			212		
18			1.56	48	7.8	164	2,134	190	2,472			170		
19	Snow	0.22	1.56	48	7.8	144	1,873	136	1,769			136		
20			1.43	48	7.7	132	1,574	280	3,339			262		
21	Snow	0.06	1.47	48	7.8	179	2,195	172	2,109			156		
22	Rain	0.47	1.59	48	7.7	180	2,387	144	1,910	2.80	37	134		
23	Rain	0.11	1.79	50	7.7	131	1,956	128	1,911			118		
24	Rain	0.03	1.79	47	8.1	140	2,090	152	2,269			138		
25			1.84	48	7.6	150	2,302	132	2,026			108		
26			1.83	45	7.8	192	2,930	140	2,137			122		
27			1.68	48	7.8	114	1,597	103	1,443			92		
28	Rain	0.04	1.63	47	7.8	93	1,264	110	1,495			100		
29			1.80	48	7.7	132	1,982	134	2,012			118		
30			1.76	49	7.7	125	1,835	132	1,938			110		
31			1.77	49	7.8	126	1,860	112	1,653			92		
Total	0	1.78	49.51	1,496	239.7	5,261	69,587	6,137	80,328	15.40	203	5,584		
Max.	0	0.47	1.84	50	8.1	258	3,421	388	4,983	4.70	63	360		
Min.	0	0.02	1.43	45	7.6	93	1,264	103	1,443	2.80	37	92		
Avg.	0	0.14	1.60	48	7.7	170	2,245	198	2,591	3.85	51	180		
Count	13	13.00	31.00	31	31.0	31	31	31	31	4.00	4	31		

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT

MARCH 1993 - PRIMARY EFFLUENT SHEET

PN-Day	P Eff. BOD mgIL	P Eff. BOD Lbs.	P Eff. SS mgIL	P. Eff. SS Lbs.	P Eff. Phos. mgIL	P Eff. Phos. Lbs.	P Eff. VSS mgIL	P Eff. NH3-N mgIL	Flow MGD	BOD Pri. Removal %	SS Pri. Removal %	P Pri. Removal %
1	153	2,016	156	2,056			120		1.58	15	24	
2	165	2,147	136	1,769			128		1.56	18	41	
3	222	2,944	134	1,777	5.60	74	128		1.59	14	32	
4	159	1,989	122	1,526			114		1.50	17	46	
5	183	2,274	80	994			80		1.49	15	74	
6	156	1,900	124	1,510			116		1.46	18	39	
7	147	1,814	176	2,172			128		1.48	22	14	
8	156	2,004	82	1,053			82		1.54	11	79	
9	159	2,069	160	2,082			136		1.56	6	40	
10	138	1,772	132	1,695			126		1.54	19	48	
11	165	2,092	128	1,623	4.80	61	96		1.52	26	52	
12	159	2,069	96	1,249			88		1.56	21	41	
13	135	1,621	88	1,057			88		1.44	27	69	
14	159	1,896	140	1,670			128		1.43	5	44	
15	168	2,200	136	1,781			120		1.57	8	33	
16	177	2,362	128	1,708	5.00	67	112		1.60	-6	28	
17	159	2,108	128	1,697			116		1.59	17	47	
18	132	1,717	144	1,873			128		1.56	20	24	
19	177	2,303	156	2,030			112		1.56	-23	-15	
20	129	1,538	136	1,622			128		1.43	2	51	
21	144	1,765	144	1,765			132		1.47	20	16	
22	165	2,188	144	1,910	3.80	50	136		1.59	8	0	
23	168	2,508	132	1,971			132		1.79	-28	-3	
24	165	2,463	152	2,269			148		1.79	-18	0	
25	159	2,440	152	2,333			136		1.84	6	-15	
26	150	2,289	172	2,625			144		1.83	22	-23	
27	135	1,892	168	2,354			152		1.68	-18	-63	
28	120	1,631	172	2,338			172		1.63	-29	-56	
29	162	2,432	142	2,132			128		1.80	-23	-6	
30	135	1,982	112	1,644			96		1.76	-8	15	
31	129	1,904	120	1,771			80		1.77	-2	-7	
Total	4,830	64,330	4,192	56,056	19.20	252	3,730		49.51	182	669	
Max.	222	2,944	176	2,625	5.60	74	172		1.84	27	79	
Min.	120	1,538	80	994	3.80	50	80		1.43	-29	-63	
Avg.	156	2,075	135	1,808	4.80	63	120		1.60	6	22	
Count	31	31	31	31	4.00	4	31		31.00	31	31	

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT

MARCH 1993 - ACTIVATED SLUDGE SHEET

PN-Day	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading fIm	Mix Liq SS mgIL	Mix Liq VSS mgIL	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mgIL	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mgIl	PE SS mgIL
1	48	5.5	4.7	0.26	3,200	2,620	33.0	0.97	2.4	174	0.62	0.51	66	43	1.58	153	156
2		5.5	5.5	0.27	3,250	2,648	32.0	1.02	1.8	170	0.67	0.51	68	43	1.56	165	136
3		5.4	5.5	0.37	3,242	2,634	32.0	1.01	1.5	167	0.61	0.50	68	43	1.59	222	134
4		5.7	6.4	0.25	3,266	2,654	30.0	1.09	1.0	172	0.64	0.52	71	43	1.50	159	122
5		5.8	9.4	0.29	3,107	2,591	30.0	1.04	0.7	175	0.61	0.50	71	43	1.49	183	80
6		5.9								172			73	43	1.46	156	124
7		5.8								170			71	43	1.48	147	176
8		5.6	8.8	0.27	3,097	2,458	30.0	1.03	3.1	166	0.65	0.52	68	43	1.54	156	82
9		5.5	4.4	0.28	3,065	2,459	28.0	1.09	2.9	172	0.62	0.49	73	43	1.56	159	160
10		5.6	5.3	0.25	3,025	2,408	27.0	1.12	4.7	170	0.62	0.50	67	43	1.54	138	132
11		5.7	5.4	0.30	2,952	2,310	26.0	1.14	5.0	175	0.58	0.46	65	43	1.52	165	128
12		5.5	7.0	0.31	2,936	2,263	25.0	1.17	5.1	177	0.57	0.44	70	43	1.56	159	96
13		6.0								177			77	43	1.44	135	88
14		6.0								178			77	43	1.43	159	140
15		5.5	5.1	0.31	3,020	2,339	30.0	1.01	7.0	171	0.57	0.44	70	43	1.57	168	136
16		5.4	5.6	0.32	3,186	2,446	29.0	1.10	3.1	172	0.59	0.43	69	43	1.60	177	128
17		5.4	5.5	0.29	3,131	2,393	30.0	1.04	3.0	183	0.60	0.45	69	43	1.59	159	128
18		5.5	5.1	0.23	3,210	2,483	29.0	1.11	4.4	181	0.62	0.48	72	43	1.56	132	144
19		5.5	4.8	0.30	3,284	2,589	29.0	1.13	3.2	174	0.50	0.39	72	43	1.56	177	156
20		6.0								173			79	43	1.43	129	136
21		5.9								174			76	43	1.47	144	144
22		5.4	5.2	0.28	3,314	2,609	28.0	1.18	5.1	172	0.60	0.46	70	43	1.59	165	144
23		4.8	5.2	0.32	3,428	2,637	31.0	1.11	2.0	167	0.71	0.56	63	50	1.79	168	132
24		4.8	4.5	0.30	3,418	2,714	30.0	1.14	2.0	172	0.65	0.51	64	50	1.79	165	152
25		4.7	4.4	0.31	3,400	2,656	27.0	1.26	1.9	177	0.71	0.55	62	50	1.84	159	152
26		4.7	3.8	0.30	3,321	2,567	27.0	1.23	2.5	182	0.70	0.56	62	50	1.83	150	172
27		5.1								182			67	50	1.68	135	168
28		5.3								180			62	50	1.63	120	172
29		4.8	4.3	0.34	3,060	2,406	24.0	1.28	6.2	178	0.61	0.48	51	50	1.80	162	142
30		4.9	5.3	0.29	2,885	2,269	21.0	1.37	3.9	189	0.64	0.50	56	50	1.76	135	112
31		4.9	5.1	0.27	2,988	2,369	22.0	1.36	5.7	190	0.67	0.53	55	50	1.77	129	120
Total	48	168.2	126.3	6.71	72,785	57,522	650.0	25.99	78.2	5,432	14.36	11.29	2,104	1,396	49.51	4,830	4,192
Max.	48	6.0	9.4	0.37	3,428	2,714	33.0	1.37	7.0	190	0.71	0.56	79	50	1.84	222	176
Min.	48	4.7	3.8	0.23	2,885	2,263	21.0	0.97	0.7	166	0.50	0.39	51	43	1.43	120	80
Avg.	48	5.4	5.5	0.29	3,165	2,501	28.3	1.13	3.4	175	0.62	0.49	68	45	1.60	156	135
Count	1	31.0	23.0	23.00	23	23	23.0	23.00	23.0	31	23.00	23.00	31	31	31.00	31	31

Robert J. Swalwell
Superintendent

MARSHALL WWTP 801 INDUSTRIAL RD. MARSHALL MI 49068 - PERMIT MI0023540

MARCH 1993 - DISCHARGE MONITORING REPORT - DISCHARGE NO. 001A

Day	F.Eff. D.O. mgIL	F.Eff. pH SU	F.Eff. SS mgIL	F.Eff. SS Lbs.	F.Eff. Total-P mgIL	Flow MGD	F.Eff. Chlorine mgIL	F.Eff. BOD mgIL	F.Eff. BOD Lbs.	F.Eff. NH3 as N mgIL	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %	Mercury mgIL
1	7.1	7.3	16	211		1.58	0.00	20	264			15	92	89		
2	6.8	7.3	14	182		1.56	0.00	20	260			2	94	90		
3	6.8	7.4	20	265	0.98	1.59	0.00	24	318			2	90	91	77	
4	6.8	7.4	26	325		1.50	0.00	25	313			152	88	87		
5	6.5	7.3	20	249		1.49	0.00	31	385			50	94	86		
6	7.1	7.4	15	183		1.46	0.00	25	304			40	93	87		
7	7.2	7.3	9	111		1.48	0.00	21	259			2	96	89		
8	6.8	7.2	17	218		1.54	0.00	15	193			2	96	91		
9	7.1	7.2	15	195		1.56	0.00	17	221			2	94	90		<0.0005
10	7.2	7.3	14	180		1.54	0.00	17	218			8	94	90		
11	7.7	7.4	13	165	0.39	1.52	0.00	17	216			4	95	92	89	
12	7.7	7.4	15	195		1.56	0.00	23	299			5	91	89		
13	7.2	7.4	11	132		1.44	0.00	19	228			32	96	90		
14	8.0	7.5	14	167		1.43	0.00	15	179			40	94	91		<0.0005
15	8.8	7.4	14	183		1.57	0.00	16	210			2	93	91		
16	7.4	7.4	15	200	0.46	1.60	0.00	22	294			2	92	87	90	
17	7.7	7.4	17	225		1.59	0.00	19	252			2	93	90		
18	7.8	7.5	15	195		1.56	0.00	18	234			2	92	89		
19	7.0	7.4	25	325		1.56	0.00	23	299			2	82	84		<0.0005
20	6.5	7.4	14	167		1.43	0.00	18	215			2	95	86		
21	7.2	7.4	11	135		1.47	0.00	14	172			2	94	92		
22	7.9	7.5	15	199	0.39	1.59	0.00	17	225			2	90	91	86	
23	6.5	7.5	13	194		1.79	0.00	20	299			2	90	85		
24	6.7	7.4	15	224		1.79	0.00	20	299			3	90	86		
25	6.8	7.4	21	322		1.84	0.00	20	307			37	84	87		<0.0005
26	7.1	7.4	25	382		1.83	0.00	18	275			38	82	91		
27	7.2	7.5	22	308		1.68	0.00	20	280			12	79	82		
28	7.6	7.5	18	245		1.63	0.00	18	245			4	84	75		
29	8.4	7.6	12	180		1.80	0.00	32	480			27	91	76		
30	7.5	7.5	21	308		1.76	0.00	19	279			7	84	85		
31	7.7	7.6	29	428		1.77	0.00	18	266			2	74	86		
Total	225.8	229.6	521	6,999	2.22	49.51	0.00	621	8,286			504	2,796	2,715	342	<0.0005
Max.	8.8	7.6	29	428	0.98	1.84	0.00	32	480			152	96	92	90	<0.0005
Min.	6.5	7.2	9	111	0.39	1.43	0.00	14	172			2	74	75	77	<0.0005
Avg.	7.3	7.4	17	226	0.56	1.60	0.00	20	267			*6	90	88	86	<0.0005
Count	31.0	31.0	31	31	4.00	31.00	31.00	31	31			31	31	31	4	4

*Geometric Mean

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT

MARCH 1993 - MISCELLANEOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	SO2 Lbs.	Lime Lbs.	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	PH	Lbs. of Lime per lb. of Dry Solids
1	5,700	2,640	310	30	298	23	272	6,000	4.7	72	5.7	0.11
2	6,800	2,640	360	30	298	26	272	6,000	4.5	72	5.9	0.12
3	5,100	2,640	350	34	298	31	255	6,000	4.6	72	5.8	0.11
4	8,000	2,760	300	34	298	31	272	6,000	4.4	74	5.9	0.12
5	8,200	2,760	450	36	199	30	289	6,000	4.5	74	5.8	0.13
6	6,200	2,640	260	34	298	15	187	4,000	4.2	74	5.9	0.13
7	5,800	2,520	90	35	298	24	187	4,000	8.3	39	5.8	0.07
8	6,600	2,640	280	39	298	29	187	4,500	4.7	73	5.7	0.11
9	6,900	2,640	300	31	298	32	289	6,000	4.4	74	5.6	0.13
10	8,000	2,760	390	22	298	30	170	6,000	4.5	74	5.7	0.07
11	8,400	2,760	250	32	298	31	408	6,000	4.6	73	5.9	0.18
12	9,700	2,760	310	36	298	28	272	5,000	5.1	70	6.0	0.13
13	11,000	2,640	270	30	298	21	204	4,000	4.6	71	5.9	0.13
14	11,300	2,880	190	15	298	25	187	4,000	4.7	74	6.0	0.12
15	7,800	2,640	250	30	298	25	272	6,000	4.5	73	5.8	0.12
16	7,200	2,760	350	40	298	25	204	5,000	4.5	72	6.0	0.11
17	9,700	2,880	250	22	298	25	238	6,000	4.7	71	6.1	0.10
18	9,300	2,880	320	32	298	21	204	5,000	4.9	72	6.0	0.10
19	7,400	2,760	400	38	298	22	221	4,500	4.7	74	6.0	0.12
20	8,000	2,520	170	18	298	24	187	4,500	4.7	73	6.0	0.11
21	5,400	2,760	160	39	397	26	187	4,100	4.6	72	6.0	0.12
22	5,900	2,760	410	29	298	25	187	4,000	4.5	72	6.4	0.12
23	6,500	2,640	190	28	298	22	289	6,000	4.7	70	6.1	0.12
24	6,100	2,640	340	24	199	9						
25	5,400	2,760	280	20	298	12	425	8,000	4.5	70	6.2	0.14
26	5,800	2,640	300	25	298	11	238	6,000	4.7	71	6.0	0.10
27	4,700	2,640	260	18	298	12	187	4,000	4.8	72	6.0	0.12
28	4,200	2,520	230	22	298	11	170	4,000	4.7	70	5.9	0.11
29	3,300	2,520	650	20	298	12	272	6,000	4.9	70	5.9	0.11
30	2,800	2,640	350	21	397	13	272	6,000	4.8	69	6.0	0.11
31	5,300	2,640	230	22	496	13	238	6,000	5.3	66	6.0	0.09
Total	212,500	83,280	9,250	886	9,436	684	7,242	158,600	143.3	2,123	178.0	3.46
Max.	11,300	2,880	650	40	496	32	425	8,000	8.3	74	6.4	0.18
Min.	2,800	2,520	90	15	199	9	170	4,000	4.2	39	5.6	0.07
Avg.	6,855	2,686	298	29	304	22	241	5,287	4.8	71	5.9	0.12

Manpower

Superintendent	1
Asst. Supt.	1
Operators	2
IPP Coordinator	1
Total	5

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT

APRIL 1993 - PLANT INFLUENT SHEET

PN-Day	Weather Type	Weather Precip.	Inf. Flow MGD	Inf. Temp F	Inf. pH SU	Inf. BOD mgIL	Inf. BOD Lbs.	Inf. SS mgIL	Inf. SS Lbs.	Inf. Pnos. mgIL	Inf. Phos. Lbs.	Inf. VSS mgIL	Inf. NH3-N mgIL	--Remarks or Other Parameters--
1	Snow	0.03	1.77	48	7.5	111	1,639	120	1,771			98		
2			1.73	48	7.8	128	1,847	122	1,760	3.40	49	110		
3			1.57	48	7.8	105	1,375	222	2,907			88		
4			1.49	49	7.8	143	1,777	136	1,690			132		
5			1.59	49	7.7	128	1,697	130	1,724			122		
6			1.65	49	7.9	166	2,284	142	1,954			138		
7			1.64	48	7.7	168	2,298	104	1,422			86		
8	Rain	0.08	1.65	48		144	1,982	94	1,294	3.50	48	80		
9	Rain	0.30	1.60	48	7.6	126	1,681	120	1,601			110		
10			1.62	48	7.4	138	1,864	96	1,297			88		
11	Rain	0.17	1.59	49	7.2	117	1,551	102	1,353			78		
12			1.74	48	7.4	131	1,901	112	1,625			100		
13			1.74	48	7.6	167	2,423	160	2,322			134		
14	Rain	0.25	1.69	48	7.6	131	1,846	162	2,283	3.80	54	150		
15	Rain	0.27	1.71	50	7.5	150	2,139	114	1,626			108		
16	Snow	0.05	1.73	49	7.3	210	3,030	136	1,962			94		
17			1.54	48	7.3	108	1,387	100	1,284			60		
18			1.56	48	7.3	156	2,030	92	1,197			74		
19	Rain	1.53	1.82	49	7.4	146	2,216	212	3,218			196		
20	Rain	0.04	1.89	50	7.3	126	1,986	104	1,639	3.70	58	104		
21			1.81	50	7.5	114	1,721	160	2,415			150		
22			1.83	50	7.7	136	2,076	136	2,076			128		
23	Rain	0.05	1.79	51	7.6	106	1,582	122	1,821			116		
24	Rain	0.12	1.66	51	7.7	114	1,578	108	1,495			108		
25			1.65	51	7.7	142	1,954	140	1,927			128		
26			1.69	50	7.6	144	2,030	156	2,199			136		
27			1.77	50	7.7	132	1,949	130	1,919			116		
28	Rain	0.39	1.73	50	7.5	135	1,948	140	2,020			138		
29	Rain	0.24	1.72	50	7.7	156	2,238	132	1,894			126		
30			1.73	50	7.6	141	2,034	146	2,107			128		
31														
Total	0	3.52	50.70	1,473	219.4	4,119	58,064	3,950	55,802	14.40	209	3,424		
Max.	0	1.53	1.89	51	7.9	210	3,030	222	3,218	3.80	58	196		
Min.	0	0.03	1.49	48	7.2	105	1,375	92	1,197	3.40	48	60		
Avg.	0	0.27	1.69	49	7.6	137	1,935	132	1,860	3.60	52	114		
Count	13	13.00	30.00	30	29.0	30	30	30	30	4.00	4	30		

Robert J. Swalwell
Superintendent

[illegible] MICHIGAN WASTEWATER TREATMENT PLANT

APRIL 1993 - PRIMARY EFFLUENT SHEET

PN-Day	P Eff. BOD mgIL	P Eff. BOD Lbs.	P Eff. SS mgIL	P. Eff. SS Lbs.	P Eff. Phos. mgIL	P Eff. Phos. Lbs.	P Eff. VSS mgIL	P Eff. NH3-N mgIL	Flow MGD	BOD Prl. Removal %	SS Prl. Removal %	P Prl. Removal %
1	129	1,904	92	1,358			64		1.77	-16	23	
2	126	1,818	84	1,212	2.70	39	76		1.73	2	31	21
3	114	1,493	56	733			56		1.57	-9	75	
4	120	1,491	106	1,317			102		1.49	16	22	
5	144	1,910	92	1,220			92		1.59	-13	29	
6	147	2,023	126	1,734			120		1.65	11	11	
7	143	1,956	100	1,368			96		1.64	15	4	
8	117	1,610	104	1,431	1.80	25	98		1.65	19	-11	49
9	129	1,721	116	1,548			116		1.60	-2	3	
10	126	1,702	124	1,675			104		1.62	9	-29	
11	111	1,472	156	2,069			116		1.59	5	-53	
12	108	1,567	96	1,393			92		1.74	18	14	
13	129	1,872	132	1,916			132		1.74	23	18	
14	78	1,099	132	1,860	2.90	41	124		1.69	40	19	24
15	60	856	100	1,426			96		1.71	60	12	
16	138	1,991	120	1,731			72		1.73	34	12	
17	129	1,657	132	1,695			88		1.54	-19	-32	
18	126	1,639	132	1,717			92		1.56	19	-43	
19	132	2,004	148	2,246			148		1.82	10	30	
20	144	2,270	164	2,585	4.40	69	160		1.89	-14	-58	-19
21	75	1,132	136	2,053			128		1.81	34	15	
22	141	2,152	144	2,198			144		1.83	-4	-6	
23	99	1,478	124	1,851			124		1.79	7	-2	
24	123	1,703	88	1,218			88		1.66	-8	19	
25	156	2,147	178	2,449			168		1.65	-10	-27	
26	186	2,622	188	2,650			188		1.69	-29	-21	
27	177	2,613	192	2,834			168		1.77	-34	-48	
28	168	2,424	184	2,655			160		1.73	-24	-31	
29	165	2,367	132	1,894			116		1.72	-6	0	
30	144	2,078	128	1,847			128		1.73	-2	12	
31												
Total	3,884	54,770	3,806	53,885	11.80	174	3,456		50.70	132	-12	75
Max.	186	2,622	192	2,834	4.40	69	188		1.89	60	75	49
Min.	60	856	56	733	1.80	25	56		1.49	-34	-58	-19
Avg.	129	1,826	127	1,796	2.95	43	115		1.69	4	-0	19
Count	30	30	30	30	4.00	4	30		30.00	30	30	4

Robert J. Swalwell
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MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

APRIL, 1992 - ACTIVATED SLUDGE SHEET

PN-Day	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading flm	Mix Liq SS mgIL	Mix Liq VSS mgIL	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mgIL	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mgIl	PE SS mgIL
1	48	4.9	6.3	0.28	2,859	2,272	21.0	1 36	6.7	202	0.59	0.47	54	50	1.77	129	92
2		5.0								204			56	43	1.73	126	84
3		5.5								198			61	43	1.57	114	56
4		5.8								205			64	43	1.49	120	106
5		5.4	6.3	0.31	2,585	2,081	20.0	1.29	7.7	198	0.51	0.41	57	36	1.59	144	92
6		5.2	4.7	0.31	2,700	2,214	20.0	1.35	6.1	191	0.55	0.44	58	31	1.65	147	126
7		5.3	6.2	0.28	2,820	2,319	21.0	1.34	6.0	186	0.56	0.45	58	29	1.64	143	100
8		5.2	6.2	0.22	2,955	2,408	22.0	1.34	4.6	189	0.63	0.52	58	29	1.65	117	104
9		5.4								192			60	29	1.60	129	116
10		5.3								191			59	29	1.62	126	124
11		5.4								196			59	29	1.59	111	156
12		5.0	6.1	0.23	2,845	2,306	22.0	1.29	6.0	195	0.54	0.43	54	29	1.74	108	96
13		5.0	4.4	0.28	2,816	2,229	21.0	1.34	5.3	192	0.59	0.48	54	29	1.74	129	132
14		5.1	4.8	0.15	3,010	2,492	23.0	1.31	4.5	189	0.57	0.45	55	29	1.69	78	132
15		5.0	6.7	0.11	3,214	2,578	23.0	1.40	2.0	183	0.68	0.55	55	29	1.71	60	100
16		5.0	5.4	0.27	3,120	2,495	23.0	1.36	2.1	190	0.65	0.52	55	29	1.73	138	120
17		5.6								197			62	36	1.54	129	132
18		5.5								190			61	36	1.56	126	132
19		4.7								174			51	36	1.82	132	148
20		4.6	4.0	0.28	3,417	2,741	28.0	1.22	0.0	184	0.73	0.61	51	36	1.89	144	164
21		4.8	4.8	0.14	3,303	2,686	27.0	1.22	2.2	183	0.74	0.60	54	36	1.81	75	136
22		4.7	4.7	0.26	3,425	2,762	28.0	1.22	1.9	180	0.77	0.62	54	36	1.83	141	144
23		4.8	5.4	0.19	3,318	2,630	28.0	1.19	2.7	175	0.74	0.59	55	43	1.79	99	124
24		5.2								176			59	43	1.66	123	88
25		5.2								183			59	50	1.65	156	178
26		5.1	3.7	0.34	3,261	2,591	24.0	1.36	2.7	177	0.78	0.62	58	50	1.69	186	188
27		4.9	3.5	0.33	3,300	2,666	25.0	1.32	2.4	188	0.75	0.61	56	50	1.77	177	192
28		5.0	3.7	0.30	3,308	2,693	25.0	1.32	2.2	182	0.73	0.59	55	50	1.73	168	184
29		5.0	5.2	0.30	3,263	2,675	25.0	1.31	1.8	187	0.75	0.61	55	50	1.72	165	132
30		5.0	5.1	0.26	3,162	2,621	22.0	1.44	3.8	188	0.71	0.58	51	50	1.73	144	128
31																	
Total	48	153.4	97.2	4.82	58,681	47,459	448.0	24.98	70.7	5,665	12.57	10.15	1,698	1,138	50.70	3,884	3,806
Max.	48	5.8	6.7	0.34	3,425	2,762	28.0	1.44	7.7	205	0.78	0.62	64	50	1.89	186	192
Min.	48	4.6	3.5	0.11	2,585	2,081	20.0	1.19	0.0	174	0.51	0.41	51	29	1.49	60	56
Avg.	48	5.1	5.1	0.25	3,088	2,498	23.6	1.31	3.7	189	0.66	0.53	57	38	1.69	129	127
Count	1	30.0	19.0	19.00	19	19	19.0	19.00	19.0	30	19.00	19.00	30	30	30.00	30	30

Robert J. Swalwell
Superintendent

MARSHALL WWTP 801 INDUSTRIAL RD. MARSHALL MI 49068 - PERMIT MI0021840

APRIL, 1992 - DISCHARGE MONITORING REPORT - DISCHARGE NO. 001A

	F.Eff. D.O. mgIL	F.Eff. pH SU	F.Eff. SS mgIL	F.Eff. SS Lbs.	F.Eff. Total-P mgIL	Flow MGD	F.Eff. Chlorine mgIL	F.Eff. BOD mgIL	F.Eff. BOD Lbs.	F.Eff. NH3 as N mgIL	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %	Mercury mgIL
Day																
1	8.5	7.5	18	266		1.77	0.000	17	251			2	85	85		<.0005
2	8.1	7.6	14	202	0.55	1.73	0.012	14	202			31	89	89	84	
3	8.3	7.7	12	157		1.57	0.000	13	170			16	95	88		
4	8.9	7.8	12	149		1.49	0.002	12	149			28	91	92		
5	8.9	7.5	9	119		1.59	0.001	13	172			11	93	90		
6	8.2	7.5	15	206		1.65	0.004	14	193			55	89	92		
7	7.7	7.5	14	191		1.64	0.005	13	178			140	87	92		
8			10	138	0.19	1.65		10	138				89	93	95	
9	7.3	7.5	11	147		1.60	0.004	11	147			8	91	91		
10	8.2	7.3	16	216		1.62	0.000	10	135			4	83	93		
11	8.2	7.3	21	278		1.59	0.000	9	119			6	79	92		<.0005
12	8.0	7.4	17	247		1.74	0.012	11	160			144	85	92		
13	7.6	7.4	16	232		1.74	0.000	8	116			108	90	95		
14	7.2	7.5	20	282	0.30	1.69	0.000	14	197			148 -	88	89	92	
15	6.5	7.2	23	328		1.71	0.000	10	143			78 -	80	93		<.0005
16	6.5	7.2	24 -	346 -		1.73	0.003	14	202			240 -	82	93		
17	6.0	7.1	20 -	257 -		1.54	0.004	12	154			288 -	80	89		
18	6.4	7.5	13 -	169 -		1.56	0.000	9	117			12 -	86	94		
19	7.1	7.3	28 -	425 -		1.82	0.000	16	243 -			8 -	87	89		
20	6.3	7.3	31 -	489 -	0.67	1.89	0.000	20	315 -			2,500 -	70	84	82	<.0005
21		7.8	21 -	317 -		1.81	0.000	16	242 -			70	87	86		
22	6.6	7.5	24 -	366 -		1.83	0.000	15	229 -			30	82	89		
23	5.7	7.4	14	209		1.79		13	194 -			6	89	88		
24	5.7	7.5	16	222		1.66	0.000	13 -	180 -			14	85	88		
25	6.1	7.4	16	220		1.65		13 -	179 -			2	89	92		
26	6.1	7.5	20	282		1.69	0.000	14 -	197			29	87	90		
27	6.2	7.4	22	325		1.77	0.000	14 -	207			176	83	89		
28	6.2	7.4	23	332		1.73	0.000	16 -	231			20	84	88		
29	6.3	7.4	17	244		1.72	0.000	16 -	230			10	87	90		
30	7.2	7.4	23	332		1.73	0.000	22 -	317			40	84	84		
31																
Total	200.0	215.8	540	7,693	1.71	50.70	0.047	402	5,706			4,224	2,576	2,699	353	<.0005
Max.	8.9	7.8	31	489	0.67	1.89	0.012	22	317			2,500	95	95	95	<.0005
Min.	5.7	7.1	9	119	0.19	1.49	0.000	8	116			2	70	84	82	<.0005
Avg.	7.1	7.4	18	256	0.43	1.69	0.002	13	190			*31	86	90	88	<.0005
Count	28.0	29.0	30	30	4.00	30.00	27.000	30	30			29	30	30	4	4

*Geometric Mean

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

APRIL 1993 - MISCELLANEOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	SO2 Lbs.	Lime Lbs.	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	PH	Lbs. of Lime per lb. of Dry Solids
1	5,900	2,880	270	20	496	8	255	6,000	4.6	68	6.1	0.11
2	7,400	2,760	330	14	496	8	289	6,000	4.9	66	6.2	0.12
3	8,500	2,760	150	6	496	7	187	3,000	4.7	69	6.2	0.16
4	5,100	2,640	140	12	397	9	221	3,000	5.0	69	6.2	0.18
5	4,800	2,760	300	13	397	10	255	6,000	5.1	67	6.4	0.10
6	3,700	2,640	210	17	397	8	187	6,000	4.7	70	6.3	0.08
7	3,400	2,760	390	14	496	8	187	6,000	4.8	69	6.2	0.08
8	2,500	2,520	270	19	397	4	323	6,000	4.6	71	6.2	0.14
9	4,200	2,640	140	9	397	15	170	4,600	4.8	69	6.3	0.09
10	4,100	2,640	130	15	397	7	170	4,500	5.2	67	6.2	0.09
11	6,400	2,760	140	13	397	8	153	4,000	4.9	68	6.2	0.09
12	4,200	2,760	420	15	397	7	255	3,000	5.0	69	6.2	0.20
13	3,300	2,640	330	20	397	7	119	3,000	5.0	67		0.09
14	3,500	2,640	320	14	199	8	204	6,000	6.4	33	6.3	0.06
15	2,600	2,520	300	14	397	8	510	13,000	6.2	62	6.0	0.08
16	5,600	2,880	390	16	496	9	952	3,000	4.3	66	6.3	0.88
17	5,300	2,760	220	14	298	7	612	12,000	5.5	67	6.0	0.11
18	2,800	2,400	140	12	199	9	238	5,000	5.0	67		0.11
19	2,500	2,640	270	11	199	7	289	6,000	5.0	67	6.0	0.11
20	3,700	2,640	170	30	0	13	323	6,000	4.9	70	5.8	0.13
21	1,300	2,640	290	22	99	11	544	6,000	4.9	71	5.7	0.22
22	900	2,640	260	15	496	13	340	6,000	5.1	70	5.7	0.13
23	100	2,520	350	17	0	16	221	4,000	6.9	48	5.8	0.10
24	200	2,280	210	20	397	12	289	4,000	4.6	72	5.9	0.19
25	300	2,520	120	17	199	5	221	4,000	5.2	68	5.8	0.13
26	200	2,640	230	18	0	11	187	5,500	4.5	74	5.7	0.09
27	100	2,400	220	20	298	12	306	5,000	4.5	73	5.9	0.16
28	100	2,520	330	21	298	12	408	5,000	4.8	73	5.9	0.20
29	100	2,400	430	21	596	14	255	6,000	4.6	74	5.9	0.11
30	100	2,520	180	24	397	15	323	3,000	4.8	73	5.9	0.27
31												
Total	92,900	78,720	7,650	493	10,125	288	8,993	160,600	150.5			4.60
Max.	8,500	2,880	430	30	596	16	952	13,000	6.9			0.88
Min.	100	2,280	120	6	0	4	119	3,000	4.3			0.06
Avg.	3,097	2,624	255	16	338	10	300	5,353	5.0			0.15

Manpower

Superintendent	1
Asst. Supt.	1
Operators	2
IPP Coordinator	1
Total	5

Robert J. Swalwell
Superintendent

[illegible]

[illegible] - FLOW [illegible]

	-----Weather----		Inf. Flow	Inf. Temp	Inf. pH	Inf. BOD	Inf. BOD	Inf SS	Inf. SS	Inf. Pnos	Inf Pnos.	Inf. VSS	Inf. NH3-N	--Remarks or Other Parameters--
	Type	Precip.	MGD	F	SU	mgIL	Lbs	mgIL	Lbs.	mgIL	Lbs.	mgIL	mgIL	
PN-														
Day														
1			1.67	50	7.6	123	1,713	124	1,727			118	8.9	
2	R	0.35	1.62	48	7.6	141	1,893	144	1,934			120	9.5	
3	R	0.16	1.78	50	7.7	153	2,271	176	2,613			152	10.3	
4	R	0.73	1.82	50	7 7	162	2,459	172	2,611			146	10.4	
5	R	0.03	1.75	50	7.8	159	2,321	178	2,598	3.80	55	160	10 0	
6			1.78	52	7.7	150	2,227	160	2,375			136	10.8	
7			1.70	52	7.7	111	1,574	160	2,268			136	10.5	
8			1.60	51	7.6	162	2,162	174	2,322			158	9.9	
9			1.59	54	7.7	150	1,989	188	2,493			152	9.8	
10			1.75	52	7.7	104	1,518	174	2,540			136	10.5	
11			1.73	52	7.8	132	1,905	148	2.135			146	10.4	
12			1.69	52	7.9	126	1,776	120	1,691			118	10.1	
13			1.66	52	7.5	146	2,021	160	2,215	3.50	48	160	11.8	
14	R	0.03	1.62	53	7.6	180	2,432	148	2,000			146	11.1	
15			1.54	52	7.8	132	1,695	126	1,618			112	11.0	
16			1.56	51	7.6	148	1,926	116	1,509			110	11.5	
17			1.73	54	7.6	190	2,741	148	2,135			142	10.9	
18	R	0.05	1.68	54	7.8	162	2,270	176	2,466			176	12.6	
19			1.66	54	7.4	183	2,534	136	1,883	3.10	43	122	11.9	
20			1.65	53	7.6	162	2,229	128	1,761			112	12.8	
21	R	0.01	1.64	54	7.5	126	1,723	130	1,778			130		
22	R	0.06	1.50	54	7.4	150	1,877	230	2,877			230		
23	R	0.62	1.54	52	7.5	165	2,119	202	2,594	3.50	45	202	11.1	
24	R	0.02	1.61	54	7.5	126	1,692	126	1,692			98	11.1	
25			1.63	54	7.5	141	1,917	188	2,556			176	11.5	
26			1.64	54	7.5	153	2,093	148	2,024			126	10.2	
27	R	0.12	1.62	54	7.7	171	2,310	174	2,351			162	13.5	
28	R	0.03	1.53	54	7.7	158	2,016	110	1,404			100	11.8	
29			1.43	54	7.6	120	1,431	116	1,383			112	11.4	
30	R	1.01	1.46	53	7.6	122	1,486	118	1,437			112	11.5	
31	R	0.04	1.52	52	7.7	152	1,927	142	1,800			116	11.9	
Total	0	3.26	50.69	1,625	236.6	4,560	62,245	4,740	64,791	13.90	192	4,322	318.7	
Max.	0	1.01	1.82	54	7.9	190	2,741	230	2,877	3.80	55	230	13.5	
Min.	0	0.01	1.43	48	7.4	104	1,431	110	1,383	3.10	43	98	8.9	
Avg.	0	0.23	1.64	52	7.6	147	2,008	153	2,090	3.48	48	139	11.0	
Count	14	14.00	31.00	31	31.0	31	31	31	31	4.00	4	31	29.0	

Robert J. Swalwell
Superintendent

[illegible] - 93 - PRIMARY EFFLUENT SHEET

	P Eff. BOD mgIL	P Eff. BOD Lbs.	P Eff. SS mgIL	P. Eff. SS Lbs.	P Eff. Pnos. mgIL	P Eff. Pnos. Lbs.	P Eff. VSS mgIL	P Eff. NH3-N mgIL	Flow MGD	BOD Pri. Removal %	SS Pri. Removal %	P Pri. Removal %
PN-												
Day												
1	114	1,586	128	1,783			120	9.5	1.67	7	-3	
2	111	1,490	104	1,396			104	9.4	1.61	21	28	
3	138	2,049	120	1,781			108	11.8	1.78	10	32	
4	141	2,140	136	2,064			124	11.9	1.82	13	21	
5	144	2,102	52	759	4.50	66	32	12.4	1.75	9	71	-18
6	171	2,539	120	1,781			68	12.0	1.78	-14	25	
7	105	1,489	102	1,446			86	11.7	1.70	5	36	
8	60	801	56	747			46	13.9	1.60	63	68	
9	144	1,910	180	2,387			148	10.6	1.59	4	4	
10	126	1,839	200	2,919			128	11.5	1.75	-21	-15	
11	159	2,294	184	2,655			124	11.4	1.73	-20	-24	
12	135	1,903	140	1,973			124	11.4	1.69	-7	-17	
13	108	1,495	120	1,661	3.30	46	112	11.1	1.66	26	25	6
14	174	2,351	140	1,892			140	12.5	1.62	3	5	
15	108	1,387	96	1,233			96	11.1	1.54	18	24	
16	111	1,444	80	1,041			76	11.5	1.56	25	31	
17	126	1,818	96	1,385			96	11.7	1.73	34	35	
18	105	1,471	82	1,149			82	11.7	1.68	35	53	
19	114	1,578	44	609	2.30	32	32	11.8	1.66	38	68	26
20	111	1,527	66	908			60	13.0	1.65	31	48	
21	81	1,108	78	1,067			78		1.64	36	40	
22	81	1,013	80	1,001			80		1.50	46	65	
23	96	1,233	88	1,130	2.40	31	88	11.9	1.54	42	56	31
24	99	1,329	86	1,155			58	12.1	1.61	21	32	
25	93	1,264	76	1,033			72	12.3	1.63	34	60	
26	102	1,395	92	1,258			84	10.4	1.64	33	38	
27	105	1,419	82	1,108			76	13.6	1.62	39	53	
28	114	1,455	70	893			66	14.1	1.53	28	36	
29	69	823	64	763			62	12.8	1.43	43	45	
30	72	877	56	682			56	13.0	1.46	41	53	
31	72	913	48	608			38	12.1	1.52	53	66	
Total	3,489	48,043	3,066	42,270	12.50	174	2,664	344.2	50.69	696	1,059	45
Max.	174	2,539	200	2,919	4.50	66	148	14.1	1.82	63	71	31
Min.	60	801	44	608	2.30	31	32	9.4	1.43	-21	-24	-18
Avg.	113	1,550	99	1,364	3.13	44	86	11.9	1.64	22	34	11
Count	31	31	31	31	4.00	4	31	29.0	31.00	31	31	4

Robert J. Swalwell
Superintendent

APPLE ... REGIONAL WASTEWATER TREATMENT PLANT

MAY 1998 - ACTIVATED SLUDGE SHEET

PN-Day	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading flm	Mix Liq SS mgIL	Mix Liq VSS mgIL	Mix Liq Settl %	Mix Liq SDI %	Mix Liq DO mgIL	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mgIl	PE SS mgIL	
1	48	5.2								195			56	50	1.67	114	128	
2		5.4								192			58	36	1.61	111	104	
3		4.8	3.8	0.36	2,263	1,914	16 0	1.41	6.2	183	0.49	0.42	62	29	1.78	138	120	
4		4.7	3.8	0.32	2,626	2,212	20.0	1.31	1.5	182	0.60	0.50	63	29	1.82	141	136	
5		4.9	11.3	0.29	2,861	2,381	21.0	1 36	1.2	184	0.59	0.49	65	29	1.75	144	52	
6		4.8	5.0	0.34	2,984	2,474	24.0	1.24	1.1	185	0.64	0.53	64	29	1.78	171	120	
7		5.1	6.2	0 20	2,999	2,438	25.0	1.20	1.0	195	0 65	0.57	74	36	1.70	105	102	
8		5.4								197			79	43	1.60	60	56	
9		5.4								196			79	50	1.59	144	180	
10		4.9	3.4	0.23	3,304	2,662	26.0	1.27	3.4	194	0.65	0.52	72	58	1.75	126	200	
11		5.0	3.8	0.28	3,391	2,724	25.0	1.36	2.0	191	0.62	0.50	73	58	1.73	159	184	127 Avg.
12		5.1	5.1	0.23	3,380	2,732	26.0	1.30	1.9	195	0.64	0.52	75	58	1.69	135	140	
13		5.2	5.9	0.19	3,268	2,666	24.0	1.36	4.3	201	0.67	0.54	77	58	1.66	108	120	
14		5.3	4.7	0.32	2,976	2,444	23.0	1.29	5.4	197	0.62	0.50	78	50	1.62	174	140	
15		5.6								204			82	43	1.54	108	96	
16		5.5								212			81	43	1.56	111	80	
17		5.0	5.4	0.30	2,505	2,040	20.0	1.25	6.7	170	0.53	0.43	73	36	1.73	126	96	
18		5.1	6.6	0.24	2,543	2,086	21.0	1.21	2.7	183	0.49	0.40	74	29	1.68	105	82	
19		5.2	12.3	0.26	2,507	2,063	20.0	1.25	5.5	188	0.55	0.45	74	29	1.66	114	44	
20		5.2	8.2	0.25	2,474	2,008	21.0	1.18	5.3	181	0.49	0.40	74	29	1.65	111	66	
21		5.3								181			77	29	1.64	81	78	
22		5.7								176			83	29	1.50	81	80	
23		5.6								177			80	29	1.54	96	88	76 Avg.
24		5.4	6.5	0.21	2,493	2,068	20.0	1.25	4.7	211	0.54	0.46	77	29	1.61	99	86	
25		5.3	7.3	0.21	2,502	2,059	21.0	1.19	5.6	222	0.47	0.38	76	29	1.63	93	76	
26		5.3	5.8	0.23	2,420	2,000	21.0	1.15	5.2	235	0.52	0.41	75	29	1.64	102	92	
27		5.3	6.9	0.24	2,570	1,995	21.0	1.22	5.8	231	0.50	0.42	76	29	1.62	105	82	
28		5.6	8.6	0.24	2,576	2,054	24.0	1.07	4.7	233	0.50	0.40	82	29	1.53	114	70	
29		6.0								243			87	29	1.43	69	64	
30		5.9								231			85	29	1.46	72	56	
31		5.7								243			81	29	1.52	72	48	
Total	48	163.9	120.6	4.94	52,642	43,020	419.0	23.90	74.2	6,208	10.76	8.84	2,312	1,141	50.69	3,489	3,066	
Max.	48	6.0	12.3	0.36	3,391	2,732	26.0	1.41	6.7	243	0.67	0.57	87	58	1.82	174	200	
Min.	48	4.7	3.4	0.19	2,263	1,914	16.0	1.07	1.0	170	0.47	0.38	56	29	1.43	60	44	
Avg.	48	5.3	6.3	0.26	2,771	2,264	22.1	1.26	3.9	200	0.57	0.47	75	37	1.64	113	99	
Count	1	31.0	19.0	19.00	19	19	19.0	19.00	19.0	31	19.00	19.00	31	31	31.00	31	31	

Robert J. Swalwell
Superintendent

MAY 1990 - DISCHARGE MONITORING REPORT - DISCHARGE NO. 001A

Day	F.Eff D.O. mgIL	F.Eff. pH SU	F.Eff. SS mgIL	F.Eff. SS Lbs.	F.Eff. Total-P mgIL	Flow MGD	F.Eff. Chlorine mgIL	F.Eff. BOD mgIL	F.Eff. BOD Lbs.	F.Eff. NH3 as N mgIL	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %	Mercury mgIL
1	6.5	7.4	32	446		1.67	0.00	13	181	10.3	143	8	74	89		
2	6.3	7.6	21	282		1.61	0.00	13	175	10.5	141	2	85	91		
3	7.4	7.6	13	193		1.78	0.00	9	134	12.4	184	2	93	94		
4	6.3	7.5	8	121		1.82	0.00	10	152	10.8	164	2	95	94		<0.0005
5	6.3	7.4	11	161	0.53	1.75	0.00	11	161	11.1	162	2	94	93	86	
6	6.2	7.3	11	163		1.78	0.00	8	119	11.7	174	3	93	95		
7	6.5	7.4	10	142		1.70	0.00	12	170	11.0	156	68	94	89		
8	6.2	7.3	3	40		1.60	0.00	9	120	9.1	121	10	98	94		
9	6.1	7.4	10	133		1.59	0.00	7	93	9.3	123	2	95	95		<0.0005
10	6.6	7.4	13	190		1.75	0.00	8	117	10.3	150	2	93	92		
11	6.3	7.5	7	101		1.73	0.00	8	115	10.9	157	2	95	94		
12	6.2	7.5	16	226		1.69	0.00	11	155	9.7	137	2	87	91		
13	7.2	7.4	25	346	0.62	1.66	0.00	8	111	12.7	176	2	84	95	82	
14	7.4	7.4	23	311		1.62	0.00	9	122	13.4	181	2	84	95		
15	6.4	7.4	20	257		1.54	0.00	10	128	13.7	176	4	84	92		
16	6.8	7.4	20	260		1.56	0.00	14	182	13.7	178	2	83	91		
17	7.9	7.5	22	317		1.73	0.00	12	173	13.2	190	25	85	94		
18	6.2	7.4	20	280		1.68	0.00	7	98	12.2	171	12	89	96		<0.0005
19	7.3	7.3	12	166	0.70	1.66	0.00	9	125	12.6	174	12	91	95	77	
20	7.1	7.5	18	248		1.65	0.00	11	151	14.2	195	31	86	93		
21	7.2	7.5	18	246		1.64	0.00	10	137			13	86	92		
22	6.5	7.4	16	200		1.50	0.00	8	100			8	93	95		
23	6.6	7.5	22	283	0.54	1.54	0.00	7	90	12.9	166	5	89	96	85	<0.0005
24	7.6	7.4	20	269		1.61	0.00	8	107	13.0	175	21	84	94		
25	7.6	7.4	12	163		1.63	0.00	12	163	13.3	181	2	94	91		
26	7.8	7.4	14	191		1.64	0.00	9	123	11.8	161	3	91	94		
27	7.5	7.6	7	95		1.62	0.00	7	95	14.4	195	5	96	96		
28	7.4	7.5	5	64		1.53	0.00	6	77	13.7	175	2	95	96		
29	7.4	7.6	6	72		1.43	0.00	4	48	14.8	177	2	95	97		
30	7.2	7.7	8	97		1.46	0.00	5	61	14.9	181	2	93	96		
31	7.0	7.6	5	63		1.52	0.00	5	63	14.6	185	2	96	97		
Total	213.0	231.2	448	6,125	2.39	50.69	0.00	280	3,844	356.2	4,850	260	2,794	2,906	330	<0.0005
Max.	7.9	7.7	32	446	0.70	1.82	0.00	14	182	14.9	195	68	98	97	86	<0.0005
Min.	6.1	7.3	3	40	0.53	1.43	0.00	4	48	9.1	121	2	74	89	77	<0.0005
Avg.	6.9	7.5	14	198	0.60	1.64	0.00	9	124	12.3	167	*4	90	94	83	<0.0005
Count	31.0	31.0	31	31	4.00	31.00	31.00	31	31	29.0	29	31	31	31	4	4

* Geometric Mean

Robert J. Swalwell
Superintendent

WATER & SEWAGE PLANT - WASTEWATER TREATMENT PLANT

MAY 1990 - MITCHELL S.D. - SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	SO2 Lbs.	Lime Lbs.	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	PH	Lbs. of Lime per lb. of Dry Solids
1		2,520	250	19	397	12	238	3,000	4.7	72	6.1	0.20
2		2,280	190	19	397	14	221	4,000	4.9	72	6.0	0.13
3		2,520	630	21	99	15	289	5,000	4.8	72	6.0	0.14
4		2,400	340	21	199	13	408	6,000	4.9	71	6.0	0.17
5		2,520	320	21	298	14	306	5,000	4.5	73	6.0	0.16
6		2,400	150	20	298	13	272	4,000	5.9	69	5.8	0.14
7		2,520	340	20	397	10	272	5,000	6.0	72	5.6	0.11
8		2,400	1,540	10	199	10	238	4,000	4.7	76	6.0	0.15
9		2,400	110	17	397	13	221	3,000	4.5	76	5.9	0.19
10		2,520	230	17	298	14	119	2,000	5.0	74	5.9	0.14
11		2,520	220	16	298	13	170	2,500	8.4	83	5.8	0.10
12		2,520	340	20	496	14	231	3,500	5.1	75	5.8	0.15
13		2,760	190	17	596	13	204	3,500	4.9	74	5.8	0.14
14		2,520	320	21	596	15	323	5,000	4.9	73	5.8	0.16
15		2,520	200	17	397	14	272	4,000	4.7	71	6.1	0.17
16		2,520	180	24	298	12	255	4,000	4.8	71	5.8	0.16
17		2,520	280	18	298	12	306	6,000	4.8	72	5.9	0.13
18		2,520	210	20	397	13	391	6,000	4.8	71	5.8	0.16
19		2,520	200	21	199	13	357	6,000	4.9	72	5.7	0.14
20		2,520	350	21	496	12	425	7,000	4.9	74	5.7	0.15
21		2,400	270	21	298	10	357	6,000	4.8	72	6.0	0.15
22		2,400	90	20	298	15	187	3,000	4.6	73	5.8	0.16
23		2,520	160	20	298	15	187	3,000	4.7	73	5.7	0.16
24		2,520	650	22	199	12	357	6,000	4.6	73	5.8	0.15
25		2,760	110	8	397	14	357	6,000	4.7	74	5.8	0.15
26		2,640	380	18	397	14	238	4,000	4.6	74	5.8	0.15
27		2,760	90	18	397	14	374	6,000	4.4	74	5.6	0.17
28		2,640	220	19	397	14	272	4,000	4.4	74	5.7	0.18
29		2,640	130	18	397	12	255	4,000	4.3	74	6.0	0.18
30		2,640	230	17	397	10	204	4,000	4.1	75	5.7	0.15
31		2,760	190	21	298	10	221	4,000	4.2	72	5.8	0.16
Total		78,600	9,110	582	10,823	399	8,527	138,500	151.5	2,271	181.2	4.76
Max.		2,760	1,540	24	596	15	425	7,000	8.4	83	6.1	0.20
Min.		2,280	90	8	99	10	119	2,000	4.1	69	5.6	0.10
Avg.		2,535	294	19	349	13	275	4,468	4.9	73	5.8	0.15

Manpower

Superintendent	1
Asst. Supt.	1
Operators	2
IPP Coordinator	1
Total	5

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

JUNE 1993 - PLANT INFLUENT SHEET

PN-Day	Weather Type	Weather Precip.	Inf. Flow MGD	Inf. Temp F	Inf. pH SU	Inf. BOD mgIL	Inf. BOD Lbs.	Inf. SS mgIL	Inf. SS Lbs.	Inf. Phos. mgIL	Inf. Phos. Lbs.	Inf. VSS mgIL	Inf. NH3-N mgIL	Remarks or Other Parameters
1			1.69	53	7.6	135	1,903	146	2,058			118	11.9	
2	R	0.10	1.74	54	7.7	174	2,525	148	2,148	5.60	81	126	11.6	
3			1.67	54	7.6	162	2,256	122	1,699			100	12.6	
4	R	0.72	1.58	53	7.6	372	4,902	266	3,505			244	11.9	
5			1.46	54	7.6	163	1,985	150	1,826			132	12.6	
6	R	0.34	1.45	53	7.5	174	2,104	192	2,322			162	13.1	
7	R	0.50	1.66	54	7.8	155	2,146	248	3,433			220	11.6	
8	R	1.25	1.80	54	7.7	132	1,982	132	1,982	2.90	44	114	10.9	
9			1.79	54	7.6	121	1,806	120	1,791			98	10.7	
10			1.76	54	7.5	174	2,554	140	2,055			120	10.9	
11			1.71	55	7.5	171	2,439	328	4,678			290	12.9	
12			1.53	55	7.6	198	2,527	236	3,011			210	8.9	
13			1.54	53	7.6	159	2,042	206	2,646			174	10.0	
14	R	0.81	1.80	54	7.5	164	2,462	182	2,732			164	9.8	
15			1.79	55	7.5	185	2,762	240	3,583	4.30	64	222	9.9	
16			1.73	54	7.4	177	2,554	116	1,674			104	10.7	
17			1.74	55	7.5	161	2,336	132	1,916			116	9.6	
18	R	0.24	1.81	55	7.5	182	2,747	134	2,023			126	9.3	
19	R	0.36	1.75	55	7.4	132	1,927	150	2,189			140	9.0	
20	R	0.47	1.62	54	7.4	118	1,594	132	1,783	3.00	41	130	7.0	
21			1.97	55	7.3	161	2,645	172	2,826			140	9.9	
22			1.88	55	7.6	132	2,070	122	1,913			106	8.9	
23			1.83	55	7.6	129	1,969	180	2,747			140	9.3	
24			1.84	56	7.6	176	2,701	220	3,376			180	9.0	
25	R	0.20	1.79	57	7.6	132	1,971	100	1,493			92	10.3	
26	R	0.59	1.72	56	7.6	120	1,721	274	3,930			236	10.4	
27	R	0.53	1.58	56	7.6	120	1,581	122	1,608			88	10.5	
28	R	0.09	1.85	57	7.6	147	2,268	146	2,253			120	9.2	
29			1.75	56	7.6	126	1,839	142	2,072			118	9.5	
30	R	0.06	1.75	57	7.5	240	3,503	258	3,766			208	9.6	
31														
Total	0	6.26	51.58	1,642	226.7	4,892	69,820	5,256	75,038	15.80	230	4,538	311.5	
Max.	0	1.25	1.97	57	7.8	372	4,902	328	4,678	5.60	81	290	13.1	
Min.	0	0.06	1.45	53	7.3	118	1,581	100	1,493	2.90	41	88	7.0	
Avg.	0	0.45	1.72	55	7.6	163	2,327	175	2,501	3.95	57	151	10.4	
Count	14	14.00	30.00	30	30.0	30	30	30	30	4.00	4	30	30.0	

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

JUNE 1993 - PRIMARY EFFLUENT SHEET

PN- Day	P Eff. BOD mgIL	P Eff. BOD Lbs.	P Eff. SS mgIL	P. Eff. SS Lbs.	P Eff. Phos. mgIL	P Eff. Phos. Lbs.	P Eff. VSS mgIL	P Eff. NH3-N mgIL	Flow MGD	BOD Prl. Removal %	SS Prl. Removal %	P Prl. Removal %
1	75	1,057	58	817			38	13.1	1.69	44	60	
2	144	2,090	58	842	4.80	70	42	12.5	1.74	17	61	14
3	105	1,462	66	919			46	13.5	1.67	35	46	
4	72	949	52	685			42	12.9	1.58	81	80	
5	75	913	42	511			42	13.0	1.46	54	72	
6	75	907	50	605			42	13.2	1.45	57	74	
7	87	1,204	60	831			52	13.0	1.66	44	76	
8	108	1,621	56	841	1.90	29	52	12.6	1.80	18	58	34
9	78	1,164	48	717			40	11.8	1.79	36	60	
10	69	1,013	42	616			36	11.1	1.76	61	70	
11	84	1,198	38	542			32	10.6	1.71	51	88	
12	57	727	40	510			34	10.2	1.53	71	83	
13	84	1,079	46	591			36	11.4	1.54	47	78	
14	81	1,216	66	991			56	10.3	1.80	51	64	
15	87	1,299	66	985	2.70	40	56	10.5	1.79	38	73	37
16	99	1,428	44	635			34	11.2	1.73	44	62	
17	105	1,524	50	726			40	10.1	1.74	35	62	
18	60	906	42	634			42	9.5	1.81	67	69	
19	81	1,182	40	584			40	8.7	1.75	39	73	
20	51	689	60	811	1.70	23	48	7.5	1.62	57	55	43
21	78	1,282	54	887			36	9.5	1.97	52	69	
22	87	1,364	42	659			30	8.4	1.88	34	66	
23	87	1,328	84	1,282			68	10.5	1.83	33	53	
24	90	1,381	70	1,074			58	10.2	1.84	49	68	
25	75	1,120	62	926			58	11.4	1.79	43	38	
26	69	990	68	975			52	11.4	1.72	43	75	
27	63	830	62	817			56	10.9	1.58	48	49	
28	129	1,990	54	833			46	10.7	1.85	12	63	
29	87	1,270	80	1,168			48	12.1	1.75	31	44	
30	171	2,496	88	1,284			68	10.7	1.75	29	66	
31												
Total	2,613	37,679	1,688	24,297	11.10	161	1,370	332.5	51.58	1,321	1,955	128
Max.	171	2,496	88	1,284	4.80	70	68	13.5	1.97	81	88	43
Min.	51	689	38	510	1.70	23	30	7.5	1.45	12	38	14
Avg.	87	1,256	56	810	2.78	40	46	11.1	1.72	44	65	32
Count	30	30	30	30	4.00	4	30	30.0	30.00	30	30	4

Robert J. Swalwell
Superintendent

MARSHALL, MICHIGAN WASTEWATER TREATMENT PLANT

JUNE, 1993 - ACTIVATED SLUDGE SHEET

PN-Day	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading fIm	Mix Liq SS mgIL	Mix Liq VSS mgIL	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mgIL	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mgIl	PE SS mgIL
1	48	5.1	8.0	0.21	2,190	1,686	21.0	1.04	6.3	238	0.38	0.29	73	29	1.69	75	58
2		5.0	7.7	0.43	2,155	1,628	20.0	1.08	5.4	229	0.41	0.31	65	29	1.74	144	58
3		5.2	7.4	0.29	2,261	1,701	21.0	1.08	4.3	229	0.47	0.36	73	29	1.67	105	66
4		5.5	10.3	0.18	2,350	1,778	23.0	1.02	5.0	231	0.42	0.32	76	29	1.58	72	52
5		5.9								235			80	22	1.46	75	42
6		5.9								229			82	22	1.45	75	50
7		5.2	7.3	0.27	2,027	1,510	20.0	1.01	5.9	227	0.38	0.27	71	22	1.66	87	60
8		4.8	7.2	0.35	2,030	1,540	20.0	1.02	5.2	223	0.41	0.31	65	22	1.80	108	56
9		4.8	8.3	0.26	1,990	1,510	20.0	1.00	4.5	221	0.40	0.30	66	14	1.79	78	48
10		4.9	10.0	0.22	2,063	1,544	22.0	0.94	5.4	225	0.37	0.28	66	14	1.76	69	42
11		5.0	11.7	0.25	2,122	1,595	24.0	0.88	5.7	225	0.42	0.32	69	7	1.71	84	38
12		5.6								225			77	14	1.53	57	40
13		5.6								224			80	14	1.54	84	46
14		4.8	6.8	0.24	2,243	1,668	28.0	0.80	6.4	224	0.42	0.51	70	14	1.80	81	66
15		4.8	7.2	0.25	2,354	1,746	32.0	0.74	5.0	226	0.47	0.35	73	14	1.79	87	66
16		5.0	12.1	0.25	2,563	1,917	35.0	0.73	5.3	227	0.47	0.36	75	22	1.73	99	44
17		5.0	11.1	0.25	2,699	2,059	38.0	0.71	5.2	222	0.52	0.40	75	29	1.74	105	50
18		4.8	12.9	0.14	2,723	2,178	44.0	0.62	4.3	232	0.47	0.37	76	29	1.81	60	42
19		4.9								233			80	29	1.75	81	40
20		5.3								234			87	36	1.62	51	60
21		4.4	8.3	0.23	2,473	1,888	43.0	0.58	5.8	212	0.52	0.40	74	36	1.97	78	54
22		4.6	11.0	0.25	2,419	1,825	40.0	0.60	3.0	185	0.49	0.37	87	43	1.88	87	42
23		4.7	11.0	0.25	2,352	1,777	42.0	0.56	4.6	170	0.45	0.34	92	43	1.83	87	42
24		4.7	6.3	0.26	2,272	1,752	38.0	0.60	2.6	162	0.43	0.33	88	43	1.84	90	70
25		4.8	7.2	0.22	2,240	1,725	37.0	0.61	2.5	164	0.40	0.32	91	43	1.79	75	62
26		5.0								165			95	50	1.72	69	68
27		5.5								167			100	50	1.58	63	62
28		4.7	7.2	0.44	2,012	1,502	34.0	0.59	4.9	148	0.42	0.32	86	43	1.85	129	54
29		4.9	4.9	0.33	1,902	1,270	43.0	0.44	3.6	145	0.43	0.34	96	36	1.75	87	80
30		4.9	5.0	0.51	2,157	1,634	50.0	0.43	2.3	202	0.43	0.32	97	36	1.75	171	88
31																	
Total	48	151.1	189.0	6.07	49,597	37,433	695.0	17.07	103.2	6,279	9.58	7.49	2,385	863	51.58	2,613	1,646
Max.	48	5.9	12.9	0.51	2,723	2,178	50.0	1.08	6.4	238	0.52	0.51	100	50	1.97	171	88
Min.	48	4.4	4.9	0.14	1,902	1,270	20.0	0.43	2.3	145	0.37	0.27	65	7	1.45	51	38
Avg.	48	5.0	8.6	0.28	2,254	1,702	31.6	0.78	4.7	209	0.44	0.34	80	29	1.72	87	55
Count	1	30.0	22.0	22.00	22	22	22.0	22.00	22.0	30	22.00	22.00	30	30	30.00	30	30

Robert J. Swalwell
Superintendent

MARSHALL WWTP 801 INDUSTRIAL RD. MARSHALL MI 49068 - PERMIT MI0023540

JUNE 1992 - DISCHARGE MONITORING REPORT - DISCHARGE NO. 001A

Day	F.Eff. D.O. mgIL	F.Eff. pH SU	F.Eff. SS mgIL	F.Eff. SS Lbs.	F.Eff. Total-P mgIL	Flow MGD	F.Eff. Chlorine mgIL	F.Eff. CBOD mgIL	F.Eff. CBOD Lbs.	F.Eff. NH3 as N mgIL	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %	Mercury mgIL
1	7.9	7.6	5	70		1.69	0.000	5	70	14.0	197	37	97	96		
2	7.4	7.6	3	44	0.44	1.74	0.001	5	73	12.9	187	7	98	97	92	<0.0005
3	7.2	7.5	9	125		1.67	0.001	7	97	12.8	178	12	93	96		
4	4.8	7.6	4	53		1.58	0.000	4	53	11.7	154	78	98	99		
5	6.2	7.6	2	24		1.46	0.000	4	49	11.9	145	3	99	98		
6	7.0	7.5	5	60		1.45	0.000	5	60	13.4	162	4	97	97		
7	7.0	7.6	8	111		1.66	0.000	6	83	13.1	181	11	97	96		
8	7.3	7.5	8	120	0.32	1.80	0.000	6	90	11.8	177	17	94	95	89	<0.0005
9	7.3	7.5	5	75		1.79	0.000	5	75	12.1	181	20	96	96		
10	7.6	7.7	5	73		1.76	0.000	5	73	10.7	157	77	96	97		
11	7.6	7.6	3	43		1.71	0.000	5	71	8.9	127	158	99	97		
12	7.3	7.5	6	77		1.53	0.000	5	64	8.2	105	268	97	97		
13	7.6	7.5	3	39		1.54	0.000	6	77	9.3	119	44	99	96		
14	7.8	7.5	7	105		1.80	0.014	4	60	8.3	125	650	96	98		
15	7.5	7.5	8	119	0.36	1.79	0.000	6	90	8.2	122	2,300	97	97	92	<0.0005
16	7.7	7.5	7	101		1.73	0.000	5	72	7.7	111	86	94	97		
17			7	102		1.74	0.000	6	87	5.9	86		95	96		
18	7.3	7.4	5	75		1.81	0.000	4	60	5.4	82	140	96	98		
19	6.7	7.4	9	131		1.75	0.000	5	73	5.8	85	140	94	96		
20	7.0	7.4	8	108	0.30	1.62	0.003	4	54	5.0	68	54	94	97	90	<0.0005
21	7.7	7.5	6	99		1.97	0.000	6	99	7.6	125	620	97	96		
22	7.0	7.5	7	110		1.88	0.001	6	94	8.1	127	195	94	95		
23	7.1	7.5	12	183		1.83	0.000	6	92	7.3	111	400	93	95		
24	6.7	7.6	14	215		1.84	0.000	8	123	9.0	138	600	94	95		
25	6.6	7.6	7	105		1.79	0.004	6	90	8.7	130	240	93	95		
26	6.1	7.5	11	158		1.72	0.000	4	57	8.8	126	304	96	97		
27	5.8	7.5	7	92		1.58	0.000	4	53	8.3	109	700	94	97		
28	7.5	7.5	7	108		1.85	0.007	7	108	8.9	137	115	95	95		
29	6.7	7.5	9	131		1.75	0.000	8	117	10.8	158	42	94	94		
30	6.1	7.4	13	190		1.75	0.000	11	161	8.8	128	118	95	95		
31																
Total	203.5	218.1	210	3,046	1.42	51.58	0.031	168	2,424	283.4	4,039	7,540	2,871	2,890	363	<0.0005
Max.	7.9	7.7	14	215	0.44	1.97	0.014	11	161	14.0	197	2,300	99	99	92	<0.0005
Min.	4.8	7.4	2	24	0.30	1.45	0.000	4	49	5.0	68	3	93	94	89	<0.0005
Avg.	7.0	7.5	7	102	0.36	1.72	0.001	6	81	9.4	135	G 87	96	96	91	<0.0005
Count	29.0	29.0	30	30	4.00	30.00	30.000	30	30	30.0	30	29	30	30	4	4

G = Geometric Mean

Sample on June 2, <0.01 mg/l copper & 0.05 mg/l zinc

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

JUNE 1993 - MISCELLANEOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	SO2 Lbs.	Lime Lbs.	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	PH	Lbs. of Lime per lb. of Dry Solids
1		2,640	200	22	298	12	340	5,500	4.1	74	5.8	0.18
2		2,640	270	18	397	13	374	6,000	4.3	73	5.8	0.17
3		2,640	140	18	397	10	357	6,000	4.2	73	5.7	0.17
4		2,640	220	19	397	11	323	6,000	4.2	74	5.7	0.15
5		2,640	20	17	298	11	221	3,500	4.1	74	5.8	0.18
6		2,520	70	16	397	8	221	3,500	4.3	75	5.8	0.17
7		2,520	180	19	298	13	255	6,000	4.2	75	5.8	0.12
8		2,760	350	16	397	10	357	6,000	4.1	72	5.8	0.17
9		2,640	230	14	397	4	323	5,500	4.2	72	5.8	0.17
10		2,520	220	1	298	4	340	6,000	4.3	73	5.7	0.16
11		2,520	200	9	397	5	357	6,000	4.1	73	5.6	0.17
12		2,520	70	10	298	4	221	4,000	4.2	75	5.7	0.16
13		2,520	150	6	397	3	221	4,000	4.3	74	5.9	0.15
14		2,520	150	10	397	4	289	5,000	4.0	73	5.9	0.17
15		2,640	220	12	298	6	340	6,000	3.7	73	5.8	0.18
16		2,520	40	13	298	8	289	5,000	4.5	73	5.7	0.15
17		2,520	420	14	298	9	323	5,500	4.4	73	5.6	0.16
18		2,640	170	15	298	7	357	6,000	4.0	72	5.8	0.18
19		2,520	1,480	15	397	8	204	3,000	4.2	73	5.7	0.19
20		2,520	230	13	397	6	221	3,500	4.0	73	5.6	0.19
21		2,760	390	10	298	19	170	3,500	4.0	74	5.8	0.14
22		2,640	280	14	199	11	170	3,500	4.4	73	5.7	0.13
23		2,640	230	18	0	8	306	5,000	4.5	70	5.7	0.16
24		2,520	130	15	298	6	272	5,000	4.7	71	5.8	0.14
25		2,640	220	19	298	13	323	5,000	4.8	72	5.7	0.16
26		2,640	110	20	298	13	272	4,000	4.7	74	5.7	0.17
27		2,520	80	26	298	17	255	4,000	4.4	74	5.8	0.17
28		2,400	150	28	298	19	238	5,000	4.5	72	5.8	0.13
29		2,520	100	27	298	20	323	5,000	4.8	72	5.7	0.16
30		2,760	240	18	298	18	391	6,000	4.9	73	5.7	0.16
31												
Total		77,640	6,960	472	9,632	300	8,653	148,000	129.1	2,192	172.4	4.88
Max.		2,760	1,480	28	397	20	391	6,000	4.9	75	5.9	0.19
Min.		2,400	20	1	0	3	170	3,000	3.7	70	5.6	0.12
Avg.		2,588	232	16	321	10	288	4,933	4.3	73	5.7	0.16

Manpower

Superintendent	1
Asst. Supt.	1
Operators	2
IPP Coordinator	1
Total	5

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

JULY 1993 - PLANT INFLUENT SHEET

	-----Weather----		Inf. Flow	Inf. Temp	Inf. pH	Inf. BOD	Inf. BOD	Inf. SS	Inf. SS	Inf. Phos.	Inf. Phos.	Inf. VSS	Inf. NH3-N	--Remarks or Other Parameters--
	Type	Precip.	MGD	F	SU	mgIL	Lbs.	mgIL	Lbs.	mgIL	Lbs.	mgIL	mgIL	
PN-														
Day														
1			1.70	55	7.6	148	2,098	128	1,815	4.40	62	112	10.7	
2			1.69	56	7.6	146	2,058	190	2,678			154	12.2	
3			1.66	56	7.6	126	1,744	156	2,160			138	8.9	
4			1.54	55	7.6	174	2,235	142	1,824			132	8.6	
5			1.68	56	7.6	120	1,681	118	1,653			96	10.0	
6			1.74	58	7.7	147	2,133	152	2,206			136	10.2	
7			1.72	58	7.4	155	2,223	152	2,180	3.20	46	150	10.2	
8	Rain	1.17	1.81	57	7.5	129	1,947	128	1,932			112	14.2	
9	Rain	0.30	1.76	59	7.5	138	2,026	122	1,791			114	10.1	
10	Rain	0.03	1.61	58	7.4	165	2,216	154	2,068			136	9.2	
11	Rain	0.05	1.63	57	7.7	144	1,958	140	1,903			128	9.3	
12			1.76	58	7.6	182	2,671	114	1,673			14	13.1	
13	Rain	0.03	1.83	58	7.5	149	2,274	128	1,954			120	10.6	
14			1.73	58	7.5	144	2,078	146	2,107	3.00	43	122	10.0	
15			1.71	60	7.7	170	2,424	140	1,997			132	10.7	
16			1.72	59	7.6	191	2,740	212	3,041			204	11.1	
17			1.56	59	7.6	165	2,147	138	1,795			134	10.3	
18	Rain	1.80	1.71	60	7.6	162	2,310	278	3,965			84	10.7	
19			1.82	59	7.3	117	1,776	116	1,761	2.80	43	96	9.8	
20			1.80	59	7.6	177	2,657	112	1,681			88	6.8	
21			1.74	59	7.5	143	2,075	140	2,032			124	10.6	
22			1.88	59	7.2	147	2,305	122	1,913			124	11.3	
23			1.76	59	7.3	174	2,554	194	2,848			154	9.2	
24	Rain	0.25	1.65	58	7.7	172	2,367	154	2,119			134	10.1	
25	Rain	0.72	1.67	58	7.6	116	1,616	320	4,457			266	9.8	
26			1.80	59	7.6	155	2,327	270	4,053			252	9.2	
27			1.79	59	7.5	154	2,299	174	2,598			160	9.6	
28			1.73	60	7.3	137	1,977	200	2,886			180	9.7	
29			1.71	60	7.5	158	2,253	114	1,626			110	11.2	
30			1.78	59	7.5	180	2,672	164	2,435			156	10.0	
31	Rain	0.06	1.70	59	7.5	165	2,339	242	3,431			224	8.3	
Total	0	4.41	53.39	1,804	233.4	4,750	68,181	5,060	72,579	13.40	194	4,286	315.7	
Max.	0	1.80	1.88	60	7.7	191	2,740	320	4,457	4.40	62	266	14.2	
Min.	0	0.03	1.54	55	7.2	116	1,616	112	1,626	2.80	43	14	6.8	
Avg.	0	0.49	1.72	58	7.5	153	2,199	163	2,341	3.35	49	138	10.2	
Count	9	9.00	31.00	31	31.0	31	31	31	31	4.00	4	31	31.0	

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

JULY 1993 - PRIMARY EFFLUENT SHEET

PN-Day	P Eff. BOD mgIL	P Eff. BOD Lbs.	P Eff. SS mgIL	P. Eff. SS Lbs.	P Eff. Phos. mgIL	P Eff. Phos. Lbs.	P Eff. VSS mgIL	P Eff. NH3-N mgIL	Flow MGD	BOD Prl. Removal %	SS Prl. Removal %	P Prl. Removal %
1	93	1,319	84	1,191	3.60	51	76	11.4	1.70	37	34	18
2	84	1,184	60	846			54	10.1	1.69	42	68	
3	63	872	76	1,052			52	9.2	1.66	50	51	
4	123	1,580	74	950			70	8.3	1.54	29	48	
5	63	883	58	813			48	8.8	1.68	48	51	
6	78	1,132	66	958			48	9.0	1.74	47	57	
7	75	1,076	64	918	2.80	40	60	9.4	1.72	52	58	11
8	105	1,585	66	996			48	10.3	1.81	19	48	
9	81	1,189	66	969			62	9.5	1.76	41	46	
10	132	1,772	52	698			48	10.1	1.61	20	66	
11	78	1,060	60	816			60	11.0	1.63	46	57	
12	69	1,013	58	851			58	10.3	1.76	62	49	
13	87	1,328	64	977			64	8.4	1.83	42	50	
14	84	1,212	82	1,183	2.30	33	80	10.9	1.73	42	44	23
15	108	1,540	68	970			66	12.0	1.71	36	51	
16	174	2,496	36	516			34	11.9	1.72	9	83	
17	72	937	52	677			46	11.0	1.56	56	62	
18	63	898	86	1,226			84	8.8	1.71	61	69	
19	75	1,138	68	1,032	2.10	32	38	10.3	1.82	36	41	25
20	135	2,027	88	1,321			70	7.6	1.80	24	21	
21	96	1,393	58	842			48	12.2	1.74	33	59	
22	47	737	100	1,568			98	12.0	1.88	68	18	
23	100	1,468	84	1,233			64	10.9	1.76	43	57	
24	98	1,349	56	771			52	11.2	1.65	43	64	
25	66	919	62	864			56	10.1	1.67	43	81	
26	92	1,381	76	1,141			70	9.5	1.80	41	72	
27	75	1,120	34	508			28	10.0	1.79	51	80	
28	74	1,068	78	1,125			68	9.7	1.73	46	61	
29	36	513	64	913			62	11.3	1.71	77	44	
30	96	1,425	60	891			58	9.0	1.78	47	63	
31	87	1,233	70	992			62	8.9	1.70	47	71	
Total	2,709	38,847	2,070	29,807	10.80	156	1,832	313.1	53.39	1,338	1,724	77
Max.	174	2,496	100	1,568	3.60	51	98	12.2	1.88	77	83	25
Min.	36	513	34	508	2.10	32	28	7.6	1.54	9	18	11
Avg.	87	1,253	67	962	2.70	39	59	10.1	1.72	43	56	19
Count	31	31	31	31	4.00	4	31	31.0	31.00	31	31	4

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

JULY 1993 - ACTIVATED SLUDGE SHEET

PN-Day	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading flm	Mix Liq SS mgIL	Mix Liq VSS mgIL	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mgIL	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mgIl	PE SS mgIL
1	48	5.1	6.1	0.24	2,426	1,870	57.0	0.43	3.1	180	0.45	0.34	94	43	1.70	93	84
2		5.1	8.2	0.22	2,330	1,773	55.0	0.42	4.5	173	0.42	0.32	94	50	1.69	84	60
3		5.2								153			94	50	1.66	63	76
4		5.6								147			100	50	1.54	123	74
5		5.1								148			91	50	1.68	63	58
6		5.0	5.9	0.27	1,900	1,402	45.0	0.42	3.0	150	0.37	0.28	88	50	1.74	78	66
7		5.0	6.0	0.26	1,843	1,369	45.0	0.41	3.2	150	0.38	0.29	89	36	1.72	75	64
8		4.8	5.4	0.38	1,810	1,398	45.0	0.40	1.4	174	0.39	0.30	84	29	1.81	105	66
9		4.9	5.8	0.27	1,872	1,477	48.0	0.39	1.0	171	0.39	0.31	86	29	1.76	81	66
10		5.4								176			99	29	1.61	132	52
11		5.3								172			98	29	1.63	78	60
12		4.9	7.2	0.21	2,060	1,601	55.0	0.37	4.5	177	0.40	0.31	89	43	1.76	69	58
13		4.7	6.2	0.28	2,021	1,559	37.0	0.55	4.4	194	0.37	0.29	88	43	1.83	87	64
14		5.0	5.0	0.27	1,962	1,505	60.0	0.33	4.2	191	0.39	0.30	97	43	1.73	84	82
15		5.0	6.0	0.35	1,945	1,476	59.0	0.33	5.1	204	0.35	0.26	100	50	1.71	108	68
16		5.0	10.6	0.60	1,828	1,401	46.0	0.40	5.2	159	0.39	0.29	100	50	1.72	174	36
17		5.5								169			110	50	1.56	72	52
18		5.0								159			94	50	1.71	63	86
19		4.7	5.5	0.26	1,879	1,449	43.0	0.44	3.4	200	0.36	0.27	87	50	1.82	75	68
20		4.8	3.9	0.52	1,740	1,314	40.0	0.44	5.9	191	0.35	0.26	92	50	1.80	135	88
21		5.0	6.2	0.35	1,741	1,338	51.0	0.34	3.3	193	0.34	0.26	96	50	1.74	96	58
22		4.6	3.3	0.19	1,710	1,323	37.0	0.46	2.8	184	0.34	0.26	89	50	1.88	47	100
23		4.9	4.2	0.37	1,739	1,318	52.0	0.33	3.4	184	0.34	0.26	94	50	1.76	100	84
24		5.2								186			100	50	1.65	98	56
25		5.2								182			98	50	1.67	66	62
26		4.8	4.4	0.36	1,689	1,291	46.0	0.37	4.3	181	0.34	0.26	91	50	1.80	92	76
27		4.8	10.1	0.32	1,714	1,179	44.0	0.39	3.9	194	0.37	0.25	92	50	1.79	75	34
28		5.0	5.0	0.27	1,890	1,313	50.0	0.38	4.1	198	0.36	0.25	95	50	1.73	74	78
29		5.0	5.5	0.14	1,676	1,257	41.0	0.41	4.6	205	0.31	0.23	96	50	1.71	36	64
30		4.8	5.3	0.40	1,568	1,176	35.0	0.45	4.3	207	0.33	0.25	93	43	1.78	96	60
31		5.1								205			97	36	1.70	87	70
Total	48	155.4	125.9	6.52	39,343	29,789	991.0	8.45	79.6	5,557	7.74	5.84	2,915	1,403	53.39	2,709	2,070
Max.	48	5.6	10.6	0.60	2,426	1,870	60.0	0.55	5.9	207	0.45	0.34	110	50	1.88	174	100
Min.	48	4.6	3.3	0.14	1,568	1,176	35.0	0.33	1.0	147	0.31	0.23	84	29	1.54	36	34
Avg.	48	5.0	6.0	0.31	1,873	1,419	47.2	0.40	3.8	179	0.37	0.28	94	45	1.72	87	67
Count	1	31.0	21.0	21.00	21	21	21.0	21.00	21.0	31	21.00	21.00	31	31	31.00	31	31

