EPA Region 5 Records Ctr.
201250

Weather Code	
1 Clear	6 Warm
2 Partly Cloudy	7 Cold
3 Cloudy	8 Windy
4 Rain	9 Melting Snow
5 Snow	

PLANT INFLUENT SHEET

January 1999

Marshall

STATE OF MICHIGAN

MI 002 3540

SUPERINTENDENT

DEPT OF ENVIRONMENTAL QUALITY

Steven D Washburn

DAY	WEATHER TYPE CODE	WEATHER PRECIP Inches	FLOW TOTAL MGD	FLOW MAX MGD	RAW SEWAGE QUALITY TEMP °F	pH SU	BOD_5 mg/l	BOD_5 LBS	SS mg/l	SS LBS	TOTAL-P mg/l	TOTAL-P LBS	VSS mg/l	NH3-N mg/l
1	5	0 05	1 330		56	7 80	212	2352	156	1730			140	14 6
2	5	1 12	1 380		55	7 90	221	2544	188	2164			174	
3	3		1 380		54	8 00	186	2141	162	1864			144	14 4
4	1		1 710		55	7 60	273	3893	142	2025			126	
5	5	0 02	1 680		59	7 70	258	3615	146	2046			126	
6	5	0 03	1 780		57	7 80	192	2850	118	1752			102	
7	1		1 750		57	7 80	180	2627	142	2072	3 45	50	134	
8	5	0 02	1 640		58	7 70	190	2599	156	2134			130	14 3
9	1		1 420		54	8 00	235	2783	232	2748			196	
10	5	0 02	1 510		55	8 00	159	2002	126	1587			114	
11	5	0 18	1 960		62	7 50	155	2534	154	2517	2 88	47	152	11 6
12	5	0 20	1 920		61	7 50	189	3026	149	2386			140	
13	3		1 890		56	7 60	186	2932	134	2112			134	11 6
14	5	0 01	1 850		59	7 70	210	3240	152	2345			148	
15	5	0 01	1 450		55	7 90	249	3011	232	2806			212	
16	3		1 330		54	8 10	236	2618	208	2307			182	
17	4	0 42	1 420		54	7 70	180	2132	192	2274			180	13 7
18	5	0 02	1 610		54	7 80	195	2618	176	2363	3 35	45	176	
19	1		1 700		55	8 00	196	2779	201	2850			184	
20	4	0 92	1 550		54	7 90	191	2469	216	2792			198	12 9
21	1		1 560		54	7 80	231	3005	244	3175			234	
22	4	0 34	1 800		52	7 70	173	2597	174	2612			162	
23	3		1 860		53	7 80	129	2001	136	2110			118	
24	5	0 16	1 950		52	7 80	137	2228	140	2277			134	
25	5	0 02	2 000		54	7 70	162	2702	154	2569			146	10 6
26	1		1 960		57	7 50	208	3400	225	3678			214	
27	1		1 960		53	7 70	130	2125	136	2223	2 63	43	124	
28	1		2 070		55	7 60	167	2883	110	1899			104	11 1
29	1		1 950		52	7 80	198	3220	174	2830			140	
30	1		1 770		53	7 60	179	2642	196	2893			182	
31	1		1 810		58	7 80	151	2279	132	1993			126	
TL		3 54	52 950					83848		73132		185		
ME			1 708				192	2705	168	2359	3 08	46	154	12 8

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

PRIMARY EFFLUENT SHEET

January 1999

Marshall
MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

	PRIMARY EFFLUENT QUALITY												
DAY	BOD-5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS		AMMONIA NITROGEN	
	mg/l	LBS	Removal	mg/l	LBS	% Removal	mg/l	LBS	% Removal	mg/l	%	mg/l	LBS
1	136	1509	35.8	92	1020	41.0				76.0	82.6	15.7	174
2	128	1473	42.1	52	598	72.3				52 0	100.0		
3	116	1335	37.6	58	827	64.2				44.0	75.9	16.3	232
4	196	2795	28.2	72	1009	49.3				60.0	83.3		
5	188	2634	27.1	80	1188	45.2				64.0	80.0		
6	169	2509	12.0	78	1138	33.9				60.0	76.9		
7	135	1970	25.0	62	848	56.3	2.0	27.4	42.0	58 0	93.5		
8	135	1846	28.9	76	900	51.3				56.0	73.7	15.4	182
9	130	1540	44.7	52	655	77.6				44.0	84.6		
10	106	1335	33.3	34	556	73.0				24.0	70.6		
11	125	2043	19.4	70	1121	54.5	1.8	28.2	38.9	66 0	94.3	13.6	218
12	149	2386	21.2	60	946	59.7				58 0	96.7		
13	139	2191	25.3	48	741	64.2				48 0	100.0	13.1	202
14	138	2129	34.3	48	580	68.4				48.0	100.0		
15	159	1923	36.1	70	776	69.8				66 0	94.3		
16	150	1664	36.4	70	829	66.3				70.0	100.0		
17	103	1220	42.8	60	806	68.8				54 0	90.0	17.2	231
18	107	1437	45.1	52	737	70.5	2.1	30.1	36.7	52.0	100.0		
19	115	1630	41.3	46	595	77.1				38.0	82.6		
20	107	1383	44.0	60	781	72.2				40 0	66.7	15.1	196
21	148	1926	35.9	82	1231	66.4				78.0	95.1		
22	169	2537	2.3	82	1272	52.9				74.0	90.2		
23	106	1644	17.8	60	976	55.9				44.0	73.3		
24	107	1740	21.9	54	901	61.4				50.0	92.6		
25	92	1535	43.2	62	1013	59.7				52.0	83.9	11.4	186
26	133	2174	36.1	70	1144	68.9				64.0	91.4		
27	136	2223	-4.6	76	1312	44.1				64.0	84.2		
28	155	2676	7.2	74	1203	32.7	2.1	34.6		64.0	86.5	12.7	207
29	153	2488	22.7	68	1004	60.9				62 0	91.2		
30	109	1609	39.1	72	1087	63.3				62.0	86.1		
31	100	1510	33.8	62	27379	53.0				62.0	100.0		
TL		59014			55174			120.2					1829
ME	134	1904	29.6	65	1780	59.8	2.0	30.1	29.4	1754.0	87.8	14.5	203

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
SURFACE WATER QUALITY DIVISION

DEQ

Discharge Number	Permit Number
001 A	MI 002 3540

DAILY DISCHARGE MONITORING REPORT

Monitoring Period
January 1999

DAY	CBOD5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS	NH3-N		PH	D.O.	F.COLI #/100ml	CL RESID	CN Amenable
	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	mg/l	LBS	SU	mg/l	MF	mg/l	mg/L
1	7.0	78	96.7	15.0	166	90.4				14.0	14.40	159.73	7.70	8.5	20	0.001	<0.02
2	9.0	104	95.9	9.0	104	95.2				9.0			7.70	8.5	23	0 002	
3	8 0	92	95.7	6.0	69	96.3				6.0	16.00	184.15	7.60	7.5	17	0.028	
4	11.0	157	96.0	11.0	157	92.3				8.0			7.50	8.4	60	0.018	
5	14.0	196	94.6	20.0	280	86.3				14.0			7.60	7.7	20	0.001	<0.02
6	12.0	178	93.8	11.0	163	90.7				7.0			7.60	7.5	22	0.001	
7	10.0	146	94.4	11.0	161	92.3	0.25	3.6	92.8	11.0			7.60	7.2	52	0.001	
8	8.0	109	95.8	13.0	178	91.7				13.0	12.50	170.97	7.60	7.6	34	0.001	<0.02
9	7.0	83	97.0	10.0	118	95.7				10.0			7.60	8.1	28	0.001	
10	7.0	88	95.6	3.0	38	97.6				3.0			7.60	8.0	20	0.012	
11	7.0	114	95.5	12.0	196	92.2	0.22	3.6	92.4	12.0	12.50	204.33	7.60	7.6	28	0.001	
12	6.0	96	96.8	7 0	112	95.3				7.0			7.60	7.4	17	0.001	<0.02
13	6.0	95	96.8	5.0	79	96.3				5.0	10.60	167.08	7.50	6.7	34	0.001	
14	9.0	139	95.7	6.0	93	96.1				6.0			7.50	7.2	33	0 001	
15	7 0	85	97.2	5.0	60	97.8				5.0			7.50	6.7	9	0.001	
16	8.0	89	96.6	10.0	111	95.2				7.0			7.70	7.8	54	0.001	
17	7.0	83	96.1	5.0	59	97.4				4.0	17.10	202.51	7.60	7.6	17	0.001	
18	7.0	94	96.4	1.0	13	99.4	0.19	2.6	94.3	1.0			7.60	8.0	18	0.001	
19	7.0	99	96.4	5.0	71	97.5				5.0			7.60	7.8	7	0.001	
20	6.0	78	96.9	5.0	65	97.7				1.0	13.50	174.51	7.60	7.3	7	0.001	
21	7.0	91	97.0	9.0	117	96.3				9.0			7.60	7.3	19	0.001	
22	9.0	135	94.8	12.0	180	93.1				12.0			7.60	7.2	17	0 001	
23	7.0	109	94.6	8.0	124	94.1				4.0			7.60	7.4	21	0.001	
24	7.0	114	94.9	6.0	98	95.7				6.0			7.60	8.1	17	0.001	
25	7.0	117	95.7	8.0	133	94.8				8.0	10.40	173.47	7.60	7.7	34	0.001	
26	7.0	114	96.6	11.0	180	95.1				11.0			7.70	8.1	22	0.001	
27	6.0	98	95.4	12.0	196	91.2	0.21	3.4	92.0	12.0			7.70	7.5	19	0.001	
28	9.0	155	94.6	11.0	190	90.0				10.0	10.90	188.18	7.60	7.6	72	0.001	
29	8.0	130	96.0	13.0	211	92.5				13.0			7.60	7.6	12	0.001	
30	7.0	103	96.1	8.0	118	95.9				8.0			7.60	8.1	12	0.001	
31	6.0	91	96.0	7.0	106	94.7				7.0			7.70	8.1	15	0.001	
TL		3459			3947			13.2									
ME	7.8	112	95.9	8.9	127	94.4	0.22	3.3	92.9	248.0	13.10	180.55		7.7	22	0.003	
WA	10.3	140		11.9	162										31		
MX											17.10	204.33	7.70			0.028	
MN													7.50	6.7			

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment See 18 U S C 1001 and 33 U S C 1319 (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 Years)

PRINTED NAME AND TITLE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTORIZED AGENT	DATE
Steven D. Washburn, Superintendent		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

ACTIVATED SLUDGE SHEET

January 1999

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	AERATION SYSTEM				MIXED LIQUOR								SECONDARY SLUDGE				
	AERTN VOL	DETEN TIME	CRT	F:M RATIO	MLSS		MLVSS		SETTL.	SDI	D.O.	AIR	SS	VSS	RAS FLOW	WASTE SLUDGE K- Gal.	
	KCF	HRS	DAYS		mg/L	Lbs.	mg/L	Lbs.	%	%	mg/L	CF	%	%	%	Gallons	Lbs.
SF	3											4				3	
1	48	6.5									5.50	133			60	37	
2	48	6.2									6.90	122			58	28	
3	48	6.2									5.70	121			58	29	
4	48	5.0	5.0	0.62	1789	5357	1515	4537	18	0.99	8.40	127	0.44	0.37	46	29	1064
5	48	5.1	5.1	0.54	1918	5743	1620	4851	18	1.07	5.50	127	0.47	0.40	47	29	1137
6	48	4.8	4.8	0.48	2022	6055	1733	5189	16	1.26	4.90	118	0.52	0.45	46	29	1258
7	48	4.9	4.4	0.38	2034	6091	1735	5195	20	1.02	4.70	122	0.55	0.46	46	30	1376
8	48	5.3	4.5	0.38	1943	5818	1638	4905	20	0.97	7.70	121	0.50	0.42	48	31	1293
9	48	6.1									4.90	123			55	30	
10	48	5.7									6.30	125			52	31	
11	48	4.4	3.7	0.47	1729	5177	1462	4378	21	0.82	8.10	121	0.54	0.46	40	31	1396
12	48	4.5	5.8	0.49	1889	5656	1616	4839	22	0.86	5.50	127	0.49	0.42	42	24	981
13	48	4.6	6.7	0.43	1998	5983	1700	5090	21	0.95	5.60	127	0.49	0.42	42	22	899
14	48	4.7	6.2	0.40	2086	6246	1791	5363	22	0.95	3.20	115	0.50	0.43	42	24	1001
15	48	5.9	3.8	0.34	2192	6564	1895	5674	23	0.95	6.20	113	0.52	0.45	55	40	1735
16	48	6.5									4.80	114			57	45	
17	48	6.1									4.50	117			56	45	
18	48	5.4	3.8	0.30	1896	5677	1621	4854	21	0.90	5.70	117	0.46	0.39	51	39	1496
19	48	5.1	4.1	0.34	1872	5606	1608	4815	22	0.85	6.30	115	0.45	0.39	48	36	1351
20	48	5.6	4.9	0.30	1821	5453	1559	4668	23	0.79	5.90	112	0.43	0.37	48	31	1112
21	48	5.5	4.9	0.40	1802	5396	1609	4818	22	0.82	7.00	110	0.47	0.39	52	28	1098
22	48	4.8	4.8	0.53	1913	5728	1613	4830	22	0.87	5.60	110	0.49	0.42	46	29	1185
23	48	4.6									3 20	115			44	30	
24	48	4.4									5.30	119			42	30	
25	48	4.3	4.2	0.31	1978	5923	1673	5010	25	0.79	6.50	116	0.56	0.47	41	30	1401
26	48	4.4	4.2	0.44	1971	5902	1650	4941	21	0.94	6.90	111	0.54	0.45	42	31	1396
27	48	4.4	4.2	0.43	2042	6115	1720	5150	21	0.97	5.80	115	0.56	0.47	42	31	1448
28	48	4.2	4.2	0.53	2036	6097	1702	5096	22	0.93	6.90	118	0.56	0.47	39	31	1448
29	48	4.4	3.9	0.48	2074	6210	1742	5216	23	0.90	4.40	117	0.63	0.53	41	30	1576
30	48	4.9									4.90	117			49	33	
31	48	4.8									6.10	118			46	37	
TL												3683				980	25650
ME	48	5.1	4.7	0.43	1950	5840	1660	4971	21	0.9	5.8	119	0.51		48	32	1282

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SLUDGE SHEET

Marshall

MI 002 3540

January, 1999

SUPERINTENDENT
Steven D. Washburn

	RAW SLUDGE				LIME STABILIZED SLUDGE					
DAY	GALLONS	TOTAL SOLIDS %	VOLATILE SOLIDS %	pH SU	LIME POUNDS	pH 2 hrs @ 25 C SU	pH 16 hrs SU	Lbs. Lime per 1000 gallons sludge		
1	7000	3.9	77.0	6.0	648	12.21	12.18	93		
2	7000	3.7	77.0	6.0	684	12.11	12.01	98		
3	7000	3.6	76.0	6.1	684	12.27	12.27	98		
4	7500	3.2	76.0	6.0	756	12.21	11.92	101		
5	7500	3.8	77.0	6.0	612	12.28	12.17	82		
6	7400	3.8	79.0	6.0	612	12.16	12.04	83		
7	7200	4.1	75.0	6.2	576	12.13	11.96	80		
8	6000	4.4	78.0	5.8	612	12.15	12.16	102		
9	6000	3.8	77.0	5.9	612	12.18	12.13	102		
10	6000	4.0	76.0	6.0	576	12.18	12.19	96		
11	6600	4.0	75.0	6.0	468	12.19	12.25	71		
12	6600	3.8	76.0	5.8	576	12.26	12.30	87		
13	6000	3.7	75.0	5.8	828	12.25	12.15	138		
14	6000	3.6	76.0	5.7	360	12.25	12.28	60		
15	6000	3.8	77.0	5.7	540	12.19	12.11	90		
16	6000	3.7	77.0	5.7	504	12.19	12.00	84		
17	6000	3.7	77.0	5.9	468	12.15	12.09	78		
18	2000	3.9	80.0	5.9	144	12.23	12.09	72		
19	7000	3.9	79.0	6.0	828	12.23	12.10	118		
20	7900	4.0	79.0	5.6	720	12.19	12.22	91		
21	7500	4.1	81.0	5.6	648	12.11	12.14	86		
22	7000	4.2	80.0	5.5	756	12.24	12.24	108		
23	7000	4.4	81.0	5.4	756	12.14	12.09	108		
24	7000	3.8	79.0	5.5	720	12.23	12.20	103		
25	7000	3.8	79.0	5.5	756	12.20	12.19	108		
26	8700	3.5	79.0	5.6	612	12.16	12.23	70		
27	7000	4.2	79.0	5.4	684	12.30	12.27	98		
28	8200	3.9	79.0	5.4	648	12.24	12.19	79		
29	7000	3.5	77.0	5.6	684	12.21	12.22	98		
30	7000	3.4	77.0	5.8	684	12.28	12.26	98		
31	7000	3.6	77.0	5.8	576	12.22	12.25	82		
TOTAL	209100				19332					
MEAN	6745	3.8	77.6	5.8	624	12.20	12.16	92		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MISCELLANEOUS SHEET

January 1999

Marshall
MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	WATER	ELECTRICAL USAGE		FUEL GAS		CHEMICALS APPLIED								
			X 120		X 100	$FECL_3$					Cl_2		SO_2	
	CF	METER	KWH	METER	CF	GALS	SP. GR.	% SOLN	LBS	mg/L	LBS	mg/L	LBS	mg/L
1	490	25	3000	41	4100	100.0	1.4320	30	27.9	2.5	25.0	2.3	12.0	1.1
2	690	25	3000	42	4200	125	1.4320	30	34.9	3.0	25	2.2	16.0	1.4
3	420	25	3000	51	5100	50	1.4320	30	14.0	1.2	18	1.6	16.0	1.4
4	400	25	3000	46	4600	100	1.4320	30	27.9	2.0	18	1.3	12.0	0.8
5	450	26	3120	43	4300	100	1.4320	30	27.9	2.0	18	1.3	12.0	0.9
6	540	25	3000	42	4200	125	1.4320	30	34.9	2.4	21	1.4	10.0	0.7
7	420	26	3120	27	2700	100	1.4320	30	27.9	1.9	26	1.8	21.0	1.4
8	560	24	2880	38	3800	50	1.4320	30	14.0	1.0	21	1.5	15.0	1.1
9	540	27	3240	36	3600	100	1.4320	30	27.9	2.4	21	1.8	17.0	1.4
10	350	25	3000	41	4100	100	1.4320	30	27.9	2.2	16	1.3	18.0	1.4
11	470	27	3240	40	4000	100	1.4320	30	27.9	1.7	34	2.1	18.0	1.1
12	410	25	3000	47	4700	75	1.4320	30	20.9	1.3	30	1.9	18.0	1.1
13	860	26	3120	44	4400	75	1.4320	30	20.9	1.3	29	1.8	17.0	1.1
14	400	27	3240	33	3300	100	1.4320	30	27.9	1.8	30	1.9	18.0	1.2
15	460	23	2760	31	3100	75	1.4320	30	20.9	1.7	30	2.5	22.0	1.8
16	640	26	3120	33	3300	75	1.4320	30	20.9	1.9	27	2.4	15.0	1.4
17	380	24	2880	19	1900	100	1.4320	30	27.9	2.4	16	1.4	15.0	1.3
18	390	25	3000	13	1300	100	1.4320	30	27.9	2.1	22	1.6	14.0	1.0
19	430	25	3000	22	2200	75	1.4320	30	20.9	1.5	22	1.6	20.0	1.4
20	420	24	2880	18	1800	75	1.4320	30	20.9	1.6	24	1.9	17.0	1.3
21	430	25	3000	15	1500	75	1.4320	30	20.9	1.6	26	2.0	13.0	1.0
22	530	22	2640	11	1100	75	1.4320	30	20.9	1.4	18	1.2	5.0	0.3
23	460	25	3000	10	1000	75	1.4320	30	20.9	1.3	24	1.5	19.0	1.2
24	320	25	3000	17	1700	75	1.4320	30	20.9	1.3	18	1.1	16.0	1.0
25	490	27	3240	22	2200	100	1.4320	30	27.9	1.7	21	1.3	19.0	1.1
26	380	25	3000	17	1700	75	1.4320	30	20.9	1.3	21	1.3	11.0	0.7
27	460	24	2880	12	1200	75	1.4320	30	20.9	1.3	16	1.0	12.0	0.7
28	430	27	3240	18	1800	75	1.4320	30	20.9	1.2	22	1.3	9.0	0.5
29	440	24	2880	17	1700	75	1.4320	30	20.9	1.3	15	0.9	14.0	0.9
30	490	25	3000	19	1900	50	1.4320	30	14.0	0.9	16	1.1	13.0	0.9
31	480	25	3000	21	2100	50	1.4320	30	14.0	0.9	14	0.9	12.0	0.8
TL	14630	779	93480	886	88600	2600			725.7		684.0		466.0	
ME	472	25	3015	29	2858	84	1.4320	30.0	23.4	1.7	22.1	1.6	15.0	1.1

MANPOWER

POSITION TITLE	NUMBER FULL TIME
SUPERINTENDANT	1
ASST. SUPT.	
OPERATOR	3
MECHANIC	
CHEMIST	
LAB TECH	
IPP COORDINATOR	1
OTHER	

GIVE THE HOURS PER DAY THAT PLANT PERSONNEL ARE NORMALLY AT THE PLANT.

WEEKDAYS	8.5	HRS
SATURDAYS	8	HRS
SUNDAYS	8	HRS
HOLIDAYS	8	HRS

Weather Code	
1 Clear	6 Warm
2 Partly Cloudy	7 Cold
3 Cloudy	8 Windy
4 Rain	9 Melting Snow
5 Snow	

PLANT INFLUENT SHEET

February 1999

Marshall

STATE OF MICHIGAN

MI 002 3540

SUPERINTENDENT

DEPT OF ENVIRONMENTAL QUALITY

Steven D Washburn

D	WEATHER		FLOW		RAW SEWAGE QUALITY									
A	TYPE	PRECIP	TOTAL	MAX	TEMP	pH	BOD_5		SS		TOTAL-P		VSS	NH3-N
Y	CODE	Inches	MGD	MGD	°F	SU	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l
1	4	0 06	2 060		58	8 00	179	3075	122	2096			116	10 7
2	4	0 20	1 980		56	8 10	192	3171	121	1998			116	
3	4	0 06	1 950		55	7 60	163	2651	142	2309			138	
4	4	0 02	1 880		54	7 50	256	4014	162	2540	3 84	60	136	
5	1		1 790		52	7 30	230	3434	148	2209			138	11 9
6	1		1 590		52	7 70	114	1512	100	1326			100	
7	5	0 28	1 710		54	7 80	145	2068	108	1540			108	
8	1		1 890		54	7 60	172	2711	126	1986			110	
9	1		1 810		57	7 80	165	2491	124	1872	2 93	44	85	
10	1		1 880		54	7 70	192	3010	186	2916			174	10 4
11	4	0 03	1 900		55	7 80	188	2979	152	2409			132	11 4
12	5	0 05	1 790		54	8 00	191	2851	138	2060			116	
13	1		1 510		52	8 00	175	2204	122	1536			110	
14	1		1 590		58	7 70	163	2161	128	1697			116	
15	1		1 850		55	7 70	207	3194	226	3487			198	
16	4	0 04	1 720		54	7 80	179	2568	171	2453			164	11 7
17	4	0 04	1 700		55	7 80	233	3303	246	3488	3 91	55	242	
18	1		1 740		57	7 90	290	4208	274	3976			252	
19	5	0 02	1 600		52	7 70	220	2936	200	2669			174	14 2
20	1		1 520		52	7 40	167	2117	158	2003			136	
21	2		1 590		55	7 80	128	1697	118	1565			108	11 5
22	1		1 730		53	7 80	215	3102	128	1847			118	
23	1		1 720		57	7 90	214	3070	142	2037			131	
24	5	0 22	1 740		54	7 80	226	3280	166	2409	3 55	52	150	
25	1		1 710		55	7 80	183	2610	148	2111			148	
26	4	0 08	1 740		52	7 60	215	3120	154	2235			132	12 8
27	4	0 09	1 570		52	8 10	215	2815	138	1807			128	
28	5	0 15	1 590		54	8 10	178	2360	146	1936			134	
29														
30														
31														
TL		1 34	48 850					78712		62517		211		
ME			1 745				193	2811	153	2233	3 56	53	140	11 8

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

PRIMARY EFFLUENT SHEET

February 1999

Marshall
MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

	PRIMARY EFFLUENT QUALITY												
DAY	BOD-5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS		AMMONIA NITROGEN	
	mg/l	LBS	Removal	mg/l	LBS	% Removal	mg/l	LBS	% Removal	mg/l	%	mg/l	LBS
1	166	2852	7.3	72	1237	41.0				68 0	94.4	12 5	215
2	155	2560	19.3	72	1171	40.5				62 0	86 1		
3	149	2423	8.6	78	1223	45 1				74 0	94.9		
4	175	2744	31.6	106	1582	34 6	3 4	50.8	11.5	86 0	81.1		
5	204	3045	11.3	102	1353	31.1				90 0	88 2	13 2	175
6	116	1538	-1.8	66	941	34.0				66 0	100.0		
7	110	1569	24.1	66	1040	38.9				66 0	100.0		
8	146	2301	15.1	80	1208	36.5				74 0	92.5		
9	151	2279	8.5	74	1160	40.3	1 2	18.3	60 1	60 0	81.1	13 0	204
10	118	1850	38.5	68	1078	63.4				68 0	100.0	13 9	220
11	144	2282	23.4	80	1194	47.4				62 0	77 5		
12	169	2523	11.5	80	1007	42.0				70 0	87 5		
13	133	1675	24.0	60	796	50 8				56 0	93.3		
14	113	1498	30.7	66	1018	48.4				66 0	100 0		
15	134	2067	35.3	76	1090	66.4				68 0	89.5		
16	104	1492	41.9	66	936	61.4				66 0	100 0	13 6	193
17	136	1928	41.6	80	1161	67.5	1 9	26.8	52.7	80 0	100.0		
18	165	2394	43.1	78	1041	71.5				66 0	84 6		
19	136	1815	38.2	86	1090	57 0				66 0	76.7	15 0	190
20	104	1318	37.7	86	1140	45.6				70 0	81.4		
21	100	1326	21.9	72	1039	39.0				60 0	83 3	12 1	175
22	143	2063	33.5	70	1004	45 3				64 0	91 4		
23	198	2840	7 5	78	1132	45.1				68 0	87 2		
24	208	3018	8.0	80	1141	51.8	2 0	29.0	42.8	64 0	80.0		
25	164	2339	10 4	72	1045	51.4				72 0	100 0		
26	204	2960	5.1	108	1414	29.9				92 0	85.2	15 6	204
27	146	1912	32 1	84	1114	39.1				84 0	100.0		
28	118	1565	33.7	92		37.0				92 0	100.0		
29													
30													
31													
TL		60179			30356			124.9					1576
ME	147	2149	22.9	79	1084	46.5	2.1	31.2	41.8	1980.0	90 6	13.6	197

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
SURFACE WATER QUALITY DIVISION

DEQ

Discharge Number	Permit Number
001 A	MI 002 3540

DAILY DISCHARGE MONITORING REPORT

Monitoring Period
February 1999

DAY	$CBOD_5$			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS	NH3-N		PH	D.O.	F.COLI #/100ml	CL RESID	CN Amenable
	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	mg/l	LBS	SU	mg/l	MF	mg/l	mg/L
1	7.6	131	95.8	7.0	120	94.3				7.0	11.5	197.57	7.60	7.7	21	0 000	<0.02
2	8.4	139	95.6	9.0	149	92.6				9.0			7.60	6.7	36	0.000	
3	8.7	141	94.7	11 0	179	92.3				11.0			7.60	7.4	28	0.000	
4	9 4	147	96.3	14.0	220	91.4	0.43	6.7	88.8	9.0			7.60	7.0	22	0.000	<0.02
5	11.2	167	95.1	17.0	254	88.5				15.0	10.70	159.74	7.60	7.6	20	0.000	
6	9.2	122	91.9	8.0	106	92.0				8.0			7.50	7.1	15	0.000	
7	7.3	104	95.0	10.0	143	90.7				10.0			7.60	7.2	14	0.000	<0.02
8	7.4	117	95.7	11.0	173	91.3				11.0			7.70	7.9	23	0.000	
9	8.7	131	94.7	16.0	242	87.1	0.24	3.6	91.8	12.0	10.10	152.46	7.60	7.6	19	0.000	<0.02
10	7.3	114	96.2	10.0	157	94.6				10.0	10.20	159.93	7.60	7.3	22	0.000	
11	7.6	120	96.0	11.0	174	92.8				11.0			7.60	7.1	39	0.000	
12	7.7	115	96.0	14.0	209	89.9				12.0			7.60	7.3	25	0.000	
13	7.1	89	95.9	8.0	101	93.4				8.0			7.70	8.2	14	0.000	
14	5.6	74	96.6	6.0	80	95.3				6.0			7.60	7.8	13	0.000	
15	6.5	100	96.9	11.0	170	95.1				11.0			7.60	8.0	18	0.000	
16	4.9	70	97.3	5.0	72	97.1				5.0	11.80	169.27	7.60	7.3	10	0.000	
17	4.8	68	97.9	9.0	128	96.3	0.15	2.1	96.2	9.0			7.60	7.7	11	0.000	
18	6.3	91	97.8	13.0	189	95.3				8.0			7.60	8.0	12	0.000	
19	5.6	75	97.5	12.0	160	94.0				8.0	13.90	185.48	7.60	7.6	16	0.000	
20	5.3	67	96.8	7.0	89	95.6				7.0			7.60	8.0	12	0.000	
21	5.3	70	95.9	6.0	80	94.9				6.0	12.10	160.45	7.60	8.4	35	0.000	
22	6.6	95	96.9	10.0	144	92.2				10.0			7.60	8.1	14	0.000	
23	8.5	122	96.0	10.0	143	93.0				10.0			7.60	7.9	18	0.000	
24	8.2	119	96.4	14.0	203	91.6	0.22	3.2	93.8	12.0			7.60	7.6	36	0 000	
25	8.4	120	95.4	15.0	214	89.9				15.0			7.50	6.7	10	0.000	
26	10.7	155	95.0	18.0	261	88.3				13.0	11.60	168.33	7.50	7.1	36	0.000	
27	13.0	170	94.0	13.0	170	90.6				13.0			7.50	6.6	60	0.000	
28	8.5	113	95.2	8.0	106	94.5				8.0			7.50	6.2	34	0.000	
29																	
30																	
31																	
TL		3149			4434			15.7									
ME	7.7	112	95.9	10.8	158	92.7	0.26	3.9	92.6	274.0	11.49	169.16		7.5	20	0.000	<.02
WA	10.2	140		13.6	191										31	0.000	
MX											13.90	197.57	7.70			0.000	<.02
MN													7.50	6.2			

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment See 18 U S C 1001 and 33 U S C 1319 (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 Years)

PRINTED NAME AND TITLE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTORIZED AGENT	DATE
Steven D. Washburn, Superintendent		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

ACTIVATED SLUDGE SHEET

February 1999

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	AERATION SYSTEM				MIXED LIQUOR								SECONDARY SLUDGE				
	AERTN VOL	DETEN TIME	CRT	F:M RATIO	MLSS		MLVSS		SETTL.	SDI	D.O.	AIR	SS	VSS	RAS FLOW	WAS	
	KCF	HRS	DAYS		mg/L	Lbs.	mg/L	Lbs.	%	%	mg/L	CF	%	%	%	Gallons	Lbs.
SF	3											4				3	
1	48	4.2	4.2	0.58	2008	6013	1654	4953	21	0.96	7.60	113	0.54	0.45	40	32	1441
2	48	4.4	3.9	0.47	2181	6531	1833	5489	20	1.09	4.86	113	0.56	0.47	41	36	1681
3	48	4.4	3.7	0.45	2143	6417	1810	5420	22	0.97	5.50	112	0.55	0.46	42	38	1743
4	48	4.6	3.0	0.50	2203	6597	1848	5534	21	1.05	4.73	119	0.63	0.53	43	42	2207
5	48	4.8	3.8	0.54	2225	6663	1871	5603	21	1.06	6.65	116	0.48	0.40	45	44	1761
6	48	5.4									0.93	114			51	49	
7	48	5.0									4.85	116			48	50	
8	48	4.6	2.6	0.47	1933	5788	1647	4932	18	1.07	6.73	114	0.57	0.48	43	46	2187
9	48	4.8	3.0	0.47	1924	5761	1635	4896	18	1.07	4.84	113	0.54	0.46	44	43	1937
10	48	4.6	3.3	0.38	1888	5653	1631	4884	18	1.05	6.73	112	0.53	0.46	43	39	1724
11	48	4.5	3.9	0.47	2021	6052	1631	4884	20	1.01	4.84	119	0.52	0.45	42	36	1561
12	48	4.8	3.5	0.48	2007	6010	1756	5258	22	0.91	6.73	121	0.58	0.50	53	36	1741
13	48	5.7									4.84	117			51	40	
14	48	5.4									6.15	113			44	37	
15	48	4.7									5.20	113			47	31	
16	48	5.0	4.6	0.28	2026	6067	1764	5282	20	1.01	6.60	117	0.53	0.46	48	30	1326
17	48	5.1	4.2	0.37	1983	5938	1720	5150	17	1.17	5.90	117	0.56	0.49	48	30	1401
18	48	5.0	4.2	0.46	1977	5920	1741	5213	20	0.99	5.01	119	0.56	0.48	46	30	1401
19	48	5.4	4.7	0.35	2011	6022	1740	5210	20	1.01	4.77	119	0.51	0.45	49	30	1276
20	48	5.7			2145	6423					5.84	121			50	35	
21	48	5.4									5.30	122			50	32	
22	48	5.0	4.1	0.41	1955	5854	1668	4995	19	1.03	6.48	121	0.57	0.49	46	30	1426
23	48	5.0	4.6	0.52	2092	6264	1819	5447	20	1.05	5.70	120	0.54	0.46	47	30	1351
24	48	5.0	4.6	0.54	2193	6567	1884	5641	23	0.95	5.59	117	0.53	0.45	46	32	1414
25	48	5.0	3.7	0.39	2339	7004	2009	6016	23	1.02	6.08	119	0.60	0.52	46	38	1902
26	48	5.0	3.4	0.52	2216	6636	1916	5737	23	0.96	7.10	117	0.53	0.46	46	44	1945
27	48	5.5									6.83	113			52	45	
28	48	5.4									6.65	114			51	50	
29	48																
30	48																
31	48																
TL												3261				1055	31426
ME	48	5.0	3.8	0.45	2074	6209	1767	5292	20	1.0	5.7	116	0.55		47	38	1654

City of Marshall
801 Industrial Rd
Marshall, MI 49068

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SLUDGE SHEET

Marshall

MI 002 3540

February 1999

SUPERINTENDENT
Steven D Washburn

	RAW SLUDGE				LIME STABILIZED SLUDGE					
DAY	GALLONS	TOTAL SOLIDS %	VOLATILE SOLIDS %	pH SU	LIME POUNDS	pH 2 hrs @ 25 C SU	pH 16 hrs SU	Lbs Lime per 1000 gallons sludge		
1	8600	3 6	77 0	5 8	336	12 0	11 4	39		
2	7000	3 4	77 0	5 9	432	12 3	12 3	62		
3	9200	3 2	77 0	5 7	504	12 3	12 3	55		
4	7700	3 3	75 0	5 8	456	12 3	12 3	59		
5	7000	3 2	76 0	5 8	456	12 3	12 3	65		
6	7200	3 3	78 0	5 8	456	12 3	12 3	63		
7	7000	3 4	76 0	5 9	432	12 2	12 1	62		
8	9500	3 4	76 0	6 0	408	12 3	12 2	43		
9	8500	3 4	76 0	6 1	432	12 3	12 1	51		
10	8000	3 4	76 0	5 9	600	12 3	12 3	75		
11	8000	3 7	76 0	6 1	375	12 3	12 3	47		
12	9000	3 6	74 0	6 0	432	12 3	12 1	48		
13	8000	3 2	76 0	6 0	480	12 3	12 3	60		
14	8825	3 5	76 0	6 0	408	12 2	12 0	46		
15	8000	3 7	77 0	6 1	432	12 2	12 1	54		
16	9000	4 2	79 0	5 9	456	12 2	12 2	51		
17	8000	4 1	78 0	5 7	432	12 2	12 1	54		
18	8000	4 5	80 0	5 6	528	12 2	12 2	66		
19	6500	4 6	80 0	5 5	375	12 2	11 9	58		
20	8000	4 1	78 0	5 4	480	12 1	12 2	60		
21	7000	3 8	76 0	5 4	432	12 2	11 5	62		
22	8700	3 8	76 0	5 5	576	12 2	12 2	66		
23	8000	3 6	76 0	5 7	528	12 1	12 2	66		
24	8500	3 5	76 0	5 9	528	12 2	12 2	62		
25	8600	3 2	76 0	5 8	480	12 2	12 2	56		
26	8600	3 0	77 0	5 9	480	12 3	12 3	56		
27	8000	3 1	78 0	6 0	432	12 3	12 3	54		
28	8000	3 4	77 0	5 9	480	12 2	12 2	60		
29										
30										
31										
TOTAL	226425				12846					
MEAN	8087	3 6	76 8	5 8	459	12 2	12 1	57		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MISCELLANEOUS SHEET

February 1999

Marshall
MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	WATER	ELECTRICAL USAGE		FUEL GAS		CHEMICALS APPLIED								
			X 120		X 100	$FECL_3$					Cl_2		SO_2	
	CF	METER	KWH	METER	CF	GALS	SP. GR.	% SOLN	LBS	mg/L	LBS	mg/L	LBS	mg/L
1	410	25	3000	17	1700	75.0	1.3920	30	21.5	1.3	19.0	1.1	13.0	0.8
2	450	24	2880	28	2800	75	1.3920	30	21.5	1.3	20	1.2	19.0	1.2
3	480	25	3000	9	900	75	1.3920	30	21.5	1.3	16	1.0	13.0	0.8
4	730	26	3120	27	2700	100	1.3920	30	28.7	1.8	16	1.0	13.0	0.8
5	490	23	2760	20	2000	100	1.3920	30	28.7	1.9	16	1.1	8.0	0.5
6	620	25	3000	17	1700	100	1.3920	30	28.7	2.2	23	1.7	8.0	0.6
7	450	25	3000	23	2300	150	1.3920	30	43.1	3.0	8	0.6	13.0	0.9
8	520	25	3000	17	1700	100	1.3920	30	28.7	1.8	15	1.0	10.0	0.6
9	470	25	3000	11	1100	125	1.3920	30	35.9	2.4	16	1.1	11.0	0.7
10	620	24	2880	9	900	100	1.3920	30	28.7	1.8	20	1.3	12.0	0.8
11	640	24	2880	6	600	125	1.3920	30	35.9	2.3	20	1.3	10.0	0.6
12	440	24	2880	24	2400	100	1.3920	30	28.7	1.9	17	1.1	10.0	0.7
13	490	25	3000	18	1800	100	1.3920	30	28.7	2.3	20	1.6	13.0	1.0
14	510	25	3000	31	3100	125	1.3920	30	35.9	2.7	25	1.9	12.0	0.9
15	430	24	2880	14	1400	100	1.3920	30	28.7	1.9	21	1.4	13.0	0.8
16	560	24	2880	13	1300	100	1.3920	30	28.7	2.0	19	1.3	12.0	0.8
17	450	25	3000	20	2000	100	1.3920	30	28.7	2.0	19	1.3	11.0	0.8
18	450	25	3000	23	2300	100	1.3920	30	28.7	2.0	20	1.4	13.0	0.9
19	620	23	2760	22	2200	100	1.3920	30	28.7	2.2	19	1.4	21.0	1.6
20	560	25	3000	27	2700	125	1.3920	30	35.9	2.8	18	1.4	13.0	1.0
21	320	26	3120	28	2800	125	1.3920	30	35.9	2.7	19	1.4	13.0	1.0
22	570	25	3000	29	2900	100	1.3920	30	28.7	2.0	21	1.5	13.0	0.9
23	410	25	3000	28	2800	100	1.3920	30	28.7	2.0	18	1.3	13.0	0.9
24	470	24	2880	26	2600	100	1.3920	30	28.7	2.0	15	1.0	13.0	0.9
25	580	24	2880	19	1900	100	1.3920	30	28.7	2.0	16	1.1	12.0	0.8
26	450	23	2760	21	2100	100	1.3920	30	28.7	2.0	13	0.9	16.0	1.1
27	580	23	2760	15	1500	100	1.3920	30	28.7	2.2	15	1.1	13.0	1.0
28	460	24	2880	23	2300	100	1.3920	30	28.7	2.2	17	1.3	14.0	1.1
29														
30														
31														
TL	14230	685	82200	565	56500	2900			832.7		501.0		355.0	
ME	508	24	2936	20	2018	104	1.3920	30.0	29.7	2.1	17.9	1.2	12.7	0.9

MANPOWER

POSITION TITLE	NUMBER FULL TIME
SUPERINTENDANT	1
ASST. SUPT.	
OPERATOR	3
MECHANIC	
CHEMIST	
LAB TECH	
IPP COORDINATOR	1
OTHER	

GIVE THE HOURS PER DAY THAT PLANT PERSONNEL ARE NORMALLY AT THE PLANT.

WEEKDAYS	8	HRS
SATURDAYS	8	HRS
SUNDAYS	8	HRS
HOLIDAYS		HRS

Weather Code	
1 Clear	6 Warm
2. Partly Cloudy	7. Cold
3 Cloudy	8 Windy
4 Rain	9 Melting Snow
5. Snow	

PLANT INFLUENT SHEET

March, 1999

Marshall

STATE OF MICHIGAN

MI 002 3540

SUPERINTENDENT

DEPT OF ENVIRONMENTAL QUALITY

Steven D. Washburn

D	WEATHER		FLOW		RAW SEWAGE QUALITY									
A	TYPE	PRECIP	TOTAL	MAX	TEMP	pH	BOD_5		SS		TOTAL-P		VSS	NH3-N
Y	CODE	Inches	MGD	MGD	°F	SU	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l
1	1		1.750		56	7.70	215	3138	232	3386			222	10.9
2	4	0.26	1 650		54	8.00	198	2725	167	2298	3.84	53	172	
3	5	0.02	1.660		54	7.90	220	3046	238	3295			220	
4	1		1.630		53	7.80	190	2583	150	2039			146	
5	5	0.27	1.580		53	7.70	232	3057	244	3215			230	14.6
6	5	0.04	1.480		52	7.90	195	2407	148	1827			142	
7	1		1.600		52	7.90	192	2562	140	1868			128	
8	5	0.27	1.830		53	7.70	164	2503	110	1679	3.33	51	88	
9	5	0.18	1.730		54	7.90	202	2914	137	1977			122	
10	1		1.740		54	7 90	190	2757	154	2235			132	12.2
11	1		1.840		55	7.80	209	3207	140	2148			114	
12	1		1.790		56	7.80	261	3896	154	2299			142	
13	1		1.510		52	8.00	237	2985	172	2166			172	
14	1		1.560		54	7.90	197	2563	136	1769			130	
15	1		1.800		54	7 60	225	3378	152	2282			122	11.9
16	1		1.800		56	7.80	200	3002	130	1952			120	
17	1		1.830		54	8.00	190	2900	112	1709	3.24	49	98	
18	1		1.790		55	7.90	186	2777	142	2120			116	
19	1		1.740		56	7.80	187	2714	118	1712			108	
20	1		1.600		52	7.90	189	2522	154	2055			138	
21	1		1.650		52	7.90	157	2160	118	1624			118	
22	1		1.800		54	7.70	178	2672	122	1831			104	
23	1		1.650		54	7.80	200	2752	110	1514			101	10 9
24	1		1.820		57	7.50	207	3142	134	2034	2.99	45	126	
25	1		1.610		56	8.00	199	2672	164	2202			158	12.3
26	1		1 660		54	7.90	240	3323	180	2492			160	
27	1		1.460		53	7.90	181	2204	130	1583			130	
28	1		1.500		52	7.80	173	2164	166	2077			160	12.8
29	1		1.700		55	7.80	214	3034	200	2836			182	
30	1		1.830		55	7.80	221	3373	160	2442			135	
31	1		1.720		57	7.60	244	3500	160	2295			152	12.2
TL		1.04	52.310					88633		66961		198		
ME			1.687				203	2859	154	2160	3.35	50	142	12.2

City of Marshall
801 Industrial Rd
Marshall, MI 49068

PRIMARY EFFLUENT SHEET

March, 1999

Marshall
MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D Washburn

	PRIMARY EFFLUENT QUALITY												
DAY	BOD-5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS		AMMONIA NITROGEN	
	mg/l	LBS	Removal	mg/l	LBS	% Removal	mg/l	LBS	% Removal	mg/l	%	mg/l	LBS
1	105	1532	51 2	106	1547	54 3				96 0	90 6	13 7	200
2	146	2009	26 0	72	997	56 9	2 1	28 4	46 6	70 0	97 2	0 0	
3	146	2021	33 6	108	1468	54 6				92 0	85 2	0 0	
4	154	2094	19 0	76	1001	49 3				70 0	92 1	0 0	
5	185	2438	20 7	100	1234	59 0				100 0	100 0	17 4	215
6	204	2518	-3 0	110	1468	25 7				110 0	100 0	0 0	
7	143	1908	25 2	74	1129	47 1				74 0	100 0	0 0	
8	199	3037	-6 0	110	1587	0 0	2 5	36 1	24 9	94 0	85 5	0 0	
9	209	3015	-7 0	112	1625	18 2				84 0	75 0	0 0	
10	188	2728	1 0	112	1719	27 3				84 0	75 0	14 0	215
11	167	2563	20 1	140	2090	0 0				104 0	74 3	0 0	
12	217	3240	16 9	120	1511	22 1				108 0	90 0	0 0	
13	158	1990	33 3	104	1353	39 5				104 0	100 0	0 0	
14	150	1952	23 9	74	1111	45 6				72 0	97 3	0 0	
15	230	3453	-3 0	100	1501	34 2				68 0	68 0	13 5	203
16	189	2837	6 0	92	1404	29 2				92 0	100 0	0 0	
17	155	2366	18 4	112	1672	0 0	1 7	24 9	48 5	92 0	82 1	0 0	
18	212	3165	-8 0	90	1306	36 6				74 0	82 2	0 0	
19	216	3135	-6 0	124	1655	-5 1				118 0	95 2	0 0	
20	160	2135	15 2	98	1349	36 4				96 0	98 0	0 0	
21	137	1885	12 7	92	1381	22 0				92 0	100 0	0 0	
22	152	2282	14 7	104	1431	14 8				92 0	88 5	0 0	
23	182	2505	8 8	108	1639	1 8				104 0	96 3	12 6	191
24	190	2884	8 2	128	1719	4 5	2 6	35 3	12 0	116 0	90 6	0 0	
25	135	1813	32 2	88	1218	46 3				88 0	100 0	14 3	198
26	170	2354	29 1	128	1559	28 9				112 0	87 5	0 0	
27	138	1680	23 8	80	1001	38 5				80 0	100 0	0 0	
28	111	1389	35 8	84	1191	49 4				84 0	100 0	13 8	196
29	150	2127	30 5	106	1618	47 0				90 0	84 9	0 0	
30	173	2640	22 0	84	1205	47 5				84 0	100 0	0 0	
31	234	3357	22 1	108	47117	32 5				104 0	96 3	12 6	5497
TL		75049			89806			124 7					6914
ME	171	2421	16 7	101	2897	31 1	2 2	31 2	33 0	2848 0	91 3	3 6	223

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
SURFACE WATER QUALITY DIVISION

DEQ

Discharge Number	Permit Number
001 A	MI 002 3540

DAILY DISCHARGE MONITORING REPORT

Monitoring Period
March, 1999

DAY	CBOD5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS	NH3-N		PH	D.O.	F.COLI #/100ml	CL RESID	CN Amenable
	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	mg/l	LBS	SU	mg/l	MF	mg/l	mg/L
1	6.4	93	97.0	9.0	131	96.1				9.0	12.30	179.52	7.60	7.9	24	0.000	<0 02
2	5.9	81	97.0	5.0	69	97.0	0.20	2.8	94.8	5.0			7.70	7.8	14	0.000	
3	5.9	82	97.3	12.0	166	95.0							7.60	7.6	21	0.000	
4	6.0	82	96.8	8.0	109	94.7				7.0			7.60	8.1	14	0 000	
5	8.3	109	96.4	13.0	171	94.7				13.0	16.00	210.84	7.60	7.5	16	0.000	
6	10.0	123	94.9	15.0	185	89.9				15.0			7.60	7.3	22	0.000	
7	14.4	192	92.5	19.0	254	86.4				19.0			7.60	8.2	20	0.000	
8	15.9	243	90.3	27.0	412	75.5	0.45	6.9	86.5	22.0			7.40	6.4	60	0.000	
9	7.6	110	96.2	15.0	216	89.1				13.0			7.60	7.3	16	0.000	<0.02
10	7.5	109	96.1	17.0	247	89.0				11.0	12.60	182.85	7.60	7.8	2	0.000	
11	7.9	121	96.2	18.0	276	87.1				14.0			7.60	7.5	12	0.000	
12	9.3	139	96.4	14.0	209	90.9				14.0			7.50	7.3	15	0.000	
13	7.6	96	96.8	9.0	113	94.8				9.0			7.60	7.2	21	0.000	
14	8.1	105	95.9	8.0	104	94.1				8.0			7.50	7.5	22	0.000	
15	9.1	137	96.0	11.0	165	92.8				6.0	12.70	190.65	7.60	7.4	13	0.000	
16	12.8	192	93.6	10.0	150	92.3				10.0			7.60	7.0	12	0.000	
17	11.8	180	93.8	13.0	198	88.4	0.34	5.2	89.5	13.0			7.60	6.4	20	0.000	<0.02
18	10.9	163	94.1	13.0	194	90.8				13.0			7.60	6.9	12	0.000	
19	8.9	129	95.2	10.0	145	91.5				10.0			7.60	8.1	9	0.000	
20	9.0	120	95.2	7.0	93	95.5				7.0			7.60	8.2	13	0.000	
21	8.0	110	94.9	11.0	151	90.7				11.0			7.60	7.5	10	0.000	
22	10.0	150	94.4	12.0	180	90.2				10.0			7.60	8.5	6	0.000	
23	7.9	109	96.1	11.0	151	90.0				11.0	11.40	156.88	7.70	8.4	10	0.000	<0 02
24	10.6	161	94.9	17.0	258	87.3	0.31	4.7	89.6	15.0			7.50	7.6	8	0.000	
25	10.2	137	94.9	10.0	134	93.9				10.0	10.00	134.27	7.50	6.6	13	0.000	
26	11.6	161	95.2	14.0	194	92.2				14.0			7.60	7.2	11	0.000	
27	13.1	160	92.8	12.0	146	90.8				12.0			7.70	7.3	48	0.000	
28	10.0	125	94.2	11.0	138	93.4				11.0	13.40	167.63	7.60	7.2	13	0.000	
29	11.1	157	94.8	15.0	213	92.5				15.0			7.70	7.9	12	0.000	
30	12.5	191	94.3	10.0	153	93.8				10 0			7.60	7.5	144	0.000	
31	15.3	219	93.7	18.0	258	88.8				18.0	10.70	153.49	7.60	7.1	324	0.000	
TL		4285			5585			19.5									
ME	9.8	138	95.1	12.7	180	91.3	0.33	4.9	90.1	355.0	12.39	172.02		7.5	17	0	
WA	12.0	164		17.9	257										34		
MX											16.00	210.84	7.70			0	
MN													7.40	6.4			

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment See 18 U S C 1001 and 33 U S C 1319 (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 Years)

PRINTED NAME AND TITLE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTORIZED AGENT	DATE
Steven D. Washburn, Superintendent		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

ACTIVATED SLUDGE SHEET

March, 1999

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	AERATION SYSTEM				MIXED LIQUOR								SECONDARY SLUDGE				
	AERTN VOL	DETEN TIME	CRT	F:M RATIO	MLSS		MLVSS		SETTL.	SDI	D.O.	AIR	SS	VSS	RAS FLOW	WAS	
	KCF	HRS	DAYS		mg/L	Lbs.	mg/L	Lbs.	%	%	mg/L	CF	%	%	%	Gallons	Lbs.
SF	3											4				3	
1	48	4.9	2.7	0.30	2121	6351	1690	5061	22	0.96	6.55	117	0.62	0.57	45	46	2379
2	48	5.2	4.0	0.39	1988	5953	1734	5192	16	1.24	5.48	115	0.56	0.49	48	32	1495
3	48	5.2	5.1	0.39	2110	6318	1725	5165	17	1.24	6.74	116	0.60	0.52	48	25	1251
4	48	5.3	8.0	0.38	2132	6384	1848	5534	21	1.02	7.30	119	0.48	0.41	40	20	801
5	48	5.5	5.1	0.44	2163	6477	1856	5558	21	1.03	5.68	104	0.53	0.45	51	29	1282
6	48	5.8			2373	7106					1.25	118			56	37	
7	48	5.4			2255	6752					2.22	84			56	44	
8	48	4.7	5.1	0.46	2669	7992	2189	6555	25	1.07	2.26	110	0.57	0.49	47	33	1569
9	48	5.0	3.2	0.51	2319	6944	1993	5968	23	1.01	6.40	114	0.62	0.53	48	42	2172
10	48	5.0	4.1	0.49	2169	6495	1871	5603	20	1.08	6.85	117	0.51	0.44	56	37	1574
11	48	4.7	3.1	0.44	2236	6695	1937	5800	21	1.06	6.36	116	0.64	0.55	54	41	2188
12	48	4.8	3.3	0.57	2200	6588	1901	5692	21	1.05	6.11	116	0.55	0.48	51	44	2018
13	48	5.7			2422	7252					2.39	114			59	50	
14	48	5.5			2198	6582					5.43	112			56	46	
15	48	4.8	3.6	0.64	2087	6249	1797	5381	20	1.04	5.75	112	0.49	0.42	48	43	1757
16	48	4.8	3.2	0.51	2177	6519	1871	5603	17	1.28	4.73	108	0.54	0.46	52	45	2027
17	48	4.7	2.8	0.39	2355	7052	2035	6094	21	1.12	3.23	110	0.61		53	50	2544
18	48	4.8	2.7	0.53	2309	6914	2003	5998	23	1.00	5.52	118	0.58		54	52	2515
19	48	5.0	2.3	0.56	2201	6591	1885	5644	18	1.22	4.42	118	0.66		54	52	2862
20	48	5.4			2162	6474					5.99	115			58	46	
21	48	5.2			2098	6282					4.39	117			55	44	
22	48	4.8	3.2	0.45	2054	6150	1677	5022	16	1.28	7.86	119	0.53		51	44	1945
23	48	5.2	3.1	0.50	1937	5800	1679	5028	19	1.02	7.69	115	0.51		55	44	1871
24	48	4.7	3.1	0.58	1917	5740	1659	4968	20	0.96	5.53	118	0.57		51	39	1854
25	48	5.4	3.5	0.31	2255	6752	1936	5797	20	1.13	3.65	120	0.59		60	39	1919
26	48	5.2	3.9	0.42	2182	6534	1867	5591	19	1.15	4.87	118	0.47		56	43	1686
27	48	5.9			2183	6537					3.17	115			62	43	
28	48	5.7			2138	6402					4.57	113			59	43	
29	48	5.1	4.4	0.42	1990	5959	1700	5090	18	1.11	6.88	125	0.42		56	39	1366
30	48	4.7	3.5	0.49	2107	6309	1807	5411	18	1.17	5.25	150	0.54		53	40	1801
31	48	5.0	3.2	0.60	2176	6516	1853	5549	19	1.15	5.10	117	0.55		55	45	2064
TL												3580				1277	42939
ME	48	5.1	3.7	0.47	2183	6538	1848	5535	20	1.1	5.1	115	0.55		53	41	1867

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SLUDGE SHEET

Marshall

MI 002 3540

March, 1999

SUPERINTENDENT
Steven D. Washburn

	RAW SLUDGE				LIME STABILIZED SLUDGE					
DAY	GALLONS	TOTAL SOLIDS %	VOLATILE SOLIDS %	pH SU	LIME POUNDS	pH 2 hrs @ 25 C SU	pH 16 hrs SU	Lbs. Lime per 1000 gallons sludge		
1	8750	4.1	79.0	6.0	480	12.2	11.0	55		
2	8225	3.8	78.0	5.9	701	12.3	12.2	85		
3	9000	4.0	77.0	6.0	517	12.2	12.3	57		
4	8700	3.7	78.0	5.6	959	12.2	12.2	110		
5	8600	3.8	79.0	5.5	738	12.3	12.3	86		
6	8000	3.7	79.0	5.5	812	12.2	12.2	102		
7	9500	3.7	77.0	5.6	775	12.3	12.3	82		
8	8700	3.4	78.0	5.7	923	12.3	12.2	106		
9	8000	3.4	78.0	5.7	738	12.2	12.3	92		
10	9000	3.4	76.0	5.5	443	12.3	12.3	49		
11	8000	3.6	76.0	5.8	812	12.3	12.3	102		
12	9000	3.5	75.0	5.8	664	12.3	12.3	74		
13	9650	3.7	77.0	5.8	849	12.2	12.3	88		
14	8600	3.9	78.0	5.8	812	12.2	12.0	94		
15	8750	3.8	77.0	5.8	664	12.2	12.0	76		
16	8500	4.1	76.0	5.8	738	12.3	12.0	87		
17	8650	4.1	77.0	5.9	812	12.4	12.3	94		
18	8575	4.1	77.0	5.8	738	12.2	12.2	86		
19	8550	4.2	77.0	5.8	775	12.3	12.3	91		
20	8700	4.2	77.0	5.7	775	12.2	12.2	89		
21	8000	4.0	76.0	5.8	775	12.0	12.2	97		
22	9000	4.2	77.0	5.8	664	12.0	11.9	74		
23	8000	4.2	77.0	5.8	775	12.0	12.1	97		
24	9000	4.1	77.0	5.7	812	12.0	12.1	90		
25	8000	4.2	76.0	5.8	554	12.0	11.2	69		
26	9000	4.1	77.0	5.7	849	12.0	12.3	94		
27	8450	4.0	78.0	5.6	738	12.2	12.2	87		
28	8000	3.9	78.0	5.7	664	12.2	12.0	83		
29	8700	4.0	77.0	5.7	923	12.3	12.1	106		
30	8000	3.9	77.0	5.7	701	12.1	11.8	88		
31	8000	4.3	74.0	5.7	849	12.3	12.2	106		
TOTAL	265600				23029					
MEAN	8568	3.9	77.1	5.7	743	12.2	12.1	87		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MISCELLANEOUS SHEET

March, 1999

Marshall
MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	WATER	ELECTRICAL USAGE		FUEL GAS		CHEMICALS APPLIED								
			X 120		X 100	$FECL_3$					Cl_2		SO_2	
	CF	METER	KWH	METER	CF	GALS	SP. GR.	% SOLN	LBS	mg/L	LBS	mg/L	LBS	mg/L
1	490	24	2880	26	2600	100.0	1.3920	30	28.7	2.0	18.0	1.2	8.0	0.5
2	490	24	2880	18	1800	100	1.3920	30	28.7	2.1	18	1.3	16.0	1.2
3	480	25	3000	27	2700	100	1.3920	30	28.7	2.1	7	0.5	12.0	0.9
4	510	25	3000	19	1900	100	1.3920	30	28.7	2.1	25	1.8	9.0	0.7
5	470	23	2760	25	2500	75	1.3920	30	21.5	1.6	18	1.4	11.0	0.8
6	530	25	3000	32	3200	100	1.3920	30	28.7	2.3	14	1.1	12.0	1.0
7	650	18	2160	29	2900	100	1.3920	30	28.7	2.2	19	1.4	12.0	0.9
8	470	26	3120	35	3500	100	1.3920	30	28.7	1.9	25	1.6	18.0	1.2
9	630	25	3000	30	3000	75	1.3920	30	21.5	1.5	30	2.1	18.0	1.2
10	630	25	3000	28	2800	100	1.3920	30	28.7	2.0	26	1.8	23.0	1.6
11	540	25	3000	21	2100	100	1.3920	30	28.7	1.9	12	0.8	14.0	0.9
12	790	22	2640	19	1900	75	1.3920	30	21.5	1.4	18	1.2	11.0	0.7
13	680	26	3120	22	2200	100	1.3920	30	28.7	2.3	15	1.2	16.0	1.3
14	450	25	3000	13	1300	100	1.3920	30	28.7	2.2	15	1.2	12.0	0.9
15	520	25	3000	13	1300	75	1.3920	30	21.5	1.4	18	1.2	14.0	0.9
16	850	23	2760	16	1600	100	1.3920	30	28.7	1.9	21	1.4	15.0	1.0
17	600	25	3000	14	1400	100	1.3920	30	28.7	1.9	18	1.2	13.0	0.9
18	590	25	3000	5	500	50	1.3920	30	14.4	1.0	18	1.2	12.0	0.8
19	650	24	2880	4	400	50	1.3920	30	14.4	1.0	15	1.0	13.0	0.9
20	600	24	2880	19	1900	125	1.3920	30	35.9	2.7	32	2.4	13.0	1.0
21	520	25	3000	15	1500	75	1.3920	30	21.5	1.6	17	1.2	13.0	0.9
22	560	25	3000	10	1000	100	1.3920	30	28.7	1.9	18	1.2	10.0	0.7
23	510	25	3000	13	1300	75	1.3920	30	21.5	1.6	18	1.3	8.0	0.6
24	630	14	1680	27	2700	75	1.3920	30	21.5	1.4	15	1.0	3.0	0.2
25	520	26	3120	13	1300	75	1.3920	30	21.5	1.6	18	1.3	20.0	1.5
26	670	23	2760	13	1300	25	1.3920	30	7.2	0.5	16	1.2	9.0	0.7
27	690	24	2880	7	700	50	1.3920	30	14.4	1.2	12	1.0	7.0	0.6
28	580	24	2880	5	500	50	1.3920	30	14.4	1.1	12	1.0	8.0	0.6
29	540	23	2760	7	700	50	1.3920	30	14.4	1.0	12	0.8	7.0	0.5
30	660	24	2880	3	300	100	1.3920	30	28.7	1.9	14	0.9	8.0	0.5
31	590	23	2760	3	300	50	1.3920	30	14.4	1.0	13	0.9	10.0	0.7
TL	18090	740	88800	531	53100	2550			732.2		547.0		375.0	
ME	584	24	2865	17	1713	82	1.3920	30.0	23.6	1.7	17.6	1.3	12.1	0.9

MANPOWER	
POSITION TITLE	NUMBER FULL TIME
SUPERINTENDANT	1
ASST. SUPT.	
OPERATOR	3
MECHANIC	
CHEMIST	
LAB TECH	
IPP COORDINATOR	1
OTHER	

GIVE THE HOURS PER DAY THAT PLANT PERSONNEL ARE NORMALLY AT THE PLANT.

WEEKDAYS	8	HRS
SATURDAYS	8	HRS
SUNDAYS	8	HRS
HOLIDAYS	8	HRS

Weather Code	
1. Clear	6. Warm
2. Partly Cloudy	7. Cold
3. Cloudy	8. Windy
4. Rain	9. Melting Snow
5. Snow	

PLANT INFLUENT SHEET

April, 1999

Marshall

STATE OF MICHIGAN

MI 002 3540

SUPERINTENDENT

DEPT OF ENVIRONMENTAL QUALITY

Steven D. Washburn

D	WEATHER		FLOW		RAW SEWAGE QUALITY									
A	TYPE	PRECIP	TOTAL	MAX	TEMP	pH	BOD_5		SS		TOTAL-P		VSS	NH3-N
Y	CODE	Inches	MGD	MGD	°F	SU	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l
1	1		1.550		55	7.80	140	1810	128	1655			18	12.1
2	1		1.450		52	7.80	156	1887	174	2104			11	
3	4	0.17	1.370		52	7.80	159	1817	152	1737			11	
4	4	0.76	1.470		53	7.90	188	2305	186	2280			6	
5	4	0.02	1.630		54	7.70	193	2624	148	2012			12	11.2
6	1		1.680		55	7.90	210	2942	169	2368			10	
7	1		1.640		57	7.90	187	2558	149	2038			18	
8	4	0.89	1.620		56	7.60	196	2648	180	2432			11	
9	4	0.15	1.590		55	7.70	184	2440	168	2228	3.52	47	15	
10	4	0.15	1.450		54	8.00	175	2116	144	1741			11	
11	4	0.07	1.500		53	7.80	160	2002	172	2152			7	
12	1		1.700		54	7.60	182	2580	136	1928			7	
13	1		1.740		56	7.70	227	3294	156	2264			6	
14	1		1.680		57	7.90	200	2802	158	2214			6	13.6
15	4	0.43	1.680		57	7.90	196	2746	162	2270	3.46	48	10	
16	4	0.07	1.460		56	7.80	174	2119	156	1900			11	
17	1		1.470		53	7.70	156	1913	142	1741			7	
18	4	0.01	1.550		53	7.60	143	1849	86	1112			8	
19	4	0.08	1.710		57	7.60	171	2439	96	1369			4	
20	4	0.04	1.600		57	7.70	164	2188	108	1441			7	12.4
21	4	1.44	1.600		57	7.60	161	2148	134	1788			8	12.0
22	4	2.03	2.020		56	7.60	175	2948	112	1887			6	
23	4	0.27	2.880		55	7.60	140	3363	96	2306			9	
24	1		2.320		54	7.70	111	2148	72	1393			6	
25	1		2.170		53	7.60	95	1719	80	1448			8	8.2
26	1		2.280		54	7.60	98	1863	88	1673	1.99	38	7	8.5
27	1		2.260		57	7.70	102	1923	73	1376			2	
28	1		2.270		57	7.70	104	1969	94	1780	2.32	44	4	
29	1		2.150		56	7.70	121	2170	96	1721			5	
30	1		1.870		54	7.60	111	1731	128	1996			9	
31														
TL		6.58	53.360					69059		56353		177		
ME			1.779				159	2302	131	1878	2.82	44	9	11.1

City of Marshall
801 Industrial Rd
Marshall, MI 49068

PRIMARY EFFLUENT SHEET

April, 1999

Marshall
MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D Washburn

	PRIMARY EFFLUENT QUALITY												
DAY	BOD-5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS		AMMONIA NITROGEN	
	mg/l	LBS	Removal	mg/l	LBS	% Removal	mg/l	LBS	% Removal	mg/l	%	mg/l	LBS
1	119	1538	15 0	100	1293	21 9				84 0	84 0	14 3	185
2	119	1439	23 7	104	1188	40 2				88 0	84 6	0 0	
3	120	1371	24 5	80	981	47 4				80 0	100 0	0 0	
4	117	1434	37 8	64	870	65 6				64 0	100 0	0 0	
5	163	2216	15 5	100	1401	32 4				96 0	96 0	13 2	185
6	152	2130	27 6	104	1422	38 5				104 0	100 0	0 0	
7	152	2079	18 7	108	1459	27 5				102 0	94 4	0 0	
8	172	2324	12 2	104	1379	42 2				92 0	88 5	0 0	
9	167	2215	9 2	112	1354	33 3	2 2	26 4	38 1	92 0	82 1	0 0	
10	127	1536	27 4	80	1001	44 4				80 0	100 0	0 0	
11	102	1276	36 3	64	907	62 8				64 0	100 0	0 0	
12	107	1517	41 2	88	1277	35 3				80 0	90 9	0 0	
13	144	2090	36 6	80	1121	48 7				64 0	80 0	0 0	
14	120	1681	40 0	68	953	57 0				56 0	82 4	14 8	207
15	140	1962	28 6	82	998	49 4	1 9	22 6	46 2	76 0	92 7	0 0	
16	119	1449	31 6	80	981	48 7				74 0	92 5	0 0	
17	101	1238	35 3	74	957	47 9				74 0	100 0	0 0	
18	84	1086	41 3	80	1141	7 0				72 0	90 0	0 0	
19	107	1526	37 4	64	854	33 3				64 0	100 0	0 0	
20	110	1468	32 9	72	961	33 3				72 0	100 0	14 7	196
21	102	1361	36 6	76	1280	43 3				76 0	100 0	8 8	148
22	92	1550	47 4	80	1922	28 6				80 0	100 0	0 0	
23	76	1825	45 7	94	1819	2 1				66 0	70 2	0 0	
24	77	1490	30 6	66	1194	8 3				60 0	90 9	0 0	
25	60	1086	36 8	58	1103	27 5				52 0	89 7	9 3	177
26	67	1274	31 6	58	1093	34 1	1 3	23 6	37 2	58 0	100 0	9 6	181
27	70	1319	31 4	50	947	31 5				50 0	100 0	0 0	
28	77	1458	26 0	58	1040	38 3	1 5	27 6	33 6	54 0	93 1	0 0	
29	89	1596	26 4	66	1029	31 3				52 0	78 8	0 0	
30	80	1248	27 9	76		40 6				64 0	84 2	0 0	
31													
TL		47781			33926			100 2					1279
ME	111	1593	30 4	80	1131	36 7	1 7	25 0	38 8	2190 0	92 2	2 8	43

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
SURFACE WATER QUALITY DIVISION

DEQ

Discharge Number	Permit Number
001 A	MI 002 3540

DAILY DISCHARGE MONITORING REPORT

Monitoring Period
April, 1999

DAY	$CBOD_5$			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS	NH3-N		PH	D.O.	F.COLI #/100ml	CL RESID	CN Amenable
	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	mg/l	LBS	SU	mg/l	MF	mg/l	mg/L
1	13.9	180	90.1	20.0	259	84.4				18.0	9.00	116.34	7.40	6.1	>60	0.000	
2	8.3	100	94.7	18.0	218	89.7				11.0	0.00		7.60	7.9	<20	0.000	
3	7.5	86	95.3	11.0	126	92.8				11.0	0.00		7.70	8.2	<20	0.000	
4	7.7	94	95.9	6.0	74	96.8				6.0	0.00		7.60	7.4	<20	0.000	
5	7.7	105	96.0	12.0	163	91.9				12.0	12.80	174.01	7.60	7.8	<20	0.000	<0.02
6	9.4	132	95.5	10.0	140	94.1				10.0	0.00		7.60	7.1	<20	0.000	
7	13.0	178	93.0	19.0	260	87.2				18.0	0.00		7.60	7.0	35	0.000	
8	9.0	122	95.4	14.0	189	92.2				11.0	0.00		7.50	7.6	<20	0.000	
9	9.8	130	94.7	20.0	265	88.1	0.28	3.7	92.0	15.0	0.00		7.60	7.5	<20	0.000	
10	12.3	149	93.0	11.0	133	92.4				11.0	0.00		7.50	8.4	20	0.000	
11	9.8	123	93.9	7.0	88	95.9				7.0	0.00		7.60	7.5	<20	0.000	
12	7.7	109	95.8	7.0	99	94.9				7.0	0.00		7.70	8.1	27	0.000	
13	8.9	129	96.1	6.0	87	96.2				6.0	0.00		7.60	7.6	<20	0.000	<0.02
14	7.7	108	96.2	8.0	112	94.9				6.0	12.30	172.34	7.70	7.2	<20	0.000	
15	8.1	113	95.9	10.0	140	93.8	0.19	2.7	94.5	10.0	0.00		7.70	7.6	<20	0.000	
16	7.8	95	95.5	16.0	195	89.7				11.0	0.00		7.60	7.5	<20	0.000	<0.02
17	7.5	92	95.2	7.0	86	95.1				7.0	0.00		7.70	8.4	<20	0.000	
18	6.6	85	95.4	8.0	103	90.7				8.0	0.00		7.70	8.0	<20	0.000	
19	7.1	101	95.8	4.0	57	95.8				4.0	0.00		7.70	8.2	<20	0.000	
20	6.9	92	95.8	7.0	93	93.5				7.0	13.30	177.48	7.70	7.5	<20	0.000	<0.02
21	7.0	93	95.7	8.0	107	94.0				8.0	13.60	181.48	7.60	7.4	22	0.000	
22	6.6	111	96.2	6.0	101	94.6				6.0	0.00		7.60	7.7	<20	0.000	
23	6.0	144	95.7	9.0	216	90.6				9.0	0.00		7.60	8.4	<20	0.000	
24	8.0	155	92.8	6.0	116	91.7				6.0	0.00		7.70	9.0	22	0.000	
25	5.6	101	94.1	8.0	145	90.0				8.0	9.30	168.31	7.70	8.6	26	0.000	
26	5.5	105	94.4	7.0	133	92.0	0.21	4.0	89.4	7.0	9.60	182.55	7.60	8.3	28	0.000	
27	5.3	100	94.8	2.0	38	97.3				2.0	0.00		7.80	8.1	22	0.000	
28	4.5	85	95.7	4.0	76	95.7	0.21	4.0	90.9	4.0	0.00		7.70	8.1	30	0.000	
29	4.3	77	96.4	9.0	161	90.6				5.0	0.00		7.60	8.0	<20	0.000	
30	3.7	58	96.7	12.0	187	90.6				9.0	0.00		7.70	7.8	<20	0.000	
31																	
TL		3352			4166			14.3									
ME	7.8	112	95.1	9.7	139	92.6	0.22	3.6	91.7	260.0	11.41	167.50		7.8	25	0.000	<0.02
WA	10.1	135		13.7	177										35		
MX											13.60	182.55	7.80			0	<0.02
MN													7.40	6.1			

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment See 18 U S C 1001 and 33 U S C 1319 (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 Years)

PRINTED NAME AND TITLE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTORIZED AGENT	DATE
Steven D. Washburn, Superintendent		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

ACTIVATED SLUDGE SHEET

April, 1999

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	AERATION SYSTEM				MIXED LIQUOR								SECONDARY SLUDGE				
	AERTN VOL	DETEN TIME	CRT	F:M RATIO	MLSS		MLVSS		SETTL.	SDI	D.O.	AIR	SS	VSS	RAS FLOW	WAS	
	KCF	HRS	DAYS		mg/L	Lbs.	mg/L	Lbs.	%	%	mg/L	CF	%	%	%	Gallons	Lbs.
SF	3											4				3	
1	48	5.6	2.9	0.24	2468	7390	2129	6375	20	1.23	3.90	109	0.63		63	48	2522
2	48	5.9	3.1	0.25	2221	6651	1909	5716	15	1.48	5.10	106	0.51		65	50	2127
3	48	6.3			2105	6303					5.90	112			69	50	
4	48	5.9			2018	6043					4.20	113			66	45	
5	48	5.3									5.20	113			59	44	
6	48	5.1	3.5	0.40	2073	6207	1793	5369	18	1.15	2.80	112	0.49		57	43	1757
7	48	5.3	3.7	0.38	2108	6312	1842	5516	19	1.11	5.10	108	0.49		58	42	1716
8	48	5.3	3.6	0.40	2198	6582	1921	5752	17	1.29	5.90	107	0.47		58	47	1842
9	48	5.4	2.8	0.42	2032	6085	1777	5321	17	1.20	5.40	114	0.53		62	50	2210
10	48	5.9			2123	6357					6.00	113			68	50	
11	48	5.7			2010	6019					5.40	115			66	46	
12	48	5.1	3.3	0.31	1861	5573	1613	4830	16	1.16	6.40	114	0.46		58	44	1688
13	48	5.0	4.0	0.43	1867	5591	1627	4872	17	1.10	6.90	112	0.53		56	32	1414
14	48	5.1	3.8	0.32	2017	6040	1751	5243	19	1.06	6.40	109	0.55		55	35	1605
15	48	5.1	3.8	0.37	2036	6097	1760	5270	19	1.07	7.30	110	0.48		49	40	1601
16	48	5.9	3.5	0.29	1953	5848	1684	5043	18	1.09	7.10	113	0.50		65	40	1668
17	48	5.9			1926	5767					6.30	114			65	39	
18	48	5.6			1881	5632					6.20	114			58	38	
19	48	5.0	4.1	0.35	1709	5117	1475	4417	16	1.07	6.80	114	0.47		51	32	1254
20	48	5.4	6.0	0.31	1812	5426	1557	4662	16	1.13	7.60	95	0.45		55	24	901
21	48	5.4	4.1	0.28	1848	5534	1599	4788	15	1.23	7.00	111	0.54		58	30	1351
22	48	4.3	4.0	0.30	2007	6010	1727	5171	18	1.12	7.10	106	0.54		46	33	1486
23	48	3.0	2.8	0.40	1805	5405	1543	4620	18	1.00	7.20	115	0.62		29	37	1913
24	48	3.7			1715	5135					7.70	114			41	32	
25	48	4.0			1725	5165					6.50	111			44	29	
26	48	3.8	4.5	0.31	1620	4851	1373	4111	16	1.01	6.60	107	0.52		42	25	1084
27	48	3.8	5.4	0.31	1687	5052	1423	4261	15	1.12	6.50	110	0.49		42	23	940
28	48	3.8	5.1	0.33	1768	5294	1482	4438	14	1.26		110	0.54		40	23	1036
29	48	4.0	4.6	0.36	1752	5246	1461	4375	17	1.03		111	0.60		42	23	1151
30	48	4.6	4.4	0.27	1870	5600	1561	4674	18	1.04		111	0.55		52	28	1284
31	48				0												
TL												3323				1122	32553
ME	48	5.0	3.9	0.33	1874	5804	1667	4992	17	1.1	6.1	111	0.52		55	37	1550

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SLUDGE SHEET

Marshall
MI 002 3540

April, 1999

SUPERINTENDENT
Steven D. Washburn

	RAW SLUDGE				LIME STABILIZED SLUDGE					
DAY	GALLONS	TOTAL SOLIDS %	VOLATILE SOLIDS %	pH SU	LIME POUNDS	pH 2 hrs @ 25 C SU	pH 16 hrs SU	Lbs. Lime per 1000 gallons sludge		
1	8500	4.1	70.0	5.7	619	12.2	12.2	73		
2	8500	4.0	76.0	5.7	654	12.3	12.2	77		
3	8500	4.0	76.0	5.7	654	12.3	12.3	77		
4	8000	4.0	77.0	5.8	722	12.3	12.3	90		
5	8700	4.0	76.0	5.8	688	12.3	12.3	79		
6	8500	4.0	77.0	5.8	654	12.3	12.3	77		
7	8000	4.1	77.0	5.7	791	12.3	12.3	99		
8	7500	4.0	76.0	5.8	654	12.2	12.3	87		
9	7700	4.2	75.0	5.9	585	12.3	12.2	76		
10	8675	4.1	75.0	6.1	619	12.3	12.3	71		
11	8000	4.0	75.0	6.2	654	12.3	12.3	82		
12	8600	4.1	75.0	6.1	654	12.3	12.2	76		
13	6800	4.2	74.0	6.1	654	12.3	12.1	96		
14	7500	4.1	74.0	6.0	654	12.2	12.2	87		
15	9000	4.2	74.0	6.0	585	12.3	12.2	65		
16	8600	4.0	73.0	6.0	757	12.4	12.4	88		
17	7525	4.0	74.0	6.1	585	12.3	12.2	78		
18	8000	4.0	73.0	6.3	619	12.3	12.3	77		
19	7600	4.1	73.0	6.3	585	12.2	12.3	77		
20	7500	4.0	73.0	6.1	585	12.1	12.0	78		
21	7400	4.0	73.0	6.0	550	12.2	11.9	74		
22	7500	4.0	72.0	6.1	619	12.2	11.9	83		
23	7250	4.3	71.0	6.1	516	12.1	11.8	71		
24	7000	4.6	70.0	5.9	585	12.2	12.0	84		
25	7975	4.6	72.0	6.2	585	12.2	12.2	73		
26	7435	4.0	71.0	6.1	585	12.2	12.1	79		
27	7640	3.9	71.0	6.1	619	12.3	12.3	81		
28	7400	3.9	74.0	6.2	619	12.2	12.1	84		
29	7500	4.1	71.0	6.0	757	12.0	12.8	101		
30	7500	3.9	72.0	6.0	826	12.2	12.2	110		
31										
TOTAL	236300				19233					
MEAN	7877	4.1	73.7	6.0	641	12.2	12.2	82		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MISCELLANEOUS SHEET

April, 1999

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	WATER	ELECTRICAL USAGE		FUEL GAS		CHEMICALS APPLIED								
			X 120		X 100	$FECL_3$					Cl_2		SO_2	
	CF	METER	KWH	METER	CF	GALS	SP. GR.	% SOLN	LBS	mg/L	LBS	mg/L	LBS	mg/L
1	640	22	2640	3	300	75.0	1.3900	30	21.6	1.7	13.0	1.0	9.0	0.7
2	620	22	2640	1	100	75	1.3900	30	21.6	1.8	18	1.5	11.0	0.9
3	650	21	2520	1	100	50	1.3900	30	14.4	1.3	19	1.7	10.0	0.9
4	670	24	2880	3	300	50	1.3900	30	14.4	1.2	20	1.6	9.0	0.7
5	570	24	2880	3	300	50	1.3900	30	14.4	1.1	14	1.0	11.0	0.8
6	500	24	2880	5	500	50	1.3900	30	14.4	1.0	24	1.7	7.0	0.5
7	870	22	2640	3	300	100	1.3900	30	28.8	2.1	27	2.0	8.0	0.6
8	600	23	2760	2	200	200	1.3900	30	57.5	4.3	19	1.4	10.0	0.7
9	490	23	2760	7	700	75	1.3900	30	21.6	1.6	19	1.4	12.0	0.9
10	680	24	2880	5	500	175	1.3900	30	50.3	4.2	22	1.8	12.0	1.0
11	470	24	2880	8	800	150	1.3900	30	43.1	3.4	20	1.6	13.0	1.0
12	440	24	2880	8	800	150	1.3900	30	43.1	3.0	22	1.6	12.0	0.8
13	490	25	3000	3	300	100	1.3900	30	28.8	2.0	11	0.8	11.0	0.8
14	550	23	2760	3	300	125	1.3900	30	35.9	2.6	13	0.9	9.0	0.6
15	610	23	2760	5	500	150	1.3900	30	43.1	3.1	23	1.6	9.0	0.6
16	620	22	2640	6	600	125	1.3900	30	35.9	3.0	13	1.1	10.0	0.8
17	480	24	2880	4	400	150	1.3900	30	43.1	3.5	12	1.0	10.0	0.8
18	540	24	2880	5	500	100	1.3900	30	28.8	2.2	13	1.0	10.0	0.8
19	520	24	2880	6	600	125	1.3900	30	35.9	2.5	15	1.1	6.0	0.4
20	450	23	2760	4	400	125	1.3900	30	35.9	2.7	16	1.2	13.0	1.0
21	460	24	2880	3	300	125	1.3900	30	35.9	2.7	15	1.1	19.0	1.4
22	570	25	3000	7	700	100	1.3900	30	28.8	1.7	16	0.9	10.0	0.6
23	520	24	2880	10	1000	125	1.3900	30	35.9	1.5	15	0.6	8.0	0.3
24	430	24	2880	7	700	100	1.3900	30	28.8	1.5	19	1.0	8.0	0.4
25	560	24	2880	3	300	150	1.3900	30	43.1	2.4	16	0.9	10.0	0.6
26	570	24	2880	8	800	100	1.3900	30	28.8	1.5	17	0.9	8.0	0.4
27	590	24	2880	4	400	100	1.3900	30	28.8	1.5	15	0.8	10.0	0.5
28	570	24	2880	5	500	100	1.3900	30	28.8	1.5	17	0.9	9.0	0.5
29	720	25	3000	3	300	100	1.3900	30	28.8	1.6	16	0.9	7.0	0.4
30	600	21	2520	4	400	100	1.3900	30	28.8	1.8	16	1.0	9.0	0.6
31														
TL	17050	704	84480	139	13900	3300			948.9		515.0		300.0	
ME	568	23	2816	5	463	110	1.3900	30.0	31.6	2.2	17.2	1.2	10.0	0.7

MANPOWER	
POSITION TITLE	NUMBER FULL TIME
SUPERINTENDANT	1
ASST. SUPT.	
OPERATOR	3
MECHANIC	
CHEMIST	
LAB TECH	
IPP COORDINATOR	1
OTHER	

GIVE THE HOURS PER DAY THAT PLANT PERSONNEL ARE NORMALLY AT THE PLANT.

WEEKDAYS	8	HRS
SATURDAYS	8	HRS
SUNDAYS	8	HRS
HOLIDAYS	8	HRS

Weather Code	
1 Clear	6 Warm
2 Partly Cloudy	7 Cold
3 Cloudy	8 Windy
4 Rain	9 Melting Snow
5 Snow	

PLANT INFLUENT SHEET

May 1999

Marshall

STATE OF MICHIGAN

MI 002 3540

SUPERINTENDENT

DEPT OF ENVIRONMENTAL QUALITY

Steven D Washburn

D	WEATHER		FLOW		RAW SEWAGE QUALITY									
A	TYPE	PRECIP	TOTAL	MAX	TEMP	pH	BOD_5		SS		TOTAL-P		VSS	NH3-N
Y	CODE	Inches	MGD	MGD	°F	SU	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l
1	1		1 870		54	7 80	134	2090	94	1466			94	11 6
2	1		1 860		54	7 70	119	1846	122	1893			122	10 5
3	1		1 840		55	7 60	107	1642	118	1811			110	11 8
4	1		2 080		56	7 60	175	3036	107	1856			107	10 2
5	4	0 01	1 920		56	7 70	171	2738	158	2530			148	10 5
6	4	0 06	2 090		57	7 40	284	4950	112	1952			104	10 3
7	1		1 600		55	7 70	126	1681	134	1788			122	9 0
8	4	0 01	1 600		54	7 60	157	2095	106	1414	2 48	33	96	11 1
9	1		1 570		56	7 70	197	2579	230	3012			218	8 0
10	1		1 840		54	7 60	187	2870	106	1627			106	10 9
11	1		1 960		56	7 70	197	3220	266	4348			234	9 0
12	1		1 830		59	7 70	154	2350	112	1709			106	11 4
13	4	0 36	1 800		58	7 70	316	4744	452	6785	2 93	44	410	10 1
14	1		1 730		56	7 70	137	1977	122	1760			100	14 0
15	4	0 01	1 600		59	7 80	134	1788	196	2615			184	7 2
16	1		1 580		58	7 70	169	2227	92	1212			88	12 4
17	4	0 82	1 820		56	7 60	166	2520	142	2155			130	11 8
18	4	0 07	1 920		55	7 40	161	2578	141	2258			133	13 0
19	1		1 900		55	7 70	104	1648	174	2757			166	9 0
20	1		1 770		58	7 60	173	2554	126	1860	2 89	43	120	2 0
21	4	0 28	1 710		58	7 50	114	1626	190	2710			170	13 9
22	4	0 10	1 600		59	7 70	102	1361	82	1094			78	8 5
23	4	0 58	1 650		59	7 60	160	2202	90	1238			90	11 2
24	4	0 04	1 890		58	7 60	162	2554	134	2112	3 51	55	96	11 0
25	1		1 840		57	7 80	239	3668	252	3867			246	11 5
26	1		1 870		60	7 40	193	3010	140	2183			122	13 6
27	1		1 870		59	7 60	298	4648	268	4180			198	8 0
28	1		1 760		57	7 50	149	2187	172	2525			128	17 2
29	1		1 530		57	7 50	121	1544	92	1174			92	8 5
30	4	0 42	1 500		57	7 50	138	1726	128	1601			120	12 6
31	4	0 08	1 590		57	7 60	185	2453	170	2254			256	9 2
TL		2 84	54 990					78111		71749		175		
ME			1 774				169	2520	156	2314	2 95	44	145	10 6

City of Marshall
801 Industrial Rd
Marshall, MI 49068

PRIMARY EFFLUENT SHEET

May 1999

Marshall
MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D Washburn

	PRIMARY EFFLUENT QUALITY												
DAY	BOD-5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS		AMMONIA NITROGEN	
	mg/l	LBS	Removal	mg/l	LBS	% Removal	mg/l	LBS	% Removal	mg/l	%	mg/l	LBS
1	92	1435	31 3	52	811	44 7				52 0	100 0	12 8	200
2	69	1070	42 0	52	798	57 4				52 0	100 0	11 0	169
3	83	1274	22 4	76	1318	35 6				60 0	78 9	12 5	217
4	98	1700	44 0	52	833	51 4				52 0	100 0	11 1	178
5	92	1473	46 2	56	976	64 6				52 0	92 9	11 1	193
6	146	2545	48 6	72	961	35 7				62 0	86 1	12 6	168
7	180	2402	-42 9	62	827	53 7				58 0	93 5	14 4	192
8	82	1094	47 8	46	602	56 6	1 4	18 6	42 7	42 0	91 3	12 2	160
9	77	1008	60 9	58	890	74 8				52 0	89 7	12 2	187
10	108	1657	42 2	64	1046	39 6				64 0	100 0	11 7	191
11	158	2583	19 8	50	763	81 2				44 0	88 0	12 1	185
12	116	1770	24 7	56	841	50 0				54 0	96 4	13 4	201
13	183	2747	42 1	112	1616	75 2	2 0	29 1	31 1	108 0	96 4	13 2	190
14	171	2467	-24 8	76	1014	37 7				54 0	71 1	15 1	201
15	83	1108	38 1	52	685	73 5				48 0	92 3	13 3	175
16	95	1252	43 8	52	789	43 5				48 0	92 3	14 1	214
17	101	1533	39 2	44	705	69 0				44 0	100 0	13 5	216
18	103	1649	36 0	52	824	63 1				52 0	100 0	13 0	206
19	92	1458	11 5	68	1004	60 9				66 0	97 1	14 9	220
20	177	2613	-2 3	78	1112	38 1	1 8	26 0	37 0	68 0	87 2	13 9	198
21	83	1184	27 2	72	961	62 1				64 0	88 9	15 0	200
22	91	1214	10 8	40	550	51 2				34 0	85 0	13 6	187
23	91	1252	43 1	34	536	62 2				34 0	100 0	13 0	205
24	181	2853	-11 7	74	1136	44 8	2 7	40 8	24 2	54 0	73 0	13 6	209
25	140	2148	41 4	58	905	77 0				58 0	100 0	14 5	226
26	140	2183	27 5	80	1248	42 9				68 0	85 0	12 3	192
27	174	2714	41 6	76	1116	71 6				64 0	84 2	13 3	195
28	148	2172	0 7	58	740	66 3				52 0	89 7	16 2	207
29	108	1378	10 7	62	776	32 6				58 0	93 5	13 5	169
30	84	1051	39 1	66	875	48 4				66 0	100 0	12 0	159
31	52	690	71 9	68	31186	60 0				68 0	100 0	13 3	6100
TL		53678			58443			114 5					11911
ME	116	1732	28 2	62	1885	55 7	2 0	28 6	33 8	1752 0	92 0	13 2	384

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
SURFACE WATER QUALITY DIVISION

DEQ

Discharge Number	Permit Number
001 A	MI 002 3540

DAILY DISCHARGE MONITORING REPORT

Monitoring Period
May 1999

DAY	CBOD5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS	NH3-N		PH	D.O.	F.COLI #/100ml	CL RESID	CN Amenable
	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	mg/l	LBS	SU	mg/l	MF	mg/l	mg/L
1	3.1	48	97.7	5.0	78	94.7				5.0	12.90	201.19	7.60	7 8	13	0.000	
2	4.0	62	96.6	4.0	62	96.7				4.0	11.90	184.60	7.60	7.3	13	0.000	<0.02
3	3.3	51	96.9	12.0	184	89.8				12.0	12.80	196.42	7.60	7 6	17	0.000	
4	4.9	85	97.2	3.0	52	97.2				3.0	11.90	206.43	7.60	7.3	21	0.000	<0.02
5	8.1	130	95.3	6.0	96	96.2				6.0	10.30	164.93	7.60	6.6	73	0.000	
6	8.5	148	97.0	8.0	139	92.9				8.0	12.20	212.65	7.70	6.7	60	0.000	
7	9.5	127	92.5	16.0	214	88.1				16.0	12.00	160.13	7.50	6.2	216	0.000	<0.02
8	6.8	91	95.7	6.0	80	94.3	0.25	3.3	89.9	6.0	11.20	149.45	7.60	6.5	28	0.000	
9	4.9	64	97.5	5.0	65	97.8				5.0	12.90	168.91	7.60	7.6	17	0.000	
10	4.2	64	97.8	6.0	92	94.3				6.0	12.90	197.96	7.70	7.2	39	0.000	
11	7.2	118	96.3	4.0	65	98.5				4.0	11.50	187.98	7.60	6.8	47	0.000	<0.02
12	9.5	145	93.8	6.0	92	94.6				6.0	12.30	187.73	7.60	6.8	80	0.000	
13	8.0	120	97.5	8.0	120	98.2	0.24	3.6	91.8	8.0	12.70	190.65	7.60	6.9	94	0.000	
14	5.4	78	96.1	7.0	101	94.3				7.0	12.90	186.12	7.60	7.3	46	0.000	
15	6.5	87	95.1	2.0	27	99.0				2.0	13.30	177.48	7.70	7.1	33	0.000	
16	4 3	57	97.5	4.0	53	95.7				4.0	14.00	184.48	7.60	6.7	45	0.000	
17	8.0	121	95.2	10.0	152	93.0				10.0	13.60	206.43	7.60	6.8	116	0.000	
18	3.7	59	97.7	1.0	16	99.3				1.0	11.60	185.75	7.60	7.1	31	0.000	
19	3.3	52	96.8	3.0	48	98.3				3.0	12.60	199.66	7.70	7.1	31	0.000	
20	3.5	52	98.0	8.0	118	93.7	0.22	3.2	92.4	8.0	13.50	199.28	7.70	7.3	38	0.000	
21	3.5	50	96.9	11.0	157	94.2				9.0	13.00	185.40	7.70	7.3	60	0.000	
22	3.8	51	96.3	3.0	40	96.3				3.0	13.00	173.47	7.70	7.6	48	0.000	
23	3.8	52	97.6	2.0	28	97.8				2.0	12.50	172.01	7.70	7.4	18	0.000	
24	5.0	79	96.9	15.0	236	88.8	0.48	7.6	86.3	7.0	12.30	193.88	7.70	7.6	51	0.000	
25	7.3	112	96.9	13.0	199	94.8				13.0	13.90	213.30	7.60	7.1	154	0.000	
26	7.3	114	96.2	9.0	140	93.6				7.0	10.70	166.88	7.60	6.6	36	0.000	
27	5.2	81	98.3	12.0	187	95.5				10.0	1.70	26.51	7.70	6.9	39	0.000	
28	6.2	91	95.8	3.0	44	98.3				3.0	11.40	167.33	7.50	6.7	22	0.000	
29	5.6	71	95.4	4.0	51	95.7				4.0	11.90	151.85	7.60	6.8	28	0.000	
30	3.7	46	97.3	1.0	13	99.2				1.0	11.00	137.61	7.60	7.2	37	0.000	
31	3.4	45	98.2	1.0	13	99.4				1.0	12.20	161.78	7.70	7.1	38	0.000	
TL		2551			2962			17.8									
ME	5.5	82	96.6	6.4	96	95.5	0.30	4.4	90.1	184.0	12.02	177.36		7.1	40	0.000	
WA	7.2	108		9.3	141										60		
MX											14.00	213.30	7.70			0.000	
MN													7.50	6.2			

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment See 18 U S C 1001 and 33 U S C 1319 (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 Years)

PRINTED NAME AND TITLE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTORIZED AGENT	DATE
Steven D. Washburn, Superintendent		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

ACTIVATED SLUDGE SHEET

May 1999

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	AERATION SYSTEM				MIXED LIQUOR								SECONDARY SLUDGE				
	AERTN VOL	DETEN TIME	CRT	F:M RATIO	MLSS		MLVSS		SETTL.	SDI	D.O.	AIR	SS	VSS	RAS FLOW	WAS	
	KCF	HRS	DAYS		mg/L	Lbs.	mg/L	Lbs.	%	%	mg/L	CF	%	%	%	Gallons	Lbs.
SF	3											4				3	
1	48	4.6			1910	5719					5.40	109			51	29	
2	48	4.6			1871	5603					4.60	107			51	29	
3	48	4.7	5.5	0.29	1746	5228	1457	4363	14	1.25	6.80	106	0.44	0.37	52	26	954
4	48	4.1	5.6	0.41	1675	5016	1381	4135	15	1.12	6.90	103	0.51	0.42	49	21	893
5	48	4.5	6.7	0.32	1843	5519	1526	4569	16	1.15	5.20	103	0.52	0.43	50	19	824
6	48	4.1	5.4	0.56	1843	5519	1529	4578	19	0.97	0.60	106	0.56	0.46	46	22	1027
7	48	5.4	5.5	0.44	2210	6618	1834	5492	21	1.05	1.30	105	0.53	0.44	59	27	1193
8	48	5.4			2197	6579					5.40	97			77	29	
9	48	5.5			2021	6052					6.60	110			63	30	
10	48	4.7	4.5	0.34	1920	5749	1608	4815	24	0.80	5.10	110	0.43	0.36	54	36	1291
11	48	4.4	3.8	0.56	1867	5591	1550	4641	15	1.24	5.10	108	0.50	0.42	50	35	1460
12	48	4.7	4.5	0.38	1885	5644	1565	4686	19	0.99	3.20	108	0.49	0.41	56	31	1267
13	48	4.8	4.3	0.56	1963	5878	1651	4944	18	1.09	2.00	112	0.48	0.40	56	34	1361
14	48	5.0	5.1	0.48	2033	6088	1717	5141	21	0.97	4.80	111	0.42	0.35	42	34	1191
15	48	5.4			1987	5950					3.80	108			64	33	
16	48	5.5			1930	5779					6.00	106			65	33	
17	48	4.7	4.2	0.33	1856	5558	1549	4638	19	0.98	2.90	99	0.49	0.49	53	32	1308
18	48	4.5	4.2	0.34	1938	5803	1597	4782	18	1.08	4.40	109	0.45	0.45	54	37	1389
19	48	4.5	3.5	0.30	1935	5794	1624	4863	20	0.97	6.50	112	0.47	0.47	54	42	1646
20	48	4.9	2.9	0.57	1836	5498	1523	4560	19	0.97	5.00	110	0.48	0.48	52	48	1922
21	48	5.0	3.2	0.27	1761	5273	1465	4387	19	0.93	5.00	108	0.47	0.42	54	42	1646
22	48	5.4			1775	5315					4.80	109			57	34	
23	48	5.2			1717	5141					7.50	111			54	33	
24	48	4.6	5.3	0.70	1652	4947	1362	4078	18	0.92	5.90	113	0.37	0.31	47	30	926
25	48	4.7	5.4	0.48	1836	5498	1506	4510	20	0.92	6.60	114	0.47	0.39	49	26	1019
26	48	4.6	5.3	0.46	1902	5695	1583	4740	21	0.91	4.00	112	0.50	0.42	49	26	1084
27	48	4.6	4.8	0.52	2077	6219	1731	5183	22	0.94	3.70	112	0.50	0.41	48	31	1293
28	48	4.9	4.3	0.39	2193	6567	1844	5522	23	0.95	5.00	109	0.51	0.42	52	36	1531
29	48	5.6			2019	6046					4.50	111			61	43	
30	48	5.7			1963	5878					4.80	124			62	44	
31	48	5.4			1858	5564						125			58	44	
TL												3387				1016	25225
ME	48	4.9	4.7	0.44	1910	5720	1580	4731	19	1.0	4.8	109	0.48		54	33	1261

City of Marshall
801 Industrial Rd
Marshall, MI 49068

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SLUDGE SHEET

May 1999

Marshall

MI 002 3540

SUPERINTENDENT
Steven D Washburn

	RAW SLUDGE				LIME STABILIZED SLUDGE					
DAY	GALLONS	TOTAL SOLIDS %	VOLATILE SOLIDS %	pH SU	LIME POUNDS	pH 2 hrs @ 25 C SU	pH 16 hrs SU	Lbs Lime per 1000 gallons sludge		
1	7375	3 7	74 0	6 1	566	12 3	12 3	77		
2	7000	3 7	74 0	6 1	599	12 3	12 2	86		
3	7750	3 9	72 0	6 0	500	12 0	11 5	65		
4	7200	4 0	73 0	6 0	533	12 3	12 2	74		
5	7750	4 1	72 0	6 0	666	12 3	12 3	86		
6	7860	3 8	74 0	5 9	566	12 1	12 0	72		
7	7615	3 6	75 0	5 9	566	12 2	12 3	74		
8	7500	3 8	74 0	6 0	566	12 3	12 2	75		
9	7000	3 9	74 0	6 1	566	12 1	11 9	81		
10	9000	4 0	74 0	6 1	566	12 1	11 6	63		
11	6000	4 1	73 0	6 0	500	12 2	12 3	83		
12	7000	2 5	74 0	6 0	633	12 3	12 3	90		
13	7000	3 8	74 0	6 0	533	12 2	12 2	76		
14	7560	3 9	73 0	5 9	566	12 2	12 2	75		
15	8600	3 4	75 0	6 0	633	12 2	12 2	74		
16	7000	3 5	75 0	6 1	533	12 2	12 0	76		
17	7500	3 9	76 0	6 0	566	12 2	12 3	75		
18	7000	3 7	75 0	6 0	500	12 2	12 0	71		
19	7750	3 8	74 0	6 0	500	12 1	11 8	65		
20	8000	3 5	75 0	6 0	599	12 3	12 3	75		
21	8525	3 8	75 0	6 1	433	12 1	11 9	51		
22	8000	3 4	76 0	6 0	599	12 4	12 3	75		
23	8000	3 3	76 0	6 0	599	12 3	12 3	75		
24	7000	3 6	76 0	5 6	633	12 3	12 3	90		
25	7700	3 3	76 0	6 0	533	12 2	12 2	69		
26	7000	3 2	75 0	5 9	400	12 3	12 3	57		
27	7800	3 6	75 0	5 7	533	12 4	12 4	68		
28	7000	3 6	75 0	5 8	500	12 2	12 1	71		
29	7800	3 6	77 0	5 8	533	12 2	12 3	68		
30	8000	3 3	75 0	6 0	500	12 2	12 2	63		
31	8000	3 2	76 0	6 1	566	12 3	12 2	71		
TOTAL	234285				17086					
MEAN	7558	3 6	74 6	6 0	551	12 2	12 1	73		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MISCELLANEOUS SHEET

May 1999

Marshall
MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	WATER	ELECTRICAL USAGE		FUEL GAS		CHEMICALS APPLIED								
			X 120		X 100	$FECL_3$					Cl_2		SO_2	
	CF	METER	KWH	METER	CF	GALS	SP. GR.	% SOLN	LBS	mg/L	LBS	mg/L	LBS	mg/L
1	620	24	2880	1	100	150.0	1.3900	30	43.1	2.8	18.0	1.2	10.0	0.6
2	490	23	2760	2	200	100	1.3900	30	28.8	1.9	18	1.2	8.0	0.5
3	510	23	2760	1	100	100	1.3900	30	28.8	1.9	18	1.2	9.0	0.6
4	630	22	2640	1	100	100	1.3900	30	28.8	1.7	14	0.8	8.0	0.5
5	760	22	2640	1	100	100	1.3900	30	28.8	1.8	14	0.9	10.0	0.6
6	540	24	2880	2	200	100	1.3900	30	28.8	1.6	12	0.7	18.0	1.0
7	730	22	2640	1	100	100	1.3900	30	28.8	2.2	12	0.9	7.0	0.5
8	550	21	2520	1	100	150	1.3900	30	43.1	3.2	13	1.0	10.0	0.7
9	510	24	2880	1	100	100	1.3900	30	28.8	2.2	13	1.0	10.0	0.8
10	550	22	2640	1	100	75	1.3900	30	21.6	1.4	6	0.4	8.0	0.5
11	620	23	2760	2	200	100	1.3900	30	28.8	1.8	25	1.5	10.0	0.6
12	520	24	2880	1	100	100	1.3900	30	28.8	1.9	14	0.9	10.0	0.7
13	520	22	2640	1	100	100	1.3900	30	28.8	1.9	17	1.1	9.0	0.6
14	450	24	2880	1	100	50	1.3900	30	14.4	1.0	8	0.6	9.0	0.6
15	740	22	2640	1	100	75	1.3900	30	21.6	1.6	28	2.1	10.0	0.7
16	440	22	2640	1	100	100	1.3900	30	28.8	2.2	14	1.1	9.0	0.7
17	520	23	2760	1	100	100	1.3900	30	28.8	1.9	15	1.0	10.0	0.7
18	540	22	2640	2	200	75	1.3900	30	21.6	1.3	17	1.1	6.0	0.4
19	520	23	2760	1	100	75	1.3900	30	21.6	1.4	16	1.0	4.0	0.3
20	540	22	2640	1	100	100	1.3900	30	28.8	1.9	18	1.2	5.0	0.3
21	520	19	2280	0		50	1.3900	30	14.4	1.0	16	1.1	19.0	1.3
22	470	24	2880	0		100	1.3900	30	28.8	2.2	16	1.2	4.0	0.3
23	740	22	2640	0		100	1.3900	30	28.8	2.1	17	1.2	9.0	0.7
24	810	23	2760	0		100	1.3900	30	28.8	1.8	13	0.8	8.0	0.5
25	600	23	2760	0		50	1.3900	30	14.4	0.9	17	1.1	8.0	0.5
26	630	23	2760	0		50	1.3900	30	14.4	0.9	12	0.8	10.0	0.6
27	730	23	2760	0		75	1.3900	30	21.6	1.4	14	0.9	7.0	0.4
28	690	22	2640	0		50	1.3900	30	14.4	1.0	13	0.9	6.0	0.4
29	650	22	2640	0		100	1.3900	30	28.8	2.3	15	1.2	6.0	0.5
30	570	22	2640	0		100	1.3900	30	28.8	2.3	17	1.4	5.0	0.4
31	630	23	2760	0		75	1.3900	30	21.6	1.6	16	1.2	3.0	0.2
TL	18340	700	84000	24	2400	2800			805.1		476.0		265.0	
ME	592	23	2710	1	120	90	1.3900	30.0	26.0	1.8	15.4	1.0	8.5	0.6

MANPOWER	
POSITION TITLE	NUMBER FULL TIME
SUPERINTENDANT	1
ASST. SUPT.	
OPERATOR	3
MECHANIC	
CHEMIST	
LAB TECH	
IPP COORDINATOR	1
OTHER	

GIVE THE HOURS PER DAY THAT PLANT PERSONNEL ARE NORMALLY AT THE PLANT.

WEEKDAYS	8	HRS
SATURDAYS	8	HRS
SUNDAYS	8	HRS
HOLIDAYS	8	HRS

Weather Code	
1 Clear	6 Warm
2 Partly Cloudy	7 Cold
3 Cloudy	8 Windy
4 Rain	9 Melting Snow
5 Snow	

PLANT INFLUENT SHEET

June 1999

Marshall

STATE OF MICHIGAN

MI 002 3540

SUPERINTENDENT

DEPT OF ENVIRONMENTAL QUALITY

Steven D Washburn

D	WEATHER		FLOW		RAW SEWAGE QUALITY									
A	TYPE	PRECIP	TOTAL	MAX	TEMP	pH	BOD_5		SS		TOTAL-P		VSS	NH3-N
Y	CODE	Inches	MGD	MGD	°F	SU	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l
1	4	0 28	1 790		58	7 50	193	2881	147	2195	3 31	49	147	13 1
2	4	0 09	1 840		62	7 80	191	2931	128	1964			116	13 0
3	1		1 840		60	7 70	177	2716	126	1934			118	13 9
4	1		1 520		58	7 70	158	2003	134	1699			128	14 7
5	1		1 510		58	7 70	143	1801	134	1688			128	12 2
6	1		1 520		60	7 70	145	1838	94	1192			94	11 8
7	1		1 750		60	7 50	157	2291	128	1868			128	11 7
8	1		1 850		60	7 70	162	2499	136	2098			136	11 1
9	1		1 750		60	7 60	166	2423	164	2394			150	11 5
10	1		1 750		60	7 60	124	1810	124	1810			112	11 1
11	4	0 23	1 580		59	7 70	185	2438	150	1977	2 89	38	128	14 4
12	4	0 02	1 500		58	7 60	170	2127	122	1526			116	13 5
13	4	0 62	1 450		58	7 50	129	1560	124	1500			116	12 3
14	1		1 770		60	7 50	138	2037	122	1801	3 28	48	122	11 2
15	1		1 780		60	7 50	183	2717	133	1974			133	11 9
16	1		1 690		64	7 60	165	2326	144	2030			122	14 4
17	1		1 720		60	7 70	170	2439	192	2754			160	13 2
18	1		1 520		59	7 70	149	1889	204	2586			188	15 5
19	1		1 390		59	7 70	167	1936	162	1878			152	14 8
20	1		1 310		59	7 60	172	1879	150	1639			144	15 0
21	1		1 590		61	7 70	214	2838	154	2042			148	13 3
22	1		1 680		66	7 70	184	2578	155	2172			144	12 1
23	4	0 02	1 640		61	7 70	162	2216	174	2380	3 57	49	158	11 8
24	4	0 59	1 700		62	7 60	237	3360	204	2892			170	12 6
25	1		1 640		62	7 70	168	2298	184	2517			168	12 0
26	4	1 37	1 440		58	7 60	184	2210	160	1922			150	12 0
27	4	0 15	1 520		61	7 50	146	1851	210	2662			200	11 6
28	4	1 15	1 740		62	7 50	165	2394	218	3164			186	11 7
29	1		1 910		62	7 80	165	2628	196	3122			169	11 3
30	4	0 68	1 820		61	7 40	160	2429	192	2914			184	11 6
31														
TL		5 20	49 510					69342		64291		185		
ME			1 650				168	2311	156	2143	3 26	46	144	12 7

City of Marshall
801 Industrial Rd
Marshall, MI 49068

PRIMARY EFFLUENT SHEET

June 1999

Marshall
MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D Washburn

	PRIMARY EFFLUENT QUALITY												
DAY	BOD-5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS		AMMONIA NITROGEN	
	mg/l	LBS	Removal	mg/l	LBS	% Removal	mg/l	LBS	% Removal	mg/l	%	mg/l	LBS
1	122	1821	36 8	92	1373	37 4	2 4	36 3	26 6	92 0	100 0	11 7	175
2	127	1949	33 5	74	1136	42 2				70 0	94 6	12 5	192
3	134	2056	24 3	74	938	41 3				70 0	94 6	15 0	190
4	128	1623	19 0	58	730	56 7				58 0	100 0	15 8	199
5	90	1133	37 1	64	811	52 2				60 0	93 8	13 8	175
6	89	1128	38 6	62	905	34 0				56 0	90 3	14 0	204
7	137	2000	12 7	42	648	67 2				42 0	100 0	14 0	216
8	113	1743	30 2	46	671	66 2				46 0	100 0	13 0	190
9	103	1503	38 0	70	1022	57 3				66 0	94 3	13 2	193
10	107	1562	13 7	76	1001	38 7				64 0	84 2	13 4	177
11	180	2372	2 7	76	951	49 3	2 0	25 3	30 1	66 0	86 8	16 5	206
12	117	1464	31 2	64	774	47 5				64 0	100 0	16 1	195
13	94	1137	27 1	80	1181	35 5				80 0	100 0	15 2	224
14	121	1786	12 3	86	1277	29 5	2 3	34 1	29 9	86 0	100 0	13 4	199
15	137	2034	25 1	68	958	48 9				68 0	100 0	13 7	193
16	125	1762	24 2	70	1004	51 4				50 0	71 4	15 0	215
17	148	2123	12 9	70	887	63 5				62 0	88 6	15 2	193
18	146	1851	2 0	80	927	60 8				70 0	87 5	17 4	202
19	88	1020	47 3	84	918	48 1				84 0	100 0	15 5	169
20	98	1071	43 0	70	928	53 3				70 0	100 0	17 4	231
21	125	1658	41 6	90	1261	41 6				82 0	91 1	16 1	226
22	155	2172	15 8	78	1067	49 7				74 0	94 9	13 4	183
23	118	1614	27 2	74	1049	57 5	1 2	17 2	66 1	66 0	89 2	13 4	190
24	191	2708	19 4	96	1313	52 9				86 0	89 6	13 8	189
25	147	2011	12 5	86	1033	53 3				82 0	95 3	16 5	198
26	122	1465	33 7	96	1217	40 0				96 0	100 0	16 7	212
27	97	1230	33 6	94	1364	55 2				94 0	100 0	14 5	210
28	103	1495	37 6	98	1561	55 0				86 0	87 8	14 4	229
29	121	1927	26 7	92	1396	53 1				78 0	84 8	13 8	209
30	121	1837	24 4	98		49 0				78 0	79 6	14 0	
31													
TL		51253			30303			112 8					5784
ME	123	1708	26 1	77	1010	49 6	2 0	28 2	38 2	2146 0	93 3	14 6	193

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
SURFACE WATER QUALITY DIVISION

DEQ

Discharge Number	Permit Number
001 A	MI 002 3540

DAILY DISCHARGE MONITORING REPORT

Monitoring Period
June 1999

DAY	$CBOD_5$			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS	NH3-N		PH	D.O.	F.COLI #/100ml	CL RESID	CN Amenable
	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	mg/l	LBS	SU	mg/l	MF	mg/l	mg/L
1	7.9	118	95.9	15.0	224	89.8	0.58	8.7	82.5	15.0	10.50	156.75	7.60	7.0	46	0.000	
2	7.7	118	96.0	12.0	184	90.6				12.0	10.70	164.20	7.60	6.2	60	0.000	
3	5.3	81	97.0	6.0	92	95.2				6.0	11.70	179.54	7.60	7.0	17	0.000	<0 02
4	3.4	43	97.8	4.0	51	97.0				4.0	13.20	167.33	7.60	7.2	17	0.000	
5	3.7	47	97.4	3.0	38	97.8				3.0	13.40	168.75	7.60	7.2	13	0.000	
6	3.5	44	97.6	5.0	63	94.7				5.0	13.50	171.14	7.60	7.0	11	0.000	
7	5.2	76	96.7	6.0	88	95.3				6.0	13.40	195.57	7.60	6.6	28	0.000	
8	5.2	80	96.8	2.0	31	98.5				2.0	10.20	157.38	7.50	6.4	106	0.000	
9	4.3	63	97.4	4.0	58	97.6				4.0	10.60	154.71	7.50	6.7	17	0.000	<0.02
10	3.8	55	96.9	6.0	88	95.2				6.0	10.30	150.33	7.60	6.5	24	0.000	
11	4.7	62	97.5	8.0	105	94.7	0.21	2.8	92.7	8.0	13.50	177.89	7.60	7.1	24	0.000	
12	5.6	70	96.7	2.0	25	98.4				2.0	14.90	186.40	7.60	7.0	23	0.000	
13	3.6	44	97.2	3.0	36	97.6				3.0	14.00	169.30	7.50	6.8	46	0.000	
14	3.3	49	97.6	3.0	44	97.5	0.96	14.2	70.7	3.0	12.00	177.14	7.70	7.2	45	0.000	
15	5.0	74	97.3	3.0	45	97.7				3.0	11.00	163.30	7.60	6.9	21	0.000	
16	7.6	107	95.4	9.0	127	93.8				6.0	11.30	159.27	7.60	6.4	42	0.000	
17	7.4	106	95.6	9.0	129	95.3				9.0	13.10	187.92	7.60	6.2	109	0.000	<0.02
18	4.4	56	97.0	8.0	101	96.1				8.0	13.60	172.40	7.60	6.4	107	0.000	
19	7.0	81	95.8	2.0	23	98.8				2.0	14.60	169.25	7.70	7.0	26	0.000	
20	5.0	55	97.1	1.0	11	99.3				1.0	16.10	175.90	7.70	7.0	20	0.000	
21	6.6	88	96.9	4.0	53	97.4				4.0	15.50	205.54	7.60	6.8	35	0.000	
22	5.9	83	96.8	6.0	84	96.1				6.0	15.50	217.17	7.60	6.6	37	0.000	<0.02
23	7.0	96	95.7	8.0	109	95.4	0.21	2.9	94.1	7.0	11.10	151.82	7.60	6.5	41	0.000	
24	10.1	143	95.7	7.0	99	96.6				7.0	11.10	157.38	7.60	6.4	46	0.000	
25	14.8	202	91.2	11.0	150	94.0				11.0	12.00	164.13	7.60	6.7	67	0.000	
26	9.0	108	95.1	3.0	36	98.1				3.0	12.00	144.12	7.50	6.2	50	0.000	
27	6.4	81	95.6	7.0	89	96.7				7.0	14.10	178.74	7.60	6.4	59	0.000	
28	6.5	94	96.1	4.0	58	98.2				4.0	13.70	198.81	7.60	6.5	55	0.000	
29	5.6	89	96.6	6.0	96	96.9				6.0	11.00	175.22	7.70	6.8	39	0.000	
30	6.8	103	95.8	9.0	137	95.3				9.0	14.60	221.61	7.60	6.6	55	0.000	
31																	
TL		2516			2475			28.5									
ME	6.1	84	96.4	5.9	82	96.2	0.49	7.1	85.0	172.0	12.74	173.97		6.7	36	0	
WA	8.5	117		7.3	106										53		
MX											16.10	221.61	7.70			0	
MN													7.50	6.2			

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment See 18 U S C 1001 and 33 U S C 1319 (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 Years)

PRINTED NAME AND TITLE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTORIZED AGENT	DATE
Steven D. Washburn, Superintendent		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

ACTIVATED SLUDGE SHEET

June, 1999

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	AERATION SYSTEM				MIXED LIQUOR								SECONDARY SLUDGE				
	AERTN VOL	DETEN TIME	CRT	F:M RATIO	MLSS		MLVSS		SETTL.	SDI	D.O.	AIR	SS	VSS	RAS FLOW	WAS	
	KCF	HRS	DAYS		mg/L	Lbs.	mg/L	Lbs.	%	%	mg/L	CF	%	%	%	Gallons	Lbs.
SF	3											4				3	
1	48	4.8	3.7	0.43	1710	5120	1426	4270	18	0.95	5.70	123	0.39	0.32	52	42	1366
2	48	4.7	4.1	0.41	1881	5632	1598	4785	20	0.94	4.00	124	0.48	0.41	53	34	1361
3	48	4.7	3.6	0.47	1746	5228	1454	4354	18	0.97	3.50	130	0.50	0.42	45	35	1460
4	48	5.7	4.5	0.34	1937	5800	1617	4842	21	0.92	5.70	127	0.50	0.42	61	31	1293
5	48	5.7			1851	5543					5.10	119			60	35	
6	48	5.7			1848	5534					3.90	118			59	34	
7	48	4.9	4.3	0.45	1762	5276	1486	4450	19	0.93	5.70	110	0.45	0.38	51	33	1238
8	48	4.7	4.6	0.37	1860	5570	1570	4701	21	0.89	2.90	120	0.48	0.40	48	30	1201
9	48	4.9	3.9	0.31	1923	5758	1637	4902	20	0.96	5.20	119	0.49	0.42	42	36	1471
10	48	4.9	3.8	0.30	2020	6049	1748	5234	21	0.96	5.20	118	0.47	0.40	52	41	1607
11	48	5.5	3.2	0.49	1902	5695	1611	4824	21	0.91	5.20	122	0.46	0.39	73	46	1765
12	48	5.7			1809	5417					3.90	122			76	46	
13	48	5.9			1705	5105					3.50	123			78	44	
14	48	4.9	3.3	0.43	1632	4887	1397	4183	19	0.86	6.50	127	0.50	0.43	64	35	1460
15	48	4.8	4.7	0.44	1783	5339	1531	4584	18	0.99	4.80	127	0.50	0.42	66	27	1126
16	48	5.1	5.0	0.68	1013	3033	865	2590	10	1.01	6.40	125	0.27	0.23	47	27	608
17	48	5.0	4.6	0.38	2177	6519	1865	5585	24	0.91	4.80	124	0.58	0.49	58	29	1403
18	48	5.7	4.4	0.34	2115	6333	1792	5366	25	0.85	5.40	123	0.47	0.40	66	37	1450
19	48	6.2			2074	6210					3.00	121			72	40	
20	48	6.6			1992	5965					4.20	120			76	40	
21	48	5.4	3.1	0.36	1832	5486	1558	4665	19	0.96	6.00	122	0.50	0.42	62	42	1751
22	48	5.1	4.4	0.44	1937	5800	1647	4932	19	1.02	2.90	124	0.43	0.37	59	37	1327
23	48	5.3	4.4	0.32	1985	5944	1705	5105	27	0.74	3.90	120	0.43	0.37	59	38	1363
24	48	5.1	3.2	0.53	2021	6052	1714	5132	20	1.01	1.50	122	0.58	0.49	56	39	1887
25	48	5.3	3.6	0.36	2207	6609	1888	5653	23	0.96	1.50	124	0.49	0.42	59	45	1839
26	48	6.0			2059	6165					1.50	120			67	52	
27	48	5.7			1912	5725					3.10	122			63	52	
28	48	5.0	2.7	0.32	1827	5471	1562	4677	17	1.07	5.10	121	0.49	0.42	55	50	2043
29	48	4.5	2.9	0.43	1794	5372	1487	4453	18	1.00	5.10	120	0.50	0.43	50	44	1835
30	48	4.7	2.7	0.39	1828	5474	1567	4692	18	1.02	4.00	124	0.57	0.49	51	42	1997
31	48																
TL												3661				1163	32850
ME	48	5.3	3.9	0.41	1871	5604	1578	4726	20	0.9	4.3	122	0.48		59	39	1493

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SLUDGE SHEET

Marshall

MI 002 3540

June 1999

SUPERINTENDENT
Steven D. Washburn

	RAW SLUDGE				LIME STABILIZED SLUDGE					
DAY	GALLONS	TOTAL SOLIDS %	VOLATILE SOLIDS %	pH SU	LIME POUNDS	pH 2 hrs @ 25 C SU	pH 16 hrs SU	Lbs. Lime per 1000 gallons sludge		
1	7900	3.5	74.0	6.1	507	12.0	11.9	64		
2	7250	3.4	75.0	6.0	702	12.2	12.4	97		
3	8300	3.3	76.0	6.0	585	12.3	12.3	70		
4	8000	3.5	74.0	5.9	702	12.3	12.3	88		
5	8525	3.4	76.0	6.0	702	12.3	12.3	82		
6	8000	3.2	74.0	6.1	702	12.2	12.2	88		
7	7000	3.3	74.0	6.1	702	12.3	12.3	100		
8	8200	3.4	74.0	6.1	702	12.3	12.3	86		
9	7400	3.5	74.0	6.0	624	12.3	12.2	84		
10	8200	3.2	72.0	6.2	624	12.3	12.3	76		
11	6000	3.8	74.0	6.0	624	12.2	12.2	104		
12	10600	3.4	75.0	6.0	780	12.3	12.4	74		
13	8000	3.4	74.0	6.1	702	12.3	12.3	88		
14	7750	3.6	74.0	6.0	780	12.3	12.3	101		
15	7500	3.2	74.0	6.0	819	12.3	12.3	109		
16	8000	3.2	74.0	6.1	819	12.2	12.4	102		
17	8000	3.3	73.0	6.0	975	12.3	12.3	122		
18	7500	3.5	72.0	6.0	7053	12.3	12.3	940		
19	7500	3.1	75.0	6.0	663	12.3	12.2	88		
20	8000	3.3	74.0	6.0	702	12.3	12.3	88		
21	8000	3.3	74.0	6.0	975	12.2	12.4	122		
22	8000	3.4	75.0	5.9	780	12.3	12.2	98		
23	8400	3.4	73.0	5.9	1053	12.3	12.3	125		
24	8500	3.8	73.0	5.9	780	12.3	12.3	92		
25	8000	3.2	73.0	5.9	1053	12.2	12.4	132		
26	8500	3.3	75.0	5.8	780	12.2	12.3	92		
27	8000	3.3	76.0	5.9	780	12.3	12.2	98		
28	8500	3.5	74.0	5.9	975	12.3	12.2	115		
29	9000	3.4	73.0	6.0	858	12.3	12.2	95		
30	7000	3.4	73.0	5.9	780	12.3	12.2	111		
31										
TOTAL	239525				29283					
MEAN	7984	3.4	74.0	6.0	976	12.3	12.3	124		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MISCELLANEOUS SHEET

June 1999

Marshall
MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	WATER	ELECTRICAL USAGE		FUEL GAS		CHEMICALS APPLIED								
			X 120		X 100	$FECL_3$					Cl_2		SO_2	
	CF	METER	KWH	METER	CF	GALS	SP. GR.	% SOLN	LBS	mg/L	LBS	mg/L	LBS	mg/L
1	750	22	2640			75.0	1.3900	30	21.6	1.4	17.0	1.1	13.0	0.9
2	960	23	2760			75	1.3900	30	21.6	1.4	10	0.7	9.0	0.6
3	900	22	2640			75	1.3900	30	21.6	1.4	33	2.2	11.0	0.7
4	770	23	2760			125	1.3900	30	35.9	2.8	21	1.7	6.0	0.5
5	800	21	2520			100	1.3900	30	28.8	2.3	19	1.5	16.0	1.3
6	650	23	2760			100	1.3900	30	28.8	2.3	22	1.7	12.0	0.9
7	720	23	2760			100	1.3900	30	28.8	2.0	21	1.4	12.0	0.8
8	670	22	2640			100	1.3900	30	28.8	1.9	21	1.4	13.0	0.8
9	680	22	2640			100	1.3900	30	28.8	2.0	16	1.1	12.0	0.8
10	700	22	2640			150	1.3900	30	43.1	3.0	13	0.9	12.0	0.8
11	810	24	2880			100	1.3900	30	28.8	2.2	15	1.1	13.0	1.0
12	780	21	2520			125	1.3900	30	35.9	2.9	15	1.2	13.0	1.0
13	660	22	2640			100	1.3900	30	28.8	2.4	15	1.2	13.0	1.1
14	890	23	2760			125	1.3900	30	35.9	2.4	17	1.2	13.0	0.9
15	840	24	2880			100	1.3900	30	28.8	1.9	17	1.1	15.0	1.0
16	690	22	2640			100	1.3900	30	28.8	2.0	22	1.6	13.0	0.9
17	790	23	2760			100	1.3900	30	28.8	2.0	18	1.3	9.0	0.6
18	810	21	2520			100	1.3900	30	28.8	2.3	16	1.3	9.0	0.7
19	670	23	2760			100	1.3900	30	28.8	2.5	29	2.5	9.0	0.8
20	600	22	2640			150	1.3900	30	43.1	3.9	21	1.9	9.0	0.8
21	1590	22	2640			100	1.3900	30	28.8	2.2	20	1.5	8.0	0.6
22	1930	22	2640			100	1.3900	30	28.8	2.1	19	1.4	8.0	0.6
23	730	23	2760			125	1.3900	30	35.9	2.6	21	1.5	7.0	0.5
24	1830	22	2640			25	1.3900	30	7.2	0.5	21	1.5	10.0	0.7
25	660	21	2520			75	1.3900	30	21.6	1.6	18	1.3	16.0	1.2
26	790	23	2760			50	1.3900	30	14.4	1.2	16	1.3	12.0	1.0
27	710	23	2760			75	1.3900	30	21.6	1.7	17	1.3	16.0	1.3
28	670	23	2760			75	1.3900	30	21.6	1.5	17	1.2	25.0	1.7
29	680	23	2760			50	1.3900	30	14.4	0.9	18	1.1	16.0	1.0
30	1200	22	2640			100	1.3900	30	28.8	1.9	21	1.4	15.0	1.0
31	.													
TL	25930	672	80640			2875			826.7		566.0		365.0	
ME	864	22	2688			96	1.3900	30.0	27.6	2.0	18.9	1.4	12.2	0.9

MANPOWER	
POSITION TITLE	NUMBER FULL TIME
SUPERINTENDANT	1
ASST. SUPT.	
OPERATOR	3
MECHANIC	
CHEMIST	
LAB TECH	
IPP COORDINATOR	1
OTHER	

GIVE THE HOURS PER DAY THAT PLANT PERSONNEL ARE NORMALLY AT THE PLANT.

WEEKDAYS	8	HRS
SATURDAYS	8	HRS
SUNDAYS	8	HRS
HOLIDAYS	8	HRS

Weather Code	
1 Clear	6 Warm
2 Partly Cloudy	7 Cold
3 Cloudy	8 Windy
4 Rain	9 Melting Snow
5 Snow	

PLANT INFLUENT SHEET

July 1999

Marshall

STATE OF MICHIGAN

MI 002 3540

SUPERINTENDENT

DEPT OF ENVIRONMENTAL QUALITY

Steven D Washburn

D	WEATHER		FLOW		RAW SEWAGE QUALITY									
A	TYPE	PRECIP	TOTAL	MAX	TEMP	pH	BOD_5		SS		TOTAL-P		VSS	NH3-N
Y	CODE	Inches	MGD	MGD	°F	SU	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l
1	4	1 06	1 960		64	7 40	146	2387	246	4021	3 26	53	232	10 7
2	1		1 870		61	7 60	110	1716	174	2714			166	12 3
3	1		1 660		62	7 60	131	1814	190	2630			180	14 5
4	1		1 590		60	7 60	123	1631	144	1910			138	13 4
5	1		1 580		60	7 80	143	1884	198	2609			182	12 5
6	1		1 620		61	7 50	150	2027	167	2256	3 20	43	137	11 7
7	1		1 610		62	7 60	185	2484	178	2390			152	11 8
8	4	1 16	1 570		61	7 60	158	2069	156	2043			150	12 9
9	4	0 11	1 690		60	7 70	152	2142	144	2030			130	13 2
10	1		1 610		60	7 70	129	1732	148	1987			142	12 2
11	1		1 510		60	7 70	132	1662	128	1612			120	12 6
12	1		1 650		62	7 60	130	1789	142	1954	3 07	42	142	12 7
13	1		1 600		63	7 80	153	2042	152	2028			152	13 8
14	1		1 570		62	7 60	155	2030	142	1859			132	13 3
15	1		1 570		61	7 60	150	1964	116	1519			106	11 1
16	1		1 620		61	7 70	150	2027	140	1892			120	12 3
17	4	0 39	1 620		61	7 80	143	1932	140	1892			136	12 3
18	2		1 570		63	7 90	140	1833	164	2147			158	11 9
19	1		1 650		64	7 90	178	2449	200	2752			184	12 4
20	4	0 02	1 840		64	7 60	132	2026	154	2363	3 16	48	146	11 1
21	4	0 16	1 970		67	7 80	145	2382	126	2070			120	10 3
22	1		1 940		64	7 70	151	2443	152	2459			140	10 2
23	4	0 70	1 860		62	7 70	113	1753	174	2699			144	10 5
24	1		1 620		62	7 70	157	2121	146	1973			132	12 8
25	1		1 500		62	7 90	176	2202	170	2127			160	12 1
26	1		1 780		68	7 60	167	2479	176	2613			142	10 6
27	1		1 920		66	7 80	151	2418	119	1906			116	10 7
28	1		1 550		63	7 70	132	1706	140	1810			120	13 4
29	1		1 630		64	7 00	185	2515	162	2202			152	11 4
30	1		1 570		62	7 70	158	2069	182	2383			176	15 2
31	4	0 47	1 510		62	7 70	180	2267	136	1713			136	13 1
TL		4 07	52		1934	238	4605	63994	4906	68562		187		
ME			1 671		62 39		149	2064	158	2212	3 17	47	147	12 2

City of Marshall
801 Industrial Rd
Marshall, MI 49068

PRIMARY EFFLUENT SHEET

July 1999

Marshall
MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D Washburn

	PRIMARY EFFLUENT QUALITY												
DAY	BOD-5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS		AMMONIA NITROGEN	
	mg/l	LBS	Removal	mg/l	LBS	% Removal	mg/l	LBS	% Removal	mg/l	%	mg/l	LBS
1	108	1765	26 0	84	1373	65 9	2 6	41 8	21 5	84 0	100 0	13 3	217
2	87	1357	20 9	74	1024	57 5				74 0	100 0	13 7	190
3	94	1301	28 2	86	1140	54 7				80 0	93 0	15 7	208
4	92	1220	25 2	64	843	55 6				64 0	100 0	15 5	204
5	96	1265	32 9	68	919	65 7				64 0	94 1	15 7	212
6	94	1270	37 3	74	994	55 7	2 0	27 0	37 2	70 0	94 6	14 9	200
7	92	1235	50 3	60	786	66 3				46 0	76 7	13 8	181
8	104	1362	34 2	56	789	64 1				56 0	100 0	14 4	203
9	152	2142	0 0	60	806	58 3				50 0	83 3	15 2	204
10	81	1088	37 2	48	604	67 6				48 0	100 0	13 0	164
11	73	919	44 7	44	605	65 6				44 0	100 0	13 4	184
12	75	1032	42 3	48	641	66 2	1 9	25 4	38 1	48 0	100 0	13 9	185
13	95	1268	37 9	36	471	76 3				36 0	100 0	15 4	202
14	79	1034	49 0	44	576	69 0				38 0	86 4	14 2	186
15	77	1008	48 7	36	486	69 0				32 0	88 9	13 1	177
16	130	1756	13 3	54	730	61 4				46 0	85 2	14 0	189
17	91	1229	36 4	36	471	74 3				36 0	100 0	13 6	178
18	76	995	45 7	46	633	72 0				46 0	100 0	12 9	178
19	74	1018	58 4	42	645	79 0				36 0	85 7	13 6	209
20	72	1105	45 5	46	756	70 1	1 4	23 2	55 4	46 0	100 0	12 9	212
21	112	1840	22 8	50	809	60 3				48 0	96 0	10 6	172
22	140	2265	7 3	68	1055	55 3				64 0	94 1	12 1	188
23	166	2575	-46 9	84	1135	51 7				58 0	69 0	12 5	169
24	97	1311	38 2	70	876	52 1				60 0	85 7	14 0	175
25	99	1238	43 8	70	1039	58 8				66 0	94 3	12 7	189
26	104	1544	37 7	80	1281	54 5				68 0	85 0	13 8	221
27	112	1793	25 8	66	853	44 5				64 0	97 0	12 2	158
28	116	1500	12 1	60	816	57 1				52 0	86 7	12 5	170
29	227	3086	-22 7	62	812	61 7				54 0	87 1	15 6	204
30	164	2147	-3 8	70	882	61 5				70 0	100 0	13 9	175
31	105	1322	41 7	60	756	55 9				60 0	100 0	14 4	6222
TL		45993			25606			117 4					11925
ME	106	1484	28 1	60	826 0	62 2	2 0	29 3	38 0	1708 0	93 0	13 8	385

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
SURFACE WATER QUALITY DIVISION

DEQ

Discharge Number	Permit Number
001 A	MI 002 3540

DAILY DISCHARGE MONITORING REPORT

Monitoring Period
July 1999

DAY	$CBOD_5$			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS	NH3-N		PH	D.O.	F.COLI #/100ml	CL RESID	CN Amenable
	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	mg/l	LBS	SU	mg/l	MF	mg/l	mg/L
1	6.2	101	95.8	4.0	65	98.4	0.28	4.6	91.4	4.0	12.30	201.06	7.60	6.5	42	0.000	<0.02
2	4.2	66	96.2	4.0	62	97.7				4.0	10.50	163.76	7.60	6.6	46	0.000	
3	5.9	82	95.5	6.0	83	96.8				6.0	14.80	204.90	7.60	6.7	25	0.000	
4	4.9	65	96.0	5.0	66	96.5				5.0	16.60	220.13	7.70	6.7	21	0.000	
5	5.7	75	96.0	4.0	53	98.0				4.0	15.70	206.88	7.70	6.8	21	0.000	
6	5.1	69	96.6	4.0	54	97.6	0.27	3.6	91.6	4.0	14.10	190.50	7.70	6.8	16	0.000	<0.02
7	4.4	59	97.6	4.0	54	97.8				4.0	13.60	182.61	7.70	7.4	186	0.000	
8	7.1	93	95.5	3.0	39	98.1				3.0	14.00	183.31	7.60	7.6	12	0.000	
9	5.5	78	96.4	4 0	56	97.2				4.0	16.00	225.51	7.60	7.1	50	0.000	
10	5.8	78	95.5	1.0	13	99.3				1.0	15.50	208.12	7.70	7.1	18	0.000	
11	5.2	65	96.1	2.0	25	98.4				2.0	14.00	176.31	7.60	6.7	8	0.000	
12	4.8	66	96.3	3.0	41	97.9	0.39	5.4	87.3	3.0	13.50	185.77	7.70	7.0	13	0.000	
13	6.4	85	95.8	1.0	13	99.3				1.0	15.90	212.17	7.70	7.1	15	0.000	
14	5.3	69	96.6	2.0	26	98.6				2.0	13.60	178.08	7.70	6.8	13	0.000	
15	3.8	50	97.5	3.0	39	97.4				3.0	11.60	151.89	7.70	6.9	20	0.000	
16	5.8	78	96.1	2.0	27	98.6				2.0	12.20	164.83	7.70	7.1	31	0.000	<0.02
17	3.6	49	97.5	1.0	14	99.3				1.0	11.90	160.78	7.60	6.7	26	0.000	
18	2.7	35	98.1	1.0	13	99.4				1.0	11.00	144.03	7.60	6.4	16	0.000	
19	3.2	44	98.2	2.0	28	99.0				2.0	9.90	136.23	7.60	6.9	30	0.000	
20	3.9	60	97.0	4.0	61	97.4	0.54	8.3	82.9	4.0	8.10	124.30	7.60	6.8	52	0.000	<0.02
21	4.2	69	97.1	3.0	49	97.6				3.0	7.60	124.87	7.60	6.7	104	0.000	
22	5.9	95	96.1	7.0	113	95.4				7.0	9.50	153.71	7.60	6.1	66	0.000	
23	5.3	82	95.3	12.0	186	93.1				12.0	9.60	148.92	7.50	6.2	41	0.000	
24	4.2	57	97.3	1.0	14	99.3				1.0	8.20	110.79	7.60	6.4	57	0.000	
25	3.5	44	98.0	3.0	38	98.2				3.0	9.00	112.59	7.60	6.3	49	0.000	
26	5.0	74	97.0	9.0	134	94.9				9.0	10.00	148.45	7.50	6.3	106	0.000	
27	4.6	74	97.0	1.0	16	99.2				1.0	7.20	115.29	7.50	6.4	44	0.000	
28	3.8	49	97.1	5.0	65	96.4				5.0	10.50	135.73	7.60	6.4	31	0.000	
29	6.5	88	96.5	6.0	82	96.3				6.0	10.40	141.38	7.50	6.4	68	0.000	
30	8.6	113	94.6	6.0	79	96.7				6.0	10.80	141.41	7.50	6.1	46	0.000	
31	7.0	88	96.1	1.0	13	99.3				1.0	9.40	118.38	7.50	6.3	47	0.000	
TL		2201			1621			21.9									
ME	5.1	71	96.5	3.7	52	97.7	0.37	5.5	88.3	114.0	11.84	163.64		6.7	33	0.000	<0.02
WA	5.7	76		5.6	85										64		
MX											16.60	225.51	7.70			0.000	<0.02
MN													7.50	6.1			

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment See 18 U S C 1001 and 33 U S C 1319 (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 Years)

PRINTED NAME AND TITLE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTORIZED AGENT	DATE
Steven D. Washburn, Superintendent		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

ACTIVATED SLUDGE SHEET

July 1999

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	AERATION SYSTEM				MIXED LIQUOR								SECONDARY SLUDGE				
	AERTN VOL	DETEN TIME	CRT	F:M RATIO	MLSS		MLVSS		SETTL.	SDI	D.O.	AIR	SS	VSS	RAS FLOW	WAS	
	KCF	HRS	DAYS		mg/L	Lbs.	mg/L	Lbs.	%	%	mg/L	CF	%	%	%	Gallons	Lbs.
SF	3											4				3	
1	48	4.4	2.7	0.40	1747	5231	1492	4468	17	1.03	4.60	123	0.56	0.48	48	42	1962
2	48	4.6	3.7	0.28	1875	5614	1601	4794	20	0.94	5.00	122	0.50	0.42	53	36	1501
3	48	5.2			1859	5567					4.70	121			60	39	
4	48	5.4			1798	5384					3.20	118			62	41	
5	48	5.5			1748	5234					3.50	118			62	41	
6	48	5.3	4.3	0.30	1679	5028	1415	4237	14	1.20	3.50	119	0.37	0.31	60	38	1173
7	48	5.4	5.2	0.30	1610	4821	1358	4066	17	0.95	4.40	122	0.36	0.31	59	31	931
8	48	5.5	5.8	0.35	1571	4704	1306	3911	16	0.98	4.50	122	0.39	0.32	61	25	813
9	48	5.1	6.6	0.54	1607	4812	1337	4004	16	1.00	3.80	120	0.38	0.32	57	23	729
10	48	5.4			1665	4986					4.10	124			60	24	
11	48	5.7			1688	5055					3.70	125			67	24	
12	48	5.2	5.8	0.25	1660	4971	1369	4099	19	0.87	5.70	124	0.43	0.35	60	24	861
13	48	5.4	5.5	0.32	1611	4824	1341	4015	23	0.70	5.70	122	0.42	0.34	62	25	876
14	48	5.5	7.7	0.25	1678	5025	1376	4120	20	0.84	5.40	122	0.39	0.32	63	20	651
15	48	5.5	7.5	0.25	1670	5001	1374	4114	21	0.80	5.80	120	0.40	0.33	60	20	667
16	48	5.3	8.5	0.42	1700	5090	1400	4192	20	0.85	5.80	120	0.36	0.29	58	20	600
17	48	5.3			1742	5216					4.50	120			59	17	
18	48	5.5			1819	5447					2 90	121			55	14	
19	48	5.2	8.1	0.22	1848	5534	1514	4534	27	0.68	6.10	121	0.43	0.36	60	19	681
20	48	4.7	7.4	0.25	1822	5456	1470	4402	29	0.63	5.00	122	0.37	0.30	51	24	741
21	48	4.4	4.3	0.42	1800	5390	1465	4387	26	0.69	4.30	121	0.48	0.39	48	31	1241
22	48	4.4	5.8	0.49	1894	5671	1554	4653	29	0.65	4.30	119	0.38	0.32	48	31	982
23	48	4.6	3.8	0.51	2018	6043	1684	5043	33	0.61	3.90	120	0.42	0.35	50	45	1576
24	48	5.3			1890	5659					3.10	118			56	45	
25	48	5.7			1840	5510					2.80	119			61	44	
26	48	4.8	3.7	0.36	1730	5180	1443	4321	25	0.69	2.20	121	0.48	0.40	51	35	1401
27	48	4.5	5.6	0.43	1688	5055	1400	4192	25	0.68	4 00	120	0.37	0.31	49	29	895
28	48	5.6	5.9	0.32	1856	5558	1558	4665	29	0.64	4.50	119	0.40	0.34	63	28	934
29	48	5.3	5.3	0.67	1846	5528	1534	4593	30	0.62	4.40	118	0.45	0.37	60	28	1051
30	48	5.5	6.2	0.41	2080	6228	1740	5210	32	0.65	1.00	116	0.39	0.33	61	31	1008
31	48	5.7			2009	6016					2.10	127			63	37	
TL												3744				931	21274
ME	48	5.2	5.7	0.37	1776	5317	1463	4382	23	0.8	4.1	121	0.42	0.35	58	30	1013

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SLUDGE SHEET

Marshall

MI 002 3540

July 1999

SUPERINTENDENT
Steven D. Washburn

	RAW SLUDGE				LIME STABILIZED SLUDGE					
DAY	GALLONS	TOTAL SOLIDS %	VOLATILE SOLIDS %	pH SU	LIME POUNDS	pH 2 hrs @ 25 C SU	pH 16 hrs SU	Lbs. Lime per 1000 gallons sludge		
1	8750	3.8	71.0	5.9	286	12.2	12.3	33		
2	8000	4.2	73.0	5.8	273	12.2	12.3	34		
3	8500	3.6	73.0	5.9	260	12.3	12.3	31		
4	8400	3.5	74.0	5.9	299	12.3	12.4	36		
5	8300	3.3	74.0	6.0	273	12.3	12.2	33		
6	8300	3.2	74.0	6.1	273	12.1	12.3	33		
7	8500	3.4	74.0	5.9	260	12.2	12.2	31		
8	8500	3.2	74.0	5.9	260	12.1	12.3	31		
9	8500	3.2	74.0	5.9	260	12.3	12.3	31		
10	8500	3.4	74.0	6.0	260	12.3	12.3	31		
11	8000	2.9	74.0	6.0	260	12.3	12.4	33		
12	8000	2.9	75.0	6.0	247	12.3	12.3	31		
13	8750	2.8	75.0	6.0	273	12.3	12.3	31		
14	8250	2.7	74.0	6.1	273	12.3	12.2	33		
15	8800	2.7	75.0	6.1	247	12.4	12.3	28		
16	8800	2.8	73.0	6.1	260	12.3	12.4	30		
17	8450	2.8	75.0	6.0	260	12.3	12.5	31		
18	8000	2.6	75.0	6.0	247	12.4	12.4	31		
19	8000	2.6	74.0	6.0	286	12.3	12.4	36		
20	8000	2.7	73.0	6.0	273	12.3	12.3	34		
21	8200	2.6	72.0	6.0	247	12.3	12.2	30		
22	8250	2.8	72.0	6.0	312	12.3	12.2	38		
23	8000	2.9	73.0	5.9	312	12.3	12.2	39		
24	8600	2.6	74.0	6.0	260	12.4	12.4	30		
25	8000	2.7	73.0	5.9	273	12.3	12.2	34		
26	9050	2.7	74.0	6.0	273	12.2	12.3	30		
27	8000	2.8	73.0	6.0	247	12.2	12.3	31		
28	8000	2.6	76.0	5.8	260	12.2	12.3	33		
29	8000	2.8	74.0	5.9	273	12.2	12.3	34		
30	8000	3.1	76.0	5.8	312	12.2	12.3	39		
31	8525	2.9	74.0	5.9	273	12.3	12.2	32		
TOTAL	257925				8372					
MEAN	8320	3.0	73.8	6.0	270	12.3	12.3	33		

City of Marshall
801 Industrial Rd
Marshall, MI 49068

MISCELLANEOUS SHEET

July 1999

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D Washburn

DAY	WATER	ELECTRICAL USAGE		FUEL GAS		CHEMICALS APPLIED								
			X 120		X 100	FECL$_3$					Cl_2		SO_2	
	CF	METER	KWH	METER	CF	GALS	SP GR	% SOLN	LBS	mg/L	LBS	mg/L	LBS	mg/L
1	730	23	2760			100 0	1 3900	30	28 8	1 8	21 0	1 3	15 0	0 9
2	860	20	2400			50	1 3900	30	14 4	0 9	19	1 2	13 0	0 8
3	660	24	2880			100	1 3900	30	28 8	2 1	14	1 0	16 0	1 2
4	820	22	2640			75	1 3900	30	21 6	1 6	34	2 6	15 0	1 1
5	570	23	2760			75	1 3900	30	21 6	1 6	22	1 7	16 0	1 2
6	820	22	2640			100	1 3900	30	28 8	2 1	22	1 6	10 0	0 7
7	780	22	2640			100	1 3900	30	28 8	2 1	22	1 6	28 0	2 1
8	860	23	2760			100	1 3900	30	28 8	2 2	24	1 8	12 0	0 9
9	730	21	2520			50	1 3900	30	14 4	1 0	24	1 7	10 0	0 7
10	770	23	2760			100	1 3900	30	28 8	2 1	20	1 5	15 0	1 1
11	700	23	2760			75	1 3900	30	21 6	1 7	12	1 0	14 0	1 1
12	720	23	2760			75	1 3900	30	21 6	1 6	18	1 3	14 0	1 0
13	1000	21	2520			75	1 3900	30	21 6	1 6	17	1 3	13 0	1 0
14	670	22	2640			75	1 3900	30	21 6	1 6	10	0 8	13 0	1 0
15	790	22	2640			100	1 3900	30	28 8	2 2	21	1 6	8 0	0 6
16	670	22	2640			50	1 3900	30	14 4	1 1	20	1 5	9 0	0 7
17	870	23	2760			100	1 3900	30	28 8	2 1	20	1 5	27 0	2 0
18	570	22	2640			75	1 3900	30	21 6	1 6	24	1 8	23 0	1 8
19	710	23	2760			75	1 3900	30	21 6	1 6	23	1 7	10 0	0 7
20	800	23	2760			75	1 3900	30	21 6	1 4	22	1 4	12 0	0 8
21	600	23	2760			75	1 3900	30	21 6	1 3	21	1 3	13 0	0 8
22	690	23	2760			75	1 3900	30	21 6	1 3	24	1 5	14 0	0 9
23	770	21	2520			75	1 3900	30	21 6	1 4	24	1 5	14 0	0 9
24	770	23	2760			50	1 3900	30	14 4	1 1	20	1 5	14 0	1 0
25	370	21	2520			75	1 3900	30	21 6	1 7	21	1 7	22 0	1 8
26	930	24	2880			75	1 3900	30	21 6	1 5	15	1 0	30 0	2 0
27	780	23	2760			75	1 3900	30	21 6	1 3	18	1 1	13 0	0 8
28	640	21	2520			75	1 3900	30	21 6	1 7	17	1 3	12 0	0 9
29	690	22	2640			50	1 3900	30	14 4	1 1	9	0 7	12 0	0 9
30	770	22	2640			50	1 3900	30	14 4	1 1	21	1 6	17 0	1 3
31	740	22	2640			125	1 3900	30	35 9	2 9	19	1 5	10 0	0 8
TL	22850	692	83040			2425			697 3		618 0		464 0	
ME	737	22	2679			78	1 3900	30 0	22 5	1 6	19 9	1 4	15 0	1 1

MANPOWER		
POSITION TITLE	NUMBER FULL TIME	
SUPERINTENDANT	1	
ASST SUPT		
OPERATOR	3	
MECHANIC		
CHEMIST		
LAB TECH		
IPP COORDINATOR	1	
OTHER		

GIVE THE HOURS PER DAY THAT PLANT PERSONNEL ARE NORMALLY AT THE PLANT

WEEKDAYS	8	HRS
SATURDAYS	8	HRS
SUNDAYS	8	HRS
HOLIDAYS	8	HRS

Weather Code	
1 Clear	6 Warm
2 Partly Cloudy	7 Cold
3 Cloudy	8 Windy
4 Rain	9 Melting Snow
5 Snow	

PLANT INFLUENT SHEET

August 1999

Marshall

STATE OF MICHIGAN

MI 002 3540

SUPERINTENDENT

DEPT OF ENVIRONMENTAL QUALITY

Steven D Washburn

D	WEATHER		FLOW		RAW SEWAGE QUALITY									
A	TYPE	PRECIP	TOTAL	MAX	TEMP	pH	BOD_5		SS		TOTAL-P		VSS	NH3-N
Y	CODE	inches	MGD	MGD	°F	SU	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l
1	1		1 430		61	7 70	175	2087	132	1574			128	13 3
2	1		1 720		62	7 50	153	2195	120	1721			110	10 6
3	1		1 750		62	7 70	206	3007	165	2408			155	12 7
4	4	0 03	1 730		67	7 80	172	2482	138	1991			132	12 1
5	1		1 710		63	7 50	176	2510	144	2054			138	11 7
6	1		1 640		63	7 80	161	2202	172	2353			146	14 7
7	4	0 34	1 480		63	7 80	155	1913	128	1580			128	12 1
8	1		1 440		61	7 70	149	1789	123	1477			123	12 5
9	4	0 27	1 590		61	7 70	167	2215	146	1936	3 30	44	134	13 7
10	4	0 27	1 740		63	7 50	175	2540	138	2003			138	10 2
11	1		1 700		64	7 60	176	2495	144	2042			128	12 5
12	4	0 18	1 690		64	8 00	224	3157	144	2030			144	14 2
13	4	0 04	1 680		65	7 90	191	2676	138	1934			126	13 6
14	1		1 530		63	7 80	176	2246	124	1582			124	13 0
15	1		1 400		61	7 80	131	1530	126	1471			126	12 0
16	1		1 690		66	7 80	172	2424	134	1889	3 29	46	112	12 4
17	1		1 830		67	7 60	186	2839	142	2167			120	15 1
18	4	0 07	1 620		64	7 80	164	2216	226	3053	3 46	47	208	14 3
19	4	0 02	1 560		65	7 80	227	2953	202	2628			182	14 1
20	1		1 490		66	7 70	171	2125	180	2237			156	18 7
21	1		1 400		62	7 70	160	1868	138	1611			138	14 8
22	4	0 14	1 370		61	7 80	171	1954	138	1577			138	14 2
23	4	0 08	1 560		68	7 80	185	2407	190	2472			164	15 3
24	4	0 07	1 550		66	7 70	170	2198	177	2288	3 76	49	170	12 7
25	4	0 05	1 620		67	7 60	146	1973	164	2216			152	12 6
26	4	0 02	1 610		68	7 70	234	3142	194	2605			190	14 7
27	1		1 560		65	7 60	189	2459	160	2082			152	15 5
28	1		1 440		61	7 70	190	2282	166	1994			156	15 1
29	1		1 400		65	7 70	164	1915	146	1705			136	14 5
30	1		1 580		60	7 60	175	2306	142	1871			138	13 5
31	1		1 680		65	7 70	173	2424	187	2620			184	13 2
TL		1 58	49 190					72527		63169		185		
ME			1 587				176	2340	154	2038	3 45	46	144	13 5

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

PRIMARY EFFLUENT SHEET

August 1999

Marshall
MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

	PRIMARY EFFLUENT QUALITY												
DAY	BOD-5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS		AMMONIA NITROGEN	
	mg/l	LBS	Removal	mg/l	LBS	% Removal	mg/l	LBS	% Removal	mg/l	%	mg/l	LBS
1	108	1288	38.3	66	787	50.0				66.0	100.0	15.3	182
2	107	1535	30.1	102	1489	15.0				92.0	90.2	12.8	187
3	224	3269	-8.7	80	1154	51.5				80.0	100.0	13.9	201
4	140	2020	18.6	86	1226	37.7				84.0	97.7	14.5	207
5	167	2382	5.1	96	1313	33.3				82.0	85.4	14.6	200
6	230	3146	-42.9	80	987	53.5				68.0	85.0	17.2	212
7	121	1494	21.9	78	937	39.1				78.0	100.0	15.5	186
8	98	1177	34.2	62	822	49.6				62.0	100.0	14.4	191
9	149	1976	10.8	86	1248	41.1	2.0	29.5	38.5	80.0	93.0	15.4	223
10	166	2409	5.1	86	1219	37.7				86.0	100.0	14.2	201
11	133	1886	24.4	84	1184	41.7				74.0	88.1	14.7	207
12	191	2692	14.7	88	1233	38.9				88.0	100.0	18.7	262
13	173	2424	9.4	94	1199	31.9				90.0	95.7	18.3	234
14	79	1008	55.1	108	1261	12.9				108.0	100.0	16.4	191
15	94	1098	28.2	101	1424	19.8				98.0	97.0	15.1	213
16	147	2072	14.5	124	1893	7.5	2.7	41.7	17.0	102.0	82.3	15.3	234
17	186	2839	0.0	130	1756	8.5				114.0	87.7	16.5	223
18	164	2216	0.0	116	1509	48.7	2.5	32.4	28.0	108.0	93.1	17.7	230
19	227	2953	0.0	120	1491	40.6				108.0	90.0	19.4	241
20	171	2125	0.0	146	1705	18.9				128.0	87.7	21 2	248
21	160	1868	0.0	128	1463	7.2				128 0	100.0	17.6	201
22	171	1954	0.0	120	1561	13.0				120.0	100.0	16.3	212
23	185	2407	0.0	142	1836	25.3				120.0	84.5	19.0	246
24	170	2198	0.0	74	1000	58.2	2.8	37.2	26.9	74.0	100.0	16.2	219
25	146	1973	0.0	142	1907	13.4				130.0	91.5	15.9	213
26	234	3142	0.0	104	1353	46.4				104.0	100.0	17.4	226
27	189	2459	0.0	128	1537	20.0				128.0	100.0	16.9	203
28	190	2282	0.0	124	1448	25.3				124.0	100.0	17.4	203
29	164	1915	0.0	104	1370	28.8				104.0	100.0	16.1	212
30	175	2306	0.0	96	1345	32.4				96.0	100.0	15.2	213
31	173	2424	0.0	104	42665	44.4				104.0	100.0	15.7	6441
TL		66934			83323			140.7					12863
ME	162	2159	8.4	103	2688	32.0	2.5	35.2	27.6	3028.0	95.1	16.3	415

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
SURFACE WATER QUALITY DIVISION

DEQ

Discharge Number	Permit Number
001 A	MI 002 3540

DAILY DISCHARGE MONITORING REPORT

Monitoring Period
August 1999

DAY	CBOD5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS	NH3-N		PH	D.O.	F.COLI #/100ml	CL RESID	CN Amenable
	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	mg/l	LBS	SU	mg/l	MF	mg/l	mg/L
1	6.1	73	96.5	2.0	24	98.5				1.0	11.30	134.77	7.60	6.2	82	0.016	
2	6.7	96	95.6	15.0	215	87.5				12.0	10.70	153.49	7.60	6.5	208	0.005	
3	7.2	105	96.5	11.0	161	93.3				11.0	9.31	135.88	7.60	6.4	92	0.000	
4	7.9	114	95.4	6.0	87	95.7				6.0	12.60	181.80	7.60	6.1	68	0.000	
5	7.1	101	96.0	14.0	200	90.3				14.0	11.30	161.15	7.60	6.1	52	0.000	
6	7.0	96	95.7	8.0	109	95.3				5.0	13.00	177.81	7.60	6.3	26	0.000	<0.02
7	7.8	96	95.0	4.0	49	96.9				4.0	12.40	153.06	7.60	6.2	31	0.000	
8	8.4	101	94.4	8.0	96	93.5				8.0	12.64	151.80	7.60	6.3	23	0.005	
9	7.7	102	95.4	9.0	119	93.8	0.48	6.4	85.5	9.0	9.94	131.81	7.60	6.7	22	0.016	
10	6.7	97	96.2	2.0	29	98.6				2.0	11.20	162.53	7.60	6.2	50	0.002	<0.02
11	7.7	109	95.6	4.0	57	97.2				4.0	9.98	141.50	7.50	6.0	65	0.000	
12	9.2	130	95.9	5.0	70	96.5				5.0	16.30	229.74	7.50	5.8	122	0.000	
13	12.8	179	93.3	8.0	112	94.2				8.0	18.20	255.00	7.60	6.0	120	0.000	<0.02
14	10.1	129	94.3	7.0	89	94.4				7.0	14.10	179.92	7.60	6.0	240	0.000	
15	4.8	56	96.3	5.0	58	96.0				5.0	11.10	129.60	7.60	6.6	33	0.000	
16	6.7	94	96.1	8.0	113	94.0	0.24	3.4	92.7	5.0	12.60	177.59	7.60	6.8	52	0.000	
17	11.8	180	93.7	10.0	153	93.0				9.0	12.70	193.83	7.60	6.1	340	0.000	<0.02
18	9.9	134	94.0	8.0	108	96.5	0.31	4.2	91.0	8.0	14.10	190.50	7.60	6.1	710	0.000	
19	8.7	113	96.2	10.0	130	95.0				10.0	13.30	173.04	7.60	6.3	72	0.016	
20	9.4	117	94.5	13.0	162	92.8				13.0	14.40	178.94	7.60	6.4	34	0.000	
21	7.8	91	95.1	9.0	105	93.5				9.0	17.30	201.99	7.60	6.6	47	0.000	
22	5.6	64	96.7	6.0	69	95.7				6.0	15.10	172.53	7.60	6.3	38	0.000	
23	6.8	88	96.3	13.0	169	93.2				13.0	13.50	175.64	7.60	5.9	67	0.000	
24	6.8	88	96.0	5.0	65	97.2	0.23	3.0	93.9	5.0	17.70	228.81	7.60	6.1	37	0.000	
25	5.9	80	96.0	9.0	122	94.5				9.0	14.70	198.61	7.70	6.0	43	0.000	
26	8.4	113	96.4	5.0	67	97.4				5.0	14.00	187.98	7.60	5.9	20	0.000	
27	5.5	72	97.1	8.0	104	95.0				8.0	16.10	209.47	7.60	6.1	20	0.000	
28	6.7	80	96.5	7.0	84	95.8				7.0	15.40	184.95	7.60	6.3	17	0.000	
29	4.8	56	97.1	7.0	82	95.2				7.0	17.10	199.66	7.60	6.2	14	0.000	
30	5.8	76	96.7	7.0	92	95.1				7.0	15.40	202.93	7.60	6.6	14	0.000	
31	6.9	97	96.0	1.0	14	99.5				1.0	13.60	190.55	7.60	6.3	20	0.000	
TL		3128			3113			16.9									
ME	7.6	101	95.7	7.5	100	95.0	0.32	4.2	90.8	223.0	13.58	178.93		6.2	52	0.002	<0.02
WA	9.3	129		9.9	131										147		
MX											18.20	255.00	7.70			0.016	<0.02
MN													7.50	5.8			

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment See 18 U S C 1001 and 33 U S C 1319 (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 Years)

PRINTED NAME AND TITLE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTORIZED AGENT	DATE
Steven D. Washburn, Superintendent		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

ACTIVATED SLUDGE SHEET

August 1999

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	AERATION SYSTEM				MIXED LIQUOR								SECONDARY SLUDGE				
	AERTN VOL	DETEN TIME	CRT	F:M RATIO	MLSS		MLVSS		SETTL.	SDI	D.O.	AIR	SS	VSS	RAS FLOW	WAS	
	KCF	HRS	DAYS		mg/L	Lbs.	mg/L	Lbs.	%	%	mg/L	CF	%	%	%	Gallons	Lbs.
SF	3											4				3	
1	48	6.0			1935	5794					2.10	121			64	38	
2	48	5.0	3.4	0.36	1698	5084	1422	4258	30	0.57	3.80	124	0.46	0.38	44	39	1496
3	48	4.9	3.3	0.71	1850	5540	1534	4593	28	0.66	4.30	124	0.51	0.42	36	40	1701
4	48	5.0	2.8	0.43	1843	5519	1551	4644	28	0.66	3.90	123	0.53	0.45	63	44	1945
5	48	5.0	3.9	0.54	1738	5204	1474	4414	25	0.70	2.70	123	0.37	0.31	41	43	1327
6	48	5.3	5.2	0.67	1852	5546	1565	4686	27	0.69	4.00	125	0.31	0.26	49	41	1060
7	48	5.8			1928	5773					3.20	127			60	43	
8	48	6.0			1880	5629					2.30	129			58	44	
9	48	5.4	4.2	0.43	1808	5414	1529	4578	24	0.75	3.60	129	0.35	0.29	53	44	1284
10	48	5.0	3.5	0.56	1732	5186	1443	4321	20	0.87	2.50	127	0.41	0.34	47	43	1470
11	48	5.1	4.4	0.36	2060	6168	1744	5222	26	0.79	0.80	126	0.42	0.36	49	40	1401
12	48	5.1	3.5	0.51	2088	6252	1776	5318	28	0.75	1.60	128	0.44	0.38	50	48	1761
13	48	5.1	3.1	0.44	2130	6378	1850	5540	29	0.73	1.50	125	0.46	0.39	49	53	2033
14	48	5.6			2088	6252					0.70	128			53	55	
15	48	6.2			2008	6013					4.00	130			56	51	
16	48	5.1	3.5	0.42	1897	5680	1640	4911	18	1.05	5.60	128	0.37	0.32	46	53	1635
17	48	4.7	3.2	0.53	2065	6183	1781	5333	20	1.03	2.00	125	0.47	0.41	42	50	1960
18	48	5.3	3.3	0.38	2248	6731	1963	5878	19	1.18	3.30	127	0.44	0.38	47	56	2055
19	48	5.5	3.0	0.54	2117	6339	1833	5489	19	1.11	4.50	135	0.44	0.38	48	58	2128
20	48	5.8	2.5	0.38	2123	6357	1859	5567	18	1.18	4.60	164	0.51	0.45	63	60	2552
21	48	6.2			2022	6055					3.60	144			65	58	
22	48	6.3			1924	5761					3.40	113			57	57	
23	48	5.5	2.7	0.50	1834	5492	1601	4794	14	1.31	5.30	114	0.43	0.37	58	57	2044
24	48	5.6	3.0	0.46	1844	5522	1605	4806	14	1.32	4.40	112	0.38	0.33	54	59	1870
25	48	5.3	2.5	0.41	1855	5555	1620	4851	11	1.69	4.30	112	0.46	0.40	54	58	2225
26	48	5.4	3.2	0.67	1806	5408	1568	4695	14	1.29	3.90	111	0.36	0.32	56	56	1681
27	48	5.5	2.9	0.50	1905	5704	1652	4947	15	1.27	3.50	112	0.42	0.36	60	57	1997
28	48	6.0			1871	5603					2.90	110			67	59	
29	48	6.2			1821	5453					2.70	115			58	58	
30	48	5.5	2.6	0.53	1696	5078	1461	4375	12	1.41	5.60	118	0.41	0.36	60	57	1949
31	48	5.1	2.3	0.54	1746	5228	1507	4513	12	1.46	4.90	117	0.53	0.45	54	52	2299
TL												3846				1571	39875
ME	48	5.5	3.3	0.49	1917	5739	1635	4897	21	1.0	3.4	124	0.43	0.37	54	51	1813

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SLUDGE SHEET

Marshall

MI 002 3540

August 1999

SUPERINTENDENT
Steven D. Washburn

	RAW SLUDGE				LIME STABILIZED SLUDGE					
DAY	GALLONS	TOTAL SOLIDS %	VOLATILE SOLIDS %	pH SU	LIME POUNDS	pH 2 hrs @ 25 C SU	pH 16 hrs SU	Lbs. Lime per 1000 gallons sludge		
1	8000	2.7	74.0	5.9	786	12.3	12.1	98		
2	8250	2.9	75.0	6.0	865	12.3	12.3	105		
3	7650	2.8	73.0	5.9	825	12.3	12.2	108		
4	8200	2.7.2.6	73.0	6.0	943	12.3	12.4	115		
5	8500	2 9	74.0	5.9	865	12.3	12.1	102		
6	8000	3.0	73.0	5.8	843	12.2	12.4	105		
7	8600	2.5	74.0	5.9	668	12.4	12.4	78		
8	8000	2.6	73.0	5.9	786	12.3	12.2	98		
9	8900	2.7	75.0	6.0	786	12.3	12.3	88		
10	8500	3.0	74.0	6.0	707	12.2	12.4	83		
11	8825	4.4	76.0	6.0	786	12.3	12.4	89		
12	8600	2.8	73 0	6.0	825	12.3	12.4	96		
13	9600	3.1	73.0	6.0	786	12.3	12.4	82		
14	9600	2.7	74.0	6.0	943	12.4	12.4	98		
15	8000	2.8	73.0	6.1	786	12.3	12.3	98		
16	9000	2.8	73.0	6.1	825	12.2	12.3	92		
17	8500	3.1	73.0	6.1	865	12.3	12.4	102		
18	8000	3.0	73.0	6.1	825	12.3	12.3	103		
19	8250	3.1	73.0	6.1	825	12.3	12.2	100		
20	8250	2.9	74.0	6.0	865	12.3	12.3	105		
21	8700	2 7	75.0	5.8	825	12.2	12.4	95		
22	8700	2.8	74.0	5.9	865	12.3	12.2	99		
23	8000	2.9	75.0	6 0	825	12.3	12.4	103		
24	9000	2.9	75.0	6.0	904	12.2	12.1	100		
25	8750	2.8	74.0	5.7	865	12.3	12.3	99		
26	8500	2.7	74.0	5 7	825	12 2	12.4	97		
27	8525	2.8	74.0	5 8	825	12.3	12.3	97		
28	8000	2.5	74.0	5.9	865	12.3	12 3	108		
29	9640	2.8	74.0	6.0	865	12.2	12.2	90		
30	9400	2.5	75.0	6.1	904	12.3	12.3	96		
31	9600	2.6	74.0	6.1	904	12.3	12.4	94		
TOTAL	266040				25877					
MEAN	8582	2.9	73.9	6.0	835	12.3	12.3	98		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MISCELLANEOUS SHEET

August, 1999

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	WATER	ELECTRICAL USAGE		FUEL GAS		CHEMICALS APPLIED								
			X 120		X 100	$FECL_3$					Cl_2		SO_2	
	CF	METER	KWH	METER	CF	GALS	SP. GR.	% SOLN	LBS	mg/L	LBS	mg/L	LBS	mg/L
1	710	21	2520			75.0	1.3860	30	21.6	1.8	19.0	1.6	11.0	0.9
2	720	22	2640			50	1.3860	30	14.4	1.0	27	1.9	8.0	0.6
3	740	22	2640			75	1.3860	30	21.6	1.5	22	1.5	7.0	0.5
4	960	21	2520			75	1.3860	30	21.6	1.5	22	1.5	11.0	0.8
5	790	22	2640			75	1.3860	30	21.6	1.5	24	1.7	21.0	1.5
6	640	21	2520			75	1.3860	30	21.6	1.6	22	1.6	13.0	1.0
7	890	20	2400			75	1.3860	30	21.6	1.8	21	1.7	14.0	1.1
8	630	22	2640			75	1.3860	30	21.6	1.8	19	1.6	16.0	1.3
9	860	21	2520			50	1.3860	30	14.4	1.1	16	1.2	14.0	1.1
10	900	23	2760			125	1.3860	30	36.0	2.5	19	1.3		
11	690	22	2640			100	1.3860	30	28.8	2.0	16	1.1	16.0	1.1
12	680	22	2640			100	1.3860	30	28.8	2.0	19	1.3	17.0	1.2
13	740	21	2520			125	1.3860	30	36.0	2.6	23	1.6	11.0	0.8
14	810	23	2760			75	1.3860	30	21.6	1.7	28	2.2	7.0	0.5
15	570	23	2760			100	1.3860	30	28.8	2.5	19	1.6	27.0	2.3
16	700	22	2640			100	1.3860	30	28.8	2.0	23	1.6	20.0	1.4
17	700	22	2640			100	1.3860	30	28.8	1.9	28	1.8	14.0	0.9
18	650	25	3000			100	1.3860	30	28.8	2.1	19	1.4	14.0	1.0
19	560	20	2400			100	1.3860	30	28.8	2.2	32	2.5	15.0	1.2
20	810	21	2520			75	1.3860	30	21.6	1.7	28	2.3	17.0	1.4
21	580	23	2760			100	1.3860	30	28.8	2.5	30	2.6	11.0	0.9
22	780	22	2640			75	1.3860	30	21.6	1.9	33	2.9	10.0	0.9
23	680	24	2880			75	1.3860	30	21.6	1.7	27	2.1	10.0	0.8
24	600	22	2640			100	1.3860	30	28.8	2.2	15	1.2	29.0	2.2
25	630	21	2520			100	1.3860	30	28.8	2.1	21	1.6	24.0	1.8
26	750	23	2760			100	1.3860	30	28.8	2.1	22	1.6	15.0	1.1
27	600	22	2640			100	1.3860	30	28.8	2.2	22	1.7	16.0	1.2
28	660	22	2640			50	1.3860	30	14.4	1.2	34	2.8	16.0	1.3
29	830	22	2640			100	1.3860	30	28.8	2.5	24	2.1	18.0	1.5
30	560	23	2760			50	1.3860	30	14.4	1.1	24	1.8	16.0	1.2
31	650	22	2640			150	1.3860	30	43.3	3.1	25	1.8	9.0	0.6
TL	22070	682	81840			2725			785.8		723.0		447.0	
ME	712	22	2640			88	1.3860	30.0	25.3	1.9	23.3	1.8	14.9	1.1

MANPOWER	
POSITION TITLE	NUMBER FULL TIME
SUPERINTENDANT	1
ASST. SUPT.	
OPERATOR	3
MECHANIC	
CHEMIST	
LAB TECH	
IPP COORDINATOR	1
OTHER	

GIVE THE HOURS PER DAY THAT PLANT PERSONNEL ARE NORMALLY AT THE PLANT.