Robert J. Swalwell
Superintendent

MARSHALL WWTP 801 INDUSTRIAL RD. MAPSHALL MI 49068 - PERMIT MI0023540

JULY 1993 - DISCHARGE MONITORING REPORT - DISCHARGE NO 001A

Day	F.Eff. D.O. mgIL	F.Eff. pH SU	F.Eff. SS mgIL	F.Eff. SS Lbs.	F.Eff. Total-P mgIL	Flow MGD	F.Eff. Chlorine mgIL	F.Eff. CBOD mgIL	F.Eff. CBOD Lbs.	F.Eff. NH3 as N mgIL	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %	Mercury mgIL
1	6.3	7.4	8	113	0.40	1.70	0.000	6	85	7.8	111	96	94	96	91	<0.0005
2	7.0	7.6	7	99		1.69	0.000	5	70	9.4	132	104	96	97		
3	7.0	7.5	10	138		1.66	0.000	4	55	9.1	126	56	94	97		
4	6.5	7.5	4	51		1.54	0.000	5	64	7.8	100	259	97	97		
5	7.2	7.5	5	70		1.68	0.003	4	56	8.7	122	28	96	97		
6	7.4	7.6	6	87		1.74	0.000	4	58	9.3	135	68	96	97		
7	6.7	7.5	4	57	0.52	1.72	0.000	5	72	9.4	135	92	97	97	84	<0.0005
8	6.1	7.6	9	136		1.81	0.018	8	121	9.7	146	56	93	94		
9	6.1	7.5	7	103		1.76	0.000	6	88	9.0	132	154	94	97		
10	6.1	7.3	5	67		1.61	0.000	6	81	8.0	107	20	97	96		
11	6.4	7.4	6	82		1.63	0.000	4	54	8.8	120	3	96	97		<0.0005
12	5.6	7.4	4	59		1.76	0.000	4	59	9.1	134	33	96	98		
13	7.4	7.5	4	61		1.83	0.000	6	92	9.2	140	38	97	96		
14	6.8	7.6	11	159	0.28	1.73	0.000	7	101	8.6	124	4	92	95	91	<0.0005
15	6.9	7.8	7	100		1.71	0.137	9	128	9.2	131	67	95	95		
16	6.7	7.5	8	115		1.72	0.016	9	129	10.8	155	240	96	95		
17	6.4	7.5	8	104		1.56	0.000	6	78	9.2	120	104	94	96		
18	6.5	7.5	8	114		1.71	0.000	8	114	9.4	134	28	97	95		
19	6.9	7.4	8	121	0.29	1.82	0.000	5	76	8.5	129	7	93	96	90	
20	6.9	7.7	9	135		1.80	0.000	12	180	6.2	93	4	92	93		
21	5.6	7.5	10	145		1.74	0.000	8	116	7.4	107	30	93	95		
22	6.7	7.6	11	172		1.88	0.000	6	94	9.4	147	17	91	96		
23	6.9	7.6	12	176		1.76	0.005	8	117	8.2	120	68	94	96		
24	6.3	7.6	12	165		1.65	0.001	9	124	9.8	135	53	92	95		
25	6.4	7.6	8	111		1.67	0.009	5	70	8.5	118	45	98	96		
26	7.0	7.6	3	45		1.80	0.024	5	75	7.7	116	13	99	97		
27	6.7	7.6	2	30		1.79	0.008	6	90	7.7	115	2	99	96		
28	7.1	7.6	9	130		1.73	0.007	6	87	7.7	111	15	96	96		
29	7.0	7.5	4	57		1.71	0.000	2	29	8.5	121	90	96	99		
30	6.8	7.6	8	119		1.78	0.000	3	45	6.7	99	88	95	98		
31	5.7	7.3	16	227		1.70	0.000	9	128	4.9	69	520	93	95		
Total	205.1	233.4	233	3,349	1.49	53.39	0.227	190	2,735	263.7	3,787	2,402	2,948	2,980	356	<0.0005
Max.	7.4	7.8	16	227	0.52	1.88	0.137	12	180	10.8	155	520	99	99	91	<0.0005
Min.	5.6	7.3	2	30	0.28	1.54	0.000	2	29	4.9	69	2	91	93	84	<0.0005
Avg.	6.6	7.5	8	108	0.37	1.72	0.007	6	88	8.5	122	G 38	95	96	89	<0.0005
Count	31.0	31.0	31	31	4.00	31.00	31.000	31	31	31.0	31	31	31	31	4	4

G - Geometric Mean

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

JULY 1993 - MISCELLANEOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	SO2 Lbs.	Lime Lbs.	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	PH	Lbs. of Lime per lb. of Dry Solids
1		2,520	1,070	19	199	18	374	6,000	5.2	68	5.5	0.14
2		2,640	1,020	26	199	20	289	6,000	4.7	72	5.7	0.12
3		2,400	950	22	298	18	204	4,000	5.3	61		0.11
4		2,400	360	34	298	17	255	3,000	4.7	73	5.8	0.22
5		2,400	650	17	298	18	340	5,000	4.7	72	5.8	0.17
6		2,400	830	13	199	17	306	7,000	4.8	71	6.0	0.11
7		2,400	780	27	0	13	340	7,000	4.7	70	5.8	0.12
8		2,520	430	27	199	19	510	7,000	4.7	73	5.8	0.18
9		2,520	150	27	199	18	238	4,000	5.0	71	5.8	0.14
10		2,400	300	30	199	17	238	4,000	5.5	75	5.7	0.13
11		2,520	100	26	397	17	221	3,000	4.8	74	5.6	0.18
12		2,520	70	10	298	16	459	8,000	4.6	75	5.5	0.15
13		2,760	530	22	298	7	374	6,000	4.5	74	5.8	0.16
14		2,520	120	24	397	5	374	7,000	4.6	75	5.8	0.14
15		2,640	350	14	298	0	340	5,000	4.3	75	5.8	0.19
16		2,520	620	25	298	10	391	6,300	4.3	73	5.9	0.17
17		2,400	180	10	298	13	204	3,000	6.5	83	5.9	0.12
18		2,400	120	21	199	13	187	4,000	4.1	74	5.8	0.14
19		2,640	120	21	298	10	408	6,000	4.4	71	5.9	0.18
20		2,520	380	22	397	28	680	10,000	4.5	71	6.0	0.18
21		2,640	220	21	199	6	357	6,000	4.0	72	5.9	0.18
22		2,760	640	17	397	6	408	6,000	3.6	72	5.9	0.22
23		2,640	920	15	199	8	357	6,000	5.4	62	6.2	0.13
24		2,400	2,020	13	397	6	272	4,000	4.2	67	6.1	0.19
25		2,520	330	15	496	7	221	5,500	3.9	72	5.7	0.12
26		2,640	180	15	298	6	306	4,000	3.7	72	5.9	0.25
27		2,760	790	17	199	8	289	6,000	4.7	70	5.7	0.12
28		2,640	620	14	298	9	204	6,500	3.7	72	5.9	0.10
29		2,760	700	6	298	5	527	8,000	4.2	72	5.8	0.19
30		2,640	550	13	298	5	408	6,000	4.1	71	6.0	0.20
31		2,520	290	10	298	2	221	3,500	4.1	73	5.6	0.18
Total		78,960	16,390	593	8,643	362	10,302	172,800	141.5	2,226	174.6	4.96
Max.		2,760	2,020	34	496	28	680	10,000	6.5	83	6.2	0.25
Min.		2,400	70	6	0	0	187	3,000	3.6	61	5.5	0.10
Avg.		2,547	529	19	279	12	332	5,574	4.6	72	5.8	0.16

Manpower

Superintendent	1
Asst. Supt.	1
Operators	2
IPP Coordinator	1
Total	5

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

AUGUST 1993 - PLANT INFLUENT SHEET

PN- Day	Weather Type	Weather Precip.	Inf. Flow MGD	Inf. Temp F	Inf. pH SU	Inf. BOD mgIL	Inf. BOD Lbs.	Inf. SS mgIL	Inf. SS Lbs.	Inf. Pnos. mgIL	Inf. Phos. Lbs.	Inf. VSS mgIL	Inf. NH3-N mgIL	--Remarks or Other Parameters--
1			1.73	59	7.5	146	2,107	116	1,674			108	9.7	
2			1.72	60	7.6	161	2,310	218	3,127	3.30	47	218	13.7	
3	Rain	0.05	1.71	59	7.4	228	3,252	154	2,196			154	10.1	
4			1.73	60	7.5	141	2,034	138	1,991			138	10.1	
5			1.70	60	7.2	189	2,680	156	2,212			144	10.2	
6	Rain	0.93	1.61	59	7.5	183	2,457	198	2,659			178	14.2	
7	Rain	0.05	1.49	58	7.5	162	2,013	154	1,914			132	16.0	
8			1.45	58	7.6	162	1,959	150	1,814			136	13.6	
9			1.63	58	7.5	174	2,365	192	2,610			158	11.6	
10	Rain	0.11	1.56	60	7.5	150	1,952	146	1,900			128	12.1	
11			1.61	60	7.5	192	2,578	138	1,853	3.80	51	114	9.8	
12			1.69	60	7.5	126	1,776	144	2,030			138	9.4	
13	Rain	0.16	1.65	60	7.5	189	2,601	204	2,807			178	10.8	
14			1.59	60	7.7	132	1,750	150	1,989			132	11.0	
15	Rain	0.05	1.45	62	7.4	135	1,633	192	2,322			148	12.5	
16			1.63	60	7.5	151	2,053	194	2,637			160	12.0	
17			1.70	60	7.5	158	2,240	222	3,148			198	12.7	
18			1.67	61	7.4	192	2,674	194	2,702			172	12.2	
19	Rain	0.35	1.65	60	7.4	153	2,105	258	3,550			228	12.7	
20			1.67	60	7.4	150	2,089	150	2,089			128	13.1	
21			1.60	60	7.7	147	1,962	154	2,055			136	12.1	
22			1.48	59	7.8									
23	Rain	0.69	1.70	60	7.5	165	2,339	190	2,694	4.20	60	172	10.6	
24			1.65	60	7.4	177	2,436	126	1,734			124	11.1	
25	Rain	0.13	1.67	61	7.4	168	2,340	186	2,591			164	16.1	
26	Rain	0.91	1.72	61		186	2,668	208	2,984			158	12.5	
27	Rain	0.12	1.70	61		170	2,410	192	2,722			164	9.4	
28	Rain	0.28	1.43	61	7.7	138	1,646	300	3,578			246	12.9	
29	Rain	0.52	1.53	61	7.2	128	1,633	152	1,940	2.90	37	134	11.5	
30	Rain	0.15	1.65	61	7.4	167	2,298	212	2,917			190	10.8	
31	Rain	0.06	1.60	61	7.4	168	2,242	220	2,936			192	10.0	
Total	0	4.56	50.37	1,860	217.1	4,888	66,601	5,408	73,372	14.20	195	4,770	354.5	
Max.	0	0.93	1.73	62	7.8	228	3,252	300	3,578	4.20	60	246	16.1	
Min.	0	0.05	1.43	58	7.2	126	1,633	116	1,674	2.90	37	108	9.4	
Avg.	0	0.30	1.62	60	7.5	163	2,220	180	2,446	3.55	49	159	11.8	
Count	15	15.00	31.00	31	29.0	30	30	30	30	4.00	4	30	30.0	

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

AUGUST 1993 - PRIMARY EFFLUENT SHEET

PN-Day	P Eff. BOD mgIL	P Eff. BOD Lbs.	P Eff. SS mgIL	P. Eff. SS Lbs.	P Eff. Phos. mgIL	P Eff. Phos. Lbs.	P Eff. VSS mgIL	P Eff. NH3-N mgIL	Flow MGD	BOD Pri. Removal %	SS Pri. Removal %	P Pri. Removal %
1	123	1,775	76	1,097			70	11.2	1.73	16	34	
2	86	1,234	86	1,234	2.30	33	86	10.9	1.72	47	61	30
3	156	2,225	70	998			70	12.3	1.71	32	55	
4	84	1,212	56	808			56	11.8	1.73	40	59	
5	126	1,786	76	1,078			76	11.4	1.70	33	51	
6	84	1,128	66	886			64	13.0	1.61	54	67	
7	87	1,081	70	870			58	14.5	1.49	46	55	
8	81	980	68	822			60	13.2	1.45	50	55	
9	99	1,346	70	952			44	12.2	1.63	43	64	
10	90	1,171	62	807			50	13.6	1.56	40	58	
11	138	1,853	76	1,020	2.60	35	64	12.1	1.61	28	45	32
12	87	1,226	66	930			64	12.1	1.69	31	54	
13	89	1,225	76	1,046			66	13.1	1.65	53	63	
14	74	981	60	796			50	12.2	1.59	44	60	
15	83	1,004	74	895			64	13.7	1.45	39	61	
16	81	1,101	94	1,278			82	12.6	1.63	46	52	
17	99	1,404	78	1,106			68	14.6	1.70	37	65	
18	90	1,254	62	864			48	14.1	1.67	53	68	
19	105	1,445	74	1,018			62	14.5	1.65	31	71	
20	132	1,838	82	1,142			64	14.4	1.67	12	45	
21	96	1,281	76	1,014			62	14.5	1.60	35	51	
22	105	1,296	72	889			26	13.7	1.48		58	
23	87	1,233	84	1,191	3.00	43	80	12.8	1.70	47	56	29
24	87	1,197	62	853			58	12.3	1.65	51	51	
25	123	1,713	50	696			40	13.2	1.67	27	73	
26	96	1,377	104	1,492			84	13.5	1.72	48	50	
27	108	1,531	86	1,219			58	13.9	1.70	36	55	
28	102	1,216	82	978			64	13.5	1.43	26	73	
29	110	1,404	82	1,046	2.60	33	64	13.0	1.53	14	46	10
30	84	1,156	80	1,101			72	13.1	1.65	50	62	
31	129	1,721	68	907			56	12.4	1.60	23	69	
Total	3,121	42,394	2,288	31,032	10.50	144	1,930	403.4	50.37	1,132	1,787	101
Max.	156	2,225	104	1,492	3.00	43	86	14.6	1.73	54	73	32
Min.	74	980	50	696	2.30	33	26	10.9	1.43	12	34	10
Avg.	101	1,368	74	1,001	2.63	36	62	13.0	1.62	38	58	25
Count	31	31	31	31	4.00	4	31	31.0	31.00	30	31	4

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

AUGUST 1993 - ACTIVATED SLUDGE SHEET

PN-Day	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading flm	Mix Liq SS mgIL	Mix Liq VSS mgIL	Mix Liq Settl %	Mix Liq SDI %	Mix Liq DO mgIL	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mgIl	PE SS mgIL
1	48	5.0								208			92	360	1.73	123	76
2		5.0	4.1	0.33	1,701	1,255	36.0	0.47	4.8	205	0.33	0.25	91	360	1.72	86	86
3		5.0	5.1	0.60	1,709	1,239	66.0	0.26	2.1	206	0.38	0.29	96	360	1.71	156	70
4		5.0	6.2	0.32	1,682	1,276	43.0	0.39	0.5	267	0.39	0.29	95	360	1.73	84	56
5		5.1	4.9	0.44	1,781	1,357	50.0	0.36	5 3	269	0.38	0.28	95	360	1.70	126	76
6		5.4	7.0	0.24	2,069	1,580	75.0	0.28	4.6	267	0.40	0.30	102	504	1.61	84	66
7		5.8								272			110	576	1.49	87	70
8		5.9								270			111	648	1.45	81	68
9		5.3	4.9	0.39	1,556	1,156	39.0	0.40	6.0	191	0.31	0.24	98	648	1.63	99	70
10		5.5	5.7	0.34	1,530	1,153	40.0	0.38	2.6	195	0.27	0.21	101	504	1.56	90	62
11		5.4	4.2	0.56	1,447	1,103	39.0	0.37	4.1	220	0.28	0.21	95	504	1.61	138	76
12		5.1	5.0	0.34	1,560	1,220	40.0	0.39	3.6	231	0.33	0.26	93	504	1.69	87	66
13		5.2	4.5	0.33	1,572	1,243	45.0	0.35	4.7	179	0.30	0.24	93	576	1.65	89	76
14		5.4								188			95	576	1.59	74	60
15		5.9								194			103	576	1.45	83	74
16		5.3	3.7	0.30	1,592	1,237	40.0	0.40	4.4	190	0.29	0.23	94	648	1.63	81	94
17		5.1	4.2	0.40	1,541	1,181	45.0	0.34	3.3	194	0.26	0.20	91	648	1.70	99	78
18		5.2	5.6	0.34	1,615	1,234	32.0	0.50	2.4	213	0.30	0.23	98	648	1.67	90	62
19		5.2	4.9	0.38	1,663	1,258	39.0	0.43	4.2	214	0.27	0.21	98	648	1.65	105	74
20		5.2	4.2	0.51	1,607	1,215	34.0	0.47	4.5	230	0.31	0.23	98	648	1.67	132	82
21		5.4								248			102	648	1.60	96	76
22		5.8								243			108	648	1.48	105	72
23		5.1	4.1	0.33	1,630	1,235	39.0	0.42	5.2	235	0.30	0.22	93	648	1.70	87	84
24		5.2	5.9	0.30	1,675	1,329	30.0	0.56	4.2	237	0.34	0.27	97	648	1.65	87	62
25		5.2	2.6	1.16	613	494	10.0	0.61	7.2	199	0.13	0.11	85	216	1.67	123	50
26		5.0	1.4	0.82	719	560	11.0	0.65	4.9	197	0.19	0.14	77	0	1.72	96	104
27		5.1	3.2	0.51	1,290	1,000	19.0	0.68	3.7	193	0.32	0.25	74	288	1.70	108	86
28		6.0								195			90	288	1.43	102	82
29		5.6								202			86	288	1.53	110	82
30		5.2	4.7	0.28	1,723	1,356	27.0	0.64	3.9	193	0.33	0.26	75	432	1.65	84	80
31		5.4	6.2	0.39	1,894	1,462	27.0	0.70	2.4	217	0.38	0.30	79	432	1.60	129	68
Total	48	164.9	102.5	9.60	34,169	26,143	826.0	10.05	88.6	6,762	6.78	5.22	2,915	15,192	50.37	3,121	2,288
Max.	48	6.0	7.0	1.16	2,069	1,580	75.0	0.70	7.2	272	0.40	0.30	111	648	1.73	156	104
Min.	48	5.0	1.4	0.24	613	494	10.0	0.26	0.5	179	0.13	0.11	74	0	1.43	74	50
Avg.	48	5.3	4.7	0.44	1,553	1,188	37.5	0.46	4.0	218	0.31	0.24	94	490	1.62	101	74
Count	1	31.0	22.0	22.00	22	22	22.0	22.00	22.0	31	22.00	22.00	31	31	31.00	31	31

Robert J. Swalwell
Superintendent

MARSHALL WWTP & INDUSTRIAL PRETREATMENT PROGRAM - MARSHALL NC 28103 - PERMIT NC0026540

OCTOBER 1992 - DISCHARGE MONITORING REPORT - DISCHARGE NO 001A

	F.Eff. D.O. mg/L	F.Eff. pH SU	F.Eff. SS mg/L	F.Eff. SS Lbs.	F.Eff. Total-P mg/L	Flow MGD	F.Eff. Chlorine mg/L	F.Eff. CBOD mg/L	F.Eff. CBOD Lbs.	F.Eff. NH3 as N mg/L	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %	Mercury mg/L
Day																
1	6.0	7.4	8	115		1.73	0.008	7	101	6.2	89	360	93	95		<0.0005
2	6.9	7.6	11	158	0.32	1.72	0.006	4	57	8.2	118	144	95	98	90	
3	6.1	7.5	10	143		1.71	0.003	13	185	8.5	121	108	94	94		
4	6.4	7.4	14	202		1.73	0.000	11	159	7.9	114	240	90	92		
5	7.0	7.4	14	198		1.70	0.000	5	71	8.1	115	52	91	97		
6	6.7	7.4	10	134		1.61	0.000	6	81	8.2	110	188	95	97		<0.0005
7	7.1	7.4	4	50		1.49	0.007	5	62	11.0	137	320	97	97		
8	7.3	7.4	10	121		1.45	0.008	5	60	10.4	126	72	93	97		
9	7.3	7.6	14	190		1.63	0.000	6	82	9.8	133	24	93	97		
10	6.6	7.4	6	78		1.56	0.000	6	78	10.1	131	320	96	96		
11		7.6	10	134	0.33	1.61	0.000	9	121	9.7	130	80	93	95	91	<0.0005
12	6.4	7.5	4	56		1.69	0.000	4	56	8.1	114	38	97	97		
13	6.8	7.6	10	138		1.65	0.000	4	55	9.8	135	15	95	98		
14	6.2	7.5	3	40		1.59	0.003	4	53	9.7	129	134	98	97		
15	6.2	7.6	6	73		1.45	0.000	4	48	9.7	117	228	97	97		
16	6.9	7.5	6	82		1.63	0.000	4	54	10.7	145	240	97	97		
17	6.7	7.5	8	113		1.70	0.000	6	85	12.5	177	117	96	96		
18	6.3	7.5	9	125		1.67	0.000	7	97	12.1	169	120	95	96		
19	6.6	7.5	6	83		1.65	0.000	4	55	12.5	172	105	98	97		<0.0005
20	6.7	7.4	7	97		1.67	0.001	4	56	11.4	159	26	95	97		
21	6.8	7.6	4	53		1.60	0.002	5	67	11.1	148	38	97	97		
22	6.7	7.7	4	49		1.48	0.000	5	62	10.6	131	34				
23	7.3	7.4	11	156	0.31	1.70	0.000	4	57	10.8	153	12	94	98	93	
24	6.7	7.3	5	69		1.65	0.000	4	55	9.2	127	33	96	98		
25	7.4	7.3	7	97		1.67	0.000	9	125	10.3	143	34	96	95		
26	7.1	7.6	13	186		1.72	0.000	8	115	9.4	135	120	94	96		
27	6.5	7.3	8	113		1.70	0.000	7	99	11.7	166	87	96	96		
28	6.5	7.5	5	60		1.43	0.002	4	48	11.5	137	90	98	97		
29	6.8	7.1	8	102	0.26	1.53	0.002	4	51	10.6	135	118	95	97	91	
30	6.7	7.4	6	83		1.65	0.000	4	55	12.1	167	20	97	98		
31	6.0	7.4	2	27		1.60	0.000	5	67	9.9	132	20	99	97		
Total	200.7	231.3	243	3,326	1.22	50.37	0.039	177	2,418	311.8	4,215	3,537	2,860	2,896	365	<0.0005
Max.	7.4	7.7	14	202	0.33	1.73	0.008	13	185	12.5	177	360	99	98	93	<0.0005
Min.	6.0	7.1	2	27	0.26	1.43	0.000	4	48	6.2	89	12	90	92	90	<0.0005
Avg.	6.7	7.5	8	107	0.31	1.62	0.001	6	78	10.1	136	G 76	95	97	91	<0.0005
Count	30.0	31.0	31	31	4.00	31.00	31.000	31	31	31.0	31	31	30	30	4	<0.0005

G = geometric mean

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

AUGUST 1993 - MISCELLANEOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs	Ferric Chloride Lbs.	SO2 Lbs.	Lime Lbs	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	PH	Lbs. of Lime per lb. of Dry Solids
1		2,640	1,690	7	298	5	187	4,000	4.6	61	5.9	0.12
2		2,520	760	10	298	5	391	6,100	4.0	70	5.8	0.19
3		2,520	880	13	398	8	340	6,000	4.1	72	5.6	0.16
4		3,000	590	14	298	5	323	6,000	3.7	72	5.7	0.17
5		3,000	1,380	14	397	8	357	6,000	3.8	73	5.6	0.19
6		2,760	370	13	397	12	306	6,000	3.8	74	5.7	0.16
7		2,760	2,400	16	199	15	323	6,500	3.9	75	5.8	0.15
8		2,760	1,510	14	397	2	357	6,000	3.9	74	5.6	0.18
9		2,640	1,420	17	199	5	340	6,000	4.3	73	5.6	0.16
10		2,640	1,380	17	397	7	510	6,000	3.7	73		0.27
11		2,640	1,450	13	298	10	357	6,500	3.6	75	5.7	0.18
12		2,760	1,620	20	298	10	357	6,000	5.0	66	5.8	0.14
13		2,520	1,640	22	397	12	357	6,000	4.3	74	5.8	0.16
14		2,520	530	21	496	14	391	6,000	3.3	76	5.4	0.24
15		2,420	1,110	21	99	14	391	6,000	3.9	75	5.8	0.20
16		2,640	2,540	22	397	14	340	6,000	3.9	72	5.4	0.17
17		2,520	1,390	21	99	16	323	6,000	3.5	74	5.6	0.18
18		2,640	1,190	16	397	21	391	6,000	3.9	71	5.6	0.20
19		2,640	1,610	22	298	19	374	6,000	3.3	71	5.9	0.22
20		2,640	1,480	25	199	11	357	6,000	4.5	71	5.5	0.16
21		2,760	1,520	25	496	17	374	6,000	3.5	72	5.6	0.21
22		2,640	1,260	32	199	17	391	6,000	3.5	73	5.6	0.22
23		2,640	1,340	19	298	17	391	6,000	3.5	73	6.0	0.22
24		2,640	350	15	298	18	374	6,000	3.6	72	5.6	0.21
25		2,640	130	25	298	20	357	6,000	3.1	73	5.9	0.23
26		2,400	140	24	298	20	357	6,000	3.9	74	5.6	0.18
27		2,400	275	29	496	22	357	6,000	3.5	72	5.9	0.20
28		2,520	275	27	99	7	504	6,000	3.2	71	6.9	0.31
29		2,520	280	28	199	18	306	6,000	4.0	74	5.7	0.15
30		2,520	270	14	397	15	374	6,000	5.2	60	5.9	0.14
31		2,520	140	20	397	18	340	6,000	3.9	72	6.1	0.17
Total		81,380	32,920	596	9,731	402	11,197	185,100	119.9	2,228	172.6	5.87
Max.		3,000	2,540	32	496	22	510	6,500	5.2	76	6.9	0.31
Min.		2,400	130	7	99	2	187	4,000	3.1	60	5.4	0.12
Avg.		2,625	1,062	19	314	13	361	5,971	3.9	72	5.8	0.19

Manpower

Superintendent	1
Asst. Supt.	1
Operators	2
IPP Coordinator	1
Total	5

Robert J. Swalwell
Superintendent

[illegible] WASTEWATER TREATMENT PLANT

SEPTEMBER 1993 - PLANT EFFLUENT SHEET

	-----Weather----		Inf. Flow	Inf. Temp	Inf. pH	Inf. BOD	Inf. BOD	Inf. SS	Inf. SS	Inf. Pnos.	Inf. Pnos.	Inf. VSS	Inf. NH3-N	--Remarks or Other Parameters--
	Type	Precip.	MGD	F	SU	mgIL	Lbs.	mgIL	Lbs.	mgIL	Lbs.	mgIL	mgIL	
PN-														
Day														
1			1.58	61	7.2	111	1,463	152	2,003			132	10.4	
2	Rain	1.14	1.59	62	7.1	143	1,896	142	1,883	3.30	44	124	10.9	
3	Rain	0.15	1.55	62	7.6	167	2,159	158	2,042			136	11.5	
4			1.45	57	7.6	131	1,584	124	1,500			106	10.9	
5	Rain	0.15	1.45	57	7.5	93	1,125	120	1,451			112	9.8	
6			1.53	58	7.5	146	1,863	178	2,271			158	10.6	
7	Rain	0.13	1.73	60	7.5	150	2,164	150	2,164			134	9.8	
8	Rain	0.02	1.61	60	7.4	141	1,893	162	2,175			154	11.7	
9	Rain	0.04	1.60	60	7.4	173	2,309	148	1,975			132	12.0	
10			1.60	60	7.7	155	2,068	136	1,815			136	12.4	
11	Rain	0.05	1.42	60	7.6	150	1,776	142	1,682			128	14.2	
12	Rain	0.08	1.43	60	7.7	144	1,717	158	1,884	3.20	38	152	13.1	
13	Rain	0.04	1.53	59	7.6	189	2,412	172	2,195			168	12.6	
14	Rain	1.84	1.71	60	7.1	155	2,211	142	2,025			116	10.1	
15			1.66	59	7.3	126	1,744	164	2,270			152	11.3	
16			1.68	60	7.3	123	1,723	168	2,354	2.90	41	160	10.7	
17			1.63	60	7.5	159	2,161	140	1,903			136	11.0	
18			1.48	59	7.5	173	2,135	116	1,432			94	10.6	
19	Rain	0.09	1.46	59	7.8	148	1,802	170	2,070			158	10.9	
20	Rain	0.33	1.76	60	7.9	105	1,541	154	2,260			136	8.5	
21			1.88	60	7.4	122	1,913	138	2,164			130	10.2	
22	Rain	0.23	1.76	60	7.4	123	1,805	150	2,202			132	9.3	
23			1.68	60	7.4	143	2,004	164	2,298	3.30	46	148	10.9	
24			1.70	60	7.5	126	1,786	122	1,730			108	9.7	
25	Rain	0.84	1.45	60	7.5	98	1,185	122	1,475			94	10.4	
26	Rain	0.14	1.49	59	8.1	116	1,441	146	1,814			120	10.3	
27	Rain	0.64	1.75	60	7.4	126	1,839	166	2,423			148	9.6	
28	Rain	0.03	1.73	60	7.2	90	1,299	160	2,309			144	15.9	
29	Rain	0.24	1.68	58	7.4	152	2,130	126	1,765			116	10.7	
30			1.64	59	7.4	165	2,257	170	2,325			160	12.0	
31														
Total	0	6.18	48.21	1,789	224.5	4,143	55,407	4,460	59,860	12.70	169	4,024	332.0	
Max.	0	1.84	1.88	62	8.1	189	2,412	178	2,423	3.30	46	168	15.9	
Min.	0	0.02	1.42	57	7.1	90	1,125	116	1,432	2.90	38	94	8.5	
Avg.	0	0.34	1.61	60	7.5	138	1,847	149	1,995	3.18	42	134	11.1	
Count	18	18.00	30.00	30	30.0	30	30	30	30	4.00	4	30	30.0	

Robert J. Swalwell
Superintendent

[illegible] WASTEWATER TREATMENT PLANT

SEPTEMBER 1993 - PRIMARY EFFLUENT SHEET

PN- Day	P Eff. BOD mgIL	P Eff. BOD Lbs.	P Eff. SS mgIL	P. Eff. SS Lbs.	P Eff. Phos. mgIL	P Eff. Phos. Lbs.	P Eff. VSS mgIL	P Eff. NH3-N mgIL	Flow MGD	BOD Prl. Removal %	SS Prl. Removal %	P Prl. Removal %
1	81	1,067	96	1,265			88	13.5	1.58	27	37	
2	89	1,180	82	1,087	2.60	34	70	13.6	1.59	38	42	21
3	111	1,435	76	982			66	13.9	1.55	34	52	
4	84	1,016	68	822			60	12.9	1.45	36	45	
5	81	980	72	871			72	12.2	1.45	13	40	
6	86	1,097	68	868			62	12.5	1.53	41	62	
7	99	1,428	80	1,154			76	11.8	1.73	34	47	
8	84	1,128	72	967			70	13.7	1.61	40	56	
9	99	1,321	66	881			60	14.2	1.60	43	55	
10	107	1,428	80	1,068			80	15.4	1.60	31	41	
11	111	1,315	64	758			60	16.5	1.42	26	55	
12	96	1,145	80	954	2.40	29	76	14.6	1.43	33	49	25
13	102	1,302	74	944			74	13.9	1.53	46	57	
14	84	1,198	74	1,055			66	13.2	1.71	46	48	
15	75	1,038	72	997			66	14.0	1.66	40	56	
16	66	925	60	841	2.00	28	58	12.4	1.68	46	64	33
17	102	1,387	70	952			70	13.7	1.63	36	50	
18	84	1,037	72	889			56	13.4	1.48	51	38	
19	78	950	72	877			64	12.3	1.46	47	58	
20	62	910	46	675			38	9.6	1.76	41	70	
21	69	1,082	68	1,066			56	12.0	1.88	43	51	
22	78	1,145	62	910	2.20	32	50	11.1	1.76	37	59	33
23	84	1,177	78	1,093			64	13.1	1.68	41	52	
24	44	624	76	1,078			64	12.1	1.70	65	38	
25	80	967	84	1,016			56	13.0	1.45	18	31	
26	83	1,031	82	1,019			66	11.8	1.49	28	44	
27	75	1,095	86	1,255			68	11.0	1.75	40	48	
28	83	1,198	80	1,154			64	12.4	1.73	8	50	
29	99	1,387	58	813			42	11.9	1.68	35	54	
30	81	1,108	58	793			50	10.3	1.64	51	66	
31												
Total	2,557	34,099	2,176	29,103	9.20	123	1,912	386.0	48.21	1,115	1,515	112
Max.	111	1,435	96	1,265	2.60	34	88	16.5	1.88	65	70	33
Min.	44	624	46	675	2.00	28	38	9.6	1.42	8	31	21
Avg.	85	1,137	73	970	2.30	31	64	12.9	1.61	37	51	28
Count	30	30	30	30	4.00	4	30	30.0	30.00	30	30	4

Robert J. Swalwell
Superintendent

[illegible] WASTEWATER TREATMENT PLANT

SEPTEMBER 199[illegible] - AERATION SLUDGE SHEET

PN-	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading #/m	Mix Liq SS mg/L	Mix Liq VSS mg/L	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mg/L	Air Cu. Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mg/l	PE SS mg/L
Day																	
1	48	5.5	4.6	0.23	1,933	1,536	30.0	0.64	3.5	224	0.41	0.32	66	50	1.58	81	96
2		5.4	4.8	0.32	1,729	1,236	27.0	0.64	5.1	221	0.37	0.27	71	50	1.59	89	82
3		5.6	5.1	0.38	1,665	1,272	23.0	0.72	4.1	235	0.35	0.26	79	50	1.55	111	76
4		5.9								214			87	58	1.45	84	68
5		5.9								227			88	58	1.45	81	72
6		5.6								232			83	58	1.53	86	68
7		5.0	3.7	0.44	1,418	1,083	17.0	0.83	5.4	227	0.33	0.26	74	43	1.73	99	80
8		5.4	4.9	0.32	1,571	1,174	19.0	0.83	4.4	226	0.34	0.26	78	43	1.61	84	72
9		5.4	5.4	0.37	1,583	1,181	20.0	0.79	4.4	219	0.38	0.28	79	50	1.60	99	66
10		5.4	4.6	0.39	1,630	1,227	21.0	0.78	3.8	231	0.33	0.24	80	50	1.60	107	80
11		6.1								227			90	50	1.42	111	64
12		6.0								222			92	50	1.43	96	80
13		5.6	5.2	0.35	1,642	1,230	22.0	0.75	3.0	213	0.36	0.27	85	65	1.53	102	74
14		5.0	4.6	0.30	1,615	1,323	21.0	0.77	3.5	221	0.38	0.31	43	58	1.71	84	74
15		5.2	4.5	0.31	1,503	1,111	20.0	0.75	4.4	228	0.36	0.26	80	50	1.66	75	72
16		5.1	5.6	0.26	1,580	1,195	21.0	0.75	4.2	227	0.38	0.28	78	50	1.68	66	60
17		5.3	4.9	0.39	1,570	1,187	21.0	0.75	4.2	230	0.33	0.25	30	43	1.63	102	70
18		5.8								218			87	58	1.48	84	72
19		5.9								224			93	58	1.46	78	72
20		4.9	7.0	0.26	1,580	1,161	23.0	0.69	4.1	229	0.35	0.26	48	55	1.76	62	46
21		4.6	4.5	0.30	1,591	1,190	22.0	0.72	4.4	233	0.38	0.28	72	58	1.88	69	68
22		4.9	5.0	0.34	1,531	1,119	20.0	0.77	4.8	227	0.36	0.26	76	58	1.76	78	62
23		5.1	4.0	0.36	1,458	1,078	19.0	0.77	3.1	234	0.29	0.22	78	58	1.68	84	78
24		5.1	4.0	0.19	1,444	1,090	20.0	0.72	3.0	232	0.36	0.27	80	50	1.70	44	76
25		5.9								231			94	50	1.45	80	84
26		5.8								232			91	50	1.49	83	82
27		4.9	3.7	0.31	1,558	1,171	18.0	0.87	3.5	233	0.36	0.27	78	50	1.75	75	86
28		5.0	4.2	0.33	1,610	1,220	18.0	0.89	2.7	238	0.35	0.26	81	58	1.73	83	80
29		5.1								241			65	29	1.68	99	58
30		5.3	2.0	0.89	539	416	7.0	0.77	6.9	191	0.12	0.09	65	0	1.64	81	58
31																	
Total	48	161.7	92.2	7.06	30,750	23,200	409.0	15.20	82.5	6,787	6.89	5.17	2,341	1,508	48.21	2,557	2,176
Max.	48	6.1	7.0	0.89	1,933	1,536	30.0	0.89	6.9	241	0.41	0.32	94	65	1.88	111	96
Min.	48	4.6	2.0	0.19	539	416	7.0	0.64	2.7	191	0.12	0.09	43	0	1.42	44	46
Avg.	48	5.4	4.6	0.35	1,538	1,160	20.5	0.76	4.1	226	0.34	0.26	78	50	1.61	85	73
Count	1	30.0	20.0	20.00	20	20	20.0	20.00	20.0	30	20.00	20.00	30	30	30.00	30	30

Robert J. Swalwell
Superintendent

SEPTEMBER 1998 - DISCHARGE MONITORING REPORT - DISCHARGE NO. 001A

Day	F.Eff. D.O. mg/L	F.Eff. pH SU	F.Eff. SS mg/L	F.Eff. SS Lbs.	F.Eff. Total-P mg/L	Flow MGD	F.Eff. Chlorine mg/L	F.Eff. CBOD mg/L	F.Eff. CBOD Lbs.	F.Eff. NH3 as N mg/L	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %	Mercury mg/L
1	6.6	7.3	6	79		1.58	0.000	4	53	11.3	149	40	96	96		<0.0002
2	6.7	7.1	6	80	0.41	1.59		5	66	12.1	160	27	96	97	88	
3	6.7	7.6	3	39		1.55	0.000	4	52	11.7	151	155	98	98		
4	7.1	7.6	4	48		1.45	0.004	3	36	10.2	123	65	97	98		
5	6.8	7.6	4	48		1.45	0.002	3	36	9.1	110	143	97	97		
6	7.1	7.6	4	51		1.53	0.000	4	51	8.3	106	93	98	97		
7	7.3	7.6	7	101		1.73	0.000	5	72	8.2	118	116	95	97		
8	6.8	7.5	5	67		1.61	0.000	5	67	7.9	106	180	97	96		
9	7.1	7.4	3	40		1.60	0.000	5	67	8.7	116	128	98	97		
10	6.9	7.6	5	67		1.60	0.000	6	80	8.7	116	100	96	96		
11	6.8	7.7	2	24		1.42	0.002	5	59	7.9	94	93	99	97		
12	6.1	7.8	4	48	0.26	1.43	0.001	10	119	7.4	88	91	97	98	92	<0.0002
13	6.7	7.9	4	51		1.53	0.000	4	51	6.7	85	68	98	93		
14	6.4	7.1	3	43		1.71	0.000	5	71	7.7	110	44	98	97		
15	6.7	7.3	5	69		1.66	0.000	4	55	6.3	87	68	97	97		
16	6.7	7.4	4	56	0.21	1.68	0.000	6	84	5.7	80	50	98	95	93	<0.0002
17	6.7	7.5	3	41		1.63	0.000	5	68	5.6	76	50	98	97		
18	6.2	7.4	2	25		1.48	0.000	5	62	4.4	54	18	98	97		
19	7.1	7.6	3	37		1.46	0.020	5	61	3.3	40	12	98	97		
20		7.4	7	103		1.76	0.000	5	73	3.5	51	37	95	95		
21	7.0	7.4	4	63		1.88	0.000	5	78	2.7	42	57	97	96		<0.0002
22	7.0	7.5	4	59	0.23	1.76	0.000	4	59	2.0	29		97	98	93	
23	6.5	7.4	4	56		1.68	0.000	5	70	2.7	38	55	98	97		
24	6.3	7.4	6	85		1.70	0.002	3	43	3.4	48	47	95	98		
25	6.0	7.3	7	85		1.45		6	73	2.4	29	50	94	94		
26	6.4	8.0	6	75		1.49		12	149	1.5	19	188	96	89		
27	6.5	7.6	9	131		1.75	0.000	6	88	1.6	23	640	95	96		
28	6.5	7.2	6	87		1.73	0.000	6	87	3.3	48	36	96	93		
29	8.0	7.5	13	182		1.68	0.000	11	154	7.6	106	130	90	93		
30	7.6	7.6	13	178		1.64	0.000	12	164	8.8	120	140	92	93		
31																
Total	196.3	224.9	156	2,115	1.11	48.21	0.031	168	2,248	190.7	2,526	2,921	2,894	2,879	366	<0.0002
Max.	8.0	8.0	13	182	0.41	1.88	0.020	12	164	12.1	160	640	99	98	93	<0.0002
Min.	6.0	7.1	2	24	0.21	1.42	0.000	3	36	1.5	19	12	90	89	88	<0.0002
Avg.	6.8	7.5	5	70	0.28	1.61	0.001	6	75	6.4	84	72	96	96	92	<0.0002
Count	29.0	30.0	30	30	4.00	30.00	27.000	30	30	30.0	30	29	30	30	4	<0.0002

Robert J. Swalwell
Superintendent

[illegible] WASTE WATER TREATMENT PLANT

SEPTEMBER 1998 - MISCELLANEOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	SO2 Lbs.	Lime Lbs.	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	Raw Sludge pH	Sludge pH 2 Hours	Sludge pH 16 hrs.	Lbs. of Lime per Lb. of Dry Solids
1		2,640	330	26	298	18	408	7,000	3.5	70	5.9	12.20	10.36	0.20
2		2,520	640	22	298	21	340	6,000	3.6	71	5.9	12.00	11.72	0.19
3		2,520	1,460	28	397	18	340	6,000	3.7	72	5.9	12.05	11.66	0.18
4		2,520	110	22	199	20	357	6,000	4.1	73	5.8	12.25	12.06	0.17
5		2,640	170	15	298	10	340	6,000	3.7	72	5.9	12.01	12.00	0.18
6		2,520	200	25	298	17	391	6,000	3.5	73	5.9	12.26	12.04	0.22
7		2,640	260	18	397	15	425	7,000	3.8	72	5.9	12.03	11.63	0.19
8		2,520	290	2	298	18	374	6,000	3.7	70	6.0	11.50	10.51	0.20
9		2,640	410	25	397	22	391	6,000	3.7	72	6.0	12.10	12.23	0.21
10		2,520	210	27	298	30	340	6,000	3.6	72	6.2	12.31	12.09	0.19
11		2,520	190	28	496	16	340	6,000	3.6	72	6.1	12.24	11.39	0.19
12		2,640	110	10	298	20	306	6,000	3.9	70	6.8	12.67	12.11	0.16
13		2,520	370	23	199	22	306	6,000	3.6	71	6.4	12.20	11.77	0.17
14		2,760	110	22	397	18	306	6,000	4.2	73	6.2	12.17	9.79	0.14
15		2,640	400	23	298	14	340	6,000	4.4	71	5.6	12.14	9.50	0.15
16		2,640	320	25	397	18	340	6,000	3.2	70	6.1	12.28	11.81	0.21
17		2,640	200	26	397	20	340	6,000	3.8	70	5.9	12.00	11.45	0.18
18		2,520	240	16	397	18	340	6,000	3.5	71	6.3	11.92	11.60	0.19
19		2,760	250	26	397	19	340	6,000	3.7	68	6.9	11.95	11.56	0.18
20		2,520	180	26	298	21	357	6,000	3.6	70	6.4	12.00	11.75	0.20
21		2,640	270	25	397	19	374	6,000	3.6	70	6.2	12.15	11.63	0.21
22		2,760	300	25	199	21	340	6,000	3.8	70	6.4	12.14	11.35	0.18
23		2,640	150	25	298	15	323	6,000	3.6	70	6.3	12.05	11.92	0.18
24		2,640	400	23	199	17	374	7,000	3.8	71	6.3	12.19	12.00	0.17
25		2,640	240	17	298	18	340	6,000	3.7	71	6.3	12.19	12.27	0.18
26		2,640	40	21	397	19	289	5,500	3.7	71	6.3	12.57	11.23	0.17
27		2,760	340	27	298	19	323	7,500	3.4	72	6.3	12.40	12.36	0.15
28		2,640	320	27	298	25	340	6,000	3.8	70	6.4	12.34	12.11	0.18
29		2,880	300	28	298	19	323	6,000	3.4	72	6.6	12.31	12.14	0.19
30		2,520	350	30	298	18	340	6,000	3.4	69	6.7	12.30	12.21	0.20
31														
Total		78,600	9,160	683	9,732	565	10,387	184,000	110.6	2,129	185.9	364.92	348.25	5.50
Max.		2,880	1,460	30	496	30	425	7,500	4.4	73	6.9	12.67	12.36	0.22
Min.		2,520	40	2	199	10	289	5,500	3.2	68	5.6	11.50	9.50	0.14
Avg.		2,620	305	23	324	19	346	6,133	3.7	71	6.2	12.16	11.61	0.18

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

OCTOBER 1993 - PLANT INFLUENT SHEET

PN-Day	Weather Type	Weather Precip.	Inf. Flow MGD	Inf. Temp F	Inf. pH SU	Inf. BOD mgIL	Inf. BOD Lbs.	Inf. SS mgIL	Inf. SS Lbs.	Inf. Phos. mgIL	Inf. Phos. Lbs.	Inf. VSS mgIL	Inf. NH3-N mgIL	Remarks or Other Parameters
1			1.59	59	7.5	123	1,631	116	1,538			100	10.9	
2			1.51	60	7.8	117	1,473	114	1,436			96	10.6	
3			1.50	59	8.3	117	1,464	168	2,102			158	10.1	
4			1.63	58	7.6	126	1,713	142	1,930			138	12.3	
5			1.52	58	7.4	152	1,927	164	2,079			160	11.3	
6			1.68	58	7.6	156	2,186	140	1,962			138	10.7	
7			1.71	59	7.5	131	1,868	218	3,109			212	10.0	
8	Rain	1.29	1.80	58	7.8	137	2,057	150	2,252	3.00	45	126	8.4	
9	Rain	0.05	1.45	58	7.4	125	1,512	128	1,548			112	10.7	
10			1.48	55	8.2	129	1,592	172	2,123			148	11.1	
11			1.72	57	7.2	150	2,152	132	1,894			102	9.8	
12			1.73	55	7.5	144	2,078	160	2,309			138	9.9	
13			1.62	56	7.4	144	1,946	134	1,810	3.40	46	130	10.8	
14			1.63	58	7.5	161	2,189	162	2,202			156	10.2	
15	Rain	0.25	1.59	58		155	2,055	126	1,671			120	12.4	
16	Rain	1.31	1.46	58	7.8	134	1,632	126	1,534			118	11.3	
17	Rain	1.03	1.76	58	7.4	130	1,908	148	2,172			126	9.2	
18	Rain	0.03	1.90	57	7.2	134	2,123	152	2,409			150	8.5	
19			1.81	56	7.2	126	1,902	106	1,600	4.30	65	100	6.4	
20			1.94	58	7.2	111	1,796	120	1,942	3.40	55	118	8.3	
21			2.05	58	7.4	102	1,744	124	2,120			100	8.7	
22			1.96	58	7.7	117	1,913	96	1,569			92	9.0	
23			1.62	58	7.7	156	2,108	146	1,973			140	11.2	
24			1.64	58	7.7	128	1,751	130	1,778			122	9.3	
25			1.90	58	7.4	99	1,569	164	2,599			140		
26			1.91	58	7.4	125	1,991	144	2,294			138		
27	Rain	0.05	1.94	58	7.6	131	2,120	180	2,912			174		
28			1.86	57	7.6	132	2,048	132	2,048			122		
29			1.82	57		117	1,776	162	2,459			150		
30			1.78	57	7.7	137	2,034	90	1,336			78		
31			1.52	54	7.8	128	1,623	158	2,003			140		
Total	0	4.01	53.03	1,784	219.5	4,074	57,877	4,404	62,711	14.10	211	4,042	241.1	
Max.	0	1.31	2.05	60	8.3	161	2,189	218	3,109	4.30	65	212	12.4	
Min.	0	0.03	1.45	54	7.2	99	1,464	90	1,336	3.00	45	78	6.4	
Avg.	0	0.57	1.71	58	7.6	131	1,867	142	2,023	3.53	53	130	10.0	
Count	7	7.00	31.00	31	29.0	31	31	31	31	4.00	4	31	24.0	

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

OCTOBER 1993 - PRIMARY EFFLUENT SHEET

PN- Day	P Eff. BOD mgIL	P Eff. BOD Lbs.	P Eff. SS mgIL	P. Eff. SS Lbs.	P Eff. Phos. mgIL	P Eff. Phos. Lbs.	P Eff. VSS mgIL	P Eff. NH3-N mgIL	Flow MGD	BOD Prl. Removal %	SS Prl. Removal %	P Prl. Removal %
1	81	1,074	64	849			46	12.9	1.59	29	45	
2	87	1,096	32	403			28	12.5	1.51	26	72	
3	75	938	48	600			48	11.3	1.50	36	71	
4	99	1,346	62	843			62	13.5	1.63	21	56	
5	96	1,217	72	913			64	13.0	1.52	37	56	
6	102	1,429	82	1,149			82	12.1	1.68	35	41	
7	93	1,326	90	1,284	2.70	39	84	12.3	1.71	29	59	10
8	116	1,741	108	1,621			84	10.6	1.80	15	28	
9	89	1,076	88	1,064			74	11.9	1.45	29	31	
10	93	1,148	100	1,234			84	13.1	1.48	28	42	
11	99	1,420	68	975			66	12.3	1.72	34	48	
12	90	1,299	86	1,241			68	10.9	1.73	38	46	
13	102	1,378	74	1,000	2.60	35	62	13.6	1.62	29	45	26
14	102	1,387	90	1,223			86	13.6	1.63	37	44	
15	95	1,260	96	1,273			80	15.6	1.59	39	24	
16	102	1,242	92	1,120			86	15.4	1.46	24	27	
17	99	1,453	90	1,321			78	12.1	1.76	24	39	
18	95	1,505	88	1,394			76	11.0	1.90	29	42	
19	90	1,359	92	1,389	3.40	51	78	8.7	1.81	29	13	23
20	153	2,475	88	1,424	3.00	49	82	10.2	1.94	-38	27	12
21	69	1,180	80	1,368			66	11.3	2.05	32	35	
22	96	1,569	80	1,308			72	12.5	1.96	18	17	
23	87	1,175	108	1,459			88	14.4	1.62	44	26	
24	66	903	90	1,231			82	11.8	1.64	48	31	
25	99	1,569	108	1,711			68		1.90	0	34	
26	66	1,051	88	1,402			74		1.91	47	39	
27	126	2,039	84	1,359			80		1.94	4	53	
28	96	1,489	78	1,210			76		1.86	27	41	
29	134	2,034	80	1,214			40		1.82	-13	51	
30	102	1,514	68	1,009			62		1.78	26	24	
31	120	1,521	86	1,090			70		1.52	4	46	
Total	3,019	43,214	2,560	36,683	11.70	173	2,196	296.6	53.03	767	1,253	71
Max.	153	2,475	108	1,711	3.40	51	88	15.6	2.05	48	72	26
Min.	66	903	32	403	2.60	35	28	8.7	1.45	-38	13	10
Avg.	97	1,394	83	1,183	2.93	43	71	12.4	1.71	25	40	18
Count	31	31	31	31	4.00	4	31	24.0	31.00	31	31	4

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

OCTOBER 1993 - ACTIVATED SLUDGE SHEET

PN-Day	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading fIm	Mix Liq SS mgIL	Mix Liq VSS mgIL	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mgIL	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mgIl	PE SS mgIL
1	48	5.4								188			74	0	1.59	81	64
2		5.7								194			74	0	1.51	87	32
3		5.7								164			72	22	1.50	75	48
4		5.3	8.2	0.26	2,311	1,724	28.0	0.83	3.2	191	0.41	0.31	65	22	1.63	99	62
5		5.7	8.0	0.23	2,435	1,790	32.0	0.76	2.5	211	0.46	0.34	73	29	1.52	96	72
6		5.1	6.3	0.27	2,400	1,774	32.0	0.75	4.0	236	0.47	0.34	76	43	1.68	102	82
7		5.0	6.6	0.21	2,833	2,128	37.0	0.77	2.8	241	0.59	0.44	77	58	1.71	93	90
8		4.8	4.8	0.30	2,600	1,957	34.0	0.76	3.5	240	0.57	0.42	72	58	1.80	116	108
9		5.9								262			89	58	1.45	89	88
10		5.8								253			91	58	1.48	93	100
11		5.0	6.0	0.33	1,944	1,443	26.0	0.75	5.4	179	0.45	0.33	77	65	1.72	99	68
12		5.0	4.7	0.31	1,950	1,416	26.0	0.75	2.9	242	0.44	0.35	76	58	1.73	90	86
13		5.3	5.2	0.36	1,748	1,281	24.0	0.73	5.6	270	0.43	0.31	80	58	1.62	102	74
14		5.3	4.2	0.36	1,726	1,272	26.0	0.66	5.0	205	0.37	0.26	79	50	1.63	102	90
15		5.4	4.1	0.32	1,742	1,308	25.0	0.70	2.3	194	0.39	0.29	82	50	1.59	95	96
16		5.9								194			89	50	1.46	102	92
17		4.9								202			74	50	1.76	99	90
18		4.5	3.8	0.39	1,747	1,273	23.0	0.76	4.5	198	0.40	0.31	66	50	1.90	95	88
19		4.8	3.9	0.36	1,820	1,276	22.0	0.83	3.2	201	0.43	0.33	70	58	1.81	90	92
20		4.4	3.8	0.62	1,804	1,340	21.0	0.86	4.2	197	0.44	0.33	65	58	1.94	153	88
21		4.2	3.8	0.30	1,740	1,333	21.0	0.83	4.3	204	0.38	0.29	62	58	2.05	69	80
22		4.4	4.0	0.40	1,726	1,316	21.0	0.82	4.5	204	0.37	0.28	65	58	1.96	96	80
23		5.3								200			77	58	1.62	87	108
24		5.3								195			76	58	1.64	66	90
25		4.5	2.9	0.42	1,669	1,259	21.0	0.79	6.3	197	0.38	0.29	70	58	1.90	99	108
26		4.5	3.6	0.27	1,683	1,279	22.0	0.77	4.4	196	0.38	0.29	70	50	1.91	66	88
27		4.4	3.6	0.54	1,651	1,271	20.0	0.83	3.4	205	0.46	0.35	60	50	1.94	126	84
28		4.6	4.2	0.38	1,696	1,301	21.0	0.81	5.1	195	0.30	0.23	70	50	1.86	96	78
29		4.7	4.6	0.50	1,848	1,365	24.0	0.77	4.1	202	0.33	0.25	76	50	1.82	134	80
30		4.8								210			78	50	1.78	102	68
31		5.7								212			111	50	1.52	120	86
Total	48	157.6	96.2	7.11	39,073	29,106	506.0	15.51	81.2	6,482	8.45	6.34	2,336	1,485	53.03	3,019	2,560
Max.	48	5.9	8.2	0.62	2,833	2,128	37.0	0.86	6.3	270	0.59	0.44	111	65	2.05	153	108
Min.	48	4.2	2.9	0.21	1,651	1,259	20.0	0.66	2.3	164	0.30	0.23	60	0	1.45	66	32
Avg.	48	5.1	4.8	0.36	1,954	1,455	25.3	0.78	4.1	209	0.42	0.32	75	48	1.71	97	83
Count	1	31.0	20.0	20.00	20	20	20.0	20.00	20.0	31	20.00	20.00	31	31	31.00	31	31

Robert J. Swalwell
Superintendent

MARSHALL WWTP 801 INDUSTRIAL RD. MARSHALL MI 49068 - PERMIT MI0023540

OCTOBER 1993 - DISCHARGE MONITORING REPORT - DISCHARGE NO. 001A

	F.Eff. D.O. mgIL	F.Eff. pH SU	F.Eff. SS mgIL	F.Eff. SS Lbs.	F.Eff. Total-P mgIL	Flow MGD	F.Eff. Chlorine mgIL	F.Eff. CBOD mgIL	F.Eff. CBOD Lbs.	F.Eff. NH3 as N mgIL	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %	Mercury mgIL
Day																
1	7.4	7.2	27	358		1.59	0.000	20	265	11.2	149	170	77	83		
2	6.1	7.7	10	126		1.51	0.000	12	151	9.0	113	139	91	90		
3	6.7	8.2	10	125		1.50	0.002	7	88	6.8	85	109	94	94		<.0002
4	6.3	7.4	18	245		1.63	0.000	10	136	10.6	144	134	87	92		
5	6.8	7.4	16	203		1.52	0.000	8	101	10.4	132	141	90	95		
6	6.7	7.4	16	224		1.68	0.001	12	168	11.1	156	23	89	92		
7	6.5	7.5	6	86	0.31	1.71	0.000	5	71	9.6	137	25	97	96	90	<.0002
8	6.4	7.4	7	105		1.80	0.000	4	60	8.5	128	25	95	97		
9	6.2	7.3	8	97		1.45	0.000	5	60	6.6	80	6	94	96		
10	7.0	7.5	11	136		1.48	0.019	6	74	6.9	85	16	94	95		
11	7.4	7.4	3	43		1.72	0.009	7	100	9.4	135	27	98	95		
12	6.8	7.6	14	202		1.73	0.000	7	101	9.9	143	16	91	95		
13	7.2	7.4	5	68	0.40	1.62	0.000	7	95	8.2	111	20	96	95	88	<.0002
14	7.2	7.5	10	136		1.63	0.000	6	82	9.3	126	16	94	96		
15			10	133		1.59		5	66	13.4	178		92	97		
16	6.7	7.7	9	110		1.46	0.000	6	73	13.8	168	55	93	96		
17	6.6	7.3	9	132		1.76	0.000	5	73	10.1	148	120	94	96		
18	7.2	7.4	9	143		1.90	0.000	5	79	8.7	138	66	94	96		
19	6.8	7.4	12	181	0.27	1.81	0.000	4	60	6.3	95	120	89	97	94	
20	7.2	7.4	9	146	0.39	1.94	0.000	3	49	8.2	133	44	93	97	88	
21	7.2	7.4	9	154		2.05	0.000	4	68	8.4	144	20	93	96		<.0002
22	7.4	7.5	6	98		1.96	0.000	6	98	9.0	147	63	94	95		
23	7.1	7.9	6	81		1.62	0.000	4	54	10.5	142	41	96	99		
24	7.3	7.6	4	55		1.64	0.001	4	55	9.9	135	36	97	97		
25	7.8	7.5	12	190		1.90	0.000	6	95			90	93	94		
26	7.5	7.3	6	96		1.91	0.000	8	127			50	96	94		
27	7.6	7.7	6	97		1.94	0.000	6	97			37	97	95		
28	7.4	7.6	12	186		1.86	0.001	7	109			74	91	95		
29	7.6	7.8	8	121		1.82	0.000	8	121			62	95	93		
30	7.7	7.6	9	134		1.78	0.000	7	104			16	90	95		
31	7.3	7.7	5	63		1.52	0.001	5	63			40	97	96		
Total	211.1	225.7	302	4,271	1.37	53.03	0.033	209	2,946	225.8	3,150	1,801	2,881	2,939	360	<.0002
Max.	7.8	8.2	27	358	0.40	2.05	0.019	20	265	13.8	178	170	98	99	94	<.0002
Min.	6.1	7.2	3	43	0.27	1.45	0.000	3	49	6.3	80	6	77	83	88	<.0002
Avg.	7.0	7.5	10	138	0.34	1.71	0.001	7	95	9.4	131	G 44	93	95	90	<.0002
Count	30.0	30.0	31	31	4.00	31.00	30.000	31	31	24.0	24	30	31	31	4	4

G = geometric mean

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

OCTOBER JUNE 1993 - MISCELLANEOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	SO2 Lbs.	Lime Lbs.	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	Raw Sludge pH	Sludge pH 2 Hours	Sludge pH 16 Hrs.	Lbs. of Lime per lb. of Dry Solids
1		2,400	630	26	199	21	357	6,500	3.0	72	6.4	12.07	12.51	0.22
2		2,520	220	28	199	21	374	6,000	3.3	69	7.2	12.61	12.65	0.22
3		2,520	290	28	397	33	374	6,750	3.2	71	7.3	12.25	12.40	0.21
4		2,520	270	29	298	15	289	5,500	3.9	79	6.3	12.37	12.13	0.16
5		2,520	340	24	298	10	255	4,200	2.4	63	6.3	12.27	12.04	0.30
6		2,880	310	25	298	27	306	6,000	3.2	75	6.1	12.35	12.00	0.19
7		2,640	170	30	298	20	340	6,000	3.1	73	6.3	12.23	12.00	0.22
8		2,640	340	30	397	22	323	6,000	3.2	71	6.2	12.29	12.19	0.20
9		2,880	170	35	199	22	408	6,000	3.5	70	6.2	12.02	12.33	0.23
10		2,760	160	30	397	15	459	6,000	3.6	71	6.4	12.36	12.15	0.25
11		2,640	140	5	397	17	340	6,000	3.5	71	6.3	12.24	12.24	0.19
12		3,000	470	25	298	13	374	7,000	3.7	69	6.5	11.73	12.00	0.17
13		2,880	1,500	24	298	11	306	7,000	3.5	70	6.3	11.83	10.91	0.15
14		2,760	150	26	199	23	289	7,000	3.2	70	6.3	11.80	10.89	0.15
15		2,400	710	25	199	12	425	6,000	3.8	68	6.5	12.29	11.90	0.22
16		2,520	130	25	199	15	340	6,000	4.0	71	6.4	11.94	11.78	0.17
17		2,640	230	13	298	17	306	6,000	3.7	70	6.3	12.19	12.07	0.16
18		2,640	160	26	298	17	357	6,000	3.8	59	6.3	12.25	11.81	0.19
19		2,520	240	24	298	17	374	6,000	4.0	71	6.1	12.21	12.29	0.19
20		2,760	370	26	298	22	340	7,500	4.2	71	5.8	12.10	11.48	0.13
21		2,760	260	26	199	17	340	6,000	4.1	69	5.9	12.27	12.01	0.16
22		2,760	50	30	199	16	323	6,000	3.5	71	6.0	12.40	12.05	0.18
23		2,640	100	21	199	27	289	6,000	3.8	68	6.6	11.95	11.77	0.15
24		2,640	0	19	397	27	289	6,000	3.5	71	6.1	12.26	11.40	0.16
25		2,640	0	22	199	20	374	7,000	3.5	71	6.1	12.26	12.09	0.18
26		2,640	360	26	199	18	357	6,200	3.7	71	6.1	12.21	12.05	0.19
27		2,880	550	24	397	20	323	6,000	3.7	72	6.2	12.14	12.56	0.17
28	2,400	2,880	480	28	298	20	357	6,000	3.7	72	6.1	12.38	12.08	0.19
29	4,900	2,880	530	25	99	25	340	6,000	3.5	73	6.1	12.29	11.76	0.19
30	4,900	2,880	470	22	397	7	306	6,000	3.3	72	6.0	12.26	11.97	0.18
31	4,800	2,880	500	28	298	13	289	6,000	3.0	72	6.0	12.14	12.04	0.19
Total	**17,000**	**83,520**	**10,300**	**775**	**8,643**	**580**	**10,523**	**190,650**	**109.1**	**2,186**	**194.7**	**377.96**	**371.55**	**5.89**
Max.	**4,900**	**3,000**	**1,500**	**35**	**397**	**33**	**459**	**7,500**	**4.2**	**79**	**7.3**	**12.61**	**12.65**	**0.30**
Min.	**2,400**	**2,400**	**0**	**5**	**99**	**7**	**255**	**4,200**	**2.4**	**59**	**5.8**	**11.73**	**10.89**	**0.13**
Avg.	**4,250**	**2,694**	**332**	**25**	**279**	**19**	**339**	**6,150**	**3.5**	**71**	**6.3**	**12.19**	**11.99**	**0.19**

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

NOVEMBER 1993 - PLANT INFLUENT SHEET

PN-Day	Weather Type	Weather Precip.	Inf. Flow MGD	Inf. Temp F	Inf. pH SU	Inf. BOD mgIL	Inf. BOD Lbs.	Inf. SS mgIL	Inf. SS Lbs.	Inf. Phos. mgIL	Inf. Phos. Lbs.	Inf. VSS mgIL	Inf. NH3-N mgIL	Remarks or Other Parameters
1			1.84	57	7.4	107	1,642	96	1,473			88	9.6	
2	Rain	0.16	1.84	57	7.1	114	1,749	120	1,841	2.90	45	114		
3			1.85	56	7.2	102	1,574	116	1,790			112		
4			1.80	57	7.1	123	1,846	138	2,072			120	8.8	
5			1.81	57	7.2	138	2,083	112	1,691			110		
6			1.67	57	7.3	142	1,978	90	1,254			88		
7			1.47	56	7.4	128	1,569	146	1,790	3.00	37	142		
8			1.61	56	7.5	122	1,638	176	2,363			168		
9			1.58	56	7.4	102	1,344	130	1,713			120	10.2	
10	Rain	0.02	1.54	56	7.5	120	1,541	152	1,952			140		
11			1.56	56	7.2	162	2,108	182	2,368			160		
12			1.57	56	7.9	147	1,925	126	1,650			124		
13	Rain	0.25	1.49	56	7.8	162	2,013	190	2,361			174		
14	Rain	0.09	1.49	56	7.7	129	1,603	144	1,789			132		
15	Rain	0.01	1.51	56	7.8	139	1,750	190	2,393			184	11.1	
16	Rain	0.04	1.56	54	7.3	144	1,873	156	2,030	3.45	45	142		
17	Rain	0.09	1.52	54	7.4	156	1,978	220	2,789			188		
18			1.59	54	7.5	182	2,413	144	1,910			138		
19	Rain	0.02	1.53	54	7.6	231	2,948	146	1,863			144		
20			1.56	54	7.4	135	1,756	120	1,561			110		
21			1.45	54	7.7	126	1,524	148	1,790			140		
22			1.54	53	7.7	132	1,695	220	2,826			204		
23	Rain	0.14	1.54	54	7.7	130	1,670	214	2,749	3.15	40	196		
24	Rain	0.07	1.61	54	7.6	174	2,336	208	2,793			206	14.6	
25	Rain	0.22	1.40	55	7.7	174	2,032	160	1,868			152		
26	Rain	0.11	1.45	55	7.6	166	2,007	136	1,645			126		
27			1.47	55	7.8	210	2,575	140	1,716			128		
28	Snow	0.02	1.50	54	7.9	150	1,877	152	1,902			136		
29			1.72	52	7.3	159	2,281	206	2,955			196		
30			1.73	53	7.6	179	2,583	140	2,020			122		
31														
Total	0	1.24	47.80	1,654	225.3	4,385	57,912	4,618	60,914	12.50	167	4,304	54.3	
Max.	0	0.25	1.85	57	7.9	231	2,948	220	2,955	3.45	45	206	14.6	
Min.	0	0.01	1.40	52	7.1	102	1,344	90	1,254	2.90	37	88	8.8	
Avg.	0	0.10	1.59	55	7.5	146	1,930	154	2,030	3.13	42	143	10.9	
Count	13	13.00	30.00	30	30.0	30	30	30	30	4.00	4	30	5.0	

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

NOVEMBER 1993 - PRIMARY EFFLUENT SHEET

PN- Day	P Eff. BOD mgIL	P Eff. BOD Lbs.	P Eff. SS mgIL	P. Eff. SS Lbs.	P Eff. Phos. mgIL	P Eff. Phos. Lbs.	P Eff. VSS mgIL	P Eff. NH3-N mgIL	Flow MGD	BOD Pri. Removal %	SS Pri. Removal %	P Pri. Removal %
1	75	1,151	72	1,105			66	12.3	1.84	30	25	
2	96	1,473	80	1,228	2.60	40	76		1.84	16	33	10
3	69	1,065	52	802			52		1.85	32	55	
4	147	2,207	76	1,141			68	12.4	1.80	-20	45	
5	90	1,359	80	1,208			78		1.81	35	29	
6	147	2,047	74	1,031			74		1.67	-4	18	
7	108	1,324	82	1,005	3.60	44	78		1.47	16	44	-20
8	78	1,047	78	1,047			68		1.61	36	56	
9	69	909	76	1,001			66	12.9	1.58	32	42	
10	141	1,811	72	925			60		1.54	-18	53	
11	120	1,561	86	1,119			72		1.56	26	53	
12	144	1,886	76	995			74		1.57	2	40	
13	144	1,789	106	1,317			98		1.49	11	44	
14	114	1,417	86	1,069			78		1.49	12	40	
15	90	1,133	64	806			62	14.5	1.51	35	66	
16	171	2,225	64	833	2.60	34	62		1.56	-19	59	26
17	81	1,027	78	989			68		1.52	48	65	
18	171	2,268	58	769			58		1.59	6	60	
19	132	1,684	62	791			62		1.53	43	58	
20	84	1,093	62	807			58		1.56	38	48	
21	90	1,088	78	943			74		1.45	29	47	
22	159	2,042	76	976			70		1.54	-20	65	
23	87	1,117	68	873	2.10	27	64		1.54	33	68	34
24	135	1,813	82	1,101			76	14.6	1.61	22	61	
25	132	1,541	92	1,074			90		1.40	24	43	
26	99	1,197	72	871			70		1.45	40	47	
27	134	1,643	72	883			64		1.47	36	49	
28	165	2,064	80	1,001			76		1.50	-10	47	
29	78	1,119	66	947			66		1.72	51	68	
30	126	1,818	76	1,097			70		1.73	30	46	
31												
Total	3,476	45,918	2,246	29,753	10.90	145	2,098	66.7	47.80	592	1,474	50
Max.	171	2,268	106	1,317	3.60	44	98	14.6	1.85	51	68	34
Min.	69	909	52	769	2.10	27	52	12.3	1.40	-20	18	-20
Avg.	116	1,531	75	992	2.73	36	70	13.3	1.59	20	49	13
Count	30	30	30	30	4.00	4	30	5.0	30.00	30	30	4

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

NOVEMBER 1993 - ACTIVATED SLUDGE SHEET

PN-Day	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading fIm	Mix Liq SS mgIL	Mix Liq VSS mgIL	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mgIL	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mgIl	PE SS mgIL
1	48	4.7	5.2	0.27	1,908	1,432	26.0	0.73	6.0	207	0.36	0.27	73	29	1.84	75	72
2		4.7	4.7	0.34	1,910	1,456	25.0	0.76	4.4	208	0.42	0.31	70	65	1.84	96	80
3		4.7	6.5	0.27	1,732	1,303	22.0	0.79	4.4	202	0.44	0.33	70	65	1.85	69	52
4		4.8	4.1	0.63	1,561	1,171	20.0	0.78	4.4	198	0.36	0.27	71	58	1.80	147	76
5		4.8	3.8	0.40	1,520	1,126	21.0	0.72	3.4	214	0.37	0.27	71	36	1.81	90	80
6		5.2								228			76	36	1.67	147	74
7		5.9								233			86	36	1.47	108	82
8		5.4	4.8	0.27	1,675	1,280	24.0	0.70	5.1	224	0.40	0.30	78	43	1.61	78	78
9		5.5	5.2	0.23	1,737	1,315	24.0	0.72	5.1	226	0.37	0.28	79	43	1.58	69	76
10		5.6	5.2	0.49	1,618	1,227	21.0	0.77	4.6	219	0.34	0.26	80	43	1.54	141	72
11		5.5	4.1	0.44	1,545	1,185	20.0	0.77	4.6	217	0.33	0.25	79	50	1.56	120	86
12		5.5	4.8	0.51	1,583	1,240	21.0	0.75	3.9	214	0.35	0.27	79	58	1.57	144	76
13		5.8								211			84	58	1.49	144	106
14		5.8								224			83	58	1.49	114	86
15		5.7	6.0	0.29	1,606	1,289	21.0	0.76	2.9	217	0.34	0.27	82	58	1.51	90	64
16		5.5	5.6	0.66	1,546	1,133	21.0	0.74	5.0	219	0.37	0.31	80	58	1.56	171	64
17		5.7	4.6	0.31	1,524	1,099	21.0	0.73	4.1	222	0.37	0.29	83	58	1.52	81	78
18		5.4	6.1	0.65	1,570	1,158	21.0	0.75	5.0	213	0.34	0.26	79	58	1.59	171	58
19		5.6	5.8	0.47	1,528	1,206	21.0	0.73	4.7	213	0.35	0.27	81	58	1.53	132	62
20		5.5								217			80	58	1.56	84	62
21		5.9								220			86	58	1.45	90	78
22		5.6	4.3	0.63	1,387	1,083	19.0	0.73	6.8	186	0.33	0.25	79	50	1.54	159	76
23		5.6	5.0	0.33	1,448	1,121	20.0	0.72	4.1	176	0.29	0.23	79	50	1.54	87	68
24		5.4	4.1	0.51	1,509	1,182	21.0	0.72	4.1	182	0.32	0.25	75	50	1.61	135	82
25		6.2								182			86	50	1.40	132	92
26		5.9								177			76	43	1.45	99	72
27		5.9								185			80	43	1.47	134	72
28		5.7								186			76	36	1.50	165	80
29		5.0	5.1	0.28	1,611	1,325	21.0	0.77	3.6	187	0.38	0.31	71	43	1.72	78	66
30		5.0	4.4	0.50	1,595	1,210	18.0	0.89	4.3	184	0.36	0.29	72	43	1.73	126	76
31																	
Total	48	163.2	99.1	8.50	32,113	24,541	428.0	15.04	90.5	6,191	7.19	5.54	2,344	1,492	47.80	3,476	2,246
Max.	48	6.2	6.5	0.66	1,910	1,456	26.0	0.89	6.8	233	0.44	0.33	86	65	1.85	171	106
Min.	48	4.7	3.8	0.23	1,387	1,083	18.0	0.70	2.9	176	0.29	0.23	70	29	1.40	69	52
Avg.	48	5.4	5.0	0.42	1,606	1,227	21.4	0.75	4.5	206	0.36	0.28	78	50	1.59	116	75
Count	1	30.0	20.0	20.00	20	20	20.0	20.00	20.0	30	20.00	20.00	30	30	30.00	30	30

Robert J. Swalwell
Superintendent

MARSHALL WWTP 801 INDUSTRIAL RD. MARSHALL MI 49068 - PERMIT MI0023540

NOVEMBER 1993 - DISCHARGE MONITORING REPORT - DISCHARGE NO. 001A

Day	F.Eff. D.O. mgIL	F.Eff. pH SU	F.Eff. SS mgIL	F.Eff. SS Lbs.	F.Eff. Total-P mgIL	Flow MGD	F.Eff. Chlorine mgIL	F.Eff. CBOD mgIL	F.Eff. CBOD Lbs.	F.Eff. NH3 as N mgIL	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %	Mercury mgIL
1	7.5	7.5	7	107		1.84	0.001	6	92	8.8	135	241	93	94		
2	7.6	7.6	11	169	0.42	1.84	0.000	5	77			57	91	96	86	<0.0002
3	7.1	7.2	3	46		1.85	0.001	4	62			44	97	96		
4	7.1	7.3	2	30		1.80	0.000	4	60	8.5	128	22	99	97		
5	6.5	7.4	7	106		1.81	0.000	4	60			17	94	97		
6	6.7	7.5	6	84		1.67	0.001	7	97			22	93	95		
7	7.5	7.8	7	86	0.36	1.47	0.000	6	74			38	95	96	88	<0.0002
8	7.6	7.4	6	81		1.61	0.000	5	67			21	97	96		
9	7.0	7.3	8	105		1.58	0.000	4	53	6.5	86	58	94	96		
10	7.1	7.4	8	103		1.54	0.000	5	64			92	95	96		
11	7.4	7.2	7	91		1.56	0.000	5	65			62	96	97		
12	7.2	8.1	6	79		1.57	0.000	5	65			22	95	97		
13	6.5	7.8	8	99		1.49	0.000	5	62			68	96	97		
14	6.5	7.7	2	25		1.49	0.001	4	50			56	99	97		
15	7.3	7.7	4	50		1.51	0.000	5	63	5.7	72	23	98	97		<0.0002
16	7.2	7.5	4	52	0.31	1.56	0.000	6	78			18	97	96	91	
17	7.0	7.2	8	101		1.52	0.000	4	51			20	96	98		<0.0002
18	5.6	7.4	7	93		1.59	0.000	14	186			8	95	92		
19	7.2	7.5	3	38		1.53	0.000	7	89			34	98	97		
20	7.4	7.4	3	39		1.56	0.002	4	52			66	98	97		
21	7.8	7.4	2	24		1.45	0.002	4	48			7	99	97		
22	7.4	7.4	2	26		1.54	0.000	5	64			13	99	96		
23	7.0	7.4	2	26	0.16	1.54	0.000	4	51			30	99	97	95	
24	7.0	7.4	5	67		1.61	0.000	5	67	8.9	120	47	98	97		
25	7.1	7.5	4	47		1.40	0.000	4	47			18	98	98		
26	7.2	7.5	3	36		1.45	0.000	5	60			43	98	97		
27	7.7	7.6	4	49		1.47	0.001	6	74			74	97	97		
28	7.6	7.6	3	38		1.50	0.001	4	50			70	98	97		
29	7.3	7.4	5	72		1.72	0.003	6	86			91	98	96		
30	7.4	7.5	6	87		1.73	0.001	4	58			138	96	98		
31																
Total	214.5	224.6	153	2,055	1.25	47.80	0.014	156	2,073	38.4	540	1,520	2,896	2,894	360	<0.0002
Max.	7.8	8.1	11	169	0.42	1.85	0.003	14	186	8.9	135	241	99	98	95	<0.0002
Min.	5.6	7.2	2	24	0.16	1.40	0.000	4	47	5.7	72	7	91	92	86	<0.0002
Avg.	7.2	7.5	5	68	0.31	1.59	0.000	5	69	7.7	108	G37	97	96	90	<0.0002
Count	30.0	30.0	30	30	4.00	30.00	30.000	30	30	5.0	5	30	30	30	4	4

G=Geometric Mean

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

NOVEMBER 1993 - MISCELLANEOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	SO2 Lbs.	Lime Lbs.	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	PH	Lbs. of Lime per 1000 Gals. Sludge
1	3,900	3,000	480	25	298	15	357	6,000	3.4	69	6.2	59.50
2	3,600	2,760	480	30	199	18	340	7,000	3.3	71	6.2	48.57
3	4,200	3,120	610	25	199	17	323	6,000	3.6	71	6.3	53.83
4	2,900	2,640	380	24	199	20	340	6,000	3.2	71	6.2	56.67
5	3,100	2,640	640	21	397	22	425	7,500	3.3	71	6.3	56.67
6	7,000	2,880	400	25	199	13	289	6,000	2.6	71	6.3	48.17
7	6,400	2,760	510	25	199	23	391	6,000	3.4	69	6.8	65.17
8	4,300	3,120	460	26	199	18	323	6,000	3.4	68	6.7	53.83
9	4,700	2,880	590	26	99	19	323	7,500	3.2	71	6.1	43.07
10	6,600	2,880	500	33	0	17	340	6,000	2.8	73	6.2	56.67
11	4,700	2,880	400	22	199	19	340	6,000	3.2	72	6.1	56.67
12	6,100	2,880	540	28	99	22	360	7,500	3.2	72	6.0	48.00
13	6,100	2,760	450	27	99	20	324	6,000	3.4	73	6.0	54.00
14	4,500	2,640	460	28	0	20	324	6,000	3.3	73	6.3	54.00
15	5,200	2,880	610	27	298	14	378	6,000	3.0	74	6.0	63.00
16	5,600	2,880	440	18	397	16	378	6,000	3.1	75	6.0	63.00
17	7,000	2,880	620	24	199	20	342	7,500	3.1	74	6.1	45.60
18	4,600	2,760	530	22	397	17	342	6,000	3.4	76	6.2	57.00
19	5,500	2,880	500	26	794	21	342	6,000	3.1	75	6.1	57.00
20	8,000	2,880	390	23	397	20	324	6,000	3.5	75	6.1	54.00
21	5,200	2,880	480	27	397	19	306	6,000	3.4	73	6.3	51.00
22	5,700	2,640	330	33	397	17	360	6,000	3.4	74	6.2	60.00
23	4,700	2,760	430	25	199	17	360	6,000	3.4	73	6.1	60.00
24	6,600	2,760	480	29	199	17	234	3,500	3.5	71	6.0	66.86
25	7,600	2,760	400	27	0	19	378	6,000	3.6	72	6.1	63.00
26	7,000	2,760	510	29	199	21	378	6,000	3.6	74	6.3	63.00
27	7,800	2,640	400	25	0	18	342	6,600	3.6	72	6.4	51.82
28	7,000	2,760	510	15	199	20	306	6,000	3.5	73	6.1	51.00
29	9,200	2,880	340	23	99	15	342	6,000	3.4	73	6.1	57.00
30	7,800	2,760	350	24	99	25	342	6,000	3.3	74	6.1	57.00
31												
Total	172,600	84,600	14,220	762	6,655	559	10,253	185,100	99.2	2,173	185.9	1675.08
Max.	9,200	3,120	640	33	794	25	425	7,500	3.6	76	6.8	66.86
Min.	2,900	2,640	330	15	0	13	234	3,500	2.6	68	6.0	43.07
Avg.	5,753	2,820	474	25	222	19	342	6,170	3.3	72	6.2	55.84

Manpower

Superintendent	1
Asst. Supt.	1
Operators	2
IPP Coordinator	1
Total	5

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

DECEMBER 1993 - PLANT INFLUENT SHEET

PN-Day	Weather Type	Weather Precip.	Inf. Flow MGD	Inf. Temp F	Inf. pH SU	Inf. BOD mgIL	Inf. BOD Lbs.	Inf. SS mgIL	Inf. SS Lbs.	Inf. Phos. mgIL	Inf. Phos. Lbs.	Inf. VSS mgIL	Inf. NH3-N mgIL	--Remarks or Other Parameters--
1	Rain	0.11	1.71	54	7.2	170	2,424	190	2,710			178		
2	Rain	0.14	1.80	54	7.1	252	3,783	188	2,822	3.80	57	168		
3	Rain	0.05	1.67	54	7.4	216	3,008	156	2,173			150		
4	Rain	0.01	1.46	54	7.5	180	2,192	142	1,729			128		
5	Rain	0.09	1.46	54	7.4	170	2,070	154	1,875			130		
6	Rain	0.02	1.71	52	8.4	149	2,125	212	3,023			194		
7			1.62	53	7.6	176	2,378	190	2,567			174		
8			1.62	53	7.7	138	1,864	124	1,675			118	11.4	
9			1.67	54	7.6	183	2,549	140	1,950	3.50	49	126		
10	Rain	0.03	1.63	54	7.5	198	2,692	144	1,958			138		
11			1.48	53	7.5	191	2,358	142	1,753			140		
12			1.38	51	7.5	162	1,864	156	1,795			134		
13			1.66	59	7.4	159	2,201	218	3,018			192		
14			1.67	59	7.6	152	2,117	126	1,755			98	12.1	
15			1.54	59	7.4	155	1,991	150	1,927	3.40	44	132		
16			1.59	59	7.6	147	1,949	184	2,440			152		
17	Rain	0.01	1.60	55	7.4	228	3,042	270	3,603			240		
18	Rain	0.13	1.39	55	7.7	177	2,052	144	1,669			130		
19			1.38	55	7.4	158	1,818	162	1,864			140		
20	R&S	0.13	1.67	59	7.6	156	2,173	192	2,674	4.70	65	172	12.8	
21	R&S	0.06	1.51	59	7.6	164	2,065	162	2,040			146		
22			1.51	59	7.9	192	2,418	220	2,771			212		
23	Snow	0.03	1.55	59	7.3	204	2,637	194	2,508			172		
24	Snow	0.03	1.39	50	7.5	174	2,017	106	1,229			106		
25	Snow	0.04	1.27	50	7.1	183	1,938	118	1,250			118		
26			1.36	50	7.3	120	1,361	144	1,633			140		
27			1.58	55	7.5	165	2,174	204	2,688			174	14.8	
28			1.63	57	7.6	146	1,985	168	2,284			142		
29	Snow	0.03	1.48	55	7.6	156	1,926	140	1,728			128		
30			1.51	55	7.4	189	2,380	164	2,065			160		
31	R&S	0.02	1.41	54	7.7	198	2,328	156	1,834			128		
Total	0	0.93	47.91	1,703	233.0	5,408	69,881	5,160	67,011	15.40	215	4,660	51.1	
Max.	0	0.14	1.80	59	8.4	252	3,783	270	3,603	4.70	65	240	14.8	
Min.	0	0.01	1.27	50	7.1	120	1,361	106	1,229	3.40	44	98	11.4	
Avg.	0	0.06	1.55	55	7.5	174	2,254	166	2,162	3.85	54	150	12.8	
Count	16	16.00	31.00	31	31.0	31	31	31	31	4.00	4	31	4.0	

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

DECEMBER 1993 - PRIMARY EFFLUENT SHEET

PN- Day	P Eff. BOD mgIL	P Eff. BOD Lbs.	P Eff. SS mgIL	P. Eff. SS Lbs.	P Eff. Phos. mgIL	P Eff. Phos. Lbs.	P Eff. VSS mgIL	P Eff. NH3-N mgIL	Flow MGD	BOD Prl. Removal %	SS Prl. Removal %	P Prl. Removal %
1	87	1,241	86	1,226			82		1.71	49	55	
2	135	2,027	98	1,471	3.80	57	92		1.80	46	48	0
3	138	1,922	96	1,337			94		1.67	36	38	
4	180	2,192	84	1,023			82		1.46	0	41	
5	119	1,449	88	1,072			84		1.46	30	43	
6	93	1,326	84	1,198			84		1.71	38	60	
7	171	2,310	102	1,378			98		1.62	2	46	
8	90	1,216	88	1,189			84	13.0	1.62	35	29	
9	135	1,880	92	1,281	2.60	36	88		1.67	26	34	26
10	198	2,692	94	1,278			86		1.63	0	35	
11	138	1,703	82	1,012			72		1.48	32	42	
12	93	1,070	92	1,059			82		1.38	43	41	
13	171	2,367	80	1,108			70		1.66	-8	63	
14	120	1,671	90	1,254			88	13.4	1.67	21	29	
15	147	1,888	108	1,387	3.00	39	90		1.54	5	28	13
16	99	1,313	88	1,167			76		1.59	33	52	
17	117	1,561	70	934			54		1.60	49	74	
18	105	1,217	82	951			74		1.39	41	43	
19	171	1,968	64	737			56		1.38	-8	60	
20	99	1,379	72	1,003	4.20	58	70	13.0	1.67	37	63	
21	90	1,133	66	831			64		1.51	45	59	12
22	120	1,511	92	1,159			68		1.51	38	58	
23	150	1,939	88	1,138			86		1.55	26	55	
24	132	1,530	76	881			76		1.39	24	28	
25	132	1,398	82	869			82		1.27	28	31	
26	93	1,055	112	1,270			108		1.36	23	22	
27	111	1,463	130	1,713			110	17.6	1.58	33	36	
28	111	1,509	100	1,359			100		1.63	24	40	
29	111	1,370	88	1,086			88		1.48	29	37	
30	117	1,473	104	1,310			104		1.51	38	37	
31	129	1,517	120	1,411			92		1.41	35	23	
Total	3,902	50,292	2,798	36,090	13.60	190	2,584	57.0	47.91	850	1,350	51
Max.	198	2,692	130	1,713	4.20	58	110	17.6	1.80	49	74	26
Min.	87	1,055	64	737	2.60	36	54	13.0	1.27	-8	22	0
Avg.	126	1,622	90	1,164	3.40	48	83	14.3	1.55	27	44	13
Count	31	31	31	31	4.00	4	31	4.0	31.00	31	31	4

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

DECEMBER 1993 - ACTIVATED SLUDGE SHEET

PN-Day	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading flm	Mix Liq SS mgIL	Mix Liq VSS mgIL	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mgIL	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mgIl	PE SS mgIL
1	48	5.0	3.8	0 32	1,572	1,301	20.0	0.79	3.2	176	0.39	0.31	73	43	1.71	87	86
2		4.8	3.3	0.52	1,600	1,301	20.0	0.80	3.4	176	0.38	0.31	68	50	1.80	135	98
3		5.2	4.0	0.43	1,770	1,480	22.0	0.80	2.2	177	0.42	0.35	86	58	1.67	138	96
4		5.9								175			85	43	1.46	180	84
5		5.9								176			83	58	1.46	129	88
6		5.0	4.1	0.32	1,648	1,388	21.0	0.78	4.2	185	0.38	0.32	72	58	1.71	93	84
7		5.3	3.4	0.59	1,572	1,311	19.0	0.83	4.4	177	0.37	0.31	77	58	1.62	171	102
8		5.3	3.9	0.31	1,559	1,298	19.0	0.82	3.9	177	0.35	0.31	77	58	1.62	90	88
9		5.2	3.5	0.51	1,500	1,221	20.0	0.75	4.4	173	0.33	0.28	75	55	1.67	135	92
10		5.3	3.5	0.70	1,501	1,285	18.0	0.83	3.2	177	0.32	0.27	76	58	1.63	198	94
11		5.8								158			83	58	1.48	138	82
12		6.2								188			90	58	1.38	93	92
13		5.2	4.1	0.62	1,516	1,273	19.0	0.80	5.2	178	0.30	0.25	74	36	1.66	171	80
14		5.2	3.6	0.43	1,498	1,291	17.0	0.88	3.8	178	0.35	0.29	73	50	1.67	120	90
15		5.6	3.2	0.49	1,492	1,275	18.0	0.83	3.9	176	0.27	0.22	78	50	1.54	147	108
16		5.4	3.5	0.39	1,378	1,137	16.0	0.86	5.1	184	0.30	0.25	75	43	1.59	99	88
17		5.4	4.5	0.42	1,393	1,251	17.0	0.82	4.3	180	0.29	0.24	76	43	1.60	117	70
18		6.2								181			89	43	1.39	105	82
19		6.2								186			90	43	1.38	171	64
20		5.2	4.7	0.34	1,580	1,350	20.0	0.79	4.3	182	0.37	0.31	74	43	1.67	99	72
21		5.7	5.9	0.27	1,646	1,414	20.0	0.82	4.3	185	0.37	0.32	89	43	1.51	90	66
22		5.7	4.2	0.36	1,639	1,405	19.0	0.86	4.6	189	0.34	0.29	92	50	1.51	120	92
23		5.6	4.4	0.46	1,676	1,404	21.0	0.80	4.0	189	0.34	0.29	90	50	1.55	150	88
24		6.2								191			98	58	1.39	132	76
25		6.8								199			105	65	1.27	132	82
26		6.3								199			96	65	1.36	93	112
27		5.5	3.0	0.35	1,720	1,382	19.0	0.91	6.6	198	0.33	0.26	77	65	1.58	111	130
28		5.3	4.0	0.35	1,798	1,424	20.0	0.90	4.4	195	0.38	0.30	75	65	1.63	111	100
29		5.8	5.2	0.31	1,873	1,486	20.0	0.94	4.7	199	0.35	0.28	81	65	1.48	111	88
30		5.7	4.1	0.34	1,815	1,443	20.0	0.91	6.1	198	0.38	0.30	75	65	1.51	117	104
31		6.1								185			79	65	1.41	129	120
Total	48	174.0	84.0	8.84	33,746	28,120	405.0	17.52	90.2	5,687	7.31	6.06	2,531	1,662	47.91	3,912	2,798
Max.	48	6.8	5.9	0.70	1,873	1,486	22.0	0.94	6.6	199	0.42	0.35	105	65	1.80	198	130
Min.	48	4.8	3.0	0.27	1,378	1,137	16.0	0.75	2.2	158	0.27	0.22	68	36	1.27	87	64
Avg.	48	5.6	4.0	0.42	1,607	1,339	19.3	0.83	4.3	183	0.35	0.29	82	54	1.55	126	90
Count	1	31.0	21.0	21.00	21	21	21.0	21.00	21.0	31	21.00	21.00	31	31	31.00	31	31

Robert J. Swalwell
Superintendent

MARSHALL WWTP 801 INDUSTRIAL RD. MARSHALL MI 49068 - PERMIT MI0023540

DECEMBER 1993 - DISCHARGE MONITORING REPORT - DISCHARGE NO. 001A

Day	F.Eff. D.O. mgIL	F.Eff. pH SU	F.Eff. SS mgIL	F.Eff. SS Lbs.	F.Eff. Total-P mgIL	Flow MGD	F.Eff. Chlorine mgIL	F.Eff. CBOD mgIL	F.Eff. CBOD Lbs.	F.Eff. NH3 as N mgIL	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %	Mercury mgIL
1	7.1	7.4	7	100		1.71	0.034	6	86			38	96	96		<0.0002
2	6.7	7.1	8	120	1.50	1.80	0.000	7	105			120	96	97	60	
3	6.5	7.4	13	181		1.67	0.000	9	125			260	92	96		
4	6.8	7.5	9	110		1.46	0.000	9	110				94	95		
5	7.0	7.1	8	97		1.46	0.001	7	85			228	95	96		
6	7.2	7.3	10	143		1.71	0.000	4	57			40	95	97		
7	7.5	7.5	12	162		1.62	0.000	8	108			86	94	95		
8	7.1	7.5	7	95		1.62	0.000	6	81	9.0	122	16	94	96		<0.0002
9	6.9	7.4	10	139	0.58	1.67	0.000	7	97			21	93	96	83	
10	6.6	7.4	11	150		1.63	0.000	10	136			69	92	95		
11	7.5	7.5	13	160		1.48	0.000	12	148			150	91	94		
12	7.8	7.5	13	150		1.38	0.000	8	92			120	92	95		
13	7.9	7.3	19	263		1.66	0.000	10	138			143	91	93		
14	7.2	7.7	9	125		1.67	0.000	6	84	10.7	149	120	93	96		<0.0002
15	7.4	7.5	9	116	0.55	1.54	0.000	7	90			160	94	95	84	
16	7.4	7.5	8	106		1.59	0.000	6	80			192	96	96		
17	7.2	7.6	8	107		1.60	0.000	7	93			216	97	97		
18	7.3	7.5	6	70		1.39	0.000	6	70			75	96	97		
19	7.3	7.4	2	23		1.38	0.000	7	81			70	99	95		
20	7.6	7.6	6	84	0.46	1.67	0.000	6	84	10.1	141	14	97	96	90	<0.0002
21	6.8	7.5	7	88		1.51	0.000	7	88			42	96	96		
22	7.3	7.7	12	151		1.51	0.000	8	101			40	95	96		
23	7.0	7.3	15	194		1.55	0.000	10	129			98	92	95		
24	6.7	7.4	12	139		1.39	0.000	13	151				89	93		
25	7.4	7.2	15	159		1.27	0.001	11	117			116	87	94		
26	9.2	7.3	9	102		1.36	0.010	6	68			22	94	95		
27	7.8	7.3	14	184		1.58	0.000	5	66	12.9	170	13	93	97		
28	7.3	7.5	11	150		1.63	0.000	8	109			7	93	95		
29	7.8	7.4	7	86		1.48	0.016	6	74			5	95	96		
30	8.1	7.4	11	139		1.51	0.001	6	76			3	93	97		
31	7.9	7.5	12	141		1.41	0.000	7	82			68	92	96		
Total	227.3	230.2	313	4,032	3.09	47.91	0.063	235	3,009	42.7	581	2,552	2,906	2,963	317	<0.0002
Max.	9.2	7.7	19	263	1.50	1.80	0.034	13	151	12.9	170	260	99	97	90	<0.0002
Min.	6.5	7.1	2	23	0.46	1.27	0.000	4	57	9.0	122	3	87	93	60	<0.0002
Avg.	7.3	7.4	10	130	0.77	1.55	0.002	8	97	10.7	145	G 53	94	96	79	<0.0002
Count	31.0	31.0	31	31	4.00	31.00	31.000	31	31	4.0	4	29	31	31	4	4

G = Geometric Mean

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

DECEMBER 1993 - MISCELLANEOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	SO2 Lbs.	Lime Lbs.	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	Raw Sludge pH	Sludge pH 2 Hours	Sludge pH 16 Hrs.	Lbs. of Lime per 1000 Gals. Sludge
1	5,400	2,760	490	23	99	18	450	6,500	3.4	73	6.0	12.35	12.38	69.23
2	5,700	2,640	340	24	99	15	450	6,500	3.4	71	6.5	12.52	12.39	69.23
3	6,000	2,760	500	28	199	21	500	6,000	4.0	72	6.0	12.60	12.38	83.33
4	6,000	2,640	440	32	199	19	500	6,000	3.1	73	6.7	12.26	12.14	83.33
5	5,200	2,760	440	26	298	18	450	6,000	3.2	73	6.1	12.31	12.16	75.00
6	5,900	2,760	330	32	199	17	700	6,000	3.4	73	6.2	12.37	12.21	116.67
7	6,400	2,760	610	37	199	26	100	6,000	3.5	73				16.67
8	6,300	2,760	610	36	199	23	425	7,500	3.4	72	5.9	12.25	12.10	56.67
9	4,200	2,760	340	20	298	17	425	6,000	3.2	71	6.0	12.30	12.37	70.83
10	7,900	2,640	540	22	199	18	550	8,000	3.5	73	6.1	12.32	12.31	68.75
11	8,200	2,760	380	22	298	19	600	8,000	3.5	73	6.1	12.47	12.41	75.00
12	7,300	2,640	470	27	298	20	550	8,000	2.8	64	7.0	12.55	12.40	68.75
13	5,900	2,880	400	25	199	21	450	8,000	3.2	74	5.9	12.00	12.02	56.25
14	4,200	2,760	300	16	199	20	525	8,000	3.2	74	6.1	12.39	12.40	65.63
15	7,300	2,640	730	30	298	23	400	6,000	3.4	73	6.0	12.32	12.18	66.67
16	5,100	2,760	430	31	199	18	425	6,000	3.3	74	6.2	12.48	12.25	70.83
17	7,500	2,760	520	34	298	25	400	6,000	3.4	76	6.0	12.41	12.18	66.67
18	5,200	2,640	490	33	199	22	425	6,000	3.5	74	6.4	12.23	12.15	70.83
19	5,500	2,640	560	27	298	25	350	6,000	3.3	72	6.9	12.53	12.38	58.33
20	8,700	2,760	360	25	298	25	400	6,000	3.1	77	5.9	12.26	12.28	66.67
21	9,400	2,880	580	26	199	30	425	6,000	3.4	76	5.9	12.51	12.32	70.83
22	7,900	2,760	470	26	199	21	375	6,000	3.8	75	6.4	12.32	12.02	62.50
23	9,500	3,000	490	34	199	22	350	6,000	3.4	76	5.9	12.30	12.00	58.33
24	10,900	2,640	490	32	199	24	325	6,000	3.7	77	5.8	10.13	10.00	54.17
25	11,500	2,880	440	40	199	23	425	7,200	3.5	73	7.1	12.57	12.33	59.03
26	15,400	2,880	440	32	298	29	400	6,000	3.5	73	7.0	12.52	12.39	66.67
27	10,500	3,000	330	31	298	21	375	6,000	3.6	75	7.6	12.59	12.33	62.50
28	12,000	3,000	380	29	199	18	375	6,000	3.9	74	5.9	12.12	11.71	62.50
29	12,400	3,000	320	23	298	18	350	6,000	3.7	73	6.2	12.42	12.06	58.33
30	11,200	2,640	360	21	298	22	350	6,000	3.6	74	5.8	12.33	12.02	58.33
31	9,300	2,760	430	24	199	20	375	6,200	4.5	65	6.1	12.53	12.41	60.48
Total	243,900	85,920	14,010	868	7,157	658	13,200	199,900	107.4	2,266	187.7	369.26	364.68	2049.01
Max.	15,400	3,000	730	40	298	30	700	8,000	4.5	77	7.6	12.60	12.41	116.67
Min.	4,200	2,640	300	16	99	15	100	6,000	2.8	64	5.8	10.13	10.00	16.67
Avg.	7,868	2,772	452	28	231	21	426	6,448	3.5	73	6.3	12.31	12.16	66.10

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

JANUARY 1995 - PLANT INFLUENT SHEET

PN-Day	Weather Type	Weather Precip.	Inf. Flow MGD	Inf. Temp F	Inf. pH SU	Inf. BOD mgIL	Inf. BOD Lbs.	Inf. SS mgIL	Inf. SS Lbs.	Inf. Phos. mgIL	Inf. Phos. Lbs.	Inf. VSS mgIL	Inf. NH3-N mgIL	Remarks or Other Parameters
1	Snow	0.02	1.56	54	7.5	123	1,600	106	1,379			96		
2			1.64	54	7.7	150	2,052	150	2,052			144		
3	Snow	0.02	1.65	54	7.6	128	1,761	160	2,202	2.80	39	158	14.2	
4			1.64	54	7.5	125	1,710	156	2,134			146		
5	Snow	0.03	1.64	54	7.6	130	1,778	142	1,942			132	12.6	
6	Snow	0.21	1.61	54	7.5	143	1,920	108	1,450			102		
7	Snow	0.01	1.62	54	7.6	150	2,027	100	1,351			86		
8			1.62	54	7.1	124	1,675	130	1,756			110		
9	Snow	0.01	1.80	54	7.6	137	2,057	180	2,702	4.20	63	162		
10			1.76	54	7.4	150	2,202	150	2,202			130		
11			1.72	54	7.5	139	1,994	152	2,180			122	14.9	
12	Rain	0.05	1.69	55	7.6	116	1,635	140	1,973			118		
13	Rain	0.17	1.68	55	7.7	145	2,032	98	1,373			94		
14	Rain	0.03	1.64	54	7.3	137	1,874	128	1,751			122		
15			1.63	54	7.8	111	1,509	138	1,876			134		
16			1.74	54	7.3	143	2,075	128	1,857			124		
17	Rain	0.07	1.77	54	7.5	121	1,786	128	1,890	3.10	46	122	11.2	
18			1.72	54	7.2	143	2,051	138	1,980			134		
19	Rain	0.57	1.75	54	7.3	141	2,058	118	1,722			118		
20	Snow	0.42	1.77	54	7.6	129	1,904	100	1,476			100		
21	Snow	0.23	1.63	54	7.6	143	1,944	114	1,550			102		
22	Snow	0.06	1.65	54	7.6	127	1,748	146	2,009			126	13.5	
23	Snow	0.04	1.79	54	7.7	129	1,926	132	1,971			106		
24			1.76	54	7.6	162	2,378	140	2,055	3.00	44	110		
25			1.87	54	7.6	155	2,417	126	1,965			122		
26			1.86	54	7.6	142	2,203	152	2,358			148		
27			1.73	52	7.7	133	1,919	132	1,905			120		
28			1.65	53	7.7	144	1,982	128	1,761			118		
29			1.67	53	7.7	124	1,727	128	1,783			100		
30			1.79	53	7.6	157	2,344	158	2,359			138	12.0	
31			1.73	53	7.8	199	2,871	270	3,896			234		
Total	0	1.94	52.78	1,670	234.1	4,300	61,158	4,276	60,859	13.10	191	3,878	78.4	
Max.	0	0.57	1.87	55	7.8	199	2,871	270	3,896	4.20	63	234	14.9	
Min.	0	0.01	1.56	52	7.1	111	1,509	98	1,351	2.80	39	86	11.2	
Avg.	0	0.13	1.70	54	7.6	139	1,973	138	1,963	3.28	48	125	13.1	
Count	15	15.00	31.00	31	31.0	31	31	31	31	4.00	4	31	6.0	

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

JANUARY 1995 - PRIMARY EFFLUENT SHEET

PN-Day	P Eff. BOD mgIL	P Eff. BOD Lbs.	P Eff. SS mgIL	P. Eff. SS Lbs.	P Eff. Phos. mgIL	P Eff. Phos. Lbs.	P Eff. VSS mgIL	P Eff. NH3-N mgIL	Flow MGD	BOD Pri. Removal %	SS Pri. Removal %	P Pri. Removal %
1	91	1,184	64	833			40		1.56	26	40	
2	104	1,422	76	1,039	3.00	41	76		1.64	31	49	-7
3	106	1,459	64	881			60	17.4	1.65	17	60	
4	102	1,395	84	1,149			84		1.64	18	46	
5	95	1,299	76	1,039			76	17.2	1.64	27	46	
6	97	1,302	56	752			56		1.61	32	48	
7	101	1,365	68	919			52		1.62	33	32	
8	90	1,216	72	973			56		1.62	27	45	
9	95	1,426	80	1,201	3.60	54	68		1.80	31	56	14
10	95	1,394	64	939			52		1.76	37	57	
11	95	1,363	68	975			28	15.8	1.72	32	55	
12	82	1,156	68	958			48		1.69	29	51	
13	106	1,485	48	673			36		1.68	27	51	
14	92	1,258	68	930			56		1.64	33	47	
15	88	1,196	64	870			52		1.63	21	54	
16	92	1,335	60	871			60		1.74	35	53	
17	89	1,314	68	1,004	2.80	41	68	13.4	1.77	26	47	10
18	83	1,191	64	918			64		1.72	42	54	
19	100	1,460	84	1,226			84		1.75	41	29	
20	94	1,388	56	827			56		1.77	27	44	
21	76	1,033	60	816			56		1.63	47	47	
22	86	1,183	72	991			68	13.7	1.65	32	51	
23	85	1,269	84	1,254			44		1.79	34	36	
24	100	1,468	68	998	3.00	44	52		1.76	38	51	3
25	86	1,341	76	1,185			76		1.87	45	40	
26	87	1,350	68	1,055			68		1.86	39	55	
27	84	1,212	80	1,154			80		1.73	37	39	
28	104	1,431	84	1,156			76		1.65	28	34	
29	93	1,295	88	1,226			76		1.67	25	31	
30	87	1,299	84	1,254			68	12.9	1.79	45	47	
31	86	1,241	71	1,024			70		1.73	57	74	
Total	2,871	40,730	2,187	31,090	12.40	180	1,906	90.4	52.78	1,019	1,469	20
Max.	106	1,485	88	1,254	3.60	54	84	17.4	1.87	57	74	14
Min.	76	1,033	48	673	2.80	41	28	12.9	1.56	17	29	-7
Avg.	93	1,314	71	1,003	3.10	45	61	15.1	1.70	33	47	5
Count	31	31	31	31	4.00	4	31	6.0	31.00	31	31	4

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

JANUARY 1995 - ACTIVATED SLUDGE SHEET

PN- Day	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading fIm	Mix Liq SS mgIL	Mix Liq VSS mgIL	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mgIL	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mgIl	PE SS mgIL
1	48	5.5								244			64	41	1.56	91	64
2		5.3								250			61	41	1.64	104	76
3		5.2	6.9	0.32	2,025	1,506	29.0	0.70	5.3	248	0.43	0.32	61	39	1.65	106	64
4		5.3	5.2	0.31	1,995	1,483	30.0	0.67	5.5	256	0.37	0.27	67	36	1.64	102	84
5		5.3	5.8	0.29	2,010	1,483	31.0	0.65	4.4	250	0.39	0.28	67	36	1.64	95	76
6		5.4	8.1	0.29	2,040	1,511	31.0	0.66	5.0	240	0.42	0.32	69	41	1.61	97	56
7		5.3								245			69	40	1.62	101	68
8		5.3								249			68	30	1.62	90	72
9		4.8	5.2	0.31	2,080	1,532	31.0	0.67	3.8	249	0.40	0.30	60	33	1.80	95	80
10		4.9	7.0	0.29	2,199	1,632	30.0	0.73	2.9	243	0.43	0.31	62	38	1.76	95	64
11		5.0	6.8	0.28	2,204	1,630	30.0	0.73	1.9	234	0.44	0.32	63	39	1.72	95	68
12		5.1	7.1	0.22	2,276	1,736	36.0	0.63	2.5	243	0.45	0.34	65	50	1.69	82	68
13		5.1	9.7	0.30	2,175	1,659	35.0	0.62	2.9	241	0.42	0.31	65	51	1.68	106	48
14		5.3								246			67	46	1.64	92	68
15		5.3								263			66	44	1.63	88	64
16		5.0	6.8	0.30	1,980	1,493	27.0	0.73	4.4	260	0.38	0.29	64	49	1.74	92	60
17		4.9	5.9	0.29	1,985	1,514	31.0	0.64	4.1	254	0.40	0.30	63	49	1.77	89	68
18		5.0	6.7	0.25	2,046	1,583	32.0	0.64	2.7	249	0.44	0.33	65	49	1.72	83	64
19		4.9	4.9	0.32	2,024	1,538	30.0	0.67	3.1	247	0.45	0.34	63	50	1.75	100	84
20		4.9	7.4	0.30	2,046	1,546	30.0	0.68	2.5	250	0.42	0.33	62	52	1.77	94	56
21		5.3								256			68	51	1.63	76	60
22		5.2								260			67	51	1.65	86	72
23		4.8	4.6	0.31	1,921	1,354	26.0	0.74	5.2	258	0.37	0.29	61	51	1.79	85	84
24		4.9	5.6	0.34	1,869	1,433	26.0	0.72	3.9	264	0.37	0.29	63	46	1.76	100	68
25		4.6	4.7	0.31	1,871	1,444	27.0	0.69	4.6	265	0.39	0.30	59	44	1.87	86	76
26		4.6	5.4	0.32	1,891	1,420	28.0	0.68	4.2	266	0.39	0.30	59	40	1.86	87	68
27		5.0	5.1	0.27	1,976	1,487	28.0	0.71	3.5	262	0.39	0.29	64	38	1.73	84	80
28		5.2								267			67	37	1.65	104	84
29		5.2								267			66	37	1.67	93	88
30		4.8	5.0	0.28	2,080	1,554	30.0	0.69	3.9	266	0.39	0.31	62	37	1.79	87	84
31		5.0	6.3	0.25	2,141	1,636	35.0	0.61	2.9	252	0.41	0.31	64	37	1.73	86	71
Total	48	157.2	130.1	6.16	42,834	32,174	633.0	14.27	79.2	7,844	8.55	6.45	1,991	1,323	52.78	2,871	2,187
Max.	48	5.5	9.7	0.34	2,276	1,736	36.0	0.74	5.5	267	0.45	0.34	69	52	1.87	106	88
Min.	48	4.6	4.6	0.22	1,869	1,354	26.0	0.61	1.9	234	0.37	0.27	59	30	1.56	76	48
Avg.	48	5.1	6.2	0.29	2,040	1,532	30.1	0.68	3.8	253	0.41	0.31	64	43	1.70	93	71
Count	1	31.0	21.0	21.00	21	21	21.0	21.00	21.0	31	21.00	21.00	31	31	31.00	31	31

Robert J. Swalwell
Superintendent

MARSHALL WWTP 801 INDUSTRIAL RD. MARSHALL MI 49068 - PERMIT MI0023540

JANUARY 1995 - DISCHARGE MONITORING REPORT - DISCHARGE NO. 001A

Day	F.Eff. D.O. mgIL	F.Eff. pH SU	F.Eff. SS mgIL	F.Eff. SS Lbs.	F.Eff. Total-P mgIL	Flow MGD	F.Eff. Chlorine mgIL	F.Eff. CBOD mgIL	F.Eff. CBOD Lbs.	F.Eff. NH3 as N mgIL	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %	Mercury mgIL
1	7.9	7.5	6	78		1.56	0.014	4	52			23	94	97		
2	8.5	7.5	8	109	0.38	1.64	0.001	5	68			21	95	97	86	<0.0002
3	8.2	7.5	10	138		1.65	0.001	6	83	9.2	127	20	94	96		
4	7.4	7.5	12	164		1.64	0.002	7	96			85	92	94		
5	8.9	7.5	12	164		1.64	0.000	7	96	9.5	130	12	92	95		
6	8.1	7.5	6	81		1.61	0.003	5	67			8	94	97		
7	7.8	7.6	9	122		1.62	0.000	6	81			10	91	96		
8	7.7	7.2	12	162		1.62		5	68				91	96		
9	8.0	7.4	10	150	0.50	1.80	0.009	5	75			18	94	96	88	<0.0002
10	7.0	7.4	10	147		1.76	0.001	6	88			11	93	96		
11	7.4	7.3	13	186		1.72	0.000	7	100	10.3	148	19	91	95		
12	7.0	7.4	8	113		1.69	0.000	5	70			4	94	96		<0.0002
13	7.0	7.6	3	42		1.68	0.000	4	56			11	97	97		
14	7.2	7.3	9	123		1.64	0.000	6	82			58	93	96		
15	7.6	7.6	8	109		1.63	0.000	4	54			36	94	96		
16	8.0	7.3	6	87		1.74	0.000	5	73			62	95	97		
17	8.1	7.2	7	103	0.59	1.77	0.000	5	74	10.7	157	12	95	96	81	
18	7.8	7.3	7	100		1.72	0.000	4	57			26	95	97		<0.0002
19	7.3	7.2	8	117		1.75	0.000	5	73			24	93	96		
20	7.8	7.5	6	89		1.77	0.000	4	59			22	94	97		
21	7.9	7.5	6	82		1.63	0.000	3	41			36	95	98		
22	8.7	7.5	11	151		1.65	0.000	4	55	7.3	101	52	92	97		
23	8.3	7.5	10	149		1.79	0.000	4	60			36	92	97		
24	8.2	7.4	9	132	0.44	1.76	0.000	5	73			31	94	97		
25	8.2	7.5	10	156		1.87	0.000	5	78			28	92	97	85	
26	7.3	7.5	9	140		1.86	0.000	4	62			30	94	97		
27	7.8	7.4	9	130		1.73	0.000	3	43			32	93	98		
28	7.4	7.5	11	151		1.65	0.000	6	83			40	91	96		
29	8.2	7.3	18	251		1.67	0.000	6	84			26	86	96		
30	8.0	7.3	14	209		1.79	0.000	5	75	6.3	93	56	91	97		
31	7.6	7.4	11	159		1.73	0.000	5	72			37	96	97		
Total	242.3	230.1	288	4,093	1.91	52.78	0.032	155	2,198	53.3	756	886	2,887	2,990	340	<0.0002
Max.	8.9	7.6	18	251	0.59	1.87	0.014	7	100	10.7	157	85	97	98	88	<0.0002
Min.	7.0	7.2	3	42	0.38	1.56	0.000	3	41	6.3	93	4	86	94	81	<0.0002
Avg.	7.8	7.4	9	132	0.48	1.70	0.001	5	71	8.9	126	30	93	96	85	<0.0002
Count	31.0	31.0	31	31	4.00	31.00	30.000	31	31	6.0	6	24	31	31	4	4

G = Geometric Mean

1/9/95 - Copper 0.02 mg/l and Zinc 0.05 mg/l

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

JANUARY 1995 - MISCELLANEOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	SO2 Lbs.	Lime Lbs.	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	Raw Sludge pH	Sludge pH 2 Hours	Sludge pH 16 Hrs.	Lbs. of Lime per 1000 Gals. Sludge
1	81	3,000	380	22	161	15	263	5,000	3.7	76		12.34	12.00	52.60
2	87	2,880	660	20	322	16	175	4,000	2.9	77	6.1	12.50	12.50	43.75
3	107	3,000	140	22	242	17	263	5,000	3.6	77	6.1	12.59	12.56	52.60
4	123	3,000	530	22	242	15	292	6,000	3.7	75	6.0	12.32	12.57	48.67
5	113	3,000	400	23	161	18	263	4,000	3.3	77	6.0	12.34	12.48	65.75
6	91	3,000	380	20	242	8	263	4,000	3.6	77	6.0	12.20	12.64	65.75
7	85	3,000	400	20	242	14	204	4,200	3.1	75	6.1	12.53	12.60	48.57
8	108	2,760	350	20	322	16	204	4,000	3.7	77	6.0	12.46	12.21	51.00
9	84	3,000	410	19	242	14	204	4,000	4.0	75	6.2	12.66	12.61	51.00
10	83	2,880	520	18	242	16	204	4,000	3.8	75	6.0	12.13	12.71	51.00
11	59	2,880	520	18	322	18	234	4,000	4.5	75	5.8	12.51	12.54	58.50
12	22	2,880	520	26	242	14	204	4,500	4.1	74	6.0	12.12		45.33
13	37	2,880	410	18	242	17	234	4,000	4.0	75		12.01	11.27	58.50
14	31	3,000	430	17	161	16	234	4,000	3.4	77	6.1	12.07	11.93	58.50
15	52	2,640	350	19	322	21	292	5,500	4.1	75	6.0	12.03	11.30	53.09
16	80	3,000	460	18	242	14	380	5,000	3.8	73	6.0	12.28	12.04	76.00
17	54	2,880	530	28	242	13	263	5,000	3.5	75	5.8	12.03	11.04	52.60
18	46	2,880	540	19	161	16	292	5,000	3.9	76	5.9	12.01	11.58	58.40
19	40	2,880	470	19	242	13	292	6,500	3.8	77	6.0	12.21	12.06	44.92
20	74	2,880	540	17	242	15	292	5,000	3.9	77	5.9	12.27	12.21	58.40
21	72	2,880	550	20	242	15	292	5,000	3.6	77	6.0	12.03	12.49	58.40
22	83	3,000	670	19	81	18	234	5,000	3.9	78	6.0	12.05	9.86	46.80
23	75	3,000	530	24	242	18	292	5,000	3.7	77	6.0	12.04	11.09	58.40
24	81	2,880	520	18	242	13	380	6,500	3.7	76	6.0	12.06	11.54	58.46
25	79	3,000	520	20	161	9	380	5,000	3.9	78	6.0	12.17	12.52	76.00
26	74	3,000	570	20	242	12	350	5,000	4.1	84	6.1	12.05	12.41	70.00
27	81	3,000	680	18	242	13	350	6,000	3.7	76	6.0	12.24	11.72	58.33
28	72	3,120	590	15	322	15	292	5,000	3.8	76	5.9	12.05	12.78	58.40
29	83	3,000	720	17	161	14	292	5,000	3.6	77	5.9	12.10	12.37	58.40
30	58	3,000	600	20	242	16	292	5,000	3.7	78	5.9	12.08	12.33	58.40
31	54	3,000	2,040	28	242	20	292	5,000	3.8	79		12.07	11.81	58.40
Total	2,269	91,200	16,930	624	7,255	469	8,498	150,200	115.9	2,371	167.8	378.55	361.77	1754.93
Max.	123	3,120	2,040	28	322	21	380	6,500	4.5	84	6.2	12.66	12.78	76.00
Min.	22	2,640	140	15	81	8	175	4,000	2.9	73	5.8	12.01	9.86	43.75
Avg.	73	2,942	546	20	234	15	274	4,845	3.7	76	6.0	12.21	12.06	56.61

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

FEBRUARY 1995 - PLANT INFLUENT SHEET

PN-Day	Weather Type	Weather Precip.	Inf. Flow MGD	Inf. Temp F	Inf. pH SU	Inf. BOD mgIL	Inf. BOD Lbs.	Inf. SS mgIL	Inf. SS Lbs.	Inf. Phos. mgIL	Inf. Phos. Lbs.	Inf. VSS mgIL	Inf. NH3-N mgIL	--Remarks or Other Parameters--
1			1.70	53	7.8	137	1,942	142	2,013			130		
2			1.71	54	7.6	140	1,997	138	1,968	4.05	58	134		
3	Snow	0.02	1.73	54	7.5	151	2,179	142	2,049			136		
4			1.59	55	7.7	124	1,644	114	1,512			96		
5	Snow	0.02	1.72	52	7.6	168	2,410	184	2,639			162		
6			1.75	53	7.6	128	1,868	188	2,744			158		
7			1.71	52	7.4	100	1,426	124	1,768			114	14.5	
8			1.68	52	7.7	143	2,004	156	2,186			130		
9			1.71	53	7.7	170	2,424	140	1,997	3.30	47	128		
10	Snow	0.02	1.72	54	7.6	209	2,998	212	3,041			190		
11			1.64	53	7.4	156	2,134	160	2,188			136		
12	Snow	0.03	1.63	52	7.7	189	2,569	152	2,066			134		
13			1.71	53	7.7	153	2,182	146	2,082			130		
14			1.75	53	7.6	167	2,437	162	2,364	5.80	85	148		
15	Rain	0.03	1.72	53	7.9	166	2,381	140	2,008			132	15.5	
16			1.62	54	8.0	153	2,067	152	2,054			136		
17			1.65	53	7.6	157	2,160	160	2,202			136		
18			1.59	54	7.6	199	2,639	258	3,421			230	15.6	
19			1.58	54	7.6	168	2,214	172	2,266	3.25	43	146		
20	Snow	0.03	1.65	53	7.7	151	2,078	142	1,954			128		
21			1.64	53	7.6	190	2,599	144	1,970			130	14.1	
22			1.67	53	7.4	170	2,368	148	2,061			136		
23			1.64	53	7.5	153	2,093	152	2,079			140		
24			1.68	53	7.5	159	2,228	158	2,214			140		
25	Snow	0.03	1.58	52	7.7	146	1,924	132	1,739			110		
26	Rain	0.45	1.60	53	7.5	170	2,268	124	1,655			112	14.2	
27	Snow	0.03	1.77	53	7.4	173	2,554	224	3,307			208		
28			1.67	53	7.5	142	1,978	142	1,978			124		
29														
30														
31														
Total	0	0.66	46.81	1,487	213.1	4,432	61,765	4,408	61,526	16.40	232	3,934	73.9	
Max.	0	0.45	1.77	55	8.0	209	2,998	258	3,421	5.80	85	230	15.6	
Min.	0	0.02	1.58	52	7.4	100	1,426	114	1,512	3.25	43	96	14.1	
Avg.	0	0.07	1.67	53	7.6	158	2,206	157	2,197	4.10	58	141	14.8	
Count	9	9.00	28.00	28	28.0	28	28	28	28	4.00	4	28	5.0	

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

FEBRUARY 1995 - PRIMARY EFFLUENT SHEET

PN- Day	P Eff. BOD mgIL	P Eff. BOD Lbs.	P Eff. SS mgIL	P. Eff. SS Lbs.	P Eff. Phos. mgIL	P Eff. Phos. Lbs.	P Eff. VSS mgIL	P Eff. NH3-N mgIL	Flow MGD	BOD Prı. Removal %	SS Prı. Removal %	P Prı. Removal %
1	92	1,304	72	1,021			72		1.70	33	49	
2	88	1,255	88	1,255	3.60	51	84		1.71	37	36	11
3	93	1,342	80	1,154			76		1.73	38	44	
4	83	1,101	60	796			56		1.59	33	47	
5	91	1,305	68	975			64		1.72	46	63	
6	70	1,022	76	1,109			76		1.75	45	60	
7	60	856	60	856			52	14.6	1.71	40	52	
8	80	1,121	80	1,121			68		1.68	44	49	
9	103	1,469	80	1,141	3.30	47	76		1.71	39	43	0
10	110	1,578	80	1,148			72		1.72	47	62	
11	106	1,450	88	1,204			80		1.64	32	45	
12	139	1,890	72	979			68		1.63	26	53	
13	88	1,255	72	1,027			64		1.71	42	51	
14	95	1,387	76	1,109	6.15	90	72		1.75	43	53	-6
15	104	1,492	84	1,205			76	15.2	1.72	37	40	
16	103	1,392	84	1,135			80		1.62	33	45	
17	108	1,486	76	1,046			64		1.65	31	53	
18	119	1,578	92	1,220			80	16.6	1.59	40	64	
19	67	883	80	1,054	3.30	43	72		1.58	60	53	0
20	101	1,390	88	1,211			80		1.65	33	38	
21	116	1,587	88	1,204			76	14.7	1.64	30	39	
22	109	1,518	100	1,393			100		1.67	36	32	
23	137	1,874	104	1,422			96		1.64	10	32	
24	130	1,821	112	1,569			100		1.68	18	29	
25	102	1,344	108	1,423			92		1.58	30	18	
26	110	1,468	104	1,388			100	14.6	1.60	35	16	
27	149	2,200	104	1,535			104		1.77	14	54	
28	114	1,588	108	1,504			104		1.67	20	24	
29												
30												
31												
Total	2,867	39,953	2,384	33,203	16.35	232	2,204	75.7	46.81	972	1,244	5
Max.	149	2,200	112	1,569	6.15	90	104	16.6	1.77	60	64	11
Mın.	60	856	60	796	3.30	43	52	14.6	1.58	10	16	-6
Avg.	102	1,427	85	1,186	4.09	58	79	15.1	1.67	35	44	1
Count	28	28	28	28	4.00	4	28	5.0	28.00	28	28	4

Robert J. Swalwell
Superıntendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

FEBRUARY 1995 - ACTIVATED SLUDGE SHEET

PN-Day	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading f/m	Mix Liq SS mg/L	Mix Liq VSS mg/L	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mg/L	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mg/l	PE SS mg/L
1	48	5.1	6.3	0.27	2,144	1,628	32.0	0.67	2.7	254	0.43	0.32	65	37.6	1.70	92	72
2		5.0	5.2	0.25	2,173	1,664	33.0	0.66	3.3	263	0.40	0.30	65	36.7	1.71	88	88
3		5.0	5.9	0.26	2,290	1,747	34.0	0.67	3.3	259	0.40	0.31	64	42.2	1.73	93	80
4		5.4								267			68	43.1	1.59	83	60
5		5.0								272			63	43.3	1.72	91	68
6		4.9	5.4	0.23	2,000	1,506	35.0	0.57	4.6	243	0.39	0.29	63	43.2	1.75	70	76
7		5.0	7.2	0.19	2,058	1,542	38.0	0.54	3.7	226	0.37	0.27	66	42.9	1.71	60	60
8		5.1	5.4	0.25	2,024	1,512	35.0	0.58	2.9	228	0.37	0.28	66	42.8	1.68	80	80
9		5.0	5.3	0.32	2,011	1,525	32.0	0.63	4.0	219	0.39	0.30	65	42.5	1.71	103	80
10		5.0	5.3	0.34	2,017	1,530	34.0	0.59	3.1	217	0.38	0.29	64	42.4	1.72	110	80
11		5.3								220			71	43.0	1.64	106	88
12		5.3								233			68	42.9	1.63	139	72
13		5.0	6.0	0.27	2,045	1,573	40.0	0.51	4.4	228	0.38	0.29	64	45.3	1.71	88	72
14		4.9	5.5	0.30	2,037	1,540	40.0	0.51	4.5	226	0.38	0.28	63	46.2	1.75	95	76
15		5.0	5.3	0.31	2,140	1,602	42.0	0.51	3.3	213	0.38	0.29	64	46.5	1.72	104	84
16		5.3	5.8	0.29	2,192	1,627	46.0	0.48	4.3	223	0.39	0.29	68	50.9	1.62	103	84
17		5.2	6.2	0.31	2,162	1,594	47.0	0.46	3.8	219	0.38	0.28	66	52.9	1.65	108	76
18		5.4								235			69	51.8	1.59	119	92
19		5.5								239			71	54.6	1.58	67	80
20		5.2								234			68	53.2	1.65	101	88
21		5.3	5.4	0.33	2,171	1,596	45.0	0.48	5.2	232	0.38	0.28	68	51.8	1.64	116	88
22		5.2	4.7	0.32	2,174	1,590	35.0	0.62	4.8	215	0.39	0.28	66	53.3	1.67	109	100
23		5.3	4.7	0.38	2,215	1,634	47.0	0.47	3.6	216	0.40	0.29	68	54.1	1.64	137	104
24		5.1	4.2	0.37	2,218	1,631	38.0	0.58	2.9	223	0.38	0.28	64	54.5	1.68	130	112
25		5.5								223			70	61.1	1.58	102	108
26		5.4								228			69	63.2	1.60	110	104
27		4.9	4.2	0.47	2,150	1,566	30.0	0.72	5.9	218	0.39	0.28	62	63.3	1.77	149	104
28		5.2	4.3	0.34	2,160	1,575	35.0	0.62	3.2	222	0.39	0.28	61	63.7	1.67	114	108
29																	
30																	
31																	
Total	48	144.5	102.2	5.79	40,381	30,182	718.0	10.87	73.5	6,495	7.37	5.48	1,849	1369.0	46.81	2,867	2,384
Max.	48	5.5	7.2	0.47	2,290	1,747	47.0	0.72	5.9	272	0.43	0.32	71	63.7	1.77	149	112
Min.	48	4.9	4.2	0.19	2,000	1,506	30.0	0.46	2.7	213	0.37	0.27	61	36.7	1.58	60	60
Avg.	48	5.2	5.4	0.30	2,125	1,589	37.8	0.57	3.9	232	0.39	0.29	66	48.9	1.67	102	85
Count	1	28.0	19.0	19.00	19	19	19.0	19.00	19.0	28	19.00	19.00	28	28.0	28.00	28	28

Robert J. Swalwell
Superintendent

MARSHALL WWTP 801 INDUSTRIAL RD. MARSHALL MI 49068 - PERMIT MI0023540

FEBRUARY 1995 - DISCHARGE MONITORING REPORT - DISCHARGE NO. 001A

Day	F.Eff. D.O. mgIL	F.Eff. pH SU	F.Eff. SS mgIL	F.Eff. SS Lbs.	F.Eff. Total-P mgIL	Flow MGD	F.Eff. Chlorine mgIL	F.Eff. CBOD mgIL	F.Eff. CBOD Lbs.	F.Eff. NH3 as N mgIL	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %	Mercury mgIL
1	7.2	7.4	12	170		1.70	0.000	5	71			51	92	96		
2	7.5	7.3	13	185	0.93	1.71	0.000	5	71			82	91	96	77	<0.0002
3	7.6	7.2	14	202		1.73	0.000	4	58			266	90	97		
4	7.7	7.4	10	133		1.59	0.000	4	53			103	91	97		
5	8.7	7.4	14	201		1.72	0.000	6	86			103	92	96		
6	8.3	7.3	13	190		1.75	0.013	5	73			110	93	96		<0.0002
7	7.8	7.2	10	143		1.71	0.002	4	57	7.0	100	30	92	96		
8	7.9	7.5	13	182		1.68	0.000	6	84			136	92	96		
9	7.8	7.5	12	171	0.73	1.71	0.000	7	100			28	91	96	78	
10	7.7	7.4	10	143		1.72	0.002	6	86			26	95	97		
11	7.6	7.5	14	191		1.64	0.000	7	96			136	91	96		
12	8.6	7.5	11	150		1.63	0.002	7	95			21	93	96		
13	8.5	7.5	12	171		1.71	0.000	6	86			33	92	96		
14	8.2	7.4	13	190	0.60	1.75	0.000	6	88			27	92	96	90	
15	7.6	7.8	9	129		1.72	0.000	6	86	10.6	152	30	94	96		
16	7.8	7.8	13	176		1.62	0.000	6	81				91	96		<0.0002
17	7.7	7.4	11	151		1.65	0.000	6	83			250	93	96		
18	7.6	7.4	10	133		1.59	0.000	6	80	12.6	167	146	96	97		
19	7.4	7.3	9	119	0.20	1.58	0.001	5	66			93	95	97	90	
20	7.9	7.5	8	110		1.65	0.000	4	55			96	94	97		<0.0002
21	8.5	7.4	8	109		1.64	0.012	5	68	11.7	160	44	94	97		
22	8.0	7.5	10	139		1.67	0.003	6	84			39	93	96		
23	7.8	7.3	10	137		1.64	0.000	5	68			41	93	97		
24	7.4	7.3	10	140		1.68	0.000	6	84			39	94	97		
25	7.5	7.5	14	184		1.58	0.000	5	66			55	89	97		
26	8.5	7.4	10	133		1.60	0.000	7	93	12.5	167	64	92	96		
27	8.1	7.3	9	133		1.77	0.000	5	74			58	96	97		
28	8.0	7.3	13	181		1.67	0.000	6	84			37	91	96		
29																
30																
31																
Total	220.9	207.7	315	4,397	2.46	46.81	0.036	156	2,174	54.4	746	2,144	2,592	2,699	335	<0.0002
Max.	8.7	7.8	14	202	0.93	1.77	0.013	7	100	12.6	167	266	96	97	90	<0.0002
Min.	7.2	7.2	8	109	0.20	1.58	0.000	4	53	7.0	100	21	89	96	77	<0.0002
Avg.	7.9	7.4	11	157	0.62	1.67	0.001	6	78	10.9	149	G 61	93	96	84	<0.0002
Count	28.0	28.0	28	28	4.00	28.00	28.000	28	28	5.0	5	27	28	28	4	4

G = Geometric Mean

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

FEBRUARY 1995 - MISCELLANEOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	SO2 Lbs.	Lime Lbs.	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	Raw Sludge pH	Sludge pH 2 Hours	Sludge pH 16 Hrs.	Lbs. of Lime per 1000 Gals. Sludge
1	6,600	3,000	550	20	161	17	236	4,000	3.7	75	5.8	12.24	12.23	59.00
2	8,100	2,880	600	19	322	15	315	6,000	3.7	77	5.9	12.18	12.11	52.50
3	8,000	3,000	630	18	161	17	263	6,000	3.7	77	6.0	12.22	12.10	43.83
4	10,200	3,000	560	18	242	11	263	5,000	3.8	77	5.9	12.16		52.60
5	12,300	3,240	750	19	242	11	289	5,100	3.5	77	5.9	12.43	12.12	56.67
6	10,400	3,000	590	20	322	17	289	5,000	3.7	77	5.9	12.14	12.05	57.80
7	10,900	3,000	600	21	242	12	236	5,000	3.5	75	6.0	12.40	12.40	47.20
8	9,800	2,880	590	22	242	17	236	5,000	3.9	77	5.9	12.06	12.24	47.20
9	9,300	2,880	640	19	242	14	263	5,000	3.7	78	5.9	12.03	12.22	52.60
10	8,700	2,880	700	16	242	17	315	5,000	3.8	77	6.0	12.11	12.20	63.00
11	13,300	3,000	600	18	161	13	289	5,000	3.9	78	5.9	12.09	12.05	57.80
12	12,000	3,000	670	17	242	17	263	5,000	3.5	77	5.9	12.11	12.28	52.60
13	11,500	3,000	920	17	242	12	315	5,000	4.4	75	6.0	12.35	12.72	63.00
14	7,700	3,000	600	18	322	8	315	5,000	3.9	75	6.1	12.12	13.11	63.00
15	6,900	2,760	590	20	322	19	263	5,000	4.0	75	6.1	12.06	12.00	52.60
16	7,800	2,880	730	18	322	9	289	6,100	4.0	76	6.3	12.04	12.11	47.38
17	6,300	2,760	620	22	322	14	236	5,000	3.9	76	6.0	12.00	12.58	47.20
18	5,000	2,760	590	20	322	15	263	5,000	3.9	76	6.0	12.14	12.21	52.60
19	5,200	2,760	790	20	403	14	263	5,000	3.6	74	6.3	12.01	11.89	52.60
20	6,800	2,880	760	20	322	16	263	5,000	3.6	80	6.1	11.72	11.42	52.60
21	7,600	2,880	570	21	322	16	289	6,000	3.9	75	6.1	12.44	12.52	48.17
22	4,700	2,760	560	20	322	19	289	5,000	3.9	74	6.1	12.16	12.35	57.80
23	6,900	2,760	580	24	403	17	263	5,000	3.9	75	6.2	12.13	12.39	52.60
24	7,300	2,880	590	24	322	25	236	6,600	3.9	72	6.6	12.07	12.49	35.76
25	7,700	2,880	730	12	322	16	210	5,000	3.9	75	6.1	12.01	12.17	42.00
26	8,600	2,760	580	16	322	16	289	5,000	3.8	73	6.2	12.10	11.96	57.80
27	6,500	2,880	520	17	322	16	289	5,000	3.8	73	6.4	12.03	11.89	57.80
28	8,000	2,880	700	17	403	18	289	6,000	3.9	73	6.3	12.13	12.39	48.17
29														
30														
31														
Total	234,100	81,240	17,910	533	8,136	428	7,618	145,800	106.7	2,119	169.9	339.68	330.20	1473.87
Max.	13,300	3,240	920	24	403	25	315	6,600	4.4	80	6.6	12.44	13.11	63.00
Min.	4,700	2,760	520	12	161	8	210	4,000	3.5	72	5.8	11.72	11.42	35.76
Avg.	8,361	2,901	640	19	291	15	272	5,207	3.8	76	6.1	12.13	12.23	52.64

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

MARCH 1995 - PLANT INFLUENT SHEET

PN- Day	Weather Type	Weather Precip.	Inf. Flow MGD	Inf. Temp F	Inf. pH SU	Inf. BOD mgIL	Inf. BOD Lbs.	Inf. SS mgIL	Inf. SS Lbs.	Inf. Phos. mgIL	Inf. Phos. Lbs.	Inf. VSS mgIL	Inf. NH3-N mgIL	--Remarks or Other Parameters--
1			1.70	52	7.5	125	1,772	130	1,843			116	13.5	
2			1.71	53	7.7	162	2,310	140	1,997	3.90	56	132		
3			1.69	53	7.4	176	2,481	172	2,424			166		
4	Snow	0.02	1.62	53	7.4	170	2,297	120	1,621			108		
5	Rain	0.24	1.62	53	7.7	164	2,216	148	2,000			126		
6	Rain	0.76	1.75	53	7.7									
7	R&S	0.34	1.96	53	7.6	137	2,239	168	2,746	3.80	62	148		
8			1.76	53	7.7	115	1,688	118	1,732			100	12.5	
9			1.78	53	7.7	153	2,271	128	1,900			116		
10			1.80	54	7.5	126	1,892	120	1,801			100		
11			1.73	52	7.6	126	1,818	136	1,962			112		
12			1.71	52	7.7	228	3,252	336	4,792			316		
13			1.81	52	7.6	128	1,932	146	2,204			124	12.8	
14			1.73	53	7.6	92	1,327	108	1,558	3.30	48	92		
15			1.75	53	7.8	131	1,912	154	2,248			150		
16			1.76	53	8.0	113	1,659	242	3,552			214		
17			1.80	52	7.8	119	1,786	132	1,982			96		
18	Rain	0.02	1.79	52	7.5	106	1,582	122	1,821	3.50	52	100		
19	Rain	0.02	1.70	53	7.6	124	1,758	154	2,183			128		
20	Rain	0.06	1.71	54	7.6	130	1,854	160	2,282			138		
21			1.71	53	7.4	123	1,754	154	2,196			144		
22			1.68	53	7.3	145	2,032	136	1,906			122		
23			1.70	53	7.4	150	2,127	134	1,900			176		
24			1.71	53	7.5	131	1,868	130	1,854			106		
25			1.63	53	7.6	131	1,781	124	1,686			115		
26			1.59	52	7.5	131	1,737	114	1,512			106		
27	R&S	0.35	1.66	52	7.5	118	1,634	144	1,994			134	11.4	
28	Rain	0.04	1.63	53	7.5	138	1,876	138	1,876			130		
29	Rain	0.02	1.60	53	7.6	120	1,601	122	1,628			118	16.7	
30			1.65	53	7.6	134	1,844	196	2,697			188	13.0	
31			1.68	54	7.6	145	2,032	178	2,494			164		
Total	0	1.87	53.12	1,638	235.2	4,091	58,332	4,504	64,391	14.50	218	4,085	79.9	
Max.	0	0.76	1.96	54	8.0	228	3,252	336	4,792	3.90	62	316	16.7	
Min.	0	0.02	1.59	52	7.3	92	1,327	108	1,512	3.30	48	92	11.4	
Avg.	0	0.19	1.71	53	7.6	136	1,944	150	2,146	3.63	54	136	13.3	
Count	10	10.00	31.00	31	31.0	30	30	30	30	4.00	4	30	6.0	

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

MARCH 1995 - PRIMARY EFFLUENT SHEET

PN- Day	P Eff. BOD mgIL	P Eff. BOD Lbs.	P Eff. SS mgIL	P. Eff. SS Lbs.	P Eff. Phos. mgIL	P Eff. Phos. Lbs.	P Eff. VSS mgIL	P Eff. NH3-N mgIL	Flow MGD	BOD Prı. Removal %	SS Prı. Removal %	P Prı. Removal %
1	90	1,276	100	1,418			88	14.3	1.70	28	23	
2	132	1,883	116	1,654	3.40	48	112		1.71	19	17	13
3	159	2,241	124	1,748			120		1.69	10	28	
4	135	1,824	86	1,162			108		1.62	21	28	
5	150	2,027	120	1,621			108		1.62	9	19	
6									1.75			
7	125	2,043	120	1,962	3.40	56	100		1.96	9	29	11
8	102	1,497	120	1,761			100	15.4	1.76	11	-2	
9	120	1,781	120	1,781			108		1.78	22	6	
10	116	1,741	100	1,501			100		1.80	8	17	
11	131	1,890	114	1,645			107		1.73	-4	16	
12	160	2,282	116	1,654			100		1.71	30	65	
13	101	1,525	136	2,053			112	14.6	1.81	21	7	
14	82	1,183	132	1,905	3.10	45	120		1.73	11	-22	6
15	106	1,547	124	1,810			124		1.75	19	19	
16	85	1,248	136	1,996			128		1.76	25	44	
17	114	1,711	140	2,102			100		1.80	4	-6	
18	126	1,881	112	1,672			96		1.79	-19	8	
19	113	1,602	128	1,815			100		1.70	9	17	
20	106	1,512	132	1,883			112		1.71	18	18	
21	108	1,540	120	1,711	3.20	46	108		1.71	12	22	9
22	116	1,625	108	1,513			108		1.68	20	21	
23	118	1,673	120	1,701			120		1.70	21	10	
24	120	1,711	124	1,768			92		1.71	8	5	
25	113	1,536	120	1,631			108		1.63	14	3	
26	107	1,419	104	1,379			104		1.59	18	9	
27	105	1,454	112	1,551			96	13.5	1.66	11	22	
28	122	1,658	108	1,468			104		1.63	12	22	
29	99	1,321	108	1,441			116	21.3	1.60	18	11	
30	102	1,404	108	1,486			104	15.8	1.65	24	45	
31	115	1,611	132	1,849			124		1.68	21	26	
Total	3,478	49,647	3,540	50,643	13.10	194	3,227	94.9	53.12	430	527	39
Max.	160	2,282	140	2,102	3.40	56	128	21.3	1.96	30	65	13
Mın.	82	1,183	86	1,162	3.10	45	88	13.5	1.59	-19	-22	6
Avg.	116	1,655	118	1,688	3.28	49	108	15.8	1.71	14	18	10
Count	30	30	30	30	4.00	4	30	6.0	31.00	30	30	4

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

MARCH 1995 - ACTIVATED SLUDGE SHEET

PN- Day	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading flm	Mix Liq SS mgIL	Mix Liq VSS mgIL	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mgIL	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mgIl	PE SS mgIL
1	48	5.1	4.5	0.27	2,134	1,554	35.0	0.61	4.0	227	0.40	0.29	66	63	1.70	90	100
2		5.0	3.7	0.41	2,063	1,528	32.0	0.64	6.8	227	0.36	0.28	68	63	1.71	132	116
3		5.1	3.6	0.48	2,109	1,575	29.0	0.73	4.2	222	0.38	0.28	69	63	1.69	159	124
4		5.3								218			72	70	1.62	135	86
5		5.3								216			72	63	1.62	150	120
6		4.9	3.9	0.36	2,193	1,590	29.0	0.76	4.3	212	0.41	0.32	68	65	1.75	118	116
7		4.4	3.2	0.46	2,064	1,468	25.0	0.83	3.1	214	0.49	0.37	59	66	1.96	125	120
8		4.9	3.6	0.30	2,090	1,640	25.0	0.84	5.2	224	0.44	0.33	65	66	1.76	102	120
9		4.8	3.4	0.39	2,040	1,545	24.0	0.85	5.9	230	0.41	0.31	65	66	1.78	120	120
10		4.8	4.1	0.38	2,042	1,549	24.0	0.85	4.0	193	0.41	0.32	64	66	1.80	116	100
11		5.0								193			66	81	1.73	131	114
12		5.0								194			67	64	1.71	160	116
13		4.8	3.0	0.32	2,055	1,602	24.0	0.86	2.1	151	0.42	0.32	63	65	1.81	101	136
14		5.0	3.4	0.23	2,140	1,687	23.0	0.93	4.0	236	0.42	0.32	66	64	1.73	82	132
15		4.9	3.5	0.32	2,086	1,631	22.0	0.95	5.5	235	0.48	0.37	66	65	1.75	106	124
16		4.9	3.2	0.25	2,105	1,658	21.0	1.00	5.6	238	0.40	0.31	67	64	1.76	85	136
17		4.8	3.0	0.35	2,091	1,637	22.0	0.95	4.8	245	0.42	0.33	63	63	1.80	114	140
18		4.8								242			64	65	1.79	126	112
19		5.1								235			67	65	1.70	113	128
20		5.0	3.4	0.28	2,166	1,800	22.0	0.98	4.3	188	0.45	0.43	69	57	1.71	106	132
21		5.0	3.7	0.31	2,137	1,677	22.0	0.97	4.8	237	0.42	0.33	69	57	1.71	108	120
22		5.1	4.2	0.33	2,107	1,653	22.0	0.96	4.3	239	0.44	0.34	67	58	1.68	116	108
23		5.1	3.7	0.34	2,121	1,654	22.0	0.96	3.9	243	0.42	0.32	66	55	1.70	118	120
24		5.0	3.6	0.34	2,138	1,662	23.0	0.93	4.7	240	0.42	0.32	68	52	1.71	120	124
25		5.3								239			71	49	1.63	113	120
26		5.4								240			73	45	1.59	107	104
27		5.2	4.1	0.30	2,131	1,631	23.0	0.93	4.2	238	0.42	0.32	70	36	1.66	105	112
28		5.3	4.8	0.31	2,331	1,773	25.0	0.93	1.6	236	0.45	0.34	72	34	1.63	122	108
29		5.4	5.1	0.24	2,449	1,867	26.0	0.94	4.1	237	0.49	0.37	73	34	1.60	99	108
30		5.2	5.0	0.25	2,493	1,864	27.0	0.92	3.2	239	0.50	0.37	71	41	1.65	102	108
31		5.1	4.0	0.29	2,464	1,836	26.0	0.95	3.5	235	0.49	0.36	68	43	1.68	115	132
Total	48	156.2	87.6	7.51	49,749	38,081	573.0	20.27	98.1	6,963	9.94	7.65	2,094	1,808	53.12	3,596	3,656
Max.	48	5.4	5.1	0.48	2,493	1,867	35.0	1.00	6.8	245	0.50	0.43	73	81	1.96	160	140
Min.	48	4.4	3.0	0.23	2,040	1,468	21.0	0.61	1.6	151	0.36	0.28	59	34	1.59	82	86
Avg.	48	5.0	3.8	0.33	2,163	1,656	24.9	0.88	4.3	225	0.43	0.33	68	58	1.71	116	118
Count	1	31.0	23.0	23.00	23	23	23.0	23.00	23.0	31	23.00	23.00	31	31	31.00	31	31

Robert J. Swalwell
Superintendent

MARSHALL WWTP 801 INDUSTRIAL RD. MARSHALL MI 49068 - PERMIT MI0023540

MARCH 1995 - DISCHARGE MONITORING REPORT - DISCHARGE NO. 001A

Day	F.Eff. D.O. mgIL	F.Eff. pH SU	F.Eff. SS mgIL	F.Eff. SS Lbs.	F.Eff. Total-P mgIL	Flow MGD	F.Eff. Chlorine mgIL	F.Eff. CBOD mgIL	F.Eff. CBOD Lbs.	F.Eff. NH3 as N mgIL	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %	Mercury mgIL
1	8.8	7.0	10	142		1.70	0.000	6	85	13.0	184	62	92	95		<0.0002
2	8.9	7.4	12	171	0.31	1.71	0.000	7	100			48	91	96	92	
3	8.2	7.2	14	197		1.69	0.000	8	113			19	92	95		
4	7.6	7.2	10	135		1.62	0.000	9	122			56	92	95		
5	7.5	7.2	14	189		1.62	0.000	7	95			41	91	96		
6	8.2	7.5				1.75	0.000					146				
7	8.3	7.5	15	245	0.35	1.96	0.000	7	114			23	91	95	91	<0.0002
8	8.3	7.6	11	161		1.76	0.000	4	59	13.7	201	33	91	97		
9	9.0	7.7	13	193		1.78	0.000	10	148			18	90	93		
10	8.3	7.5	10	150		1.80	0.000	9	135			47	92	93		
11	7.2	7.4	15	216		1.73	0.000	11	159			242	89	91		
12	6.7	7.3	10	143		1.71	0.000	11	157			24	97	95		
13	7.2	7.6	12	181		1.81	0.000	11	166	11.7	177	54	92	91		<0.0002
14	7.5	7.4	11	159	0.20	1.73	0.000	7	101			292	90	92	94	
15	8.0	7.8	11	161		1.75	0.000	4	58			16	93	97		
16	8.0	8.1	11	161		1.76	0.020	7	103			25	95	94		
17	7.8	7.8	10	150		1.80	0.000	4	60			23	92	97		
18	7.6	7.5	11	164		1.79	0.000	5	75			18	91	95		
19	7.6	7.4	12	170		1.70	0.000	5	71			8	92	96		<0.0002
20	8.3	7.5	14	200		1.71	0.000	5	71			9	91	96		
21	8.1	7.2	12	171	0.22	1.71	0.000	6	86			8	92	95	94	
22	8.1	7.3	10	140		1.68	0.000	6	84			17	93	96		
23	7.8	7.3	9	128		1.70	0.000	7	99			4	93	95		
24	7.8	7.4	11	157		1.71	0.000	6	86				92	95		
25	7.7	7.5	14	190		1.63	0.000	6	82			12	89	95		
26	8.1	7.5	10	133		1.59	0.000	6	80			4	91	95		
27	8.8	7.5	11	152		1.66	0.000	5	69	12.5	173	5	92	96		
28	8.0	7.5	10	136		1.63	0.000	6	82			5	93	96		
29	7.4	7.5	11	147		1.60	0.000	5	67	18.7	250	6	91	96		
30	7.8	7.5	11	151		1.65	0.000	6	83	16.0	220	16	94	96		
31	7.7	7.6	14	196		1.68	0.000	4	56			3	92	97		
Total	246.3	231.4	349	4,990	1.08	53.12	0.020	200	2,863	85.6	1,205	1,284	2,756	2,851	371	<0.0002
Max.	9.0	8.1	15	245	0.35	1.96	0.020	11	166	18.7	250	292	97	97	94	<0.0002
Min.	6.7	7.0	9	128	0.20	1.59	0.000	4	56	11.7	173	3	89	91	91	<0.0002
Avg.	7.9	7.5	12	166	0.27	1.71	0.001	7	95	14.3	201	G 21	92	95	93	<0.0002
Count	31.0	31.0	30	30	4.00	31.00	31.000	30	30	6.0	6	30	30	30	4	4

G = Geometric Mean

3/1/95 - Copper <0.01 mg/l, Zinc 0.05 mg/l

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

MARCH 1995 - MISCELLANEOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	SO2 Lbs.	Lime Lbs.	Raw Sludge Gals	Total Solids Percent	Vol Solids Percent	Raw Sludge pH	Sludge pH 2 Hours	Sludge pH 16 Hrs.	Lbs. of Lime per 1000 Gals. Sludge
1	10,000	2,880	570	19	322	17	270	5,000	3.9	73	6.3	12.05	11.72	54.00
2	9,900	3,000	650	19	322	18	246	5,000	3.9	73	6.3	12.14	11.64	49.20
3	8,600	2,880	720	22	322	17	270	6,500	4.1	74	6.2	12.23	12.04	41.54
4	6,500	2,760	580	19	322	18	246	5,000	3.9	72	6.2	12.15	11.88	49.20
5	6,200	2,880	720	25	322	12	246	5,000	4.0	74	6.3	12.01	11.41	49.20
6	6,600	2,880	700	19	322	14	246	5,000	4.1	73	6.2	12.39	11.01	49.20
7	8,100	2,880	570	19	242	12	270	5,000	4.6	71	6.3	12.44	12.32	54.00
8	9,000	3,000	590	22	242	16	246	5,800	4.4	73	6.4	12.35	11.84	42.41
9	8,900	2,880	590	22	161	17	246	5,000	4.3	71	6.3	12.67	12.43	49.20
10	5,200	2,760	720	23	242	16	246	5,000	4.1	73	6.3	12.52	11.95	49.20
11	3,300	2,760	650	21	242	19	221	7,000	4.2	73	6.2	12.40	10.23	31.57
12	3,300	2,640	600	20	242	16	98	5,000	4 1	73	6.3			19.60
13	400	2,880	550	10	242	18	688	5,000	4.1	73	6.3	12.33	12.66	137.60
14	300	2,640	950	18	242	17	663	5,000	4.3	73	6.2	12.45	12.55	132.60
15	400	2,760	580	17	242	17	590	5,000	4.4	74	6.4	12.47	12.55	118.00
16	1,900	2,880	620	20	161	17	491	7,000	4.2	73	6.5	12.82	12.71	70.14
17	3,600	2,880	720	20	242	16	442	5,000	4.2	73	6.5	12.44	12.49	88.40
18	3,600	2,880	550	18	242	15	442	5,000	4.2	73	6.2	12.34	12.45	88.40
19	2,700	2,760	650	23	242	19	442	5,000	4.1	73	6.2	12.28	12.44	88.40
20	3,200	2,760	660	24	242	16	491	5,000	4.3	72	6.3	12.32	12.54	98.20
21	5,000	2,760	590	18	242	17	467	6,000	4.1	72	6.3	12.13	12.09	77.83
22	3,800	3,000	560	21	242	18	442	5,000	4.1	74	6.2	12.09	12.07	88.40
23	1,000	3,000	710	21	242	17	418	5,000	3.9	73	6.1	12.08	11.60	83.60
24	800	2,760	580	21	322	3	442	6,900	4.1	72	6.0	12.27	12.69	64.06
25	200	2,880	710	24	161	14	393	5,000	4.0	73	6.2	12.11	11.45	78.60
26	200	2,640	760	21	242	15	491	5,500	4.0	71	6.3	12.04	12.26	89.27
27	1,800	2,640	890	24	242	16	442	5,000	4.0	81	6.2	12.12	11.71	88.40
28	800	2,880	540	8	242	16	516	5,200	3.9	71	6.4	12.36	12.27	99.23
29	1,100	2,760	620	17	161	17	418	6,000	3.7	73	6.1	12.02	11.66	69.67
30	1,500	2,760	560	17	242	18	442	5,000	3.7	73	6.1	12.54	12.26	88.40
31	2,200	2,760	590	18	161	17	442	5,000	3.7	73	6.0	12.34	12.41	88.40
Total	120,100	87,480	20,050	610	7,657	495	12,013	165,900	126.6	2,263	193.8	368.90	361.33	2275.93
Max.	10,000	3,000	950	25	322	19	688	7,000	4.6	81	6.5	12.82	12.71	137.60
Min.	200	2,640	540	8	161	3	98	5,000	3.7	71	6.0	12.01	10.23	19.60
Avg.	3,874	2,822	647	20	247	16	388	5,352	4.1	73	6.3	12.30	12.04	73.42