WEEKDAYS	8	HRS
SATURDAYS	8	HRS
SUNDAYS	8	HRS
HOLIDAYS		HRS

Weather Code	
1. Clear	6. Warm
2. Partly Cloudy	7. Cold
3. Cloudy	8. Windy
4. Rain	9. Melting Snow
5. Snow	

PLANT INFLUENT SHEET

September 1999

Marshall

STATE OF MICHIGAN

MI 002 3540

SUPERINTENDENT

DEPT OF ENVIRONMENTAL QUALITY

Steven D. Washburn

D	WEATHER		FLOW		RAW SEWAGE QUALITY									
A	TYPE	PRECIP	TOTAL	MAX	TEMP	pH	BOD_5		SS		TOTAL-P		VSS	NH3-N
Y	CODE	Inches	MGD	MGD	°F	SU	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l
1	1		1.680		65	7.30	177	2480	158	2214			150	11.6
2	1		1.710		66	7.50	175	2496	212	3023			190	12.1
3	1		1.500		65	7.70	183	2289	170	2127			170	16.5
4	1		1.340		62	7.70	146	1632	140	1565			140	14.4
5	1		1.250		61	7.70	132	1376	130	1355			130	13.1
6	2		1.320		62	7.60	156	1717	162	1783			154	13.9
7	1		1.470		64	7.70	107	1312	94	1152			94	14.7
8	1		1.420		64	7.70	171	2025	196	2321	3.69	44	182	13.5
9	1		1.420		65	7.80	193	2286	192	2274			174	15.2
10	1		1.360		64	7.60	164	1860	186	2110			182	15.4
11	1		1.280		65	7.60	208	2220	242	2583			232	18.8
12	4	0.10	1.240		63	7.90	191	1975	204	2110			200	14.2
13	1		1.540		61	7.40	215	2761	132	1695	4.02	52	132	12.3
14	2		1.590		66	7.70	199	2639	163	2161			157	17.4
15	2		1.540		64	7.30	192	2466	136	1747			126	12.9
16	2		1.540		65	7.60	210	2697	192	2466			162	13.8
17	1		1.420		63	7.70	190	2250	170	2013			170	17.4
18	1		1.270		63	7.80	240	2542	260	2754			238	15.2
19	1		1.210		63	7.70	180	1816	194	1958			190	13.9
20	1		1.350		62	7.70	171	1925	190	2139			178	15.1
21	2		1.340		63	7.70	246	2749	234	2615	4.25	47	224	17.8
22	1		1.350		63	7.80	212	2387	186	2094			182	19.0
23	4	0.03	1.310		63	7.60	222	2425	324	3540			308	17.6
24	1		1.310		62	8.00	230	2513	208	2272			194	19.0
25	1		1.310		62	7.80	185	2021	140	1530			136	15.2
26	1		1.190		60	7.80	179	1777	226	2243			216	14.9
27	4	0.17	1.300		62	7.80	194	2103	212	2299			212	14.5
28	4	1.05	1.420		62	7.80	203	2404	187	2215	3.54	42	187	15.0
29	4	0.36	1.470		62	7.70	184	2256	212	2599			198	17.4
30	1		1.390		61	7.90	143	1658	120	1391			118	16.9
31														
TL		1.71	41.840					65059		64348		185		
ME			1.395		63.1		187	2169	186	2145	3.88	46	178	15.3

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

PRIMARY EFFLUENT SHEET

September 1999

Marshall
MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

	PRIMARY EFFLUENT QUALITY												
DAY	BOD-5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS		AMMONIA NITROGEN	
	mg/l	LBS	Removal	mg/l	LBS	% Removal	mg/l	LBS	% Removal	mg/l	%	mg/l	LBS
1	140	1962	20.9	128	1793	19.0				104.0	81.3	14.0	196
2	113	1612	35.4	124	1551	41.5				116.0	93.5	14.6	183
3	130	1626	29.0	128	1430	24.7				128.0	100.0	19.0	212
4	107	1196	26.7	132	1376	5.7				132.0	100.0	17.2	179
5	89	928	32.6	112	1233	13.8				112.0	100.0	14.8	163
6	119	1310	23.7	120	1471	25.9				110.0	91.7	13.3	163
7	115	1410	-7.5	98	1161	-4.3				98.0	100.0	14.6	173
8	122	1445	28.7	123	1457	37.2	2.5	29.6	32.2	116.0	94.3	16.4	194
9	127	1504	34.2	124	1406	35.4				94.0	75.8	18.6	211
10	95	1078	42.1	100	1068	46.2				100.0	100.0	18.6	199
11	101	1078	51.4	122	1262	49.6				122.0	100.0	15.6	161
12	95	982	50.3	124	1593	39.2				124.0	100.0	17.5	225
13	121	1554	43.7	134	1777	-1.5	3.0	39.1	26.6	134.0	100.0	15.9	211
14	145	1923	27.1	136	1747	16.6				136.0	100.0	14.7	189
15	130	1670	32.3	140	1798	-2.9				124.0	88.6	17.2	221
16	137	1760	34.8	168	1990	12.5				156.0	92.9	16.1	191
17	145	1717	23.7	84	890	50.6				84.0	100.0	15.1	160
18	130	1377	45.8	156	1574	40.0				156.0	100.0	19.3	194
19	113	1140	37.2	164	1846	15.5				164.0	100.0	16.7	188
20	110	1238	35.7	180	2012	5.3				172.0	95.6	16.8	188
21	143	1598	41.9	172	1937	26.5	3.6	40.0	16.5	172.0	100.0	19.5	220
22	157	1768	25.9	120	1311	35.5				120.0	100.0	21.2	232
23	134	1464	39.6	140	1530	56.8				140.0	100.0	19.4	212
24	154	1683	33.0	152	1661	26.9				152.0	100.0	21.7	237
25	115	1256	37.8	156	1548	-11.4				156.0	100.0	17.6	175
26	93	923	48.0	156	1691	31.0				156.0	100.0	15.7	170
27	105	1138	45.9	156	1847	26.4				156.0	100.0	16.0	189
28	121	1433	40.4	144	1765	23.0	3.3	40.1	7.6	144.0	100.0	17.5	215
29	127	1557	31.0	140	1623	34.0				140.0	100.0	19.9	231
30	101	1171	29.4	92	1066	23.3				92.0	100.0	17.6	204
31													
TL		42500			46414			148.8					5884
ME	121	1417	34.0	134	1547	24.7	3.1	37.2	20.7	3910.0	97.1	17.1	196

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
SURFACE WATER QUALITY DIVISION

DEQ

Discharge Number	Permit Number
001 A	MI 002 3540

DAILY DISCHARGE MONITORING REPORT

Monitoring Period
September 1999

DAY	$CBOD_5$			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS	NH3-N		PH	D.O.	F.COLI #/100ml	CL RESID	CN Amenable
	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	mg/l	LBS	SU	mg/l	MF	mg/l	mg/L
1	6.7	94	96.2	6.0	84	96.2				6.0	12 60	176.54	7.60	6.0	15	0.001	
2	5 9	84	96.6	9 0	128	95.8				9.0	11.00	156.88	7.60	5.9	17	0.002	
3	6.5	81	96.4	7.0	88	95.9				7.0	15.40	192.65	7.60	6.5	24	0.000	<0.02
4	5.1	57	96.5	11.0	123	92.1				11.0	17.20	192.22	7.60	6.0	11	0.000	
5	4.8	50	96.4	2.0	21	98.5				2.0	14.50	151.16	7.60	6.3	11	0.000	
6	7.4	81	95.3	8.0	88	95.1				8.0	13.30	146.42	7 70	6.3	3	0.003	
7	8.1	99	92.4	9.0	110	90.4				9.0	14.70	180.22	7.60	6.5	4	0.002	<0.02
8	5.6	66	96.7	7.0	83	96.4	0.23	2.7	93.8	7.0	14.10	166.98	7.70	6.6	4	0.006	
9	4.1	49	97.9	6.0	71	96.9				6.0	15.80	187.12	7.60	6.2	7	0 000	
10	4.3	49	97.4	8.0	91	95.7				8.0	15.30	173.54	7.70	6.6	3	0.002	<0.02
11	5.0	53	97.6	8.0	85	96.7				8.0	14.10	150.52	7.70	6.2	7	0.012	
12	4.6	48	97.6	7.0	72	96.6				7.0	12.90	133.41	7.60	6.6	6	0.002	
13	4.4	57	98.0	7.0	90	94.7	0.34	4.4	91.5	7.0	11.30	145.13	7.60	6.5	6	0.000	<0.02
14	6.0	80	97.0	4.0	53	97.5				4.0	14.30	189.63	7.50	6.4	40	0.000	
15	5.6	72	97.1	9.0	116	93.4				9.0	13.50	173.39	7.80	6.7	8	0.009	
16	4.5	58	97.9	7.0	90	96.4				7.0	11.00	141.28	7.70	6.3	24	0.001	
17	4.5	53	97.6	8.0	95	95.3				8.0	10.80	127.90	7.70	6.5	8	0.000	
18	8.0	85	96.7	9.0	95	96.5				9.0	15.60	165.23	7.90	6.4	15	0.000	
19	6.8	69	96.2	9.0	91	95.4				9.0	14.80	149 35	7.60	6.2	12	0.000	
20	5.0	56	97.1	14.0	158	92.6				14.0	13.60	153.12	7.70	6.2	8	0.000	
21	6.2	69	97.5	14.0	156	94.0	0.53	5.9	87.5	14.0	15.30	170.99	7.60	6.7	22	0.000	
22	8.6	97	95.9	17.0	191	90.9				17.0	13.40	150.87	7.60	6.5	29	0.000	
23	7.9	86	96.4	13.0	142	96.0				13.0	17.30	189.01	7.60	6.4	77	0.000	
24	11.4	125	95.0	17.0	186	91.8				17.0	18.40	201.03	7.60	6.3	31	0.000	
25	12.1	132	93.5	15.0	164	89.3				15.0	17.00	185.73	7.60	6.0	120	0 000	
26	6.9	68	96.1	10.0	99	95.6				10.0	13.80	136.96	7.70	6.1	15	0.000	
27	6.4	69	96.7	13.0	141	93.9				13.0	13.20	143.11	7.70	6.2	43	0.000	
28	5.9	70	97.1	11.0	130	94.1	0.71	8.4	79.9	11.0	14.70	174.09	7.70	6.1	40	0.000	
29	6.1	75	96.7	12.0	147	94.3				12.0	16.20	198.61	7.70	6.4	110	0.000	
30	5.0	58	96.5	14.0	162	88.3				14.0	15.90	184.32	7.60	6.3	92	0.000	
31																	
TL		2190			3351			21.4									
ME	6.3	73	96.5	9.7	112	94.5	0.45	5.4	88.2	291.0	14.37	166.25		6.3	16	0.001	<0.02
WA	8.5	93		14.3	157										56		
MX											18.40	201.03	7.90			0.012	<0.02
MN													7.50	5.9			

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment See 18 U S C 1001 and 33 U S C 1319 (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 Years)

PRINTED NAME AND TITLE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTORIZED AGENT	DATE
Steven D. Washburn, Superintendent		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

ACTIVATED SLUDGE SHEET

September 1999

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	AERATION SYSTEM				MIXED LIQUOR								SECONDARY SLUDGE				
	AERTN VOL	DETEN TIME	CRT	F:M RATIO	MLSS		MLVSS		SETTL.	SDI	D.O.	AIR	SS	VSS	RAS FLOW	WAS	
	KCF	HRS	DAYS		mg/L	Lbs.	mg/L	Lbs.	%	%	mg/L	CF	%	%	%	Gallons	Lbs.
SF	3											4				3	
1	48	5.1	2.4	0.42	1812	5426	1576	4719	11	1.65	3.30	105	0.52	0.45	54	52	2255
2	48	5.0	3.0	0.30	2051	6142	1793	5369	10	2.05	2.80	108	0.47	0.41	53	52	2038
3	48	5.7	3.1	0.29	2140	6408	1861	5573	14	1.53	5.30	95	0.47	0.41	60	52	2038
4	48	6.4			2018	6043					3.30	101			65	56	
5	48	6.9			1934	5791					4.00	112			70	58	
6	48	6.5			1882	5635					3.90	114			67	53	
7	48	5.9	3.5	0.30	1807	5411	1567	4692	11	1.64	5.50	114	0.40	0.35	59	47	1568
8	48	6.1	3.8	0.29	1894	5671	1662	4977	10	1.89	5.40	117	0.40	0.35	63	45	1501
9	48	6.1	2.8	0.29	1970	5899	1719	5147	10	1.97	3.00	116	0.49	0.43	62	52	2125
10	48	6.3	3.5	0.21	2081	6231	1731	5183	11	1.89	3.30	115	0.37	0.32	61	57	1759
11	48	6.7			1926	5767					4.30	114			66	57	
12	48	6.9			1918	5743					3.80	119			68	58	
13	48	5.6	2.5	0.32	1868	5594	1636	4899	11	1.70	5.30	119	0.47	0.41	56	56	2195
14	48	5.4	2.9	0.37	1991	5962	1750	5240	11	1.81	2.80	120	0.45	0.40	57	54	2027
15	48	5.6	2.5	0.30	2080	6228	1870	5600	15	1.39	4.90	119	0.52	0.47	59	58	2515
16	48	5.6	2.4	0.30	2166	6486	1933	5788	11	1.97	6.10	117	0.55	0.49	58	60	2752
17	48	6.1	2.3	0.28	2279	6824	2040	6109	11	2.07	5.20	115	0.54	0.48	62	65	2927
18	48	6.8			2172	6504					4.10	121			68	66	
19	48	7.1			2078	6222					4.80	117			71	66	
20	48	6.4	2.7	0.23	2020	6049	1812	5426	12	1.68	5.70	115	0.42	0.38	62	64	2242
21	48	6.4	2.3	0.31	1896	5677	1701	5093	13	1.46	5.00	121	0.48	0.43	56	61	2442
22	48	6.4	2.1	0.34	1944	5821	1743	5219	11	1.77	6.10	121	0.55	0.49	59	61	2798
23	48	6.6	3.6	0.27	2048	6133	1831	5483	11	1.86	3.80	117	0.34	0.30	64	60	1701
24	48	6.6	3.7	0.30	2061	6171	1851	5543	10	2.06	4.80	117	0.30	0.27	64	67	1676
25	48	6.6			2066	6186					3.90	117			66	67	
26	48	7.2			1864	5582					4.20	117			68	67	
27	48	6.6	2.2	0.23	1882	5635	1672	5007	9	2.09	5.40	113	0.51	0.45	63	61	2595
28	48	6.1	1.9	0.31	1842	5516	1530	4581	9	2.05	4.70	113	0.56	0.49	58	62	2896
29	48	5.9	1.9	0.31	1893	5668	1692	5067	11	1.72	5.20	118	0.58	0.52	57	63	3047
30	48	6.2	2.9	0.23	1902	5695	1686	5049	11	1.73	6.50	120	0.37	0.33	64	64	1975
31	48																
TL												3447				1761	47073
ME	48	6.2	2.8	0.30	1983	5937	1746	5227	11	1.8	4.5	115	0.46		62	59	2242

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SLUDGE SHEET

Marshall

MI 002 3540

Seotember 1999

SUPERINTENDENT
Steven D. Washburn

	RAW SLUDGE				LIME STABILIZED SLUDGE					
DAY	GALLONS	TOTAL SOLIDS %	VOLATILE SOLIDS %	pH SU	LIME POUNDS	pH 2 hrs @ 25 C SU	pH 16 hrs SU	Lbs. Lime per 1000 gallons sludge		
1	9350	2.7	74.0	6.1	858	12.3	12.2	92		
2	9400	2.5	74.0	6.1	858	12.4	12.3	91		
3	9000	2.9	74.0	6.1	671	12.3	12.3	75		
4	8800	2.7	73.0	6.1	746	12.3	12.2	85		
5	8400	2.7	73.0	6.2	746	12.2	12.3	89		
6	8000	2.6	73.0	6.3	746	12.2	12.1	93		
7	8750	2.9	73.0	6.3	783	12.3	12.4	89		
8	8900	3.1	74.0	6.2	783	12.3	12.4	88		
9	8500	2.9	75.0	5.8	783	12.3	12.3	92		
10	8500	2.9	76.0	5.7	783	12.3	12.3	92		
11	8400	2.6	75.0	6.0	746	12.3	12.1	89		
12	8000	2.4	75.0	6.1	746	12.3	12.1	93		
13	8800	2.6	74.0	6.0	820	12.3	12.1	93		
14	12000	2.6	75.0	6.0	746	12.2	12.1	62		
15	9000	2.4	74.0	5.9	746	12.3	12.2	83		
16	8700	2.5	74.0	5.8	783	12.3	12.2	90		
17	8700	2.7	75.0	5.7	746	12.2	12.3	86		
18	9000	2.5	75.0	5.9	895	12.2	12.2	99		
19	8500	2.7	74.0	5.9	746	12.3	12.3	88		
20	8750	2.8	74.0	5.8	746	12.3	12.2	85		
21	8500	2.9	76.0	5.8	746	12.3	12.3	88		
22	9000	3.3	77.0	5.4	746	12.3	12.3	83		
23	8500	2.8	77.0	5.4	746	12.3	12.0	88		
24	9000	2.9	77.0	5.4	634	12.3	12.0	70		
25	8650	2.9	77.0	5.5	746	12.2	12.3	86		
26	8000	2.6	76.0	5.6	746	12.3	12.2	93		
27	8900	2.7	78.0	5.6	746	12.3	12.3	84		
28	8500	2.7	78.0	5.7	933	12.3	12.3	110		
29	9000	2.8	76.0	5.4	858	12.3	12.2	95		
30	8750	2.9	76.0	5.4	783	12.3	12.3	89		
31										
TOTAL	264250				23161					
MEAN	8808	2.7	75.1	5.8	772	12.3	12.2	88		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MISCELLANEOUS SHEET

September 1999

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	WATER	ELECTRICAL USAGE		FUEL GAS		CHEMICALS APPLIED								
			X 120		X 100	$FECL_3$					Cl_2		SO_2	
	CF	METER	KWH	METER	CF	GALS	SP. GR.	% SOLN	LBS	mg/L	LBS	mg/L	LBS	mg/L
1	920	22	2640			75.0	1.3860	30	21.6	1.5	25.0	1.8	22.0	1.6
2	710	22	2640			75	1.3860	30	21.6	1.5	26	1.8	15.0	1.1
3	730	22	2640			75	1.3860	30	21.6	1.7	15	1.2	12.0	1.0
4	660	22	2640			75	1.3860	30	21.6	1.9	27	2.4	15.0	1.3
5	710	22	2640			75	1.3860	30	21.6	2.1	18	1.7	13.0	1.2
6	690	23	2760			100	1.3860	30	28.8	2.6	17	1.5	13.0	1.2
7	660	22	2640			100	1.3860	30	28.8	2.4	20	1.6	13.0	1.1
8	650	22	2640			75	1.3860	30	21.6	1.8	22	1.9	14.0	1.2
9	650	22	2640			75	1.3860	30	21.6	1.8	16	1.4	10.0	0.8
10	650	22	2640			75	1.3860	30	21.6	1.9	13	1.1	10.0	0.9
11	880	22	2640			125	1.3860	30	36.0	3.4	22	2.1	10.0	0.9
12	740	23	2760			75	1.3860	30	21.6	2.1	20	1.9	19.0	1.8
13	670	23	2760			75	1.3860	30	21.6	1.7	18	1.4	11.0	0.9
14	620	23	2760			125	1.3860	30	36.0	2.7	18	1.4	10.0	0.8
15	710	22	2640			50	1.3860	30	14.4	1.1	21	1.6	16.0	1.2
16	780	24	2880			50	1.3860	30	14.4	1.1	24	1.9	19.0	1.5
17	640	24	2880			100	1.3860	30	28.8	2.4	18	1.5	12.0	1.0
18	610	21	2520			100	1.3860	30	28.8	2.7	18	1.7	12.0	1.1
19	800	22	2640			100	1.3860	30	28.8	2.9	21	2.1	11.0	1.1
20	570	23	2760			100	1.3860	30	28.8	2.6	24	2.1	12.0	1.1
21	630	20	2400			50	1.3860	30	14.4	1.3	20	1.8	10.0	0.9
22	710	22	2640			50	1.3860	30	14.4	1.3	24	2.1	5.0	0.4
23	640	22	2640			75	1.3860	30	21.6	2.0	16	1.5	13.0	1.2
24	640	22	2640			75	1.3860	30	21.6	2.0	16	1.5	23.0	2.1
25	640	22	2640			75	1.3860	30	21.6	2.0	17	1.6	8.0	0.7
26	870	23	2760			75	1.3860	30	21.6	2.2	16	1.6	10.0	1.0
27	520	22	2640			50	1.3860	30	14.4	1.3	17	1.6	10.0	0.9
28	630	22	2640			50	1.3860	30	14.4	1.2	16	1.4	8.0	0.7
29	710	24	2880			50	1.3860	30	14.4	1.2	18	1.5	10.0	0.8
30	610	22	2640			100	1.3860	30	28.8	2.5	14	1.2	11.0	0.9
31														
TL	20650	669	80280			2350			677.7		577.0		377.0	
ME	688	22	2676			78	1.3860	30.0	22.6	2.0	19.2	1.7	12.6	1.1

MANPOWER

POSITION TITLE	NUMBER FULL TIME
SUPERINTENDANT	1
ASST. SUPT.	
OPERATOR	4
MECHANIC	
CHEMIST	
LAB TECH	
IPP COORDINATOR	1
OTHER	

GIVE THE HOURS PER DAY THAT PLANT PERSONNEL ARE NORMALLY AT THE PLANT.

WEEKDAYS	8	HRS
SATURDAYS	8	HRS
SUNDAYS	8	HRS
HOLIDAYS	8	HRS

Weather Code	
1. Clear	6. Warm
2. Partly Cloudy	7. Cold
3. Cloudy	8. Windy
4. Rain	9. Melting Snow
5. Snow	

PLANT INFLUENT SHEET

October 1999

Marshall

STATE OF MICHIGAN

MI 002 3540

SUPERINTENDENT

DEPT OF ENVIRONMENTAL QUALITY

Steven D. Washburn

D	WEATHER		FLOW		RAW SEWAGE QUALITY									
A	TYPE	PRECIP	TOTAL	MAX	TEMP	pH	BOD_5		SS		TOTAL-P		VSS	NH3-N
Y	CODE	Inches	MGD	MGD	°F	SU	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l
1	1		1.380		61	7.80	172	1980	122	1404			122	17.6
2	4	0.09	1.320		61	7.80	202	2224	178	1960			168	
3	4	0.48	1.250		60	7.80	153	1595	140	1460			128	
4	2		1.540		62	7.90	161	2068	240	3082			214	
5	2		1.540		62	7.70	207	2659	163	2094	3.16	41	152	
6	1		1.500		61	7.90	148	1851	90	1126			90	15.2
7	1		1.550		62	7.90	199	2572	124	1603			124	
8	4	0.15	1.950		61	7.60	167	2716	158	2570			144	
9	2		1.570		60	7.70	187	2449	222	2907			214	12.4
10	1		1.280		61	8.00	157	1676	150	1601			136	
11	1		1.550		61	7.80	149	1926	148	1913			148	13.2
12	1		1.690		62	7.60	160	2255	130	1832	3.57	50	126	
13	4	0.18	1.600		61	7.70	187	2495	130	1735			130	
14	1		1.570		61	7.90	242	3169	132	1728			132	
15	1		1.630		60	7.80	230	3127	144	1958			136	15.6
16	4	0.05	1.440		61	7.90	204	2450	212	2546			196	
17	1		1.260		58	7.90	145	1524	164	1723			160	
18	1		1.550		62	7.80	203	2624	164	2120	4.24	55	146	
19	1		1.580		60	7.70	200	2635	148	1950			132	
20	1		1.520		62	7.80	184	2333	138	1749			120	14.9
21	1		1.560		61	7.70	164	2134	223	2901			204	
22	4	0.01	1.550		61	7.60	178	2301	146	1887			134	
23	1		1.370		60	7.60	209	2388	178	2034			162	
24	1		1.250		57	7.70	150	1564	172	1793			152	
25	1		1.490		62	7.60	175	2175	126	1566			126	
26	1		1.580		61	7.60	186	2451	128	1687			128	
27	1		1.560		61	7.70	217	2823	164	2134	3.75	49	164	13.5
28	1		1.530		61	7.70	189	2412	208	2654			194	
29	1		1.500		61	7.70	201	2515	148	1851			138	
30	4	0.01	1.320		61	7.70	189	2081	182	2004			172	
31	1		1.240		57	7.60	163	1686	138	1427			126	
TL		0.97	46.220					70855		60999		195		
ME			1.491		60.71		183	2286	158	1968	3.68	49	149	14.6

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

PRIMARY EFFLUENT SHEET

October 1999

Marshall
MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

	PRIMARY EFFLUENT QUALITY												
DAY	BOD-5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS		AMMONIA NITROGEN	
	mg/l	LBS	Removal	mg/l	LBS	% Removal	mg/l	LBS	% Removal	mg/l	%	mg/l	LBS
1	112	1289	34.9	144	1657	-18.0				144.0	100.0	18.7	215
2	128	1409	36.6	90	938	49.4				90.0	100.0		
3	101	1053	34.0	156	2004	-11.4				150.0	96.2		
4	135	1734	16.1	172	2209	28.3				136.0	79.1		
5	121	1554	41.5	132	1651	19.0	1.5	18.3	53.8	120.0	90.9		
6	112	1401	24.3	112	1448	-24.4				112.0	100.0	15.6	202
7	122	1577	38.7	104	1691	16.1				104.0	100.0		
8	107	1740	35.9	72	943	54.4				72.0	100.0		
9	101	1322	46.0	116	1238	47.7				116.0	100.0	13.5	144
10	108	1153	31.2	132	1706	12.0				104.0	78.8		
11	105	1357	29.5	124	1748	16.2				124.0	100.0	14.5	204
12	110	1550	31.3	100	1334	23.1	2.0	26.2	45.1	100.0	100.0		
13	129	1721	31.0	140	1833	-7.7				140.0	100.0		
14	153	2003	36.8	132	1794	0.0				132.0	100.0		
15	126	1713	45.2	144	1729	0.0				144.0	100.0	14.6	175
16	131	1573	35.8	120	1261	43.4				120.0	100.0	14.6	153
17	97	1019	33.1	128	1655	22.0				124.0	96.9		
18	107	1383	47.3	128	1687	22.0	2.3	30.6	45.3	124.0	96.9		
19	128	1687	36.0	112	1420	24.3				112.0	100.0		
20	127	1610	31.0	120	1561	13.0				120.0	100.0	16.9	220
21	124	1613	24.4	124	1603	44.4				116.0	93.5		
22	120	1551	32.6	128	1463	12.3				128.0	100.0		
23	99	1131	52.6	96	1001	46.1				96.0	100.0		
24	84	876	44.0	96	1193	44.2				88.0	91.7		
25	90	1118	48.6	88	1160	30.2				88.0	100.0		
26	100	1318	46.2	78	1015	39.1				78.0	100.0		
27	137	1782	36.9	108	1378	34.1	2.4	31.1	34.9	108.0	100.0	17.1	218
28	111	1416	41.3	104	1301	50.0				100.0	96.2		
29	92	1151	54.2	88	969	40.5				88.0	100.0		
30	122	1343	35.4	92	951	49.5				92.0	100.0		
31	95	982	41.7	80	30838	42.0				80.0	100.0		
TL		44133			74380			106.1					1532
ME	114	1424	37.2	115	2399	24.6	2.0	26.5	44.8	3450.0	97.4	15.7	192

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
SURFACE WATER QUALITY DIVISION

DEQ

Discharge Number	Permit Number
001 A	MI 002 3540

DAILY DISCHARGE MONITORING REPORT

Monitoring Period
October 1999

DAY	CBOD5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS	NH3-N		PH	D.O.	F.COLI #/100ml	CL RESID	CN Amenable
	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	mg/l	LBS	SU	mg/l	MF	mg/l	mg/L
1	5.2	60	97.0	15.0	173	87.7				15.0	15.30	176.09	7.70	6.8	87	0.000	<0.02
2	6.9	76	96.6	9.0	99	94.9				9.0			7.60	6.6	75	0.000	
3	5.9	62	96.1	10.0	104	92.9				10.0			7.70	6.6	52	0 000	
4	6.0	77	96.3	22.0	283	90.8				18.0			7.60	6.8	60	0.000	
5	5.9	76	97.1	11.0	141	93.3	0.45	5.8	85.8	11.0			7.60	6.8	42	0.000	<0.02
6	4.8	60	96.8	10.0	125	88.9				10.0	12.70	158.88	7.60	6 5	50	0.000	
7	7.2	93	96.4	10.0	129	91.9				10.0			7.60	6.6	51	0.000	
8	4.4	72	97.4	15.0	244	90.5				15.0			7.60	7.0	324	0.000	
9	4.4	58	97.6	6.0	79	97.3				4.0	12.00	157.13	7.50	7.0	4	0.000	
10	4.3	46	97.3	15.0	160	90.0				14.0			7.70	6.6	5	0 000	<0.02
11	6.0	78	96.0	18.0	233	87.8				18.0	12.70	164.17	7.70	6.6	4	0.000	
12	8.0	113	95.0	14.0	197	89.2	0.25	3.5	93.0	14.0			7.70	6.2	12	0.000	<0.02
13	6.8	91	96.4	14.0	187	89.2				14.0			7.70	6.4	20	0.000	
14	4.0	52	98.3	7.0	92	94.7				7.0			7.60	6.7	22	0.000	
15	4.6	63	98.0	16.0	218	88.9				16.0	11.40	154.97	7.60	6.2	24	0.000	
16	8.8	106	95.7	11.0	132	94.8				11.0	10.80	129.70	7.60	6.4	26	0.000	
17	5.8	61	96.0	19.0	200	88.4				19.0			7.60	6.7	27	0.000	
18	5 8	75	97.1	15.0	194	90.9	0.25	3.2	94.1	15.0			7.70	7.5	27	0.000	
19	5.4	71	97.3	14.0	184	90.5				14.0			7.60	7.0	41	0.000	
20	7.3	93	96.0	16.0	203	88.4				16.0	14.10	178.74	7.60	6.9	84	0.000	
21	7.1	92	95.7	16.0	208	92.8				15.0			7.60	7.0	151	0.000	
22	5.5	71	96.9	14.0	181	90.4				14.0			7.70	7.0	108	0.000	
23	6.9	79	96.7	23.0	263	87.1				23.0			7.60	6.8	38	0.000	
24	6.2	65	95.9	27.0	281	84.3				25.0			7.70	7.3	42	0.000	
25	6.1	76	96.5	18.0	224	85.7				18.0			7.70	7.3	103	0.000	
26	5.0	66	97.3	7.0	92	94.5				7.0			7.70	7.0	56	0.000	
27	5.8	75	97.3	6.0	78	96.3	0.24	3.1	93.6	6.0	12.70	165.23	7.70	6.8	104	0.000	
28	5.7	73	97.0	9.0	115	95.7				9.0			7.60	6.9	103	0.000	
29	4.8	60	97.6	11.0	138	92.6				11.0			7.60	6.8	82	0.000	
30	5.5	61	97.1	8.0	88	95.6				8.0			7.60	6.7	46	0.000	
31	5.3	55	96.7	14.0	145	89.9				13.0			7.70	6.8	49	0.000	
TL		2252			5188			15.7									
ME	5.9	73	96.7	13.5	167	91.2	0.30	3.9	91.6	409.0	12.71	160.61		6.8	41	0.000	<0.02
WA	6.5	81		18.3	221										77		
MX											15.30	178.74	7.70			0.000	<0.02
MN													7.50	6.2			

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment See 18 U S C 1001 and 33 U S C 1319 (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 Years)

PRINTED NAME AND TITLE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTORIZED AGENT	DATE
Steven D. Washburn, Superintendent		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

ACTIVATED SLUDGE SHEET

October 1999

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	AERATION SYSTEM				MIXED LIQUOR								SECONDARY SLUDGE				
	AERTN VOL	DETEN TIME	CRT	F:M RATIO	MLSS		MLVSS		SETTL.	SDI	D.O.	AIR	SS	VSS	RAS FLOW	WAS	
	KCF	HRS	DAYS		mg/L	Lbs.	mg/L	Lbs.	%	%	mg/L	CF	%	%	%	Gallons	Lbs.
SF	3											4				3	
1	48	6.2	3.2	0.26	1838	5504	1630	4881	12	1.53	6.20	120	0.31	0.27	60	66	1706
2	48	6.5			1861	5573					5.00	122			62	68	
3	48	6.9			1808	5414					5.00	125			66	67	
4	48	5.6	1.8	0.36	1813	5429	1604	4803	12	1.51	6.40	125	0.54	0.48	55	67	3017
5	48	5.6	2.1	0.33	1776	5318	1570	4701	11	1.61	6.60	124	0.46	0.41	56	66	2532
6	48	5.7	3.1	0.29	1822	5456	1624	4863	10	1.82	6.20	122	0.35	0.32	56	60	1751
7	48	5.6	2.3	0.32	1857	5561	1655	4956	12	1.55	6.10	124	0.49	0.44	56	60	2452
8	48	4.4	3.3	0.33	1960	5869	1756	5258	11	1.78	5.80	121	0.37	0.34	46	57	1759
9	48	5.5			2354	7049					2.80	118			58	62	
10	48	6.7			1902	5695					4.60	116			71	62	
11	48	5.6	2.1	0.30	1674	5013	1492	4468	11	1.52	5.50	120	0.47	0.42	57	62	2430
12	48	5.1	2.4	0.35	1674	5013	1494	4474	10	1.67	5.50	121	0.42	0.38	48	60	2102
13	48	5.4	2.8	0.38	1692	5067	1515	4537	10	1.69	5.00	118	0.36	0.33	48	60	1801
14	48	5.5	2.2	0.41	1804	5402	1618	4845	11	1.64	6.30	124	0.48	0.43	48	61	2442
15	48	5.3	2.3	0.32	1975	5914	1778	5324	12	1.65	5.30	121	0.51	0.46	47	60	2552
16	48	6.0			2241	6710					3.60	116			53	60	
17	48	6.8			1976	5917					4.40	121			61	60	
18	48	5.6	2.4	0.29	1807	5411	1608	4815	12	1.51	7.00	124	0.46	0.41	48	58	2225
19	48	5.5	2.9	0.33	1886	5647	1682	5037	13	1.45	6.70	124	0.47	0.41	51	50	1960
20	48	5.7	2.6	0.31	1953	5848	1756	5258	12	1.63	6.10	124	0.52	0.47	53	51	2212
21	48	5.5	3.0	0.29	2094	6270	1868	5594	11	1.90	6.20	119	0.51	0.45	53	49	2084
22	48	5.6	2.6	0.28	2095	6273	1874	5611	12	1.75	4.80	123	0.51	0.46	63	57	2424
23	48	6.3			2054	6150					4.20	125			69	55	
24	48	6.9			1894	5671					6.00	124			58	50	
25	48	5.8	3.8	0.24	1740	5210	1545	4626	15	1.16	7.40	120	0.38	0.33	54	43	1363
26	48	5.5	3.4	0.29	1837	5501	1538	4605	12	1.53	6.70	120	0.45	0.38	54	43	1614
27	48	5.5	3.3	0.36	1880	5629	1666	4989	16	1.18	6.50	124	0.46	0.41	53	44	1688
28	48	5.6	3.7	0.25	2108	6312	1868	5594	14	1.51	5.50	120	0.46	0.40	54	44	1688
29	48	5.7	4.2	0.20	2194	6570	1948	5833	16	1.37	5.80	118	0.45	0.39	56	42	1576
30	48	6.5			2460	7366					3.30	117			69	42	
31	48	6.9			2248	6731					4.70	117			67	42	
TL												3757				1728	43380
ME	48	5.8	2.8	0.31	1944	5822	1671	5003	12	1.6	5.5	121	0.45	0.40	56	56	2066

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SLUDGE SHEET

Marshall

MI 002 3540

October 1999

SUPERINTENDENT
Steven D. Washburn

	RAW SLUDGE				LIME STABILIZED SLUDGE					
DAY	GALLONS	TOTAL SOLIDS %	VOLATILE SOLIDS %	pH SU	LIME POUNDS	pH 2 hrs @ 25 C SU	pH 16 hrs SU	Lbs. Lime per 1000 gallons sludge		
1	9000	2.8	77.0	5.4	956	12.3	12.3	106		
2	8500	3.1	80.0	5.4	910	12.2	12.3	107		
3	8000	2.8	80.0	5.4	910	12.2	12.1	114		
4	8750	2.8	78 0	5.7	1138	12.2	12.0	130		
5	8500	2.7	77.0	5.7	910	12.3	12.3	107		
6	8500	2.8	76.0	5.6	910	12.1	12.3	107		
7	8400	2.8	75.0	5.7	910	12.3	12.0	108		
8	9400	2.7	73.0	5.7	1138	12.2	12.3	121		
9	8000	2.8	73.0	5.8	910	12.3	12.1	114		
10	8500	2.9	74.0	5.9	910	12.2	12.2	107		
11	8900	3.2	76.0	5.9	956	12.2	12.0	107		
12	8500	3.2	73.0	6.0	910	12.3	12.1	107		
13	8800	3.1	72.0	6.0	910	12.2	12.2	103		
14	8500	3.5	74.0	5.9	910	12.2	12.1	107		
15	8400	3.2	74.0	5.8	910	12.1	12.2	108		
16	8500	3.0	74.0	5.8	910	12 3	12.2	107		
17	8000	3.1	75.0	5.8	910	12.3	12.1	114		
18	8200	3.6	75.0	6.0	1092	12.2	12.1	133		
19	8400	3.0	75.0	5.9	865	12.3	12.0	103		
20	8400	3.3	75.0	5.9	774	12.3	12.2	92		
21	8400	3.3	74.0	5.9	910	12.3	12.2	108		
22	8400	3.4	73.0	6.2	1047	12.3	12.4	125		
23	8400	3.4	73.0	6.3	910	12.3	12.4	108		
24	8000	3.1	75.0	5.9	1001	12.3	12.3	125		
25	8400	3.2	76.0	6.0	1001	12.3	12.2	119		
26	8400	3.0	74.0	5 8	1001	12.3	12.4	119		
27	8400	3.0	74.0	5.8	910	12.3	12.1	108		
28	8400	3.0	76.0	5.8	1001	12.3	12.2	119		
29	7400	2.9	77.0	5.8	1092	12.2	12.3	148		
30	8600	3.0	75.0	5.8	956	12.4	12.3	111		
31	8000	3.1	77.0	5.9	910	12.3	12.1	114		
TOTAL	260950				29488					
MEAN	8418	3.1	75.2	5.8	951	12.3	12.2	113		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MISCELLANEOUS SHEET

October 1999

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	WATER	ELECTRICAL USAGE		FUEL GAS		CHEMICALS APPLIED								
			X 120		X 100	$FECL_3$					Cl_2		SO_2	
	CF	METER	KWH	METER	CF	GALS	SP. GR.	% SOLN	LBS	mg/L	LBS	mg/L	LBS	mg/L
1	670	22	2640	0		100.0	37.4600	30	1.1	0.1	17.0	1.5	9.0	0.8
2	600	23	2760	0		75	37.4600	30	0.8	0.1	19	1.7	9.0	0.8
3	540	24	2880	0		100	37.4600	30	1.1	0.1	16	1.5	7.0	0.7
4	700	24	2880	0		75	37.4600	30	0.8	0.1	17	1.3	7.0	0.5
5	820	23	2760	0		75	37.4600	30	0.8	0.1	24	1.9	7.0	0.5
6	610	23	2760	0		125	37.4600	30	1.3	0.1	14	1.1	8.0	0.6
7	670	24	2880	0		100	37.4600	30	1.1	0.1	17	1.3	14.0	1.1
8	720	21	2520	0		100	37.4600	30	1.1	0.1	24	1.5	25.0	1.5
9	680	24	2880	0		150	37.4600	30	1.6	0.1	22	1.7	20.0	1.5
10	450	22	2640	0		100	37.4600	30	1.1	0.1	27	2.5	13.0	1.2
11	570	24	2880	0		100	37.4600	30	1.1	0.1	22	1.7	9.0	0.7
12	560	22	2640	0		100	37.4600	30	1.1	0.1	24	1.7	11.0	0.8
13	750	23	2760	1	100	100	37.4600	30	1.1	0.1	27	2.0	11.0	0.8
14	630	22	2640	1	100	125	37.4600	30	1.3	0.1	19	1.5	10.0	0.8
15	660	21	2520	0		75	37.4600	30	0.8	0.1	19	1.4	8.0	0.6
16	720	23	2760	0		150	37.4600	30	1.6	0.1	19	1.6	10.0	0.8
17	580	23	2760	2	200	100	37.4600	30	1.1	0.1	19	1.8	8.0	0.8
18	620	24	2880	7	700	100	37.4600	30	1.1	0.1	17	1.3	5.0	0.4
19	610	23	2760	6	600	100	37.4600	30	1.1	0.1	21	1.6	5.0	0.4
20	940	23	2760	7	700	100	37.4600	30	1.1	0.1	16	1.3	5.0	0.4
21	660	23	2760	0		100	37.4600	30	1.1	0.1	11	0.8	11.0	0.8
22	600	23	2760	4	400	100	37.4600	30	1.1	0.1	16	1.2	25.0	1.9
23	830	24	2880	6	600	100	37.4600	30	1.1	0.1	18	1.6	12.0	1.1
24	570	24	2880	7	700	100	37.4600	30	1.1	0.1	16	1.5	10.0	1.0
25	610	23	2760	4	400	100	37.4600	30	1.1	0.1	16	1.3	10.0	0.8
26	670	24	2880	4	400	100	37.4600	30	1.1	0.1	15	1.1	12.0	0.9
27	580	23	2760	4	400	100	37.4600	30	1.1	0.1	17	1.3	7.0	0.5
28	660	23	2760	0		100	37.4600	30	1.1	0.1	18	1.4	6.0	0.5
29	970	21	2520	0		100	37.4600	30	1.1	0.1	18	1.4	7.0	0.6
30	670	24	2880	0		50	37.4600	30	0.5	0.0	17	1.5	7.0	0.6
31	520	22	2640	0		100	37.4600	30	1.1	0.1	18	1.7	6.0	0.6
TL	20440	712	85440	53	5300	3100			33.1		580.0		314.0	
ME	659	23	2756	2	442	100	37.4600	30.0	1.1	0.1	18.7	1.5	10.1	0.8

MANPOWER	
POSITION TITLE	NUMBER FULL TIME
SUPERINTENDANT	1
ASST. SUPT.	
OPERATOR	4
MECHANIC	
CHEMIST	
LAB TECH	
IPP COORDINATOR	1
OTHER	

GIVE THE HOURS PER DAY THAT PLANT PERSONNEL ARE NORMALLY AT THE PLANT.

WEEKDAYS	8	HRS
SATURDAYS	8	HRS
SUNDAYS	8	HRS
HOLIDAYS		HRS

Weather Code	
1. Clear	6. Warm
2. Partly Cloudy	7. Cold
3. Cloudy	8. Windy
4. Rain	9. Melting Snow
5. Snow	

PLANT INFLUENT SHEET

November, 1999

Marshall

STATE OF MICHIGAN

MI 002 3540

SUPERINTENDENT

DEPT OF ENVIRONMENTAL QUALITY

Steven D. Washburn

D	WEATHER		FLOW		RAW SEWAGE QUALITY									
A	TYPE	PRECIP	TOTAL	MAX	TEMP	pH	BOD_5		SS		TOTAL-P		VSS	NH3-N
Y	CODE	Inches	MGD	MGD	°F	SU	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l
1	4	0.76	1.400		61	7.60	183	2137	160	1868			152	14.2
2	2		1.560		58	7.50	157	2043	123	1600	3.72	48	123	
3	2		1.470		59	7.40	169	2072	184	2256			182	14.9
4	1		1.620		58	7.80	137	1851	88	1189			88	
5	1		1.610		59	7.70	147	1974	86	1155			76	
6	1		1.360		60	7.40	166	1883	154	1747			138	
7	1		1.240		55	7.80	188	1944	174	1799			152	15.7
8	1		1.440		59	7.50	211	2534	138	1657	3.87	46	132	
9	1		1.510		61	7.50	209	2632	122	1536			116	
10	4	0.08	1.520		60	7.30	186	2358	154	1952			154	14.5
11	1		1.600		59	7.60	170	2268	130	1735			122	
12	1		1.510		60	7.70	168	2116	130	1637			124	16.0
13	1		1.300		61	8.00	217	2353	174	1887			168	
14	1		1.190		57	7.80	192	1906	186	1846			182	
15	1		1.270		58	7.80	159	1684	200	2118	3.73	40	192	
16	1		1.390		59	7.70	164	1901	186	2156			170	
17	1		1.480		57	7.60	233	2876	208	2567			192	14.9
18	1		1.440		57	7.80	212	2546	216	2594			204	
19	4	0.46	1.480		59	7.80	218	2691	132	1629			128	
20	4	0.01	1.330		59	7.90	200	2218	180	1997			174	
21	2		1.220		54	7.80	155	1577	148	1506			142	
22	4	0.03	1.500		57	7.70	189	2364	184	2302			178	13.8
23	4	0.27	1.500		57	7.60	235	2940	144	1801	3.58	45	138	
24	1		1.640		60	7.90	214	2927	176	2407			164	
25	1		1.420		59	7.70	176	2084	160	1895			150	
26	1		1.190		59	8.00	208	2064	168	1667			162	
27	2		1.230		60	8.00	196	2011	164	1682			156	
28	1		1.230		54	7.90	161	1652	138	1416			132	15.8
29	1		1.450		56	7.70	169	2044	150	1814			124	
30	1		1.490		58	7.50	162	2013	141	1752			121	
31														
TL		1.61	42.590					65662		55169		179		
ME			1.420		######		185	2189	157	1839	3.73	45	148	15.0

City of Marshall
801 Industrial Rd
Marshall, MI 49068

PRIMARY EFFLUENT SHEET

November 1999

Marshall
MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D Washburn

	PRIMARY EFFLUENT QUALITY												
DAY	BOD-5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS		AMMONIA NITROGEN	
	mg/l	LBS	Removal	mg/l	LBS	% Removal	mg/l	LBS	% Removal	mg/l	%	mg/l	LBS
1	101	1179	44 8	80	934	50 0				80 0	100 0	17 2	201
2	115	1496	26 8	80	981	35 0	2 2	26 5	41 9	80 0	100 0		
3	128	1569	24 3	78	1054	57 6				78 0	100 0	17 8	240
4	123	1662	10 2	60	806	31 8				60 0	100 0		
5	158	2122	-7 5	60	681	30 2				50 0	83 3		
6	101	1146	39 2	48	496	68 8				38 0	79 2		
7	91	941	51 6	46	552	73 6				38 0	82 6	17 4	209
8	110	1321	47 9	52	655	62 3	2 0	24 8	49 1	52 0	100 0		
9	146	1839	30 1	40	507	67 2				40 0	100 0		
10	116	1471	37 6	46	614	70 1				46 0	100 0	17 1	228
11	105	1401	38 2	60	756	53 8				60 0	100 0		
12	123	1549	26 8	70	759	46 2				68 0	97 1	16 6	180
13	143	1550	34 1	62	615	64 4				62 0	100 0		
14	113	1121	41 1	74	784	60 2				72 0	97 3		
15	95	1006	40 3	56	649	72 0	2 3	26 2	39 4	56 0	100 0		
16	113	1310	31 1	58	716	68 8				50 0	86 2		
17	134	1654	42 5	58	697	72 1				48 0	82 8	15 8	190
18	130	1561	38 7	54	667	75 0				54 0	100 0		
19	131	1617	39 9	58	643	56 1				58 0	100 0		
20	122	1353	39 0	52	529	71 1				52 0	100 0		
21	96	977	38 1	52	651	64 9				52 0	100 0		
22	109	1364	42 3	74	926	59 8				74 0	100 0	16 1	201
23	116	1451	50 6	60	821	58 3	2 2	30 2	38 3	60 0	100 0		
24	135	1846	36 9	66	782	62 5				62 0	93 9		
25	118	1397	33 0	72	715	55 0				62 0	86 1		
26	120	1191	42 3	72	739	57 1				72 0	100 0		
27	142	1457	27 6	64	657	61 0				62 0	96 9		
28	122	1252	24 2	68	822	50 7				68 0	100 0	20 4	247
29	104	1258	38 5	80	994	46 7				64 0	80 0		
30	128	1591	21 0	66		53 2				58 0	87 9		
31													
TL		42651			21198			107 7					1696
ME	120	1422	34 4	62	707	58 5	2 2	26 9	42 2	1776 0	95 1	17 3	212

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
SURFACE WATER QUALITY DIVISION

DEQ

Discharge Number	Permit Number
001 A	MI 002 3540

DAILY DISCHARGE MONITORING REPORT

Monitoring Period
November, 1999

DAY	$CBOD_5$			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS	NH3-N		PH	D.O.	F.COLI #/100ml	CL RESID	CN Amenable
	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	mg/l	LBS	SU	mg/l	MF	mg/l	mg/L
1	5.5	64	97.0	9 0	105	94.4				9.0	13.10	152.96	7 60	6.9	48	0 000	
2	5.9	77	96.2	6 0	78	95.1	0 22	2.9	94.1	6 0			7 50	6.6	39	0 000	<0 02
3	8.2	101	95.1	11 0	135	94.0				11.0	13 50	165.51	7.70	7 0	58	0 000	
4	9.2	124	93.3	12 0	162	86.4				12 0			7 70	6.4	141	0.000	
5	7 9	106	94.6	14 0	188	83.7				12 0			7 60	6 6	24	0 000	
6	6.1	69	96.3	10.0	113	93.5				8.0			7.70	6 6	114	0.000	
7	3.2	33	98.3	4 0	41	97.7				4.0	12.40	128.24	7.60	6.9	57	0.003	
8	3.3	40	98.4	3.0	36	97.8	0 23	2.8	94.1	3.0			7.60	6.8	24	0.003	
9	4.6	58	97.8	3.0	38	97.5				3.0			7 70	6.5	18	0.000	<0.02
10	3.7	47	98.0	5 0	63	96.8				5.0	11 10	140.71	7.70	6 5	19	0.000	
11	3.7	49	97.8	6.0	80	95.4				6.0			7.60	6.7	25	0.000	
12	4.0	50	97.6	9 0	113	93.1				9.0	9.06	114.10	7.60	6.7	13	0.000	
13	4 9	53	97.7	4.0	43	97.7				4 0			7.60	6.5	22	0.000	
14	2.8	28	98.5	4 0	40	97.8				4 0			7.50	6.8	22	0.000	
15	2.6	28	98.4	2.0	21	99.0	0 25	2.6	93.3	2.0			7.60	6.9	13	0.000	
16	3 8	44	97.7	3 0	35	98.4				3.0			7.60	7 5	10	0.000	<0.005
17	3 7	46	98.4	6.0	74	97.1				4.0	7.13	88.01	7.60	7.0	29	0 024	
18	5.2	62	97.5	3 0	36	98.6				3 0			7.50	6 4	37	0.007	
19	4.6	57	97.9	5.0	62	96.2				5 0			7 50	6 5	10	0.000	
20	4.8	53	97.6	3.0	33	98.3				3 0			7.50	6.6	6	0.000	
21	3.8	39	97.5	1 0	10	99.3				1.0			7.50	6.6	4	0 000	
22	3.8	48	98.0	3.0	38	98.4				3.0	8 06	100.83	7.50	6.8	2	0 000	
23	4.3	54	98.2	1.0	13	99.3	0.30	3.8	91.6	1 0			7.60	6.4	6	0.000	
24	5 8	79	97.3	8.0	109	95.5				8 0			7.50	6 5	14	0 000	<0.005
25	6.1	72	96.5	4.0	47	97.5				4.0			7.50	6 3	142	0.000	
26	3.3	33	98.4	5.0	50	97.0				5 0			7.50	6.8	14	0.000	
27	3.9	40	98.0	4 0	41	97.6				4.0			7.50	7.1	1	0 000	
28	2.9	30	98.2	2 0	21	98.6				2 0	13.15	134.90	7.60	7.0	7	0.001	
29	2 9	35	98.3	5.0	60	96.7				5.0			7.60	7.4	9.000	0 004	
30	3 1	39	98.1	3 0	37	97.9				3.0			7.40	7.1	10	0 000	
31																	
TL		1657			1924			12.0									
ME	4.6	55	97.4	5.3	64	96.2	0.25	3.0	93.3	152.0	10.94	128.16		6.7	18	0.001	
WA	6.6	82		9.4	118										59		
MX											13.50	165.51	7.70			0.024	
MN													7.40	6.3			

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment See 18 U S C 1001 and 33 U S C 1319 (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 Years)

PRINTED NAME AND TITLE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTORIZED AGENT	DATE
Steven D. Washburn, Superintendent		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

ACTIVATED SLUDGE SHEET

November, 1999

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	AERATION SYSTEM				MIXED LIQUOR								SECONDARY SLUDGE				
	AERTN VOL	DETEN TIME	CRT	F:M RATIO	MLSS		MLVSS		SETTL.	SDI	D.O.	AIR	SS	VSS	RAS FLOW	WAS	
	KCF	HRS	DAYS		mg/L	Lbs.	mg/L	Lbs.	%	%	mg/L	CF	%	%	%	Gallons	Lbs.
SF	3											4				3	
1	48	6.2	6.4	0.19	2307	6908	2023	6058	17	1.36	5.00	120	0.46	0.41	62	28	1074
2	48	5.5	3.7	0.26	2170	6498	1907	5710	20	1.09	5.90	121	0.49	0.43	53	43	1757
3	48	5.9	3.5	0.30	2014	6031	1749	5237	22	0.92	6.70	125	0.47	0.41	57	44	1725
4	48	5.3	3.7	0.32	1976	5917	1718	5144	22	0.90	6.00	125	0.44	0.39	66	43	1578
5	48	5.4	5.1	0.43	1899	5686	1652	4947	27	0.70	5.50	120	0.38	0.33	54	35	1109
6	48	6.3			2043	6118					4.30	124			67	24	
7	48	6.9			1975	5914					4.50	126			73	23	
8	48	6.0	10.2	0.28	1863	5579	1566	4689	37	0.50	6.50	124	0.41	0.35	73	16	547
9	48	5.7	10.9	0.34	2139	6405	1811	5423	40	0.53	4.50	116	0.44	0.37	60	16	587
10	48	5.7	6.3	0.26	2227	6669	1898	5683	42	0.53	4.20	116	0.49	0.42	60	26	1063
11	48	5.4	4.3	0.26	2141	6411	1821	5453	47	0.46	6.30	124	0.48	0.41	57	37	1481
12	48	5.7	3.6	0.28	2191	6561	1852	5546	40	0.55	4.20	125	0.50	0.42	61	44	1835
13	48	6.6			2220	6648					2.70	122			71	44	
14	48	7.2			2093	6267					3.50	120			76	43	
15	48	6.8	5.2	0.20	1984	5941	1690	5061	43	0.46	5.90	126	0.38	0.32	71	36	1141
16	48	6.2	6.3	0.26	1957	5860	1659	4968	40	0.49	6.50	126	0.37	0.31	64	30	926
17	48	5.8	5.7	0.34	1945	5824	1645	4926	42	0.46	6.00	127	0.41	0.35	60	30	1026
18	48	6.0	6.3	0.28	2175	6513	1851	5543	41	0.53	3.60	125	0.41	0.34	61	30	1026
19	48	5.8	5.7	0.30	2162	6474	1812	5426	41	0.53	4.90	121	0.44	0.37	59	31	1138
20	48	6.5			2271	6800					2.90	123			64	31	
21	48	7.1			2202	6594					3.70	124			70	31	
22	48	5.7	5.0	0.25	2136	6396	1824	5462	40	0.53	4.10	120	0.48	0.41	59	32	1281
23	48	5.7	4.2	0.25	2224	6660	1909	5716	43	0.52	4.40	119	0.49	0.42	60	39	1594
24	48	5.3	4.3	0.32	2278	6821	1945	5824	40	0.57	4.60	121	0.48	0.41	56	40	1601
25	48	6.1			2382	7133					0.50	127			63	40	
26	48	7.2			2335	6992					4.30	124			76	40	
27	48	7.0			2195	6573					3.30	124			73	40	
28	48	7.0			2147	6429					4.60	128			74	40	
29	48	5.9	4.2	0.25	2004	6001	1703	5099	40	0.50	6.70	129	0.44	0.38	63	39	1431
30	48	5.8	5.6	0.29	2137	6399	1819	5447	42	0.51	5.60	131	0.43	0.36	60	32	1148
31	48																
TL												3703				1027	25067
ME	48	6.1	5.5	0.28	2126	6367	1793	5368	36	0.6	4.7	123	0.44	0.38	64	34	1253

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SLUDGE SHEET

Marshall

MI 002 3540

November, 1999

SUPERINTENDENT
Steven D. Washburn

	RAW SLUDGE				LIME STABILIZED SLUDGE					
DAY	GALLONS	TOTAL SOLIDS %	VOLATILE SOLIDS %	pH SU	LIME POUNDS	pH 2 hrs @ 25 C SU	pH 16 hrs SU	Lbs. Lime per 1000 gallons sludge		
1	8600	3.3	74.0	6.2	638	12.3	12.1	74		
2	7400	3.1	74.0	5.8	957	12.3	12.2	129		
3	8000	3.3	75.0	5.6	1148	12.3	12.3	144		
4	7400	3.2	73.0	5.9	765	12.2	12.2	103		
5	7400	3.2	74.0	5.8	606	12.3	12.2	82		
6	7400	2.9	75.0	5.9	638	12.2	12.3	86		
7	8000	3.1	74.0	5.9	670	12.3	12.2	84		
8	7600	2.8	75.0	5.8	765	12.2	12.3	101		
9	7600	3.1	74.0	5.8	695	12.2	12.1	91		
10	7400	3.0	74.0	5.8	574	12.2	12.2	78		
11	7500	2.8	73.0	5.8	670	12.4	12.2	89		
12	8300	2.8	74.0	6.1	638	12.2	12.2	77		
13	8000	3.0	73.0	6.2	670	12.3	12.4	84		
14	8800	2.8	75.0	5.9	606	12.3	12.3	69		
15	8400	2.8	76.0	5.9	797	12.3	12.4	95		
16	8400	3.0	76.0	5.9	989	12.4	12.4	118		
17	8400	2.8	75.0	6.1	638	12.4	12.4	76		
18	8400	2.7	74.0	6.0	695	12.3	12.3	83		
19	8400	2.8	75.0	5.9	695	12.3	12.3	83		
20	8400	2.7	76.0	6.0	638	12.4	12.4	76		
21	8000	2.7	75.0	5.9	638	12.3	12.2	80		
22	8850	2.9	76.0	5.9	574	12.2	12.2	65		
23	8400	3.0	76.0	5.8	695	12.2	12.1	83		
24	8400	2.9	75.0	5.9	638	12.3	12.1	76		
25	8400	3.1	73.0	6.3	638	12.4	12.2	76		
26	8400	3.0	76.0	6.0	695	12.4	12.3	83		
27	8400	3.1	72.0	7.0	638	12.4	12.4	76		
28	8400	2.7	76.0	5.9	638	12.4	12.3	76		
29	8000	2.7	77.0	6.0	606	12.3	12.4	76		
30	8800	2.7	76.0	5.8	606	12.3	12.3	69		
31										
TOTAL	243850				20858					
MEAN	8128	2.9	74.7	6.0	695	12.3	12.3	86		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MISCELLANEOUS SHEET

November, 1999

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	WATER	ELECTRICAL USAGE		FUEL GAS		CHEMICALS APPLIED								
			X 120		X 100	$FECL_3$					Cl_2		SO_2	
	CF	METER	KWH	METER	CF	GALS	SP. GR.	% SOLN	LBS	mg/L	LBS	mg/L	LBS	mg/L
1	890	24	2880	0		100.0	37.4600	30	1.1	0.1	9.0	0.8	10.0	0.9
2	580	22	2640	5	500	100	37.4600	30	1.1	0.1	18	1.4	7.0	0.5
3	560	24	2880	11	1100	50	37.4600	30	0.5	0.0	17	1.4	12.0	1.0
4	680	24	2880	4	400	100	37.4600	30	1.1	0.1	19	1.4	10.0	0.7
5	600	21	2520	4	400	100	37.4600	30	1.1	0.1	18	1.3	10.0	0.7
6	770	24	2880	6	600	75	37.4600	30	0.8	0.1	16	1.4	11.0	1.0
7	530	23	2760	7	700	100	37.4600	30	1.1	0.1	11	1.1	13.0	1.3
8	600	23	2760	2	200	75	37.4600	30	0.8	0.1	15	1.2	11.0	0.9
9	670	21	2520	4	400	100	37.4600	30	1.1	0.1	14	1.1	12.0	1.0
10	580	22	2640	4	400	100	37.4600	30	1.1	0.1	14	1.1	11.0	0.9
11	640	23	2760	6	600	100	37.4600	30	1.1	0.1	13	1.0	12.0	0.9
12	700	23	2760	6	600	100	37.4600	30	1.1	0.1	17	1.3	19.0	1.5
13	710	24	2880	2	200	50	37.4600	30	0.5	0.0	16	1.5	12.0	1.1
14	520	23	2760	5	500	75	37.4600	30	0.8	0.1	17	1.7	15.0	1.5
15	600	23	2760	8	800	75	37.4600	30	0.8	0.1	17	1.6	12.0	1.1
16	700	24	2880	8	800	100	37.4600	30	1.1	0.1	24	2.1	15.0	1.3
17	700	25	3000	3	300	100	37.4600	30	1.1	0.1	18	1.5	15.0	1.2
18	630	23	2760	10	1000	50	37.4600	30	0.5	0.0	27	2.2	10.0	0.8
19	900	22	2640	4	400	50	37.4600	30	0.5	0.0	15	1.2	12.0	1.0
20	500	24	2880	9	900	100	37.4600	30	1.1	0.1	23	2.1	13.0	1.2
21	710	23	2760	9	900	100	37.4600	30	1.1	0.1	19	1.9	12.0	1.2
22	580	23	2760	4	400	100	37.4600	30	1.1	0.1	15	1.2	11.0	0.9
23	690	23	2760	1	100	100	37.4600	30	1.1	0.1	22	1.8	13.0	1.0
24	670	23	2760	11	1100	50	37.4600	30	0.5	0.0	15	1.1	16.0	1.2
25	670	24	2880	12	1200	50	37.4600	30	0.5	0.0	12	1.0	15.0	1.3
26	830	23	2760	17	1700	100	37.4600	30	1.1	0.1	13	1.3	10.0	1.0
27	1420	24	2880	1	100	100	37.4600	30	1.1	0.1	15	1.5	6.0	0.6
28	480	25	3000	1	100	75	37.4600	30	0.8	0.1	13	1.3	8.0	0.8
29	550	25	3000	16	1600	75	37.4600	30	0.8	0.1	12	1.0	6.0	0.5
30	560	24	2880	22	2200	100	37.4600	30	1.1	0.1	12	1.0	14.0	1.1
31														
TL	20220	699	83880	202	20200	2550			27.2		486		353.0	
ME	674	23	2796	7	697	85	37.4600	30.0	0.9	0.1	16.2	1.4	11.8	1.0

MANPOWER	
POSITION TITLE	NUMBER FULL TIME
SUPERINTENDANT	1
ASST. SUPT.	1
OPERATOR	3
MECHANIC	
CHEMIST	
LAB TECH	
IPP COORDINATOR	1
OTHER	

GIVE THE HOURS PER DAY THAT PLANT PERSONNEL ARE NORMALLY AT THE PLANT.

WEEKDAYS	8	HRS
SATURDAYS	8	HRS
SUNDAYS	8	HRS
HOLIDAYS	8	HRS

Weather Code	
1 Clear	6 Warm
2 Partly Cloudy	7 Cold
3 Cloudy	8 Windy
4 Rain	9 Melting Snow
5 Snow	

PLANT INFLUENT SHEET

December 1999

Marshall

STATE OF MICHIGAN

MI 002 3540

SUPERINTENDENT

DEPT OF ENVIRONMENTAL QUALITY

Steven D Washburn

D	WEATHER		FLOW		RAW SEWAGE QUALITY									
A	TYPE	PRECIP	TOTAL	MAX	TEMP	pH	BOD_5		SS		TOTAL-P		VSS	NH3-N
Y	CODE	Inches	MGD	MGD	°F	SU	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l
1	1		1 480		56	7 20	170	2098	116	1432			104	14 1
2	4	0 10	1 430		57	7 50	187	2230	128	1527	6 13	73	112	
3	4	0 19	1 310		57	7 90	213	2327	176	1923			166	
4	4	0 55	1 260		57	7 70	206	2165	180	1892			174	
5	5	0 44	1 280		54	7 70	168	1793	200	2135			192	14 6
6	2		1 510		57	7 70	195	2456	150	1889			144	
7	2		1 520		57	7 80	215	2726	174	2206	4 41	56	158	
8	1		1 470		56	7 60	221	2709	136	1667			128	
9	4	0 03	1 500		55	7 80	213	2665	164	2052			158	16 8
10	1		1 400		56	7 80	166	1938	98	1144			88	
11	1		1 290		56	7 90	182	1958	162	1743			140	
12	1		1 230		53	8 00	193	1980	154	1580			150	
13	4	0 20	1 430		55	7 70	201	2397	132	1574			114	15 2
14	4	0 37	1 580		54	7 80	166	2187	157	2069			143	
15	5	0 48	1 700		55	7 80	169	2396	132	1871	3 70	52	130	
16	5	0 07	1 690		56	7 70	207	2918	130	1832			120	
17	1		1 500		54	7 80	162	2027	168	2102			150	
18	1		1 350		52	7 80	161	1813	178	2004			160	
19	4	0 07	1 280		52	7 90	171	1825	132	1409			120	
20	5	0 02	1 580		52	7 70	170	2240	146	1924	3 49	46	134	
21	5	0 02	1 770		54	7 60	217	3203	109	1609			106	
22	5	0 02	1 760		54	7 60	178	2613	126	1849			120	13 0
23	5	0 02	1 760		52	7 60	204	2994	116	1703			108	
24	2		1 450		51	7 70	230	2781	180	2177			166	
25	2		1 140		52	7 90	210	1997	152	1445			148	
26	2		1 170		52	8 50	226	2205	152	1483			144	
27	2		1 590		55	7 60	210	2785	156	2069			150	11 7
28	5	0 03	1 730		55	7 60	198	2857	114	1645			105	
29	2		1 680		54	7 60	241	3377	180	2522			160	
30	2		1 660		57	7 80	248	3433	156	2160			150	
31	2		1 330		56	8 20	224	2485	180	1997			150	
TL		2 61	45 830					75578		56632		227		
ME			1 478				197	2438	149	1827	4 43	57	138	14 2

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

PRIMARY EFFLUENT SHEET

December 1999

Marshall
MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

	PRIMARY EFFLUENT QUALITY												
DAY	BOD-5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS		AMMONIA NITROGEN	
	mg/l	LBS	Removal	mg/l	LBS	% Removal	mg/l	LBS	% Removal	mg/l	%	mg/l	LBS
1	116	1432	31.8	62	765	46.6				52 0	83.9	17 2	212
2	153	1825	18.2	78	852	39.1	2.8	30.7	54.2	68 0	87.2		
3	140	1530	34.3	62	652	64.8				56 0	90.3		
4	117	1229	43.2	78	833	56.7				78 0	100.0		
5	104	1110	38.1	68	856	66.0				62 0	91.2	17.5	220
6	114	1436	41.5	66	837	56.0				66 0	100.0		
7	132	1673	38.6	64	785	63.2	2 3	28.7	46.9	64 0	100.0		
8	172	2109	22.2	68	851	50.0				64 0	94.1		
9	136	1701	36.2	68	794	58.5				66 0	97.1	18.4	215
10	123	1436	25.9	86	925	12.2				76 0	88.4		
11	101	1087	44.5	80	821	50.6				74 0	92.5		
12	120	1231	37.8	62	739	59.7				56 0	90.3		
13	123	1467	38.8	78	1028	40.9				62 0	79.5	18 4	242
14	116	1529	30.1	74	1049	52.9				62 0	83.8		
15	115	1630	32.0	76	1071	42.4	2.3	31.9	38.9	72 0	94.7		
16	146	2058	29.5	82	1026	36.9				72 0	87.8		
17	109	1364	32.7	72	811	57.1				64 0	88.9		
18	96	1081	40 4	70	747	60.7				66.0	94.3		
19	107	1142	37.4	60	791	54.5				56.0	93.3		
20	105	1384	38.2	60	886	58 9	2 3	33 4	35.2	60 0	100 0	13 4	198
21	180	2657	17.1	60	881	45.0				60 0	100 0		
22	136	1996	23.6	76	1116	39.7				74 0	97.4	14 3	210
23	133	1952	34.8	68	822	41.4				68 0	100.0		
24	128	1548	44.3	80	761	55.6				80 0	100.0		
25	113	1074	46.2	74	722	51.3				74 0	100.0		
26	131	1278	42.0	66	875	56.6				56 0	84.8		
27	137	1817	34.8	80	1154	48.7				78 0	97.5	12 3	177
28	136	1962	31.3	72	1009	36.8				64 0	88.9		
29	173	2424	28.2	84	1163	53.3				82 0	97.6		
30	171	2367	31.0	68	754	56.4				64 0	94.1		
31	138	1531	38.4	92	1020	48.9				76.0	82.6		
TL		50060			27394			124.6					1475
ME	130	1615	34.3	72	884	50.4	2.4	31.2	43.8	2072.0	92.9	15.9	211

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
SURFACE WATER QUALITY DIVISION

DEQ

Discharge Number	Permit Number
001 A	MI 002 3540

DAILY DISCHARGE MONITORING REPORT

Monitoring Period
December 1999

DAY	CBOD5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS	NH3-N		PH	D.O.	F.COLI #/100ml	CL RESID	CN Amenable
	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	mg/l	LBS	SU	mg/l	MF	mg/l	mg/L
1	3 7	46	97.8	5 0	62	95.7				5.0	7.80	96.28	7.50	7.1	5	0.000	<0.005
2	4 2	50	97.8	5 0	60	96.1	0 42	5.0	93.1	5.0			7 60	6.7	26	0 000	
3	3.5	38	98.4	5.0	55	97.2				5 0			7 50	6.6	31	0.000	
4	3.1	33	98.5	4.0	42	97.8				4.0			7 50	6.7	50	0.000	
5	3.0	32	98.2	1 0	11	99.5				1.0	10.40	111.02	7 60	6 6	52	0.000	
6	3 3	42	98.3	4 0	50	97.3				4.0			7 50	7 1	8	0 000	
7	3 0	38	98.6	1.0	13	99.4	0 26	3.3	94.1	1.0			7 60	6.8	30	0.000	<0.005
8	3 6	44	98.4	2 0	25	98.5				2.0			7 50	7.0	11	0.000	
9	3.6	45	98.3	4 0	50	97.6				4 0	10.30	128.85	7 50	6.6	82	0.000	
10	3 0	35	98.2	5 0	58	94.9				5 0			7 50	6.8	12	0.000	
11	2.6	28	98.6	1.0	11	99.4				1.0			7.50	7.2	8	0 000	
12	2.9	30	98.5	3.0	31	98.1				3.0			7.60	6.7	3	0.000	<0 005
13	4 0	48	98.0	6.0	72	95.5				3.0	14.20	169 35	7.50	6 9	3	0.000	
14	9.2	121	94.5	6 0	79	96.2				6.0			7 70	7 9	120	0.000	
15	4.6	65	97.3	6.0	85	95.5	0.20	2.8	94.6	6.0			7.60	6.7	43	0.000	
16	3.8	54	98.2	3.0	42	97.7				2.0			7.60	6.8	29	0.000	
17	3 0	38	98.1	4.0	50	97.6				3.0			7 50	6 7	5	0.000	
18	3 0	34	98.1	1.0	11	99.4				1.0			7 50	6.8	8	0.000	
19	3 4	36	98.0	1.0	11	99.2				1.0			7.60	7.3	8	0 017	
20	3 8	50	97.8	4.0	53	97.3	0.19	2.5	94.6	4.0	9.00	118.59	7 60	7.6	9	0.000	<0.005
21	4 6	68	97.9	1 0	15	99.1				1.0			7.60	7 0	5	0 000	
22	3 5	51	98.0	5 0	73	96.0				5.0	8.30	121.83	7.60	6 6	2	0 000	
23	4.2	62	97.9	2.0	29	98.3				1.0			7.40	7.2	21	0.000	
24	3.6	44	98.4	5.0	60	97.2				5.0			7.50	7 1	6	0.000	
25	4.4	42	97.9	2 0	19	98.7				2.0			7 50	6.8	1	0.000	
26	3.7	36	98.4	3.0	29	98.0				3.0			7.60	7.6	1	0.016	
27	4 8	64	97.7	5.0	66	96.8				3.0	9.90	131.28	7.60	7.1	10	0.000	
28	4.3	62	97.8	4 0	58	96.5				3.0			7.60	6.6	7	0 000	
29	4 4	62	98.2	2.0	28	98.9				2.0			7.50	6.7	6	0.000	
30	6 3	87	97.5	5.0	69	96.8				2 0			7.50	6.8	7	0.000	
31	3.9	43	98.3	9 0	100	95.0				7.0			7.50	6.7	2	0.000	
TL		1525			1416			13.6									
ME	3.9	49	98.0	3.7	46	97.5	0.27	3.4	94.1	100.0	9.99	125.32		6.9	10	0.001	<0.005
WA	4.5	57		4.4	55										29		
MX											14.20	169.35	7.70			0.017	<0.005
MN													7.40	6.6			

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment See 18 U S C 1001 and 33 U S C 1319 (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 Years)

PRINTED NAME AND TITLE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTORIZED AGENT	DATE
Steven D. Washburn, Superintendent		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

ACTIVATED SLUDGE SHEET

December1999

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	AERATION SYSTEM				MIXED LIQUOR								SECONDARY SLUDGE				
	AERTN VOL	DETEN TIME	CRT	F:M RATIO	MLSS		MLVSS		SETTL.	SDI	D.O.	AIR	SS	VSS	RAS FLOW	WAS	
	KCF	HRS	DAYS		mg/L	Lbs.	mg/L	Lbs.	%	%	mg/L	CF	%	%	%	Gallons	Lbs.
SF	3											4				3	
1	48	5.8	5.2	0.26	2130	6378	1819	5447	43	0.50	6.00	131	0.46	0.39	62	32	1228
2	48	6.0	6.1	0.33	2177	6519	1859	5567	45	0.48	5.30	125	0.40	0.34	65	32	1068
3	48	6.6	5.2	0.26	2322	6953	2000	5989	44	0.53	1.80	121	0.53	0.46	71	30	1326
4	48	6.8			2292	6863					4.10	121			74	30	
5	48	6.7			2252	6743					2.60	120			74	29	
6	48	5.7	5.4	0.27	2076	6216	1774	5312	43	0.48	5.40	127	0.48	0.41	64	29	1161
7	48	5.7	5.8	0.31	2154	6450	1831	5483	44	0.49	6.30	127	0.46	0.39	63	29	1113
8	48	5.9	5.3	0.38	2171	6501	1849	5537	44	0.49	6.30	127	0.51	0.43	64	29	1233
9	48	5.7	5.2	0.30	2223	6657	1902	5695	44	0.51	6.50	125	0.51	0.43	63	30	1276
10	48	6.2	4.8	0.24	2322	6953	2015	6034	58	0.40	5.10	123	0.56	0.48	69	31	1448
11	48	6.7			2303	6896					5.00	129			76	34	
12	48	7.0			2236	6695					3.90	128			79	34	
13	48	6.0	5.3	0.27	2143	6417	1843	5519	75	0.29	5.70	128	0.43	0.37	68	34	1219
14	48	5.5	4.9	0.28	2114	6330	1811	5423	42	0.50	6.70	126	0.48	0.35	61	32	1281
15	48	5.1	5.9	0.30	2164	6480	1837	5501	44	0.49	5.60	126	0.55	0.47	56	24	1101
16	48	5.1	6.3	0.37	2201	6591	1874	5611	42	0.52	5.10	127	0.52	0.44	56	24	1041
17	48	5.7	6.2	0.24	2256	6755	1923	5758	44	0.51	2.60	130	0.50	0.43	63	26	1084
18	48	6.4			2417	7237					5.70	132			71	22	
19	48	6.7			2396	7175					4.60	128			74	24	
20	48	5.5	6.5	0.23	2320	6947	1975	5914	45	0.52	3.80	126	0.51	0.44	61	25	1063
21	48	4.9	5.6	0.45	2318	6941	1969	5896	47	0.49	5.90	131	0.55	0.46	54	27	1238
22	48	4.9	5.1	0.35	2256	6755	1924	5761	45	0.50	5.10	132	0.57	0.49	54	28	1331
23	48	4.9	4.7	0.32	2371	7100	2024	6061	45	0.53	4.30	130	0.58	0.50	54	31	1500
24	48	5.9			2539	7603					4.90	132			68	35	
25	48	7.6			2674	8007					5.10	131			86	35	
26	48	7.4			2589	7752					5.10	128			85	35	
27	48	5.4	4.7	0.29	2421	7249	2065	6183	44	0.55	4.40	130	0.51	0.43	63	36	1531
28	48	5.0	4.7	0.30	2517	7537	2164	6480	45	0.56	3.90	126	0.52	0.44	58	37	1605
29	48	5.1	4.2	0.38	2482	7432	2125	6363	40	0.62	3.10	124	0.56	0.48	58	38	1775
30	48	5.2	4.6	0.36	2540	7606	2193	6567	44	0.58	3.50	126	0.55	0.47	53	36	1651
31	48	6.5			2622	7851					3.50	128			70	30	
TL												3945				948	27273
ME	48	5.9	5.3	0.31	2323	6955	1942	5814	46	0.5	4.7	127	0.51	0.43	66	31	1299

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SLUDGE SHEET

Marshall

MI 002 3540

December 1999

SUPERINTENDENT
Steven D. Washburn

	RAW SLUDGE				LIME STABILIZED SLUDGE					
DAY	GALLONS	TOTAL SOLIDS %	VOLATILE SOLIDS %	pH SU	LIME POUNDS	pH 2 hrs @ 25 C SU	pH 16 hrs SU	Lbs. Lime per 1000 gallons sludge		
1	8400	2.7	76.0	5.8	849	12.4	12.3	101		
2	8400	2.8	74.0	5.7	849	12.2	12.2	101		
3	8400	3.1	72.0	6.8	894	12.2	12.2	106		
4	8400	3.0	76.0	6.0	894	12.2	12.3	106		
5	8000	2.8	77.0	5.8	894	12.3	12.4	112		
6	8800	2.9	77.0	5.9	894	12.3	12.2	102		
7	8400	2.7	75.0	5.9	805	12.4	12.3	96		
8	8600	2.9	74.0	5.9	894	12.3	12.2	104		
9	8400	3.1	75.0	5.8	894	12.2	12.3	106		
10	9800	2.9	75.0	5.8	805	12.3	12.3	82		
11	9400	3.0	76.0	5.9	805	12.3	12.5	86		
12	9000	2.9	77.0	5.8	894	12.3	12.4	99		
13	10900	3.0	76.0	5.8	1073	12.3	12.3	98		
14	10400	2.9	75.0	5.7	894	12.3	12.4	86		
15	10400	3.0	75.0	5.8	1565	12.3	12.3	150		
16	10350	3.2	74.0	5.8	595	12.3	12.3	57		
17	10350	3.0	74.0	5.9	895	12.3	12.3	86		
18	9300	3.0	75.0	5.9	894	12.3	12.4	96		
19	9000	3.0	75.0	6.0	894	12.3	12.2	99		
20	10850	3.1	75.0	5.8	894	12.3	12.2	82		
21	10350	3.2	74.0	5.9	1565	12.3	12.2	151		
22	10400	3.3	74.0	6.0	895	12.2	12.2	86		
23	9400	3.1	74.0	5.8	895	12.3	12.2	95		
24	9400	3.4	76.0	5.9	894	12.3	12.4	95		
25	9400	3.0	76.0	5.6	849	12.3	12.2	90		
26	9000	3.0	76.0	5.9	894	12.3	12.2	99		
27	9400	3.3	75.0	5.8	894	12.3	12.4	95		
28	9400	3.5	73.0	6.0	894	12.3	12.2	95		
29	9400	3.2	72.0	6.1	671	12.3	12.3	71		
30	9400	3.1	74.0	6.0	671	12.3	12.2	71		
31	9400	3.3	74.0	6.0	671	12.3	12.2	71		
TOTAL	290500				27868					
MEAN	9371	3.0	74.9	5.9	899	12.3	12.3	96		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MISCELLANEOUS SHEET

December 1999

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	WATER	ELECTRICAL USAGE		FUEL GAS		CHEMICALS APPLIED								
			X 120		X 100	$FECL_3$					Cl_2		SO_2	
	CF	METER	KWH	METER	CF	GALS	SP. GR.	% SOLN	LBS	mg/L	LBS	mg/L	LBS	mg/L
1	580	25	3000	9	900	100.0	37.4600	30	1.1	0.1	14.0	1.1	8.0	0.6
2	520	22	2640	9	900	50	37.4600	30	0.5	0.0	12	1.0	9.0	0.8
3	630	21	2520	5	500	100	37.4600	30	1.1	0.1	12	1.1	7.0	0.6
4	660	23	2760	1	100	75	37.4600	30	0.8	0.1	13	1.2	9.0	0.9
5	460	24	2880	9	900	75	37.4600	30	0.8	0.1	14	1.3	9.0	0.8
6	670	23	2760	16	1600	50	37.4600	30	0.5	0.0	21	1.7	9.0	0.7
7	650	24	2880	4	400	100	37.4600	30	1.1	0.1	21	1.7	7.0	0.6
8	650	24	2880	17	1700	100	37.4600	30	1.1	0.1	11	0.9	9.0	0.7
9	680	23	2760	10	1000	100	37.4600	30	1.1	0.1	15	1.2	7.0	0.6
10	410	24	2880	10	1000	150	37.4600	30	1.6	0.1	11	0.9	6.0	0.5
11	600	25	3000	8	800	100	37.4600	30	1.1	0.1	13	1.2	7.0	0.7
12	590	24	2880	10	1000	100	37.4600	30	1.1	0.1	14	1.4	5.0	0.5
13	650	24	2880	16	1600	100	37.4600	30	1.1	0.1	14	1.2	5.0	0.4
14	540	24	2880	13	1300	50	37.4600	30	0.5	0.0	19	1.4	3.0	0.2
15	660	25	3000	13	1300	100	37.4600	30	1.1	0.1	20	1.4	10.0	0.7
16	620	24	2880	14	1400	100	37.4600	30	1.1	0.1	19	1.3	19.0	1.3
17	650	24	2880	16	1600	100	37.4600	30	1.1	0.1	12	1.0	11.0	0.9
18	630	26	3120	26	2600	100	37.4600	30	1.1	0.1	20	1.8	11.0	1.0
19	470	24	2880	15	1500	100	37.4600	30	1.1	0.1	18	1.7	13.0	1.2
20	550	26	3120	18	1800	100	37.4600	30	1.1	0.1	10	0.8	12.0	0.9
21	500	27	3240	22	2200	100	37.4600	30	1.1	0.1	18	1.2	11.0	0.7
22	610	25	3000	24	2400	100	37.4600	30	1.1	0.1	22	1.5	13.0	0.9
23	640	24	2880	36	3600	100	37.4600	30	1.1	0.1	20	1.4	9.0	0.6
24	490	24	2880	13	1300	100	37.4600	30	1.1	0.1	25	2.1	8.0	0.7
25	540	27	3240	26	2600	50	37.4600	30	0.5	0.1	21	2.2	10.0	1.1
26	540	25	3000	22	2200	100	37.4600	30	1.1	0.1	22	2.3	7.0	0.7
27	500	25	3000	38	3800	50	37.4600	30	0.5	0.0	22	1.7	20.0	1.5
28	550	25	3000	19	1900	100	37.4600	30	1.1	0.1	24	1.7	12.0	0.8
29	790	25	3000	19	1900	100	37.4600	30	1.1	0.1	21	1.5	11.0	0.8
30	660	24	2880	20	2000	50	37.4600	30	0.5	0.0	20	1.4	11.0	0.8
31	580	25	3000	20	2000	100	37.4600	30	1.1	0.1	15	1.4	13.0	1.2
TL	18270	755	90600	498	49800	2800			29.9		533		301.0	
ME	589	24	2923	16	1606	90	37.4600	30.0	1.0	0.1	17.2	1.4	9.7	0.8

MANPOWER	
POSITION TITLE	NUMBER FULL TIME
SUPERINTENDANT	1
ASST. SUPT.	1
OPERATOR	3
MECHANIC	
CHEMIST	
LAB TECH	
IPP COORDINATOR	1
OTHER	

GIVE THE HOURS PER DAY THAT PLANT PERSONNEL ARE NORMALLY AT THE PLANT.

WEEKDAYS	8	HRS
SATURDAYS	8	HRS
SUNDAYS	8	HRS
HOLIDAYS	8	HRS

Weather Code	
1 Clear	6 Warm
2 Partly Cloudy	7 Cold
3 Cloudy	8 Windy
4 Rain	9 Melting Snow
5 Snow	

PLANT INFLUENT SHEET

January 2001

Marshall

STATE OF MICHIGAN

MI 002 3540

SUPERINTENDENT

DEPT OF ENVIRONMENTAL QUALITY

Steven D Washburn

D	WEATHER		FLOW		RAW SEWAGE QUALITY									
A	TYPE	PRECIP	TOTAL	MAX	TEMP	pH	BOD_5		SS		TOTAL-P		VSS	NH3-N
Y	CODE	Inches	MGD	MGD	°F	SU	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l
1	1		1 440		53	7 80	134	1609	160	1922			140	14 3
2	1		1 630		52	7 60	190	2583	149	2026	3 85	52	135	
3	5	0 03	1 660		52	7 70	191	2644	208	2880			200	
4	1		1 590		54	7 60	232	3076	238	3156			110	15 3
5	1		1 620		53	7 60	171	2310	132	1783			132	
6	5	0 01	1 490		53	7 80	198	2460	224	2784			224	
7	1		1 430		53	7 80	163	1944	162	1932	3 29	39	162	
8	1		1 650		55	7 80	147	2023	136	1871			132	13 3
9	1		1 660		53	7 70	208	2880	142	1966			138	
10	1		1 640		54	7 70	162	2216	110	1505			98	14 8
11	1		1 600		54	7 90	203	2709	144	1922			126	
12	1		1 500		53	7 70	142	1776	116	1451			112	
13	1		1 520		53	7 80	193	2447	132	1673			128	
14	1		1 500		53	7 80	193	2414	146	1826			140	
15	5	0 04	1 690		53	7 70	169	2382	166	2340			154	12 3
16	1		1 660		56	7 60	182	2520	152	2104			148	
17	1		1 620		54	7 60	138	1864	122	1648			108	
18	1		1 680		53	8 00	231	3237	184	2578			168	13 7
19	1		1 570		53	7 60	186	2435	174	2278	3 55	46	172	
20	2		1 520		52	7 60	203	2573	192	2434			188	
21	1		1 470		54	7 80	117	1434	160	1962			160	12 8
22	1		1 670		54	7 60	151	2103	190	2646			174	
23	1		1 680		53	7 60	172	2410	193	2704			176	
24	5	0 02	1 660		53	8 00	166	2298	202	2797			182	15 1
25	1		1 590		53	7 90	315	4177	178	2360			166	
26	4	1 30	1 500		53	8 10	167	2089	126	1576			124	
27	1		1 470		53	7 80	197	2415	344	4217			318	
28	4	0 04	1 480		51	7 70	146	1802	170	2098			156	
29	4	0 35	1 610		54	7 90	165	2216	116	1558	3 43	46	116	12 8
30	4	0 16	1 750		53	7 70	152	2218	145	2116			140	
31	1		1 610		52	7 70	80	1074	150	2014			140	
TL		1 95	49 160					72341		68128		184		
ME			1 586		53 2		176	2334	167	2198	3 53	46	154	13 8

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

PRIMARY EFFLUENT SHEET

January,2001

Marshall
MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

	PRIMARY EFFLUENT QUALITY												
DAY	BOD-5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS		AMMONIA NITROGEN	
	mg/l	LBS	Removal	mg/l	LBS	% Removal	mg/l	LBS	% Removal	mg/l	%	mg/l	LBS
1	63	757	53.0	42	504	73.8				36 0	85.7	13 0	156
2	110	1495	42.1	28	388	81.2	1 8	24.4	54.3	22 0	78.6		
3	119	1647	37.7	34	451	83.7				26 0	76.5		
4	89	1180	61.6	44	594	81.5				34 0	77.3	14 5	196
5	98	1324	42 7	46	572	65.2				46 0	100.0		
6	108	1342	45.5	62	739	72.3				62 0	100.0		
7	82	978	49.7	42	578	74.1	1 3	17.5	61 4	42 0	100 0		
8	112	1541	23.8	52	720	61.8				50 0	96.2	14 4	199
9	157	2174	24.5	50	684	64.8				42 0	84.0		
10	151	2065	6.8	54	721	50.9				50 0	92 6	18 1	242
11	131	1748	35.5	42	525	70.8				30 0	71 4		
12	83	1038	41.5	32	406	72.4				32 0	100 0		
13	79	1001	59.1	42	525	68.2				36 0	85 7		
14	104	1301	46.1	54	761	63.0				54 0	100.0		
15	131	1846	22.5	56	775	66.3				50 0	89 3	14 5	201
16	129	1786	29.1	46	621	69.7				42 0	91.3		
17	72	973	47 8	38	532	68.9				32 0	84.2		
18	137	1920	40.7	48	629	73.9				40 0	83 3	15 5	203
19	132	1728	29.0	48	608	72.4	1 6	19.6	56.3	48 0	100.0		
20	88	1116	56 7	42	515	78.1				42 0	100.0		
21	67	821	42.7	30	418	81.3				30 0	100 0	12 0	167
22	86	1198	43.0	36	504	81.1				30 0	83.3		
23	122	1709	29.1	44	609	77.2				42 0	95.5		
24	91	1260	45.2	46	610	77.2				40 0	87.0	14 3	190
25	137	1817	56 5	54	676	69.7				46 0	85.2		
26	108	1351	35.3	28	343	77 8				28 0	100.0		
27	81	993	58.9	32	395	90.7				26 0	81.3		
28	69	852	52.7	36	483	78.8				228 0	633.3		
29	97	1302	41.2	60	876	48.3	1 4	19.7	60.6	48 0	80.0	12 8	187
30	132	1927	13.2	38	510	73.8				34 0	89.5		
31	80	1074	0.0	44	18040	70.7				36 0	81 8		
TL		43265			35314			81.2					1740
ME	105	1396	39.1	44	1139	72.2	1 5	20.3	58.2	1404.0	106.9	14.3	193

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
SURFACE WATER QUALITY DIVISION

DEQ

Discharge Number	Permit Number
001 A	MI 002 3540

DAILY DISCHARGE MONITORING REPORT

Monitoring Period
January, 2001

DAY	CBOD5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS	NH3-N		PH	D.O.	F.COLI #/100ml	CL RESID	CN Amenable
	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	mg/l	LBS	SU	mg/l	MF	mg/l	mg/L
1	4.9	59	96.3	4 0	48	97.5				4 0	11.70	140.51	7.50	7.3	18	0 026	
2	9.0	122	95.3	1.0	14	99.3	0 22	3.0	94.3	1 0			7.50	7.8	54	0 006	<0 005
3	16.9	234	91.2	6.0	83	97.1				6.0			7 50	7.7	240	0.000	
4	14.9	198	93.6	3.0	40	98.7				3.0	16 10	213.50	7.50	7.5	558	0 000	
5	14.0	189	91.8	5 0	68	96.2				5.0			7 40	7.3	24	0.000	
6	12.9	160	93.5	3.0	37	98.7				3.0			7.40	6.1	30	0.000	
7	7.0	83	95.7	9 0	107	94.4	0.17	2.0	94.8	9.0			7.40	6.8	25	0 008	<0.005
8	7.6	105	94.8	3.0	41	97.8				3 0	11.00	151.37	7.50	7.9	24	0.000	
9	11.0	152	94.7	1.0	14	99.3				1 0			7.50	7.4	58	0.000	
10	18.8	257	88.4	13.0	178	88.2				13.0	12 80	175.07	7.40	7.3	38	0.000	
11	20.7	276	89.8	12.0	160	91.7				12 0			7.50	6.8	158	0.000	
12	14.7	184	89.6	6.0	75	94.8				6.0			7.40	6.9	15	0.000	
13	7.1	90	96.3	4.0	51	97.0				4.0			7.40	7.4	16	0.000	
14	5.8	73	97.0	5 0	63	96.6				5.0			7.50	8.0	13	0.000	
15	12 3	173	92.7	4.0	56	97.6				4.0	15.50	218.47	7.50	7.7	17	0 000	
16	10.7	148	94.1	1.0	14	99.3				1.0			7.50	6.8	27	0.000	<0 005
17	7.3	99	94.7	3.0	41	97.5				3.0			7.50	8 1	18	0.000	
18	15.2	213	93.4	9 0	126	95.1				9.0	14.40	201 76	7 40	6.9	111	0.000	
19	14.0	183	92.5	9 0	118	94.8	0.27	3.5	92.4	9.0			7.40	7.1	272	0.000	
20	11.4	145	94.4	5.0	63	97.4				5.0			7.40	7.1	352	0.000	
21	4.8	59	95.9	1.0	12	99.4				1.0	11.10	136.08	7.60	8.2	28	0 000	
22	4.4	61	97.1	3.0	42	98.4				3.0			7.50	6.9	13	0.000	
23	8.7	122	94.9	1.0	14	99.5				1 0			7.50	7.8	15	0.000	<0.005
24	8.9	123	94.6	5.0	69	97.5				5 0	12.70	175.82	7.50	6.6	37	0.000	
25	14.0	186	95.6	3.0	40	98.3				3.0			7.60	7.3	27	0.000	
26	15.1	189	91.0	4.0	50	96.8				4.0			7.50	7.0	140	0.000	
27	8.5	104	95.7	2.0	25	99.4				2.0			7.40	7.7	19	0.000	
28	4.5	56	96.9	2.0	25	98.8				2 0			7.50	7 7	12	0.000	
29	5.7	77	96.5	3.0	40	97.4	0.11	1.5	96.8	3.0	11.50	154.42	7.50	7.8	18	0.000	
30	16.2	236	89.3	3.0	44	97.9				3.0			7.50	6.8	120	0.000	
31	15.5	208	80.6	7.0	94	95.3				7.0			7.50	7.0	770	0.000	
TL		4564			1850			10.0									
ME	11.0	147	93.5	4.5	60	97.0	0.19	2.5	94.6	140.0	12.98	174.11		7.3	45	0.001	,0.005
WA	13.2	175		6.9	89										62		
MX											16.10	218.47	7.60			0.026	<0.005
MN													7.40	6.1			

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and based on my inquiry of those *individuals immediately responsible* for obtaining the information, I believe the submitted information is true, accurate and complete I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment See 18 U S C 1001 and 33 U S C 1319 (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 Years)

PRINTED NAME AND TITLE OF PRINCIPAL EXECUTIVE OFFICER OR *AUTHORIZED AGENT*	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTORIZED AGENT	DATE
Steven D. Washburn, Superintendent		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

ACTIVATED SLUDGE SHEET

January 2001

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	AERATION SYSTEM				MIXED LIQUOR								SECONDARY SLUDGE				
	AERTN VOL	DETEN TIME	CRT	F:M RATIO	MLSS		MLVSS		SETTL.	SDI	D.O.	AIR	SS	VSS	RAS FLOW	WAS	
	KCF	HRS	DAYS		mg/L	Lbs.	mg/L	Lbs.	%	%	mg/L	CF	%	%	%	Gallons	Lbs.
SF	3											4				3	
1	48	6.0			948	2839					3.78	42			96	57	
2	48	5.3	2.6	0.07	861	2578	6969	20868	58	0.15	4.67	56	0.20	0.16	61	59	984
3	48	5.2	3.4	0.72	948	2839	769	2303	30	0.32	1.68	34	0.17	0.14	59	59	837
4	48	5.4	3.8	0.46	1023	3063	859	2572	61	0.17	1.80	32	0.19	0.08	58	51	808
5	48	5.3	3.5	0.49	1085	3249	904	2707	57	0.19	2.69	30	0.27	0 22	60	41	923
6	48	5.8			1113	3333					2.22	63			66	37	
7	48	6.0			1153	3453					1.75	36			69	38	
8	48	5.2	3.1	0.56	1093	3273	911	2728	30	0.36	5.31	50	0.33	0.28	59	38	1046
9	48	5.2	4.3	0.72	1217	3644	1008	3018	45	0.27	4.68	38	0.29	0.24	56	35	847
10	48	5.3	4.0	0.63	1356	4060	1094	3276	33	0.41	3.55	56	0.34	0.28	57	36	1021
11	48	5.4	4.4	0.49	1406	4210	1184	3545	35	0.40	1.60	37	0.26	0.22	59	44	954
12	48	5.7	2.9	0.30	1372	4108	1158	3468	34	0.40	2.68	35	0.33	0.28	63	52	1431
13	48	5.7			1232	3689					5.92	124			60	52	
14	48	5.7			1122	3360					6.40	125			60	52	
15	48	5.1	2.9	0.63	1139	3411	972	2911	22	0.52	5.03	131	0.29	0.25	58	48	1161
16	48	5.2	2.5	0.56	1246	3731	1060	3174	21	0.59	2.62	32	0.34	0.29	58	52	1475
17	48	5.3	2.7	0.31	1236	3701	1051	3147	22	0.56	4.72	31	0.32	0.27	59	52	1388
18	48	5.1	2.6	0.68	1113	3333	936	2803	23	0.48	1.15	29	0.29	0.24	57	52	1258
19	48	5.5	4.1	0.60	1248	3737	959	2872	24	0.52	2.46	32	0.23	0.18	65	48	921
20	48	5.7			1325	3968					3.57	52			66	49	
21	48	5.9			1224	3665					5.25	53			66	52	
22	48	5.2	3.0	0.44	1081	3237	911	2728	20	0.54	5.09	42	0.25	0.21	66	52	1084
23	48	5.1	2.6	0.62	1082	3240	916	2743	19	0.57	4.53	44	0.29	0.25	57	52	1258
24	48	5.2	3.3	0.42	1180	3533	1010	3024	21	0.56	1.86	46	0.25	0.21	58	52	1084
25	48	5.4	2.6	0.59	1189	3560	1021	3057	23	0.52	4.62	44	0.34	0.31	65	49	1389
26	48	5.7	3.1	0.42	1245	3728	1071	3207	22	0.57	2.68	46	0.28	0.24	65	52	1214
27	48	5.9			1194	3575					3.64	44			66	53	
28	48	5.8			1114	3336					5.15	45			65	54	
29	48	5.4	3.0	0.50	1019	3051	869	2602	20	0.51	4.91	59	0.22	0.19	60	55	1009
30	48	4.9	2.2	0.73	1038	3108	877	2626	16	0.65	2.94	28	0.31	0.26	55	55	1422
31	48	5.4	3.1	0.38	1087	3255	932	2791	19	0.57	1.90	28	0.24	0.20	55	52	1041
TL												1544				1530	24554
ME	48	5.4	3.2	0.52	1151	3447	1247	3735	30	0.4	3.6	50	0.27	0.23	62	49	1116

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

BIOSOLIDS SHEET

Marshall

MI 002 3540

January 2001

SUPERINTENDENT
Steven D. Washburn

	RAW SLUDGE	RAW BIOSOLIDS			LIME STABILIZED BIOSOLIDS					
DAY	GALLONS	TOTAL SOLIDS %	VOLATILE SOLIDS %	pH SU	LIME POUNDS	pH 2 hrs @ 25 C SU		Lbs. Lime per 1000 gallons biosolids		
1	7200	3.8	73.0	6.4						
2	7000	3.7	77.0	6.4						
3	7200	3.5	76.0	6.4						
4	20000	3.3	71.0	6.6						
5	5000	4.9	76.0	6.3						
6	5000	3.3	75.0	6.1						
7	5700	4.6	75.0	6.3						
8	6000	3.4	77.0	6.3	626			104		
9	9000	3.5	77.0	6.3	1175			131		
10	18000	4.6	73.0	6.3	1018			57		
11	7000	4.5	74.0	6.3		12.1				
12	7000	4.1	76.0	6.3						
13	7000	5.0	75.0	6.0						
14	6700	4.7	75.0	6.2						
15	7400	4.2	72.0	6.2	992			134		
16	7000	3.5	72.0	6.4	992	12.1		142		
17	26000	3.6	74.0	6.1						
18	6000	3.6	75.0	5.8	940			157		
19	6000	4.0	76.0	6.0	1148			191		
20	6000	3.9	78.0	6.0						
21	8500	4.4	78.0	6.2		12.2				
22	8000	4.2	79.0	6.1						
23	8400	3.5	78.0	6.3	1018			121		
24	18000	3.7	76.0	6.1	861			48		
25	7480	4.0	76.0	6.0	1175	12.3		157		
26	9000	4.0	75.0	5.9						
27	5000	2.0	86.0	6.3						
28	8700	4.1	80.0	6.3						
29	7600	3.7	79.0	6.3						
30	6000	4.5	77.0	6.1	1175			196		
31	20000	4.2	75.0	6.2						
TOTAL	282880				11120					
MEAN	9125	3.9	76.0	6.2	1011	12.2		131		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MISCELLANEOUS SHEET

January 2001

Marshall
MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	WATER	ELECTRICAL USAGE		FUEL GAS		CHEMICALS APPLIED								
			X 120		X 100	$FECL_3$					Cl_2		SO_2	
	CF	METER	KWH	METER	CF	GALS	SP. GR.	% SOLN	LBS	mg/L	LBS	mg/L	LBS	mg/L
1	586	16	1920	62	6200	100.0	1.4020	30	350.8	29.2	29.0	2.4	12.0	1.0
2	585	19	2280	68	6800	100	1.4020	30	350.8	25.8	29	2.1	12.0	0.9
3	593	17	2040	47	4700	100	1.4020	30	350.8	25.3	16	1.2	10.0	0.7
4	513	15	1800	49	4900	100	1.4020	30	350.8	26.5	16	1.2	11.0	0.8
5	414	16	1920	48	4800	100	1.4020	30	350.8	26.0	21	1.6	12.0	0.9
6	374	16	1920	44	4400	50	1.4020	30	175.4	14.1	16	1.3	13.0	1.0
7	375	17	2040	47	4700	100	1.4020	30	350.8	29.4	19	1.6	14.0	1.2
8	1540	22	2640	52	5200	100	1.4020	30	350.8	25.5	19	1.4	12.0	0.9
9	1710	19	2280	47	4700	100	1.4020	30	350.8	25.3	15	1.1	20.0	1.4
10	1690	19	2280	59	5900	100	1.4020	30	350.8	25.6	22	1.6	17.0	1.2
11	470	19	2280	43	4300	100	1.4020	30	350.8	26.3	22	1.6	8.0	0.6
12	460	19	2280	24	2400	75	1.4020	30	263.1	21.0	30	2.4	9.0	0.7
13	430	19	2280	46	4600	100	1.4020	30	350.8	27.7	25	2.0	7.0	0.6
14	440	20	2400	38	3800	75	1.4020	30	263.1	21.0	20	1.6	7.0	0.6
15	1690	19	2280	36	3600	75	1.4020	30	263.1	18.7	23	1.6	8.0	0.6
16	1580	20	2400	35	3500	100	1.4020	30	350.8	25.3	16	1.2	9.0	0.7
17	490	18	2160	42	4200	100	1.4020	30	350.8	26.0	11	0.8	11.0	0.8
18	1650	20	2400	42	4200	75	1.4020	30	263.1	18.8	14	1.0	12.0	0.9
19	1630	18	2160	66	6600	75	1.4020	30	263.1	20.1	18	1.4	12.0	0.9
20	430	20	2400	46	4600	75	1.4020	30	263.1	20.8	14	1.1	13.0	1.0
21	460	20	2400	58	5800	75	1.4020	30	263.1	21.5	16	1.3	19.0	1.5
22	410	17	2040	47	4700	100	1.4020	30	350.8	25.2	17	1.2	11.0	0.8
23	1750	18	2160	45	4500	75	1.4020	30	263.1	18.8	13	0.9	13.0	0.9
24	1530	18	2160	47	4700	75	1.4020	30	263.1	19.0	14	1.0	11.0	0.8
25	1580	19	2280	46	4600	75	1.4020	30	263.1	19.8	26	2.0	12.0	0.9
26	430	18	2160	47	4700	75	1.4020	30	263.1	21.0	14	1.1	12.0	1.0
27	380	17	2040	48	4800	75	1.4020	30	263.1	21.5	17	1.4	12.0	1.0
28	430	18	2160	48	4800	75	1.4020	30	263.1	21.3	21	1.7	12.0	1.0
29	440	17	2040	30	3000	75	1.4020	30	263.1	19.6	12	0.9	5.0	0.4
30	1960	19	2280	68	6800	75	1.4020	30	263.1	18.0	15	1.0	5.0	0.3
31	460	17	2040	60	6000	50	1.4020	30	175.4	13.1	15	1.1	3.0	0.2
TL	27480	566	67920	1485	148500	2625			9208		575		344.0	
ME	886	18	2191	48	4790	85	1.4020	30.0	297.0	22.5	18.5	1.4	11.1	0.8

MANPOWER	
POSITION TITLE	NUMBER FULL TIME
SUPERINTENDANT	1
ASST. SUPT.	1
OPERATOR	3
MECHANIC	
CHEMIST	
LAB TECH	
IPP COORDINATOR	1
OTHER	

GIVE THE HOURS PER DAY THAT PLANT PERSONNEL ARE NORMALLY AT THE PLANT.

WEEKDAYS	8	HRS
SATURDAYS	8	HRS
SUNDAYS	8	HRS
HOLIDAYS	8	HRS

Weather Code	
1 Clear	6 Warm
2 Partly Cloudy	7 Cold
3 Cloudy	8 Windy
4 Rain	9 Melting Snow
5 Snow	

PLANT INFLUENT SHEET

February 2001

Marshall

STATE OF MICHIGAN

MI 002 3540

SUPERINTENDENT

DEPT OF ENVIRONMENTAL QUALITY

Steven D Washburn

D	WEATHER		FLOW		RAW SEWAGE QUALITY									
A	TYPE	PRECIP	TOTAL	MAX	TEMP	pH	BOD_5		SS		TOTAL-P		VSS	NH3-N
Y	CODE	Inches	MGD	MGD	°F	SU	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l
1	5	0 03	1 610		53	7 80	151	2028	162	2175			154	
2	2		1 590		52	7 80	151	2002	100	1326			86	14 3
3	5	0 02	1 620		52	7 70	212	2864	196	2648			196	
4	4	0 09	1 600		51	7 70	167	2228	116	1548			116	11 8
5	5	0 08	1 800		53	7 60	223	3348	132	1982	3 75	56	114	
6	4	0 05	1 790		52	7 80	179	2672	134	2000			118	
7	4	0 03	1 710		52	7 70	169	2410	118	1683			110	13 0
8	4	0 50	1 730		52	7 60	154	2222	120	1731			104	
9	4	0 26	2 000		51	7 60	81	1351	60	1001			60	
10	2		2 560		52	7 70	78	1665	70	1495			70	
11	1		2 810		50	7 80	111	2601	72	1687			72	
12	1		2 800		51	7 60	101	2359	102	2382			90	8 2
13	4	0 05	2 680		51	7 50	73	1632	84	1878			75	
14	4	0 15	2 240		52	7 60	95	1775	102	1906			102	
15	1		2 220		51	7 60	157	2907	130	2407	2 55	47	122	12 0
16	1		2 060		50	7 80	122	2096	116	1993			106	
17	5	0 01	1 970		51	7 80	137	2251	104	1709			76	
18	1		1 980		51	7 70	127	2097	96	1585			74	10 1
19	1		1 970		51	7 70	113	1857	94	1544			94	
20	1		1 950		51	7 60	103	1675	108	1756	2 65	43	100	
21	1		1 910		51	7 70	176	2804	110	1752			104	
22	1		1 900		51	8 00	171	2710	128	2028			128	
23	1		1 900		50	7 50	131	2076	306	4849			306	12 3
24	4	1 69	1 790		50	7 60	143	2135	90	1344			90	
25	1		2 400		50	7 50	100	2002	86	1721			80	
26	1		2 320		51	7 50	89	1722	96	1857			88	
27	1		2 250		50	7 70	120	2252	88	1651	2 53	47	84	8 8
28	1		2 210		50	7 90	138	2544	110	2027			100	
29														
30														
31														
TL		2 96	57 370					62283		53666		194		
ME			2 049				135	2224	115	1917	2 87	49	108	11 3

City of Marshall
801 Industrial Rd
Marshall, MI 49068

PRIMARY EFFLUENT SHEET

February 2001

Marshall
MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D Washburn

	PRIMARY EFFLUENT QUALITY												
DAY	BOD-5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS		AMMONIA NITROGEN	
	mg/l	LBS	Removal	mg/l	LBS	% Removal	mg/l	LBS	% Removal	mg/l	%	mg/l	LBS
1	83	1114	45 0	54	725	66 7				52 0	96 3		
2	81	1074	46 4	52	703	48 0				38 0	73 1	14 2	192
3	92	1243	56 6	64	854	67 3				64 0	100 0		
4	88	1174	47 3	60	901	48 3				60 0	100 0	11 6	174
5	129	1937	42 2	68	1015	48 5	2 2	33 4	40 3	62 0	91 2		
6	174	2598	2 8	70	998	47 8				60 0	85 7		
7	108	1540	36 1	58	837	50 8				50 0	86 2	14 3	206
8	112	1616	27 3	76	1268	36 7				68 0	89 5		
9	61	1017	24 7	48	1025	20 0				48 0	100 0		
10	48	1025	38 5	50	1172	28 6				50 0	100 0		
11	63	1476	43 2	52	1214	27 8				52 0	100 0		
12	53	1238	47 5	64	1430	37 3				54 0	84 4	7 8	174
13	72	1609	1 4	64	1196	23 8				60 0	93 8		
14	47	878	50 5	56	1037	45 1				56 0	100 0		
15	126	2333	19 7	86	1478	33 8	1 3	21 8	50 2	84 0	97 7	14 5	249
16	67	1151	45 1	30	493	74 1				24 0	80 0		
17	57	936	58 4	36	594	65 4				18 0	50 0		
18	61	1007	52 0	28	460	70 8				18 0	64 3	10 0	164
19	60	986	46 9	36	585	61 7				36 0	100 0		
20	71	1155	31 1	30	478	72 2	1 2	18 5	56 2	27 0	90 0		
21	107	1704	39 2	86	1363	21 8				86 0	100 0		
22	97	1537	43 3	56	887	56 3				56 0	100 0		
23	101	1600	22 9	82	1224	73 2				82 0	100 0	15 9	237
24	66	985	53 8	52	1041	42 2				52 0	100 0		
25	51	1021	49 0	54	1045	37 2				54 0	100 0		
26	43	832	51 7	44	826	54 2				36 0	81 8		
27	51	957	57 5	40	737	54 5	1 0	18 1	61 3	32 0	80 0	9 9	182
28	101	1862	26 8	62		43 6				56 0	90 3		
29													
30													
31													
TL		37607			25585			91 8					1580
ME	81	1343	39 5	56	914	48 5	1 4	23 0	52 0	1435 0	90 5	12 3	197

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
SURFACE WATER QUALITY DIVISION

DEQ

Discharge Number	Permit Number
001 A	MI 002 3540

DAILY DISCHARGE MONITORING REPORT

Monitoring Period
February 2001

DAY	CBOD5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS	NH3-N		PH	D.O.	F.COLI #/100ml	CL RESID	CN Amenable
	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	mg/l	LBS	SU	mg/l	MF	mg/l	mg/L
1	10.9	146	92.8	7.0	94	95.7				7.0			7.50	7.1	11	0.000	<0.005
2	7.8	103	94.8	5.0	66	95.0				1.0	12.80	169.74	7.50	7.1	4	0.000	
3	8 1	109	96.2	2.0	27	99.0				2 0			7.50	8.9	4	0.000	
4	6.8	91	95.9	2.0	27	98.3				2.0	11.10	148.12	7.50	8.3	5	0.000	
5	10.6	159	95.2	6.0	90	95.5	0.29	4.4	92.3	6.0			7.50	8.2	7	0.005	
6	14.9	222	91.7	8.0	119	94.0				8.0			7 50	6.8	180	0.000	
7	17.1	244	89.9	10.0	143	91.5				10.0	14.30	203.94	7.40	7.0	312	0.000	
8	16.0	231	89.6	9.0	130	92.5				9.0			7.40	6.8	16	0.000	
9	14.3	239	82.3	13.0	217	78.3				13.0			7.40	6.7	240	0 000	
10	12.1	258	84.5	10.0	214	85.7				10.0			7.50	8.8	53	0.000	
11	13.8	323	87.6	4.0	94	94.4				4.0			7.60	9.0	68	0.000	<0.005
12	12.5	292	87.6	14.0	327	86.3				13.0	7.90	184.48	7.50	8.5	730	0.000	
13	8.6	192	88.2	4.0	89	95.2				4.0			7.60	8.9	18	0.000	
14	6.9	129	92.7	10.0	187	90.2				10.0			7.50	8.6	7	0.000	
15	7.4	137	95.3	10.0	185	92.3	0.22	4.1	91.4	10.0	13.30	246.25	7.60	8.7	7	0.000	
16	9.4	161	92.3	4.0	69	96.6				4.0			7.50	7.6	4	0.000	
17	5.7	94	95.8	6.0	99	94.2				6.0			7.60	8.4	9	0.000	
18	4.9	81	96.1	4.0	66	95.8				4.0	9.60	158.53	7.40	8.8	9	0.000	
19	5.5	90	95.1	5.0	82	94.7				5.0			7.50	8.9	8	0.000	
20	5.0	81	95.1	7.0	114	93.5	0.16	2.6	94.0	7.0			7.40	8.3	8	0.000	<0.005
21	10.4	166	94.1	7.0	112	93.6				7.0			7.50	8.3	3	0.000	
22	11.6	184	93.2	12.0	190	90.6				12.0			7.50	7.2	12	0.000	
23	11.4	181	91.3	9.0	143	97.1				9.0	15.70	248.78	7.40	7.7	7	0.000	
24	6.7	100	95.3	7.0	105	92.2				7.0			7.40	7.6	2	0.000	
25	6.0	120	94.0	11.0	220	87.2				11.0			7.60	8.4	65	0.000	
26	4.9	95	94.5	9.0	174	90.6				9.0			7.50	8.8	31	0.000	
27	4.7	88	96.1	5.0	94	94.3	0.17	3.2	93.3	5.0	10.60	198.91	7.50	9.0	23	0.000	<0.005
28	10.1	186	92.7	4.0	74	96.4				4.0			7.50	8.8	7	0.001	
29																	
30																	
31																	
TL		4504			3548			14.2									
ME	9.4	161	92.5	7.3	127	92.9	0.21	3.6	92.7	199.0	11.91	194.84		8.1	16	0.000	<0.005
WA	14.4	258		9.7	187										128		
MX											15.70	248.78	7.60			0.005	<0.005
MN													7.40	6.7			

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment See 18 U S C 1001 and 33 U S C 1319 (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 Years)

PRINTED NAME AND TITLE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTORIZED AGENT	DATE
Steven D. Washburn, Superintendent		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

ACTIVATED SLUDGE SHEET

February 2001

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	AERATION SYSTEM				MIXED LIQUOR								SECONDARY SLUDGE				
	AERTN VOL	DETEN TIME	CRT	F:M RATIO	MLSS		MLVSS		SETTL.	SDI	D.O.	AIR	SS	VSS	RAS FLOW	WAS	
	KCF	HRS	DAYS		mg/L	Lbs.	mg/L	Lbs.	%	%	mg/L	CF	%	%	%	Gallons	Lbs.
SF	3											4				3	
1	48	5.4	4.4	0.41	1057	3165	905	2710	18	0.59	3.26	38	0.20	0 17	57	43	717
2	48	5.4	4.4	0.40	1075	3219	907	2716	19	0.57	4.22	45	0.20	0.16	55	44	734
3	48	5.3			1021	3057					7.33	47			52	46	
4	48	5.4			1014	3036					5.81	44			53	46	
5	48	4.8	3.0	0.78	983	2943	834	2497	16	0.61	4.80	42	0.26	0.22	48	45	976
6	48	4.8	3.2	0.90	1130	3384	959	2872	16	0.71	3.38	43	0.33	0.28	49	38	1046
7	48	5.0	2.8	0.45	1331	3986	1146	3432	19	0.70	3.04	44	0.41	0.36	51	42	1436
8	48	5.0	3.4	0.47	1334	3995	1152	3450	21	0.64	1.82	39	0.33	0.29	56	43	1183
9	48	4.3	3.3	0.28	1424	4264	1234	3695	22	0.65	2.55	27	0.36	0.31	48	43	1291
10	48	3.4			1243	3722					6.21	42			35	43	
11	48	3.1			1127	3375					7.46	49			31	44	
12	48	3.1	2.8	0.44	1099	3291	947	2836	15	0.73	6.74	49	0.33	0.28	29	42	1156
13	48	3.2	2.8	0.61	1045	3129	885	2650	13	0.80	7.97	41	0.30	0.26	29	45	1126
14	48	3.8	2.8	0.32	1081	3237	920	2755	13	0.83	6.68	40	0.31	0.27	36	45	1163
15	48	3.9	2.8	0.93	983	2943	836	2503	12	0.82	7.08	42	0.29	0.25	41	44	1064
16	48	4.2	3.0	0.41	1105	3309	937	2806	13	0.85	4.84	41	0.31	0.26	45	42	1086
17	48	4.4			1073	3213					6.63	45			46	43	
18	48	4.4			995	2979					8.40	48			46	41	
19	48	4.4			964	2887					7.27	43			47	38	
20	48	4.4	20.7	0.48	969	2902	800	2396	13	0.75	6.14	40	0.28	0.24	46	6	140
21	48	4.5	4.9	0.61	1124	3366	929	2782	14	0.80	5.62	44	0.26	0.22	47	32	694
22	48	4.5	3.7	0.47	1300	3893	1093	3273	16	0.81	3.56	46	0.37	0.31	48	34	1049
23	48	4.5	3.1	0.50	1261	3776	1061	3177	16	0.79	4.83	41	0.34	0.29	48	43	1219
24	48	4.8			1362	4078					5.30	43			51	48	
25	48	3.6			1182	3539					6.15	27			37	49	
26	48	3.7	2.2	0.31	1065	3189	887	2656	15	0.71	7.10	40	0.37	0.31	37	46	1419
27	48	3.8	2.8	0.35	1018	3048	922	2761	14	0.73	7.15	41	0.30	0.25	37	44	1101
28	48	3.9	2.3	0.91	940	2815	681	2039	12	0.78	6.59	45	0.33	0.27	37	44	1211
29	48																
30	48																
31	48																
TL												1176				1163	19813
ME	48	4.3	4.1	0.53	1118	3348	949	2842	16	0.7	5.6	42	0.31	0.26	44	42	1043

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

BIOSOLIDS SHEET

Marshall
MI 002 3540

February 2001

SUPERINTENDENT
Steven D. Washburn

	RAW SLUDGE	RAW BIOSOLIDS			LIME STABILIZED BIOSOLIDS					
DAY	GALLONS	TOTAL SOLIDS %	VOLATILE SOLIDS %	pH SU	LIME POUNDS	pH 2 hrs @ 25 C SU	RTD %	Lbs. Lime per 1000 gallons biosolids		
1	7500	4.4	76.0	6.0	832		11.8	111		
2	7000	4.0	77.0	6.2		12.6				
3	7000	3.2	81.0	6.3						
4	5600	4.8	77.0	6.1						
5	7000	4.0	78.0	6.1	1109		11.3	158		
6	4350	5.5	75.0	6.0	1448		7.3	333		
7	7250	3.9	77.0	6.1		12.5				
8	6000	4.1	77.0	5.9	1448		3.6	241		
9	7000	3.8	78.0	6.0		12.5				
10	7400	4.3	76.0	5.9						
11	7500	5.6	68.0	5.8						
12	7000	5.8	67.0	6.0						
13	9000	4.0	75.0	6.0	1232		8.0	137		
14	7000	4.2	74.0	6.3						
15	7500	4.0	74.0	6.3	1294		8.1	173		
16	7000	3.7	74.0	6.5		12.5				
17	7000	3.3	74.0	6.6						
18	6000	4.1	74.0	6.5						
19	6000	4.3	71.0	6.5						
20	6000	4.2	76.0	6.5	1109		8.7	185		
21	6000	3.6	73.0	6.6	1170		7.6	195		
22	8000	3.9	73.0	6.6						
23	6000	3.8	73.0	6.6	1324	12.4	6.8	221		
24	4000	3.5	74.0	6.6		12.3				
25	4000	4.4	74.0	6.5						
26	4000	4.8	74.0	5.7						
27	4000	5.6	72.0	6.5						
28	26500	4.5	73.0	6.5	1201		5.9	45		
29										
30										
31										
TOTAL	198600				12167					
MEAN	7093	4.3	74.5	6.3	1217	12.5	7.9	180		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MISCELLANEOUS SHEET

February 2001

Marshall
MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	WATER	ELECTRICAL USAGE		FUEL GAS		CHEMICALS APPLIED								
			X 120		X 100	$FECL_3$					Cl_2		SO_2	
	CF	METER	KWH	METER	CF	GALS	SP. GR.	% SOLN	LBS	mg/L	LBS	mg/L	LBS	mg/L
1	1550	20	2400	35	3500	100.0	1.4140	30	353.8	26.3	19.0	1.4	9.0	0.7
2	480	19	2280	58	5800	50	1.4140	30	176.9	13.3	14	1.1	11.0	0.8
3	460	19	2280	34	3400	75	1.4140	30	265.3	19.6	20	1.5	10.0	0.7
4	440	20	2400	37	3700	75	1.4140	30	265.3	19.9	19	1.4	9.0	0.7
5	1640	19	2280	33	3300	100	1.4140	30	353.8	23.6	17	1.1	9.0	0.6
6	2000	21	2520	40	4000	75	1.4140	30	265.3	17.8	18	1.2	9.0	0.6
7	380	19	2280	34	3400	75	1.4140	30	265.3	18.6	24	1.7	13.0	0.9
8	2020	19	2280	25	2500	75	1.4140	30	265.3	18.4	11	0.8	12.0	0.8
9	540	19	2280	37	3700	75	1.4140	30	265.3	15.9	16	1.0	10.0	0.6
10	400	20	2400	33	3300	50	1.4140	30	176.9	8.3	10	0.5	14.0	0.7
11	390	19	2280	45	4500	100	1.4140	30	353.8	15.1	14	0.6	13.0	0.6
12	420	20	2400	39	3900	75	1.4140	30	265.3	11.4	19	0.8	24.0	1.0
13	700	18	2160	32	3200	75	1.4140	30	265.3	11.9	22	1.0	11.0	0.5
14	370	20	2400	37	3700	150	1.4140	30	530.7	28.4	25	1.3	11.0	0.6
15	410	18	2160	36	3600	125	1.4140	30	442.2	23.9	17	0.9	12.0	0.6
16	1930	19	2280	43	4300	100	1.4140	30	353.8	20.6	18	1.0	14.0	0.8
17	420	19	2280	49	4900	100	1.4140	30	353.8	21.5	22	1.3	18.0	1.1
18	330	18	2160	44	4400	100	1.4140	30	353.8	21.4	17	1.0	9.0	0.5
19	340	19	2280	25	2500	100	1.4140	30	353.8	21.5	17	1.0	12.0	0.7
20	440	19	2280	48	4800	100	1.4140	30	353.8	21.8	14	0.9	6.0	0.4
21	1750	20	2400	46	4600	100	1.4140	30	353.8	22.2	19	1.2	3.0	0.2
22	1520	17	2040	37	3700	100	1.4140	30	353.8	22.3	16	1.0	2.0	0.1
23	380	20	2400	39	3900	100	1.4140	30	353.8	22.3	17	1.1	2.0	0.1
24	1850	20	2400	36	3600	100	1.4140	30	353.8	23.7	12	0.8	10.0	0.7
25	380	21	2520	31	3100	100	1.4140	30	353.8	17.7	14	0.7	12.0	0.6
26	380	17	2040	30	3000	100	1.4140	30	353.8	18.3	14	0.7	9.0	0.5
27	490	18	2160	42	4200	100	1.4140	30	353.8	18.9	8	0.4	9.0	0.5
28	1840	18	2160	43	4300	125	1.4140	30	442.2	24.0	17	0.9	7.0	0.4
29														
30														
31														
TL	24250	535	64200	1068	106800	2600			9198		470		290.0	
ME	866	19	2293	38	3814	93	1.4140	30.0	328.5	19.6	16.8	1.0	10.4	0.6

MANPOWER	
POSITION TITLE	NUMBER FULL TIME
SUPERINTENDANT	1
ASST. SUPT.	1
OPERATOR	3
MECHANIC	
CHEMIST	
LAB TECH	
IPP COORDINATOR	1
OTHER	

GIVE THE HOURS PER DAY THAT PLANT PERSONNEL ARE NORMALLY AT THE PLANT.

WEEKDAYS	8	HRS
SATURDAYS	8	HRS
SUNDAYS	8	HRS
HOLIDAYS	8	HRS

Weather Code	
1 Clear	6 Warm
2 Partly Cloudy	7 Cold
3 Cloudy	8 Windy
4 Rain	9 Melting Snow
5 Snow	

PLANT INFLUENT SHEET

March 2001

Marshall

STATE OF MICHIGAN

MI 002 3540

SUPERINTENDENT

DEPT OF ENVIRONMENTAL QUALITY

Steven D Washburn

D	WEATHER		FLOW		RAW SEWAGE QUALITY									
A	TYPE	PRECIP	TOTAL	MAX	TEMP	pH	BOD_5		SS		TOTAL-P		VSS	NH3-N
Y	CODE	Inches	MGD	MGD	°F	SU	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l
1	1		2 130		50	7 80	116	2061	86	1528	2 41	43	76	10 5
2	1		2 160		51	7 60	105	1892	78	1405			78	
3	2		2 070		51	7 80	129	2227	82	1416			82	
4	1		2 070		51	7 70	110	1899	94	1623			94	
5	5	0 02	2 180		50	7 80	138	2509	96	1745			74	9 5
6	1		2 100		51	7 60	100	1751	84	1471			84	
7	1		2 090		51	7 70	98	1708	92	1604	2 49	43	84	
8	5	0 05	2 070		51	7 60	98	1692	90	1554			84	
9	1		1 950		52	7 80	138	2244	92	1496			90	12 5
10	5	0 07	1 900		51	7 80	110	1743	92	1458			92	
11	4	0 02	1 900		51	7 80	111	1759	104	1648			102	
12	4	0 05	2 050		49	7 70	127	2171	86	1470			86	
13	1		2 040		52	7 60	114	1940	80	1361			78	
14	5	0 12	1 970		52	7 70	101	1659	76	1249	2 48	41	66	
15	5	0 02	1 980		52	7 50	133	2196	84	1387			82	
16	2		1 900		51	7 90	125	1981	70	1109			70	12 6
17	2		1 920		51	7 70	130	2082	130	2082			130	
18	1		1 880		51	7 70	141	2211	124	1944			108	
19	1		2 080		51	7 70	115	1995	104	1804			94	
20	1		1 960		51	7 60	112	1831	111	1814			102	9 3
21	1		1 850		52	7 60	110	1697	104	1605			90	
22	1		1 800		52	7 60	167	2507	146	2192			134	
23	1		1 870		52	7 60	166	2589	138	2152			138	12 9
24	2		1 810		52	7 90	125	1887	98	1479			98	
25	5	0 03	1 800		52	7 80	119	1786	104	1561			98	
26	2		1 850		52	7 70	95	1466	88	1358	2 51	39	88	
27	2		1 830		51	7 70	108	1648	104	1587			95	
28	1		1 820		52	7 80	130	1973	108	1639			98	12 0
29	1		1 810		52	8 00	121	1827	86	1298			80	
30	1		1 800		51	7 70	110	1651	100	1501			100	
31	4	0 23	1 670		51	7 70	110	1532	114	1588			114	
TL		0 61	60 310					60114		49129		166		
ME			1 945		51		120	1939	98	1585	2 47	41	93	11 3

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

PRIMARY EFFLUENT SHEET

March 2001

Marshall
MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

	PRIMARY EFFLUENT QUALITY												
DAY	BOD-5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS		AMMONIA NITROGEN	
	mg/l	LBS	Removal	mg/l	LBS	% Removal	mg/l	LBS	% Removal	mg/l	%	mg/l	LBS
1	62	1101	46.6	40	711	53.5	1 0	18.1	57.7	34 0	85.0	12 2	217
2	68	1225	35.2	36	621	53.8				36 0	100 0		
3	78	1347	39.5	30	518	63.4				30 0	100.0		
4	50	863	54.5	36	655	61.7				36 0	100.0		
5	83	1509	39.9	84	1471	12.5				64 0	76.2	10 7	187
6	82	1436	18.0	32	558	61.9				28 0	87.5		
7	59	1028	39.8	32	552	65.2	1 4	24 0	44.2	32 0	100.0		
8	94	1623	4.1	36	585	60.0				36 0	100.0		
9	67	1090	51.4	42	666	54 3				38 0	90.5	12 7	201
10	75	1188	31.8	46	729	50.0				44 0	95.7		
11	56	887	49.5	40	684	61.5				40 0	100.0		
12	88	1505	30.7	76	1293	11.6				76 0	100.0	11 6	197
13	83	1412	27.2	54	887	32.5				54 0	100.0		
14	68	1117	32.7	44	727	42.1	1 5	24.9	39.1	34 0	77.3		
15	73	1205	45.1	32	507	61.9				32 0	100.0		
16	74	1173	40.8	30	480	57.1				30 0	100.0	12 7	203
17	73	1169	43.8	48	753	63.1				48 0	100.0		
18	69	1082	51.1	48	833	61.3				48 0	100 0		
19	79	1370	31.3	44	719	57.7				36 0	81.8		
20	81	1324	27.7	48	741	56.8				42 0	87.5	10 1	156
21	65	1003	40.9	40	600	61 5				32 0	80.0		
22	70	1051	58.1	52	811	64.4				58 0	111.5		
23	85	1326	48.8	44	664	68.1				44 0	100.0	13 8	208
24	69	1042	44.8	46	691	53.1				46 0	100.0		
25	67	1006	43.7	58	895	44.2				56 0	96 6		
26	107	1651	-12.6	74	1129	15.9	1 9	29.0	24 3	66 0	89.2		
27	79	1206	26.9	54	820	48.1				46 0	85 2		
28	78	1184	40.0	34	513	68.5				26 0	76.5	12 4	187
29	95	1434	21.5	32	480	62.8				28 0	87.5		
30	73	1096	33.6	42	585	58.0				42 0	100.0		
31	75	1045	31.8	34	475	70.2				34 0	100.0		
TL		37697			22353			96.0					1557
ME	75	1216	36.1	45	721	53.4	1.5	24.0	41.3	1296.0	93.8	12.0	195

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
SURFACE WATER QUALITY DIVISION

DEQ

Discharge Number	Permit Number
001 A	MI 002 3540

DAILY DISCHARGE MONITORING REPORT

Monitoring Period
March 2001

DAY	CBOD5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS	NH3-N		PH	D.O.	F.COLI #/100ml	CL RESID	CN Amenable
	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	mg/l	LBS	SU	mg/l	MF	mg/l	mg/L
1	9.4	167	91.9	8.0	142	90.7	0.15	2.7	93.8	7.0	13.00	230.93	7.60	8.6	13	0.000	
2	6 6	119	93.7	3.0	54	96.2				3.0			7.50	8.0	17	0.000	
3	9.0	155	93.0	2.0	35	97.6				2 0			7.50	7.8	19	0 000	
4	5.5	95	95.0	1.0	17	98.9				1.0			7.60	8.8	15	0.000	<0.005
5	6.2	113	95.5	8.0	145	91.7				7.0	9.60	174.54	7.60	9.3	3	0.000	
6	5.3	93	94.7	1.0	18	98.8				1.0			7.50	8.8	120	0.000	
7	4.5	78	95.4	4.0	70	95.7	0.12	2.1	95.2	4.0			7.40	8.5	18	0.000	
8	4.3	74	95.6	7.0	121	92.2				7.0			7.40	8.8	33	0.000	
9	4.6	75	96.7	4.0	65	95.7				4.0	12.60	204.91	7.60	9.2	6	0.000	
10	10.2	162	90.7	2.0	32	97.8				2.0			7.50	8.8	23	0.000	
11	6.0	95	94.6	1.0	16	99.0				1.0			7.60	8.6	19	0.000	
12	6.7	115	94.7	3.0	51	96.5				3.0	10.30	176.10	7.60	8.7	52	0.000	<0.005
13	6.8	116	94.0	1.0	17	98.8				1.0			7.60	8.4	55	0.000	
14	5.9	97	94.2	9.0	148	88.2	0.17	2.8	93.1	4.0			7.60	8.8	0	0.000	
15	7.3	121	94.5	9.0	149	89.3				8.0			7.50	8.7	30	0.000	
16	7.8	124	93.8	4.0	63	94.3				4.0	13.50	213.92	7.50	8.9	15	0.000	
17	10.7	171	91.8	10.0	160	92.3				10.0			7.50	8.7	34	0.000	
18	9.2	144	93.5	11.0	172	91.1				11.0			7.50	8.8	10	0.000	<0.005
19	10.3	179	91.0	8.0	139	92.3				8.0			7.60	8.9	43	0.000	
20	6.8	111	93.9	4.0	65	96.4				4.0	8.90	145.48	7.50	8.4	18	0.000	
21	6.5	100	94.1	12.0	185	88.5				10.0			7.60	8.5	19	0.000	
22	4.4	66	97.4	5.0	75	96.6				5.0			7.50	8.7	3	0.000	
23	8.1	126	95.1	5.0	78	96.4				5.0	16.40	255.77	7.60	9.0	6	0.000	
24	6.3	95	95.0	2.0	30	98.0				2.0			7.60	8.9	9	0.000	
25	4.3	65	96.4	3.0	45	97.1				3.0			7.60	9.3	10	0.000	
26	4.3	66	95.5	4.0	62	95.5	0.15	2.3	94.0	4.0			7.60	8.8	14	0.000	
27	4.7	72	95.6	1.0	15	99.0				1.0			7.50	8.4	26	0.000	<0.005
28	5.1	77	96.1	3.0	46	97.2				3.0	12.10	183.66	7.60	8.7	12	0.000	
29	8.7	131	92.8	2.0	30	97.7				2.0			7.60	8.1	18	0.000	
30	5.4	81	95.1	4.0	60	96.0				4.0			7.70	8.0	12	0.000	
31	4.8	67	95.6	2.0	28	98.2				2.0			7.60	8.3	49	0.000	
TL		3350			2333			9.9									
ME	6.6	108	94.4	4.6	75	95.3	0.15	2.5	94.0	133.0	12.05	198.17		8.7	16	0.000	<0.005
WA	8.4	136		8.3	133										27		
MX											16.40	255.77	7.70			0	<0.005
MN													7.40	7.8			

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment See 18 U S C 1001 and 33 U S C 1319 (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 Years)

PRINTED NAME AND TITLE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTORIZED AGENT	DATE
Steven D. Washburn, Superintendent		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

ACTIVATED SLUDGE SHEET

March 2001

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	AERATION SYSTEM				MIXED LIQUOR								SECONDARY SLUDGE				
	AERTN VOL	DETEN TIME	CRT	F:M RATIO	MLSS		MLVSS		SETTL.	SDI	D.O.	AIR	SS	VSS	RAS FLOW	WAS	
	KCF	HRS	DAYS		mg/L	Lbs.	mg/L	Lbs.	%	%	mg/L	CF	%	%	%	Gallons	Lbs.
SF	3											4				3	
1	48	4.0	2.3	0.47	983	2943	787	2357	11	0.89	5.10	41	0.31	0.25	38	49	1267
2	48	4.0	2.6	0.56	892	2671	729	2183	10	0.89	6.00	38	0.25	0.20	37	49	1022
3	48	4.2			1258	3767					4.70	38			39	49	
4	48	4.2			829	2482					6.90	49			38	46	
5	48	4.0	3.0	0.72	860	2575	704	2108	10	0.86	6.00	49	0.28	0.23	40	37	864
6	48	4.1	2.6	0.55	1063	3183	874	2617	12	0.89	8.20	45	0.37	0.31	42	40	1234
7	48	4.1	2.7	0.39	1064	3186	875	2620	12	0.89	6.73	45	0.35	0.28	40	40	1168
8	48	4.2	4.2	0.62	1068	3198	873	2614	14	0.76	8.42	47	0.24	0.20	42	38	761
9	48	4.4	3.7	0.44	1013	3033	827	2476	11	0.92	8.61	47	0.27	0.22	50	36	811
10	48	4.5			1025	3069					8.18	60			43	35	
11	48	4.5			1067	3195					7.15	44			44	35	
12	48	4.2	3.5	0.60	1013	3033	837	2506	12	0.84	7.53	45	0.28	0.23	43	37	864
13	48	4.2	3.2	0.49	1165	3488	964	2887	14	0.83	6.85	43	0.34	0.28	42	38	1078
14	48	4.4	2.7	0.36	1242	3719	1027	3075	16	0.78	7.23	44	0.37	0.31	44	44	1358
15	48	4.4	2.5	0.41	1186	3551	978	2929	15	0.79	7.28	43	0.33	0.27	44	51	1404
16	48	4.5	2.6	0.42	1139	3411	942	2821	15	0.76	8.28	46	0.31	0.26	48	51	1319
17	48	4.5			1057	3165					8.12	45			47	50	
18	48	4.6			1038	3108					6.68	46			47	46	
19	48	4.1	2.8	0.54	994	2976	843	2524	14	0.71	8.00	46	0.29	0.24	42	44	1064
20	48	4.4	4.4	0.44	1213	3632	1011	3027	16	0.76	6 52	42	0.38	0.31	45	26	824
21	48	4.7	5.1	0.31	1286	3851	1073	3213	18	0.71	6.60	37	0.35	0.29	47	26	759
22	48	4.8	4.9	0.32	1317	3944	1088	3258	18	0.73	7.77	41	0.33	0.28	46	29	798
23	48	4.6	2.3	0.49	1100	3294	909	2722	15	0.73	7.85	52	0.50	0.41	38	35	1460
24	48	4.8			1016	3042					6.30	55			37	36	
25	48	4.8			891	2668					8.48	60			37	36	
26	48	4.7	4.1	0.64	1053	3153	863	2584	14	0.75	7.46	56	0.32	0.26	42	29	774
27	48	4.7	5.2	0.42	1167	3494	963	2884	14	0.83	7.20	52	0.28	0.23	43	29	677
28	48	4.7	4.1	0.42	1162	3479	952	2851	15	0.77	7.36	50	0.32	0.26	44	32	854
29	48	4.8	5.0	0.50	1174	3515	959	2872	14	0.84	6.11	45	0.27	0.22	44	31	698
30	48	4.8	5.0	0.36	1245	3728	1009	3021	16	0.78	6.20	48	0.29	0.24	51	31	750
31	48	5.2			1234	3695					7.43	49			55	32	
TL												1448				1187	21805
ME	48	4.4	3.6	0.48	1091	3266	913	2734	14	0.8	7.1	47	0.32	0.26	43	38	991

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

BIOSOLIDS SHEET

Marshall

MI 002 3540

March 2001

SUPERINTENDENT
Steven D Washburn

	RAW SLUDGE	RAW BIOSOLIDS			LIME STABILIZED BIOSOLIDS					
DAY	GALLONS	TOTAL SOLIDS %	VOLATILE SOLIDS %	pH SU	LIME POUNDS	pH 2 hrs @ 25 C SU	RDT Solids %	Lbs. Lime per 1000 gallons biosolids		
1	4000	4 7	71 0	6 5						
2	4000	5 7	71 0	6 3						
3	4000	8 4	62 0	5 8						
4	2400	5 6	72 0	6 2						
5	10500	4 8	74 0	6 3	2425		5 3	231		
6	4000	4 8	73 0	6 2		12 3				
7	4000	5 3	71 0	6 2						
8	4000	4 9	75 0	6 0						
9	16500	7 5	71 0	5 7						
10	8000	4 4	76 0	6 1						
11	8000	5 1	75 0	6 2						
12	7000	4 4	75 0	6 4	1412			202		
13	7500	4 1	76 0	6 1	1474		5 3	197		
14	4450	4 2	76 0	6 3		12 1	5 0			
15	4400	4 8	73 0	6 3						
16	4000	5 1	76 0	6 2						
17	1000	5 3	74 0	5 8						
18	20000	4 4	76 0	6 2						
19	5000	4 7	75 0	6 3	1596		6 4	319		
20	4000	4 4	75 0	6 2		12 2				
21	4000	4 4	76 0	5 9						
22	5000	4 5	75 0	6 0						
23	8000	4 4	76 0	6 0						
24	8000	3 3	77 0	5 9						
25	8000	4 4	76 0	6 0						
26	10000	4 0	77 0	6 0	1474			147		
27	11000	4 1	78 0	5 9	1167		12 7	106		
28	4500	3 6	77 0	5 9						
29	6000	3 7	77 0	5 9		12 3				
30	20125	4 3	77 0	5 9						
31	7000	3 6	77 0	6 0						
TOTAL	218375				9548					
MEAN	7044	4 7	74.5	6.1	1591	12.2	6.9	200		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MISCELLANEOUS SHEET

March 2001

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	WATER	ELECTRICAL USAGE		FUEL GAS		CHEMICALS APPLIED								
			X 120		X 100	$FECL_3$					Cl_2		SO_2	
	CF	METER	KWH	METER	CF	GALS	SP. GR.	% SOLN	LBS	mg/L	LBS	mg/L	LBS	mg/L
1	520	17	2040	35	3500	125.0	1.4140	30	442.2	24.9	16.0	0.9	8.0	0.5
2	380	16	1920	32	3200	100	1.4140	30	353.8	19.6	15	0.8	4.0	0.2
3	400	18	2160	30	3000	75	1.4140	30	265.3	15.4	16	0.9	9.0	0.5
4	450	18	2160	37	3700	75	1.4140	30	265.3	15.4	14	0.8	8.0	0.5
5	2250	20	2400	61	6100	100	1.4140	30	353.8	19.5	18	1.0	7.0	0.4
6	820	18	2160	32	3200	100	1.4140	30	353.8	20.2	17	1.0	9.0	0.5
7	390	17	2040	46	4600	50	1.4140	30	176.9	10.1	19	1.1	12.0	0.7
8	440	18	2160	46	4600	100	1.4140	30	353.8	20.5	16	0.9	11.0	0.6
9	390	17	2040	39	3900	100	1.4140	30	353.8	21.8	17	1.0	24.0	1.5
10	450	19	2280	33	3300	100	1.4140	30	353.8	22.3	17	1.1	13.0	0.8
11	420	18	2160	30	3000	100	1.4140	30	353.8	22.3	15	0.9	16.0	1.0
12	2100	20	2400	35	3500	100	1.4140	30	353.8	20.7	17	1.0	16.0	0.9
13	2000	17	2040	24	2400	100	1.4140	30	353.8	20.8	15	0.9	11.0	0.6
14	850	17	2040	33	3300	100	1.4140	30	353.8	21.5	19	1.2	14.0	0.9
15	400	17	2040	42	4200	100	1.4140	30	353.8	21.4	10	0.6	12.0	0.7
16	550	17	2040	45	4500	100	1.4140	30	353.8	22.3	6	0.4	12.0	0.8
17	300	17	2040	39	3900	100	1.4140	30	353.8	22.1	15	0.9	16.0	1.0
18	1050	17	2040	40	4000	50	1.4140	30	176.9	11.3	16	1.0	15.0	1.0
19	1850	20	2400	20	2000	75	1.4140	30	265.3	15.3	12	0.7	14.0	0.8
20	690	18	2160	27	2700	100	1.4140	30	353.8	21.6	13	0.8	15.0	0.9
21	400	16	1920	23	2300	100	1.4140	30	353.8	22.9	15	1.0	9.0	0.6
22	670	18	2160	28	2800	100	1.4140	30	353.8	23.6	15	1.0	8.0	0.5
23	410	17	2040	32	3200	75	1.4140	30	265.3	17.0	16	1.0	10.0	0.6
24	330	18	2160	49	4900	75	1.4140	30	265.3	17.6	15	1.0	10.0	0.7
25	410	19	2280	40	4000	75	1.4140	30	265.3	17.7	15	1.0	7.0	0.5
26	1900	18	2160	41	4100	75	1.4140	30	265.3	17.2	13	0.8	9.0	0.6
27	1570	21	2520	25	2500	75	1.4140	30	265.3	17.4	19	1.2	10.0	0.7
28	640	18	2160	31	3100	100	1.4140	30	353.8	23.3	11	0.7	10.0	0.7
29	350	18	2160	18	1800	75	1.4140	30	265.3	17.6	15	1.0	13.0	0.9
30	390	18	2160	18	1800	75	1.4140	30	265.3	17.7	13	0.9	9.0	0.6
31	360	16	1920	5	500	75	1.4140	30	265.3	19.1	121	8.7	11.0	0.8
TL	24130	553	66360	1036	103600	2750			9729		571		352.0	
ME	778	18	2141	33	3342	89	1.4140	30.0	313.8	19.4	18.4	1.2	11.4	0.7

MANPOWER	
POSITION TITLE	NUMBER FULL TIME
SUPERINTENDANT	1
ASST. SUPT.	1
OPERATOR	3
MECHANIC	
CHEMIST	
LAB TECH	
IPP COORDINATOR	1
OTHER	

GIVE THE HOURS PER DAY THAT PLANT PERSONNEL ARE NORMALLY AT THE PLANT.

WEEKDAYS	8	HRS
SATURDAYS	8	HRS
SUNDAYS	8	HRS
HOLIDAYS	8	HRS

Weather Code	
1 Clear	6 Warm
2 Partly Cloudy	7 Cold
3 Cloudy	8 Windy
4 Rain	9 Melting Snow
5 Snow	

PLANT INFLUENT SHEET

April, 2001

Marshall

STATE OF MICHIGAN

MI 002 3540

SUPERINTENDENT

DEPT OF ENVIRONMENTAL QUALITY

Steven D Washburn

D	WEATHER		FLOW		RAW SEWAGE QUALITY									
A	TYPE	PRECIP	TOTAL	MAX	TEMP	pH	BOD_5		SS		TOTAL-P		VSS	NH3-N
Y	CODE	Inches	MGD	MGD	°F	SU	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l
1	2		1 630		51	7 80	105	1427	120	1631			118	
2	4	0 01	1 670		52	7 70	92	1281	92	1281			92	10 4
3	2		1 610		52	7 70	88	1182	99	1329			99	
4	1		1 620		51	7 60	80	1081	120	1621			102	
5	4	0 26	1 610		51	7 70	124	1665	116	1558			112	
6	4	0 02	1 680		51	7 90	158	2214	112	1569			96	11 0
7	2		1 620		52	7 80	112	1513	120	1621	2 38	32	106	
8	1		1 620		52	7 60	142	1919	122	1648			102	
9	4	0 15	1 690		53	7 80	112	1579	132	1860			132	11 4
10	4	0 03	1 700		53	7 60	110	1560	108	1531			103	
11	4	0 04	1 780		53	7 30	143	2123	142	2108			126	10 8
12	2		1 650		53	7 60	159	2188	148	2037	2 60	36	130	
13	2		1 700		54	8 10	198	2807	114	1616			112	
14	4	0 01	1 670		53	7 70	148	2061	162	2256			162	
15	4	0 46	1 650		53	7 70	115	1583	92	1266			92	11 7
16	4	0 06	1 820		53	7 60	113	1715	108	1639			108	
17	1		1 650		53	7 60	111	1527	122	1679			122	
18	1		1 800		54	7 50	138	2072	122	1831			118	11 6
19	4	0 20	1 800		54	7 50	169	2537	108	1621	3 17	48	104	
20	4	0 16	1 770		53	7 50	166	2450	156	2303			120	12 8
21	4	0 36	1 710		53	7 80	130	1854	120	1711			110	
22	4	0 25	1 720		53	7 70	124	1779	86	1234			80	
23	4	0 41	1 730		55	7 60	155	2236	92	1327			92	
24	2		1 760		54	7 80	120	1761	113	1659			111	
25	2		1 760		55	7 70	114	1673	106	1556	2 46	36	98	
26	1		1 730		55	7 70	169	2438	140	2020			124	12 4
27	1		1 740		54	7 90	135	1959	132	1916			120	
28	1		1 740		54	7 80	118	1712	104	1509			90	
29	1		1 720		53	7 70	131	1879	110	1578			100	
30	1		1 710		55	7 80	124	1768	122	1740			122	
31														
TL		2.42	51.060					55545		50258		152		
ME			1.702		53		130	1851	118	1675	2.65	38	110	11 5

City of Marshall
801 Industrial Rd
Marshall, MI 49068

PRIMARY EFFLUENT SHEET

Apnl 2001

Marshall
MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D Washburn

	PRIMARY EFFLUENT QUALITY												
DAY	BOD-5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS		AMMONIA NITROGEN	
	mg/l	LBS	Removal	mg/l	LBS	% Removal	mg/l	LBS	% Removal	mg/l	%	mg/l	LBS
1	58	788	44 8	32	435	73 3				32 0	100 0		
2	51	710	44 6	30	403	67 4				30 0	100 0	10 7	144
3	73	980	17 0	56	757	43 4				56 0	100 0		
4	66	892	17 5	64	859	46 7				48 0	75 0		
5	74	994	40 3	32	448	72 4				32 0	100 0		
6	87	1219	44 9	32	432	71 4				26 0	81 3	12 6	170
7	65	878	42 0	26	351	78 3	1 1	15 4	52 1	20 0	76 9		
8	63	851	55 6	32	451	73 8				24 0	75 0		
9	63	888	43 8	36	510	72 7				36 0	100 0	11 4	162
10	93	1319	15 5	40	594	63 0				40 0	100 0		
11	90	1336	37 1	46	633	67 6				38 0	82 6	11 0	151
12	62	853	61 0	26	369	82 4	1 7	24 4	33 8	20 0	76 9		
13	99	1404	50 0	20	279	82 5				20 0	100 0		
14	80	1114	45 9	32	440	80 2				32 0	100 0		
15	59	812	48 7	26	395	71 7				26 0	100 0	10 8	164
16	56	850	50 4	34	468	68 5				34 0	100 0		
17	54	743	51 4	40	600	67 2				40 0	100 0		
18	90	1351	34 8	64	961	47 5				58 0	90 6	12 6	189
19	119	1786	29 6	72	1063	33 3	1 9	27 6	41 0	50 0	69 4		
20	117	1727	29 5	68	970	56 4				36 0	52 9	13 4	191
21	84	1198	35 4	36	516	70 0				26 0	72 2		
22	64	918	48 4	28	404	67 4				24 0	85 7		
23	79	1140	49 0	38	558	58 7				38 0	100 0		
24	61	895	49 2	64	939	43 4				60 0	93 8		
25	82	1204	28 1	54	779	49 1	1 3	19 2	45 9	46 0	85 2		
26	56	808	66 9	40	580	71 4				36 0	90 0	11 5	167
27	65	943	51 9	42	609	68 2				28 0	66 7		
28	65	943	44 9	38	545	63 5				26 0	68 4		
29	71	1018	45 8	28	399	74 5				26 0	92 9		
30	59	841	52 4	30		75 4				30 0	100 0		
31													
TL		31405			16749			86 6					1338
ME	74	1047	42 5	40	558	65 4	1 5	21 6	43 2	1038 0	87 9	11 8	167

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
SURFACE WATER QUALITY DIVISION

DEQ

Discharge Number	Permit Number
001 A	MI 002 3540

DAILY DISCHARGE MONITORING REPORT

Monitoring Period
April, 2001

DAY	CBOD5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS	NH3-N		PH	D.O.	F.COLI #/100ml	CL RESID	CN Amenable
	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	mg/l	LBS	SU	mg/l	MF	mg/l	mg/L
1	4.5	61	95.7	2.0	27	98.3				2.0			7 60	8.2	8	0.000	
2	4.5	63	95.1	1.0	14	98.9				1.0	10.60	147.63	7.60	8 7	15	0.000	<0.005
3	5.8	78	93.4	5.0	67	94.9				5.0			7.60	8.7	10	0.000	
4	6.1	82	92.4	4.0	54	96.7				3.0			7.60	8.6	34	0.000	
5	6 7	90	94.6	8.0	107	93.1				8.0			7 60	8.4	20	0.000	
6	7.4	104	95.3	3.0	42	97.3				3.0	13.90	194 76	7.60	7.8	74	0.000	
7	7.7	104	93.1	5.0	68	95.8	0.24	3.2	89.9	5.0			7.50	7.6	67	0.000	
8	5.1	69	96.4	8.0	108	93.4				8.0			7 50	7.6	96	0.000	
9	5.9	83	94.7	6.0	85	95.5				6.0			7.50	8.0	128	0.000	
10	7.3	103	93.4	1.0	14	99.1				1.0	10.90	154.54	7.60	8.1	372	0.000	<0.005
11	6.7	99	95.3	4.0	59	97.2				4.0			7.40	6.6	46	0.000	
12	4.4	61	97.2	6.0	83	95.9	0.43	5.9	83.5	6.0	9.50	130.73	7.50	7.7	124	0.000	
13	8.3	118	95.8	1.0	14	99.1				1.0			7.50	8.4	70	0.000	
14	6.5	91	95.6	3 0	42	98.1				3.0			7.50	7.8	60	0.000	
15	4.2	58	96.3	3.0	41	96.7				3.0	10 50	144.49	7.50	7.7	36	0.000	<0 005
16	4.2	64	96.3	2.0	30	98.1				2.0			7.50	8.6	37	0.000	
17	3.8	52	96.6	2.0	28	98.4				2.0			7.60	8.8	220	0.000	
18	4.4	66	96.8	4.0	60	96.7				4.0	11.55	173.39	7.50	8.4	120	0.000	
19	11.1	167	93.4	8.0	120	92.6	0.20	3.0	93.7	5.0			7.40	8.6	120	0.000	
20	10.2	151	93.9	14.0	207	91.0				4.0	13.50	199.28	7.40	6.6	34	0.000	
21	5.9	84	95.5	1.0	14	99.2				1.0			7.40	7.2	19	0.000	
22	4.7	67	96.2	2.0	29	97.7				2.0			7.40	7.6	24	0.000	
23	4.6	66	97.0	1.0	14	98.9				1.0			7.50	7.3	15	0.000	
24	4.5	66	96.3	2.0	29	98.2				2.0			7.50	8.5	9	0.000	<0.005
25	3.9	57	96.6	3.0	44	97.2	0.12	1.8	95.1	3.0			7.40	8.0	8	0.000	
26	3.8	55	97.8	4.0	58	97.1				4.0	12.70	183.24	7.50	7.9	6	0.000	
27	4.6	67	96.6	8.0	116	93.9				4.0			7.50	8.3	10	0.000	
28	5.3	77	95.5	1.0	15	99.0				1.0			7.60	8.6	10	0.000	
29	3.9	56	97.0	2.0	29	98.2				2.0			7.60	8.6	22	0.000	
30	3.7	53	97.0	1.0	14	99.2				1.0			7.60	8.4	22	0.000	
31																	
TL		2411			1632			13.9									
ME	5.7	80	95.6	3.8	54	96.9	0.25	3.5	90.5	97.0	11.64	166.01		8.0	34	0.000	<0.005
WA	6.7	95		5.6	76										104		
MX											13.90	199.28	7.60			0	<0.005
MN													7.40	6.6			

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment See 18 U S C 1001 and 33 U S C 1319 (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 Years)

PRINTED NAME AND TITLE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTORIZED AGENT	DATE
Steven D. Washburn, Superintendent		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

ACTIVATED SLUDGE SHEET

April, 2001

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	AERATION SYSTEM				MIXED LIQUOR								SECONDARY SLUDGE				
	AERTN VOL	DETEN TIME	CRT	F:M RATIO	MLSS		MLVSS		SETTL.	SDI	D.O.	AIR	SS	VSS	RAS FLOW	WAS	
	KCF	HRS	DAYS		mg/L	Lbs.	mg/L	Lbs.	%	%	mg/L	CF	%	%	%	Gallons	Lbs.
SF	3											4				3	
1	48	5.3			1190	3563					7.15	50			57	32	
2	48	5.2	4.3	0.27	1116	3342	893	2674	13	0.86	6.54	50	0.31	0.25	56	30	776
3	48	5.4	4.6	0.38	1082	3240	865	2590	13	0.83	8.05	48	0.29	0.23	60	29	701
4	48	5.3	6.4	0.32	1154	3456	922	2761	13	0.89	4.03	47	0.27	0.21	60	24	540
5	48	5.4	5.2	0.35	1212	3629	958	2869	14	0.87	7.85	45	0.32	0.26	60	26	694
6	48	5.1	5.1	0.42	1216	3641	977	2926	14	0.87	6.48	39	0.37	0.29	55	23	710
7	48	5.3			1279	3830					5.87	38			58	24	
8	48	5.3			1296	3881					5.11	32			60	27	
9	48	5.1	4.6	0.30	1222	3659	980	2935	15	0.81	5.58	37	0.33	0.27	81	29	798
10	48	5.1	3.2	0.45	1206	3611	968	2899	14	0.86	6.02	46	0.43	0.34	55	31	1112
11	48	4.8	4.1	0.43	1279	3830	1033	3093	16	0.80	3.37		0.36	0.29	52	31	931
12	48	5.2	7.6	0.27	1272	3809	1049	3141	17	0.75	5.48		0.23	0.19	56	26	499
13	48	5.1		0.44	1288	3857	1054	3156			6.48				56	32	
14	48	5.2			1307	3914					6.55				57	32	
15	48	5.2			1289	3860					6.14				57	32	
16	48	4.7	4.2	0.29	1201	3596	986	2952	18	0.67	6.75		0.34	0.28	56	30	851
17	48	5.2	4.5	0.24	1234	3695	1014	3036	17	0.73	7.21		0.32	0.27	53	31	827
18	48	4.8	4.6	0.49	1136	3402	922	2761	16	0.71	7.97		0.33	0.27	54	27	743
19	48	4.8	5.6	0.55	1346	4030	1088	3258	19	0.71	6.00		0.31	0.25	54	28	724
20	48	4.9	6.1	0.49	1429	4279	1188	3557	21	0.68	3.53		0.40	0.33	55	21	701
21	48	5.0			1626	4869					4.42				54	17	
22	48	5.0			1604	4803					4.87				56	18	
23	48	5.0	6.3	0.27	1675	5016	1388	4156	29	0.58	4.87		0.34	0.28	56	28	794
24	48	4.9	4.0	0.23	1546	4629	1281	3836	25	0.62	6.98		0.45	0.37	54	31	1163
25	48	4.9	3.8	0.32	1553	4650	1262	3779	25	0.62	6.41		0.44	0.36	53	33	1211
26	48	5.0	5.0	0.22	1514	4534	1240	3713	27	0.56	5.55		0.40	0.33	53	27	901
27	48	5.0	4.1	0.27	1414	4234	1146	3432	23	0.61	7.10		0.39	0.31	52	32	1041
28	48	5.0			1255	3758					8.21				51	36	
29	48	5.0			1199	3590					7.61				51	37	
30	48	5.0	4.2	0.32	1111	3327	887	2656			6.55		0.31	0.25	55	31	801
31	48																
TL												432				855	16517
ME	48	5.1	4.9	0.35	1308	3918	1052	3151	18	0.7	6.2	43	0.35	0.28	56	29	826

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

BIOSOLIDS SHEET

Marshall

MI 002 3540

April, 2001

SUPERINTENDENT
Steven D. Washburn

	RAW SLUDGE	RAW BIOSOLIDS			LIME STABILIZED BIOSOLIDS					
DAY	GALLONS	TOTAL SOLIDS %	VOLATILE SOLIDS %	pH SU	LIME POUNDS	pH 2 hrs @ 25 C SU	RTD Solids %	Lbs. Lime per 1000 gallons biosolids		
1	7000	4.6	76.0	6.1						
2	6500	4.1	76.0	6.4	1509			232		
3	2000	4.5	6.0	6.3	1804	12.4	8.5	902		
4	6800	4.6	77.0	6.1	1181	12.3	9.8	174		
5	8000	3.3	74.0	6.3						
6	10000	3.2	74.0	6.6	1509		5.7	151		
7	3100	4.2	69.0	7.8		12.3				
8	2000	5.8	70.0	7.5						
9	8500	3.3	73.0	6.9						
10	11447	3.8	74.0	6.6	1476		7.8	129		
11	4000	5.0	78.0	6.5		12.3				
12	4500	4.3	78.0	6.6						
13	4000	4.0	77.0	6.5						
14	3000	4.9	77.0	6.5						
15	2500	5.1	75.0	6.3						
16	2500	5.4	76.0	6.5						
17	2500	4.5	77.0	6.3						
18	5000	4.7	73.0	6.3	2033		7.5	407		
19	9500	4.6	73.0	6.3	820		12.9	86		
20	6000	3.8	75.0	6.3		12.1				
21	3000	4.2	77.0	6.3						
22	5500	6.0	76.0	6.0						
23	6000	4.4	77.0	6.1						
24	20800	4.4	77.0	6.2	1312		8.3	63		
25	8000	3.8	77.0	6.3	689		8.9	86		
26	4000	4.0	78.0	5.6		12.2				
27	5000	3.9	76.0	6.3						
28	4000	4.6	76.0	6.2						
29	5500	5.1	75.0	6.0						
30	4100	5.8	76.0	5.9						
31										
TOTAL	174747				12333					
MEAN	5825	4.5	73.1	6.4	1370	12.3	8.7	248		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MISCELLANEOUS SHEET

April, 2001

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	WATER	ELECTRICAL USAGE		FUEL GAS		CHEMICALS APPLIED								
			X 120		X 100	$FECL_3$					Cl_2		SO_2	
	CF	METER	KWH	METER	CF	GALS	SP. GR.	% SOLN	LBS	mg/L	LBS	mg/L	LBS	mg/L
1	400	17	2040	24	2400	75.0	1.3980	30	262.3	19.3	13.0	1.0	22.0	1.6
2	400	18	2160	17	1700	75	1.3980	30	262.3	18.8	15	1.1	10.0	0.7
3	2090	18	2160	22	2200	125	1.3980	30	437.2	32.6	15	1.1	8.0	0.6
4	1680	16	1920	18	1800	50	1.3980	30	174.9	12.9	14	1.0	10.0	0.7
5	360	13	1560	10	1000	25	1.3980	30	87.4	6.5	16	1.2	10.0	0.7
6	510	15	1800	6	600	100	1.3980	30	349.8	25.0	13	0.9	11.0	0.8
7	370	13	1560	2	200	100	1.3980	30	349.8	25.9	10	0.7	8.0	0.6
8	390	14	1680	4	400	75	1.3980	30	262.3	19.4	11	0.8	10.0	0.7
9	410	14	1680	5	500	100	1.3980	30	349.8	24.8	11	0.8	10.0	0.7
10	1870	16	1920	9	900	50	1.3980	30	174.9	12.3	11	0.8	8.0	0.6
11	380	12	1440	9	900	50	1.3980	30	174.9	11.8	10	0.7	10.0	0.7
12	410	13	1560	54	5400	100	1.3980	30	349.8	25.4	10	0.7	12.0	0.9
13	350	12	1440	7	700	100	1.3980	30	349.8	24.7	12	0.8	6.0	0.4
14	350	15	1800	6	600	100	1.3980	30	349.8	25.1	14	1.0	21.0	1.5
15	370	14	1680	14	1400	100	1.3980	30	349.8	25.4	13	0.9	18.0	1.3
16	330	14	1680	10	1000	100	1.3980	30	349.8	23.0	12	0.8	6.0	0.4
17	410	18	2160	36	3600	100	1.3980	30	349.8	25.4	13	0.9	7.0	0.5
18	1620	17	2040	18	1800	100	1.3980	30	349.8	23.3	14	0.9	8.0	0.5
19	1600	15	1800	9	900	150	1.3980	30	524.7	35.0	18	1.2	5.0	0.3
20	450	14	1680	8	800	100	1.3980	30	349.8	23.7	15	1.0	5.0	0.3
21	570	13	1560	3	300	100	1.3980	30	349.8	24.5	21	1.5	13.0	0.9
22	410	14	1680	2	200	100	1.3980	30	349.8	24.4	21	1.5	7.0	0.5
23	390	15	1800	8	800	100	1.3980	30	349.8	24.2	19	1.3	13.0	0.9
24	1660	18	2160	15	1500	100	1.3980	30	349.8	23.8	22	1.5	10.0	0.7
25	1010	14	1680	4	400	100	1.3980	30	349.8	23.8	22	1.5	6.0	0.4
26	400	15	1800	2	200	100	1.3980	30	349.8	24.2	18	1.2	18.0	1.2
27	460	13	1560	1	100	100	1.3980	30	349.8	24.1	5	0.3	10.0	0.7
28	240	15	1800	9	900	100	1.3980	30	349.8	24.1	15	1.0	13.0	0.9
29	380	14	1680	2	200	100	1.3980	30	349.8	24.4	14	1.0	11.0	0.8
30	510	14	1680	2	200	100	1.3980	30	349.8	24.5	14	1.0	12.0	0.8
31														
TL	20780	443	53160	336	33600	2775			9706		431		318.0	
ME	693	15	1772	11	1120	93	1.3980	30.0	323.5	22.8	14.4	1.0	10.6	0.8

MANPOWER	
POSITION TITLE	NUMBER FULL TIME
SUPERINTENDANT	1
ASST. SUPT.	1
OPERATOR	3
MECHANIC	
CHEMIST	
LAB TECH	
IPP COORDINATOR	1
OTHER	

GIVE THE HOURS PER DAY THAT PLANT PERSONNEL ARE NORMALLY AT THE PLANT.

WEEKDAYS	8	HRS
SATURDAYS	8	HRS
SUNDAYS	8	HRS
HOLIDAYS	8	HRS

Weather Code	
1 Clear	6 Warm
2 Partly Cloudy	7 Cold
3 Cloudy	8 Windy
4 Rain	9 Melting Snow
5 Snow	

PLANT INFLUENT SHEET

May 2001

Marshall

STATE OF MICHIGAN

MI 002 3540

SUPERINTENDENT

DEPT OF ENVIRONMENTAL QUALITY

Steven D Washburn

D	WEATHER		FLOW		RAW SEWAGE QUALITY									
A	TYPE	PRECIP	TOTAL	MAX	TEMP	pH	BOD_5		SS		TOTAL-P		VSS	NH3-N
Y	CODE	Inches	MGD	MGD	°F	SU	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l
1	4	0 09	1 700		55	7 50	129	1829	105	1489			105	12 2
2	1		1 630		56	7 70	140	1903	96	1305			86	12 4
3	1		1 630		56	7 80	147	1998	122	1658	2 74	37	106	11 6
4	1		1 670		56	7 60	116	1616	68	947			68	13 5
5	1		1 660		56	7 80	155	2146	178	2464			174	12 5
6	2		1 630		54	7 50	140	1903	134	1822			134	10 9
7	4	0 63	1 660		56	7 60	177	2450	162	2243			158	11 9
8	1		1 670		57	7 70	179	2493	124	1727			121	12 4
9	1		1 610		57	7 70	128	1719	150	2014			142	13 0
10	4	0 62	1 620		57	7 70	127	1716	136	1837	3 18	43	136	14 7
11	4	0 11	1 730		57	7 70	140	2020	84	1212			72	13 2
12	2		1 650		57	7 80	132	1816	118	1624			108	11 3
13	1		1 600		56	7 70	120	1601	110	1468			98	11 4
14	4	2 58	1 880		58	7 60	145	2273	122	1913			106	8 7
15	4	1 67	2 290		58	7 70	138	2636	126	2406			104	6 0
16	4	0 22	2 930		58	7 60	69	1686	52	1271			36	6 7
17	1		3 240		58	7 50	101	2729	88	2378			78	7 3
18	1		3 020		60	7 60	63	1587	24	604			24	8 1
19	1		2 520		59	7 60	86	1807	70	1471	1 32	28	68	7 4
20	4	0 05	2 170		58	7 60	95	1719	78	1412			78	8 2
21	4	0 77	2 270		58	7 50	88	1666	84	1590			76	8 9
22	1		2 210		61	7 60	322	5935	129	2378			121	8 5
23	4	0 16	2 160		59	7 60	141	2540	102	1837			102	9 4
24	4	0 52	2 150		58	7 40	102	1829	84	1506			84	8 7
25	4	0 19	2 060		58	7 70	112	1924	140	2405			140	10 8
26	4	0 42	2 050		56	7 80	105	1795	90	1539			90	9 2
27	4	0 49	2 180		56	7 70	86	1564	88	1600			88	8 1
28	1		2 190		57	7 60	105	1918	74	1352			74	8 0
29	1		2 150		57	7 70	110	1972	104	1865			104	9 2
30	1		2 110		58	7 80	96	1689	102	1795	2 03	36	82	9 4
31	4	0 33	2 090		58	7 70	117	2039	154	2684			138	10 3
TL		8 85	63 130					64521		53817		144		
ME			2 036		57		126	2081	106	1736	2 32	36	100	10 1

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

PRIMARY EFFLUENT SHEET

May 2001

Marshall
MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

	PRIMARY EFFLUENT QUALITY												
DAY	BOD-5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS		AMMONIA NITROGEN	
	mg/l	LBS	Removal	mg/l	LBS	% Removal	mg/l	LBS	% Removal	mg/l	%	mg/l	LBS
1	93	1319	27.9	52	737	50.5				52 0	100.0	13 3	189
2	81	1101	42.1	56	761	41.7				46 0	82 1	13 4	182
3	74	1006	49.7	40	557	67.2	1 4	18.8	50.7	34 0	85 0	12 3	171
4	83	1156	28.4	32	443	52 9				32 0	100.0	13 1	181
5	86	1191	44.5	30	408	83.1				30 0	100 0	12 3	167
6	80	1088	42.9	34	471	74.6				34 0	100.0	10 7	148
7	78	1080	55.9	42	585	74.1				42 0	100.0	12 4	173
8	100	1393	44.1	64	859	48.4				58 0	90.6	14 4	193
9	93	1249	27.3	56	757	62.7				52 0	92.9	14 2	192
10	78	1054	38.6	36	519	73.5	1 7	24.2	47.2	36 0	100 0	12 8	185
11	78	1125	44.3	38	523	54.8				34 0	89.5	15 2	209
12	77	1060	41.7	42	560	64.4				34 0	81.0	12 7	169
13	62	827	48.3	44	690	60.0				36 0	81.8	10 8	169
14	75	1176	48 3	48	917	60.7				40 0	83.3	10 9	208
15	93	1776	32.6	38	929	69.8				32 0	84 2	9 0	220
16	49	1197	29.0	30	811	42.3				22.0	73.3	6 4	173
17	52	1405	48.5	40	1007	54.5				32 0	80.0	6 1	154
18	51	1285	19.0	34	715	-41 7				34 0	100.0	8 0	168
19	50	1051	41.9	38	688	45.7	1 0	18.8	21.2	38 0	100.0	7 8	141
20	54	977	43.2	30	568	61.5				30 0	100.0	7 9	150
21	53	1003	39.8	40	737	52.4				36 0	90 0	9 3	171
22	176	3244	45.3	48	865	62.8				40 0	83.3	10 6	191
23	88	1585	37.6	60	1076	41.2				60 0	100.0	11 6	208
24	61	1094	40.2	40	687	52 4				40 0	100 0	8 7	149
25	59	1014	47.3	40	684	71.4				40 0	100.0	11 0	188
26	69	1180	34.3	26	473	71.1				26 0	100.0	9 2	167
27	49	891	43.0	22	402	75.0				22 0	100 0	8 5	155
28	48	877	54.3	26	466	64.9				26 0	100.0	7 7	138
29	60	1076	45 5	48	845	53.8				48 0	100.0	10 2	179
30	53	933	44.8	32	558	68.6	1.2	21.4	39.4	24 0	75.0	9 4	164
31	67	1168	42.7	54	28431	64.9				50 0	92.6	11 0	5792
TL		37578			48728			83.3					11046
ME	73	1212	41.1	41	1572	57 4	1.3	20.8	39.6	1160.0	92.4	10.7	356

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
SURFACE WATER QUALITY DIVISION

DEQ

Discharge Number	Permit Number
001 A	MI 002 3540

DAILY DISCHARGE MONITORING REPORT

Monitoring Period
May 2001

DAY	CBOD5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS	NH3-N		PH	D.O.	F.COLI #/100ml	CL RESID	CN Amenable
	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	mg/l	LBS	SU	mg/l	MF	mg/l	mg/L
1	4.2	60	96.7	1.0	14	99.0				1.0	12.40	175.81	7.50	8.2	18	0.000	<0.005
2	4.1	56	97.1	1.0	14	99.0				1.0	12.40	168.57	7.50	8.0	21	0.000	
3	4.0	54	97.3	2.0	27	98.4	0.12	1.6	95.6	2.0	11.50	156.33	7.50	8.6	14	0.000	
4	4.1	57	96.5	2.0	28	97.1				2.0	13.20	183.85	7.50	8.5	15	0.000	
5	4.8	66	96.9	1.0	14	99.4				1.0	11.40	157.83	7.50	8.3	13	0.000	
6	3.5	48	97.5	1.0	14	99.3				1.0	9.64	131.05	7.50	8.1	25	0.000	
7	4.3	60	97.6	2.0	28	98.8				2.0	10.20	141.21	7.50	8.4	9	0.000	
8	5.2	72	97.1	1.0	14	99.2				1.0	12.30	171.31	7.50	8.2	34	0.000	<0.005
9	3.8	51	97.0	1.0	13	99.3				1.0	12.20	163.81	7.60	7.9	35	0.000	
10	4.7	64	96.3	1.0	14	99.3	0.16	2.2	95.0	1.0	12.40	167.53	7.50	7.6	22	0.000	
11	3.0	43	97.9	3.0	43	96.4				3.0	14.00	201.99	7.50	7.9	44	0.000	
12	3.0	41	97.7	5.0	69	95.8				4.0	12.60	173.39	7.50	8.1	27	0.000	<0.005
13	3.6	48	97.0	2.0	27	98.2				2.0	10.10	134.77	7.60	8.2	25	0.000	
14	4.3	67	97.0	4.0	63	96.7				4.0	10.10	158.36	7.50	8.4	21	0.000	
15	5.5	105	96.0	2.0	38	98.4				2.0	8.40	160.43	7.50	8.1	17	0.000	
16	4.2	103	93.9	1.0	24	98.1				1.0	5.90	144.17	7.40	8.1	27	0.000	
17	4.2	113	95.8	2.0	54	97.7				2.0	5.20	140.51	7.50	8.5	180	0.000	
18	3.8	96	94.0	6.0	151	75.0				4.0	6.50	163.71	7.50	8.2	120	0.000	
19	4.7	99	94.5	2.0	42	97.1	0.14	2.9	89.4	2.0	6.60	138.71	7.60	8.8	25	0.000	
20	6.6	119	93.1	1.0	18	98.7				1.0	6.70	121.26	7.70	8.7	12	0.005	
21	4.6	87	94.8	3.0	57	96.4				3.0	7.30	138.20	7.50	7.3	60	0.002	<0.005
22	10.3	190	96.8	3.0	55	97.7				3.0	8.60	158.51	7.50	8.2	19	0.000	
23	4.5	81	96.8	6.0	108	94.1				6.0	9.50	171.14	7.50	7.7	52	0.008	
24	3.0	54	97.1	2.0	36	97.6				2.0	7.20	129.10	7.50	7.9	21	0.000	
25	4.4	76	96.1	1.0	17	99.3				1.0	10.50	180.39	7.60	8.4	21	0.000	
26	4.0	68	96.2	1.0	17	98.9				1.0	9.90	169.26	7.60	8.2	9	0.000	
27	3.5	64	95.9	1.0	18	98.9				1.0	8.11	147.45	7.60	8.2	4	0.000	
28	3.8	69	96.4	1.0	18	98.6				1.0	6.75	123.29	7.60	8.7	4	0.004	
29	4.2	75	96.2	1.0	18	99.0				1.0	8.20	147.03	7.60	8.5	8	0.009	
30	5.2	92	94.6	6.0	106	94.1	0.20	3.5	90.1	6.0	10.10	177.73	7.60	8.1	7	0.000	
31	3.6	63	96.9	7.0	122	95.5				7.0	9.65	168.21	7.60	8.2	8	0.000	
TL		2341			1281			10.3									
ME	4.4	76	96.3	2.4	41	97.1	0.16	2.6	92.5	70.0	9.66	156.93		8.2	20	0.001	<0.005
WA	5.5	115		3.3	69										45		
MX											14.00	201.99	7.70			0.009	<0.005
MN													7.40	7.3			

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment See 18 U S C 1001 and 33 U S C 1319 (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 Years)

PRINTED NAME AND TITLE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTORIZED AGENT	DATE
Steven D. Washburn, Superintendent		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

ACTIVATED SLUDGE SHEET

May 2001

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	AERATION SYSTEM				MIXED LIQUOR								SECONDARY SLUDGE				
	AERTN VOL	DETEN TIME	CRT	F:M RATIO	MLSS		MLVSS		SETTL.	SDI	D.O.	AIR	SS	VSS	RAS FLOW	WAS	
	KCF	HRS	DAYS		mg/L	Lbs.	mg/L	Lbs.	%	%	mg/L	CF	%	%	%	Gallons	Lbs.
SF	3											4				3	
1	48	5.1	4.6	0.40	1346	4030	1088	3258	21	0.64	6.17	34	0.34	0.28	54	31	879
2	48	5.3	3.7	0.33	1358	4066	1103	3303	22	0.62	5.75	34	0.37	0.30	57	36	1111
3	48	5.3	3.7	0.31	1318	3947	1071	3207	21	0.63	6.80	32	0.33	0.27	57	39	1073
4	48	5.2	3.2	0.38	1265	3788	1010	3024	20	0.63	7.21	38	0.36	0.29	55	39	1171
5	48	5.2			1128	3378					7.26	44			56	40	
6	48	5.3			1062	3180					7.04	41			57	39	
7	48	5.2	3.8	0.37	1197	3584	970	2905	21	0.57	6.31	39	0.32	0.26	56	35	934
8	48	5.2	3.4	0.59	984	2946	788	2360	19	0.52	6.98	38	0.29	0.23	55	36	871
9	48	5.4	2.8	0.52	1000	2994	801	2399	16	0.63	6.16	36	0.34	0.27	57	38	1078
10	48	5.3	2.9	0.41	1083	3243	866	2593	20	0.54	5.85	35	0.34	0.27	54	39	1106
11	48	5.0	3.4	0.43	1104	3306	881	2638	20	0.55	6.32	42	0.30	0.24	51	39	976
12	48	5.2			1161	3476					6.35	47			53	39	
13	48	5.4			1098	3288					6.49	40			62	38	
14	48	4.6	3.4	0.46	1060	3174	853	2554	20	0.53	6.65	41	0.28	0.22	52	40	934
15	48	3.8	3.5	0.74	990	2964	805	2410	19	0.52	5.95	37	0.33	0.26	43	31	853
16	48	2.9	2.3	0.47	942	2821	859	2572	17	0.55	6.50	37	0.38	0.31	34	39	1236
17	48	2.7	3.5	0.65	905	2710	717	2147	18	0.50	7.55	31	0.31	0.25	30	30	776
18	48	2.9	2.6	0.57	940	2815	756	2264	17	0.55	6.52	34	0.43	0.35	25	30	1076
19	48	3.4			678	2030					6.04	35			22	31	
20	48	4.0			507	1518					8.41	32			27	25	
21	48	3.8	1.3	0.62	662	1982	542	1623	12	0.55	6.40	35	0.73	0.59	48	25	1522
22	48	3.9	5.9	1.35	991	2967	805	2410	17	0.58	6.36	40	0.25	0.20	52	24	500
23	48	4.0	5.3	0.55	1186	3551	960	2875	20	0.59	6.75	40	0.31	0.25	54	26	672
24	48	4.0	4.0	0.30	1506	4510	1230	3683	27	0.56	5.39	45	0.38	0.31	46	36	1141
25	48	4.2	2.8	0.29	1449	4339	1171	3506	27	0.54	7.34	44	0.42	0.34	46	45	1576
26	48	4.2			1324	3965					7.10	41			45	48	
27	48	4.0			1189	3560					6.82	47			44	47	
28	48	3.9			1079	3231					7.21	38			44	46	
29	48	4.0	3.9	0.46	978	2929	789	2363	15	0.65	7.66	37	0.32	0.26	45	28	747
30	48	4.1	3.5	0.35	1082	3240	878	2629	15	0.72	6.77	39	0.30	0.24	45	37	926
31	48	4.1	2.8	0.50	1084	3246	779	2333	14	0.77	6.17	37	0.37	0.32	42	37	1142
TL												1190				1113	22299
ME	48	4.4	3.5	0.50	1086	3251	896	2684	19	0.6	6.7	38	0.35	0.29	47	36	1014

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

BIOSOLIDS SHEET

Marshall
MI 002 3540

May 2001

SUPERINTENDENT
Steven D. Washburn

	RAW SLUDGE	RAW BIOSOLIDS			LIME STABILIZED BIOSOLIDS					
DAY	GALLONS	TOTAL SOLIDS %	VOLATILE SOLIDS %	pH SU	LIME POUNDS	pH 2 hrs @ 25 C SU	RDT Solids %	Lbs. Lime per 1000 gallons biosolids		
1	8000	4.9	77.0	6.0	1617		6.8	202		
2	2400	3.3	76.0	5.8	764		7.9	318		
3	3400	3.9	72.0	6.0		12.5				
4	3000	5.1	85.0	6.0						
5	3000	4.0	78.0	5.7						
6	5500	5.7	76.0	5.5						
7	4000	5.1	77.0	5.7						
8	8500	4.3	76.0	5.9	1323		9.1	156		
9	10500	4.0	71.0	6.0	1058		8.1	101		
10	3500	4.1	70.0	5.9		12.3				
11	3000	4.1	76.0	5.8						
12	3000	3.4	78.0	5.9						
13	6500	5.0	74.0	5.8	1411			217		
14	6300	4.3	76.0	5.9						
15	3000	5.8	70.0	5.8						
16	5000	4.3	70.0	5.8						
17	4000	6.9	63.0	5.7	706			177		
18	4500	6.0	70.0	5.7		12.4				
19	4000	5.0	71.0	5.4						
20	6500	6.5	64.0	5.4						
21	7000	4.6	74.0	6.0	529			76		
22	9600	4.7	74.0	5.9	1235		10.9	129		
23	9600	4.4	74.0	5.8	1352	12.3	16.4	141		
24	6600	3.7	75.0	6.0	706			107		
25	3000	3.6	76.0	5.9	588			196		
26	3000	4.3	78.0	5.8						
27	6600	5.0	76.0	6.1						
28	4900	5.3	75.0	5.9						
29	4000	5.1	78.0	6.0	794	12.3		199		
30	5000	4.6	76.0	6.0						
31	5000	4.9	75.0	5.9						
TOTAL	161900				12083					
MEAN	5223	4.7	74.2	5.8	1007	12.4	9.9	168		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MISCELLANEOUS SHEET

May 2001

Marshall
MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	WATER	ELECTRICAL USAGE		FUEL GAS		CHEMICALS APPLIED								
			X 120		X 100	$FECL_3$					Cl_2		SO_2	
	CF	METER	KWH	METER	CF	GALS	SP. GR.	% SOLN	LBS	mg/L	LBS	mg/L	LBS	mg/L
1	1530	16	1920	1	100	100.0	1.3980	30	349.8	24.7	14.0	1.0	12.0	0.8
2	1240	15	1800	1	100	100.0	1.3980	30	349.8	25.7	14	1.0	14.0	1.0
3	450	14	1680	2	200	100.0	1.3980	30	349.8	25.7	6	0.4	11.0	0.8
4	410	13	1560	0		100.0	1.3980	30	349.8	25.1	15	1.1	10.0	0.7
5	420	14	1680	1	100	100.0	1.3980	30	349.8	25.3	17	1.2	12.0	0.9
6	400	14	1680	2	200	100.0	1.3980	30	349.8	25.7	16	1.2	10.0	0.7
7	420	14	1680	1	100	100.0	1.3980	30	349.8	25.3	18	1.3	30.0	2.2
8	1990	14	1680	1	100	100.0	1.3980	30	349.8	25.1	15	1.1	11.0	0.8
9	1350	15	1800	1	100	100.0	1.3980	30	349.8	26.0	15	1.1	11.0	0.8
10	410	14	1680	2	200	100.0	1.3980	30	349.8	25.9	12	0.9	11.0	0.8
11	320	18	2160	0		100.0	1.3980	30	349.8	24.2	14	1.0	11.0	0.8
12	400	9	1080	3	300	50	1.3980	30	174.9	12.7	16	1.2	12.0	0.9
13	420	14	1680	1	100	125	1.3980	30	437.2	32.8	17	1.3	12.0	0.9
14	480	15	1800	1	100	100	1.3980	30	349.8	22.3	17	1.1	8.0	0.5
15	500	16	1920	1	100	100	1.3980	30	349.8	18.3	14	0.7	13.0	0.7
16	310	16	1920	1	100	100	1.3980	30	349.8	14.3	24	1.0	5.0	0.2
17	480	15	1800	1	100	100	1.3980	30	349.8	12.9	13	0.5	7.0	0.3
18	350	15	1800	3	300	100	1.3980	30	349.8	13.9	14	0.6	20.0	0.8
19	360	13	1560	0		75	1.3980	30	262.3	12.5	16	0.8	22.0	1.0
20	460	13	1560	1	100	100	1.3980	30	349.8	19.3	18	1.0	11.0	0.6
21	430	14	1680	1	100	50	1.3980	30	174.9	9.2	20	1.1	13.0	0.7
22	1130	17	2040	1	100	100	1.3980	30	349.8	19.0	18	1.0	13.0	0.7
23	2200	16	1920	2	200	100	1.3980	30	349.8	19.4	21	1.2	13.0	0.7
24	440	15	1800	5	500	100	1.3980	30	349.8	19.5	21	1.2	14.0	0.8
25	340	14	1680	2	200	50	1.3980	30	174.9	10.2	15	0.9	15.0	0.9
26	330	15	1800	15	1500	100	1.3980	30	349.8	20.5	23	1.3	14.0	0.8
27	380	15	1800	14	1400	75	1.3980	30	262.3	14.4	22	1.2	14.0	0.8
28	420	15	1800	3	300	100	1.3980	30	349.8	19.2	23	1.3	13.0	0.7
29	400	15	1800	2	200	75	1.3980	30	262.3	14.6	21	1.2	22.0	1.2
30	770	15	1800	1	100	100	1.3980	30	349.8	19.9	20	1.1	13.0	0.7
31	400	16	1920	1	100	50	1.3980	30	174.9	10.0	17	1.0	13.0	0.7
TL	19940	454	54480	71	7100	2850			9969		526		410.0	
ME	643	15	1757	2	254	92	1.3980	30.0	321.6	19.8	17.0	1.0	13.2	0.8

MANPOWER	
POSITION TITLE	NUMBER FULL TIME
SUPERINTENDANT	1
ASST. SUPT.	1
OPERATOR	3
MECHANIC	
CHEMIST	
LAB TECH	1
IPP COORDINATOR	
OTHER	

GIVE THE HOURS PER DAY THAT PLANT PERSONNEL ARE NORMALLY AT THE PLANT.