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

APRIL 1995 - PLANT INFLUENT SHEET

PN- Day	-----Weather----- Type	Precip.	Inf. Flow MGD	Inf. Temp F	Inf. pH SU	Inf BOD mgIL	Inf. BOD Lbs.	Inf. SS mgIL	Inf. SS Lbs.	Inf. Phos. mgIL	Inf. Phos. Lbs.	Inf. VSS mgIL	Inf. NH3-N mgIL	--Remarks or Other Parameters--
1			1.55	52	7.6	142	1,836	194	2,508			168	13.0	
2			1.68	52	7.7	116	1,625	124	1,737			114	11.9	
3	Rain	0.16	1.82	53	7.5	135	2,049	152	2,307			138		
4			1.65	52	7.5	116	1,596	131	1,803			122		
5	Rain	0.08	1.69	52	7.6	111	1,565	120	1,691			108	12.4	
6			1.70	53	7.7	127	1,801	156	2,212			138	11.2	
7	Rain	0.60	1.63	52	7.5	159	2,161	336	4,568			314	12.2	
8	Rain	0.50	1.56	52	7.7	102	1,327	114	1,483	3.30	43	106	14.0	
9	Rain	0.34	1.71	54	7.6	172	2,453	150	2,139			142	13.6	
10			1.94	54	7.7	141	2,281	154	2,492			144		
11	Rain	0.26	1.99	56	7.4	129	2,141	146	2,423			134		
12	Rain	0.04	1.95	54	7.4	155	2,521	192	3,122	5.00	81	176	11.1	
13	Rain	0.02	1.90	54	7.5	175	2,773	236	3,740			208		
14			1.86	54	7.5	83	1,288	126	1,955			114		
15			1.70	54	7.5	150	2,127	258	3,658			232	12.9	
16			1.67	54	7.4	132	1,838	146	2,033			138	12.0	
17	Rain	0.22	1.97	54	7.7	109	1,791	124	2,037			112	14.2	
18			1.77	54	7.7	118	1,742	148	2,185			132	13.7	
19	Rain	0.20	1.81	54	7.5	157	2,370	158	2,385			132	14.9	
20	Rain	0.42	1.78	53	7.5	139	2,063	114	1,692			104		
21	Rain	0.02	1.77	54	7.6	145	2,140	172	2,539			152		
22			1.72	54	7.5	117	1,678	116	1,664			96		
23			1.70	54	7.5	149	2,113	182	2,580	4.10	58	162	12.6	
24	Rain	0.13	1.80	54	7.6	158	2,372	216	3,243			186		
25	Rain	0.04	1.80	54	7.5	126	1,892	117	1,756			104		
26	Rain	0.52	1.80	54	7.5	156	2,342	148	2,222	3.30	50	148		
27	Rain	0.04	1.77	55	7.6	158	2,332	146	2,155			130	13.7	
28			1.73	54	7.7	115	1,659	126	1,818			104		
29	Rain	0.02	1.68	54	7.6	105	1,471	114	1,597			92		
30	Rain	0.06	1.68	56	7.6	124	1,737	128	1,793			114		
31														
Total	0	3.67	52.78	1,610	226.9	4,021	59,085	4,744	69,539	15.70	232	4,264	193.4	
Max.	0	0.60	1.99	56	7.7	175	2,773	336	4,568	5.00	81	314	14.9	
Min.	0	0.02	1.55	52	7.4	83	1,288	114	1,483	3.30	43	92	11.1	
Avg.	0	0.20	1.76	54	7.6	134	1,969	158	2,318	3.93	58	142	12.9	
Count	18	18.00	30.00	30	30.0	30	30	30	30	4.00	4	30	15.0	

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

APRIL 1995 - PRIMARY EFFLUENT SHEET

PN- Day	P Eff BOD mgIL	P Eff. BOD Lbs.	P Eff SS mgIL	P Eff SS Lbs.	P Eff. Phos. mgIL	P Eff Phos. Lbs.	P Eff. VSS mgIL	P Eff. NH3-N mgIL	Flow MGD	BOD Prl. Removal %	SS Prl. Removal %	P Prl Removal %
1	108	1,396	136	1,758			116	17.3	1.55	24	30	
2	88	1,233	100	1,401			92	14.8	1.68	24	19	
3	101	1,533	112	1,700			48		1.82	25	26	
4	88	1,211	84	1,156			68		1.65	24	36	
5	87	1,226	84	1,184			76	15.3	1.69	22	30	
6	107	1,517	72	1,021			72	13.6	1.70	16	54	
7	91	1,237	100	1,359			100	14.5	1.63	43	70	
8	78	1,015	80	1,041	3.80	49	76	16.6	1.56	24	30	-24
9	129	1,840	84	1,198			80	17.8	1.71	25	44	
10	79	1,278	96	1,553			88		1.94	44	38	
11	101	1,676	92	1,527			92		1 99	22	37	
12	96	1,561	72	1,171	5.10	83	72	13.5	1.95	38	63	-2
13	88	1,394	80	1,268			56		1 90	50	66	
14	79	1,225	80	1,241			80		1.86	5	37	
15	108	1,531	80	1,134			80	15.9	1.70	28	69	
16	98	1,365	84	1,170			80	13.9	1.67	26	42	
17	77	1,265	104	1,709			104	17.4	1.97	29	16	
18	78	1,151	72	1,063			72	16.2	1.77	34	51	
19	96	1,449	88	1,328			60	17.8	1.81	39	44	
20	87	1,292	76	1,128			64		1.78	37	33	
21	82	1,210	76	1,122			72		1.77	43	56	
22	84	1,205	80	1,148			76		1.72	28	31	
23	78	1,106	72	1,021	2.90	41	72	14.7	1.70	48	60	29
24	94	1,411	80	1,201			48		1.80	41	63	
25	92	1,381	64	961			60		1.80	27	45	
26	77	1,156	84	1,261	3.30	50	84		1.80	51	43	0
27	107	1,580	88	1,299			72	14.9	1.77	32	40	
28	76	1,097	92	1,327			72		1.73	34	27	
29	75	1,051	84	1,177			56		1.68	29	26	
30	81	1,135	84	1,177			76	15.2	1.68	35	34	
31												
Total	2,710	39,728	2,580	37,804	15.10	223	2,264	249.4	52.78	947	1,260	3
Max.	129	1,840	136	1,758	5.10	83	116	17.8	1.99	51	70	29
Min.	75	1,015	64	961	2.90	41	48	13.5	1.55	5	16	-24
Avg.	90	1,324	86	1,260	3.78	56	75	15.6	1.76	32	42	1
Count	30	30	30	30	4.00	4	30	16.0	30.00	30	30	4

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

APRIL 1995 - ACTIVATED SLUDGE SHEET

PN-Day	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading flm	Mix Liq SS mgIL	Mix Liq VSS mgIL	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mgIL	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mgIl	PE SS mgIL
1	48	5.6								228			77	46	1.55	108	136
2		5.1								233			68	47	1.68	88	100
3		4.7	4.3	0.28	2,422	1,823	25.0	0.97	3.4	228	0.42	0.31	62	47	1.82	101	112
4		5.2	6.2	0.23	2,376	1,762	24.0	0.99	3.9	246	0.43	0.32	63	47	1.65	88	84
5		5.1	5.0	0.28	1,980	1,459	24.0	0.83	6.4	236	0.41	0.30	64	46	1.69	87	84
6		5.1	6.7	0.30	2,297	1,713	24.0	0.96	3.6	231	0.42	0.31	67	46	1.70	107	72
7		5.3	5.0	0.25	2,288	1,642	25.0	0.92	3.5	234	0.42	0.31	69	46	1.63	91	100
8		5.5								225			72	45	1.56	78	80
9		5.0								228			63	43	1.71	129	84
10		4.4	4.3	0.26	2,216	1,624	27.0	0.82	4.8	236	0.42	0.31	59	45	1.94	79	96
11		4.3	4.6	0.33	2,338	1,709	26.0	0.90	5.4	218	0.47	0.34	58	45	1.99	101	92
12		4.4	6.1	0.30	2,405	1,760	26.0	0.93	3.1	226	0.47	0.34	59	45	1.95	96	72
13		4.5	5.5	0.27	2,346	1,715	25.0	0.94	4.8	229	0.47	0.34	61	45	1.90	88	80
14		4.6								233			61	46	1.86	79	80
15		5.1								239			69	47	1.70	108	80
16		5.2								238			70	47	1.67	98	84
17		4.4	3.7	0.27	2,103	1,577	23.0	0.91	4.2	233	0.41	0.30	59	47	1.97	77	104
18		4.9	6.2	0.23	2,196	1,643	24.0	0.92	3.9	229	0.41	0.32	65	49	1.77	78	72
19		4.8	4.7	0.31	2,100	1,572	23.0	0.91	3.6	240	0.43	0.32	63	48	1.81	96	88
20		4.8	5.4	0.27	2,047	1,600	23.0	0.89	3.0	239	0.45	0.35	64	48	1.78	87	76
21		4.9	5.6	0.26	2,084	1,578	23.0	0.91	3.5	234	0.42	0.31	67	49	1.77	82	76
22		5.0								241			66	49	1.72	84	80
23		5.1								240			67	49	1.70	78	72
24		4.8	4.9	0.33	1,982	1,430	23.0	0.86	4.9	235	0.37	0.28	65	49	1.80	94	80
25		4.8	5.9	0.32	1,908	1,464	23.0	0.83	4.1	240	0.39	0.30	56	43	1.80	92	64
26		4.8	4.6	0.26	1,941	1,499	23.0	0.84	4.9	234	0.37	0.29	61	37	1.80	77	84
27		4.9	4.8	0.33	2,081	1,617	26.0	0.80	4.4	237	0.39	0.30	63	37	1.77	107	88
28		5.0	4.8	0.22	2,122	1,632	29.0	0.73	4.5	236	0.41	0.31	66	36	1.73	76	92
29		5.1								234			70	35	1.68	75	84
30		5.1								241			67	35	1.68	81	84
31																	
Total	48	147.5	98.4	5.29	41,232	30,819	466.0	16.85	79.9	7,021	7.98	5.96	1,941	1,344	52.78	2,710	2,580
Max.	48	5.6	6.7	0.33	2,422	1,823	29.0	0.99	6.4	246	0.47	0.35	77	49	1.99	129	136
Min.	48	4.3	3.7	0.22	1,908	1,430	23.0	0.73	3.0	218	0.37	0.28	56	35	1.55	75	64
Avg.	48	4.9	5.2	0.28	2,170	1,622	24.5	0.89	4.2	234	0.42	0.31	65	45	1.76	90	86
Count	1	30.0	19.0	19.00	19	19	19.0	19.00	19.0	30	19.00	19.00	30	30	30.00	30	30

Robert J. Swalwell
Superintendent

MARSHALL WWTP 801 INDUSTRIAL RD MARSHALL MI 49068 - PERMIT MI0023540

APRIL 1995 - DISCHARGE MONITORING REPORT - DISCHARGE NO 001A

Day	F.Eff. D O. mgIL	F Eff pH SU	F.Eff SS mgIL	F.Eff. SS Lbs.	F.Eff Total-P mgIL	Flow MGD	F.Eff Chlorine mgIL	F.Eff CBOD mgIL	F.Eff. CBOD Lbs.	F.Eff. NH3 as N mgIL	F Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %	Mercury mgIL
1	7.4	7.5	11	142		1 55	0.000	7	90	16.6	215	2	94	95		
2	7.5	7.5	9	126		1 68	0.000	5 -	70 -	16.3	228	7	93	96		
3	7.3	7.4	10 -	152 -		1 82	0.000	6 -	91 -			14	93	96		
4	8.1	7.5	14 -	193 -		1.65	0.000	7 -	96 -			12	89	94		
5	8.3	7.6	14 -	197 -		1 69	0.000	9 -	127 -	17.8	251	22	88	92		<0.0002
6	7.8	7.7	16 -	227 -		1.70	0.000	6 -	85 -	13.0	184	29	90	95		
7	7.9	7.4	19 -	258 -		1.63	0.000	11 -	150 -	14.1	192	40	94	93		
8	7.3	7.4	15 -	195 -	0.79	1.56	0.000	10 -	130 -	14.6	190	5	87	90	76	<0.0002
9	7.9	7.5	13 -	185 -		1.71	0.000			14.6	208	10	91			
10	7.9	7.6	7	113		1.94	0.000	3	49			13	95	98		
11	8.0	7.5	9	149		1.99	0.000	5	83			23	94	96		
12	7.5	7.4	15	244	0.57	1.95	0.000	7	114	12.3	200	22	92	95	89	<0.0002
13	8.1	7.5	13	206		1.90	0.000	5	79			27	94	97		
14	8.0	7.5	9	140		1.86	0.000	5	78			16	93	94		
15	7.6	7.5	12	170		1.70	0.000	9	128	14.4	204	10	95	94		
16	8.0	7.5	13	181		1.67	0.000	7	97	12.6	175	8	91	95		
17	8.1	7.6	9	148		1.97	0.000	3	49	16.2	266	24	93	97		
18	7.7	7.8	15	221		1.77	0.000	7	103	14.8	218	29	90	94		
19	7.5	7.5	12	181		1.81	0.000	7	106	17.6	266	21	92	96		
20	8.1	7.5	13	193		1.78	0.000	8	119			14	89	94		
21	7.8	7.6	13	192		1.77	0.000	6	89			32 -	92	96		
22	7.6	7.6	14	201		1.72	0.000	6	86			17 -	88	95		
23	8.4	7.6	10	142	0.57	1.70	0.000			14.5	206	12 -	95		86	<0.0002
24	8.2	7.6	9	135		1.80	0.000	6	90			26 -	96	96		
25	8.0	7.6	7	105		1.80	0 000	6	90			30 -	94	95		
26	7.9	7.6	12	180	1.40	1.80	0.000	6	90			16 -	92	96	58	
27	8.2	7.7	13	192		1.77	0.000	6	89	13.0	192	33 -	91	96		
28	7.9	7.6	11	159		1.73	0.000	5	72			11	91	96		
29	7.3	7.5	7	98		1.68	0.000	4	56			11	94	96		
30	7.5	7.6	12	168		1.68	0.000	4	56	12.3	172	17	91	97		
31																
Total	234.8	226.4	356	5,194	3.33	52.78	0.000	176	2,561	234.7	3,368	553	2,761	2,664	309	<0.0002
Max.	8.4	(7.8)	19	258	1.40	(1.99)	0.000	11	150	17.8	266	40	96	98	89	<0.0002
Min.	(7.3)	(7.4)	7	98	0.57	1.55	0.000	3	49	12.3	172	2	87	90	58	<0.0002
Avg.	7.8	7.5	(12)	(173)	(0.83)	(1.76)	0.000	(6)	(91)	14.7	(210)	(16)	(92)	(95)	77	<0.0002
Count	30.0	30.0	30	30	4.00	30.00	30.000	28	28	16.0	16	30	30	28	4	4

G = Geometric Mean

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

APRIL 1995 - MISCELLANEOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	SO2 Lbs.	Lime Lbs.	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	Raw Sludge pH	Sludge pH 2 Hours	Sludge pH 16 Hrs.	Lbs. of Lime per 1000 Gals. Sludge
1	900	2,760	560	20	242	17	406	6,700	3.7	74	6.1	12.11	12.05	60.60
2	600	2,640	480	20	242	19	430	5,000	3.9	87	6.2	12.02	12.05	86.00
3	700	2,760	490	20	242	10	478	6,100	3.6		6.2		11.90	78.36
4	1,600	2,640	590	21	242	15	430	6,000	3.8	75	6.1	12.14	12.24	71.67
5	1,000	3,000	540	33	242	14	502	6,000	3.6	74	6.3	11.85	11.51	83.67
6	900	2,880	540	22	161	16	454	6,600	3.6	73	6.0	12.06	11.38	68.79
7	600	2,880	730	24	161	18	574	8,000	3.5	73	6.1	12.83	9.91	71.75
8	1,000	2,640	570	20	161	17	717	8,000	3.6	73	6.1	12.34	12.20	89.63
9	200	2,880	480	24	242	19	454	6,000	3.6	74	6.1	12.30	12.29	75.67
10	900	2,760	590	24	242	19	454	5,000	3.5	73	6.2	12.40	12.63	90.80
11	400	2,760	650	14	161	16	1,147	16,000	3.7	73	6.4	12.36		71.69
12	600	2,760	600	12	161	19	1,434	20,000	3.5	72	6.3	12.44	12.18	71.70
13	1,000	2,760	580	18	242	17	645	11,500	3.9	72	6.2	12.47	12.27	56.09
14	1,000	2,640	620	19	242	17	717	10,000	3.8	72	6.2	12.39	12.31	71.70
15	700	2,760	760	19	242	15	669	10,000	4.0	72	6.4	12.39	12.26	66.90
16	700	2,760	490	20	242	18	956	10,000	3.6			12.53	12.35	95.60
17	200	2,640	610	19	161	17	837	11,700	3.6	74	6.4	12.44	12.18	71.54
18	400	2,640	560	21	242	18	454	8,000	4.3	75	6.3	12.42	12.29	56.75
19	800	2,760	730	28	161	17	478	8,000	3.6	74	6.3	12.41	12.12	59.75
20	1,000	2,640	580	18	242	16	502	8,000	3.2	76	6.5	12.41	12.26	62.75
21	500	2,760	520	22	161	10	454	8,000	3.4	76	6.4	12.49	12.12	56.75
22	400	2,640	700	22	161	14	454	6,000	3.7	75	6.4	12.39	12.29	75.67
23	100	2,640	620	22	161	9	406	6,000	3.3	77	6.5	12.44	12.36	67.67
24	200	2,760	520	23	161	12	621	10,000	3.6	77	6.4	12.34	12.40	62.10
25	200	2,640	670	20	242	13	550	6,000	3.4	77	6.4	12.21	12.21	91.67
26	200	2,640	560	15	161	14	550	7,000	3.3	78	6.3	12.51	12.43	78.57
27	200	2,760	590	14	161	13	478	6,000	3.6	78	6.4	12.34	12.41	79.67
28	100	2,640	990	18	161	14	454	5,000	3.8	80	6.2	12.29	12.30	90.80
29	200	2,640	510	17	242	13	382	5,000	3.7	81	6.5	12.23	11.93	76.40
30	100	2,640	480	17	242	13	382	5,000	3.7	80	6.3	12.39	12.36	76.40
31														
Total	17,400	81,720	17,910	606	6,126	459	17,469	240,600	109.1	2,115	182.2	357.94	351.19	2217.07
Max.	1,600	3,000	990	33	242	19	1,434	20,000	4.3	87	6.5	12.83	12.63	95.60
Min.	100	2,640	480	12	161	9	382	5,000	3.2	72	6.0	11.85	9.91	56.09
Avg.	580	2,724	597	20	204	15	582	8,020	3.6	76	6.3	12.34	12.11	73.90

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

MAY 1995 - PLANT INFLUENT SHEET

PM-Day	Weather Type	Weather Precip.	Inf. Flow MGD	Inf Temp F	Inf. pH SU	Inf. BOD mgIL	Inf BOD Lbs.	Inf SS mgIL	Inf. SS Lbs.	Inf. Phos. mgIL	Inf. Phos. Lbs.	Inf VSS mgIL	Inf. NH3-N mgIL	--Remarks or Other Parameters--
1			1.76	54	7.5	124	1,820	146	2,143			134	11.6	
2			1.77	56	7.6	140	2,067	200	2,952			184	12.6	
3	Rain	0.50	1.75	55	7.5	138	2,014	150	2,189	3.20	47	138	13.5	
4	Rain	0.32	1.74	55	7.5	124	1,799	139	2,017			126	13.8	
5	Rain	0.01	1.75	54	7.6	160	2,335	144	2,102			130	15.2	
6			1.71	54	7.6	143	2,039	146	2,082			136	13.9	
7			1.69	54	7.5	146	2,058	144	2,030			142	13.5	
8	Rain	0.35	1.80	54	7.5	146	2,192	148	2,222	3.90	59	120		
9	Rain	0.05	1.77	54	7.6	130	1,919	188	2,775			146	11.3	
10	Rain	0.46	1.79	56	7.5	151	2,254	132	1,971			112	11.6	
11			1.76	56	7.7	163	2,393	246	3,611			220	12.3	
12			1.82	56	7.6	154	2,338	182	2,763			150	12.6	
13	Rain	0.02	1.61	56	7.6	152	2,041	208	2,793			174	11.3	
14			1.63	56	7.8	156	2,121	172	2,338			148	10.5	
15			1.76	57	7.6	161	2,363	146	2,143			138	12.2	
16	Rain	0.06	1.74	57	7.6	156	2,264	164	2,380			148	13.8	
17			1.72	56	7.8	155	2,223	156	2,238	3.80	55	146	14.4	
18	Rain	0.04	1.74	56	7.7	171	2,481	142	2,061			136	15.3	
19			1.73	57	7.5	149	2,150	132	1,905			114	13.7	
20			1.61	56	7.5	143	1,920	116	1,558			100	13.1	
21			1.60	56	7.8	146	1,948	132	1,761			116	12.8	
22			1.79	56	7.6	139	2,075	144	2,150			132	14.2	
23	Rain	1.14	1.82	59	7.6	127	1,928	167	2,535			138	12.6	
24	Rain	0.35	1.81	57	7.6	152	2,295	136	2,053			116	12.9	
25	Rain	0.29	1.78	57	7.6	109	1,618	152	2,256			126	13.2	
26			1.77	57	7.5	136	2,008	240	3,543			200	15.1	
27	Rain	0.30	1.59	57	7.5	117	1,551	206	2,732			206	12.2	
28	Rain	0.04	1.60	57	7.5	118	1,575	168	2,242			148	11.3	
29	Rain	0.07	1.67	57	7.6	120	1,671	162	2,256	3.40	47	140	12.6	
30			1.75	57	7.7	115	1,678	146	2,131			134	12.9	
31			1.75	59	7.5	112	1,635	122	1,781			106	12.0	
Total	0	4.00	53.58	1,738	235.3	4,353	62,773	4,976	71,710	14.30	207	4,404	388.0	
Max.	0	1.14	1.82	59	7.8	171	2,481	246	3,611	3.90	59	220	15.3	
Min.	0	0.01	1.59	54	7.5	109	1,551	116	1,558	3.20	47	100	10.5	
Avg.	0	0.27	1.73	56	7.6	140	2,025	161	2,313	3.58	52	142	12.9	
Count	15	15.00	31.00	31	31.0	31	31	31	31	4.00	4	31	30.0	

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

MAY 1995 - PRIMARY EFFLUENT SHEET

PN-Day	P Eff. BOD mgIL	P Eff. BOD Lbs.	P Eff. SS mgIL	P. Eff. SS Lbs.	P Eff. Phos. mgIL	P Eff. Phos. Lbs.	P Eff. VSS mgIL	P Eff. NH3-N mgIL	Flow MGD	BOD Prl. Removal %	SS Prl. Removal %	P Prl. Removal %
1	82	1,204	84	1,233			72	14.4	1.76	42	42	
2	78	1,151	88	1,299			76	15.6	1.77	62	56	
3	97	1,416	88	1,284	3.50	51	88	16.1	1.75	41	41	-13
4	94	1,364	76	1,103			72	17.0	1.74	30	45	
5	87	1,270	52	759			52	19.2	1.75	73	64	
6	92	1,312	96	1,369			96	19.4	1.71	51	34	
7	104	1,466	84	1,184			88	16.4	1.69	42	42	
8	91	1,366	104	1,561	3.80	57	64		1.80	55	30	3
9	103	1,520	92	1,358			72	13.5	1.77	27	51	
10	99	1,478	84	1,254			64	14.4	1.79	52	36	
11	93	1,365	72	1,057			64	13.6	1.76	70	71	
12	93	1,412	76	1,154			64	12.5	1.82	61	58	
13	102	1,370	96	1,289			84	12.9	1.61	50	54	
14	105	1,427	88	1,196			80	12.9	1.63	51	49	
15	133	1,952	68	998			64	13.8	1.76	28	53	
16	87	1,263	84	1,219			72	14.4	1.74	69	49	
17	79	1,133	84	1,205	4.00	57	80	13.7	1.72	76	46	-5
18	183	2,656	72	1,045			64	15.8	1.74	-12	49	
19	96	1,385	64	923			60	13.7	1.73	53	52	
20	92	1,235	84	1,128			72	13.2	1.61	51	28	
21	126	1,681	76	1,014			60	13.1	1.60	20	42	
22	71	1,060	80	1,194			80	14.9	1.79	68	44	
23	70	1,063	92	1,396			80	12.4	1.82	57	45	
24	72	1,087	92	1,389			80	13.2	1.81	80	32	
25	51	757	84	1,247			68	13.9	1.78	58	45	
26	55	812	60	886			44	14.3	1.77	81	75	
27	123	1,631	84	1,114			64	12.7	1.59	-6	59	
28	59	787	68	907			52	11.5	1.60	59	60	
29	56	780	60	836	3.30	46	52	11.9	1.67	64	63	3
30	60	876	72	1,051			60	12.7	1.75	55	51	
31	78	1,138	68	992			52	12.8	1.75	34	44	
Total	2,811	40,417	2,472	35,645	14.60	211	2,140	425.9	53.58	1,542	1,510	-12
Max.	183	2,656	104	1,561	4.00	57	96	19.4	1.82	81	75	3
Min.	51	757	52	759	3.30	46	44	11.5	1.59	-12	28	-13
Avg.	91	1,304	80	1,150	3.65	53	69	14.2	1.73	50	49	-3
Count	31	31	31	31	4.00	4	31	30.0	31.00	31	31	4

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTE WATER TREATMENT PLANT

MAY 1995 - ACTIVATED SLUDGE SHEET

PN-Day	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading flm	Mix Liq SS mgIL	Mix Liq VSS mgIL	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mgIL	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mgIl	PE SS mgIL
1	48	4.9	5.5	0.23	2,254	1,742	35.0	0.64	5.0	235	0.42	0.32	64	36	1.76	82	84
2		4.9	5.4	0.22	2,325	1,779	37.0	0.63	5.3	225	0.42	0.33	63	36	1.77	78	88
3		4.9	5.6	0.26	2,408	1,834	40.0	0.60	5.4	224	0.45	0.34	64	35	1.75	97	88
4		5.0	6.8	0.24	2.511	1.886	41.0	0.61	4.5	205	0.43	0.33	64	41	1.74	94	76
5		4.9	9.8	0.22	2,494	1,899	46.0	0.54	5.1	226	0.46	0.35	66	42	1.75	87	52
6		5.0								224			68	42	1.71	92	96
7		5.1								222			68	42	1.69	104	84
8		4.8	4.6	0.25	2,415	1.797	50.0	0.48	4.9	225	0.40	0.30	64	45	1.80	91	104
9		4.9	5.4	0.28	2,464	1,817	40.0	0.62	5.1	217	0.46	0.34	65	45	1.77	103	92
10		4.8	5.9	0.27	2,458	1,858	48.0	0.51	4.5	219	0.43	0.32	67	50	1.79	99	84
11		4.9	6.8	0.24	2,409	1,891	51.0	0.47	4.0	235	0.43	0.31	69	52	1.76	93	72
12		4.7	6.2	0.28	2,372	1,694	41.0	0.58	4.8		0.42	0.31	66	41	1.82	93	76
13		5.4											75	38	1.61	102	96
14		5.3								237			74	38	1.63	105	88
15		4.9	7.2	0.38	2,394	1,725	39.0	0.61	5.0	235	0.39	0.29	67	39	1.76	133	68
16		5.0	5.9	0.24	2,386	1.746	55.0	0.43	4.3	230	0.40	0.32	70	43	1.74	87	84
17		5.0	6.0	0.21	2,424	1,801	52.0	0.47	4.0	234	0.41	0.30	71	43	1.72	79	84
18		5.0	6.9	0.52	2,395	1.718	45.0	0.53	4.4	240	0.42	0.32	70	43	1.74	183	72
19		5.0	7.6	0.26	2,340	1,753	47.0	0.50	3.8	235	0.44	0.32	70	44	1.73	96	64
20		5.4								235			75	43	1.61	92	84
21		5.4								242			76	43	1.60	126	76
22		4.8	5.7	0.21	2.280	1.692	45.0	0.51	4.8	237	0.40	0.29	68	43	1.79	71	80
23		4.7	4.8	0.21	2,233	1,657	43.0	0.52	4.3	233	0.41	0.30	67	41	1.82	70	92
24		4.8	4.9	0.21	2,250	1,700	45.0	0.50	3.6	242	0.42	0.31	67	43	1.81	72	92
25		4.8	5.3	0.15	2,197	1,653	46.0	0.48	4.2	245	0.41	0.31	65	44	1.78	51	84
26		4.9	7.1	0.17	2,097	1,587	40.0	0.52	4.7	242	0.40	0.30		43	1.77	55	60
27		5.4								320				36	1.59	123	84
28		5.4								231				34	1.60	59	68
29		5.2								244				32	1.67	56	60
30		4.9	6.0	0.18	2,095	1,610	50.0	0.42	5.3	244	0.37	0.28		34	1.75	60	72
31		4.9	6.6	0.24	2,182	1,616	57.0	0.38	3.9	238	0.39	0.30		35	1.75	78	68
Total	48	154.8	135.8	5.48	51,383	38,455	993.0	11.56	100.9	6,821	9.18	6.89	1,703	1,266	53.58	2,811	2,472
Max.	48	5.4	9.8	0.52	2,511	1,899	57.0	0.64	5.4	320	0.46	0.35	76	52	1.82	183	104
Min.	48	4.7	4.6	0.15	2,095	1,587	35.0	0.38	3.6	205	0.37	0.28	63	32	1.59	51	52
Avg.	48	5.0	6.2	0.25	2,336	1,748	45.1	0.53	4.6	235	0.42	0.31	68	41	1.73	91	80
Count	1	31.0	22.0	22.00	22	22	22.0	22.00	22.0	29	22.00	22.00	25	31	31.00	31	31

Robert J. Swalwell
Superintendent

MARSHALL WWTP 501 INDUSTRIAL RD MARSHALL MI 49068 - PERMIT MI0023540

MAY 1995 - DISCHARGE MONITORING REPORT - DISCHARGE NO. 001A

Day	F.Eff D.O. mgIL	F Eff. pH SU	F Eff. SS mgIL	F.Eff. SS Lbs.	F.Eff. Total-P mgIL	Flow MGD	F.Eff. Chlorine mgIL	F.Eff. CBOD mgIL	F.Eff. CBOD Lbs.	F.Eff. NH3 as N mgIL	F.Eff. NH3-N Lbs.	F Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %	Mercury mgIL
1	7.7	7.6	13	191		1.76	0 000	4	59	12.6	185	12	91	97		
2	7.9	7.5	11	162		1.77	0.000	4	59	13.5	199	23	95	97		
3	7.5	7.5	15	219	0.51	1.75	0.000	6	88	14.2	207	62	90	96	84	<0.0002
4	7.4	7.5	10	145		1.74	0.000	7	102	15.0	218	60	93	94		
5	7.7	7.6	12	175		1.75	0.000	6	88	17.3	252	24	92	96		
6	7.6	7.6	8	114		1.71	0.000	5	71	17.1	244	28	95	97		
7	7.6	7.5	8	113		1.69	0.000	5	70	16.0	226	15	94	97		
8	7.8	7.5	12	180	0.56	1.80	0.001	4	60			24	92	97	86	<0.0002
9	7.5	7.6	13	192		1.77	0.000	5	74	11.7	173	13	93	96		
10	7.3	7.5	9	134		1.79	0.000	6	90	12.9	193	9	93	96		
11	7.7	7.7	6	88		1.76	0.000	6	88	12.0	176	15	98	96		
12	7.6	7.6	5	76		1.82	0.000	4	61	11.5	175	14	97	97		
13	7.2	7.5	10	134		1.61	0.000	6	81	10.6	142	7	95	96		
14	7.2	7.6	10	136		1.63	0.000	6	82	11.0	150	18	94	96		
15	7.9	7.6	6	88		1.76	0.000	6	88	12.0	176	10	96	96		<0.0002
16	7.8	7.5	8	116		1.74	0.000	5	73	12.1	176		95	97		
17	7.0	7.5	11	158	0.57	1.72	0.000	6	86	12.9	185	25	93	96	85	<0.0002
18	7.3	7.5	10	145		1.74	0.000	7	102	13.8	200		93	96		
19		7.5	5	72		1.73	0.000	6	87	12.4	179	17	96	96		
20	7.6	7.5	10	134		1.61	0.000	5	67	11.4	153	21	91	97		
21	7.9	7.6	8	107		1.60	0.000	6	80	10.9	145	9	94	96		
22	7.8	7.5	6	90		1.79	0.002	3	45	12.7	190	12	96	98		
23	7.4	7.5	9	137		1.82	0.000	4	61	11.5	175	27	95	97		<0.0002
24	7.4	7.5	13	196		1.81	0.000	6	91	11.4	172	36	90	96		
25	7.4	7.4	11	163		1.78	0.000	4	59	11.6	172	23	93	96		
26	7.4	7.5	7	103		1.77	0.000	4	59	13.0	192	23	97	97		
27	7.3	7.5	12	159		1.59	0.000	5	66	11.4	151	12	94	96		
28	7.0	7.5	13	173		1.60	0.000	6	80	10.0	133	12	92	95		
29	7.5	7.6	4	56	0.56	1.67	0.000	3	42	9.1	127	15	98	98	84	
30	7.4	7.6	10	146		1.75	0.000	3	44	10.4	152	29	93	97		
31	7.5	7.2	9	131		1.75	0.000	2	29	9.5	139		93	98		
Total	225.3	233.3	294	4,235	2.20	53.58	0.003	155	2,228	371.5	5,355	595	2,911	2,990	339	<0.0002
Max.	7.9	7.7	15	219	0.57	1.82	0.002	7	102	17.3	252	62	98	98	86	<0.0002
Min.	7.0	7.2	4	56	0.51	1.59	0.000	2	29	9.1	127	7	90	94	84	<0.0002
Avg.	7.5	7.5	9	137	0.55	1.73	0.000	5	72	12.4	179	G 18	94	96	85	<0.0002
Count	30.0	31.0	31	31	4.00	31.00	31.000	31	31	30.0	30	28	31	31	4	5

G = Geometric Mean

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

MAY 1995 - MISCELLANEOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	SO2 Lbs.	Lime Lbs.	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	Raw Sludge pH	Sludge pH 2 Hours	Sludge pH 16 Hrs.	Lbs. of Lime per 1000 Gals. Sludge
1		2,640	700	22	242	13	246	7,000	3.7	80	6.3	12.31	12.15	35.14
2		2,640	770	20	242	15	282	5,000	3.8	80	6.2	12.38	12.48	56.40
3		2,760	770	22	242	13	282	5,000	3.8	78	6.2	12.34	12.25	56.40
4		2,520	670	26	242	11	282	5,000	3.6	78	6.1	12.42	12.44	56.40
5		2,640	710	11	242	11	282	5,000	3.5	79	6.1	12.47	12.54	56.40
6		2,880	570	22	242	13	299	5,000	3.8	71		12.38	12.23	59.80
7		2,280	540	20	242	16	299	5,000	3.9	78	6.0	12.33	12.43	59.80
8		2,400	740	21	242	13	317	6,000	3.8	76	6.2	12.39	12.29	52.83
9		2,520	690	22	242	13	299	5,000	4.0	72		12.35	12.37	59.80
10		2,640	670	21	242	11	405	6,000	4.1	86	6.1	12.32	12.39	67.50
11		2,640	610	17	161	11	387	7,200	4.2	75	6.2	12.36	12.47	53.75
12		2,640	680	17	242	10	405	6,000	3.8	76	5.9	12.33	12.38	67.50
13		2,520	540	17	242	15	387	6,000	3.5	76	6.1	12.31	12.35	64.50
14		2,280	620	17	242	13	370	6,000	7.0	87	6.0	12.38	12.34	61.67
15		2,520	830	14	242	8	370	6,000	3.7	76	5.9	12.29	12.31	61.67
16		2,520	530	14	161	10	387	6,000	3.7	78	5.9	12.28	12.23	64.50
17		2,520	620	17	242	10	387	6,000	3.4	76	5.9	12.32	12.37	64.50
18		2,640	620	20	242	11	370	7,700	3.8	79	5.9	12.41	12.46	48.05
19		2,640	700	12	161	13	370	6,000	3.5	76	5.9	12.38	12.33	61.67
20		2,520	550	15	242	14	370	6,000	3.6	75	6.0	12.41	12.39	61.67
21		2,520	530	19	242	12	387	6,000	3.4	77	6.1			64.50
22		1,800	630	20	161	13	370	6,000	3.7	78	6.0	12.28	12.32	61.67
23		2,280	600	19	81	16	0	6,000	3.5	76	5.9			0.00
24		2,640	730	20	0	12	405	6,000	4.0	75	5.9			67.50
25		2,760	580	24	0	15	405	7,000	3.8	75	5.9	12.34	12.43	57.86
26		2,760	660	25	0	15	352	7,500	3.6	76	5.9	12.24	12.22	46.93
27		2,520	480	21	0	10	370	6,000	3.9	74	5.8	12.30	12.29	61.67
28		2,640	600	16	161	10	370	6,000	6.8	76		12.35	12.26	61.67
29		2,640	530	17	403	13	387	6,000	3.6	78	6.7	12.37	12.14	64.50
30		2,640	780	19	242	15	370	6,000	3.6	78	5.9	12.32	12.36	61.67
31		2,640	570	18	322	15	387	6,000	3.3	77	6.0	12.21	12.28	64.50
Total		79,200	19,820	585	6,209	390	10,599	185,400	121.4	2,392	169.0	345.57	345.50	1782.40
Max.		2,880	830	26	403	16	405	7,700	7.0	87	6.7	12.47	12.54	67.50
Min.		1,800	480	11	0	8	0	5,000	3.3	71	5.8	12.21	12.14	0.00
Avg.		2,555	639	19	200	13	342	5,981	3.9	77	6.0	12.34	12.34	57.50

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

JUNE 1995 - PLANT INFLUENT SHEET

PN-Day	Weather Type	Weather Precip.	Inf Flow MGD	Inf. Temp F	Inf pH SU	Inf BOD mgIL	Inf. BOD Lbs.	Inf. SS mgIL	Inf. SS Lbs.	Inf Phos. mgIL	Inf. Phos Lbs.	Inf. VSS mgIL	Inf. NH3-N mgIL	--Remarks or Other Parameters--
1			1 74	59	7.7	134	1,945	136	1,974	3.70	54	132	12 9	
2	Rain	0 04	1.72	57	7.6	124	1,779	148	2,123			128	12.7	
3	Rain	0.07	1.63	57	7.5	115	1,563	130	1,767			112	12.6	
4			1.59	57	7.6	104	1,379	194	2,573			182	13.3	
5			1.76	59	7.6	114	1,673	136	1,996			114	14.5	
6			1.77	59	7 6	92	1,358	156	2,303			134	13.3	
7	Rain	0.02	1 60	60	7.6	129	1,721	148	1,975			118	13.3	
8			1.48	60	7.7	154	1,901	146	1,802			130	12.8	
9			1.51	59	7.7	153	1,927	128	1,612			120	14.1	
10	Rain	0.38	1.44	59	7.5	128	1,537	170	2,042			148	15.4	
11	Rain	0.03	1.41	59	7.5	140	1,646	140	1,646			126	13.1	
12			1 60	59	7.5	146	1,948	126	1,681			110	11.0	
13			1.62	59	7.5	203	2,743	270	3,648			244	12.1	
14			1.61	61	7.6	153	2,054	144	1,934	3 30	44	130	11.3	
15			1.65	61	7.5	191	2,628	134	1,844			116	11.1	
16			1 52	60	7.5	158	2,003	182	2,307			162	11.8	
17			1.40	60	7.4	155	1,810	190	2,218			164	11.3	
18			1.36	59	7.5	134	1,520	174	1,974			160	11.2	
19			1.54	60	7.5	144	1,849	170	2,183			182	11.4	
20			1.52	61	7.5	134	1,699	198	2,510			106	10.2	
21			1.55	61	7.5	152	1,965	154	1,991	3.50	45	142	11.9	
22			1.51	61	7.7	145	1,826	144	1,813			126	11.7	
23			1.59	62	7.9	191	2,533	146	1,936			120	10.1	
24	Rain	0.26	1.39	61	7.5	139	1,611	182	2,110			140	10.9	
25	Rain	1.26	1.49	62	7.5	143	1,777	190	2,361			132	11.9	
26	Rain	1.04	1.68	60	7.6	135	1,892	244	3,419			172	10.5	
27	Rain	0.53	1.67	64	7.5	116	1,616	144	2,006	5.40	75	112	11.1	
28	Rain	0.07	1.65	63	7.5	138	1,899	130	1,789			102	10.3	
29			1.61	63	7.7	157	2,108	136	1,826			114	11.4	
30			1.61	61	7.6	182	2,444	132	1,772			118	11.5	
31														
Total	0	3.70	47.22	1,803	227.1	4,303	56,354	4,822	63,135	15.90	218	4,096	360.7	
Max.	0	1.26	1.77	64	7.9	203	2,743	270	3,648	5.40	75	244	15.4	
Min.	0	0.02	1.36	57	7.4	92	1,358	126	1,612	3.30	44	102	10.1	
Avg.	0	0.37	1.57	60	7.6	143	1,878	161	2,104	3.98	55	137	12.0	
Count	10	10.00	30.00	30	30.0	30	30	30	30	4.00	4	30	30.0	

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

JUNE 1995 - PRIMARY EFFLUENT SHEET

PN- Day	P Eff. BOD mgIL	P Eff. BOD Lbs.	P Eff. SS mgIL	P Eff. SS Lbs.	P Eff. Phos. mgIL	P Eff. Phos. Lbs.	P Eff. VSS mgIL	P Eff. NH3-N mgIL	Flow MGD	BOD Pri. Removal %	SS Pri. Removal %	P Pri. Removal %
1	82	1,190	52	755	3.30	48	44	13.9	1.74	39	62	12
2	82	1,176	84	1,205			80	14.4	1.72	34	43	
3	74	1,006	72	979			64	14.0	1.63	36	45	
4	76	1,008	70	928			68	14.5	1.59	27	64	
5	71	1,042	74	1,086			60	15.1	1.76	38	46	
6	42	620	72	1,063			52	14.7	1.77	54	54	
7	74	987	80	1,068			60	15.6	1.60	43	46	
8	99	1,222	52	642			40	14.7	1.48	36	64	
9	113	1,423	52	655			52	16.6	1.51	26	59	
10	86	1,033	72	865			62	17.7	1.44	33	58	
11	93	1,094	72	847			68	14.7	1.41	34	49	
12	92	1,228	84	1,121			80	13.9	1.60	37	33	
13	118	1,594	72	973			64	13.6	1.62	42	73	
14	113	1,517	72	967	3.30	44	64	12.5	1 61	26	50	0
15	139	1,913	76	1,046			64	13.6	1.65	27	43	
16	112	1,420	80	1.014			72	14.3	1.52	29	56	
17	125	1,460	60	701			56	13.4	1.40	19	68	
18	82	930	78	885			72	12 5	1 36	39	55	
19	93	1,194	84	1,079			76	12.6	1.54	35	51	
20	105	1,331	84	1.065			68	10.3	1.52	22	58	
21	116	1,500	88	1,138	4.80	62	80	13.9	1.55	24	43	-37
22	112	1.410	84	1,058			72	13.8	1.51	23	42	
23	133	1,764	96	1,273			68	12.4	1.59	30	34	
24	39	452	72	835			74	12.6	1.39	72	60	
25	104	1,292	76	944			56	13.0	1.49	27	60	
26	94	1,317	100	1,401			68	12.5	1.68	30	59	
27	96	1,337	84	1,170	5.40	75	64	11.6	1.67	17	42	0
28	100	1,376	96	1,321			72	11.5	1.65	28	26	
29	109	1,464	80	1,074			52	12.1	1.61	31	41	
30	138	1,853	96	1,289			88	12.9	1.61	24	27	
31												
Total	2,912	38,153	2,314	30,444	16.80	229	1,960	408.9	47.22	982	1,511	-25
Max.	139	1,913	100	1,401	5.40	75	88	17.7	1.77	72	73	12
Min.	39	452	52	642	3.30	44	40	10.3	1.36	17	26	-37
Avg.	97	1,272	77	1,015	4.20	57	65	13.6	1.57	33	50	-6
Count	30	30	30	30	4.00	4	30	30.0	30.00	30	30	4

Robert J. Swalwell
Superintendent

MANSFIELD MUNICIPAL WASTEWATER TREATMENT PLANT

JUNE 1995 - ACTIVATED SLUDGE SHEET

PN-Day	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading flm	Mix Liq SS mgIL	Mix Liq VSS mgIL	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mgIL	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mgIl	PE SS mgIL
1	48	5.0	8.7	0.25	2,202	1,618	59.0	0.37	2.4	234	0.40	0.30		36	1.74	82	52
2		5.0	5.8	0.23	2,325	1,706	63.0	0.37	3.1	235	0.41	0.30		36	1.72	82	84
3		5.3								241				40	1.63	74	72
4		5.4								232				38	1.59	76	70
5		4.9	6.6	0.20	2,384	1,766	68.0	0.35	4.1	229	0.39	0.29		38	1.76	71	74
6		4.9	6.6	0.12	2,352	1,743	70.0	0.34	3.4	245	0.40	0.29		51	1.77	42	72
7		5.4	6.6	0.19	2,364	1,751	68.0	0.35	4.0	252	0.41	0.30		50	1.60	74	80
8		5.8	10.6	0.25	2,280	1,620	74.0	0.31	5.0	239	0.39	0.28	68	53	1.48	99	52
9		5.7	10.2	0.30	2,231	1,595	65.0	0.34	4.5	234	0.37	0.26	67	53	1.51	113	52
10		6.0								228			70	53	1.44	86	72
11		6.1								235			71	53	1.41	93	72
12		5.4	5.6	0.27	2,094	1,539	68.0	0.31	4.8	232	0.36	0.26	65	52	1.60	92	84
13		5.3	6.5	0.34	2,111	1,557	54.0	0.39	4.1	229	0.36	0.26	64	53	1.62	118	72
14		5.4	6.5	0.33	2,101	1,554	54.0	0.39	2.5	238	0.37	0.27	64	53	1.61	113	72
15		5.2	6.0	0.41	2,111	1,552	50.0	0.42	2.9	238	0.37	0.27	63	53	1.65	139	76
16		5.7	6.6	0.29	2,220	1,659	59.0	0.38	1.9	240	0.37	0.27	65	52	1.52	112	80
17		6.2								238			63	51	1.40	125	60
18		6.3								235			65	50	1.36	82	78
19		5.6	6.0	0.23	2,169	1,707	48.0	0.45	5.1	229	0.38	0.26	57	51	1.54	93	84
20		5.7	6.1	0.28	2,174	1,580	59.0	0.37	2.6	244	0.38	0.27	57	54	1.52	105	84
21		5.6	5.7	0.31	2,170	1,599	60.0	0.36	3.0	248	0.37	0.27	57	54	1.55	116	88
22		5.7	6.0	0.30	2,130	1,557	66.0	0.32	2.3	251	0.34	0.24	59	52	1.51	112	84
23		5.4	5.0	0.38	2,122	1,531	65.0	0.33	3.3	247	0.36	0.26	62	52	1.59	133	96
24		6.2								252			64	49	1.39	99	72
25		5.8								256			47	24	1.49	104	76
26		5.1								251			60	50	1.68	94	100
27		5.2	6.3	0.25	2,452	1,801	75.0	0.33	1.8	249	0.43	0.31	59	58	1.67	96	84
28		5.2	5.3	0.27	2,327	1,677	60.0	0.39	3.0	249	0.39	0.29	62	59	1.65	100	96
29		5.4	6.4	0.28	2,302	1,740	65.0	0.35	2.9	250	0.40	0.29	63	59	1.61	109	80
30		5.4	5.1	0.40	2,187	1,564	70.0	0.31	3.1	252	0.37	0.27	63	53	1.61	138	96
31																	
Total	48	165.0	138.3	5.88	46,808	34,416	1320.0	7.53	69.8	7,232	8.02	5.81	1,435	1,480	47.22	2,972	2,314
Max.	48	6.3	10.6	0.41	2,452	1,801	75.0	0.45	5.1	256	0.43	0.31	71	59	1.77	139	100
Min.	48	4.9	5.0	0.12	2,094	1,531	48.0	0.31	1.8	228	0.34	0.24	47	24	1.36	42	52
Avg.	48	5.5	6.6	0.28	2,229	1,639	62.9	0.36	3.3	241	0.38	0.28	62	49	1.57	99	77
Count	1	30.0	21.0	21.00	21	21	21.0	21.00	21.0	30	21.00	21.00	23	30	30.00	30	30

Robert J. Swalwell
Superintendent

MARSHALL WWTP 801 INDUSTRIAL RD MARSHALL MI 49068 - PERMIT MI00_3540

JUNE 1995 - DISCHARGE MONITORING REPORT - DISCHARGE NO. 001A

Day	F.Eff. D.O. mgIL	F.Eff. pH SU	F.Eff. SS mgIL	F.Eff. SS Lbs.	F.Eff. Total-P mgIL	Flow MGD	F.Eff. Chlorine mgIL	F.Eff. CBOD mgIL	F.Eff. CBOD Lbs.	F.Eff. NH3 as N mgIL	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %	Mercury mgIL
1	7.6	7.5	6	87	0.34	1.74	0.035	3	44	10.5	152	27	96	98	91	<0.0002
2	7.2	7.5	9	129		1.72	0.000	2	29	10.7	153	19	94	98		
3	7.4	7.5	9	122		1.63	0.000	2	27	9.5	129	67	93	98		
4	7.5	7.5	7	93		1.59	0.000			9.5	126	62	96			
5	7.9	7.5	8	117		1.76	0.000	2	29			36	94	98		
6	7.5	7.5	7	103		1.77	0.000			9.8	145	45	96			
7	7.0	7.5	10	133		1.60	0.000	2	27	10.9	145	84	93	98		
8	7.2	7.5	7	86		1.48	0.000	4	49	8.2	101	68	95	97		<0.0002
9	8.0	7.5	4	50		1.51	0.000	4	50	9.7	122	23	97	97		
10	7.5	7.4	6	72		1.44	0.000	3	36	11.4	137	41	96	98		
11	7.6	7.5	4	47		1.41	0.000	4	47	9.4	111	14	97	97		
12	8.5	7.5	10	133		1.60	0.000	3	40	9.5	127	40	92	98		
13	6.9	7.5	7	95		1.62	0.000					28	97			
14	6.6	7.4	8	107	0.76	1.61	0.000	4	54	8.5	114	17	94	97	77	
15	7.6	7.5	6	83		1.65	0.000	6	83	9.6	132	27	96	97		
16	6.2	7.4	3	38		1.52	0.000	5	63	10.1	128	29	98	97		
17	6.7	7.5	3	35		1.40	0.000	3	35	10.4	121	23	98	98		
18	7.5	7.4	5	57		1.36	0.000	2	23	8.4	95	20	97	99		<0.0002
19	7.0	7.3	6	77		1.54	0.000	3	39	9.0	116	13	96	98		
20	6.9	7.5	7	89		1.52	0.000	3	38	10.0	127	19	96	98		<0.0002
21	6.5	7.4	6	78	0.38	1.55	0.000	4	52	11.4	147	7	96	97	89	
22	6.5	7.4	5	63		1.51	0.000	3	38	12.4	156		97	98		
23	6.8	7.5	11	146		1.59	0.000	4	53	10.2	135		92	98		
24	7.0	7.5	7	81		1.39	0.000	4	46	9.7	112	15	96	97		
25	7.1	7.5	9	112		1.49	0.000	6	75	9.8	122	8	95	96		
26	6.4	7.5	13	182		1.68	0.000	6	84	10.8	151	18	95	96		
27	6.5	7.5	4	56	0.55	1.67	0.000	3	42	9.5	132	8	97	97	90	
28	6.7	7.5	9	124		1.65	0.000	4	55	9.1	125	166	93	97		
29	6.8	7.4	7	94		1.61	0.000	4	54	9.0	121	10	95	97		
30	6.8	7.4	4	54		1.61	0.000	4	54	10.3	138	8	97	98		
31																
Total	213.4	224.0	207	2,744	2.03	47.22	0.035	97	1,264	277.3	3,623	942	2,864	2,632	347	<0.0002
Max.	8.5	7.5	13	182	0.76	1.77	0.035	6	84	12.4	156	166	98	99	91	<0.0002
Min.	6.2	7.3	3	35	0.34	1.36	0.000	2	23	8.2	95	7	92	96	77	<0.0002
Avg.	7.1	7.5	7	91	0.51	1.57	0.001	4	47	9.9	129	G 24	95	97	87	<0.0002
Count	30.0	30.0	30	30	4.00	30.00	30.000	27	27	28.0	28	28	30	27	4	4

G = Geometric Mean

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

JUNE 1995 - MISCELLANEOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	S02 Lbs.	Lime Lbs.	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	Raw Sludge pH	Sludge pH 2 Hours	Sludge pH 16 Hrs.	Lbs. of Lime per 1000 Gals. Sludge
1		2,640	700	24	322	12	416	6,000	3.3	77	5.9	12.32	12.30	69.33
2		2,640	550	21	322	12	416	8,134	3.3	77	5.9	12.36	12.26	51.14
3		2,400	470	30	322	13	416	6,000	3.4	74	6.0	12.35	12.27	69.33
4		2,760	500	18	322	14	416	6,000	3.8	73	6.0	12.26	12.35	69.33
5		2,520	2,510	16	322	13	396	6,000	3.9	73	6.1	12.33	12.31	66.00
6		2,520	2,650	18	322	16	396	6,000	3.4	73	6.3	12.33	12.30	66.00
7		2,640	2,690	22	242	12	396	6,000	3.3	74	6.2	12.28	12.30	66.00
8		2,640	2,600	17	161	7	416	6,500	3.5	75	6.2	12.35	12.39	64.00
9		2,640	2,600	23	242	12	396	7,100	3.5	75	6.2	12.38	12.32	55.77
10		2,520	2,770	22	322	11	416	6,000	3.8	75	6.2	12.37	12.28	69.33
11		2,400	2,240	16	322	9	396	6,000	3.6	83	6.7	12.55	12.27	66.00
12		2,640	2,790	18	242	12	376	6,500	3.5	74	6.2	12.40	12.22	57.85
13		2,640	2,690	19	322	15	396	6,000	3.6	73	6.4	12.30	12.30	66.00
14		2,640	2,500	23	403	11	396	6,000	2.8	73	6.1	12.30	12.38	66.00
15		2,640	2,500	24	322	13	396	7,800	3.6	75	6.2	12.29	12.37	50.77
16		2,640	2,500	26	322	13	475	7,000	3.6	75	6.1	12.12	12.22	67.86
17		2,640	2,310	24	322	13	455	7,000	3.1	74	6.2	12.37	12.29	65.00
18		2,520	2,320	15	322	13	475	7,000	3.3	75	6.1	12.35	12.51	67.86
19		2,520	3,490	17	242	12	436	7,500	3.7	74	6.1	12.10	12.08	58.13
20		2,760	2,790	18	322	12	475	7,000	3.7	75	6.1	12.33	12.16	67.86
21		2,640	2,800	20	322	10	475	9,000	3.3	76	6.3	12.28	12.12	52.78
22		2,760	3,090	17	322	13	396	7,000	3.4	76	6.1	12.01	12.14	56.57
23		2,760	2,350	15	322	12	475	4,200	3.9	76	6.2		12.36	113.10
24		2,640	1,650	33	322	14	475	8,000	3.8	75	6.1	12.29	12.00	59.38
25		2,400	1,620	28	242	12	396	5,300	3.8	78	6.0	11.71		74.72
26		2,640	2,020	12	322	14	416	7,000	5.2	72	6.1	12.34	12.18	59.43
27		2,640	1,750	19	242	13	396	8,000	5.4	71	5.9	12.35	12.26	49.50
28		2,640	1,740	17	322	125	455	6,000	4.7	73	5.9	12.31	12.17	75.83
29		2,760	1,750	18	242	13	356	6,000	3.8	72	6.1	12.33	12.09	59.33
30		2,640	1,750	21	242	10	356	6,000	4.1	75	6.2	12.27	12.25	59.33
31														
Total		78,480	64,690	611	8,940	481	12,552	198,034	111.1	2,241	184.1	356.33	355.45	1939.54
Max.		2,760	3,490	33	403	125	475	9,000	5.4	83	6.7	12.55	12.51	113.10
Min.		2,400	470	12	161	7	356	4,200	2.8	71	5.9	11.71	12.00	49.50
Avg.		2,616	2,156	20	298	16	418	6,601	3.7	75	6.1	12.29	12.26	64.65

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

JULY 1995 - PLANT INFLUENT SHEET

PN- Day	Weather Type	Weather Precip.	Inf. Flow MGD	Inf. Temp F	Inf. pH SU	Inf. BOD mgIL	Inf. BOD Lbs.	Inf. SS mgIL	Inf. SS Lbs.	Inf. Phos. mgIL	Inf. Phos. Lbs.	Inf. VSS mgIL	Inf. NH3-N mgIL	Remarks or Other Parameters
1			1.41	59	7.5	138	1,623	180	2,117			156	10.9	
2			1.40	60	7.6	130	1,518	120	1,401			110	10.1	
3			1.39	60	7.5	123	1,426	182	2,110			156	11.3	
4	Rain	0.87	1.44	60	7.6	153	1,837	132	1,585	3.50	42	102	10.6	
5	Rain	0.05	1.58	60	7.4	163	2,148	142	1,871			132	11.8	
6			1.55	59	7.4	167	2,159	148	1,913			140	11.1	
7			1.50	59	7.4	165	2,064	138	1,726			114	11.7	
8			1.35	60	7.6	142	1,599	298	3,355			258	12.2	
9	Rain	0.57	1.39	63	7.4	154	1,785	192	2,226			156	12.8	
10			1.54	63	7.5	145	1,862	142	1,824			122	11.6	
11			1.54	63	7.6	157	2,016	130	1,670			114	12.2	
12			1.58	63	7.4	187	2,464	204	2,688	5.80	76	164	12.1	
13			1.61	63	7.4	148	1,987	154	2,068			114	10.4	
14			1.56	63	7.5	134	1,743	202	2,628			184	11.0	
15	Rain	0.65	1.50	64	7.5	133	1,664	212	2,652			192	9.1	
16	Rain	0.27	1.48	63	7.6	155	1,913	160	1,975			142	9.8	
17			1.61	63	7.2	358	4,807	258	3,464	3.20	43	234	11.1	
18			1.61	64	7.5	183	2,457	166	2,229			152	11.3	
19			1.48	63	7.6	223	2,753	180	2,222			162	11.3	
20	Rain	0.69	1.66	63	7.5	191	2,644	144	1,994			140	12.3	
21			1.65	63	7.4	217	2,986	176	2,422			154	10.6	
22	Rain	0.61	1.46	63	7.4	146	1,778	160	1,948			136	11.2	
23			1.45	63	7.6	131	1,584	126	1,524			114	10.8	
24	Rain	0.03	1.57	63	7.5	119	1,558	148	1,938	4.70	62	130	11.5	
25	Rain	0.21	1.64	63	7.5	165	2,257	240	3,283			228	10.9	
26	Rain	1.29	1.65	63	7.5	146	2,009	220	3,027			164	10.2	
27	Rain	0.09	1.73	63	7.4	152	2,193	132	1,905			118	8.2	
28			1.67	63	7.5	221	3,078	184	2,563			160	11.1	
29			1.43	63	7.5	143	1,705	164	1,956			134	10.7	
30			1.40	64	7.6	113	1,319	136	1,588			120	9.2	
31			1.74	64	7.5	162	2,351	188	2,728			148	11.1	
Total	0	5.33	47.57	1,930	232.1	5,064	65,290	5,358	68,599	17.20	223	4,650	340.2	
Max.	0	1.29	1.74	64	7.6	358	4,807	298	3,464	5.80	76	258	12.8	
Min.	0	0.03	1.35	59	7.2	113	1,319	120	1,401	3.20	42	102	8.2	
Avg.	0	0.48	1.53	62	7.5	163	2,106	173	2,213	4.30	56	150	11.0	
Count	11	11.00	31.00	31	31.0	31	31	31	31	4.00	4	31	31.0	

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

JULY 1995 - PRIMARY EFFLUENT SHEET

PN- Day	P Eff. BOD mgIL	P Eff. BOD Lbs.	P Eff. SS mgIL	P. Eff. SS Lbs.	P Eff. Phos. mgIL	P Eff. Phos. Lbs.	P Eff. VSS mgIL	P Eff. NH3-N mgIL	Flow MGD	BOD Pri. Removal %	SS Pri. Removal %	P Pri. Removal %
1	87	1,023	126	1,482			76	12.0	1.41	37	30	
2	101	1,179	80	934			72	11.9	1.40	22	33	
3	74	858	104	1,206			72	11.9	1.39	40	43	
4	87	1,045	96	1,153	2.90	35	80	11.6	1.44	43	27	17
5	93	1,225	60	791			56	12.4	1.58	43	58	
6	91	1,176	80	1,034			72	12.7	1.55	46	46	
7	105	1,314	96	1,201			76	12.4	1.50	36	30	
8	130	1,464	96	1,081			68	12.5	1.35	8	68	
9	124	1,437	101	1,171			84		1.39	19	47	
10	116	1,490	80	1,027			80	13.1	1.54	20	44	
11	120	1,541	84	1,079			72	13.4	1.54	24	35	
12	132	1,739	104	1,370	4.60	61	80	14.1	1.58	29	49	21
13	120	1,611	84	1,128			72	13.0	1.61	19	45	
14	106	1,379	100	1,301			88	13.5	1.56	21	50	
15	95	1,188	108	1,351			96	11.2	1.50	29	49	
16	141	1,740	92	1,136			64	11.2	1.48	9	43	
17	196	2,632	108	1,450	3.20	43	92	12.4	1.61	45	58	0
18	130	1,746	84	1,128			80	13.1	1.61	29	49	
19	166	2,049	100	1,234			84	12.5	1.48	26	44	
20	126	1,744	100	1,384			84	13.6	1.66	34	31	
21	136	1,871	116	1,596			116	12.9	1.65	37	34	
22	159	1,936	124	1,510			100	13.3	1.46	-9	23	
23	121	1,463	76	919			76	13.2	1.45	8	40	
24	89	1,165	118	1,545	4.40	58	104	12.8	1.57	25	20	7
25	143	1,956	88	1,204			84	12.4	1.64	13	63	
26	121	1,665	112	1,541			100	13.6	1.65	17	49	
27	129	1,861	108	1,558			100	9.2	1.73	15	18	
28	221	3,078	116	1,616			84	13.8	1.67	0	37	
29	157	1,872	152	1,813			112	13.1	1.43	-10	7	
30	95	1,109	114	1,331			104	11.2	1.40	16	16	
31	145	2,104	129	1,872			88	13.4	1.74	10	31	
Total	3,856	49,664	3,136	40,146	15.10	196	2,616	377.4	47.57	701	1,217	45
Max.	221	3,078	152	1,872	4.60	61	116	14.1	1.74	46	68	21
Min.	74	858	60	791	2.90	35	56	9.2	1.35	-10	7	0
Avg.	124	1,602	101	1,295	3.78	49	84	12.6	1.53	23	39	11
Count	31	31	31	31	4.00	4	31	30.0	31.00	31	31	4

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

JULY 1995 - ACTIVATED SLUDGE SHEET

PN-Day	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading flm	Mix Liq SS mgIL	Mix Liq VSS mgIL	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mgIL	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mgIl	PE SS mgIL
1		6.1								258			72	50	1.41	87	126
2		6.2								258			73	50	1.40	101	80
3		6.2	5.1	0.18	2,062	1,561	50.0	0.41	4.3	258	0.34	0.24	72	45	1.39	74	104
4		6.0								248			69	42	1.44	87	96
5		5.5	8.0	0.25	2,116	1,627	46.0	0.46	3.0	248	0.37	0.27	63	42	1.58	93	60
6		5.6	6.3	0.25	2,170	1,552	70.0	0.31	2.6	250	0.39	0.28	64	41	1.55	91	80
7		5.7	5.6	0.26	2,246	1,659	68.0	0.33	1.4	260	0.35	0.25	66	42	1.50	105	96
8		6.4								258			66	47	1.35	130	96
9		6.2								253			64	50	1.39	124	101
10		5.6	8.7	0.31	2,981	1,580	52.0	0.57	3.0	251	0.35	0.27	58	50	1.54	116	80
11		5.6	5.9	0.32	2,137	1,627	35.0	0.61	2.2	249	0.35	0.27	65	50	1.54	120	84
12		5.5	4.5	0.37	2,080	1,577	44.0	0.47	2.0	247	0.36	0.28	63	49	1.58	132	104
13		5.4	5.9	0.31	2,236	1,764	48.0	0.47		249	0.37	0.29	62	49	1.61	120	84
14		5.5	5.2	0.26	2,255	1,768	46.0	0.49	2.1	247	0.38	0.30	63	48	1.56	106	100
15		5.7								251			66	47	1.50	95	108
16		5.8								253			60	47	1.48	141	92
17		5.4	4.5	0.54	2,176	1,624	32.0	0.68	2.1	254	0.37	0.28	55	47	1.61	196	108
18		5.4	6.3	0.33	2,360	1,763	39.0	0.61	0.0	262	0.40	0.31	56	53	1.61	130	84
19		5.8	6.0	0.40	2,457	1,732	40.0	0.61	1.4	227	0.36	0.26	55	51	1.48	166	100
20		5.2	5.2	0.32	2,420	1,846	44.0	0.55	0.6	244	0.38	0.29	49	53	1.66	126	100
21		5.2	4.5	0.35	2,420	1,791	45.0	0.54	0.3	241	0.37	0.28	59	57	1.65	136	116
22		5.9								239			67	54	1.46	159	124
23		5.9								239			60	54	1.45	121	76
24		5.5	4.7	0.22	2,425	1,809	41.0	0.59		236	0.38	0.28	56	59	1.57	89	118
25		5.3	6.0	0.36	2,431	1,795	43.0	0.57	3.9	237	0.39	0.29	61	64	1.64	143	88
26		5.2	4.8	0.30	2,447	1,840	43.0	0.57	3.2	238	0.39	0.29	61	64	1.65	121	112
27		5.0	4.7	0.35	2,424	1,770	40.0	0.61	2.7	234			58	66	1.73	129	108
28		5.2	4.5	0.56	2,442	1,820	40.0	0.61	3.0	236	0.39	0.29	60	65	1.67	221	116
29		6.0								240			70	65	1.43	157	152
30		6.2								239			72	65	1.40	95	114
31		5.0	3.7	0.40	2,328	1,742	33.0	0.71		232	0.37	0.27	58	64	1.74	145	129
Total		174.9	110.2	6.65	46,613	34,247	899.0	10.76	37.8	7,636	7.06	5.29	1,943	1,630	47.57	3,856	3,136
Max.		6.4	8.7	0.56	2,981	1,846	70.0	0.71	4.3	262	0.40	0.31	73	66	1.74	221	152
Min.		5.0	3.7	0.18	2,062	1,552	32.0	0.31	0.0	227	0.34	0.24	49	41	1.35	74	60
Avg.		5.6	5.5	0.33	2,331	1,712	45.0	0.54	2.2	246	0.37	0.28	63	53	1.53	124	101
Count		31.0	20.0	20.00	20	20	20.0	20.00	17.0	31	19.00	19.00	31	31	31.00	31	31

Robert J. Swalwell
Superintendent

MARSHALL WWTP 801 INDUSTRIAL RD. MARSHALL MI 49068 - PERMIT MI0023540

JULY 1995 - DISCHARGE MONITORING REPORT - DISCHARGE NO. 001A

Day	F.Eff. D.O. mgIL	F.Eff. pH SU	F.Eff. SS mgIL	F.Eff. SS Lbs.	F.Eff. Total-P mgIL	Flow MGD	F.Eff. Chlorine mgIL	F.Eff. CBOD mgIL	F.Eff. CBOD Lbs.	F.Eff. NH3 as N mgIL	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %	Mercury mgIL
1	6.7	7.5	9	106		1.41	0.000	4	47	7.8	92	5	95	97		
2	7.4	7.5	8	93		1.40	0.000	4	47	6.8	79	5	93	97		
3	7.3	7.3	3	35	0.31	1.39	0.000	4	46	5.8	67	16	98	97	91	
4	6.6	7.5	8	96		1.44	0.017	4	48	4.7	56	47	94	97		<0.0002
5	6.7	7.3	7	92		1.58	0.005	4	53	5.8	76	82	95	98		
6	6.5	7.4	5	65		1.55	0.000	3	39	7.7	100	68	97	98		
7	6.6	7.4	7	88		1.50	0.000	4	50	6.8	85	18	95	98		
8	6.5	7.4	11	124		1.35	0.000	5	56	6.2	70	31	96	96		
9	6.6	7.5	4	46		1.39	0.000	6	70	5.9	68	76	98	96		
10	6.6	7.3	5	64		1.54	0.000	5	64	5.6	72	160	96	97		<0.0002
11	6.4	7.5	9	116		1.54	0.000	5	64	8.0	103	160	93	97		
12	6.4	7.4	16	211	1.10	1.58	0.000	5	66	10.4	137	42	92	97	81	
13	6.2	7.5	11	148		1.61	0.000	6	81	9.4	126	134	93	96		
14	6.1	7.3	10	130		1.56	0.000	3	39	9.3	121	19	95	98		
15	5.7	7.4	9	113		1.50	0.000	4	50	7.0	88	16	96	97		
16	6.3	7.4	10	123		1.48	0.000	4	49	4.7	58	20	94	97		<0.0002
17	6.4	7.2	7	94	0.37	1.61	0.000	5	67	6.6	89	20	97	99	88	
18	6.4	7.5	9	121		1.61	0.000	10	134	10.7	144	39	95	95		<0.0002
19	6.3	7.6	9	111		1.48	0.000	13	160	10.7	132	25	95	94		
20	6.3	7.4	11	152		1.66	0.000	10	138	11.8	163	88	92	95		
21	7.3	7.4	13	179		1.65	0.000	12	165	10.7	147	24	93	94		
22	6.3	7.5	16	195		1.46	0.000	12	146	9.8	119	71	90	92		
23	6.0	7.5	3	36		1.45	0.000	8	97	9.6	116	16	98	94		
24	6.2	7.5	10	131	0.27	1.57	0.000	4	52	9.3	122	36	83	97	94	
25	7.0	7.5	3	41		1.64	0.000	12	164	9.3	127	60	99	93		
26	6.5	7.4	8	110		1.65	0.000	3	41	10.5	144	78	96	98		
27	6.8	7.4	8	115		1.73	0.000	4	58	7.8	113	40	94	97		
28	6.7	7.5	8	111		1.67	0.000	7	97	11.9	166	28	96	97		
29	6.6	7.4	11	131		1.43	0.000	4	48	10.7	128	10	93	97		
30	6.9	7.5	3	35		1.40	0.000	2	23	8.5	99	11	98	98		
31	6.8	7.5	10	145		1.74	0.002	4	58	12.2	177	23	95	98		
Total	203.1	230.4	261	3,358	2.05	47.57	0.024	180	2,319	262.0	3,385	1,468	2,934	2,991	354	<0.0002
Max.	7.4	7.6	16	211	1.10	1.74	0.017	13	165	12.2	177	160	99	99	94	<0.0002
Min.	5.7	7.2	3	35	0.27	1.35	0.000	2	23	4.7	56	5	83	92	81	<0.0002
Avg.	6.6	7.4	8	108	0.51	1.53	0.001	6	75	8.5	109	G 33	95	96	89	<0.0002
Count	31.0	31.0	31	31	4.00	31.00	31.000	31	31	31.0	31	31	31	31	4	4

G = Geometric Mean

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

JULY 1995 - MISCELLANEOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	SO2 Lbs.	Lime Lbs.	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	Raw Sludge pH	Sludge pH 2 Hours	Sludge pH 16 Hrs.	Lbs. of Lime per 1000 Gals. Sludge
1		2,640	1,770	20	242	3	536	6,200	3.7	73	6.1	12.36	12.25	86.45
2		2,640	1,800	21	322	16	564	7,200	3.5	73	6.0	12.31	12.10	78.33
3		2,760	1,760	20	242	10	564	6,000	3.5	72	6.1	12.30	12.10	94.00
4		2,520	1,860	20	322	10	564	6,000	3.5	74	6.0	12.32	12.15	94.00
5		2,520	1,750	21	242	10	564	6,000	3.7	72	6.1	12.28	12.13	94.00
6		2,640	1,660	24	161	12	761	7,000	3.5		6.0	12.39	12.24	108.71
7		2,640	1,910	21	242	11	592	6,000	3.5		6.0	12.30	12.49	98.67
8		2,640	1,870	23	242	14	564	6,000	3.5		5.9	12.36	12.34	94.00
9		2,520	1,720	23	242	12	564	6,000	3.5		6.0	12.30	12.24	94.00
10		2,520	610	14	242	11	564	6,500	3.5	72	5.9	12.31	12.25	86.77
11		2,640	760	19	242	14	564	6,000	3.4	73	6.1	12.26	12.28	94.00
12		2,520	520	21	242	19	1,128	12,000	4.0	78	5.8	12.33	12.24	94.00
13		2,520	880	23	242	17	790	12,300	3.2	75	5.9	12.30	12.27	64.23
14		2,760	610	27	322	21	564	6,000	3.4	76	5.8	12.34	12.21	94.00
15		2,520	590	26	242	17	564	6,000	2.6	76	5.8	12.21	12.11	94.00
16		2,640	660	26	322	17	564	6,000	3.5	73	5.8	12.29	12.06	94.00
17		2,760	490	27	322	18	620	6,000	3.4	73	5.8	12.25	12.16	103.33
18		2,520	470	25	403	18	564	6,000	3.3	75	5.9	12.35	12.26	94.00
19		2,520	570	26	322	17	620	6,000	3.5	75	5.7	12.08	12.22	103.33
20		2,520	440	30	322	19	592	8,000	3.5	76	5.7	12.37	12.10	74.00
21		2,640	460	30	322	15	564	6,000	3.6	76	5.8	12.25	12.23	94.00
22		2,520	500	18	322	21	536	6,000	3.4	76	5.8	12.28	12.24	89.33
23		2,400	670	22	403	10	536	6,000	3.3	75	5.8	12.26	12.00	89.33
24		2,760	720	22	322	16	536	6,000	3.4	74	5.9	12.25	12.20	89.33
25		2,640	600	26	322	20	592	8,000	3.3	76	6.0	12.31	12.14	74.00
26		2,640	480	24	403	16	564	6,000	3.7	76	6.0	12.30	12.20	94.00
27		2,520	440	28	322	17	536	6,000	3.9	73	5.9	12.33	12.16	89.33
28		2,640	580	39	403	16	564	7,300	3.9	72	5.9	12.30	12.16	77.26
29		2,640	510	26	161	13	536	6,100	3.5	74	5.9	12.28	11.87	87.87
30		2,640	570	27	403	16	536	6,000	3.5			12.32	11.98	89.33
31		2,520	550	29	242	29	902	6,000	3.3	74	6.1			150.33
Total		80,520	28,780	748	9,105	475	18,809	206,600	108.0	1,932	177.5	368.89	365.38	2861.96
Max.		2,760	1,910	39	403	29	1,128	12,300	4.0	78	6.1	12.39	12.49	150.33
Min.		2,400	440	14	161	3	536	6,000	2.6	72	5.7	12.08	11.87	64.23
Avg.		2,597	928	24	294	15	607	6,665	3.5	74	5.9	12.30	12.18	92.32

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

AUGUST 1995 - PLANT INFLUENT SHEET

PN-Day	Weather Type	Weather Precip.	Inf. Flow MGD	Inf. Temp F	Inf. pH SU	Inf. BOD mgIL	Inf. BOD Lbs.	Inf. SS mgIL	Inf. SS Lbs.	Inf. Phos. mgIL	Inf. Phos. Lbs.	Inf. VSS mgIL	Inf. NH3-N mgIL	Remarks or Other Parameters
1			1.82	66	7.5	140	2,125	112	1,700			98	8.5	
2	Rain	0.92	1.69	64	7.4	115	1,621	142	2,001	3.70	52	120	9.9	
3	Rain	0.32	1.78	64	7.5	176	2,613	170	2,524			142	9.8	
4	Rain	0.12	1.75	64	7.5	206	3,007	236	3,444			192	11.5	
5	Rain	0.40	1.61	63	7.5	114	1,531	182	2,444			156	9.7	
6			1.52	66	7.6	126	1,597	138	1,749			124	10.3	
7	Rain	0.77	1.89	64	7.6	202	3,184	168	2,648			136	9.1	
8			1.69	66	7.7	134	1,889	136	1,917	4.00	56	114	9.3	
9	Rain	0.03	1.79	64	7.5	143	2,135	130	1,941			106	10.1	
10			1.89	64	7.6	154	2,427	204	3,216			176	9.3	
11			1.72	66	7.4	155	2,223	152	2,180			122	9.3	
12			1.48	66	7.5	139	1,716	156	1,926			130	10.4	
13	Rain	0.02	1.53	66	7.4	140	1,786	158	2,016			134	11.3	
14	Rain	0.06	1.78	66	7.5	156	2,316	206	3,058			144	10.6	
15	Rain	0.42	1.69	66	7.8	146	2,058	147	2,072			147	11.3	
16	Rain	0.74	1.76	64	7.6	143	2,099	184	2,701			132	12.2	
17	Rain	0.89	1.82	65	7.4	147	2,231	228	3,461			188	10.8	
18	Rain	0.20	1.76	64		213	3,126	214	3,141			198	13.4	
19	Rain	0.02	1.55	65	7.5	130	1,681	150	1,939			122	11.9	
20	Rain	0.05	1.54	65	7.5	135	1,734	158	2,029	3.10	40	132	11.4	
21			1.71	64	7.5	163	2,325	194	2,767				10.2	
22			1.75	65	7.5	143	2,087	128	1,868				9.8	
23			1.62	65	7.6	138	1,864	112	1,513			106	11.1	
24			1.67	65	7.5	132	1,838	276	3,844			232	10.6	
25			1.65	65	7.4	177	2,436	402	5,532			348	11.1	
26			1.47	64	7.5	94	1,152	190	2,329			156	11.0	
27			1.48	64	7.6	106	1,308	116	1,432	3.80	47	102	11.7	
28			1.73	68	7.6	93	1,342	240	3,463			208	11.2	
29			1.64	68	7.3	148	2,024	148	2,024			126	12.0	
30			1.67	64	7.5	171	2,382	138	1,922			116	10.8	
31			1.76	65	7.5	163	2,393	136	1,996			110	11.2	
Total	0	4.96	52.21	2,015	225.5	4,542	64,250	5,451	76,798	14.60	195	4,317	330.8	
Max.	0	0.92	1.89	68	7.8	213	3,184	402	5,532	4.00	56	348	13.4	
Min.	0	0.02	1.47	63	7.3	93	1,152	112	1,432	3.10	40	98	8.5	
Avg.	0	0.35	1.68	65	7.5	147	2,073	176	2,477	3.65	49	149	10.7	
Count	14	14.00	31.00	31	30.0	31	31	31	31	4.00	4	29	31.0	

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

AUGUST 1995 - PRIMARY EFFLUENT SHEET

PN- Day	P Eff. BOD mgIL	P Eff. BOD Lbs.	P Eff. SS mgIL	P. Eff. SS Lbs.	P Eff. Phos. mgIL	P Eff. Phos. Lbs.	P Eff. VSS mgIL	P Eff. NH3-N mgIL	Flow MGD	BOD Prı. Removal %	SS Prı. Removal %	P Prı. Removal %
1	114	1,730	104	1,579			100	11.1	1.82	19	7	
2	119	1,677	120	1,691	4.00	56	108	12.2	1.69	-3	15	-8
3	162	2,405	104	1,544			88	11.4	1.78	8	39	
4	194	2,831	124	1,810			88	13.3	1.75	6	47	
5	137	1,840	116	1,558			92	12.1	1.61	-20	36	
6	95	1,204	108	1,369			88	11.8	1.52	25	22	
7	117	1,844	120	1,892			92	11.0	1.89	42	29	
8	93	1,311	124	1,748	3.30	47	96	11.0	1.69	31	9	18
9	110	1,642	120	1,791			92	12.1	1.79	23	8	
10	114	1,797	104	1,639			84	11.8	1.89	26	49	
11	120	1,721	104	1,492			80	11.2	1.72	23	32	
12	94	1,160	108	1,333			100	12.3	1.48	32	31	
13	110	1,404	104	1,327			88	14.1	1.53	21	34	
14	123	1,826	80	1,188			44	12.4	1.78	21	61	
15	111	1,565	112	1,579			120	13.0	1.69	24	24	
16	110	1,615	120	1,761			84	13.3	1.76	23	35	
17	111	1,685	116	1,761			84	13.0	1.82	24	49	
18	127	1,864	116	1,703			84	16.6	1.76	40	46	
19	130	1,681	132	1,706			108	13.8	1.55	0	12	
20	96	1,233	92	1,182	2.20	28	80	13.3	1.54	29	42	29
21	104	1,483	112	1,597				12.4	1.71	36	42	
22	101	1,474	108	1,576				11.3	1.75	29	16	
23	150	2,027	108	1,459			88	13.4	1.62	-9	4	
24	95	1,323	68	947			48	11.7	1.67	28	75	
25	124	1,706	120	1,651			100	13.9	1.65	30	70	
26	58	711	116	1,422			88	12.0	1.47	38	39	
27	75	926	76	938	3.50	43	72	12.5	1.48	29	34	5
28	68	981	104	1,501			100	11.8	1.73	27	57	
29	84	1,149	96	1,313			84	13.1	1.64	43	35	
30	86	1,198	100	1,393			72	12.5	1.67	50	28	
31	121	1,776	88	1,292			64	12.6	1.76	26	35	
Total	3,453	48,789	3,324	46,741	13.00	174	2,516	388.0	52.21	721	1,062	44
Max.	194	2,831	132	1,892	4.00	56	120	16.6	1.89	50	75	29
Mın.	58	711	68	938	2.20	28	44	11.0	1.47	-20	4	-8
Avg.	111	1,574	107	1,508	3.25	44	87	12.5	1.68	23	34	11
Count	31	31	31	31	4.00	4	29	31.0	31.00	31	31	4