WEEKDAYS	8	HRS
SATURDAYS	8	HRS
SUNDAYS	8	HRS
HOLIDAYS	8	HRS

Weather Code	
1. Clear	6. Warm
2. Partly Cloudy	7. Cold
3. Cloudy	8. Windy
4. Rain	9. Melting Snow
5. Snow	

PLANT INFLUENT SHEET

June 2001

Marshall

STATE OF MICHIGAN

MI 002 3540

SUPERINTENDENT

DEPT OF ENVIRONMENTAL QUALITY

Steven D. Washburn

D	WEATHER		FLOW		RAW SEWAGE QUALITY									
A	TYPE	PRECIP	TOTAL	MAX	TEMP	pH	BOD_5		SS		TOTAL-P		VSS	NH3-N
Y	CODE	Inches	MGD	MGD	°F	SU	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l
1	4	0.38	2.080		57	7.80	134	2325	130	2255			130	11.9
2	4	0.27	2.050		57	7.70	123	2103	118	2017			118	9.5
3	4	0.03	2.050		56	7.70	113	1932	98	1676			98	9.2
4	2		2.060		57	7.70	118	2027	238	4089			230	10.4
5	4	0.26	2.080		58	7.70	100	1735	99	1717			99	10.0
6	4	0.02	2.090		58	7.70	98	1708	104	1813	2.61	45	94	9.8
7	2		2.020		58	7.60	110	1853	122	2055			112	9.5
8	1		2.000		58	7.60	137	2285	128	2135			120	11.0
9	1		1.950		56	7.60	122	1984	86	1399			86	9.5
10	4	0.14	1.920		57	7.40	142	2274	128	2050			124	9.9
11	4	0.39	2.110		59	7.50	126	2217	130	2288			130	9.4
12	2		2.110		60	7.50	135	2376	108	1901			106	9.1
13	2		2.100		60	7.50	109	1909	108	1892			92	8.3
14	1		2.070		62	7.50	185	3194	154	2659	2.64	46	146	10.1
15	4	0.32	1.960		62	7.40	126	2060	128	2092			124	10.9
16	1		1.880		61	7.50	100	1568	98	1537			98	8.8
17	4	0.57	1.860		57	7.60	103	1598	124	1924			122	9.7
18	2		2.080		59	7.60	125	2168	96	1665			96	9.1
19	2		2.110		60	7.60	122	2147	104	1830			97	8.8
20	1		1.960		60	7.60	98	1602	170	2779	2.44	40	158	8.6
21	4	0.99	2.060		59	7.70	137	2354	174	2989			162	10.4
22	1		1.930		60	7.60	113	1819	64	1030			64	11.4
23	1		1.900		60	7.50	132	2092	94	1490			88	9.5
24	1		1.890		58	7.60	83	1308	96	1513			90	9.0
25	1		2.020		62	7.50	142	2392	114	1921			112	9.3
26	1		1.990		61	7.60	132	2191	112	1859			101	9.9
27	1		1.970		62	7.50	148	2432	102	1676			74	8.5
28	1		1.980		60	7.60	114	1883	112	1849			102	8.7
29	1		1.850		60	7.60	123	1898	158	2438	2.18	34	156	10.1
30	1		1.850		60	7.70	137	2114	136	2098			134	9.1
31														
TL		3.37	59.980					61545		60634		165		
ME			1.999		59	7.59	123	2052	121	2021	2.47	41	115	9.6

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

PRIMARY EFFLUENT SHEET

June 2001

Marshall
MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

	PRIMARY EFFLUENT QUALITY												
DAY	BOD-5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS		AMMONIA NITROGEN	
	mg/l	LBS	Removal	mg/l	LBS	% Removal	mg/l	LBS	% Removal	mg/l	%	mg/l	LBS
1	62	1076	53.7	38	659	70.8				38.0	100.0	11 9	206
2	60	1026	51.2	36	615	69.5				36 0	100.0	9 0	154
3	60	1026	46.9	28	481	71 4				28 0	100.0	9 5	163
4	69	1185	41.5	44	763	81.5				40 0	90.9	11 6	201
5	80	1388	20.0	56	976	43.4				56 0	100.0	13 1	228
6	76	1325	22.4	68	1146	34 6	1 8	30.5	30.7	60 0	88.2	12 5	211
7	61	1028	44.5	46	767	62.3				40 0	87 0	10 5	175
8	68	1134	50.4	42	683	67.2				30 0	71 4	11 3	184
9	64	1041	47.5	44	705	48.8				44 0	100.0	10 6	170
10	51	817	64.1	36	634	71.9				36 0	100.0	9 3	164
11	70	1232	44.4	48	845	63.1				48 0	100.0	10 2	179
12	94	1654	30.4	50	876	53.7				50 0	100.0	11 8	207
13	83	1454	23.9	62	1070	42.6				50 0	80 6	10 8	186
14	101	1744	45.4	54	883	64.9	1 6	26.3	39.0	44 0	81.5	12 3	201
15	83	1357	34.1	38	596	70.3				38 0	100.0	12 0	188
16	59	925	41 0	38	589	61.2				38 0	100.0	10 0	155
17	47	729	54.4	42	729	66.1				42 0	100.0	9 2	160
18	65	1128	48.0	56	985	41.7				56 0	100.0	10 5	185
19	133	2340	-9.0	70	1144	32.7				68 0	97 1	11 5	188
20	97	1586	1.0	66	1134	61.2	1 4	23.2	44.7	52 0	78.8	11 4	196
21	109	1873	20.4	66	1062	62.1				60 0	90 9	11.6	187
22	81	1304	28.3	46	729	28.1				46 0	100.0	12 7	201
23	57	903	56.8	40	631	57.4				40 0	100.0	10 1	159
24	49	772	41.0	32	539	66.7				32 0	100.0	9 2	155
25	79	1331	44.4	50	830	56.1				50 0	100.0	10 5	174
26	111	1842	15.9	60	986	46.4				56 0	93 3	13 0	214
27	97	1594	34.5	62	1024	39.2				38 0	61 3	12 0	198
28	39	644	65.8	18	278	83.9				12 0	66.7	3 6	55
29	87	1342	29.3	66	1018	58.2	1 1	16.2	51.8	66 0	100.0	12 6	194
30	104	1605	24.1	56		58.8				56 0	100.0	12 4	
31													
TL		38402			23376			96 2					5239
ME	77	1280	37.2	49	779	57.9	1.5	24.1	41.5	44 0	92.9	10 9	175

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
SURFACE WATER QUALITY DIVISION

DEQ

Discharge Number	Permit Number
001 A	MI 002 3540

DAILY DISCHARGE MONITORING REPORT

Monitoring Period
June,2001

DAY	CBOD5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS	NH3-N		PH	D.O.	F.COLI #/100ml	CL RESID	CN Amenable
	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	mg/l	LBS	SU	mg/l	MF	mg/l	mg/L
1	5 8	101	95.7	1.0	17	99.2				1.0	11.00	190.82	7.60	8 4	27	0.000	
2	4.0	68	96.7	2.0	34	98.3				2.0	8.69	148.57	7.50	8.2	11	0.000	
3	3 8	65	96.6	1.0	17	99.0				1 0	7.87	134.55	7.60	8.3	21	0.000	<0.005
4	2.7	46	97.7	1.0	17	99.6				1.0	9.43	162.01	7.50	8.0	47	0.000	
5	4.6	80	95.4	1.0	17	99.0				1.0	10.70	185.62	7 50	7.4	47	0 000	
6	3.9	68	96.0	4 0	70	96.2	0.14	2.4	94.6	4.0	9.64	168.03	7 50	7.6	40	0.000	
7	3.8	64	96.5	2.0	34	98.4				2.0	8.56	144.21	7.50	7 6	37	0.000	
8	4.0	67	97.1	4.0	67	96.9				4.0	9.51	158.63	7.50	7.7	40	0.000	
9	3.8	62	96.9	1.0	16	98.8				1.0	9.85	160.19	7.50	7.3	25	0.000	
10	3.6	58	97.5	1.0	16	99.2				1.0	8.59	137.55	7.50	7.5	40	0.000	
11	3.9	69	96.9	1.0	18	99.2				1.0	8.20	144 30	7.50	7.6	144	0.000	<0.005
12	4.5	79	96.7	3.0	53	97.2				3.0	8.91	156.79	7.50	7.1	134	0.000	
13	4.4	77	96.0	3.0	53	97.2				2.0	7.73	135.38	7.50	6.6	34	0.000	
14	6.6	114	96.4	6.0	104	96.1	0.12	2.1	95.5	6.0	9.37	161.76	7.40	6.8	21	0.000	
15	5.4	88	95.7	4.0	65	96.9				4.0	9.37	153.17	7.40	6.9	15	0 000	
16	5.6	88	94.4	1.0	16	99.0				1.0	9.55	149.74	7.30	7.2	11	0.000	<0.005
17	3.1	48	97.0	1.0	16	99.2				1.0	7.62	118.20	7.30	7.6	12	0.000	
18	4.4	76	96.5	4.0	69	95.8				4.0	7.52	130.45	7.50	7.8	120	0 000	
19	5.0	88	95.9	3.0	53	97.1				3.0	8 18	143.95	7.60	7 3	18	0.000	
20	5.1	83	94.8	5.0	82	97.1	0.10	1.6	95.9	4.0	8.75	143.03	7.50	7.0	20	0.000	
21	5.4	93	96.1	2.0	34	98.9				2.0	7.52	129.20	7.40	6.7	114	0.000	
22	5.9	95	94.8	4.0	64	93.8				4.0	8.18	131.67	7.40	6.6	27	0.000	
23	4 1	65	96.9	1.0	16	98.9				1.0	8.75	138.65	7.40	7.1	14	0 000	
24	3.2	50	96.1	2.0	32	97.9				1.0	7.65	120.58	7.40	7 5	12	0.004	
25	4.6	77	96.8	1.0	17	99.1				1.0	7.67	129 21	7.50	7.5	62	0.007	
26	6.0	100	95.5	1.0	17	99.1				1.0	9.91	164.47	7.50	7.2	29	0.000	<0.005
27	3.9	64	97.4	8.0	131	92.2				5.0	7.98	131.11	7.50	6.9	40	0.000	
28	5.4	89	95.3	1.0	17	99.1				1.0	8.80	145.32	7.50	6.9	40	0.000	
29	3.5	54	97.2	1.0	15	99.4	0.27	4.2	87.6	1.0	9.17	141.48	7.40	6.7	33	0.000	
30	4.0	62	97.1	1.0	15	99.3				1.0	12.45	192.09	7.40	6.7	22	0.000	
31																	
TL		2238			1191			10.3									
ME	4.5	75	96.3	2.4	40	97.9	0.16	2.6	93.4	2.2	8.90	148.36		7.3	32	0.000	<0.005
WA	5.0	84		3.4	58										53		
MX											12.45	192.09	7.60			0.007	<0.005
MN													7.30	6.6			

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment See 18 U S C 1001 and 33 U S C 1319 (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 Years)

PRINTED NAME AND TITLE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTORIZED AGENT	DATE
Steven D. Washburn, Superintendent		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

ACTIVATED SLUDGE SHEET

June 2001

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	AERATION SYSTEM				MIXED LIQUOR								SECONDARY SLUDGE				
	AERTN VOL	DETEN TIME	CRT	F:M RATIO	MLSS		MLVSS		SETTL.	SDI	D.O.	AIR	SS	VSS	RAS FLOW	WAS	
	KCF	HRS	DAYS		mg/L	Lbs.	mg/L	Lbs.	%	%	mg/L	CF	%	%	%	Gallons	Lbs.
SF	3											4				3	
1	48	4.1	2.4	0.43	1038	3108	832	2491	15	0.69	6.20	43	0.45	0.36	42	35	1314
2	48	4.2			977	2926					7.13	43			43	35	
3	48	4.2			968	2899					7.78	44			44	33	
4	48	4.2	3.4	0.48	1010	3024	821	2458	15	0.67	5.74	38	0.33	0.27	44	32	881
5	48	4.1	3.3	0.54	1053	3153	862	2581	16	0.66	5.50	40	0.36	0.30	42	32	961
6	48	4.1	4.0	0.47	1143	3423	946	2833	18	0.64	5.46	40	0.27	0.23	42	38	856
7	48	4.3	2.8	0.35	1194	3575	983	2943	20	0.60	5.33	35	0.38	0.31	43	41	1299
8	48	4.3	2.9	0.40	1063	3183	944	2827	18	0.59	6.16	34	0.36	0.30	44	37	1111
9	48	4.4			1159	3471					5.13	31			45	33	
10	48	4.5			1157	3465					5.52	28			45	36	
11	48	4.1	3.1	0.46	1073	3213	886	2653	18	0.60	5.63	27	0.34	0.29	40	37	1049
12	48	4.1	2.6	0.62	1084	3246	897	2686	19	0.57	5.58	28	0.41	0.34	39	37	1265
13	48	4.1	3.1	0.46	1254	3755	1060	3174	22	0.57	4.36	23	0.41	0.35	42	35	1197
14	48	4.2	3.6	0.53	1318	3947	1102	3300	30	0.44	4.68	30	0.37	0.31	31	36	1111
15	48	4.4	3.6	0.38	1421	4255	1187	3554	34	0.42	4.09	30	0.38	0.31	47	37	1173
16	48	4.6			1371	4105					5.35	31			49	38	
17	48	4.6			1292	3869					5.86	27			48	37	
18	48	4.1	3.2	0.38	1208	3617	1003	3003	22	0.55	6.22	27	0.37	0.31	42	37	1142
19	48	4.1	3.1	0.79	1199	3590	990	2964	21	0.57	5.08	31	0.38	0.31	42	37	1173
20	48	4.4	5.3	0.52	1222	3659	1019	3051	24	0.51	4.12	39	0.23	0.19	46	36	691
21	48	4.2	3.7	0.54	1394	4174	1156	3462	24	0.58	4.34	39	0.33	0.28	45	41	1128
22	48	4.5	2.6	0.38	1399	4189	1155	3459	25	0.56	3.50	34	0.46	0.38	48	42	1611
23	48	4.5			1301	3896					4.61	33			48	41	
24	48	4.6			1220	3653					6.10	31			49	41	
25	48	4.3	3.1	0.50	1082	3240	883	2644	18	0.60	5.90	30	0.30	0.24	49	42	1051
26	48	4.3	2.8	0.67	1113	3333	915	2740	17	0.65	5.29	29	0.37	0.31	48	38	1173
27	48	4.4	3.1	0.50	1285	3848	1067	3195	19	0.68	4.55	28	0.36	0.30	49	42	1261
28	48	4.4	2.6	0.22	1277	3824	989	2961	21	0.61	4.16	28	0.43	0.34	49	41	1470
29	48	4.7	3.3	0.40	1375	4117	1131	3387	21	0.65	4.55	27	0.37	0.31	48	40	1234
30	48	4.7			1342	4018					4.50	26			53	40	
31	48																
TL												974				1127	24149
ME	48	4.3	3.2	0.48	1200	3592	992	2970	21	0.6	5.3	32	0.36	0.30	45	38	1150

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

BIOSOLIDS SHEET

June 2001

Marshall

MI 002 3540

SUPERINTENDENT
Steven D. Washburn

	RAW SLUDGE	RAW BIOSOLIDS			LIME STABILIZED BIOSOLIDS					
DAY	GALLONS	TOTAL SOLIDS %	VOLATILE SOLIDS %	pH SU	LIME POUNDS	pH 2 hrs @ 25 C SU	RDT Solids %	Lbs. Lime per 1000 gallons biosolids		
1	6000	4.3	76.0	6.2	1215			203		
2	6000	3.6	76.0	6.1		12.5				
3	8525	4.2	75.0	5.8						
4	4250	4.2	79.0	5.8						
5	10000	3.7	76.0	6.1	1944		6.7	194		
6	10000	3.5	76.0	5.9	2065		7.6	207		
7	6000	4.0	77.0	6.0		12.6				
8	6000	4.0	77.0	5.7						
9	20500	3.3	77.0	6.0						
10	8550	3.8	76.0	6.0						
11	8000	3.6	76.0	5.9						
12	6000	3.4	76.0	6.1	2430		5.8	405		
13	10000	3.6	73.0	6.1	2228		9.9	223		
14	4000	3.6	75.0	5.8		12.3				
15	4000	4.2	76.0	6.0						
16	4000	3.9	75.0	5.9						
17	7525	4.4	72.0	6.1						
18	6000	3.9	71.0	6.1						
19	8000	3.7	69.0	6.2	2228		9.5	279		
20	12000	4.0	73.0	6.1	1863		9.0	155		
21	4000	3.5	74.0	6.1		12.2				
22	4000	3.6	76.0	5.9						
23	4000	3.9	76.0	6.0						
24	8700	4.3	73.0	6.1						
25	6000	3.7	74.0	6.1						
26	11000	3.5	74.0	6.2	2228		9.0	203		
27	10500	3.1	74.0	6.1	2106		9.0	201		
28	11000	3.3	76.0	6.2		12.3				
29	4000	3.3	74.0	6.2	2754		6.1	689		
30	8500	3.3	82.0	6.2	2228	12.3		262		
31										
TOTAL	227050				23289					
MEAN	7568	3.7	75.1	6.0	2117	12.4	8.1	274		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MISCELLANEOUS SHEET

June 2001

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	WATER	ELECTRICAL USAGE		FUEL GAS		CHEMICALS APPLIED								
			X 120		X 100	$FECL_3$					Cl_2		SO_2	
	CF	METER	KWH	METER	CF	GALS	SP. GR.	% SOLN	LBS	mg/L	LBS	mg/L	LBS	mg/L
1	780	14	1680			100.0	1.3980	30	349.8	20.2	18.0	1.0	13.0	0.7
2	850	15	1800			100	1.3980	30	349.8	20.5	8	0.5	14.0	0.8
3	370	15	1800			50	1.3980	30	174.9	10.2	13	0.8	13.0	0.8
4	370	14	1680			100	1.3980	30	349.8	20.4	13	0.8	13.0	0.8
5	1640	16	1920			100	1.3980	30	349.8	20.2	14	0.8	14.0	0.8
6	1450	16	1920			75	1.3980	30	262.3	15.1	13	0.7	13.0	0.7
7	320	14	1680			50	1.3980	30	174.9	10.4	15	0.9	10.0	0.6
8	450	13	1560			125	1.3980	30	437.2	26.2	16	1.0	10.0	0.6
9	380	15	1800			75	1.3980	30	262.3	16.1	14	0.9	13.0	0.8
10	350	14	1680			100	1.3980	30	349.8	21.8	24	1.5	14.0	0.9
11	370	14	1680			100	1.3980	30	349.8	19.9	20	1.1	12.0	0.7
12	1820	17	2040			100	1.3980	30	349.8	19.9	20	1.1	14.0	0.8
13	1780	16	1920			100	1.3980	30	349.8	20.0	21	1.2	20.0	1.1
14	410	15	1800			100	1.3980	30	349.8	20.3	16	0.9	9.0	0.5
15	520	13	1560			200	1.3980	30	699.6	42.8	18	1.1	9.0	0.6
16	410	14	1680			100	1.3980	30	349.8	22.3	18	1.1	7.0	0.4
17	440	15	1800			100	1.3980	30	349.8	22.5	17	1.1	20.0	1.3
18	400	13	1560			150	1.3980	30	524.7	30.2	16	0.9	18.0	1.0
19	1570	18	2160			100	1.3980	30	349.8	19.9	15	0.9	12.0	0.7
20	1400	15	1800			100	1.3980	30	349.8	21.4	13	0.8	10.0	0.6
21	410	15	1800			100	1.3980	30	349.8	20.4	14	0.8	10.0	0.6
22	300	15	1800			150	1.3980	30	524.7	32.6	11	0.7	10.0	0.6
23	380	13	1560			100	1.3980	30	349.8	22.1	12	0.8	13.0	0.8
24	370	16	1920			100	1.3980	30	349.8	22.2	12	0.8	12.0	0.8
25	320	17	2040			100	1.3980	30	349.8	20.8	15	0.9	11.0	0.7
26	1550	17	2040			100	1.3980	30	349.8	21.1	12	0.7	10.0	0.6
27	1900	16	1920			100	1.3980	30	349.8	21.3	14	0.9	8.0	0.5
28	440	14	1680			125	1.3980	30	437.2	26.5	13	0.8	6.0	0.4
29	1840	16	1920			75	1.3980	30	262.3	17.0	12	0.8	16.0	1.0
30	500	15	1800			175	1.3980	30	612.1	39.7	13	0.8	15.0	1.0
31													17.0	
TL	24090	450	54000			3150					450		386.0	
ME	803	15	1800			105	1.3980	30.0	367.3	22.1	15.0	0.9	12.5	0.7

MANPOWER	
POSITION TITLE	NUMBER FULL TIME
SUPERINTENDANT	1
ASST. SUPT.	1
OPERATOR	3
MECHANIC	
CHEMIST	
LAB TECH	
IPP COORDINATOR	1
OTHER	

GIVE THE HOURS PER DAY THAT PLANT PERSONNEL ARE NORMALLY AT THE PLANT.

WEEKDAYS	8	HRS
SATURDAYS	8	HRS
SUNDAYS	8	HRS
HOLIDAYS	8	HRS

Weather Code	
1 Clear	6 Warm
2 Partly Cloudy	7 Cold
3 Cloudy	8 Windy
4 Rain	9 Melting Snow
5 Snow	

PLANT INFLUENT SHEET

July, 2001

Marshall

STATE OF MICHIGAN

MI 002 3540

SUPERINTENDENT

DEPT OF ENVIRONMENTAL QUALITY

Steven D Washburn

DAY	WEATHER TYPE CODE	WEATHER PRECIP Inches	FLOW TOTAL MGD	FLOW MAX MGD	RAW SEWAGE QUALITY TEMP °F	pH SU	BOD_5 mg/l	BOD_5 LBS	SS mg/l	SS LBS	TOTAL-P mg/l	TOTAL-P LBS	VSS mg/l	NH3-N mg/l
1	1		1 730		59	7 60	105	1515	130	1876			128	9 1
2	4	0 15	1 780		59	7 70	120	1781	124	1841			108	9 2
3	1		1 720		60	7 60	121	1736	175	2510			167	10 3
4	4	0 03	1 680		60	7 60	129	1807	114	1597	2 47	35	104	9 4
5	1		1 780		60	7 60	128	1900	104	1544			96	12 1
6	1		1 850		60	7 70	165	2546	98	1512			82	13 9
7	1		1 840		60	7 60	75	1151	150	2302			140	12 7
8	4	0 15	1 800		59	7 60	149	2237	100	1501			96	11 4
9	1		1 830		61	7 60	149	2274	116	1770			114	11 1
10	1		1 780		62	7 50	118	1752	114	1692			112	10 2
11	1		1 710		62	7 60	117	1669	118	1683	2 97	42	90	10 6
12	1		1 670		62	7 60	150	2089	120	1671			112	12 1
13	1		1 660		62	7 80	455	6299	126	1744			122	13 4
14	1		1 590		62	7 50	184	2440	174	2307			172	11 2
15	1		1 590		60	7 60	116	1538	154	2042			154	11 8
16	1		1 680		61	7 70	143	2004	154	2158			146	11 6
17	4	0 12	1 690		63	7 70	129	1818	131	1846			126	11 7
18	1		1 690		62	7 60	137	1931	146	2058	3 06	43	136	11 9
19	1		1 680		62	7 70	173	2424	156	2186			146	13 1
20	1		1 690		61	7 70	160	2255	148	2086			130	10 5
21	4	0 46	1 690		64	7 40	112	1579	130	1832			122	10 5
22	1		1 710		64	7 60	128	1825	136	1940			128	10 9
23	4	1 02	1 790		64	7 40	147	2195	194	2896			192	11 8
24	1		1 760		64	7 70	158	2319	219	3215			210	11 0
25	4	1 47	1 860		64	7 70	143	2218	130	2017	2 93	45	118	11 0
26	1		1 830		64	7 70	166	2534	130	1984			118	110 9
27	1		1 780		64	7 70	142	2108	134	1989			122	12 3
28	1		1 720		64	7 70	119	1707	112	1607			102	9 6
29	4	0 03	1 730		61	7 70	158	2280	138	1991			116	10 2
30	1		1 890		66	7 70	147	2317	128	2018			118	9 9
31	1		1 810		64	7 80	174	2627	134	2023			126	8 4
TL		3 43	54 010					66874		61438		166		
ME			1 742		61 9		149	2157	137	1982	2 86	41	128	14 3

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

PRIMARY EFFLUENT SHEET

July, 2001

Marshall
MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

	PRIMARY EFFLUENT QUALITY												
DAY	BOD-5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS		AMMONIA NITROGEN	
	mg/l	LBS	Removal	mg/l	LBS	% Removal	mg/l	LBS	% Removal	mg/l	%	mg/l	LBS
1	66	952	37.1	52	750	60.0				52 0	100 0	11 5	166
2	72	1069	40.0	50	717	59.7				46 0	92.0	11 8	169
3	68	975	43.8	44	616	74.9				40 0	90 9	12 6	177
4	59	827	54.3	46	683	59.6	0 9	13.1	64.4	40 0	87.0	10 8	160
5	63	935	50.8	40	617	61.5				38 0	95 0	11 6	179
6	101	1558	38.8	28	430	71.4				18.0	64.3	13 2	203
7	44	675	41.3	30	450	80.0				26 0	86.7	13 1	197
8	86	1291	42.3	28	427	72.0				26 0	92.9	10 9	166
9	86	1313	42.3	50	742	56.9				50 0	100 0	11 3	168
10	79	1173	33.1	40	570	64.9				40 0	100 0	11 5	164
11	77	1098	34.2	48	669	59.3	1 3	17 4	57.9	40 0	83 3	12 0	167
12	98	1365	34.7	44	609	63.3				38 0	86 4	13 3	184
13	163	2257	64.2	36	477	71.4				36 0	100.0	13 5	179
14	92	1220	50.0	30	398	82.8				30 0	100 0	11 1	147
15	58	769	50.0	34	476	77.9				34 0	100 0	11.5	161
16	67	939	53.1	40	564	74.0				40 0	100.0	12 4	175
17	77	1085	40.3	46	648	64.9				46 0	100 0	13 2	186
18	102	1438	25.5	46	645	68 5	1 4	18.9	55.9	40 0	87.0	14 7	206
19	84	1177	51.4	50	705	67.9				42.0	84 0	13 3	187
20	98	1381	38.8	50	705	66 2				42 0	84 0	14 0	197
21	69	973	38.4	42	599	67.7				34 0	81 0	11 4	163
22	74	1055	42.2	40	597	70.6				36 0	90.0	11 6	173
23	112	1672	23.8	50	734	74.2				50 0	100.0	12 9	189
24	105	1541	33.5	56	869	74.4				50 0	89.3	14 1	219
25	125	1939	12.6	60	916	53.8	1.4	21.2	52.6	48 0	80.0	13 6	208
26	91	1389	45.2	54	802	58.5				42 0	77.8	11 9	177
27	83	1232	41.5	38	545	71.6				34 0	89 5	12 4	178
28	69	990	42.0	36	519	67.9				34 0	94 4	10 6	153
29	103	1486	34.8	50	788	63.8				42 0	84.0	10 9	172
30	104	1639	29.3	56	845	56.3				50 0	89.3	12 8	193
31	92	1389	47.1	56	25225	58.2				50 0	89.3	10 9	4910
TL		38802			44338			70.6					10272
ME	86	1252	40.5	44	1430	66.9	1.2	17.7	57.7	1234.0	90 3	12.3	331

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
SURFACE WATER QUALITY DIVISION

DEQ

Discharge Number	Permit Number
001 A	MI 002 3540

DAILY DISCHARGE MONITORING REPORT

Monitoring Period
July, 2001

DAY	$CBOD_5$			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS	NH3-N		PH	D.O.	F.COLI #/100ml	CL RESID	CN Amenable
	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	mg/l	LBS	SU	mg/l	MF	mg/l	mg/L
1	3.6	52	96.6	1.0	14	99.2				1 0	10.15	146 45	7.50	6 6	11	0.000	
2	4.3	64	96.4	1.0	15	99.2				1.0	9.91	147.12	7.50	7.5	31	0.001	
3	4.3	62	96.4	1.0	14	99.4				1.0	9.95	142.73	7.50	7.6	27	0.003	
4	4.6	64	96.4	2.0	28	98.2	0.13	1.8	94.7	2.0	7.89	110.55	7.50	7.4	15	0.000	<0.005
5	3.9	58	97.0	1.0	15	99.0				1.0	7.71	114.46	7.50	7.5	45	0.000	
6	8.9	137	94.6	2.0	31	98.0				2.0	13.50	208.29	7.40	7.1	46	0.000	
7	7.3	112	90.3	1.0	15	99.3				1.0	11.50	176.47	7.50	6.4	50	0.000	
8	6.0	90	96.0	1.0	15	99.0				1.0	8.55	128.35	7.40	6.6	46	0.000	
9	6.0	92	96.0	4.0	61	96.6				4.0	7.62	116.30	7.40	7.0	37	0.000	
10	6.0	89	94.9	1.0	15	99.1				1.0	7.32	108 67	7.40	7.1	59	0.000	<0.005
11	4.9	70	95.8	3.0	43	97.5	0.14	2.0	95.3	3.0	6.31	89.99	7.40	7.0	26	0.000	
12	7.1	99	95.3	4.0	56	96.7				4.0	8.45	117.69	7.40	7.1	60	0.001	
13	11.0	152	97.6	1.0	14	99.2				1.0	9.90	137.06	7.40	7.0	82	0.000	
14	5.6	74	97.0	1.0	13	99.4				1.0	5.65	74.92	7.40	8.1	60	0.000	
15	3.4	45	97.1	1.0	13	99.4				1.0	4.85	64.31	7.40	10.4	38	0.000	
16	4.8	67	96.6	1.0	14	99.4				1.0	5.42	75.94	7.40	5.7	97	0.003	<0.005
17	4.3	61	96.7	1.0	14	99.2				1.0	5.79	81.61	7.40	6.6	90	0.000	
18	8.2	116	94.0	2.0	28	98.6	0.12	1.7	96.1	2.0	8.97	126.43	7.50	6.4	92	0.000	
19	4.5	63	97.4	3.0	42	98.1				3.0	6.95	97.38	7.40	6.4	68	0.000	
20	6.1	86	96.2	3.0	42	98.0				3.0	8.75	123.33	7.40	6.6	61	0.000	
21	15.6	220	86.1	31.0	437	76.2				26.0	9.28	130.80	7.40	6.4	32	0.000	
22	12.1	173	90.5	11.0	157	91.9				11.0	7.65	109.10	7.30	5.9	240	0.000	<0.005
23	5.3	79	96.4	3.0	45	98.5				3.0	4.80	71.66	7.30	6.6	120	0.008	
24	6.1	90	96.1	4.0	59	98.2				4.0	6.00	88.07	7.40	6.4	264	0.004	
25	5.2	81	96.4	3.0	47	97.7	0.11	1.7	96.2	3.0	5.93	91.99	7.50	6.8	128	0.013	
26	4.1	63	97.5	3.0	46	97.7				3.0	2.88	43.96	7.50	7.7	74	0.000	
27	3.7	55	97.4	2.0	30	98.5				1.0	1.53	22.71	7.40	7.3	244	0.000	
28	4.2	60	96.5	1.0	14	99.1				1.0	0.04	0.57	7.40	7.5	64	0.000	
29	3.7	53	97.7	2.0	29	98.6				2.0	1.47	21.21	7.50	7.5	41	0.000	
30	5.4	85	96.3	4.0	63	96.9				4.0	3.11	49.02	7.40	6.4	51	0.009	
31	5.7	86	96.7	3.0	45	97.8				3.0	0.73	11.02	7.40	6.8	560	0.000	
TL		2697			1474			7.2									
ME	6.0	87	95.7	3.3	48	97.5	0.13	1.8	95.6	96.0	6.73	97.68		7.0	63	0.001	<0.005
WA	8.3	118		8.3	119										141		
MX											13.50	208.29	7.50			0.013	<0.005
MN													7.30	5.7			

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment See 18 U S C 1001 and 33 U S C 1319 (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 Years)

PRINTED NAME AND TITLE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTORIZED AGENT	DATE
Steven D. Washburn, Superintendent		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

ACTIVATED SLUDGE SHEET

July, 2001

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	AERATION SYSTEM				MIXED LIQUOR								SECONDARY SLUDGE				
	AERTN VOL	DETEN TIME	CRT	F:M RATIO	MLSS		MLVSS		SETTL.	SDI	D.O.	AIR	SS	VSS	RAS FLOW	WAS	
	KCF	HRS	DAYS		mg/L	Lbs.	mg/L	Lbs.	%	%	mg/L	CF	%	%	%	Gallons	Lbs.
SF	3											4				3	
1	48	5.0			1348	4036					3.29	36			56	39	
2	48	4.8	4.5	0.36	1218	3647	1005	3009	19	0.64	5.78	36	0.26	0.21	54	37	802
3	48	5.0	3.0	0.34	1156	3462	952	2851	16	0.72	6.01	31	0.38	0.31	55	36	1141
4	48	5.1			1174	3515					5.22	32			58	36	
5	48	4.8	3.5	0.36	1083	3243	869	2602	14	0.77	6.19	35	0.29	0.23	54	38	919
6	48	4.7	3.3	0.65	1001	2997	802	2402	13	0.77	5.46	34	0.27	0.21	52	40	901
7	48	4.7			1021	3057					4.99	30			53	40	
8	48	4.8			985	2949					4.72	27			53	32	
9	48	4.7	5.1	0.55	991	2967	804	2407	18	0.55	4.52	27	0.24	0.19	53	29	580
10	48	4.8	3.9	0.47	1012	3030	827	2476	19	0.53	4.68	27	0.29	0.23	52	32	774
11	48	5.0	3.4	0.45	1012	3030	811	2428	19	0.53	4.67	34	0.29	0.24	59	37	895
12	48	5.2	4.5	0.46	1093	3273	984	2946	22	0.50	4.48	34	0.22	0.17	61	40	734
13	48	5.2	4.0	0.81	1149	3441	928	2779	25	0.46	3.49	35	0.26	0.21	61	40	867
14	48	5.4			1107	3315					5.01	33			63	40	
15	48	5.4			1096	3282					4.64	30			62	40	
16	48	5.1	3.9	0.36	1096	3282	867	2596	27	0.41	4.30	29	0.25	0.25	58	40	834
17	48	5.1	4.0	0.41	1082	3240	875	2620	25	0.43	4.99	34	0.24	0.24	58	40	801
18	48	5.1	4.1	0.53	1102	3300	901	2698	26	0.42	4.34	30	0.24	0.24	58	40	801
19	48	5.1	4.0	0.41	1157	3465	950	2845	40	0.29	3.06	27	0.26	0.26	60	40	867
20	48	5.1	3.6	0.47	1189	3560	974	2917	31	0.38	4.12	26	0.30	0.30	60	40	1001
21	48	5.1			1188	3557					4.62	8			60	40	
22	48	5.0			2119	6345					2.28	32			57	43	
23	48	4.8	3.9	0.62	1111	3327	907	2716	35	0.32	4.08	41	0.27	0.27	52	38	856
24	48	4.9	3.9	0.58	1113	3333	887	2656	26	0.43	3.20	38	0.29	0.29	52	35	847
25	48	4.6	3.3	0.71	1114	3336	915	2740	26	0.43	3.29	49	0.33	0.33	47	37	1018
26	48	4.7	3.1	0.48	1187	3554	966	2893	27	0.44	5.02	49	0.34	0.34	50	41	1163
27	48	4.8	3.2	0.43	1189	3560	961	2878	24	0.50	5.91	49	0.33	0.33	52	40	1101
28	48	5.0			1162	3479					6.80	42			54	40	
29	48	5.0			1084	3246					6.90	40			52	39	
30	48	4.6	4.0	0.68	1011	3027	811	2428	18	0.56	4.47	40	0.23	0.19	47	39	748
31	48	4.8	2.8	0.52	1083	3243	887	2656	19	0.57	3.64	38	0.36	0.30	51	38	1141
TL												1053				1186	18790
ME	48	5.0	3.8	0.51	1143	3423	899	2693	23	0.5	4.7	34	0.28	0.25	55	38	895

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

BIOSOLIDS SHEET

Marshall

MI 002 3540

July, 2001

SUPERINTENDENT
Steven D. Washburn

	RAW SLUDGE	RAW BIOSOLIDS			LIME STABILIZED BIOSOLIDS					
DAY	GALLONS	TOTAL SOLIDS %	VOLATILE SOLIDS %	pH SU	LIME POUNDS	pH 2 hrs @ 25 C SU	RDT Solids %	Lbs. Lime per 1000 gallons biosolids		
1	9000	3.6	75.0	6.4						
2	11000	3.4	74.0	6.4						
3	6000	3.1	75.0	6.2	880	12.1		147		
4	10000	3.0	74.0	6.4	880			88		
5	8000	2.9	74.0	6.4		12.1				
6	4000	3.7	73.0	6.3						
7	4000	3.2	76.0	6.2						
8	6400	3.8	75.0	6.0						
9	4500	3.8	76.0	5.8						
10	6500	3.6	75.0	5.9	880		7.5	135		
11	8500	3.7	74.0	6.0	560		8.2	66		
12	4000	3.5	75.0	6.0						
13	4000	3.0	73.0	6.0		12.1				
14	4000	3.7	72.0	6.1						
15	5300	4.0	73.0	5.9						
16	8000	3.4	74.0	6.1						
17	8000	2.9	71.0	6.1	880		7.8	110		
18	8000	3.4	75.0	6.1	592		8.7	74		
19	4000	3.6	74.0	6.1		12.0				
20	4000	3.3	72.0	5.9		12.0				
21	4000	3.6	70.0	5.8						
22	5500	4.2	71.0	5.8						
23	6000	3.9	68.0	5.8						
24	9000	3.6	64.0	5.8	832		6.8	92		
25	11000	3.1	71.0	6.0	576		8.3	52		
26	4000	3.5	73.0	6.0		12.1				
27	4000	3.5	72.0	5.9						
28	4000	3.2	74.0	5.7						
29	5000	4.0	71.0	5.8						
30	5250	3.7	74.0	5.8						
31	5000	3.5	72.0	5.8	1056		6.1	211		
TOTAL	189950				7136					
MEAN	6127	3.5	72.9	6.0	793	12.1	7.6	108		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MISCELLANEOUS SHEET

July, 2001

Marshall
MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	WATER	ELECTRICAL USAGE		FUEL GAS		CHEMICALS APPLIED								
			X 120		X 100	$FECL_3$					Cl_2		SO_2	
	CF	METER	KWH	METER	CF	GALS	SP. GR.	% SOLN	LBS	mg/L	LBS	mg/L	LBS	mg/L
1	420	15	1800			100.0	1.3980	30	349.8	24.2	11.0	0.8	9.0	0.6
2	380	15	1800			75	1.3980	30	262.3	17.7	14	0.9	7.0	0.5
3	410	14	1680			100	1.3980	30	349.8	24.4	19	1.3	5.0	0.3
4	490	14	1680			100	1.3980	30	349.8	25.0	12	0.9	9.0	0.6
5	380	14	1680			100	1.3980	30	349.8	23.6	17	1.1	19.0	1.3
6	610	15	1800			100	1.3980	30	349.8	22.7	13	0.8	7.0	0.5
7	370	13	1560			100	1.3980	30	349.8	22.8	16	1.0	6.0	0.4
8	370	15	1800			100	1.3980	30	349.8	23.3	15	1.0	8.0	0.5
9	360	14	1680			100	1.3980	30	349.8	22.9	16	1.0	17.0	1.1
10	1620	16	1920			100	1.3980	30	349.8	23.6	14	0.9	8.0	0.5
11	1180	16	1920			100	1.3980	30	349.8	24.5	16	1.1	13.0	0.9
12	340	16	1920			100	1.3980	30	349.8	25.1	8	0.6	12.0	0.9
13	350	13	1560			100	1.3980	30	349.8	25.3	12	0.9	17.0	1.2
14	330	15	1800			75	1.3980	30	262.3	19.8	12	0.9	13.0	1.0
15	390	14	1680			100	1.3980	30	349.8	26.4	12	0.9	12.0	0.9
16	430	15	1800			100	1.3980	30	349.8	25.0	12	0.9	11.0	0.8
17	1650	15	1800			100	1.3980	30	349.8	24.8	11	0.8	10.0	0.7
18	1220	15	1800			100	1.3980	30	349.8	24.8	13	0.9	10.0	0.7
19	460	15	1800			100	1.3980	30	349.8	25.0	12	0.9	12.0	0.9
20	460	14	1680			100	1.3980	30	349.8	24.8	14	1.0	11.0	0.8
21	330	10	1200			50	1.3980	30	174.9	12.4	13	0.9	7.0	0.5
22	330	15	1800			100	1.3980	30	349.8	24.5	17	1.2	9.0	0.6
23	540	15	1800			50	1.3980	30	174.9	11.7	16	1.1	7.0	0.5
24	370	17	2040			100	1.3980	30	349.8	23.8	20	1.4	15.0	1.0
25	1270	17	2040			100	1.3980	30	349.8	22.5	18	1.2	9.0	0.6
26	580	15	1800			100	1.3980	30	349.8	22.9	20	1.3	10.0	0.7
27	940	15	1800			100	1.3980	30	349.8	23.6	23	1.5	10.0	0.7
28	320	15	1800			100	1.3980	30	349.8	24.4	25	1.7	10.0	0.7
29	310	16	1920			100	1.3980	30	349.8	24.2	23	1.6	13.0	0.9
30	340	15	1800			75	1.3980	30	262.3	16.6	21	1.3	10.0	0.6
31	1590	16	1920			75	1.3980	30	262.3	17.4	11	0.7	10.0	0.7
TL	19140	459	55080			2900					476		326.0	
ME	617	15	1777			94	1.3980	30.0	327.2	22.6	15.4	1.1	10.5	0.7

MANPOWER	
POSITION TITLE	NUMBER FULL TIME
SUPERINTENDANT	1
ASST. SUPT.	1
OPERATOR	3
MECHANIC	
CHEMIST	
LAB TECH	
IPP COORDINATOR	1
OTHER	

GIVE THE HOURS PER DAY THAT PLANT PERSONNEL ARE NORMALLY AT THE PLANT.

WEEKDAYS	8	HRS
SATURDAYS	8	HRS
SUNDAYS	8	HRS
HOLIDAYS	8	HRS

Weather Code	
1 Clear	6 Warm
2 Partly Cloudy	7 Cold
3 Cloudy	8 Windy
4 Rain	9 Melting Snow
5 Snow	

PLANT INFLUENT SHEET

August 2001

Marshall

STATE OF MICHIGAN

MI 002 3540

SUPERINTENDENT

DEPT OF ENVIRONMENTAL QUALITY

Steven D Washburn

D	WEATHER		FLOW		RAW SEWAGE QUALITY									
A	TYPE	PRECIP	TOTAL	MAX	TEMP	pH	BOD_5		SS		TOTAL-P		VSS	NH3-N
Y	CODE	Inches	MGD	MGD	°F	SU	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l
1	1		1 810		65	7 50	165	2491	108	1630	3 29	50	94	10 9
2	4	0 03	1 790		66	7 70	190	2836	120	1791			108	12 7
3	1		1 760		65	7 50	142	2084	122	1791			112	12 3
4	1		1 610		65	7 70	131	1759	144	1934			134	10 4
5	1		1 580		62	7 70	135	1779	116	1529			110	11 0
6	1		1 650		64	7 70	181	2491	142	1954			138	13 0
7	1		1 740		64	7 50	158	2293	110	1596			103	10 9
8	1		1 720		65	7 50	180	2582	156	2238	3 16	45	156	11 2
9	4	0 55	1 720		64	7 50	183	2625	118	1693			104	11 9
10	1		1 640		65	7 60	205	2804	120	1641			116	12 5
11	1		1 450		62	7 90	179	2165	136	1645			136	12 1
12	1		1 510		62	7 70	137	1725	148	1864			140	11 9
13	1		1 520		63	7 50	136	1724	126	1597			116	12 2
14	1		1 680		62	7 60	177	2480	128	1793	2 98	42	121	14 2
15	4	0 06	1 550		63	7 60	148	1913	156	2017			146	15 3
16	4	0 07	1 570		63	7 50	150	1964	128	1676			118	20 3
17	1		1 550		64	7 60	205	2650	162	2094			158	14 3
18	4	0 58	1 570		64	7 80	229	2998	158	2069			152	13 5
19	4	0 04	1 530		63	7 60	154	1965	138	1761			134	10 6
20	1		1 730		65	7 50	159	2294	138	1991			130	11 0
21	4	0 06	1 710		64	7 50	131	1868	118	1683			114	11 3
22	4	1 34	1 780		68	7 40	137	2034	146	2167	3 18	47	140	13 9
23	1		1 740		66	7 60	170	2467	150	2177			146	14 6
24	4	0 03	1 730		67	7 90	166	2395	124	1789			116	13 4
25	4	0 06	1 570		66	7 60	137	1794	110	1440			108	11 1
26	4	0 11	1 610		66	7 60	129	1732	126	1692			116	12 2
27	4	0 14	1 670		66	7 50	171	2382	136	1894			136	11 1
28	1		1 740		63	7 60	143	2075	146	2119			144	12 4
29	1		1 750		61	7 60	143	2087	150	2189			128	13 2
30	1		1 730		64	7 50	170	2453	114	1645			108	13 1
31	1		1 620		65	7 70	161	2175	246	3324			208	13 1
TL		3 07	51 330					69085		58422		184		
ME			1 656		64 3		161	2229	137	1885	3 15	46	129	12 6

City of Marshall
801 Industrial Rd
Marshall, MI 49068

PRIMARY EFFLUENT SHEET

August 2001

Marshall
MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

	PRIMARY EFFLUENT QUALITY												
DAY	BOD-5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS		AMMONIA NITROGEN	
	mg/l	LBS	Removal	mg/l	LBS	% Removal	mg/l	LBS	% Removal	mg/l	%	mg/l	LBS
1	110	1660	33.3	60	906	44.4	1 7	26.1	47.4	52 0	86.7	12 8	193
2	107	1597	43.7	44	646	63.3				36 0	81.8	14 5	213
3	87	1277	38.7	56	752	54.1				56 0	100.0	13 7	184
4	69	926	47.3	44	580	69 4				44 0	100.0	10 9	144
5	71	936	47.4	40	550	65.5				40 0	100.0	11 7	161
6	107	1472	40.9	48	697	66.2				48 0	100.0	14 0	203
7	101	1466	36.1	36	516	67.3				36 0	100.0	13 4	192
8	123	1764	31.7	54	775	65.4	1 4	19.9	56 0	54 0	100 0	13 5	194
9	147	2109	19.7	54	739	54.2				52 0	96.3	13 5	185
10	113	1546	44.9	64	774	46.7				56 0	87.5	14 3	173
11	107	1294	40.2	52	655	61.8				52 0	100.0	13 6	171
12	83	1045	39.4	50	634	66.2				50 0	100.0	13 8	175
13	78	989	42.6	66	925	47.6				60 0	90.9	13 0	182
14	106	1485	40.1	62	801	51.6	1 5	19.3	50.0	58 0	93.5	14 4	186
15	101	1306	31.8	76	995	51.3				68 0	89.5	15 9	208
16	77	1008	48.7	54	698	57.8				46 0	85.2	14 9	193
17	97	1254	52.7	58	759	64.2				58 0	100 0	17 6	230
18	135	1768	41.0	44	561	72.2				44 0	100.0	15 5	198
19	80	1021	48.1	48	693	65.2				48 0	100 0	13 7	198
20	95	1371	40.3	54	770	60.9				54 0	100.0	11 8	168
21	100	1426	23.7	56	831	52.5				52 0	92.9	13 2	196
22	102	1514	25.5	62	900	57.5	1 5	21.2	54.1	62 0	100.0	12 8	186
23	123	1785	27.6	70	1010	53.3				68 0	97.1	14 7	212
24	101	1457	39.2	56	733	54.8				58 0	103.6	14 6	191
25	92	1205	32.8	54	725	50.9				54 0	100.0	14 2	191
26	73	980	43.4	50	696	60.3				48.0	96.0	11 4	159
27	68	947	60.2	46	668	66.2				46 0	100 0	12 4	180
28	96	1393	32.9	56	817	61.6				52 0	92.9	12 8	187
29	86	1255	39.9	54	779	64.0				44 0	81.5	12.8	185
30	111	1602	34.7	54	730	52.6				52 0	96.3	13 5	182
31	110	1486	31.7	44	605	82.1				36 0	81.8	14 3	6122
TL		42344			22920			86.5					11741
ME	99	1366	38.7	54	739	59.7	1.5	21.6	51.9		95.3	13.7	379

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
SURFACE WATER QUALITY DIVISION

DEQ

Discharge Number	Permit Number
001 A	MI 002 3540

DAILY DISCHARGE MONITORING REPORT

Monitoring Period
August 2001

DAY	CBOD5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS	NH3-N		PH	D.O.	F.COLI #/100ml	CL RESID	CN Amenable
	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	mg/l	LBS	SU	mg/l	MF	mg/l	mg/L
1	5.5	83	96.7	1.0	15	99.1	0.15	2.3	95.4	1.0	2.30	34.72	7.40	7.3	1120	0.000	
2	4.3	64	97.7	1.0	15	99.2				1.0	6.46	96.44	7.30	6.3	39	0.009	
3	3.7	54	97.4	4.0	59	96.7				3.0	5.00	73 39	7.40	6.5	39	0.000	
4	4.6	62	96.5	2.0	27	98.6				2.0	1.10	14.77	7.40	6.9	55	0.000	
5	5.3	70	96.1	1.0	13	99.1				1.0	0.66	8.70	7.40	7.2	33	0.000	
6	5.9	81	96.7	3.0	41	97.9				3.0	5.30	72.93	7.40	6.8	31	0.009	<0.005
7	6.4	93	95.9	2.0	29	98.2				2.0	6.18	89.68	7.30	6.6	32	0.009	
8	5.0	72	97.2	3.0	43	98.1	0.16	2.3	94.9	3.0	2.79	40.02	7.30	6.6	28	0.003	
9	6.2	89	96.6	3.0	43	97.5				3.0	5.22	74.88	7.30	6.4	27	0.011	
10	4.4	60	97.9	7.0	96	94.2				7.0	4.65	63.60	7.30	6.3	25	0.005	
11	6.3	76	96.5	4.0	48	97.1				4.0	4.57	55.27	7.40	6.6	31	0.007	
12	5.2	65	96.2	3.0	38	98.0				3.0	4.10	51.63	7.40	6.3	13	0.010	
13	5.3	67	96.1	5.0	63	96.0				5.0	1.39	17.62	7.30	6.4	46	0.000	
14	6.1	85	96.6	5.0	70	96.1	0.18	2.5	94.0	5.0	1.82	25.50	7.40	6.9	196	0.000	<0.005
15	3.9	50	97.4	4.0	52	97.4				4.0	2.70	34.90	7.30	6.6	25	0.000	
16	4.5	59	97.0	3.0	39	97.7				3.0	1.47	19.25	7.30	6.2	88	0.000	
17	4.0	52	98.0	4.0	52	97.5				4.0	3.49	45.12	7.30	6.4	60	0.000	
18	8.8	115	96.2	2.0	26	98.7				2.0	7.48	97.94	7.30	6.0	26	0.000	<0.005
19	5.8	74	96.2	3.0	38	97.8				3.0	3.09	39.43	7.40	6.2	21	0.000	
20	5.5	79	96.5	4.0	58	97.1				4.0	0.90	12.99	7.40	6.6	65	0.000	
21	3.6	51	97.3	1.0	14	99.2				1.0	0.63	8.98	7.40	7.1	248	0.000	
22	3.9	58	97.2	1.0	15	99.3	0.13	1.9	95.9	1.0	1.60	23.75	7.40	6.3	52	0.000	
23	4.4	64	97.4	6.0	87	96.0				6.0	3.31	48.03	7.30	6.4	45	0.000	
24	4.3	62	97.4	5.0	72	96.0				5.0	7.60	109.65	7.40	6.0	26	0.000	
25	4.8	63	96.5	3.0	39	97.3				3.0	5.45	71.36	7.30	5.8	20	0.000	
26	4.7	63	96.4	1.0	13	99.2				1.0	2.00	26.85	7.30	5.8	8	0.000	<0.005
27	4.2	58	97.5	1.0	14	99.3				1.0	1.10	15.32	7.30	6.5	18	0.006	
28	4.7	68	96.7	1.0	15	99.3				1.0	0.54	7.84	7.30	6.9	31	0.000	
29	3.0	44	97.9	2.0	29	98.7				2.0	1.05	15.32	7.40	6.6	20	0.000	
30	3.7	53	97.8	2.0	29	98.2				2.0	2.57	37.08	7.40	6.7	34	0.000	
31	4.6	62	97.1	1.0	14	99.6				1.0	3.51	47.42	7.30	6.3	10	0.000	
TL		2099			1206			9.0									
ME	4.9	68	96.9	2.8	39	97.9	0.16	2.3	95.1	87.0	3.23	44.53		6.5	38	0.002	<0.005
WA	5.6	77		4.4	59										61		
MX											7.60	109.65	7.40			0.011	<0.005
MN													7.30	5.8			

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment See 18 U S C 1001 and 33 U S C 1319 (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 Years)

PRINTED NAME AND TITLE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTORIZED AGENT	DATE
Steven D. Washburn, Superintendent		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

ACTIVATED SLUDGE SHEET

August 2001

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	AERATION SYSTEM				MIXED LIQUOR								SECONDARY SLUDGE				
	AERTN VOL	DETEN TIME	CRT	F:M RATIO	MLSS		MLVSS		SETTL.	SDI	D.O.	AIR	SS	VSS	RAS FLOW	WAS	
	KCF	HRS	DAYS		mg/L	Lbs.	mg/L	Lbs.	%	%	mg/L	CF	%	%	%	Gallons	Lbs.
SF	3											4				3	
1	48	4.8	3.1	0.59	1145	3429	932	2791	19	0.60	5.75	30	0.35	0.29	50	38	1109
2	48	4.8	4.4	0.56	1160	3473	956	2863	23	0.50	2.78	29	0.25	0.20	51	38	792
3	48	4.9	3.8	0.44	1176	3521	967	2896	22	0.53	2.75	33	0.30	0.24	51	37	926
4	48	5.4			1179	3530					5.50	35			57	37	
5	48	5.5			1114	3336					6.00	34			58	37	
6	48	5.2	4.2	0.57	1045	3129	862	2581	17	0.61	5.05	32	0.24	0.20	56	37	741
7	48	5.0	3.5	0.55	1075	3219	885	2650	18	0.60	1.19	29	0.33	0.27	58	33	908
8	48	5.0	4.5	0.56	1240	3713	1044	3126	20	0.62	4.37	28	0.34	0.28	61	29	822
9	48	5.0	4.7	0.65	1304	3905	1081	3237	29	0.45	2.84	30	0.34	0.28	61	29	822
10	48	5.3	5.9	0.44	1393	4171	1169	3500	34	0.41	1.47	36	0.29	0.24	63	29	701
11	48	5.9			1498	4486					4.38	38			70	31	
12	48	5.7			1540	4611					1.38	35			64	35	
13	48	5.7	5.2	0.27	1428	4276	1205	3608	29	0.49	4.35	34	0.28	0.23	60	35	817
14	48	5.1	4.2	0.43	1388	4156	1164	3485	28	0.50	5.22	40	0.29	0.24	59	41	992
15	48	5.6	3.7	0.39	1359	4069	1126	3372	26	0.52	4.38	43	0.31	0.26	65	43	1112
16	48	5.5	3.3	0.30	1354	4054	1123	3363	23	0.59	4.04	43	0.35	0.29	63	42	1226
17	48	5.6	4.1	0.40	1282	3839	1056	3162	22	0.58	4.90	40	0.30	0.25	68	37	926
18	48	5.5			1314	3935					3.61	39			64	35	
19	48	5.6			1380	4132					1.31	40			65	34	
20	48	5.0	4.8	0.42	1309	3920	1093	3273	21	0.62	4.90	39	0.28	0.24	57	35	817
21	48	5.0	3.8	0.44	1311	3926	1090	3264	20	0.66	5.01	37	0.35	0.30	57	35	1022
22	48	4.8	4.0	0.45	1348	4036	1116	3342	20	0.67	4.30	41	0.35	0.29	54	35	1022
23	48	5.0	6.3	0.51	1416	4240	1173	3512	22	0.64	3.32	37	0.28	0.22	55	29	677
24	48	5.0	3.6	0.38	1535	4596	1276	3821	25	0.61	2.26	38	0.47	0.39	56	33	1294
25	48	5.5			1576	4719					2.77	38			62	33	
26	48	5.4			1533	4590					2.49	40			60	33	
27	48	5.2	4.9	0.27	1407	4213	1178	3527	23	0.61	4.62	37	0.27	0.23	57	38	856
28	48	5.0	3.1	0.43	1294	3875	1075	3219	19	0.68	5.32	41	0.37	0.31	53	40	1234
29	48	4.9	3.1	0.42	1227	3674	1009	3021	18	0.68	4.66	40	0.37	0.31	55	39	1203
30	48	5.0	4.0	0.51	1267	3794	1041	3117	20	0.63	4.46	37	0.29	0.24	57	39	943
31	48	5.3	4.8	0.45	1333	3992	1104	3306	20	0.67	3.00	42	0.25	0.20	61	40	834
TL												1135				1106	21797
ME	48	5.2	4.2	0.45	1320	3954	1075	3219	23	0.6	3.8	37	0.32	0.26	59	36	948

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

BIOSOLIDS SHEET

Marshall
MI 002 3540

August 2001

SUPERINTENDENT
Steven D. Washburn

	RAW SLUDGE	RAW BIOSOLIDS			LIME STABILIZED BIOSOLIDS					
DAY	GALLONS	TOTAL SOLIDS %	VOLATILE SOLIDS %	pH SU	LIME POUNDS	pH 2 hrs @ 25 C SU	RDT Solids %	Lbs. Lime per 1000 gallons biosolids		
1	13600	2.9	71.0	6.0	1272		6.8	94		
2	10870	2.9	73.0	6.1		12.1				
3	10000	4.2	61.0	6.0						
4	10500	2.3	74.0	6.1						
5	8000	3.3	75.0	6.1						
6	10500	3.1	75.0	6.2						
7	10500	2.9	74.0	6.2						
8	10000	2.9	72.0	6.1	1584		7.5	158		
9	11250	3.6	72.0	6.2	1368		8.3	122		
10	10100	3.1	72.0	6.1		12.2				
11	10000	2.6	75.0	6.2						
12	10000	3.2	74.0	6.3						
13	20000	3.2	75.0	6.3						
14	3000	3.0	75.0	6.2	1440		9.1	480		
15	10500	3.1	70.0	6.2	600		8.3	57		
16	10000	2.9	72.0	6.1		12.0				
17	10500	2.9	75.0	6.3						
18	10000	2.6	73.0	6.4						
19	10500	3.4	75.0	6.2						
20	10000	3.4	75.0	6.3						
21	20500	3.0	75.0	6.1	1968		7.1	96		
22	10000	2.9	74.0	6.2	1920	12.1	10.3	192		
23	10000	3.2	73.0	6.2						
24	10000	3.4	78.0	6.3						
25	10000	3.2	75.0	6.0						
26	10000	2.7	77.0	6.2						
27	10000	3.1	78.0	6.1						
28	18000	3.0	75.0	6.3	1800		7.4	100		
29	12000	2.6	75.0	6.3	1488		8.4	124		
30	8000	3.2	71.0	6.3		12.1				
31	8000	3.6	76.0	6.1						
TOTAL	336320				13440					
MEAN	10849	3.1	73.7	6.2	1493	12.1	8.1	158		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MISCELLANEOUS SHEET

August 2001

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	WATER	ELECTRICAL USAGE		FUEL GAS		CHEMICALS APPLIED								
			X 120		X 100	$FECL_3$					Cl_2		SO_2	
	CF	METER	KWH	METER	CF	GALS	SP. GR.	% SOLN	LBS	mg/L	LBS	mg/L	LBS	mg/L
1	2305	18	2160			100.0	1.3980	30	349.8	23.2	17.0	1.1	11.0	0.7
2	700	14	1680			75	1.3980	30	262.3	17.6	19	1.3	9.0	0.6
3	270	16	1920			25	1.3980	30	87.4	6.0	21	1.4	9.0	0.6
4	340	15	1800			75	1.3980	30	262.3	19.5	24	1.8	3.0	0.2
5	32	16	1920			75	1.3980	30	262.3	19.9	23	1.7	3.0	0.2
6	570	17	2040			100	1.3980	30	349.8	25.4	24	1.7	5.0	0.4
7	410	15	1800			100	1.3980	30	349.8	24.1	31	2.1	8.0	0.6
8	1570	17	2040			100	1.3980	30	349.8	24.4	24	1.7	2.0	0.1
9	1710	16	1920			125	1.3980	30	437.2	30.5	23	1.6	5.0	0.3
10	300	16	1920			100	1.3980	30	349.8	25.6	17	1.2	13.0	1.0
11	420	13	1560			125	1.3980	30	437.2	36.2	22	1.8	6.0	0.5
12	350	16	1920			125	1.3980	30	437.2	34.7	17	1.3	11.0	0.9
13	290	15	1800			100	1.3980	30	349.8	27.6	26	2.1	15.0	1.2
14	1210	16	1920			125	1.3980	30	437.2	31.2	27	1.9	11.0	0.8
15	950	16	1920			100	1.3980	30	349.8	27.1	28	2.2	11.0	0.9
16	240	14	1680			100	1.3980	30	349.8	26.7	29	2.2	10.0	0.8
17	430	14	1680			100	1.3980	30	349.8	27.1	23	1.8	12.0	0.9
18	330	14	1680			125	1.3980	30	437.2	33.4	21	1.6	15.0	1.1
19	320	15	1800			100	1.3980	30	349.8	27.4	18	1.4	21.0	1.6
20	350	14	1680			100	1.3980	30	349.8	24.2	20	1.4	11.0	0.8
21	1550	17	2040			100	1.3980	30	349.8	24.5	20	1.4	6.0	0.4
22	1660	16	1920			100	1.3980	30	349.8	23.6	20	1.3	6.0	0.4
23	350	13	1560			100	1.3980	30	349.8	24.1	21	1.4	8.0	0.6
24	400	16	1920			100	1.3980	30	349.8	24.2	24	1.7	6.0	0.4
25	330	13	1560			75	1.3980	30	262.3	20.0	20	1.5	10.0	0.8
26	350	15	1800			125	1.3980	30	437.2	32.6	26	1.9	11.0	0.8
27	290	15	1800			75	1.3980	30	262.3	18.8	22	1.6	13.0	0.9
28	1660	16	1920			100	1.3980	30	349.8	24.1	21	1.4	5.0	0.3
29	1480	15	1800			100	1.3980	30	349.8	24.0	22	1.5	8.0	0.5
30	500	15	1800			75	1.3980	30	262.3	18.2	27	1.9	16.0	1.1
31	420	13	1560			75	1.3980	30	262.3	19.4	21	1.6	16.0	1.2
TL	22087	471	56520			3000					698		296.0	
ME	712	15	1823			97	1.3980	30.0	338.5	24.7	22.5	1.6	9.5	0.7

MANPOWER		
POSITION TITLE	NUMBER FULL TIME	
SUPERINTENDANT	1	
ASST. SUPT.	1	
OPERATOR	3	
MECHANIC		
CHEMIST		
LAB TECH		
IPP COORDINATOR	1	
OTHER		

GIVE THE HOURS PER DAY THAT PLANT PERSONNEL ARE NORMALLY AT THE PLANT.

WEEKDAYS	8	HRS
SATURDAYS	8	HRS
SUNDAYS	8	HRS
HOLIDAYS	8	HRS

Weather Code	
1 Clear	6 Warm
2 Partly Cloudy	7 Cold
3 Cloudy	8 Windy
4 Rain	9 Melting Snow
5 Snow	

PLANT INFLUENT SHEET

September 2001

Marshall

STATE OF MICHIGAN

MI 002 3540

SUPERINTENDENT

DEPT OF ENVIRONMENTAL QUALITY

Steven D Washburn

D	WEATHER		FLOW		RAW SEWAGE QUALITY									
A	TYPE	PRECIP	TOTAL	MAX	TEMP	pH	BOD_5		SS		TOTAL-P		VSS	NH3-N
Y	CODE	Inches	MGD	MGD	°F	SU	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l
1	1		1 420		62	7 60	118	1397	106	1255			94	11 5
2	1		1 400		62	7 60	124	1448	108	1261			94	11 7
3	4	0 01	1 490		62	7 70	142	1765	120	1491			120	10 8
4	1		1 700		65	7 50	143	2027	143	2027			138	12 1
5	1		1 700		69	7 60	177	2510	108	1531	3 57	51	88	12 6
6	1		1 570		64	7 60	168	2200	136	1781			126	15 2
7	4	0 39	1 600		64	7 50	124	1655	92	1228			92	15 1
8	4	0 22	1 510		64	7 60	154	1939	132	1662			130	13 0
9	4	1 37	1 630		63	7 60	119	1618	140	1903			128	12 4
10	1		1 620		65	7 60	41	554	118	1594			118	12 6
11	1		1 520		65	7 70	96	1217	115	1458			110	13 5
12	1		1 550		65	7 60	143	1849	138	1784	3 22	42	130	13 9
13	4	0 14	1 550		65	7 60	270	3490	150	1939			140	15 2
14	1		1 500		62	7 80	205	2565	200	2502			182	15 3
15	1		1 470		62	7 80	180	2207	122	1496			114	13 0
16	2		1 480		62	7 60	176	2172	150	1851			140	12 3
17	1		1 480		63	7 50	145	1790	152	1876			138	13 7
18	4	0 79	1 540		64	7 50	174	2235	157	2016			145	13 7
19	4	0 08	1 580		65	7 60	129	1700	126	1660	2 93	39	118	13 9
20	4	0 25	1 480		64	7 70	157	1938	142	1753			136	15 0
21	4	0 86	1 570		64	7 70	125	1637	134	1755			128	16 0
22	4	0 01	1 520		64	7 60	131	1661	112	1420			112	11 8
23	4	0 22	1 550		62	7 70	151	1952	126	1629			118	11 9
24	4	0 07	1 560		64	7 60	139	1808	136	1769			122	11 9
25	4	0 22	1 570		62	7 60	161	2108	106	1388			96	14 6
26	4	0 08	1 550		62	7 90	164	2120	138	1784			122	15 7
27	1		1 550		62	7 70	136	1758	142	1836	3 53	46	136	15 5
28	1		1 490		62	7 60	146	1814	122	1516			116	17 4
29	1		1 490		62	7 60	137	1702	124	1541			120	13 2
30	1		1 550		61	7 60	134	1732	132	1706			132	12 5
31														
TL		4 71	46 190					56567		50413		176		
ME			1 540				147	1886	131	1680	3 31	44	123	13 6

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

PRIMARY EFFLUENT SHEET

September 2001

Marshall
MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

	PRIMARY EFFLUENT QUALITY												
DAY	BOD-5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS		AMMONIA NITROGEN	
	mg/l	LBS	Removal	mg/l	LBS	% Removal	mg/l	LBS	% Removal	mg/l	%	mg/l	LBS
1	69	817	41.5	44	521	58.5				38 0	86.4	12 7	150
2	58	677	53.2	42	522	61 1				36 0	85.7	12 0	149
3	71	882	50.0	48	681	60.0				48 0	100.0	11 7	166
4	129	1829	9.8	54	766	62.2				50 0	92.6	14 6	207
5	133	1886	24.9	56	733	48.1	1 9	25.1	46.2	44 0	78.6	14 8	194
6	92	1205	45.2	42	560	69.1				34.0	81.0	14 8	197
7	92	1228	25.8	54	680	41.3				54 0	100.0	14 9	188
8	69	869	55.2	42	571	68.2				42 0	100.0	13 5	184
9	65	884	45 4	38	513	72.9				38 0	100.0	13 3	180
10	59	797	-43 9	46	583	61.0				46 0	100.0	14 3	181
11	65	824	32.3	34	440	70.4				34 0	100.0	15 2	196
12	95	1228	33.6	54	698	60.9	1.5	18.9	54.7	50 0	92.6	15 2	196
13	110	1422	59.3	60	751	60.0				50 0	83.3	17 1	214
14	113	1414	44.9	56	687	72.0				50 0	89 3	17 8	218
15	110	1349	38.9	42	518	65.6				42 0	100 0	14 8	183
16	92	1136	47.7	40	494	73.3				40 0	100.0	13 2	163
17	68	839	53.1	38	488	75.0				34 0	89 5	14 3	184
18	102	1310	41.4	58	764	63.1				52 0	89.7	15 2	200
19	91	1199	29.5	48	592	61 9	1 4	17.4	51 9	42 0	87.5	15 5	191
20	81	1000	48.4	46	602	67.6				42 0	91.3	16 1	211
21	69	903	44.8	48	608	64.2				48 0	100.0	15.9	202
22	77	976	41.2	50	646	55.4				48 0	96.0	12.8	165
23	74	957	51.0	38	494	69.8				38 0	100.0	12 2	159
24	66	859	52.5	50	655	63.2				44 0	88.0	13 3	174
25	95	1244	41.0	40	517	62.3				34 0	85.0	15 2	196
26	123	1590	25.0	58	750	58.0				44 0	75 9	18 0	233
27	121	1564	11.0	58	721	59.2	1 9	23.0	47.6	50 0	86.2	19 0	236
28	71	882	51.4	44	547	63.9				44 0	100.0	15 6	194
29	69	857	49.6	48	620	61.3				48 0	100.0	15 7	203
30	74	957	44.8	46	610	65.2				46 0	100 0	12 2	156
31													
TL		33583			18333			84.4					5671
ME	87	1119	38.3	47	611	63.2	1.7	21.1	50.1	327.5	92.6	14.7	189

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
SURFACE WATER QUALITY DIVISION

DEQ

Discharge Number	Permit Number
001 A	MI 002 3540

DAILY DISCHARGE MONITORING REPORT

Monitoring Period
September 2001

DAY	$CBOD_5$			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS	NH3-N		PH	D.O.	F.COLI #/100ml	CL RESID
	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	mg/l	LBS	SU	mg/l	MF	mg/l
1	4 2	50	96.4	1.0	12	99.1				1.0	0.06	0.71	7.40	6.5	10	0.000
2	3 4	40	97.3	1.0	12	99.1				1.0	0.18	2.10	7 50	7.2	17	0.000
3	5.4	67	96.2	2.0	25	98.3				2.0	0.67	8.33	7.40	7.1	14	0.000
4	6.2	88	95.7	1.0	14	99.3				1.0	4.73	67.06	7.40	6.3	40	0.005
5	8 3	118	95.3	5.0	71	95.4	0.19	2.7	94.7	3.0	8.64	122.50	7.40	6.1	25	0.000
6	5.2	68	96.9	1.0	13	99.3				1.0	6.00	78.56	7 40	6.6	130	0.000
7	5.1	68	95.9	4.0	53	95.7				1.0	3.10	41.37	7.30	6.4	19	0.000
8	4.8	60	96.9	1.0	13	99.2				1.0	1.98	24.93	7.30	6.3	23	0.000
9	3.2	44	97.3	3.0	41	97.9				3.0	3.55	48.26	7.40	6.7	24	0.000
10	2.7	36	93.4	4.0	54	96.6				4.0	2.94	39.72	7.40	6.4	14	0.002
11	4.0	51	95.8	1.0	13	99.1				1.0	0.35	4.44	7.40	6.3	7	0.007
12	2.7	35	98.1	1.0	13	99.3	0.15	1.9	95.3	1.0	0.65	8.40	7.40	7.0	15	0.000
13	3.5	45	98.7	3.0	39	98.0				3.0	1.85	23.91	7.40	6.9	13	0.000
14	4.9	61	97.6	4.0	50	98.0				4.0	1.01	12.64	7 40	7.0	27	0.000
15	5.6	69	96.9	3.0	37	97.5				3.0	0.14	1.72	7 40	7.3	17	0.000
16	3.7	46	97.9	1.0	12	99.3				1.0	0.11	1.36	7.40	8.0	22	0.000
17	2.6	32	98.2	1.0	12	99.3				1.0	0.40	4.94	7.50	8.1	67	0.000
18	3.5	45	98.0	1.0	13	99.4				1.0	3.30	42.38	7.40	6.6	201	0.000
19	3.3	43	97.4	1.0	13	99.2	0.17	2.2	94.3	1.0	4.46	58.77	7.30	7.1	9	0.000
20	3.5	43	97.8	2.0	25	98.6				2.0	5.96	73.57	7.40	6.5	15	0.000
21	3.7	48	97.0	1.0	13	99.3				2.0	3.77	49.36	7.40	6.4	19	0.000
22	3.7	47	97.2	1.0	13	99.1				1.0	2.95	37.40	7.40	6.4	19	0.000
23	3.3	43	97.8	1.0	13	99.2				1.0	2.85	36.84	7.50	6.7	14	0.000
24	2.8	36	98.0	4.0	52	97.1				3.0	3.48	45.28	7.50	6.8	16	0.000
25	5.0	65	96.9	1.0	13	99.1				1.0	8.32	108.94	7.40	7.2	23	0.000
26	4.0	52	97.6	1.0	13	99.3				1.0	9.92	128.24	7.40	6.6	30	0.000
27	3.7	48	97.3	2.0	26	98.6	0.20	2.5	94.4	2.0	2.87	37.10	7 40	6.2	21	0.000
28	2.6	32	98.2	1.0	12	99.2				1.0	0.72	8.95	7.40	6.4	27	0.000
29	3.5	43	97.4	3.0	37	97.6				3.0	0.61	7.58	7.40	7.0	31	0.000
30	3.0	39	97.8	2.0	26	98.5				3.0	0.63	8.14	7.50	7.1	50	0.000
31																
TL		1563			752			9.4								
ME	4.0	52	97.1	1.9	25	98.5	0.023	0.3	94.7	1.80	2.87	37.78		6.8	23	0.000
WA	5.5	73		2.7	37										31	
MX											9.92	128.24	7.50			0.007
MN													7.30	6.1		

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment See 18 U S C 1001 and 33 U S C 1319 (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 Years)

PRINTED NAME AND TITLE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTORIZED AGENT	DATE
Steven D. Washburn, Superintendent		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

ACTIVATED SLUDGE SHEET

September 2001

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	AERATION SYSTEM				MIXED LIQUOR								SECONDARY SLUDGE				
	AERTN VOL	DETEN TIME	CRT	F:M RATIO	MLSS		MLVSS		SETTL.	SDI	D.O.	AIR	SS	VSS	RAS FLOW	WAS	
	KCF	HRS	DAYS		mg/L	Lbs.	mg/L	Lbs.	%	%	mg/L	CF	%	%	%	Gallons	Lbs.
SF	3											4				3	
1	48	6.1			1374	4114					4.51	47			69	42	
2	48	6.2			1235	3698					5.88	43			71	42	
3	48	5.8	4.0	0.33	1082	3240	887	2656	20	0.54	6.20	39	0.23	0.19	65	42	806
4	48	5.1	3.7	0.71	1039	3111	858	2569	14	0.74	4.73	44	0.28	0.23	57	36	841
5	48	5.1	4.6	0.62	1227	3674	1014	3036	19	0.65	3.03	41	0.31	0.26	57	31	801
6	48	5.5	4.4	0.36	1363	4081	1114	3336	22	0.62	2.97	38	0.35	0.29	62	32	934
7	48	5.4	4.1	0.37	1351	4045	1114	3336	23	0.59	4.19	38	0.34	0.28	61	35	992
8	48	5.7			1368	4096					4.89	42			64	35	
9	48	5.3			1274	3815					5.44	48			60	35	
10	48	5.3	3.9	0.26	1253	3752	1043	3123	21	0.60	3.20	44	0.33	0.28	60	35	963
11	48	5.7	4.3	0.26	1237	3704	1041	3117	22	0.56	3.55	44	0.32	0.27	49	32	854
12	48	5.6	3.2	0.51	964	2887	807	2416	17	0.57	6.05	42	0.41	0.35	60	26	889
13	48	5.6	6.5	0.48	1204	3605	987	2955	21	0.57	4.58	55	0.29	0.24	62	23	556
14	48	5.7	7.8	0.44	1296	3881	1073	3213	25	0.52	5.24	55	0.26	0.21	65	23	499
15	48	5.9			1330	3983					5.51	54			65	25	
16	48	5.8			1376	4120					5.56	49			65	30	
17	48	5.8	4.9	0.25	1357	4063	1142	3420	30	0.45	5.46	48	0.31	0.26	62	32	827
18	48	5.6	4.4	0.42	1250	3743	1046	3132	24	0.52	6.27	44	0.32	0.26	57	32	854
19	48	5.5	4.0	0.39	1236	3701	1028	3078	23	0.54	2.80	47	0.33	0.27	55	34	936
20	48	5.8	5.6	0.32	1265	3788	1054	3156	29	0.44	3.47	48	0.24	0.20	61	34	681
21	48	5.5	4.7	0.29	1227	3674	1027	3075	28	0.44	3.75	46	0.29	0.24	56	32	774
22	48	5.7			1219	3650					5.12	45			55	32	
23	48	5.6			1152	3450					4.68	46			60	32	
24	48	5.5	4.3	0.32	1081	3237	909	2722	26	0.42	4.62	55	0.29	0.24	59	31	750
25	48	5.5	5.4	0.46	1086	3252	910	2725	25	0.43	4.91	55	0.26	0.22	58	28	607
26	48	5.6	7.2	0.58	1092	3270	910	2725	27	0.40	4.39	55	0.21	0.18	58	26	455
27	48	5.6	5.6	0.49	1268	3797	1065	3189	30	0.42	2.97	54	0.31	0.28	57	26	672
28	48	5.8	8.0	0.25	1398	4186	1167	3494	60	0.23	3.81	53	0.24	0.20	61	26	520
29	48	5.8			1387	4153					5.54	50			62	26	
30	48	5.6			1340	4012					6.51	48			59	29	
31	48																
TL												1417				944	15212
ME	48	5.6	5.0	0.41	1244	3726	1010	3024	25	0.5	4.7	47	0.30	0.25	60	31	761

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

BIOSOLIDS SHEET

Marshall

MI 002 3540

September 2001

SUPERINTENDENT
Steven D. Washburn

	RAW SLUDGE	RAW BIOSOLIDS			LIME STABILIZED BIOSOLIDS					
DAY	GALLONS	TOTAL SOLIDS %	VOLATILE SOLIDS %	pH SU	LIME POUNDS	pH 2 hrs @ 25 C SU	RDT Solids %	Lbs. Lime per 1000 gallons biosolids		
1	10500	3.3	74.0	6.2						
2	10500	3.4	74.0	6.3						
3	10000	2.6	77.0	6.2						
4	10000	2.6	77.0	6.3	1378		7.7	138		
5	10000	2.9	74.0	6.5	1196		9.7	120		
6	10000	3.4	76.0	6.2		12.1				
7	10000	2.7	75.0	6.4						
8	9450	2.6	76.0	6.3						
9	10500	3.3	76.0	6.1						
10	10000	3.2	76.0	6.2						
11	14500	2.6	76.0	6.1						
12	10000	3.0	75.0	6.3	1794		8.8	179		
13	11000	2.8	76.0	6.1	1404	12.1	8.5	128		
14	8000	2.4	75.0	6.5						
15	9000	2.7	76.0	6.4						
16	9000	3.2	75.0	6.3						
17	11000	3.2	77.0	6.3						
18	9000	2.8	78.0	6.2	1430	12.1	9.2	159		
19	9000	2.5	77.0	6.2						
20	9000	3.0	76.0	6.2						
21	9000	3.1	76.0	6.1						
22	9000	2.4	76.0	6.3						
23	9425	3.2	77.0	6.3						
24	9000	2.9	76.0	6.2						
25	9000	2.4	75.0	6.1						
26	9000	2.5	74.0	6.2	1534		9.1	170		
27	9000	2.8	75.0	6.1	1768		8.0	196		
28	9000	2.9	76.0	6.1		12.1				
29	9000	2.4	77.0	6.2						
30	9425	2.9	77.0	6.0						
31										
TOTAL	291300				10504					
MEAN	9710	2.9	75.8	6.2	1501	12.1	8.7	156		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MISCELLANEOUS SHEET

September 2001

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	WATER	ELECTRICAL USAGE		FUEL GAS		CHEMICALS APPLIED								
			X 120		X 100	$FECL_3$					Cl_2		SO_2	
	CF	METER	KWH	METER	CF	GALS	SP. GR.	% SOLN	LBS	mg/L	LBS	mg/L	LBS	mg/L
1	300	14	1680			100	1.3980	30	349.8	29.5	19.0	1.6	2.0	0.2
2	290	14	1680			100	1.3980	30	349.8	30.0	13	1.1	2.0	0.2
3	410	14	1680			100	1.3980	30	349.8	28.1	19	1.5	2.0	0.2
4	1800	15	1800			100	1.3980	30	349.8	24.7	15	1.1	4.0	0.3
5	1380	16	1920			100	1.3980	30	349.8	24.7	16	1.1	12.0	0.8
6	360	14	1680			100	1.3980	30	349.8	26.7	18	1.4	9.0	0.7
7	350	14	1680			100	1.3980	30	349.8	26.2	19	1.4	9.0	0.7
8	1330	15	1800			100	1.3980	30	349.8	27.8	18	1.4	4.0	0.3
9	690	14	1680			100	1.3980	30	349.8	25.7	19	1.4	17.0	1.3
10	470	15	1800			50	1.3980	30	174.9	12.9	24	1.8	9.0	0.7
11	380	14	1680			100	1.3980	30	349.8	27.6	19	1.5	8.0	0.6
12	1850	16	1920			100	1.3980	30	349.8	27.1	21	1.6	10.0	0.8
13	1050	15	1800			100	1.3980	30	349.8	27.1	21	1.6	18.0	1.4
14	370	15	1800			75	1.3980	30	262.3	21.0	22	1.8	12.0	1.0
15	240	14	1680			75	1.3980	30	262.3	21.4	22	1.8	12.0	1.0
16	360	14	1680			75	1.3980	30	262.3	21.3	22	1.8	11.0	0.9
17	480	14	1680			75	1.3980	30	262.3	21.3	13	1.1	13.0	1.1
18	1530	15	1800			100	1.3980	30	349.8	27.2	10	0.8	6.0	0.5
19	880	15	1800			50	1.3980	30	174.9	13.3	17	1.3	20.0	1.5
20	400	14	1680			100	1.3980	30	349.8	28.3	12	1.0	4.0	0.3
21	330	14	1680			100	1.3980	30	349.8	26.7	13	1.0	2.0	0.2
22	370	13	1560			50	1.3980	30	174.9	13.8	16	1.3	3.0	0.2
23	390	14	1680			75	1.3980	30	262.3	20.3	15	1.2	3.0	0.2
24	340	14	1680			75	1.3980	30	262.3	20.2	18	1.4	15.0	1.2
25	350	14	1680			100	1.3980	30	349.8	26.7	12	0.9	11.0	0.8
26	350	17	2040			100	1.3980	30	349.8	27.1	16	1.2	10.0	0.8
27	2820	15	1800			75	1.3980	30	262.3	20.3	15	1.2	12.0	0.9
28	350	15	1800			75	1.3980	30	262.3	21.1	17	1.4	23.0	1.9
29	350	13	1560			75	1.3980	30	262.3	21.1	18	1.4	12.0	1.0
30	350	15	1800			75	1.3980	30	262.3	20.3	17	1.3	13.0	1.0
31														
TL	20920	435	52200			2600			9094		516		288.0	
ME	697	15	1740			87	1.3980	30.0	303.1	23.6	17.2	1.3	9.6	0.7

MANPOWER	
POSITION TITLE	NUMBER FULL TIME
SUPERINTENDANT	1
ASST. SUPT.	1
OPERATOR	3
MECHANIC	
CHEMIST	
LAB TECH	
IPP COORDINATOR	1
OTHER	

GIVE THE HOURS PER DAY THAT PLANT PERSONNEL ARE NORMALLY AT THE PLANT.

WEEKDAYS	8	HRS
SATURDAYS	8	HRS
SUNDAYS	8	HRS
HOLIDAYS	8	HRS

Weather Code	
1 Clear	6 Warm
2 Partly Cloudy	7 Cold
3 Cloudy	8 Windy
4 Rain	9 Melting Snow
5 Snow	

PLANT INFLUENT SHEET

October 2001

Marshall

STATE OF MICHIGAN

MI 002 3540

SUPERINTENDENT

DEPT OF ENVIRONMENTAL QUALITY

Steven D Washburn

D	WEATHER		FLOW		RAW SEWAGE QUALITY									
A	TYPE	PRECIP	TOTAL	MAX	TEMP	pH	BOD_5		SS		TOTAL-P		VSS	NH3-N
Y	CODE	Inches	MGD	MGD	°F	SU	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l
1	1		1 780		67	7 60	218	3236	180	2672			180	
2	1		1 710		63	7 50	179	2553	125	1783			125	12 7
3	1		1 640		64	7 50	149	2038	134	1833	3 82	52	134	
4	4	1 48	1 700		63	7 50	127	1801	124	1758			118	
5	4	0 51	1 810		62	7 70	140	2113	234	3532			234	13 9
6	4	0 01	1 760		62	7 60	139	2040	118	1732			116	
7	1		1 740		60	7 60	119	1727	102	1480			100	
8	1		1 880		64	7 50	132	2070	164	2571			144	11 8
9	1		1 720		63	7 40	124	1779	115	1650	6 34	91	115	
10	4	0 12	1 720		63	7 50	146	2094	132	1894			114	13 3
11	4	1 20	1 750		62	7 60	171	2496	158	2306			142	
12	4	0 04	1 860		63	7 50	187	2901	110	1706			104	
13	4	0 74	1 840		63	7 70	341	5233	110	1688			110	
14	4	0 12	1 930		66	7 70	113	1819	106	1706	2 23	36	106	9 0
15	4	0 78	1 860		61	7 70	121	1877	114	1768			114	
16	4	0 85	2 250		61	7 70	101	1895	92	1726			91	
17	1		2 150		63	7 60	121	2170	136	2439			120	8 7
18	1		2 080		62	7 80	204	3539	80	1388			70	
19	1		2 040		64	7 50	119	2025	68	1157			68	
20	2		1 910		63	7 60	99	1577	80	1274			80	
21	4	0 02	1 870		61	7 70	112	1747	84	1310			84	10 7
22	4	0 43	1 990		61	7 60	125	2075	140	2324			93	
23	4	0 36	2 030		66	7 50	27	457	114	1930			104	
24	4	0 32	2 100		65	7 70	229	4011	174	3047	3 42	60	150	
25	4	0 27	1 980		64	7 70	156	2576	118	1949			108	12 5
26	4	0 16	2 010		61	7 60	111	1861	124	2079			122	
27	2		1 920		59	7 60	107	1713	124	1986			114	
28	1		1 830		58	7 70	110	1679	124	1893			108	
29	1		1 950		61	7 60	108	1756	112	1821			106	10 7
30	4	0 04	1 980		61	7 70	140	2312	103	1701			96	
31	2		1 940		60	7 30	430	6957	506	8187			404	
TL		7 45	58 730					74125		66289		239		
ME			1 895		62 5		152	2391	136	2138	3 95	60	125	11 5

City of Marshall
801 Industrial Rd
Marshall, MI 49068

PRIMARY EFFLUENT SHEET

October 2001

Marshall
MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D Washburn

	PRIMARY EFFLUENT QUALITY												
DAY	BOD-5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS		AMMONIA NITROGEN	
	mg/l	LBS	Removal	mg/l	LBS	% Removal	mg/l	LBS	% Removal	mg/l	%	mg/l	LBS
1	90	1336	58 7	48	713	73 3				48 0	100 0		
2	127	1811	29 1	52	711	58 4				52 0	100 0	15 7	215
3	85	1163	43 0	44	624	67 2	1 3	19 0	64 9	44 0	100 0		
4	82	1163	35 4	48	725	61 3				48 0	100 0		
5	86	1298	38 6	48	705	79 5				48 0	100 0	14 0	205
6	78	1145	43 9	50	726	57 6				50 0	100 0		
7	77	1117	35 3	38	596	62 7				12 0	31 6		
8	91	1427	31 1	54	775	67 1				42 0	77 8	12 3	176
9	144	2066	-16 1	56	803	51 3	2 6	36 7	59 6	42 0	75 0		
10	120	1721	17 8	68	992	48 5				58 0	85 3	15 3	223
11	96	1401	43 9	66	1024	58 2				54 0	81 8		
12	128	1986	31 6	48	737	56 4				34 0	70 8		
13	111	1703	67 4	50	805	54 5				50 0	100 0		
14	79	1272	30 1	62	962	41 5	1 0	16 1	53 4	62 0	100 0	9 9	154
15	72	1117	40 5	46	863	59 6				46 0	100 0		
16	72	1351	28 7	58	1040	37 0				56 0	96 6		
17	84	1506	30 6	62	1076	54 4				46 0	74 2	11 3	196
18	108	1873	47 1	48	817	40 0				42 0	87 5		
19	76	1293	36 1	52	828	23 5				52 0	100 0		
20	66	1051	33 3	42	655	47 5				42 0	100 0		
21	63	983	43 8	52	863	38 1				52 0	100 0	10 3	171
22	79	1311	36 8	54	914	61 4				89 0	164 8		
23	14	237	48 1	66	1156	42 1				58 0	87 9		
24	143	2505	37 6	58	958	66 7	1 3	21 5	62 0	48 0	82 8		
25	81	1338	48 1	46	771	61 0				36 0	78 3	11 9	199
26	71	1190	36 0	60	961	51 6				50 0	83 3		
27	70	1121	34 6	48	733	61 3				38 0	79 2		
28	61	931	44 5	44	716	64 5				34 0	77 3		
29	62	1008	42 6	52	859	53 6				52 0	100 0	10 8	178
30	123	2031	12 1	72	1165	30 1				64 0	88 9		
31	144	2330	66 5	72	35266	85 8				72 0	100 0		
TL		43785			60535			93 3					1718
ME	90	1412	37 3	54	1953	55 3	1 6	23 3	60 0	1521 0	91 1	12 4	191

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
SURFACE WATER QUALITY DIVISION

DEQ

Discharge Number	Permit Number
001 A	MI 002 3540

DAILY DISCHARGE MONITORING REPORT

Monitoring Period
October 2001

DAY	CBOD5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS	NH3-N		PH	D.O.	F.COLI #/100ml	CL RESID
	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	mg/l	LBS	SU	mg/l	MF	mg/l
1	4.1	61	98.1	2.0	30	98.9				2.0			7.50	6.6	138	0.000
2	4.3	61	97.6	1.0	14	99.2				1.0	5.90	84.14	7.40	6.6	105	0.000
3	3.6	49	97.6	2.0	27	98.5	0.16	2.2	95.8	2.0			7.40	6.0	259	0.000
4	2.9	41	97.7	4.0	57	96.8				4.0			7.40	6.7	288	0.000
5	3.4	51	97.6	5.0	75	97.9				5.0	0.86	12.98	7.40	6.9	740	0.000
6	3.7	54	97.3	3.0	44	97.5				3.0			7.40	7.6	408	0.000
7	3.7	54	96.9	2.0	29	98.0				2.0			7.50	7.6	412	0.000
8	3.3	52	97.5	5.0	78	97.0				4.0	1.67	26.18	7.40	7.0	373	0.000
9	6.7	96	94.6	4.0	57	96.5	0.35	5.0	94.5	3.0			7.30	6.3	224	0.000
10	4.3	62	97.1	5.0	72	96.2				5.0	7.06	101.27	7.30	6.2	178	0.000
11	3.8	55	97.8	2.0	29	98.7				2.0			7.40	6.4	130	0.000
12	4.9	76	97.4	2.0	31	98.2				2.0			7.40	7.0	126	0.000
13	7.6	117	97.8	4.0	61	96.4				4.0			7.30	6.2	69	0.000
14	4.6	74	95.9	7.0	113	93.4	0.13	2.1	94.2	7.0	2.15	34.61	7.40	6.9	106	0.000
15	4.7	73	96.1	3.0	47	97.4				3.0			7.40	7.9	90	0.000
16	6.4	120	93.7	4.0	75	95.7				4.0			7.40	7.0	85	0.002
17	5.0	90	95.9	8.0	143	94.1				5.0	3.43	61.50	7.40	6.6	30	0.002
18	11.0	191	94.6	7.0	121	91.3				6.0			7.40	6.2	34	0.000
19	11.2	191	90.6	7.0	119	89.7				7.0			7.40	6.5	44	0.000
20	4.5	72	95.5	3.0	48	96.3				3.0			7.40	7.2	13	0.000
21	4.2	66	96.3	5.0	78	94.0				5.0	1.81	28.23	7.40	7.2	144	0.000
22	4.5	75	96.4	5.0	83	96.4				5.0			7.30	6.3	26	0.000
23	4.3	73	84.1	8.0	135	93.0				8.0			7.40	6.6	70	0.000
24	11.5	201	95.0	5.0	88	97.1	0.21	3.7	93.9	5.0			7.40	6.4	47	0.000
25	7.2	119	95.4	4.0	66	96.6				4.0	6.49	107.17	7.40	6.7	11	0.000
26	4.3	72	96.1	7.0	117	94.4				7.0			7.40	7.4	66	0.000
27	4.2	67	96.1	2.0	32	98.4				2.0			7.40	7.1	42	0.000
28	3.6	55	96.7	2.0	31	98.4				2.0			7.40	6.9	7	0.000
29	3.5	57	96.8	3.0	49	97.3				3.0	5.63	91.56	7.40	6.6	13	0.000
30	4.6	76	96.7	3.0	50	97.1				3.0			7.40	6.6	9	0.000
31	11.4	184	97.3	10.0	162	98.0				10.0			7.50	6.3	33	0.000
TL		2684			2162			13.0								
ME	5.4	87	95.9	4.3	70	96.4	0.21	3.2	94.6	128.0	3.89	60.85		6.8	74	0.000
WA	7.3	124		6.1	104										359	
MX											7.06	107.17	7.50			0.002
MN													7.30	6.0		

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment See 18 U S C 1001 and 33 U S C 1319 (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 Years)

PRINTED NAME AND TITLE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTORIZED AGENT	DATE
Steven D. Washburn, Superintendent		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

ACTIVATED SLUDGE SHEET

October 2001

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	AERATION SYSTEM				MIXED LIQUOR								SECONDARY SLUDGE				
	AERTN VOL	DETEN TIME	CRT	F:M RATIO	MLSS		MLVSS		SETTL.	SDI	D.O.	AIR	SS	VSS	RAS FLOW	WAS	
	KCF	HRS	DAYS		mg/L	Lbs.	mg/L	Lbs.	%	%	mg/L	CF	%	%	%	Gallons	Lbs.
SF	3											4				3	
1	48	4.8	5.0	0.43	1247	3734	1040	3114	59	0.21	4.44	46	0.30	0.25	55	30	751
2	48	5.0	4.1	0.57	1269	3800	1053	3153	40	0.32	4.62	42	0.36	0.30	57	31	931
3	48	5.3	4.1	0.38	1254	3755	1030	3084	50	0.25	2.79	38	0.34	0.28	59	32	907
4	48	5.1	5.1	0.33	1415	4237	1176	3521	60	0.24	5.10	51	0.31	0.26	57	32	827
5	48	4.8	3.9	0.40	1270	3803	1072	3210	80	0.16	4.70	56	0.31	0.26	53	38	982
6	48	4.9			1363	4081					6.75	55			53	41	
7	48	5.0			1234	3695					6.03	53			52	40	
8	48	4.6	3.8	0.49	1170	3503	980	2935	76	0.15	4.78	46	0.26	0.22	44	43	932
9	48	5.0	3.0	0.72	1147	3435	961	2878	43	0.27	3.32	42	0.30	0.25	51	46	1151
10	48	5.0	4.0	0.51	1331	3986	1138	3408	55	0.24	2.61	42	0.37	0.32	51	32	987
11	48	4.9	5.8	0.43	1290	3863	1098	3288	68	0.19	3.32	42	0.35	0.29	49	23	671
12	48	4.6	4.0	0.63	1240	3713	1057	3165	32	0.39	4.46	40	0.48	0.41	53	23	921
13	48	4.7		######	1512	4528		######			3 30	39			55	23	
14	48	4.5			1480	4432					2.95	43			53	23	
15	48	4.6	8.3	0.29	1492	4468	1272	3809	64	0.23	4.03	47	0.27	0.23	49	24	540
16	48	3.8	8.4	0.39	1383	4141	1168	3497	33	0.42	4.93	46	0.27	0.23	45	22	495
17	48	4.0	5.5	0.43	1405	4207	1166	3491	34	0.41	4.53	40	0.40	0.33	46	23	767
18	48	4.1	5.0	0.53	1432	4288	1187	3554	40	0.36	4.54	31	0.45	0.37	44	23	863
19	48	4.2	4.7	0.36	1444	4324	1204	3605	33	0.44	1.33	41	0.48	0.40	45	23	921
20	48	4.5			1430	4282					4.84	39			48	23	
21	48	4.6			1355	4057					4.66	38			49	24	
22	48	4.3	3.8	0.40	1317	3944	1105	3309	29	0.45	4.29	39	0.45	0.38	48	28	1051
23	48	4.2	4.9	0.07	1415	4237	1184	3545	26	0.54	3.62	38	0.43	0.36	48	24	861
24	48	4.1	4.9	0.63	1572	4707	1319	3950	28	0.56	2.42	35	0.50	0.42	48	23	959
25	48	4.4	4.7	0.33	1632	4887	1357	4063	42	0.39	2.00	50	0.52	0.43	45	24	1041
26	48	4.3	5.7	0.33	1457	4363	1210	3623	26	0.56	5.01	52	0.38	0.31	41	24	761
27	48	4.5			1183	3542					4.95	36			57	22	
28	48	4.7			1690	5061					2.38	32			63	22	
29	48	4.4	4.7	0.27	1549	4638	1258	3767	36	0.43	3.00	29	0.38	0.31	52	31	982
30	48	4.4	3.4	0.51	1588	4755	1320	3953	30	0.53	3.50	38	0.52	0.43	46	32	1388
31	48	4.4	3.8	0.60	1568	4695	1301	3896	29	0.54	1.26	30	0.50	0.41	46	30	1251
TL												1296				879	20942
ME	48	4.6	4.8		1391	4166	1159		44	0.4	3.9	42	0.39		50	28	911

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

BIOSOLIDS SHEET

Marshall

MI 002 3540

October 2001

SUPERINTENDENT
Steven D. Washburn

	RAW SLUDGE	RAW BIOSOLIDS			LIME STABILIZED BIOSOLIDS					
DAY	GALLONS	TOTAL SOLIDS %	VOLATILE SOLIDS %	pH SU	LIME POUNDS	pH 2 hrs @ 25 C SU	RDT Solids %	Lbs. Lime per 1000 gallons biosolids		
1	9000	2.4	75.0	6.2						
2	11000	2.4	72.0	6.2	2484		8.4	226		
3	9500	3.0	71.0	6.2	1008		11.1	106		
4	12500	2.9	72.0	6.2		12.1				
5	18000	2.7	72.0	6.1						
6	10000	2.5	73.0	6.2						
7	10475	2.7	74.0	6.2						
8	12500	2.7	73.0	6.1						
9	12000	2.2	73.0	6.2	1908		5.3	159		
10	14000	2.5	72.0	6.2	2016	12.0	5.8	144		
11	12000	2.7	74.0	6.2		12.1				
12	10000	2.6	74.0	6.2						
13	10500	2.5	74.0	6.1						
14	12600	2.8	74.0	6.1						
15	18000	3.1	74.0	6.0						
16	9000	2.5	74.0	6.1	1836		7.4	204		
17	10500	2.8	73.0	6.1	1836	12.1	8.4	175		
18	10000	3.1	72.0	6.2		12.0				
19	10000	2.9	74.0	6.2						
20	10500	2.8	75.0	6.1						
21	10750	3.1	76.0	6.1						
22	10000	3.2	74.0	6.1						
23	10000	3.0	74.0	6.3	1800		5.8	180		
24	10000	3.2	66.0	6.2	1836	12.2	12.7	184		
25	10000	3.5	63.0	6.2						
26	10000	3.3	72.0	6.0						
27	10500	3.5	72.0	6.1						
28	10425	3.7	69.0	6.1						
29	9000	3.3	72.0	6.1						
30	12400	3.4	73.0	6.1	2016		10.4	163		
31	10000	3.1	75.0	6.1	2016		10.0	202		
TOTAL	345150				18756					
MEAN	11134	2.9	72.6	6.1	1876	12.1	8.5	174		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MISCELLANEOUS SHEET

October 2001

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	WATER	ELECTRICAL USAGE		FUEL GAS		CHEMICALS APPLIED								
			X 120		X 100	$FECL_3$					Cl_2		SO_2	
	CF	METER	KWH	METER	CF	GALS	SP. GR.	% SOLN	LBS	mg/L	LBS	mg/L	LBS	mg/L
1	Meter	14	1680			100.0	1.3940	30	348.8	23.5	16.0	1.1	13.0	0.9
2	not	14	1680			75	1.3940	30	261.6	18.3	17	1.2	13.0	0.9
3	working	15	1800			100	1.3940	30	348.8	25.5	15	1.1	14.0	1.0
4		14	1680			100	1.3940	30	348.8	24.6	16	1.1	20.0	1.4
5		15	1800			125	1.3940	30	436.0	28.9	17	1.1	12.0	0.8
6		15	1800			150	1.3940	30	523.2	35.6	10	0.7	15.0	1.0
7		15	1800			100	1.3940	30	348.8	24.0	23	1.6	13.0	0.9
8		14	1680			100	1.3940	30	348.8	22.2	18	1.1	12.0	0.8
9		17	2040			150	1.3940	30	523.2	36.5	15	1.0	11.0	0.8
10		15	1800			100	1.3940	30	348.8	24.3	15	1.0	10.0	0.7
11		14	1680			100	1.3940	30	348.8	23.9	18	1.2	14.0	1.0
12		13	1560			100	1.3940	30	348.8	22.5	8	0.5	13.0	0.8
13		14	1680			125	1.3940	30	436.0	28.4	28	1.8	12.0	0.8
14		15	1800			100	1.3940	30	348.8	21.7	19	1.2	15.0	0.9
15		14	1680			125	1.3940	30	436.0	28.1	23	1.5	7.0	0.5
16		15	1800			100	1.3940	30	348.8	18.6	17	0.9	11.0	0.6
17		19	2280			75	1.3940	30	261.6	14.6	20	1.1	9.0	0.5
18		14	1680			75	1.3940	30	261.6	15.1	19	1.1	16.0	0.9
19		15	1800			100	1.3940	30	348.8	20.5	22	1.3	13.0	0.8
20		14	1680			125	1.3940	30	436.0	27.4	20	1.3	13.0	0.8
21		15	1800			50	1.3940	30	174.4	11.2	21	1.3	17.0	1.1
22		14	1680			125	1.3940	30	436.0	26.3	23	1.4	12.0	0.7
23		15	1800			100	1.3940	30	348.8	20.6	5	0.3	11.0	0.6
24		16	1920			100	1.3940	30	348.8	19.9	14	0.8	5.0	0.3
25		15	1800			100	1.3940	30	348.8	21.1	16	1.0	16.0	1.0
26		15	1800			100	1.3940	30	348.8	20.8	19	1.1	14.0	0.8
27		15	1800			50	1.3940	30	174.4	10.9	15	0.9	12.0	0.7
28		13	1560			100	1.3940	30	348.8	22.9	19	1.2	10.0	0.7
29		14	1680			75	1.3940	30	261.6	16.1	18	1.1	17.0	1.0
30		17	2040			100	1.3940	30	348.8	21.1	24	1.5	7.0	0.4
31		15	1800			75	1.3940	30	261.6	16.2	10	0.6	14.0	0.9
TL		459	55080			3100			#####		540		391.0	
ME		15	1777			100	1.3940	30.0	348.8	22.3	17.4	1.1	12.6	0.8

MANPOWER	
POSITION TITLE	NUMBER FULL TIME
SUPERINTENDANT	1
ASST. SUPT.	1
OPERATOR	3
MECHANIC	
CHEMIST	
LAB TECH	
IPP COORDINATOR	1
OTHER	

GIVE THE HOURS PER DAY THAT PLANT PERSONNEL ARE NORMALLY AT THE PLANT.

WEEKDAYS	8	HRS
SATURDAYS	8	HRS
SUNDAYS	8	HRS
HOLIDAYS	8	HRS

Weather Code	
1 Clear	6 Warm
2 Partly Cloudy	7 Cold
3 Cloudy	8 Windy
4 Rain	9 Melting Snow
5 Snow	

PLANT INFLUENT SHEET

November 2001

Marshall

STATE OF MICHIGAN

MI 002 3540

SUPERINTENDENT

DEPT OF ENVIRONMENTAL QUALITY

Steven D Washburn

D	WEATHER		FLOW		RAW SEWAGE QUALITY									
A	TYPE	PRECIP	TOTAL	MAX	TEMP	pH	BOD_5		SS		TOTAL-P		VSS	NH3-N
Y	CODE	Inches	MGD	MGD	°F	SU	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l
1	4	0 87	1 920		61	7 40	155	2482	162	2594	2 60	42	158	8 5
2	4	0 03	2 100		62	7 60	142	2487	136	2382			136	
3	1		1 910		59	7 70	140	2230	108	1720			106	
4	1		1 900		59	7 70	122	1933	120	1902			106	
5	1		1 950		59	7 60	143	2326	138	2244			124	
6	1		1 950		59	7 70	166	2700	148	2407			134	10 3
7	1		1 890		59	7 70	155	2443	106	1671	2 87	45	106	
8	1		1 900		59	7 80	173	2741	114	1806			106	13 2
9	1		1 890		58	7 80	167	2632	162	2554			152	
10	1		1 810		58	7 70	122	1842	104	1570			96	
11	1		1 800		58	7 80	126	1892	102	1531	2 30	35	90	
12	1		1 950		58	7 80	149	2423	142	2309			124	11 2
13	4	0 02	1 970		58	7 90	200	3286	134	2202			129	
14	4	0 32	1 910		58	7 80	242	3855	160	2549			144	12 9
15	1		1 910		61	7 70	182	2899	150	2389			146	
16	1		1 920		62	7 70	192	3074	184	2946			166	
17	1		1 770		62	7 70	140	2067	124	1830			116	
18	4	0 07	1 790		60	7 70	158	2359	138	2060			136	11 0
19	4	0 17	1 920		60	7 70	145	2322	142	2274			132	
20	1		2 010		62	7 80	156	2615	121	2028			115	
21	1		1 990		61	7 70	192	3187	200	3319			190	11 4
22	1		1 770		52	7 70	174	2569	190	2805			180	
23	1		1 780		56	7 70	150	2227	172	2553			164	
24	4	0 30	1 830		57	7 70	152	2320	112	1709			108	
25	4	0 01	1 750		55	7 70	129	1883	134	1956			128	
26	4	0 16	1 990		60	7 50	296	4913	178	2954			174	10 9
27	4	0 03	1 840		57	7 60	193	2962	138	2118			135	
28	4	0 27	1 750		57	7 70	152	2218	146	2131	3 18	46	128	
29	4	0 84	1 790		56	7 70	185	2762	128	1911			118	
30	4	0 03	1 930		54	7 70	188	3026	140	2253			136	
31														
TL		3 12	56 590					78673		66679		168		
ME			1 886		58 6		166	2622	141	2223	2 74	42	133	11 2

City of Marshall
801 Industrial Rd
Marshall, MI 49068

PRIMARY EFFLUENT SHEET

November 2001

Marshall
MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D Washburn

DAY	PRIMARY EFFLUENT QUALITY												
	BOD-5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS		AMMONIA NITROGEN	
	mg/l	LBS	Removal	mg/l	LBS	% Removal	mg/l	LBS	% Removal	mg/l	%	mg/l	LBS
1	93	1489	40 0	68	1089	58 0	1 5	23 5	43 5	66 0	97 1	10 7	171
2	78	1366	45 1	62	988	54 4				62 0	100 0		
3	87	1386	37 9	56	887	48 1				54 0	96 4		
4	92	1458	24 6	60	976	50 0				52 0	86 7		
5	75	1220	47 6	64	1041	53 6				58 0	90 6		
6	113	1838	31 9	72	1135	51 4				64 0	88 9	13 4	211
7	102	1608	34 2	62	982	41 5	1 6	25 5	43 9	62 0	100 0		
8	92	1458	46 8	48	757	57 9				44 0	91 7	13 2	208
9	79	1245	52 7	56	845	65 4				54 0	96 4		
10	75	1132	38 5	52	781	50 0				46 0	88 5		
11	67	1006	46 8	46	748	54 9	1 2	19 4	48 3	42 0	91 3		
12	76	1236	49 0	44	723	69 0				36 0	81 8	11 4	187
13	145	2382	27 5	46	733	65 7				42 0	91 3		
14	131	2087	45 9	68	1083	57 5				60 0	88 2	14 4	229
15	109	1736	40 1	52	833	65 3				52 0	100 0		
16	103	1649	46 4	64	945	65 2				60 0	93 8		
17	80	1181	42 9	58	866	53 2				56 0	96 6		
18	80	1194	49 4	56	897	59 4				56 0	100 0	11 4	183
19	91	1457	37 2	54	905	62 0				52 0	96 3		
20	129	2162	17 3	64	1062	47 1				58 0	90 6		
21	95	1577	50 5	86	1270	57 0				62 0	72 1	12 4	183
22	83	1225	52 3	36	534	81 1				34 0	94 4		
23	71	1054	52 7	42	641	75 6				42 0	100 0		
24	72	1099	52 6	42	613	62 5				42 0	100 0		
25	67	978	48 1	52	863	61 2				50 0	96 2		
26	85	1411	71 3	54	829	69 7				54 0	100 0	12 5	192
27	129	1980	33 2	54	788	60 9				54 0	100 0		
28	105	1532	30 9	68	1015	53 4	2 0	29 6	37 7	66 0	97 1		
29	96	1433	48 1	64	1030	50 0				60 0	93 8		
30	111	1787	41 0	62	998	55 7				62 0	100 0		
31													
TL		44366			26856			98 0					1565
ME	94	1479	42 7	57	895	58 6	1 6	24 5	43 3	1602 0	94 0	12 4	196

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
SURFACE WATER QUALITY DIVISION

DEQ

Discharge Number	Permit Number
001 A	MI 002 3540

DAILY DISCHARGE MONITORING REPORT

Monitoring Period
November 2001

DAY	CBOD5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS	NH3-N		PH	D.O.	F.COLI #/100ml	CL RESID
	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	mg/l	LBS	SU	mg/l	MF	mg/l
1	7.5	120	95.2	6.0	96	96.3	0.16	2.6	93.8	6.0	8.45	135.31	7.40	6.4	71	0.000
2	3.3	58	97.7	5.0	88	96.3				5.0			7.40	6.8	26	0.000
3	4.4	70	96.9	3.0	48	97.2				3.0			7.40	6.9	5	0.000
4	4.0	63	96.7	8.0	127	93.3				8.0			7.50	7.0	15	0.013
5	3.6	59	97.5	7.0	114	94.9				6.0			7.50	7.1	14	0.000
6	3.9	63	97.7	6.0	98	95.9				6.0	7.38	120.02	7.40	7.2	5	0.000
7	11.8	186	92.4	2.0	32	98.1	0.13	2.0	95.6	2.0			7.50	7.0	5	0.000
8	4.5	71	97.4	2.0	32	98.2				2.0	10.10	160.04	7.50	7.1	45	0.001
9	4.8	76	97.1	4.0	63	97.5				4.0			7.60	7.6	30	0.000
10	8.3	125	93.2	6.0	91	94.2				6.0			7.50	7.0	10	0.000
11	7.8	117	93.8	11.0	165	89.2	0.24	3.6	89.6	10.0			7.60	7.6	19	0.000
12	5.0	81	96.6	9.0	146	93.7				8.0	8.10	131.73	7.50	7.2	68	0.000
13	11 1	182	94.5	7.0	115	94.8				7.0			7.40	6.6	36	0.000
14	12.6	201	94.8	15.0	239	90.6				14.0	14.80	235.76	7.40	6.0	120	0.000
15	10.9	174	94.0	13.0	207	91.3				13.0			7.40	6.2	73	0.000
16	11.4	183	94.1	15.0	240	91.8				14.0			7.40	6.4	152	0.000
17	7.5	111	94.6	10.0	148	91.9				10.0			7.40	6.4	24	0.000
18	6.3	94	96.0	6.0	90	95.7				6.0	8.57	127.94	7.50	6.5	122	0.000
19	8.5	136	94.1	12.0	192	91.5				12.0			7.50	7.1	137	0.000
20	15.9	267	89.8	17.0	285	86.0				17.0			7.50	6.6	476	0.000
21	10.4	173	94.6	13.0	216	93.5				11.0	10.15	168.46	7.50	6.7	640	0.000
22	9.8	145	94.4	12.0	177	93.7				12.0			7.50	7.0	384	0.000
23	6.6	98	95.6	6 0	89	96.5				6.0			7.40	7.2	10	0.000
24	6.5	99	95.7	13.0	198	88.4				13.0			7.40	6.7	12	0.000
25	5.1	74	96.0	12.0	175	91.0				12.0			7.50	6.9	28	0.000
26	4.9	81	98.3	10.0	166	94.4				10.0	8.41	139.58	7.50	7.1	3	0.000
27	8.7	134	95.5	4.0	61	97.1				4.0			7.40	7.4	22	0.000
28	7.3	107	95.2	12.0	175	91.8	0.20	2.9	93.7	9.0			7.40	6.8	19	0.000
29	5.5	82	97.0	6.0	90	95.3				6.0			7.50	7.3	40	0.000
30	8.0	129	95.7	7.0	113	95.0				7.0			7.50	6.9	24	0.000
31																
TL		3558			4074			11.1								
ME	7.5	119	95.4	8.6	136	93.8	0.18	2.8	93.2	249.0	9.50	152.35		6.9	34	0.000
WA	10.4	166		12.6	200										184	
MX											14.80	235.76	7.60			0.013
MN													7.40	6.0		

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment See 18 U S C 1001 and 33 U S C 1319 (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 Years)

PRINTED NAME AND TITLE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTORIZED AGENT	DATE
Steven D. Washburn, Superintendent		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

ACTIVATED SLUDGE SHEET

November 2001

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	AERATION SYSTEM				MIXED LIQUOR								SECONDARY SLUDGE				
	AERTN VOL	DETEN TIME	CRT	F:M RATIO	MLSS		MLVSS		SETTL.	SDI	D.O.	AIR	SS	VSS	RAS FLOW	WAS	
	KCF	HRS	DAYS		mg/L	Lbs.	mg/L	Lbs.	%	%	mg/L	CF	%	%	%	Gallons	Lbs.
SF	3											4				3	
1	48	4.5	3.9	0.35	1710	5120	1426	4270	30	0.57	1.36	35	0.45	0.37	49	35	1314
2	48	4.1	3.7	0.34	1609	4818	1359	4069	27	0.60	3.40	37	0.42	0.35	45	37	1296
3	48	4.5			1707	5111					5.35	41			49	37	
4	48	4.5			1467	4393					4.67	43			47	37	
5	48	4.4	3.0	0.35	1372	4108	1166	3491	24	0.57	5.36	47	0.44	0.38	48	37	1358
6	48	4.4	3.9	0.53	1361	4075	1154	3456	22	0.62	5.55	41	0.36	0.32	50	35	1051
7	48	4.6	3.7	0.44	1436	4300	1213	3632	22	0.65	4.49	35	0.40	0.34	51	35	1168
8	48	4.5	3.8	0.38	1470	4402	1265	3788	25	0.59	3.89	43	0.40	0.34	51	35	1168
9	48	4.6	5.4	0.37	1315	3938	1115	3339	20	0.66	5.20	43	0.25	0.22	51	35	730
10	48	4.8			1380	4132					6.32	49			45	35	
11	48	4.8			759	2273					6.64	49			43	30	
12	48	4.4		0.77	626	1874	536	1605	10	0.63	6.25	46	0.15	0.13	51	0	
13	48	4.4	8.1	0.58	1603	4800	1365	4087	24	0.67	3.37	40	0.51	0.43	49	14	595
14	48	4.5	4.7	0.49	1776	5318	1430	4282	25	0.71	0.82	38	0.47	0.41	49	29	1137
15	48	4.5	4.0	0.43	1600	4791	1358	4066	21	0.76	1.30	33	0.39	0.33	48	37	1203
16	48	4.5	5.8	0.48	1342	4018	1153	3453	20	0.67	2.70.	38	0.27	0.23	48	31	698
17	48	4.9			1488	4456					4.60	41			52	32	
18	48	4.8			1325	3968					4.49	36			52	34	
19	48	4.5	4.6	0.47	1202	3599	1033	3093	19	0.63	4.23	43	0.31	0.27	47	30	776
20	48	4.3	4.8	0.66	1276	3821	1090	3264	19	0.67	4.60	47	0.33	0.29	42	29	798
21	48	4.3	5.1	0.48	1272	3809	1087	3255	19	0.67	4.50	45	0.31	0.27	47	29	750
22	48	4.9			1053	3153					4.83	44			53	0	
23	48	4.8			1558	4665					5.75	36			52	10	
24	48	4.7			1732	5186					5.63	40			53	15	
25	48	4.9			1709	5117					5.42	50			53	20	
26	48	4.3	5.1	0.37	1505	4507	1284	3845	24	0.63	5.51	53	0.44	0.37	47	24	881
27	48	4.7	4.9	0.43	1800	5390	1540	4611	25	0.72	5.34	50	0.51	0.43	52	26	1106
28	48	4.9	4.3	0.31	1900	5689	1627	4872	36	0.53	4.30	55	0.48	0.41	53	33	1321
29	48	4.8	5.2	0.29	1918	5743	1635	4896	26	0.74	4.80	54	0.34	0.29	52	39	1106
30	48	4.5	3.8	0.40	1737	5201	1490	4462	27	0.64	4.57	50	0.46	0.39	49	36	1381
31	48																
TL												1302				856	19835
ME	48	4.6	4.6	0.45	1467	4393	1266	3792	23	0.6	4.6	43	0.38	0.33	49	29	1044

City of Marshall
801 Industrial Rd
Marshall, MI 49068

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

BIOSOLIDS SHEET

November 2001

Marshall

MI 002 3540

SUPERINTENDENT
Steven D Washburn

	RAW SLUDGE	RAW BIOSOLIDS			LIME STABILIZED BIOSOLIDS					
DAY	GALLONS	TOTAL SOLIDS %	VOLATILE SOLIDS %	pH SU	LIME POUNDS	pH 2 hrs @ 25 C SU	RDT Solids %	Lbs Lime per 1000 gallons biosolids		
1	10425	4 3	63 0	6 3		12 1				
2	10000	4 2	65 0	6 2						
3	10000	3 3	69 0	6 3						
4	10000	4 1	69 0	6 2						
5	10500	3 7	71 0	6 3						
6	10650	3 4	73 0	6 1	1875		12 5	176		
7	10500	3 5	73 0	6 2	938	12 1	10 7	89		
8	9000	2 9	75 0	6 3			7 8			
9	10000	3 4	74 0	6 2						
10	10425	3 0	78 0	6 3						
11	10800	3 9	69 0	6 3						
12	5650	2 1	75 0	6 4						
13	5500	2 8	70 0	6 4	1875		10 7	341		
14	6000	3 9	66 0	6 5	1640	12 1	11 4	273		
15	6000	3 1	73 0	6 3						
16	6400	3 5	75 0	6 3						
17	9000	3 7	74 0	6 2						
18	8500	4 9	69 0	6 0						
19	8000	3 8	74 0	6 1						
20	8500	3 4	74 0	6 2	1640		9 9	193		
21	8000	3 8	74 0	6 0		12 0				
22	8500	3 3	74 0	6 1						
23	8000	3 2	73 0	6 0						
24	8000	3 3	75 0	6 3						
25	8500	4 3	73 0	6 2						
26	8500	4 2	74 0	5 6						
27	8500	3 0	74 0	6 4	1524		8 3	179		
28	9000	3 3	74 0	6 4	322		7 2	36		
29	8000	3 3	73 0	6 4		12 1				
30	8000	3 5	73 0	6 4	1640			205		
31										
TOTAL	258850				11454					
MEAN	8628	3 5	72 2	6 2	1432	12 1	9 8	187		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MISCELLANEOUS SHEET

November 2001

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	WATER	ELECTRICAL USAGE		FUEL GAS		CHEMICALS APPLIED								
			X 120		X 100	$FECL_3$					Cl_2		SO_2	
	CF	METER	KWH	METER	CF	GALS	SP. GR.	% SOLN	LBS	mg/L	LBS	mg/L	LBS	mg/L
1	470	15	1800			100.0	1.3940	30	348.8	21.8	31.0	1.9	4.0	0.2
2	470	13	1560			100	1.3940	30	348.8	19.9	17	1.0	8.0	0.5
3	470	15	1800			75	1.3940	30	261.6	16.4	19	1.2	4.0	0.3
4	470	14	1680			75	1.3940	30	261.6	16.5	17	1.1	3.0	0.2
5	490	16	1920			50	1.3940	30	174.4	10.7	19	1.2	1.0	0.1
6	600	15	1800			100	1.3940	30	348.8	21.4	18	1.1	16.0	1.0
7	450	16	1920			100	1.3940	30	348.8	22.1	17	1.1	9.0	0.6
8	1800	14	1680			75	1.3940	30	261.6	16.5	15	0.9	11.0	0.7
9	1130	15	1800			75	1.3940	30	261.6	16.6	15	1.0	8.0	0.5
10	520	13	1560			75	1.3940	30	261.6	17.3	17	1.1	11.0	0.7
11	460	15	1800			75	1.3940	30	261.6	17.4	12	0.8	10.0	0.7
12	450	14	1680			100	1.3940	30	348.8	21.4	10	0.6	9.0	0.6
13	1950	17	2040			100	1.3940	30	348.8	21.2	13	0.8	5.0	0.3
14	1580	15	1800			75	1.3940	30	261.6	16.4	13	0.8	2.0	0.1
15	820	15	1800			75	1.3940	30	261.6	16.4	14	0.9	1.0	0.1
16	660	14	1680			100	1.3940	30	348.8	21.8	14	0.9	3.0	0.2
17	460	12	1440			50	1.3940	30	174.4	11.8	14	0.9	13.0	0.9
18	450	15	1800			100	1.3940	30	348.8	23.4	15	1.0	11.0	0.7
19	390	13	1560			50	1.3940	30	174.4	10.9	13	0.8	15.0	0.9
20	1950	17	2040			100	1.3940	30	348.8	20.8	24	1.4	12.0	0.7
21	440	14	1680			75	1.3940	30	261.6	15.8	14	0.8	14.0	0.8
22	420	13	1560			75	1.3940	30	261.6	17.7	14	0.9	6.0	0.4
23	550	14	1680			100	1.3940	30	348.8	23.5	11	0.7	4.0	0.3
24	400	14	1680			100	1.3940	30	348.8	22.9	17	1.1	8.0	0.5
25	470	17	2040			100	1.3940	30	348.8	23.9	15	1.0	3.0	0.2
26	430	15	1800			50	1.3940	30	174.4	10.5	21	1.3	3.0	0.2
27	1560	16	1920			100	1.3940	30	348.8	22.7	12	0.8	11.0	0.7
28	1410	18	2160			100	1.3940	30	348.8	23.9	15	1.0	11.0	0.8
29	890	14	1680			100	1.3940	30	348.8	23.4	27	1.8	7.0	0.5
30	710	16	1920			100	1.3940	30	348.8	21.7	19	1.2	15.0	0.9
31														
TL	23320	444	53280			2550			8894		492		238.0	
ME	777	15	1776			85	1.3940	30.0	296.5	18.9	16.4	1.0	7.9	0.5

MANPOWER	
POSITION TITLE	NUMBER FULL TIME
SUPERINTENDANT	1
ASST. SUPT.	1
OPERATOR	3
MECHANIC	
CHEMIST	
LAB TECH	
IPP COORDINATOR	3
OTHER	

GIVE THE HOURS PER DAY THAT PLANT PERSONNEL ARE NORMALLY AT THE PLANT.

WEEKDAYS	8	HRS
SATURDAYS	8	HRS
SUNDAYS	8	HRS
HOLIDAYS	8	HRS

Weather Code	
1 Clear	6 Warm
2 Partly Cloudy	7 Cold
3 Cloudy	8 Windy
4 Rain	9 Melting Snow
5 Snow	

PLANT INFLUENT SHEET

December 2001

Marshall

STATE OF MICHIGAN

MI 002 3540

SUPERINTENDENT

DEPT OF ENVIRONMENTAL QUALITY

Steven D Washburn

D	WEATHER		FLOW		RAW SEWAGE QUALITY									
A	TYPE	PRECIP	TOTAL	MAX	TEMP	pH	BOD_5		SS		TOTAL-P		VSS	NH3-N
Y	CODE	Inches	MGD	MGD	°F	SU	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l
1	2		1 750		55	7 80	141	2058	130	1897			128	
2	2		1 760		53	7 70	130	1908	156	2290			152	10 2
3	1		1 870		53	7 60	146	2277	104	1622			100	
4	4	0 03	1 830		54	7 60	163	2488	110	1679			100	
5	4	0 05	1 840		54	7 60	156	2394	126	1934			120	
6	1		1 870		53	7 50	168	2620	92	1435	3 12	49	86	
7	1		1 880		53	7 70	131	2054	82	1286			82	13 2
8	4	0 03	1 720		53	7 50	132	1894	130	1865			130	
9	1		1 670		52	7 70	130	1811	124	1727			120	
10	1		1 750		52	7 60	142	2072	164	2394			154	13 6
11	2		1 720		52	7 80	167	2396	144	2066			137	
12	4	0 23	1 900		57	7 50	142	2250	134	2123	2 92	46	120	
13	1		1 840		52	7 60	155	2379	108	1657			98	
14	4	0 76	1 720		52	7 80	176	2525	224	3213			206	15 1
15	2		1 690		52	7 80	153	2156	112	1579			106	
16	4	0 23	1 760		50	7 70	129	1894	90	1321			84	11 1
17	2		2 000		55	7 60	145	2419	132	2202			120	
18	4	0 18	2 000		52	7 70	162	2702	110	1835			99	11 7
19	1		2 000		52	7 30	158	2635	118	1968	3 36	56	112	
20	1		1 930		50	7 70	177	2849	194	3123			180	
21	4		1 790		51	7 60	106	1582	50	746			50	
22	5	0 10	1 810		51	7 60	192	2898	190	2868			178	
23	5	0 01	1 770		50	7 70	132	1949	114	1683			110	
24	5	0 03	1 740		50	7 60	148	2148	136	1974			130	12 2
25	5	0 02	1 650		50	7 60	90	1238	74	1018	2 05	28	69	
26	5	0 03	1 800		50	7 60	131	1967	112	1681			100	
27	5	0 05	1 760		50	7 70	140	2055	102	1497			98	
28	5	0 26	1 690		50	7 70	125	1762	38	536			38	13 9
29	5	0 04	1 630		49	7 80	210	2855	130	1767			118	
30	5	0 02	1 620		49	7 70	171	2310	182	2459			168	
31	5	0 01	1 680		49	7 80	144	2018	150	2102			150	
TL		2 08	55 440					68561		57545		179		
ME			1 788		52		148	2212	125	1856	2 86	45	118	12 6

City of Marshall
801 Industrial Rd
Marshall, MI 49068

PRIMARY EFFLUENT SHEET

December 2001

Marshall
MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D Washburn

	PRIMARY EFFLUENT QUALITY												
DAY	BOD-5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS		AMMONIA NITROGEN	
	mg/l	LBS	Removal	mg/l	LBS	% Removal	mg/l	LBS	% Removal	mg/l	%	mg/l	LBS
1	84	1226	40 4	68	992	47 7				66 0	97 1		
2	72	1057	44 6	50	780	67 9				50 0	100 0	11 4	178
3	86	1341	41 1	46	702	55 8				44 0	95 7		
4	80	1221	50 9	46	706	58 2				38 0	82 6		
5	103	1581	34 0	38	593	69 8				34 0	89 5		
6	109	1700	35 1	48	753	47 8	1 1	16 6	66 0	46 0	95 8		
7	87	1364	33 6	58	832	29 3				58 0	100 0	15 2	218
8	72	1033	45 5	68	947	47 7				68 0	100 0		
9	73	1017	43 8	58	847	53 2				58 0	100 0		
10	83	1211	41 5	70	1004	57 3				70 0	100 0	15 7	225
11	136	1951	18 6	80	1268	44 4				80 0	100 0		
12	118	1870	16 9	76	1166	43 3	1 5	22 9	49 0	68 0	89 5		
13	88	1350	43 2	48	689	55 6				46 0	95 8		
14	98	1406	44 3	36	507	83 9				30 0	83 3	17 2	242
15	83	1170	45 8	34	499	69 6				32 0	94 1		
16	68	998	47 3	38	634	57 8				36 0	94 7	11 7	195
17	67	1118	53 8	52	867	60 6				48 0	92 3		
18	127	2118	21 6	64	1068	41 8				54 0	84 4	14 0	234
19	95	1585	39 9	62	998	47 5	1 2	18 8	65 2	60 0	96 8		
20	81	1304	54 2	74	1105	61 9				66 0	89 2		
21	83	1239	21 7	86	1298	-72 0				82 0	95 3		
22	96	1449	50 0	72	1063	62 1				72 0	100 0		
23	78	1151	40 9	64	929	43 9				70 0	109 4		
24	74	1074	50 0	62	853	54 4				58 0	93 5	13 5	186
25	34	468	62 2	36	540	51 4	0 6	9 5	69 3	30 0	83 3		
26	76	1141	42 0	42	616	62 5				30 0	71 4		
27	113	1659	19 3	56	789	45 1				48 0	85 7		
28	81	1142	35 2	24	326	36 8				24 0	100 0	14 0	190
29	110	1495	47 6	26	351	80 0				26 0	100 0		
30	68	919	60 2	20	280	89 0				18 0	90 0		
31	81	1135	43 8	46	21269	69 3				46 0	100 0		
TL		40491			45272			67 8					1668
ME	87	1306	40 9	53	1460	52 4	1 1	16 9	62 4	1556 0	93 9	14 1	209

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
SURFACE WATER QUALITY DIVISION

DEQ

Discharge Number	Permit Number
001 A	MI 002 3540

DAILY DISCHARGE MONITORING REPORT

Monitoring Period
December 2001

DAY	CBOD5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS	NH3-N		PH	D.O.	F.COLI #/100ml	CL RESID
	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	mg/l	LBS	SU	mg/l	MF	mg/l
1	11.1	162	92.1	8.0	117	93.8				8.0			7.40	6.6	11	0.000
2	7.0	103	94.6	7.0	103	95.5				7.0	9.38	137.68	7.50	7.3	7	0.000
3	8.3	129	94.3	8.0	125	92.3				8.0			7.50	7.0	67	0.000
4	8.1	124	95.0	17.0	259	84.5				15.0			7.50	7.0	49	0.000
5	8.9	137	94.3	12.0	184	90.5				12.0			7.40	6.9	35	0.000
6	14.9	232	91.1	17.0	265	81.5	0.25	3.9	92.0	17.0			7.40	6.2	146	0.000
7	14.6	229	88.9	18.0	282	78.0				18.0	15.00	235.19	7.40	5.9	180	0.000
8	8.2	118	93.8	8.0	115	93.8				8.0			7.40	5.7	8	0.000
9	6.0	84	95.4	3.0	42	97.6				3.0			7.40	6.9	3	0.000
10	7.1	104	95.0	6.0	88	96.3				6.0	12.50	182.44	7.50	7.4	8	0.000
11	15.9	228	90.5	11.0	158	92.4				11.0			7.50	6.3	88	0.000
12	21.4	339	84.9	24.0	380	82.1	0.29	4.6	90.1	20.0			7.40	6.2	90	0.000
13	16.0	246	89.7	21.0	322	80.6				21.0			7.50	6.2	83	0.000
14	19.4	278	89.0	20.0	287	91.1				20.0	17.00	243.86	7.50	6.1	7	0.000
15	21.0	296	86.3	24.0	338	78.6				22.0			7.40	6.3	52	0.000
16	15.0	220	88.4	11.0	161	87.8				11.0	11.15	163.66	7.50	6.1	13	0.000
17	11.9	198	91.8	24.0	400	81.8				20.0			7.50	6.7	80	0.000
18	22.2	370	86.3	30.0	500	72.7				28.0	13.80	230.18	7.50	6.6	135	0.000
19	22.0	367	86.1	42.0	701	64.4	0.70	11.7	79.2	40.0			7.50	6.2	180	0.000
20	20.0	322	88.7	29.0	467	85.1				28.0			7.40	6.5	6	0.000
21	16.2	242	84.7	22.0	328	56.0				22.0			7.40	6.4	3	0.000
22	22.0	332	88.5	22.0	332	88.4				22.0			7.40	6.4	4	0.000
23	18.0	266	86.4	17.0	251	85.1				17.0			7.50	6.2	110	0.000
24	15.7	228	89.4	22.0	319	83.8				20.0	11.45	166.16	7.50	6.2	44	0.000
25	13.2	182	85.3	26.0	358	64.9	0.43	5.9	79.0	24.0			7.50	7.5	10	0.000
26	18.0	270	86.3	26.0	390	76.8				22.0			7.60	8.6	85	0.000
27	22.0	323	84.3	32.0	470	68.6				30.0			7.60	7.8	57	0.000
28	17.9	252	85.7	18.0	254	52.6				18.0	15.20	214.24	7.50	7.2	24	0.000
29	23.5	319	88.8	24.0	326	81.5				24.0			7.50	7.0	27	0.000
30	19.0	257	88.9	21.0	284	88.5				21.0			7.60	7.1	61	0.000
31	10.5	147	92.7	12.0	168	92.0				12.0			7.60	7.8	16	0.000
TL		7103			8775			26.1								
ME	15.3	229	89.6	18.8	283	82.5	0.42	6.5	85.1	555.0	13.19	196.68		6.7	29	0.000
WA	19.4	304		26.6	426										50	
MX											17.00	243.86	7.60			0
MN													7.40	5.7		

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment See 18 U S C 1001 and 33 U S C 1319 (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 Years)

PRINTED NAME AND TITLE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTORIZED AGENT	DATE
Steven D. Washburn, Superintendent		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

ACTIVATED SLUDGE SHEET

December 2001

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	AERATION SYSTEM				MIXED LIQUOR								SECONDARY SLUDGE				
	AERTN VOL	DETEN TIME	CRT	F:M RATIO	MLSS		MLVSS		SETTL.	SDI	D.O.	AIR	SS	VSS	RAS FLOW	WAS	
	KCF	HRS	DAYS		mg/L	Lbs.	mg/L	Lbs.	%	%	mg/L	CF	%	%	%	Gallons	Lbs.
SF	3											4				3	
1	48	4.9			1765	5285					4.73	44			51	34	
2	48	4.9			1290	3863					4.48	40			49	35	
3	48	4.6	5.8	0.47	1109	3321	959	2872	17	0.65	4.67	35	0.22	0.19	44	31	569
4	48	4.7	30.0	0.51	936	2803	806	2413	15	0.62	4.00	29	0.16	0.13	50	7	93
5	48	4.7	12.5	0.45	1379	4129	1185	3548	20	0.69	3.88	27	0.44	0.38	48	9	330
6	48	4.6	46.1	0.59	1117	3345	966	2893	16	0.70	2.60	39	0.29	0.25	53	3	73
7	48	4.6	46.8	0.28	1875	5614	1610	4821	28	0.67	1 10	44	0.48	0.41	55	3	120
8	48	5.0			1928	5773					3.01	44			56	33	
9	48	5.2			1968	5893					3.88	46			58	41	
10	48	4.9	4.8	0.28	1655	4956	1432	4288	28	0.59	4.67	50	0.28	0.24	55	44	1027
11	48	5.0	2.7	0.48	1568	4695	1352	4048	25	0.63	3.21	43	0.49	0.42	56	43	1757
12	48	4.5	3.8	0.49	1460	4372	1269	3800	20	0.73	2.50	39	0.37	0.32	56	37	1142
13	48	4.7	17.0	0.37	1407	4213	1213	3632	18	0.78	1.71	37	0.33	0.28	52	9	248
14	48	5.0	106.3	0.35	1539	4608	1349	4039	19	0.81	1.76	45	0.26	0.22	68	2	43
15	48	5.1			1916	5737					2.14	46			74	9	
16	48	4.9			1783	5339					0.91	42			70	12	
17	48	4.3	6.9	0.26	1682	5037	1446	4330	28	0.60	2.83	39	0.55	0.47	50	16	734
18	48	4.3	9.6	0.57	1455	4357	1245	3728	21	0.69	3.80	41	0.34	0.29	48	16	454
19	48	4.3	6.5	0.43	1444	4324	1235	3698	22	0.66	0.51	44	0.32	0.27	48	25	667
20	48	4.5	3.9	0.32	1600	4791	1373	4111	24	0.67	1.30	47	0.38	0.33	50	39	1236
21	48	4.8	4.4	0.30	1597	4782	1373	4111	22	0.73	2.05	47	0.28	0.24	60	47	1098
22	48	4.8			1414	4234					4.76	40			55	48	
23	48	4.9			1275	3818					1.25	47			58	34	
24	48	5.0	4.1	0.33	1249	3740	1079	3231	15	0.83	4.34	50	0.38	0.33	58	29	919
25	48	5.2			1136	3402					6.12	50			58	26	
26	48	4.8		0.46	966	2893	835	2500	15	0.64	8.61	50	0.17	0.15	51	0	
27	48	4.9		0.58	1113	3333	952	2851	15	0.74	6.64	51	0.18	0.15	53	0	
28	48	5.1		0.38	1175	3518	995	2979	15	0.78	5.56	50	0.35	0.30	55	0	
29	48	5.3			1014	3036					5.81	50			59	0	
30	48	5.3			876	2623					4.44	51			59	0	
31	48	5.1		0.52	855	2560	729	2183	11	0.78	6.00	51	0.19	0.16	57	0	
TL												1358				632	10510
ME	48	4.8	19.4	0.42	1405	4206	1170	3504	20	0.7	3.7	44	0.32	0.28	55	20	657

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

BIOSOLIDS SHEET

Marshall
MI 002 3540

December 2001

SUPERINTENDENT
Steven D. Washburn

	RAW SLUDGE	RAW BIOSOLIDS			LIME STABILIZED BIOSOLIDS					
DAY	GALLONS	TOTAL SOLIDS %	VOLATILE SOLIDS %	pH SU	LIME POUNDS	pH 2 hrs @ 25 C SU	RDT Solids %	Lbs. Lime per 1000 gallons biosolids		
1	4000	3.8	76.0	6.3	857			214		
2	4000	4.4	72.0	6.2						
3	9500	4.2	72.0	6.2		12.2				
4	8000	3.7	75.0	6.2						
5	8500	3.5	74.0	5.9						
6	8000	3.3	73.0	6.0						
7	8000	3.9	74.0	6.0						
8	8430	3.3	74.0	6.2						
9	8000	4.1	72.0	6.2						
10	10000	4.0	73.0	6.3						
11	10000	3.9	75.0	6.4	2320		8.1	232		
12	10000	3.8	75.0	6.4	1928		10.6	193		
13	10800	4.0	74.0	6.4						
14	10500	3.7	74.0	6.1		12.1				
15	8000	3.5	73.0	6.2						
16	8440	4.3	73.0	6.2						
17	8000	4.1	73.0	6.4						
18	8460	4.0	73.0	6.4	2356		10.7	278		
19	8600	2.7	76.0	6.5	1999	12.2	11.5	232		
20	8000	3.1	75.0	6.5	1856			232		
21	8000	3.7	75.0	6.4	858	12.2		107		
22	8000	3.1	76.0	6.6		12.3				
23	8475	3.9	75.0	6.3						
24	6500	4.0	75.0	6.3						
25	6500	4.1	75.0	6.1						
26	6500	3.9	71.0	6.2						
27	8200	3.2	76.0	6.4	2142		9.8	261		
28	8000	2.5	75.0	6.5		12.3				
29	8000	1.7	75.0	6.6						
30	4700	3.7	74.0	6.6						
31	4450	7.0	66.0	6.3						
TOTAL	244555				14316					
MEAN	7889	3.7	73.8	6.3	1790	12.2	10.1	219		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MISCELLANEOUS SHEET

December 2001

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	WATER	ELECTRICAL USAGE		FUEL GAS		CHEMICALS APPLIED								
			X 120		X 100	$FECL_3$					Cl_2		SO_2	
	CF	METER	KWH	METER	CF	GALS	SP. GR.	% SOLN	LBS	mg/L	LBS	mg/L	LBS	mg/L
1	460	15	1800	32	3200	150.0	1.3940	30	523.2	35.8	11.0	0.8	8.0	0.5
2	470	16	1920	21	2100	100	1.3940	30	348.8	23.8	13	0.9	3.0	0.2
3	540	14	1680	9	900	100	1.3940	30	348.8	22.4	15	1.0	4.0	0.3
4	490	13	1560	5	500	125	1.3940	30	436.0	28.6	19	1.2	1.0	0.1
5	600	15	1800	9	900	100	1.3940	30	348.8	22.7	15	1.0	2.0	0.1
6	520	14	1680	16	1600	100	1.3940	30	348.8	22.4	16	1.0	11.0	0.7
7	640	14	1680	22	2200	100	1.3940	30	348.8	22.2	16	1.0	15.0	1.0
8	620	15	1800	25	2500	175	1.3940	30	610.4	42.5	28	2.0	11.0	0.8
9	560	15	1800	32	3200	100	1.3940	30	348.8	25.0	18	1.3	12.0	0.9
10	430	14	1680	23	2300	100	1.3940	30	348.8	23.9	15	1.0	10.0	0.7
11	1710	16	1920	23	2300	100	1.3940	30	348.8	24.3	16	1.1	6.0	0.4
12	1750	17	2040	14	1400	100	1.3940	30	348.8	22.0	17	1.1	12.0	0.8
13	410	15	1800	18	1800	100	1.3940	30	348.8	22.7	18	1.2	5.0	0.3
14	420	15	1800	23	2300	100	1.3940	30	348.8	24.3	17	1.2	15.0	1.0
15	470	14	1680	28	2800	125	1.3940	30	436.0	30.9	20	1.4	12.0	0.9
16	390	15	1800	26	2600	75	1.3940	30	261.6	17.8	26	1.8	12.0	0.8
17	450	15	1800	25	2500	100	1.3940	30	348.8	20.9	16	1.0	12.0	0.7
18	1690	16	1920	19	1900	100	1.3940	30	348.8	20.9	16	1.0	14.0	0.8
19	430	17	2040	31	3100	100	1.3940	30	348.8	20.9	21	1.3	9.0	0.5
20	1520	16	1920	33	3300	100	1.3940	30	348.8	21.7	24	1.5	5.0	0.3
21	410	15	1800	33	3300	100	1.3940	30	348.8	23.4	25	1.7	7.0	0.5
22	420	15	1800	39	3900	100	1.3940	30	348.8	23.1	16	1.1	4.0	0.3
23	390	15	1800	47	4700	100	1.3940	30	348.8	23.6	34	2.3	4.0	0.3
24	410	14	1680	58	5800	100	1.3940	30	348.8	24.0	20	1.4	18.0	1.2
25	490	15	1800	61	6100	50	1.3940	30	174.4	12.7	20	1.5	15.0	1.1
26	490	15	1800	56	5600	100	1.3940	30	348.8	23.2	22	1.5	14.0	0.9
27	1800	16	1920	52	5200	100	1.3940	30	348.8	23.8	19	1.3	20.0	1.4
28	420	15	1800	51	5100	50	1.3940	30	174.4	12.4	21	1.5	6.0	0.4
29	500	14	1680	54	5400	100	1.3940	30	348.8	25.7	16	1.2	7.0	0.5
30	490	16	1920	55	5500	100	1.3940	30	348.8	25.8	24	1.8	6.0	0.4
31	570	14	1680	54	5400	100	1.3940	30	348.8	24.9	14	1.0	5.0	0.4
TL	20960	465	55800	994	99400	3150					588		285.0	
ME	676	15	1800	32	3206	102	1.3940	30.0	354.4	23.8	19.0	1.3	9.2	0.6

MANPOWER	
POSITION TITLE	NUMBER FULL TIME
SUPERINTENDANT	1
ASST. SUPT.	1
OPERATOR	3
MECHANIC	
CHEMIST	
LAB TECH	
IPP COORDINATOR	1
OTHER	

GIVE THE HOURS PER DAY THAT PLANT PERSONNEL ARE NORMALLY AT THE PLANT.

WEEKDAYS	8	HRS
SATURDAYS	8	HRS
SUNDAYS	8	HRS
HOLIDAYS	8	HRS

Weather Code	
1. Clear	6. Warm
2. Partly Cloudy	7. Cold
3. Cloudy	8. Windy
4. Rain	9. Melting Snow
5. Snow	

PLANT INFLUENT SHEET

January 2003

Marshall

STATE OF MICHIGAN

MI 002 3540

SUPERINTENDENT

DEPT OF ENVIRONMENTAL QUALITY

Steven D. Washburn

D	WEATHER		FLOW		RAW SEWAGE QUALITY									
A	TYPE	PRECIP	TOTAL	MAX	TEMP	pH	BOD_5		SS		TOTAL-P		VSS	NH3-N
Y	CODE	Inches	MGD	MGD	°F	SU	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l
1	1		1.090		46	7.80	242	2200	300	2727			88	
2	5	0.06	1.270		46	8.10	225	2383	196	2076			182	16.6
3	1		1.250		46	7.70	243	2533	260	2711			248	
4	5	0.01	1.250		46	7.80	271	2825	254	2648			238	
5	5	0.14	1.130		45	7.90	175	1649	160	1508			152	15.2
6	1		1.240		45	7.70	180	1861	352	3640			192	
7	1		1.250		46	7.80	266	2773	194	2022			184	
8	1		1.220		48	8.50	264	2686	180	1831			174	18.2
9	5	0.02	1.290		47	7.80	256	2754	162	1743	4.61	50	142	
10	5	0.01	1.200		46	7.60	230	2302	162	1621			162	
11	5	0.01	1.110		46	7.80	177	1639	224	2074			210	
12	1		1.130		45	7.90	179	1687	174	1640			166	
13	1		1.230		48	7.60	196	2011	248	2544	4 56	47	232	18.9
14	5	0.02	1.250		46	7.70	224	2335	240	2502			230	
15	1		1.280		47	8.00	212	2263	194	2071			168	
16	1		1.200		45	7.80	206	2062	206	2062			184	19.0
17	1		1.210		46	7.70	182	1837	170	1716			154	
18	5	0.01	1.180		45	7.80	251	2470	280	2756			262	
19	5	0.03	1.130		45	8.10	221	2083	156	1470			146	16.6
20	1		1.220		45	8.10	216	2198	184	1872			172	
21	1		1.200		45	7 70	223	2232	228	2282			218	
22	1		1.230		45	7.80	242	2482	250	2565	4.83	50	204	18.2
23	1		1.220		45	7.80	187	1903	152	1547			138	
24	1		1.200		44	7.90	229	2292	148	1481			136	
25	5	0.02	1.140		44	7.90	224	2130	208	1978			188	
26	1		1.130		44	7.80	185	1743	266	2507			248	
27	1		1.290		44	7.80	216	2324	224	2410	4.39	47	196	18.3
28	5	0.08	1.240		44	8.00	282	2916	279	2885			244	
29	1		1.280		44	7.80	252	2690	310	3309			266	
30	1		1.190		44	7.90	265	2630	316	3136			290	
31	5	0.11	1.180		43	7.80	252	2480	228	2244			214	
TL		0.52	37.430					70373		69576		193		
ME			1.207		45.3		225	2270	223	2244	4.60	48	194	17.6

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

PRIMARY EFFLUENT SHEET

January 2003

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

	PRIMARY EFFLUENT QUALITY												
DAY	BOD-5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS		AMMONIA NITROGEN	
	mg/l	LBS	Removal	mg/l	LBS	% Removal	mg/l	LBS	% Removal	mg/l	%	mg/l	LBS
1	139	1264	42.6	90	818	70.0				84 0	93.3		
2	152	1610	32.4	94	980	52.0				84 0	89.4	18 9	197
3	150	1564	38.3	86	897	66.9				84 0	97.7		
4	155	1616	42.8	98	924	61.4				98 0	100.0		
5	129	1216	26.3	78	807	51.3				76 0	97.4	16 9	175
6	136	1406	24.4	178	1856	49.4				64 0	36.0		
7	188	1960	29.3	96	977	50.5				84 0	87.5		
8	176	1791	33.3	84	904	53.3				80 0	95.2	19 5	210
9	193	2076	24.6	104	1041	35.8	5 0	49.7	-7.8	80 0	76.9		
10	167	1671	27.4	90	833	44.4				90.0	100.0		
11	134	1240	24.3	80	754	64.3				80 0	100.0		
12	125	1178	30.2	122	1252	29.9				122 0	100.0		
13	106	1087	45.9	70	730	71 8	2 4	24.5	48.5	60 0	85.7	18 3	191
14	144	1501	35.7	66	705	72.5				60 0	90.9		
15	109	1164	48.6	52	520	73.2				48 0	92.3		
16	105	1051	49.0	44	444	78.6				38 0	86.4	19 2	194
17	105	1060	42.3	54	531	68.2				46 0	85 2		
18	115	1132	54.2	44	415	84.3				44 0	100.0		
19	119	1121	46.2	34	346	78.2				34 0	100.0	17 3	176
20	117	1190	45.8	42	420	77.2				36 0	85.7		
21	98	981	56.1	46	472	79.8				40 0	87.0		
22	180	1846	25.6	70	712	72.0	1 9	19.6	60.0	60 0	85.7	21 5	219
23	164	1669	12.3	56	560	63.2				44 0	78.6		
24	127	1271	44.5	36	342	75.7				32 0	88 9		
25	118	1122	47.3	24	226	88.5				22.0	91.7		
26	91	858	50.8	24	258	91.0				20 0	83 3		
27	103	1108	52.3	50	517	77.7	1 8	18.9	58.3	42.0	84.0	17 2	178
28	126	1303	55 3	44	470	84.2				40 0	90.9		
29	117	1249	53.6	64	635	79.4				34 0	53.1		
30	89	883	66.4	54	531	82.9				46 0	85 2		
31	94	925	62.7	48	14984	78.9				42.0	87.5		
TL		41114			35860			112.8					1539
ME	131	1326	41.0	68	1157	68.0	2.8	28.2	39.8	1814.0	87.6	18.6	192

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
SURFACE WATER QUALITY DIVISION

DEQ

Discharge Number	Permit Number
001 A	MI 002 3540

DAILY DISCHARGE MONITORING REPORT

Monitoring Period
January 2003

DAY	CBOD5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS	NH3-N		PH	D.O.	F.COLI #/100ml	CL RESID
	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	mg/l	LBS	SU	mg/l	MF	mg/l
1	8.3	75	96.6	10.0	91	96.7				7.0			7.50	8.3	7	0.010
2	4.9	52	97.8	13.0	138	93.4				11.0	17.70	187.47	7.50	8.4	16	0.000
3	7.2	75	97.0	6.0	63	97.7				6.0			7.40	8.1	23	0.000
4	5.1	53	98.1	6.0	63	97.6				6.0			7.40	7.3	27	0.000
5	4.5	42	97.4	4.0	38	97.5				4.0	13.90	131.00	7.40	6.9	27	0.000
6	5.1	53	97.2	8.0	83	97.7				8.0			7.50	7.8	23	0.000
7	8.2	85	96.9	12.0	125	93.8				12.0			7.40	7.8	32	0.000
8	4.5	46	98.3	7.0	71	96.1				7.0	18.40	187.22	7.40	6.4	61	0.000
9	7.7	83	97.0	10.0	108	93.8	0.37	4.0	92.0	9.0			7.40	7.8	45	0.000
10	5.0	50	97.8	8.0	80	95.1				8.0			7.50	8.0	49	0.000
11	4.8	44	97.3	6.0	56	97.3				6.0			7.50	7.7	65	0.000
12	5.4	51	97.0	6.0	57	96.6				6.0			7.40	7.7	48	0.000
13	4.8	49	97.6	12.0	123	95.2	0.44	4.5	90.4	10.0	17.80	182.60	7.50	8.5	71	0.000
14	4.6	48	97.9	7.0	73	97.1				7.0			7.70	8.0	188	0.000
15	5.8	62	97.3	10.0	107	94.8				10.0			7.70	8.6	165	0.000
16	6.0	60	97.1	9.0	90	95.6				9.0	20.30	203.16	7.70	8.7	149	0.000
17	5.9	60	96.8	13.0	131	92.4				13.0			7.40	7.3	81	0.000
18	6.6	65	97.4	8.0	79	97.1				8.0			7.40	7.4	56	0.000
19	7.0	66	96.8	5.0	47	96.8				5.0	17.50	164.92	7.40	7.3	17	0.000
20	7.6	77	96.5	6.0	61	96.7				6.0			7.40	6.8	23	0.000
21	5.6	56	97.5	5.0	50	97.8				5.0			7.50	7.7	25	0.000
22	9.8	101	96.0	13.0	133	94.8	0.29	3.0	94.0	12.0	19.40	199.01	7.50	8.1	12	0.000
23	10.4	106	94.4	8.0	81	94.7				8.0			7.40	7.3	39	0.000
24	4.5	45	98.0	6.0	60	95.9				6.0			7.50	8.3	14	0.000
25	4.6	44	97.9	3.0	29	98.6				3.0			7.40	7.6	12	0.000
26	3.7	35	98.0	1.0	9	99.6				1.0			7.50	7.9	20	0.000
27	3.6	39	98.3	3.0	32	98.7	0.18	1.9	95.9	3.0	17.20	185.05	7.40	7.0	8	0.000
28	4.1	42	98.5	6.0	62	97.8				6.0			7.50	7.8	11	0.000
29	3.2	34	98.7	6.0	64	98.1				6.0			7.50	7.2	16	0.000
30	3.3	33	98.8	6.0	60	98.1				6.0			7.50	8.1	8	0.000
31	4.1	40	98.4	4.0	39	98.2				4.0			7.50	7.9	3	0.000
TL		1772			2301			13.4								
ME	5.7	57	97.4	7.3	74	96.5	0.32	3.3	93.1	218.0	17.78	180.05		7.7	28	0.000
WA	7.6	76		9.3	94										97	
MX											20.30	203.16	7.70			0.01
MN													7.40	6.4		

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment See 18 U S C 1001 and 33 U S C 1319 (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 Years)

PRINTED NAME AND TITLE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTORIZED AGENT	DATE
Steven D. Washburn, Superintendent		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

ACTIVATED SLUDGE SHEET

January 2003

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	AERATION SYSTEM				MIXED LIQUOR								SECONDARY SLUDGE				
	AERTN VOL	DETEN TIME	CRT	F:M RATIO	MLSS		MLVSS		SETTL.	SDI	D.O.	AIR	SS	VSS	RAS FLOW	WAS	
	KCF	HRS	DAYS		mg/L	Lbs.	mg/L	Lbs.	%	%	mg/L	CF	%	%	%	Gallons	Lbs.
SF	3											4				3	
1	48	7.9			3111	9316					8.00	126			140	26	
2	48	6.8	7.4	0.22	3000	8983	2427	7267	81	0.37	7.35	109	0.50	0.41	120	29	1209
3	48	6.9	6.7	0.21	3082	9229	2473	7405	60	0.51	5.69	85	0.57	0.45	119	29	1379
4	48	6.9			3135	9387					5.99	73			118	29	
5	48	7.6			3231	9675					3.34	69			130	29	
6	48	6.9	8.5	0.19	3147	9423	2463	7375	80	0.39	5.21	78	0.46	0.37	125	29	1113
7	48	6.9	7.2	0.26	3185	9537	2489	7453	75	0.42	5.60	66	0.55	0.43	126	29	1330
8	48	7.1	7.1	0.23	3361	10064	2626	7863	52	0.65	1.82	87	0.59	0.46	129	29	1427
9	48	6.7	7.0	0.26	3436	10289	2689	8052	50	0.69	6.40	109	0.61	0.47	122	29	1475
10	48	7.2	7.4	0.21	3527	10561	2706	8103	49	0.72	6.49	72	0.59	0.46	130	29	1427
11	48	7.8			3575	10705					5.87	68			140	29	
12	48	7.6			3494	10462					6.00	76			138	29	
13	48	7.0	7.7	0.14	3368	10085	2590	7755	48	0.70	5.50	80	0.58	0.45	127	27	1306
14	48	6.9	8.2	0.19	3388	10145	2617	7836	43	0.79	6.09	106	0.57	0.44	126	26	1236
15	48	6.7	14.3	0.14	3350	10031	2810	8414	40	0.84	6.93	127	0.35	0.28	122	24	701
16	48	7.2	10.7	0.14	3101	9286	2422	7252	37	0.84	6.94	107	0.52	0.40	130	20	867
17	48	7.1	15.8	0.15	2998	8977	2363	7076	54	0.56	2.99	97	0.40	0.31	130	17	567
18	48	7.3			3009	9010					5.75	83			131	17	
19	48	7.6			3082	9229					3.52	79			139	17	
20	48	7.1	15.7	0.17	2908	8708	2313	6926	60	0.48	1.97	92	0.39	0.31	129	17	553
21	48	7.2	13.9	0.14	2914	8726	2341	7010	38	0.77	3.97	95	0.47	0.38	123	16	627
22	48	7.0	11.3	0.26	2941	8807	2353	7046	52	0.57	5.89	92	0.55	0.44	120	17	780
23	48	7.1	8.2	0.23	2956	8851	2395	7172	50	0.59	0.66	109	0.46	0.37	120	28	1074
24	48	7.2		0.16	3308	9905	2673	8004	68	0.49	5.76	87	0.48	0.39	131	0	
25	48	7.6			3502	10486					6.10	73			140	0	
26	48	7.6			3483	10429					4.53	73			139	0	
27	48	6.7	28.3	0.14	3410	10211	2740	8205	88	0.39	1.72	79	0.48	0.39	122	9	360
28	48	6.9	16.3	0.15	3546	10618	2851	8537	70	0.51	5.78	68	0.60	0.48	121	13	651
29	48	6.7	13.8	0.15	3379	10118	2729	8172	78	0.43	0.38	113	0.55	0.44	116	16	734
30	48	7.2	12.4	0.10	3572	10696	2864	8576	78	0.46	7.59	73	0.61	0.49	124	17	865
31	48	7.3	12.4	0.11	3544	10612	2870	8594	75	0.47	5.80	65	0.57	0.46	130	18	856
TL												2716				644	20536
ME	48	7.2	11.4	0.18	3259	9760	2582	7732	60	0.6	5.0	88	0.52	0.41	128	21	978

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

BIOSOLIDS SHEET

Marshall

MI 002 3540

January 2003

SUPERINTENDENT
Steven D. Washburn

	RAW SLUDGE	RAW BIOSOLIDS			LIME STABILIZED BIOSOLIDS					
DAY	GALLONS	TOTAL SOLIDS %	VOLATILE SOLIDS %	pH SU	LIME POUNDS	pH 2 hrs @ 25 C SU	RDT Solids %	Lbs. Lime per 1000 gallons biosolids		
1	12000	3.0	74.0	6.2		12.3				
2	9000	3.2	78.0	6.2						
3	8500	2.9	77.0	6.3						
4	8000	2.7	76.0	6.3						
5	8200	3.2	77.0	6.0						
6	10000	2.7	78.0	6.2						
7	10000	2.4	77.0	6.1	3239		6.6	324		
8	10000	3.0	78.0	6.1						
9	11000	2.9	77.0	6.1	2624	12.4	6.6	239		
10	10000	3.0	64.0	8.2		12.3				
11	10500	2.7	73.0	7.0						
12	10000	3.3	77.0	6.5						
13	10500	3.1	78.0	6.4			11.2			
14	10000	3.1	74.0	6.6	2829			283		
15	10500	3.0	73.0	6.7		12.3				
16	9000	3.0	72.0	6.6						
17	9000	3.4	73.0	6.5						
18	9000	3.2	72.0	6.6						
19	10500	3.8	72.0	6.5						
20	9000	3.2	73.0	6.5						
21	9250	3.6	75.0	6.5			7.3			
22	10500	3.4	73.0	6.5	3075		7.3	293		
23	9500	3.4	72.0	6.4	3403	12.3	9.0	358		
24	8000	3.6	74.0	6.5		12.3				
25	8500	2.8	72.0	6.6						
26	6250	4.1	73.0	6.5						
27	7000	3.7	73.0	6.8						
28	10000	2.6	69.0	6.7						
29	10250	3.6	71.0	6.6	3198			312		
30	11000	3.4	72.0	6.5		12.3				
31	10300	2.9	74.0	6.6						
TOTAL	295250				18368					
MEAN	9524	3.2	73.9	6.5	3061	12.3	8.0	301		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MISCELLANEOUS SHEET

January 2003

Marshall
MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	WATER	ELECTRICAL USAGE		FUEL GAS		CHEMICALS APPLIED								
			X 120		X 100	$FECL_3$					Cl_2		SO_2	
	CF	METER	KWH	METER	CF	GALS	SP. GR.	% SOLN	LBS	mg/L	LBS	mg/L	LBS	mg/L
1	420	22	2640	33	3300	75.0	1.4180	30	266.1	29.3	27.0	3.0	19.0	2.1
2	460	15	1800	49	4900	75	1.4180	30	266.1	25.1	24	2.3	19.0	1.8
3	760	16	1920	37	3700	50	1.4180	30	177.4	17.0	18	1.7	18.0	1.7
4	460	16	1920	32	3200	100	1.4180	30	354.8	34.0	25	2.4	18.0	1.7
5	480	16	1920	32	3200	75	1.4180	30	266.1	28.2	24	2.5	19.0	2.0
6	500	16	1920	36	3600	75	1.4180	30	266.1	25.7	24	2.3	18.0	1.7
7	1870	18	2160	30	3000	100	1.4180	30	354.8	34.0	24	2.3	18.0	1.7
8	840	20	2400	26	2600	100	1.4180	30	354.8	34.9	22	2.2	16.0	1.6
9	1980	23	2760	30	3000	100	1.4180	30	354.8	33.0	20	1.9	19.0	1.8
10	500	16	1920	39	3900	100	1.4180	30	354.8	35.5	24	2.4	18.0	1.8
11	490	18	2160	43	4300	50	1.4180	30	177.4	19.2	25	2.7	20.0	2.2
12	470	17	2040	41	4100	50	1.4180	30	177.4	18.8	25	2.7	18.0	1.9
13	490	17	2040	49	4900	100	1.4180	30	354.8	34.6	26	2.5	19.0	1.9
14	1810	23	2760	65	6500	75	1.4180	30	266.1	25.5	26	2.5	19.0	1.8
15	500	23	2760	59	5900	125	1.4180	30	443.5	41.5	20	1.9	18.0	1.7
16	530	17	2040	27	2700	200	1.4180	30	709.6	70.9	24	2.4	13.0	1.3
17	450	15	1800	67	6700	100	1.4180	30	354.8	35.2	24	2.4	18.0	1.8
18	510	16	1920	53	5300	150	1.4180	30	532.2	54.1	24	2.4	18.0	1.8
19	530	16	1920	51	5100	125	1.4180	30	443.5	47.1	24	2.5	19.0	2.0
20	420	17	2040	38	3800	100	1.4180	30	354.8	34.9	23	2.3	18.0	1.8
21	460	16	1920	57	5700	100	1.4180	30	354.8	35.5	23	2.3	18.0	1.8
22	1760	20	2400	64	6400	125	1.4180	30	443.5	43.2	23	2.2	18.0	1.8
23	1810	23	2760	65	6500	100	1.4180	30	354.8	34.9	23	2.3	12.0	1.2
24	430	18	2160	49	4900	100	1.4180	30	354.8	35.5	24	2.4	19.0	1.9
25	4690	15	1800	48	4800	175	1.4180	30	620.9	65.3	26	2.7	19.0	2.0
26	440	15	1800	60	6000	150	1.4180	30	532.2	56.5	26	2.8	20.0	2.1
27	430	19	2280	51	5100	75	1.4180	30	266.1	24.7	25	2.3	19.0	1.8
28	500	19	2280	38	3800	100	1.4180	30	354.8	34.3	20	1.9	19.0	1.8
29	1840	25	3000	43	4300	100	1.4180	30	354.8	33.2	25	2.3	18.0	1.7
30	350	20	2400	39	3900	100	1.4180	30	354.8	35.7	25	2.5	19.0	1.9
31	390	18	2160	44	4400	100	1.4180	30	354.8	36.1	24	2.4	20.0	2.0
TL	27570	565	67800	1395	139500	3150					737		563.0	
ME	889	18	2187	45	4500	102	1.4180	30.0	360.5	35.9	23.8	2.4	18.2	1.8

MANPOWER	
POSITION TITLE	NUMBER FULL TIME
SUPERINTENDANT	1
ASST. SUPT.	1
OPERATOR	3
MECHANIC	
CHEMIST	
LAB TECH	
IPP COORDINATOR	1
OTHER	

GIVE THE HOURS PER DAY THAT PLANT PERSONNEL ARE NORMALLY AT THE PLANT.