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

AUGUST 1995 - ACTIVATED SLUDGE SHEET

PN-Day	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading flm	Mix Liq SS mgIL	Mix Liq VSS mgIL	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mgIL	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mgIl	PE SS mgIL
1	48	4.7	4.3	0.35	2,241	1,651	33.0	0.68		321	0.39	0.29	55	65.6	1.82	114	104
2		5.1	4.0	0.33	2,280	1,716	33.0	0.69	2.9	352	0.38	0.28	59	61.0	1.69	119	120
3		4.8	4.4	0.47	2,250	1,700	30.0	0.75	4.0	359	0.38	0.28	57	63.9	1.78	162	104
4		4.9	3.8	0.53	2,327	1,788	33.0	0.71	3.4	357	0.38	0.29	58	63.6	1.75	194	124
5		5.4								359			63	63.3	1.61	137	116
6		5.7								358			67	63.2	1.52	95	108
7		4.6	3.5	0.36	2,208	1,688	30.0	0.74	4.3	272	0.36	0.27	54	64.1	1.89	117	120
8		5.1	3.8	0.26	2,208	1,694	50.0	0.44		274	0.37	0.29	60	65.2	1.69	93	124
9		4.8	3.7	0.33	2,216	1,653	33.0	0.67	3.6	268	0.37	0.28	54	65.1	1.79	110	120
10		4.6	4.2	0.35	2,287	1,734	30.0	0.76	3.1	263	0.36	0.27	51	61.2	1.89	114	104
11		5.0	4.7	0.33	2,340	1,750	33.0	0.71	2.6	269	0.37	0.27	50	68.2	1.72	120	104
12		5.8								275			65	66.5	1.48	94	108
13		5.6								274			63	66.1	1.53	110	104
14		4.8	5.6	0.37	2,233	1,654	28.0	0.80	4.6	274	0.35	0.26	54	66.0	1.78	123	80
15		5.1	4.2	0.33	2,204	1,595	28.0	0.79	3.4	270	0.35	0.25	57	67.1	1.69	111	112
16		4.9	3.8	0.33	2,218	1,612	27.0	0.82	2.9	267	0.36	0.26	55	67.1	1.76	110	120
17		4.7	3.7	0.34	2,178	1,640	28.0	0.78	2.7	268	0.35	0.26	53	67.1	1.82	111	116
18		4.9	4.0	0.37	2,263	1,674	27.0	0.84	2.3	269	0.36	0.26	56	64.9	1.76	127	116
19		5.6								268			64	64.7	1.55	130	132
20		5.6								274			64	63.5	1.54	96	92
21		5.0	4.0	0.32	2,151	1,532	25.0	0.86	3.9	273	0.34	0.25	58	64.0	1.71	104	112
22		4.9	3.9	0.31	2,050	1,581	27.0	0.76	3.7	276	0.35	0.25	56	57.2	1.75	101	108
23		5.3	4.5	0.46	2,169	1,481	27.0	0.80	3.2	271	0.36	0.26	61	54.1	1.62	150	108
24		5.2	7.2	0.27	2,272	1,666	25.0	0.91	2.1	279	0.35	0.26	53	55.7	1.67	95	68
25		5.2	4.1	0.33	2,285	1,710	28.0	0.82	2.7	276	0.36	0.27	60	53.8	1.65	124	120
26		5.9								277			67	54.3	1.47	58	116
27		5.8								276			66	53.7	1.48	75	76
28		5.0	4.4	0.20	2,188	1,610	30.0	0.73	3.6	275	0.37	0.27	51	54.1	1.73	68	104
29		5.3	5.2	0.22	2,277	1,725	30.0	0.76	2.9	274	0.39	0.29	60	49.1	1.64	84	96
30		5.2	4.8	0.23	2,217	1,763	30.0	0.74	2.3	270	0.37	0.29	59	52.3	1.67	86	100
31		4.9	5.3	0.34	2,301	1,746	31.0	0.74	2.6	272	0.35	0.28	50	53.0	1.76	121	88
Total	48	159.4	101.0	7.74	51,363	38,363	696.0	17.29	66.8	8,910	8.37	6.23	1,800	1898.7	52.21	3,453	3,324
Max.	48	5.9	7.2	0.53	2,340	1,788	50.0	0.91	4.6	359	0.39	0.29	67	68.2	1.89	194	132
Min.	48	4.6	3.5	0.20	2,050	1,481	25.0	0.44	2.1	263	0.34	0.25	50	49.1	1.47	58	68
Avg.	48	5.1	4.4	0.34	2,233	1,668	30.3	0.75	3.2	287	0.36	0.27	58	61.2	1.68	111	107
Count	1	31.0	23.0	23.00	23	23	23.0	23.00	21.0	31	23.00	23.00	31	31.0	31.00	31	31

Robert J. Swalwell
Superintendent

MARSHALL WWTP 801 INDUSTRIAL RD. MARSHALL MI 49068 - PERMIT MI0023540

AUGUST 1995 - DISCHARGE MONITORING REPORT - DISCHARGE NO. 001A

Day	F.Eff. D.O. mgIL	F.Eff. pH SU	F.Eff. SS mgIL	F.Eff. SS Lbs.	F.Eff. Total-P mgIL	Flow MGD	F.Eff. Chlorine mgIL	F.Eff. CBOD mgIL	F.Eff. CBOD Lbs.	F.Eff. NH3 as N mgIL	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %	Mercury mgIL
1	6.6	7.4	6	91		1.82	0.000	5	76	11.0	167	23	95	96		
2	7.0	7.6	12	169	0.17	1.69	0.000	4	56	10.2	144	13	92	97	95	
3	7.1	7.4	8	119		1.78	0.000	5	74	9.1	135	43	95	97		<0.0002
4	7.0	7.5	10	146		1.75	0.000	4	58	11.0	161	17	96	98		
5	6.4	7.5	5	67		1.61	0.000	4	54	9.9	133	18	97	96		
6	6.6	7.5	6	76		1.52	0.000	3	38	8.4	106	16	96	98		
7	7.5	7.6	7	110		1.89	0.000	4	63	8.5	134		96	98		
8	6.8	7.5	7	99	0.19	1.69	0.000	3	42	7.1	100	26	95	98	95	<0.0002
9	6.6	7.6	10	149		1.79	0.000	3	45	9.4	140	37	92	98		
10	6.5	7.6	7	110		1.89	0.000	3	47	9.6	151	20	97	98		
11	6.1	7.5	11	158		1.72	0.000	3	43	8.0	115	30	93	98		
12	6.3	7.4	9	111		1.48	0.000	3	37	8.2	101	42	94	98		
13	7.0	7.4	10	128		1.53	0.000	4	51	11.2	143	70	94	97		
14	7.1	7.5	6	89		1.78	0.000	4	59	10.8	160	39	97	97		
15	6.5	7.6	9	127		1.69	0.000	3	42	9.5	134	25	94	98		
16	6.4	7.5	10	147		1.76	0.000	3	44	10.5	154	47	95	98		<0.0002
17	6.5	7.5	11	167		1.82	0.000	3	46	9.5	144	178	95	98		
18	6.3		21	308		1.76	0.000	4	59	11.8	173	76	90	98		
19	5.9	7.5	8	103		1.55	0.000	4	52	10.4	134	14	95	97		
20	6.4	7.5	6	77	0.23	1.54	0.000	5	64	9.7	125	9	96	96	93	<0.0002
21	6.7	7.4	11	157		1.71	0.000	5	71	9.3	133	57	94	97		
22	6.3	7.5	8	117		1.75	0.000	4	58	7.7	112	45	94	97		
23	6.3	7.7	9	122		1.62	0.000	4	54	10.2	138	10	92	97		
24	6.0	7.5	7	97		1.67	0.000	5	70	9.9	138	5	97	96		
25	6.7	7.5	11	151		1.65	0.000	3	41	10.0	138	6	97	98		
26	6.4	7.5	8	98		1.47	0.000	2	25	9.1	112	8	96	98		
27	6.2	7.5	3	37	0.32	1.48	0.000	3	37	8.5	105	3	97	97	92	
28	6.7	7.5	13	188		1.73	0.000	4	58	9.9	143	6	95	96		
29	6.0	7.6	12	164		1.64	0.000	6	82	10.4	142	14	92	96		
30	6.7	7.5	10	139		1.67	0.000	5	70	9.6	134	20	93	97		
31	6.9	7.5	8	117		1.76	0.000	7	103	10.3	151	20	94	96		
Total	203.5	225.3	279	3,939	0.91	52.21	0.000	122	1,719	298.7	4,200	937	2,935	3,014	375	<0.0002
Max.	7.5	7.7	21	308	0.32	1.89	0.000	7	103	11.8	173	178	97	98	95	<0.0002
Min.	5.9	7.4	3	37	0.17	1.47	0.000	2	25	7.1	100	3	90	96	92	<0.0002
Avg.	6.6	7.5	9	127	0.23	1.68	0.000	4	55	9.6	135	G 21	95	97	94	<0.0002
Count	31.0	30.0	31	31	4.00	31.00	31.000	31	31	31.0	31	30	31	31	4	4

G = Geometric Mean

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

AUGUST 1995 - MISCELLANEOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	SO2 Lbs.	Lime Lbs.	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	Raw Sludge pH	Sludge pH 2 Hours	Sludge pH 16 Hrs.	Lbs. of Lime per 1000 Gals. Sludge
1		2,520	630	29	403	15	213	12,900	4.0	76	6.1	12.28		16.51
2		2,760	620	21	322	18	221	9,000	3.5	71	6.2	12.21	12.11	24.56
3		2,640	650	23	161	20	238	10,000	3.3	72	6.1	12.21	12.05	23.80
4		2,760	650	23	0	19	272	12,000	3.9	72	5.9	12.13	12.03	22.67
5		2,640	500	24	161	18	238	9,900	3.7	73	5.8	12.17	12.11	24.04
6		2,640	580	25	322	15	221	10,000	3.6	74	5.9	12.10	12.01	22.10
7		2,760	450	24	322	20	187	8,000	3.6	75	5.9		11.41	23.38
8		2,760	520	30	322	20	374	6,000	3.7	72	5.8		12.40	62.33
9		2,760	540	20	322	10	179	8,000	4.0	74	5.9	12.40	12.12	22.38
10		2,640	590	28	322	16	162	6,000	3.8	71	5.7	12.27	12.22	27.00
11		2,640	790	27	483	16	383	10,000	3.6	74	6.0	12.36		38.30
12		2,640	730	28	403	15	255	10,000	3.4	74	5.9	12.34	12.30	25.50
13		2,640	690	29	403	12	221	10,000	3.4	74	6.1	12.27	12.31	22.10
14		2,760	740	21	242	11	247	10,000	3.4	72	6.0	12.22	12.17	24.70
15		2,520	640	17	242	11	162	6,000	3.4	71	6.1	12.19	12.10	27.00
16		2,760	870	20	242	11	153	6,000	3.6	73	6.0	12.25	11.89	25.50
17		2,760	640	24	322	8	170	8,000	3.7	70	5.9	12.38	12.22	21.25
18		2,640	820	27	242	11	145	6,000	3.9	71	6.0	12.35	12.16	24.17
19		2,640	770	28	322	9	145	6,000	3.5	73	5.7	12.32	12.11	24.17
20		2,520	670	24	242	9	162	6,000	3.3	71	5.9	12.18	11.46	27.00
21		2,760	950	23	322	10	162	6,000	3.4	74	6.0	12.17	11.87	27.00
22		2,640	730	27	242	11	153	6,000	3.4	73	6.1	12.16		25.50
23		2,640	840	28	242	10	145	6,000	3.4	72	6.1	12.20	12.01	24.17
24		2,640	860	30	242	11	179	7,800	3.3	74	6.0	12.21	12.21	22.95
25		2,880	680	31	242	10	145	6,000	3.4	73	5.9	12.29	12.11	24.17
26		2,640	810	18	242	11	145	6,000	3.5	73	5.9	12.29	12.13	24.17
27		2,520	810	20	242	16	145	6,000	3.3	74	5.9	12.36	12.19	24.17
28		2,760	720	23	242	18	145	6,000	3.3	73	5.9	12.32	12.22	24.17
29		2,760	840	22	242	20	145	7,800	3.7	72	5.8	12.30	12.19	18.59
30		2,640	690	21	242	15	145	6,000	3.7	76	5.8	12.32	12.22	24.17
31		2,760	780	22	161	20	136	6,000	3.4	75	5.8	12.35	12.08	22.67
Total		83,040	21,800	757	8,461	436	5,993	239,400	110.1	2,262	184.1	355.60	338.41	790.15
Max.		2,880	950	31	483	20	383	12,900	4.0	76	6.2	12.40	12.40	62.33
Min.		2,520	450	17	0	8	136	6,000	3.3	70	5.7	12.10	11.41	16.51
Avg.		2,679	703	24	273	14	193	7,723	3.6	73	5.9	12.26	12.09	25.49

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

SEPTEMBER 1995 - PLANT INFLUENT SHEET

PN- Day	Weather Type	Weather Precip.	Inf. Flow MGD	Inf. Temp F	Inf. pH SU	Inf BOD mgIL	Inf BOD Lbs.	Inf. SS mgIL	Inf. SS Lbs.	Inf Phos. mgIL	Inf. Phos. Lbs.	Inf. VSS mgIL	Inf NH3-N mgIL	Remarks or Other Parameters
1			1.60	65	7.5	153	2,042	150	2,002			132	11.7	
2			1.41	64	7.5	105	1,235	150	1,764			120	10.8	
3	Rain	0.10	1.36	64	7.4	111	1,259	170	1,928			146	9.7	
4			1.46	63	7.7	115	1,400	188	2,289			162	11.8	
5			1.64	64	7.6	141	1,929	146	1,997			136	10.5	
6			1.54	64	7.5	137	1,760	180	2,312			164	11.0	
7	Rain	0.72	1.58	64	7.5	132	1,739	200	2,635	3.80	50	166	11.9	
8	Rain	0.02	1.55	66	7.6	125	1,616	154	1,991			128	13.4	
9			1.59	64	7.5	209	2,771	198	2,626			144	14.0	
10			1.49	65	7.5	184	2,286	232	2,883			172	15.0	
11			1.73	65	7.4	149	2,150	128	1,847	4.60	66	114	10.8	
12			1.52	64	7.4	158	2,003	142	1,800			134	12.3	
13			1.56	64	7.5	140	1,821	142	1,847			126	12.5	
14			1.57	64	7.6	141	1,846	140	1,833			122	12.5	
15			1.56	64	7.5	149	1,939	112	1,457			100	11.9	
16	Rain	0.29	1.49	64	7.5	101	1,255	154	1,914			142	11.4	
17			1.38	64	7.6	134	1,542	164	1,888			140	12.5	
18			1.54	64	7.5	177	2,273	212	2,723			192	12.7	
19	Rain	0.11	1.53	64	7.5	142	1,812	144	1,837	3.70	47	130	11.4	
20	Rain	0.06	1.50	64	7.5	135	1,689	168	2,102			154	13.6	
21	Rain	0.55	1.56	64	7.5	215	2,797	230	2,992			206	12.7	
22	Rain	0.02	1.59	63	7.5	126	1,671	104	1,379			104	12.3	
23			1.52	62	7.4	133	1,686	104	1,318			96	11.1	
24			1.39	63	7.4	168	1,948	170	1,971			146	12.7	
25	Rain	0.04	1.39	64	7.5	157	1,820	168	1,948	4.20	49	156	12.8	
26			1.38	64	7.4	149	1,715	184	2,118			164	13.6	
27			1.41	64	7.5	150	1,764	188	2,211			160	13.3	
28			1.41	64	7.5	163	1,917	164	1,929			144	13.2	
29			1.38	64	7.4	171	1,968	200	2,302			170	13.6	
30			1.39	64	7.5	198	2,295	176	2,040			144	13.1	
31														
Total	0	1.91	45.02	1,920	224.9	4,468	55,948	4,962	61,882	16.30	212	4,314	369.8	
Max.	0	0.72	1.73	66	7.7	215	2,797	232	2,992	4.60	66	206	15.0	
Min.	0	0.02	1.36	62	7.4	101	1,235	104	1,318	3.70	47	96	9.7	
Avg.	0	0.21	1.50	64	7.5	149	1,865	165	2,063	4.08	53	144	12.3	
Count	9	9.00	30.00	30	30.0	30	30	30	30	4.00	4	30	30.0	

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

SEPTEMBER 1995 - PRIMARY EFFLUENT SHEET

PN- Day	P Eff. BOD mgIL	P Eff. BOD Lbs.	P Eff. SS mgIL	P. Eff. SS Lbs.	P Eff. Phos. mgIL	P Eff. Phos. Lbs.	P Eff. VSS mgIL	P Eff. NH3-N mgIL	Flow MGD	BOD Prl. Removal %	SS Prl. Removal %	P Prl. Removal %
1	167	2,228	92	1,228			72	13.0	1.60	-9	39	
2	76	894	116	1,364			96	12.0	1.41	28	23	
3	77	873	76	862			66	11.0	1.36	31	55	
4	68	828	112	1,364			100	12.8	1.46	41	40	
5	92	1,258	92	1,258			84	11.4	1.64	35	37	
6	80	1,027	104	1,336			92	12.6	1.54	42	42	
7	98	1,291	84	1,107	3.80	50	60	13.2	1.58	26	58	0
8	112	1,448	84	1,086			48	15.1	1.55	10	45	
9	134	1,777	120	1,591			84	15.6	1.59	36	39	
10	113	1,404	100	1,243			76	14.8	1.49	39	57	
11	135	1,948	96	1,385	4.60	66	96	12.4	1.73	9	25	0
12	106	1,344	64	811			64	13.0	1.52	33	55	
13	100	1,301	92	1,197			80	13.7	1.56	29	35	
14	45	589	48	629			40	6.8	1.57	68	66	
15	156	2,030	92	1,197			76	15.1	1.56	-5	18	
16	111	1,379	128	1,591			120	13.3	1.49	-10	17	
17	136	1,565	108	1,243			100	13.7	1.38	-1	34	
18	108	1,387	108	1,387			96	14.3	1.54	39	49	
19	99	1,263	104	1,327	5.80	74	92	14.0	1.53	30	28	
20	99	1,238	100	1,251			88	14.9	1.50	27	40	-57
21	139	1,808	124	1,613			120	16.2	1.56	35	46	
22	131	1,737	120	1,591			108	20.3	1.59	-4	-15	
23	152	1,927	132	1,673			116	13.6	1.52	-14	-27	
24	145	1,681	140	1,623			112	14.6	1.39	14	18	
25	135	1,565	116	1,345	6.00	70	116	16.0	1.39	14	31	43
26	134	1,542	140	1,611			132	15.8	1.38	10	24	
27	111	1,305	96	1,129			76	15.1	1.41	26	49	
28	95	1,117	60	706			44	14.5	1.41	42	63	
29	116	1,335	56	645			40	14.8	1.38	32	72	
30	115	1,333	76	881			64	14.3	1.39	42	57	
31												
Total	3,385	42,426	2,980	37,273	20.20	260	2,558	417.9	45.02	695	1,120	-14
Max.	167	2,228	140	1,673	6.00	74	132	20.3	1.73	68	72	43
Min.	45	589	48	629	3.80	50	40	6.8	1.36	-14	-27	-57
Avg.	113	1,414	99	1,242	5.05	65	85	13.9	1.50	23	37	-4
Count	30	30	30	30	4.00	4	30	30.0	30.00	30	30	4

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

SEPTEMBER 1995 - ACTIVATED SLUDGE SHEET

PN- Day	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading fIm	Mix Liq SS mgIL	Mix Liq VSS mgIL	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mgIL	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mgIl	PE SS mgIL
1	48	5.4	5.8	0.44	2,365	1,703	30.0	0.79	1.7	281	0.35	0.25	61	53.6	1.60	167	92
2		6.1								282			69	52.8	1.41	76	116
3		6.3								284			71	52.3	1.36	77	76
4		5.9								281			66	52.1	1.46	68	112
5		5.3	5.3	0.26	2,210	1,635	30.0	0.74	3.7	278	0.34	0.25	58	53.0	1.64	92	92
6		5.6	4.9	0.21	2,196	1,629	25.0	0.88	2.9	274	0.35	0.26	63	51.9	1.54	80	104
7		5.5	6.0	0.26	2,226	1,643	32.0	0.70	3.0	283	0.36	0.26	62	50.8	1.58	98	84
8		5.6	6.2	0.30	2,260	1,636	35.0	0.65	2.9	287	0.34	0.25			1.55	112	84
9		5.4								285					1.59	134	120
10		5.8								290					1.49	113	100
11		5.0	4.8	0.41	2,210	1,602	35.0	0.63	3.9	284	0.35	0.26	57	55.2	1.73	135	96
12		5.7	8.6	0.26	2,317	1,700	35.0	0.66	3.2	277	0.37	0.27	66	55.0	1.52	106	64
13		5.5	5.8	0.25	2,336	1,724	38.0	0.61	2.8	274	0.36	0.26	63	53.7	1.56	100	92
14		5.5	11.2	0.11	2,344	1,739	38.0	0.62	2.7	284	0.36	0.26	63	52.9	1.57	45	48
15		5.5	5.8	0.40	2,326	1,716	38.0	0.61	3.0	286	0.35	0.26	63	53.8	1.56	156	92
16		5.8								242			66	54.1	1.49	111	128
17		6.2								251			71	53.9	1.38	136	108
18		5.6	4.9	0.27	2,256	1,730	38.0	0.59	3.4	250	0.36	0.28	64	53.9	1.54	108	108
19		5.6	5.0	0.25	2,196	1,662	38.0	0.58		245	0.35	0.27	64	54.0	1.53	99	104
20		5.7	5.5	0.24	2,314	1,755	35.0	0.66	1.8	247	0.37	0.28	66	54.4	1.50	99	100
21		5.5	4.4	0.34	2,347	1,802	35.0	0.67	2.3	256	0.37	0.29	64	53.2	1.56	139	124
22		5.4	4.5	0.32	2,416	1,830	35.0	0.69	1.7	258	0.39	0.30	63	53.2	1.59	131	120
23		5.7								237			59	53.1	1.52	152	132
24		6.2								232			72	53.2	1.39	145	140
25		6.2	5.5	0.27	2,450	1,916	36.0	0.68	3.9	231	0.38	0.30	72	53.3	1.39	135	116
26		6.2	4.6	0.26	2,502	1,964	36.0	0.70	3.0	230	0.38	0.29	72	53.2	1.38	134	140
27		6.1	6.9	0.21	2,607	2,058	35.0	0.74	3.2	230	0.40	0.32	70	56.9	1.41	111	96
28		6.1	10.6	0.20	2,502	1,904	35.0	0.71	3.7	255	0.39	0.30	70	58.2	1.41	95	60
29		6.2	10.8	0.25	2,327	1,775	30.0	0.78	4.7	257	0.36	0.28	71	58.0	1.38	116	56
30		6.2								255			71	57.3	1.39	115	76
31																	
Total	48	172.9	127.1	5.50	46,707	35,123	689.0	13.69	57.5	7,906	7.28	5.49	1,777	1457.0	45.02	3,385	2,980
Max.	48	6.3	11.2	0.44	2,607	2,058	38.0	0.88	4.7	290	0.40	0.32	72	58.2	1.73	167	140
Min.	48	5.0	4.4	0.11	2,196	1,602	25.0	0.58	1.7	230	0.34	0.25	57	50.8	1.36	45	48
Avg.	48	5.8	6.4	0.27	2,335	1,756	34.5	0.68	3.0	264	0.36	0.27	66	54.0	1.50	113	99
Count	1	30.0	20.0	20.00	20	20	20.0	20.00	19.0	30	20.00	20.00	27	27.0	30.00	30	30

Robert J. Swalwell
Superintendent

MARSHALL WWTP 801 INDUSTRIAL RD MARSHALL MI 49068 - PERMIT MI0023540

SEPTEMBER 1995 - DISCHARGE MONITORING REPORT - DISCHARGE NO. 001A

Day	F.Eff. D.O. mgIL	F.Eff. pH SU	F.Eff. SS mgIL	F.Eff. SS Lbs.	F.Eff. Total-P mgIL	Flow MGD	F.Eff. Chlorine mgIL	F.Eff. CBOD mgIL	F.Eff. CBOD Lbs.	F.Eff. NH3 as N mgIL	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %	Mercury mgIL
1	7.2	7.6	9	120		1.60	0.000	5	67	9.8	131	6	94	97		
2	7.3	7.5	12	141		1.41	0.000	3	35	8.0	94	8	92	97		
3	7.2	7.5	9	102		1.36	0.000	3	34	6.6	75	33	95	97		
4	7.6	7.5	10	122		1.46	0.000	2	24	7.7	94	10	95	98		
5	7.6	7.5	11	150		1.64	0.000	2	27	8.6	118	4	92	99		
6	7.5	7.4	7	90		1.54	0.000	2	26	8.3	107	4	96	99		
7	7.5	7.5	8	105	0.45	1.58	0.000	2	26	9.7	128	6	96	98	88	
8	7.0	7.6	5	65		1.55	0.000	4	52	10.4	134	10	97	97		
9	7.1	7.6	6	80		1.59	0.000	4	53	11.0	146	11	97	98		
10	7.4	7.6	10	124		1.49	0.000	4	50	9.6	119	15	96	98		<0.0002
11	7.9	7.4	10	144	0.50	1.73	0.000	5	72	9.5	137	166	92	97	89	
12	7.6	7.6	8	101		1.52	0.000	6	76	8.6	109	51	94	96		
13	7.3	7.5	5	65		1.56	0.000	4	52	11.3	147	20	96	97		
14	7.1	7.4	5	65		1.57	0.000	6	79	10.9	143	12	96	96		
15	7.0	7.5	6	78		1.56	0.000	6	78	10.2	133	22	95	96		
16	6.8	7.5	13	162		1.49	0.000	6	75	11.7	145	14	92	94		<0.0002
17	6.4	7.6	8	92		1.38	0.000	6	69	10.2	117	26	95	96		
18	6.7	7.5	11	141		1.54	0.000	6	77	11.5	148	54	95	97		<0.0002
19	6.3	7.5	12	153	0.58	1.53	0.000	6	77	11.6	148	48	92	96	84	
20	6.1	7.5	12	150		1.50	0.000	6	75	12.9	161	31	93	96		
21	6.4	7.6	10	130		1.56	0.000	5	65	13.2	172	40	96	98		
22	7.2	7.5	18	239		1.59	0.000	10	133	17.9	237	33	83	92		
23	7.2	7.7	15	190		1.52	0.000	9	114	12.1	153	41	86	93		
24	7.0	7.5	10	116		1.39	0.000	6	70	11.3	131	22	94	96		
25	7.5	7.6	13	151	1.47	1.39	0.000	7	81	13.7	159	9	92	96	65	<0.0002
26	6.4	7.5	13	150		1.38	0.000	8	92	14.3	165	17	93	95		
27	7.0	7.4	15	176		1.41	0.000	5	59	15.0	176	30	92	97		
28	6.7	7.5	6	71		1.41	0.000	6	71	14.3	168	5	96	96		
29	7.6	7.5	7	81		1.38	0.000	4	46	14.2	163	7	97	98		
30	7.3	7.6	6	70		1.39	0.000	5	58	14.8	172	3	97	97		
31																
Total	212.9	225.7	290	3,624	3.00	45.02	0.000	153	1,911	338.9	4,230	758	2,816	2,897	326	<0.0002
Max.	7.9	7.7	18	239	1.47	1.73	0.000	10	133	17.9	237	166	97	99	89	<0.0002
Min.	6.1	7.4	5	65	0.45	1.36	0.000	2	24	6.6	75	3	83	92	65	<0.0002
Avg.	7.1	7.5	10	121	0.75	1.50	0.000	5	64	11.3	141	G 16	94	97	82	<0.0002
Count	30.0	30.0	30	30	4.00	30.00	30.000	30	30	30.0	30	30	30	30	4	4

G = Geometric Mean

Samle taken 9/18/95 - Zinc 0.02 mg/L and copper <0.01

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

SEPTEMBER 1995 - MISCELLANEOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	SO2 Lbs.	Lime Lbs.	Raw Sludge Gals	Total Solids Percent	Vol. Solids Percent	Raw Sludge pH	Sludge pH 2 Hours	Sludge pH 16 Hrs.	Lbs. of Lime per 1000 Gals. Sludge
1		2,640	680	21	242	18	469	6,000	3.3	72	5.8	12.28	12.33	78.17
2		2,640	680	22	81	25	359	6,000	3.2	73	5.8	12.28	11.96	59.83
3		2,520	710	24	242	14	442	6,000	3.5	67	7.8	12.35	12.08	73.67
4		2,520	800	25	242	14	442	7,000	3.2	75	5.9	12.30	12.23	63.14
5		2,760	620	27	161	6	469	6,000	3.5	73	6.0	12.39	12.25	78.17
6		2,640	660	26	242	19	442	6,000	3.3	74	5.9	12.27	12.29	73.67
7		2,760	700	20	242	16	469	6,000	3.5	75	5.8	12.38	12.33	78.17
8		2,640	640	26	161	22	469	8,250	3.4	75	5.7	12.33	12.39	56.85
9		2,640	690	19	242	21	414	6,000	3.1	72	5.6	12.41	12.35	69.00
10		2,640	660	18	161	14	386	6,000	4.3	53	5.7	12.38	12.30	64.33
11		2,760	620	21	161	8	414	6,000	3.3	72	6.0	12.31	12.23	69.00
12		2,640	850	19	161	14	442	6,000	3 0	71	5.9	12.41	12.18	73.67
13		2,640	620	20	242	16	497	10,000	3.1	73	5.8	12.43	12.18	49.70
14		2,640	2,940	20	242	17	524	6,000	3.2	73	5.8	12.41	12.17	87.33
15		2,640	2,130	26	161	18	497	8,000	3.1	73	5.8	12.44	12.11	62.13
16		2,520	710	21	242	18	442	6,000	3.0	74	5.8	12.35	12.13	73.67
17		2,400	610	20	161	19	442	6,000	3.0	74	5.8	12.38	11.86	73.67
18		2,640	2,060	23	242	19	386	6,000	3.1	73	5.8	12.37	12.31	64.33
19		2,520	690	20	161	19	331	8,000	3.0	74	5.9	12.36	12.07	41.38
20		2,760	750	27	242	20	331	6,000	3.0	74	5.8	12.31	12.23	55.17
21		2,760	590	22	161	17	331	6,000	3.1	74	5.6	12.21	12.17	55.17
22		2,760	750	8	242	18	359	7,100	3.3	75	5.7	12.32	12.17	50.56
23		2,760	610	15	161	19	276	6,000	3.2	71	6.6	11.94	11.16	46.00
24		2,520	770	17	242	18	331	6,000	3.1	68	6.7	12.45	12.47	55.17
25		2,520	610	19	161	20	552	4,500	3.0	77	5.9			122.67
26		2,640	1,060	19	161	16	552	6,000	2.8	57	5.8	12.25	12.23	92.00
27		2,640	580	21	564	16	386	7,000	3.1	77	5.9	12.48	12.55	55.14
28		2,640	590	21	322	26	386	6,000	3.2	75	5.9	12.45	12.31	64.33
29		2,640	600	21	403	17	386	6,000	3.6	61	5.8	12.38	11.93	64.33
30		2,520	560	32	403	17	386	6,400	3.3	74	5.7		12.20	60.31
31														
Total		78,960	25,540	640	6,851	521	12,612	192,250	96.8	2,149	178.0	345.62	353.17	2010.71
Max.		2,760	2,940	32	564	26	552	10,000	4.3	77	7.8	12.48	12.55	122.67
Min.		2,400	560	8	81	6	276	4,500	2.8	53	5.6	11.94	11.16	41.38
Avg.		2,632	851	21	228	17	420	6,408	3.2	72	5.9	12.34	12.18	67.02

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

OCTOBER 1995 - PLANT INFLUENT SHEET

PN-Day	Weather Type	Weather Precip.	Inf. Flow MGD	Inf. Temp F	Inf. pH SU	Inf. BOD mgIL	Inf. BOD Lbs.	Inf. SS mgIL	Inf SS Lbs.	Inf. Phos. mgIL	Inf. Phos. Lbs.	Inf. VSS mgIL	Inf. NH3-N mgIL	--Remarks or Other Parameters--
1			1.30	64	7.6	162	1,756	164	1,778			144		
2			1.48	64	7.4	198	2,444	220	2,716			192	13.0	
3	Rain	0.32	1.50	64	7.5	169	2,114	166	2,077			144	12.7	
4			1.43	64	7 6	192	2,290	178	2,123			168		
5	Rain	0.42	1.51	64	7 5	241	3,035	218	2,745			202		
6	Rain	0.32	1.47	62	7.5	179	2,195	176	2,158	6.00	74	158		
7	Rain	0.20	1.38	64	7.6	221	2,544	187	2,152			168		
8			1.32	62	7.5	162	1,783	154	1,695			132		
9			1.58	62	7.6	179	2,359	124	1,634			108		
10			1.54	62	7.5	195	2,505	226	2,903			210		
11			1.39	62	7.4	198	2,295	166	1,924	5.10	59	152	14.6	
12			1.43	62	7.5	185	2,206	164	1,956			176		
13			1.44	62	7.8	178	2,138	130	1,561			116		
14	Rain	0.13	1.41	62	7.5	213	2,505	136	1,599			168		
15	Rain	0.03	1.34	62	7.6	194	2,168	184	2,056			146	14.5	
16			1.46	64	7.7	202	2,460	214	2,606			192		
17			1.53	64	7.6	244	3,113	175	2,233	4.60	59	166		
18			1.47	64	7.5	203	2,489	194	2,378			182	13.7	
19	Rain	0.02	1.50	64	7.8	201	2,515	202	2,527			190		
20	Rain	1.00	1.59	64	7.6	230	3,050	86	1,140			76		
21	Rain	0.20	1.45	64	7.6	240	2,902	242	2,927			216		
22			1.46	62	7.5	195	2,374	190	2,314			172		
23			1.59	63	7.7	158	2,095	184	2,440			168	13.5	
24			1.53	63	7.7	153	1,952	168	2,144			132		
25			1.49	63	7.5	188	2,336	182	2,262			170		
26	Rain	0.93	1.52	64	8.1	196	2,485	184	2,333	6.20	79	170	15.0	
27			1.53	63	7.4	163	2,080	126	1,608			118		
28			1.44	64	7.5	200	2,402	82	985			76		
29			1.40	63	7.6	160	1,868	244	2,849			220	15.9	
30	Rain	0.23	1.49	64	7.4	135	1,678	142	1,765			128		
31	Rain	0.11	1.44	64	7.4	129	1,549	138	1,657			116		
Total	0	3.91	45.41	1,959	234.7	5,863	71,684	5,346	65,243	21.90	270	4,876	112.9	
Max.	0	1.00	1.59	64	8.1	244	3,113	244	2,927	6.20	79	220	15.9	
Min.	0	0.02	1.30	62	7.4	129	1,549	82	985	4.60	59	76	12.7	
Avg.	0	0.33	1.46	63	7.6	189	2,312	172	2,105	5.48	67	157	14.1	
Count	12	12.00	31.00	31	31.0	31	31	31	31	4.00	4	31	8.0	

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

OCTOBER 1995 - PRIMARY EFFLUENT SHEET

PN- Day	P Eff. BOD mg/L	P Eff. BOD Lbs.	P Eff SS mg/L	P Eff. SS Lbs.	P Eff. Phos. mg/L	P Eff Phos. Lbs	P Eff VSS mg/L	P Eff. NH3-N mg/L	Flow MGD	BOD Prl. Removal %	SS Prl Removal %	P Prl. Removal %
1	95	1,030	56	607			44		1.30	41	66	
2	112	1,382	64	790			50	14.0	1.48	43	71	
3	111	1,389	60	751			54	13.6	1.50	34	64	
4	121	1,443	56	668			50		1 43	37	69	
5	110	1,385	70	882			66		1.51	54	68	
6	122	1,496	74	907	2.40	29	48		1.47	32	58	60
7	108	1,243	60	691			44		1.38	51	68	
8	107	1,178	64	705			52		1.32	34	58	
9	103	1,357	56	738			56		1.58	42	55	
10	131	1,683	76	976			70		1.54	33	66	
11	106	1,229	82	951	3.00	35	74	15.1	1.39	46	51	41
12	114	1,360	68	811			64		1 43	38	59	
13	131	1,573	96	1,153			72		1.44	26	26	
14	175	2,058	76	894			56		1.41	18	44	
15	129	1,442	66	738			54	14.7	1.34	34	64	
16	102	1,242	68	828			60		1.46	50	68	
17	109	1,391	60	766	2.20	28	56		1.53	55	66	52
18	120	1,471	66	809			62	13.9	1.47	41	66	
19	131	1,639	76	951			70		1.50	35	62	
20	185	2,453	88	1,167			88		1.59	20	-2	
21	176	2,128	88	1,064			80		1.45	27	64	
22	122	1,486	88	1,072			76		1.46	37	54	
23	157	2,082	76	1,008			80	14.0	1.59	1	59	
24	113	1,442	84	1,072			60		1.53	26	50	
25	123	1,528	76	944			68		1.49	35	58	
26	119	1,509	80	1,014	5.80	74	76	16.4	1.52	39	57	6
27	130	1,659	96	1,225			92		1.53	20	24	
28	137	1,645	72	865			68		1.44	32	12	
29	102	1,191	88	1,027			72		1.40	36	64	
30	114	1,417	76	944			60	15.4	1.49	16	46	
31	124	1,489	68	817			60		1.44	4	51	
Total	3,839	47,019	2,274	27,832	13.40	166	1,982	117.1	45.41	1,037	1,686	159
Max.	185	2,453	96	1,225	5.80	74	92	16.4	1.59	55	71	60
Min.	95	1,030	56	607	2.20	28	44	13.6	1.30	1	-2	6
Avg.	124	1,517	73	898	3.35	41	64	14.6	1.46	33	54	40
Count	31	31	31	31	4.00	4	31	8.0	31.00	31	31	4

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

OCTOBER 1995 - ACTIVATED SLUDGE SHEET

PN-Day	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading flm	Mix Liq SS mgIL	Mix Liq VSS mgIL	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mgIL	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mgIl	PE SS mgIL
1	48	6.6								259			76	57.5	1.30	95	56
2		5.8	5.8	0.38	1,543	1,219	25.0	0.62	5 5	264	0.39	0 31	61	45.0	1.48	112	64
3		5.7	7.5	0.31	1,880	1,516	27.0	0.70		267	0.31	0.25	59	42.2	1.50	111	60
4		6.0	8.4	0.32	1,869	1,515	30.0	0 62	4.1	266	0.29	0.23	58	41.6	1.43	121	56
5		5.7	6.3	0.31	1,848	1,506	32.0	0.58	4.2	263	0.30	0.25	61	44.1	1.51	110	70
6		5.9	6.3	0.32	1,900	1,542	35 0	0.54	4.2	261	0.30	0.24	63	44.7	1.47	122	74
7		6.2								270			60	45.2	1.38	108	60
8		6.5								271			70	45.1	1.32	107	64
9		5.5	7.3	0.31	1,788	1,440	42.0	0.43	3.9	258	0.28	0.23	59	42.1	1.58	103	56
10		5 6	5.8	0.37	1,896	1,531	53.0	0.36	3.1	262	0.29	0.23	61	40.0	1.54	131	76
11		6.2	6.4	0.25	2,026	1,633	59.0	0.34	2.9	263	0.29	0.23	67	39.9	1.39	106	82
12		6.0	7.6	0.27	2,050	1,670	60.0	0.34	4.3	260	0 29	0.22	65	48.3	1.43	114	68
13		6.0	5.3	0.32	2,023	1,629	60.0	0.34	1.6	254	0.28	0.23	65	48.9	1.44	131	96
14		6.1								267			59	49.6	1.41	175	76
15		6.4								271			67	45.0	1.34	129	66
16		5.9	7.2	0.25	1,990	1,637	61.0	0.33	4.1	273	0.29	0.24	59	41.8	1.46	102	68
17		5.6	7.6	0.30	1,937	1,565	70.0	0.28	4.3	261	0.31	0.25	64	48.7	1.53	109	60
18		5.9	7.3	0.31	1,960	1,570	75.0	0.26	3.7	263	0.30	0.24	66	53.2	1.47	120	66
19		5.7	6.2	0.34	1,973	1,608	75.0	0.26	3.9	258	0.28	0.23	65	57.5	1.50	131	76
20		5.4	5.0	0.52	1,945	1,583	73.0	0.27	2.0	279	0.28	0.23	61	57.4	1.59	185	88
21		5.9								266			67	56.8	1.45	176	88
22		5.9								268			66	56.7	1.46	122	88
23		5.4	5.7	0.44	1,902	1,571	74.0	0.26	2.5	260	0.30	0.24	61	58.4	1.59	157	76
24		5.6	5.3	0.32	1,885	1,526	59.0	0.32	3.1	272	0.28	0.23	63	56.2	1.53	113	84
25		5.8	6.2	0.33	1,954	1,553	70.0	0.28	3.9	258	0.29	0.23	65	60.0	1.49	123	76
26		5.7	5.7	0.33	1,941	1,542	55.0	0.35	3.4	259	0.30	0.24	64	65.7	1.52	119	80
27		5.6	4.7	0.36	1,909	1,518	58.0	0.33	2.4	270	0.31	0.25	63	65.3	1.53	130	96
28		6.0								272			68	65.4	1.44	137	72
29		6.2								274			70	65.4	1.40	102	88
30		5.8	5.7	0.33	1,803	1,429	35.0	0.52	4.6	275	0.30	0.24	67	65.4	1.49	114	76
31		6.0	6.5	0.35	1,775	1,436	34.0	0.52	4.1	275	0.29	0.23	69	65.4	1.44	124	68
Total	48	182.8	139.5	7.34	41,797	33,739	1162.0	8.83	75.8	8,239	6.55	5.27	1,989	1618.5	45.41	3,839	2,274
Max.	48	6.6	8.4	0.52	2,050	1,670	75.0	0.70	5.5	279	0.39	0.31	76	65.7	1.59	185	96
Min.	48	5.4	4.7	0.25	1,543	1,219	25.0	0.26	1.6	254	0.28	0.22	58	39.9	1.30	95	56
Avg.	48	5.9	6.3	0.33	1,900	1,534	52.8	0.40	3.6	266	0.30	0.24	64	52.2	1.46	124	73
Count	1	31.0	22.0	22.00	22	22	22.0	22.00	21.0	31	22.00	22.00	31	31.0	31.00	31	31

Robert J. Swalwell
Superintendent

MARSHALL WWTP 801 INDUSTRIAL RD. MARSHALL MI 49068 - PERMIT MI0023540

OCTOBER 1995 - DISCHARGE MONITORING REPORT - DISCHARGE NO. 001A

Day	F.Eff. D.O. mgIL	F.Eff. pH SU	F.Eff. SS mgIL	F.Eff. SS Lbs.	F.Eff. Total-P mgIL	Flow MGD	F.Eff. Chlorine mgIL	F.Eff. CBOD mgIL	F.Eff. CBOD Lbs.	F.Eff. NH3 as N mgIL	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %	Mercury mgIL
1	6.0	7.5	7	76		1.30	0.000	4	43			6	96	98		
2	7.4	7.6	12	148		1.48	0.000	4	49	13.3	164	2	95	98		
3	7.1	7.6	12	150		1.50	0.000	6	75	13.5	169	4	93	96		
4	6.9	7.4	10	119		1.43	0.000	6	72			8	94	97		<0.0002
5	6.6	7.6	12	151		1.51	0.000	6	76			3	94	98		
6	7.0	7.5	10	123	0.28	1.47	0.000	4	49			8	94	98	95	
7	6.5	7.5	11	127		1.38	0.000	4	46			2	94	98		
8	6.3	7.5	10	110		1.32	0.000	4	44			10	94	98		
9	6.8	7.4	8	105		1.58	0.000	5	66			4	94	97		<0.0002
10	6.3	7.5	8	103		1.54	0.000	6	77			5	96	97		
11	6.7	7.4	10	116	0.29	1.39	0.000	4	46	13.0	151	7	94	98	94	
12	6.9	7.4	6	72		1.43	0.000	4	48			8	96	98		
13	6.7	7.6	7	84		1.44	0.002	4	48				95	98		
14	6.6	7.5	7	82		1.41	0.000	5	59			5	95	98		
15	6.5	7.5	11	123		1.34	0.000	5	56	12.8	143	8	94	97		
16	7.1	7.5	7	85		1.46	0.000	5	61			12	97	98		
17	6.7	7.5	5	64	0.23	1.53	0.000	5	64			18	97	98	95	
18	6.9	7.3	8	98		1.47	0.002	5	61	11.4	140	5	96	98		<0.0002
19	6.7	7.6	7	88		1.50	0.000	4	50			15	97	98		
20	6.4	7.5	7	93		1.59	0.000	5	66			10	92	98		
21	6.5	7.6	10	121		1.45	0.000	6	73			17	96	98		
22	7.0	7.6	12	146		1.46	0.000					7	94			<0.0002
23	6.9	7.5	8	106		1.59	0.000	4	53	10.8	143	10	96	97		
24	6.9	7.5	8	102		1.53	0.000	4	51			15	95	97		
25	7.1	7.4	9	112		1.49	0.012	4	50			8	95	98		
26	7.7	7.5	10	127	0.47	1.52	0.000	4	51	14.7	186	5	95	98	92	
27	6.8	7.4	5	64		1.53	0.000	5	64			10	96	97		
28	6.5	7.5	11	132		1.44	0.013	6	72			5	87	97		
29	7.2	7.5	12	140		1.40	0.001	4	47	11.9	139	7	95	98		
30	7.4	7.5	7	87		1.49	0.000	4	50			10	95	97		
31	7.1	7.4	10	120		1.44	0.001	4	48			10	93	97		
Total	211.2	232.3	277	3,373	1.27	45.41	0.030	140	1,713	101.4	1,235	244	2,934	2,928	376	<0.0002
Max.	7.7	7.6	12	151	0.47	1.59	0.013	6	77	14.7	186	18	97	98	95	<0.0002
Min.	6.0	7.3	5	64	0.23	1.30	0.000	4	43	10.8	139	2	87	96	92	<0.0002
Avg.	6.8	7.5	9	109	0.32	1.46	0.001	5	57	12.7	154	G 7	95	98	94	<0.0002
Count	31.0	31.0	31	31	4.00	31.00	31.000	30	30	8.0	8	30	31	30	4	4

G = Geometric Mean

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

OCTOBER 1995 - MISCELLANEOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect Power KWH	Water Cu Ft	Chlorine Lbs	Ferric Chloride Lbs.	SO2 Lbs	Lime Lbs.	Raw Sludge Gals	Total Solids Percent	Vol. Solids Percent	Raw Sludge pH	Sludge pH 2 Hours	Sludge pH 16 Hrs.	Lbs of Lime per 1000 Gals. Sludge
1		2,520	600	20	403	18	184	6,000	3.7	74	5.6			30.67
2		2,640	580	20	322	17	284	8,000	4.0	73	6.2	12.26		35.50
3		2,760	510	23	403	21	334	8,000	3.9	71	6.5	12.28	12.00	41.75
4		2,640	630	22	322	10	418	9,000	3 9	74	5.6	12.38	12.46	46.44
5		2,760	550	20	322	10	200	6,000	3.2	76	5.6	12.15	11.75	33.33
6		2,640	610	21	322	14	384	11,200	3.4	74	5.5	12.37	12 35	34 29
7		2,640	600	21	322	18	184	7,000	3.1	74	5.9	12.48	12 46	26.29
8		2,640	720	12	403	10	234	6,000	3.3	74	5.7	12.53	12.42	39.00
9		2,640	830	17	322	13		1,000	3.0	73				0.00
10		2,520	540	16	322	14	334	12,000	3.5	68	7.5	12.14	12.14	27.83
11		2,640	750	19	322	14	217	6,000	3.0	67	5.7	12.13	11.63	36.17
12		2,640	700	17	322	13	200	8,200	2.9	74	5.8	12.32	10.96	24.39
13		2,640	680	21	322	16	200	6,000	2.9	72	5.8	12.38	12.05	33.33
14		2,520	730	11	322	13	184	10,000	2.7	72	5.8	11.52	10.22	18.40
15		2,760	520	19	322	12	234	6,000	2.9	72	5.9	12.48	12.44	39.00
16		2,760	560	20	322	13	217	8,000	2.9	73	5.9	12.23	12.13	27.13
17		2,640	420	19	322	9	267	9,000	2.8	72	5.8	12.33	12.25	29.67
18		2,640	480	18	322	6	267	9,000	2.6	72	5.7	12.36	12.18	29.67
19		2,640	430	20	161	5	284	9,000	2.7	73	5.8	12.29	12.10	31.56
20		2,880	510	23	242	10	284	11,000	2.7	71	5.9	12.41	12.22	25.82
21		2,640	500	20	161	12	184	6,000	2.9	69	6.4	12.58	12.26	30.67
22		2,760	520	23	161	14	200	6,000	2.9	65	7.1	12.30	11.89	33.33
23		2,640	470	15	403	13	267	9,500	2.7	69	6.4	12.05	12.05	28.11
24		2,760	520	16	322	13	267	10,500	2.7	74	5.9	12.28	11.98	25.43
25		2,880	470	14	403	10	251	9,000	2.6	74	5.9	12.20	11.39	27.89
26		2,640	490	17	403	12	251	9,500	2.6	76	6.0	12.14	11.74	26.42
27		2,760	580	20	322	12	251	6,500	2.6	73	5.9	12.17	11.98	38.62
28		2,760	610	20	322	11	217	6,500	2.6	74	5.9	12.59	12.65	33.38
29		2,760	540	18	483	13	184	7,000	2.7	74	6.0	12.39	11.84	26.29
30		2,760	460	22	322	12	200	7,000	2.9	74	6.1	12.23	12.25	28.57
31		2,760	480	22	322	12	217	8,250	2.7	74	6.2	12.30	12.08	26.30
Total		83,280	17,590	586	10,066	390	7,399	242,150	93.0	2,245	180.0	356.27	335.87	935.23
Max.		2,880	830	23	483	21	418	12,000	4.0	76	7.5	12.59	12.65	46.44
Min.		2,520	420	11	161	5	184	1,000	2.6	65	5.5	11.52	10.22	0.00
Avg.		2,686	567	19	325	13	247	7,811	3.0	72	6.0	12.29	12.00	30.17

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

NOVEMBER 1995 - PLANT INFLUENT SHEET

PN- Day	Weather Type	Weather Precip	Inf. Flow MGD	Inf. Temp F	Inf. pH SU	Inf BOD mgIL	Inf. BOD Lbs.	Inf. SS mgIL	Inf SS Lbs.	Inf. Phos. mgIL	Inf. Phos. Lbs.	Inf. VSS mgIL	Inf. NH3-N mgIL	--Remarks or Other Parameters--
1	Rain	0.44	1.52	64	7.5	138	1,749	180	2,282			158	13.5	
2	Rain	0.22	1.62	64	7.4	139	1,878	124	1,675	3.60	49	112		
3			1.52	62	7.5	120	1,521	116	1,471			96		
4			1.48	61	7.6	146	1,802	162	2,000			130		
5			1.46	61	7.4	172	2,094	174	2,119			156		
6	Rain	0.07	1.49	63	7.4	162	2,013	192	2,386			172		
7	Snow	0.01	1.48	63	7.4	211	2,604	158	1,950	5.60	69	144	17.3	
8	Snow	0.02	1.45	63	7.8	160	1,935	166	2,007			152		
9	Rain	0.02	1.47	62	7.7	152	1,863	156	1,913			142	16.6	
10	Rain	2.00	1.56	61	7.7	132	1,717	114	1,483			108		
11	Snow	0.13	1.59	61	7.5	167	2,215	104	1,379			82		
12			1.44	62	7.5	111	1,333	144	1,729			134		
13			1.59	59	7.6	124	1,644	146	1,936	3.90	52	132		
14			1.58	60	7.6	142	1,871	173	2,280			156		
15	Snow	0.06	1.54	60	7.5	105	1,349	150	1,927			130	13.7	
16	Snow	0.01	1.56	61	7.9	155	2,017	162	2,108			144	13.5	
17	Snow	0.31	1.57	60	7.5	127	1,663	166	2,174			154		
18			1.56	60	7.3	118	1,535	134	1,743			102		
19			1.52	59	7.4	160	2,028	172	2,180	6.20	79	148	12.5	
20	Snow	0.03	1.63	61	7.5	162	2,202	140	1,903			140		
21	Snow	0.05	1.68	62	7.4	144	2,018	142	1,990			120	13.2	
22			1.57	59	7.3	166	2,174	150	1,964			136		
23			1.35	60	7.6	182	2,049	176	1,982			158		
24			1.41	56	7.6	179	2,105	128	1,505			102		
25			1.39	57	7.6	196	2,272	110	1,275			90		
26			1.40	57	7.5	184	2,148	132	1,541			120	14.3	
27	Rain	0.42	1.69	57	7.4	188	2,650	260	3,665			216		
28			1.66	57	7.5	170	2,354	204	2,824			174		
29			1.68	59	7.5	181	2,536	150	2,102			114		
30	Rain	0.02	1.68	56	7.5	194	2,718	160	2,242			132		
31														
Total	0	3.81	46.14	1,807	225.6	4,687	60,059	4,645	59,733	19.30	248	4,054	114.6	
Max.	0	2.00	1.69	64	7.9	211	2,718	260	3,665	6.20	79	216	17.3	
Min.	0	0.01	1.35	56	7.3	105	1,333	104	1,275	3.60	49	82	12.5	
Avg.	0	0.25	1.54	60	7.5	156	2,002	155	1,991	4.83	62	135	14.3	
Count	15	15.00	30.00	30	30.0	30	30	30	30	4.00	4	30	8.0	

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

NOVEMBER 1995 - PPIMARY EFFLUENT SHEET

PN-Day	P Eff BOD mgIL	P Eff BOD Lbs.	P Eff SS mgIL	P Eff SS Lbs	P Eff Phos. mgIL	P Eff Phos Lbs	P Eff VSS mgIL	P Eff NH3-N mgIL	Flow MGD	BOD Prı Removal %	SS Prı Removal %	P Prı. Removal %
1	109	1,382	96	1,217	2 30	29	88	14.7	1.52	21	47	
2	121	1,635	80	1,081			72		1.62	13	35	36
3	116	1,471	96	1,217			76		1.52	3	17	
4	97	1,197	96	1,185			60		1.48	34	41	
5	105	1,279	56	682			36		1.46	39	68	
6	106	1,317	88	1,094			84		1.49	35	54	
7	118	1,456	72	889	3.20	39	72	17.0	1.48	44	54	43
8	125	1,512	84	1,016			76		1.45	22	49	
9	128	1,569	80	981			64	19.0	1.47	16	49	
10	109	1,418	60	781			60		1.56	17	47	
11	103	1,366	80	1,061			56		1.59	38	23	
12	96	1,153	104	1,249			92		1.44	14	28	
13	108	1,432	104	1,379	2.70	36	84		1.59	13	29	31
14	115	1,515	96	1,265			80		1.58	19	45	
15	108	1,387	96	1,233			88	16.9	1.54	-3	36	
16	106	1,379	100	1,301			96	16.7	1.56	32	38	
17	121	1,584	128	1,676			100		1.57	5	23	
18	128	1,665	128	1,665			108		1.56	-8	4	
19	149	1,889	120	1,521	6.20	79	96	15.7	1.52	7	30	
20	172	2,338	115	1,563			105		1.63	-6	18	0
21	106	1,485	112	1,569			88	15.1	1.68	26	21	
22	123	1,611	76	995			56		1.57	26	49	
23	127	1,430	104	1,171			88		1.35	30	41	
24	108	1,270	96	1,129			64		1.41	40	25	
25	111	1,287	104	1,206			84		1.39	43	5	
26	100	1,168	68	794			68	14.0	1.40	46	48	
27	83	1,170	80	1,128			72		1.69	56	69	
28	85	1,177	68	941			52		1 66	50	67	
29	121	1,695	80	1,121			64		1.68	33	47	
30	124	1,737	86	1,205			64		1.68	36	50	
31												
Total	3,428	43,974	2,753	35,314	14.40	183	2,293	129.1	46.14	741	1,157	110
Max.	172	2,338	128	1,676	6.20	79	108	19.0	1.69	56	69	43
Mın.	83	1,153	56	682	2.30	29	36	14.0	1.35	-8	4	0
Avg.	114	1,466	92	1,177	3.60	46	76	16.1	1.54	25	39	28
Count	30	30	30	30	4.00	4	30	8.0	30.00	30	30	4

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

NOVEMBER 1995 - ACTIVATED SLUDGE SHEET

PN-Day	Aerat Volume KCF	Deten Time Hrs.	Sludge Age Days	Organic Loading flm	Mix Liq SS mgIL	Mix Liq VSS mgIL	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mgIL	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mgIl	PE SS mgIL
1	48	5.7	4.2	0.34	1,707	1,350	35.0	0.49	4.5	273	0.27	0.22	66	60.9	1.52	109	96
2		5.3	4.9	0.39	1,762	1,398	33.0	0.53	2.7	268	0.31	0.23	62	58.4	1.62	121	80
3		5.7	4.3	0.36	1,729	1,383	30.0	0.58	4.0	285	0.28	0.22	66	49.4	1.52	116	96
4		5.8								229			67	44.7	1.48	97	96
5		5.9								221			68	44.7	1.46	105	56
6		5.8	4.8	0.32	1,743	1,371	31.0	0.56	3 4	232	0.27	0.22	67	44.7	1.49	106	88
7		5.8	6.2	0.33	1,840	1,457	31.0	0.59	3.0	238	0.29	0.23	67	44.5	1.48	118	72
8		5.9	5.7	0.33	1,927	1,528	35.0	0.55	2.6	248	0.29	0.23	68	44.0	1.45	125	84
9		5.9	5.9	0.34	1,923	1,529	38.0	0.51	3.4	243	0.29	0.23	63	47.8	1.47	128	80
10		5.5	7.1	0.30	1,846	1,555	36.0	0.51	2.5	233	0.30	0.24	59	48.5	1.56	109	60
11		5.4								280			58	45.9	1.59	103	80
12		6.0								222			60	44.4	1.44	96	104
13		5.4	4.4	0.30	2,032	1,611	36.0	0.56	3.9	232	0.34	0.27	58	47.6	1.59	108	104
14		5.5	4.9	0.30	2,072	1,661	35.0	0.59	3.0	235	0.33	0.26	59	47.9	1.58	115	96
15		5.6	5.0	0.28	2,073	1,656	37.0	0.56	3.2	239	0.31	0.25	60	50.6	1.54	108	96
16		5.5	4.8	0.28	2,071	1,634	35.0	0.59	3.6	238	0.35	0.28	60	51.3	1.56	106	100
17		5.5	3.7	0.32	2,056	1,636	35.0	0.59	3.7	235	0.32	0.25	59	50.8	1.57	121	128
18		5.5								235			59	51.4	1.56	128	128
19		5.7								231			60	52.6	1.52	149	120
20		5.3	4.1	0.45	2,136	1,739	32.0	0.67	1.9	231	0.36	0.30	55	52.1	1.63	172	115
21		5.1	4.1	0.29	2,128	1,708	33.0	0.64	1.8	231	0.35	0.28	53	51.5	1.68	106	112
22		5.5	6.2	0.32	2,073	1,658	35.0	0.59	4.7	239	0.34	0.27	57	52.2	1.57	123	76
23		6.4								239			65	53.0	1.35	127	104
24		6.1								249			62	52.9	1.41	108	96
25		6.2								240			63	52.8	1.39	111	104
26		6.2								230			62	47.5	1.40	100	68
27		5.1	4.8	0.28	1,791	1,412	27.0	0.66	5.6	256	0.30	0.23	52	48.4	1.69	83	80
28		5.2	5.9	0.27	1,852	1,434	25.0	0.74	5.8	266	0.29	0.23	53	47.3	1.66	85	68
29		5.1	5.0	0.40	1,867	1,423	24.0	0.78	5.6	267	0.28	0.21	52	51.0	1.68	121	80
30		5.1	4.7	0.40	1,888	1,453	27.0	0.70	4.7	253	0.31	0.24	51	50.1	1.68	124	86
31																	
Total	48	168.7	100.4	6.62	38,516	30,596	650.0	12.00	73.6	7,318	6.18	4.89	1,811	1488.9	46.14	3,428	2,753
Max.	48	6.4	7.1	0.45	2,136	1,739	38.0	0.78	5.8	285	0.36	0.30	68	60.9	1.69	172	128
Min.	48	5.1	3.7	0.27	1,707	1,350	24.0	0.49	1.8	221	0.27	0.21	51	44.0	1.35	83	56
Avg.	48	5.6	5.0	0.33	1,926	1,530	32.5	0.60	3.7	244	0.31	0.24	60	49.6	1.54	114	92
Count	1	30.0	20.0	20.00	20	20	20.0	20.00	20.0	30	20.00	20.00	30	30.0	30.00	30	30

Robert J. Swalwell
Superintendent

MARSHALL WWTP 801 INDUSTRIAL RD MARSHALL MI 49068 - PERMIT MI0023540

NOVEMBER 1995 - DISCHARGE MONITORING REPORT - DISCHARGE NO. 001A

Day	F.Eff. D.O. mgIL	F.Eff. pH SU	F.Eff. SS mgIL	F.Eff. SS Lbs.	F.Eff. Total-P mgIL	Flow MGD	F.Eff. Chlorine mgIL	F.Eff. CBOD mgIL	F.Eff. CBOD Lbs.	F.Eff. NH3 as N mgIL	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %	Mercury mgIL
1	7.5	7.4	12	152		1.52	0.000	4	51	11.0	139	11	93	97		
2	6.9	7.4	5	68	0.16	1.62	0.002	4	54			28	96	97	96	
3	7.4	7.2	13	165		1.52	0.000	6	76			100	89	95		
4	7.6	7.3	4	49		1.48	0.000	6	74			27	98	96		
5	7.4	7.4	14	170		1.46	0.001	6	73			19	92	97		
6	7.5	7.4	9	112		1.49	0.000	5	62			150	95	97		
7	7.0	7.4	11	136	0.32	1.48	0.000	5	62	13.8	170		93	98	94	0.00020
8	7.1	7.6	16	193		1.45	0.000	6	73			63	90	96		
9	7.3	7.5	16	196		1.47	0.000	7	86	14.5	178	46	90	95		
10	6.9	7.5	9	117		1.56	0.000	7	91			36	92	95		
11	7.1	7.6	10	133		1.59	0.000	5	66			57	90	97		
12	7.6	7.6	13	156		1.44	0.000	5	60			48	91	95		
13	7.5	7.5	12	159	0.24	1.59	0.000	3	40			58	92	98	94	<0.0002
14	7.1	7.5	16	211		1.58	0.001	5	66			81	91	96		
15	7.4	7.5	16	205		1.54	0.000	7	90	14.5	186	40	89	93		
16	7.4	7.7	14	182		1.56	0.005	6	78	14.3	186	86	91	96		
17	7.4	7.5	15	196		1.57	0.000	6	79			45	91	95		
18	7.1	7.5	15	195		1.56	0.022	7	91			75	89	94		
19	7.2	7.5	14	177	0.66	1.52	0.000	8	101	12.6	160	42	92	95	89	<0.0002
20	6.9	7.6	12	163		1.63	0.000	9	122			114	91	94		<0.0002
21	7.2	7.5	13	182		1.68		7	98	12.5	175	50	91	95		
22	7.3	7.5	13	170		1.57	0.000	5	65			50	91	97		
23	7.3	7.8	10	113		1.35	0.000	3	34			45	94	98		
24	7.9	7.6	9	106		1.41	0.000	4	47			83	93	98		
25	8.1	7.5	13	151		1.39	0.000	5	58			35	88	97		
26	8.1	7.5	12	140		1.40	0.000	5	58	12.9	151	31	91	97		
27	7.7	7.6	6	85		1.69	0.000	3	42			29	98	98		
28	8.0	7.4	13	180		1.66	0.000	6	83			58	94	96		
29	7.8	7.5	16	224		1.68	0.000	8	112			56	89	96		
30	7.6	7.4	6	84		1.68	0.000	4	56			27	96	98		
31																
Total	222.3	224.9	357	4,572	1.38	46.14	0.031	167	2,149	106.1	1,345	1,590	2,760	2,886	373	0.00020
Max.	8.1	7.8	16	224	0.66	1.69	0.022	9	122	14.5	186	150	98	98	96	0.00020
Min.	6.9	7.2	4	49	0.16	1.35	0.000	3	34	11.0	139	11	88	93	89	<0.0002
Avg.	7.4	7.5	12	152	0.35	1.54	0.001	6	72	13.3	168	G 55	92	96	93	0.00005
Count	30.0	30.0	30	30	4.00	30.00	29.000	30	30	8.0	8	29	30	30	4	4.00000

G = Geometric Mean

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

NOVEMBER 1995 - MISCELLANEOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	SO2 Lbs.	Lime Lbs.	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	Raw Sludge pH	Sludge pH 2 Hours	Sludge pH 16 Hrs.	Lbs. of Lime per 1000 Gals. Sludge
1	1,300	2,640	600	16	322	11	320	8,000	2.7	74	6.1	12.00	11.48	40.00
2	800	2,760	500	18	403	12	369	8,000	2.8	74	6.1	12.04	11.69	46.13
3	2,100	2,880	520	21	403	13	344	9,500	3.0	75	6.1	12.18	11.88	36.21
4	2,200	2,760	460	21	322	9	197	6,000	2.9	75	7.3	12.58	12.26	32.83
5	2,500	2,760	510	22	322	7	221	6,500	2.8	75	6.3		10.22	34.00
6	1,400	2,760	520	5	322	7	295	7,500	2.9	75	6.0	12.01	11.46	39.33
7	1,600	2,760	540	17	403	7	393	10,300	2.5	75	6.3		12.37	38.16
8	2,400	2,880	630	20	322	6	369	9,000	2.9	81	6.2	12.41	12.25	41.00
9	2,400	2,760	470	15	322	8	344	9,000	2.8	75	6.0	12.20	12.07	38.22
10	2,600	2,760	560	16	403	6	344	10,000	2.8	73	6.1		11.74	34.40
11	1,600	2,880	590	17	322	9	270	6,000	2.7	73	6.1	12.25	11.90	45.00
12	2,200	2,760	490	16	322	5	270	7,000	2.8	73	6.2	11.97	11.17	38.57
13	2,200	2,880	490	18	322	6	369	9,500	2.7	74	6.1	12.31	12.18	38.84
14	2,400	2,760	540	18	322	8	295	9,300	2.7	72	6.2	12.25	11.82	31.72
15	2,700	2,760	430	19	322	11	369	8,500	2.7	72	6.3	12.25	11.90	43.41
16	2,500	2,760	440	7	322	12	295	9,000	2.7	72	6.2	12.28	11.85	32.78
17	2,300	2,880	510	15	322	14	270	9,000	2.7	74	6.1	12.01	11.52	30.00
18	2,100	2,760	260	18	242	13	270	7,500	2.5	73	6.2	11.91	10.93	36.00
19	1,700	2,760	560	23	242	12	221	4,000	2.7	73	6.1	12.57		55.25
20	1,400	2,760	1,170	22	242	13	492	7,200	2.7	74	6.2	12.42	12.37	68.33
21	2,200	2,640	690	22	483	13	492	6,000	2.7	70	6.5	12.61	12.74	82.00
22	2,300	2,640	480	24	483	12	492	6,000	2.6	73	6.2			82.00
23	2,700	2,880	510	24	483	16	246	6,000	2.7	72	6.2	11.97	11.24	41.00
24	2,600	2,880	500	13	403	18	541	14,500	2.7	72	6.4	12.64	12.48	37.31
25	2,000	2,760	470	18	403	12	516	15,000	2.5	74	6.1	12.45	12.31	34.40
26	1,800	2,520	500	17	403	11	442	15,000	3.4	74	6.2	12.66	12.52	29.47
27	2,600	2,880	450	18	403	11	492	12,000	2.3	73	6.3		12.03	41.00
28	2,800	2,880	490	20	403	11	393	11,000	2.7	73	6.2	11.40	10.12	35.73
29	2,900	2,880	390	18	322	13	541	12,000	2.9	72	6.1	12.65	12.54	45.08
30	1,900	2,760	480	17	242	12	688	16,000	3.7	73	6.2	12.42	12.09	43.00
31														
Total	64,200	83,400	15,750	535	10,552	318	11,160	274,300	83.2	2,208	186.6	306.44	331.13	1271.17
Max.	2,900	2,880	1,170	24	483	18	688	16,000	3.7	81	7.3	12.66	12.74	82.00
Min.	800	2,520	260	5	242	5	197	4,000	2.3	70	6.0	11.40	10.12	29.47
Avg.	2,140	2,780	525	18	352	11	372	9,143	2.8	74	6.2	12.26	11.83	42.37

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

DECEMBER 1995 - PLANT INFLUENT SHEET

PN- Day	Weather Type	Weather Precip.	Inf. Flow MGD	Inf. Temp F	Inf. pH SU	Inf. BOD mgIL	Inf. BOD Lbs.	Inf. SS mgIL	Inf. SS Lbs.	Inf. Phos. mgIL	Inf. Phos. Lbs.	Inf. VSS mgIL	Inf. NH3-N mgIL	--Remarks or Otner Parameters--
1			1.68	57	7.4	234	3,279	94	1,317			76		
2			1.62	57	7.4	191	2,581	116	1,567			100		
3			1.53	57	7.6	229	2,922	184	2,348			164		
4	Snow	0.02	1.54	57	7.7	163	2,094	160	2,055			140	13.9	
5			1.52	57	7.6	156	1,978	164	2,079	4.00	51	144		
6			1.56	59	7.8	186	2,420	176	2,290			120	12.5	
7			1.53	59	7.7	148	1,889	288	3,675			264		
8	Snow	0.15	1.56	59	7.6	217	2,823	160	2,082			142		
9			1.38	59	7.7	198	2,279	188	2,164			168		
10			1.35	59	7.6	173	1,948	152	1,711	4.00	45	140		
11	Snow	0.02	1.55	59	7.7	190	2,456	156	2,017			132	13.2	
12			1.60	59	7.6	217	2,896	212	2,829			188	13.4	
13	Rain	0.43	1.54	59	7.7	234	3,005	216	2,774			208		
14			1.53	59	7.6	144	1,837	180	2,297			152		
15			1.46	59	7.4	224	2,728	200	2,435			156		
16			1.39	59	7.4	168	1,948	144	1,669			116		
17			1.35	59	7.4	119	1,340	220	2,477			192		
18			1.34	57	7.5	159	1,777	148	1,654			128		
19			1.41	57	7.5	190	2,237	180	2,120			172		
20	Snow	0.03	1.51	57	7.5	222	2,796	208	2,619	4.40	55	172	13.6	
21			1.47	57	7.6	183	2,244	156	1,913			124	15.5	
22	Snow	0.01	1.50	57	7.5	214	2,677	184	2,302			172		
23			1.29	57	7.6	150	1,614	268	2,883			196		
24	Snow	0.03	1.27	57	7.6	163	1,726	164	1,737			164		
25			1.17	57	7.7	110	1,073	138	1,347			120	15.3	
26	Snow	0.03	1.38	57	7.7	88	1,013	208	2,394	4.10	47	164	16.4	
27			1.41	57	7.6	135	1,588	180	2,117			160		
28			1.43	57	7.5	102	1,216	152	1,813			112		
29			1.52	57	7.5	169	2,142	204	2,586			180		
30	Snow	0.04	1.39	57	7.5	198	2,295	192	2,226			160		
31			1.28	57	7.4	177	1,890	168	1,793			148		
Total	0	0.76	45.06	1,791	234.6	5,451	66,709	5,560	67,289	16.50	198	4,774	113.8	
Max.	0	0.43	1.68	59	7.8	234	3,279	288	3,675	4.40	55	264	16.4	
Min.	0	0.01	1.17	57	7.4	88	1,013	94	1,317	4.00	45	76	12.5	
Avg.	0	0.08	1.45	58	7.6	176	2,152	179	2,171	4.13	50	154	14.2	
Count	9	9.00	31.00	31	31.0	31	31	31	31	4.00	4	31	8.0	

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

DECEMBER 1995 - PRIMARY EFFLUENT SHEET

PN- Day	P Eff. BOD mgIL	P Eff. BOD Lbs.	P Eff. SS mgIL	P. Eff. SS Lbs.	P Eff. Phos. mgIL	P Eff. Phos. Lbs.	P Eff. VSS mgIL	P Eff. NH3-N mgIL	Flow MGD	BOD Prl. Removal %	SS Prl. Removal %	P Prl. Removal %
1	179	2,508	136	1,906			100		1.68	24	-45	
2	142	1,919	160	2,162			144		1.62	26	-38	
3	135	1,723	88	1,123			84		1.53	41	52	
4	116	1,490	96	1,233			80	13.8	1.54	29	40	
5	112	1,420	96	1,217	3.30	42	84		1.52	28	41	18
6	144	1,873	100	1,301			88	14.2	1.56	23	43	
7	112	1,429	96	1,225			88		1.53	24	67	
8	111	1,444	112	1,457			100		1.56	49	30	
9	121	1,393	108	1,243			92		1.38	39	43	
10	110	1,238	104	1,171	3.20	36	88		1.35	36	32	20
11	128	1,655	80	1,034			64	14.1	1.55	33	49	
12	125	1,668	88	1,174			68	13.4	1.60	42	58	
13	169	2,171	104	1,336			88		1.54	28	52	
14	168	2,144	100	1,276			92		1.53	-17	44	
15	139	1,693	96	1,169			68		1.46	38	52	
16	143	1,658	108	1,252			84		1.39	15	25	
17	138	1,554	104	1,171			84		1.35	-16	53	
18	126	1,408	116	1,296			88		1.34	21	22	
19	132	1,552	104	1,223			96		1.41	31	42	
20	140	1,763	96	1,209	4.10	52	80	15.2	1.51	37	54	8
21	146	1,790	104	1,275			88	18.0	1.47	20	33	
22	161	2,014	112	1,401			112		1.50	25	39	
23	124	1,334	108	1,162			100		1.29	17	60	
24	112	1,186	112	1,186			104		1.27	31	32	
25	66	644	76	742			68	17.7	1.17	40	45	
26	76	875	104	1,197	3.40	39	80	17.7	1.38	14	50	17
27	62	729	112	1,317			64		1.41	54	38	
28	87	1,038	104	1,240			68		1.43	15	32	
29	127	1,610	104	1,318			96		1.52	25	49	
30	172	1,994	132	1,530			120		1.39	13	31	
31	133	1,420	112	1,196			104		1.28	25	33	
Total	3,956	48,335	3,272	39,742	14.00	169	2,764	124.1	45.06	810	1,158	63
Max.	179	2,508	160	2,162	4.10	52	144	18.0	1.68	54	67	20
Min.	62	644	76	742	3.20	36	64	13.4	1.17	-17	-45	8
Avg.	128	1,559	106	1,282	3.50	42	89	15.5	1.45	26	37	16
Count	31	31	31	31	4.00	4	31	8.0	31.00	31	31	4

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

DECEMBER 1995 - ACTIVATED SLUDGE SHEET

PM-Day	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading flm	Mix Liq SS mgIL	Mix Liq VSS mgIL	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mgIL	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mgIl	PE SS mgIL
1	48	5.1	3.2	0.55	2,012	1,527	29.0	0.69	3.8	259	0.33	0.25	51	50.9	1.68	179	136
2		5.3								255			51	48.2	1.62	142	160
3		5.6								252			53	47.4	1.53	135	88
4		5.6	5.1	0.30	2,118	1,636	28.0	0.76	2.1	259	0.32	0.25	56	51.3	1.54	116	96
5		5.7	5.3	0.28	2,147	1,669	28.0	0.77	3.9	262	0.34	0.27	57	43.8	1.52	112	96
6		5.5	4.7	0.40	2,054	1,557	29.0	0.71	4.3	260	0.33	0.25	55	40.8	1.56	144	100
7		5.6	5.3	0.28	2,181	1,697	30.0	0.73	4.3	260	0.34	0.27	57	40.8	1.53	112	96
8		5.5	4.2	0.31	2,035	1,553	30.0	0.68	4.5	270	0.34	0.26	59	52.6	1.56	111	112
9		6.2								272			67	48.6	1.38	121	108
10		6.4								232			68	48.5	1.35	110	104
11		5.6	5.9	0.37	2,035	1,504	30.0	0.68	5.0	240	0.33	0.25	59	59.0	1.55	128	80
12		5.4	5.3	0.36	2,075	1,530	30.0	0.69	3.8	229	0.35	0.27	57	51.4	1.60	125	88
13		5.6	4.7	0.46	2,110	1,575	31.0	0.68	2.5	222	0.35	0.26	60	51.6	1.54	169	104
14		5.6	5.3	0.41	2,268	1,742	41.0	0.55	1.3	211	0.36	0.28	60	51.8	1.53	168	100
15		5.9	5.8	0.32	2,271	1,745	30.0	0.76	1.0	220	0.35	0.26	63	51.7	1.46	139	96
16		6.2								224			66	51.3	1.39	143	108
17		6.4								218			68	51.4	1.35	138	104
18		6.4	5.0	0.29	2,181	1,644	30.0	0.73	2.8	244	0.36	0.27	68	51.7	1.34	126	116
19		6.1	5.5	0.31	2,253	1,688	32.0	0.70	4.6	246	0.31	0.22	64	53.8	1.41	132	104
20		5.7	5.5	0.36	2,215	1,651	29.0	0.76	4.3	245	0.36	0.26	60	57.8	1.51	140	96
21		5.9	5.1	0.36	2,189	1,668	29.0	0.75	3.9	245	0.34	0.26	62	57.9	1.47	146	104
22		5.7	4.7	0.36	2,212	1,863	28.0	0.79	2.9	256	0.33	0.20	62	57.4	1.50	161	112
23		6.7								229			72	57.6	1.29	124	108
24		6.8								243			72	55.4	1.27	112	112
25		7.4								244			78	55.1	1.17	66	76
26		6.2	5.1	0.19	2,048	1,540	25.0	0.82	6.2	251	0.28	0.21	65	53.7	1.38	76	104
27		6.1	4.5	0.16	1,986	1,493	23.0	0.86	6.1	247	0.30	0.22	64	54.6	1.41	62	112
28		6.0	4.9	0.23	2,036	1,529	25.0	0.81	3.8	249	0.30	0.22	63	55.8	1.43	87	104
29		5.7	4.7	0.35	2,052	1,529	25.0	0.82	3.4	247	0.31	0.23	59	56.0	1.52	127	104
30		6.2								242			64	56.3	1.39	172	132
31		6.7								236			70	57.1	1.28	133	112
Total	48	185.0	100.0	6.66	42,478	32,340	582.0	14.75	74.5	7,569	6.63	4.96	1,930	1621.3	45.06	3,956	3,272
Max.	48	7.4	5.9	0.55	2,271	1,863	41.0	0.86	6.2	272	0.36	0.28	78	59.0	1.68	179	160
Min.	48	5.1	3.2	0.16	1,986	1,493	23.0	0.55	1.0	211	0.28	0.20	51	40.8	1.17	62	76
Avg.	48	6.0	5.0	0.33	2,124	1,617	29.1	0.74	3.7	244	0.33	0.25	62	52.3	1.45	128	106
Count	1	31.0	20.0	20.00	20	20	20.0	20.00	20.0	31	20.00	20.00	31	31.0	31.00	31	31

Robert J. Swalwell
Superintendent

MARSHALL WWTP 801 INDUSTRIAL RD MARSHALL MI 49068 - PERMIT MI0023540

DECEMBER 1995 - DISCHARGE MONITORING REPORT - DISCHARGE NO 001A

Day	F.Eff. D.O. mgIL	F.Eff. pH SU	F.Eff SS mgIL	F.Eff. SS Lbs.	F Eff. Total-P mgIL	Flow MGD	F.Eff Chlorine mgIL	F.Eff. CBOD mgIL	F Eff. CBOD Lbs	F Eff. NH3 as N mgIL	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %	Mercury mgIL
1	7.3	7.3	18	252		1.68	0.000	7	98			84	81	97		
2	7.7	7.4	7	95		1.62	0.000	7	95			36	94	96		
3	7 0	7.5	9	115		1 53	0.000	7	89			118	95	97		
4	6.8	7.8	12	154		1.54	0.000	6	77	9.9	127	17	93	96		
5	7 3	7.5	14	177	0 46	1.52	0.008	7	89			24	91	96	89	<0.0002
6	8.1	7.8	12	156		1.56	0.000	8	104	12.3	160	25	93	96		
7	8.1	7.7	13	166		1.53	0.016	6	77			17	95	96		
8	8.0	7.7	11	143		1.56	0.005	6	78			11	93	97		
9	8.4	7.6	15	173		1.38	0.000	6	69			23	92	97		
10	8.8	7.6	11	124	0.42	1.35	0.000	6	68			28	93	97	90	<0.0002
11	8.3	7.6	11	142		1.55	0.000	6	78	11 4	147	37	93	97		<0.0002
12	7.5	7.8	14	187		1.60	0.000	7	93	11.3	151	8	93	97		
13	7.2	7.6	15	193		1.54	0.003	9	116			13	93	96		
14	6.9	7.4	10	128		1.53	0.000	9	115			10	94	94		
15	6.8	7.5	11	134		1.46	0.000	7	85			28	95	97		
16	7.3	7.5	6	70		1.39	0.000	7	81			10	96	96		
17	7.5	7.4	12	135		1.35	0.000	7	79			6	95	94		
18	7.2	7.4	8	89		1.34	0.000	5	56			13	95	97		
19	8.1	7.4	13	153		1.41	0.000	7	82			18	93	96		
20	7.9	7.4	11	139	0.40	1.51	0.000	7	88	12.8	161	20	95	97	91	<0.0002
21	7.7	7.6	8	98		1 47	0.000	7	86	14.7	180	28	95	96		
22	7.5	7.5	13	163		1.50	0.000	9	113				93	96		
23	7.7	7.5	12	129		1.29	0.000	8	86			32	96	95		
24	7.5	7.6	8	85		1.27	0.033	4	42			5	95	98		
25	7.6	7.6	5	49		1.17	0.030	3	29	14.0	137	12	96	97		
26	9.0	7.7	9	104	0.27	1.38	0.000	4	46	15.6	180	9	96	95	93	
27	8.7	7.7	10	118		1.41	0.000	4	47			13	94	97		
28	7.9	7.5	8	95		1.43	0.000	4	48			21	95	96		
29	7.1	7.6	13	165		1.52	0.000	9	114			10	94	95		
30	7.1	7.5	17	197		1.39	0.000	10	116			3	91	95		
31	6.9	7.3	12	128		1.28	0.000	11	117			11	93	94		
Total	236.9	234.0	348	4,253	1.55	45.06	0.095	210	2,560	102.0	1,243	690	2,900	2,980	363	<0.0002
Max.	9.0	7.8	18	252	0.46	1.68	0.033	11	117	15.6	180	118	96	98	93	<0.0002
Min.	6.8	7.3	5	49	0.27	1.17	0.000	3	29	9.9	127	3	81	94	89	<0.0002
Avg.	7.6	7.5	11	137	0.39	1.45	0.003	7	83	12.8	155	G 17	94	96	91	<0.0002
Count	31.0	31.0	31	31	4.00	31.00	31.000	31	31	8.0	8	30	31	31	4	4

G = Geometric Mean

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTE WATER TREATMENT PLANT

DECEMBER 1995 - MISCELLANEOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	SO2 Lbs	Lime Lbs.	Raw Sludge Gals	Total Solids Percent	Vol Solids Percent	Raw Sludge pH	Sludge pH 2 Hours	Sludge pH 16 Hrs.	Lbs. of Lime per 1000 Gals. Sludge
1	1,800	2,760	480	20	242	12	757	18,000	2.9	73	6.2	12.25	12.25	42.06
2	1,600	2,760	460	20	161	11	562	13,000	3.4	73	6.2	12.74	12.50	43.23
3	1,500	2,760	520	20	161	11	513	13,000	2.8	71	6.3	12.56	12.48	39.46
4	1,400	2,880	480	19	81	13	488	11,000	3.2	74	6.2	12.29	12.13	44.36
5	2,300	2,880	520	22	322	11	830	20,000	3.1	74	6.1	12.39	12.09	41.50
6	2,800	2,880	430	21	322	20	317	8,500	2.8	51	6.1	12.43	12.70	37.29
7	3,100	3,000	430	22	322	9	586	8,500	2.8	73	6.2	12.23	12.06	68.94
8	4,600	3,000	490	20	161	8	317	8,500	3.1	75	6.1	12.11	11.48	37.29
9	4,300	3,000	210	20	242	12	244	8,500	3.2	74	6.5	12.28	11.92	28.71
10	4,600	2,880	420	17	242	10	195	8,500	3.2	70		12.67	12.44	22.94
11	4,200	3,120	500	16	242	13	269	8,500	3.4	74	6.0		11.05	31.65
12	3,600	3,000	320	18	242	10	293	8,500	3.5	76	6.0		9.24	34.47
13	3,600	3,120	500	20	322	15	244	8,500	3.3	75	6.5	12.08		28.71
14	2,300	3,000	500	17	242	13	244	6,000	3.3	76	5.9	12.01		40.67
15	2,300	2,880	470	17	242	15	244	7,200	3.3	76	6.0	12.32	12.06	33.89
16	2,800	2,640	400	13	242	15	195	5,000	4.3	68			10.51	39.00
17	2,900	2,640	530	9	242	13		2,500	3.4					0.00
18	3,000	2,880	440	15	322	12	317	8,500	3.8	73	6.0	12.27	11.84	37.29
19	3,200	2,880	410	20	242	9	293	7,500	3.4	75	6.1	11.71	10.26	39.07
20	2,500	2,880	610	20	242	12	317	7,500	3.5	74	6.0	12.07	12.49	42.27
21	4,500	2,880	580	19	322	15	342	7,500	3.4	74	6.0	12.19	11.85	45.60
22	3,400	3,000	570	18	161	12	391	7,500	3.6	74	5.9	12.38	11.84	52.13
23	2,800	2,640	430	21	242	13	342	7,000	5.5	74	5.9		9.78	48.86
24	3,200	2,760	730	21	322	14	293	7,500	3.4	74	6.0	12.50	12.42	39.07
25	3,500	2,760	490	19	322	13	317	7,000	3.4	75	6.0	12.61	12.34	45.29
26	3,700	2,880	550	16	81	14	293	8,300	3.8	76	5.8	12.43	11.91	35.30
27	2,900	3,000	530	16	322	12	293	7,000	3.3	76	6.1	12.21	11.84	41.86
28	2,700	2,880	570	20	161	14	342	7,000	3.4	76	6.1	12.22	11.51	48.86
29	3,200	2,880	710	20	242	7	293	7,000	3.2	75	6.1	12.59	10.46	41.86
30	3,000	3,000	490	20	403	18	244	6,000	3.5	75	6.1	12.58	12.16	40.67
31	2,400	2,640	570	16	322	7	293	7,000	3.7	74	5.9	12.15	11.52	41.86
Total	93,700	89,160	15,340	572	7,736	383	10,668	266,000	105.9	2,198	170.3	320.27	327.13	1214.13
Max.	4,600	3,120	730	22	403	20	830	20,000	5.5	76	6.5	12.74	12.70	68.94
Min.	1,400	2,640	210	9	81	7	195	2,500	2.8	51	5.8	11.71	9.24	0.00
Avg.	3,023	2,876	495	18	250	12	356	8,581	3.4	73	6.1	12.32	11.68	39.17

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

JANUARY 1997 - PLANT INFLUENT SHEET

Day	Weather Type	Weather Precip.	Inf. Flow MGD	Inf. Temp F	Inf. pH SU	Inf. BOD mgIL	Inf. BOD Lbs.	Inf. SS mgIL	Inf. SS Lbs.	Inf. Phos. mgIL	Inf. Phos. Lbs.	Inf. VSS mgIL	Inf. NH3-N mgIL	Remarks or Other Parameters
1	Rain	0.07	1.19	55	7.7	108	1,072	170	1,687			168	15.8	
2	Rain	0.03	1.49	55	7.6	241	2,995	228	2,833			210		
3	Rain	0.02	1.55	57	7.3	197	2,547	132	1,706			122		
4	Rain	0.10	1.52	59	7.5	118	1,496	146	1,851			136		
5	Snow	0.02	1.28	55	7.8	99	1,057	152	1,623	3.50	37	148		
6	Snow	0.01	1.48	55	7.6	197	2,432	158	1,950			154		
7	Snow	0.01	1.48	55	7.6	172	2,123	140	1,728			128		
8	Snow	0.05	1.52	55	7.6	206	2,611	146	1,851			132	13.8	
9	Snow	0.37	1.51	59	7.4	183	2,305	128	1,612			120		
10	Snow	0.10	1.38	59	7.6	175	2,014	196	2,256			190		
11	Snow	0.01	1.25	57	7.7	170	1,772	142	1,480			128		
12			1.23	57	7.8	170	1,744	152	1,559			146		
13			1.42	55	7.5	168	1,990	138	1,634			132		
14			1.34	55	7.7	232	2,593	163	1,822			158	14.8	
15	Snow	0.45	1.35	55	7.7	221	2,488	152	1,711	3.85	43	132		
16	Snow	0.05	1.38	54	7.6	285	3,280	216	2,486			202	13.2	
17	Snow	0.03	1.43	54	7.6	224	2,671	150	1,789			140		
18			1.25	54	7.8	166	1,731	146	1,522			128		
19			1.26	54	7.9	194	2,039	140	1,471	3.85	40	138		
20			1.54	55	7.0	261	3,352	180	2,312			152		
21	Rain	0.65	1.58	57	7.3	243	3,202	138	1,818			112	12.2	
22	Snow	0.03	1.65	55	7.5	211	2,904	180	2,477			166		
23			1.62	57	7.6	193	2,608	154	2,081	2.95	40	140		
24	Snow	0.16	1.58	57	7.5	197	2,596	152	2,003			140		
25	Snow	0.12	1.24	57	7.7	169	1,748	136	1,406			124		
26	Snow	0.13	1.29	55	7.9	175	1,883	210	2,259			192		
27	Snow	0.11	1.48	54	7.7	268	3,308	292	3,604			222		
28			1.58	55	7.9	215	2,833	220	2,899			202		
29			1.28	54	7.6	184	1,964	108	1,153			96		
30			1.69	54	7.5	218	3,073	160	2,255			146		
31			1.60	54	7.4	219	2,922	186	2,482			170		
Total	0	2.52	44.44	1,723	235.6	6,079	73,350	5,111	61,322	14.15	161	4,674	69.8	
Max.	0	0.65	1.69	59	7.9	285	3,352	292	3,604	3.85	43	222	15.8	
Min.	0	0.01	1.19	54	7.0	99	1,057	108	1,153	2.95	37	96	12.2	
Avg.	0	0.13	1.43	56	7.6	196	2,366	165	1,978	3.54	40	151	14.0	
Count	20	20.00	31.00	31	31.0	31	31	31	31	4.00	4	31	5.0	

16,763

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

JANUARY 1997 - PRIMARY EFFLUENT SHEET

Day	P Eff. BOD mgIL	P Eff. BOD Lbs.	P Eff. SS mgIL	P. Eff. SS Lbs.	P Eff. Phos. mgIL	P Eff. Phos. Lbs.	P Eff. VSS mgIL	P Eff. NH3-N mgIL	Flow MGD	BOD Pri. Removal %	SS Pri. Removal %	P Pri. Removal %
1	75	744	82	814			80	15.1	1.19	31	52	
2	110	1,367	80	994			74		1.49	54	65	
3	180	2,327	96	1,241			92		1.55	9	27	
4	83	1,052	84	1,065			80		1.52	30	42	
5	76	811	102	1,089	1.85	20	102		1.28	23	33	47
6	120	1,481	92	1,136			92		1.48	39	42	
7	119	1,469	64	790			60		1.48	31	54	
8	112	1,420	88	1,116			80	14.4	1.52	46	40	
9	120	1,511	102	1,285			100		1.51	34	20	
10	114	1,312	102	1,174			98		1.38	35	48	
11	111	1,157	98	1,022			86		1.25	35	31	
12	111	1,139	72	739			72		1.23	35	53	
13	98	1,161	78	924			76		1.42	42	43	
14	89	995	84	939			84	16.0	1.34	62	48	
15	83	934	68	766	2.90	33	68		1.35	62	55	25
16	142	1,634	92	1,059			80	13.8	1.38	50	57	
17	124	1,479	78	930			72		1.43	45	48	
18	83	865	70	730			68		1.25	50	52	
19	130	1,366	84	883	1.65	17	76		1.26	33	40	57
20	216	2,774	108	1,387			68		1.54	17	40	
21	215	2,833	92	1,212			72	13.3	1.58	12	33	
22	135	1,858	64	881			64		1.65	36	64	
23	162	2,189	68	919	2.10	28	64		1.62	16	56	29
24	133	1,753	76	1,001			70		1.58	32	50	
25	100	1,034	84	869			78		1.24	37	38	
26	107	1,151	64	689			64		1.29	39	70	
27	143	1,765	88	1,086			84		1.48	47	70	
28	150	1,977	64	843			60		1.58	30	71	
29	116	1,238	68	726			54		1.28	37	37	
30	119	1,677	74	1,043			70		1.69	45	54	
31	141	1,882	74	987			68		1.60	36	60	
Total	3,817	46,355	2,540	30,336	8.50	98	2,356	72.6	44.44	1,130	1,493	158
Max.	216	2,833	108	1,387	2.90	33	102	16.0	1.69	62	71	57
Min.	75	744	64	689	1.65	17	54	13.3	1.19	9	20	25
Avg.	123	1,495	82	979	2.13	25	76	14.5	1.43	36	48	40
Count	31	31	31	31	4.00	4	31	5.0	31.00	31	31	4

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

JANUARY 1997 - ACTIVATED SLUDGE SHEET

Day	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading flm	Mix Liq SS mgIL	Mix Liq VSS mgIL	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mgIL	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mgIl	PE SS mgIL
1	48	7.2								183			62	39.8	1.19	75	82
2		5.8	8.5	0.20	2,810	2,298	35.0	0.80	2.0	178	0.39	0.34	48	42.9	1.49	110	80
3		5.6	6.0	0.38	2,505	2,038	34.0	0.74	1.0	180	0.41	0.33	51	43.9	1.55	180	96
4		5.7								175			52	42.9	1.52	83	84
5		6.7								183			58	51.3	1.28	76	102
6		5.8	5.9	0.27	2,255	1,838	25.0	0.90	4.5	189	0.51	0.42	54	43.3	1.48	120	92
7		5.8	8.3	0.27	2,180	1,791	20.0	1.09	4.2	193	0.39	0.32	54	46.3	1.48	119	64
8		5.7	5.6	0.27	2,104	1,727	20.0	1.05	4.0	192	0.42	0.34	52	39.4	1.52	112	88
9		5.7	5.2	0.28	2,232	1,830	22.0	1.01	3.1	186	0.34	0.28	53	37.9	1.51	120	102
10		6.2	5.6	0.24	2,190	1,804	20.0	1.10	3.9	190	0.41	0.34	57	37.8	1.38	114	102
11		6.9								196			58	37.5	1.25	111	98
12		7.0								198			58	12.6	1.23	111	72
13		6.1	6.8	0.23	2,108	1,711	22.0	0.96	5.5	196	0.42	0.34	68	35.9	1.42	98	78
14		6.4	6.6	0.20	2,081	1,673	17.0	1.22	6.8	193	0.36	0.27	54	27.3	1.34	89	84
15		6.4	8.3	0.18	2,128	1,767	16.0	1.33	4.1	188	0.41	0.35	58	23.3	1.35	83	68
16		6.2	6.2	0.31	2,181	1,751	17.0	1.28	4.6	193	0.41	0.33	56	29.3	1.38	142	92
17		6.0	6.6	0.30	2,046	1,647	18.0	1.14	6.0	195	0.37	0.30	54	30.2	1.43	124	78
18		6.9								197			62	29.9	1.25	83	70
19		6.8								190			59	31.0	1.26	130	84
20		5.6	4.5	0.53	2,094	1,738	18.0	1.16	5.4	188	0.44	0.36	47	24.7	1.54	216	108
21		5.5	6.1	0.48	2,467	1,978	19.0	1.30	2.9	183	0.51	0.42	50	26.1	1.58	215	92
22		5.2	8.4	0.31	2,459	2,005	20.0	1.23	3.0	182	0.43	0.35	48	28.7	1.65	135	64
23		5.3	7.5	0.39	2,302	1,855	20.0	1.15	3.4	183	0.39	0.32	47	31.0	1.62	162	68
24		5.5	7.4	0.31	2,470	1,912	19.0	1.30	3.6	183	0.46	0.37	49	31.5	1.58	133	76
25		6.9								188			62	29.7	1.24	100	84
26		6.7								192			59	30.1	1.29	107	64
27		5.8	5.7	0.35	2,052	1,673	16.0	1.28	2.0	188	0.40	0.33	50	29.7	1.48	143	88
28		5.5	7.3	0.39	2,052	1,682	18.0	1.14	2.6	184	0.45	0.37	49	23.9	1.58	150	64
29		6.7	9.1	0.23	2,217	1,834	19.0	1.17	1.8	192	0.45	0.37	59	22.7	1.28	116	68
30		5.1	6.2	0.32	2,153	1,770	18.0	1.20		188	0.45	0.37	47	35.2	1.69	119	74
31		5.4	6.1	0.38	2,018	1,643	16.0	1.26		180	0.42	0.35	49	30.3	1.60	141	74
Total	48	188.2	147.9	6.82	49,104	39,965	449.0	24.81	74.4	5,826	9.24	7.57	1,684	1026.1	44.44	3,817	2,540
Max.	48	7.2	9.1	0.53	2,810	2,298	35.0	1.33	6.8	198	0.51	0.42	68	51.3	1.69	216	108
Min.	48	5.1	4.5	0.18	2,018	1,643	16.0	0.74	1.0	175	0.34	0.27	47	12.6	1.19	75	64
Avg.	48	6.1	6.7	0.31	2,232	1,817	20.4	1.13	3.7	188	0.42	0.34	54	33.1	1.43	123	82
Count	1	31.0	22.0	22.00	22	22	22.0	22.00	20.0	31	22.00	22.00	31	31.0	31.00	31	31

Robert J. Swalwell
Superintendent

MARSHALL WWTP 801 INDUSTRIAL RD. MARSHALL MI 49068 - PERMIT MI0023540

JANUARY 1997 - DISCHARGE MONITORING REPORT - DISCHARGE NO. 001A

Day	F.Eff. D.O. mgIL	F.Eff. pH SU	F.Eff. SS mgIL	F.Eff. SS Lbs.	F.Eff. Total-P mgIL	Flow MGD	F.Eff. Chlorine mgIL	F.Eff. CBOD mgIL	F.Eff. CBOD Lbs.	F.Eff. NH3 as N mgIL	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %	Amenable Cyanide mg/l
1	7.1	7.3	10	99		1.19	0.000	4	40	3.25	32	58	94	96		
2	7.1	7.4	4	50		1.49	0.000	4	50			20	98	98		
3	6.9	7.4	13	168		1.55	0.000	7	90			20	90	96		
4	6.6	7.3	9	114		1.52	0.000	4	51			23	94	97		
5	6.7	7.5	7	75	0.16	1.28	0.000	3	32			11	95	97	95	
6	7.1	7.5	10	123		1.48	0.000	6	74			21	94	97		
7	7.2	7.5	3	37		1.48	0.000	7	86			8	98	96		
8	7.0	7.4	12	152		1.52	0.000	7	89	5.69	72	8	92	97		
9	7.0	7.4	7	88		1.51	0.000	5	63			14	95	97		
10	7.3	7.4	11	127		1.38	0.000	5	58				94	97		
11	6.7	7.5	8	83		1.25	0.000	5	52			20	94	97		
12	6.9	7.5	7	72		1.23	0.000	5	51			18	95	97		
13	7.5	7.3	11	130		1.42	0.000	5	59			26	92	97		
14	7.7	7.2	10	112		1.34	0.000	6	67	2.73	31	8	94	97		
15	7.6	7.3	10	113	1.09	1.35	0.000	6	68			14	93	97	72	
16	7.4	7.3	9	104		1.38	0.000	7	81	3.38	39	22	96	98		
17	7.5	7.2	9	107		1.43	0.000	8	95			15	94	96		
18	7.7	7.6	9	94		1.25	0.000	5	52			21	94	97		
19	7.4	7.5	9	95	0.31	1.26	0.000	8	84			13	94	96	92	
20	7.5	6.9	9	116		1.54	0.000	10	128			20	95	96		
21	7.6	7.4	10	132		1.58	0.000	10	132	4.93	65	15	93	96		<0.01
22	7.7	7.4	8	110		1.65	0.000	10	138			5	96	95		
23	8.0	7.4	11	149	0.26	1.62	0.000	5	68			13	93	97	91	<0.01
24	8.2	7.3	12	158		1.58	0.000	8	105			5	92	96		
25	9.2	7.4	8	83		1.24	0.000	5	52			2	94	97		
26		7.5	8	86		1.29	0.000	4	43			2	96	98		<0.01
27		7.3	14	173		1.48	0.000	7	86			9	95	97		<0.01
28	6.8	7.4	12	158		1.58	0.000	10	132			20	95	95		
29	7.0	7.3	12	128		1.28	0.000	6	64			5	89	97		
30	7.0	7.3	17	240		1.69	0.000	10	141			12	89	95		
31	6.6	7.3	14	187		1.60	0.000	9	120			10	92	96		
Total	212.0	228.4	303	3,661	1.82	44.44	0.000	201	2,451	19.98	239	458	2,909	2,995	350	<0.01
Max.	9.2	7.6	17	240	1.09	1.69	0.000	10	141	5.69	72	58	98	98	95	<0.01
Min.	6.6	6.9	3	37	0.16	1.19	0.000	3	32	2.73	31	2	89	95	72	<0.01
Avg.	7.3	7.4	10	118	0.46	1.43	0.000	6	79	4.00	48	G 12	94	97	88	<0.01
Count	29.0	31.0	31	31	4.00	31.00	31.000	31	31	5.00	5	30	31	31	4	4

G = Geometric Mean

Sample of 01/27/97 - zinc 0.04 mg/l

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

JANUARY 1997 - MISCELLANEOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	S02 Lbs.	Lime Lbs.	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	Raw Sludge pH	Sludge pH 2 Hours	Sludge pH 16 Hrs.	Lbs. of Lime per 1000 Gals. Sludge
1	1,400	2,880	700	18	161	11	336	10,000	5.1	62	6.3	12.73	12.17	33.60
2	2,100	2,880	560	20	161	14	673	8,500	3.6	72	6.3	12.33	11.95	79.18
3	1,700	2,880	670	18	161	16	866	8,200	3.5	72	6.3	12.40	11.99	105.61
4	1,300	2,880	630	26	161	14	626	8,000	3.3	74	6.1	12.44	12.31	78.25
5	2,700	3,000	590	17	242	14	673	9,000	3.5	74	6.2	12.21	11.75	74.78
6	3,800	3,240	610	20	242	10	626	8,500	3.4	75	6.2	12.44	11.95	73.65
7	3,600	3,120	670	21	161	14	722	8,300	3.2	74	6.3	12.31	11.79	86.99
8	3,500	3,120	610	19	242	11	722	8,400	3.7	76	6.2	12.44	12.03	85.95
9	3,300	3,120	590	20	242	11	673	8,500	3.5	76	6.2	12.34	11.82	79.18
10	4,900	3,120	600	20	161	13	626	8,000	3.4	74	6.2	12.50	12.16	78.25
11	3,400	3,120	590	23	242	13	530	8,000	3.5	74	6.2	12.57	12.48	66.25
12	4,500	3,240	590	14	242	14	337	7,000	3.3	74	6.2	12.17	11.57	48.14
13	3,800	3,240	660	18	242	14	673	8,800	3.4	75	6.1	12.24	11.97	76.48
14	4,500	3,240	560	17	242	14	673	8,300	3.3	75	6.2	12.46	12.03	81.08
15	2,400	2,880	610	13	242	13	577	11,000	3.3	74	6.3			52.45
16	4,500	3,240	600	20	242	15	770	15,500	3.4	73	6.4			49.68
17	4,900	3,360	730	20	242	23	818	12,000	3.6	75	6.4			68.17
18	4,800	3,000	600	18	242	12	481	8,000	3.4	75	6.2	12.11	11.32	60.13
19	4,000	3,000	580	13	322	12	530	8,000	3.3	81	6.1	12.10	11.60	66.25
20	3,000	3,120	590	31	242	15	673	11,000	3.4	74	6.1	12.26	11.51	61.18
21	2,500	3,000	660	20	242	14	962	13,000	4.1	76	6.1		12.47	74.00
22	2,500	3,120	550	20	242	14	577	8,400	3.5	74	6.1	12.10	11.59	68.69
23	4,400	3,000	590	20	242	14	433	9,250	3.4	73	6.1			46.81
24	2,100	3,120	770	21	161	13	433	6,000	3.4	73	6.2	12.19	11.46	72.17
25	3,200	3,120	610	20	242	11	577	9,000	3.7	75	6.0	12.49		64.11
26	4,000	3,000	600	20	242	10	433	8,000	3.4	78	6.1			54.13
27	3,300	3,120	570	22	242	6	433	8,000	3.8	68				54.13
28	3,600	3,240	600	34	242	35	626	8,600	3.7	73	6.3			72.79
29	4,700	3,000	690	5	242	11	722	8,300	3.8	73	6.5	13.20	12.60	86.99
30	3,900	2,760	540	20	81	11	626	8,500	3.5	74	6.2	13.30	12.70	73.65
31	3,900	3,120	1,210	17	161	14	673	8,000	3.9	77	6.3	13.50	13.30	84.13
Total	106,200	95,280	19,730	605	6,773	426	19,100	278,050	110.3	2,293	186.4	286.83	276.52	2156.82
Max.	4,900	3,360	1,210	34	322	35	962	15,500	5.1	81	6.5	13.50	13.30	105.61
Min.	1,300	2,760	540	5	81	6	336	6,000	3.2	62	6.0	12.10	11.32	33.60
Avg.	3,426	3,074	636	20	218	14	616	8,969	3.6	74	6.2	12.47	12.02	69.57

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

FEBRUARY 1997 - PLANT INFLUENT SHEET

Day	-----Weather----- Type	Precip.	Inf. Flow MGD	Inf. Temp F	Inf. pH SU	Inf. BOD mgIL	Inf. BOD Lbs.	Inf. SS mgIL	Inf. SS Lbs.	Inf. Phos. mgIL	Inf. Phos. Lbs.	Inf. VSS mgIL	Inf. NH3-N mgIL	--Remarks or Other Parameters--
1			1.36	55	7.5	240	2,722	226	2,563			208		
2			1.23	55	7.5	168	1,723	144	1,477			138		
3	Rain	0.17	1.43	54	7.6	205	2,445	206	2,457			192		
4	Rain	0.15	1.50	54	7.5	264	3,303	215	2,690			210		
5			1.46	54	7.6	318	3,872	218	2,654	4.55	55	212		
6			1.62	54	7.5	189	2,554	152	2,054			144		
7			1.57	57	7.5	234	3,064	204	2,671			172		
8			1.23	54	7.5	165	1,693	132	1,354			116		
9			1.28	54	7.2	175	1,868	154	1,644			132		
10	Snow	0.01	1.60	54	7.7	251	3,349	234	3,122	3.95	53	200		
11	Snow	0.02	1.52	54	7.2	198	2,510	132	1,673			134		
12	Snow	0.03	1.47	54	7.5	203	2,489	124	1,520			108		
13			1.51	54	7.3	253	3,186	140	1,763			130		
14	Snow	0.01	1.56	55	7.5	208	2,706	158	2,056	3.13	41	146		
15	Snow	0.03	1.25	52	7.6	186	1,939	162	1,689			148		
16	Snow	0.06	1.20	52	7.6	219	2,192	182	1,821			162		
17			1.44	54	7.4	242	2,906	164	1,970			154		
18			1.57	54	7.5	229	2,998	131	1,715			130		
19			1.52	54	7.4	197	2,497	126	1,597			112		
20	Rain	1.22	1.63	54	7.4	196	2,664	156	2,121	4.60	63	132		
21	R&S	0.74	1.71	54	7.2	233	3,323	176	2,510			172		
22	Snow	0.04	1.65	54	7.4	155	2,133	156	2,147			142		
23	Snow	0.01	1.47	54	7.6	156	1,913	132	1,618			128		
24			1.68	54	7.5	175	2,452	134	1,878			124	10.6	
25			1.67	52	7.7	181	2,521	114	1,588			100	14.2	
26	Rain	0.92	1.81	53	7.5	170	2,566	120	1,811			112	10.8	
27			1.88	54	7.5	158	2,477	146	2,289			116	10.6	
28			1.83	54	7.3	198	3,022	116	1,770			106	10.8	
29														
30														
31														
Total	0	3.41	42.65	1,511	209.2	5,766	73,088	4,454	56,224	16.23	211	4,080	57.0	
Max.	0	1.22	1.88	57	7.7	318	3,872	234	3,122	4.60	63	212	14.2	
Min.	0	0.01	1.20	52	7.2	155	1,693	114	1,354	3.13	41	100	10.6	
Avg.	0	0.26	1.52	54	7.5	206	2,610	159	2,008	4.06	53	146	11.4	
Count	13	13.00	28.00	28	28.0	28	28	28	28	4.00	4	28	5.0	

14.5 lbs

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

FEBRUARY 1997 - PRIMARY EFFLUENT SHEET

Day	P Eff. BOD mgIL	P Eff. BOD Lbs.	P Eff. SS mgIL	P. Eff. SS Lbs.	P Eff. Phos. mgIL	P Eff. Phos. Lbs.	P Eff. VSS mgIL	P Eff. NH3-N mgIL	Flow MGD	BOD Pri. Removal %	SS Pri. Removal %	P Pri. Removal %
1	134	1,520	76	862			72		1.36	44	66	
2	98	1,005	64	657			64		1.23	42	56	
3	101	1,205	72	859			72		1.43	51	65	
4	165	2,064	80	1,001			74		1.50	38	63	
5	153	1,863	84	1,023	2.35	29	82		1.46	52	61	48
6	115	1,554	44	594			44		1.62	39	71	
7	118	1,545	68	890			54		1.57	50	67	
8	116	1,190	68	698			60		1.23	30	48	
9	101	1,078	72	769			62		1.28	42	53	
10	115	1,535	52	694	2.50	33	50		1.60	54	78	37
11	109	1,382	54	685			54		1.52	45	59	
12	98	1,201	66	809			54		1.47	52	47	
13	151	1,902	88	1,108			70		1.51	40	37	
14	128	1,665	56	729	2.80	36	50		1.56	38	65	11
15	96	1,001	52	542			44		1.25	48	68	
16	89	891	58	580			50		1.20	59	68	
17	111	1,333	60	721			56		1.44	54	63	
18	131	1,715	46	602			36		1.57	43	65	
19	116	1,471	54	685			48		1.52	41	57	
20	116	1,577	62	843	3.10	42	52		1.63	41	60	33
21	151	2,153	100	1,426			96		1.71	35	43	
22	56	771	68	936			62		1.65	64	56	
23	82	1,005	56	687			56		1.47	47	58	
24	94	1,317	58	813			54	11.7	1.68	46	57	
25	102	1,421	48	669			42	14.9	1.67	44	58	
26	123	1,857	68	1,026			66	12.4	1.81	28	43	
27	102	1,599	60	941			60	11.9	1.88	35	59	
28	152	2,320	76	1,160			70	12.5	1.83	23	34	
29												
30												
31												
Total	3,223	41,139	1,810	23,006	10.75	141	1,654	63.4	42.65	1,225	1,625	129
Max.	165	2,320	100	1,426	3.10	42	96	14.9	1.88	64	78	48
Min.	56	771	44	542	2.35	29	36	11.7	1.20	23	34	11
Avg.	115	1,469	65	822	2.69	35	59	12.7	1.52	44	58	32
Count	28	28	28	28	4.00	4	28	5.0	28.00	28	28	4

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

FEBRUARY 1997 - ACTIVATED SLUDGE SHEET

	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading flm	Mix Liq SS mgIL	Mix Liq VSS mgIL	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mgIL	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mgIl	PE SS mgIL	
Day																		
1	48	6.3								182			58	30.3	1.36	134	76	
2		7.0								183			61	34.3	1.23	98	64	
3		6.0	6.7	0.25	1,928	1,583	16.0	1.21	4.0	185	0.35	0.29	57	27.2	1.43	101	72	
4		5.7	5.6	0.45	1,888	1,547	15.0	1.26	2.9	181	0.35	0.29	53	13.6	1.50	165	80	
5		5.9	6.4	0.35	2,178	1,779	19.0	1.15	1.7	187	0.41	0.33	54	7.9	1.46	153	84	
6		5.3	11.6	0.27	2,310	1,890	23.0	1.00	1.2	186	0.44	0.36	48	6.4	1.62	115	44	
7		5.5	7.9	0.27	2,364	1,928	25.0	0.95	2.3	185	0.43	0.35	51	11.4	1.57	118	68	
8		7.0								187			49	19.3	1.23	116	68	
9		6.7								186			63	29.9	1.28	101	72	
10		5.4	10.2	0.27	2,357	1,927	27.0	0.87	3.1	186	0.50	0.41	48	33.3	1.60	115	52	
11		5.7	9.7	0.25	2,223	1,811	25.0	0.89	3.2	186	0.42	0.34	54	28.5	1.52	109	54	
12		5.9	8.5	0.21	2,308	1,873	28.0	0.82	3.1	189	0.43	0.35	54	39.1	1.47	98	66	
13		5.7	5.8	0.36	2,157	1,772	25.0	0.86	6.2	190	0.41	0.34	52	32.2	1.51	151	88	
14		5.5	8.9	0.31	2,172	1,794	26.0	0.84	2.3	185	0.41	0.34	51	30.9	1.56	128	56	
15		6.9								187			48	30.6	1.25	96	52	
16		7.2								189			66	30.4	1.20	89	58	
17		6.0								188			55	30.0	1.44	111	60	
18		5.5	11.6	0.32	2,341	1,767	25.0	0.94	3.1	177	0.39	0.33	51	25.0	1.57	131	46	
19		5.7	9.5	0.27	2,172	1,807	24.0	0.91	1.8	181	0.38	0.32	50	25.6	1.52	116	54	
20		5.3	7.3	0.31	2,044	1,688	26.0	0.79	5.2	168	0.37	0.30	50	12.2	1.63	116	62	
21		5.0	4.9	0.37	2,340	1,945	29.0	0.81	1.6	161	0.41	0.34	56	20.4	1.71	151	100	
22		5.2								170			58	22.6	1.65	56	68	
23		5.9								170			56	24.5	1.47	82	56	
24		5.1	8.1	0.24	2,195	1,805	28.0	0.78	4.4	174	0.40	0.33	60	23.5	1.68	94	58	
25		5.2	10.1	0.25	2,260	1,864	31.0	0.73	3.7	169	0.41	0.33	64	23.6	1.67	102	48	
26		4.8	6.6	0.33	2,261	1,867	32.0	0.71	2.5	163	0.39	0.32	59	26.4	1.81	123	68	
27		4.6	7.5	0.27	2,346	1,968	34.0	0.69	1.7	165	0.41	0.35	57	35.9	1.88	102	60	
28		4.7	5.9	0.40	2,296	1,925	30.0	0.77	3.2	167	0.40	0.34	59	37.2	1.83	152	76	
29																		
30																		
31																		
Total	48	160.7	153.0	5.78	42,140	34,540	488.0	16.95	57.2	5,027	7.71	6.36	1,542	712.2	42.65	3,223	1,810	
Max.	48	7.2	11.6	0.45	2,364	1,968	34.0	1.26	6.2	190	0.50	0.41	66	39.1	1.88	165	100	
Min.	48	4.6	4.9	0.21	1,888	1,547	15.0	0.69	1.2	161	0.35	0.29	48	6.4	1.20	56	44	
Avg.	48	5.7	8.1	0.30	2,218	1,818	25.7	0.89	3.0	180	0.41	0.33	55	25.4	1.52	115	65	
Count	1	28.0	19.0	19.00	19	19	19.0	19.00	19.0	28	19.00	19.00	28	28.0	28.00	28	28	

Robert J. Swalwell
Superintendent

MARSHALL WWTP 801 INDUSTRIAL RD. MARSHALL MI 49068 - PERMIT MI0023540

FEBRUARY 1997 - DISCHARGE MONITORING REPORT - DISCHARGE NO. 001A

Day	F.Eff. D.O. mgIL	F.Eff. pH SU	F.Eff. SS mgIL	F.Eff. SS Lbs.	F.Eff. Total-P mgIL	Flow MGD	F.Eff. Chlorine mgIL	F.Eff. CBOD mgIL	F.Eff. CBOD Lbs.	F.Eff. NH3 as N mgIL	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %	Amenable Cyanide mg/l
1	7.0	7.4	13	147		1.36	0.000	10	113			8	94	96		
2	6.5	7.5	11	113		1.23	0.000	9	92			10	92	95		
3	7.4	7.4	17	203		1.43	0.000	8	95			6	92	96		
4	6.8	7.3	10	125		1.50	0.000	9	113			15	95	97		
5	7.2	7.4	15	183	0.52	1.46	0.000	9	110			13	93	97	89	
6	6.9	7.3	7	95		1.62	0.000	9	122			23	95	95		
7	7.0	7.3	11	144		1.57	0.000	7	92			25	95	97		
8	7.0	7.2	8	82		1.23	0.000	7	72			17	94	96		
9	7.6	7.2	16	171		1.28	0.000	8	85			12	90	95		
10	7.6	7.4	13	173	0.45	1.60	0.000	7	93			11	94	97	89	<0.01
11	7.3	7.0	18	228		1.52	0.000	8	101			11	86	96		
12	7.6	7.4	18	221		1.47	0.000	7	86			12	85	97		
13	8.2	7.3	19	239		1.51	0.000	8	101			19	86	97		
14	7.1	7.3	13	169	0.53	1.56	0.000	7	91			29	92	97	83	<0.01
15	7.6	7.4	9	94		1.25	0.000	6	63			20	94	97		
16	8.0	7.4	10	100		1.20	0.000	5	50			54	95	98		
17	8.4	7.3	13	156		1.44	0.000	7	84			35	92	97		
18	7.3	7.3	9	118		1.57	0.000	7	92			13	93	97		<0.01
19	7.1	7.2	9	114		1.52	0.000	6	76			12	93	97		0.01
20	7.6	7.3	13	177	0.39	1.63	0.000	7	95			42	92	96	92	
21	7.1	7.2	11	157		1.71	0.000	7	100			46	94	97		
22	6.9	7.3	8	110		1.65	0.000	5	69			41	95	97		
23	7.6	7.5	12	147		1.47	0.000	5	61			21	91	97		
24	8.6	7.3	13	182		1.68	0.000	6	84	1.8	26	16	90	97		
25	8.1	7.4	15	209		1.67	0.000	5	70	5.2	72	13	87	97		
26	7.1	7.4	10	151		1.81	0.000	5	75	5.3	79	10	92	97		
27	7.3	7.4	15	235		1.88	0.000	7	110	3.8	60	18	90	96		
28	7.4	7.2	5	76		1.83	0.000	6	92	2.4	36	106	96	97		
29																
30																
31																
Total	207.3	205.0	341	4,319	1.89	42.65	0.000	197	2,486	18.4	273	658	2,577	2,705	353	0.01
Max.	8.6	7.5	19	239	0.53	1.88	0.000	10	122	5.3	79	106	96	98	92	0.01
Min.	6.5	7.0	5	76	0.39	1.20	0.000	5	50	1.8	26	6	85	95	83	<0.01
Avg.	7.4	7.3	12	154	0.47	1.52	0.000	7	89	3.7	55	G 19	92	97	88	0.00
Count	28.0	28.0	28	28	4.00	28.00	28.000	28	28	5.0	5	28	28	28	4	4.00

G = Geometric Mean

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

FEBRUARY 1997 - MISCELLANEOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	SO2 Lbs.	Lime Lbs.	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	Raw Sludge pH	Sludge pH 2 Hours	Sludge pH 16 Hrs.	Lbs. of Lime per 1000 Gals. Sludge
1	3,400	2,880	750	18	242	12	461	8,300	3.6	74	6.4	13.10	12.50	55.54
2	3,400	2,880	570	26	242	13	377	8,400	3.4	75	6.2	12.60	11.60	44.88
3	2,000	3,120	840	10	161	14	503	8,300	3.3	74	6.3	13.20	12.60	60.60
4	2,000	2,880	580	36	242	2	461	7,400	3.5	73	6.3	13.20	12.60	62.30
5	2,500	3,120	630	19	161	1	419	8,000	3.3	74	6.5	13.20	12.70	52.38
6	2,600	3,000	550	20	161	7	503	8,300	3.7	74	6.2	13.20	12.60	60.60
7	2,500	3,000	600	20	242	16	503	9,000	3.6	74	6.1	13.10	12.30	55.89
8	2,600	3,120	570	20	242	12	419	8,300	3.3	76	6.1	12.90	12.30	50.48
9	2,800	3,000	710	23	242	13	461	9,000	3.3	76	6.2	12.80	10.70	51.22
10	2,800	3,120	540	21	161	26	461	8,500	2.9	82	6.2	13.30	13.80	54.24
11	2,500	3,120	560	16	242	15	545	9,200	3.1	74	6.2	13.50	13.20	59.24
12	3,500	3,120	600	13	161	14	377	8,000	3.2	76	6.2	12.60	11.70	47.13
13	3,400	3,120	600	16	242	16	461	8,400	3.3	76	6.2	12.80	12.40	54.88
14	3,100	3,000	660	16	161	15	419	8,000	3.4	76	6.2	13.20	12.80	52.38
15	2,600	3,120	620	19	242	17	377	8,000	3.1	76	6.2	12.70	12.70	47.13
16	3,500	3,240	660	17	242	16	419	8,000	3.2	75	6.3	12.80	12.90	52.38
17	2,600	3,000	610	29	242	14	503	8,400	3.3	76	6.2	13.10	12.70	59.88
18	1,200	2,880	860	9	322	11	461	8,500	3.4	77	6.3	13.40	13.00	54.24
19	1,900	3,000	1,260	12	81	5	419	8,200	3.4	76	6.3	12.70	12.70	51.10
20	1,700	3,000	780	32	242	16	419	8,400	3.2	80	6.2	12.50	11.00	49.88
21	1,800	3,000	600	19	242	11	503	8,600	3.5	73	6.2	12.70	12.90	58.49
22	2,600	3,120	575	20	161	14	419	8,000	3.5	73	6.2	13.10	13.30	52.38
23	2,800	2,880	575	19	161	13	377	8,000	3.4	75	6.2	12.80	13.30	47.13
24	3,000	3,120	1,700	23	161	15	461	8,400	3.5	75	6.2	13.20	12.60	54.88
25	2,500	3,000	1,860	17	322	13	419	8,700	3.4	76	6.1	12.10	11.40	48.16
26	2,100	3,000	1,880	20	322	14	461	8,600	3.1	72	6.1	12.40	12.10	53.60
27	2,100	3,000	1,810	18	161	14	461	9,000	4.0	76	6.0	12.10	11.08	51.22
28	2,100	3,120	1,800	8	161	16	503	8,000	3.8	74	6.0	12.50	12.07	62.88
29														
30														
31														
Total	71,600	84,960	24,350	536	5,964	365	12,572	233,900	94.7	2,108	173.8	360.80	347.55	1505.08
Max.	3,500	3,240	1,880	36	322	26	545	9,200	4.0	82	6.5	13.50	13.80	62.88
Min.	1,200	2,880	540	8	81	1	377	7,400	2.9	72	6.0	12.10	10.70	44.88
Avg.	2,557	3,034	870	19	213	13	449	8,354	3.4	75	6.2	12.89	12.41	53.75

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

MARCH 1997 - PLANT INFLUENT SHEET

	-----Weather----		Inf. Flow	Inf. Temp	Inf. pH	Inf. BOD	Inf. BOD	Inf. SS	Inf. SS	Inf. Phos.	Inf. Phos.	Inf. VSS	Inf. NH3-N	--Remarks or Other Parameters--
	Type	Precip.	MGD	F	SU	mgIL	Lbs.	mgIL	Lbs.	mgIL	Lbs.	mgIL	mgIL	
Day														
1	Rain	0.02	1.70	52	7.6	194	2,751	176	2,495			166		
2			1.77	52	7.6	177	2,613	120	1,771			106		
3			1.78	54	7.4	171	2,539	130	1,930			118		
4			2.02	54	7.4	153	2,578	126	2,123	3.15	53	118	10.4	
5	Snow	0.08	1.86	54	7.4	230	3,568	116	1,799			112		
6	Snow	0.01	1.68	54	7.4	185	2,592	128	1,793			120	12.9	
7			1.69	54	7.5	186	2,622	156	2,199			150		
8			1.39	54	7.5	215	2,492	164	1,901			152		
9			1.45	54	7.7	168	2,032	176	2,128			168		
10			1.81	55	7.5	184	2,778	122	1,842			112	14.4	
11			1.76	55	7.4	210	3,082	182	2,671			176		
12			1.79	54	7.5	185	2,762	132	1,971	3.73	56	120	12.0	
13	Rain	1.07	1.65	55	7.7	185	2,546	140	1,927			130		
14	Snow	0.02	1.58	55	7.5	280	3,690	146	1,924			130		
15			1.49	55	7.6	175	2,175	168	2,088			148		
16			1.50	55	7.7	179	2,239	162	2,027			152		
17			1.62	55	7.7	169	2,283	134	1,810			112	14.0	
18			1.61	55	7.9	152	2,041	142	1,907	3.83	51	126		
19			1.66	54	7.7	198	2,741	168	2,326			146		
20			1.70	55	7.6	194	2,751	150	2,127			132		
21			1.75	55	7.3	225	3,284	132	1,927			120		
22			1.42	55	7.7	166	1,966	152	1,800			132		
23			1.44	55	7.6	162	1,946	134	1,609			116		
24	Rain	0.23	1.81	55	7.5	170	2,566	158	2,385			146		
25	Rain	0.15	1.62	55	7.6	180	2,432	136	1,837	3.58	48	120	11.6	
26			1.55	55	7.7	166	2,146	120	1,551			114	13.2	
27			1.67	55	7.6	223	3,106	344	4,791			334	10.6	
28	Rain	1.32	1.49	55	7.6	158	1,963	168	2,088			152		
29			1.53	55	7.6	137	1,748	126	1,608			114		
30	Rain	0.04	1.57	55	7.5	149	1,951	112	1,467			104		
31			1.88	55	7.6	151	2,368	158	2,477			142		
Total	0	2.94	51.24	1,690	234.6	5,677	78,348	4,678	64,299	14.29	209	4,288	99.1	
Max.	0	1.32	2.02	55	7.9	280	3,690	344	4,791	3.83	56	334	14.4	
Min.	0	0.01	1.39	52	7.3	137	1,748	112	1,467	3.15	48	104	10.4	
Avg.	0	0.33	1.65	55	7.6	183	2,527	151	2,074	3.57	52	138	12.4	
Count	9	9.00	31.00	31	31.0	31	31	31	31	4.00	4	31	8.0	

1716

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

MARCH 1997 - PRIMARY EFFLUENT SHEET

Day	P Eff. BOD mgIL	P Eff. BOD Lbs.	P Eff. SS mgIL	P. Eff. SS Lbs.	P Eff. Phos. mgIL	P Eff. Phos. Lbs.	P Eff. VSS mgIL	P Eff. NH3-N mgIL	Flow MGD	BOD Pri. Removal %	SS Pri. Removal %	P Pri. Removal %
1	109	1,545	60	851			56		1.70	44	66	
2	121	1,786	62	915			54		1.77	32	48	
3	99	1,470	58	861			56		1.78	42	55	
4	97	1,634	36	606	1.80	30	34	11.7	2.02	37	71	43
5	158	2,451	92	1,427			80		1.86	31	21	
6	104	1,457	70	981			68	12.6	1.68	44	45	
7	102	1,438	72	1,015			66		1.69	45	54	
8	134	1,553	64	742			60		1.39	38	61	
9	91	1,100	54	653			50	14.3	1.45	46	69	
10	103	1,555	50	755			42		1.81	44	59	
11	48	705	42	616			36		1.76	77	77	
12	114	1,702	56	836	2.00	30	44	12.2	1.79	38	58	46
13	116	1,596	56	771			50		1.65	37	60	
14	180	2,372	52	685			50		1.58	36	64	
15	92	1,143	64	795			60		1.49	47	62	
16	96	1,201	38	475			32		1.50	46	77	
17	90	1,216	44	594			40	15.0	1.62	47	67	
18	95	1,276	54	725	1.95	26	50		1.61	38	62	49
19	108	1,495	50	692			44		1.66	45	70	
20	86	1,219	48	681			40		1.70	56	68	
21	154	2,248	80	1,168			60		1.75	32	39	
22	96	1,137	42	497			38		1.42	42	72	
23	87	1,045	38	456			30		1.44	46	72	
24	90	1,359	52	785			52		1.81	47	67	
25	68	919	32	432	1.30	18	32	13.1	1.62	62	76	64
26	94	1,215	40	517			34	14.0	1.55	43	67	
27	133	1,852	54	752			50	10.6	1.67	40	84	
28	81	1,007	50	621			10		1.49	49	70	
29	77	983	50	638			46		1.53	44	60	
30	68	890	44	576			42		1.57	54	61	
31	93	1,458	40	627			30		1.88	38	75	
Total	3,184	44,027	1,644	22,748	7.05	104	1,436	103.5	51.24	1,367	1,957	202
Max.	180	2,451	92	1,427	2.00	30	80	15.0	2.02	77	84	64
Min.	48	705	32	432	1.30	18	10	10.6	1.39	31	21	43
Avg.	103	1,420	53	734	1.76	26	46	12.9	1.65	44	63	51
Count	31	31	31	31	4.00	4	31	8.0	31.00	31	31	4

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

MARCH 1997 - ACTIVATED SLUDGE SHEET

Day	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading flm	Mix Liq SS mgIL	Mix Liq VSS mgIL	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mgIL	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mgIl	PE SS mgIL
1	48	5.1								161			65	36.7	1.70	109	60
2		4.9								168			58	39.6	1.77	121	62
3		4.8	7.0	0.29	2,013	1,689	24.0	0.84	3.0	168	0.35	0.29	52	37.2	1.78	99	58
4		4.3	9.0	0.36	1,824	1,524	22.0	0.83	3.5	166	0.34	0.28	46	34.0	2.02	97	36
5		4.6	4.1	0.50	1,965	1,649	23.0	0.85	3.3	169	0.41	0.34	54	30.9	1.86	158	92
6		5.1	5.9	0.31	1,919	1,549	25.0	0.77	2.2	170	0.42	0.36	56	30.6	1.68	104	70
7		5.1	6.1	0.28	2,078	1,715	26.0	0.80	4.6	169	0.42	0.34	57	31.5	1.69	102	72
8		6.2								169			64	29.1	1.39	134	64
9		5.9								167			56	24.0	1.45	91	54
10		4.8	7.3	0.34	1,833	1,509	20.0	0.92	3.8	164	0.36	0.30	49	36.5	1.81	103	50
11		4.9	9.0	0.15	1,855	1,618	20.0	0.93	3.2	168	0.37	0.31	52	39.8	1.76	48	42
12		4.8	6.4	0.39	1,783	1,470	20.0	0.89	4.3	168	0.36	0.30	51	30.4	1.79	114	56
13		5.2	6.9	0.37	1,785	1,460	23.0	0.78	3.4	166	0.33	0.27	57	26.4	1.65	116	56
14		5.5	8.3	0.50	1,900	1,575	23.0	0.83	3.2	165	0.37	0.31	59	24.6	1.58	180	52
15		5.8								173			59	23.9	1.49	92	64
16		5.7								171			62	24.4	1.50	96	38
17		5.3	9.2	0.26	1,830	1,542	29.0	0.63	3.6	165	0.36	0.29	60	23.3	1.62	90	44
18		5.4	7.2	0.29	1,752	1,460	20.0	0.88	3.4	168	0.35	0.29	58	26.3	1.61	95	54
19		5.2	7.8	0.33	1,810	1,519	21.0	0.86	4.0	167	0.34	0.28	57	23.5	1.66	108	50
20		5.1	8.3	0.26	1,888	1,578	25.0	0.76	2.7	161	0.38	0.32	56	23.1	1.70	86	48
21		4.9	4.9	0.47	1,926	1,607	26.0	0.74	3.3	159	0.37	0.31	57	24.0	1.75	154	80
22		6.1								168			69	22.9	1.42	96	42
23		6.0								171			64	23.2	1.44	87	38
24		4.8	7.5	0.28	1,979	1,615	28.0	0.71	4.9	170	0.40	0.33	52	23.4	1.81	90	52
25		5.3	15.2	0.17	2,191	1,811	30.0	0.73	3.0	165	0.42	0.34	59	24.9	1.62	68	32
26		5.6	12.3	0.23	2,117	1,729	30.0	0.71	3.2	164	0.40	0.33	62	25.6	1.55	94	40
27		5.2	8.1	0.38	2,030	1,645	30.0	0.68	2.9	155	0.45	0.37	59	25.4	1.67	133	54
28		5.8								158			65	26.7	1.49	81	50
29		5.6								163			63	31.4	1.53	77	50
30		5.5								168			64	27.4	1.57	68	44
31		4.6	8.9	0.32	1,870	1,531	33.0	0.57	5.0	170	0.39	0.32	48	29.9	1.88	93	40
Total	48	162.9	159.5	6.47	38,348	31,795	498.0	15.68	70.5	5,154	7.59	6.28	1,790	880.6	51.24	3,184	1,644
Max.	48	6.2	15.2	0.50	2,191	1,811	33.0	0.93	5.0	173	0.45	0.37	69	39.8	2.02	180	92
Min.	48	4.3	4.1	0.15	1,752	1,460	20.0	0.57	2.2	155	0.33	0.27	46	22.9	1.39	48	32
Avg.	48	5.3	8.0	0.32	1,917	1,590	24.9	0.78	3.5	166	0.38	0.31	58	28.4	1.65	103	53
Count	1	31.0	20.0	20.00	20	20	20.0	20.00	20.0	31	20.00	20.00	31	31.0	31.00	31	31

Robert J. Swalwell
Superintendent

MARSHALL WWTP 801 INDUSTRIAL RD. MARSHALL MI 49068 - PERMIT MI0023540

MARCH 1997 - DISCHARGE MONITORING REPORT - DISCHARGE NO. 001A

Day	F.Eff. D.O. mgIL	F.Eff. pH SU	F.Eff. SS mgIL	F.Eff. SS Lbs.	F.Eff. Total-P mgIL	Flow MGD	F.Eff. Chlorine mgIL	F.Eff. CBOD mgIL	F.Eff. CBOD Lbs.	F.Eff. NH3 as N mgIL	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %	Amenable Cyanide mg/l
1	7.1	7.5	13	184		1.70	0.000	9	128			64	93	95		
2	7.4	7.4	11	162		1.77	0.000	6	89			37	91	97		
3	8.0	7.3	10	148		1.78	0.000	6	89			11	92	96		
4	7.6	7.3	4	67	0.25	2.02	0.000	4	67	3.81	64	29	97	97	92	
5	7.7	7.3	15	233		1.86	0.000	7	109			17	87	97		
6	7.7	7.1	14	196		1.68	0.000	6	84			9	89	97		<0.01
7	8.0	7.4	15	211		1.69	0.000	6	85	3.72	52	55	90	97		
8	7.5	7.4	11	128		1.39	0.000	6	70			5	93	97		
9	7.7	7.5	9	109		1.45	0.000	5	60	3.82	46	402	95	97		<0.01
10	8.0	7.2	7	106		1.81	0.000	4	60			11	94	98		
11	7.4	7.2	8	117		1.76	0.000	5	73			4	96	98		
12	7.7	7.3	8	119	0.28	1.79	0.000	5	75	3.30	49	19	94	97	92	<0.01
13	7.6	7.4	8	110		1.65	0.000	5	69			9	94	97		
14	7.8	7.8	9	119		1.58	0.000	7	92			3	94	98		
15	8.5	7.4	14	174		1.49	0.000	7	87			21	92	96		
16	8.5	7.5	7	88		1.50	0.000	6	75			21	96	97		<0.01
17	7.7	7.4	5	68		1.62	0.000	5	68	5.92	80	5	96	97		
18	7.9	7.3	14	188	0.26	1.61	0.000	5	67			4	90	97	93	
19	7.8	7.4	6	83		1.66	0.000	5	69			2	96	97		
20	7.3	7.5	6	85		1.70	0.000	5	71			2	96	97		
21	7.1	7.4	8	117		1.75	0.000	6	88			8	94	97		
22	7.0	7.5	11	130		1.42	0.000	5	59			3	93	97		
23	7.7	7.6	7	84		1.44	0.000	5	60			2	95	97		
24	8.1	7.4	11	166		1.81	0.000	5	75			3	93	97		
25	7.4	7.4	5	68	0.17	1.62	0.000	4	54	4.10	55	2	96	98	95	
26	7.7	7.5	7	90		1.55	0.000	5	65	4.09	53	2	94	97		
27	7.3	7.5	7	97		1.67	0.000	5	70	2.24	31	10	98	98		
28	6.9	7.5	6	75		1.49	0.000	4	50			8	96	97		
29	7.5	7.5	7	89		1.53	0.000	4	51			3	94	97		
30	7.7	7.5	6	79		1.57	0.000	4	52			4	95	97		
31	8.5	7.5	9	141		1.88	0.000	4	63			2	94	97		
Total	237.8	229.9	278	3,832	0.96	51.24	0.000	165	2,273	31.00	432	777	2,907	3,008	372	<0.01
Max.	8.5	7.8	15	233	0.28	2.02	0.000	9	128	5.92	80	402	98	98	95	<0.01
Min.	6.9	7.1	4	67	0.17	1.39	0.000	4	50	2.24	31	2	87	95	92	<0.01
Avg.	7.7	7.4	9	124	0.24	1.65	0.000	5	73	3.88	54	G 8	94	97	93	<0.01
Count	31.0	31.0	31	31	4.00	31.00	31.000	31	31	8.00	8	31	31	31	4	4

G = Geometric Mean

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

MARCH 1997 - MISCELLANEOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	SO2 Lbs.	Lime Lbs.	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	Raw Sludge pH	Sludge pH 2 Hours	Sludge pH 16 Hrs.	Lbs. of Lime per 1000 Gals. Sludge
1	1,100	2,880	1,810	16	242	14	359	8,000	3.3	76	5.9	12.45	12.44	44.88
2	2,300	3,000	1,850	13	161	14	287	8,000	3.6	76	5.9		12.19	35.88
3	1,900	3,000	1,820	16	242	22	359	8,000	3.4	78	6.0	12.55	12.28	44.88
4	1,500	3,000	2,460	18	161	15	430	8,600	3.6	77	6.0	12.34	11.70	50.00
5	3,200	3,000	3,750	18	161	15	394	9,000	3.5	75	6.0	12.36	12.05	43.78
6	2,800	3,120	2,560	13	242	15	394	8,500	3.4	75	5.9	12.38	11.80	46.35
7	2,300	3,000	2,600	21	0	15	430	8,400	3.5	76	5.9	12.36	11.97	51.19
8	2,700	2,880	2,520	36	0	16	323	8,300	3.5	76	5.8		11.54	38.92
9	1,900	3,000	2,580	17	0	14	323	8,500	3.5	78	5.9	12.64	12.45	38.00
10	1,400	3,120	2,520	18	805	17	323	8,000	3.7	76	6.2	12.21	11.59	40.38
11	1,400	2,880	2,500	19	403	15	323	8,600	3.7	74	6.0		10.29	37.56
12	1,900	3,000	2,520	19	322	10	359	8,500	3.6	74	6.2	12.50	12.47	42.24
13	2,500	3,000	2,580	19	403	17	430	8,400	3.4	75	6.3	12.11	11.18	51.19
14	2,900	3,000	2,560	21	403	11	394	9,000	3.4	76	6.2	12.16	11.55	43.78
15	3,300	3,120	2,550	21	403	10	359	8,000	4.0	77	6.1			44.88
16	2,400	2,880	2,580	13	403	13	323	8,000	3.5	76	6.2	11.72	9.99	40.38
17	1,600	2,880	2,450	13	403	14	645	8,400	3.6	76	6.2		12.47	76.79
18	2,300	3,000	2,560	16	322	13	681	8,500	3.7	75	6.3	12.55	12.46	80.12
19	1,500	2,880	2,510	14	242	15	645	8,500	3.7	75	6.2	12.62	12.46	75.88
20	900	2,880	2,500	17	403	14	645	8,500	3.8	75	6.2	12.60	12.41	75.88
21	1,200	3,000	2,570	18	483	18	681	9,000	4.0	74	6.2	12.57	12.47	75.67
22	700	3,000	2,510	17	483	13	466	8,000	3.6	75	6.0	12.63	12.47	58.25
23	2,700	2,760	2,400	16	403	17	430	8,000	3.7	74	6.4	12.67	12.37	53.75
24	2,000	3,000	2,390	19	403	17	645	8,400	3.9	72	6.3	12.64	12.52	76.79
25	3,000	2,880	2,550	29	403	14	574	9,000	3.8	72	6.1	12.69	12.34	63.78
26	1,400	3,000	2,520	16	322	10	466	8,500	3.8	73	6.3	12.46	12.22	54.82
27	400	2,760	2,580	13	322	9	394	8,000	3.9	75	6.2	12.59	12.31	49.25
28	700	2,880	2,540	14	322	7	753	7,500	3.5	74	6.3	12.68	12.49	100.40
29	1,100	2,880	2,510	13	322	8	466	8,000	4.1	73	6.3	12.68	12.51	58.25
30	2,000	2,760	2,440	19	483	11	430	8,000	3.7	73	6.4	12.71	12.37	53.75
31	1,800	2,880	2,520	11	242	13	359	8,000	3.7	74	6.5	12.20	11.90	44.88
Total	58,800	91,320	77,310	543	9,909	426	14,090	258,100	113.1	2,326	190.4	324.07	361.26	1692.50
Max.	3,300	3,120	3,750	36	805	22	753	9,000	4.1	78	6.5	12.71	12.52	100.40
Min.	400	2,760	1,810	11	0	7	287	7,500	3.3	72	5.8	11.72	9.99	35.88
Avg.	1,897	2,946	2,494	18	320	14	455	8,326	3.6	75	6.1	12.46	12.04	54.60

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

APRIL 1997 - PLANT INFLUENT SHEET

	-----Weather----		Inf. Flow	Inf. Temp	Inf. pH	Inf. BOD	Inf. BOD	Inf. SS	Inf. SS	Inf. Phos.	Inf. Phos.	Inf. VSS	Inf. NH3-N	--Remarks or Other Parameters--
	Type	Precip.	MGD	F	SU	mgIL	Lbs.	mgIL	Lbs.	mgIL	Lbs.	mgIL	mgIL	
Day														
1			1.80	55	7.7	173	2,597	122	1,831	3.10	47	112	10.2	
2			1.65	55	7.6	165	2,271	144	1,982	4.10	56	124	10.2	
3	Rain	0.08	1.74	55	7.3	221	3,207	152	2,206	3.35	49	140	10.4	
4	Rain	0.33	1.72	55	7.5	160	2,295	146	2,094	3.15	45	134	11.0	
5	Rain	0.40	1.60	57	7.5	163	2,175	160	2,135	3.80	51	150	11.0	
6			1.46	53	7.7	129	1,571	146	1,778	2.70	33	130	10.6	
7			1.87	55	7.4	175	2,729	98	1,528	3.25	51	88	8.9	
8			1.76	55	7.2	199	2,921	146	2,143	4.25	62	136	13.0	
9			1.77	55	7.7	172	2,539	152	2,244	4.10	61	140	12.1	
10			1.63	55	7.5	192	2,610	158	2,148	3.55	48	144	13.3	
11	Rain	0.25	1.64	53	7.7	162	2,216	144	1,970	3.35	46	138	13.5	
12			1.62	53	7.9	191	2,581	134	1,810	4.00	54	124	12.9	
13			1.46	55	7.9	153	1,863	142	1,729			136	12.8	
14			1.69	55	7.7	160	2,255	132	1,860	3.55	50	122	12.2	
15	Rain	0.16	1.74	55	7.7	136	1,974	122	1,770			118	11.0	
16			1.70	60	7.6	184	2,609	168	2,382			148	12.7	
17			1.78	55	7.6	168	2,494	176	2,613	3.55	53	148	13.0	
18			1.58	55	7.6	136	1,792	172	2,266			148	15.9	
19			1.46	55	7.6	149	1,814	206	2,508			178	17.0	
20			1.45	57	7.6	150	1,814	160	1,935			140	15.2	
21	Rain	0.14	1.86	55	8.0	126	1,955	176	2,730			150	13.5	
22			1.66	55	7.4	200	2,769	186	2,575			166	12.7	
23	Rain	0.03	1.74	58	7.3	206	2,989	156	2,264	4.00	58	140	13.2	
24	Rain	0.02	1.81	57	7.4	165	2,491	152	2,295			114	11.6	
25			1.75	55	7.6	186	2,715	132	1,927			110		
26			1.62	55	7.4	191	2,581	142	1,919			122		
27	Rain	0.70	1.59	57	7.4	180	2,387	134	1,777			116		
28			1.60	57	7.5	223	2,976	180	2,402			148		
29			1.61	61	7.7	195	2,618	178	2,390			162		
30	Rain	0.30	1.77	59	7.8	182	2,687	170	2,510			152		
31														
Total	0	2.41	50.13	1,672	227.5	5,192	72,493	4,586	63,720	53.80	763	4,078	297.9	
Max.	0	0.70	1.87	61	8.0	223	3,207	206	2,730	4.25	62	178	17.0	
Min.	0	0.02	1.45	53	7.2	126	1,571	98	1,528	2.70	33	88	8.9	
Avg.	0	0.24	1.67	56	7.6	173	2,416	153	2,124	3.59	51	136	12.4	
Count	10	10.00	30.00	30	30.0	30	30	30	30	15.00	15	30	24.0	

17316

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

APRIL 1997 - PRIMARY EFFLUENT SHEET

Day	P Eff. BOD mgIL	P Eff. BOD Lbs.	P Eff. SS mgIL	P. Eff. SS Lbs.	P Eff. Phos. mgIL	P Eff. Phos. Lbs.	P Eff. VSS mgIL	P Eff. NH3-N mgIL	Flow MGD	BOD Prl. Removal %	SS Prl. Removal %	P Prl. Removal %
1	111	1,666	44	661	1.40	21	40	11.4	1.80	36	64	55
2	82	1,128	60	826	2.15	30	50	10.8	1.65	50	58	48
3	145	2,104	72	1,045	2.25	33	60	10.2	1.74	34	53	33
4	101	1,449	48	689	1.55	22	44	11.5	1.72	37	67	51
5	101	1,348	60	801	1.85	25	54	10.8	1.60	38	63	51
6	77	938	46	560	1.20	15	38	9.7	1.46	40	68	56
7	146	2,277	72	1,123	3.25	51	50	11.2	1.87	17	27	0
8	134	1,967	76	1,116	2.80	41	60	13.4	1.76	33	48	34
9	100	1,476	52	768	2.10	31	52	11.1	1.77	42	66	49
10	104	1,414	62	843	2.50	34	62	11.7	1.63	46	61	30
11	77	1,053	54	739	2.00	27	54	12.9	1.64	52	63	40
12	127	1,716	62	838	2.60	35	56	16.4	1.62	34	54	35
13	104	1,266	48	584			46	13.9	1.46	32	66	
14	96	1,353	58	817	1.70	24	52	12.1	1.69	40	56	52
15	100	1,451	50	726			48	11.4	1.74	26	59	
16	113	1,602	48	681			42	14.3	1.70	39	71	
17	122	1,811	56	831	1.95	29	50	15.2	1.78	27	68	45
18	80	1,054	58	764			44	16.2	1.58	41	66	
19	77	938	60	731			52	14.6	1.46	48	71	
20	110	1,330	50	605			36	15.7	1.45	27	69	
21	90	1,396	68	1,055			64	13.8	1.86	29	61	
22	107	1,481	74	1,024			64	12.6	1.66	47	60	
23	105	1,524	82	1,190	3.15	46	76	11.5	1.74	49	47	21
24	119	1,796	52	785			48	11.6	1.81	28	66	
25	132	1,927	58	847			42		1.75	29	56	
26	104	1,405	64	865			54		1.62	46	55	
27	83	1,101	72	955			64		1.59	54	46	
28	119	1,588	72	961			60		1.60	47	60	
29	110	1,477	56	752			48		1.61	44	69	
30	109	1,609	50	738			46		1.77	40	71	
31												
Total	3,185	44,646	1,784	24,915	32.45	463	1,556	304.0	50.13	1,152	1,809	600
Max.	146	2,277	82	1,190	3.25	51	76	16.4	1.87	54	71	56
Min.	77	938	44	560	1.20	15	36	9.7	1.45	17	27	0
Avg.	106	1,488	59	831	2.16	31	52	12.7	1.67	38	60	40
Count	30	30	30	30	15.00	15	30	24.0	30.00	30	30	15

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

APRIL 1997 - ACTIVATED SLUDGE SHEET

Day	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading flm	Mix Liq SS mgIL	Mix Liq VSS mgIL	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mgIL	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mgIl	PE SS mgIL
										*							
1	48	4.8	8.3	0.36	1,840	1,525	28.0	0.66	3.3	211	0.34	0.29	53	25.4	1.80	111	44
2		5.2	7.5	0.22	2,070	1,733	30.0	0.69	2.1	215	0.50	0.42	59	30.4	1.65	82	60
3		5.0	5.0	0.49	1,737	1,439	25.0	0.69	4.1	212	0.49	0.41	47	20.4	1.74	144	72
4		5.0	8.1	0.31	1.871	1,549	21.0	0.89	2.3	207	0.50	0.41	54	15.8	1.72	101	48
5		5.4								205			59	5.9	1.60	101	60
6		5.9								201			65	32.0	1.46	77	46
7		4.6	5.8	0.43	2,183	1,788	39.0	0.56	3.6	220	0.65	0.54	56	8.3	1.87	146	72
8		4.9	7.3	0.29	2,736	2,251	53.0	0.52	0.9	225	0.67	0.54	66	35.0	1.76	134	76
9		4.9	9.5	0.25	2,428	2,000	35.0	0.69	1.5	225	0.70	0.57	67	36.6	1.77	100	52
10		5.3	7.9	0.26	2,215	1,829	35.0	0.63	4.5	221	0.55	0.46	72	45.8	1.63	104	62
11		5.3	8.3	0.21	2,037	1,697	35.0	0.58	3.3	217	0.48	0.39	72	37.0	1.64	77	54
12		5.3								215			71	36.7	1.62	127	62
13		5.9								219			80	26.8	1.46	104	48
14		5.1	7.5	0.26	2.055	1,727	35.0	0.59	4.1	217	0.47	0.39	74	23.3	1.69	96	58
15		5.0	8.2	0.29	1,989	1,660	30.0	0.66	3.6	212	0.50	0.42	72	23.9	1.74	100	50
16		5.1	9.0	0.31	2,039	1,717	28.0	0.73	3.3	214	0.49	0.41	75	25.1	1.70	113	48
17		4.8	7.3	0.35	2,019	1,706	25.0	0.81	2.5	223	0.67	0.56	71	24.1	1.78	122	56
18		5.5	7.7	0.21	1,971	1,667	22.0	0.90	3.8	225	0.68	0.57	80	23.2	1.58	80	58
19		5.5								222			84	25.9	1.56	77	60
20		5.9								220			84	24.9	1.45	110	50
21		4.6	6.2	0.27	2,167	1,740	22.0	0.99	3.9	220	0.60	0.51	65	27.9	1.86	90	68
22		5.2	6.1	0.28	2.098	1,777	20.0	1.05	3.9	206	0.64	0.54	76	23.7	1.66	107	74
23		5.0	5.3	0.29	2,093	1,770	21.0	1.00	4.4	192	0.57	0.48	73	20.6	1.74	105	82
24		4.8	8.9	0.31	2,331	1,960	20.0	1.17	2.0	194	0.66	0.56	70	23.3	1.81	119	52
25		4.9	9.5	0.25	2,690	2,526	21.0	1.28	0.2	205	0.73	0.61	60	17.5	1.75	132	58
26		5.3								202			57	23.4	1.62	104	64
27		5.4								198			62	27.5	1.59	83	72
28		5.4	7.2	0.27	2,325	1,957	28.0	0.83	5.7	202	0.42	0.36	65	22.0	1.60	119	72
29		5.4	9.7	0.24	2,426	2,016	31.0	0.78	3.0	194	0.42	0.35	64	27.2	1.61	110	56
30		4.9	9.4	0.28	2,316	1,922	30.0	0.77	4.1	192	0.44	0.37	60	29.7	1.77	109	50
31																	
Total	48	155.1	169.7	6.43	47,636	39,956	634.0	17.46	70.1	6,331	12.17	10.16	2,013	769.3	50.23	3,184	1,784
Max.	48	5.9	9.7	0.49	2,736	2,526	53.0	1.28	5.7	225	0.73	0.61	84	45.8	1.87	146	82
Min.	48	4.6	5.0	0.21	1,737	1,439	20.0	0.52	0.2	192	0.34	0.29	47	5.9	1.45	77	44
Avg.	48	5.2	7.7	0.29	2,165	1,816	28.8	0.79	3.2	211	0.55	0.46	67	25.6	1.67	106	59
Count	1	30.0	22.0	22.00	22	22	22.0	22.00	22.0	30	22.00	22.00	30	30.0	30.00	30	30

*Estimated

Robert J. Swalwell
Superintendent

MARSHALL WWTP 801 INDUSTRIAL RD. MARSHALL MI 49068 - PERMIT MI0023540

APRIL 1997 - DISCHARGE MONITORING REPORT - DISCHARGE NO. 001A

Day	F.Eff. D.O. mgIL	F.Eff. pH SU	F.Eff. SS mgIL	F.Eff. SS Lbs.	F.Eff. Total-P mgIL	Flow MGD	F.Eff. Chlorine mgIL	F.Eff. CBOD mgIL	F.Eff. CBOD Lbs.	F.Eff. NH3 as N mgIL	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %	Amenable Cyanide mg/l
1	7.1	7.5	8	120	0.18	1.80	0.000	5	75	4.1	61	2	93	97	94	
2	7.3	7.6	10	138		1.65	0.000	4	55	2.7	36	16	93	98		
3	7.3	7.3	10	145	0.23	1.74	0.000	4	58	2.5	37	4	93	98	93	
4	6.5	7.4	6	86		1.72	0.000	4	57	3.8	54	5	96	98		
5	6.7	7.4	9	120		1.60	0.000	4	53	4.3	58	4	94	98		
6	6.8	7.6	4	49		1.46	0.000	4	49	2.1	26	7	97	97		
7	7.3	7.5	8	125		1.87	0.000	5	78	4.4	68	44	92	97		
8	6.9	7.4	11	161		1.76	0.000	5	73	5.6	83	102	92	97		
9	7.3	7.5	10	148	0.22	1.77	0.000	5	74	4.1	60	164	93	97	95	
10	7.5	7.5	11	150		1.63	0.000	6	82	3.6	48	7	93	97		<0.005
11	7.4	7.5	7	96		1.64	0.000	5	68	4.3	59	39	95	97		
12	7.3	7.5	14	189		1.62	0.000	7	95	5.7	77	9	90	96		
13	7.5	7.5	7	85	0.22	1.46	0.000	5	61	4.3	52	12	95	97	95	
14	7.4	7.4	12	169		1.69	0.000	5	70	4.9	69	47	91	97		
15	7.4	7.4	9	131		1.74	0.000	5	73	4.1	59	50	93	96		<0.005
16	7.3	7.5	13	184		1.70	0.002	7	99	6.5	93	5	92	96		
17	6.8	7.5	19	282	1.01	1.78	0.000	10	148	9.3	139	96	89	94		<0.005
18	7.0	7.5	18	237		1.58	0.000	7	92	9.3	122	114	90	95		
19	7.4	7.5	11	134		1.46	0.000	5	61	8.1	99	2	95	97		
20	8.1	7.5	11	133		1.45	0.000	7	85	8.5	103	54	93	95		<0.005
21	6.9	7.5	18	279		1.86	0.000	6	93	11.5	178	12	90	95		
22	7.2	7.4	11	152		1.66	0.000	7	97	8.1	112	3	94	97		
23	7.5	7.2	13	189		1.74	0.000	9	131	8.1	117	15	92	96	75	
24	7.3	7.5	26	392		1.81	0.000	14	211	8.0	121	192	83	92		
25	5.8	7.4	25	365		1.75	0.000	13	190			800	81	93		
26	6.7	7.2	11	149		1.62	0.000	7	95			7	92	96		
27	8.2	7.2	10	133		1.59	0.000	7	93			2	93	96		
28	6.6	7.4	12	160		1.60	0.000	6	80			2	93	97		
29	6.7	7.6	10	134		1.61	0.000	5	67			2	94	97		
30	6.9	7.5	10	148		1.77	0.000	7	103			7	94	96		
31																
Total	214.1	223.4	354	4,982	1.86	50.13	0.002	190	2,666	137.8	1,931	1,825	2,765	2,889	452	<0.005
Max.	8.2	7.6	26	392	1.01	1.87	0.002	14	211	11.5	178	800	97	98	95	<0.005
Min.	5.8	7.2	4	49	0.18	1.45	0.000	4	49	2.1	26	2	81	92	75	<0.005
Avg.	7.1	7.4	12	166	0.37	1.67	0.000	6	89	5.7	80	G 15	92	96	90	<0.005
Count	30.0	30.0	30	30	5.00	30.00	30.000	30	30	24.0	24	30	30	30	5	4