WEEKDAYS	8	HRS
SATURDAYS	8	HRS
SUNDAYS	8	HRS
HOLIDAYS	8	HRS

Weather Code
1. Clear
2. Partly Cloudy
3. Cloudy
4. Rain
5. Snow
6. Warm
7. Cold
8. Windy
9. Melting Snow

PLANT INFLUENT SHEET

February 2003

Marshall

STATE OF MICHIGAN

MI 002 3540

SUPERINTENDENT

DEPT OF ENVIRONMENTAL QUALITY

Steven D. Washburn

D	WEATHER		FLOW		RAW SEWAGE QUALITY									
A	TYPE	PRECIP	TOTAL	MAX	TEMP	pH	BOD_5		SS		TOTAL-P		VSS	NH3-N
Y	CODE	Inches	MGD	MGD	°F	SU	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l
1	1		1.120		45	8.00	224	2092	194	1812			172	
2	1		1.090		44	8.00	242	2200	234	2127			226	
3	4	0.54	1.230		44	7.80	233	2390	270	2770	4.71	48	234	19.5
4	1		1.160		44	8.00	204	1974	200	1935			183	
5	5	0.02	1.170		44	8.00	213	2078	208	2030			184	
6	1		1.170		44	7.80	179	1747	134	1308			120	20.1
7	1		1.150		43	7.90	167	1602	88	844			74	
8	5	0.01	1.130		43	7.80	171	1612	106	999			90	
9	5	0.04	1.140		43	7.90	228	2168	176	1673			162	19.1
10	5	0.03	1.180		43	7.70	151	1486	94	925			86	
11	5	0.02	1.190		43	7.80	219	2173	222	2203			211	
12	1		1.170		43	7.90	230	2244	224	2186	4.41	43	200	
13	1		1.200		43	7.80	179	1791	154	1541			144	19.0
14	1		1.190		43	7.80	178	1767	126	1250			118	
15	1		1.100		43	7.80	209	1917	202	1853			182	
16	1		1.130		42	7.90	186	1753	148	1395	4.76	45	120	16.1
17	5	0.01	1.220		42	7.80	212	2157	238	2422			220	
18	1		1.230		44	7.80	244	2503	189	1939			168	
19	1		1.230		44	8.00	256	2626	178	1826			158	
20	1		1.210		45	7.80	221	2230	168	1695			152	17.3
21	5		1.110		44	7.70	247	2287	174	1611			164	
22	5	0.22	1.080		44	7.80	191	1720	192	1729			180	
23	5	0.03	1.110		43	7.90	238	2203	342	3166			300	16.0
24	5	0.02	1.120		44	7.70	167	1560	172	1607			158	
25	1		1.240		42	7.70	265	2741	364	3764			350	
26	1		1.250		43	7.70	238	2481	252	2627	5.74	60	220	19.5
27	1		1.260		43	7.80	375	3941	246	2585			216	
28	1		1.240		43	7.80	251	2596	148	1531			136	
29														
30														
31														
TL		0.94	32.820					60039		53353		196		
ME			1.172		43.4		219	2144	194	1905	4.91	49	176	18.3

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

PRIMARY EFFLUENT SHEET

February 2003

Marshall
MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

	PRIMARY EFFLUENT QUALITY												
DAY	BOD-5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS		AMMONIA NITROGEN	
	mg/l	LBS	Removal	mg/l	LBS	% Removal	mg/l	LBS	% Removal	mg/l	%	mg/l	LBS
1	112	1046	50.0	36	336	81.4				28.0	77.8		
2	110	1000	54.5	46	472	80.3				40.0	87.0		
3	1	10	99.6	38	368	85.9	1.9	18.6	59.2	34.0	89.5	20.7	200
4	127	1229	37.7	54	527	73.0				48.0	88.9		
5	119	1161	44.1	56	546	73.1				48.0	85.7		
6	88	859	50.8	38	364	71.6				34.0	89.5	20.8	199
7	107	1026	35.9	50	471	43.2				36.0	72.0		
8	91	858	46.8	40	380	62.3				32.0	80.0		
9	110	1046	51.8	50	492	71.6				42.0	84.0	18.4	181
10	87	856	42.4	44	437	53.2				36.0	81.8		
11	112	1112	48.9	60	585	73.0				52.0	86.7		
12	101	986	56.1	44	440	80.4	1.8	17.8	59.6	34.0	77.3		
13	100	1001	44.1	46	457	70.1				40.0	87.0	18.4	183
14	92	913	48.3	26	239	79.4				22.0	84.6		
15	101	927	51.7	50	471	75.2				42.0	84.0		
16	88	829	52.7	54	549	63.5	1.8	18.2	62.4	44.0	81.5	18.1	184
17	100	1017	52.8	38	390	84.0				32.0	84.2		
18	137	1405	43.9	58	595	69.3				52.0	89.7		
19	175	1795	31.6	44	444	75.3				36.0	81.8		
20	132	1332	40.3	38	352	77.4				32.0	84.2	19.1	177
21	117	1083	52.6	40	360	77.0				40.0	100.0		
22	97	874	49.2	40	370	79.2				40.0	100.0		
23	95	879	60.1	36	336	89.5				36.0	100.0	16.0	149
24	80	747	52.1	36	372	79.1				28.0	77.8		
25	106	1096	60.0	54	563	85.2				48.0	88.9		
26	124	1293	47.9	46	483	81.7	2.3	24.0	60.3	40.0	87.0	18.7	197
27	176	1849	53.1	46	476	81.3				42.0	91.3		
28	102	1055	59.4	38		74.3				34.0	89.5		
29													
30													
31													
TL		29284			11877			78.6					1470
ME	107	1046	50.7	45	424	74.7	1.9	19.6	60.4	1072.0	86.1	18.8	184

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
SURFACE WATER QUALITY DIVISION

DEQ

Discharge Number	Permit Number
001 A	MI 002 3540

DAILY DISCHARGE MONITORING REPORT

Monitoring Period
february 2003

DAY	CBOD5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS	NH3-N		PH	D.O.	F.COLI #/100ml	CL RESID
	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	mg/l	LBS	SU	mg/l	MF	mg/l
1	4.5	42	98.0	1.0	9	99.5				1.0			7.50	7.9	5	0.000
2	5.2	47	97.9	5.0	45	97.9				5.0			7.50	7.7	10	0.008
3	5.5	56	97.6	1.0	10	99.6	0.41	4.2	91.3	1.0	14.10	144.64	7.50	7.9	5	0.023
4	5.7	55	97.2	4.0	39	98.0				4.0			7.50	8.5	25	0.000
5	4.8	47	97.7	3.0	29	98.6				3.0			7.40	8.2	14	0.000
6	4.9	48	97.3	3.0	29	97.8				3.0	13.60	132.71	7.50	7.9	5	0.000
7	5.1	49	96.9	4.0	38	95.5				2.0			7.40	7.9	29	0.000
8	5.3	50	96.9	3.0	28	97.2				3.0			7.40	8.0	118	0.000
9	8.5	81	96.3	6.0	57	96.6				5.0	7.33	69.69	7.40	7.7	136	0.000
10	5.3	52	96.5	4.0	39	95.7				4.0			7.40	7.4	8	0.000
11	6.3	63	97.1	4.0	40	98.2				4.0			7.30	7.8	156	0.000
12	6.9	67	97.0	6.0	59	97.3	0.31	3.0	93.0	5.0			7.30	8.0	149	0.000
13	7.4	74	95.9	4.0	40	97.4				4.0	7.30	73.06	7.30	7.3	43	0.000
14	7.1	70	96.0	2.0	20	98.4				2.0			7.30	7.0	120	0.000
15	7.2	66	96.6	4.0	37	98.0				4.0			7.20	7.1	120	0.000
16	6.8	64	96.3	6.0	57	95.9	0.55	5.2	88.4	4.0	3.16	29.78	7.20	7.3	240	0.000
17	6.3	64	97.0	2.0	20	99.2				2.0			7.30	7.0	22	0.000
18	4.6	47	98.1	4.0	41	97.9				4.0			7.20	6.9	1	0.000
19	6.7	69	97.4	3.0	31	98.3				3.0			7.30	6.8	16	0.000
20	5.2	52	97.6	3.0	30	98.2				3.0	8.05	81.24	7.30	6.7	8	0.000
21	6.2	57	97.5	4.0	37	97.7				4.0			7.20	7.1	5	0.000
22	7.2	65	96.2	5.0	45	97.4				5.0			7.30	7.5	860	0.000
23	6.7	62	97.2	5.0	46	98.5				5.0	0.41	3.80	7.30	8.4	289	0.000
24	5.8	54	96.5	11.0	103	93.6				9.0			7.30	8.2	54	0.000
25	5.3	55	98.0	6.0	62	98.4				6.0			7.20	7.9	6	0.000
26	5.1	53	97.9	4.0	42	98.4	0.33	3.4	94.3	4.0	1.47	15.32	7.40	8.1	4	0.000
27	5.6	59	98.5	5.0	53	98.0				5.0			7.20	7.6	1	0.000
28	4.7	49	98.1	2.0	21	98.6				2.0			7.30	7.1	2	0.000
29																
30																
31																
TL		1618			1107			15.9								
ME	5.9	58	97.2	4.1	40	97.7	0.40	4.0	91.7	106.0	6.93	68.78		7.6	22	0.001
WA	7.0	68		5.7	56										96	
MX											14.10	144.64	7.50			0.023
MN													7.20	6.7		

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment See 18 U S C 1001 and 33 U S C 1319 (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 Years)

PRINTED NAME AND TITLE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTORIZED AGENT	DATE
Steven D. Washburn, Superintendent		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

ACTIVATED SLUDGE SHEET

February 2003

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	AERATION SYSTEM				MIXED LIQUOR								SECONDARY SLUDGE				
	AERTN VOL	DETEN TIME	CRT	F:M RATIO	MLSS		MLVSS		SETTL.	SDI	D.O.	AIR	SS	VSS	RAS FLOW	WAS	
	KCF	HRS	DAYS		mg/L	Lbs.	mg/L	Lbs.	%	%	mg/L	CF	%	%	%	Gallons	Lbs.
SF	3											4				3	
1	48	7.7			3598	10774					6.05	65			140	17	
2	48	7.9			3492	10456					5.89	64			144	17	
3	48	7.0	13.1	0.00	3481	10423	2800	8384	80	0.44	6.58	62	0.53	0.43	122	18	796
4	48	7.4	12.3	0.15	3310	9911	2687	8046	64	0.52	7.12	60	0.57	0.46	127	17	808
5	48	7.4	12.3	0.15	3230	9672	2608	7809	79	0.41	5.17	67	0.59	0.47	126	16	787
6	48	7.4	12.4	0.10	3410	10211	2778	8318	67	0.51	5.21	67	0.58	0.48	126	17	822
7	48	7.5	17.0	0.13	3261	9765	2635	7890	83	0.39	5.10	76	0.46	0.37	129	15	575
8	48	7.6			3270	9792					6.01	64			130	15	
9	48	7.6			3243	9711					5.04	59			129	12	
10	48	7.3	16.2	0.11	3175	9507	2597	7776	77	0.41	3.00	63	0.47	0.39	131	15	588
11	48	7.2	13.7	0.14	3179	9519	2603	7794	64	0.50	2.05	64	0.49	0.40	132	17	695
12	48	7.4	19.5	0.13	3226	9660	2632	7881	71	0.45	4.64	60	0.54	0.44	124	11	495
13	48	7.2	17.8	0.13	3184	9534	2609	7812	62	0.51	2.85	59	0.46	0.38	130	14	537
14	48	7.2	14.8	0.11	3296	9870	2694	8067	80	0.41	3.45	58	0.47	0.39	132	17	666
15	48	7.8			3177	9513					3.00	60			143	17	
16	48	7.6			3091	9256					5.59	57			139	17	
17	48	7.1			3061	9166					3.55	54			129	17	
18	48	7.0	14.7	0.19	3012	9019	2477	7417	77	0.39	1.48	58	0.46	0.30	128	16	614
19	48	7.0	19.6	0.24	3117	9334	2549	7633	60	0.52	1.61	61	0.52	0.43	128	11	477
20	48	7.1	58.5	0.17	3258	9756	2682	8031	64	0.51	2.02	59	0.40	0.33	130	5	167
21	48	7.8	24.6	0.13	3396	10169	2790	8354	84	0.40	2.25	59	0.45	0.37	141	11	413
22	48	8.0			3470	10391					4.61	61			145	14	
23	48	7.8			3345	10016					6.07	66			141	12	
24	48	7.7	16.5	0.10	3201	9585	2625	7860	68	0.47	5.37	66	0.58	0.47	140	12	580
25	48	6.9	17.6	0.14	3170	9492	2568	7690	66	0.48	5.58	68	0.54	0.44	127	12	540
26	48	6.9	13.2	0.16	3226	9660	2626	7863	81	0.40	5.33	67	0.55	0.45	126	16	734
27	48	6.8	12.0	0.24	3148	9426	2584	7738	62	0.51	3.65	65	0.45	0.37	121	21	788
28	48	6.9	11.0	0.14	3172	9498	2598	7779	82	0.39	1.00	62	0.45	0.37	120	23	863
29																	
30																	
31																	
TL												1751				422	11947
ME	48	7.4	17.7	0.14	3257	9753	2639	7902	72	0.5	4.3	63	0.50		131	15	629

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

BIOSOLIDS SHEET

Marshall

MI 002 3540

February 2003

SUPERINTENDENT
Steven D. Washburn

	RAW SLUDGE	RAW BIOSOLIDS			LIME STABILIZED BIOSOLIDS					
DAY	GALLONS	TOTAL SOLIDS %	VOLATILE SOLIDS %	pH SU	LIME POUNDS	pH 2 hrs @ 25 C SU	RDT Solids %	Lbs. Lime per 1000 gallons biosolids		
1	9000	2.9	74.0	6.6						
2	10200	3.7	76.0	6.5						
3	10600	3.1	75.0	6.5						
4	10000	3 3	74.0	6.6	1958		7.2	196		
5	10000	3.1	71.0	6.7	2312	12.3	9.7	231		
6	10000	2.9	74.0	6.7		12.3				
7	10000	3.1	75.0	6.7						
8	9000	3.1	74.0	6 7						
9	9000	2.6	76.0	6.7						
10	9000	2.5	77.0	6.6						
11	9000	3.0	77.0	6.6	2067		8.7	230		
12	9000	2.7	76.0	6.7		12.3				
13	9000	2.8	76.0	6.7						
14	9800	2.8	75.0	6.6						
15	8000	2.7	73.0	6.8						
16	10000	2.3	75.0	6.7						
17	9000	2.5	73.0	6.7						
18	8000	2.4	76.0	6.6	2122		6.5	265		
19	9000	2.9	74.0	6.6	1850	12.3	6 7	206		
20	10000	2.9	88.0	6.5		12.3				
21	9000	2.9	74.0	6.6						
22	8000	2.8	74.0	6.6						
23	10000	3.4	75.0	6 6						
24	10500	3.0	75.0	6.6						
25	10000	2.9	76.0	6 7	2094			209		
26	12000	2.8	76.0	6.6	1061			88		
27	10000	3.0	77.0	6.4		12.3				
28	9500	3.1	76.0	6.3						
29										
30										
31										
TOTAL	266600				13464					
MEAN	9521	2.9	75.4	6.6	1923	12.3	7.8	204		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MISCELLANEOUS SHEET

February 2003

Marshall
MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	WATER	ELECTRICAL USAGE		FUEL GAS		CHEMICALS APPLIED								
			X 120		X 100	$FECL_3$					Cl_2		SO_2	
	CF	METER	KWH	METER	CF	GALS	SP. GR.	% SOLN	LBS	mg/L	LBS	mg/L	LBS	mg/L
1	510	20	2400	45	4500	125.0	1.4180	30	443.5	47.5	25.0	2.7	21.0	2.2
2	560	19	2280	22	2200	125	1.4180	30	443.5	48.8	25	2.8	17.0	1.9
3	460	19	2280	41	4100	100	1.4180	30	354.8	34.6	16	1.6	19.0	1.9
4	1760	21	2520	32	3200	100	1.4180	30	354.8	36.7	21	2.2	17.0	1.8
5	1660	21	2520	57	5700	100	1.4180	30	354.8	36.4	12	1.2	17.0	1.7
6	410	19	2280	52	5200	50	1.4180	30	177.4	18.2	30	3.1	18.0	1.8
7	380	19	2280	52	5200	100	1.4180	30	354.8	37.0	17	1.8	16.0	1.7
8	490	19	2280	45	4500	100	1.4180	30	354.8	37.6	23	2.4	22.0	2.3
9	370	19	2280	55	5500	50	1.4180	30	177.4	18.7	20	2.1	19.0	2.0
10	360	19	2280	54	5400	50	1.4180	30	177.4	18.0	21	2.1	15.0	1.5
11	1740	21	2520	57	5700	100	1.4180	30	354.8	35.7	16	1.6	18.0	1.8
12	400	20	2400	57	5700	100	1.4180	30	354.8	36.4	25	2.6	20.0	2.0
13	320	18	2160	37	3700	100	1.4180	30	354.8	35.5	24	2.4	19.0	1.9
14	400	19	2280	34	3400	100	1.4180	30	354.8	35.7	24	2.4	19.0	1.9
15	380	19	2280	68	6800	50	1.4180	30	177.4	19.3	31	3.4	36.0	3.9
16	410	20	2400	70	7000	100	1.4180	30	354.8	37.6	35	3.7	30.0	3.2
17	440	20	2400	58	5800	75	1.4180	30	266.1	26.2	39	3.8	31.0	3.0
18	1660	21	2520	51	5100	75	1.4180	30	266.1	25.9	31	3.0	26.0	2.5
19	1790	21	2520	33	3300	125	1.4180	30	443.5	43.2	30	2.9	28.0	2.7
20	330	18	2160	36	3600	75	1.4180	30	266.1	26.4	30	3.0	28.0	2.8
21	380	19	2280	8	800	100	1.4180	30	354.8	38.3	26	2.8	26.0	2.8
22	390	19	2280	60	6000	75	1.4180	30	266.1	29.5	37	4.1	26.0	2.9
23	420	19	2280	47	4700	100	1.4180	30	354.8	38.3	42	4.5	28.0	3.0
24	420	19	2280	46	4600	75	1.4180	30	266.1	28.5	44	4.7	27.0	2.9
25	1720	22	2640	50	5000	100	1.4180	30	354.8	34.3	37	3.6	28.0	2.7
26	1430	22	2640	40	4000	100	1.4180	30	354.8	34.0	49	4.7	34.0	3.3
27	400	20	2400	41	4100	100	1.4180	30	354.8	33.8	43	4.1	35.0	3.3
28	680	18	2160	34	3400	100	1.4180	30	354.8	34.3	35	3.4	15.0	1.5
29														
30														
31														
TL	20670	550	66000	1282	128200	2550					808		655.0	
ME	738	20	2357	46	4579	91	1.4180	30.0	323.1	33.1	28.9	3.0	23.4	2.4

MANPOWER	
POSITION TITLE	NUMBER FULL TIME
SUPERINTENDANT	1
ASST. SUPT.	1
OPERATOR	3
MECHANIC	
CHEMIST	
LAB TECH	
IPP COORDINATOR	1
OTHER	

GIVE THE HOURS PER DAY THAT PLANT PERSONNEL ARE NORMALLY AT THE PLANT.

WEEKDAYS	8	HRS
SATURDAYS	8	HRS
SUNDAYS	8	HRS
HOLIDAYS	8	HRS

Weather Code	
1 Clear	6 Warm
2 Partly Cloudy	7 Cold
3 Cloudy	8 Windy
4 Rain	9 Melting Snow
5 Snow	

PLANT INFLUENT SHEET

March 2003

Marshall

STATE OF MICHIGAN

MI 002 3540

SUPERINTENDENT

DEPT OF ENVIRONMENTAL QUALITY

Steven D Washburn

DAY	WEATHER TYPE CODE	WEATHER PRECIP Inches	FLOW TOTAL MGD	FLOW MAX MGD	RAW SEWAGE QUALITY TEMP °F	pH SU	BOD_5 mg/l	BOD_5 LBS	SS mg/l	SS LBS	TOTAL-P mg/l	TOTAL-P LBS	VSS mg/l	NH3-N mg/l
1	5	0 01	1 120		42	7 80	221	2064	230	2148			212	
2	1		1 110		42	7 90	205	1898	256	2370			236	17 2
3	5	0 05	1 200		43	7 90	257	2572	304	3042	4 89	49	288	
4	5	0 35	1 230		43	7 80	265	2718	250	2565			233	
5	1		1 190		42	7 80	303	3007	276	2739			258	19 9
6	1		1 190		45	7 80	200	1985	244	2422			224	
7	1		1 140		44	7 70	221	2101	270	2567			240	
8	5	0 16	1 160		44	7 80	195	1887	174	1683			154	
9	5	0 01	1 130		42	8 00	203	1913	170	1602			152	17 9
10	1		1 240		43	7 70	195	2017	144	1489			126	
11	1		1 210		43	7 90	269	2715	203	2049			192	
12	5	0 25	1 310		43	7 80	258	2819	194	2120	5 55	61	180	17 8
13	1		1 290		43	7 80	254	2733	188	2023			184	
14	1		1 200		44	7 80	157	1571	60	600			56	
15	1		1 200		43	7 70	204	2042	238	2382			216	
16	1		1 220		42	7 80	197	2004	172	1750			158	
17	1		1 330		43	7 50	293	3250	216	2396	4 48	50	190	16 8
18	1		1 240		44	7 80	282	2916	219	2265			201	
19	4	0 07	1 290		45	7 60	278	2991	214	2302			200	17 1
20	4	0 42	1 360		47	7 70	244	2768	172	1951			144	
21	4	0 02	1 190		46	7 80	207	2054	158	1568			144	
22	1		1 200		46	7 80	191	1912	130	1301			124	
23	1		1 230		46	7 80	213	2185	210	2154			194	
24	4	0 21	1 300		44	7 70	207	2244	154	1670			142	
25	1		1 330		44	7 90	272	3017	230	2551			216	17 9
26	1		1 320		49	7 70	263	2895	242	2664	6 25	69	214	
27	1		1 280		44	7 80	244	2605	208	2220			192	20 9
28	4	0 58	1 250		47	7 70	178	1856	128	1334			128	
29	2		1 230		46	7 80	189	1939	180	1846			170	
30	5	0 01	1 230		43	7 80	197	2021	198	2031			182	
31	5	0 03	1 310		43	7 80	239	2611	296	3234			264	
TL		2 17	38 230					73309		65040		228		
ME			1 233		44 0		229	2365	204	2098	5 29	57	188	18 2

City of Marshall
801 Industrial Rd
Marshall, MI 49068

PRIMARY EFFLUENT SHEET

March 2003

Marshall
MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D Washburn

	PRIMARY EFFLUENT QUALITY												
DAY	BOD-5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS		AMMONIA NITROGEN	
	mg/l	LBS	Removal	mg/l	LBS	% Removal	mg/l	LBS	% Removal	mg/l	%	mg/l	LBS
1	99	925	55 2	40	374	82 6				36 0	90 0		
2	77	713	62 4	44	440	82 8				36 0	81 8	16 6	166
3	84	841	67 3	38	390	87 5	1 1	11 6	76 9	38 0	100 0		
4	114	1169	57 0	30	298	88 0				30 0	100 0		
5	137	1360	54 8	42	417	84 8				42 0	100 0	21 2	210
6	111	1102	44 5	40	380	83 6				24 0	60 0		
7	101	960	54 3	40	387	85 2				30 0	75 0		
8	89	861	54 4	36	339	79 3				32 0	88 9		
9	84	792	58 6	38	393	77 6				32 0	84 2	17 7	183
10	135	1396	30 8	20	202	86 1				16 0	80 0		
11	143	1443	46 8	24	262	88 2				20 0	83 3		
12	123	1344	52 3	18	194	90 7	1 9	20 7	65 4	14 0	77 8	16 2	174
13	102	1097	59 8	46	460	75 5				40 0	87 0		
14	101	1011	35 7	36	360	40 0				36 0	100 0		
15	95	951	53 4	34	346	85 7				34 0	100 0		
16	100	1017	49 2	30	333	82 6				30 0	100 0		
17	129	1431	56 0	44	455	79 6	2 0	20 2	56 5	30 0	68 2	18 0	186
18	126	1303	55 3	32	344	85 4				26 0	81 3		
19	155	1668	44 2	44	499	79 4				40 0	90 9	20 0	227
20	157	1781	35 7	28	278	83 7				22 0	78 6		
21	110	1092	46 9	46	460	70 9				46 0	100 0		
22	86	861	55 0	28	287	78 5				28 0	100 0		
23	89	913	58 2	34	369	83 8				34 0	100 0		
24	96	1041	53 6	30	333	80 5				30 0	100 0		
25	131	1453	51 8	20	220	91 3				20 0	100 0	18 1	199
26	129	1420	51 0	50	534	79 3	2 7	28 6	57 1	40 0	80 0		
27	140	1495	42 6	58	605	72 1				52 0	89 7	20 7	216
28	100	1043	43 8	46	472	64 1				46 0	100 0		
29	90	923	52 4	30	308	83 3				30 0	100 0		
30	86	882	56 3	34	371	82 8				34 0	100 0		
31	106	1158	55 6	34	10840	88 5				34 0	100 0		
TL		35444			21950			81 0					1562
ME	110	1143	51 5	36	708	80 8	1 9	20 3	64 0	1002 0	90 2	18 6	195

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
SURFACE WATER QUALITY DIVISION

DEQ

Discharge Number	Permit Number
001 A	MI 002 3540

DAILY DISCHARGE MONITORING REPORT

Monitoring Period
March 2003

DAY	$CBOD_5$			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS	NH3-N		PH	D.O.	F.COLI #/100ml	CL RESID
	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	mg/l	LBS	SU	mg/l	MF	mg/l
1	4.2	39	98.1	1.0	9	99.6				1.0			7.20	7.4	1	0.000
2	3.7	34	98.2	9.0	83	96.5				8.0	0.14	1.26	7.40	8.5	5	0.000
3	4.3	43	98.3	5.0	50	98.4	0.18	1.8	96.3	5.0			7.30	9.0	3	0.000
4	4.1	42	98.5	1.0	10	99.6				1 0			7.20	8.0	1	0.000
5	3.4	34	98.9	1.0	10	99.6				1.0	2.98	29.58	7.30	8.4	1	0.000
6	2.4	24	98.8	4.0	40	98.4				4.0			7.20	8.0	1	0.000
7	2.0	19	99.1	1.0	10	99.6				1.0			7.30	8.6	4	0.000
8	3.2	31	98.4	1.0	10	99.4				1.0			7.40	8.4	6	0.000
9	2.8	26	98.6	1 0	9	99.4				1.0	2.24	21.11	7.40	9.0	7	0.000
10	3.7	38	98.1	1.0	10	99.3				1.0			7.30	7.2	2	0.000
11	3.6	36	98.7	2.0	20	99.0				2.0			7.30	7.5	3	0.000
12	3.2	35	98.8	1.0	11	99.5	0.14	1.5	97.5	1.0	2.19	23.93	7.30	7.1	3	0.000
13	2.1	23	99.2	2.0	22	98.9				2.0			7.50	9.2	45	0.000
14	3.3	33	97.9	3.0	30	95.0				3.0			7.30	8.4	6	0.000
15	4.6	46	97.7	1.0	10	99.6				1.0			7.30	8.0	10	0.000
16	2.6	26	98.7	1.0	10	99.4				1.0			7.30	6.9	4	0.000
17	2.4	27	99.2	3.0	33	98.6	0.21	2.3	95.3	3.0	0.72	7.99	7.30	8.1	6	0.000
18	2.7	28	99.0	2.0	21	99.1				2.0			7.40	7.8	100	0.000
19	3.5	38	98.7	1.0	11	99.5				1.0	2.22	23.88	7.40	7.8	11	0.000
20	2.8	32	98.9	1.0	11	99.4				1.0			7.30	7.5	2	0.000
21	2.2	22	98.9	1.0	10	99.4				1.0			7.40	7.7	7	0.000
22	2.9	29	98.5	1.0	10	99.2				1.0			7.50	7.9	5	0.000
23	2.6	27	98.8	1.0	10	99.5				1.0			7.50	9.1	5	0.000
24	2.2	24	98.9	1.0	11	99.4				1.0			7.50	8.7	8	0.000
25	3.1	34	98.9	1.0	11	99.6				1.0	0.58	6.43	7.40	8.4	16	0.000
26	2.4	26	99.1	1.0	11	99.6	0.24	2.6	96.2	1.0			7.40	7.9	23	0.000
27	2.5	27	99.0	4.0	43	98.1				4.0	0.48	5.12	7.40	8.4	59	0.000
28	2.6	27	98.5	1.0	10	99.2				1.0			7.40	8.2	48	0.000
29	3.0	31	98.4	1.0	10	99.4				1.0			7.50	8.1	28	0.000
30	2.1	22	98.9	1 0	10	99.5				1.0			7.50	9.4	5	0.000
31	2.6	28	98.9	1.0	11	99.7				1.0			7.40	8.3	5	0.000
TL		951			568			8.3								
ME	3.0	31	98.7	1.8	18	99.0	0.19	2.1	96.3	55.0	1.44	14.91		8.2	6	0.000
WA	3.4	34		3.1	30										20	
MX											2.98	29.58	7.50			
MN													7.20	6.9		

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment See 18 U S C 1001 and 33 U S C 1319 (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 Years)

PRINTED NAME AND TITLE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTORIZED AGENT	DATE
Steven D. Washburn, Superintendent		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

ACTIVATED SLUDGE SHEET

March 2003

Marshall

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

MI 002 3540

SUPERINTENDENT
Steven D. Washburn

DAY	AERATION SYSTEM				MIXED LIQUOR								SECONDARY SLUDGE				
	AERTN VOL	DETEN TIME	CRT	F:M RATIO	MLSS		MLVSS		SETTL.	SDI	D.O.	AIR	SS	VSS	RAS FLOW	WAS	
	KCF	HRS	DAYS		mg/L	Lbs.	mg/L	Lbs.	%	%	mg/L	CF	%	%	%	Gallons	Lbs.
SF	3											4				3	
1	48	7.7			3067	9184					5.01	61			134	23	
2	48	7.8			3127	9363					6.02	66			137	23	
3	48	7.2	10.8	0.12	2906	8702	2398	7181	78	0.37	6.48	61	0.42	0.34	125	23	806
4	48	7.0	9.3	0.17	2811	8417	2332	6983	70	0.40	5.47	57	0.47	0.39	124	23	902
5	48	7.2	8.9	0.20	2385	7142	2237	6698	55	0.43	6.80	66	0.48	0.40	131	20	801
6	48	7.2	21.5	0.16	2796	8372	2336	6995	58	0.48	4.95	66	0.36	0.31	134	13	390
7	48	7.6	18.5	0.13	2860	8564	2380	7127	72	0.40	6.44	65	0.37	0.31	139	15	463
8	48	7.4			2938	8798					6.72	63			136	17	
9	48	7.6			2902	8690					7.52	59			142	17	
10	48	6.9	13.4	0.20	2812	8420	2341	7010	64	0.44	0.85	62	0.47	0.39	122	16	627
11	48	7.1	9.1	0.20	1869	5597	2361	7070	61	0.31	4.52	57	0.49	0.42	121	15	613
12	48	6.6	14.4	0.18	2925	8759	2428	7270	79	0.37	0.20	89	0.52	0.43	112	14	607
13	48	6.7	15.1	0.15	2963	8872	2462	7372	76	0.39	7.03	83	0.44	0.37	114	16	587
14	48	7.2	13.0	0.13	2996	8971	2503	7495	67	0.45	6.84	54	0.55	0.46	128	15	688
15	48	7.2			3149	9429					7.21	50			131	12	
16	48	7.1			3157	9453					0.49	55			128	14	
17	48	6.5	16.3	0.19	3062	9169	2546	7624	78	0.39	5.11	56	0.45	0.37	129	15	563
18	48	6.9	14.8	0.17	3041	9106	2530	7576	77	0.39	4.79	64	0.46	0.38	131	16	614
19	48	6.7	17.1	0.23	2971	8896	2456	7354	77	0.39	6.72	64	0.52	0.45	129	12	520
20	48	6.3	11.7	0.23	3155	9447	2628	7869	69	0.46	5.55	60	0.57	0.47	131	17	808
21	48	7.2	7.7	0.14	3230	9672	2660	7965	80	0.40	6.36	63	0.56	0.46	134	27	1261
22	48	7.2			3157	9453					4.91	65			131	29	
23	48	7.0			2973	8902					7.77	63			127	28	
24	48	6.6	9.3	0.15	2791	8357	2327	6968	75	0.37	6.22	58	0.37	0.31	127	29	895
25	48	6.5	6.7	0.21	2748	8229	2308	6911	71	0.39	4.65	61	0.51	0.43	118	29	1233
26	48	6.5	6.8	0.22	2588	7749	2149	6435	53	0.49	5.94	64	0.47	0.39	118	29	1137
27	48	6.7	7.5	0.22	2676	8013	2229	6675	51	0.52	6.39	60	0.44	0.37	123	29	1064
28	48	6.9	6.9	0.15	2745	8220	2297	6878	52	0.53	5.54	58	0.49	0.41	126	29	1185
29	48	7.0			2632	7881					6.91	68			126	29	
30	48	7.0			2477	7417					7.95	68			125	29	
31	48	6.6	6.9	0.20	2348	7031	1960	5869	61	0.38	7.00	57	0.45	0.38	124	27	1013
TL												1943				650	16778
ME	48	7.0	11.7	0.18	2847	8525	2375	7111	68	0.4	5.6	63	0.47	0.39	128	21	799

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

BIOSOLIDS SHEET

Marshall

MI 002 3540

March 2003

SUPERINTENDENT
Steven D. Washburn

	RAW SLUDGE	RAW BIOSOLIDS			LIME STABILIZED BIOSOLIDS					
DAY	GALLONS	TOTAL SOLIDS %	VOLATILE SOLIDS %	pH SU	LIME POUNDS	pH 2 hrs @ 25 C SU	RDT Solids %	Lbs. Lime per 1000 gallons biosolids		
1	9000	2.7	74.0	6.4						
2	12000	3.1	74.0	6.4						
3	12000	3.0	74.0	6.5						
4	12000	2.7	73.0	6.6	2107		7.8	176		
5	10000	2.9	74.0	6.5	1686	12.3	8.2	169		
6	11500	3.1	74.0	6.5		12.3				
7	12000	3.0	73.0	6.4						
8	10000	2.8	73.0	6.4						
9	12000	3.3	75.0	6.4						
10	10000	2.9	72.0	6.5	3010	12.3	7.5	301		
11	10800	2.8	74.0	6.4			7.1			
12	10000	3.0	74.0	6.5						
13	10000	2.8	74.0	6.4						
14	10000	3.0	75.0	6.4						
15	10000	2.7	73.0	6.4						
16	10000	3.2	78.0	6.4						
17	10000	3.0	76.0	6.4						
18	10500	3.1	77.0	6.4						
19	10000	2.7	75.0	6.4	2288		6.3	229		
20	10000	2.7	74.0	6.4	2348	12.3	7.3	235		
21	10000	3.1	75.0	6.3		12.3				
22	12000	2.7	75.0	6.3						
23	10000	3.0	76.0	6.3						
24	10500	2.8	76.0	6.5						
25	11500	2.9	76.0	6.4						
26	12000	3.3	74.0	6.4	2258		7.9	188		
27	11500	3.0	75.0	6.3	1686		7.0	147		
28	12000	4.9	83.0	6.0		12.3				
29	10000	3.0	75.0	6.2						
30	10000	4.1	71.0	6.1						
31	10000	3.4	75.0	6.2						
TOTAL	331300				15383					
MEAN	10687	3.1	74.7	6.4	2198	12.3	7.4	206		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MISCELLANEOUS SHEET

March 2003

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	WATER	ELECTRICAL USAGE		FUEL GAS		CHEMICALS APPLIED								
			X 120		X 100	$FECL_3$					Cl_2		SO_2	
	CF	METER	KWH	METER	CF	GALS	SP. GR.	% SOLN	LBS	mg/L	LBS	mg/L	LBS	mg/L
1	430	18	2160	28	2800	175.0	1.4000	30	613.0	65.6	28.0	3.0	22.0	2.4
2	450	19	2280	47	4700	175	1.4000	30	613.0	66.2	31	3.3	23.0	2.5
3	380	18	2160	50	5000	150	1.4000	30	525.4	52.5	30	3.0	27.0	2.7
4	1870	22	2640	39	3900	150	1.4000	30	525.4	51.2	28	2.7	8.0	0.8
5	1360	21	2520	23	2300	150	1.4000	30	525.4	52.9	24	2.4	11.0	1.1
6	530	17	2040	62	6200	100	1.4000	30	350.3	35.3	17	1.7	15.0	1.5
7	430	19	2280	34	3400	100	1.4000	30	350.3	36.8	23	2.4	16.0	1.7
8	420	19	2280	37	3700	100	1.4000	30	350.3	36.2	21	2.2	12.0	1.2
9	420	18	2160	50	5000	50	1.4000	30	175.1	18.6	19	2.0	11.0	1.2
10	1890	20	2400	49	4900	100	1.4000	30	350.3	33.9	18	1.7	10.0	1.0
11	460	19	2280	30	3000	125	1.4000	30	437.9	43.4	19	1.9	10.0	1.0
12	440	22	2640	36	3600	125	1.4000	30	437.9	40.1	15	1.4	10.0	0.9
13	400	20	2400	28	2800	100	1.4000	30	350.3	32.6	16	1.5	11.0	1.0
14	580	18	2160	21	2100	100	1.4000	30	350.3	35.0	13	1.3	9.0	0.9
15	490	18	2160	16	1600	50	1.4000	30	175.1	17.5	11	1.1	9.0	0.9
16	500	18	2160	11	1100	100	1.4000	30	350.3	34.4	15	1.5	11.0	1.1
17	460	17	2040	16	1600	100	1.4000	30	350.3	31.6	14	1.3	10.0	0.9
18	690	19	2280	17	1700	50	1.4000	30	175.1	16.9	15	1.5	12.0	1.2
19	1970	20	2400	19	1900	100	1.4000	30	350.3	32.6	15	1.4	10.0	0.9
20	1630	21	2520	10	1000	75	1.4000	30	262.7	23.2	13	1.1	6.0	0.5
21	400	18	2160	13	1300	100	1.4000	30	350.3	35.3	13	1.3	15.0	1.5
22	450	19	2280	21	2100	100	1.4000	30	350.3	35.0	14	1.4	10.0	1.0
23	550	19	2280	16	1600	100	1.4000	30	350.3	34.1	15	1.5	11.0	1.1
24	400	19	2280	6	600	100	1.4000	30	350.3	32.3	14	1.3	10.0	0.9
25	390	18	2160	8	800	100	1.4000	30	350.3	31.6	14	1.3	11.0	1.0
26	1780	21	2520	12	1200	100	1.4000	30	350.3	31.8	3	0.3	9.0	0.8
27	1460	21	2520	9	900	100	1.4000	30	350.3	32.8	22	2.1	11.0	1.0
28	430	19	2280	9	900	100	1.4000	30	350.3	33.6	16	1.5	9.0	0.9
29	390	18	2160	26	2600	50	1.4000	30	175.1	17.1	16	1.6	10.0	1.0
30	460	19	2280	28	2800	100	1.4000	30	350.3	34.1	16	1.6	11.0	1.1
31	440	19	2280	17	1700	100	1.4000	30	350.3	32.1	15	1.4	10.0	0.9
TL	22950	593	71160	788	78800	3225					543		370.0	
ME	740	19	2295	25	2542	104	1.4000	30.0	364.4	35.7	17.5	1.7	11.9	1.2

MANPOWER	
POSITION TITLE	NUMBER FULL TIME
SUPERINTENDANT	1
ASST. SUPT.	1
OPERATOR	3
MECHANIC	
CHEMIST	
LAB TECH	
IPP COORDINATOR	1
OTHER	

GIVE THE HOURS PER DAY THAT PLANT PERSONNEL ARE NORMALLY AT THE PLANT.

WEEKDAYS	8	HRS
SATURDAYS	8	HRS
SUNDAYS	8	HRS
HOLIDAYS	8	HRS

Weather Code
1. Clear
2. Partly Cloudy
3. Cloudy
4. Rain
5. Snow
6. Warm
7. Cold
8. Windy
9. Melting Snow

PLANT INFLUENT SHEET

April 2003

Marshall

STATE OF MICHIGAN

MI 002 3540

SUPERINTENDENT

DEPT OF ENVIRONMENTAL QUALITY

Steven D. Washburn

D	WEATHER		FLOW		RAW SEWAGE QUALITY									
A	TYPE	PRECIP	TOTAL	MAX	TEMP	pH	BOD_5		SS		TOTAL-P		VSS	NH3-N
Y	CODE	Inches	MGD	MGD	°F	SU	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l
1	1		1.290		44	7.70	311	3346	233	2507			202	16.6
2	1		1.270		46	8.10	278	2945	216	2288			198	
3	4	0.89	1.300		46	7.60	249	2700	244	2645	5.08	55	216	18.8
4	4	1.21	1.530		46	7.70	197	2514	168	2144			150	
5	4	0.01	1.310		45	7.70	140	1530	136	1486			114	
6	5	0.11	1.440		43	7.70	200	2402	278	3339			258	
7	4	0.21	1.330		44	7.90	250	2773	278	3084			254	14.4
8	1		1.400		44	7.70	233	2721	219	2557			198	
9	1		1.440		44	7.70	159	1910	192	2306			186	
10	1		1.430		44	7.60	170	2027	190	2266	4.34	52	172	12.9
11	1		1.380		45	7.80	212	2440	164	1888			146	
12	1		1.330		43	7.70	185	2052	188	2085			174	
13	1		1.280		45	7.60	196	2092	226	2413			198	14.4
14	1		1.370		45	7.60	221	2525	268	3062	5.23	60	238	
15	1		1.350		45	7.80	224	2522	150	1689			139	15.8
16	1		1.350		45	7.60	278	3130	212	2387			198	
17	4	0.04	1.340		45	7.60	216	2414	174	1945			160	
18	1		1.250		45	7.70	183	1908	138	1439			120	
19	1		1.250		45	7.70	165	1720	158	1647			144	
20	4	0.20	1.190		45	7.70	209	2074	204	2025			196	
21	4	0.06	1.320		45	7.90	250	2752	180	1982			174	16.9
22	1		1.310		47	7.80	284	3103	246	2688	5.44	59	235	
23	1		1.350		46	7.60	254	2860	224	2522			194	
24	1		1.320		47	7.80	246	2708	232	2554			210	17.1
25	1		1.320		46	7.60	302	3325	222	2444			198	
26	1		1.300		44	7.80	261	2830	244	2645			220	
27	1		1.200		49	7.60	226	2262	300	3002			278	
28	1		1.270		48	7.60	241	2553	220	2330			208	
29	1		1.270		46	7.70	246	2606	209	2214			192	
30	4	0.87	1.310		50	7.60	254	2775	180	1967			172	
31														
TL		3.60	39.800					75516		69547		226		
ME			1.327		45.4		228	2517	210	2318	5.02	57	191	15.9

City of Marshall
801 Industrial Rd
Marshall, MI 49068

PRIMARY EFFLUENT SHEET

Apnl 2003

Marshall
MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D Washburn

	PRIMARY EFFLUENT QUALITY												
DAY	BOD-5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS		AMMONIA NITROGEN	
	mg/l	LBS	Removal	mg/l	LBS	% Removal	mg/l	LBS	% Removal	mg/l	%	mg/l	LBS
1	134	1442	56 9	28	301	88 0				24 0	85 7	17 2	185
2	121	1282	56 5	24	260	88 9				16 0	66 7		
3	157	1702	36 9	50	638	79 5	2 2	28 6	55 9	42 0	84 0	22 3	285
4	147	1876	25 4	50	546	70 2				40 0	80 0		
5	84	918	40 0	24	288	82 4				18 0	75 0		
6	85	1021	57 5	34	377	87 8				28 0	82 4		
7	121	1342	51 6	24	280	91 4				24 0	100 0	13 8	161
8	131	1530	43 8	44	528	79 9				26 0	59 1		
9	93	1117	41 5	32	382	83 3				24 0	75 0	12 8	153
10	116	1383	31 8	40	460	78 9	2 2	24 7	50 5	36 0	90 0		
11	112	1289	47 2	28	311	82 9				28 0	100 0		
12	102	1131	44 9	32	342	83 0				32 0	100 0		
13	94	1003	52 0	24	274	89 4				22 0	91 7	14 0	160
14	94	1074	57 5	24	270	91 0	2 0	22 2	62 3	22 0	91 7		
15	130	1464	42 0	22	248	85 3				18 0	81 8	17 4	196
16	152	1711	45 3	40	447	81 1				28 0	70 0		
17	159	1777	26 4	50	521	71 3				46 0	92 0		
18	96	1001	47 5	38	396	72 5				28 0	73 7		
19	85	886	48 5	30	298	81 0				22 0	73 3		
20	79	784	62 2	28	308	86 3				22 0	78 6		
21	114	1255	54 4	36	393	80 0				36 0	100 0	16 4	179
22	134	1464	52 8	20	225	91 9	2 5	28 5	53 5	20 0	100 0		
23	154	1734	39 4	40	440	82 1				24 0	60 0		
24	168	1849	31 7	44	484	81 0				38 0	86 4	19 4	214
25	172	1894	43 0	52	564	76 6				52 0	100 0		
26	157	1702	39 8	28	280	88 5				28 0	100 0		
27	108	1081	52 2	30	318	90 0				30 0	100 0		
28	96	1017	60 2	40	424	81 8				34 0	85 0		
29	51	540	79 3	36	393	82 8				32 0	88 9		
30	145	1584	42 9	64		64 4				62 0	96 9		
31													
TL		39853			10998			104 0					1532
ME	120	1328	47 0	35	367	82 4	2 2	26 0	55 5	902 0	85 6	16 7	191

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
SURFACE WATER QUALITY DIVISION

DEQ

Discharge Number	Permit Number
001 A	MI 002 3540

DAILY DISCHARGE MONITORING REPORT

Monitoring Period
April 2003

DAY	$CBOD_5$			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS	NH3-N		PH	D.O.	F.COLI #/100ml	CL RESID
	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	mg/l	LBS	SU	mg/l	MF	mg/l
1	2.9	31	99.1	1.0	11	99.6				1.0	3.60	38.73	7.30	7.6	2	0.000
2	2.7	29	99.0	1.0	11	99.5				1.0			7.30	6.7	1	0.000
3	2.4	26	99.0	1.0	11	99.6	0.33	3.6	93.5	1.0	2.88	31.22	7.30	7.2	1	0.000
4	2.4	31	98.8	1.0	13	99.4				1.0			7.30	7.0	7	0.000
5	2.9	32	97.9	1.0	11	99.3				1.0			7.40	8.0	32	0.000
6	1.9	23	99.1	5.0	60	98.2				5.0			7.40	9.0	25	0.000
7	3.4	38	98.6	1.0	11	99.6				1.0	0.66	7.32	7.40	8.6	51	0.000
8	2.7	32	98.8	1.0	12	99.5				1.0			7.40	8.2	81	0.000
9	1.9	23	98.8	1.0	12	99.5				1.0	0.05	0.60	7.30	8.5	57	0.000
10	3.0	36	98.2	6.0	72	96.8	0.37	4.4	91.5	4.0			7.40	8.1	36	0.000
11	2.2	25	99.0	1.0	12	99.4				1.0			7.30	8.1	34	0.000
12	2.5	28	98.6	1.0	11	99.5				1.0			7.40	8.2	17	0.000
13	1.7	18	99.1	1.0	11	99.6				1.0	0.06	0.64	7.40	8.2	16	0.000
14	2.1	24	99.0	1.0	11	99.6	0.37	4.2	92.9	1.0			7.30	7.6	28	0.000
15	2.2	25	99.0	1.0	11	99.3				1.0	5.18	58.32	7.40	7.5	19	0.000
16	2.4	27	99.1	1.0	11	99.5				1.0			7.40	7.1	31	0.000
17	2.9	32	98.7	1.0	11	99.4				1.0			7.40	7.3	88	0.000
18	2.2	23	98.8	1.0	10	99.3				1.0			7.40	7.0	22	0.000
19	2.4	25	98.5	1.0	10	99.4				1.0			7.50	8.5	204	0.000
20	2.2	22	98.9	5.0	50	97.5				5.0			7.40	7.8	88	0.000
21	3.3	36	98.7	1.0	11	99.4				1.0	0.44	4.84	7.30	7.6	120	0.000
22	3.0	33	98.9	1.0	11	99.6	0.39	4.2	92.9	1.0			7.30	7.2	79	0.000
23	3.7	42	98.5	1.0	11	99.6				1.0			7.30	6.9	34	0.000
24	4.4	48	98.2	5.0	55	97.8				4.0	6.31	69.47	7.30	6.9	162	0.000
25	3.7	41	98.8	2.0	22	99.1				2.0			7.30	6.8	33	0.000
26	3.5	38	98.7	1.0	11	99.6				1.0			7.50	7.6	240	0.000
27	2.6	26	98.8	1.0	10	99.7				1.0			7.50	7.8	220	0.000
28	2.6	28	98.9	6.0	64	97.3				4.0			7.60	8.0	10	0.000
29	3.6	38	98.5	1.0	11	99.5				1.0			7.50	7.8	16	0.000
30				5.0	55	97.2				5.0			7.40	6.8	10	0.000
31																
TL		878			631			16.4								
ME	2.7	30	98.8	1.9	21	99.1	0.36	4.1	92.7	52.0	2.40	26.39		7.7	29	0.000
WA	3.5	38		3.0	32										99	
MX											6.31	69.47	7.60			
MN													7.30	6.7		

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment See 18 U S C 1001 and 33 U S C 1319 (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 Years)

PRINTED NAME AND TITLE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTORIZED AGENT	DATE
Steven D. Washburn, Superintendent		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

ACTIVATED SLUDGE SHEET

April 2003

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	AERATION SYSTEM				MIXED LIQUOR								SECONDARY SLUDGE				
	AERTN VOL	DETEN TIME	CRT	F:M RATIO	MLSS		MLVSS		SETTL.	SDI	D.O.	AIR	SS	VSS	RAS FLOW	WAS	
	KCF	HRS	DAYS		mg/L	Lbs.	mg/L	Lbs.	%	%	mg/L	CF	%	%	%	Gallons	Lbs.
SF	3											4				3	
1	48	6.7	10.1	0.24	2426	7264	2031	6082	45	0.54	5.20	52	0.43	0.36	124	20	717
2	48	6.8	8.6	0.21	2457	7357	2059	6165	58	0.42	2.15	54	0.49	0.41	124	21	858
3	48	6.6	10.0	0.33	2039	6106	1702	5096	46	0.44	5.46	59	0.43	0.36	121	17	610
4	48	5.6	12.1	0.30	2476	7414	2069	6195	50	0.50	3.88	65	0.49	0.40	105	15	613
5	48	6.6			2910	8714					5.21	66			126	15	
6	48	6.0			2855	8549					6.86	65			111	15	
7	48	6.5	11.6	0.19	2621	7848	2341	7010	78	0.34	6.70	65	0.54	0.45	112	15	676
8	48	6.2	13.4	0.22	2855	8549	2374	7109	67	0.43	5.15	65	0.51	0.42	113	15	638
9	48	6.0	11.0	0.15	2954	8845	2441	7309	78	0.38	6.34	65	0.48	0.40	109	20	801
10	48	6.0	10.5	0.19	2971	8896	2470	7396	75	0.40	5.99	60	0.44	0.36	105	23	844
11	48	6.2	8.1	0.18	2968	8887	2432	7282	63	0.47	6.24	55	0.57	0.47	112	23	1093
12	48	6.5			2958	8857					6.04	60			123	23	
13	48	6.7			3089	9250					5.57	59			118	23	
14	48	6.3	7.2	0.15	2832	8480	2351	7040	77	0.37	5.10	52	0.59	0.49	118	24	1181
15	48	6.4	8.7	0.20	2940	8804	2424	7258	75	0.39	4.46	50	0.53	0.44	121	23	1017
16	48	6.4	8.2	0.23	2944	8815	2444	7318	71	0.41	0.19	60	0.56	0.46	121	23	1074
17	48	6.4	8.3	0.24	2966	8881	2466	7384	77	0.39	1.11	62	0.56	0.46	122	23	1074
18	48	6.9	7.8	0.13	3047	9124	2525	7561	85	0.36	0.25	86	0.61	0.51	130	23	1170
19	48	6.9			3359	10058					5.02	62			126	23	
20	48	7.2			3219	9639					5.57	49			132	18	
21	48	6.5	8.2	0.16	3195	9567	2660	7965	89	0.36	5.97	57	0.58	0.48	121	24	1161
22	48	6.6	10.7	0.19	3093	9262	2586	7744	88	0.35	4.69	62	0.45	0.38	125	23	863
23	48	6.4	10.3	0.24	2959	8860	2453	7345	84	0.35	1.52	61	0.45	0.38	123	23	863
24	48	6.5	10.6	0.25	3058	9157	2520	7546	83	0.37	2.14	57	0.45	0.37	126	23	863
25	48	6.5	8.8	0.24	3213	9621	2654	7947	92	0.35	1.03	90	0.47	0.39	125	28	1098
26	48	6.6			3266	9780					5.33	101			128	31	
27	48	7.2			3187	9543					5.91	103			138	41	
28	48	6.8	4.1	0.13	3025	9058	2537	7597	94	0.32	6.17	101	0.53	0.44	128	50	2210
29	48	6.8	4.1	0.08	2755	8250	2307	6908	91	0.30	6.31	71	0.46	0.39	128	52	1995
30	48	6.6	4.1	0.26	2490	7456	2069	6195	80	0.31	3.47	55	0.42	0.35	122	52	1821
31	48																
TL												1969				749	23240
ME	48	6.5	8.9	0.20	2904	8696	2360	7066	75	0.4	4.5	66	0.50	0.42	121	25	1056

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

BIOSOLIDS SHEET

April 2003

Marshall

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

MI 002 3540

SUPERINTENDENT
Steven D. Washburn

	RAW SLUDGE	RAW BIOSOLIDS			LIME STABILIZED BIOSOLIDS					
DAY	GALLONS	TOTAL SOLIDS %	VOLATILE SOLIDS %	pH SU	LIME POUNDS	pH 2 hrs @ 25 C SU	RDT Solids %	Lbs. Lime per 1000 gallons biosolids		
1	10000	3.2	75.0	6.3						
2	10000	3.1	76.0	6.2						
3	12000	3.2	75.0	6.0	2258		9.7	188		
4	10000	3.2	75.0	6.0	1686		10.9	169		
5	10000	3.2	75.0	6.0		12.3				
6	10000	3.4	76.0	6.1						
7	12000	3.2	76.0	6.2						
8	10000	3.1	77.0	6.2	2099			210		
9	10000	3.6	79.0	6.0		12.3				
10	12000	2.8	77.0	6.2						
11	12000	2.8	76.0	6.3						
12	10000	2.5	75.0	6.2						
13	11500	2.9	76.0	6.2						
14	12000	3.1	75.0	6.2						
15	12000	2.8	75.0	6.3						
16	12000	2.7	76.0	6.3	2385		8.8	199		
17	12000	2.7	76.0	6.3	2353		8.3	196		
18	12000	2.7	74.0	6.2		12.2				
19	12000	2.3	75.0	6.4		12.2				
20	12000	2.4	76.0	6.5						
21	12000	2.4	77.0	6.5						
22	12000	2.8	76.0	6.5						
23	12000	2.5	76.0	6.4	2385		8.2	199		
24	11000	2.7	76.0	6.2	1590		9.6	145		
25	12000	3.0	75.0	6.1		12.2				
26	12500	2.8	77.0	6.2						
27	12000	3.1	78.0	6.0						
28	12000	2.4	77.0	6.1						
29	12000	2.4	76.0	6.3						
30	12000	2.5	76.0	6.2	2353		8.9	196		
31										
TOTAL	343000				17109					
MEAN	11433	2.9	76.0	6.2	2139	12.2	9.2	188		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MISCELLANEOUS SHEET

April 2003

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	WATER	ELECTRICAL USAGE		FUEL GAS		CHEMICALS APPLIED								
			X 120		X 100	$FECL_3$					Cl_2		SO_2	
	CF	METER	KWH	METER	CF	GALS	SP. GR.	% SOLN	LBS	mg/L	LBS	mg/L	LBS	mg/L
1	400	17	2040	11	1100	100.0	1.4000	30	350.3	32.6	16.0	1.5	11.0	1.0
2	390	17	2040	7	700	100	1.4000	30	350.3	33.1	16	1.5	9.0	0.8
3	1730	20	2400	16	1600	100	1.4000	30	350.3	32.3	13	1.2	10.0	0.9
4	1610	21	2520	22	2200	100	1.4000	30	350.3	27.5	11	0.9	9.0	0.7
5	420	18	2160	37	3700	75	1.4000	30	262.7	24.0	7	0.6	10.0	0.9
6	450	19	2280	33	3300	100	1.4000	30	350.3	29.2	2	0.2	12.0	1.0
7	490	19	2280	38	3800	100	1.4000	30	350.3	31.6	9	0.8	9.0	0.8
8	1650	20	2400	35	3500	100	1.4000	30	350.3	30.0	11	0.9	10.0	0.9
9	410	19	2280	24	2400	100	1.4000	30	350.3	29.2	11	0.9	10.0	0.8
10	780	18	2160	17	1700	100	1.4000	30	350.3	29.4	10	0.8	10.0	0.8
11	520	17	2040	8	800	100	1.4000	30	350.3	30.4	11	1.0	10.0	0.9
12	720	18	2160	11	1100	125	1.4000	30	437.9	39.5	12	1.1	10.0	0.9
13	560	18	2160	8	800	75	1.4000	30	262.7	24.6	11	1.0	11.0	1.0
14	550	17	2040	3	300	100	1.4000	30	350.3	30.7	10	0.9	10.0	0.9
15	600	18	2160	4	400	75	1.4000	30	262.7	23.3	12	1.1	9.0	0.8
16	2030	17	2040	4	400	125	1.4000	30	437.9	38.9	10	0.9	6.0	0.5
17	1970	16	1920	11	1100	100	1.4000	30	350.3	31.3	11	1.0	10.0	0.9
18	540	18	2160	6	600	100	1.4000	30	350.3	33.6	11	1.1	12.0	1.2
19	530	15	1800	3	300	75	1.4000	30	262.7	25.2	10	1.0	11.0	1.1
20	520	14	1680	3	300	100	1.4000	30	350.3	35.3	11	1.1	12.0	1.2
21	460	15	1800	5	500	100	1.4000	30	350.3	31.8	10	0.9	9.0	0.8
22	440	14	1680	12	1200	100	1.4000	30	350.3	32.1	11	1.0	11.0	1.0
23	1860	19	2280	12	1200	100	1.4000	30	350.3	31.1	12	1.1	11.0	1.0
24	1470	16	1920	6	600	100	1.4000	30	350.3	31.8	13	1.2	11.0	1.0
25	810	17	2040	5	500	75	1.4000	30	262.7	23.9	13	1.2	11.0	1.0
26	590	18	2160	4	400	100	1.4000	30	350.3	32.3	14	1.3	10.0	0.9
27	610	19	2280	3	300	100	1.4000	30	350.3	35.0	16	1.6	11.0	1.1
28	520	19	2280	2	200	100	1.4000	30	350.3	33.1	13	1.2	11.0	1.0
29	880	15	1800	1	100	100	1.4000	30	350.3	33.1	17	1.6	10.0	0.9
30	1980	17	2040	4	400	100	1.4000	30	350.3	32.1	14	1.3	8.0	0.7
31														
TL	26490	525	63000	355	35500	2925					348		304.0	
ME	883	18	2100	12	1183	98	1.4000	30.0	341.5	30.9	11.6	1.1	10.1	0.9

MANPOWER

POSITION TITLE	NUMBER FULL TIME
SUPERINTENDANT	1
ASST. SUPT.	1
OPERATOR	3
MECHANIC	
CHEMIST	
LAB TECH	
IPP COORDINATOR	1
OTHER	

GIVE THE HOURS PER DAY THAT PLANT PERSONNEL ARE NORMALLY AT THE PLANT.

WEEKDAYS	8	HRS
SATURDAYS	8	HRS
SUNDAYS	8	HRS
HOLIDAYS	8	HRS

Weather Code	
1 Clear	6 Warm
2 Partly Cloudy	7 Cold
3 Cloudy	8 Windy
4 Rain	9 Melting Snow
5 Snow	

PLANT INFLUENT SHEET

May 2003

Marshall

STATE OF MICHIGAN

MI 002 3540

SUPERINTENDENT

DEPT OF ENVIRONMENTAL QUALITY

Steven D Washburn

D	WEATHER		FLOW		RAW SEWAGE QUALITY									
A	TYPE	PRECIP	TOTAL	MAX	TEMP	pH	BOD_5		SS		TOTAL-P		VSS	NH3-N
Y	CODE	Inches	MGD	MGD	°F	SU	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l
1	4	0 30	1 340		50	7 60	280	3129	250	2794			216	17 0
2	1		1 290		48	7 70	261	2808	200	2152			174	17 5
3	1		1 270		48	7 80	239	2531	226	2394			206	14 7
4	4	0 62	1 190		47	7 70	208	2064	200	1985			186	15 5
5	4	0 18	1 410		50	7 50	263	3093	320	3763	5 23	62	288	16 5
6	4	0 03	1 420		50	7 70	212	2511	208	2463			186	18 5
7	4	0 29	1 330		50	7 70	231	2562	222	2462			188	16 7
8	4	0 63	1 360		53	7 80	259	2938	188	2132			174	18 8
9	4	0 07	1 400		49	8 00	231	2697	130	1518			122	15 5
10	4	0 05	1 440		50	7 80	268	3219	164	1970			158	16 4
11	4	0 75	1 350		49	7 60	236	2657	168	1892			158	16 5
12	4	0 03	1 490		50	7 60	177	2200	122	1516			116	16 3
13	1		1 470		49	7 60	195	2391	101	1238	4 89	60	98	16 4
14	4	0 29	1 450		50	7 70	185	2237	182	2201			158	17 2
15	4	0 18	1 410		49	7 70	254	2987	228	2681			202	15 7
16	1		1 420		52	7 70	148	1753	104	1232			96	16 4
17	1		1 390		52	7 70	205	2376	166	1924			142	13 3
18	1		1 290		50	7 70	143	1538	142	1528			132	15 4
19	4	0 18	1 440		50	7 60	198	2378	136	1633	3 93	47	136	14 7
20	1		1 400		51	7 60	234	2732	178	2078			174	14 7
21	1		1 400		50	7 50	219	2557	196	2288	4 19	49	172	15 1
22	1		1 330		53	7 70	169	1875	146	1619			128	15 6
23	4	0 06	1 230		54	7 60	181	1857	182	1867			160	17 1
24	4	0 06	1 200		48	7 70	175	1751	210	2102			182	15 8
25	1		1 170		48	7 60	146	1425	110	1073			98	14 1
26	1		1 220		48	7 70	203	2065	184	1872			167	15 4
27	4	0 05	1 560		50	7 60	266	3461	209	2719	5 02	65	182	15 7
28	1		1 530		52	7 60	200	2552	178	2271			164	15 9
29	1		1 470		53	7 60	236	2893	156	1913			144	16 4
30	4	0 52	1 560		52	7 80	267	3474	282	3669			262	15 2
31	4	0 03	1 460		52	7 70	230	2801	212	2581	5 04	61	204	12 9
TL		4 32	42 690					77512		65532		344		
ME			1 377		50 2		217	2500	184	2114	4 72	57	167	15 9

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

PRIMARY EFFLUENT SHEET

May 2003

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

	PRIMARY EFFLUENT QUALITY												
DAY	BOD-5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS		AMMONIA NITROGEN	
	mg/l	LBS	Removal	mg/l	LBS	% Removal	mg/l	LBS	% Removal	mg/l	%	mg/l	LBS
1	150	1676	46.4	54	603	78.4				44.0	81.5	20.5	229
2	125	1345	52.1	36	381	82.0				34.0	94.4	19.3	204
3	120	1271	49.8	40	397	82.3				34.0	85.0	16.4	163
4	111	1102	46.6	34	400	83.0				34.0	100.0	15.5	182
5	87	1023	66.9	28	332	91.3	1.3	15.5	75.0	28.0	100.0	16.2	192
6	153	1812	27.8	32	355	84.6				26.0	81.3	20.6	228
7	98	1087	57.6	26	295	88.3				20.0	76.9	17.3	196
8	105	1191	59.5	40	467	78.7				38.0	95.0	16.9	197
9	130	1518	43.7	42	504	67.7				38.0	90.5	19.3	232
10	158	1898	41.0	26	293	84.1				26.0	100.0	16.6	187
11	117	1317	50.4	38	472	77.4				38.0	100.0	15.2	189
12	97	1205	45.2	44	539	63.9				42.0	95.5	15.6	191
13	145	1778	25.6	42	508	58.4	2.5	30.0	49.3	38.0	90.5	19.1	231
14	139	1681	24.9	40	470	78.0				32.0	80.0	17.0	200
15	117	1376	53.9	30	355	86.8				26.0	86.7	15.3	181
16	102	1208	31.1	46	533	55.8				38.0	82.6	15.4	179
17	104	1206	49.3	38	409	77.1				30.0	78.9	13.8	148
18	83	893	42.0	34	408	76.1				34.0	100.0	14.1	169
19	96	1153	51.5	16	187	88.2	0.7	8.5	81.4	16.0	100.0	16.3	190
20	122	1424	47.9	34	397	80.9				34.0	100.0	16 9	197
21	152	1775	30.6	50	555	74.5	1.4	15.0	67.8	42.0	84.0	19.4	215
22	112	1242	33.7	38	390	74.0				36.0	94.7	16.6	170
23	96	985	47.0	46	460	74.7				44.0	95.7	18.2	182
24	81	811	53.7	34	332	83.8				32.0	94.1	15.8	154
25	83	810	43.2	32	326	70.9				28.0	87.5	14.6	149
26	77	783	62.1	38	494	79.3				38.0	100.0	19.5	254
27	148	1926	44.4	42	536	79.9	2.1	26.7	58.4	36.0	85.7	18.1	231
28	46	587	77.0	60	736	66.3				56.0	93.3	18.3	224
29	123	1508	47.9	44	572	71.8				40.0	90.9	16.7	217
30	85	1106	68.2	40	487	85.8				40.0	100.0	13.7	167
31	98	1193	57.4	48	584	77.4	2.1	744.1	58.5	48.0	100.0	16.6	202
TL		39889			13778			839.8					6053
ME	112	1287	47.7	38	444	77.5	1.7	140.0	65.1	1090.0	91.8	16.9	195

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
SURFACE WATER QUALITY DIVISION

DEQ

Discharge Number	Permit Number
001 A	MI 002 3540

DAILY DISCHARGE MONITORING REPORT

Monitoring Period
May 2003

DAY	CBOD5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS	NH3-N		PH	D.O.	F.COLI #/100ml	CL RESID	
	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	mg/l	LBS	SU	mg/l	MF	mg/l	
1	4.2	47	98.5	2.0	22	99.2				2.0	6.52	72.86	7.40	6.7	30	0.000	
2	2.9	31	98.9	1.0	11	99.5				1.0	0.07	0.75	7.40	7.2	61	0 000	
3	3.1	33	98.7	1.0	11	99.6				1.0	0.05	0.53	7.50	7.4	114	0.000	
4	7.7	76	96.3	1.0	10	99.5				1.0	0.04	0.40	7.60	7.9	50	0.000	
5	2.7	32	99.0	1.0	12	99.7	0.22	2.6	95.8	1.0	0.05	0.59	7.40	7.8	160	0.000	
6	5.0	59	97.6	1.0	12	99.5				1.0	1.86	22.03	7.30	7.0	6	0.000	
7	2.4	27	99.0	1.0	11	99.5				1.0	0.06	0.67	7.40	7.2	82	0.000	
8	2.6	29	99.0	1.0	11	99.5				1.0	0.09	1.02	7.40	7.5	66	0.000	
9	2.4	28	99.0	3.0	35	97.7				3.0	0.04	0.47	7.40	7.4	120	0.000	
10	12.1	145	95.5	49.0	588	70.1				49.0	0.04	0.48	7.40	7.2	176	0.000	
11	13.0	146	94.5	33.0	372	80.4				33.0	0.03	0.34	7.50	7.1	240	0.000	
12	10.8	134	93.9	64.0	795	47.5				64.0	0.69	8.57	7.40	7.1	600	0.000	
13	10.3	126	94.7	22.0	270	78.2	0.98	12.1	79.9	22.0	6.39	78.34	7.30	6.7	33	0.000	
14	4.0	48	97.8	3.0	36	98.4				3.0	0.58	6.97	7.40	6.8	174	0.000	
15	3.1	36	98.8	1.0	12	99.6				1.0	0.10	1.15	7.50	7.5	46	0.000	
16	2.0	24	98.6	1.0	12	99.0				1.0	0.04	0.46	7.50	7.7	80	0.000	
17	2.9	34	98.6	1.0	12	99.4				1.0	0.06	0.64	7.50	7.7	41	0.000	
18	1.9	20	98.7	1.0	11	99.3				1.0	0.06	0.59	7.60	8.1	16	0.000	
19	3.2	38	98.4	1.0	12	99.3	0.24	2.9	93.9	1.0	3.91	46.96	7.40	7.6	4	0.000	
20	3.9	46	98.3	1.0	12	99.4				1.0	11.00	128.44	7.40	6.7	3	0.000	
21	3.4	40	98.4	3.0	35	98.5	0.10	1.2	97.6	3.0	10.70	124.93	7.40	6.7	10	0.000	
22	1.5	17	99.1	1.0	11	99.3				1.0	4.52	50.14	7.20	6.5	9	0.000	
23	3.2	33	98.2	3.0	31	98.4				3.0	1.36	13.95	7.50	6.3	2	0.000	
24	0.8	8	99.5	1.0	10	99.5				1.0	3.30	33.03	7.40	7.2	3	0.000	
25	2.3	22	98.4	2.0	20	98.2				2.0	1.33	12.98	7.40	6.8	1	0.000	
26	1.9	19	99.1	2.0	20	98.9				2.0	0.36	3.66	7.40	7.9	6	0.000	
27	3.8	49	98.6	1.0	13	99.5				1.0	8.76	113.97	7.20	7.4	5	0.000	
28	6.3	80	96.9	7.0	89	96.1	0.12	1.5		7.0	12.20	155.67	7.40	7.1	12	0.028	
29	3.9	48	98.3	2.0	25	98.7				2.0	5.97	73.19	7.40	6.7	6	0.000	
30	1.4	18	99.5	1.0	13	99.6				1.0	0.47	6.11	7.40	8.3	120	0.000	
31	3.0	37	98.7	1.0	12	99.5	0.37	4.5	92.7	1.0	0.12	1.46	7.50	7.8	132	0.000	
TL		1533			2544			24.7									
ME	4.2	49	98.0	6.9	82	95.2	0.34	4.1	76.6	213.0	2.60	31.01		7.3	28	0.001	
WA	8.0	95		25.0	301										142		
MX											12.20	155.67	7.60			0.028	
MN													7.20	6.3			

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment See 18 U S C 1001 and 33 U S C 1319 (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 Years)

PRINTED NAME AND TITLE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTORIZED AGENT	DATE
Steven D. Washburn, Superintendent		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

ACTIVATED SLUDGE SHEET

May 2003

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	AERATION SYSTEM				MIXED LIQUOR								SECONDARY SLUDGE				
	AERTN VOL	DETEN TIME	CRT	F:M RATIO	MLSS		MLVSS		SETTL.	SDI	D.O.	AIR	SS	VSS	RAS FLOW	WAS	
	KCF	HRS	DAYS		mg/L	Lbs.	mg/L	Lbs.	%	%	mg/L	CF	%	%	%	Gallons	Lbs.
SF	3											4				3	
1	48	6.4	4.7	0.28	2411	7219	2019	6046	90	0.27	1.15	93	0.41	0.35	122	45	1539
2	48	6.7	5.6	0.22	2391	7160	2010	6019	91	0.26	6.06	125	0.40	0.34	128	38	1268
3	48	6.8			2322	6953					7.20	130			131	35	
4	48	7.2			2246	6725					7.15	127			138	30	
5	48	6.1	7.7	0.19	2165	6483	1827	5471	89	0.24	6.40	103	0.42	0.36	116	24	841
6	48	6.1	8.7	0.33	2199	6585	1851	5543	95	0.23	6.21	101	0.38	0.32	116	24	761
7	48	6.5	9.6	0.19	2287	6848	1915	5734	91	0.25	6.27	105	0.37	0.31	121	23	710
8	48	6.3	7.6	0.21	2288	6851	1895	5674	94	0.24	6.20	104	0.40	0.34	122	27	901
9	48	6.2	14.7	0.34	1755	5255	1470	4402	90	0.20	5.98	99	0.39	0.33	117	11	358
10	48	6.0			2354	7049					5.53	93			118	12	
11	48	6.4			2295	6872					4.81	103			115	32	
12	48	5.8	3.9	0.23	2123	6357	1771	5303	95	0.22	6.31	70	0.37	0.31	98	53	1635
13	48	5.9	4.0	0.39	1856	5558	1538	4605	95	0.20	1.83	73	0.34	0.28	93	49	1389
14	48	5.9	4.0	0.35	1952	5845	1613	4830	96	0.20	6.30	108	0.34	0.28	102	52	1475
15	48	6.1	3.7	0.30	1961	5872	1554	4653	85	0.23	7.12	111	0.37	0.31	105	52	1605
16	48	6.1	3.7	0.24	1916	5737	1693	5070	84	0.23	6.82	107	0.36	0.30	104	52	1561
17	48	6.2			1935	5794					6.61	107			106	52	
18	48	6.7			1816	5438					7.51	105			114	52	
19	48	6.0	4.0	0.27	1674	5013	1432	4288	90	0.19	6.64	60	0.29	0.25	103	52	1258
20	48	6.2	3.8	0.35	1582	4737	1348	4036	65	0.24	1.19	55	0.29	0.25	105	52	1258
21	48	6.2	3.9	0.44	1568	4695	1333	3992	75	0.21	1.25	60	0.28	0.24	105	52	1214
22	48	6.5	3.6	0.30	1635	4896	1391	4165	82	0.20	0.35	58	0.31	0.27	110	52	1344
23	48	7.0			1597	4782			76	0.21	2.59	60			120	52	
24	48	7.2			1707	5111					3.04	60			123	52	
25	48	7.4			1692	5067					1.72	58			121	52	
26	48	7.1			1615	4836					3.44	57			121	52	
27	48	5.5	3.8	0.53	1422	4258	1212	3629	68	0.21	3.39	56	0.26	0.22	93	52	1128
28	48	5.6	3.3	0.15	1537	4602	1297	3884	56	0.27	1.24	54	0.32	0.27	96	52	1388
29	48	5.9	4.0	0.37	1660	4971	1377	4123	83	0.20	0.31	97	0.29	0.24	100	52	1258
30	48	5.5	3.6	0.28	1585	4746	1328	3977	78	0.20	5.20	116	0.30	0.25	94	52	1301
31	48	5.9			1526	4569					6.73	122			100	52	
TL												2777				1339	24189
ME	48	6.3	5.4	0.30	1906	5706	1594	4772	84	0.2	4.6	90	0.34	0.29	112	43	1209

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

BIOSOLIDS SHEET

Marshall

MI 002 3540

May 2003

SUPERINTENDENT
Steven D. Washburn

	RAW SLUDGE	RAW BIOSOLIDS			LIME STABILIZED BIOSOLIDS					
DAY	GALLONS	TOTAL SOLIDS %	VOLATILE SOLIDS %	pH SU	LIME POUNDS	pH 2 hrs @ 25 C SU	RDT Solids %	Lbs. Lime per 1000 gallons biosolids		
1	12000	2.9	76.0	6.0	1786		8.0	149		
2	12000	2.8	76.0	6.0		12.1				
3	12500	2.7	76.0	6.0						
4	12500	3.6	76.0	5.8						
5	12500	3.1	76.0	5.9						
6	13000	3.3	74.0	6.3	2296	12.2	7.6	177		
7	13000	3.1	72.0	6.3						
8	13300	3.1	74.0	6.0						
9	13300	3.0	75.0	6.0						
10	14000	3.4	76.0	5.8						
11	9000	3.1	76.0	5.8						
12	15000	3.6	71.0	5.8						
13	15000	3.0	72.0	6.1	2137		8.2	142		
14	15000	2.4	73.0	6.1	2393	12.3	8.6	160		
15	18000	2.5	73.0	6.2		12.3				
16	17600	3.1	75.0	6.2						
17	22100	3.0	74.0	6.1						
18	3100			6.0						
19	13000	2.5	74.0	6.2						
20	12000	3.2	75.0	6.2	2329		6.7	194		
21	15000	3.2	76.0	6.0	2233	12.2	7.7	149		
22	15000	3.2	70.0	6.0		12.2				
23	9700	3.0	76.0	5.9						
24	17000	2.9	76.0	6.0						
25	13000	2.7	77.0	6.0						
26	13600	2.5	74.0	6.2						
27	11700	2.5	77.0	6.3	2296		6.9	196		
28	13600	3.1	74.0	6.1	2074	12.3	5.8	153		
29	11700	3.0	71.0	6.2		12.2				
30	11700	3.2	70.0	6.1						
31	13600	3.1	74.0	5.8						
TOTAL	413500				17544					
MEAN	13339	3.0	74.3	6.0	2193	12.2	7.4	165		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MISCELLANEOUS SHEET

May 2003

Marshall
MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	WATER	ELECTRICAL USAGE		FUEL GAS		CHEMICALS APPLIED								
			X 120		X 100	$FECL_3$					Cl_2		SO_2	
	CF	METER	KWH	METER	CF	GALS	SP. GR.	% SOLN	LBS	mg/L	LBS	mg/L	LBS	mg/L
1	1571	20	2400	2	200	100.0	1.4000	30	350.3	31.3	15.0	1.3	10.0	0.9
2	321	19	2280	5	500	100	1.4000	30	350.3	32.6	11	1.0	9.0	0.8
3	410	21	2520	8	800	50	1.4000	30	175.1	16.5	15	1.4	12.0	1.1
4	430	21	2520	6	600	75	1.4000	30	262.7	26.5	14	1.4	10.0	1.0
5	370	18	2160	2	200	175	1.4000	30	613.0	52.1	15	1.3	11.0	0.9
6	1804	20	2400	6	600	150	1.4000	30	525.4	44.4	14	1.2	10.0	0.8
7	439	19	2280	4	400	100	1.4000	30	350.3	31.6	14	1.3	10.0	0.9
8	402	18	2160	4	400	150	1.4000	30	525.4	46.3	14	1.2	11.0	1.0
9	460	18	2160	2	200	100	1.4000	30	350.3	30.0	14	1.2	10.0	0.9
10	400	17	2040	1	100	25	1.4000	30	87.6	7.3	14	1.2	10.0	0.8
11	420	20	2400	3	300	75	1.4000	30	262.7	23.3	16	1.4	12.0	1.1
12	631	15	1800	5	500	100	1.4000	30	350.3	28.2	20	1.6	10.0	0.8
13	1532	21	2520	4	400	100	1.4000	30	350.3	28.6	34	2.8	9.0	0.7
14	1849	22	2640	0		200	1.4000	30	700.6	57.9	25	2.1	14.0	1.2
15	551	20	2400	26	2600	100	1.4000	30	350.3	29.8	31	2.6	14.0	1.2
16	501	20	2400	3	300	100	1.4000	30	350.3	29.6	28	2.4	15.0	1.3
17	370	19	2280	2	200	75	1.4000	30	262.7	22.7	25	2.2	15.0	1.3
18	460	19	2280	2	200	75	1.4000	30	262.7	24.4	26	2.4	14.0	1.3
19	474	15	1800	0		225	1.4000	30	788.1	65.6	28	2.3	15.0	1.2
20	1897	19	2280	1	100	175	1.4000	30	613.0	52.5	28	2.4	16.0	1.4
21	1769	15	1800	1	100	150	1.4000	30	525.4	45.0	24	2.1	13.0	1.1
22	500	15	1800	0		75	1.4000	30	262.7	23.7	27	2.4	16.0	1.4
23	390	13	1560	0		100	1.4000	30	350.3	34.1	19	1.9	14.0	1.4
24	400	14	1680	0		75	1.4000	30	262.7	26.3	25	2.5	14.0	1.4
25	410	13	1560	0		100	1.4000	30	350.3	35.9	24	2.5	14.0	1.4
26	532	14	1680	0		75	1.4000	30	262.7	25.8	25	2.5	14.0	1.4
27	1790	17	2040	0		75	1.4000	30	262.7	20.2	20	1.5	15.0	1.2
28	1980	15	1800	0		100	1.4000	30	350.3	27.5	20	1.6	15.0	1.2
29	372	17	2040	0		100	1.4000	30	350.3	28.6	19	1.5	15.0	1.2
30	461	20	2400	0		100	1.4000	30	350.3	26.9	15	1.2	16.0	1.2
31	440	19	2280	0		100	1.4000	30	350.3	28.8	16	1.3	14.0	1.1
TL	24336	553	66360	87	8700	3300					635		397.0	
ME	785	18	2141	3	458	106	1.4000	30.0	372.9	32.4	20.5	1.8	12.8	1.1

MANPOWER	
POSITION TITLE	NUMBER FULL TIME
SUPERINTENDANT	1
ASST. SUPT.	1
OPERATOR	3
MECHANIC	
CHEMIST	
LAB TECH	
IPP COORDINATOR	1
OTHER	

GIVE THE HOURS PER DAY THAT PLANT PERSONNEL ARE NORMALLY AT THE PLANT.

WEEKDAYS	8	HRS
SATURDAYS	8	HRS
SUNDAYS	8	HRS
HOLIDAYS	8	HRS

Weather Code	
1 Clear	6 Warm
2 Partly Cloudy	7 Cold
3 Cloudy	8 Windy
4 Rain	9 Melting Snow
5 Snow	

PLANT INFLUENT SHEET

June 2003

Marshall

STATE OF MICHIGAN

MI 002 3540

SUPERINTENDENT

DEPT OF ENVIRONMENTAL QUALITY

Steven D Washburn

D	WEATHER		FLOW		RAW SEWAGE QUALITY									
A	TYPE	PRECIP	TOTAL	MAX	TEMP	pH	BOD_5		SS		TOTAL-P		VSS	NH3-N
Y	CODE	Inches	MGD	MGD	°F	SU	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l
1	1		1 270		46	7 70	268	2839	264	2796			248	13 9
2	1		1 280		53	7 60	254	2712	236	2519			220	19 3
3	4	0 03	1 300		52	7 60	226	2450	214	2320	4 86	53	196	14 7
4	4	0 05	1 330		52	7 70	280	3106	186	2063			164	19 9
5	1		1 340		51	7 60	251	2805	144	1609			94	21 7
6	4	0 02	1 350		53	7 60	189	2128	204	2297			180	20 5
7	1		1 310		51	7 60	278	3037	198	2163			172	18 3
8	4	0 15	1 170		51	7 70	222	2166	202	1971			192	16 5
9	1		1 270		57	8 00	257	2722	194	2055	4 89	52	176	18 7
10	4	0 10	1 330		57	7 90	236	2618	181	2008			159	18 3
11	4	0 34	1 320		55	7 70	194	2136	162	1783			144	17 8
12	4	0 03	1 260		54	7 70	317	3331	198	2081			176	17 0
13	1		1 290		54	7 30	275	2959	186	2001			166	18 8
14	1		1 330		54	7 50	265	2939	166	1841			154	14 7
15	1		1 150		59	7 60	203	1947	220	2110			198	16 8
16	1		1 330		52	7 60	231	2562	212	2352			178	17 7
17	4	0 04	1 300		52	7 40	415	4499	350	3795			280	23 3
18	4	0 12	1 300		53	7 60	337	3654	184	1995			168	17 1
19	1		1 280		51	7 80	266	2840	186	1986	4 38	47	174	16 6
20	1		1 210		53	7 60	247	2493	242	2442			228	16 8
21	1		1 220		51	7 60	235	2391	220	2238			204	16 9
22	1		1 150		53	8 00	181	1736	242	2321			226	15 1
23	1		1 270		53	7 70	187	1981	230	2436			204	14 1
24	1		1 310		58	7 60	248	2709	254	2775			230	15 5
25	1		1 320		54	7 80	226	2488	182	2004	4 63	51	154	15 7
26	4	0 33	1 230		54	7 70	224	2298	186	1908			180	17 0
27	4	0 04	1 210		53	7 60	172	1736	70	706			66	17 7
28	4	0 23	1 150		53	7 60	229	2196	194	1861			170	18 4
29	4	0 01	1 090		53	7 60	137	1245	78	709			76	18 0
30	1		1 090		53	7 50	229	2082	196	1782			174	14 9
31														
TL		1 49	37 760					76804		62927		202		
ME			1 259		53 2		243	2560	199	2098	4 69	51	178	16 8

City of Marshall
801 Industrial Rd
Marshall, MI 49068

PRIMARY EFFLUENT SHEET

June 2003

Marshall
MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D Washburn

	PRIMARY EFFLUENT QUALITY												
DAY	BOD-5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS		AMMONIA NITROGEN	
	mg/l	LBS	Removal	mg/l	LBS	% Removal	mg/l	LBS	% Removal	mg/l	%	mg/l	LBS
1	105	1112	60 8	34	360	87 1				34 0	100 0	14 3	151
2	98	1046	61 4	38	412	83 9				38 0	100 0	19 3	209
3	187	2027	17 3	48	532	77 6	2 7	29 5	45 3	40 0	83 3	18 0	200
4	190	2108	32 1	33	369	82 3				32 0	97 0	21 8	244
5	108	1207	57 0	34	383	76 4				28 0	82 4	18 1	204
6	97	1092	48 7	46	503	77 5				36 0	78 3	19 5	213
7	96	1049	65 5	38	371	80 8				34 0	89 5	15 8	154
8	90	878	59 5	50	530	75 2				46 0	92 0	17 1	181
9	120	1271	53 3	30	333	84 5	1 4	15 6	71 2	30 0	100 0	17 1	190
10	163	1808	30 9	48	528	73 5				36 0	75 0	21 2	233
11	129	1420	33 5	50	525	69 1				42 0	84 0	19 4	204
12	114	1198	64 0	46	495	76 8				44 0	95 7	16 9	182
13	162	1743	41 1	42	466	77 4				38 0	90 5	17 1	190
14	163	1808	38 5	38	364	77 1				38 0	100 0	15 7	151
15	108	1036	46 8	38	422	82 7				36 0	94 7	15 2	169
16	92	1020	60 2	36	390	83 0				30 0	83 3	15 5	168
17	152	1648	63 4	64	694	81 7				56 0	87 5	21 2	230
18	182	1973	46 0	46	491	75 0				42 0	91 3	16 4	175
19	126	1345	52 6	56	565	69 9	1 9	18 7	57 8	54 0	96 4	16 7	169
20	105	1060	57 5	48	488	80 2				48 0	100 0	15 1	154
21	134	1363	43 0	44	422	80 0				44 0	100 0	14 7	141
22	81	777	55 2	36	381	85 1				36 0	100 0	15 6	165
23	80	847	57 2	38	415	83 5				32 0	84 2	17 7	193
24	155	1693	37 5	42	462	83 5				38 0	90 5	18 7	206
25	170	1871	24 8	52	533	71 4	1 5	15 5	67 4	48 0	92 3	16 9	173
26	129	1323	42 4	26	262	86 0				22 0	84 6	19 0	192
27	97	979	43 6	40	384	42 9				34 0	85 0	16 0	153
28	102	978	55 5	40	364	79 4				40 0	100 0	14 9	135
29	99	900	27 7	32	291	59 0				30 0	93 8	16 2	147
30	101	918	55 9	46		76 5				40 0	87 0		
31													
TL		39501			12736			79 3					5276
ME	125	1317	47 8	42	425	77 3	1 9	19 8	60 4	1146 0	91 3	17 3	182

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
SURFACE WATER QUALITY DIVISION

DEQ

Discharge Number	Permit Number
001 A	MI 002 3540

DAILY DISCHARGE MONITORING REPORT

Monitoring Period
June 2003

DAY	CBOD5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS	NH3-N		PH	D.O.	F.COLI #/100ml	CL RESID
	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	mg/l	LBS	SU	mg/l	MF	mg/l
1	2.6	28	99.0	1.0	11	99.6				1.0	0.07	0.70	7.75	8.2	6	0.000
2	2.2	23	99.1	1.0	11	99.6				1.0	0.36	3.85	7.50	7.1	10	0.000
3	5.8	63	97.4	1.0	11	99.5	0.18	2.0	96.3	1.0	0.88	9.53	7.50	7.2	49	0.000
4	4.9	54	98.3	5.0	55	97.3				4.0	1.52	16.86	7.60	8.9	214	0.000
5	3.2	36	98.7	1.0	11	99.3				1.0	5.48	61.24	7.30	8.5	25	0.000
6	3.6	41	98.1	3.0	34	98.5				2.0	7.80	87.82	7.30	6.3	8	0.000
7	3.6	39	98.7	4.0	44	98.0				3.0	4.72	51.57	7.30	6.4	17	0.000
8	3.4	33	98.5	2.0	20	99.0				2.0	2.00	19.52	7.50	6.1	13	0.001
9	2.2	23	99.1	1.0	11	99.5	0.21	2.2	95.8	1.0	1.16	12.29	7.30	7.6	60	0.000
10	3.6	40	98.5	1.0	11	99.4				1.0	3.70	41.04	7.40	6.6	14	0.000
11	2.7	30	98.6	1.0	11	99.4				1.0	2.17	23.89	7.50	6.7	24	0.000
12	2.5	26	99.2	1.0	11	99.5				1.0	0.11	1.19	7.40	7.2	70	0.000
13	3.3	36	98.8	1.0	11	99.5				1.0	0.09	0.93	7.30	7.2	77	0.000
14	7.7	85	97.1	1.0	11	99.4				1.0	2.87	31.83	7.40	6.9	240	0.000
15	4.5	43	97.8	1.0	10	99.5				1.0	0.28	2.66	7.40	6.6	43	0.000
16	4.7	52	98.0	5.0	55	97.6				5.0	0.47	5.16	7.40	7.1	260	0.000
17	6.9	75	98.3	9.0	98	97.4				9.0	1.41	15.29	7.40	7.0	63	0.000
18	8.9	96	97.4	6.0	65	96.7				4.0	8.48	91.94	7.30	6.4	48	0.000
19	5.0	53	98.1	1.0	11	99.5	0.18	1.9	95.9	1.0	0.43	4.59	7.40	6.7	33	0.000
20	5.2	52	97.9	1.0	10	99.6				1.0	1.15	11.61	7.50	7.7	67	0.000
21	3.5	36	98.5	5.0	51	97.7				5.0	3.20	32.56	7.30	6.5	24	0.000
22	4.2	40	97.7	1.0	10	99.6				1.0	1.39	13.33	7.30	6.6	19	0.000
23	4.6	49	97.5	2.0	21	99.1				2.0	3.19	33.79	7.30	6.9	28	0.000
24	3.8	42	98.5	1.0	11	99.6				1.0	4.16	45.45	7.30	6.4	29	0.000
25	3.9	43	98.3	7.0	77	96.2	0.17	1.9	96.2	6.0	5.14	56.59	7.30	6.4	37	0.000
26	5.9	61	97.4	3.0	31	98.4				3.0	2.02	20.72	7.30	6.0	35	0.000
27	5.2	52	97.0	8.0	81	88.6				8.0	0.15	1.51	7.40	6.8	33	0.000
28	6.4	61	97.2	8.0	77	95.9				8.0	0.13	1.25	7.40	7.0	27	0.000
29	5.2	47	96.2	4.0	36	94.9				4.0	0.14	1.27	7.40	7.1	19	0.000
30	7.1	65	96.9	10.0	91	94.9				9.0	0.16	1.45	7.40	7.2	61	0.000
31																
TL		1425			994			8.0								
ME	4.5	47	98.1	3.2	33	98.1	0.18	2.0	96.1	89.0	2.16	23.38		7.0	35	0.000
WA	6.1	65		6.7	65										89	
MX											8.48	91.94	7.75			0.001
MN													7.30	6.0		

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment See 18 U S C 1001 and 33 U S C 1319 (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 Years)

PRINTED NAME AND TITLE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTORIZED AGENT	DATE
Steven D. Washburn, Superintendent		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

ACTIVATED SLUDGE SHEET

June 2003

Marshall

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

MI 002 3540

SUPERINTENDENT
Steven D. Washburn

DAY	AERATION SYSTEM				MIXED LIQUOR								SECONDARY SLUDGE				
	AERTN VOL	DETEN TIME	CRT	F:M RATIO	MLSS		MLVSS		SETTL.	SDI	D.O.	AIR	SS	VSS	RAS FLOW	WAS	
	KCF	HRS	DAYS		mg/L	Lbs.	mg/L	Lbs.	%	%	mg/L	CF	%	%	%	Gallons	Lbs.
SF	3											4				3	
1	48	6.8			1592	4767					7.64	104			116	52	
2	48	6.7	4.0	0.26	1570	4701	1320	3953	42	0.37	5.87	100	0.27	0.23	115	52	1171
3	48	6.6	3.9	0.55	1454	4354	1226	3671	50	0.29	5.38	104	0.29	0.23	113	46	1113
4	48	6.5	4.5	0.53	1599	4788	1334	3995	45	0.36	6.32	107	0.29	0.25	111	44	1064
5	48	6.4	4.5	0.28	1710	5120	1432	4288	51	0.34	6.68	58	0.31	0.26	107	44	1138
6	48	6.4	5.0	0.26	1704	5102	1421	4255	51	0.33	0.76	52	0.28	0.23	108	44	1027
7	48	6.6			1676	5019					3.44	52			111	43	
8	48	7.4			1685	5046					0.55	84			126	43	
9	48	6.8	4.9	0.31	1639	4908	1382	4138	52	0.32	5.38	102	0.28	0.24	110	43	1004
10	48	6.5	6.1	0.45	1593	4770	1328	3977	36	0.44	4.92	102	0.27	0.23	108	35	788
11	48	6.5	4.9	0.31	1800	5390	1514	4534	38	0.47	5.19	100	0.33	0.27	111	40	1101
12	48	6.8	5.6	0.26	1873	5608	1549	4638	52	0.36	5.38	102	0.28	0.23	117	43	1004
13	48	6.7	4.8	0.37	1867	5591	1565	4686	40	0.47	3.90	100	0.29	0.24	114	48	1161
14	48	6.5			1884	5641					4.88	99			110	57	
15	48	7.5			1880	5629					4.27	102			128	61	
16	48	6.5	2.9	0.24	1707	5111	1444	4324	58	0.29	5.21	101	0.36	0.30	84	59	1771
17	48	6.6	2.6	0.41	1594	4773	1337	4004	58	0.27	5.24	113	0.38	0.31	68	58	1838
18	48	6.6	3.0	0.50	1594	4773	1325	3968	35	0.46	6.36	97	0.34	0.29	99	57	1616
19	48	6.7	3.2	0.35	1560	4671	1301	3896	35	0.45	4.95	124	0.27	0.22	114	64	1441
20	48	7.1	3.7	0.28	1504	4504	1262	3779	31	0.49	5.55	83	0.24	0.20	121	60	1201
21	48	7.1			1424	4264					2.36	53			121	53	
22	48	7.5			1452	4348					3.94	51			128	46	
23	48	6.8	5.2	0.24	1384	4144	1160	3473	26	0.53	2.77	51	0.25	0.21	116	38	792
24	48	6.6	9.3	0.53	1329	3980	1076	3222	24	0.55	4.77	80	0.19	0.08	115	27	428
25	48	6.5	9.6	0.48	1536	4599	1310	3923	31	0.50	5.00	98	0.24	0.20	111	24	480
26	48	7.0	9.4	0.30	1814	5432	1461	4375	37	0.49	2.65	101	0.30	0.24	120	23	575
27	48	7.1	8.0	0.21	1875	5614	1535	4596	41	0.46	5.43	102	0.30	0.24	120	28	701
28	48	7.5			1868	5594					5.27	102			121	32	
29	48	7.9			1828	5474					5.31	103			135	39	
30	48	7.9	5.4	0.23	1644	4923	1339	4009	24	0.69	5.66	103	0.28	0.22	135	39	911
31	48																
TL												2730				1342	22326
ME	48	6.9	5.3	0.35	1655	4955	1363	4081	41	0.4	4.7	91	0.29	0.23	114	45	1063

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

BIOSOLIDS SHEET

June 2003

Marshall

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

MI 002 3540

SUPERINTENDENT
Steven D. Washburn

	RAW SLUDGE	RAW BIOSOLIDS			LIME STABILIZED BIOSOLIDS					
DAY	GALLONS	TOTAL SOLIDS %	VOLATILE SOLIDS %	pH SU	LIME POUNDS	pH 2 hrs @ 25 C SU	RDT Solids %	Lbs. Lime per 1000 gallons biosolids		
1	13600	3.1	76.0	6.1						
2	1300	3.0	77.0	5.9						
3	12000	2.9	77.0	6.1	2210			184		
4	11700	3.1	76.0	6.1	2665	12.3	8.5	228		
5	13600	3.0	74.0	6.3		12.2	8.1			
6	11700	3.3	74.0	6.2						
7	12600	3.0	73.0	6.4						
8	13100	2.7	75.0	6.3						
9	12200	2.7	75.0	6.4						
10	13400	2.8	73.0	6.5	2665		8.7	199		
11	13500	3.3	73.0	6.3	2405	12.2	7.5	178		
12	12500	2.9	72.0	6.5		12.3				
13	11700	3.2	74.0	6.5						
14	13800	2.8	75.0	6.3						
15	13600	2.8	78.0	6.2						
16	12000	2.8	78.0	6.3						
17	12500	2.7	78.0	6.4	2795		9.1	224		
18	12800	2.9	76.0	6.4	2568		10.0	201		
19	14000	3.0	74.0	6.4		12.2				
20	11200	2.9	75.0	6.4						
21	12100	3.0	75.0	6.1						
22	15500	2.9	75.0	6.2						
23	13600	2.9	75.0	6.2						
24	13600	2.8	73.0	6.4	2568		9.4	189		
25	13400	3.3	72.0	6.4	2340		12.7	175		
26	13000	3.3	72.0	6.4		12.2				
27	14600	3.9	72.0	6.3						
28	13500	4.1	73.0	6.2						
29	14500	2.8	74.0	6.4						
30	12900	2.5	73.0	6.5						
31										
TOTAL	379500				20216					
MEAN	12650	3.0	74.6	6.3	2527	12.2	9.3	197		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MISCELLANEOUS SHEET

June 2003

Marshall
MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	WATER	ELECTRICAL USAGE		FUEL GAS		CHEMICALS APPLIED								
			X 120		X 100	$FECL_3$					Cl_2		SO_2	
	CF	METER	KWH	METER	CF	GALS	SP. GR.	% SOLN	LBS	mg/L	LBS	mg/L	LBS	mg/L
1	400	19	2280			100.0	1.4000	30	350.3	33.1	17.0	1.6	16.0	1.5
2	535	18	2160			150	1.4000	30	525.4	49.2	18	1.7	16.0	1.5
3	1738	18	2160			150	1.4000	30	525.4	48.5	18	1.7	14.0	1.3
4	1794	22	2640			100	1.4000	30	350.3	31.6	18	1.6	8.0	0.7
5	412	14	1680			150	1.4000	30	525.4	47.0	17	1.5	12.0	1.1
6	411	12	1440			150	1.4000	30	525.4	46.7	16	1.4	14.0	1.2
7	411	14	1680			100	1.4000	30	350.3	32.1	17	1.6	16.0	1.5
8	420	16	1920			125	1.4000	30	437.9	44.9	15	1.5	13.0	1.3
9	432	18	2160			125	1.4000	30	437.9	41.3	17	1.6	16.0	1.5
10	1521	18	2160			150	1.4000	30	525.4	47.4	18	1.6	15.0	1.4
11	1391	21	2520			100	1.4000	30	350.3	31.8	18	1.6	14.0	1.3
12	191	19	2280			150	1.4000	30	525.4	50.0	18	1.7	14.0	1.3
13	181	17	2040			150	1.4000	30	525.4	48.8	19	1.8	13.0	1.2
14	201	16	1920			125	1.4000	30	437.9	39.5	17	1.5	15.0	1.4
15	220	18	2160			125	1.4000	30	437.9	45.7	22	2.3	14.0	1.5
16	201	19	2280			100	1.4000	30	350.3	31.6	20	1.8	16.0	1.4
17	2076	21	2520			125	1.4000	30	437.9	40.4	16	1.5	16.0	1.5
18	1663	22	2640			125	1.4000	30	437.9	40.4	25	2.3	17.0	1.6
19	162	20	2400			150	1.4000	30	525.4	49.2	26	2.4	16.0	1.5
20	261	13	1560			150	1.4000	30	525.4	52.1	24	2.4	15.0	1.5
21	170	14	1680			150	1.4000	30	525.4	51.6	27	2.7	18.0	1.8
22	200	14	1680			100	1.4000	30	350.3	36.5	26	2.7	16.0	1.7
23	193	14	1680			150	1.4000	30	525.4	49.6	18	1.7	15.0	1.4
24	1507	19	2280			150	1.4000	30	525.4	48.1	27	2.5	11.0	1.0
25	1294	20	2400			150	1.4000	30	525.4	47.7	25	2.3	17.0	1.5
26	2323	17	2040			150	1.4000	30	525.4	51.2	26	2.5	19.0	1.9
27	980	18	2160			150	1.4000	30	525.4	52.1	24	2.4	15.0	1.5
28	390	16	1920			100	1.4000	30	350.3	36.5	23	2.4	16.0	1.7
29	320	19	2280			50	1.4000	30	175.1	19.3	21	2.3	19.0	2.1
30	253	18	2160			125	1.4000	30	437.9	48.2	26	2.9	15.0	1.7
31														
TL	22251	524	62880			3875					619		451.0	
ME	742	17	2096			129	1.4000	30.0	452.4	43.1	20.6	2.0	15.0	1.4

MANPOWER	
POSITION TITLE	NUMBER FULL TIME
SUPERINTENDANT	1
ASST. SUPT.	1
OPERATOR	3
MECHANIC	
CHEMIST	
LAB TECH	
IPP COORDINATOR	1
OTHER	

GIVE THE HOURS PER DAY THAT PLANT PERSONNEL ARE NORMALLY AT THE PLANT.

WEEKDAYS	8	HRS
SATURDAYS	8	HRS
SUNDAYS	8	HRS
HOLIDAYS	8	HRS

Weather Code	
1 Clear	6 Warm
2 Partly Cloudy	7 Cold
3 Cloudy	8 Windy
4 Rain	9 Melting Snow
5 Snow	

PLANT INFLUENT SHEET

July 2003

Marshall

STATE OF MICHIGAN

MI 002 3540

SUPERINTENDENT

DEPT OF ENVIRONMENTAL QUALITY

Steven D Washburn

D	WEATHER		FLOW		RAW SEWAGE QUALITY									
A	TYPE	PRECIP	TOTAL	MAX	TEMP	pH	BOD_5		SS		TOTAL-P		VSS	NH3-N
Y	CODE	Inches	MGD	MGD	°F	SU	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l
1	1		1 220		59	7 52	274	2788	250	2544			226	17 3
2	1		1 170		57	7 60	205	2000	166	1620	4 53	44	154	17 6
3	1		1 050		55	7 72	220	1927	162	1419			148	17 8
4	4	0 04	1 070		56	7 70	223	1990	238	2124			216	18 9
5	4	0 19	1 140		55	7 60	229	2177	268	2548			234	18 9
6	4	1 32	1 170		52	7 50	245	2391	264	2576			230	16 6
7	4	0 18	1 230		54	7 60	220	2257	334	3426			294	18 1
8	4	0 28	1 290		54	7 70	287	3088	137	1474	5 87	63	124	18 1
9	4	0 11	1 330		55	7 70	148	1642	80	887			70	17 9
10	4	0 31	1 270		57	7 60	198	2097	148	1568			122	17 1
11	1		1 170		53	7 60	239	2332	184	1795			166	18 1
12	1		1 130		53	7 60	218	2054	176	1659			158	18 0
13	1		1 070		53	7 60	175	1562	218	1945			196	17 3
14	1		1 180		55	7 50	304	2992	320	3149			244	17 0
15	4	0 04	1 230		56	7 60	317	3252	271	2780			247	19 5
16	1		1 200		54	7 60	237	2372	268	2682			252	19 9
17	1		1 160		56	7 70	316	3057	238	2303	6 17	60	226	20 0
18	1		1 190		63	7 70	450	4466	218	2164			204	21 9
19	2		1 090		56	7 70	260	2364	298	2709			270	16 5
20	4	1 00	1 140		54	7 50	235	2234	266	2529			266	14 5
21	4	0 64	1 250		55	7 70	188	1960	210	2189	4 44	46	172	16 2
22	1		1 250		55	7 60	333	3472	281	2929			263	20 5
23	1		1 190		55	7 70	294	2918	236	2342			218	21 9
24	1		1 230		56	7 70	245	2513	162	1662			146	20 0
25	2		1 220		55	7 60	220	2238	230	2340			204	18 9
26	2		1 130		55	7 60	184	1734	158	1489			152	15 9
27	2		1 070		55	7 60	278	2481	278	2481			250	16 4
28	4	0 01	1 250		56	7 60	295	3075	276	2877			224	16 2
29	1		1 240		67	7 60	219	2265	201	2079			182	15 5
30	1		1 200		56	7 60	191	1912	110	1101			98	21 0
31	1		1 160		55	7 60	223	2157	226	2186			204	18 0
TL		4 12	36 690					75766		67576		213		
ME			1 184		55 7		247	2444	222	2180	5 25	53	199	18 1

City of Marshall
801 Industrial Rd
Marshall, MI 49068

PRIMARY EFFLUENT SHEET

July 2003

Marshall
MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D Washburn

	PRIMARY EFFLUENT QUALITY												
DAY	BOD-5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS		AMMONIA NITROGEN	
	mg/l	LBS	Removal	mg/l	LBS	% Removal	mg/l	LBS	% Removal	mg/l	%	mg/l	LBS
1	152	1547	44 5	44	448	82 4				40 0	90 9	18 3	186
2	149	1454	27 3	60	525	63 9	1 9	17 0	57 2	50 0	83 3	19 9	174
3	104	911	52 7	20	178	87 7				16 0	80 0	18 7	167
4	77	687	65 5	32	304	86 6				32 0	100 0	16 8	160
5	59	561	74 2	30	293	88 8				30 0	100 0	16 5	161
6	67	654	72 7	32	328	87 9				32 0	100 0	14 8	152
7	73	749	66 8	26	280	92 2				20 0	76 9	15 2	164
8	156	1678	45 6	50	555	63 5	1 2	13 4	79 4	46 0	92 0	18 3	203
9	136	1509	8 1	46	487	42 5				36 0	78 3	18 2	193
10	93	985	53 0	44	429	70 3				40 0	90 9	16 6	162
11	95	927	60 3	36	339	80 4				30 0	83 3	16 8	158
12	81	763	62 8	34	303	80 7				34 0	100 0	16 4	146
13	72	643	58 9	26	256	88 1				26 0	100 0	18 0	177
14	97	955	68 1	34	349	89 4				34 0	100 0	17 8	183
15	163	1672	48 6	44	440	83 8				36 0	81 8	20 6	206
16	151	1511	36 3	54	522	79 9				52 0	96 3	23 5	227
17	95	919	69 9	36	357	84 9	1 7	17 1	72 1	32 0	88 9	18 2	181
18	141	1399	68 7	38	345	82 6				30 0	78 9	24 0	218
19	99	900	61 9	42	399	85 9				40 0	95 2	18 5	176
20	82	780	65 1	12	125	95 5				12 0	100 0	17 0	177
21	79	824	58 0	30	313	85 7	1 4	14 4	68 9	28 0	93 3	17 3	180
22	143	1491	57 1	46	457	83 6				36 0	78 3	17 3	172
23	151	1499	48 6	56	574	76 3				50 0	89 3	20 7	212
24	121	1241	50 6	34	346	79 0				26 0	76 5	22 5	229
25	80	814	63 6	48	452	79 1				46 0	95 8	19 2	181
26	71	669	61 4	44	393	72 2				44 0	100 0	17 5	156
27	94	839	66 2	26	271	90 6				26 0	100 0	15 4	161
28	128	1334	56 6	48	496	82 6				34 0	70 8	16 2	168
29	218	2254	0 5	68	681	66 2				60 0	88 2	18 2	182
30	151	1511	20 9	54	522	50 9				46 0	85 2	21 3	206
31	101	977	54 7	26	7956	88 5				26 0	100 0	20 3	193
TL		34656			19726			61 9					5611
ME	112	1118	53 2	39	636	79 7	1 6	15 5	69 4	1090 0	90 1	18 4	181

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
SURFACE WATER QUALITY DIVISION

DEQ

Discharge Number	Permit Number
001 A	MI 002 3540

DAILY DISCHARGE MONITORING REPORT

Monitoring Period
July 2003

DAY	$CBOD_5$			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS	NH3-N		PH	D.O.	F.COLI #/100ml	CL RESID
	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	mg/l	LBS	SU	mg/l	MF	mg/l
1	7.5	76	97.3	5.0	51	98.0				5.0	6.22	63.29	7.43	7.4	113	0 000
2	5.2	51	97.5	8.0	78	95.2	0.19	1.9	95.7	7.0	5.26	51.33	7.37	6.0	33	0 000
3	3.8	33	98.3	3.0	26	98.1				3.0	2.48	21.72	7.38	6.7	23	0.000
4	4.7	42	97.9	7.0	62	97.1				7.0	0.20	1.78	7.40	7.1	40	0.000
5	4.7	45	97.9	7.0	67	97.4				7.0	2.24	21.30	7.40	7.0	15	0.000
6	5.2	51	97.9	3.0	29	98.9				3.0	0.77	7.51	7.20	6.3	3	0.000
7	4.0	41	98.2	1.0	10	99.7				1.0	0.74	7.59	7.30	7.4	13	0.000
8	3.5	38	98.8	1.0	11	99.3	0.13	1.4	97.8	1.0	3.20	34.43	7.30	7.0	4	0.000
9	3.3	37	97.8	2.0	22	97.5				2.0	3.68	40.82	7.30	7.0	2	0.000
10	3.5	37	98.2	3.0	32	98.0				3.0	0.69	7.26	7.40	6.5	2	0.000
11	3.5	34	98.5	3.0	29	98.4				2.0	0.54	5.23	7.40	6.4	2	0.000
12	3.1	29	98.6	5.0	47	97.2				5.0	0.45	4.19	7.40	6.9	5	0.000
13	3.0	27	98.3	2.0	18	99.1				2.0	0.16	1.43	7.40	7.3	2	0.000
14	3.2	31	98.9	3.0	30	99.1				3.0	2.04	20.08	7.40	7.4	2	0.000
15	3.1	32	99.0	1.0	10	99.6				1.0	2.12	21.75	7.30	6.3	10	0.000
16	3.1	31	98.7	4.0	40	98.5				3 0	5.36	53.64	7.50	7.1	6	0.000
17	2.9	28	99.1	2.0	19	99.2	0.21	2.0	96.6	2.0	0.31	3.01	7.50	7.0	5	0.000
18	4.5	45	99.0	3.0	30	98.6				3.0	1.18	11.71	7.50	7.3	142	0.000
19	4.7	43	98.2	1.0	9	99.7				1.0	3.04	27.64	7.30	6.2	10	0.000
20	4.6	44	98.0	1.0	10	99.6				1.0	4.72	44.88	7.40	7.1	17	0.000
21	4.4	46	97.7	2.0	21	99.0	0.26	2.7	94.1	2.0	0.97	10.15	7.40	7.2	22	0.000
22	3.8	40	98.9	1.0	10	99.6				1.0	7.12	74.23	7.50	6.7	6	0.000
23	3.3	33	98.9	1.0	10	99.6				1.0	4.48	44.46	7.40	6.3	15	0.000
24	3.3	34	98.7	1.0	10	99.4				1.0	0.67	6.83	7.50	7.3	144	0.000
25	1.9	19	99.1	3.0	31	98.7				3.0	0.63	6.45	7.40	6.9	10	0.000
26	1.7	16	99.1	2.0	19	98.7				2.0	0.11	1.07	7.50	7.2	4	0.000
27	2.7	24	99.0	1.0	9	99.6				1.0	0.19	1.68	7.40	7.1	5	0.000
28	2.7	28	99.1	6.0	63	97.8				3.0	1.08	11.26	7.30	6.7	28	0.000
29	3.3	34	98.5	3.0	31	98.5				3.0	1.35	13.96	7.30	6.2	18	0.000
30	2.1	21	98.9	1.0	10	99.1				1.0	0.58	5.83	7.60	7.2	15	0.000
31	2.1	20	99.1	1.0	10	99.6				1.0	0.86	8.35	7.30	6.5	6	0.000
TL		1109			853			8.0								
ME	3.6	36	98.5	2.8	28	98.6	0.20	2.0	96.1	81.0	2.05	20.48		6.9	10	0.000
WA	5.0	48		4.9	46										25	
MX											7.12	74.23	7.60			
MN													7.20	6.0		

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment See 18 U S C 1001 and 33 U S C 1319 (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 Years)

PRINTED NAME AND TITLE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTORIZED AGENT	DATE
Steven D. Washburn, Superintendent		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

ACTIVATED SLUDGE SHEET

July 2003

Marshall

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

MI 002 3540

SUPERINTENDENT
Steven D. Washburn

DAY	AERATION SYSTEM				MIXED LIQUOR								SECONDARY SLUDGE				
	AERTN VOL	DETEN TIME	CRT	F:M RATIO	MLSS		MLVSS		SETTL.	SDI	D.O.	AIR	SS	VSS	RAS FLOW	WAS	
	KCF	HRS	DAYS		mg/L	Lbs.	mg/L	Lbs.	%	%	mg/L	CF	%	%	%	Gallons	Lbs.
SF	3											4				3	
1	48	7.1	4.2	0.44	1459	4369	1162	3479	18	0.81	6.97	68	0.27	0.21	117	46	1036
2	48	7.4	6.0	0.38	1554	4653	1265	3788	300	0.05	0.90	101	0.25	0.20	126	37	771
3	48	8.2	5.8	0.23	1685	5046	1342	4018	350	0.05	6.53	69	0.28	0.22	132	37	864
4	48	8.1			1690	5061					6.21	80			125	50	
5	48	7.6			1452	4348					6.90	39			121	50	
6	48	7.4			1388	4156					3.60	40			125	45	
7	48	7.0	7.1	0.23	1310	3923	1071	3207	21	0.62	7.71	45	0.18	0.15	125	37	555
8	48	6.7	8.5	0.56	1243	3722	1000	2994	22	0.57	5.04	66	0.17	0.14	119	31	440
9	48	6.5	6.0	0.39	1580	4731	1283	3842	25	0.63	5.47	54	0.28	0.22	111	34	794
10	48	6.8	6.3	0.26	1589	4758	1271	3806	30	0.53	4.17	55	0.26	0.20	116	35	759
11	48	7.4	5.6	0.23	1625	4866	1337	4004	27	0.60	5.60	55	0.30	0.23	126	35	876
12	48	7.6			1660	4971					4.61	55			131	38	
13	48	8.1			1704	5102					5.11	52			137	40	
14	48	7.3	5.8	0.26	1496	4480	1227	3674	22	0.68	6.62	52	0.22	0.18	131	42	771
15	48	7.0	6.1	0.50	1366	4090	1119	3351	223	0.06	4.10	105	0.20	0.16	124	40	667
16	48	7.2	5.3	0.37	1635	4896	1349	4039	27	0.61	6.88	81	0.25	0.20	123	44	917
17	48	7.4	4.6	0.22	1715	5135	1389	4159	31	0.55	6.21	64	0.26	0.21	128	51	1106
18	48	7.2	5.3	0.36	1611	4824	1312	3929	27	0.60	5.46	67	0.21	0.17	127	52	911
19	48	7.9			1671	5004					3.58	54			127	52	
20	48	7.6			1698	5084					8.70	50			122	52	
21	48	6.9	5.1	0.22	1499	4489	1238	3707	26	0.58	5.64	52	0.22	0.18	121	48	881
22	48	6.9	4.5	0.42	1454	4354	1184	3545	26	0.56	5.91	55	0.25	0.20	125	46	959
23	48	7.2	5.0	0.39	1559	4668	1278	3827	30	0.52	5.14	92	0.24	0.20	131	47	941
24	48	7.0	4.8	0.31	1644	4923	1343	4021	35	0.47	6.80	68	0.27	0.22	121	46	1036
25	48	7.1	4.9	0.20	1618	4845	1330	3983	31	0.52	5.04	50	0.26	0.22	120	46	997
26	48	7.6			1686	5049					5.43	55			130	46	
27	48	8.1			1708	5114					6.18	47			137	46	
28	48	6.9	2.7	0.36	1489	4459	1221	3656	30	0.50	4.48	79	0.22	0.18	74	91	1670
29	48	6.9		0.55	1682	5037	1365	4087	30	0.56	5.65	113	0.36	0.30	98	0	
30	48	7.2		0.29	2069	6195	1711	5123	41	0.50	6.08	74	0.33	0.27	123	0	
31	48	7.4	10.2	0.18	2246	6725	1846	5528	70	0.32	3.33	79	0.36	0.29	127	22	661
TL												2016				1286	17611
ME	48	7.3	5.7	0.34	1606	4809	1302	3899	66	0.5	5.5	65	0.26	0.21	123	41	881

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

BIOSOLIDS SHEET

Marshall

MI 002 3540

July 2003

SUPERINTENDENT
Steven D. Washburn

	RAW SLUDGE	RAW BIOSOLIDS			LIME STABILIZED BIOSOLIDS					
DAY	GALLONS	TOTAL SOLIDS %	VOLATILE SOLIDS %	pH SU	LIME POUNDS	pH 2 hrs @ 25 C SU	RDT Solids %	Lbs. Lime per 1000 gallons biosolids		
1	13000	2.5	74.0	6.5	2519		12.1	194		
2	12300	2.8	73.0	6.6	1835	12.2	15.0	149		
3	11700	2.8	72.0	6.5						
4	16700	2.3	71.0	6.8						
5	12400	2.4	74.0	6.8						
6	13600	2.7	76.0	6.8						
7	13600	2.6	73.0	6.8						
8	13600	2.8	72.0	6.7	2519		15.3	185		
9	13100	3.6	73.0	6.4	2301		14.5	176		
10	11700	3.2	71.0	6.5		12.2				
11	13600	2.2	73.0	6.7						
12	15500	2.6	76.0	6.5						
13	12250	2.0	72.0	6.8						
14	9100	3.3	72.0	6.5						
15	10180	3.1	78.0	6.2	2301		9.3	226		
16	11150	3.2	75.0	6.4	1866		8.9	167		
17	14000	3.0	74.0	6.5		12.2				
18	10000	3.0	73.0	6.1						
19	10100	3.0	76.0	6.1						
20	10500	3.2	76.0	6.3						
21	9700	3.0	74.0	6.3						
22	11500	3.2	73.0	6.1	2239		9.6	195		
23	10600	3.1	72.0	6.1	1089		9.8	103		
24	12800	3.0	73.0	5.9		12.1				
25	11200	3.0	75.0	6.0						
26	10250	2.9	75.0	6.1						
27	10700	2.6	75.0	6.2						
28	9800	2.7	73.0	6.2						
29	9700	3.4	72.0	6.2	2333		8.0	241		
30	11700	3.5.	73.0	6.0	1400		10.6	120		
31	1900	3.3	73.0	5.9		12.1				
TOTAL	357930				20402					
MEAN	11546	2.9	73.6	6.4	2040	12.2	11.3	175		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MISCELLANEOUS SHEET

July 2003

Marshall
MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	WATER	ELECTRICAL USAGE		FUEL GAS		CHEMICALS APPLIED								
			X 120		X 100	$FECL_3$					Cl_2		SO_2	
	CF	METER	KWH	METER	CF	GALS	SP. GR.	% SOLN	LBS	mg/L	LBS	mg/L	LBS	mg/L
1	2091	19	2280			75.0	1.4000	30	262.7	25.8	26.0	2.6	19.0	1.9
2	1399	18	2160			125	1.4000	30	437.9	44.9	25	2.6	14.0	1.4
3	140	18	2160			150	1.4000	30	525.4	60.0	23	2.6	14.0	1.6
4	140	18	2160			125	1.4000	30	437.9	49.1	26	2.9	16.0	1.8
5	440	12	1440			100	1.4000	30	350.3	36.8	18	1.9	16.0	1.7
6	641	14	1680			150	1.4000	30	525.4	53.8	24	2.5	17.0	1.7
7	163	16	1920			150	1.4000	30	525.4	51.2	25	2.4	15.0	1.5
8	1747	18	2160			150	1.4000	30	525.4	48.8	22	2.0	15.0	1.4
9	1417	17	2040			100	1.4000	30	350.3	31.6	22	2.0	15.0	1.4
10	310	14	1680			100	1.4000	30	350.3	33.1	20	1.9	14.0	1.3
11	163	14	1680			100	1.4000	30	350.3	35.9	21	2.2	14.0	1.4
12	140	15	1800			150	1.4000	30	525.4	55.8	25	2.7	15.0	1.6
13	140	13	1560			150	1.4000	30	525.4	58.9	20	2.2	20.0	2.2
14	285	15	1800			75	1.4000	30	262.7	26.7	18	1.8	13.0	1.3
15	1544	22	2640			125	1.4000	30	437.9	42.7	18	1.8	14.0	1.4
16	1467	18	2160			100	1.4000	30	350.3	35.0	15	1.5	11.0	1.1
17	216	15	1800			150	1.4000	30	525.4	54.3	14	1.4	11.0	1.1
18	191	15	1800			150	1.4000	30	525.4	52.9	14	1.4	11.0	1.1
19	211	15	1800			100	1.4000	30	350.3	38.5	14	1.5	13.0	1.4
20	200	13	1560			100	1.4000	30	350.3	36.8	14	1.5	11.0	1.2
21	213	14	1680			100	1.4000	30	350.3	33.6	11	1.1	11.0	1.1
22	1448	17	2040			150	1.4000	30	525.4	50.4	1	0.1	12.0	1.2
23	1087	19	2280			150	1.4000	30	525.4	52.9	17	1.7	12.0	1.2
24	261	15	1800			125	1.4000	30	437.9	42.7	20	1.9	14.0	1.4
25	181	15	1800			125	1.4000	30	437.9	43.0	20	2.0	13.0	1.3
26	90	14	1680			150	1.4000	30	525.4	55.8	19	2.0	7.0	0.7
27	100	13	1560			100	1.4000	30	350.3	39.3	20	2.2	10.0	1.1
28	214	14	1680			150	1.4000	30	525.4	50.4	22	2.1	18.0	1.7
29	1815	24	2880			100	1.4000	30	350.3	33.9	24	2.3	14.0	1.4
30	1083	17	2040			100	1.4000	30	350.3	35.0	21	2.1	15.0	1.5
31	241	17	2040			125	1.4000	30	437.9	45.3	26	2.7	14.0	1.4
TL	19778	498	59760			3800					605		428.0	
ME	638	16	1928			123	1.4000	30.0	429.4	43.7	19.5	2.0	13.8	1.4

MANPOWER		
POSITION TITLE	NUMBER FULL TIME	
SUPERINTENDANT	1	
ASST. SUPT.	1	
OPERATOR	3	
MECHANIC		
CHEMIST		
LAB TECH		
IPP COORDINATOR	1	
OTHER		
GIVE THE HOURS PER DAY THAT PLANT PERSONNEL ARE NORMALLY AT THE PLANT.		
WEEKDAYS	8	HRS
SATURDAYS	8	HRS
SUNDAYS	8	HRS
HOLIDAYS	8	HRS

Weather Code	
1 Clear	6 Warm
2 Partly Cloudy	7 Cold
3 Cloudy	8 Windy
4 Rain	9 Melting Snow
5 Snow	

PLANT INFLUENT SHEET

August 2003

Marshall

STATE OF MICHIGAN

MI 002 3540

SUPERINTENDENT

DEPT OF ENVIRONMENTAL QUALITY

Steven D Washburn

DAY	WEATHER TYPE CODE	WEATHER PRECIP Inches	FLOW TOTAL MGD	FLOW MAX MGD	RAW SEWAGE QUALITY TEMP °F	pH SU	BOD_5 mg/l	BOD_5 LBS	SS mg/l	SS LBS	TOTAL-P mg/l	TOTAL-P LBS	VSS mg/l	NH3-N mg/l
1	4	0 25	1 230		64	7 60	204	2093	202	2072			182	19 6
2	4	0 01	1 070		54	7 30	186	1660	198	1767			178	18 6
3	4	0 13	1 110		55	7 60	205	1898	186	1722			174	18 1
4	4	0 06	1 210		57	7 50	254	2563	272	2745			242	17 9
5	1		1 220		62	7 80	287	2920	180	1831			161	18 7
6	1		1 230		60	7 50	243	2493	156	1600	2 08	21	134	19 0
7	1		1 200		56	7 50	218	2182	162	1621			140	17 1
8	1		1 190		55	7 50	194	1925	178	1767			162	17 3
9	1		1 190		55	7 60	284	2819	210	2084			192	12 6
10	1		1 030		57	7 40	248	2130	256	2199			244	15 7
11	4	0 36	1 150		56	7 70	269	2580	216	2072			192	20 0
12	4	0 13	1 150		60	7 70	370	3549	258	2474			252	19 0
13	1		1 150		63	7 00	269	2580	274	2628	5 50	53	238	20 2
14	4	0 26	1 150		57	7 40	221	2120	200	1918			178	16 8
15	4	0 06	1 170		56	7 30	276	2693	162	1581			136	15 0
16	4	0 02	1 230		64	7 70	376	3857	202	2072			194	16 3
17	1		1 120		56	7 60	247	2307	180	1681			168	13 2
18	1		1 200		56	7 60	201	2012	244	2442			216	11 2
19	1		1 220		56	7 70	216	2198	219	2228			198	14 1
20	1		1 300		60	7 60	235	2548	192	2082	4 73	51	174	15 8
21	4	0 04	1 210		64	7 70	287	2896	130	1312			126	17 1
22	1		1 230		60	7 70	239	2452	202	2072			182	17 1
23	1		1 180		58	7 60	296	2913	254	2500			230	14 8
24	1		1 070		56	7 50	196	1749	220	1963			198	14 8
25	4	0 84	1 160		58	7 60	187	1809	204	1974			186	13 7
26	4	0 01	1 160		60	7 60	175	1693	164	1587	4 32	42	150	13 3
27	1		1 160		61	7 70	412	3986	318	3076			290	17 0
28	1		1 190		58	7 50	237	2352	224	2223			204	19 3
29	1		1 090		58	7 50	206	1873	212	1927			192	18 1
30	1		1 040		58	7 60	182	1579	216	1873			188	15 5
31	4	0 36	1 010		57	7 60	171	1440	182	1533			162	16 6
TL		2 53	36 020					73867		62628		167		
ME			1 162				245	2383	209	2020	4 16	42	189	16 6

City of Marshall
801 Industrial Rd
Marshall, MI 49068

PRIMARY EFFLUENT SHEET

August 2003

Marshall
MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D Washburn

	PRIMARY EFFLUENT QUALITY												
DAY	BOD-5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS		AMMONIA NITROGEN	
	mg/l	LBS	Removal	mg/l	LBS	% Removal	mg/l	LBS	% Removal	mg/l	%	mg/l	LBS
1	97	995	52 5	36	369	82 2				34 0	94 4	16 9	173
2	74	660	60 2	28	259	85 9				28 0	100 0	17 9	166
3	81	750	60 5	26	262	86 0				26 0	100 0	17 0	172
4	97	979	61 8	28	285	89 7				26 0	92 9	19 6	199
5	169	1720	41 1	44	451	75 6				42 0	95 5	20 6	211
6	164	1682	32 5	58	580	62 8	1 1	10 7	48 6	42 0	72 4	20 5	205
7	107	1071	50 9	40	397	75 3				34 0	85 0	17 3	172
8	102	1012	47 4	46	457	74 2				42 0	91 3	18 5	184
9	92	913	67 6	48	412	77 1				48 0	100 0	14 8	127
10	107	919	56 9	46	441	82 0				46 0	100 0	17 4	167
11	112	1074	58 4	44	422	79 6				44 0	100 0	20 3	195
12	196	1880	47 0	46	441	82 2				42 0	91 3	24 2	232
13	179	1717	33 5	64	614	76 6	2 1	19 9	62 2	52 0	81 3	23 3	223
14	105	1007	52 5	46	449	77 0				40 0	87 0	18 8	183
15	116	1132	58 0	42	431	74 1				28 0	66 7	18 0	185
16	163	1672	56 6	50	467	75 2				50 0	100 0	17 2	161
17	150	1401	39 3	52	520	71 1				48 0	92 3	19 1	191
18	106	1061	47 3	64	651	73 8				58 0	90 6	16 5	168
19	153	1557	29 2	54	585	75 3				40 0	74 1	18 5	201
20	182	1973	22 6	48	484	75 0	2 4	24 1	49 5	38 0	79 2	18 5	187
21	127	1282	55 7	52	533	60 0				50 0	96 2	15 4	158
22	143	1467	40 2	54	531	73 3				42 0	77 8	18 1	178
23	81	797	72 6	66	589	74 0				62 0	93 9	16 4	146
24	116	1035	40 8	60	580	72 7				56 0	93 3	16 5	160
25	108	1045	42 2	56	542	72 5				52 0	92 9	16 2	157
26	142	1374	18 9	68	658	58 5	4 7	45 7	-9 3	56 0	82 4	18 4	178
27	194	1877	52 9	90	893	71 7				78 0	86 7	22 6	224
28	218	2164	8 0	122	1109	45 5				112 0	91 8	20 6	187
29	138	1255	33 0	72	624	66 0				62 0	86 1	18 9	164
30	130	1128	28 6	116	977	46 3				80 0	69 0	17 7	149
31	99	834	42 1	70	21028	61 5				58 0	82 9	16 9	5077
TL		39431			37046			100 4					10479
ME	131	1272	45 5	56	1195	72 7	2 6	25 1	37 7	1516 0	88 6	18 5	338

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
SURFACE WATER QUALITY DIVISION

DEQ

Discharge Number	Permit Number
001 A	MI 002 3540

DAILY DISCHARGE MONITORING REPORT

Monitoring Period
August 2003

DAY	$CBOD_5$			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS	NH3-N		PH	D.O.	F.COLI #/100ml	CL RESID
	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	mg/l	LBS	SU	mg/l	MF	mg/l
1	1.9	19	99.1	1.0	10	99.5				1.0	1.26	12.93	7.60	7.4	14	0.000
2	2.3	21	98.8	1 0	9	99.5				1.0	1.30	11.60	7.30	6.5	1	0.000
3	2.7	25	98.7	1.0	9	99.5				1.0	0.55	5.08	7.40	6.9	4	0.000
4	2.7	27	98.9	2.0	20	99.3				2.0	1.51	15.24	7.30	6.7	1	0.000
5	3.4	35	98.8	1.0	10	99.4				1.0	0.23	2.33	7.40	7.3	63	0.000
6	3.2	33	98.7	8.0	82	94.9	0.14	1.4	93.4	5.0	1.77	18.16	7.50	7.6	33	0.000
7	2.9	29	98.7	1.0	10	99.4				1.0	2.40	24.02	7.30	7.1	5	0.000
8	2.7	27	98.6	5.0	50	97.2				5.0	2.51	24.91	7.30	6.4	12	0.000
9	2.7	27	99.0	3.0	30	98.6				3.0	4.96	49.23	7.40	6.5	1	0.000
10	2.1	18	99.2	1.0	9	99.6				1.0	1.01	8.68	7.30	6.2	1	0.000
11	2.3	22	99.1	1.0	10	99.5				1.0	1.16	11.13	7.40	6.7	1	0.000
12	3.0	29	99.2	2.0	19	99.2				2.0	4.00	38.36	7.30	7.2	9	0.000
13	2.7	26	99.0	1.0	10	99.6	0.10	1.0	98.2	1.0	3.24	31.07	7.40	6.7	2	0.000
14	1.5	14	99.3	1.0	10	99.5				1.0	0.47	4.55	7.40	7.3	69	0.000
15	3.0	29	98.9	1.0	10	99.4				1.0	2.18	21.27	7.50	7.3	48	0.000
16	2.1	22	99.4	1.0	10	99.5				1.0	0.73	7.47	7.40	6.4	36	0.000
17	3.1	29	98.7	1.0	9	99.4				1.0	0.38	3.50	7.40	6.8	40	0.000
18	2.3	23	98.9	8.0	80	96.7				4.0	0.08	0.84	7.60	7.6	9	0.000
19	2.8	28	98.7	1.0	10	99.5				1.0	3.53	35.92	7.30	6.3	2	0.000
20	2.3	25	99.0	1.0	11	99.5	0.12	1.3	97.4	1.0	2.07	22.44	7.30	6.3	42	0.000
21	2.8	28	99.0	2.0	20	98.5				2.0	1.45	14.63	7.40	6.9	240	0.000
22	14.4	148	94.0	76.0	780	62.4				56.0	4.31	44.21	7.40	5.1	6	0.000
23	4.4	43	98.5	10.0	98	96.1				9.0	3.23	31.79	7.30	6.1	1	0.000
24	2.8	25	98.6	1.0	9	99.5				1.0	3.13	27.93	7.40	6.0	1	0.000
25	3.3	32	98.2	2.0	19	99.0				2.0	5.84	56.50	7.40	6.3	1	0.000
26	6.6	64	96.2	1.0	10	99.4	0.23	2.2	94.7	1.0	11.10	107.39	7.40	6.2	2	0.000
27	2.5	24	99.4	6.0	58	98.1				6.0	11.10	107.39	7.40	6.2	16	0.000
28	3.6	36	98.5	1.0	10	99.6				1.0	9.36	92.89	7.40	6.3	21	0.000
29	2.7	25	98.7	3.0	27	98.6				2.0	7.91	71.91	7.40	6.5	3	0.000
30	2.8	24	98.5	2 0	17	99.1				2.0	10.20	88.47	7.30	6.8	3	0.000
31	3.3	28	98.1	1.0	8	99.5				1.0	6.47	54.50	7.30	6.7	3	0.000
TL		984			1474			5.9								
ME	3.3	32	98.6	4.7	48	97.7	0.15	1.5	95.9	118.0	3.53	33.75		6.7	6	0.000
WA	5.4	53		14.1	144										28	
MX											11.10	107.39	7.60			
MN													7.30	5.1		

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment See 18 U S C 1001 and 33 U S C 1319 (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 Years)

PRINTED NAME AND TITLE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTORIZED AGENT	DATE
Steven D. Washburn, Superintendent		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

ACTIVATED SLUDGE SHEET

August 2003

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	AERATION SYSTEM				MIXED LIQUOR								SECONDARY SLUDGE				
	AERTN VOL	DETEN TIME	CRT	F:M RATIO	MLSS		MLVSS		SETTL.	SDI	D.O.	AIR	SS	VSS	RAS FLOW	WAS	
	KCF	HRS	DAYS		mg/L	Lbs.	mg/L	Lbs.	%	%	mg/L	CF	%	%	%	Gallons	Lbs.
SF	3											4				3	
1	48	7.0	9.1	0.18	2279	6824	1861	5573	73	0.31	5.72	73	0.32	0.26	119	28	747
2	48	8.1			2309	6914					2.18	43			137	36	
3	48	7.8			2280	6827					4.31	43			132	39	
4	48	7.1	5.8	0.18	2206	6606	1806	5408	73	0.30	4.25	72	0.31	0.25	121	44	1138
5	48	7.1	6.2	0.34	2104	6300	1705	5105	45	0.47	6.32	112	0.27	0.22	120	45	1013
6	48	7.0	5.4	0.30	2297	6878	1872	5606	58	0.40	4.63	69	0.34	0.28	120	45	1276
7	48	7.2	4.7	0.22	2036	6097	1639	4908	70	0.29	2.68	41	0.30	0.24	123	52	1301
8	48	7.2	4.7	0.21	1986	5947	1624	4863	78	0.25	3.90	44	0.27	0.22	127	56	1261
9	48	7.2			1944	5821					3.52	45			130	58	
10	48	8.4			1853	5549					4.55	43			146	58	
11	48	7.5	5.2	0.24	1837	5501	1502	4498	81	0.23	5.71	76	0.22	0.18	129	58	1064
12	48	7.5	4.3	0.42	1804	5402	1492	4468	80	0.23	6.08	93	0.26	0.21	128	58	1258
13	48	7.5	4.8	0.38	1859	5567	1528	4575	84	0.22	6.18	111	0.24	0.20	128	58	1161
14	48	7.5	4.9	0.21	1914	5731	1566	4689	87	0.22	5.56	111	0.24	0.20	128	58	1161
15	48	7.4	8.3	0.23	1986	5947	1613	4830	87	0.23	0.40	55	0.27	0.22	121	32	721
16	48	7.0			1887	5650					4.57	104			128	41	
17	48	7.7			1948	5833					6.47	145			141	44	
18	48	7.2	5.2	0.21	2064	6180	1707	5111	78	0.26	4.80	90	0.29	0.24	132	49	1185
19	48	7.1	3.7	0.45	1410	4222	1157	3465	78	0.18	4.39	56	0.29	0.24	130	47	1137
20	48	6.6	5.7	0.43	1911	5722	1543	4620	83	0.23	5.54	82	0.28	0.23	122	43	1004
21	48	7.1	5.9	0.27	1984	5941	1568	4695	85	0.23	0.31	63	0.28	0.22	132	43	1004
22	48	7.0	5.0	0.35	1767	5291	1417	4243	92	0.19	4.99	94	0.24	0.19	133	53	1061
23	48	7.3			1614	4833					2.34	100			127	58	
24	48	8.1			1726	5168					2.34	101			150	58	
25	48	7.4	5.1	0.24	1909	5716	1444	4324	86	0.22	4.60	77	0.27	0.21	131	50	1126
26	48	7.4	4.6	0.34	1847	5531	1364	4084	72	0.26	3.58	77	0.29	0.22	131	50	1209
27	48	7.4	4.3	0.44	1914	5731	1426	4270	83	0.23	3.58	77	0.32	0.24	131	50	1334
28	48	7.2	3.9	0.49	2048	6133	1466	4390	85	0.24	4.42	118	0.34	0.24	128	55	1560
29	48	7.9	3.6	0.24	2405	7202	1781	5333	70	0.34	4.48	75	0.37	0.28	140	64	1975
30	48	8.3			2317	6938					4.72	50			142	64	
31	48	8.5			2080	6228					4.96	49			147	65	
TL												2389				1559	24696
ME	48	7.4	5.3	0.30	1985	5943	1575	4717	78	0.3	4.3	77	0.29	0.23	131	50	1176

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

BIOSOLIDS SHEET

Marshall

MI 002 3540

August 2003

SUPERINTENDENT
Steven D. Washburn

	RAW SLUDGE	RAW BIOSOLIDS			LIME STABILIZED BIOSOLIDS					
DAY	GALLONS	TOTAL SOLIDS %	VOLATILE SOLIDS %	pH SU	LIME POUNDS	pH 2 hrs @ 25 C SU	RDT Solids %	Lbs. Lime per 1000 gallons biosolids		
1	10300	3.7	72.0	6.0						
2	11100	3.2	74.0	5.9						
3	10300	2.5	73.0	6.0						
4	11000	2.5	74.0	6.2						
5	11000	2.7	74.0	6.2	2100		10.4	191		
6	10500	2.9	73.0	6.2	800	12.1	12.3	76		
7	13800	2.6	70.0	6.3						
8	12700	2.7	67.0	6.2						
9	12700	2.8	72.0	6.2						
10	10600	2.4	73.0	6.2						
11	9700	2.7	72.0	6.2						
12	4200	2.6	72.0	6.1	1975		7.7	470		
13	21200	2.9	72.0	6.0	1600	12.1	6.8	75		
14	4100	2.6	73.0	6.0						
15	9700	2.3	73.0	5.6						
16	14600	3.1	74.0	5.7						
17	12600	2.6	75.0	5.9						
18	24900	2.3	75.0	5.4						
19	13200	2.1	74.0	5.8	2250		6.0	170		
20	17700	2.3	74.0	5.9	2150	12.2	9.4	121		
21	17500	2.1	75.0	6.0		12.2				
22	17600	2.3	72.0	5.9						
23	18500	2.3	75.0	6.0						
24	18500	2.1	73.0	6.1						
25	5900	1.9	83.0	5.4						
26	13000	2.0	75.0	5.9	2400		7.3	185		
27	10000	1.8	76.0	6.0	2575		12.3	258		
28	9700	2.6	74.0	6.0	1925	12.2	8.4	198		
29	15000	2.7	74.0	6.0		12.2				
30	13500	2.5	72.0	6.2						
31	13600	2.5	72.0	6.3						
TOTAL	398700				17775					
MEAN	12861	2.5	73.5	6.0	1975	12.2	9.0	194		

City of Marshall
801 Industrial Rd
Marshall, MI 49068

MISCELLANEOUS SHEET

August 2003

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D Washburn

DAY	WATER	ELECTRICAL USAGE		FUEL GAS		CHEMICALS APPLIED								
			X 120		X 100	$FECL_3$					Cl_2		SO_2	
	CF	METER	KWH	METER	CF	GALS	SP GR	% SOLN	LBS	mg/L	LBS	mg/L	LBS	mg/L
1	151	15	1800			125 0	1 3980	30	437 2	42 6	20 0	1 9	13 0	1 3
2	170	14	1680			100	1 3980	30	349 8	39 2	19	2 1	13 0	1 5
3	160	13	1560			100	1 3980	30	349 8	37 8	20	2 2	12 0	1 3
4	222	16	1920			150	1 3980	30	524 7	52 0	17	1 7	10 0	1 0
5	1906	20	2400			100	1 3980	30	349 8	34 4	15	1 5	11 0	1 1
6	1004	17	2040			150	1 3980	30	524 7	51 1	20	1 9	18 0	1 8
7	312	13	1560			100	1 3980	30	349 8	35 0	16	1 6	12 0	1 2
8	272	13	1560			150	1 3980	30	524 7	52 9	17	1 7	12 0	1 2
9	290	14	1680			100	1 3980	30	349 8	35 2	16	1 6	12 0	1 2
10	280	13	1560			100	1 3980	30	349 8	40 7	19	2 2	12 0	1 4
11	280	17	2040			100	1 3980	30	349 8	36 5	15	1 6	11 0	1 1
12	1753	19	2280			125	1 3980	30	437 2	45 6	15	1 6	11 0	1 1
13	1493	21	2520			100	1 3980	30	349 8	36 5	14	1 5	12 0	1 3
14	280	16	1920			125	1 3980	30	437 2	45 6	14	1 5	11 0	1 1
15	261	14	1680			100	1 3980	30	349 8	35 8	18	1 8	15 0	1 5
16	301	20	2400			150	1 3980	30	524 7	51 1	24	2 3	17 0	1 7
17	240	23	2760			150	1 3980	30	524 7	56 2	20	2 1	16 0	1 7
18	310	16	1920			100	1 3980	30	349 8	35 0	22	2 2	15 0	1 5
19	1866	17	2040			150	1 3980	30	524 7	51 6	20	2 0	16 0	1 6
20	1651	19	2280			125	1 3980	30	437 2	40 3	19	1 8	16 0	1 5
21	230	15	1800			125	1 3980	30	437 2	43 3	17	1 7	13 0	1 3
22	402	17	2040			100	1 3980	30	349 8	34 1	26	2 5	18 0	1 8
23	390	18	2160			100	1 3980	30	349 8	35 5	29	2 9	19 0	1 9
24	400	18	2160			250	1 3980	30	874 4	98 0	29	3 2	18 0	2 0
25	400	15	1800			125	1 3980	30	437 2	45 2	19	2 0	12 0	1 2
26	1713	18	2160			100	1 3980	30	349 8	36 2	17	1 8	11 0	1 1
27	1790	23	2760			125	1 3980	30	437 2	45 2	16	1 7	10 0	1 0
28	1460	21	2520			125	1 3980	30	437 2	44 1	14	1 4	13 0	1 3
29	280	15	1800			125	1 3980	30	437 2	48 1	13	1 4	12 0	1 3
30	180	15	1800			150	1 3980	30	524 7	60 5	15	1 7	12 0	1 4
31	1040	14	1680			150	1 3980	30	524 7	62 3	12	1 4	12 0	1 4
TL	21487	519	62280			3875					567		415 0	
ME	693	17	2009			125	1 3980	30 0	437 2	45 4	18 3	1 9	13 4	1 4

MANPOWER	
POSITION TITLE	NUMBER FULL TIME
SUPERINTENDANT	1
ASST SUPT	1
OPERATOR	3
MECHANIC	
CHEMIST	
LAB TECH	
IPP COORDINATOR	1
OTHER	

GIVE THE HOURS PER DAY THAT PLANT PERSONNEL ARE NORMALLY AT THE PLANT

WEEKDAYS	8	HRS
SATURDAYS	8	HRS
SUNDAYS	8	HRS
HOLIDAYS	8	HRS

Weather Code	
1 Clear	6 Warm
2 Partly Cloudy	7 Cold
3 Cloudy	8 Windy
4 Rain	9 Melting Snow
5 Snow	

PLANT INFLUENT SHEET

September 2003

Marshall

STATE OF MICHIGAN

MI 002 3540

SUPERINTENDENT

DEPT OF ENVIRONMENTAL QUALITY

Steven D Washburn

D	WEATHER		FLOW		RAW SEWAGE QUALITY									
A	TYPE	PRECIP	TOTAL	MAX	TEMP	pH	BOD_5		SS		TOTAL-P		VSS	NH3-N
Y	CODE	Inches	MGD	MGD	°F	SU	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l
1	4	0 45	1 130		54	7 50	185	1743	196	1847			170	15 7
2	1		1 190		59	7 60	215	2134	193	1915			174	17 4
3	4	0 79	1 260		58	7 40	198	2081	146	1534	4 10	43	130	18 6
4	1		1 200		59	7 50	215	2152	202	2022			176	18 5
5	1		1 120		61	7 40	270	2522	166	1551			144	19 5
6	1		1 110		58	7 60	357	3305	312	2888			282	18 6
7	1		1 100		59	7 50	244	2238	230	2110			206	17 4
8	1		1 180		60	7 50	228	2244	196	1929			178	16 2
9	1		1 200		59	7 60	230	2302	165	1651			150	17 7
10	1		1 140		60	7 50	238	2263	206	1959			202	16 9
11	1		1 080		59	7 60	214	1928	246	2216	5 20	47	228	17 7
12	1		1 100		59	7 60	237	2174	182	1670			160	18 6
13	1		1 120		57	7 60	253	2363	210	1962			184	14 8
14	4	0 22	1 010		55	7 60	176	1483	170	1432			150	15 4
15	4	0 01	1 120		57	7 50	167	1560	172	1607			154	14 2
16	1		1 200		64	7 60	234	2342	111	1111			90	15 5
17	1		1 150		56	7 50	268	2570	172	1650			132	16 6
18	1		1 090		58	7 80	302	2745	208	1891	5 01	46	198	15 9
19	1		1 090		62	7 50	277	2518	244	2218			222	15 7
20	1		1 080		57	7 40	286	2576	218	1964			188	15 8
21	4	0 32	1 120		55	7 50	235	2195	240	2242			214	14 2
22	4	0 96	1 160		62	7 40	308	2980	234	2264			214	14 9
23	4	0 01	1 350		59	7 40	227	2556	202	2274			187	17 5
24	4	0 73	1 210		57	7 70	256	2583	196	1978	4 86	49	172	17 9
25	1		1 120		61	7 60	204	1906	184	1719			170	18 0
26	4	0 31	1 120		58	7 60	192	1793	184	1719			162	18 2
27	4	0 06	1 090		57	7 60	222	2018	182	1654			168	15 4
28	4	0 05	1 030		53	7 70	174	1495	166	1426			152	17 3
29	4	0 01	1 130		56	7 10	222	2092	210	1979			178	18 2
30	1		1 200		57	7 60	259	2592	195	1952			179	16 2
31														
TL		3 92	34 200					67453		56331		185		
ME			1 140		58 2		236	2248	198	1878	4 79	46	177	16 8

City of Marshall
801 Industnal Rd
Marshall, MI 49068

PRIMARY EFFLUENT SHEET

September 2003

Marshall
MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D Washburn

	PRIMARY EFFLUENT QUALITY												
DAY	BOD-5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS		AMMONIA NITROGEN	
	mg/l	LBS	Removal	mg/l	LBS	% Removal	mg/l	LBS	% Removal	mg/l	%	mg/l	LBS
1	93	876	49 7	70	660	64 3				58 0	82 9	16 4	155
2	176	1747	18 1	96	1009	50 3				80 0	83 3	22 3	234
3	162	1702	18 2	80	801	45 2	3 2	31 6	22 9	66 0	82 5	24 3	243
4	152	1521	29 3	60	560	70 3				52 0	86 7	23 0	215
5	112	1046	58 5	52	481	68 7				46 0	88 5	18 6	172
6	105	972	70 6	50	459	84 0				50 0	100 0	17 5	161
7	95	872	61 1	38	374	83 5				38 0	100 0	15 7	155
8	89	876	61 0	34	340	82 7				34 0	100 0	15 5	155
9	169	1691	26 5	50	475	69 7				38 0	76 0	19 4	184
10	156	1483	34 5	70	631	66 0				68 0	97 1	19 8	178
11	105	946	50 9	38	349	84 6	2 2	20 5	56 9	34 0	89 5	17 9	164
12	95	872	59 9	46	430	74 7				40 0	87 0	16 0	149
13	152	1420	39 9	32	270	84 8				26 0	81 3	16 7	141
14	105	884	40 3	42	392	75 3				34 0	81 0	15 9	149
15	137	1280	18 0	66	661	61 6				52 0	78 8	19 5	195
16	157	1571	32 9	66	633	40 5				52 0	78 8	19 0	182
17	99	950	63 1	38	345	77 9				36 0	94 7	16 9	154
18	137	1245	54 6	22	200	89 4	1 9	17 2	62 3	22 0	100 0	17 5	159
19	123	1118	55 6	40	360	83 6				38 0	95 0	18 8	169
20	96	865	66 4	44	411	79 8				38 0	86 4	16 2	151
21	116	1084	50 6	48	464	80 0				38 0	79 2	14 7	142
22	108	1045	64 9	26	293	88 9				26 0	100 0	15 7	177
23	167	1880	26 4	68	686	66 3				54 0	79 4	18 2	184
24	182	1837	28 9	66	616	66 3	2 0	18 2	59 9	54 0	81 8	19 8	185
25	119	1112	41 7	36	336	80 4				36 0	100 0	17 9	167
26	101	943	47 4	48	436	73 9				48 0	100 0	17 4	158
27	105	955	52 7	48	412	73 6				46 0	95 8	15 5	133
28	109	936	37 4	42	396	74 7				42 0	100 0	16 3	154
29	98	924	55 9	76	761	63 8				56 0	73 7	17 6	176
30	177	1771	31 7	50	500	74 4				44 0	88 0	18 5	185
31													
TL		36423			14741			87 6					5127
ME	127	1214	44 9	51	491	72 6	2 3	21 9	50 5	1346 0	88 9	18 0	171

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
SURFACE WATER QUALITY DIVISION

DEQ

Discharge Number	Permit Number
001 A	MI 002 3540

DAILY DISCHARGE MONITORING REPORT

Monitoring Period
September 2003

DAY	CBOD5			SUSPENDED SOLIDS			TOTAL PHOSPHORUS			VSS	NH3-N		PH	D.O.	F.COLI #/100ml	CL RESID
	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	LBS	% REM	mg/l	mg/l	LBS	SU	mg/l	MF	mg/l
1	3.2	30	98.3	3.0	28	98.5				3.0	4.75	44.76	7.30	6.7	5	0.000
2	3.9	39	98.2	1.0	10	99.5				1.0	9.30	92.30	7.40	6.6	238	0.001
3	3.1	33	98.4	5.0	53	96.6	0.13	1.4	96.8	5.0	10.80	113.49	7.40	6.1	2	0.001
4	4.9	49	97.7	4.0	40	98.0				4.0	3.22	32.23	7.30	6.0	1	0.000
5	3.7	35	98.6	3.0	28	98.2				2.0	0.56	5.23	7.40	7.0	96	0.000
6	3 5	32	99.0	5.0	46	98.4				5.0	5.04	46.66	7.40	6.2	8	0.000
7	3.9	36	98.4	1.0	9	99.6				1.0	1.97	18.07	7.40	6.7	28	0.000
8	4.0	39	98.2	1.0	10	99.5				1.0	3.07	30.20	7.40	6.5	18	0.000
9	4.2	42	98.2	1.0	10	99.4				1.0	2 98	29.82	7.40	6.6	65	0.000
10	4.0	38	98.3	1.0	10	99.5				1.0	2.85	27.10	7.40	6.6	3	0.000
11	2.6	23	98.8	1.0	9	99.6	0.16	1.4	96.9	1.0	0.11	0.99	7.50	7.2	1	0.000
12	3.2	29	98.6	4.0	37	97.8				3.0	0.21	1.93	7.70	6.8	120	0.000
13	3.4	32	98.7	2.0	19	99.0				2.0	0.76	7.10	7.40	6.5	240	0.000
14	3.4	29	98.1	4.0	34	97.6				4 0	0.03	0.25	7.30	7.3	170	0.000
15	5.4	50	96.8	16.0	149	90.7				12.0	0.11	1.03	7.60	7.4	120	0.000
16	3.7	37	98.4	6.0	60	94.6				5.0	1.31	13.11	7.60	6.5	126	0.000
17	3.8	36	98.6	4.0	38	97.7				4.0	1.16	11.13	7.30	6.9	120	0.000
18	6.2	56	97.9	1.0	9	99.5	0.26	2.4	94.8	1.0	1.04	9.45	7.50	6.2	196	0.000
19	5.7	52	97.9	3.0	27	98.8				3.0	0.81	7.36	7.30	6.0	5	0.000
20	4.6	41	98.4	11.0	99	95.0				9.0	0.12	1.08	7.30	7.6	198	0.000
21	5.1	48	97.8	9.0	84	96.3				8.0	0.19	1.77	7.50	6.8	5	0.000
22	4.7	45	98.5	2.0	19	99.1				2.0	0.20	1.93	7.50	6.7	230	0 000
23	6.9	78	97.0	5.0	56	97.5				5.0	2.26	25.45	7.50	6.1	1	0.000
24	4.8	48	98.1	9.0	91	95.4	0.22	2.2	95.5	7.0	0.22	2.22	7.60	6.8	120	0.000
25	5.2	49	97.5	6.0	56	96.7				6.0	0.19	1.77	7.40	7.3	57	0.000
26	4.2	39	97.8	4.0	37	97.8				4.0	0.20	1.87	7.40	7.0	120	0.000
27	5.0	45	97.7	6.0	55	96.7				6.0	0.25	2.28	7.40	7.0	16	0.000
28	4.5	39	97.4	9.0	77	94.6				9.0	0.28	2.41	7.40	7.3	4	0.000
29	5.6	53	97.5	9.0	85	95.7				9.0	0.81	7.63	7.30	6.7	14	0 000
30	4.5	45	98.3	3.0	30	98.5				3.0	1.37	13.71	7.40	7.3	120	0.000
31																
TL		1248			1316			7.4								
ME	4.4	42	98.1	4.6	44	97.5	0.19	1.8	96.0	127.0	1.87	18.48		6.7	28	0.000
WA	5.4	53		7.1	67										150	
MX											10.80	113.49	7.70			0.001
MN													7.30	6.0		

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment See 18 U S C 1001 and 33 U S C 1319 (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 Years)

PRINTED NAME AND TITLE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTORIZED AGENT	DATE
Steven D. Washburn, Superintendent		

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

ACTIVATED SLUDGE SHEET

September 2003

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D. Washburn

DAY	AERATION SYSTEM				MIXED LIQUOR								SECONDARY SLUDGE				
	AERTN VOL	DETEN TIME	CRT	F:M RATIO	MLSS		MLVSS		SETTL.	SDI	D.O.	AIR	SS	VSS	RAS FLOW	WAS	
	KCF	HRS	DAYS		mg/L	Lbs.	mg/L	Lbs.	%	%	mg/L	CF	%	%	%	Gallons	Lbs.
SF	3											4				3	
1	48	7.6	3.5	0.23	1816	5438	1278	3827	31	0.59	4.26	52	0.29	0.21	136	64	1548
2	48	7.2	3.8	0.48	1733	5189	1228	3677	31	0.56	4.10	56	0.30	0.21	132	55	1376
3	48	6.8	4.0	0.43	1852	5546	1333	3992	35	0.53	3.12	60	0.30	0.22	123	56	1401
4	48	7.2	4.0	0.36	1958	5863	1413	4231	53	0.37	2.51	114	0.33	0.24	143	53	1459
5	48	7.7	4.8	0.24	1982	5935	1440	4312	35	0.57	6.34	82	0.28	0.21	146	53	1238
6	48	7.8			2213	6627					2.75	44			150	56	
7	48	7.8			1663	4980					2.77	48			151	58	
8	48	7.3	3.9	0.24	1577	4722	1205	3608	36	0.44	4.16	46	0.27	0.21	136	54	1216
9	48	7.2	4.9	0.49	1475	4417	1147	3435	38	0.39	3.67	87	0.24	0.19	131	45	901
10	48	7.6	5.5	0.39	1602	4797	1266	3791	41	0.39	5.76	103	0.29	0.23	137	36	871
11	48	8.0	5.6	0.24	1711	5123	1344	4024	42	0.41	5.84	74	0.33	0.26	145	33	908
12	48	7.8	5.6	0.21	1706	5108	1360	4072	30	0.57	5.19	47	0.31	0.25	145	35	905
13	48	7.7			1439	4309					2.54	82			140	35	
14	48	8.5			1711	5123					5.87	118			155	35	
15	48	7.7	8.8	0.32	2910	8714	1350	4042	48	0.61	6.03	79	0.29	0.24	140	41	992
16	48	7.2	5.1	0.35	1513	4531	1513	4531	32	0.47	4.83	88	0.23	0.18	131	46	882
17	48	7.5	4.8	0.24	1610	4821	1298	3887	45	0.36	5.76	62	0.26	0.21	136	46	997
18	48	7.9	4.6	0.34	1517	4542	1227	3674	38	0.40	3.31	52	0.23	0.19	143	51	978
19	48	7.9	4.0	0.30	1490	4462	1234	3695	30	0.50	3.07	94	0.25	0.21	138	54	1126
20	48	8.0			1496	4480					6.88	74			136	52	
21	48	7.7			1291	3866					4.86	53			131	54	
22	48	7.4	5.8	0.33	1250	3743	1043	3123	24	0.52	4.36	59	0.20	0.17	129	39	651
23	48	6.4	6.8	0.63	1205	3608	992	2970	21	0.57	3.81	92	0.22	0.18	115	29	532
24	48	7.1	6.7	0.49	1523	4560	1249	3740	28	0.54	5.51	112	0.28	0.23	131	29	677
25	48	7.7	6.0	0.26	1747	5231	1406	4210	32	0.55	5.59	85	0.27	0.22	139	39	878
26	48	7.7	5.1	0.23	1634	4893	1343	4021	29	0.56	5.22	60	0.29	0.24	140	40	967
27	48	7.9			1627	4872					5.50	62			146	44	
28	48	8.4			1493	4471					6.13	65			151	42	
29	48	7.6	5.3	0.26	1449	4339	1205	3608	25	0.58	3.29	65	0.22	0.18	138	45	826
30	48	7.2	4.7	0.52	1383	4141	1139	3411	20	0.69	4.95	65	0.23	0.19	131	46	882
31	48																
TL												2180				1365	22211
ME	48	7.6	5.1	0.34	1653	4948	1273	3813	34	0.5	4.6	73	0.27		138	46	1010

City of Marshall
801 Industrial Rd.
Marshall, MI 49068

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

BIOSOLIDS SHEET

Marshall

MI 002 3540

September 2003

SUPERINTENDENT
Steven D. Washburn

	RAW SLUDGE	RAW BIOSOLIDS			LIME STABILIZED BIOSOLIDS					
DAY	GALLONS	TOTAL SOLIDS %	VOLATILE SOLIDS %	pH SU	LIME POUNDS	pH 2 hrs @ 25 C SU	RDT Solids %	Lbs. Lime per 1000 gallons biosolids		
1	11700	2.4	75.0	6.5						
2	28900	2.3	73.0	6.5	2852		6.5	99		
3	30800	2.8	70.0	6.5	2822		8.6	92		
4	31000	2.6	70.0	6.5	2440	12.2	6.7	79		
5	17600	2.0	72.0	6.7		12.2				
6	21300	2.0	70.0	6.8						
7	15900	2.4	71.0	6.7						
8	20700	2.8	64.0	6.6						
9	7800	2.6	70.0	6.0	2499		6.3	320		
10	14500	2.6	70.0	6.5	2381		8.4	164		
11	9400	2.7	72.0	6.6		12.2				
12	18200	2.2	73.0	6.5						
13	17000	2.0	70.0	6.5						
14	17900	2.1	71.0	6.7						
15	17800	2.2	70.0	6.7	2176		9.4	122		
16	18800	1.9	70.0	6.8	2822		9.8	150		
17	1700	1.5	71.0	6.8		12.2				
18	15000	3.5	76.0	6.5						
19	13600	3.0	74.0	6.4						
20	11900	2.9	74.0	6.2						
21	14000	2.8	74.0	6.3						
22	13000	2.6	76.0	6.5						
23	7750	2.5	75.0	6.2	2969		7.4	383		
24	11600	3.3	75.0	6.3	2293	12.2	7.6	198		
25	13700	3.2	69.0	6.6		12.2				
26	13700	2.7	71.0	6.6						
27	12600	2.8	71.0	6.5						
28	14100	2.4	73.0	6.9						
29	8000	2.0	70.0	6.6						
30	7800	2.8	73.0	6.6	2734		9.0	351		
31										
TOTAL	457750				25988					
MEAN	15258	2.5	71.8	6.5	2599	12.2	8.0	196		

City of Marshall
801 Industrial Rd
Marshall, MI 49068

MISCELLANEOUS SHEET

September 2003

Marshall

MI 002 3540

STATE OF MICHIGAN
DEPT OF ENVIRONMENTAL QUALITY

SUPERINTENDENT
Steven D Washburn

DAY	WATER	ELECTRICAL USAGE		FUEL GAS		CHEMICALS APPLIED								
			X 120		X 100	$FECL_3$					Cl_2		SO_2	
	CF	METER	KWH	METER	CF	GALS	SP GR	% SOLN	LBS	mg/L	LBS	mg/L	LBS	mg/L
1	2710	23	2760			100 0	1 4100	30	352 8	37 4	14 0	1 5	11 0	1 2
2	1990	17	2040			150	1 4100	30	529 2	53 3	12	1 2	10 0	1 0
3	1620	18	2160			100	1 4100	30	352 8	33 6	16	1 5	13 0	1 2
4	1810	15	1800			125	1 4100	30	441 0	44 1	17	1 7	14 0	1 4
5	350	26	3120			125	1 4100	30	441 0	47 2	15	1 6	13 0	1 4
6	250	14	1680			100	1 4100	30	352 8	38 1	17	1 8	13 0	1 4
7	220	14	1680			100	1 4100	30	352 8	38 5	17	1 9	13 0	1 4
8	250	22	2640			100	1 4100	30	352 8	35 8	16	1 6	13 0	1 3
9	1860	21	2520			100	1 4100	30	352 8	35 3	15	1 5	9 0	0 9
10	1600	21	2520			100	1 4100	30	352 8	37 1	23	2 4	15 0	1 6
11	220	15	1800			100	1 4100	30	352 8	39 2	18	2 0	14 0	1 6
12	500	16	1920			50	1 4100	30	176 4	19 2	19	2 1	14 0	1 5
13	160	17	2040			100	1 4100	30	352 8	37 8	18	1 9	14 0	1 5
14	210	20	2400			100	1 4100	30	352 8	41 9	20	2 4	15 0	1 8
15	2340	20	2400			100	1 4100	30	352 8	37 8	21	2 2	15 0	1 6
16	2060	19	2280			100	1 4100	30	352 8	35 3	19	1 9	15 0	1 5
17	160	15	1800			100	1 4100	30	352 8	36 8	16	1 7	15 0	1 6
18	160	14	1680			150	1 4100	30	529 2	58 2	17	1 9	17 0	1 9
19	480	19	2280			125	1 4100	30	441 0	48 5	28	3 1	12 0	1 3
20	270	16	1920			125	1 4100	30	441 0	49 0	27	3 0	15 0	1 7
21	840	14	1680			125	1 4100	30	441 0	47 2	26	2 8	19 0	2 0
22	230	14	1680			125	1 4100	30	441 0	45 6	28	2 9	19 0	2 0
23	1890	22	2640			50	1 4100	30	176 4	15 7	26	2 3	20 0	1 8
24	1310	21	2520			100	1 4100	30	352 8	35 0	24	2 4	18 0	1 8
25	320	16	1920			175	1 4100	30	617 4	66 1	30	3 2	20 0	2 1
26	790	14	1680			125	1 4100	30	441 0	47 2	27	2 9	18 0	1 9
27	980	14	1680			100	1 4100	30	352 8	38 8	28	3 1	19 0	2 1
28	2020	15	1800			125	1 4100	30	441 0	51 3	28	3 3	15 0	1 7
29	380	16	1920			175	1 4100	30	617 4	65 5	14	1 5	11 0	1 2
30	1900	19	2280			100	1 4100	30	352 8	35 3	32	3 2	21 0	2 1
31														
TL	29880	527	63240			3350					628		450 0	
ME	996	18	2108			112	1 4100	30 0	393 9	41 7	20 9	2 2	15 0	1 6

MANPOWER	
POSITION TITLE	NUMBER FULL TIME
SUPERINTENDANT	1
ASST SUPT	1
OPERATOR	3
MECHANIC	
CHEMIST	
LAB TECH	
IPP COORDINATOR	1
OTHER	

GIVE THE HOURS PER DAY THAT PLANT PERSONNEL ARE NORMALLY AT THE PLANT

WEEKDAYS	8	HRS
SATURDAYS	8	HRS
SUNDAYS	8	HRS
HOLIDAYS	8	HRS

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH January 1961 — MISCELLANEOUS DATA — OPERATOR R.J. Swalwell

Date	Weather: Precip Inches	Weather: Temp. (°F) Max.	Weather: Temp. (°F) Min.	Weather: Type*	Raw Sewage: Temp. °F	Raw Sewage: Flow MGD	pH	Grit cf/mg	~~XXXXX~~ water ~~XXXXX~~ cu. ft.	Cl_2 lbs.	Power KWH x10	AUX. FUEL gas cu. x 100 ft.	Remarks
1		30	22	Cl	51	1.53			47		16	12	
2	.06	34	22	S	52	1.61	7.7		38		16	24	
3	.01	28	2	S	52	1.65	7.7		48		20	20	
4	.01	25	13	S	52	1.66	7.7		76		16	21	
5		39	17	C	52	1.65	7.8		68		16	15	
6		42	28	C	52	1.67	7.8		47		20	5	
7		38	20	Cl	52	1.61	7.7		37		16	18	
8		24	14	Cl	52	1.55	7.7		46		16	20	
9		30	16	C	52	1.64			37		16	20	
10		38	18	C	52	1.61	7.8		35		16	37	
11		40	18	C	52	1.63	7.8		15		16	10	
12		42	20	C	52	1.63	7.8		23		16	49	
13		50	28	C	52	1.64	7.7		129		20	20	
14		42	18	Cl	52	1.61	7.7		34		16	72	
15		34	22	Cl	52	1.53	7.6		38		16	17	
16		36	22	Cl	51	1.65	7.6		82		16	53	
17		38	18	Cl	52	1.64	7.7		142		16	41	
18		32	16	Cl	52	1.64	7.8		51		20	16	
19	.2	26	14	S	51	1.66	7.3		43		16	50	
20	.1	26	6	S	51	1.69	7.9		57		16	50	
21	.1	18	0	S	51	1.58	7.6		47		16	21	
22		16	-6	Cl	50	1.54	7.6		43		16	82	
23	.03	17	-3	S	50	1.65	7.7		46		16	67	
24		11	-11	C	50	1.61	7.9		46		16	22	
25		14	-8	Cl	51	1.62	7.8		48		20	61	
26	.03	24	4	S	50	1.60	7.8		150		16	51	
27	.03	16	-2	S	50	1.63	7.7		160		16	53	
28	.01	20	2	S	50	1.56	7.7		50		16	66	
29		20	4	Cl	50	1.50	7.6		32		20	20	
30	.02	24	6	S	50	1.62	7.7		46		16	57	
31	.01	30	14	S	50	1.63	7.9		48		16	17	
ARITH. MEAN	.019	29	11		51	1.61	7.8		63		17	35	
STAT. MEAN						1.62							

*C—Clear CL—Cloudy R—Rain **Indicate Unit
W—Windy CA—Calm S—Snow

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH January 1961

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

Date	Raw Sludge Gals.	Raw Sludge Lbs. Per 1000 c.f. Digester	Raw Sludge pH	Raw Sludge Total Solids %	Raw Sludge Vol. Solids %	Transfer ~~XXXXXX~~ #1 to #2 Gals.	Transfer pH	Transfer Total Solids %	Transfer Vol. Solids %	Transfer Susp. Solids Mg/l	Transfer 5-Day B O D Mg/l	Transfer Total Solids %	Transfer Vol. Solids %	Transfer Vol. Acids Mg/l	sludge near bottom pH #1	Temp. °F #1	Gas Produced cu. ft.	Gas Wasted cu. ft.	Remarks
	8.5	30															cu. ft.	x100	
1	1326	9		4.5	54											89	49	0	Note – include gallons
2	1326	18	5.8	6.2	79											90	21	0	of sludge to beds
3	1326	10	5.9	3.2	84											89	50	0	*Gas vent-
4	1326	21	5.6	7.2	80	20774	7.1	.47	63						7.1	90	40	0	ing under
5	1326	16	5.5	5.3	82												36	0	cover and
6	1326	16	5.2	5.3	82											85	44	0	not meter-
7	1326	14	5.6	4.8	83											87	45	0	ed.
8	1326	21	5.6	6.8	82											89	6	0	
9	1326	21		6.8	82												38	38	
10	1326	19	5.5	6.2	80										7.0	85	13	4	
11	1326	4	6.0	1.8	56											87	54	54	
12	1326	40	5.4	13.8	78											84	37	37	
13	1326	17	5.8	6.0	80	11492	7.0	2.2	71							87	51	11	
14	1326	10	5.8	3.4	83											89	17	17	
15	2210	27	5.7	5.4	81											94	64	0	
16	3094	42	5.6	7.1	68											95	41	41	
17	1768	18	5.9	4.5	81											96	37	11	
18	1326	16	5.8	5.4	80										7.0	94	58	2	
19	2210	33	5.8	6.5	80											93	41	3	
20	1326	14	6.2	4.5	81	32000	7.0	.64	64							96	17	2	
21	1768	21	5.9	5.2	82											92	28	1	
22	1326	17	5.6	5.4	83											90	3	3	
23	1768	22	5.7	5.5	79											97	2	2	
24	1768	18	5.9	4.4	81											98	37	1	
25	1768	29	5.7	7.2	80										7.0	95	2	2	
26	1326	16	5.8	5.1	83											96	2	2	
27	1326	10	5.9	3.3	82											97	22	2	
28	1326	18	5.8	6.1	80											100	14	2	
29	1326	18	5.5	6.2	77											96	51	1	
30	1768	25	5.9	5.2	77										7.1	96	2	2	
31	1326	5	5.7	1.6	81											99	64	2	
ARITH. MEAN	1526	19	5.7	5.5	79	21422	7.0	1.1	66						7.0	92	32	8	
STAT. MEAN		18																	

MICHIGAN DEPARTMENT OF HEALTH

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH January 19 61

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

Date	digester sludge to beds: Gals.	Lbs. Per 1000 c.f. Digester	pH	Total Solids %	Vol. Solids %	Supernatant: Gals.	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l x10	5-Day B O D Mg/l x10	sludge near bottom: Total Solids %	Vol. Solids %	Vol. Acids Mg/l	pH #2	Temp. °F #2	Gas: Produced cu. ft	Wasted cu. ft.	Remarks
1																			Note — include gallons
2																			of sludge to beds
3																			
4						20774	7.1	.35	68	190	68				7.1				
5																72			
6																75			
7																			
8																			
9																			
10															7.0				
11																			
12																			
13						11492	7.1	.33	60	208	58								
14																			
15																			
16																			
17																66			
18															7.0	68			
19																70			
20						32000	7.1	.36	63	185	67								
21																			
22																			
23																			
24																			
25															7.0				
26																			
27																			
28																68			
29																70			
30															7.2				
31																			
ARITH. MEAN						64266	7.1	.35	64	194	64				7.1	70			
STAT. MEAN																			

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH January 1961

PRIMARY TREATMENT DATA

OPERATOR Robert Swalwell

Date	5 Day BOD Inf Mg/l	5 Day BOD Inf lbs x10	5 Day BOD Eff Mg/l	5 Day BOD Eff lbs x10	5 Day BOD Rem %	Suspended Solids Inf Mg/l	Suspended Solids Inf lbs. x10	Suspended Solids Eff Mg/l	Suspended Solids Eff lbs x10	Suspended Solids Rem %	Suspended Volatile Solids Inf Mg/l	Suspended Volatile Solids Inf lbs. x10	Suspended Volatile Solids Eff Mg/l	Suspended Volatile Solids Eff lbs. x10	Receiving Stream Data: Temp.	Above D.O.	Above B.O.D.	Below D.O.	Below B.O.D.
1	75	95	55	70	27	109	139	46	58	58	99	126	28	36					
2	102	137	58	78	43	100	134	31	42	69	89	119	27	36					
3	92	126	73	101	21	140	193	72	99	48	127	175	64	88					
4	68	94	60	83	12	84	117	57	78	32	69	95	47	65					
5	75	103	55	75	27	168	231	58	80	66	147	202	42	57					
6	81	113	55	76	32	154	214	46	64	70	136	190	40	56					
7	79	106	49	66	38	115	155	42	56	64	102	137	38	51					
8	81	105	58	75	28	101	131	62	80	40	86	111	54	69					
9	90	123	64	87	29	140	191	58	79	59	120	164	48	66					
10	67	90	64	86	.05	73	98	63	84	14	64	86	54	72					
11	134	182	58	79	57	170	231	50	68	71	151	205	45	61	34	11.0	2.0	11.2	2.6
12	72	98	36	49	50	78	106	50	68	26	66	90	37	50					
13	67	92	43	58	36	68	93	52	71	24	55	75	42	57					
14	79	106	52	70	34	98	132	51	68	48	78	105	42	56					
15	79	101	33	42	58	123	157	34	43	72	110	141	33	42					
16	74	102	61	84	18	132	182	56	77	58	111	153	45	62	36	11.2	2.6	11.0	2.8
17	79	108	49	67	38	100	137	43	59	57	91	124	40	55	36	10.8	1.6	11.0	2.4
18	85	116	52	71	39	116	159	48	66	59	100	137	41	56					
19	85	116	52	72	39	156	215	53	73	66	140	194	45	62					
20	75	106	60	84	20	81	114	68	96	16	67	94	53	74					
21	73	96	58	76	21	117	154	53	70	55	110	145	47	62					
22	79	102	43	55	46	90	116	38	49	58	80	103	34	44					
23	96	132	46	63	52	84	116	38	52	55	73	101	33	45					
24	72	97	62	83	14	114	153	74	100	35	100	134	55	73					
25	67	91	55	74	18	156	210	51	69	67	143	193	48	65					
26	61	81	49	65	20	71	95	48	64	32	56	74	38	51					
27	64	81	46	62	28	80	109	57	77	29	66	90	45	61					
28	70	91	52	67	26	71	92	41	53	42	62	81	37	48					
29	92	115	46	57	50	93	117	31	39	67	81	101	28	35					
30	79	107	70	94	11	98	132	67	90	32	80	108	54	73					
31	73	99	64	87	12	100	136	52	71	48	83	113	81	110					
ARITH MEAN	80	107	54	73	30	109	147	51	69	50	95	128	44	59	35	11.0	2.1	11.1	2.6
STAT MEAN		105		74			148		70										

Remarks

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH February 19 61 — MISCELLANEOUS DATA — OPERATOR R. J. Swalwell

Date	Weather: Precip Inches	Weather: Temp. (°F) Max.	Weather: Temp. (°F) Min.	Weather: Type*	Raw Sewage: Temp. °F	Raw Sewage: Flow MGD	Raw Sewage: pH	Grit cf/mg	WATER CU. FT.	Cl₂ lbs.	Power KWH x10	AUX. FUEL CU.* FT.* x100	Remarks
1		22	-4	-CL	50	1.59	7.9		43		16	49	
2	.13	10	-2	S	50	1.63	7.6		42		16	24	
3	.01	20	10	S	50	1.65	7.8		42		16	38	
4		24	-4	CL	50	1.62	7.7		47		16	27	
5		30	6	C	50	1.56	7.6		42		16	25	
6		34	4	C	50	1.64	7.7		45		16	30	
7		38	6	C	51	1.59	7.8		46		16	33	
8		40	12	C	51	1.57	7.6		87		16	27	
9		38	18	CL	50	1.58	7.7		40		16	17	
10		42	20	C	50	1.59	7.6		45		20	15	
11	.01	38	30	R&S	50	1.65	7.6		46		16	23	
12		42	28	CL	50	1.52	7.5		41		16	25	
13		52	30	CL	50	1.65	7.7		49		16	21	
14		38	28	C	50	1.61	7.6		95		16	11	
15		50	22	CL	50	1.61	7.6		46		16	68	
16	.01	42	24	R	50	1.62	7.6		41		16	15	
17	.22	48	36	R	51	1.67	7.7		39		16	28	
18	.27	58	24	R	51	1.69	7.6		38		16	16	
19		28	16	CL	50	1.57	7.5		40		16	30	
20		39	19	C	50	1.68	7.7		85		16	11	
21		48	22	C	50	1.66	7.8		60		16	26	
22	.20	52	26	R	50	1.65	7.7		47		16	10	
23	.01	48	32	R	51	1.66	7.5		120		20	15	
24	.56	46	30	R&S	50	1.67	7.6		40		16	11	
25	.40	30	24	S	50	1.62	7.6		36		16	32	
26		42	28	CL	49	1.59	7.6		40		16	24	
27		42	24	C	50	1.69	7.6		42		16	6	
28		38	22	C	49	1.67	7.8		40		16	21	
29													
30													
31													
ARITH. MEAN	.065	39	19		50	1.62	7.7		51		16	24	
STAT. MEAN						1.62							

*C—Clear CL—Cloudy R—Rain **Indicate Unit
W—Windy CA—Calm S—Snow

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH February 19 61

PRIMARY TREATMENT DATA

OPERATOR R.J. Swalwell

Date	5-Day B O D Inf Mg/l	5-Day B O D Inf lbs. x10	5-Day B O D Eff Mg/l	5-Day B O D Eff lbs. x10	5-Day B O D Rem %	Suspended Solids Inf Mg/l	Suspended Solids Inf lbs. x10	Suspended Solids Eff. Mg/l	Suspended Solids Eff. lbs. x10	Suspended Solids Rem %	Suspended Volatile Solids Inf Mg/l	Suspended Volatile Solids Inf lbs. x10	Suspended Volatile Solids Eff Mg/l	Suspended Volatile Solids Eff lbs. x10	Receiving Stream Data: Temp.	Above D.O.	Above B.O.D.	Below D.O.	Below B.O.D.
1	85	113	64	85	25	106	141	53	70	50	90	119	42	55					
2	79	108	55	74	30	150	204	60	81	60	126	171	44	59					
3	73	101	40	55	45	93	128	46	63	51	86	119	38	52					
4	98	132	61	82	38	104	141	42	56	60	91	123	38	51					
5	98	128	52	67	47	131	171	42	54	68	113	147	37	48					
6	84	115	61	83	27	215	293	58	79	73	190	260	45	61					
7	92	122	72	95	22	102	135	61	81	40	86	114	53	70					
8	110	144	58	76	47	128	168	64	84	50	106	139	49	64	34	11.4	2.4	11.6	2.8
9	73	96	58	76	21	93	123	54	71	42	84	111	47	62	35	11.2	3.0	11.2	3.2
10	73	97	52	69	29	80	106	47	62	41	65	86	42	55					
11	67	87	58	75	13	93	121	43	55	54	76	99	37	48					
12	92	116	52	66	44	97	123	41	53	58	80	102	35	45					
13	85	117	67	92	21	84	116	51	70	39	72	99	42	58					
14	92	123	79	106	14	100	134	50	67	50	83	112	40	54					
15	79	106	67	90	15	88	118	54	72	61	82	110	50	67	37	10.4	1.8	10.4	1.2
16	85	115	58	78	32	80	108	44	59	45	66	89	39	53	36	10.8	2.0	11.0	2.8
17	64	89	58	81	9	77	107	63	88	19	59	82	46	64					
18	74	105	61	86	18	79	111	50	70	37	71	100	46	65					
19	104	136	61	80	41	158	207	37	48	77	130	170	34	45					
20	102	143	73	102	28	136	191	56	78	59	123	173	48	68					
21	75	104	64	88	15	107	148	66	91	38	92	127	52	72	36	12.0	3.2	11.4	3.0
22	85	117	55	75	39	118	162	63	86	47	100	138	47	65	37	11.6	2.6	11.6	3.0
23	73	101	61	84	15	102	141	59	82	42	90	124	50	69					
24	67	93	55	76	18	90	125	45	62	50	79	110	37	52					
25	84	114	61	82	27	84	114	76	103	1	80	108	65	88					
26	63	83	46	61	27	90	119	34	45	62	77	102	30	40					
27	90	127	73	103	19	95	134	56	79	41	80	113	46	65					
28	85	119	61	85	28	107	149	64	89	40	86	120	48	67	38	11.4	2.4	11.4	3.2
29																			
30																			
31																			
ARITH. MEAN	83	113	60	81	27	107	144	53	71	48	92	124	44	59	36	11.2	2.5	11.2	2.7
STAT MEAN		114		81			134		72										

MICHIGAN DEPARTMENT OF HEALTH

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH February 1961

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

Date	Raw Sludge Gals. 8.5	Lbs. Per 1000 c.f. Digester 30	pH	Total Solids %	Vol. Solids %	transfer Supernatant #1 to #2 Gals.	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	5-Day B O D Mg/l	sludge near bottom Total Solids %	Vol. Solids %	Vol. Acids Mg/l	Temp. pH #1	Temp. °F #1	Gas Produced cu. ft. X 100	Gas Wasted cu. ft.	Remarks
1	1547	23	5.6	6.0	78												20	2	Note — include gallons
2	1326	14	5.9	4.6	80											98	67	2	of sludge to beds
3	1326	20	5.7	7.2	75										7.0	97	56	2	
4	1768	23	5.6	5.7	80											96	52	2	
5	1989	17	5.8	3.6	83											100	44	2	
6	1547	19	6.0	5.5	82										7.2	97	37	2	
7	1989	25	6.0	5.7	78											96	37	2	
8	1989	28	5.6	6.4	79	7956	7.0	2.4	64						7.0	95	46	2	
9	1768	23	5.7	5.7	81											99	42	1	
10	1768	26	5.8	5.2	99											96	49	1	
11	1326	11	5.9	3.7	83											95	48	2	
12	1547	28	5.7	6.9	88											98	48	1	
13	1989	21	5.5	4.6	81											96	41	1	
14	1326	13	5.7	4.3	80										6.9	97	54	2	
15	1326	13	6.0	4.2	82												2	2	
16	1768	16	5.9	4.0	83	10166	6.9	.59	68							96	65	0	
17	1768	20	5.8	5.1	79											96	61	0	
18	1326	17	5.7	5.9	78											100	60	0	
19	2210	19	5.9	4.0	80											98	49	0	
20	1326	14	5.7	4.6	82											98	50	0	
21	1326	18	5.5	6.4	76											97	46	0	
22	1989	23	5.5	5.3	77												58	0	
23	1768	21	5.4	5.7	75	12818	6.9	2.1	62						6.9	98	45	0	
24	1326	15	5.6	5.4	77											100	60	0	
25	1768	16	5.7	4.0	83											97	45	0	
26	1547	20	5.4	6.5	72											98	53	0	
27	1989	23	5.8	5.4	77											96	50	0	
28	1326	12	6.1	4.2	80											97	51		
29																			
30																			
31																			
ARITH. MEAN	1642	19	5.7	5.2	80	10313	6.9	1.7	64						7.0	97	48	1	
STAT. MEAN		19																	

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH February 1961 — DIGESTER AND SLUDGE DATA — OPERATOR R.J. Swalwell

Date	to ~~Digester~~ Sludge Beds Gals.	Lbs. Per 1000 c.f. Digester	pH	Total Solids %	Vol. Solids %	Supernatant Gals.	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l x 10	5-Day B O D Mg/l x10	sludge near bottom Total Solids %	Vol. Solids %	Vol. Acids Mg/l	pH #2	Temp. °F #2	Gas Produced cu. ft.	Wasted cu. ft.	Remarks
1																			Note — include gallons
2																67			of sludge to beds
3															7.1	69			
4																74			
5																			
6															7.1	75			
7																77			
8															7.0	79			
9																			
10																80			
11																82			
12																			
13																82			
14																			
15	10166		7.0	7.7	56										7.0	82			
16																85			
17																88			
18																			
19																87			
20																			
21																85			
22																87			
23						12818	7.0	.36	64	248	67				7.0				
24																			
25																86			
26																			
27																86			
28																			
29																			
30																			
31																			
ARITH. MEAN	10166		7.0	7.7	56	12818	7.0	.36	64	248	67				7.0	81			
STAT. MEAN																			

MICHIGAN DEPARTMENT OF HEALTH

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH March 1961

MISCELLANEOUS DATA

OPERATOR R.J. Swalwell

Date	Weather: Precip Inches	Weather: Temp. (°F) Max.	Weather: Temp. (°F) Min.	Weather: Type*	Raw Sewage: Temp. °F	Raw Sewage: Flow MGD	pH	Grit cf/mg	Plant Eff. E. Coli. MPN/100ml.	Cl_2 lbs.	Power KWH x10	AUX. FUEL ** cu. ft. gas x 100	Remarks
1		44	22	Cl	49	1.69	7.7		200		16	18	
2		50	30	C	50	1.72	7.6		55		16	26	
3	.08	56	34	R	50	1.75	7.4		105		16	24	
4	.19	56	36	R	50	1.72	7.5		55		16	10	
5	.31	40	34	R	49	1.68	7.6		26		16	22	
6		64	32	Cl	50	1.82	7.5		79		16	9	
7	.01	44	26	R	50	1.80	7.6		44		16	12	
8	.46	32	26	R&S	50	1.82	7.7		42		16	13	
9		36	16	Cl	49	1.80	7.6		51		20	20	
10		38	20	C	49	1.80	7.6		45		16	14	
11		38	26	Cl	49	1.75	7.6		38		20	15	
12	.38	48	30	R&S	50	1.71	7.5		36		16	11	
13	.66	40	32	R	50	1.91	7.7		131		16	25	
14		40	28	Cl	50	1.91	7.8		82		16	33	
15		42	22	C	50	1.89	7.7		39		20	41	
16		34	14	Cl	50	1.89	7.7		44		16	30	
17		34	16	C	49	1.87	7.8		39		16	29	
18	.23	40	24	R	49	1.84	7.7		39		20	25	
19		44	20	Cl	49	1.75	7.4		36		20	21	
20		48	30	Cl	49	1.91	7.7		33		16	7	
21	.10	42	34	R	50	1.87	7.8		34		16	26	
22	.24	50	40	R	50	1.87	7.6		150		16	11	
23	.12	44	36	R	50	1.90	7.7		31		16	29	
24		50	24	Cl	50	1.89	7.7		43		20	17	
25		56	30	C	50	1.86	7.5		26		16	14	
26		64	42	C	50	1.78	7.3		34		16	5	
27	.02	72	38	R	50	1.91	7.5		41		16	16	
28		42	32	Cl	50	1.82	7.7		29		16	14	
29		38	18	Cl	50	1.81	7.6		35		20	32	
30		46	26	C	50	1.83	7.6		36		16	17	
31	.01	48	30	R&S	50	1.81	7.6		14		16	14	
ARITH. MEAN	.09	46	28		50	1.82	7.6		55		17	19	
STAT. MEAN						1.82							

*C—Clear CL—Cloudy R—Rain **Indicate Unit
W—Windy CA—Calm S—Snow

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH March 19 61

PRIMARY TREATMENT DATA

OPERATOR R.J. Swalwell

Date	5-Day B O D Inf. Mg/l	5-Day B O D Inf. lbs. x10	5-Day B O D Eff Mg/l	5-Day B O D Eff lbs. x10	5-Day B O D Rem %	Suspended Solids Inf Mg/l	Suspended Solids Inf lbs. x10	Suspended Solids Eff Mg/l	Suspended Solids Eff lbs. x10	Suspended Solids Rem %	Suspended Volatile Solids Inf Mg/l	Suspended Volatile Solids Inf lbs. x10	Suspended Volatile Solids Eff Mg/l	Suspended Volatile Solids Eff lbs. x10	Receiving Stream Data: Temp.	Above D.O.	Above B.O.D.	Below D.O.	Below B.O.D
1	79	111	61	86	23	103	145	56	79	46	84	118	43	60	39	11.0	2.2	10.8	2.6
2	67	96	55	79	18	80	115	60	86	25	73	105	56	80	40	10.8	2.2	10.8	2.6
3	73	107	55	80	25	81	118	57	83	30	65	94	49	71					
4	69	99	61	87	12	85	122	53	76	38	75	108	37	53					
5	85	119	55	77	35	120	168	50	70	58	96	134	43	60					
6	73	111	61	92	16	104	158	81	123	22	86	131	58	88					
7	64	96	49	73	23	81	122	48	72	33	66	99	37	55	41	10.2	3.4	10.2	3.4
8	67	102	55	83	18	79	120	56	85	29	58	88	30	45					
9	64	96	58	87	9	107	161	70	105	35	88	132	62	93					
10	73	110	55	82	25	98	147	68	102	31	63	94	38	57					
11	79	115	67	98	15	74	108	43	63	42	64	93	36	53					
12	57	81	40	57	30	80	114	47	67	41	65	92	41	59					
13	75	119	70	111	7	103	164	70	111	32	76	121	50	79					
14	61	97	61	97	0	81	129	65	103	20	72	115	58	92					
15	82	129	64	101	22	60	94	45	70	25	49	77	27	43	36	11.4	3.6	11.0	3.0
16	67	106	46	71	31	116	183	42	67	64	99	156	31	49					
17	64	100	49	76	23	65	101	46	71	29	56	87	37	58					
18	64	98	55	84	14	61	93	51	78	16	56	86	43	66					
19	72	105	49	71	32	87	127	23	33	74	73	107	22	32					
20	61	97	61	97	0	93	148	63	100	32	82	130	56	89					
21	73	114	43	66	41	110	172	33	51	70	85	133	30	47					
22	61	94	58	90	5	87	135	48	74	45	70	108	41	63					
23	55	87	36	57	35	92	146	42	66	54	80	127	34	54					
24	61	96	43	68	30	58	91	39	62	33	48	75	34	54					
25	76	118	70	108	8	59	91	44	69	25	60	93	41	64					
26	73	108	52	77	29	102	151	38	57	63	87	129	32	47					
27	64	102	46	73	28	120	191	44	71	63	94	150	34	54					
28	92	139	49	74	47	126	191	37	56	71	116	176	33	50	47	9.4	2.8	9.4	3.2
29	61	92	55	83	10	82	124	42	64	49	70	106	39	59					
30	64	97	64	97	0	74	113	57	86	23	63	96	49	74	40	12.0	3.6	11.6	3.2
31	67	101	58	87	13	102	154	46	69	56	86	130	38	57					
ARITH. MEAN	69	105	55	83	20	89	135	50	76	41	74	113	41	61	41	10.8	3.0	10.6	3.0
STAT MEAN		105		84			134		75										

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH March 1961 DIGESTER AND SLUDGE DATA OPERATOR R.J. Swalwell

Date	Raw Sludge Gals. 8.5	Lbs. Per 1000 c.f. Digester 30	pH	Total Solids %	Vol. Solids %	transfer ~~xxxxxx~~ #1 to #2 Gals.	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	5-Day B O D Mg/l	sludge near bottom Total Solids %	Vol. Solids %	Vol. Acids Mg/l	pH #1	Temp. °F #1	Gas Produced cu. ft. X	Wasted cu. ft. 100	Remarks
1	1326	21	5.5	7.6	76												51	51	Note – include gallons
2	1768	20	5.6	5.4	76											95	54	13	of sludge to beds
3	1768	26	5.8	6.4	80	13260	7.0	.51	63						7.0	96	61	0	
4	1326	11	5.7	3.8	80												43	0	
5	1768	20	5.6	5.6	73											93	53	0	
6	2210	42	5.2	7.5	89											95	51	51	
7	1326	13	5.6	4.6	79											92	44	44	
8	1326	11	5.7	3.5	83										7.0	90	42	42	
9	1326	20	5.6	6.9	77											87	27	27	
10	1326	18	5.6	6.2	76											84	36	36	
11	1326	19	5.8	7.2	73											82	37	37	
12	1326	14	5.8	5.1	75											81	30	30	
13	1326	17	5.6	6.0	78	15912	7.0	2.5	65							80	41	2	
14	1326	15	6.1	5.1	77										6.9	83	36	0	
15	1768	25	5.6	6.9	74											86	42	0	
16	1326	20	5.7	6.9	77											90	44	0	
17	1326	8	5.6	2.9	75											93	46	0	
18	1326	13	5.8	4.3	81											96	43	0	
19	1768	17		4.4	79											97	37	0	
20	1326	18	5.6	6.4	78											98	51	0	
21	1768	25	5.5	6.6	77												48	0	
22	1326	18	5.7	6.4	78											95	56	0	
23	1326	18	5.5	6.5	77											94	51	16	
24	1326	18	5.7	6.2	76	11271	6.9	.48	63						6.9	94	55	0	
25	1326	12	5.6	4.7	70											96	19	0	
26	1547	18	5.6	5.4	78											95	66	66	
27	1105	17	5.8	7.1	75											92	45	2	
28	1768	21	5.2	5.5	77											96	55	0	
29	1326	20	5.6	7.0	76												47	0	
30	1547	19	5.8	5.8	78											94	38	0	
31	1768	17	5.9	4.3	80										7.0	92	55	0	
ARITH. MEAN	1476	18	5.6	5.7	77	13481	7.0	1.16	63						6.96	91	45	13	
STAT. MEAN		18																	

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH March 1961 — DIGESTER AND SLUDGE DATA — OPERATOR R.J. Swalwell

Date	Raw Sludge Gals.	Raw Sludge Lbs. Per 1000 c f. Digester	Raw Sludge pH	Raw Sludge Total Solids %	Raw Sludge Vol. Solids %	Supernatant Gals.	Supernatant pH	Supernatant Total Solids %	Supernatant Vol. Solids %	Supernatant Susp. Solids Mg/l x10	Supernatant 5-Day B O D Mg/l x10	sludge near bottom Total Solids %	sludge near bottom Vol. Solids %	sludge near bottom Vol. Acids Mg/l	pH #2	Temp. °F #2	Gas Produced cu ft	Gas Wasted cu ft.	Remarks
1																87			Note – include gallons
2																			of sludge to beds
3						13260	7.1	.46	67	328	82				7.1				
4																88			
5																90			
6																			
7																			
8															7.1				
9																			
10																			
11																			
12																			
13																			
14						15912	7.3	.49	65	280	89				7.3				
15																			
16																			
17																			
18																			
19																			
20																69			
21																71			
22																76			
23																79			
24	7500		6.9	8.3	56	3757	6.9	.60	68	426	100				6.9	80			
25																			
26																			
27																			
28																			
29																81			
30																83			
31															7.1	85			
ARITH. MEAN	7500		6.9	8.3	56	10976	7.1	.516	62	344	90				7.1	81			
STAT. MEAN																			

MICHIGAN DEPARTMENT OF HEALTH

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH April 1961 MISCELLANEOUS DATA OPERATOR R.J. Swalwell

Date	Weather: Precip Inches	Weather: Temp. (°F) Max.	Weather: Temp. (°F) Min.	Type*	Raw Sewage: Temp °F	Raw Sewage: Flow MGD	pH	Grit cf/mg	~~XXXXXX~~ water ~~XXXXXX~~ cu. ft.	Cl₂ lbs.	Power KWH x10	AUX FUEL **gas cu. ft. x 100	Remarks
1	.02	40	20	S	50	1.81	7.5		43		20	36	
2		38	24	Cl	50	1.70	7.6		48		16	30	
3		40	28	Cl	50	1.82	7.6		183		16	14	
4		50	30	Cl	50	1.78	7.6		54		16	16	
5	.18	54	34	R	50	1.80	7.6		93		16	24	
6	.03	48	30	R&S	50	1.75	7.6		40		16	8	
7		44	20	Cl	50	1.74	7.7		40		16	27	
8		48	30	Cl	50	1.71	7.6		36		16	9	
9	.20	38	30	R&S	50	1.72	7.7		42		16	26	
10		40	22	Cl	50	1.77	7.5		42		16	14	
11		56	34	C	50	1.78	7.8		55		16	6	
12	.17	44	32	R	50	1.74	7.7		36		16	10	
13		56	30	C	50	1.72	7.7		176		20	12	
14		60	40	Cl	50	1.73	7.7		50		16	16	
15	.92	62	30	R&S	50	1.77	7.7		31		16	6	
16	.42	32	28	R&S	49	1.68	7.6		54		16	18	
17	.02	38	30	S	50	1.85	7.6		39		16	13	
18		50	28	Cl	50	1.88	7.7		40		20	5	
19		60	34	C	50	1.90	7.6		53		16	2	
20	.19	64	44	R		1.91	7.7		61		16	2	
21	.33	62	44	R	51	2.01	7.6		57		20	3	
22	.08	56	34	R	51	1.88	7.6		49		16	6	
23	.27	70	48	R	51	1.90	7.4		38		16	3	
24	1.28	72	42	R	50	2.23	7.5		161		20	3	
25	.08	43	39	R	50	2.28	7.5		45		16	5	
26		54	36	Cl	50	2.26	7.8		47		20	3	
27	.05	60	40	R	51	2.27	7.7		49		20	17	
28	.05	46	34	R	51	2.24	7.8		47		20	18	
29		52	32	CL	50	2.15	7.5		37		16	3	
30		60	34	CL	50	2.09	7.4		34		20	4	
31													
ARITH. MEAN	.143	51	33		50	1.90	7.6		59		17	12	
STAT. MEAN						1.83							

*C—Clear CL—Cloudy R—Rain **Indicate Unit
W—Windy CA—Calm S—Snow

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH April 19 61

PRIMARY TREATMENT DATA

OPERATOR R.J. Swalwell

Date	5-Day B O D Inf Mg/l	5-Day B O D Inf lbs. x10	5-Day B O D Eff Mg/l	5-Day B O D Eff lbs. x10	5-Day B O D Rem %	Suspended Solids Inf Mg/l	Suspended Solids Inf lbs. x10	Suspended Solids Eff Mg/l	Suspended Solids Eff lbs x10	Suspended Solids Rem %	Suspended Volatile Solids Inf Mg/l	Suspended Volatile Solids Inf lbs. x10	Suspended Volatile Solids Eff Mg/l	Suspended Volatile Solids Eff lbs. x10	Receiving Stream Data Temp.	Above D.O.	Above B.O.D	Below D.O.	Below B.O.D
1	78	118	69	104	12	75	113	44	66	41	66	99	39	59					
2	72	102	52	73	28	91	129	50	71	45	78	111	40	57					
3	72	109	64	97	11	99	150	56	85	43	85	129	45	69					
4	81	120	70	104	14	91	135	50	74	45	79	117	42	63	40	11.4	2.4	11.6	2.6
5	72	108	67	101	5	104	156	52	78	50	94	141	44	66	42	11.2	2.4	11.2	2.8
6	79	115	55	80	30	121	176	47	69	61	100	146	40	58	44	10.8	2.6	11.0	3.0
7	73	106	58	84	21	62	90	38	55	39	58	84	36	52					
8	92	131	76	108	17	157	223	51	73	68	142	202	47	67					
9	171	245	55	79	68	130	187	42	61	68	103	148	35	50					
10	132	195	85	125	36	206	340	70	103	66	170	251	60	88					
11	85	126	64	95	25	147	218	42	63	71	142	210	39	58	40	11.6	3.2	11.6	2.8
12	98	142	70	101	29	87	126	49	71	44	69	100	37	54					
13	73	105	55	79	25	110	158	40	57	64	103	148	35	50	43	11.4	2.4	11.8	2.8
14	94	135	55	79	42	98	141	48	70	51	81	117	39	56					
15	76	112	58	85	24	66	97	46	68	30	56	82	39	58					
16	69	96	58	81	16	98	137	34	48	65	82	115	31	43					
17	64	99	61	94	5	130	210	53	83	58	113	175	42	65					
18	76	119	58	91	24	103	162	46	72	55	85	133	46	72	39	11.6	3.2	11.6	3.2
19	73	116	43	68	41	127	201	38	60	70	112	178	31	49	44	10.4	2.2	10.8	2.8
20	71	113	52	82	27	86	137	51	81	41	72	115	40	64					
21	58	97	52	87	13	61	102	50	84	18	43	72	40	67					
22	61	95	55	85	10	64	100	40	63	38	59	92	35	55					
23	73	116	49	77	33	92	146	52	82	44	70	111	27	43					
24	64	119	55	102	14	127	226	73	136	43	78	145	38	70					
25	55	105	49	93	11	96	182	50	95	48	78	148	38	72					
26	58	109	46	86	21	84	158	50	94	41	71	133	40	75					
27	55	104	46	87	16	70	132	47	89	33	57	108	40	76	49	8.6	2.8	9.0	2.8
28	61	114	46	86	25	66	123	42	79	36	60	112	38	71					
29	58	104	52	93	10	51	91	38	68	26	51	91	36	64					
30	67	117	46	80	31	71	124	35	61	51	62	108	30	52					
31																			
ARITH. MEAN	77	120	57	90	23	99	154	48	75	49	84	131	39	61	43	10.9	2.65	11.1	2.85
STAT MEAN		116		90			148		76										

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH April 19 61

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

Date	Raw Sludge Gals. 8.5	Raw Sludge Lbs. Per 1000 c.f. Digester 30	Raw Sludge pH	Raw Sludge Total Solids %	Raw Sludge Vol. Solids %	transfer ~~xxxxx~~ #1 to #2 Gals.	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	5-Day B O D Mg/l	Total Solids %	sludge near bottom Vol. Solids %	Vol. Acids Mg/l	pH # 1	Temp. °F # 1	Gas Produced cu. ft. X 100	Gas Wasted cu. ft.	Remarks
1	1326	14	5.8	5.0	75											90	50	0	Note – include gallons
2	1768	20	5.8	4.7	83											94	51	0	of sludge to beds
3	1768	20	5.9	5.0	80	16796	7.0	3.0	63						7.0	96	44	0	
4	1768	22	5.7	5.7	77											97	50	0	
5	3978	50	5.7	5.4	83										6.9		50	0	
6	1768	20	5.8	5.0	79											92	71	0	
7	1326	16	5.9	5.6	77											92	42	0	
8	1326	18	5.7	6.7	73											94	59	0	
9	1768	21	5.8	5.3	79											96	56	0	
10	1326	19	5.6	7.1	72											98	47	0	
11	1326	18	5.8	6.4	77	13260	6.9	.45	67						6.9	99	53	0	
12	1768	31	5.7	8.4	76											96	61	0	
13	1547	26	5.3	8.0	75											100	83	33	
14	1547	25	5.7	7.4	77												56	2	
15	1326	18	6.1	6.5	77												68	0	
16	1547	28	5.9	9.0	71											100	61	0	
17	1768	30	5.7	7.7	77											96	41	0	
18	1105	15	5.6	6.2	78												68	0	
19	1326	23	5.8	7.9	78											96	58	0	
20	1326	20	5.6	6.7	80											94	54	0	
21	1326	19	5.8	6.3	80	13260	7.0	.52	66						7.0	97	66	9	
22	884	15	5.5	7.6	78											95	56	0	
23	1547	24	5.5	7.2	78											98	66	0	
24	1768	26	5.7	6.7	78											96	67	45	
25	1547	23	5.6	7.0	75											95	53	14	
26	1768	28	5.8	7.6	74											96	58	0	
27	1326	20	5.8	7.2	74											94	75	0	
28	1326	21	5.6	7.8	74											95	65	0	
29	1105	19	5.6	8.4	74											97	52	0	
30	442	6	5.9	6.2	77											98	48	0	
31																			
ARITH. MEAN	1525	22	5.7	6.7	77	15439	7.0	1.32	65						6.95	96	58	12	
STAT. MEAN		22																	

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH April 19 61

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

Date	Raw Sludge Gals.	Raw Sludge Lbs. Per 1000 c.f. Digester	Raw Sludge pH	Raw Sludge Total Solids %	Raw Sludge Vol. Solids %	Supernatant Gals.	Supernatant pH	Supernatant Total Solids %	Supernatant Vol. Solids %	Supernatant Susp. Solids Mg/l x10	Supernatant 5-Day B O D Mg/l x10	sludge near bottom Total Solids %	sludge near bottom Vol. Solids %	sludge near bottom Vol. Acids Mg/l	Temp. pH #2	Temp. °F #2	Gas Produced cu. ft.	Gas Wasted cu. ft.	Remarks
1																88			Note — include gallons
2																			of sludge to beds
3						16796	7.1	.38	62	201	61				7.1				
4																85			
5															7.0	88			
6																89			
7																91			
8																			
9																			
10																			
11						13260	7.0	.38	70	130	84				7.0	88			
12																			
13																			
14																86			
15																90			
16																			
17																90			
18																90			
19																92			
20																93			
21						13260	7.1	.41	67	153	64				7.1	91			
22																94			
23																			
24																96			
25																			
26																			
27																92			
28																96			
29																96			
30																			
31																			
ARITH. MEAN						14440	7.1	.39	66	162	70				7.05	91			
STAT. MEAN																			

MICHIGAN DEPARTMENT OF HEALTH

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH May 1961 MISCELLANEOUS DATA OPERATOR R.J. Swalwell

Date	Weather Precip Inches	Weather Temp. (°F) Max.	Weather Temp. (°F) Min.	Type*	Raw Sewage Temp °F	Raw Sewage Flow MGD	pH	Grit cf/mg	Plant Eff E Coli MPN/100ml	Cl₂ lbs	Power KWH X 10	AUX FUEL Gas** cu. ft. X 100	Remarks
									Water cu. ft.				
1		47	29	Cl	51	2.17	7.6		43		16	6	
2		48	34	Cl	51	2.15	7.7		53		20	9	
3		60	36	Cl	51	2.10	7.7		51		20	5	
4		62	38	C	51	2.08	7.5		178		16	3	
5	.08	62	44	R	51	2.05	7.6		48		20	4	
6	.18	72	48	R	51	2.09	7.5		35		16	2	
7	.05	76	56	R	51	2.03	7.4		40		20	1	
8	.17	72	48	R	51	2.16	7.7		41		16	2	
9	.02	58	32	R	51	2.04	7.5		40		20	4	
10		64	38	C	51	2.03	7.7		44		16	2	
11		76	50	C	51	2.03	7.6		36		20	6	
12		84	54	C	52	2.13	6.6		1739	35	16	2	
13		84	58	C	52	2.11	7.5		1860	43	20	1	
14	.02	84	64	R	52	2.02	7.4		1830	42	16	1	
15	.04	78	40	R	51	2.12	7.6		1910	69	20	1	
16		62	40	C	52	2.06	7.7		1790	77	16	1	
17	.01	66	46	R	52	2.01	7.7		1780	71	20	2	
18	.01	56	36	R	52	1.99	7.6		1860	69	16	9	
19		68	42	C	52	2.01	7.7		1890	73	20	4	
20	.07	68	44	R	52	1.94	7.4		1890	64	16	4	
21		66	36	Cl	52	1.88	7.3		1840	63	20	3	
22		66	36	C	52	1.98	7.5		1760	70	16	2	
23		70	40	C	52	1.95	7.5		1770	67	20	3	
24		76	50	C	52	1.97	7.4		1750	70	16	2	
25	.25	76	34	R	52	1.97	7.5		1880	68	20	1	
26		48	30	Cl	52	1.91	7.6		1830	78	16	13	
27		66	46	C	52	1.87	7.4		1750	73	20	8	
28		74	52	C	52	1.84	7.4		1730	75	16	2	
29		68	36	C	53	1.90	7.4		1800	71	20	3	
30		72	46	C	52	1.83	7.5		1700	74	16	2	
31	.31	74	56	R	53	1.99	7.3		1730	66	16	2	
ARITH. MEAN	.039	68	43		52	2.01	7.5		1184	66	18	4	
STAT. MEAN						2.02							

C—Clear CL—Cloudy R—Rain **Indicate Unit
W—Windy CA—Calm S—Snow

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH May 19 61

PRIMARY TREATMENT DATA

OPERATOR R.J. Swalwell

Date	5-Day B O D					Suspended Solids					Suspended Volatile Solids				Receiving Stream Data				
	Inf.		Eff.		Rem.	Inf		Eff		Rem.	Inf		Eff		Temp.	Above		Below	
	Mg/l	lbs. x10	Mg/l	lbs. x10	%	Mg/l	lbs. x10	Mg/l	lbs. x10	%	Mg/l	lbs. x10	Mg/l	lbs. x10		D.O.	B.O.D.	D.O.	B.O.d
1	64	116	52	94	19	92	166	54	97	41	83	150	50	90					
2	55	98	30	54	45	72	129	51	91	29	60	107	38	68	38	9.2	2.6	9.2	2.4
3	73	128	52	91	29	96	168	55	96	43	76	133	40	70	38	9.4	2.0	9.6	1.8
4	58	100	49	85	16	107	186	51	88	52	93	161	43	74					
5	58	99	40	68	31	84	144	33	56	61	70	120	32	55					
6	70	122	55	95	21	80	139	55	95	31	62	108	41	71					
7	60	102	58	98	3	99	168	49	83	51	83	140	37	63					
8	96	173	74	134	23	113	204	60	108	47	97	175	50	90					
9	61	104	58	98	5	74	126	43	73	42	61	104	34	58					
10	64	108	49	83	23	106	180	35	59	67	96	163	28	48	52	8.6	1.8	9.0	2.4
11	61	103	55	93	10	74	125	48	81	35	64	108	35	59					
12	73	130	49	87	33	96	171	37	66	62	78	138	52	92					
13	67	118	52	91	22	61	107	33	58	46	56	98	30	53					
14	69	116	46	77	33	95	160	33	56	65	80	135	27	46					
15	82	145	81	143	1	114	202	62	110	46	98	173	54	95					
16	73	125	36	62	51	104	179	57	97	45	91	156	48	82	60	8.4	2.4	8.4	2.4
17	76	127	52	87	32	87	146	45	75	48	73	123	35	59	59	9.8	2.0	9.8	2.4
18	61	101	49	81	20	50	83	27	45	46	41	68	21	35					
19	73	123	64	107	12	94	158	51	85	46	80	134	41	68					
20	73	118	64	103	12	67	108	46	74	31	61	98	38	61					
21	85	133	52	81	39	115	181	32	50	72	98	153	22	35					
22	76	125	66	109	13	114	189	65	107	43	99	164	51	84					
23	70	113	61	99	13	102	166	52	84	49	80	130	42	68					
24	70	115	61	100	13	76	124	48	79	37	62	102	38	62	58	10.8	2.4	11.6	2.6
25	79	130	58	95	27	135	222	50	82	64	120	197	41	67					
26	70	111	40	64	43	91	145	43	68	53	81	129	36	57					
27	73	114	55	85	25	122	190	48	74	61	111	173	42	65					
28	73	112	36	55	51	79	121	30	46	62	69	106	22	34					
29	72	114	43	68	40	111	176	32	51	71	100	159	34	54					
30	76	116	61	93	20	78	119	58	88	26	66	100	40	61					
31	67	111	55	91	8	82	136	43	72	46	54	89	30	50					
ARITH. MEAN	70	115	53	89	24	93	155	46	77	49	79	131	38	64	51	9.4	2.2	9.6	2.3
STAT MEAN		118		88			155		78										

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH May 1961

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

Date	Raw Sludge Gals.	Raw Sludge Lbs. Per 1000 c.f. Digester	Raw Sludge pH	Raw Sludge Total Solids %	Raw Sludge Vol. Solids %	Transfer Sludge #1 to #2 Gals.	Transfer Sludge pH	Transfer Sludge Total Solids %	Transfer Sludge Vol. Solids %	Transfer Sludge Susp. Solids Mg/l	Transfer Sludge 5-Day B O D Mg/l	Transfer Sludge Total Solids %	Transfer Sludge Vol. Solids %	Transfer Sludge Vol. Acids Mg/l	sludge near bottom pH #1	Temp. °F #1	Gas Produced cu. ft. X 100	Gas Wasted cu. ft.	Remarks
1	1105	18	5.8	7.4	77											98	55	55	Note — include gallons
2	1326	24	5.7	9.1	70	15912	6.9	1.1	63						6.9	95	48	5	of sludge to beds
3	884	15	5.6	8.7	71											98	44	0	
4	1326	23	5.7	8.6	71												47	0	
5	1326	21	5.7	8.1	69											98	40	0	
6	1326	22	5.6	7.9	75											98	60	0	
7	1105	18	5.6	7.6	76												54	0	
8	1105	20	5.7	8.9	71											99	50	0	
9	1105	19	5.7	8.0	75												46	0	
10	1105	16	5.6	6.8	77											97	48	29	
11	1768	30	5.7	8.0	76											96	55	6	
12	1326	25	5.6	8.6	77										7.0	99	50	0	
13	1326	21	5.8	7.4	77											97	55	0	
14	1326	27	5.6	9.4	78											100	65	0	
15	1326	24	5.4	8.0	80											98	69	69	
16	884	14	5.6	7.3	78	16796	7.7	3.1	67						7.7	96	60	1	
17	1326	16	5.6	5.5	78											100	52	0	
18	1547	25	5.4	7.4	79												58	0	
19	1105	19	5.2	8.2	77											97	66	0	
20	1105	19	5.6	7.8	78											98	44	0	
21	1326	21	5.6	7.1	80											100	70	0	
22	884	16	5.7	8.3	80											98	46	46	
23	1768	29	5.6	7.4	79											95	43	43	
24	1105	18	5.7	7.4	78											93	63	0	
25	2652	47	5.2	7.2	87											98	61	0	
26	1326	19	5.6	6.7	79	16796	6.8	1.6	73						6.8	100	57	0	
27	1105	16	5.6	6.7	79											97	55	0	
28	1989	24	5.8	5.3	81											100	58	0	
29	884	15	5.5	7.6	79											98	72	72	
30	1326	19	5.6	6.4	80											95	56	56	
31	1326	17	5.8	5.8	79											93	53	0	
ARITH. MEAN	1305	21	5.6	7.6	77	16501	7.1	1.9	68						7.1	97	55	12	
STAT. MEAN		21																	

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH May 1961

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

Date	Raw Sludge Gals.	Raw Sludge Lbs. Per 1000 c.f. Digester	Raw Sludge pH	Raw Sludge Total Solids %	Raw Sludge Vol. Solids %	Supernatant Gals.	Supernatant pH	Supernatant Total Solids %	Supernatant Vol. Solids %	Supernatant Susp. Solids Mg/l x10	Supernatant 5-Day B O D Mg/l x10	Supernatant Total Solids %	Supernatant Vol. Solids %	Supernatant Vol. Acids Mg/l	sludge near bottom pH #2	Temp. °F #2	Gas Produced cu. ft.	Gas Wasted cu. ft.	Remarks
1																			Note — include gallons
2	7875		7.3	9.0	55	15912	7.3	.38	66	157	61				7.3				of sludge to beds
3																			
4																90			
5																			
6																88			
7																91			
8																			
9																91			
10																92			
11																			
12															7.1				
13																			
14																			
15																96			
16						16796	7.4	.32	65	148	58				7.4				
17																			
18																94			
19																95			
20																97			
21																			
22																100			
23																			
24																			
25																			
26						16796	7.0	.31	59	120	52				7.0				
27																95			
28																94			
29																98			
30																			
31																			
ARITH. MEAN	7875		7.3	9.0	55	16501	7.2	.34	63	142	57				7.2	96			
STAT. MEAN																			

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH June 1961 MISCELLANEOUS DATA OPERATOR R.J. Swalwell

Date	Weather Precip. Inches	Weather Temp. (°F) Max.	Weather Temp. (°F) Min.	Type*	Raw Sewage Temp. °F	Raw Sewage Flow MGD	pH	Grit cf/mg	~~Mixed Liquor~~ water ~~Mixed Liquor~~ cu. ft.	Cl2 lbs.	Power KWH x10	AUX. FUEL Gas cu. ft. X 100	Remarks
1	.38	76	62	R	54	2.08	7.4		1750	70	16	2	
2	.10	78	46	R	54	1.98	7.4		1730	68	20	2	P.H. merter out of service
3		72	46	C	53	1.94	7.4		1710	43	16	2	from June 8th to the 21st.
4		86	52	C	53	1.87	7.3		1680	61	16	0	
5		84	52	C	54	2.02	7.2		1740	71	20	1	
6	.05	86	56	R	54	1.99	7.4		1790	75	16	0	
7	.11	82	60	R	54	1.99	7.5		1730	72	20	0	
8	.18	78	60	R	54	2.02			1620	70	16	0	
9		84	58	CL	54	2.02			1820	68	16	0	
10		88	62	C	54	1.98			1770	74	16	3	
11		90	68	C	54	1.93			1760	74	20	0	
12		96	68	C	56	2.07			1690	73	16	0	
13	.41	92	52	R	56	2.06			1820	75	20	0	
14		68	44	CL	56	1.87			1850	37	16	0	
15		70	42	CL	56	1.85			1810	68	16	0	
16		84	46	C	56	1.91			2030	69	20	0	
17		80	50	C	55	1.85			1530	72	16	0	
18		80	58	C	54	1.81			1390	73	16	0	
19	.44	84	48	R	55	1.98			1750	69	20	0	
20		72	44	C	54	1.88			1790	68	16	4	
21		82	50	C	55	1.90			1718	67	16	4	
22	.17	76	52	R	55	1.89	7.6		1740	68	20	0	
23	.04	64	42	R	54	1.88	7.6		1770	80	16	3	
24	.01	72	50	R	55	1.86	7.5		1820	62	16	2	
25		72	46	CL	54	1.76	7.4		1580	54	16	4	
26		84	52	C	55	1.90	7.5		1820	76	20	1	
27		86	62	C	55	1.87	7.7		1750	70	16	1	
28		92	66	C	56	1.91	7.7		1830	68	20	1	
29		93	65	C	56	1.92	7.6		1840	67	16	1	
30		98	68	C	56	1.98	7.7		1880	68	20	1	
31													
ARITH. MEAN	.063	82	54		55	1.93	7.5		1750	68	17.5	1	
STAT. MEAN						1.93							

*C—Clear CL—Cloudy R—Rain **Indicate Unit
W—Windy CA—Calm S—Snow

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH June 19 61

PRIMARY TREATMENT DATA

OPERATOR R.J. Swalwell

Date	5-Day B O D Inf. Mg/l	5-Day B O D Inf. lbs. x10	5-Day B O D Eff. Mg/l	5-Day B O D Eff. lbs. x10	5-Day B O D Rem. %	Suspended Solids Inf. Mg/l	Suspended Solids Inf. lbs. x10	Suspended Solids Eff. Mg/l	Suspended Solids Eff. lbs. x10	Suspended Solids Rem. %	Suspended Volatile Solids Inf. Mg/l	Suspended Volatile Solids Inf. lbs. x10	Suspended Volatile Solids Eff. Mg/l	Suspended Volatile Solids Eff. lbs. x10	Receiving Stream Data Temp	Remarks above D.O.	Remarks above B.O.D.	Remarks below D.O.	Remarks below B.O.D.
1	64	111	30	52	47	77	133	29	50	62	60	104	21	36					
2	70	115	67	111	4	72	119	50	82	31	62	102	44	72					
3	85	137	73	118	14	107	173	36	58	66	97	157	36	58					
4	64	100	61	95	5	64	100	35	54	45	60	94	34	53					
5	73	123	64	108	12	96	162	69	116	28	81	136	59	99					
6	73	121	58	96	21	52	86	39	65	25	40	66	26	43					
7	79	131	61	101	23	124	206	44	73	65	99	164	42	69					
8	70	118	61	103	13	100	169	51	86	49	86	145	41	69					
9	73	123	64	108	12	80	135	46	77	43	71	119	42	70					
10	73	121	63	104	14	88	145	33	54	63	72	119	29	48					
11	64	103	52	83	19	80	129	32	51	60	67	108	24	39					
12	104	180	72	124	31	96	166	74	128	23	81	140	58	100					
13	67	115	64	110	4	100	172	55	94	45	86	148	47	81	71	7.2	2.2	7.2	2.2
14	58	90	55	85	5	64	100	63	98	2	56	87	51	79					
15	80	123	60	93	25	75	116	44	68	41	64	98	36	55					
16	55	87	52	83	6	100	160	40	64	60	94	150	36	57					
17	87	134	70	108	14	103	159	58	89	44	88	136	44	67					
18	63	95	52	78	18	103	156	26	39	75	84	127	20	30					
19	90	148	67	111	26	90	148	51	84	43	72	119	40	66					
20	85	133	64	100	25	174	273	43	67	69	151	237	47	74					
21	70	111	64	101	9	104	165	44	69	58	88	139	36	57	62	8.4	2.2	8.4	2.0
22	58	91	52	82	10	113	178	44	69	61	103	163	34	54	63	8.6	1.4	8.8	1.4
23	67	105	58	91	13	82	128	52	81	37	69	108	42	65					
24	85	132	73	113	14	83	129	44	68	47	70	108	42	65					
25	96	106	52	76	28	87	128	40	59	54	78	114	34	50					
26	96	152	92	145	4	80	127	54	85	33	67	106	42	66					
27	92	143	58	90	37	80	125	49	76	39	66	103	37	58	60	8.8	1.4	9.4	1.6
28	67	107	61	97	9	82	131	51	81	39	67	107	39	62	65	9.4	2.2	9.6	1.6
29	67	107	61	97	9	82	131	50	80	39	69	110	41	65					
30	58	95	52	86	10	87	143	40	66	54	78	129	36	59					
31																			
ARITH. MEAN	74	119	61	98	16	91	148	46	74	47	78	124	39	62	64	8.5	1.9	8.7	1.76
STAT. MEAN		119		99			144		74										

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH June 1961

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

Date	Raw Sludge Gals.	Raw Sludge Lbs. Per 1000 c.f. Digester	Raw Sludge pH	Raw Sludge Total Solids %	Raw Sludge Vol. Solids %	transfer ~~XXXXX~~ #1 to # 2 Gals.	transfer pH	transfer Total Solids %	transfer Vol. Solids %	transfer Susp. Solids Mg/l	transfer 5-Day B O D Mg/l	sludge near bottom Total Solids %	sludge near bottom Vol. Solids %	sludge near bottom Vol. Acids Mg/l	pH	Temp. °F	Gas Produced cu. ft.	Gas Wasted cu. ft.	Remarks
	8.5	30													#1	#1	X 100		
1	1326	22	5.4	7.5	78											97	62	0	Note — include gallons
2	1326	24	5.5	8.1	80											100	52	0	of sludge to beds
3	1105	18	5.4	7.7	78											97	57	0	
4	1326	31	5.2	10.4	80											100	45	0	
5	1105	17	5.5	6.9	77											98	45	27	
6	2210	32	5.3	6.4	80											97	74	0	
7	1326	21	5.4	7.0	80											96	73	45	
8	1105	22		8.7	80											97	60	60	
9	1105	20		7.9	81											95	59	59	
10	1326	22		7.4	80											94	55	55	
11	1326	22		7.7	79											92	31	0	
12	1105	14		5.7	80	16796		1.9	59							92	77	77	
13	1547	22		6.5	79												57	4	
14	1326	19		6.4	78											95	74	0	
15	1105	16		6.6	76											95	52	0	
16	1105	14		5.9	75											98	64	0	
17	1105	18		7.6	76											99	50	0	
18	1105	20		8.7	76											98	48	0	
19	884	13		6.6	78											100	58	58	
20	1768	30		8.0	76											98	61	61	
21	1326	16		5.8	73											96	64	64	
22	1105	19	5.6	7.9	78											94	60	39	
23	1326	20	5.6	7.2	77	15691	6.9	1.3	75						6.9	94	65	44	
24	1326	23	5.7	7.9	78											94	58	58	
25	1768	19	5.8	4.9	77											92	72	0	
26	1326	21	5.6	7.7	75											98	41	0	
27	1326	21	5.6	7.5	75											97	67	51	
28	1105	18	5.7	7.7	75												59	59	
29	1547	21	5.7	6.5	74											95	41	41	
30	1105	17	5.3	7.5	74											92	78	61	
31																			
ARITH. MEAN	1297	20	5.5	7.3	77	16242	6.9	1.6	67						6.9	96	59	29	
STAT. MEAN		20																	

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH June 1961

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

Date	To ~~XXXXX~~ Beds					Supernatant						sludge near bottom				Temp.	Gas		Remarks
	Gals.	Lbs. Per 1000 c.f. Digester	pH	Total Solids %	Vol. Solids %	Gals.	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l X10	5-Day B O D Mg/l X10	Total Solids %	Vol. Solids %	Vol. Acids Mg/l	pH #2	°F #2	Produced cu. ft.	Wasted cu. ft.	
1																			Note – include gallons
2																			of sludge to beds
3																95			
4																93			
5																96			
6																94			
7																98			
8																			
9																			
10																			
11																			
12	7072			9.3	54	9724		.42	59	274	61								
13																			
14																			
15																92			
16																			
17																			
18																96			
19																			
20																			
21																			
22																			
23						15691		.30	62	122	36				7.1				
24																			
25																			
26																			
27																90			
28																90			
29																			
30																			
31																			
ARITH. MEAN	7072			9.3	54	12708		.36	60	198	48				7.1	94			
STAT. MEAN																			

MICHIGAN DEPARTMENT OF HEALTH

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH July 1961 MISCELLANEOUS DATA OPERATOR R.J. Swalwell

Date	Weather Precip. Inches	Weather Temp. (°F) Max.	Weather Temp. (°F) Min.	Type*	Raw Sewage Temp. °F	Raw Sewage Flow MGD	pH	Grit cf/mg	~~Water~~ water cu. ft.	Cl₂ lbs.	Power KWH x10	AUX. FUEL Gas cu. ft. x 100	Remarks
1	.51	94	70	R	56	1.94	7.7		1860	63	16	4	
2		84	56	Cl	55	1.76	7.9		1880	63	16	4	
3		76	52	C	55	1.89	7.6		1890	70	16	0	
4		80	56	C	55	1.93	7.4		1750	65	16	0	
5		86	56	C	55	1.91	7.5		1780	61	20	0	
6		92	62	C	55	1.91	7.7		1900	71	16	1	
7		80	50	C	56	1.90	7.6		1750	67	20	0	
8		80	50	C	56	1.75	7.6		1780	72	16	0	
9		84	52	C	55	1.68	7.4		1770	76	12	0	
10	.02	84	58	R	56	1.88	7.6		1790	69	16	1	
11		88	60	C	56	1.89	7.6		2340	71	20	12	
12		92	58	C	56	1.88	7.7		1820	67	20	10	
13	.01	76	60	R	56	1.82	7.5		1800	69	16	10	
14	.11	80	60	R	57	1.93	7.5		1800	67	16	9	
15	.21	86	60	R	56	1.92	7.4		1810	75	16	8	
16	.01	80	56	R	56	1.74	7.4		1780	62	20	8	
17		85	58	C	57	1.92	7.4		1690	55	16	0	
18		91	65	C	57	1.92	7.5		2430	73	20	0	
19		87	65	Cl	57	1.91	7.5		1840	67	16	0	
20		88	62	Cl	58	1.90	7.4		1710	66	16	4	
21	.51	90	68	R	58	1.94	7.4		1860	66	20	4	
22	.02	88	68	R	57	1.91	7.3		1860	63	16	4	
23	.22	88	66	R	58	1.78	7.4		1770	61	16	4	
24	.05	80	64	R	58	1.97	7.3		1730	69	16	4	
25	.02	80	56	R	57	1.90	7.4		1800	70	20	0	
26		90	62	C	57	1.89	7.5		1750	68	16	0	
27		92	66	C	57	1.90	7.4		1760	67	16	0	
28	.64	86	66	R	58	2.00	7.4		2230	80	20	0	
29		90	66	C	58	1.92	7.3		1840	71	16	0	
30	.13	90	68	R	58	1.84	7.2		1790	72	20	0	
31	1.0	82	58	R	58	2.07	7.5		1780	72	16	0	
ARITH. MEAN	.11	85	60		57	1.89	7.5		1848	68	17.2	3	
STAT. MEAN						1.90							

*C—Clear CL—Cloudy R—Rain **Indicate Unit
W—Windy CA—Calm S—Snow

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH July 1961

PRIMARY TREATMENT DATA

OPERATOR R.J. Swalwell

Date	5-Day B O D Inf Mg/l	5-Day B O D Inf lbs. x10	5-Day B O D Eff Mg/l	5-Day B O D Eff lbs. x10	5-Day B O D Rem %	Suspended Solids Inf Mg/l	Suspended Solids Inf lbs. x10	Suspended Solids Eff Mg/l	Suspended Solids Eff lbs. x10	Suspended Solids Rem %	Suspended Volatile Solids Inf Mg/l	Suspended Volatile Solids Inf lbs. x10	Suspended Volatile Solids Eff Mg/l	Suspended Volatile Solids Eff lbs. x10	Receiving Stream Data: Temp.	Above D.O.	Above B.O.D.	Below D.O.	Below B.O.D
1	110	178	74	120	33	114	185	48	77	53	79	128	35	56					
2	51	75	49	72	4	82	120	25	37	70	70	103	22	32					
3	110	173	58	91	47	94	148	33	52	65	81	127	32	50					
4	68	109	60	97	12	67	108	39	63	42	60	97	31	50					
5	68	108	65	103	4	114	182	49	78	57	84	134	29	46					
6	65	103	53	84	19	59	94	56	89	5	54	86	49	78					
7	64	101	54	85	16	73	116	34	54	53	60	95	29	46					
8	72	105	36	52	50	84	123	34	50	60	74	108	29	42					
9	67	94	43	60	36	124	174	35	49	72	104	146	27	38					
10	78	122	58	91	26	123	193	60	94	51	107	168	40	63					
11	104	164	73	115	30	98	154	52	82	47	78	123	32	50	65	9.0	1.4	10.0	3.2
12	64	100	64	100	0	74	116	38	59	49	60	94	40	62	69	10.6	2.2	10.6	2.4
13	67	102	64	97	5	87	132	58	88	33	70	106	43	65	69	10.0	2.2	10.0	2.8
14	67	108	55	88	18	62	100	54	87	13	48	77	42	67					
15	61	97	49	78	20	83	133	42	67	49	70	112	37	59					
16	70	101	58	84	17	111	161	36	52	68	97	141	30	43					
17	78	125	73	117	6	142	227	60	96	58	107	171	45	71					
18	73	117	73	117	0	80	128	65	104	19	73	117	52	83	70	10.4	2.2	10.4	2.2
19	68	108	65	103	4	75	119	51	81	32	65	103	45	71					
20	73	116	61	96	16	196	310	51	81	74	168	266	37	59					
21	58	94	52	84	10	64	103	48	77	25	53	85	47	76					
22	92	146	64	102	30	110	175	47	75	57	89	142	43	68					
23	61	90	55	81	10	85	126	47	70	45	71	105	36	53					
24	73	120	73	120	0	92	151	66	108	28	80	131	52	85					
25	67	106	79	125	-15	90	142	56	88	38	80	127	43	68					
26	56	88	56	88	0	63	99	42	66	33	50	79	36	56					
27	61	96	61	96	0	120	190	50	79	58	104	165	43	68					
28	60	100	60	100	0	110	184	60	100	46	87	145	56	93					
29	85	136	85	136	0	102	163	62	99	39	88	141	58	93					
30	85	131	67	103	21	115	177	44	67	62	90	138	36	55					
31	67	115	64	110	4	108	187	56	96	48	72	124	36	62					
ARITH MEAN	72	114	61	97	14	97	153	48	76	47	80	125	39	62	68	10.0	2.0	10.25	2.65
STAT MEAN		111		97			147		75										

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH July 1961 — DIGESTER AND SLUDGE DATA — OPERATOR R.J. Swalwell

Date	Raw Sludge Gals.	Raw Sludge Lbs. Per 1000 c.f. Digester	Raw Sludge pH	Raw Sludge Total Solids %	Raw Sludge Vol. Solids %	transfer #1 to #2 Gals.	transfer #1 to #2 pH	transfer #1 to #2 Total Solids %	transfer #1 to #2 Vol. Solids %	transfer #1 to #2 Susp. Solids Mg/l	transfer #1 to #2 5-Day B O D Mg/l	sludge near bottom Total Solids %	sludge near bottom Vol. Solids %	sludge near bottom Vol Acids Mg/l	pH	Temp °F	Gas Produced cu. ft.	Gas Wasted cu ft.	Remarks
	8.5	30													#1	#1	X 100		
1	1105	17	5.4	7.8	72											93	60	60	Note – include gallons
2	1326	19	6.2	7.2	71											92	41	41	of sludge to beds
3	1326	22	5.5	7.6	79											90	71	3	
4	1326	23	5.7	8.7	72											96	61	0	
5	1326	24	5.7	9.0	72											98	68	21	
6	1326	17	5.5	6.0	75	17680	6.9	2.0	71							100	77	30	
7	1326	22	5.6	8.1	75											98	25	25	
8	1105	16	5.5	6.5	80											95	72	16	
9	1768	30	5.3	8.3	73											94	37	22	
10	1989	43	5.3	8.8	88										6.9	94	72	72	
11	1989	24	5.4	5.7	76											92	60	60	
12	1105	19	5.7	8.0	76											90	45	45	
13	1105	16	5.3	6.9	77											89	37	37	
14	1105	25	5.6	11.6	70											88	77	13	
15	1105	6	5.8	2.7	71											92	30	29	
16	1326	24	5.5	8.7	75											91	73	15	
17	1547	25	5.6	7.9	74											96	33	16	
18	1105	16	5.5	6.7	76	15912	6.9	.61	66						6.9	94	35	12	
19	1326	21	5.6	7.6	76												89	73	
20	1326	24	5.4	8.4	76											92	66	66	
21	1326	25	5.6	8.9	76											90	52	52	
22	1326	20	5.5	7.1	75											90	39	39	
23	1326	19	5.6	6.5	79											88	53	32	
24	1105	16	5.9	6.7	76											89	71	71	
25	1105	16	5.6	6.5	77										7.0	88	59	59	
26	1326	20	5.4	6.9	77											86	55	55	
27	1326	17	5.7	6.0	78											84	55	55	
28	1105	27	5.6	8.6	77											84	60	2	
29	1326	17	5.6	5.9	77											91	20	0	
30	1326	20	5.3	7.2	76											90	22	0	
31	1989	33	5.3	7.7	76											90	67	0	
ARITH. MEAN	1373	21	5.55	7.4	76	16796	6.9	1.3	68.5						6.9	91	54	33	
STAT MEAN		21																	

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH July 19 61

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

Date	to ~~xxxxxx~~ beds Gals	Lbs. Per 1000 c f Digester	pH	Total Solids %	Vol Solids %	Supernatant Gals	pH	Total Solids %	Vol Solids %	Susp Solids Mg/l x10	5 Day B O D Mg/l x10	sludge near bottom Total Solids %	Vol Solids %	Vol Acids Mg/l	pH #2	Temp °F #2	Gas Produced cu ft	Gas Wasted cu ft	Remarks
1																			Note — include gallons of sludge to beds
2																			
3																			
4																			
5																			
6						17680	6.9	.31	61.2	103	61				6.9	89			
7																94			
8																91			
9																96			
10															6.9				
11																			
12																			
13																			
14																			
15																			
16																			
17																			
18	6750		6.9	9.1	57	9162	6.9	.36	63.0	260	61				6.9				
19																			
20																89			
21																			
22																			
23																			
24																			
25															7.0				
26																			
27																			
28																			
29																			
30																			
31																			
ARITH. MEAN	6750		6.9	9.1	57	13421	6.9	.335	62	181	61				6.9	92			
STAT MEAN																			

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH August 1961 MISCELLANEOUS DATA OPERATOR R.J. Swalwell

Date	Weather Precip Inches	Weather Temp. (°F) Max.	Weather Temp. (°F) Min.	Type*	Raw Sewage Temp °F	Raw Sewage Flow MGD	pH	Grit cf/mg	Plant Eff E. Coli	Cl_2 lbs.	Power KWH x10	AUX FUEL ** Gas cu. ft. x 100	Remarks
									Water ~~xxxxxx~~ cu. ft.				
1	.28	76	62	R	57	1.93	7.5		1870	68	20	0	
2		82	60	C	58	2.02	7.5		1800	72	16	0	
3	.01	86	64	R	58	2.00	7.4		1770	78	20	0	
4	.17	84	62	R	57	1.99	7.5		1840	66	16	0	
5	.13	70	60	R	57	1.95	7.4		1830	64	20	0	
6		78	52	Cl	57	1.83	7.2		1790	63	16	0	
7		80	60	C	57	2.01	7.5		1750	65	16	0	
8		86	68	C	57	2.06	7.2		2190	59	20	0	
9		88	66	C	58	2.00	7.2		1800	70	16	0	
10	.05	86	66	R	58	1.98	7.3		1720	65	20	4	
11		84	56	C	58	2.00	7.2		1780	69	16	3	
12		78	56	C	58	1.87	7.2		1770	61	20	3	
13	.05	76	56	R	57	1.72	7.2		1710	35	16	2	
14		85	56	C	57	1.91	7.3		1870	70	16	0	
15		84	60	C	58	1.86	7.2		1870	70	20	10	
16		82	54	C	58	1.85	7.2		1750	70	16	10	
17		84	56	C	58	1.81	7.3		1670	69	20	7	
18		86	62	C	58	1.89	7.2		1850	77	16	4	
19	2.52	88	54	R	58	2.21	7.0		1830	65	20	9	
20		70	50	C	56	1.82	7.0		1980	64	20	10	
21		75	50	C	57	1.97	7.2		1770	73	16	0	
22	.15	78	58	R	57	1.98	7.3		1760	72	20	0	
23	.13	70	58	R	58	1.83	7.2		1810	65	16	0	
24	.30	76	60	R	57	1.92	7.2		1840	55	20	0	
25		80	60	Cl	58	1.94	7.2		1630	67	16	0	
26	.51	80	62	R	58	1.92	7.3		1740	62	20	0	
27	.47	88	64	R	57	1.93	7.1		1680	62	20	0	
28	1.12	86	62	R	58	2.26	7.2		1810	71	20	0	
29		84	60	C	58	2.19	7.3		1830	80	20	0	
30		86	62	C	58	2.21	7.3		2100	78	24	8	
31		88	68	C	59	2.11	7.5		1920	74	20	1	
ARITH. MEAN	.19	81	59		57	1.97	7.3		1810	67	18.5	2.3	
STAT. MEAN						1.95							

C—Clear CL—Cloudy R—Rain **Indicate Unit
W—Windy CA—Calm S—Snow

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH August 1961

PRIMARY TREATMENT DATA

OPERATOR R.J. Swalwell

Date	5-Day B O D Inf. Mg/l	5-Day B O D Inf. lbs. x10	5-Day B O D Eff. Mg/l	5-Day B O D Eff. lbs. x10	5-Day B O D Rem. %	Suspended Solids Inf. Mg/l	Suspended Solids Inf. lbs. x10	Suspended Solids Eff. Mg/l	Suspended Solids Eff. lbs. x10	Suspended Solids Rem. %	Suspended Volatile Solids Inf. Mg/l	Suspended Volatile Solids Inf. lbs. x10	Suspended Volatile Solids Eff. Mg/l	Suspended Volatile Solids Eff. lbs. x10	Receiving Stream Data: Temp.	Above D.O.	Above B.O.D.	Below D.O.	Below B.O.D
1	97	156	64	103	34	104	168	50	80	62	77	124	37	59					
2	55	92	61	103	-10	92	155	53	89	42	76	128	26	44					
3	79	131	85	142	-7	76	126	57	94	25	65	108	49	81					
4	55	91	58	96	-5	55	91	50	83	9	46	76	39	65					
5	70	114	70	114	0	68	110	37	60	46	65	105	33	54					
6	54	82	57	86	-5	91	138	36	55	60	62	94	22	34					
7	66	110	66	110	0	109	183	51	85	53	87	146	40	67					
8	73	125	64	110	12	92	158	41	70	55	71	121	30	51	67	7.6	1.6	7.6	2.4
9	70	116	61	101	13	70	116	42	70	40	58	96	36	60	71	8.2	2.8	8.4	3.4
10	79	130	64	105	19	105	173	50	82	52	90	148	41	67					
11	61	102	64	107	-5	79	132	51	85	35	58	96	40	67					
12	67	105	64	100	4	92	143	64	100	30	80	125	55	85					
13	66	94	58	83	17	106	152	34	49	68	95	136	35	50					
14	96	153	70	111	28	191	304	55	87	71	165	262	40	64					
15	73	113	67	104	8	75	116	43	66	43	63	97	35	54					
16	67	103	79	122	-15	75	116	64	98	17	64	98	54	83	68	8.8	3.4	9.0	3.8
17	79	119	61	92	23	93	140	64	96	31	77	116	47	71	68	8.8	2.2	8.4	2.0
18	61	96	55	86	10	67	106	47	74	30	51	80	40	63					
19	70	130	64	118	9	138	254	84	155	39	87	160	50	92					
20	66	100	27	41	59	98	149	33	50	66	80	121	26	39					
21	90	148	64	105	29	130	214	67	110	49	111	183	54	88					
22	67	111	67	111	0	90	148	46	76	49	81	133	42	69	63	7.8	1.6	8.0	1.6
23	85	130	70	107	18	84	128	53	81	37	72	110	42	64					
24	73	117	55	88	25	128	250	63	101	51	107	171	49	78					
25	79	128	55	89	30	103	167	52	84	50	80	129	38	62					
26	85	136	58	93	32	95	152	46	73	52	75	120	41	65					
27	61	98	55	88	10	110	177	42	67	62	88	141	32	41					
28	72	163	79	168	-10	117	220	72	135	39	73	137	57	107					
29	64	140	61	134	5	93	170	55	101	41	80	146	50	92	70	6.8	1.6	6.8	1.8
30	98	217	73	161	25	104	191	72	132	44	82	151	63	116					
31	67	141	46	97	31	63	111	63	111	0	51	90	43	76					
ARITH. MEAN	72	122	63	106	12	97	160	53	87	43	78	127	41	68	68	8.0	2.2	8.0	2.5
STAT. MEAN		121		104			155		86										

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH August 19 61

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

Date	Raw Sludge Gals.	Raw Sludge Lbs. Per 1000 c.f. Digester	Raw Sludge pH	Raw Sludge Total Solids %	Raw Sludge Vol. Solids %	Transfer #1 to #2 Gals.	Transfer pH	Transfer Total Solids %	Transfer Vol. Solids %	Transfer Susp. Solids Mg/l	Transfer 5-Day B O D Mg/l	sludge near bottom Total Solids %	sludge near bottom Vol. Solids %	sludge near bottom Vol. Acids Mg/l	sludge near bottom pH #1	Temp °F #1	Gas Produced cu. ft X 100	Gas Wasted cu. ft. X 100	Remarks
	8.5	30																	
1	1105	16	5.5	6.7	76											95	71	0	Note – include gallons
2	1326	21	5.5	7.5	76											100	58	0	of sludge to beds
3	1105	19	5.6	8.3	75	19227	7.0	2.2	62						7.0	100	70	32	
4	1105	21	5.4	9.1	74											99	77	55	
5	1105	20	5.3	8.5	76											98	56	56	
6	1105	18	5.2	7.8	76											95	93	40	
7	2210	31	5.5	6.5	76											100	73	30	
8	1326	22	5.4	7.8	76											96	77	28	
9	1326	25	5.6	8.6	76										7.0	97	40	8	
10	1326	21	5.5	7.5	77												81	81	
11	1326	20	5.4	7.1	76											94	52	52	
12	1326	21	5.3	7.1	79											92	54	37	
13	1547	25	5.3	7.3	78											94	50	33	
14	1547	22	5.4	6.6	75											93	78	78	
15	1105	16	5.6	6.7	76											92	61	38	
16	1105	16	5.4	6.8	77											92	57	57	
17	1105	18	5.3	7.8	75											91	43	43	
18	1326	22	5.4	7.6	77	16133	7.0	2.4	54						7.0	90	58	40	
19	1989	28	5.4	6.6	76											91	47	31	
20	1326	21	5.8	7.0	79											90	45	31	
21	1326	22	5.7	8.5	69											90	75	52	
22	1326	19	5.5	7.5	69											90	62	48	
23	1768	35	5.6	10.0	71											90	62	62	
24	1326	26	5.4	9.9	70											90	69	54	
25	1326	22	5.5	8.4	72											89	73	59	
26	1326	28	5.3	10.9	69											89	41	34	
27	1768	25	5.4	6.9	73											88	53	10	
28	2210	35	5.5	7.8	72	17238	7.0	2.1	55							92	55	40	
29	1105	19	5.6	8.6	71											90	67	59	
30	2431	33	5.4	7.1	68											90	58	58	
31	1326	18	5.5	6.3	73										7.0	88	51	6	
ARITH. MEAN	1419	23	5.46	7.8	74	17533	7.0	2.2	57						7.0	90	61	40	
STAT MEAN		22																	

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH August 1961 DIGESTER AND SLUDGE DATA OPERATOR R.J. Swalwell

Date	to ~~XXXXXXX~~ beds					Supernatant						sludge near bottom				Temp	Gas		Remarks
	Gals.	Lbs. Per 1000 c.f. Digester	pH	Total Solids %	Vol. Solids %	Gals.	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l x10	5-Day B O D Mg/l x10	Total Solids %	Vol. Solids %	Vol Acids Mg/l	pH #2	°F #2	Produced cu. ft.	Wasted cu ft.	Note – include gallons of sludge to beds
1																			
2																			
3						19227	7.1	.31	61	133	21				7.1	88			
4																92			
5																			
6																			
7																			
8																93			
9															7.1	95			
10																			
11																			
12																			
13																			
14																			
15																			
16																			
17															7.1				
18	7721		7.0	8.4	54	8412	7.1	.37	64	255	28								
19																			
20																			
21																			
22																			
23																			
24																			
25																			
26																			
27																			
28						17238	7.1	.31	60	155	39								
29																			
30																			
31															7.1				
ARITH. MEAN	7721		7.0	8.4	54	14959	7.1	.33	62	181	29				7.1	90			
STAT MEAN																			

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH September 19____ MISCELLANEOUS DATA OPERATOR R.J. Swalwell

Date	Weather: Precip Inches	Weather: Temp. (°F) Max.	Weather: Temp. (°F) Min.	Weather: Type*	Raw Sewage: Temp. °F	Raw Sewage: Flow MGD	pH	Grit cf/mg	Phosphorus ~~MPN/100ml~~ Water ~~xxxxx~~ cu. ft.	Cl_2 lbs.	Power KWH x 10	AUX. FUEL ** Gas cu. ft. x 100	Remarks
1	.02	82	68	R	58	1.81	7.3		1860	69	20	0	
2	.37	86	66	R	58	1.98	7.4		1790	66	20	0	
3	.10	74	68	R	58	1.84	7.3		1760	65	16	0	
4	.01	86	70	R	58	1.89	7.4		1740	56	20	0	
5		88	66	C	60	2.02	7.5		1850	73	20	0	
6	.63	88	60	R	60	2.07	7.5		1850	72	16	0	
7		84	60	C	59	1.96	7.7		1880	69	20	1	
8		84	62	C	59	2.00	7.5		1880	77	20	8	
9		88	68	C	59	1.93	7.5		1860	70	16	10	
10		90	70	C	59	1.86	7.6		1840	69	20	9	
11	.17	86	62	R	59	2.01	7.4		2090	75	16	0	
12	.18	72	62	R	60	1.97	7.4		1820	66	20	7	
13	.65	86	64	R	59	2.19	7.6		1800	81	20	5	
14		66	46	Cl	59	1.73	7.5		1830	66	24	1	
15		66	46	C	58	1.58	7.4		1850	32	20	0	
16		72	46	C	58	1.75	7.4		60		20	8	
17		74	46	C	58	1.70	7.3		74		20	1	
18		72	44	C	58	1.81	7.4		128		16	1	
19		74	50	C	58	1.78	7.6		78		20	2	
20		78	58	C	58	1.80	7.5		83		16	1	
21		30	62	C	58	1.82	7.4		68		16	4	
22	.02	84	64	R	58	1.90	7.5		181		20	9	
23	.87	70	60	R	58	1.88	7.4		64		16	8	
24	.27	78	60	R	58	1.80	7.3		62		20	8	
25	.69	68	42	R	58	1.97	7.4		72		16	10	
26		62	40	C	58	1.86	7.9		70		16	8	
27	.13	70	38	R	57	1.88	7.6		79		20	10	
28		56	32	C	57	1.81	7.7		96		16	3	
29		62	38	C	57	1.85	7.6		95		20	2	
30	.63	78	46	R	57	1.92	7.5		86		20	3	
31													
ARITH. MEAN	.16	77	55		58	1.88	7.5		967	67	13.7	4	
STAT. MEAN						1.88							

C—Clear CL—Cloudy R—Rain **Indicate Unit
W—Windy CA—Calm S—Snow

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH September 1961 PRIMARY TREATMENT DATA OPERATOR R.J. Swalwell

Date	5-Day BOD Inf. Mg/l	5-Day BOD Inf. lbs x10	5-Day BOD Eff. Mg/l	5-Day BOD Eff. lbs x10	5-Day BOD Rem. %	Suspended Solids Inf. Mg/l	Suspended Solids Inf. lbs x10	Suspended Solids Eff. Mg/l	Suspended Solids Eff. lbs x10	Suspended Solids Rem %	Suspended Volatile Solids Inf. Mg/l	Suspended Volatile Solids Inf. lbs x10	Suspended Volatile Solids Eff. Mg/l	Suspended Volatile Solids Eff. lbs x10	Receiving Stream Data: Temp.	Above D.O.	Above B.O.D.	Below D.O.	Below B.O.D
1	49	74	49	74	0	68	103	59	89	13	58	87	47	71					
2	61	101	61	101	0	60	99	41	67	32	50	82	35	58					
3	45	68	27	41	40	107	164	28	43	74	96	147	26	40					
4	78	123	61	96	22	147	232	60	94	54	121	191	50	79					
5	55	92	43	72	22	123	207	48	81	61	111	186	47	80					
6	73	126	58	100	21	127	220	64	111	50	90	156	44	76					
7	64	104	55	89	14	76	124	48	78	37	64	104	40	65	70	7.0	.8	7.2	1.6
8	52	86	58	97	-11	58	97	49	81	16	47	78	41	68					
9	92	148	61	98	33	140	225	47	75	66	107	172	42	67					
10	61	94	43	66	30	140	218	30	46	79	122	189	27	42					
11	58	97	61	102	-5	75	126	68	114	9	63	106	57	95					
12	52	85	52	85	0	72	118	40	66	44	60	98	33	54					
13	67	125	85	156	-27	170	310	110	200	35	145	265	79	145	68	6.8	1.4	6.6	1.6
14	58	83	64	92	-10	205	296	65	94	68	135	195	46	66					
15	52	68	46	60	12	86	113	74	98	14	63	83	49	64					
16	64	93	52	76	19	77	112	49	71	36	60	88	40	58					
17	66	94	40	57	40	141	200	35	50	75	130	185	29	41					
18	90	135	55	83	39	170	257	52	78	69	138	208	38	58					
19	67	99	64	95	4	137	204	63	93	54	113	168	42	63	60	8.6	1.8	8.4	1.6
20	52	78	49	73	6	76	114	53	79	30	60	90	37	56					
21	58	88	46	70	21	72	109	46	70	36	62	94	39	59					
22	64	101	40	63	38	68	108	38	60	44	58	92	32	51					
23	61	95	70	110	-15	113	177	60	94	47	96	150	51	80					
24	79	118	43	64	46	187	280	26	39	86	173	260	28	42					
25	67	110	55	90	18	114	187	50	82	56	94	154	39	64					
26	73	113	46	71	37	131	203	33	51	75	117	182	28	44					
27	67	105	52	81	22	76	119	47	73	38	65	102	39	61					
28	67	101	55	83	18	185	279	52	78	71	171	258	45	67	56	8.6	1.0	8.4	1.0
29	64	98	52	80	19	126	194	41	63	68	114	176	34	52					
30	64	102	67	107	-5	61	97	58	93	5	62	99	50	80					
31																			
ARITH. MEAN	64	100	54	84	15	113	176	51	80	48	95	148	41	65	63.5	7.75	1.25	7.65	1.45
STAT. MEAN		100		84			179		78										

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH September 19 61

DIGESTER AND SLUDGE DATA

OPERATOR R. J. Swalwell

Date	Raw Sludge Gals.	Raw Sludge Lbs. Per 1000 c.f. Digester	Raw Sludge pH	Raw Sludge Total Solids %	Raw Sludge Vol. Solids %	Transfer #1 to #2 Gals.	Transfer pH	Transfer Total Solids %	Transfer Vol. Solids %	Transfer Susp. Solids Mg/l	Transfer 5-Day B O D Mg/l	sludge near bottom Total Solids %	sludge near bottom Vol. Solids %	sludge near bottom Vol. Acids Mg/l	pH #1	Temp. °F #1	Gas Produced cu. ft. X 100	Gas Wasted cu. ft. X 100	Remarks
	8.5	30																	
1	1768	32	5.6	9.5	67												65	0	Note – include gallons
2	1105	16	5.7	7.5	67											92	58	0	of sludge to beds
3	1989	33	5.5	8.7	67											96	20	0	
4	1326	22	5.5	8.8	66											93	72	72	
5	1326	18	5.4	7.5	66											92	60	60	
6	1547	23	5.5	7.5	70											90	51	51	
7	1105	16	5.6	7.3	69											88	58	0	
8	1105	20	5.6	8.8	72	14807	6.9	2.2	58						6.9	94	48	28	
9	1105	21	5.5	9.8	68											92	36	24	
10	1105	18	5.6	8.3	70											92	78	64	
11	1989	45	5.1	8.9	90											92	52	52	
12	1326	22	5.5	8.1	72											90	52	52	
13	2210	34	5.1	7.7	71											89	45	45	
14	1326	22	5.6	8.3	72											88	66	0	
15	1326	24	5.4	9.0	71											90	57	0	
16	1326	26	5.5	7.7	72											94	60	0	
17	2652	34	5.7	6.5	70											96	72	0	
18	2652	31	5.4	4.7	90											94	74	0	
19	1326	24	5.6	8.9	71	18122	6.9	2.2	69							94	67	0	
20	1768	30	5.5	8.2	73										6.9	94	70	0	
21	1326	24	5.5	8.6	74											99	36	24	
22	1105	11	5.6	4.9	76											96	75	75	
23	1547	29	5.4	9.2	72											95	56	56	
24	1989	44	5.5	10.4	75											94	47	47	
25	1547	25	5.6	7.9	74											92	63	63	
26	1768	25	5.5	6.9	74											90	58	58	
27	1326	20	5.5	7.2	74											88	56	56	
28	1989	27	5.8	6.5	76										6.9	87	45	0	
29	1326	22	5.7	8.1	74	17017	6.9	2.1	56							90	70	0	
30	1326	20	5.7	7.3	74											94	72	0	
31																			
ARITH. MEAN	1554	25	5.5	8.0	73	16649	6.9	2.2	61						6.9	92	58	28	
STAT. MEAN		25																	

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH September 19 61

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

Date	to ~~xxxxx~~ Beds					Supernatant						sludge near bottom				Temp.	Gas		Remarks
	Gals.	Lbs. Per 1000 c.f. Digester	pH	Total Solids %	Vol. Solids %	Gals.	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l x 10	5-Day B O D Mg/l x10	Total Solids %	Vol. Solids %	Vol. Acids Mg/l	pH #2	°F #2	Produced cu. ft.	Wasted cu. ft.	
1																89			Note — include gallons
2																			of sludge to beds
3																			
4																87			
5																			
6																			
7																			
8						14807	7.0	.31	63	97	41				7.0				
9																86			
10																			
11																			
12																			
13																			
14																			
15																88			
16																			
17																			
18																92			
19	7500		7.0	9.8	51	10622	7.0	.43	64	260	33					95			
20															7.0	98			
21																			
22																			
23																			
24																			
25																			
26																			
27																			
28															7.1				
29						17017	7.1	.34	61	208	24					86			
30																			
31																			
ARITH. MEAN	7500		7.0	9.8	51	14149	7.0	.36	63	188	30				7.0	90			
STAT MEAN																			

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH October 1961 MISCELLANEOUS DATA OPERATOR R.J. Swalwell

Date	Weather: Precip Inches	Weather: Temp. (°F) Max.	Weather: Temp. (°F) Min.	Weather: Type*	Raw Sewage: Temp °F	Raw Sewage: Flow MGD	Raw Sewage: pH	Grit cf/mg	~~XXXXX~~ ~~XXXX~~ water ~~XXXXX~~ cu. ft.	Cl_2 lbs.	Power KWH x10	AUX FUEL ** Gas cu. ft. x 100	Remarks
1		50	34	C	57	1.73	7.5		84		16	3	
2		52	31	C	57	1.86	7.5		91		16	15	* Meter stuck
3	.01	54	34	R	56	1.82	7.7		230		20	10	
4	.01	62	44	R	56	1.77	7.3		100		16	8	
5		72	50	C	57	1.76	7.8		114		20	17	
6		72	46	C	57	1.79	7.7		95		16	3	
7		70	42	C	58	1.74	7.7		85		20	5	
8		70	48	C	58	1.65	7.6		83		16	8	
9		76	56	C	58	1.85	8.6		121		16	7	
10		80	56	C	58	1.86	7.8		148		20	15	
11	.01	74	48	R	58	1.79	7.8		105		16	10	
12	.18	72	50	R	58	1.78	7.6		95		20	4	
13	.23	64	36	R	58	1.75	7.7		223		16	10	
14		48	32	CL	57	1.69	7.6		88		20	8	
15		60	32	CL	57	1.62	7.5		87		16	8	
16		58	34	C	57	1.73	7.6		94		20	2	
17		72	48	C	56	1.72	7.7		91		16	1	
18		70	46	C	56	1.69	7.6		86		16	2	
19	.04	60	40	R	56	1.68	7.7		95		20	4	
20	.01	50	42	R	56	1.71	7.6		83		16	10	
21		46	40	CL	56	1.64	7.6		83		20	10	
22		66	40	C	56	1.62	7.5		83		16	6	
23	.09	62	36	R	56	1.77	7.5		100		16	8	
24	.10	58	38	R	56	1.72	7.5		246		20	10	
25	.31	58	40	R	56	1.76	7.6		97		16	13	
26		48	30	CL	56	1.55	7.7		81		16	17	
27		52	32	C	56	1.39*	7.6		67		20	12	
28	.03	56	46	R	56	1.63	7.5		70		16	10	
29	1.0	64	52	R	56	1.59	7.2		78		16	20	
30	.01	60	44	R	56	1.89	7.4		67		16	14	
31		58	48	C	56	1.65	7.6		78		16	14	
ARITH. MEAN	.07	62	43		57	1.72	7.6		108		17.4	9	
STAT. MEAN						1.72							

C—Clear CL—Cloudy R—Rain **Indicate Unit
W—Windy CA—Calm S—Snow

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH October 1961

PRIMARY TREATMENT DATA

OPERATOR R.J. Swalwell

Date	5 Day B O D Inf Mg/l	5 Day B O D Inf lbs x10	5 Day B O D Eff Mg/l	5 Day B O D Eff lbs x10	5 Day B O D Rem %	Suspended Solids Inf Mg/l	Suspended Solids Inf lbs x10	Suspended Solids Eff Mg/l	Suspended Solids Eff lbs x10	Suspended Solids Rem %	Suspended Volatile Solids Inf Mg/l	Suspended Volatile Solids Inf lbs x10	Suspended Volatile Solids Eff Mg/l	Suspended Volatile Solids Eff lbs x10	Receiving Stream Data: Temp.	Above D.O.	Above B.O.D.	Below D.O.	Below B.O.D
1	67	97	77	111	-15	78	112	27	39	65	68	98	24	34					
2	52	80	52	80	0	126	195	64	99	49	115	178	56	86					
3	79	120	52	79	34	80	121	48	73	40	62	94	37	56					
4	73	108	43	63	41	81	119	49	72	40	66	97	37	55					
5	79	116	49	72	38	134	197	50	73	63	122	179	43	64	52	9.4	1.8	9.6	1.6
6	70	104	43	64	39	61	91	34	51	44	51	76	26	39					
7	70	101	61	88	13	128	186	40	58	63	120	174	42	61					
8	85	117	49	68	42	219	310	31	42	86	204	281	29	40					
9	64	98	52	80	19	97	150	43	67	56	89	137	40	62					
10	73	113	64	99	12	145	225	60	93	59	130	202	53	82	59	9.0	1.2	9.0	1.2
11	70	104	52	77	26	75	112	37	55	51	54	80	26	39					
12	55	81	62	92	-11	151	224	54	80	64	135	201	43	64					
13	73	107	49	72	33	86	125	53	77	38	74	108	43	63					
14	67	94	43	61	36	207	291	42	60	80	202	284	40	56					
15	90	121	52	70	42	151	204	32	43	79	128	173	27	36					
16	92	132	49	70	47	160	231	58	83	64	145	209	52	75					
17	98	141	49	70	50	184	264	32	46	83	164	235	25	36					
18	73	103	61	86	16	77	108	58	81	25	69	97	51	72					
19	73	102	58	81	21	127	178	50	70	61	113	159	46	64	54	9.6	1.4	9.0	1.0
20	79	113	49	70	38	97	138	51	73	47	79	113	39	56					
21	85	116	70	95	18	118	162	52	71	56	108	148	45	62					
22	79	107	67	90	18	128	173	34	46	73	120	162	37	50					
23	84	124	67	99	20	254	375	61	90	76	256	378	64	94					
24	79	113	67	96	18	268	384	66	94	75	244	350	63	90					
25	98	144	64	94	35	216	317	57	83	73	191	279	47	69					
26	71	92	54	69	24	115	149	45	58	60	106	137	40	51					
27	77	89	52	60	32	132	153	47	54	64	122	141	36	41					
28	116	158	73	99	37	131	178	48	65	63	112	152	34	46					
29	61	81	58	77	5	120	159	55	72	63	87	115	40	53					
30	78	123	78	123	0	103	163	71	112	31	93	146	63	99					
31	85	117	70	96	18	107	147	65	89	39	87	120	50	69					
ARITH. MEAN	77	112	58	82	25	134	192	49	70	59	118	171	43	60	55	9.3	1.5	9.2	1.3
STAT MEAN		110		82			177		71										

Remarks

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR Marshall, MICHIGAN

MONTH October 1961 — DIGESTER AND SLUDGE DATA — OPERATOR R.J. Swalwell

Date	Raw Sludge Gals.	Raw Sludge Lbs. Per 1000 c.f. Digester	Raw Sludge pH	Raw Sludge Total Solids %	Raw Sludge Vol. Solids %	Transfer ~~Supernat~~ #1 to #2 Gals.	Transfer pH	Transfer Total Solids %	Transfer Vol. Solids %	Transfer Susp. Solids Mg/l	Transfer 5-Day B O D Mg/l	sludge near bottom Total Solids %	sludge near bottom Vol. Solids %	sludge near bottom Vol. Acids Mg/l	sludge near bottom pH	Temp. °F	Gas Produced cu. ft.	Gas Wasted cu. ft.	Remarks
	8.5	50													#1	#1	X 100		
1	1768	21	5.8	5.5	75											92	73	0	Note — include gallons
2	2210	35	5.5	7.2	77											97	83	72	of sludge to beds
3	2210	35	5.6	7.2	78											94	69	69	
4	1768	28	5.7	7.4	76											92	62	62	
5	1326	14	5.7	4.9	77											90	70	0	
6	1326	15	5.6	5.8	70											94	43	0	
7	1326	19	5.7	6.4	79											94	75	38	
8	1989	29	5.7	6.5	78											95	63	37	
9	1547	30	5.3	8.4	83											93	66	66	
10	1768	23	5.4	5.5	83	17680	6.9	.4	50						6.9	92	63	63	
11	1768	31	5.6	8.1	75											90	56	56	
12	1768	23	5.8	6.0	76											88	58	0	
13	1326	14	5.7	4.5	80											94	56	0	
14	1326	23	5.5	8.5	73											97	44	0	
15	1547	21	5.4	6.3	77											94	61	0	
16	1547	22	5.6	6.5	76											94	22	0	
17	2210	35	5.5	7.2	77											93	63	0	
18	2210	30	5.6	6.3	77											93	64	0	
19	2210	39	5.7	8.2	76											93	73	0	
20	1326	21	5.7	7.3	77											99	61	31	
21	1326	17	5.4	5.9	79											97	87	6	
22	1989	22	5.6	5.2	77											95	78	0	
23	1989	30	5.5	6.8	77											100	70	63	
24	1326	18	5.5	6.1	76	21216	7.0	.7	44						7.0	96	64	64	
25	2652	38	5.7	6.4	81											94	53	53	
26	884	7	5.6	3.6	75											90	68	8	
27	1326	19	5.5	6.5	78											96	38	0	
28	1768	28	5.6	6.9	80											98	58	40	
29	1326	21	5.6	6.8	79											94	43	0	
30	1768	26	5.8	6.7	79											96	40	0	
31	1326	15	5.6	5.2	77											96	51	0	
ARITH. MEAN	1682	24	5.6	6.4	77	19448	6.95	.55	47						6.95	94	61	23	
STAT. MEAN		24																	

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH October 1961 — DIGESTER AND SLUDGE DATA — OPERATOR R.J. Swalwell

Date	to ~~Digester~~ Beds							Supernatant		X10	X10	sludge near bottom			Temp.	Gas		Remarks
	Gals.	Lbs. Per 1000 c.f. Digester	pH	Total Solids %	Vol. Solids %	Gals.	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	5-Day B O D Mg/l	Total Solids %	Vol. Solids %	Vol. Acids Mg/l	pH #2	°F #2	Produced cu. ft.	Wasted cu. ft.	
1																90			Note — Include gallons of sludge to beds
2																			
3																			
4																			
5																			
6																			
7																86			
8																			
9																85			
10						17680	7.2	.36	67	142	39				7.2				
11																			
12																			
13																			
14																83			
15																84			
16																89			
17																87			
18																90			
19																94			
20																			
21																88			
22																96			
23																			
24	8840		7.1	11.1	47	12376	7.1	.32	60	230	21				7.1				
25																			
26																			
27																			
28																			
29																			
30																			
31																85			
ARITH. MEAN	8840		7.1	11.1	47	15028	7.15	.34	64	286	30				7.15	88			
STAT. MEAN																			

MICHIGAN DEPARTMENT OF HEALTH

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH November 19 61

MISCELLANEOUS DATA

OPERATOR R.J. Swalwell

Date	Weather Precip Inches	Weather Temp. (°F) Max.	Weather Temp. (°F) Min.	Weather Type*	Raw Sewage Temp. °F	Raw Sewage Flow MGD	pH	Grit cf/mg	~~XXXXX~~ water ~~XXXXX~~ cu. ft.	Cl_2 lbs.	Power KWH X10	AUX. FUEL ** cu. ft. X 100	Remarks
1		56	40	CL	56	1.72	5.6		68		16	12	
2	.10	74	54	R	56	1.78	5.7		76		16	12	
3	.29	58	24	R	57	1.77	5.6		75		16	22	
4		49	30	C	56	1.68	5.6		73		16	18	
5		50	34	CL	56	1.63	5.5		55		16	20	
6		44	30	CL		1.73			309		12	20	
7		44	30	CL		1.72	5.6		181		16	29	
8		38	28	CL	55	1.67	5.4		83		20	25	
9		42	22	C	55	1.68	5.5		84		16	20	
10		42	30	C	55	1.69	5.7		74		16	26	
11		60	32	CL	55	1.66	5.6		74		16	9	
12		52	48	CL	55	1.58	5.7		73		16	7	
13	.25	64	36	R	56	1.76	5.5		85		20	4	
14		44	28	CL	55	1.72	5.5		80		16	6	
15	.41	50	40	R	55	1.74	5.4		77		16	10	
16	.05	62	36	R	55	1.79	5.4		78		16	20	
17		38	22	CL	55	1.68	5.3		104		20	16	
18		38	22	CL	54	1.67	5.7		73		16	17	
19	.04	34	24	S	54	1.63	5.5		276		16	16	
20		38	24	C	54	1.70	5.5		91		16	16	
21	.17	42	28	R	55	1.73	5.3		85		16	15	
22	.21	42	34	R	54	1.84	5.5		80		20	16	
23		46	38	CL	54	1.65	5.7		74		16	11	
24		46	28	CL	54	1.71	5.6		79		16	25	
25		54	34	C	54	1.68	5.4		74		16	8	
26		54	28	C	54	1.66	5.4		76		16	10	
27		34	20	C	54	1.72	5.4		83		20	14	
28		32	18	CL	54	1.71	5.4		85		16	18	
29		40	20	C	54	1.68	5.5		301		16	13	
30		44	24	C	54	1.69	5.4		103		16	14	
31													
ARITH. MEAN	.05	47	30		55	1.70	5.5		104		16.5	16	
STAT. MEAN						1.70							

*C—Clear CL—Cloudy R—Rain **Indicate Unit
W—Windy CA—Calm S—Snow

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH November 19 61

PRIMARY TREATMENT DATA

OPERATOR Robert J. Swalwell

Date	5-Day B O D					Suspended Solids					Suspended Volatile Solids				Receiving Stream Data				
	Inf.		Eff.		Rem.	Inf.		Eff.		Rem.	Inf.		Eff.		Temp.	Remarks			
	Mg/l	lbs. x10	Mg/l	lbs. x10	%	Mg/l	lbs. x10	Mg/l	lbs. x10	%	Mg/l	lbs. x10	Mg/l	lbs. x10		D.O.	B.O.D.	D.O.	B.O.D
1	85	122	73	105	14	84	121	62	89	26	68	97	46	66					
2	73	109	21	31	71	124	184	27	40	78	118	175	30	46					
3	70	103	52	76	26	96	141	45	67	53	77	113	39	58					
4	79	111	46	65	42	104	146	64	89	39	96	134	57	79					
5	85	116	64	87	25	106	144	44	60	59	89	121	36	49					
6																			
7	126	181	52	74	59	158	226	36	51	77	140	201	34	49					
8	77	107	65	90	16	108	151	100	139	7	89	124	78	109					
9	98	137	73	102	26	97	136	52	73	46	84	118	46	65					
10	104	147	64	90	39	105	148	56	78	47	91	128	50	70					
11	79	109	61	84	23	102	141	57	78	44	90	124	48	67					
12	89	117	15	19	83	149	197	12	16	92	129	170	9	12					
13	96	141	40	59	58	102	149	44	65	57	90	132	38	56					
14	66	94	55	79	17	80	115	44	63	45	70	100	37	53	48	9.0	1.2	9.2	2.2
15	77	112	67	97	13	148	215	62	90	58	126	183	52	75					
16	65	97	55	82	15	116	173	64	95	45	106	158	56	83					
17	67	94	58	81	13	95	133	82	115	14	66	92	50	70					
18	77	107	55	76	29	95	132	52	72	45	89	124	47	66					
19	85	116	30	41	65	173	235	45	61	74	155	210	31	42					
20	96	136	64	90	33	187	265	61	86	68	155	219	48	68					
21	65	93	52	75	20	155	223	56	80	64	132	191	40	58	39	11.0	0	11.0	2.6
22	85	131	58	89	32	100	153	62	95	38	79	121	52	80					
23	93	128	64	88	31	100	138	58	79	42	78	107	51	70					
24	85	121	46	66	46	107	153	50	71	53	92	131	42	60					
25	102	143	61	85	40	181	254	27	38	85	163	228	27	38					
26	69	95	61	84	12	75	104	38	53	49	71	98	36	50					
27	76	109	52	74	32	113	162	43	62	62	93	133	30	43					
28	73	104	58	82	21	87	124	56	79	36	71	101	45	64					
29	65	91	57	80	12	145	203	65	91	56	135	190	56	78					
30	61	86	49	69	20	124	175	75	106	40	102	144	49	69	37	11.4	2.6	11.2	2.4
31																			
ARITH. MEAN	82	116	54	77	32	118	167	53	75	52	102	144	43	62	41	10.5	1.3	10.5	2.4
STAT. MEAN		113		79			153		75										

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

D-4.5
MICHIGAN DEPARTMENT OF HEALTH

MONTH November 19 61 — DIGESTER AND SLUDGE DATA — OPERATOR R.J. Swalwell

Date	Raw Sludge Gals. 8.5	Lbs. Per 1000 c.f. Digester	pH	Total Solids %	Vol. Solids %	Transfer Sludge #1 to #2 Gals.	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	5-Day B O D Mg/l	sludge near bottom Total Solids %	Vol. Solids %	Vol. Acids Mg/l	pH #1	Temp. °F #1	Gas Produced cu. ft. X 100	Wasted cu. ft.	Remarks
1	1768	23	5.6	6.1	76											96	64	24	Note — include gallons
2	1326	18	5.7	6.4	78											94	66	22	* of sludge to beds
3	1326	20	5.6	6.9	77											96	46	20	Gas meter
4	1326	16	5.6	5.8	76											94	*17	17	out of
5	2210	32	5.5	6.7	77											96	*16	16	service.
6	1326	22	5.5	7.4	81											98	*15	15	
7	1326	20	5.6	6.7	81											96	*15	15	
8	2210	39	5.4	7.9	80	19006	7.0	1.2	63						7.0	92	*14	14	
9	2210	37	5.5	7.4	80											96	*13	13	
10	1326	27	5.7	8.0	88											94	*13	13	
11	1326	21	5.6	7.2	80											97	73	13	
12	1768	25	5.7	6.5	78												69	13	
13	1326	19	5.5	6.5	80											98	55	11	
14	1768	27	5.5	6.8	80											94	72	12	
15	1326	20	5.4	6.7	81											97	65	58	
16	1326	24	5.4	8.0	80	15470	7.0	.9	60						7.0	95	46	46	
17	1768	24	5.3	5.5	85											92	76	40	
18	1326	19	5.7	6.5	80											92	32	0	
19	2210	33	5.5	6.7	78											93	35	0	
20	1326	22	5.5	7.3	82											92	63	0	
21	1768	23	5.3	5.6	82											92	53	0	
22	1326	26	5.5	8.6	81											96	59	56	
23	1326	15	5.7	5.0	83											93	83	40	
24	1326	20	5.6	7.0	79											96	59	21	
25	884	14	5.4	7.4	78											96	48	13	
26	2210	27	5.4	5.1	85											94	54	18	
27	1547	22	5.4	6.1	82											94	61	0	
28	1326	20	5.4	6.8	80	17017	7.0	2.3	64						7.0	97	47	0	
29	1326	16	5.5	5.3	82											95	65	0	
30	1105	17	5.4	6.6	84												49	0	
31																			
ARITH. MEAN	1532	23	5.5	6.7	81	17164	7.0	1.5	62						7.0	95	48	17	
STAT. MEAN		22																	

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH November 19 61

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

Date	to ~~[illegible]~~ beds Gals.	Lbs. Per 1000 c.f. Digester	pH	Total Solids %	Vol. Solids %	Supernatant x10 x10 Gals.	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	5-Day B O D Mg/l	sludge near bottom Total Solids %	Vol. Solids %	Vol. Acids Mg/l	pH #2	Temp. °F #2	Gas Produced cu. ft.	Wasted cu. ft.	Remarks
1																			Note — include gallons
2																86			of sludge to beds
3																			
4																			
5																			
6																			
7																			
8						19006	7.0	.31	59	114	45				7.0	85			
9																82			
10																82			
11																82			
12																86			
13																			
14																88			
15																			
16						15470	7.1	.25	58	59	30				7.1				
17																			
18																			
19																			
20																			
21																82			
22																			
23																			
24																			
25																76			
26																78			
27																			
28						17017	7.1	.30	54	71	40				7.1				
29																82			
30																84			
31																			
ARITH. MEAN						17164	7.1	.29	57	71	38				7.1	83			
STAT. MEAN																			

MICHIGAN DEPARTMENT OF HEALTH

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH December 1961

MISCELLANEOUS DATA

OPERATOR R.J. Swalwell

Date	Weather Precip Inches	Weather Temp (°F) Max.	Weather Temp (°F) Min.	Type*	Raw Sewage Temp °F	Raw Sewage Flow MGD	pH	Grit cf/mg	~~XXXXX~~ Water ~~XXXXX~~ cu. ft.	Cl_2 lbs.	Power KWH X10	AUX FUEL Gas** cu. ft. x 100	Remarks
1		46	24	C	54	1.68	7.4		93		20	6	
2		50	26	C	54	1.66	7.3		88		16	6	
3		56	28	CL	54	1.66	7.2		91		16	12	
4	.89	58	30	R	55	1.88	7.2		106		16	13	
5		36	24	CL	54	1.73	7.4		91		16	14	
6	.02	40	26	S	54	1.75	7.3		87		20	20	
7	.06	28	18	S	54	1.71	7.4		87		16	21	
8		30	16	C	53	1.72	7.3		92		20	18	
9	.14	34	24	R&S	53	1.69	7.3		78		16	16	
10		36	26	CL	53	1.68	7.2		74		16	21	
11	.26	40	26	R	53	1.80	7.3		289		16	15	
12	.03	40	14	S	53	1.73	7.2		84		20	22	
13		20	6	CL	53	1.68	7.3		83		16	23	
14		28	10	CL	53	1.67	7.2		81		20	21	
15		26	8	CL	52	1.71	7.3		87		16	20	
16	.18	34	20	R	53	1.74	7.4		87		20	18	
17		34	30	CL	52	1.62	7.3		75		16	18	
18		34	30	CL	52	1.69	7.4		81		16	15	
19	.04	34	28	S	52	1.71	7.3		93		16	16	
20		32	26	CL	52	1.69	7.4		104		20	7	
21		34	26	CL	52	1.69	7.5		121		16	12	
22	.05	34	22	S	52	1.70	7.3		295		20	14	
23	.14	26	20	S	52	1.55	7.2		103		16	21	
24		28	16	CL	52	1.53	7.1		101		16	14	
25		30	18	CL	52	1.54	7.3		107		16	18	
26		34	24	CL	52	1.67	7.4		104		16	16	
27	.01	26	10	S	52	1.69	7.3		112		16	20	
28	.03	18	-4	S	52	1.69	7.5		102		16	20	
29	.01	18	6	S	52	1.68	7.5		107		16	22	
30	.02	20	8	S	52	1.63	7.2		102		16	20	
31		16	2	CL	52	1.61	7.3		92		16	21	
ARITH. MEAN	.06	33	19		53	1.68	7.3		106		17	17	
STAT. MEAN						1.69							

C—Clear CL—Cloudy R—Rain **Indicate Unit

W—Windy CA—Calm S—Snow

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH December 1961

PRIMARY TREATMENT DATA

OPERATOR R.J. Swalwell

Date	5-Day B O D					Suspended Solids					Suspended Volatile Solids				Remarks
	Inf.		Eff.		Rem.	Inf.		Eff.		Rem.	Inf.		Eff.		
	Mg/l	lbs. x10	Mg/l	lbs. x10	%	Mg/l	lbs. x10	Mg/l	lbs. x10	%	Mg/l	lbs. x10	Mg/l	lbs. x10	
1	81	113	49	90	40	97	136	50	70	49	78	109	38	53	
2	134	186	77	106	43	158	218	78	108	51	136	189	66	91	
3	89	123	49	68	45	132	183	41	57	69	121	167	33	46	
4	80	125	82	128	-3	150	235	82	128	45	116	182	57	89	
5	65	93	64	92	2	84	121	63	91	25	74	107	52	75	
6	78	114	40	58	49	112	164	45	66	60	98	143	36	52	
7	65	92	61	87	6	130	186	58	82	55	118	168	50	71	
8	77	110	55	79	29	124	178	75	108	40	111	159	64	92	
9	73	103	58	81	21	117	165	45	64	62	108	152	45	64	
10	69	96	12	17	83	84	118	21	29	75	73	102	21	29	
11	93	140	69	103	26	110	165	63	94	43	49	74	90	135	
12	77	111	52	75	33	76	109	57	82	25	68	98	46	67	
13	65	91	55	77	15	83	116	50	70	40	68	95	41	58	
14	77	107	43	60	44	96	134	41	57	57	84	117	37	52	
15	65	93	55	79	15	71	101	67	95	6	55	78	42	60	
16	69	100	58	84	16	65	94	46	67	29	57	82	38	55	
17	73	99	40	54	45	83	112	32	43	61	77	104	31	42	
18	92	130	27	38	71	105	148	39	55	63	93	131	35	49	
19	69	99	30	43	57	126	180	33	47	74	109	156	30	43	
20	77	109	58	82	25	120	169	71	100	41	107	151	58	82	
21	77	109	67	94	13	147	207	59	83	60	125	176	47	66	
22	73	104	55	78	25	84	119	56	80	33	73	104	44	62	
23	85	110	58	75	32	88	114	30	38	66	88	114	32	41	
24	73	93	43	55	41	68	87	37	47	46	66	84	33	42	
25	58	74	58	74	0	73	94	57	73	22	54	69	39	50	
26	122	170	64	89	48	198	276	62	86	69	166	231	51	71	
27	77	108	55	77	29	182	257	60	85	67	166	234	51	72	
28	61	86	49	69	20	58	82	53	75	9	51	72	45	63	
29	77	108	64	89	17	72	101	56	78	22	60	84	45	63	
30	89	121	64	87	28	91	124	41	56	55	81	110	41	56	
31	73	98	24	32	67	58	78	27	36	53	49	66	20	27	
ARITH. MEAN	78	110	55	75	32	105	147	51	73	47	90	126	44	62	
STAT. MEAN		107		77			145		73						

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH December 19 61 — DIGESTER AND SLUDGE DATA — OPERATOR R.J. Swalwell

Date	Raw Sludge Gals. 8.5	Lbs. Per 1000 c.f. Digester	pH	Total Solids %	Vol. Solids %	Transfer Supernat #1 to #2 Gals.	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	5-Day B O D Mg/l	sludge near bottom Total Solids %	Vol. Solids %	Vol. Acids Mg/l	pH #1	Temp. °F #1	Gas Produced cu. ft. X 100	Wasted cu. ft.	Remarks
1	1326	21	5.5	6.9	83											94	46	0	Note — include gallons
2	1326	18	5.4	5.8	85											96	49	0	of sludge to beds
3	884	8	5.7	4.6	71											97	69	0	
4	1547	23	5.3	6.9	78											94	60	0	
5	2431	39	5.4	7.1	80											94	57	0	
6	1326	23	5.5	7.9	78											97	55	0	
7	1768	28	5.4	6.9	80											95	50	0	
8	1326	24	5.5	7.9	80	17238	6.8	3.7	57						6.8	97	72	0	
9	1326	18	5.5	6.2	78											96	63	0	
10	1326	21	5.2	7.3	78											94	69	0	
11	1326	20	5.4	6.7	78											99	50	0	
12	884	16		8.2	78												54	0	
13	1326	18	5.3	6.2	78										6.8	96	52	0	
14	1547	29	5.2	8.6	78											95	47	0	
15	1547	26	5.3	7.6	79											96	33	0	
16	1547	17	5.5	5.3	76											96	50	0	
17	1326	16	5.6	5.2	81												54	0	
18	1326	22	5.0	7.7	77											96	70	0	
19	1326	21	5.1	7.1	78											101	40	0	
20	1326	27	5.4	9.1	79	15470	6.8	.7	75						6.8	100	44	0	
21	1105	15	5.2	5.6	86											98	64	0	
22	1547	27	5.2	7.5	83											96	53	0	
23	1326	25	5.4	7.7	86											96	45	0	
24	1105	16	5.8	6.0	85											98	42	0	
25	1989	26	5.4	5.4	86											94	36	0	
26	1105	16	5.4	6.0	84											96	53	0	
27	1105	17	5.2	6.5	85											94	47	0	
28	2652	42	4.0	6.7	83											93	28	0	
29	2210	31	5.1	7.0	84											92	56	0	
30	1326	18	6.1	5.2	90											94	73	0	
31	1105	17	5.6	6.0	88											92	52	0	
ARITH. MEAN	1440	22	5.4	6.7	81	16354	6.8	2.2	66						6.8	96	53	0	
STAT. MEAN		22																	

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH December 19 61

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

Date	To ~~Sludge~~ Beds Gals.	Lbs. Per 1000 c f. Digester	pH	Total Solids %	Vol. Solids %	Supernatant x10 Gals.	pH	Total Solids %	Vol Solids %	Susp. Solids Mg/l	5-Day B O D Mg/l	sludge near bottom Total Solids %	Vol. Solids %	Vol. Acids Mg/l	pH #2	Temp. °F #2	Gas Produced cu. ft	Gas Wasted cu. ft.	Remarks
1																87			Note — include gallons
2																			of sludge to beds
3																84			
4																88			
5																89			
6																			
7																			
8						17832	7.0	.60	40	195	200				7.0	87			
9																			
10																90			
11																92			
12																			
13															6.9	90			
14																91			
15																91			
16																			
17																			
18																86			
19																			
20						15470	6.9	.37	63	186	490				6.9	86			
21																88			
22																			
23																			
24																86			
25																			
26																84			
27																84			
28																			
29																80			
30																83			
31																			
ARITH. MEAN						16354	6.95	.48	51	190	345				6.9	87			
STAT MEAN																			

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH January 1963 MISCELLANEOUS DATA OPERATOR Robert J. Swalwell

Date	Weather: Precip Inches	Weather: Temp (°F) Max	Weather: Temp (°F) Min	Type*	Raw Sewage: Temp °F	Raw Sewage: Flow MGD	pH	Grit cf/mg	~~Water~~ Water cu. ft.	Cl₂ lbs	Power KWH x10	AUX FUEL Gas** cu. ft. X 100	Remarks
1		24	8	C	51	1.55	7.6		27		20	15	
2		30	20	C	51	1.72	7.6		430		20	16	
3	.01	36	26	R	51	1.70	7.6		28		16	13	
4		38	28	CL	52	1.70	7.7		18		20	16	
5		34	28	CL	51	1.68	7.7		8		16	15	
6		34	24	CL	51	1.63	7.5		8		20	14	
7	.02	30	24	S	51	1.72	7.6		11		16	28	
8		38	30	CL	51	1.77	7.6		16		20	18	
9		40	32	CL	52	1.68	7.7		26		20	16	
10		34	20	CL	52	1.71	7.7		15		20	18	
11	.26	24	20	S	51	1.67	7.7		30		16	33	
12	.01	30	-4	S	51	1.65	7.6		26		20	27	
13	.01	12	2	S	50	1.59	7.7		4		20	28	
14		14	-5	CL	51	1.68	7.8		360		16	26	
15		10	-10	CL	51	1.67	7.8		48		20	27	
16		12	-4	C	51	1.66	7.7		50		20	22	
17		28	16	CL	51	1.66	7.8		25		20	16	
18	.01	34	8	S	50	1.65	7.7		18		16	17	
19	.29	14	8	S	50	1.64	7.9		26		20	25	
20		10	-10	CL	50	1.61	7.7		20		20	23	
21	.08	18	-10	S	50	1.63	7.8		20		16	22	
22	.05	23	-3	S	50	1.62	7.6		32		20	22	
23	.01	6	-16	S	50	1.64	7.8		28		24	24	
24		3	-5	C	50	1.62	7.8		182		20	23	
25	.05	14	-6	S	49	1.68	7.8		400		20	23	
26	.03	26	6	S	50	1.67	7.7		37		20	23	
27	.01	18	-6	S	50	1.60	7.8		20		20	23	
28		12	-6	C	50	1.63	7.7		27		16	18	
29	.01	26	0	S	49	1.64	7.8		34		20	19	
30	.01	22	2	S	49	1.67	7.7		44		20	18	
31	.01	18	4	S	49	1.66	7.8		33		20	18	
ARITH. MEAN	.028	23	7		50	1.66	7.6		66		19.1	21	
STAT. MEAN			15			1.66							

*C—Clear CL—Cloudy R—Rain **Indicate Unit
W—Windy CA—Calm S—Snow

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH January 1963 PRIMARY TREATMENT DATA OPERATOR Robert J. Swalwell

Date	5-Day BOD Inf. Mg/l	5-Day BOD Inf. lbs x10	5-Day BOD Eff. Mg/l	5-Day BOD Eff. lbs x10	5-Day BOD Rem %	Suspended Solids Inf Mg/l	Suspended Solids Inf lbs x10	Suspended Solids Eff. Mg/l	Suspended Solids Eff. lbs x10	Suspended Solids Rem %	Suspended Volatile Solids Inf. Mg/l	Suspended Volatile Solids Inf. lbs x10	Suspended Volatile Solids Eff. Mg/l	Suspended Volatile Solids Eff. lbs x10	Remarks
1	92	119	63	81	32	104	134	52	67	50	86	111	44	57	Samples used are 24 hr.
2	84	120	57	82	32	122	174	58	83	53	108	154	48	69	composits collected by
3	60	85	48	68	20	109	155	44	62	60	95	135	38	54	automatic samplers. The
4	60	85	48	68	20	71	101	38	54	47	65	92	38	54	effluent samples contain
5	93	130	63	88	32	96	134	46	64	52	88	123	44	62	supernatant while the raw
6	60	82	48	65	20	94	128	45	61	52	75	102	33	45	do not.
7	84	120	64	92	24	162	232	31	44	81	143	204	22	31	
8	69	102	60	89	13	139	206	63	93	55	129	191	58	86	
9	88	123	69	97	22	148	207	32	45	78	127	178	25	35	
10	64	92	33	47	48	94	134	36	51	62	84	120	31	44	
11	76	106	60	83	21	96	133	48	67	50	77	107	36	50	
12	80	110	60	83	25	142	196	42	58	70	132	182	42	58	
13	60	80	42	56	30	98	130	35	47	64	86	114	32	43	
14	84	118	57	80	32	85	119	56	78	34	74	104	54	76	
15	84	117	68	95	19	94	131	71	99	25	78	122	56	78	
16	68	94	63	87	7	91	126	63	87	31	76	105	45	63	
17	84	116	60	83	29	107	148	48	66	55	84	116	43	59	
18	84	116	66	91	21	91	126	60	83	34	71	98	44	61	
19	88	121	67	92	24	98	134	48	66	51	92	126	48	66	
20	84	113	51	68	40	101	135	43	58	57	84	113	33	44	
21	80	109	58	79	28	92	125	55	75	40	74	101	44	60	
22	76	103	68	92	11	107	144	53	72	51	99	134	51	69	
23	88	121	54	74	39	93	127	53	73	43	78	107	45	62	
24	88	119	54	73	39	87	117	63	85	28	68	92	53	72	
25	88	123	63	88	28	174	244	58	81	67	147	206	43	60	
26	80	111	64	89	20	100	139	50	70	50	78	108	34	47	
27	76	101	54	72	30	83	110	34	45	59	77	102	34	45	
28	84	114	66	90	21	131	178	59	80	55	113	154	47	64	
29	72	99	56	77	22	70	96	51	70	27	63	86	48	66	
30	63	88	39	54	36	66	92	43	60	35	56	78	35	49	
31	80	110	54	75	33	129	178	57	79	56	113	156	45	62	
ARITH. MEAN	78	108	58	79	26	106	146	50	68	51	91	126	42	58	
STAT. MEAN		109		80			139		69						

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR Marshall, MICHIGAN

MONTH January 19 63 — DIGESTER AND SLUDGE DATA — OPERATOR Robert J. Swalwell

Date	Raw Sludge Gals.	Lbs. Per 1000 c.f. Digester	pH	Total Solids %	Vol. Solids %	Transfer #1 to #2 Gals.	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	5-Day B O D Mg/l	sludge near bottom Total Solids %	Vol. Solids %	Vol. Acids Mg/l	pH #1	Temp. °F #1	Gas Produced cu. ft. X 100	Gas Wasted cu. ft. X 100	Remarks
1	1326	15	5.7	4.9	79	10166	7.2	1.3	66						7.2	96	43	2	Note — include gallons
2	884	14		6.8	81											91	52	2	of sludge to beds
3	1326	21	5.8	6.9	82												43	1	
4	1326	15	5.9	4.7	83											95	65	65	
5	1326	15	6.1	4.9	83											90	53	8	
6	884	11		5.4	85											94	50	42	
7	1326	8	6.0	2.8	78											92	49	2	
8	1326	15	5.9	4.9	83	12376		.87	68							95	40	28	
9	1326	17	5.9	5.9	78											92	58	4	
10	1768	21		4.9	84											91	42	2	
11	1768	16	6.1	4.6	71											95	46	46	
12	1326	14	5.6	4.4	83											90	61	5	
13	1768	18	6.0	4.0	86											95	51	1	
14	1768	21	5.9	5.2	82											95	46	2	
15	2210	26	6.1	5.2	81											97	46	43	
16	1768	25	6.1	6.3	80	7956	7.0	7.6	55					815	7.0	91	57	0	
17	1768	22	6.0	5.6	78											96	40	1	
18	1326	17	5.8	5.8	76											92	72	1	
19	1326	14		4.7	82											90	58	1	
20	1326	20	5.6	6.5	83											96	65	1	
21	1768	25	6.1	6.1	82											94	55	1	
22	1768	22	6.0	5.8	77											97	62	42	
23	1105	15	5.9	5.8	81	14807	7.0	1.1	67						7.0	94	33	33	
24	884	10	6.2	4.8	83											90	61	0	
25	1768	26	5.9	6.5	81											97	51	0	
26	1326	15		4.9	83											93	54	0	
27	2210	27	6.2	5.4	81											97	53	0	
28	1326	14	5.8	4.7	79											94	45	0	
29	1768	26	6.0	6.5	81												47	0	
30	1326	20	5.9	6.5	81											96	56	35	
31	1768	17	6.4	4.3	81											93	8	8	
ARITH. MEAN	1487	18	6.0	5.3	81	11326	7.1	2.7	62					815	7.1	94	50	12	
STAT. MEAN																			

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

D-4.5
MICHIGAN DEPARTMENT OF HEALTH

MONTH January 1963 — DIGESTER AND SLUDGE DATA — OPERATOR Robert J. Swalwell

Date	Raw Sludge: Gals.	Raw Sludge: Lbs. Per 1000 c.f. Digester	Raw Sludge: pH	Raw Sludge: Total Solids %	Raw Sludge: Vol. Solids %	Supernatant: Gals.	Supernatant: pH	Supernatant: Total Solids %	Supernatant: Vol. Solids %	Supernatant: Susp. Solids Mg/l (x10)	Supernatant: 5-Day B O D Mg/l (x10)	sludge near bottom: Total Solids %	sludge near bottom: Vol. Solids %	sludge near bottom: Vol. Acids Mg/l	pH #2	Temp. °F #2	Gas: Produced cu. ft.	Gas: Wasted cu. ft.	Remarks
1						10166		.35	68	181	69				7.1	67			Note — include gallons
2																70			of sludge to beds
3																74			
4																			
5																			
6																			
7																			
8						12376		.41	68	250	78								
9																			
10																75			
11																			
12																			
13																			
14																			
15																			
16						7956		.38	66	245	81				7.1	64			
17																			
18																66			
19																72			
20																71			
21																74			
22																			
23						14807		.51	71	258	114								
24																			
25																			
26																72			
27																			
28																72			
29																74			
30																			
31																			
ARITH. MEAN						11326		.41	68	234	86				7.1	71			
STAT. MEAN																			

MICHIGAN DEPARTMENT OF HEALTH

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH February 1963 — MISCELLANEOUS DATA — OPERATOR Robert J. Swalwell

Date	Weather: Precip. Inches	Weather: Temp. (°F) Max.	Weather: Temp. (°F) Min.	Type*	Raw Sewage: Temp. °F	Raw Sewage: Flow MGD	Raw Sewage: pH	Grit cf/mg	~~Power~~ ~~KWH~~ water cu. ft.	Cl₂ lbs.	Power KWH X10	AUX. FUEL Gas cu. ft. x 100	Remarks
1	.02	36	16	R	49	1.72	7.8		39		20	18	
2		36	-2	CL	50	1.66	7.8		30		16	20	
3		22	2	CL	49	1.61	7.7		22		16	21	
4		36	12	CL	49	1.71	7.7		276		20	13	
5		38	22	C	49	1.69	7.7		77		16	10	
6		46	26	CL	50	1.71	7.5		43		20	10	
7		30	0	C	50	1.66	7.6		26		20	15	
8		16	6	C	50	1.66	7.8		50		16	26	
9	.01	26	10	S	50	1.67	7.6		59		20	18	
10	.08	32	18	S	49	1.60	7.5		36		16	19	
11		26	2	CL	49	1.70	7.8		45		20	22	
12		26	10	CL	50	1.59	7.7		46		16	13	
13	.03	26	14	S	49	1.67			46		20	21	
14		20	-4	C	50	1.65	7.4		66		20	21	
15		14	-6	C	49	1.66	7.6		42		20	21	
16		28	16	CL	49	1.64	7.6		44		16	21	
17	.01	38	26	S	49	1.62	7.7		344		16	12	
18		44	26	C	49	1.72	7.8		45		20	7	
19	.01	44	24	S	49	1.69	7.9		50		20	10	
20	.07	26	-2	S	49	1.65	7.8		49		20	22	
21		8	-8	CL	48	1.66	7.9		41		16	24	
22		12	6	C	49	1.65	7.9		51		20	24	
23	.11	30	12	S	48	1.65	7.7		45		20	16	
24	.01	22	10	S	48	1.56	7.7		27		16	17	
25		18	-18	C	49	1.67	7.8		45		20	20	
26		12	-6	C	49	1.63	7.9		51		20	29	
27	.12	26	18	S	48	1.67	7.7		333		16	13	
28		26	6	C	48	1.65	7.9		49		20	13	
29													
30													
31													
ARITH. MEAN	.017	27	8		49	1.66	7.7		74		18.4	18	
STAT. MEAN						1.66							

*C—Clear CL—Cloudy R—Rain **Indicate Unit
W—Windy CA—Calm S—Snow

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH February 1963 PRIMARY TREATMENT DATA OPERATOR Robert J. Swalwell

Date	5-Day BOD Inf. Mg/l	5-Day BOD Inf. lbs. x10	5-Day BOD Eff. Mg/l	5-Day BOD Eff. lbs. x10	5-Day BOD Rem %	Suspended Solids Inf Mg/l	Suspended Solids Inf lbs. x10	Suspended Solids Eff Mg/l	Suspended Solids Eff lbs. x10	Suspended Solids Rem %	Suspended Volatile Solids Inf. Mg/l	Suspended Volatile Solids Inf. lbs. x10	Suspended Volatile Solids Eff. Mg/l	Suspended Volatile Solids Eff. lbs. x10
F 1	72	103	60	86	17	86	123	54	77	37	69	99	42	60
SA 2	80	110	48	66	40	102	141	44	61	57	96	132	36	50
SU 3	76	105	57	76	25	103	138	45	60	56	87	117	41	55
M 4	68	97	54	77	21	76	109	43	61	43	65	93	36	51
TU 5	76	107	55	78	28	97	137	85	120	12	78	110	64	90
W 6	76	109	60	86	21	95	136	47	67	51	80	114	36	51
TH 7	108	149	57	79	53	130	179	59	81	55	114	157	55	76
F 8	80	110	60	83	25	92	127	55	76	40	70	97	36	50
SA 9	72	100	52	72	28	84	117	40	56	52	72	100	36	50
SU 10	72	96	57	76	21	119	158	47	63	61	105	140	34	45
M 11	72	102	48	68	33	91	129	37	53	59	79	112	30	43
TU 12	96	128	21	28	78	162	215	32	43	80	139	185	25	33
W 13	76	106	64	89	16	91	126	62	86	32	71	99	53	74
TH 14	80	110	57	79	29	78	108	62	86	21	67	92	56	77
F 15	76	105	60	83	21	70	97	50	69	29	53	73	35	48
SA 16	80	110	72	99	10	134	184	48	66	64	116	159	34	47
SU 17	72	97	42	57	42	101	136	31	42	69	94	127	28	38
M 18	80	114	60	86	25	100	143	56	82	43	79	113	46	66
TU 19	80	113	63	89	21	102	144	62	87	39	71	100	47	66
20	72	99	57	79	21	71	98	48	66	32	63	87	44	61
21	68	94	57	79	16	77	106	63	87	18	59	81	48	66
W 22	76	105	33	46	57	95	131	51	70	46	73	101	34	47
TH 23	76	105	66	91	13	134	185	52	72	61	122	168	52	72
F 24	76	99	63	82	17	65	85	40	52	39	59	77	40	52
SA 25	84	117	63	88	25	128	178	57	79	56	113	157	46	67
SU 26	100	136	63	86	37	160	218	56	76	65	140	190	42	57
M 27	76	106	54	75	29	106	147	58	81	45	94	131	51	71
TU 28	64	88	45	62	30	96	158	43	71	55	80	132	33	54
29														
30														
31														
ARITH. MEAN	78	108	55	76	29	102	141	51	71	47	86	119	41	58
STAT. MEAN		106		78			136		71					

Remarks

Samples used are 24 hr. composits collected by automatic samplers. The effluent samples contain supernatant while the raw do not.

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH February 1963 — DIGESTER AND SLUDGE DATA — OPERATOR Robert J. Swalwell

Date	Raw Sludge Gals.	Raw Sludge Lbs. Per 1000 c.f. Digester	Raw Sludge pH	Raw Sludge Total Solids %	Raw Sludge Vol. Solids %	transfer ~~Supernat~~ #1 to #2 Gals.	transfer pH	transfer Total Solids %	transfer Vol. Solids %	transfer Susp. Solids Mg/l	transfer 5-Day B O D Mg/l	sludge near bottom Total Solids %	sludge near bottom Vol. Solids %	sludge near bottom Vol. Acids Mg/l	pH #1	Temp. °F #1	Gas Produced cu. ft. X 100	Gas Wasted cu. ft. X 100	Remarks
1	1326	19		6.2	80	12376		.96	66							90	45	0	Note — include gallons
2	1326	13	5.8	4.4	81											95	52	0	of sludge to beds
3	1326	20	5.6	6.5	82											92	42	0	
4	884	12	5.8	6.1	80											90	33	0	
5	1326	18	5.8	6.1	80											92	46	0	
6	2210	36	5.8	7.2	80											95	56	0	
7	1326	21	5.9	6.8	81											98	60	0	
8	1326	14	6.0	5.2	74											94	53	0	
9	1326	15		4.9	81											92	47	0	
10	2210	34		6.8	80											96	48	0	
11	1768	26		6.2	83											93	48	0	
12	1326	20		6.6	79											96	44	0	
13	1326	23		6.9	88											98	40	0	
14	1768	25	6.1	6.2	81	9282		.79	68						7.0	98	51	0	
15	1326	18	5.6	6.1	76											94	47	0	
16	1326	13	5.7	4.3	81											92	47	0	
17	1768	28	5.5	7.1	78											96	51	0	
18	1768	26	6.1	6.4	83											93	51	0	
19	1326	22	6.0	7.3	81											97	51	34	
20	2652	36	6.1	5.9	82											94	51	15	
21	1326	19	6.2	6.2	82											94	42	0	
22	1326	16	6.2	5.2	80	13260		1.4	64							96	61	0	
23	1326	17		5.4	85											94	50	0	
24	1768	28		6.6	84											97	51	0	
25	884	12	6.1	6.1	81											93	48	0	
26	884	8	6.1	3.9	78										6.9	98	43	0	
27	1326	20	6.1	6.6	80	12376		6.2	61							99	47	0	
28	1326	21		7.0	80										7.0	96	41	0	
29																			
30																			
31																			
ARITH. MEAN	1468	21	5.9	6.1	81	11823		2.3	65						7.0	95	48	1.7	
STAT. MEAN		20																	

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR Marshall, MICHIGAN

MONTH February 1963 — DIGESTER AND SLUDGE DATA — OPERATOR Robert J. Swalwell

Date	Raw Sludge: Gals.	Raw Sludge: Lbs. Per 1000 c.f. Digester	Raw Sludge: pH	Raw Sludge: Total Solids %	Raw Sludge: Vol. Solids %	Supernatant: Gals.	Supernatant: pH	Supernatant: Total Solids %	Supernatant: Vol. Solids %	Supernatant: Susp. Solids Mg/l (X10)	Supernatant: 5-Day B O D Mg/l (X10)	sludge near bottom: Total Solids %	sludge near bottom: Vol. Solids %	sludge near bottom: Vol. Acids Mg/l	pH #2	Temp. °F #2	Gas: Produced cu. ft.	Gas: Wasted cu. ft.	Remarks
1						12376		.47	72	183	105								Note — Include gallons
2																			of sludge to beds
3																74			
4																76			
5																			
6																			
7																			
8																74			
9																76			
10																			
11																77			
12																			
13																			
14						9282		.49	69	198	102								
15															7.1	77			
16																78			
17																			
18																78			
19																			
20																			
21																			
22						13260		.46	67	139	78								
23																78			
24																			
25															7.1	78			
26																			
27						12376		.47	71	398	90				7.2				
28																80			
29																			
30																			
31																			
ARITH. MEAN						11823		.47	70	230	94				7.1	77			
STAT. MEAN																			

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH March 1963 MISCELLANEOUS DATA OPERATOR Robert J. Swalwell

Date	Weather Precip. Inches	Weather Temp. (°F) Max.	Weather Temp. (°F) Min.	Type*	Raw Sewage Temp. °F	Raw Sewage Flow MGD	pH	Grit cf/mg	~~Bacteria~~ Water ml. cu. ft.	Cl₂ lbs.	Power KWH x 10	AUX. FUEL Gas cu. ft. x 100	Remarks
1		30	0	C	49	1.63	7.8		39		20	17	* Both 1700 g.p.m. pump motors
2	.06	38	24	S	49	1.65	7.7		36		16	12	kicked out their overload protect-
3		48	32	CL	49	1.62	7.5		19		20	8	ion at 12:30pm. The 750 g.p.m.
4	.10	42	30	R	48	1.77	7.7		35		16	16	pump remained in operation. The
5	.34	38	28	R&S	49	1.80	7.7		47		20	19	flow that the small pump couldn't
6	.03	32	22	S	49	1.78	7.9		41		20	18	handle was bi-passed to the river
7	.06	40	26	S	49	1.80	7.8		25		20	13	until 8am the next morning. No
8	.05	40	20	S	49	1.86	7.8		34		20	15	reason for the overloads kicking
9	.01	38	22	S	49	1.77	7.5		32		16	12	out could be found.
10		28	18	CL	49	1.72	7.6		25		20	15	
11	.14	38	26	R&S	48	1.84	7.4		212		16	10	
12	.37	50	30	R&S	48	1.79	7.5		31		20	10	
13	.01	36	22	S	49	1.79	7.6		128		20	12	
14		38	16	CL	49	1.79	7.5		33		20	12	
15		42	30	CL	48	1.79	7.6		34		20	8	
16	.04	50	36	R	48	1.82	7.5		30		16	11	
17		44	20	CL	49	*1.30	7.5		20		16	16	
18		42	22	CL	48	1.86	7.6		94		20	7	
19	.85	40	24	R&S	48	1.97	7.4		32		20	19	
20	.01	34	28	S	48	1.94	7.6		66		20	19	
21		34	16	CL	48	1.90	7.6		122		24	19	
22		36	20	C	48	1.96	7.7		169		20	11	
23		56	32	C	48	1.89	7.5		33		20	3	
24		68	46	C	49	1.85	7.6		23		20	1	
25	.13	62	48	R	49	1.97	7.4		40		20	3	
26	.10	52	30	R	49	1.95	7.6		41		20	10	
27		62	34	C	49	1.92	7.4		40		20	3	
28		62	36	C	49	1.93	7.6		38		20	1	
29	.24	78	42	R	49	2.01	7.5		41		20	2	
30		74	38	C	49	1.91	7.4		42		20	5	
31	.02	60	44	R	49	1.83	7.4		29		20	5	
ARITH. MEAN	.082	46	28		49	1.82	7.6		53		19.4	11	
STAT. MEAN						1.83							

*C—Clear CL—Cloudy R—Rain **Indicate Unit
W—Windy CA—Calm S—Snow

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH March 19 63 — PRIMARY TREATMENT DATA — OPERATOR Robert J. Swalwell

Date	5-Day BOD Inf. Mg/l	5-Day BOD Inf. lbs x10	5-Day BOD Eff. Mg/l	5-Day BOD Eff. lbs x10	5-Day BOD Rem. %	Suspended Solids Inf. Mg/l	Suspended Solids Inf. lbs x10	Suspended Solids Eff. Mg/l	Suspended Solids Eff. lbs x10	Suspended Solids Rem %	Suspended Volatile Solids Inf. Mg/l	Suspended Volatile Solids Inf. lbs x10	Suspended Volatile Solids Eff. Mg/l	Suspended Volatile Solids Eff. lbs x10	Remarks
1	76	103	54	73	29	84	114	49	67	41	65	88	35	48	Samples used are 24 hr.
2	84	116	60	83	29	132	182	56	77	58	116	160	56	77	composits collected by
3	76	103	57	77	25	96	130	43	58	55	83	112	35	47	automatic samplers. The
4	72	107	57	84	21	150	222	58	86	61	121	179	44	65	effluent samples contain
5	66	99	45	68	32	84	126	52	78	38	61	92	40	60	supernatant while the raw
6	68	101	63	93	7	138	204	40	59	65	124	184	33	49	do not.
7	84	126	48	72	43	100	150	57	86	43	86	129	40	60	
8	63	98	51	79	19	89	138	74	115	17	65	101	57	88	
9	76	112	60	89	22	116	172	58	86	50	94	139	46	68	
10	92	132	51	73	45	119	170	47	67	61	97	139	36	51	
11	60	92	51	78	15	79	121	54	83	32	66	101	42	64	
12	96	143	24	36	75	112	167	28	42	75	89	133	22	33	
13	68	101	48	72	29	94	140	55	82	42	76	113	41	61	
14	76	113	45	67	41	131	195	44	66	66	103	153	32	48	
15	63	94	51	76	19	66	98	52	77	21	45	67	34	51	
16	72	109	60	91	17	100	152	52	79	48	74	112	42	64	
17	52	56	52	56	0	71	77	40	43	44	63	68	37	40	
18	72	112	54	84	25	90	140	49	76	46	70	109	37	57	
19	80	131	54	89	33	122	200	66	108	46	75	123	46	75	
20	63	102	48	78	24	79	128	53	86	33	61	99	42	68	
21	68	107	27	43	60	94	149	54	85	43	69	109	46	73	
22	72	117	60	98	18	72	117	58	95	19	55	90	43	70	
23	64	101	48	76	25	98	155	48	76	51	92	145	40	63	
24	64	99	48	74	25	108	166	33	51	69	94	145	29	45	
25	64	105	51	84	20	124	203	50	82	60	103	169	38	62	
26	68	111	54	88	21	77	126	49	80	36	65	106	39	64	
27	63	101	45	72	29	81	130	43	69	47	62	99	28	45	
28	72	116	42	68	42	169	272	46	74	73	142	229	33	53	
29	68	114	39	66	43	96	161	43	72	55	73	123	30	50	
30	57	91	42	67	26	114	181	28	45	75	98	156	28	45	
31	63	96	39	60	38	103	158	39	60	62	90	138	28	43	
ARITH. MEAN	70	107	49	75	29	103	156	49	75	49	83	126	38	58	
STAT. MEAN		106		76			154		75						

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR Marshall, MICHIGAN

MONTH March 1963 — DIGESTER AND SLUDGE DATA — OPERATOR Robert J. Swalwell

Date	Raw Sludge Gals.	Lbs. Per 1000 c.f. Digester	pH	Total Solids %	Vol. Solids %	transfer Digester #1 to #2 Gals.	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	5-Day B O D Mg/l	sludge near bottom Total Solids %	Vol. Solids %	Vol. Acids Mg/l	pH #1	Temp. °F #1	Gas Produced cu. ft. X 100	Gas Wasted cu. ft. X 100	Remarks
1	1768	22	6.3	5.4	80											95	52	0	Note — include gallons
2	1326	18	5.9	5.9	80											99	53	0	of sludge to beds
3	1768	16		4.0	81											96	51	0	
4	1768	24	5.9	6.1	80										6.9	94	51	0	
5	2210	32	6.2	6.2	83											97	57	41	
6	1768	21	6.2	5.2	81											94	52	18	
7	1326	17	5.9	5.6	78											96	53	0	
8	1326	13	6.4	4.4	80	17238		.69	68						7.0	98	51	0	
9	1326	18	6.0	5.8	82											94	44	0	
10	2210	30	5.9	6.1	77											93	42	0	
11	2210	26	6.0	5.0	83											94	49	0	
12	1326	23	5.7	7.8	80											96	53	0	
13	884	11	5.8	5.5	83											95	52	0	
14	884	13		6.4	81											94	45	31	
15	1768	19	6.0	4.8	80											92	44	0	
16	1326	13	6.0	4.1	82											96	55	0	
17	1547	15	6.1	4.4	79											94	54	0	
18	1547	45	5.4	12.6	81											97	57	0	
19	1547	20	6.0	5.6	82											100	61	40	
20	1547	26	5.9	7.8	76											97	40	40	
21	1326	21	6.0	7.4	74	15912		1.3	66						6.8	94	55	7	
22	2210	36	5.9	7.4	77											97	71	0	
23	1326	17	5.5	6.2	74											94	61	0	
24	1989	19	5.7	4.5	76											92	67	0	
25	1326	20	5.8	6.9	77											98	59	53	
26	1326	19	6.0	6.9	74	8177		1.8	63							97	53	5	
27	1326	22	5.7	7.8	75											94	60	0	
28	1547	26	5.8	7.6	77												65	0	
29	1105	14	5.7	5.8	78											94	68	0	
30	1547	18	5.6	5.5	76											96	42	33	
31	1547	18	6.0	5.3	78											94	45	30	
ARITH. MEAN	1547	21	5.9	6.1	79	13776		1.3	66						6.9	95	54	9.6	
STAT. MEAN																			

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR Marshall, MICHIGAN

MONTH March 1963 — DIGESTER AND SLUDGE DATA — OPERATOR Robert J. Swalwell

Date	Digested sludge to beds: Gals.	Lbs. Per 1000 c.f. Digester	pH	Total Solids %	Vol. Solids %	Supernatant x 10: Gals.	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	5-Day B O D Mg/l	sludge near bottom: Total Solids %	Vol. Solids %	Vol. Acids Mg/l	pH #2	Temp. °F #2	Gas: Produced cu. ft.	Wasted cu. ft.	Remarks
1																80			Note — include gallons of sludge to beds
2																			
3																82			
4															7.0	84			
5																			
6																			
7																			
8						17238		.48	69	231	84				7.0				
9																84			
10																86			
11																			
12																			
13																82			
14																84			
15																			
16																			
17																84			
18																			
19																			
20																			
21						15912		.48	72	275	71				7.0				
22																			
23																82			
24																88			
25																			
26	8177			9.6	57														
27																87			
28																90			
29																92			
30																95			
31																93			
ARITH. MEAN	8177			9.6	57	16575		.48	70	253	78				7.0	86			
STAT. MEAN																			

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH April 1963 MISCELLANEOUS DATA OPERATOR Robert Swalwell

Date	Weather Precip. Inches	Weather Temp. (°F) Max.	Weather Temp. (°F) Min.	Type*	Raw Sewage Temp. °F	Raw Sewage Flow MGD	pH	Grit cf/mg	~~XXXX~~ water ~~XXXX~~ cu. ft.	Cl₂ lbs.	Power KWH x 10	AUX. FUEL gas cu. ft. x 100	Remarks
1	.50	72	48	R	49	2.05	7.4		377		20	6	
2		80	58	CL	50	2.03	7.5		65		20	4	
3	.08	66	28	R	50	2.00	7.4		40		20	3	
4		42	24	C	49	1.92	7.7		47		20	12	
5		56	32	C	49	1.92	7.8		76		20	6	
6		64	32	C	49	1.87	7.7		56		20	4	
7		56	36	C	49	1.85	7.7		56		16	6	
8	.06	46	28	R	50	1.90	7.8		58		20	15	
9		42	22	C	50	1.88	7.6		53		20	8	
10		46	26	C	49	1.86	7.7		51		16	9	
11		54	28	C	49	1.86	7.8		55		20	6	
12		56	30	C	49	1.88	7.8		392		20	8	
13		54	30	C	49	1.84	7.7		49		20	13	
14		56	26	C	49	1.73	7.6		50		16	13	
15		62	38	C		1.87	7.7		60		20	8	
16	.12	66	48	R	50	1.84	7.8		62		20	10	
17	.09	76	36	R	51	1.87	7.7		45		20	4	
18	.64	64	38	R	50	1.92	7.8		220		16	5	
19	.27	72	42	R	51	1.91	7.8		70		20	12	
20	.03	60	44	R	50	1.86	7.7		48		20	11	
21		56	34	C	50	1.77	7.6		52		20	8	
22	.42	52	30	R	50	1.92	7.7		59		20	12	
23	.02	42	26	R	50	1.88	7.8		53		20	14	
24		52	30	C	50	1.87	7.8		491		24	9	
25		62	36	C	50	1.83	7.6		182		20	3	
26		62	36	CL	50	1.86	7.7		55		20	8	
27		70	42	C	50	1.87	7.6		45		20	9	
28		68	48	C		1.76	7.7		54		20	7	
29	.34	66	44	R	52	1.94	7.6		49		20	8	
30	.08	44	26	R&S	51	1.87	7.7		73		20	19	
31													
ARITH. MEAN	.088	59	35		50	1.88	7.7		101		19.6	8.7	
STAT. MEAN						1.88							

*C—Clear CL—Cloudy R—Rain **Indicate Unit
W—Windy CA—Calm S—Snow

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH April 1963 — PRIMARY TREATMENT DATA — OPERATOR Robert Swalwell

Date	5-Day BOD Inf. Mg/l	5-Day BOD Inf. lbs. x10	5-Day BOD Eff. Mg/l	5-Day BOD Eff. lbs. x10	5-Day BOD Rem. %	Suspended Solids Inf. Mg/l	Suspended Solids Inf. lbs. x10	Suspended Solids Eff. Mg/l	Suspended Solids Eff. lbs. x10	Suspended Solids Rem. %	Suspended Volatile Solids Inf. Mg/l	Suspended Volatile Solids Inf. lbs. x10	Suspended Volatile Solids Eff. Mg/l	Suspended Volatile Solids Eff. lbs. x10	Remarks
M 1	72	123	48	82	33	108	185	57	97	47	80	137	44	75	Samples used are 24 hr.
TU 2	54	91	39	66	28	69	117	41	69	41	51	86	28	47	composits collected by
W 3	51	85	39	65	24	56	94	41	68	27	47	78	36	60	automatic samplers. The
TH 4	60	96	39	62	35	84	134	48	77	43	66	106	32	51	effluent samples contain
F 5	63	101	45	72	29	70	112	50	80	40	59	94	38	61	supernatant while the raw
SA 6	64	100	48	75	25	86	134	40	62	54	74	115	38	59	do not.
SU 7	57	88	39	60	32	67	103	30	46	55	61	94	28	43	
M 8	72	114	51	81	29	68	107	53	84	22	61	96	48	76	
TU 9	63	99	48	75	24	62	97	44	69	29	57	89	40	63	
W 10	68	105	39	60	43	85	132	42	65	51	70	109	34	53	
TH 11	67	104	36	56	46	104	161	57	88	45	85	132	40	62	
F 12	60	110	51	80	15	77	121	56	88	27	59	93	45	71	
SA 13	66	101	51	78	23	112	171	54	83	52	104	159	52	80	
SU 14	72	104	45	65	38	74	107	37	53	50	68	98	30	43	
M 15	72	112	57	89	21	91	142	53	83	42	73	114	43	67	
TU 16	72	110	48	73	33	97	148	53	81	45	75	115	36	55	
W 17	76	119	24	37	68	125	195	35	55	72	110	172	31	48	
TH 18	76	122	48	77	37	132	211	48	77	64	94	150	40	48	
F 19	66	105	45	72	32	74	118	53	84	21	62	99	44	70	
SA 20	72	112	42	65	42	110	171	36	56	67	98	152	34	53	
SU 21	88	130	48	71	46	220	326	36	53	84	207	306	32	47	
M 22	88	141	48	77	46	126	202	62	99	51	103	165	51	82	
TU 23	84	132	48	75	43	122	192	49	77	60	108	170	30	47	
W 24	96	150	48	75	50	119	186	49	76	50	99	154	38	59	
TH 25	76	116	45	69	41	205	314	55	84	73	161	251	31	47	
F 26	80	124	51	79	36	101	157	43	67	57	83	129	37	57	
SA 27	92	144	50	78	46	112	175	56	87	50	100	156	52	81	
SU 28	80	118	45	66	44	100	147	42	62	58	92	135	29	43	
M 29	80	130	80	130	0	88	143	66	107	25	77	125	51	83	
TU 30	92	144	51	80	45	106	165	50	78	53	102	159	50	78	
31															
ARITH. MEAN	73	114	47	73	35	102	159	48	75	49	86	135	38	63	
STAT. MEAN		114		73			151		72						

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

D-4.5
MICHIGAN DEPARTMENT OF HEALTH

MONTH April 19 63 — DIGESTER AND SLUDGE DATA — OPERATOR Robert Swalwell

Date	Raw Sludge Gals.	Raw Sludge Lbs. Per 1000 c.f. Digester	Raw Sludge pH	Raw Sludge Total Solids %	Raw Sludge Vol. Solids %	transfer ~~SUPERNATANT~~ #1 to #2 Gals.	transfer pH	sludge near bottom Total Solids %	sludge near bottom Vol. Solids %	sludge near bottom Susp. Solids Mg/l	sludge near bottom 5-Day B O D Mg/l	sludge near bottom Total Solids %	sludge near bottom Vol. Solids %	sludge near bottom Vol. Acids Mg/l	pH #1	Temp. °F #1	Gas Produced cu. ft. x 100	Gas Wasted cu. ft. x 100	Remarks
1	1326	18	5.9	6.1	76											93	70	30	Note — include gallons
2	1768	24	5.9	6.6	72											96	81	75	of sludge to beds
3	2210	29	5.9	6.1	76											93	65	22	
4	1326	14	5.8	5.2	73											95	66	0	
5	1326	16	6.1	6.0	73	15028		1.3	64						7.2	100	71	11	
6	1768	21	6.1	5.5	77											96	84	0	
7	1547	18	6.0	5.8	73											94	70	64	
8	1326	17	6.2	6.0	76											92	57	18	
9	1989	22	6.2	5.1	78											96	83	31	
10	1326	17	6.3	5.9	75											94	63	9	
11	1326	16	6.3	5.7	76	5746		6.9	59						6.9	98	70	0	
12	1326	15	6.1	4.8	81												66	41	
13	1326	15	6.0	5.0	80											96	50	50	
14	1768	19	6.4	4.6	81											92	85	31	
15	1326	14	6.3	4.8	79											97	50	33	
16	1326	20	6.0	6.7	80											95	73	73	
17	884	12	6.1	5.9	81											93	55	13	
18	1326	14		4.7	79											96	60	39	
19	1326	19	6.1	6.7	77	11050		.63	66						7.0	96	66	21	
20	1326	17		5.6	82											99	64	0	
21	1326	16	6.2	5.4	79											96	52	0	
22	1768	24	6.1	6.1	78											94	57	0	
23	1326	21	6.1	7.3	76											99	58	0	
24	884	11	6.1	5.7	80											97	58	0	
25	1326	19		6.2	81											96	63	0	
26	1768	22	6.1	5.7	79											96	64	59	
27	1326	15	6.1	5.8	78											94	55	55	
28	1105	17	5.8	6.8	78											92	52	52	
29	1326	20	5.9	6.7	79	13481		1.3	62						7.1	91	61	9	
30	1326	15	6.0	4.8	82											91	60	0	
31																			
ARITH. MEAN	1422	18	6.1	5.8	78	11328		2.5	63						7.1	95	64	25	
STAT. MEAN		18																	

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

MICHIGAN DEPARTMENT OF HEALTH

Marshall, MICHIGAN

MONTH April 1963 DIGESTER AND SLUDGE DATA OPERATOR Robert Swalwell

Date	digested ~~[illegible]~~ to beds Gals.	Lbs. Per 1000 c.f. Digester	pH	Total Solids %	Vol. Solids %	Supernatant x10 Gals.	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	x10 5-Day B O D Mg/l	sludge near bottom Total Solids %	Vol. Solids %	Vol. Acids Mg/l	pH #2	Temp. °F #2	Gas Produced cu. ft.	Gas Wasted cu ft.	Remarks
1																			Note — include gallons
2																			of sludge to beds
3																			
4																			
5						15028		.50	70	238	78				7.4				
6																90			
7																98			
8																			
9																			
10																92			
11	5750			8.9	57										7.1				
12																94			
13																			
14																			
15																			
16																			
17																			
18																			
19						11050		.39	69	154	48				7.0				
20																85			
21																88			
22																91			
23																			
24																90			
25																92			
26																95			
27																			
28																			
29						13481		.43	68	187	42				7.1				
30																			
31																			
ARITH. MEAN	5750			8.9	57	13186		.44	69	193	56				7.2	95			
STAT. MEAN																			

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH May 19 63 MISCELLANEOUS DATA OPERATOR Robert Swalwell

Date	Weather Precip. Inches	Weather Temp (°F) Max.	Weather Temp (°F) Min.	Type*	Raw Sewage Temp °F	Raw Sewage Flow MGD	pH	Grit cf/mg	Water cu. ft.	Cl₂ lbs.	Power KWH x10	AUX. FUEL Gas cu. ft. x 100	Remarks
1		62	32	C	50	1.87	7.7		125		20	6	
2		68	42	C	51	1.89	7.7		56		20	2	
3		74	54	CL	51	1.90	7.6		79		20	7	
4	.39	78	46	R	52	1.90	7.5		58		16	9	
5		64	40	C	51	1.84	7.7		39		20	11	
6		68	44	C	52	1.92	7.6		402		20	2	
7		78	60	C	52	1.93	7.6		56		20	3	
8		86	66	CL		1.98	7.5		67		16	5	
9	1.05	86	62	R	53	1.78	7.6		50		16	5	
10	.08	66	36	R	53	1.95	7.7		42		16	5	
11		58	42	C	52	1.84	7.7		55		12	9	
12	.11	64	44	R	51	1.74	7.5		26		12	9	
13		74	50	CL	52	1.91	7.6		55		16	6	
14		62	42	C	51	1.85	7.6		55		16	3	
15		64	46	C	51	1.78	7.6		951	66	12	2	
16		74	50	C	52	1.81	7.7		1207	66	20	1	
17	.67	68	42	R	52	1.82	7.7		989	70	20	5	
18		66	44	CL	52	1.81	7.6		1060	71	20	5	
19	.01	66	42	R	52	1.77	7.6		962	71	20	5	
20		66	44	C	53	1.87	7.7		905	80	20	6	
21	.08	58	36	R&S	52	1.83	7.6		987	78	20	7	
22		49	29	CL	52	1.82	7.8		1055	61	20	12	
23		62	34	C	52	1.78	7.7		1026	63	20	2	
24		72	40	C	52	1.79	7.7		1063	70	20	5	
25		76	42	C	52	1.76	7.7		1040	69	16	7	
26		76	48	C	52	1.72	7.6		1034	59	20	7	
27	.32	66	58	R	54	1.86	8.0		1188	70	20	2	
28	.01	72	52	R	53	1.89	7.6		1050	64	20	2	
29		70	42	CL	54	1.84	7.5		1050	71	20	5	
30		82	46	C	52	1.72	7.6		1010	66	16	8	
31		84	50	C	53	1.55	7.7		1047	71	20	7	
ARITH. MEAN	.09	70	45		52	1.83	7.6		606	69	18.2	5.5	
STAT. MEAN						1.84							

*C—Clear CL—Cloudy R—Rain **Indicate Unit
W—Windy CA—Calm S—Snow

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH May 1963 PRIMARY TREATMENT DATA OPERATOR Robert Swalwell

Date	5-Day BOD Inf Mg/l	5-Day BOD Inf lbs x10	5-Day BOD Eff Mg/l	5-Day BOD Eff lbs x10	5-Day BOD Rem %	Suspended Solids Inf Mg/l	Suspended Solids Inf lbs x10	Suspended Solids Eff Mg/l	Suspended Solids Eff lbs x10	Suspended Solids Rem %	Suspended Volatile Solids Inf Mg/l	Suspended Volatile Solids Inf lbs x10	Suspended Volatile Solids Eff Mg/l	Suspended Volatile Solids Eff lbs x10	Remarks
W 1	76	119	51	80	33	107	167	52	81	51	92	144	43	67	Samples used are 24 hr. composits collected by automatic samplers. The effluent samples contain supernatant while the raw do not.
TH 2	88	139	51	81	42	81	128	41	65	49	72	114	35	55	
F 3	100	158	64	101	36	110	174	48	76	56	96	152	40	63	
SA 4	84	133	60	95	29	108	171	44	70	59	104	164	44	70	
5	80	122	66	101	18	73	112	35	54	52	64	98	31	47	
M 6	88	141	48	77	46	87	139	39	62	55	73	117	34	54	
TU 7	80	129	80	129	0	95	153	73	118	23	81	130	56	90	
W 8	68	112	54	89	21	81	134	47	78	42	75	124	46	76	
TH 9	76	112	54	80	29	132	195	64	95	52	112	166	44	65	
F 10	64	104	51	83	22	82	134	49	80	40	58	95	39	64	
SA 11	84	129	54	83	36	86	132	44	67	49	86	132	44	67	
12	64	93	45	65	30	70	102	35	51	50	70	102	31	45	
M 13	68	108	39	62	43	117	186	47	75	60	100	159	40	64	
TU 14	56	86	45	69	20	84	129	44	68	48	76	117	41	63	
W 15	60	89	45	67	25	80	118	45	67	44	71	105	43	64	
16	57	86	45	68	21	94	142	39	59	59	74	112	28	42	
17	104	158	48	73	54	124	188	51	78	59	113	172	42	64	
18	80	121	54	82	33	78	118	58	88	26	64	97	52	79	
19	45	67	39	58	13	63	93	32	47	49	55	81	28	41	
20	60	94	51	80	15	102	159	64	100	37	80	125	47	73	
21	54	83	42	64	22	108	165	48	73	56	93	142	36	55	
22	51	78	46	70	10	88	134	39	59	56	77	117	33	50	
23	57	84	42	62	26	78	115	50	74	36	60	89	35	52	
24	84	125	45	67	46	70	104	42	63	40	59	88	38	57	
25	56	82	48	71	14	102	150	34	50	67	84	123	26	38	
26	84	120	45	64	48	112	160	37	53	67	98	140	36	51	
27	72	112	60	93	17	105	163	53	82	50	82	127	44	68	
28	68	107	54	85	21	80	126	22	35	73	70	111	19	30	
29	66	101	51	78	23	100	153	43	66	57	89	136	38	58	
30	112	160	64	92	43	112	160	58	83	48	92	132	47	67	
31	84	108	46	59	45	95	123	49	63	48	83	107	39	50	
ARITH MEAN	73	112	51	78	28	94	143	46	70	50	81	123	39	59	
STAT MEAN		112		77			142		70						

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MICHIGAN DEPARTMENT OF HEALTH

MONTH May 1963 — DIGESTER AND SLUDGE DATA — OPERATOR Robert Swalwell

Date	Raw Sludge Gals.	Raw Sludge Lbs. Per 1000 c.f. Digester	Raw Sludge pH	Raw Sludge Total Solids %	Raw Sludge Vol. Solids %	transfer ~~xxxxx~~#1 to #2 Gals.	transfer pH	transfer Total Solids %	transfer Vol. Solids %	transfer Susp. Solids Mg/l	transfer 5-Day B O D Mg/l	sludge near bottom Total Solids %	sludge near bottom Vol. Solids %	sludge near bottom Vol. Acids Mg/l	pH #1	Temp. °F #1	Gas Produced cu. ft. X 100	Gas Wasted cu. ft. X 100	Remarks
1	1326	17	6.2	5.4	81												56	0	Note — include gallons
2	1326	23	5.9	6.8	80											95	53	0	of sludge to beds
3	1326	23	5.7	7.5	81											95	56	40	*Electric
4	1326	23	5.6	6.9	78											95	56	56	wires cut
5	2210	27	5.9	5.3	82											91	67	24	at digester
6	1105	13	5.9	5.0	83											96	53	0	building
7	1105	14	5.9	5.3	83											99	48	31	while re-
8	1105	16		6.3	80											98	60	60	pairing
9	*															95	48	48	broken
10	1326	16	6.0	5.2	84	10608		1.6	61						7.0		38	38	water main.
11	1326	17	6.0	5.8	78												36	36	
12	1326	18	5.8	6.3	77												63	63	
13	*																42	42	
14	*																29	29	
15	*																3	3	
16	2210	30	5.8	6.1	79												49	0	
17	1768	25	6.0	6.6	76											90	47	0	
18	1326	19	5.8	6.5	79											92	59	0	
19	1326	15	6.1	5.2	79											94	63	0	
20	1326	15	6.0	5.2	77											99	50	45	
21	1326	16	6.0	5.6	74	18564		1.2	62						7.2	97	70	22	
22	1547	21	5.9	6.1	78											102	58	0	
23	2431	65	5.7	10.2	93											98	55	0	
24	2652	26	5.8	4.6	76											104	62	41	
25	1768	23	5.9	5.6	81											100	65	65	
26	2210	36	6.0	7.3	79											97	53	53	
27	1768	21	6.1	5.3	79											94	58	12	
28	1768	21	6.0	5.3	80											98	64	0	
29	1326	15	5.9	4.6	85											101	68	45	
30	1326	22	5.9	7.3	80											100	50	50	
31	2210	31	5.7	5.2	96	13702		2.1	61						6.9	98	62	62	
ARITH. MEAN	1596	23	5.9	6.0	81	14291		1.6	61						7.0	97	53	28	
STAT. MEAN		21																	

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH May 1963 DIGESTER AND SLUDGE DATA OPERATOR Robert Swalwell

Date	to ~~XXXXXX~~ beds Gals.	Lbs. Per 1000 c.f. Digester	pH	Total Solids %	Vol. Solids %	Supernatant x10 Gals.	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	x10 5-Day B O D Mg/l	sludge near bottom Total Solids %	Vol. Solids %	Vol. Acids Mg/l	pH #2	Temp. °F #2	Gas Produced cu. ft.	Wasted cu. ft.	Remarks
1																90			Note — include gallons
2																92			of sludge to beds
3																94			
4																			
5																			
6																			
7																			
8																			
9						10608		.38	69	134	48				7.1				
10																			
11																			
12																			
13																			
14																			
15																			
16																			
17																			
18																			
19																			
20																			
21	7956			9.5	43	10608		.32	62	45	36				7.1				
22																			
23																85			
24																			
25																			
26																			
27																			
28																			
29																			
30																			
31						13702		.32	64	42	48				7.5				
ARITH. MEAN	7956			9.5	43	11639		.34	65	76	44				7.2	90			
STAT. MEAN																			

MICHIGAN DEPARTMENT OF HEALTH

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH June 1963 MISCELLANEOUS DATA OPERATOR Robert J. Swalwell

Date	Weather Precip. Inches	Weather Temp. (°F) Max.	Weather Temp. (°F) Min.	Type*	Raw Sewage Temp. °F	Raw Sewage Flow MGD	pH	Grit cf/mg	~~Sludge~~ ~~XXXX~~ water ~~XXXXX~~ cu. ft.	Cl₂ lbs.	Power KWH x 10	AUX. FUEL Gas cu. ft. x 100	Remarks
1		88	58	C	54	1.77	7.7		1010	65	20	8	
2		92	60	C	54	1.75	7.7		1091	63	16	8	
3		92	62	C	55	2.00	7.6		973	75	20	1	
4		90	64	C	54	1.89	7.7		1006	57	20	4	
5		90	64	C	55	1.90	7.6		988	70	20	6	
6	.66	92	66	R	55	1.92	7.8		1025	69	20	5	
7		88	66	CL	56	1.97	7.7		1038	67	24	6	
8	.54	90	62	R	56	1.94	7.6		1022	69	20	5	
9		92	68	CL	55	1.84	7.7		1023	70	20	6	
10	.08	91	47	R	56	1.97	7.6		989	72	20	0	
11		54	44	C	54	1.76	7.7		1006	71	16	0	
12		68	42	C	54	1.80	7.7		1018	74	20	2	
13	.05	72	50	R	54	1.81	7.6		975	77	20	5	
14		70	46	C	54	1.86	7.6		1044	77	20	1	
15		80	48	C	54	1.82	7.5		980	91	20	0	
16		78	48	C	54	1.75	7.6		956	93	20	4	
17		80	50	C	55	1.83	7.6		969	97	20	5	
18		90	62	C	55	1.80	7.6		935	93	16	4	
19	.12	86	58	R	55	1.83	7.6		1137	91	20	6	
20		72	42	C	56	1.76	7.8		925	94	20	6	
21		70	40	C	55	1.78	7.7		939	95	20	6	
22		88	44	C	54	1.75	7.6		955	100	16	5	
23		92	48	C	55	1.64	7.6		950	94	20	5	
24		96	56	C	56	1.85	7.6		960	95	20	6	
25		94	62	C	56	1.84	7.7		996	84	20	2	
26		94	64	C	56	1.83	7.6		989	83	16	4	
27	.20	98	66	R	57	1.81	7.7		1476	95	20	5	
28	.03	96	64	R	57	1.86	7.6		1735	79	20	4	
29		98	64	CL	56	1.86	7.6		1609	106	20	4	
30		98	68	C	56	1.74	7.6		1605	92	20	8	
31													
ARITH. MEAN	.056	86	56		55	1.83	7.6		1077	82	19.5	4.4	
STAT. MEAN						1.83							

*C—Clear CL—Cloudy R—Rain **Indicate Unit
W—Windy CA—Calm S—Snow

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

D-4.1
MICHIGAN DEPARTMENT OF HEALTH

MONTH June 1963

PRIMARY TREATMENT DATA

OPERATOR Robert J. Swalwell

Date	5-Day BOD Inf. Mg/l	5-Day BOD Inf. lbs. x10	5-Day BOD Eff. Mg/l	5-Day BOD Eff. lbs. x10	5-Day BOD Rem. %	Suspended Solids Inf Mg/l	Suspended Solids Inf lbs. x10	Suspended Solids Eff Mg/l	Suspended Solids Eff lbs. x10	Suspended Solids Rem. %	Suspended Volatile Solids Inf. Mg/l	Suspended Volatile Solids Inf. lbs. x10	Suspended Volatile Solids Eff. Mg/l	Suspended Volatile Solids Eff. lbs. x10	Remarks
SA 1	80	118	64	95	20	77	114	52	77	33	62	92	42	62	Samples used are 24 hr.
SU 2	80	117	72	105	10	101	147	54	79	47	83	121	41	60	composits collected by
M 3	88	147	72	120	18	131	219	56	94	57	106	177	47	78	automatic samplers. The
TU 4	88	139	68	107	23	95	150	53	84	44	77	122	42	66	effluent samples contain
W 5	76	120	64	101	16	105	166	55	87	48	88	139	44	70	supernatant while the raw
TH 6	84	134	60	96	29	108	173	48	77	56	85	136	37	59	do not.
F 7	88	144	64	105	27	87	143	41	67	53	80	131	37	61	
SA 8	84	136	80	130	5	87	141	55	89	37	78	126	52	84	
SU 9	76	116	60	92	21	82	125	43	66	48	69	106	39	60	
M 10	72	118	68	112	6	133	218	58	95	56	122	200	55	90	
TU 11	60	103	39	57	35	65	96	42	62	35	51	75	30	44	
W 12	64	96	51	77	20	70	105	40	60	43	58	87	33	50	
TH 13	88	133	72	109	18	114	172	69	104	40	99	149	59	89	
F 14	72	112	63	98	13	72	112	61	95	15	58	90	46	71	
SA 15	72	109	51	78	22	142	216	50	76	65	132	201	50	76	
SU 16	80	111	54	79	33	123	180	43	63	65	104	152	32	47	
M 17	80	122	54	83	33	113	173	43	66	62	90	138	33	50	
TU 18	80	120	68	102	15	102	153	54	81	47	86	129	44	66	
W 19	68	104	60	92	12	79	121	44	67	44	65	99	35	54	
TH 20	72	106	60	88	17	97	143	52	76	46	79	116	38	56	
F 21	78	115	57	84	27	103	152	52	77	50	99	147	44	65	
SA 22	78	114	60	88	23	110	161	24	35	78	92	134	12	18	
SU 23	84	115	60	82	29	164	225	37	51	77	146	200	31	42	
M 24	104	160	71	109	32	120	185	52	80	57	97	149	42	65	
TU 25	84	129	62	95	26	114	174	46	70	60	95	145	34	52	
W 26	81	124	65	99	20	92	141	36	55	61	74	113	27	41	
TH 27	88	133	61	92	31	126	190	38	57	70	113	171	34	51	
28	56	87	50	78	11	71	110	36	56	49	59	91	31	48	
SA 29	84	130	70	109	17	156	242	36	56	77	130	202	28	43	
SU 30	84	122	58	84	31	85	123	35	51	59	76	110	33	48	
31															
ARITH. MEAN	79	121	62	95	22	104	159	47	72	53	88	135	38	59	
STAT. MEAN		122		95			156		72						

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH June 1963 — DIGESTER AND SLUDGE DATA — OPERATOR Robert J. Swalwell

Date	Raw Sludge Gals.	Raw Sludge Lbs. Per 1000 c.f. Digester	Raw Sludge pH	Raw Sludge Total Solids %	Raw Sludge Vol. Solids %	transfer ~~xxxxxx~~ #1 to #2 Gals.	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	5-Day B O D Mg/l	sludge near bottom Total Solids %	Vol. Solids %	Vol. Acids Mg/l	pH #1	Temp. °F #1	Gas Produced cu. ft. X 100	Gas Wasted cu. ft. X 100	Remarks
1	1326	19		6.1	82											95	92	32	Note — include gallons
2	1989	19	6.1	3.9	85											101	37	28	of sludge to beds
3	1547	25	5.6	6.3	91												68	9	
4	1768	25	5.6	6.1	82											96	82	62	
5	1326	18	5.5	5.9	80											96	58	58	
6	1326	15	5.8	4.8	84											94	69	69	
7	884	5		2.4	77	7032		6.7	58							93	65	65	
8	1326	14	5.7	4.7	79											92	38	38	
9	1768	28	5.6	6.8	82											90	85	26	
10	1326	12	5.7	3.9	82											96	63	0	
11	1326	27	5.5	9.3	78											96	64	0	
12	1326	20	5.6	6.5	81											96	72	51	
13	1326	21	5.8	6.7	83											96	55	55	
14	884	14	5.8	7.0	78	17238		.82	68						7.2	94	74	23	
15	1326	20	5.6	6.7	80											102	71	0	
16	1326	15	5.6	5.2	79											100	72	62	
17	1326	17	5.5	5.7	81											98	70	70	
18	1326	21	5.5	6.9	80											96	68	68	
19	1326	20	5.5	6.9	78											93	64	64	
20	1326	21	5.6	7.2	78											92	84	28	
21	884	12	5.5	6.2	78											98	70	21	
22	1326	19	5.4	6.1	80											96	67	16	
23	1326	13	5.6	4.4	81											98	73	65	
24	1326	16	5.6	5.3	78											98	67	67	
25	884	16	5.5	8.2	77	7072		1.8	63						7.1	95	58	18	
26	1326	17	5.6	5.6	79											95	80	71	
27	1326	19	5.6	6.4	81											95	59	59	
28	1326	25	5.3	8.6	78											94	71	58	
29	1326	21	5.4	7.1	81											94	71	65	
30	1326	24	5.4	8.5	76											93	51	44	
31																			
ARITH. MEAN	1326	19	5.6	6.2	80	10447		3.1	63						7.15	96	67	43	
STAT. MEAN		19																	

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

D-4.5
MICHIGAN DEPARTMENT OF HEALTH

MONTH June 19 63

DIGESTER AND SLUDGE DATA

OPERATOR Robert J. Swalwell

Date	Digested ~~Raw~~ sludge to beds: Gals.	Lbs. Per 1000 c.f. Digester	pH	Total Solids %	Vol. Solids %	Supernatant x10: Gals.	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	5-Day B O D Mg/l	sludge near bottom x10: Total Solids %	Vol. Solids %	Vol. Acids Mg/l	pH #2	Temp. °F #2	Gas: Produced cu. ft.	Wasted cu. ft.	Remarks
1																			Note — include gallons
2																82			of sludge to beds
3																90			
4																			
5																			
6																			
7						7032		.36	67										
8																			
9																			
10																			
11																90			
12																94			
13															7.0				
14						17238		.44	71	185	51								
15																92			
16																96			
17																			
18																			
19																			
20																			
21																89			
22																92			
23																95			
24																			
25	4500			10.8	54										7.1				
26																96			
27																			
28																			
29																			
30																			
31																			
ARITH. MEAN	4500			10.8	54	12135		.40	69	185	51				7.05	92			
STAT. MEAN																			

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH July 19 63 MISCELLANEOUS DATA OPERATOR Robert J. Swalwell

Date	Weather: Precip. Inches	Weather: Temp. (°F) Max.	Weather: Temp. (°F) Min.	Type*	Raw Sewage: Temp. °F	Raw Sewage: Flow MGD	pH	Grit cf/mg	water cu. ft.	Cl₂ lbs.	Power KWH x10	AUX. FUEL Gas cu. ft. x 100	Remarks
1		101	70	C	58	1.91	5.7		1930	100	20	7	
2		90	52	C	58	1.83	5.5		1613	93	16	2	
3		76	42	C	56	1.69	5.6		1658	96	20	0	
4		78	46	C	56	1.56	5.9		1617	89	16	5	
5		86	50	C	56	1.69	5.8		1671	89	20	4	
6		92	60	C	56	1.68	5.7		1635	95	20	4	
7		80	48	CL	57	1.60			1639	88	16	5	
8		76	42	C	56	1.67	5.6		1526	101	20	1	
9		74	44	CL	56	1.62			1641	92	16	0	
10		80	50	C	56	1.65			1597	99	16	4	
11		88	58	C	56	1.68	5.7		1612	100	20	5	
12		90	60	CL	57	1.75	5.7		1902	95	20	6	
13	1.25	86	62	R	58	1.82	5.8		1641	88	20	5	
14		82	58	CL	57	1.64	5.7		1518	121	16	7	
15	.05	78	60	R		1.81	5.7		1569	97	20	0	
16	.12	88	64	R	56	1.85	5.5		1591	101	20	3	
17	.21	94	68	R	58	1.90	5.8		1584	102	20	4	
18	.93	92	66	R	58	1.96	5.4		1625	92	20	4	
19	.06	86	66	R	60	1.94	5.7		1573	-64	20	4	
20		82	58	CL	59	1.88	5.5		1639	123	16	5	
21		88	60	CL	59	1.83			1607	81	20	3	
22	.01	86	60	R	58	1.88	5.8		1588	92	20	4	
23		86	60	C	58	1.90	5.6		1915	97	20	4	
24		92	64	C	58	1.88	5.5		1623	96	20	4	
25		94	66	C	58	1.86			1614	91	20	4	
26		94	68	C	59	1.90			1664	96	20	4	
27		90	68	C	60	1.86	5.7		1565	111	20	4	
28	.51	86	66	R	59	1.90			1605	80	16	4	
29		82	56	C	60	1.88			1580	91	20	6	
30		86	62	C	59	1.81			1568	104	20	0	
31	.06	86	60	R	58	1.84	5.5		1613	93	16	0	
ARITH. MEAN	.10	86	59		58	1.80	5.7		1636	95	18.8	3.6	
STAT. MEAN													

*C—Clear CL—Cloudy R—Rain **Indicate Unit
W—Windy CA—Calm S—Snow

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR Marshall, MICHIGAN

MONTH July 1963 PRIMARY TREATMENT DATA OPERATOR Robert J. Swalwell

Date	5-Day BOD Inf. Mg/l	5-Day BOD Inf. lbs x10	5-Day BOD Eff. Mg/l	5-Day BOD Eff. lbs x10	5-Day BOD Rem. %	Suspended Solids Inf Mg/l	Suspended Solids Inf lbs x10	Suspended Solids Eff Mg/l	Suspended Solids Eff lbs x10	Suspended Solids Rem %	Suspended Volatile Solids Inf. Mg/l	Suspended Volatile Solids Inf. lbs x10	Suspended Volatile Solids Eff. Mg/l	Suspended Volatile Solids Eff. lbs x10	Remarks
M 1	92	146	59	94	36	181	288	43	68	76	161	256	35	56	Samples used are 24 hr.
T 2	84	129	52	80	38	96	147	42	64	56	80	122	34	52	composits collected by
W 3	68	96	56	79	18	137	193	39	55	72	112	158	30	42	automatic samplers. The
Th 4	64	83	51	66	20	104	135	52	68	50	82	107	40	52	effluent samples contain
F 5	68	96	57	80	16	100	141	38	54	62	89	125	31	44	supernatant while the raw
S 6	92	129	69	97	25	142	199	40	56	72	124	174	34	48	do not.
7	72	96	58	77	19	76	101	34	45	55	70	93	31	42	
M 8	108	150	68	95	37	164	228	42	58	75	141	196	34	47	
T 9	80	108	58	78	28	112	151	42	57	63	84	113	34	46	
W 10	78	108	72	99	8	134	185	41	57	70	117	161	32	44	
Th 11	88	123	72	101	18	189	265	46	64	76	163	228	34	48	
F 12	72	105	56	82	22	92	134	42	61	54	75	110	35	51	
S 13	64	97	54	97	16	92	140	36	55	61	80	122	32	49	
14	88	121	71	97	19	77	105	45	62	42	65	89	35	48	
15	116	175	63	95	46	124	187	60	91	52	99	149	48	72	
16	116	179	77	119	34	187	287	54	83	71	169	260	45	69	
W 17	64	101	64	101	0	93	147	52	82	44	83	131	36	57	
T 18	88	143	65	106	26	145	236	62	101	57	92	150	42	68	
19	68	110	59	96	13	278	450	44	71	85	248	402	28	45	
20	100	157	73	115	27	96	151	43	68	55	80	126	38	60	
21	60	92	60	92	0	79	121	47	72	41	62	95	38	58	
M 22	81	127	60	94	26	82	129	52	82	37	66	104	42	66	
T 23	104	164	73	115	31	93	147	50	79	46	68	107	34	54	
W 24	66	104	66	104	0	91	143	47	74	48	68	107	33	52	
Th 25	104	161	69	107	34	93	144	49	76	47	74	115	36	56	
26	76	120	65	103	15	94	149	52	82	45	65	103	34	54	
27	104	161	69	107	34	102	158	50	62	61	88	136	38	59	
28	64	101	60	95	6	144	228	45	71	69	105	166	33	52	
M 29	90	141	60	94	33	91	143	36	57	60	72	113	28	44	
T 30	88	133	68	103	23	89	134	50	76	55	66	100	40	60	
W 31	72	110	49	75	32	74	113	44	67	41	65	99	38	58	
ARITH. MEAN	83	125	63	95	23	118	177	45	68	58	97	146	36	53	
STAT. MEAN		122		95			168		68						

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR Marshall, MICHIGAN

MONTH July 1963 — DIGESTER AND SLUDGE DATA — OPERATOR Robert J. Swalwell

Date	Raw Sludge Gals.	Raw Sludge Lbs. Per 1000 c.f. Digester	Raw Sludge pH	Raw Sludge Total Solids %	Raw Sludge Vol. Solids %	transfer ~~XXXXXX~~ #1 to #2 Gals.	transfer pH	transfer Total Solids %	transfer Vol. Solids %	transfer Susp. Solids Mg/l	transfer 5-Day B O D Mg/l	sludge near bottom Total Solids %	sludge near bottom Vol. Solids %	sludge near bottom Vol. Acids Mg/l	pH #1	Temp. °F #1	Gas Produced cu. ft. x 100	Gas Wasted cu. ft. x 100	Remarks
1	1326	21	5.7	6.9	79											93	80	80	Note — include gallons
2	1768	15	5.5	5.5	56											92	56	45	of sludge to beds
3	884	11	5.6	5.9	76											91	52	14	
4	1326	14	5.9	4.6	81											94	65	64	
5	1326	15	5.8	5.2	77	11934		6.5	59						7.1	92	71	71	
6	884	12	5.7	5.6	82											91	63	63	
7	1326	13		4.5	79											90	45	45	
8	1326	22	5.6	6.7	88											89	72	14	
9	1326	19		6.0	83											95	60	0	
10	884	12		6.0	83											100	61	38	
11	884	15	5.7	7.6	79											100	53	53	
12	1326	14	5.7	4.9	78											98	60	60	
13	1768	15	5.8	4.0	74											96	47	47	
14	1547	23	5.7	6.6	81											94	77	17	
15	1105	15	5.7	5.9	80											98	57	0	
16	884	15	5.5	8.9	65											102	48	29	
17	884	8	5.8	5.2	63	10166		.58	68						7.2	102	64	64	
18	1326	18	5.4	7.1	66											100	50	50	
19	1326	15	5.7	5.6	72											98	37	37	
20	1105	17	5.5	7.0	76											97	67	67	
21	1105	9		6.0	49											96	42	42	
22	884	7	5.8	6.0	49											95	48	48	
23	1105	18	5.6	7.4	76	19890		.70	57							93	40	40	
24	884	14	5.5	7.2	77											92	63	63	
25	1326	20		7.0	77											90	50	50	
26	1326	19		6.6	76											89	51	51	
27	1326	16	5.7	5.5	78											89	53	53	
28	1547	15		4.8	70											89	42	42	
29	884	13		7.1	74											88	51	51	
30	1105	16		7.1	74											88	48	1	
31	1768	27	5.5	7.2	74											94	61	0	
ARITH. MEAN	1219	16	5.7	6.2	74	13997		2.6	61						7.15	94	56	42	
STAT. MEAN		15																	

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

D-4.5
MICHIGAN DEPARTMENT OF HEALTH

MONTH July 19 63

DIGESTER AND SLUDGE DATA

OPERATOR Robert J. Swalwell

Date	Digested ~~XXXXXXX~~ to beds Gals.	Lbs. Per 1000 c.f. Digester	pH	Total Solids %	Vol. Solids %	Supernatant Gals.	pH	Total Solids %	Vol. Solids %	x10 Susp. Solids Mg/l	x10 5-Day B O D Mg/l	sludge near bottom Total Solids %	Vol. Solids %	Vol. Acids Mg/l	pH	Temp. °F	Gas Produced cu. ft.	Gas Wasted cu. ft	Remarks
1																			Note — include gallons
2																			of sludge to beds
3																			
4																			
5						11934		.36	68	145	60				7.8				
6																			
7																			
8																			
9																			
10																			
11																			
12																			
13																			
14																			
15																			
16																			
17						10166		.35	69	68	48				7.2				
18																			
19																			
20																			
21																			
22																			
23																			
24	6975			10.6	54	12915		.33	73	87	66								
25																			
26																			
27																			
28																			
29																			
30																			
31																			
ARITH. MEAN	6975			10.6	54	11672		.35	70	100	58				7.5				
STAT. MEAN																			

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH August 1963 — MISCELLANEOUS DATA — OPERATOR Robert J. Swalwell

Date	Weather: Precip. Inches	Weather: Temp. (°F) Max.	Weather: Temp. (°F) Min.	Type*	Raw Sewage: Temp. °F	Raw Sewage: Flow MGD	pH	Grit cf/mg	~~[illegible]~~ water ~~[illegible]~~ cu. ft.	Cl₂ lbs.	Power KWH x10	AUX. FUEL Gas cu. ft. x 100	Remarks
1		86	56	C	59	1.82	7.6		1614	92	20	0	
2	.54	84	62	R	59	1.89	7.6		1630	100	20	0	
3		86	58	CL	60	1.88	7.6		1585	111	20	0	
4		80	52	CL	59	1.68	7.5		1591	81	16	5	
5		84	64	CL	58	1.82			1951	95	20	4	
6		84	66	CL	58	1.84	7.5		1621	89	20	4	
7		86	58	C	58	1.82	7.7		1607	94	16	5	
8		84	62	C	59	1.78	7.8		1612	94	20	5	
9	.56	78	54	R	59	1.85	7.6		1655	96	20	4	
10		82	56	C	59	1.77	7.6		1650	121	16	5	
11		86	54	C	60	1.71	7.6		1572	84	20	5	
12	.04	80	64	R	60	1.78	7.5		1618	102	16	5	
13		70	46	CL	58	1.70	7.5		1668	98	20	5	
14		70	42	C	57	1.77	7.6		1664	100	20	2	
15		74	48	C	57	1.63	7.5		1718	81	20	3	
16		78	60	CL	57	1.62	7.6		2085	90	20	5	
17		66	40	CL	57	1.51	7.6		1696	88	16	6	
18	.01	74	54	R	57	1.49	7.5		1596	136	16	8	
19		74	50	C	58	1.59	7.5		1729	83	20	6	
20		80	54	C	58	1.57	7.6		1792	92	16	5	
21	.01	86	62	R	58	1.59	7.6		1638	85	20	2	
22		88	58	C	59	1.60	7.6		1631	91	16	0	
23	.77	84	62	R	59	1.68	7.5		1643	91	20	0	
24		74	54	CL	59	1.57	7.6		1710	100	20	0	
25		74	48	C		1.50			1605	107	16	0	
26		74	50	C	58	1.60			1600	87	16	0	
27		80	60	CL		1.59	7.6		1660	92	20	6	
28	.08	70	60	R	59	1.63	7.5		2028	92	16	5	
29		78	52	C	58	1.60	7.9		1652	95	20	3	
30		76	50	C	59	1.60	7.6		1728	85	20	4	
31		70	46	C	58	1.49	7.5		1596	98	16	0	
ARITH. MEAN	.065	79	55		58	1.68	7.6		1682	95	18.5	3.3	
STAT. MEAN						1.69							

*C—Clear CL—Cloudy R—Rain **Indicate Unit
W—Windy CA—Calm S—Snow

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH August 1963 — PRIMARY TREATMENT DATA — OPERATOR Robert Swalwell

Date	5-Day BOD Inf. Mg/l	5-Day BOD Inf. lbs x10	5-Day BOD Eff. Mg/l	5-Day BOD Eff. lbs x10	5-Day BOD Rem. %	Suspended Solids Inf. Mg/l	Suspended Solids Inf. lbs x10	Suspended Solids Eff. Mg/l	Suspended Solids Eff. lbs x10	Suspended Solids Rem. %	Suspended Volatile Solids Inf. Mg/l	Suspended Volatile Solids Inf. lbs x10	Suspended Volatile Solids Eff. Mg/l	Suspended Volatile Solids Eff. lbs x10
Th 1	64	97	60	91	6	96	146	47	71	51	82	125	40	61
F 2	76	120	59	93	22	162	256	59	93	64	141	223	45	71
Sa 3	72	113	64	100	11	84	132	28	44	67	72	113	28	44
Su 4	75	105	64	90	15	96	134	47	66	51	83	116	37	52
M 5	92	140	73	111	21	216	328	53	81	76	195	296	44	67
Tu 6	72	110	64	98	11	90	138	46	70	49	82	125	46	70
W 7	67	102	64	97	4	87	132	46	70	47	66	100	34	52
Th 8	73	108	73	108	0	89	132	48	71	46	80	118	46	68
F 9	76	117	57	88	25	100	154	49	75	51	89	137	45	69
Sa 10	100	148	64	95	36	128	189	54	80	58	114	169	43	64
Su 11	68	97	66	94	4	105	150	38	54	64	94	134	35	50
M 12	88	130	69	102	22	88	130	44	65	50	73	108	37	55
Tu 13	80	114	78	111	3	88	125	52	74	41	70	99	35	50
W 14	88	130	71	105	19	116	172	58	86	50	100	148	47	70
Th 15	84	114	73	99	13	270	367	61	83	77	249	339	45	61
F 16	66	89	62	84	6	83	112	52	70	37	70	95	41	82
Sa 17	92	116	64	81	30	108	136	40	50	63	88	111	34	43
Su 18	112	139	80	99	29	96	119	55	68	43	91	113	54	67
M 19	88	117	76	101	14	120	160	62	82	48	113	150	57	76
Tu 20	112	147	76	100	32	113	148	65	85	43	90	118	56	73
W 21	88	117	68	90	23	84	112	67	89	20	69	92	46	61
Th 22	88	117	64	85	27	122	162	54	72	56	100	133	38	51
F 23	116	162	76	106	35	136	190	57	80	58	104	156	43	60
Sa 24	96	126	76	100	21	94	123	66	86	28	80	105	56	73
Su 25	*	*	*	*	*	*	*	*	*	*	*	*	*	*
M 26	112	149	80	106	29	107	142	58	77	46	88	117	48	64
Tu 27	112	149	60	80	46	95	126	52	69	45	79	105	42	56
W 28	80	109	68	92	15	136	185	67	91	51	112	152	51	69
Th 29	72	96	66	88	8	94	125	50	67	47	64	85	39	52
F 30	96	128	63	84	34	93	124	55	73	41	78	104	49	65
Sa 31	84	104	66	82	21	118	146	58	72	51	104	129	58	72
ARITH. MEAN	86	120	68	95	19	114	160	53	74	51	97	137	44	62
STAT. MEAN		118		95			142		74					

Remarks

Samples taken are 24 hr. composits collected by automatic samplers. The effluent samples contain supernatant while the raw do not.