G = Geometric Mean

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

APRIL 1997 - MISCELLANEOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	SO2 Lbs.	Lime Lbs.	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	Raw Sludge pH	Sludge pH 2 Hours	Sludge pH 16 Hrs.	Lbs. of Lime per 1000 Gals. Sludge
1	1,100	3,120	2,540	23	322	15	437	8,000	3.7	73	6.4	10.90	9.74	54.63
2	500	3,000	2,570	10	403	15	473	8,000	3.6	74	6.2	12.50	12.52	59.13
3	300	2,520	2,400	20	322	8	437	8,000	3.2	75	6.1	12.55	12.37	54.63
4	300	2,880	2,350	20	322	6	510	8,000	3.5	75	6.2	12.44	12.25	63.75
5	500	2,640	2,700	15	242	29	546	8,000	3.5	73	6.2	11.92	12.24	68.25
6	100	2,760	2,410	13	322	8	291	6,000	3.2	74	6.2			48.50
7	1,600	3,000	2,630	19	322	5	582	8,400	4.2	73	6.0	12.63	12.37	69.29
8	2,300	3,000	2,430	15	322	9	510	8.000	3.7	73	6.0	12.53	12.36	63.75
9	2,200	3,120	2,400	14	322	6	473	8,000	3.6	75	6.2	12.27	12.27	59.13
10	2,200	2,880	2,440	12	322	6	510	8,000	3.4	77	6.2		12.24	63.75
11	500	3,000	2,650	15	322	7	546	8,000	3.8	74	6.1	12.53	12.44	68.25
12	2,100	2,880	2,360	17	322	9	473	8,000	3.5	75	6.0	12.64	12.33	59.13
13	1,700	2,880	2,420	18	242	8	401	8,000	3.4	74	6.2	12.54	12.23	50.13
14	800	3,000	2,410	13	242	9	510	8,000	3.6	75	6.0		12.27	63.75
15	600	2,760	2,510	14	242	8	364	8,000	3.6	76	6.1		12.40	45.50
16	900	2,880	2,460	16	242	9	655	8,400	4.1	72	6.1	12.54	12.37	77.98
17	1,500	3,000	2,380	13	242	6	510	8,000	3.6	74	6.0	12.47	12.30	63.75
18	1,100	3,000	2,450	18	242	13	546	8,400	4.0	73	6.0	12.44	12.30	65.00
19	700	2,520	1,790	21	242	17	510	8,000	4.2	76	5.9	12.55	12.35	63.75
20	1,100	2,880	2,040	21	242	12	546	8.200	3.4	77	6.1	12.47	12.16	66.59
21	900	2,760	2,070	12	242	21	401	8,000	3.8	77	6.0	12.56	12.32	50.13
22	500	2,760	1,970	18	161	13	364	8,000	3.6	77	6.4	12.00	12.30	45.50
23	600	2,880	1,920	20	242	14	364	8,000	3.6	78	6.1		12.02	45.50
24	500	2,880	1,700	15	242	15	510	8,000	3.4	79	5.9	12.20	11.89	63.75
25	800	3,000	1,700	18	242	15	655	8,400	3.5	77	6.0	12.38	12.19	77.98
26	400	2,880	1,700	19	242	14	473	8,000	3.5	77	5.8		10.73	59.13
27	400	2,400	1,950	18	242	15	510	8,000	3.6	76	6.0	12.52	12.20	63.75
28	500	2,880	1,380	19	242	15	436	9,200	3.8	75	6.0	12.69	12.36	47.39
29	200	2,640	2,030	24	161	19	765	11,000	3.5	78	5.9	12.57	12.37	69.55
30	300	2,640	1,230	23	161	8	1,384	18,000	3.5	77	5.9	12.61	12.48	76.89
31														
Total	27,200	85,440	65,990	513	7,978	354	15,692	254,000	108.6	2,259	182.2	297.45	352.37	1828.15
Max.	2,300	3,120	2,700	24	403	29	1,384	18,000	4.2	79	6.4	12.69	12.52	77.98
Min.	100	2,400	1,230	10	161	5	291	6,000	3.2	72	5.8	10.90	9.74	45.50
Avg.	907	2,848	2,200	17	266	12	523	8,467	3.6	75	6.1	12.39	12.15	60.94

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

MAY 1997 - PLANT INFLUENT SHEET

Day	Weather Type	Weather Precip.	Inf. Flow MGD	Inf. Temp F	Inf. pH SU	Inf. BOD mgIL	Inf. BOD Lbs.	Inf. SS mgIL	Inf. SS Lbs.	Inf. Phos. mgIL	Inf. Phos. Lbs.	Inf. VSS mgIL	Inf. NH3-N mgIL	--Remarks or Other Parameters--
1	Rain	0.07	1.63	59	7.1	209	2,841	92	1,251	3.68	50	84	13.9	
2	Rain	0.59	1.67	60	7.6	188	2,618	148	2,061			134	12.8	
3	Rain	0.03	1.61	54	7.5	236	3,169	214	2,873			200	14.2	
4			1.47	59	7.7	181	2,219	146	1,790			130	14.0	
5	Rain	0.34	1.82	57	7.7	221	3,355	136	2,064			139	12.3	
6			1.75	61	7.2	239	3,488	175	2,554			124	13.0	
7	Rain	0.43	1.75	59	7.6	203	2,963	156	2,277	4.10	60	136	13.3	
8	Rain	0.07	1.70	59	7.6	203	2,878	144	2,042			128	14.0	
9	Rain	0.01	1.68	59	7.6	203	2,844	220	3,082			160	13.8	
10			1.51	59	7.7	178	2,242	230	2,896			200	13.8	
11	Rain	0.09	1.49	55	7.7	203	2,523	186	2,311			170	14.5	
12			1.71	57	7.5	187	2,667	170	2,424			150	10.5	
13	Rain	0.04	1.93	59	7.5	171	2,752	141	2,270			132	9.9	
14	Rain	0.34	1.82	57	7.5	182	2,763	136	2,064			134	14.0	
15	Rain	0.08	1.52	57	7.4	178	2,256	180	2,282			170	14.0	
16	Rain	0.13	1.50	57	7.4	144	1,801	158	1,977			132	12.5	
17			1.51	57	7.6	135	1,700	130	1,637			112	12.2	
18	Rain	0.69	1.53	60	7.5	166	2,118	210	2,680			188	10.5	
19	Rain	0.02	1.88	57	7.3	197	3,089	132	2,070	3.45	54	120	13.6	
20			1.76	59	7.5	191	2,804	170	2,495			148	11.9	
21			1.78	59	7.5	203	3,014	128	1,900			108	11.7	
22			1.76	59	7.6	240	3,523	126	1,849			106	13.8	
23			1.62	57	7.4	201	2,716	136	1,837	3.18	43	112	12.8	
24	Rain	0.35	1.44	57	7.6	164	1,970	154	1,849			138	12.4	
25	Rain	0.01	1.47	61	7.8	174	2,133	168	2,060			154	12.1	
26			1.53	61	7.8	148	1,889	120	1,531			106	11.5	
27			1.83	61	7.6	170	2,595	144	2,198			124	12.3	
28	Rain	0.26	1.72	61	7.6	181	2,596	132	1,894			120	12.9	
29	Rain	0.15	1.78	61	7.7	181	2,687	130	1,930			118	14.1	
30			1.62	61	7.5	237	3,202	144	1,946			137	12.5	
31			1.39	61	7.7	173	2,006	170	1,971			158	13.7	
Total	0	3.70	51.18	1,820	234.0	5,887	81,419	4,826	66,066	14.41	207	4,272	398.5	
Max.	0	0.69	1.93	61	7.8	240	3,523	230	3,082	4.10	60	200	14.5	
Min.	0	0.01	1.39	54	7.1	135	1,700	92	1,251	3.18	43	84	9.9	
Avg.	0	0.21	1.65	59	7.5	190	2,626	156	2,131	3.60	52	138	12.9	
Count	18	18.00	31.00	31	31.0	31	31	31	31	4.00	4	31	31.0	

17816

Prepared By
Steven D. Washburn

Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

MAY 199- - PRIMARY EFFLUENT SHEET

Day	P Eff. BOD mgIL	P Eff. BOD Lbs.	P Eff. SS mgIL	P. Eff. SS Lbs.	P Eff. Phos. mgIL	P Eff. Phos. Lbs.	P Eff. VSS mgIL	P Eff. NH3-N mgIL	Flow MGD	BOD Pri. Removal %	SS Pri. Removal %	P Pri. Removal %
1	143	1,944	64	870	3.55	48	60	13.5	1.63	32	30	4
2	124	1,727	54	752			50	13.9	1.67	34	64	
3	133	1,786	54	725			50	15.8	1.61	44	75	
4	92	1,128	40	490			40	13.4	1.47	49	73	
5	95	1,442	38	577			38	12.9	1.82	57	72	
6	162	2,364	62	905			58	14.0	1.75	32	65	
7	139	2,029	40	584	2.40	35	38	15.7	1.75	32	74	41
8	149	2,113	62	879			48	15.7	1.70	27	57	
9	129	1,807	48	673			40	13.5	1.68	36	78	
10	93	1,171	38	479			30	14.9	1.51	48	83	
11	102	1,268	44	547			38	17.6	1.49	50	76	
12	102	1,455	54	770			48	14.4	1.71	45	68	
13	99	1,594	50	805			44	13.1	1.93	42	65	
14	110	1,670	62	941			56	16.1	1.82	40	54	
15	109	1,382	60	761			56	17.3	1.52	39	67	
16	76	951	54	676			40	14.8	1.50	47	66	
17	92	1,159	50	630			42	13.9	1.51	32	62	
18	95	1,212	62	791			54	11.7	1.53	43	70	
19	139	2,179	76	1,192	2.35	37	52	13.8	1.88	29	42	32
20	154	2,260	78	1,145			68	13.7	1.76	19	54	
21	115	1,707	48	713			38	12.9	1.78	43	63	
22	150	2,202	68	998			50	14.6	1.76	38	46	
23	113	1,527	60	811			54	15.0	1.62	44	56	
24	103	1,237	56	673			48	12.7	1.44	37	64	
25	91	1,116	48	588			46	12.5	1.47	48	71	
26	79	1,008	52	664	1.40	18	44	10.9	1.53	47	57	56
27	98	1,496	56	855			42	13.5	1.83	42	61	
28	112	1,607	48	689			46	14.3	1.72	38	64	
29	128	1,900	48	713			42	14.8	1.78	29	63	
30	143	1,932	62	838			54	14.8	1.62	40	57	
31	92	1,067	54	626			50	14.5	1.39	47	68	
Total	3,561	49,437	1,690	23,355	9.70	138	1,464	440.2	51.18	1,230	1,965	133
Max.	162	2,364	78	1,192	3.55	48	68	17.6	1.93	57	83	56
Min.	76	951	38	479	1.40	18	30	10.9	1.39	19	30	4
Avg.	115	1,595	55	753	2.43	34	47	14.2	1.65	40	63	33
Count	31	31	31	31	4.00	4	31	31.0	31.00	31	31	4

Prepared By
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Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

MAY 1997 - ACTIVATED SLUDGE SHEET

Day	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading f/m	Mix Liq SS mg/L	Mix Liq VSS mg/L	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mg/L	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mg/l	PE SS mg/L
1	48	5.3	8.4	0.32	2,440	2,031	31.0	0.79	3.1	223	0.48	0.39	66	29.7	1.63	143	64
2		5.2	10.1	0.27	2,546	2,127	29.0	0.88	1.8	221	0.46	0.38	61	35.3	1.67	124	54
3		5.4								225			62	35.2	1.61	133	54
4		5.9								226			63	30.1	1.47	92	40
5		4.7	11.9	0.25	2,296	1,915	32.0	0.72	5.3	220	0.54	0.35	49	25.7	1.82	95	38
6		4.9	6.5	0.49	1,964	1,606	27.0	0.73	5.1	226	0.42	0.36	50	30.8	1.75	162	62
7		4.9	10.3	0.39	2,012	1,733	23.0	0.87	3.4	225	0.36	0.28	51	29.4	1.76	139	40
8		5.1	5.4	0.53	1,576	1,322	16.0	0.99	4.5	222	0.30	0.25	58	0.7	1.70	149	62
9		5.1	12.8	0.25	2,883	2,421	30.0	0.96	1.0	227	0.44	0.37	60	24.5	1.68	129	48
10		5.7								226			64	29.1	1.51	93	38
11		5.8								222			67	30.5	1.49	102	44
12		5.0	9.5	0.24	2,448	2,044	38.0	0.64	4.6	225	0.47	0.39	59	36.2	1.71	102	54
13		4.5	8.3	0.29	2,238	1,824	30.0	0.75	5.8	226	0.43	0.34	51	37.6	1.93	99	50
14		4.7	6.9	0.31	2,180	1,820	28.0	0.78	5.0	224	0.44	0.36	54	37.6	1.82	110	62
15		5.7	8.8	0.25	2,238	1,871	28.0	0.80	5.2	227	0.40	0.34	61	37.8	1.52	109	60
16		5.7	9.4	0.18	2,125	1,760	28.0	0.76	6.2	224	0.33	0.28	62	39.3	1.50	76	54
17		5.7								223			65	36.6	1.51	92	50
18		5.6								216			64	36.6	1.53	95	62
19		4.6	5.2	0.42	2,084	1,746	29.0	0.72	3.8	223	0.44	0.37	51	37.2	1.88	139	76
20		4.9	4.8	0.51	1,829	1,472	27.0	0.68	1.1	228	0.42	0.36	54	28.7	1.76	154	78
21		4.8	9.1	0.32	2,155	1,793	29.0	0.74	4.2	230	0.37	0.31	54	27.0	1.78	115	48
22		4.9	6.4	0.41	2,142	1,789	28.0	0.77	2.8	229	0.41	0.35	54	28.8	1.76	150	68
23		5.3	8.4	0.27	2,281	1,914	28.0	0.81	6.2	225	0.37	0.31	60	30.5	1.62	113	60
24		6.0								222			65	30.7	1.44	103	56
25		5.9								227			64	31.6	1.47	91	48
26		5.6	9.4	0.18	2,076	1,859	35.0	0.59	6.1	225	0.35	0.27	64	29.8	1.53	79	52
27		4.7	7.3	0.29	2,092	1,716	30.0	0.70	5.0	227	0.42	0.34	53	30.6	1.83	98	56
28		5.0	9.6	0.29	2,206	1,837	30.0	0.74	5.1	225	0.42	0.35	56	30.4	1.72	112	48
29		4.8	8.9	0.36	2,114	1,764	26.0	0.81	4.5	224	0.42	0.35	54	28.9	1.78	128	48
30		5.3	7.5	0.37	2,092	1,760	28.0	0.75	3.6	223	0.40	0.33	60	28.6	1.62	143	62
31		6.2								223			71	30.6	1.39	92	54
Total	48	163.0	185.0	7.19	48,017	40,124	630.0	16.96	93.4	6,959	9.09	7.43	1,827	956.1	51.19	3,561	1,690
Max.	48	6.2	12.8	0.53	2,883	2,421	38.0	0.99	6.2	230	0.54	0.39	71	39.3	1.93	162	78
Min.	48	4.5	4.8	0.18	1,576	1,322	16.0	0.59	1.0	216	0.30	0.25	49	0.7	1.39	76	38
Avg.	48	5.3	8.4	0.33	2,183	1,824	28.6	0.77	4.2	224	0.41	0.34	59	30.8	1.65	115	55
Count	1	31.0	22.0	22.00	22	22	22.0	22.00	22.0	31	22.00	22.00	31	31.0	31.00	31	31

Prepared By
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Robert J. Swalwell
Superintendent

MARSHALL WWTP 601 INDUSTRIAL RD. MARSHALL MI 49068 - PERMIT MI0023540

MAY 1997 - DISCHARGE MONITORING REPORT - DISCHARGE NO. 001A

Day	F.Eff. D.O. mgIL	F.Eff. pH SU	F.Eff. SS mgIL	F.Eff. SS Lbs.	F.Eff. Total-P mgIL	Flow MGD	F.Eff. Chlorine mgIL	F.Eff. CBOD mgIL	F.Eff. CBOD Lbs.	F.Eff. NH3 as N mgIL	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %	Amenable Cyanide mg/l
1	7.2	7.5	7	95	0.31	1.63	0.000	5	68	9.1	124	2	92	98	92	
2	6.8	7.6	12	167		1.67	0.000	6	84	8.1	113	2	92	97		
3	7.2	7.6	12	161		1.61	0.000	7	94	10.1	136	1	94	97		
4	7.3	7.6	9	110		1.47	0.000	4	49	9.7	119	1	94	98		
5	7.8	7.6	10	152		1.82	0.000	6	91	9.2	140	6	93	97		
6	7.6	7.6	5	73		1.75	0.000	5	73	8.4	123	2	97	98		
7	7.2	7.4	10	146	0.50	1.75	0.000	6	88	7.9	115	2	94	97	88	
8	6.9	7.4	8	113		1.70	0.000	9	128	10.4	147	74	94	96		
9	6.6	7.5	14	196		1.68	0.000	9	126	11.9	167	4	96	96		
10	7.6	7.6	10	126		1.51	0.000	5	63	11.0	139		96	97		
11	7.6	7.6	8	99		1.49	0.000	4	50	10.8	134	3	94	98		<.005
12	7.5	7.4	10	143		1.71	0.000	5	71	13.6	194	3	93	97		
13	7.9	7.6	10	161		1.93	0.000	6	97	10.5	169	35	92	96		
14	7.5	7.5	11	167		1.82	0.000	5	76	9.2	140	2	92	97		<.005
15	7.6	7.4	12	152		1.52	0.000	5	63	9.7	123	9	93	97		
16	8.3	7.5	11	138		1.50	0.000	5	63	12.3	154	12	93	96		
17	8.0	7.5	9	113		1.51	0.000	5	63	11.6	146	16	93	96		
18	7.9	7.5	11	140		1.53	0.025	6	77	9.8	125	1	95	98		
19	7.8	7.5	10	157	0.42	1.88	0.015	4	63	9.1	143	61	92	98	88	
20	7.5	7.2	6	88		1.76	0.018	4	59	8.9	131	82	96	98		<.005
21	6.9	7.3	10	148		1.78	0.004	4	59	10.8	160	121	92	98		<.005
22	7.5	7.5	5	73		1.76	0.000	4	59	8.4	123	67	96	98		
23	7.0	7.5	10	135		1.62	0.000	4	54	8.3	112	68	93	98		
24	6.7	7.5	8	96		1.44	0.000	4	48	11.0	132	68	95	98		
25	7.5	7.6	10	123		1.47	0.000	5	61	9.7	119	54	94	97		
26	8.2	7.6	10	128	0.19	1.53	0.000	4	51	9.5	121	52	92	97	94	
27	8.1	7.6	10	153		1.83	0.000	5	76	9.6	147	96	93	97		
28	7.8	7.6	10	143		1.72	0.000	5	72	11.2	161	65	92	97		
29	7.1	7.5	11	163		1.78	0.000	5	74	12.4	184	141	92	97		
30	7.1	7.5	6	81		1.62	0.000	6	81	12.4	168	90	96	97		
31	6.5	7.5	7	81		1.39	0.000	5	58	12.0	139	118	96	97		
Total	230.2	232.8	292	4,023	1.42	51.18	0.062	162	2,237	316.6	4,345	1,258	2,906	3,013	362	<.005
Max.	8.3	7.6	14	196	0.50	1.93	0.025	9	128	13.6	194	141	97	98	94	<.005
Min.	6.5	7.2	5	73	0.19	1.39	0.000	4	48	7.9	112	1	92	96	88	<.005
Avg.	7.4	7.5	9	130	0.36	1.65	0.002	5	72	10.2	140	15	94	97	91	<.005
Count	31.0	31.0	31	31	4.00	31.00	31.000	31	31	31.0	31	30	31	31	4	4

G = Geometric Mean

Prepared By
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MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

MAY 1997 - MISCELLANEOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	SO2 Lbs.	Lime Lbs.	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	Raw Sludge pH	Sludge pH 2 Hours	Sludge pH 16 Hrs.	Lbs. of Lime per 1000 Gals. Sludge
1	600	3,000	1,270	16	242	18	595	12,000	3.9	77	5.8	12.62	12.15	49.58
2	700	2,880	1,120	17	322	8	1,190	20,500	3.8	79	5.9	12.55	12.41	58.05
3	1,000	2,880	1,090	16	242	7	327	6,250	3.4	78	6.2		12.36	52.32
4	400	2,640	1,240	15	242	7	357	6,000	3.8	80	6.0	12.57	12.38	59.50
5	600	2,760	1,140	18	161	9	179	5,000	3.9	77	6.0		12.43	35.80
6	400	2,760	1,200	17	161	9	417	6,400	4.1	75	6.0	12.50	12.35	65.16
7	300	2,880	1,270	20	242	9	536	6,500	4.0	77	5.9	12.46	12.33	82.46
8	200	2,760	560	6	161	8	298	6,400	4.1	77	5.7	12.28	12.30	46.56
9	500	2,760	810	18	161	9	298	6,700	4.1	75	5.7	12.28	11.83	44.48
10	400	2,880	500	14	322	9	357	6,000	4.2	76	5.9	12.53	12.41	59.50
11	1,400	2,640	500	12	322	9	327	6,000	3.7	76	6.1		12.04	54.50
12	300	2,760	510	14	322	10	476	7,000	3.9	76	6.1	12.52	12.40	68.00
13	200	2,880	590	15	322	9	446	6,000	4.2	74	6.1	12.48	12.44	74.33
14	300	2,880	530	10	322	13	536	9,000	3.8	74	6.1	12.46	12.42	59.56
15	600	2,760	540	10	322	15	536	8,500	3.4	73	6.0	12.46	12.44	63.06
16	300	2,760	640	11	322	18	446	8,500	3.5	76	6.0	12.51	12.39	52.47
17	300	2,760	620	10	322	12	416	8,000	3.2	75	6.0	12.58	12.38	52.00
18	0	2,520	610	10	322	14	357	8,000	3.3	76	6.0	12.54	12.09	44.63
19	300	2,760	520	8	322	16	446	9,500	3.8	73	6.0	12.38	12.41	46.95
20	100	2,760	500	11	322	14	298	8,400	3.9	74	6.0	12.47	12.37	35.48
21	200	2,760	600	13	322	16	268	8,300	3.9	76	5.9	12.46	12.41	32.29
22	100	2,640	490	7	322	18	536	8,750	3.8	75	5.9	12.48	12.40	61.26
23	200	2,760	520	7	322	19	476	8,500	3.9	76	5.8	12.44	12.47	56.00
24	100	2,760	600	8	322	13	388	8,000	3.6	76	5.8	12.26	11.80	48.50
25	100	2,760	560	6	242	16	417	8,000	3.5	76	5.9	12.53	12.27	52.13
26	200	2,760	520	8	322	17	388	8,300	3.4	76	6.0		11.27	46.75
27	200	2,640	520	7	322	9	595	8,750	3.7	75	6.0	12.46	12.39	68.00
28	100	2,760	580	9	242	10	565	8,000	3.7	76	6.0	12.42	12.24	70.63
29	100	2,760	490	7	322	12	476	7,000	3.4	77	5.9	12.47	12.38	68.00
30	0	2,640	520	8	322	12	506	8,000	3.7	72	6.4	12.39	12.53	63.25
31	100	2,760	500	8	322	12	446	8,000	3.3	76	5.9	12.59	12.47	55.75
Total	10,300	85,680	21,660	356	8,858	377	13,899	250,250	115.9	2,349	185.0	336.69	380.96	1726.92
Max.	1,400	3,000	1,270	20	322	19	1,190	20,500	4.2	80	6.4	12.62	12.53	82.46
Min.	0	2,520	490	6	161	7	179	5,000	3.2	72	5.7	12.26	11.27	32.29
Avg.	332	2,764	699	11	286	12	448	8,073	3.7	76	6.0	12.47	12.29	55.71

Prepared By
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Robert J. Swalwell
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

JUNE 1997 - PLANT INFLUENT SHEET

Day	Weather Type	Weather Precip.	Inf. Flow MGD	Inf. Temp F	Inf. pH SU	Inf. BOD mgIL	Inf. BOD Lbs.	Inf. SS mgIL	Inf. SS Lbs.	Inf. Phos. mgIL	Inf. Phos. Lbs.	Inf. VSS mgIL	Inf. NH3-N mgIL	Remarks or Other Parameters
1	Rain	0.40	1.42	61	7.6	153	1,812	226	2,676			210	13.6	
2	Rain	0.58	1.69	61	7.6	204	2,875	258	3,636			234	13.2	
3			1.63	61	7.7	207	2,814	378	5,139			220	13.5	
4			1.79	62	7.4	211	3,150	140	2,090	3.13	47	120	10.8	
5			1.86	61	7.5	158	2,451	170	2,637			150	11.2	
6			1.74	61	7.4	190	2,757	208	3,018			164	12.8	
7			1.43	61	7.7	214	2,552	210	2,505			172	18.8	
8			1.43	61	7.6	164	1,956	166	1,980			146	13.6	
9			1.89	63	7.5	157	2,475	126	1,986			108	10.8	
10			1.82	63	7.5	177	2,687	132	2,004			124	11.5	
11			1.76	64	7.5	149	2,187	126	1,849	2.80	41	101	11.1	
12	Rain	0.17	1.68	63	7.2	196	2,746	152	2,130			126	11.8	
13			1.66	61	7.5	170	2,354	120	1,661			102	13.2	
14			1.44	63	7.6	161	1,934	148	1,777			120	12.0	
15	Rain	0.10	1.42	62	7.6	171	2,025	138	1,634			122	12.1	
16	Rain	0.49	1.64	61	7.4	182	2,489	180	2,462			160	14.9	
17			1.65	61	7.7	191	2,628	190	2,615			148	13.3	
18			1.52	62	7.7	177	2,244	160	2,028	4.43	56	146	14.2	
19	Rain	0.28	1.62	61	7.5	215	2,905	220	2,972			182	13.4	
20	Rain	2.06	1.76	61	7.7	173	2,539	202	2,965			186	12.0	
21	Rain	0.54	1.78	62	7.5	150	2,227	144	2,138			134	11.0	
22	Rain	0.03	1.70	64	7.7	177	2,510	124	1,758			112	11.3	
23	Rain	0.10	1.76	61	7.5	159	2,334	156	2,290	3.13	46	134	11.8	
24			1.81	61	7.4	158	2,385	122	1,842			106	10.0	
25			1.76	62	7.6	158	2,319	128	1,879			120	11.4	
26			1.84	61	7.5	184	2,824	218	3,345			190	11.5	
27			1.67	61	7.6	147	2,047	148	2,061			124	10.4	
28			1.57	61	7.6	137	1,794	172	2,252			142	10.9	
29			1.56	62	7.5	134	1,743	130	1,691			118	10.6	
30	Rain	0.02	1.90	62	7.4	162	2,567	162	2,567			142	10.5	
31														
Total	0	4.77	50.20	1,851	226.2	5,186	72,330	5,154	71,589	13.49	190	4,363	367.2	
Max.	0	2.06	1.90	64	7.7	215	3,150	378	5,139	4.43	56	234	18.8	
Min.	0	0.02	1.42	61	7.2	134	1,743	120	1,634	2.80	41	101	10.0	
Avg.	0	0.43	1.67	62	7.5	173	2,411	172	2,386	3.37	47	145	12.2	
Count	11	11.00	30.00	30	30.0	30	30	30	30	4.00	4	30	30.0	

1701b

Steven D. Washburn
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

JUNE 1997 - PRIMARY EFFLUENT SHEET

Day	P Eff. BOD mgIL	P Eff. BOD Lbs.	P Eff. SS mgIL	P. Eff. SS Lbs.	P Eff. Phos. mgIL	P Eff. Phos. Lbs.	P Eff. VSS mgIL	P Eff. NH3-N mgIL	Flow MGD	BOD Pri. Removal %	SS Pri. Removal %	P Pri. Removal %
1	78	924	64	758			60	13.9	1.42	49	72	
2	104	1,466	54	761			28	14.8	1.69	49	79	
3	113	1,536	38	517			32	16.1	1.63	45	90	
4	132	1,971	60	896	2.25	34	48	12.9	1.79	37	57	28
5	110	1,706	42	652			36	11.8	1.86	30	75	
6	112	1,625	56	813			50	14.2	1.74	41	73	
7	79	942	58	692			44	14.3	1.43	63	72	
8	78	930	52	620			48	14.0	1.43	52	69	
9	108	1,702	48	757			46	13.0	1.89	31	62	
10	126	1,913	48	729			46	14.0	1.82	29	64	
11	103	1,512	36	528	1.80	26	30	14.6	1.76	31	71	36
12	149	2,088	66	925			50	13.5	1.68	24	57	
13	128	1,772	48	665			36	15.7	1.66	25	60	
14	82	985	46	552			32	14.6	1.44	49	69	
15	92	1,090	48	568			40	13.0	1.42	46	65	
16	101	1,381	44	602			38	15.1	1.64	45	76	
17	95	1,307	36	495	2.25	31	28	15.2	1.65	50	81	49
18	99	1,255	38	482			38	15.9	1.52	44	76	
19	86	1,162	46	621			46	13.7	1.62	60	79	
20	89	1,306	68	998			68	14.1	1.76	49	66	
21	96	1,425	46	683			46	12.3	1.78	36	68	
22	93	1,319	40	567			36	11.4	1.70	47	68	
23	83	1,218	40	587	1.70	25	34	12.7	1.76	48	74	46
24	83	1,253	48	725			36	12.4	1.81	47	61	
25	98	1,438	36	528			34	13.0	1.76	38	72	
26	82	1,258	42	645			42	13.2	1.84	55	81	
27	83	1,156	52	724			40	13.5	1.67	44	65	
28	79	1,034	42	550			42	10.7	1.57	42	76	
29	80	1,041	32	416			30	11.3	1.56	40	75	
30	106	1,680	40	634			30	11.4	1.90	38	75	
31												
Total	2,947	41,396	1,414	19,689	8.00	116	1,214	406.3	50.20	1,284	2,128	159
Max.	149	2,088	68	998	2.25	34	68	16.1	1.90	63	90	49
Min.	78	924	32	416	1.70	25	28	10.7	1.42	24	57	28
Avg.	98	1,380	47	656	2.00	29	40	13.5	1.67	43	71	40
Count	30	30	30	30	4.00	4	30	30.0	30.00	30	30	4

Steven D. Washburn
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

JUNE 1997 - ACTIVATED SLUDGE SHEET

Day	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading flm	Mix Liq SS mgIL	Mix Liq VSS mgIL	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mgIL	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mgIl	PE SS mgIL
1	48	6.1								221			68	30.3	1.42	78	64
2		5.1	8.1	0.28	2,070	1,738	29.0	0.71	5.7	222	0.37	0.31	59	29.4	1.69	104	54
3		5.3	12.0	0.29	2,079	1,752	29.0	0.72	5.1	222	0.39	0.33	58	29.7	1.63	113	38
4		4.8	6.8	0.41	2,049	1,588	29.0	0.71	5.1	222	0.35	0.29	51	28.0	1.79	132	60
5		4.6	9.0	0.35	1,961	1,645	24.0	0.82	3.5	220	0.35	0.29	52	28.9	1.86	110	42
6		5.0	8.7	0.28	2,363	1,950	29.0	0.81	3.7	220	0.42	0.35	55	30.6	1.74	112	56
7		6.0								221			67	30.0	1.43	79	58
8		6.0								222			70	31.2	1.43	78	52
9		4.6	8.4	0.32	2,121	1,756	29.0	0.73	5.5	222	0.43	0.35	52	29.6	1.89	108	48
10		4.7	8.8	0.36	2,145	1,790	26.0	0.83	3.8	220	0.37	0.31	54	29.6	1.82	126	48
11		4.9	12.4	0.28	2,181	1,824	27.0	0.81	2.9	218	0.35	0.31	55	30.0	1.76	103	36
12		5.1	6.8	0.40	2,112	1,765	26.0	0.81	4.3	216	0.37	0.31	57	30.3	1.68	149	66
13		5.2	10.7	0.30	2,373	1,981	27.0	0.88	2.0	217	0.39	0.33	56	29.3	1.66	128	48
14		6.0								222			66	31.8	1.44	82	46
15		6.1								217			71	28.4	1.42	92	48
16		5.3	11.2	0.25	2,242	1,863	31.0	0.72	4.5	216	0.40	0.35	60	28.5	1.64	101	44
17		5.2	13.8	0.23	2,283	1,917	30.0	0.76	3.5	220	0.38	0.31	59	29.9	1.65	95	36
18		5.7	14.2	0.22	2,292	1,918	30.0	0.76	3.1	219	0.38	0.31	62	30.6	1.52	99	38
19		5.3	10.7	0.21	2,212	1,847	30.0	0.74	3.5	214	0.33	0.27	58	29.1	1.62	86	46
20		4.9	6.4	0.24	2,133	1,784	28.0	0.76	2.8	223	0.36	0.30	54	28.5	1.76	89	68
21		4.8								225			54	29.9	1.78	96	46
22		5.1								226			59	29.5	1.70	93	40
23		4.9	11.1	0.23	2,183	1,793	29.0	0.75	4.0	223	0.35	0.28	55	29.5	1.76	83	40
24		4.8	8.9	0.24	2,148	1,759	29.0	0.74	2.8	220	0.37	0.30	57	29.5	1.81	83	48
25		4.9	12.2	0.29	2,146	1,660	31.0	0.69	2.2	223	0.36	0.29	57	30.4	1.76	98	36
26		4.7	9.8	0.24	2,114	1,732	31.0	0.68	3.0	228	0.37	0.31	51	30.5	1.84	82	42
27		5.2	8.6	0.23	2,076	1,712	30.0	0.69	4.1	228	0.34	0.28	60	25.2	1.67	83	52
28		5.5								226			63	30.3	1.57	79	42
29		5.5								224			65	29.3	1.56	80	32
30		4.5	9.1	0.36	1,920	1,574	27.0	0.71	4.2	224	0.35	0.29	54	26.8	1.90	106	40
31																	
Total	48	155.7	207.7	5.99	45,203	37,348	601.0	15.84	79.3	6,641	7.78	6.47	1,759	884.6	50.20	2,947	1,414
Max.	48	6.1	14.2	0.41	2,373	1,981	31.0	0.88	5.7	228	0.43	0.35	71	31.8	1.90	149	68
Min.	48	4.5	6.4	0.21	1,920	1,574	24.0	0.68	2.0	214	0.33	0.27	51	25.2	1.42	78	32
Avg.	48	5.2	9.9	0.29	2,153	1,778	28.6	0.75	3.8	221	0.37	0.31	59	29.5	1.67	98	47
Count	1	30.0	21.0	21.00	21	21	21.0	21.00	21.0	30	21.00	21.00	30	30.0	30.00	30	30

Steven D. Washburn
Superintendent

MARSHALL WWTP 801 INDUSTRIAL RD. MARSHALL MI 49068 - PERMIT MI0023540

JUNE 1997 - DISCHARGE MONITORING REPORT - DISCHARGE NO. 001A

Day	F.Eff. D.O. mgIL	F.Eff. pH SU	F.Eff. SS mgIL	F.Eff. SS Lbs.	F.Eff. Total-P mgIL	Flow MGD	F.Eff. Chlorine mgIL	F.Eff. CBOD mgIL	F.Eff. CBOD Lbs.	F.Eff. NH3 as N mgIL	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %	Amenable Cyanide mg/l
1	7.8	7.7	9	107		1.42	0.000	4	47	10.3	122	6	96	97		
2	7.8	7.6	10	141		1.69	0.000	4	56	10.8	152	42	96	98		
3	7.3	7.6	2	27		1.63	0.000	3	41	14.0	190	420	99	99		
4	7.9	7.5	4	60	0.23 3.4	1.79	0.000	3	45	10.2	152	5	97	99	93	
5	6.9	7.5	7	109		1.86	0.000	4	62	7.4	115	6	96	97		
6	7.1	7.4	5	73		1.74	0.000	4	58	9.6	139	3	98	98		
7	7.1	7.6	5	60		1.43	0.000	4	48	9.7	116	2	98	98		
8	7.7	7.6	5	60		1.43	0.000	3	36	9.8	117	2	97	98		
9	7.8	7.5	8	126		1.89	0.000	4	63	8.6	136	440	94	97		
10	7.1	7.5	5	76		1.82	0.000	5	76	10.0	152	189	96	97		
11	6.9	7.4	4	59	0.18 2.4	1.76	0.000	4	59	8.3	122	5	97	97	94	
12	7.1	7.3	9	126		1.68	0.000	5	70	7.9	111	7	94	97		<0.005
13	6.3	7.5	7	97		1.66	0.000	5	69	11.0	152	41	94	98		
14	6.7	7.6	7	84		1.44	0.000	4	48	8.7	104	13	95	98		
15	7.4	7.6	4	47		1.42	0.000	4	47	6.6	78	10	97	98		
16	6.9	7.5	10	137		1.64	0.000	4	55	9.3	127	11	94	98		<0.005
17	7.0	7.5	5	69	0.22 3.0	1.65	0.000	4	55	9.6	132	5	97	98	95	
18	6.4	7.5	7	89		1.52	0.000	4	51	6.7	85	4	96	98		
19	6.5	7.4	6	81		1.62	0.000	4	54	6.3	85	5	97	98		
20	6.4	7.6	10	147		1.76	0.000	4	59	4.9	72	6	95	98		<0.005
21	6.3	7.4	8	119		1.78	0.000	4	59	2.8	42	9	94	97		
22	6.5	7.4	2	28		1.70	0.000	4	57	3.1	44	14	98	98		<0.005
23	6.7	7.4	4	59	0.10 1.5	1.76	0.000	3	44	3.7	54	31	97	98	95	
24	6.4	7.4	5	75		1.81	0.000	3	45	4.8	72	20	96	98		
25	6.3	7.5	1	15		1.76	0.000	3	44	2.9	43	8	99	98		
26	6.6	7.5	4	61		1.84	0.000	3	46	2.0	31	6	98	98		
27	7.6	7.5	7	97		1.67	0.000	3	42	0.7	10	182	95	98		
28	6.7	7.5	2	26		1.57	0.000	3	39	0.3	4	304	99	98		
29	7.4	7.5	3	39		1.56	0.000	3	39	3.0	39	195	98	98		
30	6.8	7.3	6	95		1.90	0.000	3	48	3.1	49	242	96	98		
31																
Total	209.4	224.8	171	2,387	0.73	50.20	0.000	112	1,562	206.1	2,847	2,233	2,893	2,935	377	<0.005
Max.	7.9	7.7	10	147	0.23	1.90	0.000	5	76	14.0	190	440	99	99	95	<0.005
Min.	6.3	7.3	1	15	0.10	1.42	0.000	3	36	0.3	4	2	94	97	93	<0.005
Avg.	7.0	7.5	6	80	0.18	1.67	0.000	4	52	6.9	95	G 18	96	98	94	<0.005
Count	30.0	30.0	30	30	4.00	30.00	30.000	30	30	30.0	30	30	30	30	4	4

10.5
3.4
1.5
2.6
4

G = Geometric Mean

Steven D. Washburn
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

JUNE 1997 - MISCELLANEOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	SO2 Lbs	Lime Lbs.	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	Raw Sludge pH	Sludge pH 2 Hours	Sludge pH 16 Hrs.	Lbs. of Lime per 1000 Gals. Sludge
1		2,640	400	8	322	12	404	8,000	3.3	75	5.9	12.35	11.98	50.50
2		2,760	480	10	322	14	484	8,500	3.6	77	5.9	12.48	12.42	56.94
3		2,760	595	11	322	12	484	8,000	4.1	68	6.0	12.51	12.52	60.50
4		2,640	595	19	322	13	296	6,500	4.9	68	5.9	12.20	11.19	45.54
5		2,640	530	13	161	10	484	9,200	4.6	67	5.8	12.39	12.37	52.61
6		2,760	440	12	322	10	538	8,000	4.6	69	5.8	12.48	12.43	67.25
7		2,640	425	10	322	11	404	8,200	4.2	71	5.8	12.45	12.43	49.27
8		2,520	425	8	242	6	323	8,000	3.9	72	5.8	12.43	12.34	40.38
9		2,640	490	9	322	9	511	9,500	4.1	71	5.9	12.17	11.92	53.79
10		2,760	470	12	322	9	538	8,600	3.7	73	5.9	12.37	12.25	62.56
11		2,640	380	11	322	10	511	8,500	3.9	73	5.9	12.32	12.17	60.12
12		2,640	480	11	322	8	565	8,500	3.7	73	5.9	12.22	12.24	66.47
13		2,640	590	13	322	9	484	8,000	3.7	73	5.9	12.40	12.44	60.50
14		2,640	410	15	322	12	322	8,500	3.6	74	5.8		12.20	37.88
15		2,640	410	14	322	9	108	8,000	3.7	72	5.8	12.31	12.04	13.50
16		2,640	370	14	242	10	404	8,400	3.9	74	5.8	12.50	12.44	48.10
17		2,640	490	15	322	11	322	8,500	3.7	80	5.8	12.43	12.38	37.88
18		2,520	430	16	322	10	404	8,500	3.5	75	6.0		12.42	47.53
19		2,520	460	12	242	9	511	8,400	3.5	76	5.9	12.43	12.42	60.83
20		2,760	670	15	161	11	404	8,500	3.4	75	5.9	12.44	12.47	47.53
21		2,520	460	15	322	7	377	8,000	3.5	72	5.9	12.45	12.38	47.13
22		2,640	410	15	242	4	377	8,000	3.5	74	5.9	12.52	12.22	47.13
23		2,640	480	14	242	3	457	8,500	3.4	75	5.7	12.39	12.38	53.76
24		2,760	450	15	242	18	430	8,500	3.4	73	5.7	12.41	12.43	50.59
25		2,640	450	19	322	7	511	8,600	3.3	74	5.8	12.44	12.40	59.42
26		2,760	490	10	242	5	538	8,500	3.0	73	5.8	12.39	12.45	63.29
27		2,640	410	12	242	3	377	8,000	3.2	76	5.9	12.45	12.47	47.13
28		2,880	430	11	242	3	377	9,000	2.9	75	6.0	12.48	12.48	41.89
29		2,640	430	4	161	5	322	9,000	2.8	76	5.9	12.60	12.51	35.78
30		2,760	420	8	322	3	430	8,000	2.6	74	6.0	12.45	12.45	53.75
31														
Total		79,920	13,970	371	8,457	263	12,697	250,400	109.2	2,198	176.0	347.46	369.24	1519.53
Max.		2,880	670	19	322	18	565	9,500	4.9	80	6.0	12.60	12.52	67.25
Min.		2,520	370	4	161	3	108	6,500	2.6	67	5.7	12.17	11.19	13.50
Avg.		2,664	466	12	282	9	423	8,347	3.6	73	5.9	12.41	12.31	50.65

Steven D. Washburn
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

JULY 1997 - PLANT INFLUENT SHEET

Day	-----Weather----- Type	Precip.	Inf. Flow MGD	Inf. Temp F	Inf. pH SU	Inf. BOD mgIL	Inf. BOD Lbs.	Inf. SS mgIL	Inf. SS Lbs.	Inf. Phos. mgIL	Inf. Phos. Lbs.	Inf. VSS mgIL	Inf. NH3-N mgIL	--Remarks or Other Parameters--
1			1.82	62	7.5	161	2,444	162	2,459			146	10.6	
2	Rain	0.25	1.81	62	7.5	175	2,642	162	2,445			150	9.5	
3			1.80	62	7.3	165	2,477	146	2,192			142	12.2	
4			1.42	61	7.5	193	2,286	150	1,776			141	18.5	
5			1.46	61	7.4	204	2,484	146	1,778			134	16.5	
6	Rain	0.07	1.49	61	7.2	161	2,001	166	2,063	3.00	37	150	13.0	
7			1.80	61	7.1	189	2,837	144	2,162			120	10.9	
8	Rain	0.03	1.78	62	7.3	173	2,568	124	1,841			118	11.3	
9			1.81	62	7.2	161	2,430	114	1,721			100	11.2	
10			1.74	62	7.2	157	2,278	156	2,264			134	11.3	
11			1.68	64	7.3	150	2,102	144	2,018			128	11.6	
12			1.43	62	7.3	177	2,111	214	2,552			194	15.2	
13			1.43	64	7.3	233	2,779	140	1,670			130	12.7	
14	Rain	0.75	1.80	64	7.3	206	3,092	112	1,681			96	11.1	
15			1.72	64	7.4	205	2,941	128	1,836	3.35	48	110	11.0	
16			1.81	63	7.3	191	2,883	198	2,989			142	12.0	
17	Rain	0.02	1.77	66	7.3	304	4,488	222	3,277			172	10.9	
18			1.69	64	7.6	188	2,650	220	3,101			176	10.9	
19			1.36	63	7.4	178	2,019	194	2,200			170	13.5	
20			1.37	63	7.5	166	1,897	180	2,057			158	14.8	
21	Rain	0.60	1.64	64	7.4	173	2,366	204	2,790	4.83	66	182	13.9	
22			1.60	64	7.5	203	2,709	152	2,028			70	14.3	
23			1.61	64	7.4	176	2,363	108	1,450			88	13.1	
24			1.59	64	7.4	208	2,758	156	2,069			138	11.9	
25			1.61	66	7.5	148	1,987	166	2,229			152	13.0	
26			1.39	63	7.3	185	2,145	174	2,017			174	14.5	
27	Rain	0.03	1.38	63	7.5	196	2,256	174	2,003			154	12.3	
28			1.59	65	7.4	221	2,931	220	2,917			186	12.8	
29			1.64	68	7.5	211	2,886	192	2,626	4.58	63	172	12.8	
30			1.68	66	7.3	207	2,900	232	3,251			86	13.3	
31			1.65	66	7.3	172	2,367	200	2,752			82	13.5	
Total	0	1.75	50.37	1,966	228.4	5,837	79,076	5,200	70,213	15.76	214	4,295	394.1	
Max.	0	0.75	1.82	68	7.6	304	4,488	232	3,277	4.83	66	194	18.5	
Min.	0	0.02	1.36	61	7.1	148	1,897	108	1,450	3.00	37	70	9.5	
Avg.	0	0.25	1.62	63	7.4	188	2,551	168	2,265	3.94	54	139	12.7	
Count	7	7.00	31.00	31	31.0	31	31	31	31	4.00	4	31	31.0	

172

Steven D. Washburn
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

JULY 1997 - PRIMARY EFFLUENT SHEET

	P Eff. BOD mgIL	P Eff. BOD Lbs.	P Eff. SS mgIL	P. Eff. SS Lbs.	P Eff. Phos. mgIL	P Eff. Phos. Lbs.	P Eff. VSS mgIL	P Eff. NH3-N mgIL	Flow MGD	BOD Pri. Removal %	SS Pri. Removal %	P Pri. Removal %
Day												
1	127	1,928	44	668			42	12.5	1.82	21	73	
2	118	1,781	52	785			46	10.7	1.81	33	68	
3	128	1,922	62	931			46	13.0	1.80	22	58	
4	97	1,149	48	568			64	16.8	1.42	50	68	
5	136	1,656	56	682			50	16.8	1.46	33	62	
6	113	1,404	52	646			46	14.8	1.49	30	69	
7	128	1,922	78	1,171			62	13.0	1.80	32	46	
8	125	1,856	72	1,069	2.40	36	62	13.1	1.78	28	42	20
9	62	936	62	936			48	13.6	1.81	61	46	
10	114	1,654	64	929			52	13.7	1.74	29	59	
11	112	1,569	78	1,093			64	13.6	1.68	29	46	
12	100	1,193	82	978			72	14.1	1.43	33	62	
13	111	1,324	70	835			60	14.8	1.43	37	50	
14	166	2,492	94	1,411			80	13.2	1.80	29	16	
15	147	2,109	84	1,205	1.70	24	70	13.6	1.72	29	34	49
16	147	2,219	88	1,328			74	14.1	1.81	28	56	
17	97	1,432	94	1,388			62	13.8	1.77	49	58	
18	200	2,819	110	1,550			88	16.3	1.69	34	45	
19	132	1,497	100	1,134			36	15.0	1.36	30	48	
20	110	1,257	78	891			68	15.2	1.37	38	57	
21	115	1,573	92	1,258	3.10	42	92	16.3	1.64	31	55	36
22	113	1,508	82	1,094			76	15.4	1.60	35	46	
23	127	1,705	80	1,074			70	16.9	1.61	37	26	
24	129	1,711	86	1,140			80	15.5	1.59	27	45	
25	139	1,866	84	1,128			78	15.4	1.61	33	49	
26	112	1,298	98	1,136			98	14.0	1.39	24	44	
27	115	1,324	60	691			56	14.9	1.38	38	66	
28	107	1,419	76	1,008			48	15.0	1.59	45	65	
29	143	1,956	82	1,122	2.10	29	64	13.9	1.64	35	57	54
30	123	1,723	74	1,037			58	13.3	1.68	41	68	
31	115	1,583	70	963			54	13.8	1.65	33	65	
Total	3,808	51,783	2,352	31,849	9.30	131	1,966	446.1	50.37	1,054	1,649	159
Max.	200	2,819	110	1,550	3.10	42	98	16.9	1.82	61	73	54
Min.	62	936	44	568	1.70	24	36	10.7	1.36	21	16	20
Avg.	123	1,670	76	1,027	2.33	33	63	14.4	1.62	34	53	40
Count	31	31	31	31	4.00	4	31	31.0	31.00	31	31	4

Steven D. Washburn
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

JULY 1997 - ACTIVATED SLUDGE SHEET

	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading f/m	Mix Liq SS mg/L	Mix Liq VSS mg/L	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mg/L	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mg/l	PE SS mg/L
Day																	
1	48	4.7	9.0	0.39	2,008	1,647	31.0	0.65	2.0	225	0.37	0.29	55	29.1	1.82	127	44
2		4.8	7.8	0.36	2,046	1,671	31.0	0.66	1.5	223	0.40	0.36	52	29.5	1.81	118	52
3		4.8	6.4	0.37	1,980	1,726	31.0	0.64	2.4	230	0.35	0.29	50	28.2	1.80	128	62
4		6.1								234			62	28.5	1.42	97	48
5		5.9								232			60	29.0	1.46	136	56
6		5.8								231			63	30.2	1.49	113	52
7		4.8	4.9	0.39	1,934	1,645	28.0	0.69	2.5	234	0.36	0.29	54	28.7	1.80	128	78
8		4.8	5.9	0.33	2,114	1,854	29.0	0.73	0.9	223	0.37	0.29	55	28.4	1.78	125	72
9		4.8	6.6	0.18	2,078	1,720	32.0	0.65	2.1	236	0.38	0.31	53	30.1	1.81	62	62
10		5.0	7.2	0.29	2,223	1,899	35.0	0.64	2.1	236	0.37	0.31	57	30.2	1.74	114	64
11		5.1	6.4	0.28	2,319	1,902	37.0	0.63	1.3	242	0.38	0.32	60	30.6	1.68	112	78
12		6.0								237			72	31.4	1.43	100	82
13		6.0								229			71	30.4	1.43	111	70
14		4.8	4.4	0.46	2,058	1,815	35.0	0.59	2.0	226	0.38	0.32	52	31.1	1.80	166	94
15		5.0	5.5	0.38	2,200	1,839	38.0	0.58	1.1	222	0.39	0.33	58	29.6	1.72	147	84
16		4.8	5.3	0.38	2,331	1,955	40.0	0.58	0.7	239	0.38	0.32	55	29.1	1.81	147	88
17		4.9	5.0	0.25	2,335	1,929	40.0	0.58	1.6	231	0.46	0.38	56	35.1	1.77	97	94
18		5.1	4.4	0.49	2,267	1,940	43.0	0.53	2.1	231	0.38	0.31	60	36.7	1.69	200	110
19		6.3								249			74	36.8	1.36	132	100
20		6.3								245			73	35.6	1.37	110	78
21		5.3	5.4	0.30	2,252	1,757	44.0	0.51	3.1	247	0.37	0.30	60	37.7	1.64	115	92
22		5.4	5.8	0.29	2,107	1,745	38.0	0.55	2.2	248	0.36	0.30	60	37.3	1.60	113	82
23		5.4	5.6	0.34	2,010	1,667	35.0	0.57	2.7	246	0.32	0.26	62	36.6	1.61	127	80
24		5.4	5.8	0.34	2,219	1,677	35.0	0.63	2.9	243	0.31	0.26	62	36.7	1.59	129	86
25		5.4	5.3	0.34	2,000	1,837	40.0	0.50	2.4	238	0.30	0.21	63	36.3	1.61	139	84
26		6.2								239			72	37.9	1.39	112	98
27		6.2								241			70	32.1	1.38	115	60
28		5.4	5.4	0.32	1,830	1,494	37.0	0.49	1.6	254	0.31	0.31	63	23.8	1.59	107	76
29		5.3	4.9	0.44	1,828	1,474	41.0	0.45	1.8	253	0.33	0.33	62	16.0	1.64	143	82
30		5.1	6.0	0.33	2,062	1,738	43.0	0.48	1.6	253	0.33	0.33	60	11.0	1.68	123	74
31		5.2	6.6	0.31	2,109	1,719	50.0	0.42	1.8	252	0.37	0.37	58	18.4	1.65	115	70
Total	48	165.9	129.4	7.55	46,310	38,650	813.0	12.75	42.4	7,369	7.97	6.79	1,884	942.1	50.37	3,808	2,352
Max.	48	6.3	9.0	0.49	2,335	1,955	50.0	0.73	3.1	254	0.46	0.38	74	37.9	1.82	200	110
Min.	48	4.7	4.4	0.18	1,828	1,474	28.0	0.42	0.7	222	0.30	0.21	50	11.0	1.36	62	44
Avg.	48	5.4	5.9	0.34	2,105	1,757	37.0	0.58	1.9	238	0.36	0.31	61	30.4	1.62	123	76
Count	1	31.0	22.0	22.00	22	22	22.0	22.00	22.0	31	22.00	22.00	31	31.0	31.00	31	31

Steven D. Washburn
Superintendent

MARSHALL WWTP 801 INDUSTRIAL RD. MARSHALL MI 49068 - PERMIT MI0023540

JULY 1997 - DISCHARGE MONITORING REPORT - DISCHARGE NO. 001A

Day	F.Eff. D.O. mgIL	F.Eff. pH SU	F.Eff. SS mgIL	F.Eff. SS Lbs.	F.Eff. Total-P mgIL	Flow MGD	F.Eff. Chlorine mgIL	F.Eff. CBOD mgIL	F.Eff. CBOD Lbs.	F.Eff. NH3 as N mgIL	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %	Amenable Cyanide mg/l
1	6.0	7.5	8	121		1.82	0.000	4	61	5.4	82	28	95	98		
2	6.0	7.5	4	60		1.81	0.000	4	60	4.3	65	46	98	98		
3	6.5	7.3	7	105		1.80	0.000	4	60	3.5	53	47	95	98		
4	6.0	7.5	7	83		1.42	0.000	3	36	3.6	43	30	97	98		
5	6.2	7.4	1	12		1.46	0.000	5	61	2.8	34	46	99	98		
6	6.0	7.2	2	25		1.49	0.000	4	50	1.5	19	32	99	98		
7	6.6	7.1	2	30		1.80	0.000	3	45	2.9	44	64	99	98		
8	6.0	7.3	4	59	0.42	1.78	0.000	4	59	4.7	70	53	97	98	86	
9	6.2	7.2	5	75		1.81	0.000	5	75	8.1	122	66	96	97		
10	6.6	7.2	7	102		1.74	0.000	4	58	6.2	90	44	96	98		<0.005
11	6.4	7.3	9	126		1.68	0.000	4	56	4.4	62	106	94	97		
12	6.3	7.3	3	36		1.43	0.000	4	48	2.9	35	60	99	97		
13	6.6	7.3	6	72		1.43	0.000	3	36	3.3	39	81	96	98		
14	6.2	7.3	7	105		1.80	0.000	5	75	9.3	140	47	94	98		<0.005
15	6.0	7.4	11	158	0.17	1.72	0.000	5	72	7.3	105	125	91	98	95	
16	6.0	7.3	9	136		1.81	0.000	6	91	10.1	152	180	95	97		<0.005
17	6.3	7.3	13	192		1.77	0.000	4	59	6.7	99	66	94	98		
18	5.9	7.3	10	141		1.69	0.000	4	56	6.3	89	47	95	99		
19	6.2	7.6	12	136		1.36	0.000	5	57	8.2	93	145	94	97		
20	6.2	7.4	5	57		1.37	0.000	5	57	4.9	56	19	97	97		<0.005
21	6.4	7.5	5	68	0.17	1.64	0.000	5	68	5.7	78	28	98	97	96	
22	6.5	7.4	6	80		1.60	0.000	5	67	7.3	97	15	96	97		
23	6.0	7.4	8	107		1.61	0.000	5	67	5.9	79	23	93	98		
24	6.5	7.5	5	66		1.59	0.000	5	66	4.5	60	34	97	97		
25	6.6	7.3	3	40		1.61	0.000	6	81	7.2	97	43	98	97		
26	6.1	7.5	9	121		1.61	0.000	6	81	6.7	90	102	95	96		
27	6.1	7.4	5	58		1.39	0.000	5	58	2.7	31	56	97	97		
28	6.2	7.5	10	115		1.38	0.000	5	58	4.7	54	50	95	97		
29	5.7	7.3	8	106	0.36	1.59	0.000	9	119	8.8	117	40	96	96	92	
30	6.2	7.3	8	109		1.64	0.000	8	109	6.9	94	54	97	96		
31	6.4	7.4	6	84		1.68	0.000	8	112	6.0	84	120	97	95		
Total	192.9	228.2	205	2,787	1.12	50.33	0.000	152	2,057	172.8	2,371	1,897	2,979	3,018	369	0
Max.	6.6	7.6	13	192	0.42	1.82	0.000	9	119	10.1	152	180	99	99	96	0
Min.	5.7	7.1	1	12	0.17	1.36	0.000	3	36	1.5	19	15	91	95	86	0
Avg.	6.2	7.4	7	90	0.28	1.62	0.000	5	66	5.6	76	G 52	96	97	92	0
Count	31.0	31.0	31	31	4.00	31.00	31.000	31	31	31.0	31	31	31	31	4	4

3.9

G = Geometric Mean

Steven D. Washburn
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

JULY 1997 - MISCELLANEOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	SO2 Lbs.	Lime Lbs.	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	Raw Sludge pH	Sludge pH 2 Hours	Sludge pH 16 Hrs.	Lbs. of Lime per 1000 Gals. Sludge
1		2,640	500	10	161	4	347	8,000	2.4	76	6.0	12.59		43.38
2		2,760	520	11	322	5	416	8,500	2.5	75	5.9	12.45	12.40	48.94
3		2,640	600	12	242	5	416	8,000	2.6	56	5.9	12.49	12.21	52.00
4		2,880	380	12	161	5	254	8,000	2.8	75	6.1		12.31	31.75
5		2,640	480	12	161	4	416	9,000	2.4	73	6.1	12.57	12.52	46.22
6		2,640	440	14	161	4	462	8,000	2.4	75	5.9	12.38	12.29	57.75
7		2,760	610	15	161	5	347	9,500	2.5	75	6.1	12.42	12.21	36.53
8		2,640	590	17	242	5	277	9,000	2.7	74	6.0	12.37	12.37	30.78
9		2,880	500	12	322	5	439	9,200	2.6	85	6.0	12.39	12.33	47.72
10		2,520	630	11	322	5	485	8,600	3.0	74	6.1	12.32	12.28	56.40
11		2,640	750	18	322	9								
12		3,000	510	15	322	9	277	8,000	2.7	75	6.1	12.54	12.42	34.63
13		2,640	1,670	12	322	10	92	8,000	2.7	73	6.1	12.42	12.37	11.50
14		2,760	1,550	14	483	8	347	12,600	2.9	74	6.3	12.30	12.31	27.54
15		2,640	540	15	322	9	277	8,600	2.8	75	6.2	12.41	12.40	32.21
16		2,760	2,120	13	322	8	347	10,000	3.1	73	6.2		11.35	34.70
17		2,760	1,750	14	322	9	323	11,200	3.1	74	6.2	12.36	12.17	28.84
18		2,640	1,090	16	322	12	323	9,000	3.1	75	6.2	12.59	12.17	35.89
19		2,640	1,750	20	403	12	393	9,000	2.9	73	6.2	12.20	12.53	43.67
20		2,640	1,440	21	322	12	370	9,000	2.9	73	6.3	12.27	12.01	41.11
21		2,640	460	17	322	11	439	10,000	3.0	72	6.3	12.41	12.31	43.90
22		2,880	680	16	242	13	462	9,500	3.3	73	6.3	12.32	12.42	48.63
23		2,880	670	17	242	12	323	10,000	3.0	73	6.2	12.47	12.13	32.30
24		2,640	58,050	18	322	10	462	9,000	3.4	69	6.2	12.49	12.48	51.33
25		2,760	680	19	322	13	323	8,500	2.8	71	6.2	12.42	12.52	38.00
26		2,640	1,450	20	322	7	323	9,000	2.7	72	6.3	12.43		35.89
27		2,640	65,050	14	322	5	300	9,200	2.7	66	6.2	12.41	12.38	32.61
28		2,760	62,070	24	322	6	370	9,000	2.9	72	6.3	12.52	12.12	41.11
29		2,760	620	19	322	6	323	9,000	2.9	70	6.2	12.49	12.51	35.89
30		2,880	1,950	19	322	7	462	9,000	3.2	74	6.2	12.66	12.39	51.33
31		2,640	1,670	17	322	10	323	9,200	3.2	73	6.0	12.49	12.47	35.11
Total		84,240	211,770	484	9,099	245	10,718	272,600	85.2	2,188	184.3	348.18	344.38	1187.64
Max.		3,000	65,050	24	483	13	485	12,600	3.4	85	6.3	12.66	12.53	57.75
Min.		2,520	380	10	161	4	92	8,000	2.4	56	5.9	12.20	11.35	11.50
Avg.		2,717	6,831	16	294	8	357	9,087	2.8	73	6.1	12.44	12.30	39.59

Steven D. Washburn
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

AUGUST 1997 PLANT INFLUENT SHEET

Day	Weather Type	Weather Precip.	Inf. Flow MGD	Inf. Temp F	Inf. pH SU	Inf. BOD mgIL	Inf. BOD Lbs.	Inf. SS mgIL	Inf. SS Lbs.	Inf. Phos. mgIL	Inf. Phos. Lbs.	Inf. VSS mgIL	Inf. NH3-N mgIL	--Remarks or Other Parameters--
1			1.64	58	7.5	218	2,982	176	2,407			164	13.2	
2			1.33	58	7.5	191	2,119	154	1,708			136	14.2	
3	RAIN	0.39	1.35	60	7.6	152	1,711	162	1,824			136	13.2	
4			1.54	60	7.6	193	2,479	156	2,004			142	11.9	
5			1.72	60	7.6	159	2,281	128	1,836	3.08	44	114	10.6	
6			1.69	60	7.6	178	2,509	100	1,409			184	11.7	
7			1.66	63	7.4	256	3,544	148	2,049			120	13.4	
8			1.70	64	7.6	176	2,495	180	2,552			180	11.3	
9			1.33	62	7.5	185	2,052	168	1,863			154	13.3	
10	RAIN	0.30	1.35	63	7.6	149	1,678	154	1,734			134	14.1	
11	RAIN	0.39	1.56	63	7.7	168	2,186	176	2,290			152	16.4	
12	RAIN	0.34	1.64	63	7.8	199	2,722	204	2,790			180	16.0	
13			1.73	63	7.7	189	2,727	152	2,193	3.40	49	136	15.8	
14	RAIN	0.02	1.54	63	7.6	208	2,671	152	1,952			128	16.1	
15			1.44	68	7.6	186	2,234	172	2,066			162	16.3	
16	RAIN	0.43	1.53	64	7.6	194	2,475	218	2,782			200	15.9	
17	RAIN	0.33	1.41	63	7.6	189	2,223	146	1,717			134	16.2	
18	RAIN	0.05	1.61	65	7.6	171	2,296	112	1,504			106	13.2	
19	RAIN	0.17	1.74	63	7.6	169	2,452	208	3,018			90	12.2	
20	RAIN	0.03	1.62	63	7.8	204	2,756	200	2,702	4.35	59	86	13.7	
21	RAIN	0.05	1.57	63	7.6	172	2,252	156	2,043			134	11.9	
22	RAIN	0.25	1.55	65	7.5	208	2,689	202	2,611			188	11.8	
23	RAIN	0.45	1.67	65	7.5	214	2,981	150	2,089			132	11.3	
24	RAIN	0.32	1.71	68	7.6	187	2,667	162	2,310			136	11.2	
25			1.94	64	7.5	209	3,382	152	2,459			172	12.9	
26			1.73	63	7.2	182	2,626	157	2,265	3.68	53	140	11.2	
27			1.76	64	7.6	169	2,481	172	2,525			156	11.7	
28			1.76	64	7.5	175	2,569	184	2,701			156	12.1	
29			1.47	63	7.6	265	3,249	198	2,427			180	12.0	
30	RAIN	0.34	1.18	63	7.7	184	1,811	158	1,555			146	12.4	
31			1.09	62	7.6	216	1,964	160	1,454			148	11.1	
Total	0	3.86	48.56	1,950	235.0	5,915	77,260	5,117	66,841	14.51	205	4,526	408.3	
Max.	0	0.45	1.94	68	7.8	265	3,544	218	3,018	4.35	59	200	16.4	
Min.	0	0.02	1.09	58	7.2	149	1,678	100	1,409	3.08	44	86	10.6	
Avg.	0	0.26	1.57	63	7.6	191	2,492	165	2,156	3.63	51	146	13.2	
Count	15	15.00	31.00	31	31.0	31	31	31	31	4.00	4	31	31.0	

(73 lbs

Steven D. Washburn
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

AUGUST 1997 - PRIMARY EFFLUENT SHEET

Day	P Eff. BOD mgIL	P Eff. BOD Lbs.	P Eff. SS mgIL	P. Eff. SS Lbs.	P Eff. Phos. mgIL	P Eff. Phos. Lbs.	P Eff. VSS mgIL	P Eff. NH3-N mgIL	Flow MGD	BOD Prı. Removal %	SS Prı. Removal %	P Prı. Removal %
1	143	1,956	82	1,122			72	14.1	1.64	34	53	
2	114	1,265	88	976			76	14.8	1.33	40	43	
3	103	1,160	82	923			78	15.1	1.35	32	49	
4	95	1,220	64	822			60	14.6	1.54	51	59	
5	133	1,908	100	1,434	2.00	29	82	13.3	1.72	16	22	35
6	142	2,001	96	1,353			162	13.8	1.69	20	4	
7	233	3,226	140	1,938			112	14.6	1.66	9	5	
8	148	2,098	112	1,588			112	12.2	1.70	16	38	
9	121	1,342	112	1,242			88	14.2	1.33	35	33	
10	116	1,306	80	901			66	14.4	1.35	22	48	
11	120	1,561	86	1,119			72	16.0	1.56	29	51	
12	120	1,641	76	1,039			64	16.7	1.64	40	63	
13	95	1,371	56	808	3.40	49	40	15.5	1.73	50	63	15
14	114	1,464	64	822			54	16.0	1.54	45	58	
15	101	1,213	48	576			46	16.7	1.44	46	72	
16	102	1,302	40	510			40	15.3	1.53	47	82	
17	109	1,282	36	423			36	15.1	1.41	42	75	
18	94	1,262	52	698			52	13.1	1.61	45	54	
19	106	1,538	40	580			40	12.7	1.74	37	81	
20	127	1,716	42	567	2.15	29	30	14.1	1.62	38	79	51
21	98	1,283	34	445			24	12.3	1.57	43	78	
22	99	1,280	58	750			46	13.2	1.55	52	71	
23	107	1,490	48	669			44	12.8	1.67	50	68	
24	122	1,740	44	628			36	11.0	1.71	35	73	
25	113	1,828	54	874			42	13.4	1.94	46	64	
26	207	2,987	62	895	3.00	43	54	12.2	1.73	14	61	18
27	121	1,776	54	793			50	13.2	1.76	28	69	
28	149	2,187	76	1,116			60	12.2	1.76	15	59	
29	149	1,827	74	907			70	14.4	1.47	44	63	
30	96	945	70	689			54	13.9	1.18	48	56	
31	104	945	62	564			62	13.2	1.09	52	61	
Total	3,801	50,120	2,132	27,772	10.55	150	1,924	434.1	48.56	1,121	1,755	119
Max.	233	3,226	140	1,938	3.40	49	162	16.7	1.94	52	82	51
Mın.	94	945	34	423	2.00	29	24	11.0	1.09	9	4	15
Avg.	123	1,617	69	896	2.64	38	62	14.0	1.57	36	57	30
Count	31	31	31	31	4.00	4	31	31.0	31.00	31	31	4

Steven D. Washburn
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

AUGUST 1997 - ACTIVATED SLUDGE SHEET

Day	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading f/m	Mix Liq SS mg/L	Mix Liq VSS mg/L	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mg/L	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mg/l	PE SS mg/L
1	48	5.3	5.6	0.38	2,101	1,704	55.0	0.38	2.0	126	0.34	0.27	69	28.8	1.64	143	82
2		6.5								165			85	38.7	1.33	114	88
3		6.4								165			74	54.1	1.35	103	82
4		5.6	6.7	0.28	1,829	1,475	46.0	0.40	2.9	128	0.32	0.26	63	43.9	1.54	95	64
5		5.0	3.7	0.44	1,765	1,439	43.0	0.41	1.8	121	0.33	0.26	56	43.8	1.72	133	100
6		5.1	3.8	0.47	1,735	1,411	42 0	0.41	5.8	130	0.33	0.26	55	31.1	1.69	142	96
7		5.2	2.9	0.69	1,909	1,555	44.0	0.43	5.8	129	0.32	0.26	59	30.6	1.66	233	140
8		5.1	3.9	0.41	2,093	1,723	50.0	0.42	0.4	129	0.37	0.31	58	30.2	1.70	148	112
9		6.5								167			74	29.7	1.33	121	112
10		6.4								127			70	31.3	1.35	116	80
11		5.5	5.5	0.31	2,039	1,687	55.0	0.37	3.4	170	0.30	0.25	63	32.2	1.56	120	86
12		5.3	5.9	0.32	2,046	1,711	49.0	0.42	4.4	129	0.33	0.28	59	29.7	1.64	120	76
13		5.0	7.0	0.29	1,885	1,570	46.0	0.41	1.0	128	0.30	0.25	55	30.2	1.73	95	56
14		5.6	6.7	0.32	1,851	1,539	39.0	0.47	2.6	124	0.29	0.24	63	35.1	1.54	114	64
15		6.0								125			65	21.7	1.44	101	48
16		5.6								128			60	21.6	1.53	102	40
17		6.1								130			64	21.6	1.41	109	36
18		5.4	6.8	0.31	1,594	1,348	33.0	0.48	4.7	129	0.27	0.23	59	17.9	1.61	94	52
19		5.0	8.3	0.36	1,618	1,425	40.0	0.40	3.5	129	0.25	0.21	55	16.6	1.74	106	40
20		5.3	8.9	0.40	1,684	1,425	42.0	0.40	3.3	126	0.28	0.24	60	14.9	1.62	127	42
21		5.5	11.7	0.30	1,742	1,424	40.0	0.44	2.8	127	0.28	0.24	55	12.3	1.57	98	34
22		5.6	7.2	0.28	1,800	1,537	45.0	0.40	2.8	126	0.36	0.30	61	16.1	1.55	99	58
23		5.2								125			54	15.6	1.67	107	48
24		5.0								126			52	15.3	1.71	122	44
25		4.4	7.5	0.33	2,178	1,851	65.0	0.34	1.6	124	0.34	0.29	51	20.1	1.94	113	54
26		5.0	7.6	0.52	2,272	1,921	70.0	0.32	1.8	124	0.37	0.31	62	33.5	1.73	207	62
27		4.9	9.5	0.28	2,523	2,137	79.0	0.32	1.1	123	0.46	0.39	62	42.6	1.76	121	54
28		4.9	6.3	0.36	2,361	2,008	80.0	0.30	1.8	143	0.39	0.34	50	44.1	1.76	149	76
29		5.9	7.2	0.33	2,172	1,851	72.0	0.30	3.0	149	0.46	0.39	64	59.0	1.47	149	74
30		7.3								145			80	31.7	1.18	96	70
31		7.9								145			86	29.1	1.09	104	62
Total	48	173.2	132.8	7.39	39,197	32,741	1035.0	7.83	56.5	4,162	6.69	5.58	1,943	923.1	48.56	3,801	2,132
Max.	48	7.9	11.7	0.69	2,523	2,137	80.0	0.48	5.8	170	0.46	0.39	86	59.0	1.94	233	140
Min.	48	4.4	2.9	0.28	1,594	1,348	33.0	0.30	0.4	121	0.25	0.21	50	12.3	1.09	94	34
Avg.	48	5.6	6.6	0.37	1,960	1,637	51.8	0.39	2.8	134	0.33	0.28	63	29.8	1.57	123	69
Count	1	31.0	20.0	20.00	20	20	20.0	20.00	20.0	31	20.00	20.00	31	31.0	31.00	31	31

Steven D. Washburn
Superintendent

MARSHALL WWTP 801 INDUSTRIAL RD. MARSHALL MI 49068 - PERMIT MI0023540

AUGUST 1997 - DISCHARGE MONITORING REPORT - DISCHARGE NO. 001A

Day	F.Eff. D.O. mgIL	F.Eff. pH SU	F.Eff. SS mgIL	F.Eff. SS Lbs.	F.Eff. Total-P mgIL	Flow MGD	F.Eff. Chlorine mgIL	F.Eff. CBOD mgIL	F.Eff. CBOD Lbs.	F.Eff. NH3 as N mgIL	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %	Amenable Cyanide mg/l
1	6.4	7.4	7	96		1.64	0.000	7	96	5.2	71	94	96	97		
2	6.2	7.5	11	122		1.33	0.000	8	89	7.1	79	16	93	96		
3	6.4	7.5	4	45		1.35	0.000	8	90	2.9	33	200	98	95		
4	6.4	7.4	5	64		1.54	0.000	8	103	2.2	28	186	97	96		
5	6.5	7.5	10	143	0.30 43	1.72	0.000	8	115	4.1	59	143	92	95	90	<0.005
6	6.9	7.5	3	42		1.69	0.000	7	99	1.1	16	760	97	96		
7	6.9	7.4	11	152		1.66	0.000	8	111	4.0	55	260	93	97		
8	6.2	7.4	9	128		1.70	0.000	9	128	4.3	61	375	95	95		
9	6.4	7.5	5	55		1.33	0.000	5	55	1.4	16	160	97	97		
10	6.7	7.6	5	56		1.35	0.000	5	56	2.2	25	57	97	97		
11	6.4	7.4	8	104		1.56	0.000	5	65	3.4	44	42	95	97		
12	6.6	7.5	9	123		1.64	0.000	5	68	1.2	16	28	96	97		
13	6.3	7.4	8	115	0.43 62	1.73	0.000	4	58	3.7	53	40	95	98	87	<0.005
14	6.4	7.5	12	154		1.54	0.000	10	128	10.0	128	56	92	95		<0.005
15	6.4	7.5	12	144		1.44	0.000	8	96	11.2	135	30	93	96		
16	6.5	7.6	10	128		1.53	0.000	6	77	10.8	138	61	95	97		
17	6.9	7.6	4	47		1.41	0.000	5	59	10.1	119	40	97	97		
18	7.4	7.5	8	107		1.61	0.000	5	67	6.7	90	28	93	97		<0.005
19	7.9	7.5	6	87		1.74	0.000	4	58	5.2	76	9	97	98		
20	6.3	7.5	8	108	0.26 56	1.62	0.000	5	68	7.2	97	29	96	98	94	
21	6.6	7.6	5	65		1.57	0.000	4	52	4.3	56	7	97	98		
22	6.6	7.5	8	103		1.55	0.000	4	52	5.9	76	14	96	98		
23	6.5	7.6	4	56		1.67	0.000	4	56	10.0	139	33	97	98		
24	6.1	7.5	4	57	5.2	1.71	0.000	3	43	6.6	94	31	98	98		
25	6.2	7.5	8	129		1.94	0.000	5	81	7.7	125	50	95	98		
26	6.5	7.5	7	101	0.46 64	1.73	0.000	3	43	7.9	114	39	96	98	88	
27	6.0	7.5	9	132		1.76	0.000	4	59	10.2	150	40	95	98		
28	6.7	7.6	11	161		1.76	0.000	4	59	9.4	138	152	94	98		
29	6.4	7.6	10	123		1.47	0.000	6	74	8.1	99	30	95	98		
30	7.1	7.6	8	79		1.18	0.000	5	49	9.4	93	52	95	97		
31	6.7	7.6	7	64		1.09	0.000	6	55	8.8	80	8	96	97		
Total	203.5	232.8	236	3,093	1.45	48.56	0.000	178	2,306	192.3	2,503	3,070	2,958	3,007	359	0
Max.	7.9	7.6	12	161	0.46	1.94	0.000	10	128	11.2	150	760	98	98	94	0
Min.	6.0	7.4	3	42	0.26	1.09	0.000	3	43	1.1	16	7	92	95	87	0
Avg.	6.6	7.5	8	100	0.36	1.57	0.000	6	74	6.2	81	G 52	95	97	90	0
Count	31.0	31.0	31	31	4.00	31.00	31.000	31	31	31.0	31	31	31	31	4	4