* No samples taken.

MICHIGAN DEPARTMENT OF HEALTH

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH August 1963 — DIGESTER AND SLUDGE DATA — OPERATOR Robert J. Swalwell

Date	Raw Sludge Gals.	Raw Sludge Lbs. Per 1000 c.f. Digester	Raw Sludge pH	Raw Sludge Total Solids %	Raw Sludge Vol. Solids %	transfer ~~Sludge~~ #1 to #2 Gals.	transfer pH	transfer Total Solids %	transfer Vol. Solids %	transfer Susp. Solids Mg/l	transfer 5-Day B O D Mg/l	sludge near bottom Total Solids %	sludge near bottom Vol. Solids %	sludge near bottom Vol. Acids Mg/l	pH #1	Temp. °F #1	Gas Produced cu. ft. X 100	Gas Wasted cu. ft. X 100	Remarks
1	1326	6	5.8	3.0	55											100	53	31	Note — include gallons
2	1326	24		8.5	74	14144		2.1	69							99	73	30	of sludge to beds
3	1326	14	6.0	5.1	75											96	34	0	
4	1768	28		6.7	83												75	75	
5	2210	29		5.6	84											94	57	57	
6	884	10	5.5	5.0	77											92	51	51	
7	1326	23	5.4	7.6	82											90	49	49	
8	1326	18	5.6	5.9	80											89	42	42	
9	1326	21	5.4	7.2	78											88	40	40	
10	884	17	5.3	8.8	76											88	66	66	
11	1768	24	5.6	6.0	81											87	59	59	
12	1326	19	5.5	6.6	77											86	47	47	
13	1326	22	5.3	7.8	75											84	62	62	
14	884	16	5.4	8.0	78											84	51	51	
15	1326	21	5.6	7.0	80											84	52	52	
16	1326	18		6.2	78											84	56	56	
17	1326	19	5.7	6.3	81											83	50	50	
18	1326	19	5.5	6.3	80											83	40	40	
19	1326	17	5.5	5.6	80	13702		1.4	62							82	67	67	
20	1326	20	5.6	6.6	80											82	41	41	
21	1326	21	5.6	7.1	78											81	54	1	
22	1326	17		5.9	78											80	65	0	
23	1326	18	5.6	5.8	81											88	70	0	
24	1326	18	5.7	6.3	78											95	66	0	
25	1326	15	5.5	4.9	79											102	64	0	
26	1105	13	5.5	5.2	82											98	61	0	
27	884	14	5.3	7.1	80											97	71	70	
28	884	13	5.4	6.6	81	9945		1.8	60						7.3	102	69	69	
29	884	14	5.4	6.6	83	5304		8.1	57							100	61	24	
30																97	70	14	
31	1768	19	5.7	5.1	76											96	58	0	
ARITH. MEAN	1304	18	5.5	6.3	78	10774		3.35	62						7.3	90	57	37	
STAT. MEAN		18																	

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR Marshall, MICHIGAN

MONTH August 1963 — DIGESTER AND SLUDGE DATA — OPERATOR Robert Swalwell

Date	Digested ~~XXXXXXXXXXXX~~ to beds: Gals.	Lbs. Per 1000 c.f. Digester	pH	Total Solids %	Vol. Solids %	Supernatant x10: Gals.	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	5-Day B O D Mg/l	x10 sludge near bottom: Total Solids %	Vol. Solids %	Vol. Acids Mg/l	pH #2	Temp. °F #2	Gas: Produced cu. ft.	Wasted cu. ft.	Remarks
1																			Note — include gallons
2						14144		.26	65	106	36								of sludge to beds
3																92			
4																94			
5																			
6																			
7																			
8																			
9																			
10																			
11																			
12																			
13																			
14																			
15																			
16																			
17																			
18																			
19						13702		.28	61	77	21								
20																			
21																			
22																			
23																			
24																			
25																82			
26																86			
27																92			
28						9945		.31	67	47	48				7.7				
29	5250			7.8	56														
30																94			
31																			
ARITH. MEAN	5250			7.8	56	12597		.28	64	77	35				7.7	90			
STAT. MEAN																			

MICHIGAN DEPARTMENT OF HEALTH

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH September 1963 — MISCELLANEOUS DATA — OPERATOR Robert Swalwell

Date	Weather: Precip. Inches	Weather: Temp. (°F) Max.	Weather: Temp. (°F) Min.	Type*	Raw Sewage: Temp. °F	Raw Sewage: Flow MGD	pH	Grit cf/mg	~~XXXX XXXX~~ water ~~XXXXXXX~~ cu.ft.	Cl₂ lbs.	Power KWH x10	AUX. FUEL Gas cu. ft. x 100	Remarks
1		76	52	CL	57	1.48	7.6		1640	83	16	4	
2		72	60	C	57	1.53	7.4		1534	91	20	6	
3		74	54	CL	59	1.64	7.6		1668	93	16	5	
4		70	48	C	58	1.56	7.7		1546	96	20	8	
5		66	40	C	58	1.55	7.7		1561	112	16	4	
6	.01	74	48	R	57	1.57	7.7		1660	87	20	2	
7		78	58	CL	57	1.53	7.6		1622	94	16	2	
8		78	50	C	57	1.48	7.6		1538	118	20	5	
9		84	52	C	60	1.59	7.5		1925	96	16	6	
10		76	52	C	58	1.52	7.6		1640	94	20	8	
11	.14	86	58	R	58	1.58	7.7		1595	93	16	7	
12	.06	73	37	R	58	1.51	7.6		1627	92	20	12	
13		60	36	C		1.46	7.6		1592	104	20	12	
14		70	46	C	57	1.45	7.5		1615	100	16	11	
15		76	52	C	57	1.40	7.6		1566	85	16	9	
16		84	52	C	59	1.52	7.6		74		16	4	
17		84	54	C	58	1.56	7.6		25		20	6	
18		84	58	C	58	1.44	7.5		18		20	6	
19	.14	84	54	R	59	1.58	7.6		246		16	8	
20	.17	64	46	R	58	1.47	7.6		24		16	9	
21	.03	66	46	R	57	1.46	7.6		28		20	10	
22		64	42	C	57	1.38	7.6		7		16	13	
23		62	42	C	58	1.45	7.6		22		16	8	
24		68	44	C	57	1.22	7.6		23		16	9	
25		76	46	C	58	1.43	7.6		30		20	7	
26		76	46	C	58	1.41	7.8		25		16	4	
27		76	54	CL	58	1.48	7.6		25		16	6	
28	.06	68	42	R	58	1.40	7.5		34		16	8	
29		58	36	CL	57	1.32	7.6		11		20	8	
30		68	44	C	58	1.43	7.5		28		16	8	
31													
ARITH. MEAN	.02	73	48		58	1.48	7.6		832	96	17.6	7	
STAT. MEAN						1.48							

*C—Clear CL—Cloudy R—Rain **Indicate Unit
W—Windy CA—Calm S—Snow

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR Marshall, MICHIGAN

MONTH September 1963 — PRIMARY TREATMENT DATA — OPERATOR Robert Swalwell

Date	5-Day BOD Inf. Mg/l	5-Day BOD Inf. lbs x10	5-Day BOD Eff. Mg/l	5-Day BOD Eff. lbs x10	5-Day BOD Rem. %	Suspended Solids Inf. Mg/l	Suspended Solids Inf. lbs x10	Suspended Solids Eff. Mg/l	Suspended Solids Eff. lbs x10	Suspended Solids Rem. %	Suspended Volatile Solids Inf. Mg/l	Suspended Volatile Solids Inf. lbs x10	Suspended Volatile Solids Eff. Mg/l	Suspended Volatile Solids Eff. lbs x10	Remarks
Su 1	72	89	39	48	46	130	160	40	49	69	123	152	40	49	Samples taken are 24 hr. composits collected by automatic samplers. The effluent samples contain supernatant while the raw do not.
M 2	100	128	63	80	37	112	143	49	63	56	99	126	44	56	
Tu 3	80	109	60	82	25	92	126	47	64	49	76	104	40	55	
W 4	80	104	63	82	21	90	117	52	68	42	72	94	41	53	
Th 5	72	93	60	78	17	93	120	52	67	44	80	103	47	61	
F 6	108	111	64	84	41	241	315	76	99	69	220	288	55	72	
Sa 7	80	102	64	82	20	92	117	52	66	44	76	97	42	54	
Su 8	96	118	68	84	29	80	99	46	57	43	68	84	38	47	
M 9	104	138	60	80	42	138	183	50	61	58	116	154	40	53	
Tu 10	80	101	64	81	20	99	126	59	75	40	81	103	48	61	
W 11	80	105	64	84	20	93	123	53	70	43	75	99	38	50	
Th 12	68	86	51	64	25	92	116	42	53	54	75	94	35	44	
F 13	78	95	64	78	18	118	144	44	54	63	98	119	36	44	
Sa 14	84	102	27	33	68	100	121	40	48	60	96	116	40	48	
Su 15	96	112	76	89	21	124	145	56	65	55	104	121	45	53	
M 16	76	96	76	96	0	103	131	55	70	47	80	101	41	52	
Tu 17	108	141	48	62	56	186	242	37	48	80	165	215	25	33	
W 18	80	96	72	86	10	113	136	62	74	45	97	116	51	61	
Th 19	100	132	33	43	67	114	150	42	55	63	94	124	28	37	
F 20	100	123	88	108	12	110	135	94	115	15	88	108	65	80	
Sa 21	104	127	45	55	47	112	136	30	37	73	96	117	26	32	
Su 22	92	106	64	74	30	105	121	40	46	62	90	104	31	36	
M 23	100	121	88	106	12	102	123	76	92	26	89	108	64	77	
Tu 24	100	102	80	81	20	101	103	66	67	35	80	81	52	53	
W 25	96	115	51	61	47	144	172	45	54	69	120	143	34	41	
Th 26	76	89	68	80	15	89	105	61	72	32	73	86	46	54	
F 27	88	109	36	44	59	165	204	48	59	71	148	183	38	47	
Sa 28	108	126	60	70	41	174	203	36	42	79	156	182	36	42	
Su 29	104	115	68	75	35	112	123	47	52	58	97	107	40	44	
M 30	96	115	68	81	29	121	144	62	74	49	108	129	47	56	
31															
ARITH. MEAN	90	110	61	75	31	118	146	52	63	53	101	125	42	52	
STAT. MEAN		109		72			134		62						

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

D-4.5
MICHIGAN DEPARTMENT OF HEALTH

MONTH R September 19 63 — DIGESTER AND SLUDGE DATA — OPERATOR Robert Swalwell

transfer ~~xxxx~~ Supernatant #1 to #2

Date	Raw Sludge Gals.	Raw Sludge Lbs. Per 1000 c.f. Digester	Raw Sludge pH	Raw Sludge Total Solids %	Raw Sludge Vol. Solids %	Supernatant Gals.	Supernatant pH	Supernatant Total Solids %	Supernatant Vol. Solids %	Supernatant Susp. Solids Mg/l	Supernatant 5-Day B O D Mg/l	sludge near bottom Total Solids %	sludge near bottom Vol. Solids %	sludge near bottom Vol. Acids Mg/l	pH #1	Temp. °F #1	Gas Produced cu. ft. x 100	Gas Wasted cu. ft. x 100	Remarks
1	1326	17	5.5	5.6	79											100	49	41	Note — include gallons
2	884	15	5.4	7.5	78											98	71	71	of sludge to beds
3	1105	21	5.3	8.1	83										6.9	96	59	59	
4	1105	16	5.3	6.5	80											94	57	57	
5	1768	28	5.4	6.7	84											92	66	20	
6	1326	24	5.3	8.4	77											98	77	0	
7	1326	24	5.5	7.5	84											104	71	0	
8	1326	17		5.8	81											102	73	63	
9	1105	15	5.5	5.9	80											100	53	53	
10	1105	13	5.8	5.4	78											98	62	62	
11	1326	24	5.5	8.6	75	11492		.91	68						7.1	96	71	71	
12	884	14		7.5	76											94	68	68	
13	884	19	5.4	8.4	89											93	67	67	
14	1326	20	5.5	6.8	80											92	73	27	
15	884	12	5.4	6.0	81											98	57	17	
16	1768	49	5.4	10.8	90											96	65	7	
17	884	13	5.5	7.1	75											102	63	40	
18	884	16	5.5	8.1	78										7.1	102	63	63	
19	1768	29		7.9	75											99	63	63	
20	1326	15		5.3	77	10166		1.2	65							96	48	48	
21	2652	41	5.4	7.5	72											94	92	37	
22	1768	19	5.6	4.9	79											100	75	27	
23	884	8	5.9	3.8	85											97	47	33	
24	1768	23	5.5	5.7	79											97	66	66	
25	1326	15	5.8	5.1	77											94	63	63	
26	884	12	5.6	9.0	54											92	71	0	
27	1326	14	5.9	4.8	78	11492		1.8	63						7.1	102	73	69	
28	1326	22		8.0	75											97	57	57	
29	1326	20		6.7	79											94	92	41	
30	1768	22	5.7	5.4	82											99	61	61	
31																			
ARITH. MEAN	1311	20	5.5	6.0	79	11050		1.3	65						7.1	97	66	45	
STAT. MEAN		19																	

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH September 1963 — DIGESTER AND SLUDGE DATA — OPERATOR Robert Swalwell

Date	Raw Sludge: Gals.	Raw Sludge: Lbs. Per 1000 c.f. Digester	Raw Sludge: pH	Raw Sludge: Total Solids %	Raw Sludge: Vol. Solids %	Supernatant: Gals.	Supernatant: pH	Supernatant: Total Solids %	Supernatant: Vol. Solids %	Supernatant: Susp. Solids Mg/l (x10)	Supernatant: 5-Day B O D Mg/l (x10)	sludge near bottom: Total Solids %	sludge near bottom: Vol. Solids %	sludge near bottom: Vol. Acids Mg/l	pH #2	Temp. °F #2	Gas: Produced cu. ft.	Gas: Wasted cu. ft.	Remarks
1																98			Note — include gallons of sludge to beds
2																			
3															7.1				
4																			
5																			
6																			
7																			
8																96			
9																			
10																			
11						11492	.40	69	92	36					7.2				
12																			
13																			
14																			
15																			
16																90			
17																			
18															7.1				
19																			
20						10166	.39	69		54									
21																			
22																			
23																90			
24																			
25																			
26																			
27						11492	.40	69	308	60					7.2				
28																			
29																			
30																			
31																			
ARITH. MEAN						11050	.40	69	200	50					7.15	94			
STAT. MEAN																			

MICHIGAN DEPARTMENT OF HEALTH

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH October 1963 — MISCELLANEOUS DATA — OPERATOR Robert J. Swalwell

Date	Weather Precip. Inches	Weather Temp (°F) Max.	Weather Temp (°F) Min.	Type*	Raw Sewage Temp °F	Raw Sewage Flow MGD	pH	Grit cf/mg	~~XXXX~~ water ~~XXXX~~ gal. cu. ft.	Cl₂ lbs.	Power KWH	AUX. FUEL Gas ~~oil~~ cu. ft. x 100	Remarks
1		72	50	C	57	1.38	7.6		289		16	8	
2	.01	76	48	R	57	1.42	7.8		30		16	8	
3		64	32	C	57	1.39	7.7		42		20	7	
4		64	34	C	56	1.40	7.6		23		16	8	
5		74	44	C	57	1.38	7.6		12		16	8	
6		86	58	C	57	1.31	7.5		12		20	7	
7		80	42	C	60	1.45	7.6		19		16	7	
8		68	36	CL	57	1.33	7.6		29		16	8	
9		70	40	C	57	1.37	7.6		21		16	7	
10		76	48	C	57	1.39	7.6		186		20	8	
11		74	40	CL	58	1.39	7.6		277		16	8	
12		62	34	C	58	1.31	7.6		25		16	10	
13		66	32	C	57	1.24	7.5		298		20	8	
14		70	36	C	58	1.36	7.5		132		16	8	
15		74	38	C	57	1.33	7.6		14		16	7	
16		80	46	C	57	1.34			53		16	8	
17		78	50	C	57	1.29	7.6		718		20	7	
18	.06	72	54	R	58	1.41	7.5		266		16	9	
19	.37	68	50	R	58	1.36	7.5		18		16	8	
20		70	52	CL	58	1.35	7.5		18		16	6	
21		70	52	CL	58	1.42	7.7		17		16	7	
22		78	50	C	58	1.40	7.6		26		20	6	
23		78	52	C	58	1.40	7.6		338		16	6	
24		78	52	C	58	1.39	7.6		29		16	4	
25		78	48	CL		1.40	7.6		220		16	1	
26		78	52	C	58	1.37	7.5		20		16	1	
27		64	34	CL	57	1.28	7.6		18		20	2	
28	.02	58	34	R	58	1.32	7.6		24		16	2	
29		52	24	C	56	1.29	7.7		20		20	9	
30	.17	54	30	R	56	1.29	7.6		18		16	8	
31	.45	48	40	R	56	1.35	7.8		20		16	15	
ARITH. MEAN	.035	70	43		57	1.36	7.6		104		17	7	
STAT. MEAN						1.36							

*C—Clear CL—Cloudy R—Rain **Indicate Unit
W—Windy CA—Calm S—Snow

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH October 1963 — PRIMARY TREATMENT DATA — OPERATOR Robert J. Swalwell

Date	5-Day BOD Inf. Mg/l	5-Day BOD Inf. lbs x10	5-Day BOD Eff. Mg/l	5-Day BOD Eff. lbs x10	5-Day BOD Rem. %	Suspended Solids Inf Mg/l	Suspended Solids Inf lbs x10	Suspended Solids Eff Mg/l	Suspended Solids Eff lbs x10	Suspended Solids Rem %	Suspended Volatile Solids Inf. Mg/l	Suspended Volatile Solids Inf. lbs x10	Suspended Volatile Solids Eff. Mg/l	Suspended Volatile Solids Eff. lbs x10	Remarks
Tu 1	100	115	24	28	76	107	123	30	35	72	80	92	20	23	Samples taken are 24 hr. composits collected by automatic samplers. The effluent samples contain supernatant while the raw do not.
W 2	88	104	36	43	59	114	135	53	63	54	93	110	40	47	
Th 3	104	121	72	83	31	105	122	61	71	42	89	103	49	57	
F 4	84	98	68	79	19	88	103	61	71	31	67	78	46	54	
Sa 5	116	134	45	52	61	234	269	54	62	77	198	228	38	44	
Su 6	116	121	60	63	48	158	165	48	50	70	146	152	44	46	
M 7	108	131	64	77	41	99	120	64	77	35	79	96	53	64	
Tu 8	112	124	76	84	32	231	256	50	55	78	214	237	38	42	
W 9	64	73	18	21	72	82	94	31	35	62	71	81	23	26	
Th 10	104	121	88	102	15	115	133	74	86	36	106	123	65	75	
F 11	104	121	88	102	15	106	123	82	95	23	92	107	71	82	
Sa 12	96	105	88	96	8	128	140	62	68	52	118	129	56	61	
Su 13	104	108	92	95	12	102	105	66	68	36	86	89	56	58	
M 14	108	122	108	122	0	120	136	82	93	27	100	113	65	74	
Tu 15	104	115	96	106	8	100	111	78	87	22	92	102	68	75	
W 16	96	107	88	98	8	100	112	58	65	42	90	101	53	59	
Th 17	240	258	84	90	65	195	210	61	66	69	161	173	47	51	
F 18	108	127	72	85	33	116	136	36	42	70	97	114	34	40	
S 19	100	113	88	100	12	112	127	55	62	51	102	115	44	50	
20	105	118	68	77	35	102	115	49	55	52	93	105	44	50	
M 21	92	109	76	90	17	98	116	67	79	32	79	94	52	62	
22	90	105	76	89	16	110	128	57	67	48	96	112	47	55	
23	84	98	72	84	14	124	145	52	61	58	107	125	42	49	
24	92	107	88	102	4	106	123	65	75	39	91	105	51	59	
25	90	105	63	74	30	110	128	73	85	34	95	111	57	67	
26	102	117	88	101	14	101	115	63	72	38	87	99	55	63	
27	96	103	76	81	21	103	110	47	50	54	99	106	44	47	
28	102	112	88	97	14	101	111	49	54	52	82	90	38	42	
29	96	103	76	82	21	97	104	66	71	32	76	82	48	52	
30	88	95	68	73	23	95	102	58	62	39	69	74	43	46	
31	96	108	84	95	13	102	115	43	48	58	82	92	33	37	
ARITH. MEAN	103	116	74	83	27	118	133	58	65	48	101	114	47	53	
STAT. MEAN		112		86			123		65						

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

D-4.5
MICHIGAN DEPARTMENT OF HEALTH

MONTH October 1963 — DIGESTER AND SLUDGE DATA — OPERATOR Robert J. Swalwell

Date	Raw Sludge Gals.	Lbs. Per 1000 c.f. Digester	pH	Total Solids %	Vol. Solids %	transfer ~~[illegible]~~ #1 to #2 Gals.	pH	Total Solids %	Vol Solids %	Susp Solids Mg/l	5-Day B O D Mg/l	sludge near bottom Total Solids %	Vol Solids %	Vol Acids Mg/l	pH #1	Temp °F #1	Gas Produced cu ft. x 100	Gas Wasted cu ft x 100	Remarks
1	1326	22	5.6	7.3	80												53	53	Note — include gallons
2	884	16	5.5	7.7	82	6630		1.4	66						7.1	94	80	32	of sludge to beds
3	1326	18	5.7	5.9	80											101	70	16	
4	1326	11	5.9	3.5	84											106	66	11	
5	1326	19	5.6	6.5	79											102	68	13	
6	1326	22	5.5	6.3	81												71	14	
7	1768	26	5.6	6.3	81											100	30	30	
8	1326	20		6.7	81											98	55	55	
9	884	9	5.6	4.7	79											95	67	67	
10																94	48	48	
11	884	11	5.6	5.4	80											94	40	40	
12	1326	15	5.6	4.9	82											92	66	66	
13	1768	30	5.6	7.7	79											89	51	16	
14	1326	17	5.8	5.8	78	12376		1.6	63						7.1	94	53	0	
15	884	10		5.1	77											100	57	0	
16	1547	16		4.6	80											105	65	0	
17	1768	22	5.9	5.2	84												62	0	
18	1768	31		6.8	91												68	0	
19	1326	16	5.8	5.2	81											100	62	53	
20	1768	21	5.8	5.3	80											98	43	43	
21	884	13	5.4	6.6	80											96	45	45	
22	884	13	5.5	6.3	83	9945		8.3	56						7.0	94	60	60	
23	884	14	5.5	7.0	80											93	53	53	
24	663	11	5.6	7.5	78											92	51	14	
25	663	9	5.6	6.0	82											96	50	0	
26	1105	15	5.6	6.3	76											102	53	0	
27	1105	15	5.5	6.2	76											99	54	0	
28	1105	18	5.6	7.1	82											98	51	0	
29	1105	17	5.5	6.6	81											102	54	0	
30	884	19	5.6	9.2	82											106	65	48	
31	884	14	5.7	6.8	81											104	42	42	
ARITH. MEAN	1201	17	5.6	6.2	81	9650		3.8	62						7.1	98	57	26	
STAT. MEAN		17																	

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR Marshall, MICHIGAN

MONTH October 1963 — DIGESTER AND SLUDGE DATA — OPERATOR Robert J. Swalwell

Date	Digested ~~Raw Sludge~~ to beds Gals.	Lbs. Per 1000 c.f. Digester	pH	Total Solids %	Vol. Solids %	Supernatant x10 Gals.	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	5-Day B O D Mg/l	sludge near bottom x10 Total Solids %	Vol. Solids %	Vol. Acids Mg/l	pH #2	Temp. °F #2	Gas Produced cu. ft.	Gas Wasted cu. ft.	Remarks
1																			Note — include gallons
2	6630			9.4	56										7.2				of sludge to beds
3																			
4																			
5																86			
6																90			
7																96			
8																			
9																			
10																			
11																			
12																			
13																			
14						12376		.38	67	169	30				7.1				
15																			
16																			
17																88			
18																96			
19																98			
20																			
21																			
22						9945		.41	69	233	28				7.2	90			
23																			
24																			
25																			
26																88			
27																92			
28																96			
29																			
30																			
31																			
ARITH. MEAN	6630			9.4	56	11160		.40	68	201	29				7.2	92			
STAT. MEAN																			

MICHIGAN DEPARTMENT OF HEALTH

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH November 1963 — MISCELLANEOUS DATA — OPERATOR Robert Swalwell

Date	Weather: Precip. Inches	Weather: Temp. (°F) Max.	Weather: Temp. (°F) Min.	Type*	Raw Sewage: Temp °F	Raw Sewage: Flow MGD	pH	Grit cf/mg	~~XXXX~~ water ~~XXXXXX~~ cu. ft.	Cl₂ lbs.	Power KWH x 10	AUX. FUEL Gas cu. ft. x 100	Remarks
1	.03	48	30	R	56	1.33	7.7		20		20	15	
2	.01	46	24	R&S	56	1.28	7.6		18		16	17	
3		50	30	CL	56	1.25	7.5		25		20	12	
4	.04	50	42	R	58	1.36	7.6		316		16	12	
5	.02	52	44	R	57	1.35	7.7		53		16	9	
6		56	40	CL	57	1.39	7.6		131		20	5	
7		50	36	C	57	1.32	7.7		34		16	6	
8		56	32	C	56	1.37	7.6		31		20	13	
9		60	34	CL	56	1.31	7.7		20		16	13	
10		58	30	CL	56	1.26	7.6		25		16	13	
11	.09	46	34	R	56	1.38	7.6		34		20	14	
12	.07	40	32	R	56	1.33	7.6		26		20	19	
13	.29	42	34	R	56	1.35	7.5		35		16	15	
14		43	33	CL	56	1.34	7.7		380		16	10	
15		50	38	C	56	1.35	7.6		35		16	9	
16		58	46	CL	56	1.31	7.6		21		16	2	
17	.07	64	52	R	56	1.32	7.5		38		16	2	
18		54	30	CL	56	1.36	7.5		35		16	9	
19		52	32	C	56	1.34	7.6		16		16	7	
20	.59	54	42	R	56	1.41	7.6		80		16	11	
21	.01	58	44	R	56	1.39	7.6		20		16	7	
22	.20	60	36	R	56	1.44	7.6		28		20	12	
23		38	22	CL	55	1.34	7.7		29		16	22	
24		40	24	C	54	1.26	7.7		19		16	16	
25		44	28	C	55	1.35	7.6		463		16	10	
26		52	30	C	55	1.37	7.6		34		16	10	
27		46	30	C	55	1.39	7.6		23		16	8	
28		56	34	C	54	1.28	7.6		16		16	10	
29		40	24	C	55	1.34	7.6		29		20	18	
30	.01	36	20	S	54	1.29	7.6		18		16	20	
31													
ARITH. MEAN	.05	50	34		56	1.34	7.6		69		17.1	12	
STAT. MEAN						1.34							

*C—Clear CL—Cloudy R—Rain **Indicate Unit
W—Windy CA—Calm S—Snow

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR Marshall, MICHIGAN

MONTH November 1963 — PRIMARY TREATMENT DATA — OPERATOR Robert Swalwell

Date	5-Day BOD Inf Mg/l	5-Day BOD Inf lbs. x10	5-Day BOD Eff Mg/l	5-Day BOD Eff lbs. x10	5-Day BOD Rem %	Suspended Solids Inf Mg/l	Suspended Solids Inf lbs. x10	Suspended Solids Eff Mg/l	Suspended Solids Eff lbs. x10	Suspended Solids Rem %	Suspended Volatile Solids Inf Mg/l	Suspended Volatile Solids Inf lbs. x10	Suspended Volatile Solids Eff Mg/l	Suspended Volatile Solids Eff lbs. x10
F 1	108	120	48	53	56	99	110	70	78	30	86	95	60	67
Sa 2	108	115	104	111	4	82	88	57	61	31	76	81	57	61
Su 3	162	169	88	92	46	116	121	40	42	66	104	108	37	39
M 4	96	109	88	100	8	105	119	60	68	43	89	101	52	59
Tu 5	126	142	80	90	37	146	164	46	52	69	121	136	37	42
W 6	252	292	80	93	68	320	371	47	54	85	272	315	36	42
Th 7	120	132	88	97	27	101	111	55	61	46	87	96	45	50
F 8	102	117	88	101	14	356	407	65	74	82	335	383	48	55
Sa 9	120	131	100	109	17	97	106	50	55	49	90	98	46	50
Su 10	114	120	33	35	71	107	112	28	29	74	89	94	20	21
M 11	102	117	88	101	14	112	129	83	96	26	92	106	70	74
Tu 12	89	99	89	99	0	93	103	75	83	19	73	81	60	67
W 13	80	90	80	90	0	105	118	52	59	50	89	100	38	43
Th 14	88	98	60	67	18	111	124	78	87	30	95	106	70	78
F 15	102	115	80	90	18	98	110	51	57	48	82	92	42	47
Sa 16	102	110	84	91	18	139	152	57	62	59	127	139	52	57
Su 17	132	145	80	88	39	151	166	48	53	68	127	140	39	43
M 18	92	104	80	91	9	122	138	56	64	54	105	119	43	49
Tu 19	96	107	76	85	21	105	117	56	63	47	92	103	45	50
W 20	80	94	66	78	18	88	103	56	66	36	76	89	51	60
Th 21	108	125	72	83	33	112	130	65	75	42	87	101	52	60
F 22	93	112	68	82	27	153	184	57	68	63	132	159	45	54
Sa 23	96	107	76	85	21	87	97	61	68	30	81	91	55	61
Su 24	96	101	80	84	17	96	101	43	45	55	80	84	35	37
M 25	80	90	68	77	15	102	115	61	69	40	83	93	47	53
Tu 26	84	96	72	82	14	92	105	53	61	42	73	83	38	43
W 27	92	107	84	97	9	85	99	54	63	37	73	85	41	48
Th 28	114	122	80	85	30	85	91	60	64	29	74	79	54	58
F 29	88	98	54	60	39	96	107	56	63	42	77	86	46	51
Sa 30	94	101	72	77	23	90	97	50	54	44	76	82	43	46
31														
ARITH MEAN	107	120	77	86	24	122	137	56	63	48	105	118	47	52
STAT MEAN		112		88			116		63					

Remarks

Samples taken are 24 hr. composits collected by automatic samplers. The effluent samples contain supernatant while the raw do not.

MICHIGAN DEPARTMENT OF HEALTH

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR Marshall, MICHIGAN

MONTH November 1963 — DIGESTER AND SLUDGE DATA — OPERATOR Robert Swalwell

Date	Raw Sludge Gals.	Raw Sludge Lbs. Per 1000 c.f. Digester	Raw Sludge pH	Raw Sludge Total Solids %	Raw Sludge Vol. Solids %	transfer ~~xxxxxx~~ #1 to #2 Gals.	transfer pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	5-Day B O D Mg/l	sludge near bottom Total Solids %	sludge near bottom Vol. Solids %	sludge near bottom Vol. Acids Mg/l	pH #1	Temp. °F #1	Gas Produced cu. ft. x 100	Gas Wasted cu. ft. x 100	Remarks
1	1326	21	5.7	7.0	81	11050		1.3	64						7.1	102	66	66	Note — include gallons
2	1105	9	5.8	3.8	75											98	54	54	of sludge to beds
3	884	9	5.6	4.2	83											96	45	45	* Scum
4	884	13	5.6	6.5	82											94	45	45	pumped
5	1105	18	5.6	7.2	80											92	49	16	with sludge
6	884	12	5.9	5.7	83											96	51	0	
7	1105	16	5.7	6.4	82											100	51	0	
8	663	13	5.6	8.5	81										7.2	104	48	34	
9	884	15	5.5	7.1	83											102	46	46	
10	884	12	5.6	5.8	80											99	50	50	
11	1547	24	5.7	6.7	81											96	42	42	
12	1326	21		7.1	78	12155		1.3	66							94	66	66	
13	884	16	5.4	7.8	80										7.2	92	50	19	
14	1326	16	5.6	5.4	80	7514		.92	68							96	50	0	
15	1105	19	5.6	7.8	79											102	61	0	
16	1105	18		7.1	81											99	55	0	
17	884	13	5.5	6.4	80												53	0	
18	1105	18	5.5	7.5	78											97	53	0	
19	1105	17	5.6	6.6	80											104	56	0	
20	2652	93	5.3	13.5	91												67	52	
21	1768	15	5.7	3.8	77											100	64	64	
22	884	14		7.4	78											96	56	56	
23	1326	20	5.5	6.8	79											94	58	58	
24	1105	21	5.6	8.1	81											91	61	61	
25																	46	0	
26	1105	16	5.6	6.7	79											96	59	0	
27	884	15		7.2	81											102	67	45	
28	1326	22	5.5	7.1	81											100	53	53	
29	1105	16	5.7	6.4	82	11934		1.5	64							96	66	26	
30	1326	21	5.8	6.8	83												76	0	
31																			
ARITH. MEAN	1158	19	5.6	6.8	81	10663		1.3	66						7.2	98	55	30	
STAT. MEAN		17																	

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

D-4.5
MICHIGAN DEPARTMENT OF HEALTH

MONTH November 1963 — DIGESTER AND SLUDGE DATA — OPERATOR Robert Swalwell

Date	Digested ~~Raw Sludge~~ to beds Gals.	Lbs. Per 1000 c.f. Digester	pH	Total Solids %	Vol. Solids %	Supernatant Gals.	pH	Total Solids %	Vol. Solids %	Susp. Solids Mg/l	5-Day B O D Mg/l	sludge near bottom Total Solids %	Vol. Solids %	Vol. Acids Mg/l	pH #2	Temp. °F #2	Gas Produced cu. ft.	Gas Wasted cu. ft.	Remarks
1						11050		.52	71	500	96				7.2				Note — include gallons of sludge to beds
2																			
3																			
4																			
5																			
6																			
7																			
8																			
9															7.2				
10																			
11																			
12																			
13																			
14	7514			10.2	54	12155		.45	69	211	48				7.1				
15																			
16																81			
17																86			
18																90			
19																			
20																90			
21																			
22																			
23																			
24																			
25																			
26																			
27																			
28																			
29						11934		.41	61		69					79			
30																84			
31																			
ARITH. MEAN	7514			10.2	54	11713		.46	67	237	71				7.2	85			
STAT. MEAN																			

MICHIGAN DEPARTMENT OF HEALTH

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH December 1963 MISCELLANEOUS DATA OPERATOR Robert J. Swalwell

Date	Weather: Precip. Inches	Weather: Temp. (°F) Max.	Weather: Temp. (°F) Min.	Type*	Raw Sewage: Temp. °F	Raw Sewage: Flow MGD	pH	Grit cf/mg	water cu. ft.	Cl₂ lbs.	Power KWH x 10	AUX. FUEL Gas cu. ft. x 100	Remarks
1	.02	30	20	S	54	1.26	7.6		36		16	17	
2		32	12	CL	54	1.34	7.6		29		16	15	
3		32	20	C	54	1.33	7.7		22		16	15	
4		30	18	C	54	1.30	7.7		21		16	15	
5		36	24	C	54	1.33	7.7		20		20	21	
6		44	26	C	54	1.33	7.6		387		16	18	
7	.32	52	26	R	54	1.32	7.5		16		16	15	
8	.03	38	22	S	54	1.28	7.6		30		16	18	
9	.04	36	22	S	54	1.33	7.7		28		16	21	
10	.03	32	26	R&S	54	1.32	7.7		22		16	19	
11	.24	32	22	S	54	1.32	7.8		28		20	20	
12		33	13	CL	54	1.29	7.7		26		16	15	
13		22	0	C	53	1.29	7.7		24		16	19	
14	.03	14	4	S	52	1.27	7.7		23		16	37	
15		22	2	C	52	1.22	7.6		17		16	26	
16		24	0	C	54	1.29	7.8		26		16	19	
17	.16	22	12	S	54	1.33	7.8		379		16	21	
18	.02	23	0	S	52	1.28			37		16	20	
19		14	-6	C	52	1.29	7.7		25		16	18	
20	.02	18	0	S	54	1.30	7.6		27		20	20	
21	.01	24	10	S	53	1.24	7.6		24		16	20	
22		32	18	CL	53	1.22	7.8		35		16	17	
23	.01	32	12	S	53	1.33	7.7		24		16	18	
24		30	14	CL	53	1.27			35		16	16	
25		38	16	C		1.16	7.7		14		16	18	
26	.01	38	18	R&S	52	1.36	7.6		23		16	21	
27	.06	30	16	S	54	1.35	7.6		49		16	13	
28	.03	24	12	S	52	1.31	7.6		30		20	34	
29		18	-2	CL	52	1.24	7.7		34		16	23	
30		16	-10	C	52	1.36	7.7		344		16	18	
31		18	-10	C	53	1.35	7.6		26		16	21	
ARITH. MEAN	.033	29	12		53	1.30	7.7		60		16.5	20	
STAT. MEAN						1.30							

*C—Clear CL—Cloudy R—Rain **Indicate Unit

W—Windy CA—Calm S—Snow

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR Marshall, MICHIGAN

MONTH December 1963 — PRIMARY TREATMENT DATA — OPERATOR Robert J. Swalwell

Date	5-Day BOD Inf. Mg/l	5-Day BOD Inf. lbs x10	5-Day BOD Eff. Mg/l	5-Day BOD Eff. lbs x10	5-Day BOD Rem. %	Suspended Solids Inf. Mg/l	Suspended Solids Inf. lbs x10	Suspended Solids Eff. Mg/l	Suspended Solids Eff. lbs x10	Suspended Solids Rem. %	Suspended Volatile Solids Inf. Mg/l	Suspended Volatile Solids Inf. lbs x10	Suspended Volatile Solids Eff. Mg/l	Suspended Volatile Solids Eff. lbs x10
1	96	101	84	88	13	94	99	55	58	42	79	83	45	47
2	84	94	72	80	14	102	114	56	63	45	91	102	46	51
3	84	93	57	63	32	90	100	65	72	28	75	83	55	61
4	108	117	64	69	41	102	111	57	62	44	87	94	47	51
5	102	113	80	89	22	105	116	76	84	28	87	96	62	69
6	88	98	84	93	5	95	105	62	69	35	76	84	44	49
7	132	145	75	83	43	111	122	62	68	44	101	111	52	57
8	84	90	65	69	23	93	99	49	52	47	80	85	40	43
9	102	113	84	93	18	101	112	61	68	40	87	96	50	55
10	88	97	80	88	9	88	97	67	74	24	73	80	49	54
11	84	92	68	75	19	129	142	56	62	57	109	120	48	53
12	88	95	64	69	27	90	97	56	60	38	73	79	43	46
13	96	103	76	82	21	99	107	58	62	41	83	89	49	53
14	88	93	64	68	27	91	96	60	64	34	75	79	56	59
15	93	95	63	64	32	93	95	42	43	55	84	85	37	38
16	102	110	57	61	44	107	115	68	73	36	103	111	46	49
17	114	126	45	50	61	132	146	49	54	63	110	122	39	43
18	88	94	72	77	18	95	101	58	62	39	71	76	42	45
19	102	110	80	86	22	106	114	57	61	46	94	101	50	54
20	114	124	64	69	44	111	120	53	57	52	90	98	43	47
21	132	136	80	83	39	175	181	53	55	70	163	169	49	51
22	80	81	63	64	21	76	77	45	46	41	67	68	38	39
23	114	126	66	73	42	112	124	48	53	57	95	105	41	45
24														
25	60	58	45	44	25	66	64	39	38	41	55	53	33	32
26	96	109	80	91	17	95	108	71	81	25	90	102	65	74
27	96	108	45	51	53	124	140	51	57	59	103	116	39	44
28	88	96	72	79	18	80	87	52	57	35	64	70	33	36
29	88	91	72	74	18	90	93	51	53	43	76	79	40	41
30	96	109	36	41	63	112	127	39	44	65	94	107	30	34
31	96	108	62	70	35	98	110	56	63	43	81	91	44	50
ARITH. MEAN	96	104	67	73	29	102	111	56	61	44	87	94	45	49
STAT. MEAN		104		74			110		61					

Remarks

Samples Taken are 24 hr. composits collected by automatic samplers. The effluent samples contain supernatant while the raw do not.

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

D-4.5
MICHIGAN DEPARTMENT OF HEALTH

MONTH December 1963 — DIGESTER AND SLUDGE DATA — OPERATOR Robert J. Swalwell

Date	Raw Sludge Gals.	Raw Sludge Lbs. Per 1000 c.f. Digester	Raw Sludge pH	Raw Sludge Total Solids %	Raw Sludge Vol. Solids %	transfer ~~XXXXXXX~~ #1 to #2 Gals.	transfer pH	transfer Total Solids %	transfer Vol. Solids %	transfer Susp. Solids Mg/l	transfer 5-Day B O D Mg/l	sludge near bottom Total Solids %	sludge near bottom Vol. Solids %	sludge near bottom Vol. Acids Mg/l	pH #1	Temp. °F #1	Gas Produced cu. ft. x 100	Gas Wasted cu. ft. x 100	Remarks
1	1326	20		6.6	81											102	61	0	Note — include gallons
2	663	11	5.6	7.0	82											99	64	0	of sludge to beds
3	1105	22		9.0	78											106	63	0	
4	1989	28	5.6	6.3	79											104	68	0	
5	884	14	5.5	7.0	80											110	60	60	
6	884	14	5.6	7.2	81	12376		1.8	65							105	70	70	
7	1105	15	5.6	6.2	80											100	77	26	
8	1105	17	5.6	6.7	83											96	50	0	
9	1105	17		6.9	80											96	52	0	
10	1105	17	5.8	6.8	81											102	52	0	
11	1768	28	5.6	6.9	80											100	70	0	
12	2210	34	5.5	6.8	80											108	66	45	
13	1768	27	5.7	6.7	81											104	54	54	
14	884	12	6.0	5.9	80											98	55	55	
15	1326	23	5.7	7.8	77											94	57	57	
16	1326	20	5.7	6.7	81											92	62	0	
17	1326	18	5.7	5.9	82	12818		7.5	55						6.9	99	68	0	
18	1326	20	5.6	6.6	79											98	63	0	
19	1547	19	5.8	5.4	81											98	60	0	
20	1326	16	5.8	5.3	83											98	61	0	
21	1547	20	5.7	5.6	83											98	61	0	
22	1989	30	5.6	6.6	82											97	63	0	
23	1768	25	5.7	6.0	83											96	63	0	
24	884	13		6.1	82											100	58	0	
25																104	53	53	
26	1105	17	5.8	6.8	82											101	43	43	
27	1326	21		8.2	69	14144		.88	69						7.0	97	50	50	
28	884	12	5.7	5.7	86											94	49	48	
29	1326	20	5.8	6.7	79											90	79	40	
30	884	14	5.6	6.4	83											94	55	0	
31	884	11	5.5	5.3	83											100	61	0	
ARITH. MEAN	1289	19	5.7	6.6	81	13113		3.4	63						7.0	99	60	19	
STAT. MEAN		19																	

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH December 1963 — DIGESTER AND SLUDGE DATA — OPERATOR Robert J. Swalwell

Date	Raw Sludge digested to beds Gals.	Lbs Per 1000 c.f. Digester	pH	Total Solids %	Vol. Solids %	Supernatant Gals	pH	Total Solids %	Vol. Solids %	Susp Solids Mg/l	5-Day B O D Mg/l	sludge near bottom Total Solids %	Vol Solids %	Vol Acids Mg/l	pH	Temp °F	Gas Produced cu ft.	Gas Wasted cu ft	Remarks
1																			Note — include gallons
2																85			of sludge to beds
3																			
4																85			
5																			
6						12376		.44	70	265	51								
7																82			
8																88			
9																90			
10																			
11																89			
12																			
13																			
14																			
15																			
16																			
17						12818		.49	70	299	70				7.3				
18																81			
19																84			
20																87			
21																90			
22																93			
23																96			
24																			
25																			
26																			
27						14144		.64	72		75				7.2				
28																			
29																			
30																			
31																			
ARITH. MEAN						13113		.52	71	282	65				7.2	88			
STAT. MEAN																			

MICHIGAN DEPARTMENT OF HEALTH

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR Marshall, MICHIGAN

MONTH January 1966 MISCELLANEOUS DATA OPERATOR Robert J. Swalwell

Date	Weather: Precip. Inches	Weather: Temp. (°F) Max.	Weather: Temp. (°F) Min	Weather: Type*	Raw Sewage: Temp °F	Raw Sewage: Flow MGD	Raw Sewage: pH	Grit cf/mg	~~Sludge Ex-Coll.~~ water ~~[illegible]~~ cu. ft.	Cl2 lbs.	Power KWH x 10	AUX. FUEL ~~Gas~~ cu. ft. x 100	Remarks
1		36	26	CL	52	2.00	7.6		81		16	16	* PH meter in for repair.
2		45	27	CL	52	2.03	7.7		59		20	21	
3		34	20	C	52	2.12			66		20	16	
4		40	16	C	52	2.05			74		20	15	
5		44	16	C	52	2.05	7.9		97		20	15	
6	.01	34	26	S	52	2.04	7.9		78		16	17	
7		28	2	CL	52	2.01	7.9		70		20	21	
8		20	10	CL	51	1.96	7.4		70		20	21	
9		40	20	CL	52	1.92	7.9		62		16	17	
10	.01	30	10	S	52	2.01			72		16	17	
11		22	6	C	51	1.94	7.9		301		20	26	
12	.30	30	20	S	51	1.96	7.8		80		20	24	
13	.01	32	22	S	51	1.92	7.8		67		16	24	
14		32	8	C	52	1.94	7.9		85		20	18	
15		18	-6	C	51	1.85	8.1		85		16	22	
16		22	10	CL	51	1.82	*		84		16	20	
17		26	10	CL	52	1.92			83		16	21	
18		24	4	CL	51	1.89			79		20	47	
19		30	16	CL	51	1.87			70		16	45	
20		30	20	CL	51	1.90			96		20	17	
21		32	20	CL	51	1.93			420		20	15	
22	.08	30	20	S	51	1.86			93		16	27	
23	.01	28	10	S	51	1.78			65		20	22	
24		24	6	CL	52	1.88			71		16	22	
25		20	6	CL	50	1.85			71		20	22	
26	.01	20	2	S	51	1.84			75		16	23	
27		16	-8	CL	51	1.84			65		16	25	
28		12	-10	C	50	1.85			62		20	28	
29		12	-6	C	51	1.82			96		16	23	
30		16	2	CL	51	1.77			74		20	20	
31	.01	22	8	S	51	1.83			380		16	24	
ARITH MEAN	.01	27	11		51	1.92			104		18.1	22	
STAT MEAN						1.91							

*C—Clear CL—Cloudy R—Rain **Indicate Unit
W—Windy CA—Calm S—Snow

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH January 1966

PRIMARY TREATMENT DATA

OPERATOR Robert J. Swalwell

Date	5-Day B O D Inf. Mg/l	5-Day B O D Inf. lbs. x10	5-Day B O D Eff. Mg/l	5-Day B O D Eff. lbs. x10	5-Day B O D Rem. %	Suspended Solids Inf. Mg/l	Suspended Solids Inf. lbs. x10	Suspended Solids Eff. Mg/l	Suspended Solids Eff. lbs. x10	Suspended Solids Rem %	Suspended Volatile Solids Inf. Mg/l	Suspended Volatile Solids Inf. lbs. x10	Suspended Volatile Solids Eff. Mg/l	Suspended Volatile Solids Eff. lbs. x10	Remarks
1						76	127	36	60	53	62	103	32	53	
2	80	135	36	61	55	104	176	22	37	79	94	159	22	37	
3	48	85	39	69	19	51	90	28	50	45	45	80	27	48	
4	88	150	72	123	18										
5	60	103	45	77	25	76	130	45	77	41	64	109	40	68	
6	68	116	48	82	29	96	163	41	70	57	89	151	38	65	
7	84	141	68	114	19	162	272	46	77	72	155	260	45	75	
8	68	111	28	46	59	92	150	28	46	70	85	139	26	43	
9	76	122	36	58	53	92	147	30	48	67	80	128	27	43	
10	72	121	54	91	25	86	144	40	67	54	71	119	32	54	
11	72	116	57	92	21	85	138	53	86	38	74	120	45	73	
12	76	124	54	88	29	83	136	41	67	51	79	129	38	62	
13	100	160	51	82	49	75	120	31	50	59	72	115	28	45	
14	76	123	60	97	21	70	113	46	74	34	57	92	38	61	
15	88	136	39	60	56	100	154	36	56	64	90	139	34	52	
16						101	153	39	59	61	90	136	35	53	
17	88	141	56	90	36	98	157	56	74	53	85	136	39	62	
18	88	139	54	85	39	67	106	45	71	33	58	91	42	66	
19	76	119	45	70	41	73	114	31	49	58	60	95	25	39	
20	68	108	52	82	24	138	219	33	52	76	124	197	31	49	
21	90	145	68	109	24	110	193	68	109	38	96	155	60	97	
22	72	112	51	79	29	76	118	52	81	32	71	110	49	76	
23	76	113	30	45	61	72	107	34	50	53	63	94	28	42	
24	76	119	60	94	21	77	121	55	86	29	66	103	48	75	
25	72	111	57	88	21	83	128	46	71	45	67	103	38	59	
26	72	111	58	89	19	80	123	50	77	38	74	114	42	64	
27	72	111	33	51	39	104	160	32	49	69	87	134	28	43	
28	76	117	45	69	41	82	127	45	69	45	71	110	38	59	
29	56	85	45	68	18	113	172	42	64	63	101	153	33	50	
30															
31	60	92	36	55	40	92	140	51	78	45	87	133	44	67	
ARITH MEAN	75	120	49	79	33	90	145	41	66	53	80	128	36	58	
STAT. MEAN		120		80			139		65						

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH January 1966 — DIGESTER AND SLUDGE DATA — OPERATOR Robert J. Swalwell

Date	Raw Sludge: Gals.	Raw Sludge: Lbs. Per 1000 c.f. Digester	Raw Sludge: pH	Raw Sludge: Total Solids %	Raw Sludge: Vol. Solids %	Supernatant x10: Gals.	Supernatant x10: pH	Supernatant x10: Total Solids %	Supernatant x10: Vol. Solids %	Supernatant x10: Susp. Solids Mg/l	Supernatant x10: 5-Day B O D Mg/l	sludge near bottom: Total Solids %	sludge near bottom: Vol. Solids %	sludge near bottom: Vol. Acids Mg/l	sludge near bottom: pH	Temp. °F #1	Gas x 100: Produced cu. ft.	Gas x 100: Wasted cu. ft.	Remarks
1	1326	18	6.0	6.0	80											92	52	24	Note — include gallons
2	1105	17	6.0	6.9	78											94	32	32	of sludge to beds
3	1547	21		6.1	79											90	31	30	
4																86	29	29	
5	1768	32		8.2	78											84	32	32	
6	2210	33	6.3	6.8	79											82	43	8	
7	1768	28	6.2	7.2	78											86	43	0	
8	1326	18	6.0	6.1	79											90	42	0	
9	884	13	5.9	6.3	81	15470		.36	69	61	39					92	35	0	
10	884	15	5.8	7.3	80											95	37	0	
11	1326	22		7.5	79											97	66	35	
12	1326	17	6.0	6.0	77											96	53	52	
13	1768	27	5.9	6.7	81											90	39	18	
14	1326	23	5.8	8.3	74											91	58	31	
15	884	12	5.9	6.0	80											92	41	41	
16	884	12		6.1	79											87	43	43	
17	2210	32		6.3	81											84	40	40	
18	884	16		7.9	81											81	46	46	
19	1768	32		7.8	81											84	49	49	
20	1768	25		6.4	79											86	55	0	
21	1326	18		6.0	80	15912		.37	74		96					92	50	0	
22	884	11		5.4	82											99	39	0	
23	884	15		7.6	80											101	30	0	
24	1326	17		5.9	78											95	55	54	
25	1326	20		7.0	77											89	42	3	
26	1768	28		7.0	79											95	47	0	
27	1768	26		6.5	79											98	48	0	
28	884	17		10.0	66											99	48	0	
29	884	12		6.2	77											102	47	0	
30	884	11		5.3	80											104	49	0	
31	1768	25		6.6	77											104	42	0	
ARITH. MEAN	1356	20	6.0	6.8	78	15691		.36	71	61	67					92	44	18	
STAT. MEAN		20																	

MICHIGAN DEPARTMENT OF HEALTH

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH February 19 66

MISCELLANEOUS DATA

OPERATOR Robert J. Swalwell

Date	Weather: Precip. Inches	Weather: Temp. (°F) Max.	Weather: Temp. (°F) Min	Weather: Type*	Raw Sewage: Temp °F	Raw Sewage: Flow MGD	pH	Grit cf/mg	Plant Eff. % Water cu ft.	Cl₂ lbs.	Power KWH x 10	AUX. FUEL Gas cu. ft. x 100	Remarks
1		36	8	CL	51	1.83			157		20	20	
2		34	12	CL	51	1.83			79		16	16	
3	.01	32	20	S	51	1.85			75		20	15	
4		30	0	CL	51	1.86			69		20	20	
5		28	10	CL	51	1.82			71		16	16	
6		34	16	CL	51	1.81			65		16	17	
7		44	20	CL	51	1.89			76		16	10	
8		42	34	CL	50	1.88			111		29	10	
9	.27	56	40	R	51	1.89			88		16	10	
10	.26	52	28	R	51	1.93			90		20	10	
11		42	20	C	51	1.94			70		16	12	
12		44	24	C	51	1.94			62		20	17	
13		44	20	C	51	1.86			80		16	20	
14		34	18	CL	51	1.88			308		20	14	
15		36	18	C	50	1.92			220		20	16	
16	.01	38	8	S	50	1.92	7.8		50		16	22	
17	.01	20	10	S	50	1.89	7.8		28		16	20	
18	.02	20	-4	S	50	1.89	7.8		86		16	25	
19		24	-4	C	49	1.89	7.7		71		16	22	
20		20	2	CL	50	1.81	7.6		77		20	23	
21		26	8	C	51	1.91	7.7		76		20	18	
22		28	14	CL	50	1.87	7.8		126		16	18	
23		34	24	C	50	1.87	7.9		76		16	15	
24		34	20	C	50	1.90	7.8		452		20	20	
25	.07	34	14	S	50	1.90	7.9		174		16	14	
26		20	16	CL	49	1.85	7.7		100		20	13	
27		22	21	C	50	1.78	7.9		83		16	11	
28	.77	24	30	R&S	50	1.98	7.7		84		20	12	
29													
30													
31													
ARITH MEAN	.05	35	16		50	1.88	7.8		111		17.9	16	
STAT MEAN						1.88							

*C—Clear CL—Cloudy R—Rain **Indicate Unit

W—Windy CA—Calm S—Snow

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

D-4.1
MICHIGAN DEPARTMENT OF HEALTH

MONTH February 19 66

PRIMARY TREATMENT DATA

OPERATOR Robert J. Swalwell

Date	5-Day B O D Inf. Mg/l	5-Day B O D Inf. lbs x 10	5-Day B O D Eff. Mg/l	5-Day B O D Eff. lbs. x 10	5-Day B O D Rem. %	Suspended Solids Inf. Mg/l	Suspended Solids Inf. lbs. x 10	Suspended Solids Eff. Mg/l	Suspended Solids Eff. lbs. x 10	Suspended Solids Rem. %	Suspended Volatile Solids Inf. Mg/l	Suspended Volatile Solids Inf. lbs. x 10	Suspended Volatile Solids Eff. Mg/l	Suspended Volatile Solids Eff. lbs. x 10	Remarks
1	72	110	42	64	42	67	102	49	75	27	61	93	43	66	
2	80	122	54	82	33	78	119	43	66	58	66	101	38	58	
3	80	123	51	79	36	84	130	38	59	55	72	111	35	54	
4	64	99	42	65	34	60	93	49	76	19	52	81	33	51	
5	86	131	51	77	25	66	100	37	56	44	65	99	37	56	
6	90	136	51	77	43	120	181	34	51	72	107	162	29	44	
7	76	120	64	101	16	111	175	53	84	52	93	147	42	66	
8	72	113	56	88	22	105	165	43	67	59	91	143	35	55	
9	88	139	80	126	12	85	134	65	102	24	66	104	49	77	
10	92	148	60	97	35	115	185	47	76	59	99	159	39	63	
11	76	123	51	83	33	81	131	42	68	48	69	112	35	57	
12	69	112	57	92	17	93	150	50	80	46	80	131	45	73	
13	66	102	40	62	39	80	124	48	74	40	73	113	44	68	
14	76	119	69	108	14	100	157	50	78	50	73	114	38	59	
15	68	109	48	77	29	82	131	31	50	62	78	125	25	40	
16	64	104	39	63	39	85	138	22	36	74	77	125	22	36	
17	80	126	42	66	48	126	199	52	82	59	114	180	43	68	
18	68	107	68	107	0	72	113	43	68	40	67	106	41	65	
19	72	113	45	71	37	92	145	36	57	61	92	145	36	57	
20	76	115	40	60	34	87	131	43	65	51	82	124	40	60	
21	68	108	68	108	0	81	129	55	88	32	79	126	49	78	
22	78	122	48	75	34	134	209	45	70	66	128	200	36	56	
23	104	162	60	94	43	102	159	67	105	34	91	142	55	86	
24	92	146	57	90	38	80	127	36	57	55	70	111	36	57	
25	116	184	69	109	41	92	146	50	79	46	80	127	43	68	
26	104	160	68	105	35	107	165	42	65	61	94	145	39	60	
27	84	125	56	83	33	93	138	38	56	59	81	120	33	49	
28	68	112	56	92	18	89	147	48	79	46	73	121	40	66	
29															
30															
31															
ARITH. MEAN	80	125	55	86	30	92	144	45	70	50	81	127	39	69	
STAT. MEAN		120		86			143		71						

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

D-4.5
MICHIGAN DEPARTMENT OF HEALTH

MONTH February 1966

DIGESTER AND SLUDGE DATA

OPERATOR Robert J. Swalwell

Date	Raw Sludge Gals.	Raw Sludge Lbs. Per 1000 c.f. Digester	Raw Sludge pH	Raw Sludge Total Solids %	Raw Sludge Vol. Solids %	Supernatant Gals.	Supernatant pH	Supernatant Total Solids %	Supernatant Vol. Solids %	Supernatant Susp. Solids Mg/l (x10)	Supernatant 5-Day B O D Mg/l (x10)	sludge near bottom Total Solids %	sludge near bottom Vol. Solids %	sludge near bottom Vol. Acids Mg/l	pH #1	Temp. °F #1	Gas Produced cu. ft. X 100	Gas Wasted cu. ft. X 100	Remarks
1	1326	20		6.9	78	13260		.38	75	125	36					106	45	42	Note — include gallons
2	884	18		9.0	78											96	45	45	of sludge to beds
3	1326	24		8.2	79											92	54	0	
4	1768	33		8.3	80											100	46	0	
5	1326	23		7.6	80											102	46	0	
6	1326	22		7.6	78											106	49	0	
7	1326	24		8.0	80											108	52	0	
8	1326	22		7.8	76											104	50	0	
9	1105	18		7.3	78											104	44	0	
10	1989	32		7.4	78												47	0	
11	1326	20		6.8	79											107	48	0	
12	1326	22		7.4	78											110	53	45	
13	1768	23		6.0	78											106	47	47	
14	1326	19		5.6	79	13923		.44	64	136	102					100	36	36	
15	1547	24	5.9	7.0	79											94	46	46	
16	1105	14	6.1	5.8	79											90	44	44	
17	884	15	5.9	7.5	78											86	43	0	
18	884	14	5.9	6.8	80											94	49	0	
19	884	16	6.0	8.6	76											98	34	0	
20	1326	18	6.0	6.1	81											96	55	0	
21	1105	14	5.8	5.2	86											102	51	0	
22	1326	20	5.9	6.9	77											108	36	0	
23	1768	28	6.1	7.2	78											108	47	0	
24	884	16	6.1	8.2	79											110	51	38	
25						13260		.41	76	105	144					106	46	8	
26	1768	31	5.5	8.0	78											101	7	0	
27	1768	19	5.8	5.3	70											100	54	0	
28	1326	17	5.8	5.7	79											97	50	0	
29																			
30																			
31																			
ARITH. MEAN	1334	21	5.9	7.1	78	13491		.41	72	122	94					101	46	13	
STAT. MEAN		21																	

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR Marshall, MICHIGAN

MONTH March 1966 MISCELLANEOUS DATA OPERATOR Robert J. Swalwell

Date	Weather: Precip. Inches	Weather: Temp. (°F) Max.	Weather: Temp. (°F) Min.	Weather: Type*	Raw Sewage: Temp. °F	Raw Sewage: Flow MGD	pH	Grit cf/mg	~~Process Water~~ water ~~Consumed~~ cu. ft.	Cl_2 lbs.	Power KWH x 10	AUX. FUEL ~~gas~~ cu. ft. x 100	Remarks
1		38	24	C	50	1.93	7.8		77		20	15	
2	.01	55	25	R	50	1.92	7.6		150		16	20	
3	.35	56	40	R	51	2.00	7.8		117		20	11	
4		50	20	C	51	2.01	7.8		96		20	12	
5	.01	38	18	S	51	1.87	7.8		82		16	12	
6	.03	31	17	S	50	1.97	7.9		77		16	19	
7		30	12	C	50	1.99	7.8		400		20	20	
8		36	28	C	49	1.96	7.8		110		20	14	
9		50	26	C	50	1.97	7.9		76		16	20	
10	.08	52	36	R	50	2.00	7.8		70		20	13	
11	.28	60	42	R	50	2.00	7.7		148		16	3	
12	.11	52	34	R	50	2.04	7.6		56		20	3	
13		51	25	C	50	1.95	7.8		55		16	11	
14		54	28	C	51	2.05	8.1		94		20	10	
15		50	26	C	50	2.00	7.7		77		16	4	
16		52	30	C	50	2.01	7.9		73		20	5	
17		68	50	C	50	2.02	7.7		73		20	5	
18	.06	58	36	R	50	2.05	7.7		368		20	10	
19	.05	42	30	R&S	51	2.03	7.8		65		16	17	
20		48	30	CL	50	1.94	7.8		84		20	12	
21	.50	62	45	R	51	2.11	7.9		64		16	9	
22	.09	66	40	R	50	2.12	7.8		188		20	9	
23	.10	60	24	R&S	52	2.07	7.9		93		16	18	
24	.01	30	16	S	51	2.09	8.0		121		20	20	
25	.09	30	20	S	50	2.11	7.4		78		20	19	
26		34	14	CL	50	2.09	7.8		75		16	20	
27		34	16	C	50	2.00	7.8		68		20	14	
28		38	20	C	51	2.10	8.0		320		20	16	
29	.15	46	30	R	50	2.09	8.2		132		16	15	
30		46	20	CL	50	2.06	7.7		78		16	6	
31	.03	47	26	R&S		2.08	7.9		73		20	1	
ARITH MEAN	.063	47	27		50	2.02	7.8		117		18.3	12	
STAT MEAN						2.02							

*C—Clear CL—Cloudy R—Rain **Indicate Unit
W—Windy CA—Calm S—Snow

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH March 1966

PRIMARY TREATMENT DATA

OPERATOR Robert J. Swalwell

Date	5-Day B O D					Suspended Solids					Suspended Volatile Solids				Remarks
	Inf.		Eff.		Rem.	Inf.		Eff.		Rem.	Inf.		Eff.		
	Mg/l	lbs x 10	Mg/l	lbs. x 10	%	Mg/l	lbs. x 10	Mg/l	lbs. x 10	%	Mg/l	lbs. x 10	Mg/l	lbs. x 10	
1	74	119	70	113	5	88	142	59	95	33	71	114	44	71	Samples used are 24 hr. composits
2	84	134	64	102	24	93	149	60	96	35	76	122	44	70	collected by automatic samplers. The
3	68	113	27	45	60	138	230	34	57	75	98	163	27	45	effluent samples contain supernatant
4	78	131	48	80	38	97	163	35	59	64	83	139	27	45	while the raw do not.
5	78	128	44	72	44	94	154	47	77	50	82	135	41	67	
6	83	129	27	42	68	77	120	28	44	64	70	109	28	44	
7	84	139	72	120	14	180	299	48	80	73	164	272	44	73	
8	64	105	60	98	6	56	92	50	82	11	50	82	43	70	
9	72	118	60	99	17	91	150	55	90	40	88	145	45	74	
10	90	150	54	90	40	115	192	60	100	48	92	153	55	92	
11	88	147	64	107	27	98	163	55	92	44	84	150	46	77	
12	84	143	48	82	43	83	141	42	71	49	77	131	38	65	
13	72	117	61	99	15	93	151	45	73	52	75	122	37	60	
14	92	157	68	116	26	100	171	55	94	45	88	150	47	80	
15	64	107	45	75	30	73	122	35	58	52	65	108	31	52	
16	114	191	92	154	19	130	218	58	97	55	109	183	46	77	
17	84	142	72	121	12	90	152	48	81	47	83	140	45	76	
18	60	103	60	103	0	60	103	53	91	12	54	92	46	79	
19	95	161	30	51	68	97	164	31	52	68	91	154	28	47	
20	85	138	45	73	47	111	180	42	68	62	90	146	35	57	
21	76	134	76	134	0	94	165	70	123	26	80	86	59	104	
22	72	127	68	120	6	88	156	58	103	34	77	136	50	88	
23	68	117	64	110	6	106	183	63	109	41	87	150	47	81	
24	80	139	53	92	27	77	134	48	84	38	63	110	39	68	
25	104	183	60	106	42	107	188	50	88	53	89	157	42	74	
26	78	136	38	66	51	80	139	33	58	59	72	125	32	56	
27	76	127	45	75	41	71	118	39	65	45	62	103	34	57	
28	76	133	63	110	17	85	149	53	93	38	73	128	45	79	
29	72	125	57	99	21	80	139	57	82	41	69	120	38	66	
30	56	96	56	96	0	66	113	49	84	26	54	93	39	67	
31	58	101	58	101	0	80	139	46	80	43	77	136	43	75	
ARITH. MEAN	78	132	56	95	26	93	158	48	81	46	80	134	41	69	
STAT. MEAN		130		95			153		83						

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

D-4.5
MICHIGAN DEPARTMENT OF HEALTH

MONTH March 19 66 — DIGESTER AND SLUDGE DATA — OPERATOR Robert J. Swalwell

Date	Raw Sludge Gals.	Raw Sludge Lbs. Per 1000 c.f. Digester	Raw Sludge pH	Raw Sludge Total Solids %	Raw Sludge Vol. Solids %	Supernatant Gals.	Supernatant pH	Supernatant Total Solids %	Supernatant Vol. Solids %	Supernatant Susp. Solids Mg/l	Supernatant 5-Day B O D Mg/l	x 10 transfer Total Solids %	x 10 transfer Vol. Solids %	x 10 transfer Vol. Acids Mg/l	Temp pH # 1	Temp °F # 1	Gas Produced cu. ft. x 100	Gas Wasted cu ft.	Remarks
1	884	10	6.1	5.2	78											104	51	0	Note — include gallons
2	884	17	6.0	8.5	79											102	69	50	of sludge to beds
3	884	19	5.8	9.3	82											100	52	52	
4	1326	23	6.1	8.2	76											96	74	47	On some dates where
5	1326	17		6.0	78											98	68	35	gas production
6	884	16		8.1	77											99	57	33	figures appear low
7	1326	20	5.7	7.0	77											98	41	0	an unknown amount
8	1326	23	5.9	7.9	79											102	51	0	of gas was vented
9	884	11	6.1	5.3	79											105	53	35	that was not metered.
10	1326	30	6.0	9.5	83	14586		.43	75			1.3	67			103	48	48	
11	1326	22	5.9	7.6	77											97	48	48	
12	884	14	5.8	7.4	78											92	45	45	
13	884	11	5.8	5.5	80											90	46	46	
14	1326	28	5.7	8.8	86											88	41	0	
15	1326	19	5.9	6.8	75											94	52	0	
16	1326	25	5.6	8.7	77											100	53	0	
17	2210	42	6.0	7.9	86											104	42	0	
18	884	19	5.9	10.1	74											108	49	0	
19	1326	22	5.9	7.5	78											112	48	40	
20	884	11	6.2	5.7	78											106	46	46	
21																102	37	37	
22						21216		.40	76		102	4.9	47				30	30	
23	3094	41	6.3	6.3	75											94	28	28	
24	1768	25	5.7	6.8	73											86	31	0	
25	1326	23	5.8	8.1	76											90	10	0	
26	884	17	5.4	9.5	73											86	33	0	
27	884	15	5.8	7.5	79											90	13	0	
28	2210	38	5.2	7.2	84											88	27	0	
29	884	12	5.3	6.5	76											90	9	0	
30	1326	18	6.1	6.3	76											88	25	0	
31	1768	54		12.5	86											86	14	0	
ARITH. MEAN	1296	22	5.8	7.6	78	17901		.41	75.5		102	3.1	57			97	42	20	
STAT. MEAN		20																	

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH April 1966 MISCELLANEOUS DATA OPERATOR Robert J. Swalwell

Date	Weather Precip. Inches	Weather Temp. (°F) Max.	Weather Temp. (°F) Min.	Weather Type*	Raw Sewage Temp. °F	Raw Sewage Flow MGD	Raw Sewage pH	Grit cf/mg	~~Mech. Eq. Cock.~~ water ~~Mech.~~ cu. ft.	Cl₂ lbs.	Power KWH x 10	AUX. FUEL ~~gas~~ cu. ft. x 100	Remarks
1	.20	36	30	R&S	51	2.12	7.8		61		16	34	
2	.03	44	30	S	50	2.08	7.7		66		20	50	
3		42	26	CL	50	1.97	7.6		69		16	32	
4		40	28	C	51	2.10	7.9		99		20	10	
5	.01	42	30	S	49	2.08	7.9		85		20	10	
6	.16	40	30	S	50	2.07	7.8		84		20	35	
7		40	22	CL	49	2.11	7.9		500		16	41	
8		42	26	CL	50	2.10	7.8		109		20	40	
9		44	24	C	51	2.11	7.8		130		16	25	
10		49	25	CL	49	2.03	7.9		38		20	11	
11		50	26	C	51	2.16			65		20	10	
12		50	30	C	50	2.08	7.9		272		20	10	
13		56	30	C	50	2.08			416		12	14	
14		56	32	C	50	2.08	8.0		501		16	10	
15		60	30	C	50	2.09	7.8		34		16	5	
16		60	30	C	50	2.06			15		16	5	
17	.37	64	40	R	50	2.05	7.8		6		12	5	
18	.05	76	52	R	51	2.13	7.9		30		12	4	
19	.16	68	56	R	52	2.15	7.7		59		16	6	
20	.70	76	38	R	52	2.25			274		16	6	
21		52	30	CL	51	2.16	7.8		62		16	10	
22	.30	62	40	R	51	2.19	7.7		35		16	10	
23	1.08	58	40	R	51	2.42			18		16	8	
24		66	38	CL	51	2.31	7.8		14		16	3	
25		66	38	C	52	2.43			53		16	5	
26		50	34	CL	52	2.38	7.8		51		16	9	
27	.72	48	30	R	51	2.37	7.7		19		16	10	
28		52	32	C	51	2.43	8.0		29		16	8	
29	.32	64	44	R	51	2.45	7.8		130		16	10	
30		58	32	CL	51	2.41	7.8		22		16	13	
31													
ARITH. MEAN	.137	54	33		51	2.18	7.8		112		16.7	15	
STAT. MEAN						2.18							

*C—Clear CL—Cloudy R—Rain **Indicate Unit
W—Windy CA—Calm S—Snow

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH April 1966 PRIMARY TREATMENT DATA OPERATOR Robert J. Swalwell

Date	5-Day BOD Inf. Mg/l	5-Day BOD Inf. lbs. x 10	5-Day BOD Eff. Mg/l	5-Day BOD Eff. lbs. x 10	5-Day BOD Rem. %	Suspended Solids Inf. Mg/l	Suspended Solids Inf. lbs. x 10	Suspended Solids Eff. Mg/l	Suspended Solids Eff. lbs. x 10	Suspended Solids Rem. %	Suspended Volatile Solids Inf. Mg/l	Suspended Volatile Solids Inf. lbs. x 10	Suspended Volatile Solids Eff. Mg/l	Suspended Volatile Solids Eff. lbs. x 10
1	60	106	46	81	23	91	161	46	81	49	78	138	45	80
2	64	111	42	73	34	94	163	43	75	54	77	134	33	57
3	68	112	56	92	18	81	133	53	87	35	71	117	45	74
4	62	109	38	67	39	119	208	47	82	61	111	194	38	67
5	64	111	72	125	-12	123	213	77	134	37	107	186	60	104
6	68	117	68	117	0	81	140	59	102	26	63	109	46	79
7	60	106	33	58	45	121	213	41	72	41	110	194	33	58
8	72	126	63	110	13	117	205	52	91	56	106	186	44	77
9	60	106	51	90	15	77	136	54	95	30	70	123	54	95
10	54	91	45	76	17	87	147	40	68	54	78	132	35	59
11	72	130	48	86	33	152	274	59	106	61	127	229	43	77
12	51	88	44	76	14	85	147	65	113	31	80	139	58	101
13	96	167	63	109	34	84	146	66	115	21	74	128	56	80
14	84	146	64	111	24	133	231	64	111	52	119	206	56	97
15	96	167	72	125	25	72	125	50	87	31	64	112	48	84
16	96	165	68	117	29	76	131	66	113	13	66	113	62	107
17	76	130	39	67	49	101	173	33	56	67	91	156	31	53
18	65	115	20	36	69	88	156	22	39	75	71	126	15	27
19	60	108	51	91	15	114	204	52	93	54	99	178	50	90
20	63	118	33	62	48	78	146	38	71	51	64	120	32	60
21	63	113	42	76	33	96	173	34	61	65	91	164	32	58
22	72	131	36	66	50	111	203	25	46	78	106	194	23	42
23														
24	72	139	60	116	17	87	168	48	92	45	86	166	48	92
25	69	140	36	73	48	78	158	33	67	58	68	138	28	57
26	72	143	57	113	21	73	145	45	89	38	68	135	40	79
27	48	95	60	119	-20	74	146	70	138	5	62	123	60	119
28	54	109	51	103	6	75	152	41	83	45	60	122	31	63
29	75	153	45	92	40	111	269	66	135	41	103	209	62	126
30	68	137	56	113	18	62	125	62	125	0	47	94	51	102
31														
ARITH. MEAN	68	124	50	91	26	94	172	50	91	44	83	151	43	78
STAT. MEAN		124		90			174		91					

Remarks

Primary digester out of service for cleaning and repair May 12. No temps. or gas production figures will be used until the digester is back in service. The secondary digester will be used as a single stage unit.

Filled all 10 drying beds during month. Averages - 11.5% dry solids and 58.6% volatile solids.

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR Marshall, MICHIGAN

MONTH April 1966 — DIGESTER AND SLUDGE DATA — OPERATOR Robert J. Swalwell

Date	Raw Sludge: Gals.	Raw Sludge: Lbs. Per 1000 c.f. Digester	Raw Sludge: pH	Raw Sludge: Total Solids %	Raw Sludge: Vol. Solids %	Supernatant: Gals.	Supernatant: pH	Supernatant: Total Solids %	Supernatant: Vol. Solids %	Supernatant: Susp. Solids Mg/l	Supernatant: 5-Day B O D Mg/l	sludge near bottom: Total Solids %	sludge near bottom: Vol. Solids %	sludge near bottom: Vol. Acids Mg/l	sludge near bottom: pH	Temp. °F # 1	Gas: Produced cu. ft. X 100	Gas: Wasted cu. ft.	Remarks
1																87	28	28	Note — include gallons
2	1326	23	5.5	9.0	69											92	21	21	of sludge to beds
3	1768	21	5.2	5.4	78											97	25	25	Amount of raw
4	1768	31	4.9	7.0	88											100	28	28	sludge pumped
5						11050		.45	74							94	31	31	after April 10,
6	2210	31	5.3	6.4	78											97	26	26	is estimated.
7	2652	36	5.1	6.2	78											93	24	24	
8	1326	9	5.1	3.1	75											100	21	21	Temp. and gas
9	1547	23	5.9	6.5	79											98	21	21	production not
10						24952		.45	73							92	22	22	metered after
11																			April 12.
12																			
13																			
14																			
15	1768	28	~~5.2~~	7.2	77														
16	1768	30		7.9	75														
17	1768	23		5.9	78														
18	1768	30		8.6	71														
19																			
20																			
21	1768	18		5.0	71														
22																			
23	1768	17	5.5	4.4	75														
24	1768	25	5.8	6.7	75														
25																			
26																			
27	1768	30	5.3	5.6	73														
28	1768	17	5.6	4.6	75														
29																			
30	1768	24	5.5	6.5	73														
31																			
ARITH. MEAN	1756	24	5.4	6.2	76	17901		.45	74							95	25	25	
STAT. MEAN		24																	

MICHIGAN DEPARTMENT OF HEALTH

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH May 1966 MISCELLANEOUS DATA OPERATOR Robert J. Swalwell

Date	Weather: Precip. Inches	Weather: Temp (°F) Max.	Weather: Temp (°F) Min	Type*	Raw Sewage: Temp °F	Raw Sewage: Flow MGD	pH	Grit cf/mg	~~Water Sewage~~ water cu. ft.	Cl₂ lbs.	Power x10 KWH	AUX. FUEL gas cu. ft. x 100	Remarks
1		52	29	C	51	2.33	7.8		40		16	9	
2		58	38	C	52	2.42			360		16	7	
3		48	26	C	51	2.38	7.8		210		16	9	
4		60	38	C	51	2.35	7.8		19		16	9	
5		76	48	C	52	2.41	7.8		28		20	6	
6		60	36	C	52	2.35	7.7		34		16	6	
7		68	38	C	52	2.29			10		16	6	
8		46	28	CL	52	2.16			10		16	10	
9		46	32	C		2.28	8.0		11		16	14	
10	.01	54	32	R	52	2.25	8.0		27		16	11	
11	2.02	42	38	R	52	2.48			19		16	10	
12	.12	42	36	R	51	2.55	7.9		20		16	7	
13	.06	54	40	R	51	2.56	7.9		31		16	10	
14		64	36	C	51	2.55			1559	26	20	8	
15	.11	72	52	R	51	2.51	7.7		1501	73	16	7	
16		67	45	C	53	2.56	7.8		1800	103	20	3	
17	.63	72	54	R	52	2.58	7.8		1440	90	16	3	
18		68	44	CL	53	2.52	7.8		1450	92	20	1	
19	.27	68	48	R	52	2.54	7.8		1440	103	16	1	
20	.27	68	48	R	52	2.55	7.8		1480	103	20	1	
21		72	44	C	53	2.50	7.7		1470	84	16	2	
22		80	48	C	53	2.43	7.8		1460	97	20	1	
23	.13	86	54	R	54	2.54	7.9		1360	98	16	1	
24		70	46	C	53	2.47	7.8		1420	93	16	1	
25		76	46	C	53	2.44	7.8		1460	91	20	3	
26		85	58	C	53	2.46			1730	90	20	3	
27		84	46	C		2.43	7.9		1470	93	20	4	
28		68	32	C	54	2.38	7.8		1450	99	20	3	
29		60	38	C	53	2.22	7.7		1450	86	20	3	
30		60	34	C	53	2.26	7.8		1180	79	24	5	
31		64	34	C	54	2.40	7.7		1420	95	20	4	
ARITH MEAN	.117	64	41		52	2.42	7.8		883	94	17.8	5.4	
STAT MEAN						2.44							

*C—Clear CL—Cloudy R—Rain **Indicate Unit

W—Windy CA—Calm S—Snow

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH May 1966 PRIMARY TREATMENT DATA OPERATOR Robert J. Swalwell

Date	5-Day B O D Inf. Mg/l	5-Day B O D Inf. lbs x10	5-Day B O D Eff. Mg/l	5-Day B O D Eff. lbs. x10	5-Day B O D Rem. %	Suspended Solids Inf. Mg/l	Suspended Solids Inf. lbs. x10	Suspended Solids Eff. Mg/l	Suspended Solids Eff. lbs. x10	Suspended Solids Rem. %	Suspended Volatile Solids Inf. Mg/l	Suspended Volatile Solids Inf. lbs. x10	Suspended Volatile Solids Eff. Mg/l	Suspended Volatile Solids Eff. lbs. x10
1	52	101	42	82	19	86	167	34	66	61	76	148	27	52
2	60	121	42	85	30	121	244	31	63	74	119	240	28	57
3	60	119	57	113	5	108	214	40	79	63	94	187	33	66
4	48	94	48	94	0	93	182	55	108	41	76	149	45	88
5	60	121	45	90	25	106	213	39	78	63	95	191	35	70
6	66	129	57	112	14	146	286	48	94	67	136	267	44	86
7	45	86	54	103	-21	66	126	48	92	27	56	107	40	76
8														
9	54	103	45	86	17	130	247	43	82	67	117	223	38	72
10	68	128	54	101	21	97	182	40	75	59	88	165	37	69
11														
12	45	96	42	89	7	63	134	44	94	31	55	117	39	83
13	51	109	45	96	12	92	196	41	88	56	82	175	34	73
14	57	121	44	94	23	89	189	39	83	56	82	174	35	75
15	52	109	49	103	6	70	147	33	69	53	29	61	28	59
16	80	171	68	145	15	112	239	44	94	61	99	211	35	75
17	68	146	56	121	18	137	295	29	62	79	114	245	26	56
18	54	114	53	111	2	60	126	36	76	40	55	116	30	63
19	68	144	64	136	6	87	184	38	80	56	70	148	33	70
20	63	134	60	128	5	69	147	37	79	46	55	117	30	64
21	39	81	60	125	-35	102	213	35	73	66	92	192	28	58
22	102	207	51	103	50	70	142	35	71	50	61	124	28	57
23	45	95	72	152	-38	65	138	41	87	37	56	119	37	78
24	54	111	51	105	6	77	159	35	72	55	65	134	31	64
25	68	138	48	98	29	119	242	32	65	73	108	220	32	65
26	68	140	56	115	18	71	146	27	55	62	71	146	27	55
27	57	116	57	116	0	65	132	39	79	40	57	116	35	71
28	68	135	66	131	3	58	115	40	79	31	52	103	37	73
29	76	141	66	122	14	68	126	33	61	52	59	109	26	48
30	64	121	72	136	-15	82	155	36	68	56	71	134	30	57
31	62	124	50	100	19	61	122	35	70	43	54	108	30	60
ARITH. MEAN	60	123	55	110	9	89	179	38	77	54	77	157	33	67
STAT. MEAN		120		108			176		76					

Remarks

For the past few years, during May & June, we have noticed that the B.O.D. of our raw samples drops quite often during the month. This drop is sometimes great enough to cause an addition rather than a reduction in B.O.D. The raw samples are collected as always and are collected before chlorination takes place. The B.O.D. of the effluent remains quite constant.

Primary digester out of service during month of May. Secondary used as a single stage unit.

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH May 19 66

DIGESTER AND SLUDGE DATA

OPERATOR Robert J. Swalwell

Date	Raw Sludge Gals.	Raw Sludge Lbs. Per 1000 c.f. Digester	Raw Sludge pH	Raw Sludge Total Solids %	Raw Sludge Vol. Solids %	Supernatant Gals.	Supernatant pH	Supernatant Total Solids %	Supernatant Vol. Solids %	Supernatant Susp. Solids Mg/l	Supernatant 5-Day B O D Mg/l	sludge near bottom Total Solids %	sludge near bottom Vol. Solids %	sludge near bottom Vol. Acids Mg/l	Temp. pH	Temp. °F	Gas Produced cu. ft.	Gas Wasted cu. ft.	Remarks
1	*1326	22	5.8	8.0	74														Note — include gallons of sludge to beds
2	1326	16		5.8	76														
3	1326	22		8.0	74														* Gallons of raw sludge estimated during month.
4																			
5	1326	19	5.9	6.9	75														
6																			
7	1326	22	5.7	8.4	70														
8	1326	8		2.7	76														
9	1326	22	5.7	8.2	71														
10	1326	21	5.7	7.7	71														
11	1326	15	5.8	5.9	69														
12	1326	26	5.6	9.8	70														
13	1326	23	5.7	8.5	72														
14	1326	19	5.6	7.5	68														
15	1326	24	5.7	8.4	77														
16	1326	22	5.6	7.2	80														
17																			
18	1326	19		7.0	73														
19																			
20	1326	23	5.6	9.4	66														
21	1326	19	5.7	7.6	68														
22	1326	27		11.5	64														
23	1326	22		8.4	70														
24																			
25																			
26																			
27	1326	22		8.7	66														
28	1326	23	5.6	9.8	61														
29	1326	18	5.7	7.7	62														
30	1326	28	5.6	12.0	62														
31																			
ARITH. MEAN	1326	21	5.7	8.0	70														
STAT. MEAN		21																	

MICHIGAN DEPARTMENT OF HEALTH

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH June 1966 — MISCELLANEOUS DATA — OPERATOR Robert J. Swalwell

Date	Weather: Precip. Inches	Weather: Temp. (°F) Max.	Weather: Temp. (°F) Min.	Type*	Raw Sewage: Temp. °F	Raw Sewage: Flow MGD	pH	Grit cf/mg	~~XXXXXX~~ water ~~XXXXXX~~ cu. ft.	Cl₂ lbs.	Power KWH x10	AUX. FUEL Gas cu. ft. x 100	Remarks
1		72	38	C		2.36	7.9		1410	101	20	4	
2		76	42	C	54	2.33	7.8		1440	95	20	3	
3		80	52	CL	54	2.38	7.8		1480	92	24	5	
4		88	64	CL	55	2.39	7.8		1500	103	20	3	
5		88	68	CL	54	2.31	7.8		1470	100	20	4	
6	.02	84	52	R	56	2.50	7.9		1410	102	20	3	
7		86	60	C	55	2.44	7.8		1430	100	20	0	
8	.14	82	52	R	55	2.41	7.9		1420	99	20	2	
9	.24	58	44	R	54	2.33	7.8		1420	110	24	1	
10		74	44	C	54	2.40	7.8		1480	99	20	2	
11		82	52	C	55	2.36	7.8		1450	95	20	1	
12	.22	90	64	R	54	2.26	7.8		1490	97	20	1	
13	.07	82	60	R	56	2.40	7.9		1530	91	20	10	
14	.01	78	52	R	54	2.34	7.9		1520	90	20	0	
15	.53	78	56	R	55	2.39	7.7		1440	100	24	34	
16		76	46	C	54	2.36	7.8		1450	92	20	35	
17	.02	80	48	R	54	2.39	7.8		1810	91	20	34	
18		82	50	CL	55	2.37	7.7		1460	113	20	35	
19		86	60	CL	55	2.26	7.8		1430	100	20	35	
20		88	64	C	56	2.35	8.1		920	72	24	34	
21	.01	92	60	R	57	2.38	7.9		2230	91	20	34	
22		96	64	C	56	2.37	7.9		1700	97	20	34	
23		94	64	C	57	2.33			2270	86	24	18	
24		94	64	C	57	2.37	7.9		2210	91	20	6	
25		98	70	C	58	2.33	7.9		2100	100	20	0	
26	.10	94	64	R	57	1.98	8.0		2050	87	20	0	
27		92	66	C	57	2.32	7.8		2030	90	20	0	
28	.89	84	64	R	57	2.46	7.8		2080	125	20	0	
29		90	64	C	57	2.38	7.8		2370	113	20	0	
30		98	62	C	57	2.33	7.8		2350	87	20	0	
31													
ARITH. MEAN	.075	85	57		55	2.35	7.8		1678	97	20.7	11	
STAT MEAN						2.36							

*C—Clear CL—Cloudy R—Rain **Indicate Unit

W—Windy CA—Calm S—Snow

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH June 1966 — PRIMARY TREATMENT DATA — OPERATOR Robert J. Swalwell

Date	5-Day BOD Inf. Mg/l	5-Day BOD Inf. lbs x10	5-Day BOD Eff. Mg/l	5-Day BOD Eff. lbs x10	5-Day BOD Rem %	Suspended Solids Inf Mg/l	Suspended Solids Inf lbs x10	Suspended Solids Eff Mg/l	Suspended Solids Eff lbs x10	Suspended Solids Rem %	Suspended Volatile Solids Inf Mg/l	Suspended Volatile Solids Inf lbs x10	Suspended Volatile Solids Eff. Mg/l	Suspended Volatile Solids Eff. lbs x10	Remarks
1	72	142	60	118	17	95	187	40	79	58	84	165	30	59	
2	66	128	63	122	5	86	167	48	93	44	79	153	38	74	
3	66	131	48	95	27	129	256	43	85	67	117	232	37	73	
4	51	102	57	114	-12	60	120	43	86	28	55	110	41	82	
5	48	92	48	92	0	70	135	34	66	51	62	119	30	58	
6	68	142	68	142	0	133	277	45	94	66	108	225	35	73	
7	81	165	45	92	44	73	149	34	69	53	63	128	28	57	
8						37	74	37	74	0	29	58	30	60	
9						78	152	51	99	35	62	120	37	72	
10	60	120	60	120	0	89	178	34	68	62	73	146	25	50	
11	52	102	45	89	13	114	224	34	67	70	89	175	28	55	
12	57	107	57	107	0	65	122	31	58	52	57	107	29	55	
13	52	104	48	96	8	87	174	45	90	48	77	154	39	78	
14	45	88	45	88	0	61	119	33	64	46	52	102	25	49	
15						78	155	31	62	60	67	134	24	48	
16	48	94	57	112	-19	66	130	30	59	55	56	110	25	49	
17	36	72	36	72	0	50	100	38	76	24	46	92	32	64	
18	54	107	32	63	41	70	138	40	79	43	61	121	31	61	
19	92	173	57	107	38	62	117	27	51	57	54	102	23	43	
20	48	94	57	112	-19	75	147	41	80	45	68	133	39	76	
21	44	87	42	83	5	66	131	38	75	44	63	125	32	64	
22	48	95	48	95	0	67	132	59	117	16	57	113	56	111	
23	68	132	54	105	21	104	202	38	74	64	91	177	34	66	
24	64	127	45	89	30	79	156	30	59	62	65	129	24	47	
25	72	140	45	87	38	85	165	27	52	68	77	150	21	41	
26	56	92	30	50	46	74	122	26	43	65	60	99	21	35	
27	76	147	54	104	29	133	257	42	81	68	118	228	33	64	
28	68	140	68	140	0	96	197	60	123	38	87	179	56	115	
29	60	119	60	119	0	73	145	36	71	51	63	125	33	66	
30	64	124	32	62	50	83	161	43	84	48	72	140	38	74	
31															
ARITH. MEAN	56	117	50	99	13	81	160	39	76	50	70	138	32	64	
STAT. MEAN		117		98			152		75						

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

D-4.5
MICHIGAN DEPARTMENT OF HEALTH

MONTH June 1966

DIGESTER AND SLUDGE DATA

OPERATOR Robert J. Swalwell

Date	Raw Sludge Gals.	Raw Sludge Lbs. Per 1000 c.f. Digester	Raw Sludge pH	Raw Sludge Total Solids %	Raw Sludge Vol. Solids %	Supernatant Gals.	Supernatant pH	Supernatant Total Solids %	Supernatant Vol. Solids %	Supernatant Susp. Solids Mg/l	Supernatant 5-Day B O D Mg/l	sludge near bottom Total Solids %	sludge near bottom Vol. Solids %	sludge near bottom Vol. Acids Mg/l	Temp. pH	Temp. °F # 1	Gas Produced cu. ft.	Gas Wasted cu. ft.	Remarks
1	* 1326	28	5.8	10.0	75														Note — include gallons of sludge to beds
2	* 1326	28	5.7	10.0	75														
3	* 1326	17	5.8	6.7	68											56			
4	* 1326	23	5.6	9.0	68											56			
5	* 1326	23	5.5	8.7	69														
6	* 1326	17	5.8	6.0	74														
7	* 1326	28	5.7	11.0	68											60			
8																60			
9	884	11		5.6	75											60			
10	884	13	5.9	7.6	69											60			
11	1768	24	5.8	6.6	72											61			
12	1326	17	5.9	6.0	76											61			
13	1326	17	5.5	5.4	85											61			
14	884	15	5.2	8.0	73														
15																			
16	884	16	6.0	8.5	73											68			
17	884	12	5.9	7.0	71											72			
18	1326	20	6.0	7.6	71											76			
19	1105	18	5.9	7.7	75											80			
20	1105	14	5.7	6.5	70											83			
21	884	18	5.9	9.5	74											86			
22	884	18		10.1	69											90			
23	884	21	5.7	11.8	70											94			
24	1326	26	5.8	10.0	69											94			
25	884	18	5.7	10.1	71											93			
26	1547	33	5.6	11.7	65											92			
27	1105	19	5.8	8.4	71											90			
28																88			
29																			
30																81			
31																			
ARITH. MEAN	1132	19	5.7	8.4	72											75			
STAT. MEAN		20																	

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH July 1966 MISCELLANEOUS DATA OPERATOR Robert J. Swalwell

Date	Weather Precip. Inches	Weather Temp. (°F) Max.	Weather Temp. (°F) Min.	Type*	Raw Sewage Temp. °F	Raw Sewage Flow MGD	pH	Grit cf/mg	~~XXXXXX~~ water ~~XXXXXXXgal.~~ cu. ft.	Cl₂ lbs.	Power KWH x10	AUX. FUEL gas cu. ft. x 100	Remarks
1		94	62	C	57	2.34	7.8		2130	81	24	0	In May of this year we started cleaning our
2		98	68	C	57	2.32	7.8		2160	100	20	0	primary digester. We removed all but aboyt 3
3		98	72	C	57	2.18	7.6		2060	98	20	0	of scum blanket and this we could not pump. As
4	.15	86	60	R	57	2.15	7.8		2010	98	20	0	we now have facilities for pumping scum to an
5	.01	90	66	R	57	2.37	7.7		2080	88	24	0	unused portion of the plant grounds we put the
6	.04	86	60	R	57	2.33			2120	89	20	0	digester back in service with the hopes that
7		82	54	C	57	2.24	7.8		2070	93	20	0	the scum blanket would break up by next spring.
8		88	58	C	57	2.29	7.7		2160	88	20	0	
9	.67	88	64	R	58	2.35	7.6		2100	97	20	0	In July we decidéd that the wooden cover on the
10		92	65	C	58	2.24	7.8		2140	99	20	0	primary digester would have to be replaced
11	.05	88	68	R	59	2.35	7.8		2000	86	20	0	before winter. To make this job easier and
12	.12	98	68	R	59	2.38	7.9		2130	137	20	0	also with the scum blanket still in mind we
13	.01	94	68	R	59	2.36	8.0		2200	89	20	0	decided to have the complete cover lifted off.
14	.01	78	56	R	59	2.29			2100	94	20	0	The digester was taken out of service and
15		78	48	C	57	2.28	7.7		2110	90	20	0	pumped down as far as possible and the cover
16		84	49	C	57	2.23	7.8		2090	116	20	0	was removed by a crane. As of this writting
17		90	64	C	58	2.14	7.8		2130	86	20	0	we are still waiting for the crane to return
18		92	68	C	58	2.32	7.7		2120	88	20	0	and start cleaning out the scum layer.
19		84	50	C	57	2.23	7.7		2150	60	20	0	
20		78	48	C	57	2.10			2150	87	20	0	During this month the pipeing to the waste
21		82	48	C	57	2.15			2150	96	16	0	gas burner failed and as it was buried in
22		86	60	C	57	2.21			2180	139	20	0	cement a new line had to be ~~XXXX~~ laid. We
23		94	60	C	57	2.14	7.6		2130	105	16	0	are now awaiting parts for the waste gas
24		93	61	CL	58	2.05			2120	107	12	0	burner. All gas has been vented during this
25		94	68	C	59	2.22	7.9		2110	121	16	0	period.
26	.09	96	70	R	58	2.19	7.7		2250	110	16	0	
27		88	70	CL	60	2.19	7.6		2380	125	16	0	
28		90	58	CL	60	2.19	7.8		2130	113	12	0	
29		78	50	C	60	2.18	7.6		2260	117	16	0	
30		82	52	C	58	2.15			2200	110	12	0	
31		86	57	CL	60	1.97	7.7		2140	110	16	0	
ARITH. MEAN	.037	88	60		58	2.23	7.7		2137	101	18.6	0	
STAT MEAN						2.23							

*C—Clear CL—Cloudy R—Rain **Indicate Unit
W—Windy CA—Calm S—Snow

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH July 1966 PRIMARY TREATMENT DATA OPERATOR Robert J. Swalwell

Date	5-Day B O D Inf. Mg/l	5-Day B O D Inf. lbs x 10	5-Day B O D Eff. Mg/l	5-Day B O D Eff. lbs x 10	5-Day B O D Rem %	Suspended Solids Inf Mg/l	Suspended Solids Inf lbs x10	Suspended Solids Eff Mg/l	Suspended Solids Eff lbs x10	Suspended Solids Rem %	Suspended Volatile Solids Inf Mg/l	Suspended Volatile Solids Inf lbs x10	Suspended Volatile Solids Eff Mg/l	Suspended Volatile Solids Eff lbs x10	Remarks
1	56	109	56	109	0	92	180	40	78	57	75	146	32	62	
2	60	116	33	64	45	118	228	24	46	80	94	182	24	46	
3	48	87	27	49	44	122	222	36	65	71	112	204	34	62	
4	59	106	48	86	19	76	136	41	74	46	61	109	31	56	
5	68	134	45	89	34	104	206	33	65	68	89	176	25	49	
6	68	132	51	99	25	61	119	32	62	48	51	99	29	56	
7															
8	64	122	42	80	34	179	342	32	61	82	164	313	27	52	
9	68	133	42	82	38	138	270	35	69	75	125	245	32	63	
10	57	106	51	95	11	55	103	31	58	44	48	90	26	49	
11	76	149	57	112	25	91	178	46	90	45	78	153	37	73	
12	60	119	60	119	0	72	143	39	77	46	60	119	33	66	
13	48	94	57	112	-19	65	128	45	89	31	55	108	38	75	
14	60	115	60	115	0	67	128	47	90	30	55	105	34	65	
15	54	103	54	103	0	69	131	41	78	41	59	112	33	63	
16	52	97	48	89	8	72	134	29	54	60	64	119	29	54	
17	56	100	56	100	0	73	130	38	68	48	61	109	30	54	
18	48	93	54	104	-11	73	141	42	81	42	57	110	20	56	
19	42	78	28	52	33	51	95	36	67	30	46	86	34	63	
20	60	105	45	79	25	98	172	34	60	65	80	140	26	46	
21															
22															
23	72	129	63	112	13	105	187	37	66	65	85	152	30	54	
24	68	116	51	87	25	100	171	16	27	84	90	154	16	27	
25	80	148	69	128	14	120	222	40	74	67	95	176	30	56	
26	52	95	45	82	13	107	195	36	66	66	93	170	32	58	
27	64	117	48	88	25	80	146	35	64	56	69	126	29	53	
28	76	139	63	115	17	95	173	41	75	57	80	146	36	66	
29	60	109	42	76	20	80	145	38	69	54	72	131	34	62	
30	84	151	66	118	21	90	161	38	68	58	82	147	33	59	
31	64	105	60	99	6	98	161	38	62	61	81	133	30	49	
ARITH. MEAN	62	114	51	94	17	91	170	36	68	56	78	145	30	57	
STAT. MEAN		112		94			162		68						

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH July 1966 — DIGESTER AND SLUDGE DATA — OPERATOR Robert J. Swalwell

Date	Raw Sludge: Gals.	Raw Sludge: Lbs. Per 1000 c.f. Digester	Raw Sludge: pH	Raw Sludge: Total Solids %	Raw Sludge: Vol. Solids %	Supernatant: Gals.	Supernatant: pH	Supernatant: Total Solids %	Supernatant: Vol. Solids %	Supernatant: Susp. Solids Mg/l	Supernatant: 5-Day B O D Mg/l	sludge near bottom: Total Solids %	sludge near bottom: Vol. Solids %	sludge near bottom: Vol. Acids Mg/l	sludge near bottom: pH	Temp. °F	Gas: Produced cu. ft.	Gas: Wasted cu. ft.	Remarks
1	*																**	**	Note — include gallons of sludge to beds
2	1326	14	5.7	5.2	72														13,260 gals of digested sludge pumped to lagoon. 11.3% dry 59.4% volatile.
3	1326	24	5.6	9.4	68														
4	1326	18	5.8	6.7	70														
5																			
6	1326	11	5.7	3.8	76														
7	1326	24		9.3	68														
8	1326	17		6.2	74														
9	1326	16	5.7	5.6	78														* All raw sludge estimated on timed pumped run.
10	1326	19	5.6	6.9	72														
11	1326	12	5.8	4.3	72														
12	1326	20	5.6	7.3	74														
13	1326	18		6.9	68														** All gas produced vented to the atmosphere.
14	1326	19	6.0	6.9	72														
15																			
16																			
17	1326	13	6.1	4.7	75														
18	1326	12	5.8	4.1	81														
19	1326	16	5.9	5.9	73														
20	1326	22	5.7	8.3	72														
21																			
22																			
23	1326	20	5.6	7.6	70														
24	1326	24		9.7	67														
25																			
26																			
27	1326	15	5.6	6.0	68														
28	1326	24	5.5	9.7	66														
29	1326	23	5.7	9.3	66														
30	1326	27		9.9	73														
31	1326	20	5.9	7.5	72														
ARITH. MEAN	1326	19	5.7	7.0	72														
STAT. MEAN		19																	

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH August 1966 MISCELLANEOUS DATA OPERATOR Robert J. Swalwell

Date	Weather Precip. Inches	Weather Temp. (°F) Max.	Weather Temp. (°F) Min.	Type*	Raw Sewage Temp. °F	Raw Sewage Flow MGD	pH	Grit cf/mg	water cu. ft.	Cl₂ lbs.	Power KWH x10	AUX. FUEL Gas cu. ft. x 100	Remarks
1	.75	86	64	R	60	2.23	7.7		2110	110	16		As of this writing we are still waiting for repairs and parts for the floating cover which has been removed from the primary digester. We also are waiting on parts for the waste gas burner and for pipeing changes for our sludge circulating pump. We are in hopes that we can have both digesters back in normal operation by Oct. 1.
2		74	46	CL	59	2.14	7.8		2160	95	12		
3		78	48	C	58	2.09	7.8		2180	105	16		
4		83	50	C	58	2.16	7.8		2150	100	16		
5		88	56	C	58	2.19	7.8		2240	105	16		
6		88	56	C	58	2.20	7.8		2200	100	16		
7		91	61	C	59	2.07	7.8		2060	94	12		
8	.21	90	60	R	60	2.22			2470	97	12		
9	.11	78	54	R	59	2.16			2180	94	16		
10	.42	68	54	R	58	2.16	7.8		2270	104	16		
11		76	52	CL	59	2.20			2210	104	16		
12		74	48	C	58	2.23			2430	107	20		
13		80	62	CL	59	2.18	7.8		2170	100	16		
14		78	62	CL	59	2.14	7.7		2120	94	20		
15	1.17	86	64	R	60	2.40	8.0		2200	106	20		
16		76	52	CL	58	2.24	7.7		2200	95	16		
17		86	62	C	59	2.24	7.8		2160	105	16		
18		88	56	C	59	2.23	7.9		2200	104	16		
19		76	50	C		2.21	7.8		2150	100	16		
20		80	60	C	59	2.21	7.8		2230	96	12		
21	1.94	81	67	R	59	2.38	7.7		2170	92	16		
22	.02	76	52	R	61	2.39	7.9		2430	91	16		
23		66	46	CL	59	2.26	8.0		2180	97	16		
24		74	48	C	59	2.27	7.9		2150	94	16		
25		76	52	C	59	2.25	7.8		2160	91	16		
26		82	56	C	59	2.36	7.9		2280	100	16		
27		85	57	C	60	2.29	7.9		2070	92	16		
28		84	58	C	60	2.22	7.8		2140	98	16		
29		88	60	C	60	2.27	7.9		2120	110	16		
30		88	62	C	60	2.28	7.9		2240	92	16		
31		88	60	C	60	2.26	7.9		2470	108	16		
ARITH. MEAN	.15	81	56		59	2.23	7.8		2210	99	15.5		
STAT. MEAN						2.23							

*C—Clear CL—Cloudy R—Rain **Indicate Unit
W—Windy CA—Calm S—Snow

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH August 1966

PRIMARY TREATMENT DATA

OPERATOR Robert J. Swalwell

Date	5-Day BOD Inf. Mg/l	5-Day BOD Inf. lbs. x10	5-Day BOD Eff. Mg/l	5-Day BOD Eff. lbs. x10	5-Day BOD Rem. %	Suspended Solids Inf. Mg/l	Suspended Solids Inf. lbs. x10	Suspended Solids Eff. Mg/l	Suspended Solids Eff. lbs. x10	Suspended Solids Rem. %	Suspended Volatile Solids Inf. Mg/l	Suspended Volatile Solids Inf. lbs. x10	Suspended Volatile Solids Eff. Mg/l	Suspended Volatile Solids Eff. lbs. x10	Remarks
1	76	141	69	128	9	209	389	51	95	76	181	337	41	76	
2	64	114	69	123	-8	90	161	40	71	56	83	148	36	64	
3	68	119	63	110	8	85	148	40	70	53	70	122	29	51	
4	69	124	69	124	0	83	149	50	90	40	72	130	44	79	
5	86	157	72	131	16	113	206	36	66	68	93	170	32	58	
6	64	117	72	132	-13	135	248	43	79	68	123	226	38	70	
7	68	117	48	83	15	82	142	35	60	57	72	124	31	54	
8						91	168	49	91	46	76	141	45	83	
9	68	122	48	86	29	73	131	35	63	52	62	112	32	58	
10	68	122	39	70	43	165	297	34	61	79	148	267	30	54	
11	76	139	51	94	33	100	184	39	72	61	90	165	36	66	
12															
13	78	142	78	142	0	75	136	52	95	31	67	122	48	87	
14	84	150	57	102	32	103	184	38	68	63	88	157	31	55	
15	88	176	24	48	73	143	286	24	48	83	127	254	22	44	
16	102	191	63	118	38	173	323	41	77	76	166	310	36	67	
17	84	157	30	56	64	203	379	40	75	80	189	353	31	58	
18	80	149	51	95	36	93	173	32	60	66	74	138	26	48	
19	64	120	57	107	11	103	193	37	69	64	89	167	33	62	
20	84	154	57	105	32	87	160	32	59	63	82	151	30	55	
21	40	79	40	79	0	139	276	60	119	57	127	252	52	103	
22	64	128	72	143	-13	130	259	39	78	70	117	233	33	66	
23	80	151	72	136	10	130	245	41	77	69	118	222	37	70	
24	74	140	74	140	0	107	203	45	85	58	91	172	35	66	
25	64	120	51	96	20	107	201	46	86	57	86	161	45	84	
26	66	130	62	122	6	114	224	43	85	62	109	215	43	85	
27	87	166	48	z92	45	82	157	41	78	50	79	151	39	74	
28	80	148	54	100	32	119	220	30	56	75	107	198	22	41	
29	72	136	57	108	21	188	356	63	119	67	163	309	54	102	
30	68	129	50	95	27	161	306	44	84	73	145	276	33	63	
31	68	128	60	113	12	150	283	41	77	73	136	256	34	64	
ARITH. MEAN	74	137	57	106	20	121	226	41	77	63	108	201	36	67	
STAT. MEAN		136		107			216		76						

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH _____ 19____ DIGESTER AND SLUDGE DATA OPERATOR _____

Date	Raw Sludge Gals. *	Raw Sludge Lbs. Per 1000 c.f. Digester	Raw Sludge pH	Raw Sludge Total Solids %	Raw Sludge Vol. Solids %	Supernatant Gals.	Supernatant pH	Supernatant Total Solids %	Supernatant Vol. Solids %	Supernatant Susp. Solids Mg/l	Supernatant 5-Day B O D Mg/l	sludge near bottom Total Solids %	sludge near bottom Vol. Solids %	sludge near bottom Vol. Acids Mg/l	Temp. pH	Temp. °F	Gas Produced cu. ft.	Gas Wasted cu. ft.	Remarks
1	1326	13		4.7	74														Note — include gallons of sludge to beds
2	1326	18	6.0	6.5	72														
3	1326	23	5.8	9.2	67														* All sludge quantity estimated on timed pump run.
4	1326	17	6.2	6.4	70														
5	1326	19	6.0	7.1	73														
6	1326	16	6.0	5.9	72														
7	1326	24	5.9	10.3	62														** Sludge line to digester plugged with sand.
8	1326	13		4.6	76														
9	**																		
10	**																		
11	**																		
12	**																		
13	1326	24	5.7	10.3	61														
14	1326	21	5.8	7.8	73														
15	1326	18	5.9	6.7	71														
16	1326	21	5.8	7.8	73														
17	1326	26	6.0	11.2	63														
18																			
19	1326	21	5.9	8.0	71														
20	1326	23	5.9	8.1	75														
21	1326	21	5.8	7.6	72														
22	1326	24	6.2	8.9	70														
23	1326	22	6.0	9.0	66														
24	1326	24	6.1	9.2	70														
25	1326	22	6.1	8.6	69														
26	1326	22	6.1	9.1	65														
27	1326	17	6.1	6.3	74														
28	1326	22	6.0	8.0	73														
29	1326	17	6.1	6.0	74														
30	1326	21	6.0	8.4	68														
31																			
ARITH. MEAN	1326	20	6.0	7.8	70														
STAT. MEAN																			

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH September 19 66 MISCELLANEOUS DATA OPERATOR Robert J. Swalwell

Date	Weather Precip. Inches	Weather Temp. (°F) Max.	Weather Temp. (°F) Min.	Type*	Raw Sewage Temp °F	Raw Sewage Flow MGD	pH	Grit cf/mg	~~XXXXX~~ water ~~XXXXXgal.~~ cu. ft.	Cl₂ lbs.	Power x 10 KWH	AUX. FUEL gas cu.ft. x 100	Remarks
1		88	62	C	59	2.21	7.9		2340	100	160		
2		88	68	C	59	2.27	8.0		2200	106	200		
3	.58	86	66	R	60	2.26	7.8		2190	94	160		
4	.01	77	50	R	59	2.10	7.8		2140	95	120		
5		70	46	C	58	2.08	7.7		2090	95	160		
6		72	44	C	59	2.14	7.8		2160	103	120		
7		74	46	C	58	2.11	7.9		2160	104	160		
8		76	46	C	58	2.13			2180	103	120		
9		76	50	C	58	2.15	7.8		2210	100	160		
10		78	50	C	59	2.15	7.7		2210	135	120		
11		81	57	C	58	2.08	7.7		2150	95	160		
12		82	56	C	61	2.17	7.8		2160	104	160		
13		82	58	C	59	2.14	7.8		2150	96	120		
14	.52	76	40	R	59	2.14	8.0		2450	94	160		
15		62	34	C	58	2.08	7.9		2240	76	120		
16		66	40	C	58	2.08	7.9		20		160		
17		74	44	C	58	2.06	7.8		25		120		
18		76	55	C	58	2.04			10		160		
19		76	54	CL	60	2.13	7.7		41		120		
20		60	52	CL		2.10	7.8		64		160		
21	.46	64	52	R	59	2.12	7.8		35		120		
22		68	40	C	58	2.06	7.7		25		160		
23		64	36	C	58	1.81	7.8		78		120		
24	.01	54	44	R	58	1.95	7.6		32		160	24	
25		63	32	C	58	1.90	7.7		4		160	5	
26		63	39	CL	60	1.99	7.8		369		120	4	
27		64	38	CL	59	1.94	7.9		38		160	4	
28	.34	64	38	R	58	1.96	7.8		69		200	7	
29	.30	60	40	R		1.99	7.7		197		200	7	
30	.01	54	36	R	58	1.84			247		160	7	
31													
ARITH. MEAN	.074	72	47		59	2.07	7.8		1143	100	14.9	8.1	
STAND. MEAN													

*C—Clear CL—Cloudy R—Rain **Indicate Unit
W—Windy CA—Calm S—Snow

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH September 1966

PRIMARY TREATMENT DATA

OPERATOR Robert J. Swalwell

Date	5-Day B O D Inf. Mg/l	5-Day B O D Inf. x10 lbs.	5-Day B O D Eff. Mg/l	5-Day B O D Eff. x10 lbs.	5-Day B O D Rem %	Suspended Solids Inf Mg/l	Suspended Solids Inf x10 lbs.	Suspended Solids Eff Mg/l	Suspended Solids Eff x10 lbs.	Suspended Solids Rem %	Suspended Volatile Solids Inf Mg/l	Suspended Volatile Solids Inf x10 lbs.	Suspended Volatile Solids Eff Mg/l	Suspended Volatile Solids Eff x10 lbs
1	60	111	72	133	-20	112	206	44	81	61	96	177	37	68
2	76	144	60	114	21	93	176	46	87	51	82	155	40	76
3	72	136	56	106	22	118	222	62	117	48	112	211	62	117
4	64	112	60	105	6	108	189	41	72	62	98	172	37	65
5	64	111	72	125	11	92	160	46	80	48	81	141	44	76
6	68	121	61	109	10	104	186	35	62	76	91	162	27	48
7	76	134	72	127	5	111	195	57	100	49	88	155	42	74
8	66	117	42	75	36	150	266	47	83	69	135	240	40	71
9	84	151	64	115	24	136	244	53	95	61	130	233	41	74
10	84	151	78	140	7	106	190	47	84	56	95	170	40	72
11	68	118	60	104	12	97	168	38	66	61	82	142	31	54
12	76	138	76	138	0	107	194	46	163	57	96	174	36	65
13	76	136	60	107	21	90	161	46	82	49	77	137	38	68
14	80	143	57	102	29	130	232	43	77	67	110	196	36	64
15	72	125	72	125	0	147	255	43	75	41	135	234	37	64
16	72	125	56	97	22	72	125	48	83	33	62	108	48	83
17	68	121	68	121	0	88	156	74	131	16	72	128	68	121
18	66	115	66	115	0	196	340	40	69	80	172	298	34	59
19	72	122	60	102	17	98	167	48	82	51	1 86	146	40	68
20	60	105	39	68	35	78	137	65	65	53	67	117	30	53
21	64	113	57	101	11	88	156	49	87	44	80	141	46	81
22	60	103	68	120	-13	96	165	69	119	28	82	141	57	98
23	68	103	63	95	7	93	140	36	54	61	82	124	28	42
24						66	107	60	98	9	64	104	60	98
25						133	211	77	122	41	120	190	64	101
26	72	120	39	65	46	76	126	35	58	54	67	111	35	58
27	80	129	57	92	29	101	163	63	102	38	86	139	54	87
28	78	128	56	92	28	85	139	78	128	8	82	134	65	106
29	56	93	60	100	-7	135	224	81	134	40	109	181	53	88
30														
31														
ARITH. MEAN	70	123	61	107	12	115	186	51	91	48	94	164	44	76
STAT. MEAN		122		107			180		91					

Remarks

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

D-4.5
MICHIGAN DEPARTMENT OF HEALTH

MONTH September 19 66

DIGESTER AND SLUDGE DATA

OPERATOR Robert J. Swalwell

Date	Raw Sludge Gals. *	Raw Sludge Lbs. Per 1000 c.f. Digester	Raw Sludge pH	Raw Sludge Total Solids %	Raw Sludge Vol. Solids %	Supernatant Gals.	Supernatant pH	Supernatant Total Solids %	Supernatant Vol. Solids %	Supernatant Susp. Solids Mg/l	Supernatant 5-Day B O D Mg/l	sludge near bottom Total Solids %	sludge near bottom Vol. Solids %	sludge near bottom Vol. Acids Mg/l	sludge near bottom pH	Temp. °F	Gas Produced cu. ft.	Gas Wasted cu. ft.	Remarks
1	1326	22	5.9	8.0	73														Note — include gallons of sludge to beds
2	1326	20	5.8	7.0	74														* Estimated
3	1326	21	5.7	7.8	73														
4	1326	24		8.5	75														
5																			
6	1326	23	5.8	8.9	67														
7	1326	28	6.0	10.9	69														
8	1326	22	6.0	8.5	70														
9																			
10	1326	21	5.8	7.5	74														
11	1326	25	5.8	9.0	75														
12	1326	22	6.0	8.6	67														
13	1326	19	5.9	6.8	74														
14	1326	25	5.7	9.2	72														
15																			
16																			
17	1326	21	5.7	8.1	69														
18	1326	24	5.7	9.2	70														
19																			
20	1326	14		5.0	72														
21	1326	22		8.0	74														
22	1326	29	5.7	11.1	71														
23	1326	24	5.7	8.5	74														
24	1326	22	5.8	8.1	74														
25	1326	20	5.6	8.4	74														
26																			
27	1326	21	6.1	7.1	78														
28																			
29	1326	18	6.0	6.5	76														
30																			
31																			
ARITH. MEAN	1326	22	5.8	8.2	72														
STAT. MEAN		22																	

MICHIGAN DEPARTMENT OF HEALTH

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH October 1966 MISCELLANEOUS DATA OPERATOR Robert J. Swalwell

Date	Weather: Precip. Inches	Weather: Temp. (°F) Max.	Weather: Temp. (°F) Min.	Weather: Type*	Raw Sewage: Temp. °F	Raw Sewage: Flow MGD	pH	Grit cf/mg	~~water~~ water ~~xxxxxx~~ cu ft.	Cl₂ lbs.	Power KWH x 10	AUX. FUEL ~~gas~~ cu. ft. x 100	Remarks
1		56	32	CL	57	1.98	7.7		186		20	7	
2		60	40	C	56	1.97	7.8		190		20	5	
3		66	46	CL	59	2.04	7.7		64		16	4	
4	.03	60	42	R	57	1.99			80		20	2	
5		52	26	C	57	2.00	7.8		214		20	5	
6		56	32	C	57	2.00	7.8		184		20	6	
7		68	44	C	57	1.99	7.8		200		20	31	
8		74	46	C	58	2.01	7.7		10		16	34	
9	.10	73	42	R	58	1.96	7.9		4		20	34	
10		60	44	C	58	2.05	7.8		128		20	47	
11		58	30	C	58	1.98	7.9		73		20	32	
12	.09	60	34	R	57	1.96	7.8		59		20	38	
13	.11	62	50	R	57	1.99	8.0		48		16	40	
14	.59	74	60	R	58	2.06	7.9		0		20	16	
15		62	40	CL	58	2.03	7.9		0		20	4	
16		46	40	CL	57	1.96	7.8		0		16	15	
17		52	35	C	58	2.03	7.7		405		20	20	
18	.09	46	36	R	57	1.99	8.1		158		20	45	
19	.05	50	30	R	58	1.93	8.0		24		16	42	
20		54	32	C	58	1.96	7.9		21		20	45	
21		60	38	C	58	1.95	7.9		28		20	45	
22		62	32	C	57	1.95	7.7		21		16	46	
23		56	30	C		1.88	7.8		43		16	46	
24		56	24	C	58	1.94	7.7		32		20	28	
25		48	28	C	56	1.89	7.8		31		16	11	
26		54	26	C	56	1.91	7.8		19		16	8	
27		60	32	C	56	1.94	7.9		128		16	36	
28		68	40	C	56	1.98	7.8		320		20	47	
29		46	20	C	56	1.89	7.7		137		16	51	
30		47	27	C	56	1.86	7.9		43		20	9	
31		58	36	CL	58	1.92	7.8		66		16	7	
ARITH. MEAN	.034	58	36	5	57	1.97	7.8		94		18.5	26	
STAT MEAN						1.97							

*C—Clear CL—Cloudy R—Rain **Indicate Unit

W—Windy CA—Calm S—Snow

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH October 19 66

PRIMARY TREATMENT DATA

OPERATOR Robert J. Swalwell

Date	5-Day BOD Inf. Mg/l	5-Day BOD Inf. lbs	5-Day BOD Eff. Mg/l	5-Day BOD Eff. lbs.	5-Day BOD Rem. %	Suspended Solids Inf. Mg/l	Suspended Solids Inf. lbs.	Suspended Solids Eff. Mg/l	Suspended Solids Eff. lbs.	Suspended Solids Rem. %	Suspended Volatile Solids Inf. Mg/l	Suspended Volatile Solids Inf. lbs.	Suspended Volatile Solids Eff. Mg/l	Suspended Volatile Solids Eff. lbs.
1	108	178	51	84	53	86	142	52	86	40	78	129	46	76
2	80	131	72	118	10	115	189	46	76	60	103	169	37	61
3	102	174	80	136	21	172	293	60	102	65	140	238	50	85
4	60	100	76	126	-27	114	189	56	93	51	106	169	45	75
5	52	87	60	100	-15	96	160	50	83	48	86	143	39	65
6	60	100	56	93	7	141	234	58	97	59	129	215	51	85
7	76	126	60	100	21	156	259	24	40	85	144	239	20	33
8	88	147	56	94	36	154	258	32	54	79	150	251	32	54
9	80	131	51	83	36	135	221	68	111	50	110	180	55	90
10	78	133	64	109	13	150	257	48	82	68	130	222	42	72
11	88	145	80	132	9	151	249	53	88	65	122	201	51	84
12	72	118	57	93	21	114	186	40	65	65	82	134	29	46
13	90	149	60	100	33	112	186	41	68	63	97	161	36	60
14	68	117	51	88	25	108	186	30	52	72	91	156	28	48
15	76	129	54	91	29	104	176	28	47	73	92	156	26	44
16	114	186	68	111	40	110	180	50	82	55	101	165	44	72
17	68	115	60	102	13	107	181	48	81	55	100	169	46	78
18	76	126	64	106	16	89	148	50	83	44	78	129	43	71
19	80	129	68	109	15	120	193	52	84	57	108	174	44	71
20	56	92	64	105	-7	81	132	48	78	41	74	121	42	69
21	60	98	78	127	-30	72	117	43	70	40	67	109	40	65
22	84	137	64	104	24	85	138	43	70	49	80	130	39	63
23	96	151	88	138	8	140	220	64	100	54	121	190	54	85
24	84	136	63	102	25	137	222	47	76	66	126	204	46	74
25	72	113	57	90	21	142	224	71	112	50	133	210	56	88
26	68	108	60	96	12	112	178	34	54	70	98	156	28	45
27	60	97	60	97	0	119	193	39	63	67	97	157	30	49
28	92	152	54	89	41	163	269	30	50	82	147	243	29	48
29	76	120	64	101	16	116	182	56	88	52	53	84	28	44
30	80	124	65	101	19	128	199	43	67	67	116	180	40	62
31	78	125	63	101	7	86	138	46	74	47	75	120	41	66
ARITH. MEAN	78	128	63	104	16	120	197	47	77	59	104	171	40	65
STAT. MEAN		126		102			198		77					

Remarks

Samples used are 24 hr. composits collected by automatic samplers. The effluent samples contain supernatant while the raw do not.

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

D-45
MICHIGAN DEPARTMENT OF HEALTH

MONTH October 1966

DIGESTER AND SLUDGE DATA

OPERATOR Robert J. Swalwell

Date	Raw Sludge Gals.	Raw Sludge Lbs Per 1000 c f. Digester	Raw Sludge pH	Raw Sludge Total Solids %	Raw Sludge Vol Solids %	transfer ~~[illegible]~~ # 1 to #2 Gals.	transfer pH	transfer Total Solids %	transfer Vol Solids %	transfer Susp Solids Mg/l	transfer 5-Day B O D Mg/l	sludge near bottom Total Solids %	sludge near bottom Vol Solids %	sludge near bottom Vol Acids Mg/l	pH # 1	Temp °F #1	Gas Produced cu ft	Gas Wasted cu ft	Remarks
1	1326	21	5.9	7.5	74														Note — include gallons of sludge to beds
2	1326	22		7.7	75														
3	1326	20	5.9	7.5	71														
4	1326	24	5.9	8.6	75														Filled 1 bed during
5																			month. 7500 gals.
6	1326	30	5.6	10.2	79														10.8% dry solids
7	1326	22	5.8	9.0	65											60			54.8% volatile.
8	1768	29	5.8	7.1	82											63			
9	1326	24	5.8	7.2	89											66			
10	884	14	5.9	8.0	71											68			
11	884	13	5.8	7.1	75											72			
12	1547	23	6.2	7.1	75	17680		.2	70						5.9	73			
13	1326	17	5.5	5.7	80											76			
14	1326	16	5.5	7.8	56											78			
15	1326	20	5.6	6.7	80											78			
16	884	16	5.6	8.9	70											77			
17	1326	17	6.2	5.8	76										6.2	76			
18	884	15	6.2	7.8	76											77			
19	1768	20	6.2	5.2	75											80			
20	1326	24	6.1	8.3	76											81			
21	1768	26	6.1	7.1	74											84			
22	1768	18	6.1	4.6	80											86			
23	1326	20	6.0	7.0	75											88			
24	2210	31	6.1	6.5	77										6.0	91			
25	1326	25	5.7	9.5	70														
26	1326	20	6.0	6.8	77											90			
27	1326	17	6.1	5.7	79	10166		.3	70										
28	1989	29	6.0	6.7	77											90			
29	1326	19	5.9	6.7	76											92			
30	1326	21	5.9	7.2	79											96			
31															5.8	93			
ARITH. MEAN	1387	21	5.9	7.3	75	13920		.25	70						6.0	80			
STAT. MEAN		21																	

MICHIGAN DEPARTMENT OF HEALTH

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH November 1966 — MISCELLANEOUS DATA — OPERATOR Robert J. Swalwell

Date	Weather: Precip. Inches	Weather: Temp. (°F) Max.	Weather: Temp. (°F) Min.	Weather: Type*	Raw Sewage: Temp. °F	Raw Sewage: Flow MGD	pH	Grit cf/mg	~~Disch. Excess~~ water ~~xxxxxx~~ cu. ft.	Cl₂ lbs.	Power KWH x10	AUX. FUEL gas cu. ft. x 100	Remarks
1	.01	40	28	S	57	1.88	7.7		84		16	33	
2	.06	32	24	S	56	1.89	7.8		71		16	18	
3	.61	34	18	S	56	1.88	7.7		59		20	18	
4		38	22	C	55	1.94	7.7		127		16	16	
5		42	26	CL	55	1.90	7.7		109		20	40	
6		44	32	C	56	1.89	7.6		27		20	39	
7	.09	58	42	R	57	2.02			68		16	6	
8	.34	60	48	R	56	2.02	7.6		46		20	44	
9	1.19	60	46	R	56	2.22	7.9		419		20	45	
10		48	36	CL	56	2.15	7.8		50		16	56	
11		70	32	CL	56	2.07	7.7		38		20	30	
12		44	20	CL	55	2.06	7.7		25		20	12	
13		46	26	C	55	1.96	7.7		42		16	9	
14		44	24	C	57	2.02	7.6		75		20	62	
15		46	26	C	54	1.98	7.9		56		16	26	
16		58	44	C	55	1.97	7.6		30		20	9	
17	.06	58	38	R	55	2.00	7.8		45		16	40	
18		44	28	CL	56	1.99	7.6		66		20	20	
19		36	28	CL	54	1.94	7.6		36		20	17	
20		38	32	C	55	1.90	7.7		42		16	20	
21		48	26	C		2.06			519		20	51	
22	.05	54	38	R	55	1.88	7.6		61		20	46	
23	.19	60	50	R	55	1.99	7.5		37		16	32	
24		58	50	CL	55	1.90	7.6		38		20	8	
25	.47	52	38	R	56	1.97	7.6		61		16	10	
26	.15	56	38	R&S	55	1.98	7.6		71		20	55	
27	.39	58	27	S	55	1.97			80		16	19	
28	.07	30	24	S	56	2.01			51		20	18	
29	.02	32	26	S	55	1.98	7.8		25		20	50	
30	.02	38	16	S	55	2.00	7.7		176		20	55	
31													
ARITH. MEAN	.124	48	31		55	1.98	7.7		87		18.4	30	
STAT. MEAN						1.97							

*C—Clear CL—Cloudy R—Rain **Indicate Unit
W—Windy CA—Calm S—Snow

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH November 1966 PRIMARY TREATMENT DATA OPERATOR Robert J. Swalwell

Date	5-Day B O D Inf. Mg/l	5-Day B O D Inf. lbs x10	5-Day B O D Eff. Mg/l	5-Day B O D Eff. lbs x10	5-Day B O D Rem. %	Suspended Solids Inf. Mg/l	Suspended Solids Inf. lbs x10	Suspended Solids Eff. Mg/l	Suspended Solids Eff. lbs x10	Suspended Solids Rem %	Suspended Volatile Solids Inf. Mg/l	Suspended Volatile Solids Inf. lbs x10	Suspended Volatile Solids Eff. Mg/l	Suspended Volatile Solids Eff. lbs x10
1	84	132	66	103	21	110	172	52	82	53	98	154	45	71
2	72	113	76	120	-6	117	184	56	88	52	106	167	49	77
3	68	107	60	94	12	83	130	50	78	40	74	116	44	69
4	68	110	54	87	21	123	199	47	76	62	117	189	45	73
5	72	114	68	108	6	144	228	52	82	64	129	204	46	73
6	68	107	63	99	5	97	153	46	72	53	86	136	42	66
7	48	81	48	81	0	118	199	53	89	55	92	155	42	71
8	56	94	52	88	7	118	199	35	59	70	103	174	26	44
9	40	74	57	106	-42	93	172	76	141	18	77	143	52	96
10	92	165	47	84	51	190	341	36	65	81	166	298	29	52
11	92	159	54	93	41	94	162	53	91	44	87	150	51	88
12	76	131	69	119	9	165	283	60	103	64	159	273	55	94
13	88	144	60	98	32	101	165	42	69	58	90	147	33	54
14	60	101	48	81	20	117	197	47	79	60	104	175	38	64
15	48	79	24	40	50	58	96	48	79	17	52	86	35	58
16	64	105	30	49	34	92	151	20	33	78	.84	138	19	31
17	54	90	36	60	33	93	155	47	78	49	81	134	42	70
18	76	126	66	110	14	77	128	52	86	32	71	118	44	73
19	64	104	45	73	30	107	173	45	73	58	98	159	39	63
20	84	133	66	105	21	135	214	50	79	63	123	195	43	68
21	64	110	53	91	17	142	244	43	74	70	128	220	35	60
22	60	94	60	94	0	71	111	47	74	33	64	100	43	67
23	56	93	56	93	0	88	146	44	73	50	82	136	40	66
24	52	82	52	82	0	86	136	33	52	62	75	119	29	46
25	72	118	63	104	14	80	131	50	82	37	76	125	47	77
26	76	125	57	94	12	100	165	48	79	52	80	132	43	71
27														
28	68	114	72	121	-6	84	141	74	124	12	78	131	70	117
29	68	112	57	94	16	125	206	43	71	66	118	195	41	68
30	60	100	30	50	50									
31														
ARITH. MEAN	67	111	54	90	16	107	178	48	80	50	93	160	40	69
STAT. MEAN		110		90			171		78					

Remarks

Samples used are 24hr. composits collected by automatic samplers. The effluent samples contain supernatant while the raw do not.

MICHIGAN DEPARTMENT OF HEALTH

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR Marshall, MICHIGAN

MONTH November 1966 — DIGESTER AND SLUDGE DATA — OPERATOR Robert J. Swalwell

Date	Raw Sludge Gals.	Raw Sludge Lbs. Per 1000 c.f. Digester	Raw Sludge pH	Raw Sludge Total Solids %	Raw Sludge Vol. Solids %	Supernatant Gals.	Supernatant pH	Supernatant Total Solids %	Supernatant Vol. Solids %	Supernatant Susp. Solids Mg/l	Supernatant 5-Day B O D Mg/l	sludge near bottom Total Solids %	sludge near bottom Vol. Solids %	sludge near bottom Vol. Acids Mg/l	pH #1	Temp. °F #1	Gas Produced cu. ft. x 100	Gas Wasted cu ft. x 100	Remarks
1	1768	21	5.8	5.5	78											92			Note — include gallons of sludge to beds
2	884	12	5.7	6.3	76											92			
3	1768	12		6.3	78											90			Transfered
4	1326	15	5.8	5.2	79											88			21,952 gals.
5																86			during month.
6	1768	24	5.6	6.5	75											88			.23% dry solids
7	884	12		6.5	71											89			69.8% volatile
8	884	15		7.9	74											87			
9	884	12	5.7	5.8	79											90			Average PH of #2
10	884	15	5.9	8.8	70	13702	7.2	.33	67						5.6	94			digester was 6.8
11	1326	18	6.2	7.4	64											96	35	35	
12	1326	13	5.8	4.6	75											94	24	24	Filled one bed
13	884	13	5.8	6.9	73											92	25	25	8250 gals. 10.6%
14	2210	32		6.9	75											90	26	26	dry solids and
15	1768	28	5.8	8.0	71											94	30	30	53.5% volatile.
16	884	13	5.6	7.3	70										6.0	92	28	28	
17	1326	22	5.7	8.4	70											90	28	28	
18															5.9	94	30	30	
19	1326	18	5.5	6.7	72											92	23	23	
20	884	15	5.5	8.1	72											90	22	22	
21	884	15	5.6	8.3	74											88	23	23	
22	884	17		9.5	70											92	26	26	
23	1326	16	5.7	5.5	77											96	27	27	
24	1326	24		8.8	73											94	25	25	
25	1326	21	6.0	7.3	76											92	25	25	
26	1768	27	5.7	7.2	76											90	28	28	
27																95	25	25	
28	1768	25	5.6	6.3	78											92	22	22	
29																90	20	20	
30	2210	31	5.8	6.8	74										6.0	88	21	21	
31																			
ARITH. MEAN	1326	19	5.7	7.0	74	13702	7.2	.33	67						5.9	91	26	26	
STAT. MEAN																			

MICHIGAN DEPARTMENT OF HEALTH

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MONTH December 1966 — MISCELLANEOUS DATA — OPERATOR Robert J. Swalwell

Date	Weather: Precip. Inches	Weather: Temp. (°F) Max.	Weather: Temp. (°F) Min.	Type*	Raw Sewage: Temp. °F	Raw Sewage: Flow MGD	pH	Grit cf/mg	~~[illegible]~~ water ~~[illegible]~~ cu. ft.	Cl₂ lbs.	Power KWH x 10	AUX. FUEL ~~Gas~~ cu. ft. x 100	Remarks
1	.02	18	6	S	54	1.98	7.7		318		20	68	
2	.02	18	0	S	54	1.94	7.7		358		20	63	
3		22	0	C	54	1.93	7.6		51		20	67	
4	.30	25	13	R	54	1.87	7.5		27		16	62	
5	.04	40	34	R	54	1.99	7.7		52		16	27	
6	.62	44	36	R	54	2.14	7.7		53		20	41	
7	1.60	60	44	R	54	2.44	7.7		72		20	41	
8	.12	64	38	R	55	2.51	7.7		55		24	48	
9	.10	40	26	S	54	2.48	7.6		36		20	50	
10	.02	40	24	S	54	2.35	7.7		21		20	66	
11		31	15	C	53	2.27	7.7		15		20	54	
12		30	12	C	54	2.33	7.7		27		20	32	
13		28	14	C	53	2.29	7.7		335		20	20	
14		32	18	C	53	2.26	7.7		71		24	28	
15		38	18	C	52	2.24	7.7		62		20	55	
16		36	28	C	52	2.28	7.6		16		20	55	
17		42	30	CL	53	2.24	7.6		11		20	48	
18		39	17	CL	53	2.18	7.7		13		20	50	
19	.38	34	18	S	54	2.26	7.8		20		20	58	
20	.01	32	26	S	53	2.20	7.7		28		20	50	
21		39	23	CL	53	2.20	7.6		28		24	25	
22		28	11	CL	52	2.12	7.7		25		20	24	
23		24	14	CL	53	2.10	7.6		26		20	53	
24	.01	28	20	S	53	2.08	7.6		93		20	69	
25	.01	26	20	S	52	1.96	7.7		32		16	66	
26		29	21	CL	52	2.05	7.6		347		20	55	
27		32	18	CL	52	2.11	7.6		166		20	39	
28	.25	36	22	S	52	2.11	7.7		51		20	19	
29	.03	30	16	S	52	2.07	7.8		20		20	19	
30		26	10	CL	52	2.13	7.8		18		20	51	
31		34	22	CL	52	2.10	7.5		47		20	50	
ARITH. MEAN	.114	34	20		53	2.17	7.7		80		20	47	
STAT MEAN						2.15							

*C—Clear CL—Cloudy R—Rain **Indicate Unit

W—Windy CA—Calm S—Snow

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR Marshall, MICHIGAN

MONTH December 19 66 — PRIMARY TREATMENT DATA — OPERATOR Robert J. Swalwell

Date	5-Day BOD Inf. Mg/l	5-Day BOD Inf. x10 lbs.	5-Day BOD Eff. Mg/l	5-Day BOD Eff. x10 lbs.	5-Day BOD Rem. %	Suspended Solids Inf. Mg/l	Suspended Solids Inf. x10 lbs.	Suspended Solids Eff. Mg/l	Suspended Solids Eff. x10 lbs.	Suspended Solids Rem. %	Suspended Volatile Solids Inf. Mg/l	Suspended Volatile Solids Inf. x10 lbs.	Suspended Volatile Solids Eff. Mg/l	Suspended Volatile Solids Eff. x10 lbs.
1	60	99	56	92	7	94	155	39	64	59	94	155	39	64
2	64	104	60	97	6	147	238	38	61	74	139	225	34	55
3	60	97	60	97	0	88	142	49	79	44	81	130	45	72
4	84	131	42	66	50	111	173	25	39	78	98	153	23	36
5	78	129	54	90	31	114	182	54	90	53	91	151	47	78
6	63	112	60	107	5	125	223	59	105	53	104	186	46	82
7	51	104	40	81	22	102	208	47	96	54	81	165	33	67
8	50	105	43	90	14	67	140	32	67	52	57	119	26	54
9	64	132	54	112	16	89	184	33	68	63	77	159	29	60
10	60	118	39	76	35	98	192	28	55	71	89	174	27	53
11	60	114	36	68	40	73	138	26	49	64	55	104	21	40
12	54	105	54	105	0	104	202	43	85	59	92	179	35	68
13	53	101	52	99	2	88	168	41	78	47	73	139	36	69
14	50	94	94	94	0	73	138	62	117	14	60	113	51	96
15	48	90	39	73	19	82	153	33	62	60	71	133	26	49
16	72	138	56	107	22	98	186	28	53	72	90	171	28	53
17	72	134	57	106	21	131	245	44	82	66	121	226	42	78
18	60	109	48	87	20	124	225	34	62	73	103	187	27	49
19	80	151	51	96	36	108	204	43	81	60	90	170	41	77
20	65	119	36	66	45	74	136	32	59	57	69	127	30	55
21	57	105	57	105	0	67	123	42	77	37	57	105	38	70
22	73	129	50	88	32	77	136	51	90	34	68	120	42	74
23	76	133	60	105	21	84	147	56	98	33	79	138	52	91
24	64	111	54	94	16	82	142	46	80	44	72	125	42	73
25	24	39	12	20	50	46	75	18	29	61	40	65	16	26
26	70	120	35	60	50	117	200	33	56	72	110	188	28	48
27	72	127	55	97	24	99	174	50	88	50	88	155	46	81
28	60	106	42	74	30	74	130	45	79	39	67	118	41	72
29	66	114	56	97	15	59	102	31	54	47	58	100	31	54
30	59	105	34	60	42	126	224	48	85	62	114	202	42	75
31	80	140	67	117	16	94	165	42	74	55	86	151	36	63
ARITH. MEAN	63	113	49	88	22	97	169	40	73	55	83	149	35	64
STAT. MEAN		114		87			169		73					

Remarks

Samples used are 24hr. composits collected by automatic samplers. The effluent samples contain supernatant while the raw do not.

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR Marshall, MICHIGAN

MONTH December 1966 — DIGESTER AND SLUDGE DATA — OPERATOR Robert J. Swalwell

Date	Raw Sludge: Gals.	Raw Sludge: Lbs. Per 1000 c.f. Digester	Raw Sludge: pH	Raw Sludge: Total Solids %	Raw Sludge: Vol. Solids %	Supernatant x10: Gals.	Supernatant x10: pH	Supernatant x10: Total Solids %	Supernatant x10: Vol. Solids %	Supernatant x10: Susp. Solids Mg/l	Supernatant x10: 5-Day B O D Mg/l	sludge near bottom: Total Solids %	sludge near bottom: Vol. Solids %	sludge near bottom: Vol. Acids Mg/l	sludge near bottom: pH # 1	Temp. °F # 1	Gas: Produced cu. ft.	Gas: Wasted cu. ft.	Remarks
1																93	22		Note — include gallons
2	2210	33	5.8	7.0	76											96	23	s	of sludge to beds
3	884	12	6.1	6.3	78											92	25	a	During month 33592
4	1105	15	6.0	6.4	74											96	28	m	gals. transfered
5	884	11	5.9	5.7	76											93	27	e	from #1 to #2.
6	1326	15	6.0	4.4	76	10608	6.8	.56	71	500	168				5.9	94	35		2.33% dry and 67.2%
7	2210	31	5.9	6.7	74											95	39	a	volatile.
8	2652	34	6.0	5.9	77												39	s	
9	1326	28		9.4	68										5.9	91	42		Temp. of #2 digester
10	1326	24	5.9	7.4	74											92	42	w	averaged 73.
11	1768	27	5.9	7.1	76											95	40	a	
12	1326	21	5.8	6.4	76											94	39	s	
13	1326	21	5.8	6.7	73											94	37	t	
14	1326	20		5.9	77	11492	7.0	.58	68	390	165				6.0	92	33	e	
15	1326	19	5.8	5.5	81											92	40	d	
16	884	12	5.7	6.4	72											95	40		
17	1326	22	5.8	6.6	76												40		
18	1768	23	6.1	5.9	78											95	41		
19	1768	18	5.9	4.8	76											92	37		
20	2210	31	5.9	6.5	77										6.0	93	34		
21	1768	24	5.8	6.2	76											96	33		
22	884	12		6.1	76	11492	7.0	.47	67		66				6.1	94	32		
23	884	11	5.7	6.0	73											92	44		
24	1326	25	6.0	7.6	75											96	47		
25	1326	26	5.5	8.5	69											94	47		
26	884	14	5.7	7.3	74											92	46		
27	1768	25	5.8	6.3	78											91	52		
28																94	43		
29	1326	20	6.2	5.9	77											93	34		
30	1326	24	6.0	6.9	78											90	34		
31	884	7		3.8	75											92	32		
ARITH. MEAN	1425	21	5.9	6.4	75	11164	6.9	.54	69	445	166				6.0	94	37		
STAT. MEAN		21																	

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MICHIGAN
DEPARTMENT OF PUBLIC HEALTH
D 4 12M 5 66

MONTH January 1968 — MISCELLANEOUS DATA — OPERATOR Robert J. Swalwell

Date	Weather: Precip Inches	Weather: Temp (°F) Max.	Weather: Temp (°F) Min	Type*	Raw Sewage: Temp °F	Raw Sewage: Flow MGD	pH	water ~~xxx~~ cu ft ~~xxx~~ x 10	Plant Eff E Coli * ~~xx~~N/100ml	Cl₂ lbs	Power x10 KWH	AUX FUEL ~~Gas~~ cu. ft. x 100	Remarks
1		16	-1	CL		2.22		174		100	20	23	*Tests were made using the membrane filter
2	.02	26	14	S		2.29	7.5	165		100	20	20	standard coliform method. See Chlorine sheets
3	.01	26	6	S	51	2.26	7.5	170		105	20	19	for time of day samples were taken.
4	.01	14	-4	S	51	2.25	7.6	200		105	20	20	
5		22	2	C	51	2.26		176		100	24	26	** Supernatant being returned to settling
6	.03	18	4	S	51	2.24	7.6	172		88	20	23	tanks during day.
7	.03	12	-7	S	50	2.15	7.7	169		101	24	21	
8	.02	18	-4	R&S	51	2.26	7.5	166		110	24	23	
9		26	10	C	51	2.23	7.6	171		100	20	30	
10		20	8	C	51	2.21	7.6	170		101	20	14	
11		20	7	C	51	2.19	7.5	173		93	20	14	
12		28	12	C	51	2.21	7.5	176		94	20	15	
13	.19	28	20	S	51	2.16	7.5	171		90	20	13	
14	.23	37	21	S	51	2.15	7.6	171		95	20	18	
15		22	2	C	52	2.18	7.7	160		98	24	20	
16		26	2	C	51	2.21	7.8	196	** 250	105	20	13	
17		36	26	C	51	2.17	7.7	179		95	24	13	
18	.01	44	28	R	51	2.21	7.5	180	100	100	20	10	
19		36	24	C	50	2.13	7.5	182		95	20	10	
20		42	20	C	51	2.10	7.6	182		95	20	10	
21		38	20	C	50	2.06	7.7	180		98	24	1	
22		26	22	CL	51	2.14	7.6	178		100	20	8	
23	.01	24	2	R&S	51	2.09	7.7	173		100	24	33	
24		22	2	C	50	2.07	7.7	180	90	90	24	19	
25		26	6	C	50	2.07	7.7	178	30	94	24	18	
26	.01	40	24	R&S	50	2.06	7.6	188		98	20	12	
27	.58	42	34	R	50	2.17	7.5	184		90	20	10	
28	.15	44	35	R	50	2.16		178		100	20	14	
29	.34	48	30	R	51	2.34	7.5	208	85	98	24	5	
30		37	24	C	50	2.33	7.5	195		97	24	6	
31	.60	44	30	R	51	2.37	7.4	176	55	115	20	8	
ARITH MEAN	.07	29	14		51	2.19	7.6	178	102	98	21	16	
STAT MEAN						2.20							

*C—Clear CL—Cloudy R—Rain **Indicate Unit
W—Windy CA—Calm S—Snow

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR Marshall, MICHIGAN

MONTH January 1968 — DIGESTER AND SLUDGE DATA — OPERATOR Robert J. Swalwell

Date	Raw Sludge: Gals	Raw Sludge: Lbs Per 1000 c.f Digester	Raw Sludge: pH	Raw Sludge: Total Solids %	Raw Sludge: Vol Solids %	Supernatant x10: Gals	Supernatant x10: pH	Supernatant x10: Total Solids %	Supernatant x10: Vol Solids %	Supernatant x10: Susp Solids Mg/l	Supernatant x10: 5-Day B O D Mg/l	sludge near bottom: Total Solids %	sludge near bottom: Vol Solids %	sludge near bottom: Vol Acids Mg/l	sludge near bottom: pH # 1	Temp °F # 1	Gas: Produced cu ft x 100	Gas: Wasted cu ft	Remarks
1																100	34	0	Note — include gallons
2	1768	35		8.5	82											100	36	0	of sludge to beds
3	1768	20	5.9	5.1	77											100	43	0	
4	1768	21	6.0	5.4	79												48	0	
5	1768	20	5.8	5.3	75											100	50	0	
6	1768	22	5.8	5.6	78											100	48	0	
7	1326	14	5.9	4.8	79											100	35	0	
8	2652	29	6.0	5.1	77	12818	7.0	.24	51	15	30				7.1	100	40	0	
9	2210	21	5.9	4.1	80											97	47	0	
10	2652	32	5.9	5.4	79												44	0	
11	884	7	6.0	3.3	81											97	44	0	
12	1326	16	5.8	5.5	76												42	0	
13	884	10	6.1	5.1	76											97	3	0	
14	1326	17		6.0	76											95	65	0	
15	1326	21		6.9	81											98	44	0	
16	884	13	5.8	6.6	80	10608	7.0	.25	65	35	32				7.1	99	38	0	
17	1326	20	5.8	7.0	76												54	0	
18	1768	19	5.8	5.4	71												50	0	
19	1768	25		6.7	74											97	49	0	
20	884	13	5.7	6.5	81											99	45	0	
21	884	12	5.6	6.6	75											100	39	0	
22	1768	20	5.9	5.4	76											100	46	36	
23	1326	15	6.0	4.8	81	10829	7.0	.25	71	28	34				7.1	98	45	8	
24	1326	13	5.9	4.4	76												47	0	
25	1326	18	5.8	6.2	77											95	45	0	
26	2652	38	5.4	6.2	83												44	0	
27	1326	23	5.7	7.9	77											96	42	0	
28	884	8	5.8	3.7	83											97	40	0	
29	884	9	5.7	5.0	73											97	38	0	
30	1326	21	5.8	7.6	75											98	38	0	
31	1768	24	5.8	6.2	78											98	39	0	
ARITH MEAN	1518	19	5.8	5.7	78	11418	7.0	.25	63	26	32					98	43	1.4	
STAT MEAN		19																	

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

D-4.1
MICHIGAN DEPARTMENT OF PUBLIC HEALTH

Marshall, MICHIGAN

MONTH January 1968 — PRIMARY TREATMENT DATA — OPERATOR Robert J. Swalwell

Date	5-Day BOD Inf Mg/l	5-Day BOD Inf x10 lbs	5-Day BOD Eff Mg/l	5-Day BOD Eff x10 lbs.	5-Day BOD Rem %	Suspended Solids Inf Mg/l	Suspended Solids Inf x10 lbs.	Suspended Solids Eff Mg/l	Suspended Solids Eff x10 lbs.	Suspended Solids Rem %	Suspended Volatile Solids Inf Mg/l	Suspended Volatile Solids Inf x10 lbs.	Suspended Volatile Solids Eff Mg/l	Suspended Volatile Solids Eff x10 lbs.	Remarks
1	48	89	42	78	13	80	148	30	56	63	76	141	30	56	Samples used are 24 hr. composits.
2	67	128	54	103	19	83	159	28	53	66	70	134	25	48	collected by automatic samplers. The
3	57	107	48	90	16	62	117	33	62	47	54	102	26	49	effluent samples contain supernatant while
4	57	107	51	96	11	79	148	33	62	58	72	135	30	56	the raw do not.
5															
6	72	134	48	90	33	144	269	34	64	76	135	252	34	64	
7	72	129	48	86	33	73	131	30	54	59	63	113	24	43	
8	63	119	54	102	14	131	247	39	74	70	123	232	39	74	
9	80	149	54	100	33	100	186	29	54	71	97	180	29	54	
10	88	162	51	94	42	120	221	34	63	72	105	194	28	52	
11	88	161	57	104	35	93	170	30	55	68	82	150	26	47	
12	63	116	51	94	19	87	160	31	57	64	75	138	26	48	
13	68	122	54	97	21	46	83	33	59	28	45	81	30	54	
14	80	143	40	72	50	66	118	32	57	52	62	111	30	54	
15	64	116	36	65	44	107	195	38	69	65	93	169	30	55	
16	72	133	54	100	25	106	195	32	59	70	95	175	28	52	
17	72	130	54	98	25	97	176	32	58	67	90	163	30	54	
18	84	155	57	105	32	72	133	38	70	47	60	111	31	57	
19	76	135	33	59	57	146	259	38	67	74	131	233	36	64	
20	72	126	54	95	25	100	175	37	65	63	92	161	31	54	
21	68	117	45	94	34	119	204	31	53	74	105	180	28	48	
22	72	129	51	91	29	89	159	30	54	66	73	130	28	50	
23	80	139	57	99	29	107	187	36	63	66	103	180	38	66	
24	100	173	51	88	49	106	183	23	40	78	99	171	21	36	
25	84	145	63	109	25	164	283	41	71	75	153	264	38	66	
26	76	131	51	88	33	100	172	33	57	67	89	153	28	48	
27	84	152	48	87	43	87	157	35	63	60	82	148	34	62	
28															
29	99	193	60	117	39	204	398	47	92	77	166	324	32	62	
30	64	124	57	111	11	120	233	30	58	75	113	220	28	54	
31	60	119	51	101	15	102	202	34	75	67	89	176	27	53	
ARITH MEAN	73	134	51	94	29	103	188	34	62	65	93	170	30	55	
STAT. MEAN		133		95			180		63						

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MICHIGAN DEPARTMENT OF PUBLIC HEALTH
D-4 12M 5-66

MONTH February 1968 — MISCELLANEOUS DATA — OPERATOR Robert J. Swalwell

Date	Weather: Precip. Inches	Weather: Temp. (°F) Max.	Weather: Temp. (°F) Min.	Weather: Type*	Raw Sewage: Temp. °F	Raw Sewage: Flow MGD	pH	~~XXX~~ water cu. ft cf/mg x 10	Plant Eff. E. Coli. MPN/100ml.	Cl₂ lbs.	Power KWH x 10	AUX. FUEL ~~Gas~~ cu. ft. x 10	Remarks
1	1.14	52	30	R	50	2.63	7.5	182	40	125	28	7	
2	.03	32	20	S	50	2.67	7.4	181		112	24	9	
3		34	14	C	50	2.63	7.4	177		103	28	9	
4		39	16	C	50	2.53	7.6	176		104	24	11	
5		42	16	C	50	2.61	7.5	171		108	28	10	
6		44	18	C	49	2.54	7.5	176		110	24	8	
7		42	22	C	50	2.49	7.6	176	110	107	24	8	
8	.01	30	25	S	50	2.48	7.7	216	85	105	24	24	
9		22	4	CL	50	2.47	7.5	188		124	28	20	
10	.01	16	4	S	49	2.44	7.2	179		105	28	23	
11	.05	18	8	S	49	2.37	7.6	183		108	28	22	
12		19	3	CL	50	2.42	7.7	171		100	24	21	
13		24	4	C	49	2.35	7.6	175	60	104	28	13	
14		28	18	C	49	2.39	7.6	178		100	24	10	
15		30	16	C	49	2.35	7.7	177		96	28	16	
16		38	2	CL	49	2.36	7.6	178		119	24	17	
17		16	2	CL	49	2.33	7.5	184		109	24	19	
18		24	8	C	49	2.24	7.6	173		90	24	17	
19	.04	32	10	S	50	2.33	7.6	216		98	28	20	
20	.01	20	-6	S	49	2.28	7.5	194	35	96	20	30	
21		18	0	CL	49	2.26	7.5	173	260	105	24	41	
22		25	8	C	49	2.27	7.6	161		100	24	20	
23		34	12	C	49	2.26	7.5	145		100	24	21	
24		30	6	C	49	2.24	7.5	148		104	24	16	
25		34	13	C	50	2.20	7.7	144		105	24	3	
26		36	14	C	50	2.29	7.7	143		105	20	15	
27	.06	34	20	S	50	2.27	7.6	149		102	24	18	
28		34	15	CL	49	2.27	7.6	151		98	24	15	
29		28	10	C	49	2.27	7.6	146		100	24	21	
30													
31													
ARITH. MEAN	.05	30	12		49	2.39	7.6	173	98	105	25	17	
STAT MEAN						2.37							

*C—Clear CL—Cloudy R—Rain **Indicate Unit
W—Windy CA—Calm S—Snow

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

D-4.1
MICHIGAN DEPARTMENT OF PUBLIC HEALTH

MONTH February 19 68

PRIMARY TREATMENT DATA

OPERATOR Robert J. Swalwell

Date	5-Day BOD Inf Mg/l	5-Day BOD Inf x10 lbs	5-Day BOD Eff Mg/l	5-Day BOD Eff x10 lbs.	5-Day BOD Rem %	Suspended Solids Inf Mg/l	Suspended Solids Inf x10 lbs.	Suspended Solids Eff Mg/l	Suspended Solids Eff x10 lbs.	Suspended Solids Rem %	Suspended Volatile Solids Inf Mg/l	Suspended Volatile Solids Inf x10 lbs.	Suspended Volatile Solids Eff Mg/l	Suspended Volatile Solids Eff x10 lbs.	Remarks
1	57	125	48	105	17	125	274	50	110	60	102	224	33	72	
2	60	134	42	94	30	75	167	33	73	56	66	147	27	60	
3						110	241	35	77	68	97	213	30	66	
4	75	158	48	101	36	71	150	37	78	48	62	131	33	70	
5	57	124	54	118	5	114	248	29	63	75	108	235	28	61	
6	63	133	48	102	24	109	231	30	64	73	97	205	24	51	
7	76	158	45	93	48	186	386	34	71	82	170	353	28	58	
8	96	199	48	99	50	169	349	23	48	86	158	327	16	33	
9	54	111	51	105	6	61	126	35	72	43	56	115	33	68	
10	76	155	54	110	30	161	328	33	67	80	146	297	25	51	
11	57	113	42	83	26	95	188	44	87	54	83	164	33	65	
12	63	127	60	121	5	67	135	31	63	54	59	119	25	50	
13	76	149	57	112	25	87	171	34	67	61	77	151	28	55	
14	66	132	48	96	27	194	387	32	64	84	173	345	23	46	
15	66	129	36	71	45	128	251	39	76	70	116	227	30	59	
16	92	181	36	71	61	85	167	34	67	60			31	61	
17	76	148	48	93	37	140	272	52	101	63	128	249	50	97	
18	64	120	51	95	20	87	163	31	58	64	72	134	24	45	
19	54	105	51	99	6	83	161	35	68	58	75	146	30	58	
20	68	129	48	91	29	110	209	34	65	69	109	207	34	65	
21	64	121	48	90	25	111	209	35	66	68	106	200	32	60	
22	76	144	45	85	41	128	242	30	57	77	124	235	30	57	
23	88	166	51	96	42	134	253	30	57	78	126	238	30	57	
24	63	118	51	95	19	104	194	32	60	69	99	185	30	56	
25	64	117	57	105	11	104	191	31	57	70	91	167	25	46	
26	88	168	57	109	35	86	164	35	67	59	72	138	27	52	
27	82	155	65	123	21	59	112	32	61	46	52	98	32	61	
28	96	182	57	108	41	134	254	25	47	81	125	237	25	47	
29	56	106	39	73	30	74	139	34	64	54	70	131	33	62	
30															
31															
ARITH MEAN	70	139	49	98	28	110	220	34	68	66	101	201	29	58	
STAT MEAN		134		98			216		68						

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR Marshall, MICHIGAN

MONTH February 1968 — DIGESTER AND SLUDGE DATA — OPERATOR Robert J. Swalwell

Date	Raw Sludge Gals.	Raw Sludge Lbs Per 1000 c.f Digester	Raw Sludge pH	Raw Sludge Total Solids %	Raw Sludge Vol. Solids %	Supernatant Gals.	Supernatant pH	Supernatant Total Solids %	Supernatant Vol. Solids %	Supernatant x10 Susp. Solids Mg/l	Supernatant x10 5-Day B O D Mg/l	sludge near bottom Total Solids %	sludge near bottom Vol. Solids %	sludge near bottom Vol. Acids Mg/l	pH	Temp °F # 1	Gas Produced cu ft.	Gas Wasted cu. ft.	Remarks
1	1326	15		5.3	75	12376		.28	61	105						98	50	0	Note — include gallons
2	1768	23	6.0	6.2	76												49	0	of sludge to beds
3	1326	17	5.8	5.9	76											95	43	0	
4																96	36	0	
5	1768	17	6.0	4.7	77											98	40	32	
6	1326	16	6.0	5.9	75											96	45	45	
7	2210	29	5.9	6.1	76											92	45	45	
8	884	11	5.8	5.8	75											90	31	0	
9	1326	11	5.9	3.7	77	11050		.26	61	92	42					92	39	0	
10	884	11	5.7	5.6	75											90	45	0	
11	1326	18	5.7	6.2	78											91	39	0	
12	2652	33	6.0	5.7	78											92	37	0	
13	2210	31	6.0	6.2	80											92	36	0	
14	1768	22	5.9	5.7	78											92	20	0	
15	1326	13	5.9	4.7	76											91	40	0	
16						15470		.27	60	108	51					92	31	0	
17	1326	22	5.7	7.8	76											92	6	0	
18	1326	19		5.9	84											90	40	0	
19	1547	19	5.9	5.4	80											91	27	20	
20	1326	16	6.0	5.0	78											90	30	30	
21	884	8	5.9	4.2	78											87	32	32	
22	1326	21		7.2	77											87	32	32	
23	1326	16	6.0	5.3	79											85	31	31	
24	1326	17	5.9	5.4	77											84	30	30	
25	884	12	6.1	6.2	80											82	29	29	
26																80	7	7	
27	1768	22	5.8	5.5	79											80	*	*	
28	1768	29	6.0	7.4	79											79			
29	2210	34	5.8	6.8	80											78			
30																			
31																			
ARITH MEAN	1504	19	5.9	5.8	78	12965		.27	61	102	47					89	34	13	
STAT MEAN		19																	

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MICHIGAN
DEPARTMENT OF PUBLIC HEALTH
D-4 12M 5-66

MONTH March 1968 MISCELLANEOUS DATA OPERATOR Robert J. Swalwell

Date	Weather: Precip. Inches	Weather: Temp. (°F) Max.	Weather: Temp. (°F) Min.	Type*	Raw Sewage: Temp. °F	Raw Sewage: Flow MGD	pH	Water cu. ft. cf/mg x 10	Plant Eff. E. Coli. MPN/100ml.	Cl₂ lbs.	Power KWH x 10	AUX. FUEL Gas cu. ft. x 100	Remarks
1		36	14	C	49	2.27	7.5	150		112	24	17	
2		30	10	C	49	2.20	7.6	170		100	20	21	
3		34	14	C	50	2.18	7.6	146		101	24	17	
4		42	22	C	50	2.26	7.5	144		105	24	14	
5	.01	46	20	S	50	2.23	7.6	142		100	20	15	
6		38	16	C	49	2.21		145	20	100	24	10	
7		44	20	C	49	2.23	7.7	145		100	24	10	
8	.25	54	26	R	49	2.28	7.6	148		102	20	10	
9		46	36	CL	50	2.21		147		47	24	8	
10		42	22	C	50	2.18	7.5	135		90	20	9	
11	.19	40	22	S		2.26	7.5	157		102	24	10	
12		24	2	CL		2.22	7.6	155		100	20	56	
13		28	8	C	50	2.14	7.5	178		111	24	60	
14		42	20	C	49	2.37	7.6	287		99	24	48	
15	.08	46	36	R	49	2.25	7.5	156		103	24	53	
16	.16	56	26	C	49	2.25	7.6	149		96	20	54	
17		58	31	C	50	2.24	7.6	150		94	20	49	
18		60	40	C	50	2.30	7.5	143		97	20	46	
19		68	42	CL	50	2.24	7.6	149		100	20	46	
20	.04	48	32	S	50	2.26	7.7	149	20	91	24	44	
21		36	26	CL	49	2.25	7.6	149	50	95	20	61	
22	.50	32	20	S	49	2.30	7.6	154	130	96	20	57	
23	.10	32	20	S	49	2.22	7.7	150		90	28	83	
24		43	28	C	49	2.21	7.4	146		96	24	56	
25	.07	58	36	R	50	2.32	7.4	188	30	95	20	46	
26		66	38	CL	50	2.34	7.4	159		107	20	38	
27		72	44	C	50	2.27	7.5	150		95	24	47	
28		74	50	C	50	2.28	7.5	150		100	20	43	
29		64	30	C	50	2.22	7.5	148		101	24	46	
30		66	38	C	50	2.24	7.5	141		100	20	44	
31		62	26	CL	50	2.15	7.5	152		95	20	48	
ARIT. MEANN	.04	48	26		50	2.24	7.5	156	50	97	22	38	
STAT. MEANN						2.25							

*C—Clear CL—Cloudy R—Rain **Indicate Unit
W—Windy CA—Calm S—Snow

D-4.1

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR Marshall, MICHIGAN

MONTH March 1968

PRIMARY TREATMENT DATA

OPERATOR Robert J. Swalwell

Date	5-Day BOD Inf. Mg/l	5-Day BOD Inf. x10 lbs	5-Day BOD Eff Mg/l	5-Day BOD Eff x10 lbs.	5-Day BOD Rem %	Suspended Solids Inf Mg/l	Suspended Solids Inf x10 lbs.	Suspended Solids Eff Mg/l	Suspended Solids Eff x10 lbs.	Suspended Solids Rem %	Suspended Volatile Solids Inf Mg/l	Suspended Volatile Solids Inf x10 lbs.	Suspended Volatile Solids Eff Mg/l	Suspended Volatile Solids Eff x10 lbs.	Remarks
1	63	119	51	119	19	75	142	40	76	47	67	127	38	72	
2	54	99	51	94	6	103	189	40	73	61	94	172	34	62	
3	80	145	57	104	29	46	84	24	44	48	41	75	19	35	
4	72	136	63	119	12	66	124	31	58	53	62	117	30	57	
5	80	149	57	106	29	120	223	31	58	74	111	206	25	47	
6	63	116	48	88	24	104	192	30	55	71	98	181	29	53	
7	63	117	48	89	24	80	149	28	52	65	62	115	26	48	
8	64	122	51	97	20	79	150	32	61	60	68	129	25	48	
9															
10	84	153	57	104	32	86	156	39	71	55	77	140	31	56	
11	78	148	42	79	46	134	253	23	43	83	122	230	21	40	
12	72	133	48	89	33	134	248	28	52	79	117	217	26	48	
13	64	114	63	112	z2	77	137	47	84	39	68	121	44	79	
14	69	136	60	119	13	95	188	35	69	63	78	154	27	53	
15	69	130	57	107	17	62	116	31	58	50	59	128	31	58	
16	66	124	60	113	9	88	165	48	90	46	81	152	44	83	
17	69	129	57	106	17	94	176	56	105	40	83	155	45	84	
18	74	142	64	123	14	120	230	42	81	65	113	217	39	75	
19	76	142	54	101	29	96	179	34	64	65	91	170	31	58	
20	80	151	54	102	33	61	115	38	72	38	115	215	36	68	
21	48	90	48	90	0	82	154	29	54	65	80	150	26	49	
22	66	127	51	98	23	122	234	36	69	71	114	219	33	63	
23	72	133	54	100	25	81	150	35	65	57	76	141	33	61	
24	60	111	51	94	15	92	170	39	70	58	79	146	30	55	
25	80	155	54	104	33	165	319	37	72	78	137	265	28	54	
26	51	100	48	94	6	73	142	33	64	55	62	121	30	59	
27	66	125	51	97	23	120	227	32	61	73	113	214	31	59	
28	56	107	30	57	46	101	192	27	51	73	89	169	23	44	
29	72	133	52	96	28	151	280	33	61	78	142	263	32	59	
30	64	120	56	105	13	85	159	32	60	62	80	149	27	50	
31	64	115	48	86	25	98	176	30	54	69	86	154	27	48	
ARITH MEAN	68	127	53	99	22	96	181	35	65	61	87	164	31	58	
STAT. MEAN		126		100			173		65						

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR Marshall, MICHIGAN

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

MONTH March 1968 — DIGESTER AND SLUDGE DATA — OPERATOR Robert J. Swalwell

Date	Raw Sludge Gals.	Raw Sludge Lbs Per 1000 c.f Digester	Raw Sludge pH	Raw Sludge Total Solids %	Raw Sludge Vol Solids %	Supernatant x10 Gals.	Supernatant x10 pH	Supernatant x10 Total Solids %	Supernatant x10 Vol Solids %	Supernatant x10 Susp Solids Mg/l	Supernatant x10 5-Day B O D Mg/l	sludge near bottom Total Solids %	sludge near bottom Vol Solids %	sludge near bottom Vol Acids Mg/l	pH	Temp °F #1	Gas Produced cu ft x 100	Gas Wasted cu ft	Remarks
1	884	13	5.7	6.3	80	10608	6.6	.28	52	192	42					76			Note — include gallons
2	2210	35	5.7	6.9	80											75			of sludge to beds
3	1768	25	5.7	6.1	82											74			Due to work on heat-
4	1326	18	5.5	5.7	82											74			exchanger all gas was
5	1326	20		7.1	76											72			vented until Mar. 13.
6	1326	19	5.8	6.3	79											72			
7																71			Filled bed # 7 from
8	884	15	5.6	7.5	77											70			primary digester on
9	884	11	5.7	6.1	69											70			Mar. 25. 7500 gals.
10	1326	17		5.9	77											70			6.5% dry solids.
11	1326	19	5.6	6.6	76											69			61.0% volatile Solids.
12	1326	24	5.9	7.7	82											69			
13	1326	15	5.9	5.2	77	12818	6.7	.26	70	104	49					71	27	27	Filled bed # 4 from
14	1326	21	5.7	7.1	78											75	24	24	secondary digester on
15	1326	20	5.8	7.0	78											77	23	23	Mar. 26. 7500 gals.
16	1326	15	5.8	5.1	79											82	23	23	4.1% dry solids.
17	1105	13	6.1	5.3	79											85	23	23	50.0% volatile solids.
18	1326	19	5.9	6.5	78											88	45	45	
19	1768	36	6.0	6.6	78											91	49	49	Transfered 30940 gals.
20	884	9	5.9	4.8	78											89	47	47	from #1 to #2 during
21	1326	22	5.8	7.5	79											88	49	49	month. averaged .39%
22	1326	20	5.9	6.7	80											88	52	52	dry solids and 62.3%
23	884	12	5.8	6.2	77											88	48	48	volatile solids.
24	1326	19		6.6	78											88	51	51	
25																91	32	32	
26																91	30	30	
27	884	9	5.7	4.7	79											90	26	26	
28	1326	17	5.9	5.9	79											90	35	35	
29	1326	19	5.9	6.7	77											94	48	48	
30	1326	21	5.8	7.0	79											92	54	54	
31	884	13	5.8	6.5	78											97	43	43	
ARITH MEAN	1271	18	5.8	6.3	78	11713	6.7	.27	61	148	45					81	38	38	
STAT MEAN		18																	

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MICHIGAN
DEPARTMENT OF PUBLIC HEALTH
D 4 12M 5 66

MONTH April 1968 — MISCELLANEOUS DATA — OPERATOR Robert J. Swalwell

Date	Weather: Precip. Inches	Weather: Temp. (°F) Max	Weather: Temp. (°F) Min	Weather: Type*	Raw Sewage: Temp °F	Raw Sewage: Flow MGD	pH	Water cu ft x 10 cf/mg	Plant Eff. E Coli MPN/100ml	Cl₂ lbs	Power x10 KWH	AUX. FUEL Gas cu ft x 100	Remarks
1		48	26	C	50	2.23	7.5	141		106	24	52	
2		60	44	C	50	2.23		148		96	20	20	
3	1.15	60	46	R	50	2.36	7.6	186	50	110	24	17	
4		66	26	CL	51	2.38	7.5	159		100	20	8	
5		40	22	C	50	2.29	7.6	147		100	24	10	
6		50	30	C	50	2.28	7.5	147		93	20	8	
7		65	28	C	50	2.22	7.5	153		98	20	10	
8		65	40	C	51	2.35	7.4	142		104	24	2	
9		57	32	C	51	2.26	7.6	152		99	20	2	
10		66	27	C	50	2.24	7.6	148		91	24	2	
11		64	40	C	51	2.27	7.5	144		90	20	9	
12		77	54	C	51	2.27	7.5	149		109	20	4	
13	.01	80	54	R	52	2.27	7.5	145		96	20	3	
14	.51	65	33	R	52	2.25	7.6	151		97	24	6	
15		56	34	C	52	2.33	7.5	177	270	106	20	5	
16		66	44	C	52	2.31	7.5	148		95	20	3	
17	.15	62	46	R	52	2.28	7.5	142		106	20	4	
18		58	46	C	51	2.28		144		103	24	4	
19		68	46	CL	51	2.32	7.5	148		121	20	6	
20	.13	64	48	R	51	2.30	7.5	146		100	20	5	
21		62	42	CL	51	2.22	7.6	154		99	20	6	
22		70	50	C	52	2.33		141		104	24	4	
23	.38	72	35	R&H	52	2.33	7.5	143		101	20	24	
24	.15	44	30	R&S	52	2.24		144		90	20	25	
25		38	28	C	51	2.24	7.6	143		100	20	13	
26		58	28	C	51	2.24	7.5	146		100	24	6	
27		62	32	C	51	2.22	7.5	146		107	20	6	
28		67	44	C	51	2.17		168		100	20	5	
29		62	40	C	52	2.27	7.5	137		110	24	5	
30		60	34	C	51	2.24	7.4	153		114	20	6	
31													
ARITH MEAN	.08	61	38		51	2.27	7.5	150		102	21.3	10	
STAT MEAN						2.27							

*C—Clear CL—Cloudy R—Rain **Indicate Unit
W—Windy CA—Calm S—Snow

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

Marshall, MICHIGAN

MONTH April 1968

PRIMARY TREATMENT DATA

OPERATOR Robert J. Swalwell

Date	5-Day BOD Inf. Mg/l	5-Day BOD Inf. lbs	5-Day BOD Eff. Mg/l	5-Day BOD Eff. lbs.	5-Day BOD Rem %	Suspended Solids Inf. Mg/l	Suspended Solids Inf. lbs.	Suspended Solids Eff Mg/l	Suspended Solids Eff lbs.	Suspended Solids Rem %	Suspended Volatile Solids Inf. Mg/l	Suspended Volatile Solids Inf. lbs.	Suspended Volatile Solids Eff Mg/l	Suspended Volatile Solids Eff lbs.	Remarks
1	64	119	60	112	6	88	164	40	74	55	78	145	27	50	
2	57	106	45	84	21	91	169	38	71	58	81	151	30	56	
3	64	126	45	89	30	116	228	40	79	66	99	195	29	57	
4	57	113	48	95	16	63	125	33	66	48	57	113	27	54	
5	76	145	51	97	33	104	199	37	71	64	98	187	34	65	
6	64	121	51	97	20	73	139	34	65	53	69	131	31	59	
7	72	133	45	83	37	91	168	28	52	69	83	154	24	44	
8	64	125	57	112	11	116	227	47	92	60	80	157	42	82	
9	48	90	42	79	13	67	126	26	49	61	60	113	26	49	
10	60	112	42	78	30	78	146	36	67	54	68	127	31	58	
11	57	108	45	85	21	109	206	27	51	75	93	176	21	40	
12	64	121	54	102	16	106	201	20	38	81	92	174	18	34	
13	63	119	60	114	5	119	225	24	45	80	112	212	22	42	
14	45	84	51	96	-13	50	94	28	53	44	42	79	22	41	
15	88	171	60	117	32	72	140	40	78	44	65	126	33	64	
16	63	121	57	110	10	90	173	37	71	59	86	166	31	60	
17	66	126	57	108	14	96	193	32	61	67	96	183	32	61	
18	51	97	54	103	-6	83	158	35	67	58	72	137	32	61	
19	72	139	63	122	13	99	192	56	108	56	82	159	41	79	
20	92	176	64	123	30	160	307	35	67	78	151	290	33	63	
21	92	170	60	111	35	84	155	40	74	52	75	139	33	61	
22															
23	76	148	60	117	21	75	146	37	72	51	58	113	32	62	
24	72	134	57	106	21	112	209	32	60	71	101	189	26	49	
25	104	194	51	95	51	133	248	30	56	78	114	213	28	52	
26	80	149	52	97	35	87	163	35	65	60	77	144	33	62	
27	96	178	88	163	8	107	198	32	59	70	102	189	31	57	
28	42	76	36	65	14	94	170	23	42	76	82	148	17	31	
29	72	136	57	108	21	117	221	36	68	69	107	203	34	64	
30	84	157	54	101	36	162	303	31	58	81	156	291	28	52	
31															
ARITH MEAN	69	131	54	102	20	98	186	34	65	63	87	166	29	55	
STAT. MEAN		133		103			182		63						

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR Marshall, MICHIGAN

MONTH April 19 68

DIGESTER AND SLUDGE DATA

OPERATOR Robert J. Swalwell

Date	Raw Sludge Gals	Raw Sludge Lbs Per 1000 c f Digester	Raw Sludge pH	Raw Sludge Total Solids %	Raw Sludge Vol Solids %	Supernatant Gals.	Supernatant pH	Supernatant Total Solids %	Supernatant Vol Solids %	Supernatant Susp Solids Mg/l	Supernatant 5-Day B O D Mg/l	sludge near bottom Total Solids %	sludge near bottom Vol Solids %	sludge near bottom Vol Acids Mg/l	sludge near bottom pH	Temp °F #1	Gas Produced cu ft X 100	Gas Wasted cu ft X 100	Remarks
										x10	x10								
1	884	13	5.8	6.8	77											95	37	37	Note — include gallons
2																94	35	35	of sludge to beds
3	1768	23	5.7	6.5	79											95	31	4	
4	1326	19	5.8	6.3	81											95	33	0	Transfered 22984 gals.
5	1326	21	5.7	6.6	86											95	45	0	from #1 to #2 during
6	884	14	6.0	6.8	80											96	42	0	month. Averaged .44%
7	1326	16	6.0	5.3	80											98	39	0	dry solids and 60.7%
8	1326	25	5.5	7.8	84											98	37	0	volatile solids.
9	1547	22	6.0	6.4	88											99	44	0	
10	1989	25		5.9	76											99	51	36	
11	884	11	5.8	5.9	76											97	47	47	
12	1326	27	5.9	8.4	84	13260		.49	56	104	34					96	44	5	
13	1326	22	5.9	8.0	73											94	8	0	
14	884	14	5.8	7.4	74											93	42	0	
15	1768	20	6.0	5.2	76												28	0	
16	1326	17	5.9	5.8	77											92	33	0	
17	1326	20	5.9	7.1	76											94	41	0	
18	1768	28	5.8	7.4	77											95	51	0	
19	884	13	5.7	7.0	77	9724		.27	52	129	46					97	45	0	
20	884	14		7.4	77											96	41	0	
21	1768	25	5.9	6.4	77											97	40	0	
22	1547	18		5.3	77											95	45	0	
23	1326	19	5.9	6.8	73											97	44	31	
24	1547	21	5.9	6.4	76											95	40	0	
25	884	14	5.9	8.0	72											99	52	0	
26																100	40	0	
27	1768	27	5.5	6.8	80											102	41	0	
28	1326	22		8.0	75											96	44	0	
29																100	39	0	
30	1768	31	5.5	8.0	77											102	40	0	
31																			
ARITH MEAN	1358	20	5.8	6.8	78	11492		.38	54	116	40					97	40	6.5	
STAT MEAN		20																	

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MICHIGAN
DEPARTMENT OF PUBLIC HEALTH
D 4 12M 5 66

MONTH May 1968 MISCELLANEOUS DATA OPERATOR Robert J. Swalwell

Date	Weather: Precip Inches	Weather: Temp (°F) Max.	Weather: Temp (°F) Min	Weather: Type*	Raw Sewage: Temp °F	Raw Sewage: Flow MGD	pH	water ~~XXXX~~ cu ft x 10 cf/mg	Plant Eff. E Coli MPN/100ml	Cl₂ lbs.	Power KWH x 10	AUX. FUEL Gas cu. ft. x 100	Remarks
1		62	32	C	51	2.23	7.5	154		100	24	0	
2		75	43	CL	51	2.21	7.5	148		100	20	0	
3		66	34	C	52	2.24	7.5	145		100	24	3	
4		58	32	CL	52	2.19	7.4	149		95	20	4	
5		55	27	C	51	2.09	7.6	145		95	20	7	
6		60	36	C	52	2.22	7.5	148		100	24	4	
7		68	48	C	52	2.17	7.6	141		97	20	1	
8		76	54	CL	52	2.18	7.6	147		95	20	0	
9		68	38	C	52	2.23	7.5	193		95	20	2	
10		68	46	C	52	2.18	7.5	181		100	20	7	
11	.12	60	44	R	52	2.13	7.5	144		91	20	2	
12		75	47	C	52	2.14	7.5	148		96	24	4	
13		80	52	CL	53	2.25	7.5	140		100	20	3	
14	.49	80	52	R	53	2.31	7.6	145		100	20	3	
15	.67	86	60	R	54	2.37	7.6	153		113	24	7	
16		62	44	CL	54	2.31	7.5	149	50	96	20	2	
17		56	32	C	53	2.24	7.5	141		103	24	1	
18	.14	60	40	R	52	2.24	7.5	143		99	20	2	
19		53	37	CL	52	2.14	7.5	147		96	20	3	
20		60	38	C	54	2.27	7.6	171		100	24	2	
21		66	36	CL	53	2.23	7.5	145		106	20	6	
22	.05	68	48	R	53	2.23	7.6	144	40	100	20	6	
23		60	48	CL	53	2.24	7.5	182		106	24	3	
24		72	44	C		2.29	7.5	165		100	20	4	
25	.22	74	48	R	53	2.22	7.4	146		97	24	5	
26	.84	60	50	R	53	2.23	7.6	147		93	20	4	
27	.91	70	50	R	54	2.53	7.6	145	1600	113	24	2	
28	.08	60	50	R	53	2.46		143		96	20	3	
29		62	44	CL	54	2.46		167		123	24	3	
30		64	44	C	54	2.23		143		88	20	4	
31		75	54	C	53	2.34		137		100	24	2	
ARITH MEAN	.11	66	44		53	2.25	7.5	152		100	21.5	3.1	
STAT MEAN						2.25							

*C—Clear CL—Cloudy R—Rain **Indicate Unit
W—Windy CA—Calm S—Snow

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR Marshall, MICHIGAN

MONTH May 1968 PRIMARY TREATMENT DATA OPERATOR Robert J. Swalwell

Date	5-Day B O D Inf. Mg/l	5-Day B O D Inf. x10 lbs.	5-Day B O D Eff. Mg/l	5-Day B O D Eff. x10 lbs.	5-Day B O D Rem. %	Suspended Solids Inf. Mg/l	Suspended Solids Inf. x10 lbs.	Suspended Solids Eff. Mg/l	Suspended Solids Eff. x10 lbs.	Suspended Solids Rem. %	Suspended Volatile Solids Inf. Mg/l	Suspended Volatile Solids Inf. x10 lbs.	Suspended Volatile Solids Eff. Mg/l	Suspended Volatile Solids Eff. x10 lbs.	Remarks
1	88	164	54	100	39	130	242	39	73	70	120	223	35	65	Samples used are 24hr. composits collected
2	72	133	48	88	33	93	171	30	55	68	82	151	26	48	by automatic samplers. The effluent samples
3	96	179	54	101	44	127	237	30	56	76	121	226	29	54	contain supernatant while the raw do not.
4	64	117	51	93	20	176	321	47	86	73	157	287	36	66	
5	76	132	42	73	45	95	166	31	54	67	88	153	27	47	
6	69	128	54	100	22	83	154	28	52	66	74	137	23	43	
7	88	159	57	103	35	105	190	32	58	70	92	167	27	49	
8	68	124	57	104	16	124	225	30	55	76	116	211	26	47	
9	66	123	52	97	21	140	260	39	73	72	127	236	30	56	
10	60	109	48	87	20	93	169	41	76	56	83	154	36	67	
11	68	121	54	96	21	105	186	32	57	70	91	162	32	57	
12	66	118	48	86	27	138	246	33	59	76	120	214	30	53	
13	66	124	66	124	0	98	184	43	81	56	88	165	39	73	
14	68	131	63	121	7	127	245	40	77	69	112	216	33	64	
15	80	158	60	119	25	125	247	60	119	52	104	206	45	89	
16	76	146	54	104	29	104	200	37	71	64	96	185	35	67	
17	80	149	57	106	29	125	234	41	77	67	125	234	37	69	
18	68	127	57	106	16	86	161	36	67	58	76	142	31	58	
19	80	143	54	96	33	100	179	40	71	60	84	140	34	61	
20	64	121	51	97	20	103	195	27	51	74	103	195	25	47	
21	76	141	54	100	29	118	219	28	52	76	108	201	27	50	
22	96	179	68	126	29	153	285	42	78	73	138	257	36	67	
23	68	123	45	84	34	101	189	36	67	64	87	163	30	56	
24	72	138	51	97	29	95	181	37	71	61	88	168	32	61	
25	63	117	63	117	0	158	292	34	63	79	139	257	32	59	
26	65	121	54	100	17	106	197	30	56	72	92	171	23	43	
27	76	160	45	95	41	119	251	39	82	67	106	224	31	65	
28	108	222	51	105	53	158	324	36	74	77	144	295	32	66	
29	76	156	48	98	37	84	172	33	68	60	69	142	28	57	
30	60	112	48	89	20	83	154	39	73	53	73	136	38	71	
31	63	123	51	100	19	104	203	41	80	61	94	183	38	74	
ARITH. MEAN	74	139	54	97	26	115	215	36	69	67	103	194	32	60	
STAT. MEAN		140		100			215		69						

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR Marshall, MICHIGAN

MONTH May 1968 DIGESTER AND SLUDGE DATA OPERATOR Robert J. Swalwell

Date	Raw Sludge Gals	Raw Sludge Lbs Per 1000 c f Digester	Raw Sludge pH	Raw Sludge Total Solids %	Raw Sludge Vol Solids %	Supernatant Gals	Supernatant pH	Supernatant Total Solids %	Supernatant Vol Solids %	Supernatant Susp Solids Mg/l	Supernatant 5-Day B O D Mg/l	sludge near bottom Total Solids %	sludge near bottom Vol Solids %	sludge near bottom Vol Acids Mg/l	sludge near bottom pH	Temp °F	Gas Produced cu ft	Gas Wasted cu ft	Remarks
1	1326	18	5.7	6.2	76	11492		.26	58	114			2			102	44		Note — include gallons
2	884	17	5.6	8.7	77												37		of sludge to beds
3	884	18	5.6	8.8	81											99	40		
4	1326	31	5.8	10.2	81											98	44		During month transfere
5	884	24	5.4	11.6	81											100	39		44642 gals. from #1 to
6																98	30		#2. Averaged 2.18% dry
7	1326	25	5.5	8.6	76											100	33	23	solids and 59.5% volat
8																99	32	32	
9	884	20	5.5	10.8	75											98	32	32	Filled 1 bed May 22,
10	884	17	5.6	8.9	75											96	32	32	averaged 6.8% dry soli
11	884	16	5.4	8.9	70											95	31		6.8 % dry solids and
12	1768	33	5.6	8.9	75											96	45		52.4% volatile.
13	1768	23	5.5	6.0	76											98	46		
14	884	10	5.9	5.7	74											100	45		
15	1768	24	5.9	6.3	75	11492		.25	64	106	44					101	53		
16	1326	19	5.8	6.8	75											98	48		
17	884	15	5.6	8.1	74												48		
18	1326	26	5.7	8.9	77											97	48		
19	884	14	5.7	7.6	75											100	44		
20	1768	32		8.6	74											99	45		
21	1768	22	5.7	6.0	75											98	54		
22																100	41		
23	1768	25	5.9	6.5	76											99	36		
24	2210	28	5.7	5.9	76											97	38		
25	884	14		8.0	72											100	38		
26	1768	29	5.7	8.0	72											101	40		
27	1768	27	5.8	7.4	74											101	40		
28	1768	27	5.7	7.5	71	13260		.25	59	134	40					102	42		
29	1326	18		6.4	74											103	53		
30	1326	22		8.2	73											101	43		
31	884	13		6.8	74												45		
ARITH MEAN	1326	22	5.7	7.9	75	12081		.25	60	118	42					99	41		
STAT MEAN		22																	

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MICHIGAN
DEPARTMENT OF PUBLIC HEALTH
D-4 12M 5-66

MONTH June 1968 MISCELLANEOUS DATA OPERATOR Robert J. Swalwell

Date	Weather: Precip. Inches	Weather: Temp. (°F) Max.	Weather: Temp. (°F) Min.	Weather: Type*	Raw Sewage: Temp. °F	Raw Sewage: Flow MGD	pH	Grit cf/mg 2	~~Water~~ ~~Xxxxxx~~ water ~~Xxxxxxxx~~ cu. ft.	Cl₂ lbs.	Power KWH x10	AUX FUEL ~~Gas~~ cu. ft. x 100	Remarks
1		72	48	CL	53	2.29			1400	97	20	2	
2		76	49	C	53	2.28			1680	99	20	1	
3		78	48	C	55	2.38			1500	106	20	2	
4		90	54	C	56	2.40			1420	100	20	1	
5		90	56	C	56	2.36			1480	104	20	2	
6		92	66	C	56	2.38			1440	103	24	10	
7		96	66	C	56	2.44			1520	114	20	9	
8		98	64	C	56	2.33			1480	100	20	8	
9		99	66	C	56	2.31			1430	104	20	8	
10		92	68	C	56	2.41			1340	108	20	5	
11	.09	94	60	R	56	2.43			2010	105	20	15	
12		70	44	CL	55	2.30	7.5		1990	110	20	24	
13		80	48	C	54	2.26	7.6		1510	114	20	0	
14	.06	84	60	R	54	2.26	7.6		1440	106	20	0	
15	.01	80	54	R	55	2.17	7.5		1410	100	20	0	
16		74	53	CL	54	2.11	7.5		1430	104	16	0	
17	.21	76	50	R	56	2.29	7.5		1370	100	20	0	
18		76	54	CL	55	2.26			1470	102	20	0	
19		78	44	C	55	2.28	7.5		1450	105	24	0	
20		78	56	C	55	2.26			1510	117	20	0	
21	.41	88	56	R	56	2.31			1420	100	20	0	
22		82	54	C	56	2.23			1460	100	20	0	
23	.56	91	65	R	56	2.22			1470	96	20	0	
24		91	67	CL	57	2.48			1880	114	16	5	
25	4.34	72	56	R	56	3.10	7.5		1410	125	28	5	
26	.59	62	54	R	57	2.96	7.6		1450	109	24	5	
27	.02	63	52	R	56	2.82	7.5		1430	106	24	6	
28		74	54	CL	56	2.73	7.5		1480	123	24	6	
29	.45	80	66	R	56	2.79	7.4		1410	96	20	5	
30		92	67	CL		2.72	7.5		1450	100	24	6	
31													
ARITH MEAN	.22	82	57		55	2.42	7.5		1505	106	20.8	4.2	
STA MEAN						2.35							

*C—Clear CL—Cloudy R—Rain **Indicate Unit
W—Windy CA—Calm S—Snow

1-L

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

D-4.1
MICHIGAN DEPARTMENT OF PUBLIC HEALTH

Marshall, MICHIGAN

MONTH June 1968

PRIMARY TREATMENT DATA

OPERATOR Robert J. Swalwell

Date	5-Day BOD Inf. Mg/l	5-Day BOD Inf. lbs. x10	5-Day BOD Eff. Mg/l	5-Day BOD Eff. lbs. x10	5-Day BOD Rem. %	Suspended Solids Inf. Mg/l	Suspended Solids Inf. lbs. x10	Suspended Solids Eff. Mg/l	Suspended Solids Eff. lbs. x10	Suspended Solids Rem. %	Suspended Volatile Solids Inf. Mg/l	Suspended Volatile Solids Inf. lbs. x10	Suspended Volatile Solids Eff. Mg/l	Suspended Volatile Solids Eff. lbs. x10	Remarks
1	84	160	57	109	32	82	157	32	61	61	78	149	31	59	
2	56	107	40	76	29	87	165	37	70	57	74	141	31	59	
3	80	159	66	131	18	84	167	43	85	49	69	137	30	60	
4	66	132	45	90	32	117	234	32	64	73	103	206	23	46	
5	58	114	39	77	33	119	234	31	61	74	91	179	27	53	
6	75	149	42	83	44	77	153	32	64	58	68	135	27	54	
7	76	155	54	110	29	130	265	48	98	63	121	246	44	90	
8	64	124	51	99	20	86	167	30	58	65	81	157	28	54	
9	45	87	33	64	27	84	162	30	58	64	74	143	26	50	
10	62	125	57	115	8	123	247	39	78	68	104	209	30	60	
11	66	134	48	97	27	138	280	35	71	75	122	247	28	57	
12	64	123	45	86	30	102	196	31	59	70	82	157	27	52	
13	72	136	42	79	42	166	313	48	90	71	142	268	42	79	
14	48	90	36	68	25	92	173	33	62	64	86	162	32	60	
15	57	103	57	103	0	91	165	30	54	67	88	159	30	54	
16	72	127	48	84	33	89	157	27	58	70	76	134	25	44	
17	72	138	66	126	8	106	202	43	82	59	87	166	36	69	
18	67	126	51	96	24	103	194	36	68	65	92	173	31	58	
19	63	120	60	114	5	85	162	39	74	54	74	141	34	65	
20	60	113	54	102	10	92	173	36	68	61	78	147	25	47	
21	80	154	57	110	29	170	328	32	62	81	163	314	36	69	
22	64	119	45	84	30	81	151	32	60	61	76	141	31	58	
23	60	111	51	94	15	103	191	33	61	68	86	159	26	48	
24	51	105	36	74	29	109	225	26	54	76	96	199	24	50	
25	70	181	42	109	40	157	406	64	165	59	95	246	39	101	
26	51	126	36	89	29	100	247	31	77	69	100	247	31	77	
27	57	134	42	99	26	54	127	26	61	52	53	125	26	61	
28	64	146	48	109	25	130	296	39	89	70	130	296	31	71	
29	72	168	40	93	44	117	272	45	105	62	108	251	40	93	
30	54	122	48	109	11	64	145	37	84	42	55	125	29	66	
31															
ARITH. MEAN	65	130	48	96	25	105	212	36	73	64	92	185	31	62	
STAT. MEAN		130		96			195		72						

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR Marshall, MICHIGAN

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

MONTH June 1968 — DIGESTER AND SLUDGE DATA — OPERATOR Robert J. Swalwell

Date	Raw Sludge Gals.	Raw Sludge Lbs. Per 1000 c.f. Digester	Raw Sludge pH	Raw Sludge Total Solids %	Raw Sludge Vol. Solids %	Supernatant Gals.	Supernatant pH	Supernatant Total Solids %	Supernatant Vol. Solids %	Supernatant Susp. Solids Mg/l (x10)	Supernatant 5-Day B O D Mg/l (x10)	sludge near bottom Total Solids %	sludge near bottom Vol. Solids %	sludge near bottom Vol. Acids Mg/l	sludge near bottom pH	Temp. °F #1	Gas Produced cu. ft. X 100	Gas Wasted cu. ft.	Remarks
1	1326	17		6.3	72											100	44	0	Note — include gallons
2	884	15		8.6	70											102	43	0	of sludge to beds
3	1768	28		7.6	72											100	43	0	* Gas vented.
4	1326	19		7.0	74											102	45	0	
5	884	14		7.8	72												39	0	Transfered 36244
6	884	14		7.8	72											101	36	23	gals. from #1 to
7	884	15		9.4	64	11934		.25	64	86						100	21	21	#2 during Month.
8	1326	24		8.9	73											101	24	24	Average 1.09% dry
9	884	13		7.3	73											100	24	24	solids and 60.6%
10	1326	21		7.6	73											99	48	18	volatile solids.
11	884	15		8.1	73											98	28	17	
12	884	13		7.7	69											99	46	7	
13	1326	17		6.2	73											98	42	0	
14	884	17	5.7	9.4	72											100	40	0	
15	884	17		9.2	74											102	40	0	
16	1326	21	5.8	7.5	76											103	41	0	
17	1326	21	5.7	7.2	76											103	12	0	
18	884	17	5.6	9.3	74											102	50	0	
19	884	15		7.7	75											105	25	12	
20	1326	17		6.0	74	11934		.25	51	115	40					104	43	4	
21	1326	22		8.5	69												42	0	
22	1326	22		7.8	75											101	45	0	
23	1326	16		5.8	75											100	48	0	
24																	9	9	
25	2652	38		6.6	77											101	41	5	
26	1326	23	5.7	9.0	69												42	0	
27	1768	28	5.8	8.0	69											100	40	0	
28	1768	33	5.8	10.2	65	12372		.25	57	112	36					102	*	*	
29	1326	20	5.8	7.9	67											100	*	*	
30	1326	22	6.1	8.8	65											99	*	*	
31																			
ARITH. MEAN	1250	20	5.8	7.9	72	12081		.25	57	104	38					101	33	5.5	
STAT. MEAN		19																	

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MICHIGAN
DEPARTMENT OF PUBLIC HEALTH
D-4 12M 5-66

MONTH July 1968 MISCELLANEOUS DATA OPERATOR Robert J. Swalwell

Date	Weather Precip. Inches	Weather Temp. (°F) Max.	Weather Temp. (°F) Min	Type*	Raw Sewage Temp. °F	Raw Sewage Flow MGD	pH	Grit cf/mg	~~Water~~ water ~~Meter~~ cu. ft.	Cl₂ lbs.	Power KWH X10	AUX FUEL ~~Gas~~ Gu. ft. x 100	Remarks
1		84	58	C	57	2.73	7.4		1390	109	24	6	
2		72	46	C	57	2.68	7.5		1480	116	24	27	
3		76	44	C	56	2.59			1480	109	24	5	
4	.19	80	60	R	56	2.42	7.5		1400	100	24	5	
5	.07	82	52	R	56	2.61	7.5		1450	115	16	5	
6		82	52	C	56	2.49	7.5		1420	100	20	6	
7		87	59	C	56	2.42	7.6		1640	99	20	5	
8		90	64	C	58	2.59	7.5		1650	107	20	5	
9		88	54	C	57	2.60	7.5		1430	105	24	5	
10		80	54	C	57	2.53	7.4		1490	102	20	5	
11		88	56	C	58	2.52			1530	118	24	5	
12		92	64	C	58	2.56			1460	105	20	5	
13		94	68	C	58	2.48			1430	109	20	5	
14	.05	95	68	R	57	2.40	7.6		1450	108	20	5	
15		93	70	C	58	2.60	7.4		1390	109	20	5	
16		96	68	C	59	2.58			1430	108	24	4	
17		96	74	C	59	2.52	7.5		2010	109	24	4	
18		86	62	C	59	2.47	7.4		1450	105	20	4	
19		83	56	C	59	2.45	7.6		1470	103	20	4	
20		88	60	C	59	2.36	7.5		1400	100	24	4	
21	.50	92	66	R	57	2.28	7.5		1430	103	24	3	
22		84	54	CL	59	2.46	7.4		1480	107	20	4	
23	3.09	90	62	R	58	2.88	7.3		1920	117	24	4	
24		84	62	CL	60	2.55	7.5		1590	108	24	4	
25		84	59	C		2.61	7.4		1480	112	24	3	
26		88	62	C	59	2.57	7.4		1400	100	24	4	
27	.48	82	52	R	58	2.57	7.4		1440	98	20	4	
28		75	48	C	58	2.39	7.5		1620	98	24	4	
29		80	54	C	58	2.52	7.5		1920	108	20	4	
30		80	58	C	58	2.44	7.5		1680	117	24	4	
31	.11	80	54	R	58	2.45	7.6		1390	105	20	4	
ARITH. MEAN	.145	86	59		58	2.53	7.5		1523	107	21.9	5.2	
STAT. MEAN						2.52							

*C—Clear CL—Cloudy R—Rain **Indicate Unit
W—Windy CA—Calm S—Snow

1-L

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR Marshall, MICHIGAN

D-4.1
MICHIGAN DEPARTMENT OF PUBLIC HEALTH

MONTH July 19 68 — PRIMARY TREATMENT DATA — OPERATOR Robert J. Swalwell

Date	5-Day BOD Inf. Mg/l	5-Day BOD Inf. x10 lbs.	5-Day BOD Eff. Mg/l	5-Day BOD Eff. x10 lbs.	5-Day BOD Rem %	Suspended Solids Inf. Mg/l	Suspended Solids Inf. x10 lbs.	Suspended Solids Eff. Mg/l	Suspended Solids Eff. x10 lbs.	Suspended Solids Rem %	Suspended Volatile Solids Inf. Mg/l	Suspended Volatile Solids Inf. x10 lbs.	Suspended Volatile Solids Eff. Mg/l	Suspended Volatile Solids Eff. x10 lbs.	PHOSPHATE raw mg/l	PHOSPHATE raw lbs.	PHOSPHATE eff. mg/l	PHOSPHATE eff. lbs.	Remarks
1	51	116	60	137	-18	97	221	37	84	62	97	221	34	77					
2	57	127	48	107	16	66	148	30	67	55	60	134	27	60					
3	48	104	48	104	0	64	138	30	65	53	61	132	29	63					
4	48	97	40	81	17	49	99	28	57	43	49	99	28	57					
5						42	91	31	67	26	40	87	31	67					
6	61	127	42	87	31	65	135	26	54	60	63	131	26	54					
7	51	103	45	91	12	66	133	32	65	52	54	109	22	44					
8	60	130	15	32	75	78	168	33	71	58	70	151	29	63					
9	80	173	48	104	40	85	184	31	67	64	79	171	29	63					
10	68	143	45	95	34	112	236	40	84	64	103	217	37	78					
11	68	143	54	113	21	69	145	33	69	52	57	120	23	48					
12	56	120	54	115	4	98	209	35	75	64	83	177	28	60					
13	76	157	51	105	33	67	139	35	72	48	65	134	35	72					
14	60	120	54	108	10	81	162	28	56	65	69	138	25	50					
15	57	124	48	104	16	80	173	45	98	44	69	150	38	82					
16						78	168	37	80	53	63	136	30	65					
17	58	122	57	120	2	45	95	29	61	36	37	78	16	34					
18	57	117	57	117	0	67	138	31	64	54	67	138	31	64					
19	57	116	54	110	05	71	145	45	92	37	62	127	33	67					
20	98	193	60	118	39	122	240	36	71	71	111	218	33	65					
21	48	91	33	63	31	74	141	28	53	62	67	127	25	48					
22	64	131	42	86	34	177	363	50	103	72	168	345	46	94					
23	92	221	42	101	54	123	295	34	82	72	105	252	27	65					
24	64	136	48	102	25	70	149	42	89	40	58	123	32	68					
25	60	131	42	91	30	79	172	24	52	70	68	148	20	44	5.8	126	4.3	94	
26	45	96	40	86	11	63	135	50	107	21	61	131	29	62					
27	45	96	36	77	20	67	144	26	56	61	63	135	25	54					
28	48	96	40	80	17	70	140	29	58	59	59	118	21	42	5.3	106	4.7	94	
29	60	126	45	95	25	129	271	29	61	78	114	240	24	50	6.6	139	5.2	109	
30	53	108	44	90	17	91	185	34	69	63	78	159	32	65	5.6	114	5.5	112	
31	48	98	42	86	25	101	206	38	78	62	87	178	35	72	6.2	127	5.8	118	
ARITH. MEAN	60	126	46	97	22	82	173	34	72	56	74	156	29	61	5.9	122	5.1	105	
STAT. MEAN		122		98			159		71										

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR Marshall, MICHIGAN

D-4 5
MICHIGAN DEPARTMENT OF PUBLIC HEALTH

MONTH July 19 68

DIGESTER AND SLUDGE DATA

OPERATOR Robert J. Swalwell

Date	Raw Sludge Gals	Raw Sludge Lbs Per 1000 c f Digester	Raw Sludge pH	Raw Sludge Total Solids %	Raw Sludge Vol Solids %	Supernatant Gals	Supernatant pH	Supernatant Total Solids %	Supernatant Vol Solids %	Supernatant Susp Solids Mg/l (X10)	Supernatant 5-Day B O D Mg/l (X10)	sludge near bottom Total Solids %	sludge near bottom Vol Solids %	sludge near bottom Vol Acids Mg/l	sludge near bottom pH	Temp °F #1	Gas Produced cu ft X 100	Gas Wasted cu ft X 100	Remarks
1	884	12	5.9	7.2	67											97			Note — include gallons
2	884	13		7.4	67											97	39	39	of sludge to beds
3	1326	23	5.8	9.2	67												32	32	Transfered 32,708 gals.
4	884	14		8.3	69											93	26	26	from #1 to #2 during
5	884	14	5.6	8.3	67											97	4	0	month. Average 3.93%
6	884	14	5.7	8.7	65											98	44	36	dry solids and 56.5%
7	884	15	5.6	8.8	66												33	33	volatile solids.
8	884	14	5.9	8.8	63											92	32	32	
9	1326	22	5.8	8.9	66												32	32	
10	1326	23	5.7	9.2	68											91	34	34	
11						9724		.25	70	118	39					90	36	36	
12																90	24	24	
13	1326	25		9.8	68											90	24	24	
14	884	11		6.2	70												25	25	
15	884	15	5.6	8.6	69												11	11	
16	1326	24		9.5	68												18	18	
17																87	29	29	
18	1326	23	5.6	9.3	67											87	22	22	
19	884	16	5.5	9.7	68											88	22	22	
20	884	13	5.6	6.8	74											88	43	30	
21	884	11	5.5	6.4	71											88	46	36	
22	1326	17	5.6	6.4	71											87	26	23	
23	1326	23	5.6	9.0	70											88	51	24	
24	1326	20	5.6	7.7	70	10608		.27	68		38					88	32	32	
25	884	14	5.7	8.4	65											87	53	32	
26	884	14	5.6	8.1	69											88	45	22	
27	1326	21	5.7	8.3	69											90	42	32	
28	1326	21		8.1	68											89	33	33	
29																88	47	31	
30	1326	20	5.6	7.7	69	12376		.28	57	149	34					90	38	26	
31	1326	20		7.7	69											90	33	24	
ARITH MEAN	1097	17	5.7	8.2	68	10902		.27	65	133	37					90	31	26	
STAT MEAN		18																	

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MICHIGAN DEPARTMENT OF PUBLIC HEALTH
D-4 12M 5 66

MONTH August 1968 MISCELLANEOUS DATA OPERATOR Robert J. Swalwell

Date	Weather: Precip. Inches	Weather: Temp. (°F) Max.	Weather: Temp. (°F) Min.	Weather: Type*	Raw Sewage: Temp. °F	Raw Sewage: Flow MGD	Raw Sewage: pH	Grit cf/mg	~~Sludge~~ water ~~Vol.~~ cu. ft.	Cl₂ lbs.	Power KWH X10	AUX. FUEL gas cu. ft. x 100	Remarks
1		78	50	C	58	2.42	7.6		1430	102	24	12	
2		80	56	C	58	2.38	7.5		1450	100	20	11	
3		86	62	C	58	2.32	7.5		1470	95	24	12	
4		91	68	C	57	2.31			1460	93	20	11	
5		88	70	C	59	2.53	7.5		1390	103	20	8	
6	.02	94	66	R	58	2.56			1430	100	20	8	
7	.43	90	66	R	59	2.47	P		1410	106	20	9	
8	1.22	92	66	R	59	2.72	H		1400	106	24	9	
9		86	64	CL	59	2.68			1480	106	24	7	
10		74	46	C	59	2.47	M		1410	95	20	7	
11		72	46	C	59	2.39	E		1460	96	20	8	
12		80	56	C	59	2.49	T		1630	118	20	28	
13		84	60	C	59	2.53	E		1480	102	24	14	
14		84	56	C	59	2.52	R		1370	108	24	12	
15	.42	86	60	R	59	2.52			1430	104	20	25	
16	.48	90	64	R	61	2.59	R		1430	104	20	25	
17		82	60	CL		2.47	E		1590	97	24	17	
18		85	61	C		2.39	P		1560	100	20	7	
19		92	71	C	60	2.66	A		1500	108	24	10	
20		89	68	CL		2.60	I		1720	116	24	7	
21		94	72	CL		2.63	R		1540	109	20	22	
22		92	72	C		2.58	E		1520	105	24	12	
23		94	72	C	62	2.61	D		2020	107	20	9	
24		92	62	CL	62	2.42			1500	100	24	8	
25		70	51	C	59	2.27			1650	105	20	7	
26		64	42	C	60	2.33	7.6		1480	109	24	24	
27		70	44	C	59	2.25	7.4		1510	110	20	28	
28		7_	46	C	59	2.23	7.5		1500	107	20	23	
29		7_	46	C	58	2.23	7.5		1610	114	20	20	
30		7_	48	C	58	2.27	7.4		1560	107	20	21	
31	.01	82	54	R	58	2.22			1530	88	24	10	
ARITH MEAN	.083	83	59		59	2.45	7.5		1514	104	21.7	14	
STAT MEAN						2.45							

*C—Clear CL—Cloudy R—Rain **Indicate Unit
W—Windy CA—Calm S—Snow

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OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

D-4.1
MICHIGAN DEPARTMENT OF PUBLIC HEALTH

Marshall, MICHIGAN

MONTH August 1968 PRIMARY TREATMENT DATA OPERATOR Robert J. Swalwell

Date	5-Day BOD Inf. Mg/l	5-Day BOD Inf. x10 lbs.	5-Day BOD Eff. Mg/l	5-Day BOD Eff. x10 lbs.	5-Day BOD Rem %	Suspended Solids Inf. Mg/l	Suspended Solids Inf. x10 lbs.	Suspended Solids Eff. Mg/l	Suspended Solids Eff. x10 lbs.	Suspended Solids Rem %	Suspended Volatile Solids Inf. Mg/l	Suspended Volatile Solids Inf. x10 lbs.	Suspended Volatile Solids Eff. Mg/l	Suspended Volatile Solids Eff. x10 lbs.	PHOSPHATE RAW mg/l	PHOSPHATE RAW lbs.	PHOSPHATE EFF. mg/l	PHOSPHATE EFF. lbs.	Remarks
1	39	79	36	73	8	59	119	27	54	54	57	115	27	54	6.3	127	6.0	121	
2	45	89	39	77	13	122	242	31	62	75	115	228	27	54					
3	54	104	51	99	6	72	139	20	39	72	65	126	18	35					
4	66	127	39	75	41	50	96	21	40	58	92	92	16	31	6.4	123	5.5	106	
5	60	127	45	95	25	62	131	31	65	50	54	114	25	53	8.0	169	6.6	139	
6	48	102	42	90	13	89	190	36	77	60	85	181	33	70	6.8	145	5.0	107	
7																			
8	51	116	45	102	12	178	404	44	100	75	147	333	36	82					
9	51	114	42	94	18	95	212	28	63	71	82	183	22	49	6.2	139	5.6	125	
10	72	148	48	99	33	109	225	31	64	72	95	196	26	54					
11						60	120	33	66	45									
12	76	158	48	100	47	130	270	48	100	63	124	258	46	96	15.0	312	7.8	162	
13	68	143	48	101	29	86	181	32	68	63	71	150	32	68					
14	87	183	57	120	34	122	256	38	80	69	111	233	33	69	7.0	147	6.4	134	
15	65	137	53	111	18	68	143	29	61	57	62	130	25	53	8.0	168	6.2	130	
16	45	97	48	104	-7	73	158	33	71	55	61	132	30	65	5.6	121	4.8	104	
17	76	157	51	105	33	125	258	28	58	76	103	212	21	43					
18	64	128	51	102	20	74	147	33	66	55	69	138	33	66	7.7	153	6.2	124	
19	60	133	60	133	0	199	441	50	111	80	177	393	45	100	8.6	191	7.2	160	
20	57	124	54	117	5	91	197	25	54	73	79	171	20	43	8.3	180	7.0	152	
21	60	132	54	118	10	75	164	29	64	61	60	132	26	57	8.0	175	5.8	127	
22	72	155	60	129	17	93	200	40	86	57	80	172	31	67	7.0	151	5.7	123	
23	69	150	52	113	25	92	200	40	87	57	83	181	38	83					
24	96	194	56	113	42	103	208	41	83	60	98	198	41	83					
25	64	121	58	110	9	73	138	34	64	53	59	112	26	49	7.2	136	6.6	125	
26	54	105	54	105	0	79	153	42	82	47	69	134	34	66	8.6	167	7.6	148	
27	54	101	60	113	-11	98	184	33	62	66	86	161	23	43	8.2	154	7.8	146	
28	80	149	63	117	21	87	162	42	78	52	76	141	38	71	7.5	140	5.5	102	
29	84	156	63	117	25	97	180	41	76	58	81	151	34	63	7.8	145	7.0	130	
30	84	159	57	108	32	109	206	44	83	60	100	189	42	80	8.0	151	6.8	129	
31																			
ARITH. MEAN	64	132	51	105	19	96	198	35	71	62	85	175	30	63	7.8	159	6.4	130	
STAT. MEAN		131		105			183		71										

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR Marshall, MICHIGAN

MONTH August 1968 — DIGESTER AND SLUDGE DATA — OPERATOR Robert J. Swalwell

Date	Raw Sludge: Gals	Raw Sludge: Lbs Per 1000 c.f Digester	Raw Sludge: pH	Raw Sludge: Total Solids %	Raw Sludge: Vol. Solids %	Supernatant x 10: Gals.	Supernatant x 10: pH	Supernatant x 10: Total Solids %	Supernatant x 10: Vol. Solids %	Supernatant x 10: Susp. Solids Mg/l	Supernatant x 10: 5-Day B O D Mg/l	sludge near bottom: Total Solids %	sludge near bottom: Vol Solids %	sludge near bottom: Vol. Acids Mg/l	sludge near bottom: pH	Temp °F #1	Gas: Produced cu ft. X 100	Gas: Wasted cu. ft. X 100	Remarks
1	1326	20	5.6	8.0	67											90	36	33	Note — include gallons
2	884	17	5.6	9.5	71											89	3	0	of sludge to beds
3	884	13	5.6	7.7	70											92	53	0	
4	1105	19	5.7	8.7	68												32	32	Transfered 21658 gals.
5	884	13		7.4	68											86	31	21	from #1 to #2 during
6	884	14		8.5	64												32	32	month. Averaged .45%
7																86	26	26	dry solids and 62.1%
8	1326	23		9.3	65											86	22	16	volatile.
9	884	12		7.9	60											86	24	17	
10																86	22	22	Filled 1 bed from north
11	884	11		7.2	61											86	23	23	digester during month.
12	1326	23		9.7	62											86	24	24	1700 gals. 9.0% dry
13	1326	21		8.8	64											87	26	17	solids and 53.3% Vol.
14	884	13		8.4	64											87	25	25	
15	1326	19		7.4	67											89	29	29	Pumped scum to landfill
16	1326	20		8.5	64											90	31	31	during month. 7000 lbs.
17	1326	24		8.1	78											91	31	31	dry weight.
18	1768	28		8.6	65											90	33	33	
19	884	20		11.9	68											89	29	29	
20	884	19		12.0	63											89	30	30	
21	1768	32		10.6	61	11492		.27	57	138						88	36	36	
22																89	35	35	
23	1326	24		10.3	63											89	34	34	
24	884	14		8.1	67											89	34	34	
25	1326	22		8.6	67											88	33	31	
26	1768	27	5.7	8.5	64											87	30	30	
27	1768	29	5.6	9.9	59											88	34	34	
28	1326	27	5.5	12.6	57											89	35	35	
29	1763	35	5.6	12.0	58	10166		.26	64	118						90	46	30	
30	1768	23	5.7	7.5	61											92	35	35	
31	884	15	5.7	8.7	67											92	43	33	
ARITH MEAN	1239	21	5.6	9.1	65	10849		.265	60	128						88	31	27	
STAT MEAN		20																	

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR Marshall, MICHIGAN

MICHIGAN
DEPARTMENT OF PUBLIC HEALTH
D 4 12M 5 66

MONTH September 1968 — MISCELLANEOUS DATA — OPERATOR Robert J. Swalwell

Date	Weather: Precip. Inches	Weather: Temp (°F) Max.	Weather: Temp (°F) Min	Raw Sewage: Type*	Raw Sewage: Temp °F	Raw Sewage: Flow MGD	pH	Grit cf/mg	~~Flow~~ ~~Meter~~ water ~~Meter~~ cu. ft.	Cl₂ lbs.	Power KWH x10	AUX. FUEL gas cu. ft. x 100	Remarks
1	.62	70	54	R	58	2.19			1490	100	20	8	
2	.04	72	50	R		2.26	7.7		1470	85	20	9	
3		83	55	C	59	2.40	7.5		1550	112	20	9	
4		84	62	C		2.40	7.5		1510	103	24	24	
5	.09	76	50	R	61	2.37	7.5		2110	112	20	10	
6		72	42	C	59	2.32	7.5		2030	111	20	10	
7		72	44	C	59	2.27	7.4		1420	97	20	9	
8		81	55	CL	59	2.25	7.6		1450	120	20	8	
9	.61	74	56	R	60	2.38	7.5		1350	107	20	8	
10	.23	68	52	R	60	2.37	7.5		1740	112	20	9	
11		66	40	CL	59	2.35	7.8		1800	116	20	9	
12		72	42	C	59	2.36	7.6		1530	111	24	12	
13		76	50	C	59	2.35	7.5		1680	102	20	10	
14		78	52	C	59	2.35	7.4		1560	100	20	10	
15		79	54	C	59	2.15	7.6		1600	107	20	13	
16		82	60	C	60	2.35	7.6		1990	105	20	14	
17	.26	74	62	R	60	2.32	7.5		2460	105	20	13	
18	.29	74	50	R	60	2.31	7.7		1530	107	24	14	
19	1.35	68	54	R	59	2.48	7.5		1550	88	20	13	
20	.01	74	56	R	60	2.45	7.6		1590	113	24	28	
21		82	60	C	60	2.38	7.5		1530	100	20	19	
22	.26	76	60	R	60	2.36	7.6		1590	100	20	10	
23	.06	84	62	R	61	2.53			1540	115	20	12	
24	.26	70	46	R		2.51	7.5		1500	107	24	11	
25		64	44	CL	59	2.42			1690	110	20	12	
26		66	42	C		2.36	7.7		1600	104	20	18	
27		68	36	C	58	2.36	7.6		1630	112	20	18	
28		64	38	C	58	2.25	7.6		1610	106	20	22	
29		68	42	C	57	2.22	7.6		1730	104	20	16	
30		70	46	C	60	2.37	7.5		1520	136	24	16	
31													
ARITH MEAN	.136	74	51		59	2.35	7.6		1643	107	20.8	13	
STAT MEAN						2.35							

*C—Clear CL—Cloudy R—Rain **Indicate Unit
W—Windy CA—Calm S—Snow

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR Marshall, MICHIGAN

MONTH September 1968 — PRIMARY TREATMENT DATA — OPERATOR Robert J. Swalwell

Date	5-Day B O D Inf. Mg/l	5-Day B O D Inf. lbs.	5-Day B O D Eff. Mg/l	5-Day B O D Eff. lbs.	5-Day B O D Rem %	Suspended Solids Inf. Mg/l	Suspended Solids Inf. lbs.	Suspended Solids Eff Mg/l	Suspended Solids Eff lbs.	Suspended Solids Rem %	Suspended Volatile Solids Inf. Mg/l	Suspended Volatile Solids Inf. lbs.	Suspended Volatile Solids Eff Mg/l	Suspended Volatile Solids Eff lbs.	PHOSPHATE Inf. mg/l	PHOSPHATE Inf. lbs.	PHOSPHATE Eff. mg/l	PHOSPHATE Eff. lbs.	Remarks
1																			
2	88	166	64	121	27	104	196	34	64	67	93	175	30	57	9.0	170	7.4	139	
3	72	144	64	128	11	93	186	37	74	60	76	152	30	60	7.4	148	6.6	132	
4	72	144	60	120	17	73	146	31	62	58	65	130	29	58	6.4	128	5.2	104	
5	56	111	56	111	0	87	172	38	75	56	74	146	28	55	6.6	130	5.6	111	
6	46	89	52	101	-13	65	126	29	56	55	56	108	25	48					
7	66	125	60	114	9	55	104	39	74	29	52	98	39	74					
8	66	124	57	107	14	110	206	27	51	76	94	176	19	36	8.0	150	7.4	139	
9	63	125	51	101	19	111	220	37	73	67	93	185	35	69	7.4	147	6.4	127	
10	72	142	54	107	25	106	210	34	67	68	102	202	34	67					
11	54	106	64	125	-19	118	231	42	82	64	109	214	40	78	6.8	133	5.8	114	
12	51	100	48	94	6	89	175	41	81	54	79	155	35	69	7.0	138	6.1	120	
13	112	220	54	106	59	89	174	39	76	56	81	159	35	69					
14	72	141	60	118	17	116	227	30	59	74	100	196	27	53					
15	64	115	54	97	16	94	169	26	47	72	80	143	23	41					
16	92	180	60	118	35	180	353	45	88	75	154	302	30	59					
17	68	132	60	116	12	96	186	42	81	56	90	174	41	79					
18	68	131	51	98	25	141	272	35	67	75	127	245	28	54					
19	60	124	51	105	11	173	358	55	114	68	146	302	42	87					
20	68	139	63	129	7	75	153	36	74	52	71	145	34	69					
21	68	135	51	101	10	105	206	29	58	72	99	197	27	54					
22																			
23	84	177	69	146	18	143	302	48	101	66	122	257	31	65					
24	45	94	54	113	-20	130	272	33	69	75	113	237	30	73					
25	32	65	32	65	0	117	236	33	67	72	105	212	28	57	7.1	143	6.5	131	
26	77	152	57	112	26	168	331	41	81	76	145	285	33	65					
27	68	134	54	106	21	96	189	37	73	62	85	167	34	67	7.6	150	7.4	146	
28	69	140	63	118	9	72	135	45	84	38	68	128	43	85					
29	72	133	61	113	15	136	252	49	91	64	114	211	37	68	8.0	148	7.6	141	
30	72	142	60	119	17	146	289	51	101	65	128	253	47	93	10.1	200	7.4	146	
31																			
ARITH. MEAN	68	133	57	111	13	110	217	38	75	63	97	191	33	64	7.6	149	6.6	129	
STAT. MEAN		132		112			206		75										

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR Marshall, MICHIGAN

MONTH September 1968 — DIGESTER AND SLUDGE DATA — OPERATOR Robert J. Swalwell

Date	Raw Sludge Gals	Raw Sludge Lbs Per 1000 c.f Digester	Raw Sludge pH	Raw Sludge Total Solids %	Raw Sludge Vol Solids %	Supernatant Gals	Supernatant pH	Supernatant Total Solids %	Supernatant Vol Solids %	Supernatant Susp Solids Mg/l (x10)	Supernatant 5-Day B O D Mg/l (x10)	sludge near bottom Total Solids %	sludge near bottom Vol Solids %	sludge near bottom Vol Acids Mg/l	sludge near bottom pH	Temp °F #1	Gas Produced cu ft x 100	Gas Wasted cu ft x 100	Remarks
1	1326	16	5.8	5.7	74											92	34	34	Note — include gallons
2	1326	25	5.5	10.8	61											90	26	26	of sludge to beds
3	1326	23	5.6	9.5	64											90	27	27	
4	1768	21	5.6	6.1	70											89	30	30	Transfered 39338 gals.
5	1326	22	5.4	8.9	64	11050		.26	63	108	45					90	39	24	from #1 to #2 during
6	1326	24	4.7	9.9	64											90	32	32	Month. Averaged .40%
7	1326	23	5.1	9.6	64											89	35	26	dry solids and 61.9%
8	1326	22	5.4	8.6	68											90	31	31	volatile solids.
9	1326	20	5.7	7.9	66											88	38	20	
10	1326	17	5.6	6.9	67											89	42	27	
11	1326	25	5.5	11.6	58											88	37	24	
12						15470		.24	66	107	36					86	35	19	
13																88	24	24	
14	3094	47	5.5	7.9	68											87	25	25	
15	1768	22		7.0	64											86	29	29	
16	2210	32		7.7	67											87	28	27	
17	1768	30	5.6	8.6	69											88	44	24	
18	1326	28	5.5	11.9	63											87	34	26	
19	1768	31	5.6	9.4	65											86	24	24	
20	1768	31	5.6	9.6	65											87	31	31	
21	1326	26	5.7	9.7	70											87	28	28	
22	1768	25	5.6	7.3	67											87	28	28	
23	1768	27	5.5	8.1	68	12818		.25	72	135	45					90	49	3	
24	1326	26		10.3	66											90	28	17	
25																	24	24	
26																88	19	19	
27	2652	31	5.7	6.4	64											90	22	22	
28	884	13		7.9	65											88	20	20	
29	1768	27	5.8	8.2	67											88	11	11	
30	2210	23		5.5	67											86	0	0	
31																			
ARITH MEAN	1632	25	5.5	8.5	66	13113		.25	67	117	42					88	29	23	
STAT MEAN		25																	

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

D 4 12M 5 66

MONTH October 19 68 — MISCELLANEOUS DATA — OPERATOR Robert J. Swalwell

Date	Weather: Precip Inches	Weather: Temp (°F) Max	Weather: Temp (°F) Min	Type*	Raw Sewage: Temp °F	Raw Sewage: Flow MGD	pH	Grit cf/mg	~~XXXXX~~ water ~~XXXXX~~ cu. ft.	Cl₂ lbs	Power KWH x10	AUX FUEL ~~Gas~~ cu. ft. x 100	Remarks
1		76	56	C	58	2.34	7.4		1510	120	20	22	
2	.07	74	50	R	59	2.31	7.4		1530	109	20	16	
3	.01	56	34	R	59	2.29	7.5		1480	106	20	21	
4	.01	50	34	R&S	57	2.25	7.5		1520	113	24	25	
5		56	36	CL	57	2.18	7.4		1540	97	20	20	
6	.12	50	44	R	57	2.17	7.5		1510	98	16	10	
7		58	38	CL	59	2.26	7.3		1430	115	20	11	
8		62	40	C	58	2.25	7.5		1590	133	20	12	
9	.29	69	44	R	58	2.27			2520	120	24	23	
10		56	34	C	58	2.21	7.5		1650	111	20	18	
11		62	38	C	58	2.19	7.5		1740	119	20	10	
12		68	38	C	58	2.16			1730	110	20	10	
13		73	46	CL	57	2.19	7.5		1700	112	20	9	
14		78	56	C	59	2.25	7.5		1590	124	20	4	
15		80	56	C	59	2.22	7.5		1600	127	20	7	
16		76	56	C	60	2.05			1630	117	20	7	
17		78	54	CL	59	2.19	7.5		1590	117	24	6	
18	.24	62	36	R	59	2.16	7.5		1650	113	20	9	
19		60	38	C	57	2.04	7.5		1710	100	20	10	
20		56	34	CL	57	2.05	7.5		1670	100	16	13	
21		62	34	C	58	2.16	7.5		1590	127	20	8	
22	.05	56	38	R	59	2.20	7.5		1580	115	20	6	
23		52	36	C	57	2.19	7.4		1720	114	24	10	
24	.13	52	36	R	58	2.19	7.5		1610	108	24	8	
25		48	36	CL	57	2.18	7.4		1610	113	20	15	
26		50	36	CL	57	2.20	7.5		1650	106	20	15	
27	.01	53	36	R	57	2.11	7.5		1620	102	20	13	
28	.01	42	34	R	58	2.21	7.5		1510	114	20	22	
29		44	26	CL		2.17	7.6		1480	108	20	20	
30		46	28	C	2.12		7.5		1820	106	20	18	
31		60	32	C		1.86	7.5		1830	114	20	15	
ARITH MEAN	.03	60	40		58	2.18	7.5		1642	113	20.4	13	
STAT MEAN						2.18							

*C—Clear CL—Cloudy R—Rain **Indicate Unit

W—Windy CA—Calm S—Snow

1-L

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

D-4.1
MICHIGAN DEPARTMENT OF PUBLIC HEALTH

Marshall, MICHIGAN

MONTH October 19 68

PRIMARY TREATMENT DATA

OPERATOR Robert J. Swalwell

Date	5-Day BOD Inf Mg/l	5-Day BOD Inf lbs x10	5-Day BOD Eff Mg/l	5-Day BOD Eff lbs x10	5-Day BOD Rem %	Suspended Solids Inf Mg/l	Suspended Solids Inf lbs x10	Suspended Solids Eff Mg/l	Suspended Solids Eff lbs x10	Suspended Solids Rem %	Suspended Volatile Solids Inf Mg/l	Suspended Volatile Solids Inf lbs x10	Suspended Volatile Solids Eff Mg/l	Suspended Volatile Solids Eff lbs x10	TOTAL PHOSPHATE Inf. mg/l	TOTAL PHOSPHATE Inf. lbs.	TOTAL PHOSPHATE Eff. mg/l	TOTAL PHOSPHATE Eff. lbs.	Remarks
1	66	129	51	100	23	154	300	47	92	70	138	269	38	74					
2	57	110	48	92	16	99	191	45	87	55	89	172	36	69					
3	60	115	51	97	15	171	327	37	71	78	145	277	32	61					
4	69	130	57	107	17	117	220	49	92	58	108	203	47	88					
5	76	138	68	124	11	102	185	39	71	62	94	171	39	71					
6	80	145	60	109	25	127	230	47	85	63	113	205	40	72					
7	72	136	57	107	21	101	190	37	70	63	91	172	32	60					
8	87	163	60	113	31	112	210	51	96	55	90	169	40	75					
9																			
10	60	111	54	100	10	128	236	40	74	69	119	219	35	65					
11						74	135	38	69	49	63	115	33	60					
12																			
13	57	104	54	99	5	83	152	54	99	35	73	133	44	80					
14	64	120	60	113	6	132	248	48	90	64	112	210	35	66					
15	54	100	63	117	-17	92	170	58	107	37	85	157	54	100					
16	51	87	21	36	53	115	197	40	68	65	104	178	35	60					
17	72	131	57	104	21	88	161	36	66	59	75	137	30	55					
18	64	115	42	76	34	78	140	22	40	72	35	63	22	40					
19	36	61	42	71	-17	116	197	34	58	71	103	175	30	51					
20	45	77	39	67	13	75	128	34	58	55	56	96	26	44					
21						115	207	38	68	67	106	191	35	63					
22	70	128	66	121	6	113	207	68	125	40	102	187	61	112					
23	54	99	42	77	22														
24	63	115	57	106	10	138	252	42	77	70	125	228	42	77					
25	66	120	57	104	14	114	207	54	98	53	102	185	45	82					
26	68	125	63	116	7	109	200	38	70	65	102	187	34	62					
27	72	127	48	84	33	111	195	36	63	68	97	171	28	49	15.5	273	14.0	246	
28	57	105	51	94	11	136	251	48	88	65	124	229	41	76	21.0	387	18.5	341	
29	57	103	54	98	5	81	147	45	81	44	72	130	39	71	14.0	253	12.5	226	
30	66	117	57	101	14	90	159	51	90	43	78	138	43	76	15.5	274	15.5	274	
31	72	112	57	88	21	121	188	55	85	55	107	166	42	65	13.0	202	14.0	217	
ARITH MEAN	64	116	55	97	15	110	201	44	80	59	97	176	38	69	15.8	278	14.9	261	
STAT MEAN		117		98			197		80										

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR Marshall, MICHIGAN

MONTH October 1968 — DIGESTER AND SLUDGE DATA — OPERATOR Robert J. Swalwell

Date	Raw Sludge: Gals	Raw Sludge: Lbs Per 1000 c.f Digester	Raw Sludge: pH	Raw Sludge: Total Solids %	Raw Sludge: Vol. Solids %	Supernatant x10: Gals	Supernatant x10: pH	Supernatant x10: Total Solids %	Supernatant x10: Vol Solids %	Supernatant x10: Susp Solids Mg/l	Supernatant x10: 5-Day B O D Mg/l	sludge near bottom: Total Solids %	sludge near bottom: Vol Solids %	sludge near bottom: Vol Acids Mg/l	sludge near bottom: pH	Temp °F #1	Gas: Produced cu ft X 100	Gas: Wasted cu ft X 100	Remarks
1	2210	37	5.6	8.6	68	11934		.22	67	85	260					87	22	22	Note — include gallons
2	1768	32	5.6	9.8	65											89	43	22	of sludge to beds
3	2652	43	5.7	8.0	71											89	24	24	
4	1326	20	5.5	7.8	68											89	45	23	
5	1326	24	5.6	9.4	68											89	26	26	
6	1768	31	5.6	8.0	76											88	26	26	
7	1326	26	5.7	11.8	58											87	40	14	
8	1326	26		10.0	69	8840		.23	63	73	400					88	27	15	
9	2210	41	5.6	9.5	69											87	20	20	
10	2210	34	5.7	8.1	67											88	30	20	
11	1326	29	5.8	9.6	80											88	42	18	
12	1326	24	5.7	8.9	71	11934		.22	60	78	160					89	21	10	
13	2210	33	5.7	7.2	73											89	48	32	
14																87	48	21	
15	1768	27	5.6	8.3	66											88	10	1	
16	884	16	5.6	10.7	61											90	19	14	
17	2652	35	5.6	7.0	68											90	20	20	
18	2652	38	5.5	7.1	72											88	49	0	
19	1768	15	5.5	4.6	67											91	47	0	
20	1768	25		7.1	71											94	42	0	
21	2652	33	5.5	6.1	72	17680		.21	65	65	100					94	52	0	
22	2210	40	5.5	9.2	69											96	56	0	
23	2652	39	5.5	9.2	68											100	60	0	
24	1768	29	5.6	8.9	64											102	52	0	
25	2210	41	5.5	10.9	60	10608		.21	52	67	90					104	26	15	
26	1326	24	5.5	10.0	62											98	52	52	
27	1326	22	5.7	9.2	63											96	65	65	
28	884	14		8.5	68											94	42	42	
29	1326	16	5.4	6.5	67											92	36	36	
30	2652	33	5.5	6.3	70											91	36	36	
31																89	33	33	
ARITH MEAN	1844	29	5.6	8.5	68	12199		.22	59	74	364					91	37	20	
STAT MEAN		30																	

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MICHIGAN
DEPARTMENT OF PUBLIC HEALTH
D-4 12M 5-66

MONTH November 19 68

MISCELLANEOUS DATA

OPERATOR Robert J. Swalwell

Date	Weather: Precip. Inches	Weather: Temp. (°F) Max.	Weather: Temp. (°F) Min.	Weather: Type*	Raw Sewage: Temp. °F	Raw Sewage: Flow MGD	pH	Grit cf/mg	~~XXXXX~~ water ~~XXXXX~~ cu. ft.	Cl₂ lbs.	Power KWH x 10	AUX. FUEL ~~gas~~ cu. ft. x 100	Remarks
1		72	38	C	58	2.11			1790	112	20	9	
2		46	36	C	57	2.04	7.3		1800	106	20	11	
3		48	24	C	56	2.01	7.5		1840	107	16	13	
4		52	30	C	57	2.09	7.4		1890	113	20	12	
5		58	32	C	56	2.07	7.5		1870	110	20	16	
6	.06	48	38	R	56	2.05	7.6		1750	117	20	27	
7	102	42	30	R	57	2.08			1800	119	20	27	
8	.01	42	32	S	57	2.06	7.5		1820	111	20	50	
9		40	22	CL	56	2.01	7.5		1810	100	20	60	
10		40	20	CL	55	1.97	7.6		1860	99	20	60	
11		40	26	CL	57	2.09	7.5		1660	107	20	61	
12	.01	40	20	S	56	2.07	7.5		1770	104	20	60	
13		40	20	C	56	2.04	7.6		2110	113	20	30	
14	.85	50	36	R	56	2.16	7.7		1910	110	20	19	
15	.12	54	36	R	56	2.12	7.6		1690	114	20	22	
16	.51	40	32	R	56	2.13	7.5		1690	103	20	20	
17	.47	46	34	R	57	2.16	7.5		1680	106	20	23	
18	.16	42	28	R&S	56	2.27	7.5		1640	111	20	23	
19	.07	32	26	S		2.25			1630	110	24	28	
20		28	24	CL		2.24	7.5		1660	112	20	24	
21		44	26	C	55	2.23	7.4		1620	106	20	15	
22		50	30	C	56	2.20	7.5		1660	113	20	15	
23		56	40	CL	56	2.16	7.4		1660	119	20	14	
24		48	26	CL	55	2.14	7.5		1700	101	20	14	
25		42	32	C	56	2.23	7.7		1630	112	20	15	
26		42	26	CL	56	2.19	7.7		1690	111	20	15	
27	.29	40	34	R	55	2.21	7.6		2290	112	20	20	
28	1.42	44	32	R	54	2.32	7.4		1640	100	20	22	
29		36	30	CL	54	2.34	7.5		1720	102	20	21	
30		38	24	C	55	2.31			1680	102	24	21	
31													
ARITH. MEAN	.13	45	29		56	2.15	7.5		1768	109	20.1	26	
STAT MEAN						2.14							

*C—Clear CL—Cloudy R—Rain **Indicate Unit
W—Windy CA—Calm S—Snow

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR Marshall, MICHIGAN

MONTH November 19 68

PRIMARY TREATMENT DATA

OPERATOR Robert J. Swalwell

Date	5-Day BOD Inf. Mg/l	5-Day BOD Inf. x10 lbs.	5-Day BOD Eff. Mg/l	5-Day BOD Eff. x10 lbs.	5-Day BOD Rem %	Suspended Solids Inf Mg/l	Suspended Solids Inf x10 lbs.	Suspended Solids Eff Mg/l	Suspended Solids Eff x10 lbs.	Suspended Solids Rem %	Suspended Volatile Solids Inf. Mg/l	Suspended Volatile Solids Inf. x10 lbs.	Suspended Volatile Solids Eff Mg/l	Suspended Volatile Solids Eff x10 lbs.	Total Phosphate Inf. mg/l	Total Phosphate Inf. lbs.	Total Phosphate Eff. mg/l	Total Phosphate Eff. lbs.	Remarks
1	66	116	60	106	9	102	180	42	74	59	96	169	42	74					
2	68	133	54	92	21	134	228	34	58	75	126	214	32	54					
3	60	101	48	80	20	85	142	32	54	62	74	124	25	42					
4	76	132	57	89	25	131	228	46	80	65	117	204	35	61					
5																			
6	52	89	48	82	8	116	198	35	60	70	100	171	34	58					
7	63	109	56	97	11	154	267	50	87	68	137	238	36	62	14.5	252	12.0	208	
8	66	113	45	77	32	98	168	43	74	56	80	137	30	52					
9	66	111	64	107	3	101	169	48	80	53	80	134	44	74					
10	57	94	60	99	-5	101	167	41	67	59	91	150	34	56					
11	72	125	64	112	11	132	230	39	68	71	109	190	36	63	19.5	340	19.5	340	
12	63	109	57	98	10	117	202	49	85	58	102	176	40	69					
13	60	102	54	92	10	97	165	46	78	53	88	150	39	66	14.0	238	13.5	230	
14	52	94	52	94	0	122	220	40	72	67	109	196	36	65	16.0	288	14.0	252	
15	76	134	60	106	21	121	214	41	72	66	110	194	37	65					
16	72	128	63	112	12	66	117	34	60	49	60	107	34	60					
17	68	122	60	108	12	93	167	38	68	59	77	139	28	50	15.0	270	15.0	270	
18	60	114	64	121	-7	58	110	42	80	28	50	95	37	70	15.0	284	14.0	265	
19																			
20						115	214	43	80	63	101	189	36	67	12.0	224	11.0	205	
21	65	121	54	100	17	107	199	28	52	74	95	177	25	47					
22	84	154	63	116	25	142	261	43	79	70	128	235	40	73					
23	64	115	57	103	11	83	149	29	52	65	75	135	28	60					
24	76	136	63	112	17	108	193	36	64	67	95	170	28	50	16.3	291	14.5	259	
25	68	126	64	119	6	76	141	38	71	50	68	126	37	69					
26	80	146	60	110	25	164	299	47	86	71	152	278	40	73	15.5	283	15.5	283	
27	68	125	68	125	0	90	166	43	79	52	82	151	40	74					
28	80	155	57	110	29	102	197	53	103	48	94	182	53	103					
29	48	94	51	100	-6	94	183	45	88	52	87	170	41	80					
30	69	133	57	110	17	95	183	30	58	68	88	170	25	48					
31																			
ARITH MEAN	67	120	58	103	12	107	191	41	72	61	95	170	35	63	15.3	274	14.3	257	
STAT. MEAN		119		104			189		73										

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR Marshall, MICHIGAN

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MICHIGAN DEPARTMENT OF PUBLIC HEALTH

MONTH November 1968 — DIGESTER AND SLUDGE DATA — OPERATOR Robert J. Swalwell

Date	Raw Sludge Gals	Raw Sludge Lbs Per 1000 c f Digester	Raw Sludge pH	Raw Sludge Total Solids %	Raw Sludge Vol Solids %	Supernatant Gals	Supernatant pH	Supernatant Total Solids %	Supernatant Vol Solids %	Supernatant Susp Solids Mg/l	Supernatant 5-Day B O D Mg/l	sludge near bottom Total Solids %	sludge near bottom Vol Solids %	sludge near bottom Vol Acids Mg/l	Temp pH #1	Temp °F #1	Gas Produced cu ft X 100	Gas Wasted cu ft X 100	Remarks
1	1768	14		3.7	74											86	27	27	Note — include gallons
2	1768	25	5.6	8.0	62											85	23	23	of sludge to beds
3	2652	36	5.8	6.8	71											84	25	25	
4	2652	41	5.6	7.6	71											82	25	25	
5																81	23	23	
6																80	17	17	
7	2652	39		8.7	60											80	13	3	
8						7956										80	23	12	
9	3536	45		6.5	70											83	20	20	
10	2210	34		8.3	66											86	30	30	
11																88	30	30	
12	884	12		6.9	71	11934		.21	63	680	80					92	39	39	
13	1768	25	5.7	7.0	71											94	33	0	
14	1768	18	5.6	5.2	70											96	37	0	
15	1326	29	5.5	11.9	64											96	32	0	
16	1326	22	5.6	9.2	64											96	34	0	
17	1326	21	5.5	8.1	68											97	36	z0	
18	1326	17	5.6	7.5	62											97	36	0	
19																98	29	0	
20	1326	23		9.5	64											98	30	0	
21																98	25	0	
22																99	15	14	
23	1326	12	5.5	4.6	70											97	33	33	
24	1326	26		10.9	62											94	26	26	
25	1326	20	5.6	7.7	69											91	27	0	
26	1768	26	5.8	8.2	64											94	37	0	
27	884	10		6.2	68											95	39	0	
28	884	12		7.3	68											97	29	0	
29	884	12	5.7	7.3	68											97	28	0	
30	884	13		7.9	65											98	25	0	
31																			
ARITH MEAN	1633	23	5.6	7.6	67	9945		.21	63	680	80					91	28	12	
STAT MEAN		22																	

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

Marshall, MICHIGAN

MIC- GAN
ARTMENT OF PUBLIC HEALTH
D-4 12M 5-66

MONTH December 1968 MISCELLANEOUS DATA OPERATOR

Date	Weather Precip. Inches	Weather Temp. (°F) Max.	Weather Temp. (°F) Min.	Type*	Raw Sewage Temp. °F	Raw Sewage Flow MGD	pH	Grit cf/mg	~~Flow~~ water ~~x100~~ cu. ft.	Cl₂ lbs.	Power KWH x10	AUX FUEL ~~gas~~ cu. ft. x 100	Remarks
1	.20	35	30	R&S	54	2.33			1660	43	20	15	
2	.09	40	34	R	55	2.41			1480	118	20	15	
3		47	32	CL	55	2.37			1750	110	20	28	
4	.12	38	24	S	55	2.37			1660	111	24	30	
5	.07	26	18	S	54	2.32			1610	110	20	16	
6	.01	26	20	S	54	2.28			1640	111	24	17	
7		32	16	CL	54	2.23			1670	104	20	20	
8		26	14	CL	53	2.21			1670	105	20	22	
9		26	16	C	54	2.28			1600	112	20	21	
10		30	16	C	53	2.26			2250	104	20	20	
11		44	20	C	54	2.27			1710	115	24	19	
12	.23	52	34	R	54	2.28			1660	107	20	18	
13	.02	35	18	S	54	2.26			1690	117	20	48	
14		30	6	C	53	2.19			1690	104	20	20	
15		20	6	C	52	2.11			1660	102	20	23	
16		30	12	C	53	2.24			1650	104	20	23	
17		32	12	C	53	2.21			1680	101	24	24	
18	.33	36	24	R	53	2.25			1730	120	24	14	
19	.14	41	28	R&S	53	2.26			1670	112	20	36	
20		34	28	C	53	2.23			1650	33	24	57	
21	.30	36	28	S	52	2.15			1610	117	20	50	
22	.40	37	22	R&S	53	2.15			1640	107	24	56	
23	.16	28	16	S	53	2.26			2210	119	24	54	
24		24	2	CL	53	2.17			1650	108	24	52	
25		18	2	C	52	2.08			1710	100	24	60	
26	.04	30	16	R	52	2.23			1650	117	20	58	
27	.92	38	28	R	52	2.43			1680	122	24	55	
28	.40	36	18	R&S	51	2.50			1630	122	24	56	
29		28	13	CL	51	2.40			1680	110	24	49	
30	.16	34	14	S	52	2.50			1660	115	24	53	
31	.10	16	-6	S	51	2.45			1740	110	24	71	
ARITH. MEAN	.12	32	18		53	2.28			1698	106	21.9	36	
STAT. MEAN						2.29							

*C—Clear CL—Cloudy R—Rain **Indicate Unit
W—Windy CA—Calm S—Snow

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

Marshall, MICHIGAN

MONTH December 1968 — PRIMARY TREATMENT DATA — OPERATOR Robert J. Swalwell

Date	5-Day BOD Inf. Mg/l	5-Day BOD Inf. lbs. x10	5-Day BOD Eff Mg/l	5-Day BOD Eff lbs. x10	5-Day BOD Rem %	Suspended Solids Inf Mg/l	Suspended Solids Inf lbs. x10	Suspended Solids Eff Mg/l	Suspended Solids Eff lbs. x10	Suspended Solids Rem %	Suspended Volatile Solids Inf Mg/l	Suspended Volatile Solids Inf lbs. x10	Suspended Volatile Solids Eff Mg/l	Suspended Volatile Solids Eff lbs. x10	Total Phosphate INF mg/l	Total Phosphate INF lb.	Total Phosphate EFF mg/l	Total Phosphate EFF lbs.	Remarks
1	68	132	60	117	12	107	208	30	58	72	93	181	25	49					
2	60	121	60	121	0	76	153	36	72	53	63	127	30	60	14 -	281	15.0	304	
3	84	166	76	150	10	83	164	45	89	46	72	142	40	79	13 0	257	13.0	257	
4	68	134	64	127	6	63	125	49	97	22	57	113	46	91					
5	56	108	54	104	4	55	106	29	56	47	46	89	25	48					
6	86	164	63	120	27	62	118	41	78	34	57	108	35	67					
7																			
8	72	133	57	105	21	122	225	37	68	70	109	201	29	53					
9	84	160	64	122	24	138	262	47	89	66	128	243	41	78	[redacted]	[redacted]	[redacted]	[redacted]	
10	70	132	57	107	19	70	132	40	75	43	64	121	40	75	13 5	254	13 -	245	
11	80	151	65	123	19	76	144	38	72	50	62	117	28	53					
12	76	145	60	114	21	137	261	35	67	75	132	251	31	59	13 -	247	13 5	257	
13	84	158	64	121	24	80	151	43	81	46	74	139	42	79					
14	72	131	63	115	12	118	215	28	51	76	105	192	21	38					
15																			
16	63	118	63	118	0	100	187	37	69	73	125	234	31	58	15 -	336	16 5	308	
17	70	129	66	122	6	87	160	36	66	59	77	142	30	55	14 0	257	13 5	249	
18	72	135	60	113	17	58	109	40	75	31	54	101	36	68	12 5	235	13 5	253	
19	60	113	51	96	15	96	35	66	31	51	96	32	60	60					
20	76	141	63	117	17	101	188	39	73	61	96	179	37	69					
21	64	115	60	108	6	92	165	39	70	58	87	156	34	61					
22	60	108	54	97	10	93	167	32	57	66	78	140	24	53					
23	66	124	57	107	14	66	124	36	68	46	62	117	36	68					
24	72	130	54	98	25	86	156	20	36	77	78	141	20	36					
25	48	83	36	62	25	54	94	23	40	57	53	92	23	40					
26	54	100	48	89	11	90	167	39	73	57	79	147	37	69					
27	66	134	54	109	18	79	160	43	87	46	76	154	43	87					
28	56	117	52	108	7	48	100	31	65	35	46	96	29	60					
29						103	206	33	66	68	99	198	33	66					
30	76	158	64	133	16														
31	69	141	66	135	4	52	106	31	63	40	42	86	26	53					
ARITH. MEAN	69	131	59	113	14	84	159	36	69	54	77	147	33	61	14 5	267	14 0	267	
STAT		132		113			156		69										

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

OPERATION REPORT of SEWAGE TREATMENT PLANT FOR Marshall, MICHIGAN

MONTH December 19 68 — DIGESTER AND SLUDGE DATA — OPERATOR Robert J. Swalwell

Date	Raw Sludge: Gals	Raw Sludge: Lbs Per 1000 c.f Digester	Raw Sludge: pH	Raw Sludge: Total Solids %	Raw Sludge: Vol. Solids %	Supernatant: Gals	Supernatant: pH	Supernatant: Total Solids %	Supernatant: Vol Solids %	Supernatant: Susp Solids Mg/l	Supernatant: 5-Day B O D Mg/l	sludge near bottom: Total Solids %	sludge near bottom: Vol Solids %	sludge near bottom: Vol Acids Mg/l	sludge near bottom: pH	Temp °F #1	Gas: Produced cu ft X 100	Gas: Wasted cu ft X 100	Remarks
1	1326	20	5.4	7.7	67											97	5	0	Note — include gallons
2	1768	35	5.5	10.0	69											94	43	0	of sludge to beds
3																97	40	0	
4																99	28	16	
5	1768	31	5.3	9.3	66											97	27	27	
6	1326	19	5.6	7.4	70											94	31	0	
7	884	14	5.5	8.1	69											95	35	0	
8	1326	12	5.6	4.7	69											97	32	0	
9	1326	16	5.7	7.2	58											97	29	0	
10	2210	30	5.6	7.2	67											98	36	0	
11	2210	33		7.4	71	10608		.19	47	470						97	43	0	
12																98	27	0	
13	1326	20		7.8	70												8	0	
14	884	10		5.5	70											94	30	0	
15	1768	29		8.4	70											95	4	0	
16	2652	43		8.3	70											91	38	0	
17	2652	38		7.0	72											93	28	0	
18	1768	33		9.9	67	15028		.19	61	660	420					92	39	0	
19	1326	18		7.1	69												27	17	
20	1326	16		6.1	70												32	32	
21	1326	17		6.5	72											94	27	27	
22	1326	19		7.3	69												32	32	
23	884	12		7.0	66											94	29	29	
24	1326	23		9.3	65											92	32	32	
25																95	27	27	
26																97	25	25	
27	1326	19		7.4	68	11050		.19	46	680	300					98	9	9	
28	1326	20		8.9	61											95	30	30	
29	1326	22		9.2	64											96	30	0	
30																	30	30	
31	2652	33		6.5	67											92	30	30	
ARITH MEAN	1547	23		7.6	68	12229		.19	51	603	360					95	29	12	
STAT MEAN		23																	

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4

Marshall, MICHIGAN

MONTH January 1971 — MISCELLANEOUS DATA — OPERATOR Robert J. Swalwell

DATE	WEATHER Precip. Inches	Temp. (°F) Max.	Temp. (°F) Min.	Type	RAW SEWAGE Temp. °F	Flow MGD Total MGD	Flow MGD Max. Rate	Flow MGD Min. Rate	pH	water cf/~~mx~~	Cl_2 lbs.	POWER KWH	AUX. FUEL *	CHEMICALS APPLIED					REMARKS
1		34	8	CL	52	2.12	2.60	1.60		1650	89	320	28						* Gas - cu. ft. X 100
2		36	24	CL	52	2.24	2.60	1.60	7.4	1590	99	280	24						
3	.26	41	26	R&S	52	2.19	2.70	1.30	7.5	1550	115	280	20						
4		42	14	CL	52	2.33	2.90	1.50	7.5	1560	111	280	24						
5	.02	18	6	S	52	2.23	2.70	1.50	7.6	1490	112	280	40						
6		14	0	C	51	2.21	2.70	1.50	7.5	1670	114	320	40						
7		16	0	C	51	2.21	2.70	1.50	7.5	1580	112	280	42						
8		20	2	C	51	2.18	2.70	1.50	7.5	1590	112	320	39						
9		28	12	CL	51	2.17	2.80	1.50	7.5	1560	116	280	26						
10		32	18	CL	51	2.13	2.60	1.50	7.5	1590	119	280	30						
11		34	16	CL	52	2.22	2.80	1.50		1510	124	280	30						
12		26	18	CL	51	2.18	2.60	1.50	7.5	1580	113	280	26						
13	.02	32	20	R	51	2.18	2.80	1.50	7.5	1570	112	280	26						
14		32	12	CL	51	2.16	2.60	1.50	7.6	1550	109	280	25						
15		24	16	CL	51	2.19	2.60	1.50	7.7	1610	110	280	25						
16	.07	28	6	S	51	2.12	2.80	1.50	7.5	1500	113	280	26						
17		20	2	C	51	2.17	2.60	1.50	7.5	1570	119	280	29						
18		22	-4	CL	51	2.22	2.90	1.50	7.5	1550	119	280	30						
19		22	18	CL	50	2.16	2.70	1.50	7.5	1560	111	280	45						
20		29	17	CL	51	2.19	2.70	1.70	7.5	1400	96	320	20						
21		34	16	C	51	2.17	2.70	1.60	7.5	1370	112	280	20						
22	.01	38	16	S	51	2.19	2.70	1.70	7.5	1380	109	320	30						
23		32	18	C	51	2.13	2.70	0.50	7.6	1420	97	280	27						
24		40	20	C		2.11	2.60	0.50	7.5	1410	97	280	20						
25		40	17	CL	51	2.22	2.70	0.70	7.5	1360	109	280	48						
26	.03	20	5	S	51	2.15	2.70	1.70	7.6	1370	106	280	30						
27	.03	16	2	S	51	2.16	2.70	1.80	7.5	1320	110	320	30						
28		17	3	C	50	2.16	2.60	1.70	7.6	1370	110	280	20						
29	.10	32	10	S	50	2.18	3.00	2.00	7.5	1360	107	320	20						
30	.02	14	-6	S	50	2.18	3.00	2.00	7.4	1350	107	280	33						
31		9	-10	C	50	2.18	2.90	2.00	7.5	1330	113	280	27						
TOTAL	.56										3402	8960	900						
ARITH. MEAN						2.18				1493	110								

MDPH
D-4.1

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH January 19 71 PRIMARY TREATMENT DATA OPERATOR Robert J. Swalwell

DATE	5-DAY BOD INF. Mg/l	5-DAY BOD INF. LBS. X 10	5-DAY BOD EFF. Mg/l	5-DAY BOD EFF. LBS. X 10	5-DAY BOD REM. %	SUSPENDED SOLIDS INF. Mg/l	SUSPENDED SOLIDS INF. LBS. X 10	SUSPENDED SOLIDS EFF. Mg/l	SUSPENDED SOLIDS EFF. LBS. X 10	SUSPENDED SOLIDS REM. %	SUSP. VOLATILE SOLIDS INF. Mg/l	SUSP. VOLATILE SOLIDS INF. LBS. X 10	SUSP. VOLATILE SOLIDS EFF. Mg/l	SUSP. VOLATILE SOLIDS EFF. LBS. X 10	Total PHOSPHORUS – P INF. Mg/l	Total PHOSPHORUS – P INF. LBS. X	Total PHOSPHORUS – P EFF. Mg/l	Total PHOSPHORUS – P EFF. LBS. X	Total PHOSPHORUS – P REM. %	REMARKS
1																				
2	68	127	66	123	3	76	142	40	75	47	70	131	39	73						
3	70	128	64	117	9	56	102	31	57	45	50	91	27	49						
4	66	128	47	91	29	138	268	41	80	71	126	245	32	62						
5	62	115	43	80	31	69	128	27	50	61	60	112	26	48						
6	56	103	52	96	7	58	107	30	55	48	56	103	28	52						
	76	140	43	79	43	94	173	26	48	72	79	146	24	44						
8	67	122	52	95	20	56	102	32	58	43	50	91	29	53						
9	66	119	54	98	18	77	139	29	52	62	68	123	29	52						
9	65	115	50	89	23	55	98	23	41	58	51	91	20	36						
[illegible]																				
12	60	109	52	95	13	51	93	25	45	51	51	93	25	45						
13	53	96	44	80	17	54	98	24	44	56	54	98	24	44						
14	54	97	37	67	31	76	137	25	45	67	72	130	25	45						
15	54	99	47	86	13	66	121	27	49	59	63	115	26	47						
16	70	124	59	104	16	55	97	26	46	53	54	95	26	46						
17	76	138	64	116	16	75	136	32	58	57	67	121	29	52						
18	72	133	57	106	21	94	174	39	72	59	86	159	39	72						
19	68	122	56	101	18	82	148	24	43	71	78	140	24	43						
20	83	152	55	100	34	85	155	37	68	56	73	133	33	60						
21	57	103	52	94	9	46	83	36	65	22	44	80	34	62						
22	65	119	62	113	5	101	185	43	79	57	95	173	40	73						
23	58	103	47	83	19	68	121	25	44	63	57	101	22	39						
24	78	137	47	83	39	106	187	24	42	77	98	172	24	42						
25	55	102	45	83	18	110	204	27	50	76	99	183	27	50						
26	66	118	42	75	36	70	126	35	63	50	61	109	35	63						
27	51	92	34	61	33	68	122	25	45	63	64	115	25	45						
28	56	101	30	54	46	77	139	32	58	58	77	139	32	58						
29	70	127	58	105	17	77	140	39	71	49	72	131	39	71						
30	70	127	50	91	32	66	120	27	49	59	63	115	27	49						
31	66	120	46	84	30	78	142	29	53	63	72	131	26	47						
TOTAL		3418		2649			3987		1605			3666		1522						
ARITH. MEAN	65	118	50	91	22	73	137	30	55	58	69	126	29	52						

Digester Volume, ft^3
Primary 14,000
Secondary 14,000

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.5

Marshall, MICHIGAN

Supernatant To Raw Wastewater Wet Well
Process Pattern Raw - pri. dig. - sec. dig. - beds

MONTH _____ 19 ____

DIGESTER AND SLUDGE DATA

OPERATOR Robert J. Swalwell

DATE	RAW SLUDGE Gals. X 10	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 X 10 Mg/l	P Mg/l	P Lbs.	5-Day BOD X10 Mg/l	DIGESTED SLUDGE Gals. X	Total Solids %	Vol. Solids %	pH	Gas Produced cu. ft X
1						97																		0
2	221	8.3	67	37	5.9	95	6.6	3.3	59			9282												19
3	133	8.2	68	22		96	6.4																	0
4	133	9.9	62	25	5.7	93	6.3																	19
5	133	7.0	68	19	5.8	93	6.4																	0
6	133	8.6	67	23	5.4	92	6.5																	14
7	133	7.1	66	19	5.8	92	6.5																	12
8	133	5.9	73	17	5.9	93	6.5																	14
9	177	8.3	71	32	5.9	94	6.5																	26
10	221	6.1	76	31	5.8	95																		0
11						92	6.5	2.5	54			7514		.50	66	340			102					15
12	177	6.4	75	26	5.9	92																		17
13	133	7.0	69	19	5.8	94	6.5																	10
14	133	5.2	76	16	5.8	92																		14
15	133	6.2	73	18	5.8	92																		11
16	88	8.4	72	16	5.8	93																		27
17	88	7.2	74	14	5.7	94																		19
18						93	6.5																	0
19	133	6.6	73	19	5.8	94	6.6	2.3	48			8398		.52		322								6
20						95																		9
21	133	6.2	76	19	5.6	94																		11
22	133	6.2	82	20	5.8	93																		12
23	177	4.1	83	18	6.1	92																		25
24	111	5.1	76	13	5.9	92																		0
25	111	6.4	74	16	5.7	90	6.4																	37
26						92																		0
27	133	6.1	73	18	5.8	90		2.6	56			6630		.27		354			102					31
28	133	7.6	71	22	6.0	92	6.8																	10
29	133	7.3	72	21	5.9	93																		44
30	177	5.8	72	23	5.9	96																		33
31	133	6.9	72	20	5.8	97																		36
TOTAL	3669											31824												471
ARITH. MEAN	141	6.9	72	21		93		2.7	54			7956		.43	66	339			102					15

MDPH
D-4

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH February 19 71 — MISCELLANEOUS DATA — OPERATOR Robert J. Swalwell

DATE	WEATHER Precip. Inches	Temp. (°F) Max.	Temp. (°F) Min.	Type	RAW SEWAGE Temp. °F	Flow MGD Total MGD	Flow MGD Max. Rate	Flow MGD Min. Rate	pH	water cf/mg	Cl_2 lbs.	POWER KWH	AUX. FUEL *	CHEMICALS APPLIED					REMARKS
1	.02	10	-12	S	50	2.45	2.90	2.00	7.7	1460	108	280	20						* Gas - cu. ft. X 100
2		17	12	C	50	2.06	3.00	1.70	7.5	1510	112	320	20						
3	.17	32	16	R&S	49	2.16	2.80	1.80	7.5	1530	107	280	22						
4	1.13	46	26	R	50	2.67	3.10	2.10	7.4	1520	100	280	10						
5		30	18	C	48	2.55	3.00	1.70	7.5	1510	108	320	50						
6		26	10	C	49	2.34	2.70	1.50	7.5	1560	95	280	25						
7		26	7	CL	50	2.28	2.80	1.50		1560	97	280	25						
8		20	4	C	50	2.29	2.90	1.50	7.6	1490	107	280	25						
9		16	6	C	49	2.30	2.90	1.50	7.5	1510	100	320	30						
10		26	12	C	49	2.24	2.70	1.50	7.6	1540	100	280	20						
11	.02	42	22	R	50	2.29	3.00	1.50	7.5	1530	112	280	20						
12	.13	32	6	S	50	2.21	2.80	1.50	7.5	1550	107	280	21						
13		12	-4	C	50	2.19	3.10	1.50	7.5	1510	93	280	32						
14		28	2	CL	49	2.16	2.70	1.60	7.5	1630	79	320	21						
15		34	22	C	50	2.19	2.80	1.50	7.6	1510	104	280	20						
16	.13	38	22	R	49	2.20	2.80	1.50	7.5	1640	104	280	20						
17		41	32	CL	50	2.26	2.80	1.50	7.5	1430	109	280	19						
18	.80	46	34	R	49	2.76	3.60	2.10	7.5	1520	104	320	16						
19	1.07	46	36	R	48	2.77	3.20	2.20	7.4	1580	127	280	15						
20	.04	38	26	R	49	2.56	3.20	2.00	7.5	1550	104	320	20						
21		34	26	CL		2.47	2.80	2.00	7.6	1550	106	320	20						
22	.14	34	26	R&S	49	2.44	2.90	2.00		1510	101	280	22						
23		35	20	CL	50	2.40	2.80	2.00	7.5	1550	105	320	20						
24		38	22	CL	49	2.36	2.90	2.00	7.6	1500	107	280	22						
25		47	24	C	50	2.43	2.80	2.00	7.5	1540	103	320	21						
26		54	34	CL	50	2.44	2.90	2.00	7.4	1560	112	240	20						
27		36	28	CL	50	2.44	3.00	1.90	7.7	1550	101	280	18						
28		36	23	C	50	2.34	2.90	1.90	7.6	1580	95	280	22						
29																			
30																			
31																			
TOTAL	3.65										2907	8160	616						
ARITH. MEAN						2.37				1535	104								

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.1

Marshall, MICHIGAN

MONTH February 1971 PRIMARY TREATMENT DATA OPERATOR Robert J. Swalwell

DATE	5-DAY BOD INF. Mg/l	5-DAY BOD INF. LBS. X 10	5-DAY BOD EFF. Mg/l	5-DAY BOD EFF. LBS. X 10	5-DAY BOD REM. %	SUSPENDED SOLIDS INF. Mg/l	SUSPENDED SOLIDS INF. LBS. X 10	SUSPENDED SOLIDS EFF. Mg/l	SUSPENDED SOLIDS EFF. LBS. X 10	SUSPENDED SOLIDS REM. %	SUSP. VOLATILE SOLIDS INF. Mg/l	SUSP. VOLATILE SOLIDS INF. LBS. X 10	SUSP. VOLATILE SOLIDS EFF. Mg/l	SUSP. VOLATILE SOLIDS EFF. LBS. X 10	Total PHOSPHORUS – P INF. Mg/l	Total PHOSPHORUS – P INF. LBS. X	Total PHOSPHORUS – P EFF. Mg/l	Total PHOSPHORUS – P EFF. LBS. X	Total PHOSPHORUS – P REM. %	REMARKS
1	68	139	46	94	32	88	180	32	65	64	84	172	32	65						
2	77	132	63	108	18	82	141	38	65	54	76	131	35	60						
3	86	155	50	90	42	144	259	31	56	79	140	252	31	56						
4	64	143	43	96	33	93	207	35	78	62	89	198	34	76						
5	49	104	40	85	18	73	155	31	66	58	61	130	31	66						
6	60	117	42	82	30	60	117	29	57	52	57	111	28	55						
	61	116	41	78	33	80	152	34	65	58	73	139	32	61						
8	72	138	56	107	22	74	141	28	53	62	72	138	28	53						
9	48	92	40	77	17	96	184	40	77	58	94	180	40	77						
10						106	198	30	56	72	102	191	29	54						
11	60	115	36	69	40	80	153	32	61	60	76	145	32	61						
12	62	114	41	76	34	61	112	24	44	61	59	109	23	42						
13	80	146	56	102	30	93	170	52	95	44	76	139	42	77						
14	79	142	52	94	34	75	135	29	52	61	62	112	22	40						
15	64	117	44	80	31	77	141	24	44	69	66	121	19	35						
16	56	103	44	81	21	51	94	23	42	55	42	77	21	39						
17	88	166	57	107	35	104	196	43	81	59	96	181	34	64						
18	56	129	40	92	29	128	295	38	87	70	78	180	25	58						
19	56	129	44	102	21	68	157	40	92	41	53	122	32	74						
20	68	145	48	102	29	79	169	24	51	70	62	132	21	45						
21	61	126	49	101	20	85	175	30	62	65	74	152	24	49						
22																				
23	60	120	53	106	12	64	128	26	52	59	52	104	24	48						
24	68	134	50	98	27	131	258	33	65	75	116	228	27	53						
25	64	130	53	107	17	71	144	36	73	49	60	122	30	61						
26	64	130	46	94	28	80	163	30	61	63	62	126	26	53						
27	70	142	60	122	14	56	114	36	73	36	52	106	34	69						
28	60	117	51	100	13	45	185	33	64	65	95	185	33	64						
29																				
30																				
31																				
TOTAL		3341		2450			4520		1737			3983		1555						
ARITH. MEAN	65	129	48	94	26	85	167	33	64	60	75	148	29	58						

Digester Volume, ft^3
Primary 14,000
Secondary 14,000

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.5

Marshall, MICHIGAN

Supernatant To Raw Wastewater Wet Well
Process Pattern Raw-pri. dig.-sec.dig.- beds

MONTH February 1971

DIGESTER AND SLUDGE DATA

OPERATOR Robert J. Swalwell

DATE	RAW SLUDGE Gals. 10	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. 10^X	SUPERNATANT pH	SUPERNATANT Total Solids %	SUPERNATANT Vol. Solids %	SUPERNATANT Susp. Solids x10 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 100
1	133	5.9	71	17		97																		27
2	133	9.0	70	25	5.8	98		2.6	53			1326		.50	65	314			1320					8
3	133	7.0	72	20	5.9	95																		0
4	133	5.9	75	18	6.0	94																		45
5	133	7.6	72	22	5.9	94																		16
6	133	5.5	71	16	5.9	93																		48
7	133	7.1	69	20		96																		0
8						93																		41
9	133	6.1	70	17	6.0	96																		9
10	133	6.6	72	19	5.9	94																		41
11	133	7.5	67	20	5.9	96		1.0	60			1326		.48	67	332			930					35
12	177	7.8	67	28	5.8	97																		30
13	133	7.3	68	20	5.8	98																		32
14	133	6.4	74	19	6.0	99																		28
15						99																		19
16	133	6.5	70	18	5.9	100																		19
17	88	6.4	68	12	5.7	100																		16
18	133	6.4	68	18	5.7	99		1.2	57			1326		.46	66	342	67		600					6
19						98																		33
20	133	11.7	61	29	5.8	96																		32
21	177	6.6	68	24	5.6	93																		25
22	88	8.6	59	14	5.7	94																		14
23	133	9.4	64	24	5.9	93																		8
24						92																		23
25	265	7.4	68	41		94																		11
26						92																		27
27	133	8.7	64	22	5.8	94																		20
28	133	8.3	62	21	6.1	94																		20
29																								
30																								
31																								
TOTAL	3182											3978												633
ARITH. MEAN	145	7.4	68	21		96		1.6	57			1326		.48	66	330			950					23

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4

Marshall, MICHIGAN

MONTH March 19 71 — MISCELLANEOUS DATA — OPERATOR Robert J. Swalwell

DATE	WEATHER Precip. Inches	Temp. (°F) Max.	Temp. (°F) Min.	Type	RAW SEWAGE Temp. °F	Flow MGD Total MGD	Flow MGD Max. Rate	Flow MGD Min. Rate	pH	~~xxxx~~ water ~~xx~~/mg	Cl_2 lbs.	POWER KWH	AUX. FUEL * Gas	CHEMICALS APPLIED					REMARKS
1		38	18	CL	50	2.42	2.80	1.90	7.5	1580	104	280	17						*cu. ft. X 100
2		34	16	C	50	2.39	2.80	1.80	7.5	1580	109	320	17						
3		26	10	C	49	2.35	2.70	1.80	7.6	1530	104	320	17						
4		34	14	C	49	2.43	3.00	1.80	7.6	1550	102	320	14						
5	.05	44	28	R	49	2.35	3.50	2.00	7.5	1510	120	320	16						
6	.44	40	26	R&S	49	2.43	2.90	1.90	7.5	1560	110	320	18						
7	.02	33	17	S	49	2.32	2.90	1.80	7.6	1490	105	320	18						
8		26	6	C	49	2.38	3.00	1.80	7.6	1400	102	320	20						
9	.21	36	10	S	49	2.36	2.80	1.80	7.5	1630	109	360	22						
10	.07	38	26	S	49	2.34	3.00	1.80	7.5	1540	110	320	17						
11		42	24	C	50	2.36	2.90	1.70	7.5	1480	101	320	20						
12		44	30	C	49	2.35	2.90	1.70	7.5	1490	119	280	19						
13		44	32	CL	49	2.38	3.10	1.80	7.4	1550	100	320	17						
14	.10	64	39	R	50	2.49	2.90	1.90	7.5	1530	109	320	0						
15	.07	42	26	R&S	49	2.54	3.10	2.00	7.5	1530	106	320	19						
16		31	17	CL	49	2.49	3.10	1.90	7.7	1500	106	320	20						
17		38	20	C	49	2.47	2.90	1.90	7.5	1520	116	280	20						
18	.22	42	26	R&S	50	2.49	3.00	1.90	7.6	1510	100	320	18						
19	.07	40	28	R&S	49	2.52	3.00	1.90	7.6	1530	107	280	18						
20		34	18	CL	49	2.44	2.90	1.90	7.4	1500	105	320	18						
21		46	24	CL	49	2.45	3.10	1.90	7.5	1510	110	320	25						
22	.03	38	18	S	49	2.50	3.10	2.00	7.6	1460	106	280	24						
23		28	12	CL	49	2.51	3.20	1.90	7.6	1570	104	320	24						
24		32	12	CL	49	2.45	3.40	1.90	7.5	1510	116	280	20						
25		36	20	C	49	2.48	3.10	1.80	7.5	1480	108	280	24						
26		40	24	C	49	2.44	2.90	1.80	7.5	1550	111	280	21						
27		48	32	C	49	2.41	2.90	1.70	7.4	1420	120	280	31						
28		48	32	CL	50	2.41	2.90	1.60	7.5	1570	97	280	18						
29		36	20	CL	49	2.43	2.90	1.80	7.5	1680	105	280	14						
30		44	28	C	49	2.41	2.90	1.70	7.5	1780	108	280	10						
31		64	36	C	49	2.40	2.90	1.80	7.4	1780	110	280	7						
TOTAL	1.28										3339	9440	563						
ARITH. MEAN						2.42				1543	108								

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.1

Marshall, MICHIGAN

MONTH March 19 71 — PRIMARY TREATMENT DATA — OPERATOR Robert J. Swalwell

DATE	5-DAY BOD INF. Mg/l	5-DAY BOD INF. LBS. X 10	5-DAY BOD EFF. Mg/l	5-DAY BOD EFF. LBS. X 10	5-DAY BOD REM. %	SUSPENDED SOLIDS INF. Mg/l	SUSPENDED SOLIDS INF. LBS. X 10	SUSPENDED SOLIDS EFF. Mg/l	SUSPENDED SOLIDS EFF. LBS. X 10	SUSPENDED SOLIDS REM. %	SUSP VOLATILE SOLIDS INF. Mg/l	SUSP VOLATILE SOLIDS INF. LBS. X 10	SUSP VOLATILE SOLIDS EFF. Mg/l	SUSP VOLATILE SOLIDS EFF. LBS. X 10	Total PHOSPHORUS – P INF. Mg/l	Total PHOSPHORUS – P INF. LBS. X	Total PHOSPHORUS – P EFF. Mg/l	Total PHOSPHORUS – P EFF. LBS. X	Total PHOSPHORUS – P REM. %	REMARKS
1						80	161	50	101	38	60	121	35	71						
2	64	128	54	108	16	63	126	28	56	56	63	126	28	56						
3	64	125	60	118	6	87	171	30	59	66	76	149	27	53						
4	57	116	51	103	11	60	122	30	61	50	56	114	28	57						
5	100	196	81	159	19	136	267	41	80	70	117	229	35	69						
6	66	134	56	114	15	57	116	49	99	14	46	93	46	93						
	63	122	53	103	16	66	128	32	62	52	66	128	32	62						
8	65	129	52	103	20	51	101	30	60	41	44	87	26	52						
9	75	148	52	102	30	52	102	31	61	40	40	79	21	41						
10	68	133	60	117	12	73	142	29	57	60	66	129	26	51						
11	66	130	55	108	17	58	114	31	61	47	48	94	24	47						
12	51	100	48	94	6	57	112	37	73	35	44	86	27	53						
13	72	143	64	127	11	105	208	28	56	73	98	195	23	46						
14	70	145	50	104	29	86	179	31	64	64	75	156	25	52						
15	75	159	65	138	13	131	277	30	64	77	115	244	25	53						
16	67	139	53	110	21	60	125	26	54	57	49	102	21	44						
17	67	138	56	115	16	62	128	31	64	50	53	109	25	52						
18	68	141	50	104	27	67	139	33	69	51	54	112	25	52						
19	75	158	45	95	40	69	145	30	63	57	66	139	24	50						
20	67	136	51	104	24	51	104	27	55	47	43	88	24	49						
21	73	149	51	104	30	77	157	28	57	64	61	125	23	47						
22	58	121	51	106	12	58	121	31	65	47	39	81	17	35						
23	61	128	46	96	25	50	105	22	46	56	42	88	19	40						
24	59	121	44	90	25	55	112	25	51	55	47	96	24	49						
25	53	110	39	81	26	56	116	33	68	41	42	87	27	56						
26	60	122	48	98	20	55	112	25	51	55	49	100	17	35						
27	67	135	59	119	12	78	157	22	44	72	70	141	16	32						
28	72	145	55	111	23	104	209	33	66	68	92	185	26	52						
29	74	150	54	109	27	73	148	29	59	60	58	118	22	44						
30	70	141	61	124	13	97	195	32	64	67	80	161	23	46						
31	58	116	47	94	19	89	178	38	76	57	74	148	33	66						
TOTAL		4058		3258			4577		1966			3910		1605						
ARITH. MEAN	67	135	54	108	19	73	148	31	63	54	62	126	26	52						

Digester Volume, ft^3
· Primary 14,000
· Secondary 14,000

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.5

Marshall, MICHIGAN

Supernatant To Raw Wastewater Wet Well
Process Pattern Raw-pri.dig.-sec.dig.-beds

MONTH _____ 19 ____ DIGESTER AND SLUDGE DATA OPERATOR _____

DATE	RAW SLUDGE Gals. 10^X	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. 10^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 100
1						94																		
2	133	7.2	65	19	5.8	92		1.2	43			1238		.47	67	3460								26
3	133	10.2	62	26	5.7	94																		18
4						94																		12
5	133	8.9	64	23	5.5	94																		2
6	133	5.5	73	16	6.1	92																		17
7	177	6.1	74	24	5.9	92																		13
8	177	5.9	67	21	5.8	92																		
9	155	7.1	66	22	6.0	90																		13
10	88	7.9	64	14	6.0	90																		4
11	177	8.1	64	28	5.9	88																		28
12	133	11.0	58	26	5.9	90		2.2	46			1061		.36	65	2240			720					28
13	133	7.6	66	20	5.8	91																		18
14	133	8.7	63	22	5.9	91																		19
15						92																		
16	177	8.5	64	29	5.8	90																		22
17	177	8.2	68	30	5.9	92																		16
18	177	7.6	64	26	5.9	92																		14
19	133	7.5	67	20		91																		12
20	88	6.9	86	16	5.9	90																		
21	133	8.3	68	23	5.8	89																		13
22						90																		
23	177	7.7	65	27	5.9	92																		
24	133	9.2	61	22	5.8	93		2.0	64			972		.33	67	1880			810					20
25	88	8.6	59	14	6.0	93																		28
26	133	8.1	60	20	5.9	94																		30
27	133	8.8	62	22	5.9	95																		28
28	133	7.3	65	19	6.0	96																		32
29						96																		7
30	133	10.1	60	24	5.5	94																		35
31	88	8.4	61	14	6.0	95																		22
TOTAL	3602											3271												477
ARITH. MEAN	139	8.1	65	22		92		1.8	51			1090		.38	66	2527			765					15

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4

Marshall, MICHIGAN

MONTH April 1971 — MISCELLANEOUS DATA — OPERATOR Robert J. Swalwell

DATE	WEATHER Precip. Inches	Temp. (°F) Max.	Temp. (°F) Min.	Type	RAW SEWAGE Temp. °F	Flow MGD Total MGD	Flow MGD Max. Rate	Flow MGD Min. Rate	pH	water cf x 10	Cl_2 lbs.	POWER KWH	AUX. FUEL *	CHEMICALS APPLIED					REMARKS
1	.10	54	28	R	49	2.42	2.90	1.80	7.4	188	105	280	13						* Gas - cu. ft. X 100
2	.08	36	22	S	49	2.45	2.90	1.80	7.4	183	109	320	12						
3		30	14	CL	49	2.38	2.90	1.80	7.4	180	111	280	28						
4		39	22	C	49	2.37	2.80	1.80	7.5	175	55	320	12						
5		43	22	C	49	2.45	3.00	1.80	7.6	181	103	280	10						
6		48	22	C	49	2.41	2.90	1.70	7.5	191	112	280	11						
7		56	30	C	49	2.44	3.00	2.00		189	106	280	12						
8		68	40	C	49	2.42	2.90	1.80	7.5	187	112	280	10						
9	.01	62	26	R	50	2.33	3.00	1.80	7.4	183	114	280	5						
10		58	30	C	49	2.36	2.90	1.80	7.4	184	117	240	5						
11		72	46	C	49	2.35	2.80	1.80		185	112	280	5						
12	.33	80	44	R	51	2.49	3.10	2.00	7.4	181	116	240	5						
13	.10	50	24	R	51	2.43	2.90	1.90		185	104	280	5						
14		48	28	C	50	2.47	3.00	1.80	7.4	162	104	280	5						
15		60	32	C	50	2.43	3.00	2.00	7.5	160	112	280	7						
16	.21	82	44	R	50	2.41	2.90	2.00	7.4	163	126	240	6						
17		70	42	C	51	2.42	2.80	1.90	7.4	161	110	280	10						
18		64	33	CL	51	2.34	2.80	1.90	7.4	160	112	280	10						
19		70	40	C	51	2.44	3.00	2.00	7.5	158	121	240	10						
20		74	44	C	51	2.46	2.90	1.90	7.5	158	124	240	12						
21		56	34	C	52	2.41	3.00	1.90		160	107	280	9						
22		58	28	C	51	2.41	3.00	1.80	7.6	156	88	280	8						
23		60	26	C	51	2.37	2.80	1.60	7.5	162	110	280	11						
24		44	32	CL	51	2.36	2.90	1.50	7.5	166	104	320	9						
25		56	36	CL	51	2.34	2.80	1.70	7.4	162	108	320	7						
26		52	32	CL	52	2.40	3.00	2.00	7.4	159	107	280	10						
27	.09	48	38	R	51	2.40	2.90	2.00		172	114	240	14						
28	.11	48	38	R	51	2.42	2.80	1.80	7.6	162	111	280	14						
29		50	30	CL	51	2.37	3.00	1.80	7.4	168	116	280	21						
30	.05	58	40	R	51	2.41	3.20	1.80	7.5	163	114	280	7						
31																			
TOTAL	1.08										3264	8320	303						
ARITH. MEAN						2.40				172	109								

MDPH
D-4.1

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH April 1971 PRIMARY TREATMENT DATA OPERATOR Robert J. Swalwell

DATE	5-DAY BOD INF. Mg/l	5-DAY BOD INF. LBS. X 10	5-DAY BOD EFF. Mg/l	5-DAY BOD EFF. LBS. X 10	5-DAY BOD REM. %	SUSPENDED SOLIDS INF. Mg/l	SUSPENDED SOLIDS INF. LBS. X 10	SUSPENDED SOLIDS EFF. Mg/l	SUSPENDED SOLIDS EFF. LBS. X 10	SUSPENDED SOLIDS REM. %	SUSP. VOLATILE SOLIDS INF. Mg/l	SUSP. VOLATILE SOLIDS INF. LBS. X 10	SUSP. VOLATILE SOLIDS EFF. Mg/l	SUSP. VOLATILE SOLIDS EFF. LBS. X 10	Total PHOSPHORUS – P INF. Mg/l	Total PHOSPHORUS – P INF. LBS. X	Total PHOSPHORUS – P EFF. Mg/l	Total PHOSPHORUS – P EFF. LBS. X	Total PHOSPHORUS – P REM. %	REMARKS
1	55	111	46	93	16	61	123	35	71	43	49	99	27	54						
2	54	110	45	92	17	77	157	25	51	68	67	137	21	43						
3	70	139	51	101	27	50	99	24	48	52	39	77	14	28						
4						76	150	21	42	72	67	132	16	32						
5	66	135	60	123	9															
6	80	161	64	129	20	103	207	30	60	71	94	189	27	54						
7																				
8	60	121	54	109	10	88	178	35	71	60	80	161	33	67						
9	57	111	52	101	9	65	126	36	70	45	58	113	31	60						
10	84	165	64	126	24	92	181	32	63	65	72	142	20	39						
11																				
12	89	185	76	158	15	134	278	62	129	54	115	239	46	96						
13																				
14	64	132	57	117	11	66	136	33	68	50	59	122	29	60						
15	65	132	51	103	22	65	132	42	85	35	57	116	38	77						
16	66	133	50	101	24	110	221	24	48	78	98	197	22	44						
17	84	170	55	111	35	104	210	25	50	76	87	176	16	32						
18	70	137	67	131	4	84	164	29	57	66	72	141	23	45						
19	69	140	61	124	12	99	201	46	94	72	84	171	33	67						
20	92	189	63	130	32	118	242	48	98	75	101	207	36	74						
21																				
22	82	165	65	131	21	57	115	19	38	67	52	105	19	38						
23	83	164	60	119	28	71	140	38	75	47	58	115	27	53						
24	65	128	42	83	35	61	120	29	57	53	48	94	22	43						
25	88	172	62	121	30	85	166	32	62	62	72	141	25	49						
26	69	138	60	120	13	95	190	43	86	55	73	146	32	64						
27	76	152	60	120	21	84	168	32	64	62	71	142	27	54						
28	67	135	62	125	7	67	135	34	69	49	58	117	27	54						
29	66	130	58	115	12	133	263	35	69	74	114	225	29	57						
30	96	193	58	117	40	135	271	35	70	74	119	239	29	58						
31																				
TOTAL		3648		2900			4810		1695			3743		1342						
ARITH. MEAN	73	146	58	116	20	87	192	34	68	61	75	150	27	54						

Digester Volume, ft^3
Primary 14,000
Secondary 14,000

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MDPH
D-4.5

Supernatant To Raw wastewater wetwell
Process Pattern Raw-pri.dig.-sec.dig.-beds

MONTH April 1971

DIGESTER AND SLUDGE DATA

OPERATOR Robert J. Swalwell

DATE	RAW SLUDGE Gals. 10^X	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. 10^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. 10^X	DIGESTED SLUDGE Total Solids %	DIGESTED SLUDGE Vol. Solids %	DIGESTED SLUDGE pH	Gas Produced cu. ft X 100
1	88	9.2	54	13	5.8	95		.90	80											884	11.3	44		32
2	133	8.9	57	21	6.0	95																		25
3	133	10.5	49	21	5.9	95																		25
4						95																		24
5	133	8.5	59	20		95																		17
6						95																		17
7	177	6.8	78	28	5.7	95																		17
8	177	8.0	56	24	6.0	94																		4
9						91																		35
10	133	11.1	58	26	5.8	94																		24
11	133	8.7	65	23	5.8	94																		22
12						94																		19
13	221	7.3	66	32	5.8	95																		27
14	177	7.4	66	26	5.8	95																		29
15	177	6.9	62	23	5.8	96																		36
16	133	8.4	66	22	5.9	97		.40	50			1057		.30	62	1580			540	884	3.9	53		31
17	133	9.0	58	21	5.8	99																		43
18	133	8.2	72	24	5.8	100																		31
19						100																		21
20	177	7.8	64	27	5.9	102																		19
21						98																		15
22	133	6.0	69	17	6.0	97																		15
23	177	5.6	72	22		94																		37
24	133	5.4	53	12	6.0	96																		24
25	177	7.8	64	27	5.9	97																		24
26						97																		18
27	177	7.8	61	26	5.8	98																		17
28	133	6.7	61	17	5.9	98																		20
29	133	9.4	62	23	5.9	98		.50	67			1061		.26	62	1230			540					29
30	133	9.0	60	22	5.9	99																		21
31																								
TOTAL	3448											2117								1778				724
ARITH. MEAN	150	8.0	62	22		96		.60	66			1059		.28	62	1405			540	884	7.6	49		24

MDPH
D-4

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH May 19 71 — MISCELLANEOUS DATA — OPERATOR Robert J. Swalwell

DATE	WEATHER Precip. Inches	Temp. (°F) Max.	Temp. (°F) Min.	Type	RAW SEWAGE Temp. °F	Flow MGD Total MGD	Flow MGD Max. Rate	Flow MGD Min. Rate	pH	water cf/mg	Cl_2 lbs.	POWER KWH	AUX. FUEL *	CHEMICALS APPLIED					REMARKS
1	.02	58	38	R	51	2.39	3.40	1.80	7.5	1640	113	240	13						* gas - cu. ft. X 100
2		50	31	CL	51	2.40	3.10	1.80	7.4	1650	100	280	13						
3		56	30	C	52	2.39	3.00	1.90	7.6	1590	103	240	10						
4		62	40	CL	52	2.40	3.80	1.80	7.6	1690	115	280	11						
5	.21	70	48	R	52	2.37	2.80	1.90	7.5	1650	108	240	9						
6		68	40	C	52	2.32	2.80	1.70		1660	110	280	10						
7		68	46	C	52	2.32	3.30	1.80	7.6	1690	108	240	7						
8		73	40	C	52	2.24	2.80	1.80	7.6	1560	121	240	10						
9		72	40	CL	52	2.23	2.70	1.80	7.4	1670	117	240	9						
10		78	50	C	52	2.34	3.20	1.80	7.6	1600	121	240	9						
11	.18	72	34	R	53	2.29	2.80	1.90	7.5	1600	110	240	10						
12		48	30	CL	52	2.26	2.80	1.70	7.5	1990	113	280	7						
13		66	42	C	52	2.28	3.00	1.70	7.6	1630	107	280	10						
14		78	46	C	53	2.27	3.00	1.60	7.5	1630	115	280	10						
15		80	54	C	53	2.26	3.20	1.30	7.4	1540	135	240	11						
16	.05	80	42	R	53	2.19	3.10	1.60	7.5	1600	108	240	4						
17		84	60	C	54	2.32	2.90	1.80	7.6	1570	109	280	5						
18		90	62	C	53	2.36	2.80	1.80	7.5	1590	114	240	2						
19	.22	82	42	R	54	2.31	3.20	1.70	7.7	1570	123	280	9						
20		68	40	CL	54	2.25	3.00	1.60	7.7	1630	108	240	9						
21		64	38	C	54	2.20	3.10	1.50	7.6	1650	118	280	5						
22		72	44	C	54	2.20	3.20	1.40	7.6	1540	120	280	2						
23	.23	78	54	R	54	2.17	3.00	1.30	7.5	1580	114	200	10						
24	.24	80	50	R	54	2.38	3.10	1.40	7.6	1580	113	280	12						
25	.04	54	44	R	54	2.29	3.10	1.30	7.5	1600	110	280	10						
26		54	40	CL	54	2.25	2.70	1.30	7.5	1620	108	240	8						
27		68	36	C	54	2.26	2.80	1.30	7.5	2000	102	280	8						
28		74	40	C	54	2.27	2.80	1.40	7.5	1630	73	280	4						
29		80	44	C	55	2.19	2.80	1.70	7.4	1540	120	240	8						
30		82	50	C	54	2.17	2.60	1.70	7.5	1650	108	280	8						
31		80	52	CL	54	2.16	2.80	1.20	7.5	1630	105	240	8						
TOTAL	1.19										3449	8000	256						
ARITH. MEAN						2.28				1638	111								

MDPH
D-4.1

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH May 1971 — PRIMARY TREATMENT DATA — OPERATOR Robert J. Swalwell

DATE		5-DAY BOD INF. Mg/l	5-DAY BOD INF. LBS. X 10	5-DAY BOD EFF. Mg/l	5-DAY BOD EFF. LBS. X 10	5-DAY BOD REM. %	SUSPENDED SOLIDS INF. Mg/l	SUSPENDED SOLIDS INF. LBS. X 10	SUSPENDED SOLIDS EFF. Mg/l	SUSPENDED SOLIDS EFF. LBS. X 10	SUSPENDED SOLIDS REM. %	SUSP. VOLATILE SOLIDS INF. Mg/l	SUSP. VOLATILE SOLIDS INF. LBS. X 10	SUSP. VOLATILE SOLIDS EFF. Mg/l	SUSP. VOLATILE SOLIDS EFF. LBS. X 10	Total PHOSPHORUS – P INF. Mg/l	Total PHOSPHORUS – P INF. LBS. X 10	Total PHOSPHORUS – P EFF. Mg/l	Total PHOSPHORUS – P EFF. LBS. X	Total PHOSPHORUS – P REM. %	REMARKS
19.93	1	86	171	76	151	12	94	187	56	112	40	76	151	43	86						
20.02	2	97	194	73	146	25	124	248	38	76	69	113	226	35	70						
19.93	3	68	136	64	128	6	90	179	52	104	42	74	147	42	84						
20.02	4	60	120	51	102	15	96	192	38	76	60	83	166	28	56						
19.77	5	60	119	51	101	15	117	231	31	61	74	104	206	29	57						
19.35	6	75	145	60	116	20	123	238	30	58	76	109	211	25	48						
19.35		54	104	54	104	0	91	176	36	70	60	77	149	18	35						
18.68	8	88	164	80	149	9	108	202	41	77	62	96	179	29	54						
18.60	9	80	149	60	112	25	92	171	33	61	64	75	140	26	48						
19.52	9	74	144	65	127	12	125	244	32	62	74	115	224	27	53						
19.10	11	76	145	66	126	13	100	191	38	73	62	75	143	38	73						
18.85	12	66	124	60	113	9	70	132	28	53	60	62	117	22	41						
19.02	13	63	120	52	99	17	103	196	30	57	71	89	169	21	40						
18.93	14	66	125	57	108	14	89	168	37	70	58	71	134	22	42						
18.85	15	70	132	60	113	14	90	170	19	36	79	81	153	19	36						
18.26	16	78	142	72	131	8	101	184	38	69	62	88	161	32	58						
19.32	17	54	104	54	104	0	72	139	30	58	58	65	126	27	52						
19.68	18	60	118	51	100	18	92	181	35	69	62	82	161	31	61						
19.27	19	108	208	65	125	40	133	256	37	71	72	119	229	31	60						
18.77	20	64	120	48	90	25	77	145	30	56	61	67	126	28	53						
18.35	21	69	127	56	103	19	69	127	35	64	49	64	117	33	61						
18.35	22	78	143	72	132	8	125	229	38	70	70	102	187	27	50						
18.10	23	72	130	64	116	11	72	130	34	62	53	65	118	34	62						
19.85	24	74	147	68	135	8	90	179	40	79	56	79	157	34	67						
19.10	25	64	122	56	107	13	102	197	34	65	67	96	183	31	59						
18.77	26	80	150	73	137	9	87	163	35	66	60	80	150	32	60						
18.85	27	66	124	55	104	17	80	151	28	53	65	68	128	23	43						
18.93	28	66	125	52	98	21	92	174	34	64	63	78	148	28	53						
18.26	29	63	115	58	106	8	82	150	37	68	55	76	139	36	66						
19.10	30	85	154	60	109	29	97	176	23	42	76	90	163	20	36						
18.01	31	75	135	65	117	13	78	140	22	40	72	67	121	18	32						
TOTAL			4256		3609			5646		2042			4929		1696						
ARITH. MEAN		73	137	61	116	15	96	182	34	66	63	83	159	29	55						

Digester Volume, ft^3
Primary 14,000
Secondary 14,000

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.5

Marshall, MICHIGAN

Supernatant To Raw Wetwell
Process Pattern Raw-Pri. dig-sec. dig-beds

MONTH May 19 71

DIGESTER AND SLUDGE DATA

OPERATOR Robert J. Swalwell

DATE	RAW SLUDGE Gals. X	RAW SLUDGE Total Solids %	RAW SLUDGE Vol. Solids %	RAW SLUDGE Vol. Solids Lbs/1000c.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. 10^X	DIGESTED SLUDGE Total Solids %	DIGESTED SLUDGE Vol. Solids %	DIGESTED SLUDGE pH	Gas Produced cu. ft X 100
1	133	7.4	64	19	5.9	99																		21
2	133	8.1	62	20	5.8	100																		19
3						99																		13
4	133	7.9	61	19	5.9	97														1100	9.4	44		14
5	133	9.6	61	24		94																		28
6	177	9.6	61	31	5.8	97																		22
7	265	8.1	63	41	5.5	97																		29
8	133	7.3	64	19	5.5	98																		27
9	221	7.7	72	37	5.7	99																		35
10						99																		26
11	309	7.2	66	45	5.7	98																		36
12						95																		28
13	221	9.5	64	41	5.6	94																		29
14	133	9.4	64	24	5.9	92																		28
15	133	8.8	66	23	5.8	94		.90	56			1105		.22	62	960			450					32
16	88	9.1	70	17	5.8	96																		25
17						97																		
18	309	8.4	69	57	5.8	96																		50
19	265	7.7	69	43	5.7	94																		10
20						92																		43
21	133	11.4	65	30	5.6	96																		14
22	88	3.9	77	8	6.2	96																		47
23	88	10.4	71	20	5.8	94																		26
24						92		.74	54			884		.23	61	740			320					27
25	221	7.5	69	35	5.7	95																		30
26	265	8.7	66	46	5.7	96																		36
27	88	7.1	68	13	5.9	96																		33
28	133	8.7	67	23	5.8	88																		47
29	265	8.3	69	46	5.8	100																		42
30	88	9.9	68	18	5.7	99																		39
31																								24
TOTAL	4155											1989								1100				880
ARITH. MEAN	173	8.4	67	29		96		.82	55			995		.22	61	850			385	1100	9.4	44		28

MDPH
D-4

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH June 19 71 — MISCELLANEOUS DATA — OPERATOR Robert J. Swalwell

DATE	WEATHER Precip. Inches	Temp. (°F) Max.	Temp. (°F) Min.	Type	RAW SEWAGE Temp. °F	Flow MGD Total MGD	Flow MGD Max. Rate	Flow MGD Min. Rate	pH	water mg/mg	Cl_2 lbs.	POWER KWH	AUX. FUEL *	CHEMICALS APPLIED					REMARKS
1	.04	70	56	R	54	2.32	2.80	1.70	7.7	1570	106	280	7						* Gas -- cu. ft. X 100
2		76	50	CL	55	2.32	2.70	1.60	7.6	1610	109	240	0						
3		86	56	C	55	2.33	2.80	1.50	7.6	1580	113	280	0						
4		90	60	C	55	2.36	2.90	1.70	7.6	1650	113	280	0						
5		92	66	C	56	2.33	2.90	1.50	7.6	1650	111	240	0						
6	.38	87	62	R	56	2.29	3.50	1.50	7.5	1620	109	240	2						
7	.04	88	50	R	56	2.46	3.10	1.50	7.6	1540	134	280	2						
8		64	46	C	55	2.28	2.90	1.50	7.5	1980	112	280	2						
9		74	42	C	55	2.29	2.90	1.50	7.5	1330	112	240	4						
10		82	56	C	55	2.30	3.70	1.60	7.6	1330	104	280	3						
11	.04	90	64	R	55	2.36	3.00	1.90	7.6	1300	111	280	2						
12	.36	84	59	R	56	2.33	2.90	1.60	7.6	1570	112	240	2						
13		86	60	CL	56	2.25	2.80	1.90	7.5	2570	116	240	4						
14		84	60	CL	56	2.37	3.00	1.90	7.6	1710	109	280	2						
15		88	54	C	56	2.35	2.90	1.80	7.6	1490	96	280	2						
16		90	56	C	56	2.34	3.00	1.70	7.5	1620	123	240	5						
17		92	58	C	56	2.36	2.90	1.60	7.6	1640	112	280	5						
18		92	66	C	56	2.36	2.90	1.80	7.5	1980	116	280	5						
19		98	70	C	56	2.30	2.80	1.70	7.6	1600	120	280	5						
20	.04	94	60	R	56	2.27	2.70	1.60	7.6	1630	104	240	7						
21		82	58	C	58	2.35	3.00	1.60	7.6	1670	120	240	3						
22	.09	86	60	R	58	2.35	3.00	1.60		1610	108	280	3						
23		86	62	C	58	2.31	2.80	1.60	7.8	1600	109	240	3						
24		94	70	C	58	2.34	3.00	1.80		1570	129	280	3						
25		90	62	C	58	2.32	2.90	1.70	7.6	1610	126	240	3						
26		96	68	C	57	2.29	2.80	1.90	7.5	1620	110	240	3						
27		100	70	C	58	2.24	2.80	1.80	7.7	1610	114	280	3						
28		101	74	C	58	2.38	3.70	1.60	7.7	1570	120	240	2						
29		100	70	C	60	2.33	3.70	1.10	7.6	1580	126	240	0						
30	.17	96	66	R	59	2.36	3.00	1.60	7.6	1610	126	280	0						
31																			
TOTAL	1.16										3430	7840	82						
ARITH. MEAN						2.33				1634	114								

MDPH
D-4.1

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH June 19 71 — PRIMARY TREATMENT DATA — OPERATOR Robert J. Swalwell

DATE	5-DAY BOD INF. Mg/l	5-DAY BOD INF. LBS. X	5-DAY BOD EFF. Mg/l	5-DAY BOD EFF. LBS. X	5-DAY BOD REM. %	SUSPENDED SOLIDS INF. Mg/l	SUSPENDED SOLIDS INF. LBS. X	SUSPENDED SOLIDS EFF. Mg/l	SUSPENDED SOLIDS EFF. LBS. X	SUSPENDED SOLIDS REM. %	SUSP. VOLATILE SOLIDS INF. Mg/l	SUSP. VOLATILE SOLIDS INF. LBS. X	SUSP. VOLATILE SOLIDS EFF. Mg/l	SUSP. VOLATILE SOLIDS EFF. LBS. X	Total PHOSPHORUS – P INF. Mg/l	Total PHOSPHORUS – P INF. LBS. X	Total PHOSPHORUS – P EFF. Mg/l	Total PHOSPHORUS – P EFF. LBS. X	Total PHOSPHORUS – P REM. %	REMARKS
1	74	143	65	126	12	80	155	40	77	50	62	120	30	58						
2	74	143	64	124	14	113	219	33	64	71	103	199	28	54						
3	86	167	64	124	26	95	185	29	56	70	89	173	25	49						
4						143	291	28	55	80	120	236	25	49						
5	72	140	65	126	10	74	144	40	78	46	64	124	33	64						
6	88	168	66	126	25	102	195	20	38	80	83	159	18	34						
7	72	148	62	127	14	88	181	42	86	52	71	146	37	76						
8	83	158	70	133	16	117	226	32	61	74	99	188	24	46						
9	92	176	68	130	26	125	239	33	63	74	110	210	26	50						
10	72	138	66	126	8	101	194	48	92	73	90	173	41	79						
11	84	175	48	94	43	65	129	22	43	52	44	87	16	31						
12	80	155	61	119	24	143	278	25	49	83	127	247	18	35						
13	84	158	65	122	23	77	145	27	51	65	61	114	24	45						
14	90	178	64	127	29	112	221	30	59	73	89	176	22	43						
15	77	151	69	135	10	120	235	49	96	59	92	180	36	71						
16	88	172	65	127	26	128	250	49	96	62	109	213	38	74						
17	86	169	64	126	26	92	181	36	71	61	77	152	31	61						
18	65	128	59	116	9	112	220	34	67	70	101	199	25	49						
19	88	169	84	161	5	87	167	34	65	61	79	152	31	59						
20	84	159	67	127	20	94	178	38	72	60	85	161	31	59						
21	74	145	67	131	9	103	202	31	61	70	88	172	26	51						
22																				
23	86	166	62	119	28	112	216	32	62	72	95	183	25	48						
24																				
25	84	165	72	142	14	80	157	39	77	51	69	136	36	71						
26	80	153	78	149	3	114	218	44	84	61	109	208	41	78						
27	77	144	67	125	13	80	149	37	69	54	67	125	33	62						
28	90	179	70	139	22	113	224	42	83	63	82	163	34	67						
29	76	148	63	122	17	122	237	36	70	71	99	192	34	66						
30	78	154	66	130	15	101	199	32	63	68	88	173	26	51						
31																				
TOTAL		4249		3453			5635		1908			4761		1580						
ARITH. MEAN	81	157	66	128	18	100	201	34	68	65	88	170	29	56						

Digester Volume, ft^3
Primary 14,000
Secondary 14,000

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.5

Marshall, MICHIGAN

Supernatant To raw wetwell
Process Pattern raw-pri. dig-sec. dig-beds

MONTH June 19 71

DIGESTER AND SLUDGE DATA

OPERATOR

DATE	RAW SLUDGE Gals. X 10	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 100
1						95																		19
2	177	7.5	66	27	5.7	94																		8
3	221	7.3	65	32	5.9	92																		44
4	177	10.4	69	38	5.7	96																		22
5	133	10.4	68	28	5.7	96																		40
6	177	7.2	70	27	5.6	96																		26
7						94		.57	64			11492		.21	68	1580			210					22
8	177	11.1	66	40	5.6	94																		23
9						92																		21
10	133	12.0	60	28		93																		24
11	177	7.3	68	26	5.8	95																		32
12	177	8.8	66	31	5.7	98																		33
13	133	7.8	67	21	5.8	100																		28
14						98																		23
15	133	9.6	68	26	5.5	96		.58	59			9724		.21	56	990			335					36
16	221	11.4	71	54	5.6	95																		34
17	221	8.7	73	43	5.5	93																		33
18	265	9.8	67	53	5.5	91																		39
19	88	7.7	69	14		90																		32
20	265	7.7	69	42	5.6	90																		36
21	133	7.2	58	17	5.7	88		1.1	67			9724		.21	67	850			295					35
22	221	9.0	69	41	5.6	92																		33
23	177	8.2	71	31	5.6	94																		33
24	221	7.7	69	36	5.8	96																		41
25	177	9.8	66	35	5.7	100		1.1	54			11492		.21	61	950			270					52
26	177	6.8	72	26	5.8	96																		48
27	133	6.4	75	19	5.8	101																		23
28						99																		13
29	88	9.2	71	17	5.7	99																		48
30	221	9.4	72	46	5.5	98																		46
31																								
TOTAL	4420											42432												942
ARITH. MEAN	177	8.7	68	32		95		.84	61			10608		.21	63	1092			280					31

MDPH
D-4

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH July 1971 — MISCELLANEOUS DATA — OPERATOR Robert J. Swalwell

DATE	WEATHER Precip. Inches	Temp. (°F) Max.	Temp. (°F) Min.	Type	RAW SEWAGE Temp. °F	Flow MGD Total MGD	Flow MGD Max. Rate	Flow MGD Min. Rate	pH	~~Grit~~ water cf/~~Mg~~	Cl_2 lbs.	POWER KWH	AUX. FUEL *	CHEMICALS APPLIED					REMARKS
1		82	58	CL	58	2.08	3.10	0.50	7.6	2010	135	200	3						* Gas - cu. ft. X 100
2		86	54	C	58	2.02	2.70	0.50		1630	102	240	3						
3		90	60	C	59	2.52	3.00	2.00	7.5	1580	117	240	4						
4	.78	92	65	R	58	2.40	3.30	2.00	7.5	1610	111	240	3						Pumped both settling
5	.18	80	63	R		2.45	3.00	1.90		1610	99	240	3						tanks down during month.
6		88	56	C	58	2.54	3.10	1.90	7.5	1610	111	240	2						Both in fairly good con-
7		92	66	C	58	2.55	3.10	1.80	7.7	1540	113	280	2						dition, although alum-
8	.73	88	66	R	58	2.49	4.50	1.70	7.5	1580	124	280	3						inum under liquid sur-
9		90	65	C	58	2.46	3.30	0.10	7.6	1590	139	280	3						face is badly eaten
10		90	64	C	58	2.59	3.10	2.10	7.6	1580	126	240	2						away.
11		83	53	C	58	2.50	3.00	2.00	7.6	1630	117	240	3						
12		86	68	C	58	2.50	3.00	2.00	7.5	1610	119	240	3						
13		84	56	CL	59	2.27	3.10	0.60	7.5	1570	129	280	3						
14		80	54	C	58	2.49	2.90	2.00	7.6	1690	106	240	3						
15	.80	76	56	R	58	2.65	4.10	1.40	7.5	1810	122	280	2						
16	.21	86	58	R	59	2.75	3.20	2.10	7.5	1630	102	280	2						
17		80	48	C	59	2.76	3.10	2.10	7.5	1680	114	280	3						
18	.06	84	60	R	59	2.68	3.00	2.40	7.6	1610	116	280	2						
19	.89	72	48	R	58	2.92	3.80	2.10	7.5	1570	133	280	3						
20		80	52	C	58	2.76	3.20	2.00	7.6	1600	118	280	3						
21		84	53	CL	57	2.61	3.00	2.00	7.6	1640	116	280	2						
22		87	62	CL	57	2.68	3.00	1.90	7.5	1600	117	280	2						
23		87	64	CL	58	2.71	3.10	1.80	7.5	1670	123	240	4						
24		84	60	C	58	2.67	3.20	1.80	7.6	2140	109	280	3						
25	.80	87	61	R	58	2.72	3.70	1.90	7.5	1620	107	240	2						
26	.02	74	50	R	59	2.69	3.40	2.00	7.5	1630	117	280	1						
27		76	54	CL	58	2.57	2.90	1.80	7.5	1660	108	280	1						
28	.08	72	52	R	58	2.55	2.90	1.70	7.5	1680	107	280	1						
29		76	56	CL	58	2.67	3.00	2.40	7.5	1680	123	280	2						
30		78	48	C	58	2.52	3.10	1.70		1820	123	240	2						
31		74	50	C	58	2.46	3.00	1.60	7.5	1750	113	290	2						
TOTAL	4.55										3616	262	2.5						
ARITH. MEAN						2.56				1665	117								

MDPH
D-4.1

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH July 19 71 — PRIMARY TREATMENT DATA — OPERATOR Robert J. Swalwell

DATE	5-DAY BOD INF. Mg/l	5-DAY BOD INF. LBS. X 10	5-DAY BOD EFF. Mg/l	5-DAY BOD EFF. LBS. X 10	5-DAY BOD REM. %	SUSPENDED SOLIDS INF. Mg/l	SUSPENDED SOLIDS INF. LBS. X 10	SUSPENDED SOLIDS EFF. Mg/l	SUSPENDED SOLIDS EFF. LBS. X 10	SUSPENDED SOLIDS REM. %	SUSP. VOLATILE SOLIDS INF. Mg/l	SUSP. VOLATILE SOLIDS INF. LBS. X 10	SUSP. VOLATILE SOLIDS EFF. Mg/l	SUSP. VOLATILE SOLIDS EFF. LBS. X 10	Total PHOSPHORUS – P INF. Mg/l	Total PHOSPHORUS – P INF. LBS. X	Total PHOSPHORUS – P EFF. Mg/l	Total PHOSPHORUS – P EFF. LBS. X	Total PHOSPHORUS – P REM. %	REMARKS
1	80	139	60	104	25	138	239	36	62	74	82	142	32	56						
2	72	121	60	101	17	112	189	33	56	71	83	140	25	42						
3	68	143	60	126	12	75	158	34	71	55	60	126	30	63						
4																				
5	66	135	60	123	9	71	145	40	82	44	63	129	36	74						
6	68	144	60	127	12	94	199	39	83	59	82	174	32	68						
	68	145	60	128	12	100	213	48	102	52	90	191	41	87						
8	76	158	57	118	25	144	299	51	106	65	125	260	43	89						
9	76	156	60	123	21	132	271	49	101	63	94	193	42	86						
[illegible]	68	147	54	117	21	155	335	47	99	70	134	289	36	78						
[illegible]	100	209	52	112	48	124	259	31	65	75	101	211	28	58						
12	64	133	54	113	16	151	315	45	94	70	136	284	42	88						
13	71	134	66	125	7	89	168	55	104	38	76	144	47	89						
14	62	129	53	110	15	60	125	25	52	58	50	104	21	44						
15	76	168	54	119	29	92	203	31	69	66	73	161	24	53						
16	63	145	48	110	24	78	179	38	87	51	57	131	27	62						
17	76	175	50	115	34	84	193	24	55	71	74	170	20	46						
18	67	150	48	106	28	62	139	25	56	59	58	130	25	56						
19	74	180	50	122	32	140	341	29	71	79	102	248	21	51						
20	71	163	50	115	30	87	200	32	74	63	67	154	25	58						
21	72	157	57	124	21	99	216	27	59	73	80	174	22	48						
22	64	143	54	121	16	68	152	29	65	57	60	134	28	63						
23	93	210	68	154	27	99	224	37	84	63	85	192	31	70						
24	57	127	48	107	16	80	178	31	69	55	70	156	25	56						
25	64	145	42	95	34	87	197	35	79	60	66	150	32	73						
26	80	179	45	101	44	140	314	29	65	79	125	280	29	65						
27	76	163	45	96	41	93	199	28	60	70	73	156	27	58						
28	68	145	48	102	29	85	181	36	77	58	77	164	32	68						
[illegible]	66	147	48	107	27	119	265	30	67	75	104	232	26	58						
30																				
31	66	135	60	123	9	60	123	28	57	53	43	88	23	47						
TOTAL		4425		3344			6219		2171			5107		1854						
ARITH. MEAN	71	153	54	115	24	101	214	35	75	63	82	176	30	64						

Digester Volume, ft^3
Primary 14,000
Secondary 14,000

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.5

Marshall, MICHIGAN

Supernatant To raw wetwell
Process Pattern raw-pri. dig-sec. dig-beds

MONTH July 19 71

DIGESTER AND SLUDGE DATA

OPERATOR Robert J. Swalwell

DATE	RAW SLUDGE Gals. 10x	RAW SLUDGE Total Solids %	RAW SLUDGE Vol. Solids %	RAW SLUDGE Vol. Solids Lbs/1000c.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. 10x	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. 10x	DIGESTED SLUDGE Total Solids %	DIGESTED SLUDGE Vol. Solids %	DIGESTED SLUDGE pH	Gas Produced cu. ft x100
1	111	8.5	74	21		96														1190	4.1	54		36
2						94																		39
3						94																		34
4	309	8.2	70	54	5.8	93																		40
5						92																		31
6	221	9.4	66	42	5.6	91																		34
7						96																		53
8						100																		16
9	133	8.6	58	20		99		1.1	67			884		.32	63	1920			690					89
10	884	6.8	67	125		94																		91
11						94																		84
12	530	6.8	67	73		92																		74
13	1060	6.8	67	146	6.5	90																		77
14						86																		44
15	265	4.6	64	24	6.6	90		2.1	46			1238		.35	63	2360								82
16	133	7.4	51	16	6.0	96																		51
17	88	5.9	75	12	6.1	103																		85
18	177	5.3	70	20	6.0	100																		58
19						97																		50
20	177	6.7	58	21	6.0	96																		51
21	133	6.0	70	17		94																		48
22	133	4.6	59	11	5.5	94																		43
23	265	6.8	67	36		92		.83	53			1017		.26	61	1380			360					18
24	88	8.4	70	16		91																		57
25						99																		49
26	254	6.8	67	49		98																		49
27	177	6.1	65	21	5.9	95																		33
28	133	8.3	67	22	5.9	93																		48
29	133	6.5	86	23	5.8	97																		36
30	133	5.3	73	16	5.8	100		.60	76			1149		.27	56	1440			320					47
31	133	6.0	69	17	5.8	98																		38
TOTAL	5768											4287								1190				1585
ARITH. MEAN	262	6.8	67	36		95		1.2	59			1072		.30	61	1775			456	1190	4.1	54		51

MDPH
D-4

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH August 19 71 — MISCELLANEOUS DATA — OPERATOR Robert J. Swalwell

DATE	WEATHER Precip. Inches	Temp. (°F) Max.	Temp. (°F) Min.	Type	RAW SEWAGE Temp. °F	Flow MGD Total MGD	Flow MGD Max. Rate	Flow MGD Min. Rate	pH	~~XXXX~~ water cf/~~XX~~	Cl_2 lbs.	POWER KWH	AUX. FUEL *	CHEMICALS APPLIED					REMARKS
1		81	55	C	57	2.46	2.90	1.50	7.5	1730	119	280	2						Heavy foaming in div-
2	.03	84	56	R	59	2.56	3.10	2.10	7.6	1740	115	240	2						ersion box occurred on
3		76	60	C	58	2.62	3.20	2.10	7.5	1680	118	280	1						Aug. 31st at 9:00 a.m.
4		76	46	C	58	2.51	3.00	2.10	7.5	2020	117	280	0						Looked like heavy con-
5		83	49	C	58	1.97	3.00	0.40	7.6	1610	123	240	0						centration of soap.
6		82	50	C	58	2.59	3.40	2.00	7.5	1650	127	240	1						The source could not be
7		86	54	C	57	2.59	3.00	1.90	7.4	1630	110	280	1						found.
8		84	59	C	58	2.55	2.90	1.80	7.5	1620	109	280	1						
9		90	69	C	59	2.73	3.40	2.00	7.5	1600	122	280	0						* Gas - cu. ft. X 100
10	.37	92	60	R	59	2.72	3.30	2.00	7.5	1640	121	280	0						
11		74	48	C	59	2.66	3.10	2.00	7.5	1590	114	240	0						
12		78	57	C	58	2.70	3.20	2.00	7.5	1630	114	280	2						
13	.12	86	64	R	58	2.79	3.30	1.80	7.5	1660	112	280	2						
14		84	58	C	59	2.66	3.30	2.10	7.5	1510	115	280	2						
15		76	52	C	57	2.62	3.10	2.00	7.5	1830	118	280	1						
16		80	50	C	58	2.78	3.50	2.00	7.5	1870	127	280	0						
17		84	52	C	58	2.73	3.30	1.90	7.5	1780	118	280	2						
18		84	56	C	58	2.73	3.30	2.20	7.7	1730	114	280	2						
19	.23	88	66	R	59	2.75	3.80	1.90	7.5	1800	122	280	2						
20		86	66	C	59	2.77	3.30	1.90	7.4	1920	122	280	2						
21		86	60	C	59	2.70	3.20	1.90	7.5	2040	109	280	2						
22		88	51	CL	59	2.60	3.10	2.20	7.5	2450	110	280	2						
23		74	46	C	60	2.70	3.30	2.00	7.4	2070	122	280	0						
24	.05	80	56	R	59	2.71	3.40	1.90	7.5	1800	135	280	0						
25	.02	82	59	R	59	2.69	3.30	1.70	7.5	1670	124	280	0						
26		79	58	CL	59	2.59	3.20	1.70	7.5	2030	119	280	0						
27	.05	74	54	R	59	2.64	3.10	2.20	7.5	1740	117	280	0						
28		78	48	C	58	2.59	3.00	2.10	7.4	1740	113	240	0						
29		82	52	C	57	2.58	3.10	2.00	7.5	1920	120	280	2						
30		82	58	C	59	2.70	3.30	1.80	7.5	1900	119	280	1						
31	.05	80	58	R	59	2.61	3.20	1.90	7.5	1900	110	240	1						
TOTAL	.92										3655	8440	31						
ARITH. MEAN						2.63				1790	118								

MDPH
D-4.1

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH August 19 71 PRIMARY TREATMENT DATA OPERATOR Robert J. Swalwell

DATE	5-DAY BOD INF. Mg/l	5-DAY BOD INF. LBS. X 10	5-DAY BOD EFF. Mg/l	5-DAY BOD EFF. LBS. X 10	5-DAY BOD REM. %	SUSPENDED SOLIDS INF. Mg/l	SUSPENDED SOLIDS INF. LBS. X 10	SUSPENDED SOLIDS EFF. Mg/l	SUSPENDED SOLIDS EFF. LBS. X 10	SUSPENDED SOLIDS REM. %	SUSP. VOLATILE SOLIDS INF. Mg/l	SUSP. VOLATILE SOLIDS INF. LBS. X 10	SUSP. VOLATILE SOLIDS EFF. Mg/l	SUSP. VOLATILE SOLIDS EFF. LBS. X 10	Total PHOSPHORUS – P INF. Mg/l	Total PHOSPHORUS – P INF. LBS. X	Total PHOSPHORUS – P EFF. Mg/l	Total PHOSPHORUS – P EFF. LBS. X	Total PHOSPHORUS – P REM. %	REMARKS
1	66	135	51	105	23	87	179	29	59	67	74	152	29	59						
2	63	135	52	111	17	-142	303	49	105	66	124	265	38	81						
3	66	144	60	131	9	73	160	29	63	60	57	125	24	52						
4	63	132	57	119	10	61	128	42	88	31	49	103	34	71						
5	80	131	68	112	15	-128	210	30	49	77	115	189	28	46						
6	78	168	54	117	31	86	186	31	67	64	74	160	26	56						
7	75	162	60	130	20	-145	313	38	84	73	126	272	31	67						
8	72	153	57	121	21	74	157	30	64	59	62	132	26	55						
9	64	146	60	137	6	80	182	38	87	53	69	157	33	75						
10	56	127	54	122	4	80	181	39	88	51	72	163	35	79						
11	63	140	54	120	14	73	162	43	95	41	62	138	37	82						
12	62	140	50	113	19	71	160	35	79	51	65	146	32	72						
13	60	140	48	112	20	-118	275	33	77	64	109	254	29	67						
14	80	177	72	160	10	-113	251	66	146	42	99	220	55	122						
15	92	201	60	131	35	-111	243	32	70	71	93	203	31	68						
16	75	174	57	132	24	80	186	36	83	55	78	181	36	83						
17	76	173	57	130	25	-142	323	45	102	68	126	287	39	89						
18	60	137	53	121	12	97	221	33	75	66	90	205	30	68						
19	63	145	54	124	14	65	147	49	112	25	59	135	44	101						
20	70	162	51	118	27	-148	342	29	67	80	125	289	26	60						
21	70	158	53	119	24	77	173	31	70	60	70	159	25	56						
22	63	137	54	117	14	78	169	29	63	63	70	152	27	59						
23	80	180	57	128	29	86	194	37	83	57	69	155	29	65						
24	76	172	56	127	26	-119	269	41	93	66	102	231	34	77						
25	76	170	54	121	29	80	171	49	110	39	60	135	37	83						
26	72	156	60	130	17	-113	244	42	91	63	96	207	37	80						
27	88	194	75	165	15	100	220	52	115	48	86	189	41	90						
28	68	147	48	104	29	64	138	33	71	48	57	123	27	58						
29	69	148	57	123	17	67	144	36	77	46	54	116	31	67						
30	64	144	57	128	11	103	232	43	97	58	80	180	34	77						
31	80	174	72	157	10	-122	266	43	94	65	105	229	35	76						
TOTAL		4802		3885			6539		2624			5651		2241						
ARITH. MEAN	71	155	57	125	19	96	211	38	85	57	83	182	33	72						

Digester Volume, ft^3
Primary 14,000
Secondary 14,000

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.5

Marshall, MICHIGAN

Supernatant To Raw Wetwell
Process Pattern raw-pri. dig. - sec. dig. - beds

MONTH August 19 71

DIGESTER AND SLUDGE DATA

OPERATOR Robert J. Swalwell

DATE	RAW SLUDGE Gals. X 10	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 10	DIGESTED SLUDGE Total Solids %	DIGESTED SLUDGE Vol. Solids %	DIGESTED SLUDGE pH	Gas Produced cu. ft X 100
1	133	5.0	72	15	5.9	96																		38
2	177	8.0	67	29	5.0	95																		35
3	221	8.0	59	31	5.9	93																		11
4						92																		46
5						98																		13
6	177	8.6	66	30	5.4	98																		35
7	88	7.3	65	13	5.8	96																		35
8	133	8.3	64	21	5.7	95																		35
9						94																		35
10	265	9.0	67	49	5.6	94		.52	57			9282		.23	60	1040			360					35
11	133	7.7	71	22	5.7	92																		35
12	133	6.9	65	18	5.6	97																		35
13	133	9.9	60	24	5.6	100																		35
14	88	3.1	63	5	5.7	100																		35
15	155	12.3	60	35	5.6	98																		35
16						96																		35
17	133	8.3	67	22	5.4	96		.91	53			9724		.19	63	760			295					40
18	177	5.4	69	20	5.7	95																		32
19	88	7.2	73	14	5.8	94																		34
20	133	9.1	70	25	5.7	92																		34
21	133	8.1	69	22	5.8	92																		35
22	177	8.9	67	32		91																		35
23	177	8.9	82	39	5.3	95																		35
24						97															900	5.8	42	35
25	133	8.6	64	22	5.8	96		.40	50			11492		.20	57	990			160		900	13.1	38	33
26	133	10.1	64	26		93																		27
27	133	10.1	64	26	5.7	91																		35
28	177	8.1	70	30	5.6	97																		32
29	155	11.2	62	33	5.6	95																		35
30	243	8.1	65	39	5.5	92																		33
31	133	9.1	68	25	5.4	90																		40
TOTAL	3956											30498								1800				1043
ARITH. MEAN	152	8.3	67	26		95		.61	53			10166		.21	61	930			272	900	9.5	40		34

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4

Marshall, MICHIGAN

MONTH September 19 71 — MISCELLANEOUS DATA — OPERATOR Robert J. Swalwell

DATE	WEATHER Precip. Inches	Temp. (°F) Max.	Temp. (°F) Min.	Type	RAW SEWAGE Temp. °F	Flow MGD Total MGD	Flow MGD Max. Rate	Flow MGD Min. Rate	pH	xxxx water cf/xx	Cl_2 lbs.	POWER KWH	AUX. FUEL *	CHEMICALS APPLIED					REMARKS
1		84	66	Cl	58	2.65	3.20	1.80	7.5	1950	113	280	2						* Gas - cu. ft. X 100
2		80	66	CL	59	2.67	3.20	2.20	7.5	2130	118	280	2						
3		84	70	CL	60	2.83	3.60	2.20	7.5	3410	109	320	3						
4	.07	84	66	R	60	2.65	3.20	2.20	7.5	3880	97	280	3						Sludge circulating pump
5	.29	92	65	R	59	2.59	3.10	2.20	7.5	1850	99	280	2						out of service for
6	.19	82	64	R	59	2.63	3.10	2.20	7.5	1740	95	280	2						repair - Sept. 15 - 22.
7		86	65	CL	60	2.77	3.30	2.20	7.5	2000	120	320	3						
8		88	61	C	60	2.74	3.30	2.20	7.5	1680	115	280	2						
9		83	60	C	60	2.67	3.10	2.20	7.6	1650	92	280	3						
10	.01	84	54	R	60	2.68	3.20	2.20	7.6	1550	120	240	3						
11		76	58	CL	59	2.61	3.10	1.50	7.5	1600	108	280	3						
12		70	53	CL	59	2.58	3.10	2.20	7.5	1770	98	280	4						
13		70	50	CL	59	2.55	3.10	2.10	7.6	1800	114	320	5						
14		80	54	C	59	2.57	3.00	1.20	7.5	1490	112	200	4						
15	.04	70	50	R	60	2.54	3.20	2.00	7.6	1610	115	200	6						
16	.08	72	52	R	59	2.53	3.70	1.70		1520	113	200	5						
17		70	46	CL	59	2.52	3.70	1.70	7.4	1510	115	200	5						
18	.03	70	52	R	59	2.46	4.00	1.40	7.5	1510	117	200	6						
19	.83	65	53	R	59	2.54	3.00	1.90	7.5	1490	117	200	5						
20	.09	62	40	R	60	2.60	3.10	1.90	7.7	1740	119	200	6						
21		67	40	C	58	2.54	3.10	1.90	7.5	1550	117	280	7						
22		70	46	C	59	2.56	3.10	1.90	7.5	1510	118	280	10						
23		66	34	C	59	2.56	3.10	1.90	7.4	1520	131	280	11						
24		64	38	C	59	2.52	3.00	1.90	7.4	1590	114	320	10						
25	.11	58	46	R	57	2.47	3.00	1.80	7.4	1550	114	280	11						
26	.85	66	52	R	57	2.58	3.00	1.90	7.5	1540	115	320	7						
27	.01	74	60	R	59	2.63	3.20	2.20	7.5	1520	110	320	6						
28		83	65	C	59	2.72	3.20	2.20		3690	113	320	6						
29		78	58	C		2.64	3.30	2.10	7.6	1700	111	280	3						
30		84	62	C	58	2.66	3.10	2.10	7.5	1990	112	320	5						
31																			
TOTAL	2.60										3361	8120	150						
ARITH. MEAN						2.61				1868	112								

MDPH
D-4.1

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH September 19 71 PRIMARY TREATMENT DATA OPERATOR Robert J. Swalwell

DATE	5-DAY BOD INF. Mg/l	5-DAY BOD INF. LBS. X 10	5-DAY BOD EFF. Mg/l	5-DAY BOD EFF. LBS. X 10	5-DAY BOD REM. %	SUSPENDED SOLIDS INF. Mg/l	SUSPENDED SOLIDS INF. LBS. X 10	SUSPENDED SOLIDS EFF. Mg/l	SUSPENDED SOLIDS EFF. LBS. X 10	SUSPENDED SOLIDS REM. %	SUSP. VOLATILE SOLIDS INF. Mg/l	SUSP. VOLATILE SOLIDS INF. LBS. X 10	SUSP. VOLATILE SOLIDS EFF. Mg/l	SUSP. VOLATILE SOLIDS EFF. LBS. X 10	Total PHOSPHORUS – P INF. Mg/l	Total PHOSPHORUS – P INF. LBS. X	Total PHOSPHORUS – P EFF. Mg/l	Total PHOSPHORUS – P EFF. LBS. X	Total PHOSPHORUS – P REM. %	REMARKS
1	73	161	63	139	14	87	192	41	91	53	76	168	35	77						
2	72	160	60	134	17	73	163	46	102	37	62	138	41	91						
3	52	123	39	92	25	79	186	37	87	53	66	156	31	73						
4	60	133	51	113	15	72	159	49	108	32	64	141	41	91						
5	75	162	60	130	25	61	132	34	73	44	40	86	27	58						
6	66	145	57	125	14	73	160	45	99	38	63	138	40	88						
[illegible]	84	194	63	146	25	115	266	43	99	63	103	237	38	88						
8	72	165	72	165	0	95	217	49	112	48	82	187	41	94						
9	54	120	51	114	6	62	138	39	87	37	56	125	33	73						
10	50	112	40	89	20	52	116	42	94	19	46	103	38	85						
11	73	159	67	146	8	69	150	32	70	54	60	131	29	63						
12	80	172	57	123	29	85	183	40	86	53	71	153	33	71						
13	68	145	61	130	10	58	123	47	100	19	49	104	38	81						
14	64	137	56	120	13	81	174	39	84	52	70	150	31	66						
15	60	127	45	95	25	66	140	35	74	47	55	116	31	66						
16																				
17	72	151	60	126	17	88	184	44	92	50	74	155	37	78						
18	72	148	60	123	17	74	152	28	57	62	67	137	26	53						
19	70	148	51	108	27	78	165	39	83	50	70	148	33	70						
20	81	176	76	165	6	67	145	42	91	37	59	128	36	78						
21	90	191	74	157	18	111	235	33	70	70	88	186	26	55						
22	88	188	77	164	13	73	156	43	92	41	63	135	35	75						
23	76	162	76	162	0	83	177	57	122	31	72	154	45	96						
24	80	168	76	160	5	98	206	53	111	46	82	172	44	92						
25	90	185	84	173	7	92	190	38	78	59	77	159	29	60						
26	84	181	67	144	17	117	252	31	68	74	96	207	24	52						
27	84	184	72	158	14	71	156	20	44	72	60	132	16	35						
28	72	163	72	163	0	62	141	33	75	47	53	120	29	66						
29	93	205	87	192	6	102	227	44	97	57	90	188	41	90						
30	72	160	66	146	8	55	122	41	91	25	47	104	34	75						
31																				
TOTAL		4625		4002			5007		2537			4268		2140						
ARITH. MEAN	73	159	63	138	14	77	173	40	87	47	68	147	34	74						

Digester Volume, ft^3
Primary 14,000
Secondary 14,000

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.5

Marshall, MICHIGAN

Supernatant To Raw Wetwell
Process Pattern raw - pri. dig.- sec. dig. - beds

MONTH September 1971

DIGESTER AND SLUDGE DATA

OPERATOR Robert J. Swalwell

DATE	RAW SLUDGE Gals. 10X	RAW SLUDGE Total Solids %	RAW SLUDGE Vol. Solids %	RAW SLUDGE Vol. Solids Lbs/1000c.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 100
1						88																		2
2	177	9.6	63	32	5.5	88																		2
3	133	13.2	60	32	5.6	93																		3
4	177	9.4	66	33	5.7	97																		3
5	133	6.7	73	20	5.7	100																		2
6	133	9.0	68	25	5.7	102																		2
7	88	14.3	62	24	5.6	101																		3
8	155	7.4	72	25	5.1	100																		2
9	88	10.0	64	17	5.0	97																		3
10	133	11.7	61	28	5.2	96																		3
11	88	9.4	64	16	5.4	95																		3
12	155	11.0	64	33	5.4	94																		4
13	309	8.1	74	56	5.4	92																		5
14						90																		4
15																								6
16																								5
17	221	9.8	63	41	5.1																			5
18	133	6.9	71	20	5.3																			6
19	133	9.6	67	26	5.4																			5
20																								6
21	177	7.7	63	26	5.7																			7
22	133	8.3	69	23	5.6	87																		10
23	133	9.9	65	26	5.5	90						10166		.20	68	830			560					11
24	177	8.6	69	32	5.5	95																		10
25	88	11.4	62	19	5.5	99																		11
26	177	7.9	72	30	5.6	102																		7
27	177	9.9	76	41	5.0	100																		6
28	133	9.4	67	25	5.7	97																		6
29						96																		3
30	221	7.4	72	35	5.8	96																		5
31																								
TOTAL	3669											10166												150
ARITH. MEAN	153	9.4	67	29		95						10166		.20	68	830			560					5

MDPH
D-4

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH October 1971

MISCELLANEOUS DATA

OPERATOR Robert J. Swalwell

DATE	WEATHER Precip. Inches	Temp. (°F) Max.	Temp. (°F) Min.	Type	RAW SEWAGE Temp. °F	Flow MGD Total MGD	Flow MGD Max. Rate	Flow MGD Min. Rate	pH	water cf/day	Cl_2 lbs.	POWER KWH	AUX. FUEL **	CHEMICALS APPLIED					REMARKS
1		84	60	C	59	2.69	3.40	2.20	7.7	1580	129	240	10						* Plant water system
2		84	58	C	59	2.61	3.10	2.20	7.5	1500	148	240	11						valve stuck closed at
3	.16	83	52	R	59	2.56	3.00	2.20		*850	51	240	9						8 pm.
4		66	46	C	60	2.62	3.20	1.70	7.6	2160	116	280	8						
5	.04	70	44	R	59	2.54	3.10	2.00	7.4	1520	110	240	8						
6	.27	56	34	R	59	2.49	3.00	2.00	7.5	1500	113	240	6						** Gas - cu. ft. X 100
7		56	34	C	59	2.46	3.00	1.70	7.4	1500	110	280	7						
8	.21	58	42	R	59	2.46	3.00	1.90	7.7	1520	107	240	5						
9		60	34	CL	57	2.41	3.00	1.80	7.6	1540	113	240	6						
10		58	40	CL	57	2.43	2.90	2.00	7.7	1470	112	240	11						
11		60	33	CL	59	2.49	3.00	1.90	7.9	1460	110	280	10						
12		60	38	CL	58	2.50	3.00	2.10	7.6	1450	126	240	14						
13	.23	56	46	R	58	2.49	3.00	1.30	7.6	1800	109	280	12						
14		62	44	C	58	2.49	3.00	1.30	7.6	1580	105	240	12						
15		72	48	C	58	2.46	3.00	0.80	7.7	1460	109	280	10						
16		68	48	C	58	2.44	3.00	1.60	7.6	1390	119	240	8						
17		65	50	CL	57	2.41	3.00	1.90	7.6	1450	117	240	12						
18		70	48	C	59	2.55	3.10	2.00	7.6	1470	123	280	10						
19		76	42	C	59	2.54	3.00	1.90	7.5	1530	114	240	10						
20		74	46	C	58	2.50	3.00	2.10		1510	117	280	9						
21	.63	74	56	R	59	2.55	3.00	2.00	7.7	1520	114	240	10						
22	.40	64	58	R	59	2.61	3.10	2.20	7.6	1530	127	240	9						
23	.12	60	56	R	58	2.51	3.10	2.10	7.5	1470	116	280	9						
24	.01	64	50	R	57	2.52	3.00	1.80	7.5	1500	124	240	9						
25		64	52	C	59	2.58	3.10	2.00	7.6	1910	111	280	8						
26		72	52	C	58	2.56	3.00	1.40	7.6	1520	116	240	8						
27		70	40	CL	58	2.51	3.00	1.30	7.6	1540	109	240	7						
28		70	40	C	58	2.45	3.00	0.90	7.7	1530	111	280	7						
29		70	42	C	58	2.47	3.00	2.10	7.6	1570	108	240	5						
30		74	48	C	57	2.50	3.00	2.00	7.7	1500	123	280	8						
31		55	31	C	57	2.39	3.00	1.90	7.5	1510	117	240	12						
TOTAL	2.07										3534	7880	280						
ARITH. MEAN						2.51				1527	114								

MDPH
D-4.1

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH October 19 71 — PRIMARY TREATMENT DATA — OPERATOR Robert J. Swalwell

DATE	5-DAY BOD INF. Mg/l	5-DAY BOD INF. LBS. X 10	5-DAY BOD EFF. Mg/l	5-DAY BOD EFF. LBS. X 10	5-DAY BOD REM. %	SUSPENDED SOLIDS INF. Mg/l	SUSPENDED SOLIDS INF. LBS. X 10	SUSPENDED SOLIDS EFF. Mg/l	SUSPENDED SOLIDS EFF. LBS. X 10	SUSPENDED SOLIDS REM. %	SUSP. VOLATILE SOLIDS INF. Mg/l	SUSP. VOLATILE SOLIDS INF. LBS. X 10	SUSP. VOLATILE SOLIDS EFF. Mg/l	SUSP. VOLATILE SOLIDS EFF. LBS. X 10	Total PHOSPHORUS – P INF. Mg/l	Total PHOSPHORUS – P INF. LBS X	Total PHOSPHORUS – P EFF. Mg/l	Total PHOSPHORUS – P EFF. LBS. X	Total PHOSPHORUS – P REM. %	REMARKS
1	92	206	64	144	30	104	233	52	117	50	90	202	44	99						
2	75	163	66	144	25	74	161	29	63	61	65	142	24	52						
3																				
4	75	164	57	125	24	87	190	37	81	58	75	164	30	66						
5	60	127	54	114	10	64	136	33	70	48	53	112	28	59						
6	78	162	45	93	42	77	160	43	89	44	64	133	36	75						
[illegible]	89	183	70	144	21	125	257	52	107	58	105	215	43	88						
8	71	146	63	129	12	96	197	53	109	45	91	187	51	105						
9	88	177	68	137	23	88	177	43	86	51	69	139	36	72						
[illegible]	90	182	70	142	22	79	160	36	73	54	70	142	34	69						
[illegible]	81	168	72	150	11	74	154	39	81	47	62	129	32	66						
12	68	142	66	138	3	95	198	52	108	45	83	173	44	92						
13	81	168	66	137	19	97	201	47	98	52	87	181	38	79						
14	63	131	50	104	21	74	154	39	81	47	63	131	31	64						
15	65	133	51	105	22	70	144	34	70	51	53	109	27	55						
16	56	114	49	100	13	68	138	48	98	29	56	114	38	77						
17	74	149	55	111	26	97	195	36	72	63	84	169	32	64						
18	64	136	48	102	25	82	174	49	104	40	71	151	43	91						
19	66	139	50	106	24	80	169	45	95	44	66	139	33	70						
20	58	121	48	100	17	105	219	52	108	51	81	169	46	96						
21	68	145	60	128	12	95	202	47	100	51	80	170	35	74						
22	79	172	57	124	29	121	263	57	124	53	98	213	43	94						
23	66	138	60	126	9	86	180	59	123	31	72	130	44	92						
24	69	145	62	130	10	91	191	42	88	54	78	164	35	74						
25	74	159	60	129	19	100	215	41	88	59	82	179	35	75						
26	72	154	57	122	21	78	167	51	109	35	65	139	42	90						
27	57	119	48	100	16	65	136	36	75	45	57	119	34	71						
28	58	119	45	92	22	102	208	45	92	55	91	186	38	78						
29	70	144	59	122	16	69	142	62	128	10	58	119	50	103						
30	69	144	51	106	26	58	121	44	92	24	48	100	38	79						
31	52	104	48	96	8	72	143	38	76	47	58	116	32	64						
TOTAL		4454		3600			5379		2805			4536		2333						
MONTH MEAN	71	148	57	120	19	86	179	45	94	48	73	151	37	78						

Digester Volume, ft^3
Primary 14,000
Secondary 14,000

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.5

Marshall, MICHIGAN

Supernatant To Raw Wetwell
Process Pattern raw - pri. dig.- sec. dig. - Beds

MONTH October 19 71

DIGESTER AND SLUDGE DATA

OPERATOR Robert J. Swalwell

DATE	RAW SLUDGE Gals. 10	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 100
1	133	8.5	69	24	5.7			1.6	53			13260		.23		1060								48
2	133	9.1	68	25	5.6	92																		43
3	177	7.4	69	27	5.6	98																		45
4						100																		35
5	133	8.2	71	23	5.6	100																		36
6	133	9.1	69	25	5.6	98																		39
7	133	9.2	66	24	5.6	96																		44
8	177	7.3	70	27	5.8	94																		43
9	133	8.7	72	25	5.7	98																		46
10	88	7.8	73	15	5.9	102																		41
11						100																		32
12	88	9.2	70	17	5.8	98		1.7	47			11492		.22	65	940			320					42
13	133	7.7	72	22	5.6	96																		37
14	133	7.1	73	21	5.7	94																		39
15	133	8.7	72	25	5.8	99																		39
16	133	7.2	73	21	5.9	96																		39
17	133	7.5	72	22	5.9	95																		38
18	155	8.4	67	27	5.7	93																		36
19	155	8.6	69	28	5.2	92																		33
20	177	6.6	69	24	5.7	96																		40
21	133	8.5	69	23	5.7	99																		44
22	133	8.7	66	23	5.7	103		1.9	52			11492		.24	63	1380			300					51
23	133	10.0	65	26	5.8	100																		40
24	111	8.1	64	17	5.7	97																		41
25	133	8.8	70	25	5.4	96																		37
26	111	6.9	70	16	5.8	94																		33
27	133	8.4	64	22	5.8	92																		34
28	133	8.0	68	22	5.6	91																		37
29	133	11.3	61	28	5.8	95																		37
30	88	8.7	66	15	5.8	98																		5
31	133	6.6	75	20	5.6	98		1.7	56			13260		.20	62	700			300					53
TOTAL	3845											49504												1207
ARITH. MEAN	133	8.3	69	23		97		1.7	52			12376		.22	63	1020			307					39