G = Geometric Mean

Steven D. Washburn
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

AUGUST 1997 - MISCELLANEOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	SO2 Lbs.	Lime Lbs.	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	Raw Sludge pH	Sludge pH 2 Hours	Sludge pH 16 Hrs.	Lbs. of Lime per 1000 Gals. Sludge
1		2,760	1,750	25	322	9	755	9,500	2.7	70	6.2	12.51	12.56	79.47
2		2,760	1,360	30	322	11	666	8,000	2.7	71	6.1	12.00	12.56	83.25
3		2,640	950	12	161	11	533	5,000	2.8	71	6.2	12.51	11.58	106.60
4		2,880	420	14	403	12	533	8,000	5.0	70	6.4	12.55	12.49	66.63
5		2,640	610	21	322	12	799	14,000	2.4	72	6.3			57.07
6		2,760	610	16	242	10	1,154	23,800	2.4	71	6.3	12.52	12.51	48.49
7		2,760	1,440	20	242	17	1,465	22,000	2.9	68	6.2	12.44	12.52	66.59
8		2,760	1,880	23	322	15	1,909	15,000	3.1	71	6.1	12.54	12.56	127.27
9		2,760	580	24	242	13	888	15,000	2.6	71	6.2	12.58	12.40	59.20
10		2,520	460	24	242	14	1,110	15,000	2.5	78	6.2	12.57	12.00	74.00
11		2,760	460	29	242	19	1,243	7,700	2.4	71	6.2	12.53	12.51	161.43
12		2,760	680	23	242	17	1,154	18,000	2.7	74	6.2	12.19	12.35	64.11
13		2,760	590	23	242	21	577	12,000	3.7	54	6.2	12.50	11.85	48.08
14		2,760	500	25	242	19	1,376	20,000	6.0	63	6.5	12.49	12.42	68.80
15		2,760	590	26	242	21	1,110	5,000	3.6	72	6.4	12.58	12.58	222.00
16		2,640	520	28	242	12	577	7,000	6.0	50	6.2	12.37	12.53	82.43
17		2,760	500	22	242	7	444	7,000	3.7	75	5.9	12.41	12.18	63.43
18		2,760	600	22	242	25	888	6,000	3.8	74	5.7	12.38	12.46	148.00
19		2,760	730	17	161	11	799	6,000	4.6	74	5.6	12.31	12.34	133.17
20		2,760	550	17	242	11	710	6,000	4.1	71	5.6	12.37	12.39	118.33
21		2,760	550	18	161	16	666	8,000	3.9	72	5.5	12.34	12.35	83.25
22		2,760	560	18	161	12	755	7,000	3.7	74	5.6	12.39	12.47	107.86
23		2,760	700	19	242	11	577	6,500	4.0	75	5.6	12.48	12.41	88.77
24		2,640	600	8	161	10	577	5,500	4.6	73	5.8	12.43	12.39	104.91
25		2,880	550	14	242	10	622	6,200	4.0	72	5.6	12.33	12.41	100.32
26		2,760	610	19	161	10	488	4,500	3.8	76	5.5	12.36	12.39	108.44
27		2,640	740	18	161	10	577	4,500	3.7	77	5.3	12.40	12.41	128.22
28		2,760	760	20	161	10	622	4,500	3.8	77	5.3	12.32	12.37	138.22
29		2,760	740	21	161	8	577	7,000	3.6	77	5.4	12.37	12.31	82.43
30		2,760	500	19	161	17	622	6,500	3.4	78	5.4	12.34	12.33	95.69
31		2,640	700	20	161	11	577	7,500	3.4	78	5.4	12.35	12.26	76.93
Total		84,840	22,790	635	7,092	412	25,350	297,700	111.6	2,220	183.1	372.46	370.89	2993.40
Max.		2,880	1,880	30	403	25	1,909	23,800	6.0	78	6.5	12.58	12.58	222.00
Min.		2,520	420	8	161	7	444	4,500	2.4	50	5.3	12.00	11.58	48.08
Avg.		2,737	735	20	229	13	818	9,603	3.6	72	5.9	12.42	12.36	96.56

Steven D. Washburn
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

SEPTEMBER -1997 PLANT INFLUENT SHEET

	-----Weather----		Inf. Flow	Inf. Temp	Inf. pH	Inf. BOD	Inf. BOD	Inf. SS	Inf. SS	Inf. Phos.	Inf. Phos.	Inf. VSS	Inf. NH3-N	--Remarks or Other Parameters--
	Type	Precip.	MGD	F	SU	mgIL	Lbs.	mgIL	Lbs.	mgIL	Lbs.	mgIL	mgIL	
Day														
1			1.42	63	7.6	222	2,629	168	1,990			154	11.5	
2			1.61	62	7.5	220	2,954	224	3,008			208	12.3	
3			1.56	62	7.5	159	2,069	160	2,082			142	14.2	
4			1.58	62	7.7	178	2,346	148	1,950	3.80	50	132	16.2	
5			1.51	63	7.6	197	2,481	198	2,493			184	13.9	
6			1.59	62	7.7	181	2,400	164	2,175			154	13.7	
7			1.57	62	7.6	189	2,475	230	3,012			214	15.7	
8	RAIN	0.04	1.53	66	7.7	216	2,756	262	3,343			256	15.8	
9	RAIN	4.85	1.91	65	7.2	158	2,517	182	2,899	4.35	69	142	10.8	
10			1.75	65	7.5	131	1,912	130	1,897			118	11.9	
11			1.80	63	7.6	188	2,822	222	3,333			198	12.4	
12			1.80	63	7.2	258	3,873	234	3,513			204	9.9	
13			1.50	62	7.5	214	2,677	270	3,378			238	11.4	
14	RAIN	0.13	1.49	64	7.5	203	2,523	212	2,634			188	13.1	
15			1.70	66	7.5	203	2,878	244	3,459			218	12.4	
16	RAIN	1.04	1.91	67	7.6	215	3,425	248	3,950			218	10.7	
17	RAIN	0.92	1.09	66	7.5	195	1,773	324	2,945			288	10.2	
18	RAIN	0.04	1.98	64	7.3	290	4,789	318	5,251			280	9.9	
19	RAIN	0.92	1.93	65	7.5	198	3,187	318	5,119	3.96	64	286	9.3	
20			1.86	61	7.6	217	3,366	216	3,351			196	10.6	
21			1.56	61	7.5	166	2,160	182	2,368			176	13.7	
22	RAIN	0.25	1.77	64	7.5	291	4,296	474	6,997			426	11.3	
23			1.79	63	7.6	287	4,285	326	4,867			294	11.5	
24			1.79	63	7.6	174	2,598	176	2,627			160	11.9	
25			1.71	64	7.5	262	3,736	376	5,362	4.72	67	348	11.5	
26			1.60	62	7.6	186	2,482	188	2,509			158	12.7	
27			1.53	60	7.5	214	2,731	210	2,680			178	11.7	
28	RAIN	0.22	1.52	63	7.6	210	2,662	220	2,789			194	11.0	
29	RAIN	0.06	1.63	63	7.4	234	3,181	246	3,344			240	14.8	
30	RAIN	0.07	1.60	63	7.6	198	2,642	218	2,909			218	14.8	
31														
Total	0	8.54	49.59	1,899	225.8	6,254	86,623	7,088	98,234	16.83	250	6,410	370.8	
Max.	0	4.85	1.98	67	7.7	291	4,789	474	6,997	4.72	69	426	16.2	
Min.	0	0.04	1.09	60	7.2	131	1,773	130	1,897	3.80	50	118	9.3	
Avg.	0	0.78	1.65	63	7.5	208	2,887	236	3,274	4.21	63	214	12.4	
Count	11	11.00	30.00	30	30.0	30	30	30	30	4.00	4	30	30.0	

(17116)

Steven D. Washburn
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

SEPTEMBER -1997 PRIMARY EFFLUENT SHEET

	P Eff. BOD mgIL	P Eff. BOD Lbs.	P Eff. SS mgIL	P. Eff. SS Lbs.	P Eff. Phos. mgIL	P Eff. Phos. Lbs.	P Eff. VSS mgIL	P Eff. NH3-N mgIL	Flow MGD	BOD Pri. Removal %	SS Pri. Removal %	P Pri. Removal %
Day												
1	134	1,587	80	947			78	12.7	1.42	40	52	
2	98	1,316	36	483			36	15.3	1.61	55	84	
3	92	1,197	48	624			40	14.6	1.56	42	70	
4	124	1.634	42	553	2.10	28	36	16.8	1.58	30	72	45
5	117	1,473	56	705			56	15.6	1.51	41	72	
6	98	1,300	46	610			46	15.1	1.59	46	72	
7	134	1,755	50	655			50	15.4	1.57	29	78	
8	143	1,825	50	638			50	15.8	1.53	34	81	
9	106	1,689	38	605	2.40	38	38	12.8	1.91	33	79	45
10	101	1,474	42	613			36	12.3	1.75	23	68	
11	117	1,756	48	721			48	14.0	1.80	38	78	
12	126	1,892	56	841			46	12.4	1.80	51	76	
13	99	1,238	50	626			42	12.9	1.50	54	81	
14	109	1,354	60	746			54	13.1	1.49	46	72	
15	108	1,531	52	737			46	12.8	1.70	47	79	
16	133	2,119	48	765			46	12.5	1.91	38	81	
17	105	1,830	58	1,011			50	10.4	2.09	46	82	
18	135	2,229	76	1,255			64	10.8	1.98	53	76	
19	99	1,594	62	998	1.66	27	62	11.2	1.93	50	81	58
20	110	1,706	56	869			56	12.4	1.86	49	74	
21	89	1,158	58	755			58	12.9	1.56	46	68	
22	113	1,668	58	856			58	12.9	1.77	61	88	
23	112	1,672	54	806			52	12.9	1.79	61	83	
24	101	1,508	64	955			54	13.9	1.79	42	64	
25	110	1,569	62	884	2.10	30	58	14.4	1.71	58	84	56
26	92	1,228	52	694			38	13.8	1.60	51	72	
27	103	1,314	60	766			48	12.5	1.53	52	71	
28	119	1,509	76	963			54	13.4	1.52	43	65	
29	114	1,550	38	517			38	15.3	1.63	52	85	
30	114	1,521	32	427			32	15.8	1.60	42	85	
31												
Total	3,355	47,195	1,608	22,625	8.26	123	1,470	406.7	50.59	1,353	2,273	204
Max.	143	2,229	80	1,255	2.40	38	78	16.8	2.09	61	88	58
Min.	89	1,158	32	427	1.66	27	32	10.4	1.42	23	52	45
Avg.	112	1,573	54	754	2.07	31	49	13.6	1.69	45	76	51
Count	30	30	30	30	4.00	4	30	30.0	30.00	30	30	4

Steven D. Washburn
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

SEPTEMRER 1997 ACTIVATED SLUDGE SHEET

	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading f/m	Mix Liq SS mg/L	Mix Liq VSS mg/L	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mg/L	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mg/l	PE SS mg/L
Day																	
1	48	6.1							7.5	150			66	29.0	1.42	134	80
2		5.4	11.7	0.27	1,895	1,611	53.0	0.36	7.5	145	0.32	0.26	55	29.0	1.61	98	36
3		5.5	9.0	0.25	1,878	1,594	48.0	0.39	7.5	150	0.37	0.31	59	30.0	1.56	92	48
4		5.5	9.7	0.34	1,797	1,594	40.0	0.45	7.4	148	0.28	0.24	57	30.0	1.58	124	42
5		5.7	7.3	0.34	1,722	1,462	35.0	0.49	7.3	144	0.37	0.30	59	30.0	1.51	117	56
6		5.4							7.4	141			56	24.0	1.59	98	46
7		5.5							7.3	143			56	22.0	1.57	134	50
8		5.6	8.2	0.41	1,739	1,472	30.0	0.58	7.4	144	0.38	0.32	54	24.0	1.53	143	50
9		4.5	9.3	0.35	1,881	1,590	35.0	0.54	7.5	145	0.32	0.30	49	25.0	1.91	106	38
10		4.9	8.6	0.33	1,765	1,475	34.0	0.52	7.4	145	0.33	0.28	52	23.0	1.75	101	42
11		4.8	7.5	0.40	1,794	1,483	33.0	0.54	7.3	143	0.37	0.31	50	22.0	1.80	117	48
12		4.8	6.4	0.42	1,805	1,512	32.0	0.56	7.4	143	0.41	0.34	49	24.0	1.80	126	56
13		5.7							7.4	141			58	22.0	1.50	99	50
14		5.8							7.2	141			58	22.0	1.49	109	60
15		5.1	7.3	0.34	1,797	1,490	33.0	0.54	7.2	138	0.34	0.28	51	24.0	1.70	108	52
16		4.5	6.8	0.50	1,744	1,423	25.0	0.70	7.3	136	0.39	0.32	46	22.0	1.91	133	48
17		4.1	5.1	0.43	1,711	1,426	28.0	0.61	7.4	140	0.40	0.33	43	24.0	2.09	105	58
18		4.4	4.2	0.51	1,763	1,470	30.0	0.59	7.3	138	0.41	0.34	45	24.0	1.98	135	76
19		4.5	6.0	0.32	2,012	1,689	37.0	0.54	7.4	136	0.39	0.32	49	30.0	1.93	99	62
20		4.6							7.4	143			50	30.0	1.86	110	56
21		5.5							7.4	146			63	29.0	1.56	89	58
22		4.9	6.5	0.36	1,873	1,566	32.0	0.59	7.4	142	0.35	0.29	53	30.0	1.77	113	58
23		4.8	6.7	0.37	1,793	1,515	32.0	0.56	7.4	143	0.33	0.27	53	31.0	1.79	112	54
24		4.8	5.2	0.36	1,661	1,387	30.0	0.55	7.4	143	0.33	0.27	54	30.0	1.79	101	64
25		5.0	5.7	0.37	1,675	1,406	30.0	0.56	7.4	139	0.31	0.28	47	26.0	1.71	110	62
26		5.4	7.4	0.28	1,704	1,431	30.0	0.57	7.4	142	0.36	0.30	57	20.0	1.60	91	52
27		5.6							7.5	140			58	16.0	1.53	103	60
28		5.7							7.3	137			59	18.0	1.52	119	76
29		5.3	11.2	0.32	1,936	1,595	38.0	0.51	7.3	137	0.40	0.33	57	16.0	1.63	114	38
30		5.4	13.7	0.31	1,951	1,620	35.0	0.56	7.5	140	0.36	0.30	57	17.0	1.60	114	32
31																	
Total	48	154.7	163.5	7.59	37,896	31,811	720.0	11.31	221.5	4,263	7.52	6.29	1,620	743.0	50.59	3,354	1,608
Max.	48	6.1	13.7	0.51	2,012	1,689	53.0	0.70	7.5	150	0.41	0.34	66	31.0	2.09	143	80
Min.	48	4.1	4.2	0.25	1,661	1,387	25.0	0.36	7.2	136	0.28	0.24	43	16.0	1.42	89	32
Avg.	48	5.2	7.8	0.36	1,805	1,515	34.3	0.54	7.4	142	0.36	0.30	54	24.8	1.69	112	54
Count	1	30.0	21.0	21.00	21	21	21.0	21.00	30.0	30	21.00	21.00	30	30.0	30.00	30	30

Steven D. Washburn
Superintendent

MARSHALL WWTP 801 INDUSTRIAL RD. MARSHALL MI 49068 - PERMIT MI0023540

SEPTEMBER 1997 DISCHARGE MONITORING REPORT - DISCHARGE NO. 001A

Day	F.Eff. D.O. mgIL	F.Eff. pH SU	F.Eff. SS mgIL	F.Eff. SS Lbs.	F.Eff. Total-P mgIL	Flow MGD	F.Eff. Chlorine mgIL	F.Eff. CBOD mgIL	F.Eff. CBOD Lbs.	F.Eff. NH3 as N mgIL	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %	Amenable Cyanide mg/l
1	7.8	7.6	11	130		1.42	0.000	6	71	7.0	83	28	93	97		
2	7.4	7.6	7	94		1.61	0.000	6	81	8.4	113	13	97	97		
3	7.1	7.5	12	156	11.23	1.56	0.000	6	78	7.4	96	21	93	96		
4	6.9	7.6	8	105	0.89	1.58	0.000	7	92	9.3	123	17	95	96	77	
5	6.6	7.5	12	151		1.51	0.000	7	88	9.3	117	5	94	96		
6	6.4	7.5	10	133		1.59	0.000	6	80	9.9	131	8	94	97		
7	6.3	7.5	8	105		1.57	0.000	4	52	9.1	119	8	97	98		
8	6.2	7.6	9	115	14.02	1.53	0.000	6	77	12.7	162	50	97	97		
9	6.4	7.5	5	80	0.88	1.91	0.000	7	112	8.6	137	120	97	96	80	
10	6.7	7.6	10	146		1.75	0.000	4	58	6.6	96	4	92	97		
11	6.6	7.5	11	165		1.80	0.000	6	90	8.6	129	33	95	97		<0.005
12	6.5	7.5	10	150		1.80	0.000	7	105	6.8	102	30	96	97		
13	6.7	7.5	6	75		1.50	0.000	5	63	5.0	63	40	98	98		
14	6.8	7.5	11	137		1.49	0.000	4	50	4.4	55	11	95	98		
15	6.6	7.5	6	85		1.70	0.000	4	57	4.9	69	13	98	98		<0.005
16	6.3	7.4	5	80		1.91	0.000	4	64	5.4	86	33	98	98		<0.005
17	6.1	7.4	11	192		2.09	0.000	4	70	4.3	75	48	97	97		
18	6.7	7.5	15	248	4.82	1.98	0.000	4	66	3 9	64	8	95	99		
19	6.3	7.6	14	225	0.30	1.93	0.000	5	80	4.7	76	27	96	97	93	<0.005
20	6.2	7.6	6	93		1.86	0.000	5	78	7.0	109	20	97	98		
21	5.8	7.6	3	39		1.56	0.000	4	52	4.6	60	23	98	98		
22	6.7	7.6	7	103		1.77	0.000	5	74	4.7	69	20	99	98		
23	6.4	7.6	4	60	5.97	1.79	0.000	4	60	4.3	64	20	99	99		
24	6.6	7.5	10	149	0.40	1.79	0.000	4	60	6.1	91	20	94	98	92	
25	6.4	7.5	8	114		1.71	0.000	4	57	5.6	80	40	98	98		
26	6.4	7.5	3	40		1.60	0.000	4	53	3.7	49	16	98	98		
27	6.5	7.5	9	115		1.53	0.000	4	51	2.8	36	43	96	98		
28	6.0	7.4	7	89		1.52	0.000	4	51	3.5	44	20	97	98		
29	6.6	7.4	6	82		1.63	0.000	5	68	5.9	80	98	98	98		
30	6.5	7.4	10	137		1.64	0.000	5	68	7.2	98	23	95	97		
31																
Total	196.5	225.5	254	3,592	2.47	50.63	0.000	150	2,104	191.7	2,677	860	2,886	2,924	342	0
Max.	7.8	7.6	15	248	0.89	2.09	0.000	7	112	12.7	162	120	99	99	93	0
Min.	5.8	7.4	3	39	0.30	1.42	0.000	4	50	2.8	36	4	92	96	77	0
Avg.	6.6	7.5	8	120	0.62	1.69	0.000	5	70	6.4	89	G 21	96	97	86	0
Count	30.0	30.0	30	30	4.00	30.00	30.000	30	30	30.0	30	30	30	30	4	4

G = Geometric Mean

Steven D. Washburn
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

SEPREMBER 1997 - MISCELLANEOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	SO2 Lbs.	Lime Lbs.	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	Raw Sludge pH	Sludge pH 2 Hours	Sludge pH 16 Hrs.	Lbs. of Lime per 1000 Gals. Sludge
1		2,640	730	19	161	13	467	6,500	3.5	79	5.4	12.34	12.28	71.85
2		2,760	1,010	11	322	10	401	6,300	3.8	79	5.4	12.34	12.20	63.65
3		2,760	630	16	322	15	401	6,500	3.5	79	5.5	12.40	12.43	61.69
4		2,760	570	16	322	13	367	6,500	3.7	78	5.4	12.40	12.41	56.46
5		2,640	690	18	161	13	367	6,500	3.5	77	5.5	12.40	12.37	56.46
6		2,640	930	18	322	13	401	6,500	3.3	78	5.5	12.38	12.31	61.69
7		2,640	2,260	18	322	11	367	6,500	3.4	77	5.5	11.98	11.71	56.46
8		2,640	540	18	322	7	434	9,500	3.3	77	5.5	11.48	10.37	45.68
9		2,760	670	14	161	6	367	7,750	3.7	72	5.6	12.37	12.35	47.35
10		2,640	780	21	322	5	300	6,800	3.9	74	5.5	12.23	12.03	44.12
11		2,760	650	18	322	10	534	6,500	3.4	74	5.4	12.37	12.39	82.15
12		2,880	730	19	322	10	467	6,500	3.3	74	5.4		12.44	71.85
13		2,640	630	20	161	10	134	4,000	3.2	75	5.4			33.50
14		2,640	620	20	322	9		6,000	3.2	75	5.4			0.00
15		2,880	1,440	21	161	11								
16		2,760	1,460	19	242	8		4,500	3.6	75	5.4			0.00
17		2,760	1,490	23	322	11		7,500	3.1	71	5.3			0.00
18		2,760	1,490	8	322	15		6,800	4.0	71	5.5			0.00
19		2,880	1,610	16	322	6	768	14,800	3.3	73	5.3	12.33	12.42	51.89
20		2,760	1,560	14	322	6	501	6,000	3.2	73	5.5	12.45	12.38	83.50
21		2,880	1,530	15	242	9	367	7,000	3.2	74	5.5	12.35	12.29	52.43
22		2,760	1,520	18	242	9	401	6,000	3.2	73	5.6	12.01	11.62	66.83
23		2,760	1,460	17	322	20	567	9,200	3.1	74	5.6	12.33	12.30	61.63
24		2,760	1,690	19	242	10	467	8,700	3.2	74	5.6	12.37	12.29	53.68
25		2,760	1,500	16	242	12	567	8,650	3.1	75	5.3	12.26	12.35	65.55
26		2,760	1,520	27	322	12	567	8,650	3.4	74	5.5	12.40	12.28	65.55
27		2,640	1,610	16	242	12	567	8,650	3.1	75	5.5	12.38	12.36	65.55
28		2,760	1,400	18	322	14	567	8,600	3.2	75	5.6	12.42	12.35	65.93
29		2,760	1,410	19	242	12	601	8,000	3.5	50	5.7	12.37	12.38	75.13
30		2,760	1,430	22	242	13	634	7,500	3.3	74	5.7	12.37	12.42	84.53
31														
Total		82,200	35,560	534	8,215	325	11,581	212,900	98.2	2,149	159.0	282.73	292.73	1545.12
Max.		2,880	2,260	27	322	20	768	14,800	4.0	79	5.7	12.45	12.44	84.53
Min.		2,640	540	8	161	5	134	4,000	3.1	50	5.3	11.48	10.37	0.00
Avg.		2,740	1,185	18	274	11	463	7,341	3.4	74	5.5	12.29	12.20	53.28

Steven D. Washburn
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

OCTOBER 1997 - PLANT INFLUENT SHEET

Day	Weather Type	Weather Precip.	Inf Flow MGD	Inf Temp F	Inf pH SU	Inf BOD mgIL	Inf. BOD Lbs.	Inf SS mgIL	Inf. SS Lbs.	Inf Phos. mgIL	Inf. Phos. Lbs	Inf. VSS mgIL	Inf. NH3-N mgIL	--Remarks or Other Parameters--
1			1.59	63	7.5	326	4,323	444	5,888			402	13.3	
2			1.60	57	7.4	236	3,149	114	1,521			96	14.1	
3			1.57	62	7.4	391	5,120	506	6,625	4.11	54	474		
4	RAIN	0.25	1.59	61	7.1	358	4,747	406	5,384			376		
5			1.48	61	7.5	217	2,678	234	2,888			206		
6			1.78	63	7.4	219	3,251	208	3,088			192	16.4	
7			1.78	62	7.3	206	3,058	164	2,435			158	11.4	
8			1.95	64	7.2	217	3,529	222	3,610			198		
9	RAIN	0.30	1.86	65	7.3	193	2,994	202	3,134			180		
10			1.72	64	7.4	208	2,984	184	2,639			166		
11			1.65	61	7.3	252	3,468	316	4,348			286		
12			1.52	61	7.5	252	3,195	492	6,237			456		
13			1.65	64	7.4	225	3,096	208	2,862			181		
14			1.49	64	7.5	221	2,746	262	3,256	3.91	49	228	13.4	
15			1.51	63	7.5	168	2,116	118	1,486			106	14.8	
16			1.51	63	7.2	259	3,262	332	4,181			302		
17			1.50	64	7.6	232	2,902	246	3,077			218		
18			1.48	60	7.1	383	4,727	504	6,221			569		
19			1.39	61	7.7	200	2,319	230	2,666			208		
20			1.68	61	7.5	221	3,096	222	3,110	3.83	54	198		
21	RAIN	0.03	1.72	61	7.7	228	3,271	229	3,285			198	12.7	
22			1.69	61	7.6	183	2,579	186	2,622			166		
23	RAIN	0.07	1.59	58	7.7	250	3,315	230	3,050			206		
24			1.68	63	7.6	216	3,026	204	2,858			190	13.7	
25	RAIN	0.13	1.62	61	7.6	254	3,432	256	3,459			232		
26	RAIN	1.15	1.61	58	7.6	202	2,712	228	3,061			170		
27			1.39	61	7.6	205	2,376	268	3,107			158		
28			1.72	61	7.6	267	3,830	214	3,070	3.67	53	194	14.7	
29			1.57	60	7.6	248	3,247	278	3,640			248		
30	RAIN	0.02	1.48	60	7.6	284	3,505	148	1,827			126		
31	RAIN	0.05	1.46	60	7.6	325	3,957	294	3,580			266		
Total	0	2.00	49.83	1,908	231.6	7,646	102,013	8,149	108,216	15.52	209	7,354	124.5	
Max.	0	1.15	1.95	65	7.7	391	5,120	506	6,625	4.11	54	569	16.4	
Min.	0	0.02	1.39	57	7.1	168	2,116	114	1,486	3.67	49	96	11.4	
Avg.	0	0.25	1.61	62	7.5	247	3,291	263	3,491	3.88	52	237	13.8	
Count	8	8.00	31.00	31	31.0	31	31	31	31	4.00	4	31	9.0	

18516

Steven D. Washburn
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

OCTOBER 1997 - PRIMARY EFFLUENT SHEET

Day	P Eff. BOD mgIL	P Eff. BOD Lbs.	P Eff. SS mgIL	P. Eff. SS Lbs.	P Eff. Phos. mgIL	P Eff. Phos. Lbs.	P Eff. VSS mgIL	P Eff. NH3-N mgIL	Flow MGD	BOD Pri. Removal %	SS Pri. Removal %	P Pri. Removal %
1	118	1,565	72	955			52	14.2	1.59	64	84	
2	113	1,508	66	881			54	13.4	1.60	52	42	
3	154	2,016	92	1,205	2.56	34	82		1.57	61	82	38
4	164	2,175	106	1,406			92		1.59	54	74	
5	133	1,642	70	864			60		1.48	39	70	
6	111	1,648	86	1,277			82	13.3	1.78	49	59	
7	128	1,900	74	1,099			70	11.9	1.78	38	55	
8	136	2,212	74	1,203			70		1.95	37	67	
9	110	1,706	70	1,086			62		1.86	43	65	
10	164	2,353	94	1,348			78		1.72	21	49	
11	160	2,202	80	1,101			68		1.65	37	75	
12	123	1,559	84	1,065			76		1.52	51	83	
13	153	2,105	78	1,073			72		1.65	32	63	
14	131	1,628	78	969	2.72	34	74	14.8	1.49	41	70	30
15	111	1,398	86	1,083			76	17.3	1.51	34	27	
16	121	1,524	60	756			60		1.51	53	82	
17	133	1,664	72	901			64		1.50	43	71	
18	143	1,765	88	1,086			82	15.0	1.48	63	83	
19	134	1,553	84	974			80		1.39	33	63	
20	154	2,158	94	1,317	2.79	39	86		1.68	30	58	27
21	123	1,764	86	1,234			78	13.9	1.72	46	62	
22	117	1,649	88	1,240			80		1.69	36	53	
23	121	1,605	82	1,087			72	15.2	1.59	52	64	
24	156	2,186	86	1,205			78		1.68	28	58	
25	191	2,581	90	1,216			43		1.62	25	65	
26	128	1,719	110	1,477			88		1.61	37	52	
27	116	1,345	90	1,043			90		1.39	43	46	
28	151	2,166	84	1,205	2.45	35	80		1.72	43	61	33
29	132	1,728	96	1,257			80		1.57	47	65	
30	140	1,728	92	1.136			84		1.48	51	38	
31	150	1,826	104	1,266			94		1.46	54	65	
Total	4,219	56,577	2,616	35,014	10.52	142	2,307	129.0	49.83	1,337	1,951	128
Max.	191	2,581	110	1,477	2.79	39	94	17.3	1.95	64	84	38
Min.	110	1,345	60	756	2.45	34	43	11.9	1.39	21	27	27
Avg.	136	1,825	84	1,129	2.63	35	74	14.3	1.61	43	63	32
Count	31	31	31	31	4.00	4	31	9.0	31.00	31	31	4

Steven D. Washburn
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

OCTOBER 1997 - ACTIVATED SLUDGE SHEET

	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading flm	Mix Liq SS mgIL	Mix Liq VSS mgIL	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mgIL	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mgIl	PE SS mgIL
Day																	
1	48	5.4	6.1	0.33	1,940	1,589	38.0	0.51	6.4	145	0.35	0.29	61	16.0	1.59	118	72
2		5.4	6.9	0.30	2,037	1,682	39.0	0.52	9.5	139	0.39	0.32	60	23.0	1.60	113	66
3		5.5	5.3	0.39	2,113	1,746	44.0	0.48	6.4	134	0.33	0.27	57	30.0	1.57	154	92
4		5.4							6.0	139			59	35.0	1.59	164	106
5		5.8							6.4	135			66	35.0	1.48	133	70
6		4.8	4.8	0.32	2,057	1,703	38.0	0.54	6.4	135	0.37	0.31	50	35.0	1.78	111	86
7		4.8	5.3	0.39	1,947	1,625	39.0	0.50	6.1	136	0.40	0.34	52	37.0	1.78	128	74
8		4.4	4.8	0.45	1,938	1,631	35.0	0.55	6.2	134	0.32	0.27	49	38.0	1.95	136	74
9		4.6	5.1	0.36	1,864	1,577	27.0	0.69	6.0	137	0.37	0.32	52	33.0	1.86	110	70
10		5.0	4.4	0.47	1,962	1,656	32.0	0.61	6.5	142	0.34	0.29	53	31.0	1.72	164	94
11		5.2							6.3	140			57	33.0	1.65	160	80
12		5.7							6.3	134			63	36.0	1.52	123	84
13		5.2	5.6	0.41	2,016	1,704	34.0	0.59	6.2	139	0.37	0.32	59	36.0	1.65	153	78
14		5.8	6.0	0.34	1,933	1,610	30.0	0.64	7.8	144	0.33	0.27	65	33.0	1.49	131	78
15		5.7	5.2	0.29	1,871	1,587	29.0	0.65	7.2	144	0.33	0.28	64	26.0	1.51	111	86
16		5.7	7.9	0.30	1,986	1,678	29.0	0.68	6.8	142	0.34	0.29	64	23.0	1.51	121	60
17		5.7	6.6	0.33	1,996	1,692	30.0	0.67	6.6	143	0.30	0.26	64	24.0	1.50	133	72
18		5.8							6.5	142			64	22.0	1.48	143	88
19		6.2							6.5	138			70	27.0	1.39	134	84
20		5.1	4.7	0.41	2,064	1,741	27.0	0.76	6.4	136	0.31	0.26	57	30.0	1.68	154	94
21		5.0	4.7	0.36	1,942	1,638	26.0	0.75	6.5	143	0.38	0.26	56	29.0	1.72	123	86
22		5.1	4.7	0.33	1,956	1,651	27.0	0.72	6.7	145	0.35	0.30	58	26.0	1.69	117	88
23		5.4	5.7	0.31	2,083	1,756	26.0	0.80	6.7	143	0.36	0.32	60	22.0	1.59	121	82
24		5.1	5.2	0.42	2,100	1,756	24.0	0.88	6.4	142	0.36	0.30	57	29.0	1.68	156	86
25		5.3							6.3	142			59	31.0	1.62	191	90
26		5.4							6.3	143			58	30.0	1.61	128	110
27		6.2	0.6	0.26	2,020	1,705	27.0	0.75	7.2	145	0.30	0.26	69	30.0	1.39	116	900
28		5.0	5.0	0.43	2,000	1,686	25.0	0.80	7.1	142	0.33	0.28	56	31.0	1.72	151	84
29		5.5	4.9	0.33	2,054	1,727	26.0	0.79	6.3	141	0.35	0.30	61	31.0	1.57	132	96
30		5.8	5.5	0.32	2,099	1,778	30.0	0.70	6.5	138	0.36	0.30	66	33.0	1.48	140	92
31		5.9	5.1	0.34	2,151	1,812	30.0	0.72	6.6	136	0.34	0.29	66	33.0	1.46	150	104
Total	48	167.2	120.1	8.21	46,129	38,730	712.0	15.31	205.1	4,338	7.98	6.70	1,852	928.0	49.83	4,219	3,426
Max.	48	6.2	7.9	0.47	2,151	1,812	44.0	0.88	9.5	145	0.40	0.34	70	38.0	1.95	191	900
Min.	48	4.4	0.6	0.26	1,864	1,577	24.0	0.48	6.0	134	0.30	0.26	49	16.0	1.39	110	60
Avg.	48	5.4	5.2	0.36	2,006	1,684	31.0	0.67	6.6	140	0.35	0.29	60	29.9	1.61	136	111
Count	1	31.0	23.0	23.00	23	23	23.0	23.00	31.0	31	23.00	23.00	31	31.0	31.00	31	31

Steven D. Washburn
Superintendent

MARSHALL WWTP 501 INDUSTRIAL RD. MARSHALL MI 49068 - PERMIT MI0023540

OCTOBER 1997 - DISCHARGE MONITORING REPORT - DISCHARGE NO. 001A

Day	F.Eff. D.O. mgIL	F.Eff. pH SU	F.Eff. SS mgIL	F.Eff. SS Lbs.	F.Eff. Total-P mgIL	Flow MGD	F.Eff. Chlorine mgIL	F.Eff. CBOD mgIL	F.Eff. CBOD Lbs.	F.Eff. NH3 as N mgIL	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %	Amenable Cyanide mg/l
1	6.4	7.4	11	146		1.59	0.000	5	66	3.9	52	27	98	98		
2	6.5	7.5	11	147	4.71	1.60	0.000	4	53	3.8	51	10	90	98		
3	6.4	7.4	9	118	0.36	1.57	0.000	4	52			48	98	99	91	
4	6.0	7.4	12	159		1.59	0.000	5	66			29	97	99		
5	6.4	7.4	6	74		1.48	0.000	4	49			76	97	98		
6	6.4	7.3	10	148		1.78	0.000	3	45	6.0	89	40	95	99		
7	6.1	7.4	11	163		1.78	0.000	4	59	6.3	94	9	93	98		<0.02
8	6.2	7.2	10	163		1.95	0.002	6	98			32	95	97		<0.02
9	6.0	7.4	10	155		1.86	0.000	5	78			54	95	97		
10	6.5	7.5	10	143		1.72	0.008	5	72			50	95	98		
11	6.3	7.5	9	124		1.65	0.000	6	83			15	97	98		
12	6.3	7.4	7	89		1.52	0.000	4	51			63	99	98		
13	6.2	7.3	5	69	3.85	1.65	0.000	5	69			470	98	98		<0.02
14	6.8	7.5	6	75	0.31	1.49	0.000	5	62	10.9	135	4	98	98	92	<0.02
15	7.2	7.4	16	201		1.51	0.000	5	63	12.2	154	105	86	97		
16	6.8	7.6	4	50		1.51	0.000	6	76			22	99	98		
17	6.6	7.3	7	88		1.50	0.000	6	75			6	97	97		
18	6.5	7.3	13	160		1.48	0.000	6	74	9.3	115	65	97	98		
19	6.5	7.1	7	81	4.06	1.39	0.000	6	70			16	97	97		
20	6.4	7.4	17	238	0.29	1.68	0.000	7	98			16	92	97	92	
21	6.5	7.5	10	143		1.72	0.000	6	86	7.6	109	26	96	97		
22	6.7	7.5	12	169		1.69	0.000	6	85			22	94	97		
23	6.7	7.4	13	172		1.59	0.000	6	80			9	94	98		
24	6.4	7.3	15	210		1.68	0.000	8	112			24	93	96		
25	6.3	7.3	18	243		1.62	0.000	8	108	6.7	91	14	94	97		
26	6.3	7.4	13	175		1.61	0.000	8	107			34	94	96		
27	7.2	7.6	15	174	4.30	1.39	0.000	7	81			56	91	97		
28	7.1	7.4	10	143	0.30	1.72	0.000	10	143			55	95	96	92	
29	6.3	7.5	12	157		1.57	0.000	6	79	11.3	148	10	96	98		
30	6.5	7.4	11	136		1.48	0.000	7	86			21	93	98		
31	6.6	7.4	15	183	4.23	1.46	0.000	7	85			18	95	98		
Total	201.1	229.4	335	4,498	1.26	49.83	0.010	180	2,411	78.0	1,036	1,446	2,948	3,025	367	0
Max.	7.2	7.6	18	243	0.36	1.95	0.008	10	143	12.2	154	470	99	99	92	0
Min.	6.0	7.1	4	50	0.29	1.39	0.000	3	45	3.8	51	4	86	96	91	0
Avg.	6.5	7.4	11	145	0.32	1.61	0.000	6	78	7.8	104	47	95	98	92	0
Count	31.0	31.0	31	31	4.00	31.00	31.000	31	31	10.0	10	31	31	31	4	4

G = Geometric Mean

Steven D. Washburn
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

OCTOBER 97- MISCELLANEOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	SO2 Lbs.	Lime Lbs.	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	Raw Sludge pH	Sludge pH 2 Hours	Sludge pH 16 Hrs.	Lbs. of Lime per 1000 Gals. Sludge
1		2,880	1,570	21	242	15	553	7,500	3.3	76	5.6	12.19	11.97	73.73
2		2,880	1,690	22	242	12	553	7,500	3.5	75	5.4	12.42	12.36	73.73
3		2,640	1,530	23	161	11	588	7,500	3.1	75	5.4	12.36	12.38	78.40
4		2,760	1,690	9	161	6	623	7,800	3.6	79	5.4	12.43	12.51	79.87
5		2,760	1,610	17	322	22	484	7,800	3.6	78	5.3	12.04	11.53	62.05
6		2,760	1,530	16	322	9	519	7,800	3.0	79	5.2	12.57	12.38	66.54
7		2,760	1,620	18	322	12	553	7,800	3.3	77	5.5	12.50	12.59	70.90
8		2,760	1,620	19	322	11	519	7,800	2.9	75	5.6	12.58	12.35	66.54
9		2,760	1,600	21	322	12	484	7,800	3.1	73	5.6	12.40	12.34	62.05
10		2,880	1,660	17	322	12	450	7,800	3.1	76	5.5	12.57	12.55	57.69
11		2,760	1,690	15	322	11	519	7,900	3.0	77	5.6	12.57	12.31	65.70
12		2,640	1,770	22	242	12	519	7,800	3.0	76	5.7	12.70	12.44	66.54
13		2,760	1,590	22	322	16	519	7,900	3.1	76	5.8	12.62	12.58	65.70
14		2,880	1,660	20	322	16	484	7,600	3.4	76	5.8	12.45	12.48	63.68
15		2,880	1,525	20	322	22	450	7,700	3.4	76	6.0	12.61	12.39	58.44
16		2,880	1,825	21	322	15	415	7,700	3.3	76	6.0	12.44	12.50	53.90
17		3,000	1,825	24	242	18	415	7,500	3.3	76	5.6	12.44	12.02	55.33
18		2,880	1,835	20	161	18	380	7,700	3.3	76	5.5	12.18	12.25	49.35
19		2,760	1,805	21	322	19	346	7,700	3.6	79	5.6	12.61	12.26	44.94
20		3,000	1,945	19	242	20	415	7,800	3.4	76	5.5	11.75	10.97	53.21
21		2,880	1,615	20	322	18	484	7,700	3.4	77	5.4	12.19	12.07	62.86
22		3,000	1,755	15	242	15	450	8,800	4.2	78	5.6	12.56	12.44	51.14
23	9	2,760	1,675	18	322	17	277	7,700	3.5	77	5.4	12.32	12.13	35.97
24	10	3,240	1,865	21	81	18	380	7,600	3.7	77	5.5	12.13	12.06	50.00
25	6	3,000	1,865	20	322	20	484	7,700	3.4	76	5.6	12.37	12.14	62.86
26	7	2,880	1,685	19	242	15	450	7,700	3.3	73	5.7	12.50	12.36	58.44
27	14	3,240	1,805	22	322	20	450	7,500	3.4	76	5.7	12.53	12.42	60.00
28	17	2,880	1,525	25	322	15	415	7,700	3.2	76	5.6	12.48	12.35	53.90
29	6	3,000	1,845	19	242	12	450	7,600	3.4	74	5.6	12.44	12.33	59.21
30	3	3,000	1,655	20	161	10	830	12,800	3.5	76	5.7	12.40	11.99	64.84
31	2	2,760	1,505	18	242	4	657	10,000	3.4	78	5.7	12.23	12.13	65.70
Total	74	88,920	52,385	604	8,377	453	15,115	247,200	103.7	2,365	173.1	384.58	379.58	1893.20
Max.	17	3,240	1,945	25	322	22	830	12,800	4.2	79	6.0	12.70	12.59	79.87
Min.	2	2,640	1,505	9	81	4	277	7,500	2.9	73	5.2	11.75	10.97	35.97
Avg.	8	2,868	1,690	19	270	15	488	7,974	3.3	76	5.6	12.41	12.24	61.07

Steven D. Washburn
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

NOVEMBER 1997 - PLANT INFLUENT SHEET

	-----Weather----		Inf. Flow	Inf. Temp	Inf. pH	Inf. BOD	Inf. BOD	Inf. SS	Inf. SS	Inf. Phos.	Inf. Phos.	Inf. VSS	Inf. NH3-N	--Remarks or Other Parameters--
	Type	Precip.	MGD	F	SU	mgIL	Lbs.	mgIL	Lbs.	mgIL	Lbs.	mgIL	mgIL	
Day														
1	RAIN	0.03	1.52	62	7.6	310	3,930	384	4,868			342		
2	RAIN	0.05	1.49	61	7.7	328	4,076	382	4,747			352		
3	RAIN	0.07	1.58	61	7.7	376	4,955	516	6,799			496		
4	RAIN	0.03	1.68	61	7.3	232	3,251	198	2,774			182	13.6	
5			1.71	60	7.7	235	3,351	224	3,195	3.67	52	296		
6			1.69	60	7.8	236	3,326	184	2,593			168	12.3	
7			1.44	60	7.5	293	3,519	280	3,363			258		
8			1.45	60	7.5	268	3,241	266	3,217			244		
9	RAIN	0.01	1.42	62	7.6	208	2,463	212	2,511			200		
10			1.46	60	7.6	298	3,629	346	4,213			326	14.4	
11	RAIN	0.07	1.57	59	7.7	364	4,766	378	4,949	4.41	58	362		
12			1.48	59	7.6	224	2,765	218	2,691			198		
13	RAIN	0.14	1.59	60	7.5	171	2,268	166	2,201			154	14.5	
14	RAIN	0.05	1.69	59	7.6	216	3,044	192	2,706			176		
15	RAIN	0.01	1.68	59	7.5	226	3,167	208	2,914			192		
16			1.73	59	7.5	210	3,030	200	2,886			188		
17			1.60	59	7.6	189	2,522	224	2,989			206	12.9	
18			1.59	62	7.6	286	3,793	318	4,217			292		
19			1.80	59	7.7	182	2,732	170	2,552	3.88	58	150	11.9	
20	RAIN	0.02	1.73	59	7.7	187	2,698	136	1,962			116		
21			1.64	59	7.5	270	3,693	142	1,942			134		
22			1.54	60	7.7	229	2,941	144	1,849			130		
23	RAIN	0.01	1.61	59	7.5	233	3,129	198	2,659			176		
24	RAIN	0.03	1.68	60	7.4	224	3,139	178	2,494	4.23	59	154		
25			1.59	60	7.6	251	3,328	246	3,262			224	13.7	
26	RAIN	0.02	1.67	56	7.6	243	3,384	136	1,894			236	13.7	
27	RAIN	0.18	1.22	55	7.6	250	2,544	228	2,320			200		
28	RAIN	0.03	1.29	56	7.6	208	2,238	200	2,152			188		
29	RAIN	0.29	1.56	56	7.7	261	3,396	176	2,290			168		
30			1.47	58	7.5	335	4,107	346	4,242			338		
31														
Total	0	1.04	47.17	1,780	227.7	7,543	98,423	7,196	93,451	16.19	228	6,846	107.0	
Max.	0	0.29	1.80	62	7.8	376	4,955	516	6,799	4.41	59	496	14.5	
Min.	0	0.01	1.22	55	7.3	171	2,238	136	1,849	3.67	52	116	11.9	
Avg.	0	0.07	1.57	59	7.6	251	3,281	240	3,115	4.05	57	228	13.4	
Count	16	16.00	30.00	30	30.0	30	30	30	30	4.00	4	30	8.0	

17516

Steven D. Washburn
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

NOVEMBER 199[illegible] - PRIMARY EFFLUENT SHEET

Day	P Eff. BOD mgIL	P Eff. BOD Lbs.	P Eff. SS mgIL	P. Eff. SS Lbs.	P Eff. Phos. mgIL	P Eff. Phos. Lbs.	P Eff. VSS mgIL	P Eff. NH3-N mgIL	Flow MGD	BOD Prı. Removal %	SS Prı. Removal %	P Prı. Removal %
1	169	2,142	112	1,420			102		1.52	45	71	
2	152	1,889	96	1,193			88		1.49	54	75	
3	146	1,924	104	1,370			102		1.58	61	80	
4	161	2,256	104	1,457			98	13.4	1.68	31	47	24
5	199	2,838	110	1,569	2.79	40	96		1.71	15	51	
6	185	2,608	106	1,494			96	13.8	1.69	22	42	
7	190	2,282	142	1,705			120		1.44	35	49	
8	205	2,479	130	1,572			116		1.45	24	51	
9	193	2,286	122	1,445			116		1.42	7	42	
10	170	2,070	120	1,461			120	14.8	1.46	43	65	
11	191	2,501	68	890	3.47	45	68		1.57	48	82	21
12	167	2,061	100	1,234			96		1.48	25	54	
13	136	1,803	92	1,220			92	14.0	1.59	20	45	
14	174	2,452	128	1,804			128		1.69	19	33	
15	176	2,466	92	1,289			92		1.68	22	56	
16	165	2,381	76	1,097			76		1.73	21	62	
17	129	1,721	106	1,414			104	14.0	1.60	32	53	
18	172	2,281	100	1,326			100		1.59	40	69	
19	137	2,057	96	1,441	2.70	41	88	13.8	1.80	25	44	30
20	184	2,655	92	1,327			80		1.73	2	32	
21	210	2,872	104	1,422			104		1.64	22	27	
22	183	2,350	92	1,182			92		1.54	20	36	
23	182	2,444	104	1,396			104		1.61	22	47	
24	157	2,200	84	1,177	2.62	37	76		1.68	30	53	38
25	170	2,254	76	1,008			68	14.6	1.59	32	69	
26	191	2,660	112	1,560			52	15.4	1.67	21	53	
27	131	1,333	56	570			36		1.22	48	75	
28	120	1,291	64	689			64		1.29	42	68	
29	148	1,926	62	807			62		1.56	43	65	
30	151	1,851	72	883			72		1.47	55	79	
31												
Total	5,044	66,333	2,922	38,423	11.58	162	2,708	113.8	47.17	926	1,675	113
Max.	210	2,872	142	1,804	3.47	45	128	15.4	1.80	61	82	38
Mın.	120	1,291	56	570	2.62	37	36	13.4	1.22	2	27	21
Avg.	168	2,211	97	1,281	2.90	41	90	14.2	1.57	31	56	28
Count	30	30	30	30	4.00	4	30	8.0	30.00	30	30	4

Steven D. Washburn
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

NOVEMBER 1997 - ACTIVATED SLUDGE SHEET

Day	Aerat Volume kCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading flm	Mix Liq SS mgIL	Mix Liq VSS mgIL	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mgIL	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge kGal	Daily Flow MGD	PE BOD mgIl	PE SS mgIL
1	48	5.7								137			63	31.0	1.52	169	112
2		5.8								140			63	31.0	1.49	152	96
3		5.5	4.6	0.36	2,094	1,777	30.0	0.70	3.7	143	0.35	0.29	59	30.0	1.58	146	104
4		5.1	4.4	0.41	2,144	1,827	29.0	0.74	2.6	142	0.37	0.32	57	32.0	1.68	161	104
5		5.0	4.1	0.52	2,145	1,823	29.0	0.74	2.5	142	0.39	0.33	56	30.0	1.71	199	110
6		5.1	4.7	0.43	2,355	2,009	28.0	0.84	1.6	140	0.40	0.34	56	34.0	1.69	185	106
7		6.0	4.3	0.37	2,433	2,072	30.0	0.81	2.0	140	0.38	0.32	68	39.0	1.44	190	142
8		5.9								140			65	43.0	1.45	205	130
9		6.1								139			66	42.0	1.42	193	122
10		5.9	4.9	0.34	2,382	2,028	26.0	0.92	3.4	139	0.31	0.31	66	43.0	1.46	170	120
11		5.5	7.6	0.44	2,266	1,914	27.0	0.84	4.4	141	0.31	0.31	62	39.0	1.57	191	68
12		5.8	5.6	0.37	2,290	1,836	24.0	0.95	3.5	147	0.33	0.33	65	36.0	1.48	167	100
13		5.4	5.5	0.32	2,241	1,906	24.0	0.93	3.2	146	0.29	0.29	61	37.0	1.59	136	92
14		5.1	3.7	0.43	2,246	1,907	24.0	0.94	4.8	140	0.32	0.32	56	38.0	1.69	174	128
15		5.1								146			54	33.0	1.68	176	92
16		5.0								149			53	31.0	1.73	165	76
17		5.4	4.7	0.30	2,243	1,921	18.0	1.25	4.2	152	0.37	0.33	57	32.0	1.60	129	106
18		5.4	4.9	0.41	2,176	1,858	20.0	1.09	5.0	146	0.40	0.34	52	35.0	1.59	172	100
19		4.8	4.3	0.39	2,069	1,762	21.0	0.99	4.4	141	0.46	0.39	43	35.0	1.80	137	96
20		5.0	4.7	0.51	2,078	1,724	20.0	1.04	4.2	140	0.46	0.40	47	32.0	1.73	184	92
21		5.3	4.5	0.53	2,122	1,795	21.0	1.01	4.8	140	0.45	0.38	47	34.0	1.64	210	104
22		5.6								140			47	37.0	1.54	183	92
23		5.4								143			44	36.0	1.61	182	104
24		5.1	5.0	0.44	1,948	1,666	17.0	1.15	4.8	144	0.45	0.39	45	31.0	1.68	157	84
25		5.4	6.1	0.43	2,056	1,767	19.0	1.08	3.7	136	0.43	0.37	48	31.0	1.59	170	76
26		5.2	3.7	0.53	1,949	1,671	22.0	0.89	3.2	137	0.42	0.36	51	26.0	1.67	191	112
27		7.1								137			77	23.0	1.22	131	56
28		6.7								136			72	22.0	1.29	120	64
29		5.5								144			60	24.0	1.56	148	62
30		5.9								140			65	25.0	1.47	151	72
31																	
Total	48	165.6	87.3	7.54	39,237	33,263	429.0	16.89	66.0	4,247	6.89	6.12	1,725	992.0	47.17	5,044	2,922
Max.	48	7.1	7.6	0.53	2,433	2,072	30.0	1.25	5.0	152	0.46	0.40	77	43.0	1.80	210	142
Min.	48	4.8	3.7	0.30	1,948	1,666	17.0	0.70	1.6	136	0.29	0.29	43	22.0	1.22	120	56
Avg.	48	5.5	4.8	0.42	2,180	1,848	23.8	0.94	3.7	142	0.38	0.34	58	33.1	1.57	168	97
Count	1	30.0	18.0	18.00	18	18	18.0	18.00	18.0	30	18.00	18.00	30	30.0	30.00	30	30

Steven D. Washburn
Superintendent

MARSHALL WWTP 801 INDUSTRIAL RD. MARSHALL MI 49068 - PERMIT MI0023540

NOVEMBER 1997- DISCHARGE MONITORING REPORT - DISCHARGE NO. 001A

Day	F.Eff. D.O. mgIL	F.Eff. pH SU	F.Eff. SS mgIL	F.Eff. SS Lbs.	F.Eff. Total-P mgIL	Flow MGD	F.Eff. Chlorine mgIL	F.Eff. CBOD mgIL	F.Eff. CBOD Lbs.	F.Eff. NH3 as N mgIL	F.Eff. NH3-N Lbs.	F.Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %	Amenable Cyanide mg/l
1	6.4	7.6	20	254		1.52	0.000	10	127			29	95	97		
2	6.8	7.6	8	99		1.49	0.000	9	112			39	98	97		
3	6.6	7.6	15	198		1.58	0.000	9	119			42	97	98		
4	6.5	7.6	10	140		1.68	0.000	8	112	7.5	105	36	95	97	89	
5	6.2	7.5	18	257	0.41	1.71	0.000	9	128			15	92	96		
6	6.5	7.5	18	254	5.8	1.69	0.000	11	155	9.1	128	132	90	95		
7	6.4	7.6	19	228		1.44	0.000	9	108			26	93	97		
8	6.6	7.6	16	193		1.45	0.000	9	109			28	94	97		
9	6.2	7.6	13	154		1.42	0.000	9	107			82	94	96		
10	6.7	7.6	18	219	7.1	1.46	0.000	9	110	10.5	128	28	95	97		<0.02
11	6.7	7.5	16	210	0.54	1.57	0.000	11	144			20	96	97	88	
12	6.5	7.5	19	235		1.48	0.000	10	123			101	91	96		
13	6.7	7.5	15	199		1.59	0.000	11	146	11.6	154	42	91	94		
14	6.7	7.5	24	338		1.69	0.000	14	197			58	88	94		
15	6.4	7.5	23	322		1.68	0.000	15	210			71	89	93		<0.02
16	6.8	7.4	23	332		1.73	0.000	15	216	10.3	149	125	89	93		<0.02
17	6.8	7.4	24	320		1.60	0.000	15	200			30	89	92		
18	7.1	7.6	10	133	6.0	1.59	0.000	12	159	13.1	174	26	97	96		<0.02
19	7.3	7.6	20	300	0.40	1.80	0.000	12	180			95	88	93	90	
20	6.8	7.4	17	245		1.73	0.000	10	144			70	88	95		
21	6.7	7.5	15	205		1.64	0.000	10	137			82	89	96		
22	7.0	7.5	22	283		1.54	0.000	15	193			100	85	93		
23	6.5	7.5	24	322	6.0	1.61	0.000	15	201			82	88	94		
24	7.3	7.4	19	266	0.43	1.68	0.000	16	224			92	89	93	90	
25	6.7	7.4	22	292	6.23	1.59	0.000	18	239	11.4	151	71	91	93		
26	6.5	7.5	19	265		1.67	0.000	16	223	11.5	160	80	92	93		
27	6.6	7.4	16	163		1.22	0.000	17	173			40	93	93		
28	7.3	7.6	9	97		1.29	0.000	14	151			48	96	93		
29	7.5	7.5	15	195		1.56	0.000	14	182			45	91	95		
30	7.5	7.4	11	135		1.47	0.000	10	123			21	97	97		
31																
Total	202.3	225.4	518	6,852	1.78	47.17	0.000	362	4,752	85.0	1,149	1,756	2,760	2,850	357	0
Max.	7.5	7.6	24	338	0.54	1.80	0.000	18	239	13.1	174	132	98	98	90	0
Min.	6.2	7.4	8	97	0.40	1.22	0.000	8	107	7.5	105	15	85	92	88	0
Avg.	6.7	7.5	17	228	0.45	1.57	0.000	12	158	10.6	144	G 50	92	95	89	0
Count	30.0	30.0	30	30	4.00	30.00	30.000	30	30	8.0	8	30	30	30	4	4

G = Geometric Mean

Steven D. Washburn
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

NOVEMBER 1997 - MISCELLANEOUS SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	SO2 Lbs.	Lime Lbs.	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	Raw Sludge pH	Sludge pH 2 Hours	Sludge pH 16 Hrs.	Lbs. of Lime per 1000 Gals. Sludge
1	5	2,880	1,825	22	242	7	457	8,400	3.6	78	5.7	12.14	12.12	54.40
2	6	2,880	1,685	22	322	14	528	7,800	3.4	78	5.5	12.10	12.11	67.69
3	9	3,120	1,685	21	322	11	563	7,700	3.5	78	5.4	12.07	12.08	73.12
4	10	3,000	1,545	13	322	12	528	7,000	3.7	80	5.3	12.07	12.01	75.43
5	9	3,000	1,635	18	242	13	563	8,000	3.1	78	5.3	12.17	12.14	70.38
6	6	3,000	1,515	19	161	12	528	7,800	3.1	77	5.7	12.10	12.13	67.69
7	9	3,000	1,595	17	161	12	493	7,700	3.0	77	5.6	12.30	12.27	64.03
8	7	3,000	1,735	20	0	14	457	7,900	3.3	80	5.6	12.28	12.19	57.85
9	7	2,880	1,735	20	242	14	493	7,900	3.4	80	5.3	12.11	12.16	62.41
10	11	3,000	1,955	24	322	18	633	8,000	3.5	80	5.4	12.24	12.27	79.13
11	12	3,120	1,605	18	322	14	563	11,000	4.2	83	5.4	12.12	12.00	51.18
12	18	3,000	1,565	28	403	17	563	8,000	4.4	82	5.1	12.06	11.95	70.38
13	11	3,000	1,585	21	403	14	528	9,000	3.0	80	5.2	12.31	12.12	58.67
14	21	3,000	1,525	21	403	12	493	7,700	2.8	77	5.5	12.14	12.15	64.03
15	18	3,000	1,525	22	403	13	493	7,900	3.1	78	5.8	12.39	12.28	62.41
16	21	3,000	1,525	22	322	12	528	7,800	3.1	77	5.8	12.31	12.16	67.69
17	22	3,120	1,515	26	403	15	493	7,800	3.5	76	5.8	12.27	12.19	63.21
18	20	3,000	1,575	22	403	13	493	7,800	3.5	77	5.8	12.16	12.03	63.21
19	20	3,120	1,565	10	322	14	563	7,800	2.3	74	5.7	12.25	12.19	72.18
20	13	2,880	1,525	18	322	13	704	7,700	3.8	75	6.1	12.35	12.06	91.43
21	15	3,000	1,515	19	403	13	493	7,600	3.2	76	5.5	12.42	12.20	64.87
22	12	3,000	15,645	22	403	16	457	7,800	3.1	75	5.7	12.57	12.21	58.59
23	19	3,120	1,495	23	403	19	493	7,600	3.3	76	5.8	12.50	12.31	64.87
24	8	3,000	1,665	22	242	16	493	7,600	3.3	75	5.8	12.47	12.39	64.87
25	16	3,000	1,565	20	322	16	493	7,600	3.3	74	5.9	12.53	12.25	64.87
26	9	3,000	1,775	23	322	21	704	7,600	3.3	78	5.9	12.42	12.10	92.63
27	10	3,000	1,615	24	322	19	528	7,500	3.7	75	5.9	12.35	12.00	70.40
28	15	2,880	1,565	29	322	17	563	7,500	3.5	74	5.9	12.50	12.37	75.07
29	5	3,000	1,605	23	322	17	598	7,700	3.6	74	5.9	12.43	12.27	77.66
30	8	2,880	1,595	25	322	10	598	7,700	3.3	75	6.2	12.52	12.01	77.66
31														
Total	372	89,880	62,460	634	9,425	428	16,084	236,900	100.9	2,317	169.5	368.65	364.72	2047.97
Max.	22	3,120	15,645	29	403	21	704	11,000	4.4	83	6.2	12.57	12.39	92.63
Min.	5	2,880	1,495	10	0	7	457	7,000	2.3	74	5.1	12.06	11.95	51.18
Avg.	12	2,996	2,082	21	314	14	536	7,897	3.4	77	5.7	12.29	12.16	68.27

Steven D. Washburn
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

DECEMBER 1997 - PLANT INFLUENT SHEET

	-----Weather----		Inf. Flow	Inf. Temp	Inf. pH	Inf. BOD	Inf. BOD	Inf. SS	Inf. SS	Inf. Phos.	Inf. Phos.	Inf. VSS	Inf. NH3-N	--Remarks or Otner Parameters--
	Type	Precip.	MGD	F	SU	mgIL	Lbs.	mgIL	Lbs.	mgIL	Lbs.	mgIL	mgIL	
Day														
1			1.50	59	7.7	215	2.690	172	2,152			152	14.2	
2			1.65	60	7.7	221	3,041	184	2,532			158		
3	RAIN	0.03	1.59	60	7.5	287	3,806	202	2,679			180		
4	SNOW	0.05	1.55	59	7.5	225	2,909	218	2,818	4.17	54	192		
5	SNOW	0.07	1.42	58	7.7	238	2,819	232	2,748			212	16.4	
6	SNOW	0.03	1.29	55	7.9	214	2.302	192	2,066			180		
7	SNOW	0.01	1.36	56	7.8	233	2,643	216	2,450			202		
8	SNOW	0.02	1.50	59	7.8	237	2,965	272	3,403			258		
9	SNOW	0.47	1.58	59	7.6	270	3,558	262	3,452	3.55	47	242	14.8	
10	SNOW	0.63	1.64	60	7.8	226	3,091	222	3,036			198		
11			1.65	59	7.6	211	2,904	230	3,165			198	13.2	
12			1.54	58	7.7	213	2,736	204	2,620			190		
13			1.56	56	7.8	287	3,734	252	3,279			224		
14			1.54	56	7.6	254	3,262	262	3,365			242		
15			1.54	56	7.6	201	2,582	232	2,980			202	15.4	
16			1.68	56	7.9	240	3,363	208	2,914			182		
17			1.56	58	7.6	224	2,914	206	2,680			178		
18			1.50	58	7.6	280	3,503	220	2,752	4.23	53	196	15.5	
19			1.61	57	7.7	337	4,525	372	4,995			340		
20			1.65	57	7.7	289	3,977	266	3,660			228		
21			1.61	58	7.5	295	3,961	220	2,954			184		
22	RAIN	0.29	1.63	58	7.5	296	4,024	402	5,465			354	12.8	
23			1.20	57	7.7	256	2,562	202	2,022	5.10	51	186		
24	RAIN	0.44	1.30	56	7.6	195	2,114	170	1.843			170		
25			1.25	56	7.6	168	1,751	266	2,773			192		
26	RAIN	0.02	1.39	55	7.8	188	2,179	172	1,994			152	15.4	
27			1.69	54	7.7	298	4,200	260	3,665			240		
28			1.52	56	7.7	246	3,118	404	5,121			320		
29	SNOW	0.01	1.71	54	7.7	284	4,050	290	4,136			238		
30	SNOW	0.01	1.38	55	7.9	248	2,854	194	2,233			194	12.4	
31			1.56	54	7.3	217	2,823	364	4,736			314		
Total	0	2.08	47.15	1,769	237.8	7,593	96,960	7,568	96,687	17.05	205	6,698	130.1	
Max.	0	0.63	1.71	60	7.9	337	4,525	404	5,465	5.10	54	354	16.4	
Min.	0	0.01	1.20	54	7.3	168	1,751	170	1,843	3.55	47	152	12.4	
Avg.	0	0.16	1.52	57	7.7	245	3,128	244	3,119	4.26	51	216	14.5	
Count	13	13.00	31.00	31	31.0	31	31	31	31	4.00	4	31	9.0	

Steven D. Washburn
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

DECEMBER 1997 - PRIMARY EFFLUENT SHEET

Day	P Eff. BOD mg/L	P Eff BOD Lbs.	P Eff. SS mg/L	P. Eff. SS Lbs.	P Eff. Phos. mg/L	P Eff. Phos. Lbs.	P Eff. VSS mg/L	P Eff. NH3-N mg/L	Flow MGD	BOD Pri. Removal %	SS Pri. Removal %	P Pri. Removal %
1	146	1,826	62	776			48	15.9	1.50	32	64	
2	155	2,133	72	991			60		1.65	30	61	
3	181	2,400	76	1,008			64		1.59	37	62	
4	151	1,952	78	1.008	3.26	42	64		1.55	33	64	22
5	137	1,622	82	971			78	17.2	1.42	42	65	
6	142	1.528	80	861			76		1.29	34	62	
7	131	1,486	82	930			76		1.36	44	62	
8	154	1,927	90	1.126			80		1.50	35	67	
9	161	2,122	66	870	2.28	30	66	15.4	1.58	40	75	36
10	144	1,970	78	1,067			66		1.64	36	65	
11	169	2,326	80	1,101			64	14.0	1.65	20	65	
12	146	1,875	98	1,259			84		1.54	31	52	
13	161	2,095	82	1,067			74		1.56	44	67	
14	135	1,734	62	796			54		1.54	47	76	
15	134	1,721	54	694			48	16.0	1.54	33	77	
16	142	1,990	70	981			62		1.68	41	66	
17	145	1,887	88	1,145			74		1.56	35	57	
18	142	1,776	74	926	2.62	33	62	15.4	1.50	49	66	38
19	155	2,081	88	1,182			72		1.61	54	76	
20	153	2,105	84	1,156			62		1.65	47	68	
21	155	2,081	94	1,262			72		1.61	47	43	
22	149	2,026	94	1,278			94	12.6	1.63	50	77	
23	162	1,621	80	801	2.89	29	80		1.20	37	60	43
24	114	1,236	90	976			86		1.30	42	47	
25	101	1,053	86	897			80		1.25	40	68	
26	123	1,426	86	997			74	16.2	1.39	35	50	
27	121	1,705	72	1,015			64		1.69	59	72	
28	122	1,547	90	1,141			80		1.52	50	78	
29	174	2,481	84	1,198			76		1.71	39	71	
30	200	2,302	56	645			56	13.3	1.38	19	71	
31	169	2,199	74	963			74		1.56	22	80	
Total	4,574	58,232	2,452	31,083	11.05	134	2,170	136.0	47.15	1,204	2,034	139
Max.	200	2,481	98	1,278	3.26	42	94	17.2	1.71	59	80	43
Min.	101	1,053	54	645	2.28	29	48	12.6	1.20	19	43	22
Avg.	148	1,878	79	1,003	2.76	33	70	15.1	1.52	39	66	35
Count	31	31	31	31	4.00	4	31	9.0	31.00	31	31	4

Steven D. Washburn
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

DECEMBER 1997- ACTIVATED SLUDGE SHEET

Day	Aerat Volume KCF	Deten. Time Hrs.	Sludge Age Days	Organic Loading f/m	Mix Liq SS mg/L	Mix Liq VSS mg/L	Mix Liq Settl. %	Mix Liq SDI %	Mix Liq DO mg/L	Air Cu Ft. X 10000	Return SS %	Return VSS %	Return %	Waste Sludge KGal	Daily Flow MGD	PE BOD mg/l	PE SS mg/L
1	48	5.7	8.4	0.33	2,180	1,874	31.0	0.70	5.3	153	0.36	0.31	63	24.0	1.50	146	62
2		5.2	6.3	0.41	2,071	1,756	26.0	0.80	6.0	145	0.35	0.30	56	24.0	1.65	155	72
3		5.4	6.1	0.46	2,049	1,747	30.0	0.68	5.0	139	0.40	0.34	54	24.0	1.59	181	76
4		5.6	6.8	0.33	2,295	1,949	38.0	0.60	3.4	139	0.51	0.44	59	24.0	1.55	151	78
5		6.1	7.0	0.28	2,271	1,922	39.0	0.58	4.3	146	0.36	0.30	65	26.0	1.42	137	82
6		6.7								143			71	32.0	1.29	142	80
7		6.3								140			65	33.0	1.36	131	82
8		5.7	5.3	0.38	1,987	1.680	32.0	0.62	5.6	152	0.32	0.26	62	28.0	1.50	154	90
9		5.5	7.2	0.40	2,083	1,760	33.0	0.63	5.7	141	0.34	0.29	59	23.0	1.58	161	66
10		5.3	5.6	0.39	2,008	1,701	33.0	0.61	4.6	147	0.34	0.28	59	23.0	1.64	144	78
11		5.2	5.8	0.43	2,130	1,815	35.0	0.61	4.7	161	0.38	0.32	56	23.0	1.65	169	80
12		5.6	5.1	0.35	2,144	1,815	39.0	0.55	4.7	157	0.36	0.30	61	25.0	1.54	146	98
13		5.5								153			59	29.0	1.56	161	82
14		5.6								163			60	30.0	1.54	135	62
15		5.6	9.7	0.30	2.248	1,907	38.0	0.59	4.5	145	0.37	0.31	61	31.0	1.54	134	54
16		5.1	6.5	0.37	2,132	1,793	39.0	0.55	4.9	144	0.36	0.30	55	31.0	1.68	142	70
17		5.5	5.6	0.35	2,132	1,807	36.0	0.59	4.7	149	0.33	0.28	62	31.0	1.56	145	88
18		5.7	7.4	0.30	2,292	1,948	40.0	0.57	5.1	141	0.36	0.31	62	32.0	1.50	142	74
19		5.4	5.4	0.38	2,144	1,815	39.0	0.55	4.8	137	0.35	0.30	54	30.0	1.61	155	88
20		5.2								137			54	30.0	1.65	153	84
21		5.4								137			56	29.0	1.61	155	94
22		5.3	5.6	0.34	2,372	2,019	36.0	0.66	2.4	135	0.46	0.39	55	35.0	1.63	149	94
23		7.2	9.2	0.26	2.456	2,092	35.0	0.70	3.2	135	0.41	0.35	74	38.0	1.20	162	80
24		6.6	7.4	0.20	2,408	2,051	38.0	0.63	4.0	134	0.49	0.42	68	37.0	1.30	114	90
25		6.9								134			70	37.0	1.25	101	86
26		6.2	6.5	0.26	2,159	1,833	36.0	0.60	6.7	136	0.43	0.37	61	31.0	1.39	123	86
27		5.1								144			49	28.0	1.69	121	72
28		5.7								155			54	31.0	1.52	122	90
29		5.0	4.9	0.50	1,955	1,663	30.0	0.65	5.0	137	0.41	0.35	48	30.0	1.71	174	84
30		6.2	9.3	0.45	2,003	1,706	30.0	0.67	3.9	141	0.40	0.34	59	26.0	1.38	200	56
31		5.5	6.4	0.42	2,047	1,755	24.0	0.85	4.8	148	0.42	0.36	52	23.0	1.56	169	74
Total	48	177.1	147.4	7.88	47,566	40,408	757.0	14.01	103.3	4,468	8.51	7.22	1,843	898.0	47.15	4,574	2,452
Max.	48	7.2	9.7	0.50	2,456	2,092	40.0	0.85	6.7	163	0.51	0.44	74	38.0	1.71	200	98
Min.	48	5.0	4.9	0.20	1,955	1,663	24.0	0.55	2.4	134	0.32	0.26	48	23.0	1.20	101	54
Avg.	48	5.7	6.7	0.36	2,162	1,837	34.4	0.64	4.7	144	0.39	0.33	59	29.0	1.52	148	79
Count	1	31.0	22.0	22.00	22	22	22.0	22.00	22.0	31	22.00	22.00	31	31.0	31.00	31	31

Steven D. Washburn
Superintendent

MARSHALL WWTP 801 INDUSTRIAL RD MARSHALL MI 49068 - PERMIT MI0023540

DECEMBER 1997- DISCHARGE MONITORING REPORT - DISCHARGE NO. 001A

Day	F Eff D O mgIL	F.Eff. pH SU	F Eff. SS mgIL	F Eff. SS Lbs.	F.Eff. Total-P mgIL	Flow MGD	F.Eff Chlorine mgIL	F.Eff. CBOD mgIL	F.Eff. CBOD Lbs.	F.Eff. NH3 as N mgIL	F Eff. NH3-N Lbs	F Eff. F Coli per 100 ml	SS Rem. %	BOD Rem. %	Total-P Rem. %	Amenable Cyanide mg/l
1	7.3	7.6	14	175		1.50	0.000	9	113	13.5	169	20	92	96		
2	7.7	7.6	11	151		1.65	0.000	9	124			57	94	96		
3	6.8	7.4	13	172	(145)	1 59	0.000	9	119			56	94	97		
4	6.6	7.4	13	168		1.55	0.000	9	116			30	94	96		
5	7 2	7.5	13	154	0.34	1.42	0.000	9	107	12.6	149	15	94	96	92	
6	7.7	7.7	11	118	4031bs	1.29	0.000	10	108			14	94	95		<0.02
7	7.2	7.6	7	79		1.36	0.000	12	136			33	97	95		
8	7.3	7.6	9	113		1.50	0.000	12	150			14	97	95		
9	7.4	7.6	9	119	0.30	1.58	0.000	9	119	13.0	171	24	97	97	92	<0.02
10	7.1	7.6	15	205	395	1.64	0.000	8	109			40	93	96		
11	7 0	7.6	11	151		1.65	0.000	7	96	13.1	180	27	95	97		
12	7.0	7.6	13	167		1.54	0.000	7	90			10	94	97		
13	7.5	7.6	12	156		1.56	0.000	9	117			27	95	97		<0.02
14	7.2	7.5	7	90		1.54	0.000	9	116			14	97	96		
15	6.9	7.5	9	116		1.54	0.000	11	141	11.6	149	6	96	95		
16	7.3	7.6	5	70		1.68	0.000	12	168			31	98	95		
17	7.2	7.6	14	182		1.56	0.000	8	104			25	93	96		<0.02
18	7.4	7.5	7	88	0.70	1.50	0.000	7	88	11.7	146	25	97	98	84	
19	7.4	7.6	9	121	876	1.61	0.000	6	81			26	98	98		
20	7.3	7.6	11	151		1.65	0.000	8	110			28	96	97		
21	6.9	7.5	12	161		1.61	0.000	8	107			126	95	97		
22	6.6	7.5	11	150		1.63	0.000	10	136	10.0	136	26	97	97		
23	6.5	7.5	7	70	0.39	1.20	0.000	9	90			23	97	96	92	
24	6.8	7.5	9	98	390	1.30	0.000	6	65			13	95	97		
25	7.0	7.5	7	73		1.25	0.000	5	52			24	97	97		
26	8.2	7.7	11	128	(516)	1.39	0.000	6	70	14.8	172	8	94	97		
27	8.0	7.6	11	155		1.69	0.000	7	99			18	96	98		
28	7.0	7.6	10	127		1.52	0.000	6	76			12	98	98		
29	7.0	7.3	12	171		1.71	0.000	9	128			23	96	97		
30	7.0	7.5	9	104		1.38	0.000	10	115	13.4	154	16	95	96		
31	7.2	7.5	13	169		1.56	0.000	7	91			22	96	97		
Total	222.7	234.0	325	4,151	1.73	47.15	0.000	263	3,341	113.7	1,427	833	2,961	2,992	360	0
Max.	8.2	7.7	15	205	0.70	1.71	0.000	12	168	14.8	180	126	98	98	92	0
Min.	6.5	7.3	5	70	0.30	1.20	0.000	5	52	10.0	136	6	92	95	84	0
Avg.	7.2	7.5	10	134	0.43	1.52	0.000	8	108	12.6	159	27	96	97	90	0
Count	31.0	31.0	31	31	4.00	31.00	31.000	31	31	9.0	9	G 22	31	31	4	4

G = Geometric Mean

Steven D. Washburn
Superintendent

MARSHALL MICHIGAN WASTEWATER TREATMENT PLANT

DECEMBER 1997 - MISCELLANEOUS & SLUDGE SHEET

Day	Fuel Gas Cu Ft	Elect. Power KWH	Water Cu Ft	Chlorine Lbs.	Ferric Chloride Lbs.	SO2 Lbs.	Lime Lbs.	Raw Sludge Gals.	Total Solids Percent	Vol. Solids Percent	Raw Sludge pH	Sludge pH 2 Hours	Sludge pH 16 Hrs.	Lbs. of Lime per 1000 Gals. Sludge
1	4	3,120	1,545	25	322	19	286	7,600	4.1	78	5.9	12.06	12.13	37.63
2	12	3,120	1,395	20	322	22	286	7,650	3.9	78	5.5	12.08	12.07	37.39
3	16	3,000	1,525	22	403	16	286	7,650	3.8	74	5.9	12.08	12.19	37.39
4	14	3,000	1,535	22	242	16	336	7,600	3.3	76	5.7	12.17	11.97	44.21
5	23	3,000	1,375	24	242	16	353	7,600	3.1	77	5.9	12.26	12.25	46.45
6	19	3,000	1,565	24	403	14	269	7,700	3.4	76	6.2	12.22	12.23	34.94
7	18	3,000	1,305	22	242	12	282	7,550	3.2	78	5.8	12.10	12.24	37.35
8	18	3,000	1,455	29	322	10	319	7,700	3.6	80	5.8	12.23	12.18	41.43
9	22	3,120	1,275	20	242	8	319	7,600	3.9	79	5.6	12.14	12.16	41.97
10	23	3,000	1,385	19	322	15	302	7,700	3.7	80	5.4	12.16	12.08	39.22
11	21	3,120	1,415	22	322	18	202	7,700	3.2	78	5.5	12.06	12.08	26.23
12	27	3,000	1,425	22	242	23	286	7,700	3.2	76	5.7	12.20	12.23	37.14
13	25	3,000	1,535	22	242	15	302	9,500	3.2	76	5.9	12.25	11.98	31.79
14	23	3,000	1,245	20	322	13	302	7,700	3.0	76	5.9	12.15	12.21	39.22
15	20	2,880	1,435	18	322	13	319	7,850	3.1	76	5.8	12.09	12.30	40.64
16	20	3,000	1,625	16	322	14	319	7,800	3.1	76	6.0	12.23	12.30	40.90
17	21	3,120	1,365	16	242	9	269	7,600	3.3	76	6.0	12.24	12.12	35.39
18	14	2,880	1,215	18	322	12	252	7,400	3.3	75	6.0	12.14	12.29	34.05
19	15	3,120	1,285	19	242	17	269	7,000	3.2	77	6.0	12.27	12.12	38.43
20	19	3,000	1,435	20	242	12	218	7,650	3.7	76	6.0	12.17	12.17	28.50
21	23	2,880	1,315	18	242	17	252	7,500	3.4	76	5.9	12.24	12.27	33.60
22	24	3,120	1,285	21	242	17	319	7,550	3.5	76	5.9	12.22	12.26	42.25
23	20	3,000	545	29	403	17	252	7,650	3.3	76	6.0	12.25	12.22	32.94
24	21	3,000	325	21	242	17	252	7,400	3.2	76	6.1	12.28	12.13	34.05
25	20	2,760	375	24	322	17	252	7,500	3.1	74	6.1	12.19	12.19	33.60
26	22	3,240	255	22	242	13	218	7,550	3.2	75	6.2	12.22	11.85	28.87
27	22	3,000	245	22	242	14	218	7,600	3.2	76	6.2	12.06	12.19	28.68
28	20	2,760	195	22	242	12	252	7,650	3.4	76	6.2	12.16	12.00	32.94
29	20	3,240	305	20	161	11	252	7,650	3.7	71	6.1	12.19	12.20	32.94
30	25	3,000	305	19	403	12	336	12,600	3.6	73	6.0	12.16	12.21	26.67
31	31	3,000	235	17	242	12	470	14,600	3.3	74	6.1	12.17	12.22	32.19
Total	622	93,480	33,725	655	8,865	453	8,849	249,500	105.2	2,361	183.3	377.44	377.04	1109.01
Max.	31	3,240	1,625	29	403	23	470	14,600	4.1	80	6.2	12.28	12.30	46.45
Min.	4	2,760	195	16	161	8	202	7,000	3.0	71	5.4	12.06	11.85	26.23
Avg.	20	3,015	1,088	21	286	15	285	8,048	3.4	76	5.9	12.18	12.16	35.77

Steven D. Washburn
Superintendent