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4

Marshall, MICHIGAN

MONTH November 19 71

MISCELLANEOUS DATA

OPERATOR Robert J. Swalwell

DATE	WEATHER Precip. Inches	Temp. (°F) Max.	Temp. (°F) Min.	Type	RAW SEWAGE Temp. °F	Flow MGD Total MGD	Flow MGD Max. Rate	Flow MGD Min. Rate	pH	water cf/day	Cl_2 lbs.	POWER KWH	AUX. FUEL *	CHEMICALS APPLIED					REMARKS
1	.10	66	36	R	58	2.49	3.00	2.00	7.6	1480	121	280	7						* Gas - cu. ft. X 100
2		56	34	C	58	2.46	3.10	2.00	7.6	1490	122	240	15						
3	.07	48	30	R&S	58	2.43	3.00	2.00	7.5	1540	112	240	19						
4		44	32	CL	57	2.41	2.90	2.00	7.9	1950	114	280	10						
5		58	38	CL	57	2.38	3.00	2.00	7.6	1560	114	240	15						
6	.01	42	20	S	56	2.29	2.80	2.00	7.6	1470	116	280	20						
7		32	16	CL	55	2.33	2.80	1.90	7.6	1570	114	240	22						
8	.03	40	18	S	57	2.38	2.90	2.00	7.5	1570	111	280	20						
9	.04	36	30	R&S	56	2.37	3.00	2.00		1510	111	280	25						
10		48	24	C	56	2.36	3.00	2.00		1410	134	240	23						
11		47	26	C	56	2.37	2.90	2.00	7.7	1470	118	280	20						
12		56	32	C	56	2.39	3.00	1.80	7.5	1560	118	240	20						
13		48	36	C	56	2.32	2.90	1.20	7.5	1560	115	280	21						
14		63	41	C	56	2.34	3.00	2.00	7.7	1540	116	240	16						
15		60	30	C	57	2.45	3.20	2.00	7.7	1540	116	280	15						
16		56	34	C	56	2.42	3.00	1.10	7.7	1920	113	280	14						
17		66	46	C	56	2.40	3.00	2.00	7.7	1540	122	240	19						
18	.34	64	38	R	57	2.46	3.20	2.00	7.7	1470	118	240	20						
19	.05	40	30	R	57	2.51	3.00	2.00	7.6	1400	107	280	20						
20	.23	44	30	R&S	57	2.32	2.90	1.90	7.7	1470	117	240	24						
21		36	16	CL	57	2.29	2.80	1.80	7.6	1530	117	280	29						
22		28	12	C	56	2.41	3.00	2.00	7.6	1470	121	270	27						
23	.02	32	12	S	54	2.37	2.90	2.00	7.7	1630	115	240	28						
24		35	a3	CL	54	2.39	2.90	2.00	7.6	1490	128	320	23						
25		38	24	C	55	2.24	2.90	1.50	7.5	1560	102	240	18						
26	.44	42	32	S	54	2.33	2.90	2.00	7.6	1580	106	240	19						
27		36	26	CL	55	2.31	2.80	1.90	7.5	1560	103	280	19						
28	.06	40	30	S	54	2.33	2.80	1.80	7.5	1560	104	280	19						
29	.15	35	25	S	55	2.39	2.90	1.70	7.7	1500	122	280	21						
30		30	10	C	54	2.36	3.00	1.90	7.6	1500	115	280	22						
31																			
TOTAL	1.54										3462	7920	590						
ARITH. MEAN						2.38				1547	115								

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.1

Marshall, MICHIGAN

MONTH November 1971 PRIMARY TREATMENT DATA OPERATOR Robert J. Swalwell

DATE	5-DAY BOD INF. Mg/l	5-DAY BOD INF. LBS. X 10	5-DAY BOD EFF. Mg/l	5-DAY BOD EFF. LBS. X 10	5-DAY BOD REM. %	SUSPENDED SOLIDS INF. Mg/l	SUSPENDED SOLIDS INF. LBS. X 10	SUSPENDED SOLIDS EFF. Mg/l	SUSPENDED SOLIDS EFF. LBS. X 10	SUSPENDED SOLIDS REM. %	SUSP. VOLATILE SOLIDS INF. Mg/l	SUSP. VOLATILE SOLIDS INF. LBS. X 10	SUSP. VOLATILE SOLIDS EFF. Mg/l	SUSP. VOLATILE SOLIDS EFF. LBS. X 10	Total PHOSPHORUS – P INF. Mg/l	Total PHOSPHORUS – P INF. LBS. X	Total PHOSPHORUS – P EFF. Mg/l	Total PHOSPHORUS – P EFF. LBS. X	Total PHOSPHORUS – P REM. %	REMARKS
1	60	125	56	116	7	72	150	43	89	40	57	118	34	71						
2	92	189	60	123	35	135	277	39	80	71	119	244	36	74						
3	78	158	59	120	24	65	132	55	111	15	53	107	44	89						
4	69	139	36	72	48	76	153	39	78	49	67	135	35	70						
5	72	143	68	135	6	92	183	44	87	52	83	165	35	69						
6	76	145	64	122	16	70	134	34	65	51	56	107	27	52						
7	84	163	68	132	19	92	179	39	76	58	86	167	32	62						
8	66	131	52	103	21	73	145	46	91	37	63	125	40	79						
9																				
10	64	126	60	118	6	87	171	35	69	60	87	171	32	63						
11	84	166	68	134	19	92	182	52	103	44	91	180	52	103						
12	80	159	61	122	24	98	195	60	120	39	83	165	52	104						
13	78	151	66	128	15	119	230	40	77	66	110	213	31	60						
14	69	135	60	117	13	83	162	38	74	54	70	137	34	66						
15	73	149	63	129	14	98	200	42	86	57	79	161	32	65						
16	84	170	66	133	21	87	176	54	109	38	76	153	45	91						
17	80	160	64	128	20	83	126	44	88	47	77	154	42	84						
18	75	154	65	133	13	54	111	50	103	7	49	101	47	96						
19	72	151	48	100	37	83	174	49	103	41	70	147	39	82						
20	92	178	72	139	22	97	188	42	81	57	84	163	34	66						
21	76	145	51	97	33	78	149	37	71	53	66	126	32	61						
22	80	161	63	127	21	96	193	36	72	63	81	163	28	56						
23	72	142	65	129	10	86	170	42	83	51	72	142	33	65						
24	88	175	68	136	22	114	227	54	108	53	101	201	49	98						
25	80	149	64	120	20	136	254	36	67	74	130	243	32	60						
26	96	187	60	117	38	112	218	37	72	67	99	192	33	64						
27	96	185	60	116	38	88	170	43	83	51	59	114	34	66						
28	124	241	69	134	44	143	278	35	68	75	124	241	32	62						
29	81	161	56	112	31	125	249	45	90	65	123	245	45	90						
30	93	183	66	130	29	155	305	48	94	69	122	240	34	67						
31																				
TOTAL		4621		3522			5481		2498			4820		2135						
ARITH. MEAN	80	159	61	121	23	96	189	43	86	52	84	166	37	74						

Digester Volume, ft^3
Primary 14,000
Secondary 14,000

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MDPH
D-4.5

Supernatant To Raw Wetwell
Process Pattern raw-pri. dig. - sec. dig. - Beds

MONTH November 19 71

DIGESTER AND SLUDGE DATA

OPERATOR Robert J. Swalwell

DATE	RAW SLUDGE Gals. 10	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. 10 X	DIGESTED SLUDGE Total Solids %	DIGESTED SLUDGE Vol. Solids %	DIGESTED SLUDGE pH	Gas Produced cu. ft X 100
1	133	9.5	78	30		95																		41
2	133	6.5	68	18	5.7	93																		38
3	133	7.1	74	21	5.7	91																		36
4	177	8.1	73	32	5.7	95																		40
5	177	8.3	69	31	5.7	98																		40
6	133	9.3	65	24	5.6	101																		38
7	133	5.1	74	15	5.5	98																		41
8	133	6.0	74	18		95																		36
9						93																		31
10	133	6.4	70	18	5.6	92														1017	7.2	56		30
11						94		1.7	47															34
12	133	10.7	68	29	5.3	92																		27
13	88	9.7	71	19	5.1	94																		28
14	133	7.9	72	23	5.5	96																		30
15	177	7.6	81	33		100																		32
16						96																		29
17	133	9.1	65	24	5.8	92																		29
18	133	4.8	77	15	6.0	86																		19
19	133	8.9	66	24	5.6	88																		27
20	133	11.7	60	28	5.5	90																		35
21	133	9.4	70	27	5.6	93																		33
22	221	7.6	78	40	5.8	95																		32
23	177	8.6	71	33	5.9	96																		53
24	133	8.8	69	24	5.8	92	7.1	1.4	50			9282	6.8	.26	64	1160			245					43
25						96																		38
26						100																		35
27	265	8.5	67	46	5.4	103																		33
28	133	8.8	74	26	5.6	100																		34
29						96																		30
30	177	7.2	70	27	5.8	94																		34
31																								
TOTAL	3580											9282								1017				1024
ARITH. MEAN	149	8.2	71	26		95		1.5	49			9282		.26	64	1160			245	1017	7.2	56		34

MDPH
D-4

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH December 19 71

MISCELLANEOUS DATA

OPERATOR Robert J. Swalwell

DATE	WEATHER Precip. Inches	Temp. (°F) Max.	Temp. (°F) Min.	Type	RAW SEWAGE Temp. °F	Flow MGD Total MGD	Flow MGD Max. Rate	Flow MGD Min. Rate	pH	water cf/~~mg~~	Cl_2 lbs.	POWER KWH	AUX. FUEL *	CHEMICALS APPLIED					REMARKS
1		28	10	C	55	2.35	2.80	1.90	7.6	1510	113	280	22						* Gas - cu. ft. X 100
2		33	14	C	55	2.48	3.00	2.00	7.6	1540	117	280	20						
3		36	16	C	54	2.37	3.00	1.20	7.5	1510	114	240	21						
4	.01	36	22	R	55	2.26	2.90	1.90	7.4	1470	126	320	23						
5	.11	38	32	R	54	2.29	2.80	1.90	7.5	1500	104	240	20						
6	.26	42	30	R	55	2.41	3.10	1.90	7.7	1570	101	240	20						
7	.02	38	32	R	54	2.36	2.90	1.90	7.6	1840	118	280	18						
8	.01	42	36	R	55	2.36	2.90	1.90	7.7	1560	112	280	18						
9	.45	46	40	R	54	2.37	2.90	1.90	7.7	1570	118	280	16						
10	.63	62	30	R	54	2.22	3.00	1.90	7.6	1590	117	280	15						
11		44	24	C	54	2.49	3.00	1.90	7.6	1540	123	280	21						
12		45	21	CL	54	2.49	3.00	1.80	7.6	1550	121	280	20						
13	.01	34	20	S	54	2.51	3.10	1.80	7.7	1550	121	280	19						
14	.90	54	28	R	54	2.22	3.10	2.30	7.5	1600	112	280	20						
15	.11	59	35	R	54	2.36	3.30	2.00	7.6	1530	122	280	21						
16		39	26	CL	54	2.34	3.20	2.30	7.6	1580	115	280	22						
17	.01	28	16	S	54	2.29	3.20	2.00	7.7	1600	116	280	23						
18	.01	28	20	S	53	2.26	3.20	2.00		1630	109	280	25						
19		38	26	CL	54	2.23	3.20	2.00	7.7	1570	109	280	19						
20		38	32	CL	53	2.41	3.60	2.10	7.5	1990	122	320	21						
21		35	16	CL	53	2.47	3.40	2.40	7.7	1580	117	280	23						
22		32	16	C	52	2.35	3.30	2.30	7.8	1580	116	280	21						
23		44	28	C	53	2.30	3.20	2.40	7.5	1560	113	280	20						
24		42	24	CL	54	2.32	3.30	2.40	7.4	1590	69	280	20						
25		44	28	CL	53	2.25	3.10	2.30	7.5	1650	112	280	19						
26	.04	40	32	R	53	2.25	3.20	2.30	7.6	1590	106	280	19						
27	.06	55	22	R&S	54	2.36	3.20	2.20	7.8	1540	114	280	18						
28		26	16	CL	52	2.41	3.60	2.30	7.6	1590	114	280	31						
29	1.38	38	20	R	52	2.62	3.60	2.60	7.6	1600	119	320	21						
30	.02	42	18	R	51	2.56	3.60	2.00		1570	125	320	21						
31		32	24	CL	52	2.35	2.80	1.80	7.4	1570	110	320	20						
TOTAL	4.03										3525	8760	637						
ARITH. MEAN						2.37				1588	114								

MDPH
D-4.1

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH December 19 71 PRIMARY TREATMENT DATA OPERATOR Robert J. Swalwell

DATE	5-DAY BOD INF. Mg/l	5-DAY BOD INF. LBS. X 10	5-DAY BOD EFF. Mg/l	5-DAY BOD EFF. LBS. X 10	5-DAY BOD REM. %	SUSPENDED SOLIDS INF. Mg/l	SUSPENDED SOLIDS INF. LBS. X 10	SUSPENDED SOLIDS EFF. Mg/l	SUSPENDED SOLIDS EFF. LBS. X 10	SUSPENDED SOLIDS REM. %	SUSP. VOLATILE SOLIDS INF. Mg/l	SUSP. VOLATILE SOLIDS INF. LBS. X 10	SUSP. VOLATILE SOLIDS EFF. Mg/l	SUSP. VOLATILE SOLIDS EFF. LBS. X 10	Total PHOSPHORUS – P INF. Mg/l	Total PHOSPHORUS – P INF. LBS. X	Total PHOSPHORUS – P EFF. Mg/l	Total PHOSPHORUS – P EFF. LBS. X	Total PHOSPHORUS – P REM. %	REMARKS
1	84	165	64	125	24	118	231	51	100	57	99	194	38	74						
2	90	186	56	116	38	106	219	44	91	59	92	190	39	81						
3	93	184	62	123	33	165	326	34	67	79	134	265	26	51						
4	84	158	64	121	24	88	166	33	62	63	69	130	24	45						
5	84	160	72	138	14	147	281	50	96	66	128	244	45	86						
6	76	153	54	109	30	117	235	26	52	78	87	175	20	40						
7	128	252	76	150	41	144	283	50	98	65	114	224	40	79						
8	95	187	58	114	39	139	274	52	102	63	111	218	44	87						
9	93	184	45	89	52	129	255	42	83	67	120	237	37	73						
10	69	128	63	116	9	95	176	63	117	34	89	165	57	106						
11	76	158	54	112	29	88	183	42	87	52	77	160	34	71						
12	88	183	69	143	22	83	172	36	75	57	66	137	31	64						
13	84	176	64	134	24	91	190	41	86	55	74	155	31	65						
14	84	155	62	115	26	115	213	43	80	63	92	170	34	63						
15	74	146	58	114	22	75	148	48	94	36	60	118	39	77						
16	72	141	60	117	17	90	176	37	72	59	77	150	29	57						
17	90	172	57	109	37	101	193	41	78	59	83	159	31	59						
18																				
19	80	149	76	141	5	86	160	41	76	52	69	128	34	63						
20	88	177	69	139	22	85	171	39	78	54	72	145	36	72						
21	94	194	63	130	33	92	190	45	93	51	74	152	33	68						
22	88	172	66	129	25	94	184	41	80	56	63	123	30	59						
23	84	161	66	127	21	105	201	37	71	65	89	171	30	58						
24	77	149	48	93	38	89	172	25	48	72	72	139	17	33						
25	64	120	51	96	20	75	141	32	60	57	68	128	24	45						
26	69	130	60	113	13	70	131	27	51	61	62	116	26	49						
27	88	173	60	118	32	104	205	49	96	53	90	177	40	79						
28	92	185	71	143	23	92	185	50	101	46	77	155	39	78						
29	88	192	72	157	18	115	251	51	111	56	100	219	39	85						
30																				
31	88	172	72	141	18	112	220	70	137	38	101	198	59	116						
TOTAL		4862		3572			5932		2442			4942		1983						
ARITH. MEAN	85	168	63	123	26	104	205	43	84	58	87	170	35	68						

Digester Volume, ft^3
Primary 14,000
Secondary 14,000

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.5

Marshall, MICHIGAN

Supernatant To Raw Wetwell
Process Pattern Raw-Pri.Dig. - Sec.Dig. - Beds

MONTH December 19 71

DIGESTER AND SLUDGE DATA

OPERATOR Robert J. Swalwell

DATE	RAW SLUDGE Gals. X 10	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 100
1	111	9.6	69	22	5.8	96																		34
2	111	10.3	67	23	5.4	99																		33
3	221	7.8	70	37	5.8	100																		32
4	133	5.7	73	17	5.7	101		1.3	62			13260		.25	67	1220			420					45
5	133	8.0	73	24	5.7	98																		38
6	133	8.5	67	23		94																		39
7	133	6.6	70	19	6.0	95																		39
8	88	9.5	71	18	5.6	89																		34
9	133	13.2	61	32		93																		40
10	88	9.2	64	16	5.7	97																		37
11	133	9.2	67	25	5.8	100																		40
12	111	8.9	72	21	5.6	102																		38
13	133	8.7	59	21		99																		33
14	265	5.8	74	35	5.5	96																		42
15						92		1.5	53			9724		.23	70	1100			410					39
16	88	10.6	72	20		97																		30
17	133	11.0	54	24	5.7	100																		31
18	88	9.7	66	17	5.8																			35
19	133	6.9	61	17	5.9	100																		35
20	133	7.1	80	23																				34
21	133	7.3	68	20	5.9	93																		30
22						92																		31
23	177	8.1	67	29	5.8	96																		31
24						98																		30
25	88	9.3	66	16	5.5	98																		31
26	133	6.8	70	19	6.0	100																		30
27						101																		41
28	133	9.5	64	24	5.6	98																		23
29	133	8.4	64	22	5.8	96		1.2	52			8840		.31	64	2100			565					46
30						92																		30
31	133	6.3	69	18	5.7	95																		31
TOTAL	3426											31824												1084
ARITH. MEAN	132	8.5	68	22		97		1.3	56			10608		.26	67	1473			465					35

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4

Marshall, MICHIGAN

MONTH January 19 72 — MISCELLANEOUS DATA — OPERATOR Robert J. Swalwell

DATE	WEATHER Precip. Inches	Temp. (°F) Max.	Temp. (°F) Min.	Type	RAW SEWAGE Temp. °F	Flow MGD Total MGD	Flow MGD Max. Rate	Flow MGD Min. Rate	pH	xxx water cfxxx	Cl_2 lbs.	POWER KWH	AUX. FUEL *	CHEMICALS APPLIED					REMARKS
1	.12	42	27	S	52	2.27	2.70	1.30	7.5	1650	110	280	20						* Gas - cu. ft. X 100
2		34	26	CL	52	2.38	2.80	1.80	7.6	1610	111	280	17						
3	.02	36	20	S	53	2.38	2.90	1.90	7.6	1610	119	280	21						
4	.08	23	3	S	52	2.35	2.80	1.90		1580	118	320	26						
5		24	4	CL	52	2.33	2.80	1.60	7.6	1570	116	280	26						
6		23	8	C	51	2.35	2.80	1.80	7.5	1530	130	320	22						
7		34	14	C	52	2.30	2.70	1.90	7.6	1590	118	280	23						
8		38	16	CL	52	2.29	2.80	1.90	7.5	1640	112	320	20						
9		42	24	CL	52	2.25	2.80	1.90	7.5	1570	109	280	18						
10		42	20	C	52	2.39	2.80	1.90	7.5	1560	114	280	15						
11		36	22	CL	52	2.29	2.80	1.80	7.5	1560	119	280	21						
12	.16	42	24	S	52	2.26	2.70	1.90	7.7	1580	115	280	20						
13	.07	26	-1	S	52	2.23	2.70	1.90	7.6	1840	119	280	26						
14	.01	20	-8	S	52	2.25	2.80	1.80	7.6	1560	132	280	30						
15		2	-18	CL	50	2.14	2.60	1.70	7.4	1660	104	280	32						
16		17	-15	Cl	51	2.16	2.60	1.90	7.5	1600	95	320	30						
17		36	16	C	52	2.23	2.80	1.80	7.5	1560	112	320	25						
18		42	23	CL	52	2.17	2.70	0.80	7.3	1630	112	320	20						
19	.27	33	24	R	51	2.13	2.60	0.80	7.4	1580	110	320	23						
20	.04	36	18	R&S	51	2.15	2.90	1.80		1600	108	280	16						
21	.22	38	20	R	51	2.14	2.50	1.80	7.5	1630	107	320	20						
22	.11	46	26	R	50	2.16	2.70	1.80	7.4	1600	105	320	19						
23	.05	32	14	S	51	2.15	2.60	1.80	7.5	1590	107	320	25						
24	.01	44	6	R	52	2.37	3.10	1.70	7.6	1550	119	320	30						
25		16	4	CL	51	2.31	3.00	1.60	7.4	1960	123	360	24						
26		16	5	C	50	2.30	2.80	0.70	7.5	1550	111	320	25						
27	.15	20	6	S	50	2.31	2.80	1.90	7.4	1630	109	360	24						
28	.01	20	-2	S	50	2.33	2.80	1.90		1580	136	320	27						
29		18	4	C	50	2.25	3.10	1.80	7.5	1530	105	320	28						
30		20	0	C	50	2.24	2.60	1.70	7.5	1620	114	320	30						
31		28	4	C	50	2.28	2.90	1.70	7.4	1580	113	360	25						
TOTAL	1.32										3532	9520	728						
ARITH. MEAN						2.26				1610	114								

MDPH
D-4.1

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH January 19 72 PRIMARY TREATMENT DATA OPERATOR Robert J. Swalwell

DATE	5-DAY BOD INF. Mg/l	5-DAY BOD INF. LBS. X 10	5-DAY BOD EFF. Mg/l	5-DAY BOD EFF. LBS. X 10	5-DAY BOD REM. %	SUSPENDED SOLIDS INF. Mg/l	SUSPENDED SOLIDS INF. LBS. X 10	SUSPENDED SOLIDS EFF. Mg/l	SUSPENDED SOLIDS EFF. LBS. X 10	SUSPENDED SOLIDS REM. %	SUSP. VOLATILE SOLIDS INF. Mg/l	SUSP. VOLATILE SOLIDS INF. LBS. X 10	SUSP. VOLATILE SOLIDS EFF. Mg/l	SUSP. VOLATILE SOLIDS EFF. LBS. X 10	Total PHOSPHORUS – P INF. Mg/l	Total PHOSPHORUS – P INF. LBS. X	Total PHOSPHORUS – P EFF. Mg/l	Total PHOSPHORUS – P EFF. LBS. X	Total PHOSPHORUS – P REM. %	REMARKS
1	84	159	64	121	24	94	178	41	78	56	84	159	34	64						
2	80	159	57	113	29	104	206	25	50	66	87	173	19	38						
3	76	151	64	127	16	65	129	53	105	18	55	109	45	89						
4																				
5	76	148	63	122	17	93	181	39	76	58	82	159	32	62						
6	80	157	64	125	20	123	241	56	110	54	105	206	48	94						
7						171	328	47	90	73	153	293	35	67						
8	68	130	54	103	21	41	78	21	40	49	32	61	15	29						
9	75	141	60	113	20	72	135	24	45	67	61	114	20	38						
10	87	166	60	115	20	78	149	40	76	49	64	122	32	61						
11	78	149	72	138	8	108	206	58	111	46	93	178	48	92						
12	86	162	60	113	30	59	111	42	79	29	53	100	38	72						
13	63	117	54	100	13	66	123	46	86	30	50	93	27	50						
14	73	137	59	111	19	104	195	71	133	32	100	188	66	124						
15	57	102	42	75	26	46	82	23	41	50	34	61	16	29						
16	69	124	54	97	22	76	137	34	61	55	66	119	29	52						
17	71	132	53	99	25	88	164	30	56	66	75	140	26	48						
18	60	109	56	101	7	67	121	47	85	30	57	103	37	67						
19	60	107	52	92	13	86	153	48	85	44	71	126	40	71						
20																				
21	63	112	40	71	23	70	125	28	50	60	61	109	23	41						
22	72	130	45	81	37	84	151	27	49	68	60	108	22	40						
23	52	93	40	72	23	68	122	28	50	59	56	100	23	41						
24	84	166	72	142	14	80	158	47	93	41	73	144	40	79						
25	80	154	57	110	29	86	166	46	89	47	69	133	35	67						
26	75	144	60	115	20	96	184	31	59	68	80	153	25	48						
27	75	145	57	110	24	82	158	41	79	50	70	135	36	69						
28																				
29	84	158	63	118	25	99	186	56	105	43	84	158	50	94						
30	72	134	51	95	29	101	189	45	84	55	90	168	40	75						
31	72	137	54	103	25	96	183	49	93	49	70	133	37	70						
TOTAL		3723		2862			4539		2158			3845		1771						
ARITH. MEAN	73	138	57	107	21	86	162	41	77	50	73	137	33	63						

Digester Volume, ft^3
Primary 14,000
Secondary 14,000

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.5

Marshall, MICHIGAN

Supernatant To Raw Wetwell

Process Pattern Raw - pri. dig.- Sec. dig. - Beds

MONTH January 19 72

DIGESTER AND SLUDGE DATA

OPERATOR Robert J. Swalwell

DATE	RAW SLUDGE Gals. X 10	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 100
1						97																		28
2	133	6.9	69	19	5.6	99																		32
3	221	8.2	74	41	5.5	100																		34
4	133	8.5	65	22	5.9	100																		40
5	221	9.2	66	40	5.9	102																		39
6	177	7.7	64	26	5.9	96		1.7	50			11492		.28	72	1540			550					47
7	133	7.6	66	20	6.0	100																		44
8	265	7.0	68	389	5.9	103																		40
9	177	6.9	67	25	5.9	104																		33
10	133	7.2	82	24	6.0	100																		32
11	88	5.3	73	10	6.2	96																		40
12	133	10.2	66	27	5.8	93																		35
13	88	9.5	63	16	5.7	91																		30
14	133	9.3	62	23	5.4	93		.90	56			11492		.27	68	1380			480					30
15	88	9.9	58	15	5.8	94																		36
16	133	10.5	65	28	5.6	90																		30
17						87																		25
18	133	5.9	76	18	5.5	86																		26
19	177	8.5	69	32	5.6	84																		28
20	133	9.5	66	25	5.5	85																		27
21	133	11.7	66	31	5.5	87																		34
22	133	10.3	68	28	5.5	90																		35
23	88	7.8	70	15	5.8	92																		30
24	133	7.2	72	21	5.8	93		1.1	60			7514		.25	68	1140			530					25
25						94																		34
26	133	10.5	70	30	5.5	95																		30
27	221	7.2	68	33	5.8	96																		41
28	133	8.1	70	23	5.8	96																		24
29	88	12.0	68	22	5.5	96																		33
30	88	7.7	70	14	5.8	98																		32
31	177	7.0	68	25	5.8	98																		8
TOTAL	4022											30498												1002
ARITH. MEAN	144	8.5	68	25		95		1.2	55			10166		.27	69	1353			520					32

MDPH
D-4

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH February 1972 — MISCELLANEOUS DATA — OPERATOR Robert J. Swalwell

DATE	WEATHER Precip. Inches	Temp. (°F) Max.	Temp. (°F) Min.	Type	RAW SEWAGE Temp. °F	Flow MGD Total MGD	Flow MGD Max. Rate	Flow MGD Min. Rate	pH	~~xxxx~~ water cf~~xxx~~	Cl_2 lbs.	POWER KWH	AUX. FUEL *	CHEMICALS APPLIED					REMARKS
1		36	24	CL	50	2.25	2.60	1.70	7.4	1500	106	320	24						* Gas - cu. ft. X 100
2	.17	38	24	S	50	2.29	2.90	1.70	7.4	1730	122	320	24						
3	.04	34	14	S	50	2.24	2.80	1.10	7.6	1570	105	320	26						
4	.01	18	4	S	50	2.25	2.80	1.20		1580	107	280	22						
5		20	6	CL	50	2.21	2.80	1.80	7.6	1550	119	320	25						
6	.01	20	-9	S	50	2.18	2.70	1.70	7.5	1570	121	320	29						
7		19	2	CL	50	2.28	2.90	1.70	7.6	1570	112	320	26						
8		24	-4	C	51	2.23	2.80	1.00	7.5	1560	108	320	27						
9		22	-6	C	51	2.22	2.70	1.20	7.7	1760	111	320	26						
10		30	0	CL	51	2.21	2.60	1.10	7.5	1610	116	320	23						
11		32	26	CL	52	2.20	2.90	1.60		1580	122	320	22						
12	.02	46	30	R	51	2.21	2.80	1.60	7.5	1530	119	280	19						
13		38	26	CL	51	2.20	2.60	1.60	7.5	1590	113	320	14						
14	.10	44	26	S	51	2.36	2.80	1.60	7.4	1600	115	280	17						
15		36	14	CL	51	2.28	2.70	1.60	7.6	1600	72	280	20						
16		34	18	C	51	2.25	2.70	1.60	7.5	1470	126	280	25						
17		44	24	CL	50	2.16	2.60	1.60	7.5	1650	120	280	21						
18		31	18	CL	51	2.35	2.70	1.60	7.5	1610	119	280	25						
19	.02	24	8	S	51	2.17	2.70	1.60	7.6	1660	95	280	26						
20		32	8	CL	50	2.16	2.60	1.60	7.6	1640	105	320	20						
21		44	12	CL	51	2.31	2.80	1.60	7.5	1930	121	280	24						
22		24	14	C	51	2.22	2.70	1.80	7.5	1510	130	320	23						
23	.06	34	20	S	50	2.23	2.70	1.80	7.4	1560	122	320	22						
24		34	16	CL	50	2.19	2.60	1.00	7.7	1590	112	320	21						
25	.06	36	22	S	50	2.24	2.70	1.70	7.6	1580	124	320	20						
26		32	16	C	50	2.14	2.60	1.70	7.5	1370	195	280	20						
27		39	24	CL	50	2.16	2.60	1.60	7.5	1600	108	320	20						
28		48	28	C	51	2.25	2.80	1.80	7.5	1590	117	320	16						
29		54	30	C	50	2.27	2.70	1.80	7.6	1440	115	320	24						
30																			
31																			
TOTAL	.49										3377	8880	651						
MTH. AVG.						2.23				1590	116								

MDPH
D-4.1

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH February 19 72 — PRIMARY TREATMENT DATA — OPERATOR Robert J. Swalwell

DATE	5-DAY BOD INF. Mg/l	5-DAY BOD INF. LBS. X 10	5-DAY BOD EFF. Mg/l	5-DAY BOD EFF. LBS. X 10	5-DAY BOD REM. %	SUSPENDED SOLIDS INF. Mg/l	SUSPENDED SOLIDS INF. LBS. X 10	SUSPENDED SOLIDS EFF. Mg/l	SUSPENDED SOLIDS EFF. LBS. X 10	SUSPENDED SOLIDS REM. %	SUSP. VOLATILE SOLIDS INF. Mg/l	SUSP. VOLATILE SOLIDS INF. LBS. X 10	SUSP. VOLATILE SOLIDS EFF. Mg/l	SUSP. VOLATILE SOLIDS EFF. LBS. X 10	Total PHOSPHORUS – P INF. Mg/l	Total PHOSPHORUS – P INF. LBS. X	Total PHOSPHORUS – P EFF. Mg/l	Total PHOSPHORUS – P EFF. LBS. X	Total PHOSPHORUS – P REM. %	REMARKS
1	86	161	72	135	16	101	190	53	99	48	82	154	44	83						
2	84	160	51	97	39	109	208	44	84	60	98	187	38	73						
3	84	157	57	106	32	63	118	31	58	51	49	92	25	47						
4																				
5	64	118	48	88	25	162	299	38	70	77	130	240	32	59						
6	72	131	54	98	25	68	124	33	60	51	58	105	30	55						
7	76	145	54	103	29	107	204	31	59	71	88	167	26	49						
8	65	121	59	110	9	59	110	36	67	39	50	93	31	58						
9	72	133	54	100	18	80	148	28	52	65	63	117	23	43						
10	68	125	54	100	21	83	153	34	63	59	69	127	29	50						
11																				
12	57	105	48	88	16	82	151	31	57	62	68	125	20	37						
13	80	147	54	99	33	102	187	32	59	69	89	163	27	50						
14	80	157	63	124	21	81	159	37	73	54	69	136	33	65						
15	88	167	60	114	32	99	188	33	63	67	82	156	28	53						
16	76	143	68	128	11	112	210	50	94	55	97	182	40	75						
17	92	166	68	122	26	117	211	45	81	62	89	160	39	70						
18	84	165	60	118	29	120	235	66	129	45	98	192	56	110						
19	88	159	60	109	32	112	203	48	87	57	85	154	37	67						
20	72	138	64	115	11	88	158	43	77	51	79	142	36	65						
21	84	162	68	131	19	101	195	54	104	47	83	156	42	81						
22	69	128	60	111	13	92	170	37	68	60	79	146	29	54						
23	76	141	60	112	21	117	218	50	93	57	87	162	37	69						
24	80	146	63	115	21	89	163	54	99	39	73	133	46	84						
25	90	168	60	112	33	94	176	45	84	52	83	155	39	73						
26	92	164	68	121	26	83	148	44	79	47	66	118	35	63						
27	92	166	76	137	17	95	171	41	74	57	82	148	38	68						
28	84	158	68	128	19	103	193	37	69	64	83	156	26	49						
29	74	140	63	119	15	80	151	40	76	50	71	134	35	66						
30																				
31																				
TOTAL		3963		3040			4841		2078			4000		1715						
ARITH. MEAN	79	147	60	113	23	96	179	41	77	56	80	148	34	64						

Digester Volume, ft^3
Primary 14,000
Secondary 14,000

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.5

Marshall, MICHIGAN

Supernatant To Raw Wetwell
Process Pattern Raw - pri. dig. - sec. dig. - beds

MONTH _____ 19 ___

DIGESTER AND SLUDGE DATA

OPERATOR Robert J. Swalwell

DATE	RAW SLUDGE Gals. 10	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 100
1	133	7.3	67	20	5.6	96																		48
2	133	6.1	73	18	5.6	99		2.1	63			10166		.30	69	1820			585					1
3	177	4.6	74	18	5.8	95																		40
4	88	10.2	70	19	5.6	99																		29
5	133	7.7	67	21	5.9	99																		28
6	133	7.2	72	21	5.9	99																		30
7						99																		27
8	177	6.9	73	27	5.6	100																		30
9	177	9.9	66	35	5.8	100																		32
10	88	7.2	67	13	5.9	101																		33
11	133	8.2	63	21	5.9	101		1.8	61			9724		.29	68	1520			420					36
12	88	9.1	72	17	5.7	102																		32
13	88	11.2	63	19	5.9	103																		29
14	133	8.4	87	29	5.6	103																		27
15	177	7.7	63	26	5.8	99																		29
16	133	11.8	57	27	5.6	96																		42
17	88	10.1	63	17	5.5	98																		36
18	88	10.1	63	17	5.5	100																		30
19	88	10.7	64	18	5.8	100																		29
20	177	4.7	45	9	5.8	100		.3	67			11934		.29	70	1340			475					28
21						100																		28
22	133	6.3	70	18	5.7	102																		28
23	133	7.6	71	22		102																		26
24	177	9.2	68	33	5.8	101																		28
25	88	11.0	60	18		102																		29
26	88	13.2	60	21	5.5	102																		25
27	133	8.8	69	24	5.8	102																		28
28	133	5.0	75	15	6.0	99																		30
29	133	9.0	65	24	5.8	95																		31
30																								
31																								
TOTAL	3448											31824												869
ARITH. MEAN	128	8.5	67	21		100		1.4	63			10608		.29	69	1560			494					30

MDPH
D-4

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH March 1972

MISCELLANEOUS DATA

OPERATOR Robert J. Swalwell

DATE	WEATHER Precip. Inches	Temp. (°F) Max.	Temp. (°F) Min.	Type	RAW SEWAGE Temp. °F	Flow MGD Total MGD	Flow MGD Max. Rate	Flow MGD Min. Rate	pH	~~xxxx~~ water cf/~~xx~~	Cl_2 lbs.	POWER KWH	AUX. FUEL *	CHEMICALS APPLIED					REMARKS
1	.29	52	12	R&S	51	2.30	2.70	1.80	7.5	1600	116	280	20						* Gas - cu. ft. X 100
2		22	8	C	50	2.24	2.70	1.80	7.5	1580	115	320	22						
3	.01	30	10	S	50	2.41	2.90	2.00	7.5	1820	117	360	26						
4	.05	36	14	S	50	2.41	2.90	2.00	7.5	1630	124	360	30						
5		21	9	CL	50	2.38	2.80	1.30	7.5	1560	123	360	32						
6		43	15	C	50	2.43	2.90	1.90	7.5	1510	114	320	36						
7	.01	50	14	S	51	2.42	2.90	1.20	7.6	1540	120	320	26						
8		23	11	CL	50	2.42	2.80	1.50	7.5	1630	116	360	31						
9	.02	33	4	S	50	2.42	2.80	1.90	7.7	1590	117	320	30						
10		30	10	C	50	2.23	2.80	1.80		1580	116	360	15						
11		58	26	C	51	2.22	2.80	1.80	7.5	1530	122	320	19						
12	.96	51	30	R	51	2.33	2.80	1.90		1580	120	360	16						
13	.95	33	30	R&S	49	2.52	3.20	2.00	7.5	1520	122	360	15						
14	.06	33	29	S	50	2.45	2.80	2.00	7.5	1570	119	360	17						
15	.17	46	32	R	50	2.51	2.80	2.00	7.5	1530	117	360	18						
16	.03	42	32	R&S	50	2.58	3.20	2.00	7.5	1900	132	360	17						
17		42	22	CL	50	2.56	3.20	2.00	7.5	1600	128	400	16						
18		35	22	C	50	2.53	3.20	2.00	7.4	1630	114	360	17						
19		46	27	CL	50	2.47	3.00	1.90	7.4	1590	109	360	11						
20		58	38	CL	51	2.59	3.20	2.00	7.5	1580	100	360	16						
21	.29	64	34	R	51	2.62	3.10	2.00	7.4	1540	116	320	15						
22	.01	38	20	S	50	2.56	3.10	2.00	7.5	1590	114	360	15						
23		31	17	CL	50	2.55	3.10	2.00	7.5	1600	128	360	20						
24		36	20	C	50	2.53	3.30	1.90	7.6	1600	115	360	16						
25		38	20	C	49	2.50	3.20	2.00	7.5	1640	105	320	15						
26		46	28	C	50	2.46	2.80	1.00	7.4	1620	106	360	20						
27		46	27	C	50	2.56	3.20	2.00	7.4	1980	119	360	22						
28		44	26	C	50	2.51	3.10	2.00	7.6	1600	128	320	18						
29	.44	34	28	S	50	2.47	3.10	1.90	7.5	1590	120	360	15						
30		37	23	CL	50	2.44	3.10	2.00	7.5	1570	122	320	12						
31	.15	48	28	S	50	2.43	2.80	2.00	7.5	1620	114	320	15						
TOTAL	3.44										3648	10720	613						
ARITH. MEAN						2.45				1640	118								

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.1

Marshall, MICHIGAN

MONTH March 1972 PRIMARY TREATMENT DATA OPERATOR Robert J. Swalwell

DATE	5-DAY BOD INF. Mg/l	5-DAY BOD INF. LBS. X 10	5-DAY BOD EFF. Mg/l	5-DAY BOD EFF. LBS. X 10	5-DAY BOD REM. %	SUSPENDED SOLIDS INF. Mg/l	SUSPENDED SOLIDS INF. LBS. X 10	SUSPENDED SOLIDS EFF. Mg/l	SUSPENDED SOLIDS EFF. LBS. X 10	SUSPENDED SOLIDS REM. %	SUSP. VOLATILE SOLIDS INF. Mg/l	SUSP. VOLATILE SOLIDS INF. LBS. X 10	SUSP. VOLATILE SOLIDS EFF. Mg/l	SUSP. VOLATILE SOLIDS EFF. LBS. X 10	Total PHOSPHORUS – P INF. Mg/l	Total PHOSPHORUS – P INF. LBS. X	Total PHOSPHORUS – P EFF. Mg/l	Total PHOSPHORUS – P EFF. LBS. X	Total PHOSPHORUS – P REM. %	REMARKS
1	76	146	54	104	29	112	215	45	86	60	92	176	37	71						
2	72	134	51	95	29	63	118	37	69	41	53	99	32	60						
3	63	127	63	127	0	85	171	50	101	41	62	125	33	66						
4	78	157	68	137	13	60	121	42	84	30	48	96	32	64						
5	72	143	64	127	11	61	121	36	71	41	51	101	30	60						
6	84	170	64	130	24	88	178	42	85	52	80	162	35	71						
7	76	153	72	145	5	139	281	46	93	67	121	244	35	71						
8	68	137	54	109	21	76	153	41	83	46	59	119	32	65						
9	85	170	63	127	25	97	196	34	69	65	80	161	25	50						
10	78	145	60	112	23	95	177	35	65	63	78	145	29	54						
11	92	170	56	104	39	133	246	31	57	77	108	200	25	46						
12																				
13	66	139	56	118	15	100	210	52	109	48	81	170	37	78						
14	63	129	53	108	16	66	135	31	63	53	57	116	24	49						
15	86	180	60	126	30	116	243	35	73	70	96	201	29	61						
16	93	200	71	153	24	116	250	75	161	35	87	187	58	125						
17	80	171	65	139	19	152	325	38	81	75	140	299	33	70						
18	78	165	63	133	19	96	203	44	93	54	66	139	32	68						
19	88	181	64	132	27	83	171	37	76	55	70	144	30	62						
20	76	164	60	130	21	109	235	37	80	66	85	184	27	58						
21	72	157	60	131	17	87	190	37	81	57	70	153	28	61						
22	72	154	60	128	17	136	290	50	107	63	116	248	41	88						
23	76	162	60	128	21	92	196	37	79	60	71	151	28	60						
24	64	135	55	116	14	88	186	32	68	64	80	169	27	57						
25	76	158	59	125	21	71	148	36	75	49	57	119	26	54						
26	75	154	63	129	16	93	191	35	72	62	82	168	32	66						
27	66	141	51	109	23	59	126	35	75	41	52	111	29	62						
28	96	201	65	136	32	173	362	51	107	71	143	299	41	86						
29	72	148	63	130	13	89	183	34	70	62	71	146	26	54						
30	80	163	60	122	25	69	140	43	88	38	59	120	31	63						
31	69	140	53	107	23	55	111	43	87	22	45	291	40	81						
TOTAL		4694		3717			5872		2508			4843		1981						
ARITH. MEAN	79	162	63	128	21	95	202	41	86	56	81	167	33	68						

Digester Volume, ft^3
Primary 14,000
Secondary 14,000

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.5

Marshall, MICHIGAN

Supernatant To Raw Wetwell
Process Pattern Raw - pri. dig.- Sec. dig. - Beds

MONTH March 1972

DIGESTER AND SLUDGE DATA

OPERATOR Robert J. Swalwell

DATE	RAW SLUDGE Gals. 10	RAW SLUDGE Total Solids %	RAW SLUDGE Vol. Solids %	RAW SLUDGE Vol. Solids Lbs/1000c.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 100
1	133	11.0	65	29	5.8	92																		28
2	88	11.1	66	20	5.7	90																		28
3						91		1.7	55			9724		.29	66	1480			475					40
4	177	8.9	65	31	5.5	94																		31
5	133	9.2	62	23	5.7	95																		27
6						96																		23
7	133	7.7	70	22	5.8	97																		21
8	111	9.2	65	20	5.8	97																		25
9	155	8.5	68	27		96																		24
10	111	6.6	84	19	5.7	93																		23
11	133	6.7	74	20	5.7	94																		34
12	111	8.9	64	19	5.8	95																		15
13						96																		24
14	177	5.7	70	22	5.9	96																		22
15	133	9.2	64	24	5.7	96																		24
16	177	9.1	65	32	5.8	96		1.3	54			9724		.26	70	1220			490					32
17	133	9.0	65	24	5.8	97																		24
18	133	9.0	65	24	5.8	98																		28
19	88	9.0	69	17	5.8	98																		29
20	221	5.7	86	33	6.1	99																		27
21	133	9.5	75	29	5.8	98																		28
22	177	10.5	65	37	5.8	99		1.5	50			12818		.29	67	1460			600					9
23	133	8.5	69	23		96																		43
24						100																		24
25	177	8.5	65	29	5.9	101																		25
26	133	10.0	62	25	5.8	102																		24
27	177	7.0	66	25		100																		
28	177	7.0	66	25		96																		30
29	133	9.7	65	25	6.1	92																		40
30	133	7.7	68	21	5.9	95																		30
31						96																		23
TOTAL	3713											32266												805
ARITH. MEAN	143	8.6	68	25		96		1.5	53			10755		.28	68	1387			522					26

MDPH
D-4

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH April 1972 — MISCELLANEOUS DATA — OPERATOR Robert J. Swalwell

DATE	WEATHER Precip. Inches	Temp. (°F) Max.	Temp. (°F) Min.	Type	RAW SEWAGE Temp. °F	Flow MGD Total MGD	Flow MGD Max. Rate	Flow MGD Min. Rate	pH	~~XXXX~~ cf/mg	Cl_2 lbs.	POWER KWH	AUX. FUEL *	CHEMICALS APPLIED					REMARKS
1	.03	40	26	S	50	2.41	2.80	2.00	7.5	1600	110	320	13						* Gas - cu. ft. X 100
2		41	24	CL	50	2.37	2.80	2.00	7.5	1600	112	320	16						
3	.18	50	24	S	51	2.49	3.20	2.00	7.6	1540	127	360	18						Power off for 52 min.
4		36	26	C	50	2.44	2.80	2.00		1560	117	320	14						April 28. Plant bi-
5		48	32	C	50	2.47	3.10	2.00	7.7	1590	120	360	18						passed for about 37 Min.
6	.27	61	17	R	51	2.50	3.10	2.00	7.4	1550	117	360	25						
7	.04	24	12	S	50	2.50	3.10	2.00	7.5	1560	123	360	20						
8		36	20	C	50	2.47	3.00	2.00	7.5	1610	109	320	15						
9		47	28	C	50	2.51	2.80	1.80	7.3	1620	110	400	17						
10		63	37	C	51	2.55	3.10	2.00	7.7	1550	121	320	16						
11		62	34	C	50	2.56	3.10	1.90		1950	118	320	15						
12	.34	68	44	R	51	2.65	3.10	2.00	7.5	1600	126	320	15						
13		58	36	CL	52	2.68	3.40	2.00	7.5	1580	124	320	15						
14	.36	58	40	R	51	2.64	3.30	2.00	7.4	1590	135	360	18						
15	.01	58	44	R	51	2.47	2.90	2.00	7.4	1590	113	320	17						
16	1.58	48	32	R	51	2.89	4.30	2.20	7.5	1600	119	360	15						
17		66	40	C	51	2.97	3.60	2.40	7.7	1550	122	280	7						
18	.64	74	50	R	51	3.03	4.20	2.40	7.6	2040	130	280	9						
19	.33	70	36	R	52	3.05	3.70	2.50	7.4	1560	131	280	9						
20		54	32	CL	51	3.00	3.40	2.40	7.5	1560	120	320	10						
21	.32	54	40	R	51	2.96	3.40	2.30	7.5	1580	125	320	10						
22	.02	48	36	R	51	2.96	3.50	2.30	7.4	1700	120	280	10						
23		50	36	CL	51	2.82	3.30	2.00	7.5	1510	113	320	8						
24		45	26	CL	52	2.94	3.50	2.30	7.5	1580	120	320	11						
25		52	27	C	51	2.93	3.50	2.20	7.5	1600	120	280	8						
26		60	30	C	51	2.88	3.40	2.20	7.5	1600	124	320	8						
27		62	40	C	51	2.86	3.40	2.40	7.5	1560	130	320	6						
28		68	50	C	51	2.74	3.30	2.00	7.5	1730	120	280	6						
29	.10	64	44	R	52	2.71	3.20	2.20	7.6	1510	114	280	5						
30	.01	73	52	R	52	2.76	3.20	2.20	7.5	1590	117	240	5						
31																			
TOTAL	4.23										3607	9560	379						
ARITH. MEAN						2.71				1615	120								

MDPH
D-4.1

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH April 1972 PRIMARY TREATMENT DATA OPERATOR Robert J. Swalwell

DATE	5-DAY BOD INF. Mg/l	5-DAY BOD INF. LBS. X 10	5-DAY BOD EFF. Mg/l	5-DAY BOD EFF. LBS. X 10	5-DAY BOD REM. %	SUSPENDED SOLIDS INF. Mg/l	SUSPENDED SOLIDS INF. LBS. X 10	SUSPENDED SOLIDS EFF. Mg/l	SUSPENDED SOLIDS EFF. LBS. X 10	SUSPENDED SOLIDS REM. %	SUSP. VOLATILE SOLIDS INF. Mg/l	SUSP. VOLATILE SOLIDS INF. LBS. X 10	SUSP. VOLATILE SOLIDS EFF. Mg/l	SUSP. VOLATILE SOLIDS EFF. LBS. X 10	Total PHOSPHORUS – P INF. Mg/l	Total PHOSPHORUS – P INF. LBS. X	Total PHOSPHORUS – P EFF. Mg/l	Total PHOSPHORUS – P EFF. LBS. X	Total PHOSPHORUS – P REM. %	REMARKS
1	64	129	60	121	6	59	119	52	105	12	47	94	40	80						
2	60	119	56	111	7	132	261	26	51	80	107	212	24	47						
3	99	206	54	112	45	84	174	33	69	61	74	154	28	58						
4																				
5	66	136	60	124	9	64	132	38	78	41	57	117	32	66						
6	48	100	40	83	17	71	148	32	67	55	62	129	32	67						
7	60	125	51	106	15	43	90	39	81	9			38	79						
8	66	136	48	99	33	60	124	45	93	25	52	107	33	68						
9	69	144	54	113	22	73	153	32	67	56	66	138	25	52						
10	136	290	104	222	24	106	226	36	77	66	91	194	27	58						
11	120	255	112	238	7	58	123	33	70	43	49	104	29	62						
12	132	292	96	212	27	117	259	37	82	68	103	228	30	66						
13	112	250	93	208	17	86	192	34	76	60	76	170	27	60						
14	112	247	102	225	9	58	128	49	110	19	35	77	40	88						
15	112	231	100	206	11	65	134	41	84	37	56	115	38	78						
16	128	308	104	251	19	98	236	38	92	61	65	157	30	72						
17	120	297	88	218	27	132	327	32	79	76	99	245	23	57						
18	108	273	91	230	16	80	202	25	63	69	64	162	23	58						
19	100	254	91	232	9	90	229	34	86	62	72	183	27	69						
20	64	160	54	135	16	121	303	27	68	78	92	230	19	48						
21	84	207	54	133	36	57	141	35	86	39	48	119	29	72						
22	76	188	51	126	33	66	163	32	79	52	56	138	27	67						
23	57	134	48	113	16	76	179	29	68	62	60	141	24	56						
24	63	154	48	118	24	80	196	29	71	64	65	159	23	56						
25	72	176	63	154	13	67	164	39	95	42	56	137	31	76						
26	69	166	60	144	13	70	168	31	74	56	61	147	25	60						
27	84	200	58	138	31	90	215	28	67	69	77	184	23	55						
28	76	174	65	149	14	156	356	40	91	74	134	306	33	75						
29	70	158	61	138	13	65	147	47	106	28	54	122	36	81						
30	72	166	57	131	21	73	168	30	69	59	60	138	23	53						
31																				
TOTAL		5675		4590			5457		2304			4407		1884						
ARITH. MEAN	86	196	70	158	19	83	188	35	79	53	69	157	29	65						

Digester Volume, ft^3
Primary 34,000
Secondary 14,000

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.5

Marshall, MICHIGAN

Supernatant To Raw wetwell
Process Pattern Raw-pri. dig.-sec. dig.- beds

MONTH April 1972

DIGESTER AND SLUDGE DATA

OPERATOR Robert J. Swalwell

DATE	RAW SLUDGE Gals. X 10	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 100
1	133	9.9	72	28	5.8	97																		24
2	133	7.7	65	20	5.8	97																		23
3						97		1.4	62			10608		.25	68	2120			360					8
4	88	9.5	70	18	5.7	96																		39
5	88	9.6	67	17	5.7	100																		26
6	133	7.9	67	21	5.8	100																		23
7	133	7.7	69	22	5.9	100																		24
8	133	8.4	68	23	5.8	100																		27
9	88	9.2	68	17	5.9	100																		28
10	177	8.0	86	47	5.7	101																		19
11	111	7.9	66	17	5.9	97																		24
12	133	8.5	65	22	5.9	95																		23
13	111	9.9	68	23	5.9	92																		22
14	133	7.7	69	22	5.8	90		1.2	63			9724		.29	52	1620			960					31
15	88	7.2	72	14	5.9	92																		23
16	133	10.1	64	26	5.8	95																		23
17						95																		21
18	133	8.9	66	25		97																		24
19	88	10.5	63	18	5.6	97																		21
20	133	11.5	61	29	5.7	98																		24
21	88	13.3	62	22	5.7	98																		26
22						99																		25
23	133	11.7	63	29	5.7	100																		25
24	88	8.4	76	17	5.7	100																		25
25	133	6.2	75	19	5.8	100		.90	55			10608		.23	67	920			225					27
26	133	9.4	64	24	5.9	101																		27
27	133	9.4	61	23	5.8	101																		26
28	88	10.3	62	17	5.9	102																		27
29	133	7.2	62	18	5.9	102																		15
30	133	8.9	64	23	5.9	104																		33
31																								
TOTAL	3227											30940												24
ARITH. MEAN	120	9.1	67	22		98		1.2	60			10313		.26	62	1553			515					

MDPH
D-4

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH May 1972 — MISCELLANEOUS DATA — OPERATOR Robert J. Swalwell

DATE	WEATHER Precip. Inches	Temp. (°F) Max.	Temp. (°F) Min.	Type	RAW SEWAGE Temp. °F	Flow MGD Total MGD	Flow MGD Max. Rate	Flow MGD Min. Rate	pH	~~Max~~ water cf~~m~~	Cl_2 lbs.	POWER KWH	AUX. FUEL *	CHEMICALS APPLIED					REMARKS
1	.12	78	54	R	52	2.85	3.40	2.20	7.5	1680	124	280	2						* Gas - cu. ft. X 100
2		72	42	CL	53	2.80	3.30	2.00	7.7	1610	124	280	7						
3		56	40	CL	52	2.78	3.30	2.00	7.6	1610	128	280	10						
4		63	37	C	52	2.72	3.30	2.00	7.5	1640	124	280	12						
5	.30	71	50	R	52	2.73	3.40	2.00	7.4	1640	119	320	11						
6	.32	76	42	R	52	2.72	3.40	2.00	7.4	1670	117	240	10						
7	.37	48	40	R	52	2.71	3.20	2.00	7.4	1600	121	280	10						
8	.08	50	36	R	53	2.81	3.50	1.80	7.6	1980	122	320	10						
9		58	32	CL	52	2.77	3.30	1.70		1590	63	280	3						
10		66	38	C	52	2.76	3.30	1.80		1340	115	320	3						
11		72	41	C	53	2.76	3.40	2.00	7.5	1670	124	320	4						
12		76	50	C		2.81	3.40	1.50	7.5	1770	130	280	3						
13	.48	66	54	R	53	2.67	3.30	1.90	7.5	1720	111	280	4						
14	1.23	76	51	R	52	2.89	4.10	2.30	7.4	1460	111	320	2						
15	.11	64	50	R	53	2.95	3.50	1.80	7.5	2290	117	280	1						
16		70	46	CL	53	2.90	3.50	1.80	7.5	1850	122	320	2						
17		80	50	C	53	2.90	3.50	2.20	7.4	1730	122	320	1						
18		84	54	C	54	2.87	3.40	2.10	7.5	1730	127	280	4						
19		82	52	C	54	2.88	3.40	2.10	7.5	1730	127	320	5						
20		86	56	C	54	2.79	3.40	2.10	7.5	1710	116	280	5						
21		87	55	C	54	2.78	3.30	2.10	7.5	1810	117	280	5						
22		84	52	C	54	2.84	3.50	2.10		1770	133	280	7						
23		89	56	C	54	2.83	3.40	2.10		1700	126	280	8						
24		88	52	C	55	2.81	3.20	2.00		1720	120	280	7						
25		88	52	C		2.82	3.40	2.00	7.5	1670	125	320	7						
26		82	52	C	55	2.79	3.30	1.90	7.4	1680	134	280	8						
27		88	50	C	55	2.67	3.20	2.00	7.5	1700	121	280	1						
28		86	52	C	55	2.58	3.10	2.10	7.4	1700	112	280	1						
29	.31	86	60	R	54	2.66	3.20	2.10	7.5	1680	112	240	7						
30	.05	64	40	R	54	2.76	3.50	1.80		1740	118	320	7						
31		50	40	CL	54	2.73	3.20	1.80	7.5	1600	116	280	8						
TOTAL	3.37										3698	9000	175						
ARITH. MEAN						2.79				1703	119								

MDPH
D-4.1

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH May 19 72 PRIMARY TREATMENT DATA OPERATOR Robert J. Swalwell

DATE	5-DAY BOD INF. Mg/l	5-DAY BOD INF. LBS. X 10	5-DAY BOD EFF. Mg/l	5-DAY BOD EFF. LBS. X 10	5-DAY BOD REM. %	SUSPENDED SOLIDS INF. Mg/l	SUSPENDED SOLIDS INF. LBS. X 10	SUSPENDED SOLIDS EFF. Mg/l	SUSPENDED SOLIDS EFF. LBS. X 10	SUSPENDED SOLIDS REM. %	SUSP. VOLATILE SOLIDS INF. Mg/l	SUSP. VOLATILE SOLIDS INF. LBS. X 10	SUSP. VOLATILE SOLIDS EFF. Mg/l	SUSP. VOLATILE SOLIDS EFF. LBS. X 10	Total PHOSPHORUS – P INF. Mg/l	Total PHOSPHORUS – P INF. LBS. X	Total PHOSPHORUS – P EFF. Mg/l	Total PHOSPHORUS – P EFF. LBS. X	Total PHOSPHORUS – P REM. %	REMARKS
1	54	128	48	114	11	72	171	31	74	57	63	150	27	64						
2	64	149	54	126	16	101	236	18	42	82	60	140	14	33						
3	64	148	42	97	34	64	148	30	70	53	50	116	22	51						
4	72	163	63	143	12	76	172	47	107	38	64	145	37	84						
5	54	123	43	98	20	80	182	28	64	65	71	162	24	55						
6	69	156	48	109	30	66	150	27	61	59	56	127	20	45						
7	60	136	51	115	15	64	145	30	68	53	53	120	25	57						
8	57	134	48	113	17	100	234	31	73	69	80	188	25	59						
9																				
10																				
11	66	152	51	117	23	77	177	39	90	49	62	143	30	69						
12	66	155	44	103	33	78	183	24	56	69	65	152	20	47						
13	57	127	48	107	16	74	165	20	45	73	61	136	16	36						
14	72	174	48	108	38	118	284	32	71	73	80	178	27	65						
15	48	118	42	103	12	86	212	42	103	51	73	180	32	79						
16	66	160	45	109	32	113	273	47	114	58	98	237	39	94						
17	48	116	42	102	13	86	208	39	94	55	75	181	32	77						
18	63	151	48	115	24	99	237	28	67	71	83	199	17	41						
19	57	137	52	125	9	89	214	45	108	49	77	185	39	94						
20	64	149	54	126	16	68	158	28	65	59	54	126	20	47						
21	69	160	60	139	13	83	192	38	88	54	70	162	30	70						
22	60	142	60	142	0	67	159	47	111	30	52	123	35	83						
23	57	135	57	135	0	100	236	49	116	51	73	172	34	80						
24																				
25	68	160	48	113	29	159	374	38	89	76	115	270	31	73						
26	68	158	48	112	29	91	212	29	67	68	70	163	20	47						
27	64	143	51	114	20	88	196	35	78	60	82	183	31	69						
28	48	103	48	103	0	73	157	34	73	53	61	131	26	56						
29	82	182	60	133	27	113	251	36	80	68	104	231	31	69						
30																				
31	68	155	54	123	21	102	232	45	102	56	87	198	39	89						
TOTAL		3914		3144			5558		2176			4498		1733						
ARITH. MEAN	62	145	50	116	19	88	206	35	81	59	72	167	28	64						

Digester Volume, ft^3
Primary 14,000
Secondary 14,000

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.5

Marshall, MICHIGAN

Supernatant To Raw Wetwell
Process Pattern Raw-Pri. Dig.-Sec. Dig. - Beds

MONTH May 19 72

DIGESTER AND SLUDGE DATA

OPERATOR

DATE	RAW SLUDGE Gals. 10	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 100
1	221	5.2	73	25	6.0	104																		
2	133	9.1	61	23	5.9	100																		39
3						97																		29
4	133	7.9	62	20	5.9	96		1.4	x.x											6188	10.5	43		31
5	133	7.0	68	19	5.7	93			60															31
6	133	4.6	68	13	5.8	91																		30
7	133	6.7	68	18		90																		25
8						88																		22
9	133	10.3	62	26	5.8	90																		23
10	133	9.5	60	23	5.9	92																		24
11	88	12.9	61	21	5.6	94																		10
12	133	9.0	63	23	6.0	93		.60	67			11492		.26	63	1000			270					44
13	88	13.0	54	19	5.8	99																		34
14	133	9.9	63	25	5.9	101																		31
15						102																		25
16	177	10.2	64	35	5.7	104																		25
17	133	8.6	62	21	5.8	100																		28
18	133	11.2	61	27	5.7	97																		32
19						96																		8
20	133	9.5	63	24	6.0	95																		48
21	88	11.8	60	19	5.8	100																		29
22						102		.70				9282		.25	65	1160			210					14
23	177	10.1	54	29	6.0	101																		39
24	133	7.1	64	18	6.0	98																		26
25	88	12.6	62	21	5.6	96																		29
26	133	9.2	65	20	5.7	94																		28
27	88	12.1	60	19	5.8	93																		28
28	133	8.2	60	20	6.0	91																		29
29						95																		26
30	177	10.2	66	36	5.9	99																		25
31	221	8.5	66	38	5.8	101																		25
TOTAL	3403											20774								6188				837
ARITH. MEAN	136	9.4	63	23		97		.90	63			10387		.25	64	1080			240	6188	10.5	43		28

MDPH
D-4

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH June 1972 — MISCELLANEOUS DATA — OPERATOR Robert J. Swalwell

DATE	WEATHER Precip. Inches	Temp. (°F) Max.	Temp. (°F) Min.	Type	RAW SEWAGE Temp. °F	Flow MGD Total MGD	Flow MGD Max. Rate	Flow MGD Min. Rate	pH	water cf	Cl_2 lbs.	POWER KWH	AUX. FUEL *	CHEMICALS APPLIED					REMARKS
1		72	48	CL	55	2.72	3.20	1.80	7.4	2060	125	320	2						* Gas - cu. ft. X 100
2	.13	82	60	R	55	2.82	3.50	2.00	7.5	1730	129	280	8						
3		88	62	C	55	2.74	3.40	2.10	7.4	1700	135	280	7						
4		85	48	C	55	2.64	3.30	1.70	7.5	1700	105	280	4						
5	.31	82	60	R	55	2.75	3.40	2.10	7.5	1650	129	280	4						
6		80	50	C	56	2.74	3.40	2.00	7.5	1690	117	240	4						
7		84	54	C	55	2.73	3.40	1.90	7.5	1680	124	280	3						
8		82	60	C	55	2.78	3.30	2.00	7.4	1670	129	280	3						
9		78	40	CL	55	2.71	3.30	1.80	7.5	1740	122	280	4						
10		68	36	C	54	2.63	3.20	2.00	7.4	1690	119	280	5						
11		80	56	CL	55	2.53	3.10	2.00	7.4	1700	110	280	4						
12	.10	78	62	R	56	2.73	3.30	2.00	7.6	2040	118	240	5						
13		88	68	C	55	2.75	3.20	2.10	7.4	1680	127	280	4						
14	.52	91	60	R	57	2.79	3.40	2.10	7.5	1740	122	280	5						
15		76	52	C	57	2.79	3.40	2.10	7.4	1730	122	280	4						
16		68	46	C	56	2.71	3.40	1.90	7.5	1700	123	280	5						
17		80	48	C	56	2.58	3.10	2.00	7.5	1750	135	280	4						
18		84	54	C	55	2.56	3.20	2.00	7.5	1700	123	280	6						
19		91	70	C	56	2.75	3.40	1.70	7.4	1690	127	240	6						
20	.01	86	46	R	57	2.73	3.30	1.70	7.5	1680	125	280	6						
21	.03	62	48	R	56	2.64	3.40	1.90	7.4	1700	124	280	7						
22	.01	66	48	R	56	2.58	3.20	2.00	7.5	1700	125	280	7						
23	.07	54	48	R	56	2.64	3.30	1.90	7.5	2050	134	320	7						
24		62	50	CL	56	2.53	3.10	2.00	7.5	1720	128	280	6						
25	.09	76	53	R	56	2.51	3.10	1.90	7.5	1670	117	280	5						
26	.01	78	52	R	56	2.69	3.30	2.00	7.4	1680	125	280	4						
27		89	58	CL	57	2.68	3.30	2.00	7.4	1760	125	280	4						
28	.12	88	60	R	56	2.62	3.20	2.00	7.5	1650	125	280	4						
29	.27	78	60	R	57	2.63	3.60	2.00	7.6	1690	116	280	3						
30		82	58	C	57	2.65	3.10	2.00	7.5	1690	124	280	3						
31																			
TOTAL	1.67										3709	8360	143						
ARITH. MEAN						2.68				1734	124								

MDPH
D-4.1

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH June 19 72 PRIMARY TREATMENT DATA OPERATOR Robert J. Swalwell

DATE	5-DAY BOD INF. Mg/l	5-DAY BOD INF. LBS. X 10	5-DAY BOD EFF. Mg/l	5-DAY BOD EFF. LBS. X 10	5-DAY BOD REM. %	SUSPENDED SOLIDS INF. Mg/l	SUSPENDED SOLIDS INF. LBS. X 10	SUSPENDED SOLIDS EFF. Mg/l	SUSPENDED SOLIDS EFF. LBS. X 10	SUSPENDED SOLIDS REM. %	SUSP. VOLATILE SOLIDS INF. Mg/l	SUSP. VOLATILE SOLIDS INF. LBS. X 10	SUSP. VOLATILE SOLIDS EFF. Mg/l	SUSP. VOLATILE SOLIDS EFF. LBS. X 10	Total PHOSPHORUS – P INF. Mg/l	Total PHOSPHORUS – P INF. LBS. X	Total PHOSPHORUS – P EFF. Mg/l	Total PHOSPHORUS – P EFF. LBS. X	Total PHOSPHORUS – P REM. %	REMARKS
1	51	116	42	95	18	146	331	45	102	69	117	265	30	68						
2	68	160	48	113	29	132	310	42	99	68	120	282	37	87						
3	72	165	60	137	17	127	290	39	89	69	103	235	32	73						
4	66	145	54	119	18	89	196	32	70	64	80	176	27	59						
5	60	138	54	124	10	98	225	38	87	61	80	184	29	67						
6	76	174	61	139	20	81	185	39	n89	52	66	151	33	75						
7	54	123	44	100	19	67	153	40	91	40	55	125	30	68						
8	72	167	60	139	17	113	262	56	130	42	92	213	48	111						
9	72	163	51	115	29	109	246	51	115	53	92	208	45	102						
10	72	158	57	125	21	64	140	50	110	22	54	118	41	90						
11	76	160	60	127	21	93	196	33	70	65	82	173	27	57						
12	72	164	57	130	21	125	285	49	112	61	107	244	38	87						
13	108	248	65	149	40	109	250	53	122	51	78	179	40	92						
14	72	168	66	154	9	125	291	57	133	54	117	272	45	105						
15	72	168	63	147	13	97	226	57	133	41	89	207	54	126						
16	76	172	66	149	13	128	289	58	131	55	115	260	53	120						
17	64	138	50	108	22	104	224	45	97	57	87	187	38	82						
18	66	141	57	122	14	80	171	31	66	61	68	145	27	58						
19	66	151	60	138	9	100	229	28	64	72	86	197	23	53						
20	60	137	60	137	0	85	194	47	107	45	72	164	39	89						
21	72	159	48	106	33	144	317	52	115	64	127	280	43	95						
22	64	138	48	103	25															
23	74	163	48	106	35	116	255	53	117	54	101	222	41	90						
24	80	169	63	133	21	129	272	46	97	64	111	234	41	87						
25	72	151	67	140	7	69	144	29	61	58	63	132	26	54						
26	69	155	61	137	12	144	323	48	108	67	124	278	38	85						
27	80	179	56	125	30	92	206	46	103	50	76	170	36	80						
28	80	175	76	166	5	80	175	40	87	50	70	153	37	81						
29	68	150	58	127	15	89	195	45	99	49	72	158	34	75						
30	63	139	52	115	17	99	219	32	71	68	75	166	25	55						
31																				
TOTAL		4734		3825			6799		2875			5778		2371						
ARITH. MEAN	71	158	57	128	19	105	234	44	99	56	89	199	36	82						

Digester Volume, ft^3
Primary 14,000
Secondary 14,000

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.5

Marshall, MICHIGAN

Supernatant To Raw Wetwell
Process Pattern Raw-pri.dig.-sec.dog. -Beds

MONTH June 19 72

DIGESTER AND SLUDGE DATA

OPERATOR Robert J. Swalwell

DATE	RAW SLUDGE Gals. X 10	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 100
1	133	9.1	68	23	5.8	99		1.4	59			12376		.24	62	1060								
2	133	5.5	67	15	6.0	106																		45
3	133	8.0	64	20	5.9	102																		35
4	111	7.4	69	17	5.9	100																		35
5						97																		39
6	88	11.6	62	19		96																		35
7	133	11.6	62	29	6.1	95																		32
8	88	9.4	63	16	5.8	94																		31
9	177	7.6	79	32	6.0	92																		33
10	133	9.8	60	24	5.9	90																		33
11	133	9.2	67	25	5.9	94																		35
12	177	8.2	79	35	5.8	98																		12
13	88	10.6	61	17	5.7	98		1.7	60			11492		.28	62	1620			340					56
14	133	9.8	65	26	5.8	95																		36
15	177	8.5	67	30	5.8	93																		35
16						92																		31
17	265	9.4	66	50	5.8	90																		32
18	133	11.4	58	27	5.8	89																		31
19	133	10.7	84	36	5.7	94																		34
20	133	8.9	68	24	5.8	99																		34
21	133	9.2	74	27	5.8	102																		35
22	133	5.2	77	16	5.7	104																		26
23	133	9.7	67	26	5.7	107		.30	67			11050		.29	62	1740			180					39
24						101																		26
25	88	9.9	67	18	5.7	99																		30
26						97																		37
27	177	7.5	77	31	5.9	96																		30
28						94																		24
29	177	10.2	66	36	5.6	93																		24
30	133	11.1	63	28	5.9	91																		25
31																								
TOTAL	3470											34918												950
ARITH. MEAN	139	9.2	68	26		97		1.1	62			11639		.27	62	1473			260					32

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4

Marshall, MICHIGAN

MONTH July 1972 — MISCELLANEOUS DATA — OPERATOR Robert J. Swalwell

DATE	WEATHER Precip. Inches	Temp. (°F) Max.	Temp. (°F) Min.	Type	RAW SEWAGE Temp. °F	Flow MGD Total MGD	Flow MGD Max. Rate	Flow MGD Min. Rate	pH	~~XXXX~~ water cf/~~XX~~	Cl_2 lbs.	POWER KWH	AUX. FUEL *	CHEMICALS APPLIED					REMARKS
1		90	64	C	57	2.51	3.20	2.00	7.5	1690	129	240	4						* Gas - cu. ft. X 100
2	.03	84	52	R	57	2.41	2.90	2.00	7.4	1690	115	280	3						
3		74	48	C	55	2.50	3.00	2.00	7.5	1690	120	280	3						
4		73	47	CL	54	2.40	2.90	2.00	7.4	1760	109	240	3						
5		73	44	CL	56	2.54	3.10	2.00	7.5	1670	127	240	2						
6		80	50	C	57	2.53	3.10	2.00	7.5	1720	120	280	4						
7	.22	78	54	R	57	2.59	3.10	2.00	7.5	2060	125	280	5						
8		82	62	CL	57	2.56	3.20	2.00	7.4	1710	121	240	8						
9	.02	83	58	R	57	2.46	3.00	2.00	7.4	1630	125	240	4						
10		92	66	C	56	2.35	3.20	2.20	7.6	1700	120	280	3						
11	.04	96	66	R	57	2.37	3.30	2.20	7.5	1700	119	280	2						
12		92	68	CL	57	2.36	3.50	2.20	7.5	1690	115	280	2						
13	.22	84	68	R	58	2.31	3.50	2.30	7.5	1700	114	240	3						
14	.42	88	66	R	59	2.54	3.80	2.40	7.5	1700	76	320	3						
15		82	58	CL	58	2.42	3.60	2.40	7.4	1640	141	240	4						
16	.01	87	58	R	57	2.41	3.30	2.30	7.4	1720	110	280	3						
17	.39	88	66	R	58	2.55	3.80	2.30	7.4	1680	134	280	3						
18	.77	90	66	R	58	2.64	4.20	2.50	7.5	2050	127	280	3						
19		90	68	CL	58	2.53	3.80	2.40	7.3	1670	129	240	2						
20		94	71	C	58	2.57	3.30	2.40	7.4	1680	129	280	3						
21		94	71	CL	59	2.38	3.30	2.00	7.4	1660	123	280	3						
22		96	72	CL	58	2.49	3.00	2.00	7.5	1680	122	240	2						
23		93	66	CL	59	2.43	3.00	1.90	7.4	1660	121	240	3						
24		88	64	C	59	2.52	3.10	1.90		1640	125	280	5						
25		78	52	C	58	2.44	2.90	1.80		1650	117	280	4						
26	.32	68	56	R	58	2.44	2.90	1.90	7.4	1720	121	280	4						
27	.01	74	50	R	58	2.45	3.00	1.80	7.6	1650	123	320	5						
28		78	52	C	58	2.47	3.10	1.80	7.5	1680	128	280	4						
29		82	52	C	58	2.39	2.90	1.80	7.4	1770	105	280	5						
30		87	55	C	58	2.32	2.80	1.70	7.4	1720	78	240	4						
31		88	56	C	59	2.51	3.10	2.00		2030	127	280	4						
TOTAL	2.95										3695	8320	110						
ARITH. MEAN						2.46				1723	119								

MDPH
D-4.1

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH July 19 72 PRIMARY TREATMENT DATA OPERATOR Robert J. Swalwell

DATE	5-DAY BOD INF. Mg/l	5-DAY BOD INF. LBS. X 10	5-DAY BOD EFF. Mg/l	5-DAY BOD EFF. LBS. X 10	5-DAY BOD REM. %	SUSPENDED SOLIDS INF. Mg/l	SUSPENDED SOLIDS INF. LBS. X 10	SUSPENDED SOLIDS EFF. Mg/l	SUSPENDED SOLIDS EFF. LBS. X 10	SUSPENDED SOLIDS REM. %	SUSP. VOLATILE SOLIDS INF. Mg/l	SUSP. VOLATILE SOLIDS INF. LBS. X 10	SUSP. VOLATILE SOLIDS EFF. Mg/l	SUSP. VOLATILE SOLIDS EFF. LBS. X 10	Total PHOSPHORUS – P INF. Mg/l	Total PHOSPHORUS – P INF. LBS. X	Total PHOSPHORUS – P EFF. Mg/l	Total PHOSPHORUS – P EFF. LBS. X	Total PHOSPHORUS – P REM. %	REMARKS
1	69	144	52	109	25	132	276	47	98	64	106	222	38	80						
2	64	129	48	96	25	61	123	28	56	54	50	101	25	50						
3	75	156	63	131	16	86	179	35	73	59	69	144	29	60						
4	63	126	56	112	11	66	132	34	68	49	56	112	26	52						
5	84	178	66	140	21	94	199	48	102	49	81	172	40	85						
6	68	143	56	118	18	68	143	35	74	49	52	110	28	59						
7	72	156	57	123	21	102	220	42	91	59	82	177	33	71						
8	75	160	60	128	20	99	211	27	58	73	83	177	23	49						
9	66	135	58	119	12	95	195	37	76	61	81	166	32	66						
10	72	141	64	125	11	100	196	35	69	65	81	159	35	69						
11	69	136	51	101	26	93	184	39	77	68	76	150	31	61						
12	71	140	59	116	17	78	154	42	83	42	62	122	35	69						
13	68	131	54	104	21	79	152	45	87	43	77	148	38	73						
14	63	133	56	119	11	116	246	39	83	66	99	210	35	74						
15	120	242	76	153	37	105	212	45	91	57	89	180	36	73						
16	74	149	54	109	27	78	157	31	62	60	66	133	28	56						
17	80	170	67	143	16	98	208	45	96	54	82	174	38	81						
18	73	161	57	126	22	114	251	44	97	61	71	156	30	66						
19	76	160	60	127	21	89	188	43	91	52	73	154	36	76						
20	72	154	57	122	21	78	167	35	75	55	67	144	31	66						
21	74	147	54	107	27	107	212	40	79	62	89	177	32	64						
22	60	125	51	106	15	73	152	28	58	62	60	125	22	46						
23	68	138	51	103	25	91	184	38	77	58	72	146	33	67						
24																				
25	80	163	57	116	29	115	234	68	138	41	98	199	52	106						
26	72	147	60	122	17	96	195	43	88	55	79	161	37	75						
27	55	112	45	92	18	113	231	34	69	70	100	204	27	55						
28	84	173	51	105	39	150	309	36	74	76	129	266	30	62						
29	71	142	57	114	20	74	147	41	82	44	60	120	33	66						
30	72	139	60	116	17	78	151	38	74	51	65	126	33	64						
31																				
TOTAL		4330		3402			5608		2346			4635		1941						
ARITH. MEAN	73	149	57	117	21	94	193	39	81	57	77	160	33	67						

Digester Volume, ft^3
Primary 14,000
Secondary 14,000

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.5

Marshall, MICHIGAN

Supernatant To Raw Wetwell
Process Pattern Raw - pri.dig.- Sec.dig. - Beds

MONTH July 19 72

DIGESTER AND SLUDGE DATA

OPERATOR Robert J. Swalwell

DATE	RAW SLUDGE Gals. X 10	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. 10 X	DIGESTED SLUDGE Total Solids %	DIGESTED SLUDGE Vol. Solids %	DIGESTED SLUDGE pH	Gas Produced cu. ft X 100
1	133	9.8	68	27	5.9	96																		30
2	133	9.9	71	28	5.8	102																		30
3						104																		23
4	221	6.7	77	35	5.7	102																		26
5	133	7.1	72	21	5.8	99																		18
6	177	7.9	70	30	5.7	97		1.8	63			11050		.26	62	1360			280					45
7	133	8.4	70	24	5.6	94																		38
8	133	7.0	75	21	5.9	100																		35
9	88	12.5	69	23	5.7	106																		29
10						108																		23
11	133	8.9	72	26	5.7	107																		22
12	133	6.5	71	19	5.8	104																		22
13	177	8.7	72	34	5.6	102																		24
14	133	7.1	70	20		100																		17
15	133	7.1	70	20	5.8	99		1.3	58			13702		.29	64	1820			400					48
16	133	10.2	73	30	5.7	96																		32
17	111	9.7	75	24	5.5	95																		30
18	155	9.1	70	30	5.7	93																		34
19	88	8.3	66	15	5.8	92																		19
20	133	9.8	83	33	5.6	91																		22
21	177	9.1	70	34	5.8	90																		29
22						96																		28
23	177	9.8	72	41	5.6	102																		29
24	177	10.2	82	45	5.5	106																		31
25	133	10.2	69	28	5.4	103																		29
26						100																		32
27	88	10.4	68	19	5.5	99		1.6	65											1326	9.3	47		35
28	133	9.1	68	25	5.6	96																		35
29	133	8.8	71	25	5.7	94																		38
30	133	8.0	71	23	5.4	92																		35
31						92																		26
TOTAL	3624											24752								1326				
ARITH. MEAN	139	8.9	72	27		99		1.6	62			12376		.27	63	1590			340	1326	9.3	47		

MDPH
D-4

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH August 1972 — MISCELLANEOUS DATA — OPERATOR Robert J. Swalwell

DATE	WEATHER Precip. Inches	Temp. (°F) Max.	Temp. (°F) Min.	Type	RAW SEWAGE Temp. °F	Flow MGD Total MGD	Flow MGD Max. Rate	Flow MGD Min. Rate	pH	~~xxx~~ water cf/~~xg~~	Cl_2 lbs.	POWER KWH	AUX. FUEL *	CHEMICALS APPLIED					REMARKS
1	.21	86	64	R	59	2.47	3.10	2.00	7.6	1710	123	280	4						* Gas - cu. ft. X 100
2	.07	80	60	R	59	2.46	3.00	1.90	7.6	1750	119	240	5						
3	.01	74	48	R	59	2.52	3.00	2.00	7.5	1790	117	280	5						
4		74	46	C	59	2.50	3.00	1.90	7.5	1710	118	280	5						
5		80	58	C	58	2.43	3.00	1.90	7.4	1710	123	280	5						
6	.10	76	60	R	58	2.38	2.80	1.90	7.4	1760	122	240	6						
7	.10	64	52	R	58	2.56	3.10	2.00	7.4	1920	130	280	6						
8	.28	64	52	R	58	2.53	3.10	2.00	7.4	1770	121	320	5						
9		68	42	CL	58	2.44	3.00	1.90	7.4	1920	122	280	6						
10		76	52	C	59	2.44	3.00	1.90	7.5	1860	121	280	6						
11	.12	74	60	R	58	2.48	3.00	1.90	7.4	1910	120	280	6						
12		84	58	C	58	2.43	3.00	2.00	7.4	2200	122	280	5						
13		88	64	C	58	2.42	2.90	1.90	7.5	1860	127	240	6						
14		93	59	C	58	2.56	3.30	1.90	7.5	1840	124	280	4						
15		78	50	C	59	2.47	3.00	1.90	7.5	1870	123	280	5						
16	.41	80	62	R	58	2.53	3.00	2.00	7.5	2020	41	280	5						
17		86	68	CL	60	2.56	3.10	2.00	7.5	1780	134	280	5						
18	1.38	88	64	R	60	2.77	3.80	2.10	7.3	2280	131	280	5						
19		84	58	CL	60	2.54	3.00	2.00	7.4	1850	118	280	5						
20		86	62	C	59	2.54	3.10	1.90	7.5	1810	119	280	5						
21	.20	88	68	R	59	2.58	3.20	1.70	7.5	1830	121	280	6						
22	1.90	90	66	R	60	2.84	4.40	2.10	7.4	1830	121	280	5						
23	.14	84	66	R	60	2.72	3.20	2.20	7.4	1840	121	320	5						
24	.07	82	58	R	60	2.72	3.40	2.10	7.5	1850	120	280	4						
25	.02	84	66	R	60	2.76	3.50	2.10	7.4	2280	133	280	2						
26	.02	82	64	R	59	2.57	3.20	2.00	7.4	1800	117	240	2						
27		70	56	CL	59	2.54	2.80	2.00	7.4	1850	117	240	4						
28		80	56	C	58	2.63	3.30	2.00	7.4	1810	120	280	5						
29		82	58	C	59	2.63	3.20	2.00	7.5	1810	124	280	5						
30		86	56	C	60	2.57	3.10	1.90	7.3	1840	121	320	4						
31		84	56	C	59	2.55	3.10	1.90	7.4	1900	127	280	4						
TOTAL	5.03										3717	8600	150						
ARITH. MEAN						2.55				1870	120								

MDPH
D-4.1

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH August 1972 — PRIMARY TREATMENT DATA — OPERATOR Robert J. Swalwell

DATE	5-DAY BOD INF. Mg/l	5-DAY BOD INF. LBS. X 10	5-DAY BOD EFF. Mg/l	5-DAY BOD EFF. LBS. X 10	5-DAY BOD REM. %	SUSPENDED SOLIDS INF. Mg/l	SUSPENDED SOLIDS INF. LBS. X 10	SUSPENDED SOLIDS EFF. Mg/l	SUSPENDED SOLIDS EFF. LBS. X 10	SUSPENDED SOLIDS REM. %	SUSP. VOLATILE SOLIDS INF. Mg/l	SUSP. VOLATILE SOLIDS INF. LBS. X 10	SUSP. VOLATILE SOLIDS EFF. Mg/l	SUSP. VOLATILE SOLIDS EFF. LBS. X 10	Total PHOSPHORUS – P INF. Mg/l	Total PHOSPHORUS – P INF. LBS. X	Total PHOSPHORUS – P EFF. Mg/l	Total PHOSPHORUS – P EFF. LBS. X	Total PHOSPHORUS – P REM. %	REMARKS
1	68	140	56	115	18	80	165	37	76	54	70	144	32	66						
2	72	148	54	111	25	99	203	36	74	64	74	152	31	64						
3	64	134	57	120	11	88	185	47	99	47	80	168	41	86						
4	57	119	43	90	25	77	161	41	85	47	62	129	37	77						
5	69	140	65	132	6	91	184	32	65	65	83	168	27	55						
6	68	135	57	113	16	77	153	37	73	52	66	131	33	66						
7	65	139	63	135	3	139	297	50	107	64	118	252	39	83						
8	69	146	62	131	10	117	247	58	122	50	95	200	46	97						
9	68	138	65	132	4	77	157	48	98	38	65	132	36	73						
10	76	155	65	132	14	115	234	50	102	57	94	191	42	85						
11	63	130	48	99	24	103	213	35	72	66	82	170	24	50						
12	78	158	57	116	27	68	138	34	69	50	54	109	26	53						
13	66	133	54	109	18	67	135	35	71	48	57	115	31	63						
14						79	169	40	85	49	63	135	29	62						
15	57	117	54	111	5	71	146	51	105	28	66	136	49	101						
16	69	146	64	135	7	124	262	55	116	56	102	215	40	84						
17	63	135	56	120	11	95	203	56	120	41	84	179	49	105						
18	60	139	54	125	10	95	219	80	185	16	73	169	46	106						
19	66	140	57	121	14	95	201	40	85	58	76	161	29	61						
20	69	146	59	125	15	105	222	36	76	66	89	189	31	66						
21	57	123	45	97	21	72	155	37	80	49	62	133	31	67						
22	56	133	53	126	5	86	204	55	130	36	65	154	42	99						
23	68	154	54	122	21	93	211	52	118	44	77	175	42	95						
24	63	143	56	127	11	102	231	44	100	57	85	193	33	75						
25	64	147	57	131	11	85	196	27	62	68	66	152	23	53						
26	73	156	63	135	14	70	150	41	88	41	59	126	35	75						
27	72	152	57	121	21	83	176	35	74	58	73	155	31	66						
28	66	145	57	125	14	62	136	38	83	39	50	110	33	72						
29	72	158	61	134	15	156	342	42	92	73	143	314	34	75						
30	64	137	56	120	13	92	197	40	86	57	78	167	29	62						
31	72	153	64	136	11	96	204	63	134	34	76	162	43	91						
TOTAL		4239		3646			6096		2932			5086		2333						
ARITH. MEAN	66	141	57	122	14	92	197	44	95	52	77	164	35	75						

Digester Volume, ft^3
Primary 14,000
Secondary 14,000

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.5

Marshall, MICHIGAN

Supernatant To Raw Wetwell
Process Pattern raw -pri. dig.- sec. dig. - beds

MONTH August 1972

DIGESTER AND SLUDGE DATA

OPERATOR Robert J. Swalwell

DATE	RAW SLUDGE Gals. X 10	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 100
1	133	10.9	67	29	5.3	92																		27
2	199	9.1	70	38	5.5	91																		32
3	88	8.9	66	16	5.6	89																		31
4	133	12.1	63	31	5.6	88																		31
5	88	11.1	66	20	5.6	88																		31
6	133	8.0	70	22	5.6	87																		32
7	177	9.8	68	36	5.5	87		1.6	78			11934		.27	63	1420			480					22
8																								40
9	133	10.7	67	28	5.5	100																		42
10						109																		37
11	133	9.5	71	27	5.5	104																		29
12	88	9.2	69	17	5.6	100																		32
13	133	12.9	67	35	5.5	98																		32
14	133	12.4	86	43	5.7	95																		37
15	177	7.6	73	30	5.6	94																		33
16	177	10.3	67	37	5.4	92																		36
17	133	8.2	70	23	5.4	90																		29
18						90		1.3	64			10608		.26	64	1200								46
19	133	9.7	69	27	5.4	89																		33
20	133	10.2	69	28	5.6	88																		36
21						88																		30
22	354	9.0	70	67	5.5	98																		22
23	177	9.3	67	34	5.5	98																		45
24	88	9.8	66	18	5.5	95																		35
25	177	11.2	63	38	5.5	93																		35
26	88	12.4	56	18	5.6	92		1.2	55			13260				2320			220					35
27	88	12.0	60	19	5.7	90																		35
28						89																		35
29	177	8.9	64	30	5.5	89																		41
30	88	10.3	63	17	5.5	88																		42
31	88	13.6	60	22		87																		40
TOTAL	3647											35802												1063
ARITH. MEAN	140	10.3	67	29		92		1.4	65			11934		.27	64	1647			350					34

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4

Marshall, MICHIGAN

MONTH September 1972 — MISCELLANEOUS DATA — OPERATOR Robert J. Swalwell

DATE	WEATHER Precip. Inches	Temp. (°F) Max.	Temp. (°F) Min.	Type	RAW SEWAGE Temp. °F	Flow MGD Total MGD	Flow MGD Max. Rate	Flow MGD Min. Rate	pH	~~XXX~~ Water cf~~XX~~	Cl_2 lbs.	POWER KWH	AUX. FUEL *	CHEMICALS APPLIED					REMARKS
1	.05	84	54	R	59	2.57	3.30	1.90	7.4	1850	123	280	5						* Gas - cu. ft. X 100
2	.07	60	48	R	58	2.37	2.80	1.90	7.5	1910	122	240	6						
3		70	46	CL	58	2.31	2.80	1.80	7.4	1790	103	280	6						
4		70	44	C	58	2.41	3.10	1.80	7.5	1820	104	240	6						
5		74	50	C	59	2.51	3.20	1.90	7.5	1870	122	280	5						
6		76	56	C	59	2.45	3.10	1.80	7.4	1820	120	280	5						
7	1.15	84	62	R	60	2.47	3.30	1.90	7.4	1780	116	280	6						
8		70	46	CL	60	2.51	3.00	1.90	7.4	1770	113	280	5						
9		66	44	C	60	2.39	3.00	1.80	7.3	1830	118	280	4						
10		74	51	CL	58	2.35	2.90	1.80	7.4	1770	117	280	4						
11	.27	70	60	R	59	2.45	3.10	1.90	7.0	1760	120	240	3						
12	.82	74	62	R	59	2.49	2.80	1.90	7.5	1760	117	280	4						
13	.03	78	60	R	59	2.53	3.20	1.90	7.4	1770	121	240	6						
14		68	44	C	60	2.45	3.00	1.80	7.5	1770	118	280	7						
15		70	52	C	60	2.53	3.10	2.00	7.5	1760	133	280	7						
16		76	60	C	59	2.43	3.00	2.00	7.5	1780	123	240	7						
17	.98	85	58	R	59	2.56	3.40	2.00	7.2	1720	119	280	5						
18	.01	76	58	R	60	2.57	3.40	1.90	7.4	1740	121	280	6						
19		70	52	C	59	2.68	3.20	2.00	7.4	1760	121	280	6						
20		74	54	C	59	2.54	3.40	1.90	7.5	2060	121	280	7						
21		66	39	CL	59	2.41	3.00	1.80	7.4	1750	119	240	6						
22		58	42	C	58	2.34	3.00	1.80	7.5	1730	126	280	4						
23	.02	62	46	R	58	2.25	2.60	1.80	7.5	1760	108	240	5						
24	.08	75	62	R	59	2.32	2.90	1.80	7.4	1730	114	240	6						
25	1.42	72	64	R	59	2.66	4.00	2.00	7.4	1700	125	280	6						
26	.02	74	48	R	60	2.57	3.30	2.00	7.5	1720	125	280	9						
27		62	46	CL	59	2.48	3.00	1.90	7.4	1720	121	280	5						
28	.58	74	52	R	59	2.68	3.10	2.10	7.4	1690	116	280	8						
29	.07	60	38	R	59	2.54	3.10	1.90	7.5	1760	119	280	7						
30	.01	54	38	R	58	2.34	2.90	1.90	7.4	1700	126	280	7						
31																			
TOTAL	5.58										3571	8080	173						
ARITH. MEAN						2.47				1778	119								

MDPH
D-4.1

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH September 1972 PRIMARY TREATMENT DATA OPERATOR Robert J. Swalwell

DATE	5-DAY BOD INF. Mg/l	5-DAY BOD INF. LBS. X 10	5-DAY BOD EFF. Mg/l	5-DAY BOD EFF. LBS. X 10	5-DAY BOD REM. %	SUSPENDED SOLIDS INF. Mg/l	SUSPENDED SOLIDS INF. LBS. X 10	SUSPENDED SOLIDS EFF. Mg/l	SUSPENDED SOLIDS EFF. LBS. X 10	SUSPENDED SOLIDS REM. %	SUSP. VOLATILE SOLIDS INF. Mg/l	SUSP. VOLATILE SOLIDS INF. LBS. X 10	SUSP. VOLATILE SOLIDS EFF. Mg/l	SUSP. VOLATILE SOLIDS EFF. LBS. X 10	Total PHOSPHORUS – P INF. Mg/l	Total PHOSPHORUS – P INF. LBS. X	Total PHOSPHORUS – P EFF. Mg/l	Total PHOSPHORUS – P EFF. LBS. X	Total PHOSPHORUS – P REM. %	REMARKS
1	63	135	54	116	14	76	163	55	118	28	59	126	44	94						
2	60	119	52	103	13	75	148	34	67	55	65	129	26	51						
3	69	133	60	116	13	67	129	33	64	51	58	112	29	56						
4	69	139	60	121	13	71	143	34	68	52	62	125	30	60						
5	69	144	51	107	26	110	230	36	75	67	75	157	28	59						
6	68	139	54	110	20	84	172	36	74	57	74	151	31	63						
7	64	132	48	99	25	86	177	38	78	56	73	150	29	60						
8	68	142	63	132	7	98	205	51	107	48	81	170	40	84						
9	66	132	63	126	5	107	213	40	80	63	94	187	30	60						
10	76	149	64	125	16	108	212	40	78	63	97	190	36	71						
11	68	139	63	129	7	97	198	45	92	54	80	163	36	74						
12	67	139	54	112	19	94	195	41	85	56	73	152	29	60						
13	66	139	54	114	18	95	200	41	87	57	78	165	29	61						
14	58	118	48	98	17	91	186	40	82	56	77	157	34	69						
15	64	135	54	114	16	71	150	66	139	7	60	127	60	127						
16	57	116	45	91	21	56	114	32	65	43	42	85	21	43						
17	66	141	51	109	23	75	160	47	100	37	62	132	44	94						
18	84	180	64	137	24	117	251	57	122	51	96	206	33	71						
19	60	134	57	127	5	66	148	38	85	42	52	116	30	67						
20	88	186	54	114	39	167	354	40	85	76	135	286	31	66						
21	66	133	51	103	23	82	165	52	105	37	58	117	38	76						
22	88	172	57	111	35	132	258	44	86	67	90	176	34	66						
23	68	128	63	118	7	61	114	50	94	18	50	94	38	71						
24	66	128	60	116	9	67	130	45	87	33	55	106	37	72						
25	66	146	66	146	0	80	177	58	129	28	60	133	42	93						
26	63	135	61	131	3	60	129	43	92	28	49	105	34	73						
27	63	130	54	112	14	67	139	50	103	25	52	107	42	87						
28	64	143	45	101	29	71	158	44	98	38	54	121	36	80						
29	60	127	51	108	15	88	186	48	102	45	72	152	37	78						
30	70	137	60	117	14	63	123	31	61	51	103	103	25	49						
31																				
TOTAL		4170		3463			5236		2708			4300		2135						
ARITH. MEAN	67	139	56	115	16	86	175	44	90	46	70	143	34	71						

Digester Volume, ft^3
Primary 14,000
Secondary 14,000

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.5

Marshall, MICHIGAN

Supernatant To Raw Wetwell
Process Pattern Raw-pri. dig.-sec.dig. - beds

MONTH September 19 72

DIGESTER AND SLUDGE DATA

OPERATOR Robert J. Swalwell

DATE	RAW SLUDGE Gals. 10	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 100
1	88	11.7	62	19	5.5	87																		41
2	133	11.1	63	28	5.5	87																		41
3	88	11.0	68	20	5.8	86																		39
4						85																		35
5	199	9.1	70	39	5.7	85																		37
6	155	9.1	70	30	5.7	84																		38
7	155	7.3	69	24		84																		38
8	133	7.3	69	20	5.4	83																		27
9	133	8.5	67	23	5.6	82		1.3	67			10608		.22	62	1200			220					49
10	88	8.8	67	16	5.4	82																		44
11	177	7.3	72	28	5.5	82																		39
12	177	9.4	67	33	5.4	82																		41
13	133	8.2	61	20	5.5	81																		41
14	88	9.3	68	17		81																		37
15	177	9.3	68	34	5.3	81		1.0	50			11492		.29	66	2020			405					31
16	133	8.1	68	22	5.5	81																		50
17	177	7.6	68	28	5.6	81																		43
18						81																		37
19	221	8.1	67	36	5.5	81																		35
20	133	9.5	68	26	5.5	81																		37
21	88	10.8	60	18		80																		36
22	88	10.8	60	18	5.5	80																		35
23	88	10.6	62	18	5.5	80																		36
24	88	11.2	62	19	5.4	80																		36
25						80																		35
26	177	9.9	67	36	5.5	80																		26
27	133	8.9	65	23	5.6	80		2.3	79			14144		.17	63	840			300					50
28	133	10.0	61	25	5.5	79																		36
29	133	8.7	66	23	5.6	79																		36
30	133	8.8	66	23	5.4	78																		34
31																								
TOTAL	3647											36244												1140
ARITH. MEAN	135	9.3	66	25		82		1.5	65			12081		.23	64	1353			308					38

MDPH
D-4

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH October 1972 — MISCELLANEOUS DATA — OPERATOR Robert J. Swalwell

DATE	WEATHER Precip. Inches	Temp. (°F) Max.	Temp. (°F) Min.	Type	RAW SEWAGE Temp. °F	Flow MGD Total MGD	Flow MGD Max. Rate	Flow MGD Min. Rate	pH	water cf	Cl_2 lbs.	POWER KWH	AUX. FUEL *	CHEMICALS APPLIED					REMARKS
1		63	41	CL	57	2.31	2.70	1.80	7.4	1670	122	240	5						* Gas - cu. ft. X 100
2		72	50	C	58	2.40	3.00	1.80	7.5	2030	121	280	6						
3		72	50	C	58	2.39	2.90	1.80	7.5	1710	119	240	6						
4	.05	66	54	R	58	2.40	3.00	1.90	7.3	1710	112	280	6						
5		68	50	C	58	2.42	3.00	1.80	7.4	1730	100	280	5						
6		64	38	CL	58	2.40	3.00	1.80	7.4	1720	129	240	8						
7		54	40	C	58	2.29	2.90	1.80	7.4	1750	116	280	10						
8		60	31	CL	57	2.25	2.80	1.70	7.4	1670	126	280	11						
9		52	32	C	58	2.31	2.80	1.80	7.3	1750	111	240	11						
10	.07	60	40	R	58	2.36	2.90	1.80	7.4	1710	123	280	10						
11	.03	64	50	R	58	2.30	3.00	1.80	7.4	1730	118	280	10						
12		52	32	CL	58	2.27	2.90	1.70	7.4	1700	118	280	11						
13		52	38	CL	57	2.28	2.80	1.70	7.4	1720	126	240	12						
14		60	28	C	57	2.25	3.00	1.70	7.4	1840	115	280	10						
15	.04	52	35	R	57	2.19	2.70	1.80	7.4	1560	111	280	12						
16		62	30	C	58	2.37	3.10	1.80	7.5	2130	120	280	14						
17		42	26	CL	58	2.24	3.00	1.70	7.3	1680	123	280	10						
18	T	41	19	S	58	2.23	2.60	1.70	7.4	1810	116	280	11						
19		40	20	C	57	2.21	2.80	1.70	7.4	1720	118	280	39						
20	.02	48	24	R	57	2.22	2.80	1.70	7.4	1720	123	280	42						
21	.41	46	40	R	56	2.25	2.90	1.80	7.5	1740	116	240	10						
22	1.04	58	46	R	56	2.33	2.80	1.90	7.5	1790	93	280	12						
23	.03	60	36	R	58	2.40	3.00	1.90		1740	114	280	14						
24		42	32	CL	57	2.37	3.00	1.90	7.3	2130	119	240	13						
25		48	32	CL	56	2.30	2.70	1.80	7.3	1860	114	280	10						
26		52	30	C	56	2.34	3.00	1.70	7.5	1850	120	280	11						
27	.11	58	34	R	56	2.29	2.80	1.80	7.4	1830	122	280	13						
28	.25	52	36	R	56	2.29	2.60	1.80	7.3	1880	111	120	13						
29		44	36	CL	56	2.25	3.00	1.70	7.2	1840	109	160	10						
30		46	34	CL	56	2.34	3.20	1.70	7.3	2160	121	320	16						
31	.09	43	35	R	56	2.30	3.00	1.70	7.4	1850	114	320	19						
TOTAL	2.14										3620	8200	390						
ARITH. MEAN						2.31				1798	117								

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.1

Marshall, MICHIGAN

MONTH October 19 72 PRIMARY TREATMENT DATA OPERATOR Robert J. Swalwell

DATE	5-DAY BOD					SUSPENDED SOLIDS					SUSP. VOLATILE SOLIDS				Total PHOSPHORUS – P					REMARKS
	INF.		EFF.		REM.	INF.		EFF.		REM.	INF.		EFF.		INF.		EFF.		REM.	
	Mg/l	LBS. X 10	Mg/l	LBS. X 10	%	Mg/l	LBS. X 10	Mg/l	LBS. X 10	%	Mg/l	LBS. X 10	Mg/l	LBS. X 10	Mg/l	LBS. X	Mg/l	LBS. X	%	
1	74	143	54	104	27	101	195	37	71	63	79	152	27	52						
2	65	130	54	108	17	82	164	41	82	50	69	138	33	66						
3	80	159	69	138	14	78	155	38	76	51	66	132	31	62						
4	86	172	63	126	27	82	164	42	84	49	69	138	31	62						
5	63	127	57	115	10	80	161	38	77	53	62	125	33	67						
6	72	144	68	136	6	85	171	59	118	31	75	150	47	94						
7	63	120	54	103	14	69	132	47	90	32	55	105	37	71						
8	68	128	51	96	25	84	158	36	68	57	68	128	29	54						
9	76	146	63	121	17	102	197	48	92	53	83	160	40	77						
10	66	130	57	112	14	83	163	36	71	57	66	130	27	53						
11	64	123	54	104	19	79	152	36	69	54	66	127	29	56						
12	60	114	49	93	18	75	142	51	97	32	57	108	42	80						
13	64	122	48	91	25	117	223	38	72	68	101	192	31	59						
14	69	130	57	107	17	93	175	39	73	58	76	143	29	54						
15	84	153	60	110	29	134	245	39	71	71	117	214	33	60						
16	74	146	61	121	18	80	158	42	83	48	64	127	32	63						
17	66	123	66	123	0	64	120	54	101	16	54	101	46	86						
18	84	156	60	112	29	88	164	41	76	53	78	145	32	60						
19	64	118	54	100	16	94	173	45	83	52	80	147	35	65						
20	71	131	60	111	16	83	154	44	81	47	64	118	31	57						
21	72	135	45	84	37	62	116	36	68	42	52	98	24	45						
22	76	148	57	111	25	86	167	33	64	62	73	142	28	54						
23	67	134	57	114	15	78	156	42	84	46	58	116	31	62						
24	72	142	57	113	21	90	178	47	93	48	77	152	38	75						
25	69	132	54	104	22	86	165	53	102	38	67	129	41	79						
26	65	127	46	90	29	73	142	43	84	41	54	105	31	61						
27	76	145	63	120	17	63	120	30	57	52	52	99	26	50						
28	70	134	57	109	19	58	111	31	59	47	49	94	23	44						
29	84	158	72	135	17	94	176	35	66	63	79	148	28	53						
30	80	156	72	141	10	71	139	41	80	42	62	121	32	62						
31	66	127	60	115	9	78	150	33	63	58	64	123	24	46						
TOTAL		4253		3467			4986		2455			4107		1929						
ARITH. MEAN	71	137	58	112	19	84	161	41	79	49	69	132	32	62						

Digester Volume, ft^3
Primary 14,000
Secondary 14,000

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.5

Marshall, MICHIGAN

Supernatant To Raw wetwell
Process Pattern raw - pri. dig.-sec. dig. - beds

MONTH October 19 72

DIGESTER AND SLUDGE DATA

OPERATOR Robert j. Swalwell

DATE	RAW SLUDGE Gals. 10^X	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. 10^X	DIGESTED SLUDGE Total Solids %	DIGESTED SLUDGE Vol. Solids %	DIGESTED SLUDGE pH	Gas Produced cu. ft X 100
1	133	8.2	67	22	5.5	78																		32
2						78																		32
3	133	9.6	67	26	5.5	78																		31
4	133	9.2	62	23	5.7	78																		32
5	265	8.5	67	46	5.8	78																		33
6						77		1.3	57			10166		.28	62	1640			540					28
7	88	8.2	68	15		77																		46
8	133	8.2	68	22	5.6	77																		33
9	111	12.7	81	34	5.3	77																		31
10	155	10.1	76	36	5.4	76																		31
11	177	8.1	67	29	5.8	76																		28
12	133	8.7	67	23	5.8	76																		30
13	88	10.6	62	18	5.7	75																		25
14	88	8.4	64	14	5.6	75																		29
15	133	8.9	66	23	5.8	75																		27
16						74		.6	60			11934												7
17	133	8.3	68	23	5.7	75																		39
18	133	11.9	64	31	5.8	74																		25
19	133	7.7	65	20	5.7	73																		26
20	133	8.0	68	22	5.8	87																		32
21	133	9.1	65	24	5.6	100																		36
22	133	10.1	64	26	5.7	104																		36
23						110																		27
24	221	10.8	63	45	5.6	102																		25
25	133	8.2	67	22	5.7	95																		27
26	133	10.3	64	27		90																		21
27						88		.4	60			11492		.23	64	980			530	575	12.4	49		37
28	133	7.5	67	20																				23
29	88	10.1	63	17	5.6																			18
30																								18
31	221	8.1	67	37	5.3	75																		17
TOTAL	3492											33592								575				882
ARITH. MEAN	140	9.2	67	26		82		.8	59			11197		.25	63	1310			535					28

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4

Marshall, MICHIGAN

MONTH November 19 72 — MISCELLANEOUS DATA — OPERATOR Robert J. Swalwell

DATE	WEATHER Precip. Inches	Temp. (°F) Max.	Temp. (°F) Min.	Type	RAW SEWAGE Temp. °F	Flow MGD Total MGD	Flow MGD Max. Rate	Flow MGD Min. Rate	pH	GRIT water cf/~~mx~~	Cl_2 lbs.	POWER KWH	AUX. FUEL *	CHEMICALS APPLIED					REMARKS
1	.41	56	42	R	56	2.37	2.90	1.90	7.4	1860	109	320	13						* Gas - cu. ft X 100
2		64	42	CL	56	2.36	2.70	1.80	7.5	1820	119	240	12						
3	.01	50	40	R	56	2.35	3.00	1.90	7.4	1910	110	280	12						
4		44	38	CL	56	2.31	3.00	1.80	7.4	2100	113	280	12						
5		48	32	CL	55	2.29	2.90	1.80	7.4	2090	119	280	11						
6	.01	56	34	R	56	2.36	3.00	1.80	7.5	2160	116	280	10						
7	.90	54	42	R	56	2.46	2.70	1.90	7.5	2080	114	280	12						
8		46	38	CL	56	2.40	3.00	1.80	7.5	1890	116	280	11						
9		42	38	CL	56	2.43	3.00	1.90	7.5	1840	140	280	18						
10	.05	44	38	R	56	2.44	2.90	1.90	7.5	2090	124	320	12						
11		46	38	CL	56	2.37	3.00	1.90	7.5	1840	111	280	15						
12		46	35	CL	55	2.36	2.90	1.90	7.6	1820	111	240	15						
13	.74	36	30	R&S	56	2.46	3.10	1.80	7.5	1750	114	320	14						
14	.03	34	16	S	55	2.41	3.00	1.90	7.6	1790	117	280	15						
15		32	12	CL	55	2.35	2.90	1.90	7.7	1810	113	320	13						
16		34	14	CL	55	2.37	3.00	1.80	7.7	1800	115	280	12						
17		36	28	CL	55	2.35	3.00	1.90	7.6	1810	112	280	21						
18		38	32	CL	54	2.31	2.90	1.80	7.5	1850	99	280	34						
19	.21	37	31	R&S	54	2.35	2.80	1.90	7.6	1800	108	320	20						
20	T	38	30	S	54	2.41	3.00	1.80	7.7	1800	115	280	16						
21		40	28	CL	55	2.41	3.00	1.90	7.5	1780	124	280	20						
22		34	28	CL	55	2.40	3.00	1.80	7.5	1920	114	280	19						
23		36	24	C	55	2.30	2.90	1.90	7.5	1830	96	280	16						
24		40	26	CL	54	2.37	3.20	1.90	7.5	1800	114	280	12						
25	.60	38	30	S	54	2.40	3.30	1.90	7.6	1830	114	280	17						
26	.13	36	29	S	54	2.37	3.20	1.90	7.6	1790	89	280	14						
27		34	28	CL	54	2.48	3.30	1.90	7.6	1780	123	320	20						
28		36	20	CL	54	2.34	3.10	1.80	7.7	1820	117	280	10						
29		34	20	CL	54	2.34	2.60	1.80	7.6	1810	128	320	20						
30	.03	37	24	S	54	2.35	3.00	1.80	7.6	1830	117	240	23						
31																			
TOTAL	3.12										3431	8560	469						
ARITH. MEAN						2.38				1870	114								

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.1

Marshall, MICHIGAN

MONTH November 19 72 PRIMARY TREATMENT DATA OPERATOR Robert J. Swalwell

DATE	5-DAY BOD INF. Mg/l	5-DAY BOD INF. LBS. X 10	5-DAY BOD EFF. Mg/l	5-DAY BOD EFF. LBS. X 10	5-DAY BOD REM. %	SUSPENDED SOLIDS INF. Mg/l	SUSPENDED SOLIDS INF. LBS. X 10	SUSPENDED SOLIDS EFF. Mg/l	SUSPENDED SOLIDS EFF. LBS. X 10	SUSPENDED SOLIDS REM. %	SUSP. VOLATILE SOLIDS INF. Mg/l	SUSP. VOLATILE SOLIDS INF. LBS. X 10	SUSP. VOLATILE SOLIDS EFF. Mg/l	SUSP. VOLATILE SOLIDS EFF. LBS. X 10	Total PHOSPHORUS – P INF. Mg/l	Total PHOSPHORUS – P INF. LBS. X	Total PHOSPHORUS – P EFF. Mg/l	Total PHOSPHORUS – P EFF. LBS. X	Total PHOSPHORUS – P REM. %	REMARKS
1	80	158	57	113	29	67	132	41	81	39	56	111	36	71						
2	84	165	72	142	14	102	201	56	110	45	92	181	51	100						
3	75	147	64	125	15	90	176	63	123	30	77	151	52	102						
4	84	160	64	122	24	126	241	39	74	69	107	204	29	55						
5	74	143	52	100	30	47	91	27	52	43	47	91	27	52						
6	66	130	60	118	9	74	146	41	81	45	56	110	23	45						
7	83	170	68	140	18	93	191	47	96	49	79	162	45	92						
8	85	170	62	124	27	87	174	48	96	45	71	142	40	80						
9	69	140	60	120	13	95	193	50	101	47	81	164	35	71						
10	89	181	68	138	24	109	222	69	140	37	87	177	58	118						
11	66	130	58	115	12	76	150	46	91	39	63	125	33	65						
12	69	136	57	112	17	66	130	37	73	44	54	106	30	59						
13	68	140	64	131	6	116	238	54	111	53	100	205	45	92						
14	72	145	63	127	13	111	223	48	96	57	99	199	42	84						
15	68	133	57	118	16	82	161	53	104	35	70	137	46	90						
16	68	134	66	130	3	74	146	55	109	26	55	115	42	83						
17	68	133	57	112	16	74	145	53	104	28	59	116	44	86						
18	60	116	56	108	4	70	135	40	77	43	56	108	31	60						
19	76	149	51	100	33	109	214	46	90	58	97	190	41	80						
20	63	127	51	103	23	76	153	43	86	43	63	127	31	62						
21	92	185	53	107	42	165	332	44	88	73	130	261	37	74						
22	68	136	44	88	35	80	160	27	54	54	67	134	24	48						
23	72	138	64	123	11	74	142	30	58	59	60	115	24	46						
24	78	154	65	129	17	85	168	42	83	51	63	125	32	63						
25	68	136	57	114	16	93	186	33	66	65	72	144	23	46						
26	62	123	58	115	6	52	103	36	71	31	43	85	30	59						
27	76	157	65	134	14	103	213	52	108	50	87	180	44	91						
28	76	148	63	123	17	72	141	42	82	42	51	100	32	62						
29	72	141	54	105	25	101	197	43	84	57	83	162	34	66						
30	71	139	54	106	24	75	147	36	71	52	61	120	30	59						
31																				
TOTAL		4364		3542			5251		2660			4347		2161						
ARITH. MEAN	73	145	59	118	18	88	175	45	89	47	73	145	36	72						

Digester Volume, ft^3
Primary 14,000
Secondary 14,000

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MDPH
D-4.5

Supernatant To Raw Wetwell
Process Pattern raw-pri.dig.-sec.dig.-beds

MONTH November 19 72

DIGESTER AND SLUDGE DATA

OPERATOR Robert J. Swalwell

DATE	RAW SLUDGE Gals. 10	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 100
1	133	6.0	67	16	5.3	73																		20
2	88	9.3	64	16		84																		16
3						88																		18
4	177	10.5	58	33	5.3	91																		17
5	88	9.1	70	17	5.7	91																		17
6						91																		19
7	177	10.1	63	34	5.8	95																		18
8						94																		18
9	133	10.0	65	26		96																		19
10	133	10.0	65	26	5.6	96																		20
11	88	9.1	67	16	5.8	96																		25
12	177	10.4	65	36	5.7	98																		25
13						100																		9
14	88	9.7	62	16	5.8	98		.60	77			10608		.21	64	820			540					31
15	133	12.4	59	30		88																		22
16	88	11.0	62	18	5.7	94																		25
17	133	8.5	63	22	5.7	98																		24
18	133	13.0	55	29	5.7	98																		24
19	88	10.1	65	18	5.8	100																		23
20						100																		20
21	133	11.1	65	29	5.5	102																		21
22	133	13.1	59	31	5.6	101																		21
23						101																		19
24	88	10.2	68	18	5.6	102																		20
25	88	9.4	65	16	5.6	102																		21
26	133	11.2	62	28	5.6	102																		20
27						102																		
28	221	9.4	62	39	5.6	98		2.50	75			12376		.31	68	1740			1050					9
29	133	11.7	58	27	5.6	88																		38
30	133	11.7	54	25	5.7	104																		2
31																								
TOTAL	2917											22984												550
ARITH. MEAN	127	10.3	63	24		96		1.60	76			11492		.26	66	1280			795					18

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4

Marshall, MICHIGAN

MONTH December 1972 — MISCELLANEOUS DATA — OPERATOR Robert J. Swalwell

DATE	WEATHER Precip. Inches	Temp. (°F) Max.	Temp. (°F) Min.	Type	RAW SEWAGE Temp. °F	Flow MGD Total MGD	Flow MGD Max. Rate	Flow MGD Min. Rate	pH	~~GRIT~~ water cf/~~mg~~	Cl_2 lbs.	POWER KWH	AUX. FUEL *	CHEMICALS APPLIED					REMARKS
1	.15	32	24	S	54	2.32	3.20	1.80	7.7	1830	115	280	18						* Gas - cu. ft. X 100
2		44	24	CL	54	2.29	3.10	1.80	7.6	1810	114	320	19						
3	.03	30	19	S	54	2.26	3.10	1.80	7.6	1820	120	280	20						
4	.05	28	20	S	54	2.49	3.60	2.10	7.7	2210	114	280	20						
5	.50	34	22	R&S	54	2.37	3.00	1.90	7.6	1820	110	280	27						
6	.02	24	-2	S	54	2.25	2.60	1.80	7.6	1820	120	280	25						
7	.03	24	0	S	53	2.25	2.60	1.90	7.8	1870	120	280	20						
8	.01	33	24	R	53	2.25	2.50	1.80	7.7	1880	109	280	20						
9	.09	35	22	R&S	53	2.26	2.90	1.80	7.6	1820	111	320	21						
10	.01	27	0	S	53	2.20	2.80	1.80	7.6	1800	109	280	20						
11	.22	23	2	S	54	2.25	2.90	1.80	7.7	1870	108	320	24						
12	1.02	34	22	R&S	53	2.31	2.80	1.80	7.7	1800	110	320	22						
13		28	22	CL	52	2.26	2.70	1.80	7.6	1820	101	240	21						
14		30	22	CL	52	2.26	2.70	1.80	7.6	1840	114	320	25						
15	.10	28	16	S	52	2.44	3.10	2.00	7.6	1870	112	320	27						
16	.01	20	4	S	52	2.39	3.00	2.00	7.7	1890	128	320	24						
17		26	6	CL	52	2.41	3.10	2.00	7.7	1910	114	320	20						
18		36	22	CL	53	2.44	3.00	1.90	7.7	1910	111	320	21						
19		40	34	CL	52	2.47	3.10	1.90	7.7	1880	114	320	20						
20	.03	38	34	R	52	2.47	2.90	1.90	7.7	1900	125	320	20						
21		40	32	CL	52	2.42	3.00	1.90	7.7	1850	121	280	18						
22		36	30	CL	52	2.44	3.20	1.90	7.6	1870	120	320	18						
23		36	30	CL	52	2.36	3.10	1.90	7.6	1790	122	280	19						
24		34	30	CL	52	2.35	3.00	1.90	7.6	1790	112	280	18						
25	.07	34	29	S	52	2.28	2.60	1.90	7.5	1910	111	280	19						
26		35	20	CL	52	2.47	3.20	2.00	7.7	1830	112	320	17						
27		36	22	CL	52	2.50	3.10	1.90	7.6	2130	117	280	17						
28	.03	36	26	S	52	2.48	3.40	1.90	7.6	1880	113	280	16						
29	.51	42	28	R	51	2.56	3.20	2.10	7.5	1840	118	320	18						
30	.88	50	32	R	51	2.95	3.70	2.30	7.4	1830	120	280	19						
31		36	22	CL	51	2.94	3.50	2.50		1810	80	320	18						
TOTAL	3.76										3525	9240	631						
ARITH. MEAN						2.39				1868	114								

MDPH
D-4.1

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH December 1972 PRIMARY TREATMENT DATA OPERATOR Robert J. Swalwell

DATE	5-DAY BOD INF. Mg/l	5-DAY BOD INF. LBS. X 10	5-DAY BOD EFF. Mg/l	5-DAY BOD EFF. LBS. X 10	5-DAY BOD REM. %	SUSPENDED SOLIDS INF. Mg/l	SUSPENDED SOLIDS INF. LBS. X 10	SUSPENDED SOLIDS EFF. Mg/l	SUSPENDED SOLIDS EFF. LBS. X 10	SUSPENDED SOLIDS REM. %	SUSP. VOLATILE SOLIDS INF. Mg/l	SUSP. VOLATILE SOLIDS INF. LBS. X 10	SUSP. VOLATILE SOLIDS EFF. Mg/l	SUSP. VOLATILE SOLIDS EFF. LBS. X 10	Total PHOSPHORUS – P INF. Mg/l	Total PHOSPHORUS – P INF. LBS. X	Total PHOSPHORUS – P EFF. Mg/l	Total PHOSPHORUS – P EFF. LBS. X	Total PHOSPHORUS – P REM. %	REMARKS
1	76	147	54	104	29	129	250	46	89	64	75	145	36	70						
2	80	153	48	92	40	100	191	48	92	52	79	151	37	71						
3	60	113	39	74	35	91	172	29	55	68	79	149	24	45						
4	80	166	60	125	25	79	164	38	79	52	64	133	34	71						
5	68	134	48	95	29	83	164	44	87	47	68	134	38	75						
6	65	122	51	96	22	72	135	41	77	43	67	126	35	66						
7	64	120	42	79	34	128	240	48	90	63	65	122	34	64						
8	45	84	36	68	20	66	124	48	90	27	42	79	34	64						
9	51	96	33	62	35	79	149	32	60	60	51	96	30	57						
10	63	116	45	83	29	72	132	26	48	64	40	73	20	37						
11	60	113	54	101	10	84	158	38	71	55	64	120	33	62						
12	60	116	42	81	30	80	154	33	64	59	62	119	26	50						
13	69	130	51	96	26	104	196	33	62	68	77	145	26	49						
14	71	134	51	96	28	94	177	37	70	61	72	136	29	55						
15	88	179	44	90	50	135	275	54	110	60	101	205	48	98						
16	65	130	42	84	35	83	165	49	98	41	64	128	38	76						
17	69	139	60	121	13	92	185	44	88	52	67	135	36	72						
18	68	138	60	122	12	85	173	45	92	47	72	147	37	75						
19	100	206	51	105	49	91	187	47	97	48	73	150	38	78						
20	76	157	65	134	14	88	181	46	95	48	69	142	35	72						
21	76	153	65	131	14	77	155	58	117	25	65	131	50	101						
22	76	155	63	128	16	159	324	40	81	75	132	269	28	57						
23	73	144	64	126	11	65	128	43	85	34	47	292	34	67						
24	69	135	54	106	22	64	125	36	71	44	51	100	28	55						
25	48	91	36	68	25	54	103	27	51	50	46	87	19	36						
26	80	165	68	140	15	95	196	47	97	51	75	155	40	82						
27	68	142	60	125	12	131	273	35	73	73	119	248	31	65						
28	60	124	54	112	10	61	126	32	66	48	53	110	27	56						
29	60	128	48	102	20	87	186	37	79	57	66	141	28	60						
30	57	140	48	118	16	69	170	40	98	42	56	138	33	81						
31	51	125	48	118	6	72	177	33	81	54	66	162	29	71						
TOTAL		4195		3182			5535		2513			4268		2038						
ARITH. MEAN	68	135	51	103	24	89	179	40	81	53	69	138	33	66						

Digester Volume, ft^3
Primary 14,000
Secondary 14,000

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.5

Marshall, MICHIGAN

Supernatant To Raw Wetwell
Process Pattern raw-pri.dig.-sec.dig.-beds

MONTH December 1972

DIGESTER AND SLUDGE DATA

OPERATOR Robert J. Swalwell

DATE	RAW SLUDGE Gals. X 10	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 100
1	88	11.6	55	17	5.7																			39
2	88	12.7	61	20	5.6	105																		24
3	88	9.5	63	16	5.8	104																		24
4	177	9.6	59	31	6.0	102																		6
5	221	10.5	57	40	5.9	96																		37
6						100		5.3	64			13702		.46	67									8
7	177	9.2	65	32	5.9	97																		35
8	133	10.8	60	26	6.0	106																		20
9	88	7.9	63	13	5.9	86																		22
10	133	10.9	62	27	5.6	101																		20
11						96																		22
12						100																		22
13	177	10.4	55	31	6.0	104																		4
14	133	11.0	56	25		92																		30
15	177	19.0	41	41	5.8	102																		20
16	88	13.2	49	17	5.9	102																		18
17	88	9.7	57	15	5.8	97																		20
18						96																		20
19						99																		17
20	177	12.3	52	34	5.6	100																		15
21	88	12.1	53	17	6.0	98																		3
22	133	11.1	50	22	6.0	93																		30
23	133	13.3	39	21	6.0			2.0	66			12818												20
24	111	9.8	71	23	5.9	85																		14
25	133	8.7	61	22	5.8	82																		17
26						78																		17
27	111	12.4	50	21	5.6	90																		20
28	133	8.9	58	21	6.0	92																		18
29	133	12.2	45	22	6.1	93																		21
30	133	10.9	58	25	6.0	94																		23
31	177	7.4	60	24	6.4	96																		23
TOTAL	3315											26520												629
ARITH. MEAN	133	11.0	56	24		96		3.6	65			13260		.46	67									20

MDPH
D-4

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH January 19 74

MISCELLANEOUS DATA

OPERATOR Robert J. Swalwell

DATE	WEATHER Precip. inches	Temp. (°F) Max.	Temp. (°F) Min.	Type	RAW SEWAGE Temp °F	Flow MGD Total MGD	Flow MGD Max Rate	Flow MGD Min. Rate	pH	GRIT water cf/~~XX~~	Cl_2 lbs.	POWER KWH	AUX. FUEL *	CHEMICALS APPLIED					REMARKS
1	.01	20	-1	R	51	2.73	3.10	2.20	7.6	2600	121	360	23						*Gas - cu. ft. X 100
2	.05	22	1	S	51	2.96	3.60	2.20	7.5	2680	119	400	21						
3		26	4	CL	51	2.83	3.20	2.20	7.6	2660	114	360	29						
4		22	4	CL	51	2.81	3.50	2.10	7.5	2650	119	360	17						
5		26	12	CL	51	2.75	3.30	2.00	7.6	2630	99	360	25						
6	.03	26	12	S	51	2.63	3.00	2.00	7.6	2590	100	360	25						
7	.01	18	-2	S	51	2.83	3.50	2.00	7.5	2730	86	360	14						
8	.31	20	1	S	51	2.75	3.10	2.20	7.4	2670	116	400	13						
9	.07	24	4	S	50	2.75	3.30	2.10	7.5	2700	129	360	22						
10	.08	30	18	S	51	2.73	3.10	2.10	7.4	2740	114	360	22						
11	.03	24	11	S	51	2.70	3.20	2.00	7.5	2740	112	400	22						
12		18	2	CL	51	2.67	3.10	2.10	7.6	2700	102	360	22						
13		25	5	CL	50	2.65	3.00	2.10	7.6	2760	102	320	10						
14		32	25	CL	51	2.74	3.40	2.10	7.7	2820	118	400	14						
15		38	26	CL	51	2.71	3.30	2.20	7.6	1990	115	320	13						
16		42	28	CL	51	2.70	3.50	2.20	7.5	1860	114	320	13						
17		32	26	CL	51	2.63	3.10	2.10	7.6	1690	115	320	14						
18		42	26	CL	50	2.72	3.40	2.10	7.5	1990	118	320	14						
19	.66	35	28	R	51	2.70	3.40	2.20	7.5	1780	109	320	13						
20	.79	46	34	R	50	3.10	3.80	2.60	7.6	1890	105	360	13						
21		35	32	CL	51	3.37	4.10	2.80	7.7	1810	122	400	13						
22	.48	38	33	R	50	3.41	4.10	2.80	7.7	1800	133	360	13						
23		34	23	CL	51	3.38	4.10	2.70	7.7	1890	120	400	14						
24		38	24	C	50	3.35	4.30	2.80	7.6	1810	120	360	13						
25		44	28	C	51	3.35	4.20	2.80	7.6	1820	119	360	14						
26	.52	50	28	R	50	3.33	4.00	2.80	7.7	1850	104	360	14						
27		37	28	CL	51	3.31	3.80	2.70	7.7	1870	107	320	15						
28	.20	34	28	S	50	3.38	4.20	2.70		1800	127	400	14						
29		36	27	CL	50	3.31	3.80	2.80	7.4	1840	122	360	14						
30		46	29	C	51	3.39	4.00	2.70	7.5	1830	128	360	14						
31		-2	18	CL	50	3.22	3.90	2.60	7.6	1800	115	360	14						
TOTAL	3.24										3544	11160	511						
ARITH MEAN						2.96				2225	114								

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.1

Marshall, MICHIGAN

MONTH January 1974 — PRIMARY TREATMENT DATA — OPERATOR Robert J. Swalwell

DATE	5-DAY BOD INF. Mg/l	5-DAY BOD INF. LBS. X 10	5-DAY BOD EFF. Mg/l	5-DAY BOD EFF. LBS. X 10	5-DAY BOD REM. %	SUSPENDED SOLIDS INF. Mg/l	SUSPENDED SOLIDS INF. LBS. X 10	SUSPENDED SOLIDS EFF. Mg/l	SUSPENDED SOLIDS EFF. LBS. X 10	SUSPENDED SOLIDS REM. %	SUSP. VOLATILE SOLIDS INF. Mg/l	SUSP. VOLATILE SOLIDS INF. LBS. X 10	SUSP. VOLATILE SOLIDS EFF. Mg/l	SUSP. VOLATILE SOLIDS EFF. LBS. X 10	Total PHOSPHORUS – P INF. Mg/l	Total PHOSPHORUS – P INF. LBS. X	Total PHOSPHORUS – P EFF. Mg/l	Total PHOSPHORUS – P EFF. LBS. X	Total PHOSPHORUS – P REM. %	REMARKS
1	66	150	36	82	45	116	264	28	64	76	101	230	24	55						
2	72	178	39	96	46	101	249	30	74	70	75	185	22	54						
3	42	99	39	92	7	72	170	49	116	32	52	123	28	66						
4	57	135	47	110	18	63	148	30	70	52	40	94	19	45						
5	54	124	51	117	6	39	89	38	87	3	31	71	30	69						
6	62	136	36	79	43	69	151	30	66	57	57	125	24	53						
7	54	127	51	120	6	63	149	36	85	43	41	97	25	59	4.0	94	3.8	90	5	
8	54	124	39	89	28	89	204	30	69	66	66	151	23	53	3.8	87	3.2	73	16	
9	60	138	36	83	40	105	241	34	78	68	71	163	25	57	4.0	92	3.6	83	10	
10	66	150	33	75	50	84	191	27	61	68	52	118	21	48	3.8	87	3.2	73	16	
11	60	135	42	95	30	50	113	42	95	16	27	61	18	41						
12	60	134	44	98	27	53	118	22	49	58	44	98	14	31						
13	60	133	42	93	30	76	168	27	60	64	59	130	21	46	3.6	80	3.0	66	11	
14	54	123	48	110	11	94	215	31	71	67	74	169	23	53						
15	45	102	42	95	7	93	210	33	75	65	74	167	23	52						
16	57	128	42	95	26	73	164	36	91	51	47	106	24	54	3.2	72	3.0	68	6	
17	48	105	39	86	19	56	123	38	83	32	41	90	23	50	3.4	75	3.2	70	6	
18	51	116	42	95	18	88	200	33	75	63	67	152	22	50						
19	73	164	45	101	38	71	160	34	77	52	55	124	23	52						
20	51	132	36	93	29	56	145	31	80	45	41	106	21	54						
21	68	191	38	107	44	44	124	32	90	27	21	59	16	45	2.8	79	2.8	79	0	
22	54	154	39	111	28	108	307	43	122	60	67	191	27	77	2.6	74	2.2	63	15	
23	48	135	30	85	38	76	214	49	138	36	29	82	35	99						
24	36	101	30	84	17	90	251	37	103	59	68	190	23	64	2.6	73	2.4	67	8	
25	42	117	39	109	7	54	151	33	92	39	30	84	21	59						
26	40	111	24	67	40	77	214	15	42	81	54	150	9	25						
27	57	157	45	124	21	85	235	29	80	66	59	163	16	44	2.8	77	2.8	77	0	
28																				
29	44	121	30	83	32	47	130	26	72	45	34	94	20	55	2.8	77	3.2	88	-14	
30	36	99	28	77	34	64	176	25	69	61	45	123	15	41	4.4	121	2.8	77	36	
31	52	140	33	89	37	99	266	31	83	69	88	236	25	67	2.8	75	2.8	75	0	
TOTAL		3959		2840			5540		2417			3932		1618		1163		1049		
ARITH. MEAN	54	132	39	95	27	75	185	33	81	53	54	131	22	54	3.3	83	3.0	75	8	

Digester Volume, ft^3
Primary 14,000
Secondary 14,000

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.5

Marshall, MICHIGAN

Supernatant To Raw Wetwell
Process Pattern raw-pri.dig.-sec.dig.-beds

MONTH January 1974

DIGESTER AND SLUDGE DATA

OPERATOR Robert J. Swalwell

DATE	RAW SLUDGE Gals. 10	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 100
1						90																		20
2	177	9.6	56	29	6.1	90																		19
3	177	8.6	82	38	6.1	90																		19
4	177	10.0	64	35	6.1	88																		18
5	88	8.2	51	11	6.3	87																		21
6	133	9.2	51	19	6.3	88																		20
7	111	9.3	53	17	6.2	88																		1
8	243	8.4	57	35	6.2	86																		27
9	88	10.3	41	11	6.1	86		1.0	67			8398		.28	56	1620			495					20
10	88	9.1	56	14	6.1	86																		22
11	133	8.7	54	19	6.1	86																		22
12	88	11.3	52	16	6.3	86																		23
13	133	8.4	53	18	6.2	86																		23
14	177	9.1	58	28	6.3	87																		17
15	111	9.1	53	16	6.1	87		.9	63			13260												7
16	88	4.7	57	7	6.3	84																		31
17	155	9.1	53	23	6.3	86																		27
18	177	9.2	59	29	6.2	88																		24
19	133	7.3	60	18	6.3	89																		23
20	177	8.3	59	27	6.2	90																		22
21	88	9.6	48	12	6.2	90																		19
22	133	8.4	49	17	6.4	90																		20
23	155	10.1	54	25	6.6	90																		17
24	133	8.7	67	24	6.4	89																		18
25	133	8.8	59	21	6.4	88																		20
26	133	10.3	52	21	6.5	88																		22
27	133	9.5	55	21	6.6	89																		19
28	177	9.3	50	25	6.5	89		.9	56			16354		.28	60	1480			630					19
29	199	10.8	57	37	6.5	90																		6
30	133	10.4	54	23	6.4	87																		40
31	133	8.4	53	18	6.7	90																		30
TOTAL	4199											38012												636
ARITH. MEAN	140	9.1	56	22		88		.9	62			12671		.28	58	1546			562					21

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4

Marshall, MICHIGAN

MONTH February 1974

MISCELLANEOUS DATA

OPERATOR Robert J. Swalwell

DATE	WEATHER Precip. Inches	Temp. (°F) Max.	Temp. (°F) Min.	Type	RAW SEWAGE Temp. °F	Flow MGD Total MGD	Flow MGD Max. Rate	Flow MGD Min. Rate	pH	~~BOD~~ Water cfs	Cl_2 lbs.	POWER KWH	AUX. FUEL *	CHEMICALS APPLIED					REMARKS
1	.23	24	16	S	50	3.25	4.00	2.80	7.6	1940	126	360	19						* Gas - cu. ft. X 100
2		28	14	CL	50	3.07	3.60	2.70	7.6	1850	112	320	19						
3	.07	28	14	S	49	3.02	3.60	2.70	7.5	1800	88	360	18						
4		17	-2	C	50	3.15	4.00	2.50	7.5	1830	127	400	22						
5	.27	20	10	S	50	3.11	3.50	2.60	7.6	2110	114	360	19						
6	.15	20	10	S	49	3.04	3.60	2.50	7.6	1860	112	360	18						
7		20	-8	C	49	2.99	3.40	2.10	7.5	1840	110	360	22						
8		24	-8	C	49	3.04	3.70	2.50	7.5	1910	117	400	20						
9	.01	24	8	S	50	2.95	3.50	2.50	7.5	1900	111	360	19						
10	.09	21	14	S	50	2.85	3.40	2.40	7.6	1830	108	400	20						
11		30	14	CL	49	3.00	4.80	1.80	7.5	1850	124	360	14						
12		42	34	C	50	2.97	4.20	1.00	7.6	1860	124	360	7						
13		36	10	CL	50	2.91	3.50	2.20	7.6	1840	122	320	16						
14		26	6	CL	49	2.87	3.40	2.20	7.6	1810	121	320	20						
15		26	6	CL	49	2.97	3.60	2.20	7.5	1920	124	360	16						
16		36	17	C	49	2.84	3.50	2.20	7.6	1890	105	320	15						
17		36	16	C	49	2.79	3.40	2.20	7.5	1940	104	360	15						
18	.18	41	26	R	49	2.98	3.60	2.20	7.6	1820	120	320	14						
19	.34	36	18	R	50	3.00	3.60	2.20	7.5	1840	120	320	15						
20		40	18	C	50	2.97	3.70	2.20	7.6	1870	126	360	11						
21	.65	46	34	R	49	3.11	3.50	2.60	7.4	1840	125	320	8						
22	.29	42	16	R	50	3.34	4.30	2.60	7.5	1830	117	360	17						
23		26	10	CL	49	3.19	3.80	2.60	7.6	1910	106	360	21						
24		20	4	CL	48	3.21	3.70	2.60	7.5	1800	108	360	44						
25		26	6	C	49	3.21	4.10	2.60	7.7	1900	125	360	13						
26		35	14	C	50	3.18	3.60	2.60	7.6	1840	115	360	11						
27		46	30	C	50	3.17	3.80	2.50	7.6	2130	130	360	20						
28		52	30	C	50	3.14	3.60	2.50	7.5	1740	121	360	6						
29																			
30																			
31																			
TOTAL	2.28										3262	9920	479						
ARITH. MEAN						3.05				1875	117								

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.1

Marshall, MICHIGAN

MONTH February 19 74 PRIMARY TREATMENT DATA OPERATOR Robert J. Swalwell

DATE	5-DAY BOD					SUSPENDED SOLIDS					SUSP. VOLATILE SOLIDS				Total PHOSPHORUS – P					REMARKS
	INF.		EFF.		REM.	INF.		EFF.		REM.	INF.		EFF.		INF.		EFF.		REM.	
	Mg/l	LBS. X 10	Mg/l	LBS. X 10	%	Mg/l	LBS. X 10	Mg/l	LBS. X 10	%	Mg/l	LBS. X 10	Mg/l	LBS. X 10	Mg/l	LBS. X	Mg/l	LBS. X	%	
1	45	121	33	89	27	93	252	32	86	66	73	197	21	56						
2	45	115	24	61	47	58	148	24	61	59	45	115	17	43						
3	45	113	33	83	27	58	146	23	58	60	46	115	15	37						
4	44	115	32	84	27	59	155	27	71	54	43	113	17	45	4.4	116	4.4	116	0	
5	64	166	48	124	25	103	267	29	75	72	65	169	17	44	4.0	103	3.2	83	20	
6	45	114	44	111	2	105	266	34	86	68	81	205	23	58						
7	60	149	39	97	35	53	132	36	90	32	29	72	16	40	3.8	95	3.0	74	21	
8	75	190	39	99	48	108	273	34	86	69	81	205	24	61						
9	57	140	40	98	47	59	145	27	66	54	47	116	21	52						
10	51	121	42	100	18	50	119	28	67	44	38	90	19	45						
11	92	230	51	128	46	102	255	34	85	67	72	180	19	48						
12	48	119	48	119	0	65	161	34	84	48	47	116	22	54	3.4	84	3.6	89	-6	
13	66	160	42	102	36	104	252	43	104	59	77	187	31	75						
14	54	129	40	96	26	72	172	30	72	58	44	105	15	36	3.2	77	3.2	77	0	
15	60	149	39	97	35	125	309	38	94	70	74	183	23	57						
16	42	99	36	85	14	59	140	31	73	47	38	90	24	57						
17	45	105	39	91	13	57	133	27	63	53	43	100	20	47						
18	45	112	40	99	11	74	183	39	97	47	53	132	26	65	3.8	94	3.6	89	5	
19	44	110	39	98	11	59	148	28	70	53	38	95	16	40	3.8	95	4.0	100	-5	
20	48	119	40	99	17	63	156	40	99	37	43	106	25	62	3.4	84	3.4	84	0	
21	48	124	30	78	38	97	252	28	73	71	52	135	14	36						
22	51	142	30	84	41	86	240	30	84	65	37	103	15	42	3.0	84	3.4	95	-13	
23	36	96	30	80	17	33	88	12	32	64	22	59	8	21						
24	72	193	33	88	54	54	145	30	80	44	39	104	19	51						
25	36	96	28	75	22	60	161	37	99	38	38	102	25	67	3.2	86	3.2	86	0	
26	54	143	39	103	28	60	159	33	88	45	50	133	28	74	3.0	80	3.0	80	0	
27	57	151	24	63	58	73	193	21	56	58	53	140	19	50	2.8	74	2.8	74	0	
28	48	126	40	105	17	68	178	36	94	47	40	105	20	52	3.2	84	3.2	84	0	
29																				
30																				
31																				
TOTAL		3747		2646			5228		2203			3572		1415		1156		1131		
ARITH. MEAN	53	134	37	95	28	73	187	31	79	55	50	128	20	51	3.5	89	3.4	87	1.7	

Digester Volume, ft^3
Primary 14,000
Secondary 14,000

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.5

Marshall, MICHIGAN

Supernatant To Raw Wetwell
Process Pattern raw-pri.dig.-sec.dig.-beds

MONTH February 1974

DIGESTER AND SLUDGE DATA

OPERATOR Robert J. Swalwell

DATE	RAW SLUDGE Gals. 10^X	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 100
1	221	9.1	55	30	6.6	90																		32
2	88	9.9	52	14	6.5	92																		29
3	111	7.7	58	15	6.6	92																		25
4	199	10.0	57	34	6.5	92																		21
5	88	8.3	57	13	6.2	91																		21
6						90																		19
7	133	7.8	59	18	6.4	90																		16
8	133	9.6	56	22	6.5	88																		1
9	88	7.7	68	14	6.4	86		.8	71			12376												23
10	88	9.6	56	14	6.3	88																		1
11	88	9.8	54	14	6.3																			34
12	155	11.4	46	25	6.5	88																		10
13	111	10.3	41	14	6.5	86																		23
14	265	8.4	50	34	6.6	86																		18
15	133	8.4	55	19	6.5	86																		20
16	133	8.9	50	18	6.5	86																		19
17	133	9.2	50	19	6.4	86																		17
18						86																		15
19	221	9.6	48	31	6.4	86																		5
20	177	9.1	54	27	6.5	82		.8	78			14144				1300			520					23
21	221	10.7	51	36	6.4	84																		24
22	88	9.1	56	14	6.3	86																		22
23	133	9.8	55	22	6.3	86																		21
24	88	10.1	52	14	6.2	86																		21
25	133	12.0	48	23	6.4	86																		6
26	177	9.1	53	26	6.3	82																		14
27	265	9.7	52	40		82																		13
28	177	8.7	50	23	6.2	82		1.2	74			11934				1240			400					37
29																								
30																								
31																								
TOTAL	3845											38454												530
ARITH. MEAN	148	9.4	53	22		84		.9	74			12818				1270			460					19

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4

Marshall, MICHIGAN

MONTH March 19 74 — MISCELLANEOUS DATA — OPERATOR Robert J. Swalwell

DATE	WEATHER Precip. Inches	Temp. (°F) Max.	Temp. (°F) Min.	Type	RAW SEWAGE Temp. °F	Flow MGD Total MGD	Flow MGD Max. Rate	Flow MGD Min. Rate	pH	water cf/day	Cl_2 lbs.	POWER KWH	AUX. FUEL *	CHEMICALS APPLIED					REMARKS
1	.14	42	32	R	50	3.12	3.80	2.50	7.7	1800	120	320	12						* Gas - cu. ft. X 100
2		52	36	CL	49	3.12	3.60	2.60	7.5	1860	108	360	7						
3	.20	70	36	R	50	3.18	3.70	2.60		1870	107	280	8						
4	1.48	51	33	R	50	3.61	4.80	3.00	7.4	1850	115	360	6						
5		50	36	CL	50	3.68	4.20	3.00	7.7	2400	126	360	6						
6		56	36	CL	50	3.62	4.30	3.00	7.5	1040	120	360	6						
7	.42	56	32	R	50	3.62	4.30	2.90	7.3	1570	131	360	3						
8	.28	38	33	R	49	3.70	4.40	3.10	7.4	1520	122	360	12						
9	.17	56	28	R	49	3.65	4.30	3.00	7.6	1610	115	400	9						
10		42	26	CL	49	3.66	4.20	3.00	7.5	1550	111	360	13						
11		42	30	CL	49	3.67	4.40	3.00	7.6	1540	128	360	18						
12		38	18	CL	49	3.57	4.00	2.90	7.7	1610	127	400	4						
13		32	16	C	49	3.53	4.30	2.90	7.6	1890	124	400	12						
14		42	18	C	49	3.50	4.00	2.90	7.6	1630	126	400	8						
15	.23	42	32	R	49	3.48	4.20	2.90	7.6	1600	131	360	11						
16	.07	38	26	R	49	3.43	4.00	2.80	7.6	1650	113	400	14						
17		40	26	CL	49	3.38	4.00	2.80	7.4	1670	113	360	10						
18	.16	46	32	R	49	3.44	4.20	2.80	7.7	1660	122	400	12						
19		40	22	C	50	3.36	3.70	2.80	7.6	1590	131	360	11						
20	.10	42	22	R		2.13	3.70	0.00	7.4	2570	89	280	20						
21	.14	34	26	R	49	2.83	4.90	0.00		800	122	320	23						
22	.03	42	22	R	49	3.31	3.90	2.70	7.5	770	117	320	18						
23	.02	26	10	R	49	3.25	3.80	2.70	7.6	1630	115	320	19						
24		18	4	CL	48	3.26	3.80	2.70	7.5	1640	107	320	20						
25		32	9	CL	49	3.31	4.80	2.70	7.6	1930	121	360	12						
26		42	25	CL	50	3.25	3.80	2.70	7.5	1580	105	360	11						
27		42	28	CL	50	3.24	3.90	2.70	7.6	1560	127	320	17						
28	.38	32	28	R	49	3.32	3.70	2.70	7.6	1550	123	360	15						
29	.76	37	30	R	49	3.30	3.90	2.80	7.5	1450	123	320	10						
30	.05	38	32	R	49	3.39	3.90	2.90	7.4	1450	104	360	12						
31		48	34	CL	49	3.38	3.90	2.80	7.6	1420	108	320	13						
TOTAL	4.63										3654	10920	372						
ARITH. MEAN						3.36				1621	118								

MDPH
D-4.1

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH March 19 74 — PRIMARY TREATMENT DATA — OPERATOR Robert J. Swalwell

DATE	5-DAY BOD INF. Mg/l	5-DAY BOD INF. LBS. X 10	5-DAY BOD EFF. Mg/l	5-DAY BOD EFF. LBS. X 10	5-DAY BOD REM. %	SUSPENDED SOLIDS INF. Mg/l	SUSPENDED SOLIDS INF. LBS. X 10	SUSPENDED SOLIDS EFF. Mg/l	SUSPENDED SOLIDS EFF. LBS. X 10	SUSPENDED SOLIDS REM. %	SUSP. VOLATILE SOLIDS INF. Mg/l	SUSP. VOLATILE SOLIDS INF. LBS. X 10	SUSP. VOLATILE SOLIDS EFF. Mg/l	SUSP. VOLATILE SOLIDS EFF. LBS. X 10	Total PHOSPHORUS – P INF. Mg/l	Total PHOSPHORUS – P INF. LBS. X	Total PHOSPHORUS – P EFF. Mg/l	Total PHOSPHORUS – P EFF. LBS. X	Total PHOSPHORUS – P REM. %	REMARKS
1	21	54	12	31	43	50	130	32	83	36	38	98	21	54						
2	68	176	44	114	35	46	119	11	29	76	33	86	5	13						
3																				
4	56	168	36	108	36	98	295	34	102	65	49	147	18	54	2.8	84	2.6	78	7	
5	56	173	36	111	36	71	220	32	99	55	37	115	13	40	2.6	80	3.0	93	-15	
6	52	157	33	97	37	77	232	32	97	58	54	163	18	54	2.2	66	2.6	78	-18	
7	40	120	30	91	25	86	260	37	112	57	54	163	23	69	2.4	72	2.4	72	0	
8	36	111	28	86	22	72	222	28	86	61	44	136	16	49						
9	60	182	40	122	33	43	131	28	85	35	29	88	16	49						
10	44	134	28	85	36	61	186	18	55	70	42	128	10	30						
11	48	147	33	101	31	80	244	22	67	73	46	141	19	58	2.4	73	2.0	61	17	
12	48	143	33	98	31	83	247	32	95	61	50	149	15	45						
13	42	124	24	71	43	84	247	36	106	57	53	156	22	65	2.6	77	2.4	71	8	
14	48	140	20	58	42	74	216	51	149	31	40	117	33	96						
15	39	113	15	44	38	47	136	24	70	49	27	78	13	38						
16	45	129	30	86	33	54	154	11	31	80	32	92	2	6						
17	48	135	27	76	44	58	163	27	76	53	38	107	14	39	2.6	73	2.2	62	15	
18	36	103	33	95	8	61	175	32	92	48	34	98	24	69	2.2	63	2.4	69	-9	
19	48	134	15	42	31	110	308	41	115	63	62	174	30	84	2.8	78	2.4	67	14	
20																				
21	57	134	36	85	37	80	189	20	47	75	55	130	16	38						
22	54	149	39	108	28	82	226	32	88	61	49	135	19	52						
23	45	122	20	54	56	59	160	14	38	76	46	125	10	27						
24	42	114	33	90	21	60	163	41	111	32	40	109	18	49	2.8	76	2.8	76	0	
25	36	99	28	77	22	63	174	37	102	41	43	119	23	64						
26	42	114	30	81	29	48	130	19	52	60	22	60	8	22	2.0	54	1.8	49	10	
27	54	146	30	81	44	110	297	35	95	68	70	189	24	65						
28	42	116	24	66	18	105	290	35	97	66	58	161	24	66						
29	54	149	44	121	19	103	283	24	66	77	53	146	16	44						
30	30	85	18	51	40	40	113	15	42	63	23	65	0	0						
31	45	127	27	76	40	60	253	30	85	50	46	130	21	59						
TOTAL		3798		2406			5963		2372			3605		1398		796		776		
ARITH. MEAN	46	131	29	83	33	71	206	29	82	59	44	124	17	48	2.5	72	2.4	71	2.6	

Digester Volume, ft^3
Primary 14,000
Secondary 14,000

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MDPH
D-4.5

Supernatant To raw wetwell
Process Pattern raw-pri.dig.-sec.dig.-beds

MONTH March 1974

DIGESTER AND SLUDGE DATA

OPERATOR Robert J. Swalwell

DATE	RAW SLUDGE Gals. X 10	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	199	8.1	56	27	6.5	86																		
2	177	8.2	66	29	6.5	86																		
3	133	9.9	59	24	6.3	87																		
4	133	5.6	62	14	6.6	90																		
5	133	5.7	58	13	6.5	90																		
6	309	9.8	59	55	6.0	88																		
7						88		.8	88			11934		.30	54	1860			570					
8	199	8.3	67	34	6.3	92																		
9	133	9.8	59	23	6.2	92																		
10	88	10.5	55	16	6.1	92																		
11						94																		
12	177	11.1	50	30	6.1	94																		
13	177	11.4	47	29	6.0	90																		
14	133	9.3	53	20	6.6	90																		
15	88	10.5	51	14	6.1	90		1.4	43			12376		.27	59	1360			440					
16	133	12.2	48	24	6.4	92																		
17	133	9.2	54	20	6.3	92																		
18	177	9.9	52	28	6.3	95																		
19	177	10.9	51	30	6.5	95																		
20	177	9.3	52	26	6.0	94																		
21	133	9.8	52	20	6.4	92																		
22	88	10.3	48	13	6.3	94																		
23	133	9.6	50	19	6.2	94																		
24	88	10.8	49	14	6.3	92																		
25	177	9.8	49	26	6.2	92																		
26	177	10.6	53	30	6.3	88		1.0	78			12376		.29	52	1260			440					
27	177	11.4	52	32	6.2	92																		
28						95																		
29						98																		
30						99																		
31						100																		
TOTAL	3845											36686												
ARITH. MEAN	154	9.7	54	24		92		1.1	69			12228		.29	55	1493			483					

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4

Marshall, MICHIGAN

MONTH ~~March~~ April 1974

MISCELLANEOUS DATA

OPERATOR Robert J. Swalwell

DATE	WEATHER Precip. Inches	Temp. (°F) Max.	Temp. (°F) Min.	Type	RAW SEWAGE Temp. °F	Flow MGD Total MGD	Flow MGD Max. Rate	Flow MGD Min. Rate	pH	~~Cook~~ Water cf/mg	Cl_2 lbs.	POWER KWH	AUX. FUEL *	CHEMICALS APPLIED					REMARKS
1	.58	44	36	R	50	3.55	4.60	2.90	7.5	1550	132	360	0						* Gas-cu. ft. x 100
2		64	36	C	50	3.53	4.00	2.90	7.5	1480	124	320	0						
3	.63	64	46	R	50	3.67	4.60	3.10	7.6	1540	128	400	0						
4		52	32	CL	50	3.69	4.60	3.10	7.4	1660	123	320	5						
5		40	22	CL	50	3.70	430	3.10	7.4	1730	112	320	5						
6		50	26	CL	50	3.57	4.10	3.10	7.5	1550	133	360	20						
7	.47	42	26	R	50	3.49	4.10	3.00	7.4	1520	127	360	11						
8		36	20	CL	50	3.63	4.40	3.00	7.4	1550	133	360	34						
9		42	24	C	50	3.56	4.30	3.00	7.7	1640	115	360	35						
10		58	28	C	49	3.55	4.20	3.00	7.5	1590	127	320	14						
11	.12	58	44	R	50	3.59	4.30	3.00	7.5	1580	118	360	3						
12	.07	70	48	R	50	3.53	4.00	3.00	7.5	1530	35	320	4						
13		70	50	C	50	3.55	4.30	3.00	7.4	1540	121	360	10						
14	.07	66	34	R	50	3.41	4.00	2.90	7.5	1420	120	320	4						
15		48.	28	CL	50	3.53	4.30	2.90	7.4	1480	126	360	5						
16		56	30	C	50	3.49	4.10	3.00	7.3	1450	138	320	2						
17		60	34	C	50	3.45	4.30	2.80	7.4	1800	130	360	2						
18	.29	60	27	R	51	3.43	4.00	2.90	7.7	1740	125	320	3						
19		55	30	CL	50	3.40	4.30	2.80	7.5	1680	131	320	2						
20		70	36	C	50	3.34	4.00	2.80	7.4	1710	113	360	6						
		70	56	C	50	3.39	3.80	2.90	7.5	1640	112	280	8						
22		64	36	CL	50	3.46	4.30	3.00	7.6	1650	131	360	8						
23	.01	41	28	R	50	3.36	4.00	2.90	7.8	1720	121	320	7						
24		55	30	C	50	3.35	4.10	2.80	7.4	1710	130	320	7						
25		58	36	CL	50	3.36	4.30	2.80	7.4	1700	133	360	2						
26		72	46	C	51	3.33	4.10	2.80	7.4	1710	129	280	2						
27		79	56	C	50	3.23	4.10	2.70	7.4	1610	124	320	1						
	.33	74	58	R	51	3.29	3.80	2.70	7.5	1630	114	320	4						
	.22	72	54	R	52	3.29	4.20	2.70	7.5	1630	116	320	3						
		65	42	CL	51	3.32	3.90	2.70	7.4	1680	127	320	3						
TOTAL	2.79										3678	10080	216						
AVG. MON.						3.47				1614	122								

MDPH
D-4.1

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH April 19 74 — PRIMARY TREATMENT DATA — OPERATOR Robert J. Swalwell

DATE	5-DAY BOD INF. Mg/l	5-DAY BOD INF. LBS. X 10	5-DAY BOD EFF. Mg/l	5-DAY BOD EFF. LBS. X 10	5-DAY BOD REM. %	SUSPENDED SOLIDS INF. Mg/l	SUSPENDED SOLIDS INF. LBS. X 10	SUSPENDED SOLIDS EFF. Mg/l	SUSPENDED SOLIDS EFF. LBS. X 10	SUSPENDED SOLIDS REM. %	SUSP. VOLATILE SOLIDS INF. Mg/l	SUSP. VOLATILE SOLIDS INF. LBS. X 10	SUSP. VOLATILE SOLIDS EFF. Mg/l	SUSP. VOLATILE SOLIDS EFF. LBS. X 10	Total PHOSPHORUS – P INF. Mg/l	Total PHOSPHORUS – P INF. LBS. X	Total PHOSPHORUS – P EFF. Mg/l	Total PHOSPHORUS – P EFF. LBS. X	Total PHOSPHORUS – P REM. %	REMARKS
1	36	106	28	83	22	76	224	28	86	62	46	136	5	15						
2	42	124	30	88	29	81	238	40	118	51	49	144	24	71	2.6	77	2.4	71	8	
3	36	110	20	61	44	65	199	37	113	43	30	92	16	49	2.4	73	2.4	73	0	
4	51	157	32	98	37	92	283	30	92	67	46	142	19	58						
5	39	120	33	102	15	85	262	42	130	51	70	216	34	105						
6	30	89	28	83	6	38	113	28	83	26	28	83	9	27						
7	36	105	27	79	25	30	87	23	67	23	18	52	16	47	2.2	64	2.2	64	0	
8	42	127	28	85	33	61	185	26	79	57	32	97	17	51	3.2	97	2.8	85	13	
9	33	98	24	71	27	55	163	21	62	62	27	80	6	18	2.8	83	2.2	65	21	
10	48	142	28	83	42	84	249	26	77	69	49	145	15	44						
11	36	108	28	84	22	44	132	36	108	18	28	84	21	63						
12	33	97	20	59	39	21	62	13	38	38	15	44	8	24						
13	39	115	33	98	15	33	98	26	77	21	27	80	17	50						
14	52	148	40	114	23	51	145	42	119	18	38	108	20	57						
15	102	300	44	130	57	77	227	35	103	55	49	144	26	77	3.4	100	3.0	88	12	
16	40	116	39	113	3	65	189	50	146	23	30	87	30	87						
17	52	150	32	92	38	75	216	48	138	36	43	124	36	104						
18	63	180	39	112	38	125	258	36	103	71	91	260	23	66						
19	58	164	33	94	26	62	176	27	77	56	36	102	13	37						
20	44	123	36	100	18	58	162	21	58	64	37	103	11	31						
21	52	149	24	69	54	49	141	20	57	59	40	115	15	43						
22	52	150	40	115	23	53	153	32	92	40	34	98	26	75	2.2	63	1.8	52	18	
23	51	143	40	112	22	86	241	46	129	47	49	137	25	70	2.4	67	2.8	78	-17	
24	68	190	48	134	29	114	318	55	154	52	81	226	38	106	3.2	89	2.8	78	13	
25	45	126	40	112	11	67	186	47	132	30	55	154	38	106	2.6	73	2.8	78	-8	
26	68	189	57	158	16	103	286	44	122	57	65	181	33	92						
27	69	186	48	129	41	36	97	15	40	58	20	54	15	40						
28	70	192	51	140	27	67	184	45	123	33	50	137	31	85						
29	60	170	40	113	33	104	294	33	93	68	80	226	19	54	4.4	124	2.2	62	50	
30	48	133	44	122	8	91	252	73	202	20	53	147	48	133						
31																				
TOTAL		4307		3033			5822		3018			3798		1886		910		794		
ARIT-MEAN	50	144	35	101	27	68	194	35	101	46	44	127	22	63	2.9	83	2.5	72	10	

Digester Volume, ft^3
Primary 14,000
Secondary 14,000

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.5

Marshall, MICHIGAN

Supernatant To Raw wetwell
Process Pattern raw-pri.dig.-sec.dig.-beds

MONTH April 19 74

DIGESTER AND SLUDGE DATA

OPERATOR Robert 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 100
1	*					98																		25
2						95																		12
3						92																		15
4						90																		10
5						89																		10
6	309	13.4	50	63		88																		12
7	133	12.8	50	26	5.8	84																		11
8	265	10.4	52	44	6.2	81																		8
9	221	13.9	49	46	6.3	86		1.3	75			12818												32
10	177	10.7	55	32	6.1	90																		27
11	133	11.3	50	23	6.4	90																		26
12	88	11.3	54	16		87																		23
13	265	12.0	55	53	6.0	86																		20
14						84																		17
15	177	11.4	52	32	6.1	84																		17
16	309	11.7	49	54	6.3	82																		8
17	133	9.9	56	22	5.9	80		1.3	50			11492												21
18	88	9.1	58	14	5.8	79																		46
19	88	11.7	48	15	5.7	89																		27
20	88	12.1	56	18	6.1	94																		27
21	133	10.4	58	24	6.0	95																		28
22	88	9.7	57	15		98																		30
23	177	10.7	54	31	6.1	100																		24
24	133	11.4	60	28	6.2	100																		26
25						100																		37
26	133	8.4	63	21	6.3	108		1.5	57			13260		.31		1480			400					34
27	88	13.3	54	19	6.2	109																		24
28	88	11.7	56	18	6.2	100																		19
29	88	11.4	53	16		98																		19
30	221	11.3	54	41		96																		16
31																								
TOTAL	3624											37570												651
ARITH. MEAN	158	11.3	54	29		95		1.4	61			12523		.31		1480			400					

* Sludge pump out of service April 1-5.

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4

Marshall, MICHIGAN

MONTH May 1974

MISCELLANEOUS DATA

OPERATOR Robert J. Swalwell

DATE	WEATHER Precip. Inches	Temp. (°F) Max.	Temp. (°F) Min.	Type	RAW SEWAGE Temp. °F	Flow MGD Total MGD	Flow MGD Max. Rate	Flow MGD Min. Rate	pH	~~XXXXX~~ water cf/~~mg~~	Cl_2 lbs.	POWER KWH	AUX. FUEL *	CHEMICALS APPLIED					REMARKS
1		64	42	C	52	3.33	4.20	2.70	7.4	1670	131	320							* Gas - Shut off due
2		69	46	CL	52	3.30	3.80	2.70	7.5	1670	122	320							to construction.
3	.04	58	36	R	51	3.29	3.90	2.70	7.4	1610	130	360							
4		62	36	CL	50	3.23	4.10	2.70	7.5	1640	121	360							
5	.11	60	35	R	51	3.22	3.70	2.70	7.6	1720	117	320							
6		58	26	CL	51	3.28	4.30	2.80	7.6	1680	138	320							
7	.26	54	36	R	51	3.32	4.00	2.80	7.6	1700	129	360							
8	.31	40	34	R	51	3.30	4.00	2.70	7.5	1680	127	320							
9		46	32	CL	51	3.26	3.70	2.60	7.4	1750	118	360							
10	.02	64	42	R	51	3.24	4.10	2.70	7.5	1640	121T	320							
11	.84	68	48	R	51	3.33	4.00	2.80	7.6	1680	114	320							
12	.02	60	35	R	51	3.32	3.80	2.80	7.5	1680	112	320							
13	.03	60	42	R	51	3.40	4.40	2.80	7.6	1700	134	360							
14	.69	73	48	R	52	3.45	3.90	3.00		1620	112	360							
15	.07	60	46	R	52	3.48	4.30	2.90	7.5	1630	133	360							
16	1.46	70	46	R	52	3.81	4.90	3.40	7.5	1630	123	360							
17	.02	68	46	R	53	3.90	5.00	3.60		1610	126	320							
18	.03	70	52	R	52	3.82	4.30	3.30	7.5	1640	123	360							
19		74	48	C	52	3.77	4.20	3.70	7.5	1640	118	320							
20		78	52	C	52	3.82	4.70	3.50	7.5	1670	137	360							
21		88	62	CL	53	3.74	4.30	3.10	7.4	1660	125	320							
22		77	57	CL	53	3.70	4.40	3.00	7.4	1620	131	320							
23		74	46	C	53	3.65	4.40	3.00	7.3	1620	134	320							
24		62	48	CL	53	3.53	4.40	2.90	7.4	1620	132	360							
25		62	42	C	52	3.41	4.20	2.90	7.4	1750	121	320							
26		68	38	C	51	3.53	3.90	2.90	7.3	1650	118	320							
27		72	48	C	52	3.41	3.90	2.90	7.5	1590	115	320							
28	.75	74	46	R	53	3.58	4.40	2.90	7.5	1610	130	320							
29	.02	78	60	R	53	3.61	4.00	3.10	7.6	1590	135	360							
30		80	58	CL	54	3.52	4.40	3.00	7.5	1540	125	320							
31		72	48	CL	53	3.48	4.20	3.90	7.4	1530	128	320							
TOTAL	4.67										3880	10400							
ARITH. MEAN						3.48				1646	125								

MDPH
D-4.1

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH May 1974 PRIMARY TREATMENT DATA OPERATOR Robert J. Swalwell

DATE	5-DAY BOD INF. Mg/l	5-DAY BOD INF. LBS. X 10	5-DAY BOD EFF. Mg/l	5-DAY BOD EFF. LBS. X 10	5-DAY BOD REM. %	SUSPENDED SOLIDS INF. Mg/l	SUSPENDED SOLIDS INF. LBS. X 10	SUSPENDED SOLIDS EFF. Mg/l	SUSPENDED SOLIDS EFF. LBS. X 10	SUSPENDED SOLIDS REM. %	SUSP. VOLATILE SOLIDS INF. Mg/l	SUSP. VOLATILE SOLIDS INF. LBS. X 10	SUSP. VOLATILE SOLIDS EFF. Mg/l	SUSP. VOLATILE SOLIDS EFF. LBS. X 10	Total PHOSPHORUS – P INF. Mg/l	Total PHOSPHORUS – P INF. LBS. X	Total PHOSPHORUS – P EFF. Mg/l	Total PHOSPHORUS – P EFF. LBS. X	Total PHOSPHORUS – P REM. %	REMARKS
1	39	108	28	78	28	90	249	28	78	69	51	141	17	47						
2	54	148	30	82	44	88	242	28	77	68	66	181	21	58	4.0	110	3.0	82	25	
3	60	165	36	99	40	92	252	40	109	57	44	121	18	49						
4	45	125	32	89	29	78	216	37	102	52	49	136	25	69						
5	51	137	33	88	35	86	230	34	91	60	71	190	19	51						
6	44	120	33	90	25	93	254	36	98	61	59	161	21	57						
7	36	100	21	58	42	87	240	42	116	52	53	146	22	61						
8	36	99	24	66	33	106	291	33	91	69	55	151	19	52						
9	57	154	39	106	32	104	282	35	95	66	62	168	22	60						
10	42	113	27	73	36	80	216	33	89	59	43	116	16	43						
11	56	156	39	108	30	71	197	26	72	63	62	172	10	28						
12	64	177	39	108	39	78	216	33	91	58	49	136	20	55						
13	45	128	33	94	27	104	295	50	142	52	56	159	23	65	2.8	79	3.2	91	-14	
14																				
15	48	139	36	104	25	75	217	32	93	57	50	145	20	58						
16	48	152	39	124	19	82	260	70	222	15	55	175	35	111						
17																				
18	40	127	28	89	30	34	108	22	70	35	24	76	16	51						
19	40	126	33	104	17	59	185	48	151	19	37	116	31	97						
20	45	143	33	105	27	77	245	43	137	44	42	134	26	83	2.8	89	3.2	101	-14	
21	45	140	30	93	33	67	209	30	93	55	44	137	20	62	3.2	100	2.8	87	14	
22	76	234	42	129	48	97	299	33	102	66	66	204	22	68						
23	63	192	52	158	17	166	505	69	210	58	124	377	45	137						
24	39	115	36	106	7	59	173	34	100	42	39	115	21	62						
25	51	145	36	102	29	64	182	36	102	44	45	128	23	65						
26	42	124	39	115	7	66	194	25	73	62	52	153	21	62						
27	60	171	33	94	45	29	82	20	57	31	25	71	19	54						
28	63	188	42	125	33	143	426	49	146	66	107	319	25	75						
29	45	135	32	96	29	85	256	40	120	53	56	168	26	78						
30	52	152	42	123	19	130	382	40	117	69	84	247	25	73						
31	45	131	36	104	20	108	313	29	84	73	87	252	14	41						
TOTAL		4144		2910			7044		3121			4884		2204		378		361		
ARITH. MEAN	49	143	35	100	29	86	243	37	108	54	58	168	26	76	3.2	95	3.1	90	2.8	

Digester Volume, ft^3
Primary 14,000
Secondary 14,000

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.5

Marshall, MICHIGAN

Supernatant To Raw wetwell
Process Pattern raw-pri.dig.-sec.dig.-beds

MONTH May 1974

DIGESTER AND SLUDGE DATA

OPERATOR Robert J. Swalwell

DATE	RAW SLUDGE Gals. X10	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. X10	Total Solids %	Vol. Solids %	pH	Gas Produced cu. ft X
1	309	11.6	56	61	6.0	95																		7
2	88	10.6	54	15	6.1	90																		17
3	177	9.9	55	29	6.3	92																		
4	133	10.1	58	24	6.4	90																		
5	88	13.5	47	17	6.0	90																		
6	88	12.4	58	19	6.4	90		1.4	67			9724				1800			180					
7	265	12.0	56	54	6.1	96																		
8	88	10.7	52	15	6.4	100																		
9	177	14.8	49	39	6.1	100																		
10	265	10.0	55	44	6.1	101																		
11	133	10.2	58	24	6.1	98																		
12	88	10.4	58	16	6.1	100																		
13						101		2.0	63			9724		.32	46	1940			360					3
14	133	10.2	55	23	6.0	98																		38
15	177	12.7	55	38	6.2	102																		29
16	88	11.3	58	18	5.9	102																		29
17	133	10.5	51	22	6.2	104																		23
18	133	12.4	54	27	6.3	100																		22
19	88	12.5	56	19	6.2	100																		23
20						101		6.6	60											1547	12	41		32
21	88	11.2	55	17	6.1	109																		34
22	133	10.6	52	22	6.2	108																		9
23	88	11.8	53	17	6.0	98																		
24	133	12.5	52	26	6.2	96																		
25	88	12.1	51	17	6.2	90																		
26	177	10.0	56	30	6.1	94																		
27						99																		
28	309	10.0	54	51	6.3	100																		
29	88	12.8	50	17	6.1	99																		
30	88	12.0	54	17	6.3	100																		
31	133	12.1	55	27	6.1	100																		
TOTAL	3978											19448								1547				266
ARITH. MEAN	142	11.5	54	27		98		3.3	63			9724		.32	46	1870			270	1547	12	41		22

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4

Marshall, MICHIGAN

MONTH June 19 74

MISCELLANEOUS DATA

OPERATOR Robert J. Swalwell

DATE	WEATHER Precip. Inches	Temp. (°F) Max.	Temp. (°F) Min.	Type	RAW SEWAGE Temp. °F	Flow MGD Total MGD	Flow MGD Max. Rate	Flow MGD Min. Rate	pH	~~Raw~~ Water cf/mg	Cl_2 lbs.	POWER KWH	AUX. FUEL	CHEMICALS APPLIED					REMARKS
1		79	48	C	53	3.42	4.20	2.90	7.4	1630	110	320							
2		78	46	C	52	3.37	3.80	2.80	7.3	1620	111	320							
3		86	64	C	53	3.49	4.40	2.80	7.4	1540	143	320							
4		87	60	C	54	3.44	4.10	2.80	7.2	1670	130	320							
5	.18	86	64	R	54	3.42	4.10	2.60	7.3	1600	1.28	320							
6	.01	86	66	R	55	3.43	4.00	2.90	7.3	1430	130	320							
7	.76	82	66	R	55	3.49	4.40	3.00	7.3	1580	121	320							
8	.06	84	66	R	54	3.38	4.10	2.90	7.4	1410	115	280							
9	.29	86	62	R	54	3.35	3.80	3.00	7.4	1440	116	280							
10	.04	70	46	R	55	3.47	4.30	2.80	7.4	1400	127	360							
11	.03	67	42	R	54	3.39	4.00	2.60	7.3	1400	120	320							
12		73	47	C	54	3.37	4.20	2.60	75	1670	144	320							
13	.02	76	54	R	54	3.34	3.90	2.90	7.3	1110	125	280							
14	.02	82	58	R	54	3.39	4.10	2.90	7.4	1420	127	320							
15	.08	74	50	R	54	3.32	3.80	2.90	7.3	1410	118	280							
16	.04	58	48	R	54	3.22	3.80	2.80	7.3	1320	109	280							
17	.09	60	52	R	54	3.41	4.10	2.80	7.4	1280	1.45	360							
18	.08	76	56	R	54	3.37	4.00	2.80	7.3	1280	135	280							
19	.26	80	58	R	55	3.37	4.10	2.70	7.2	1210	133	240							
20	.37	90	61	R	55	3.43	4.10	2.80	7.2	1320	133	240							
21		80	60	Cl	55	3.41	4.20	2.60		1340	132	320							
22	.01	74	48	R	54	3.22	3.80	2.50	7.3	1390	115	280							
23		64	46	Cl	54	3.21	3.70	2.80	7.3	1430	110	320							
24		70	46	Cl	55	3.32	4.20	2.70	7.3	1300	128	320							
25		74	52	Cl	54	3.31	3.80	2.70	7.2	1280	135	320							
26		82	52	C	55	3.30	4.10	2.70	7.2	1240	136	320							
27		84	52	C	55	3.28	3.90	2.60	6.9	1290	126	320							
28		86	52	C	54	3.31	4.00	2.60	6.9	1180	139	320							
29		84	66	C	55	3.12	3.80	2.60		1250	115	320							
30		86	52	C	55	3.11	3.60	2.60		1360	93	320							
31																			
TOTAL	2.34										3747	9240							
ARITH. MEAN						3.35				1393	125								

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.1

Marshall, MICHIGAN

MONTH June 19 74 PRIMARY TREATMENT DATA OPERATOR Robert J. Swalwell

DATE	5-DAY BOD INF. Mg/l	5-DAY BOD INF. LBS. X 10	5-DAY BOD EFF. Mg/l	5-DAY BOD EFF. LBS. X 10	5-DAY BOD REM. %	SUSPENDED SOLIDS INF. Mg/l	SUSPENDED SOLIDS INF. LBS. X 10	SUSPENDED SOLIDS EFF. Mg/l	SUSPENDED SOLIDS EFF. LBS. X 10	SUSPENDED SOLIDS REM. %	SUSP. VOLATILE SOLIDS INF. Mg/l	SUSP. VOLATILE SOLIDS INF. LBS. X 10	SUSP. VOLATILE SOLIDS EFF. Mg/l	SUSP. VOLATILE SOLIDS EFF. LBS. X 10	Total PHOSPHORUS – P INF. Mg/l	Total PHOSPHORUS – P INF. LBS. X 10	Total PHOSPHORUS – P EFF. Mg/l	Total PHOSPHORUS – P EFF. LBS. X 10	Total PHOSPHORUS – P REM. %	REMARKS
1	54	154	36	103	33	93	265	24	68	74	62	177	11	31						
2	48	135	44	124	8	107	301	43	121	60	89	250	30	84						
3	60	175	42	122	30	107	311	24	70	78	77	224	19	55						
4	66	189	51	146	23	74	212	47	135	36	55	158	39	112						
5	60	171	54	154	10	69	197	32	91	54	53	151	22	63						
6	66	189	56	160	15	96	275	45	129	53	70	200	30	86						
7	60	175	48	140	20	83	242	42	122	49	52	151	20	58						
8	48	135	40	113	17	47	132	33	93	30	27	76	16	45						
9	44	123	42	117	4	84	235	27	75	68	78	218	20	56						
10	57	165	48	139	15	67	194	18	52	73	39	113	5	14						
11	63	178	39	110	38	114	322	32	90	72	81	229	22	62						
12	54	152	39	110	28	79	222	40	112	49	51	143	27	76						
13	33	92	30	84	9	87	252	50	139	43	60	167	28	78						
14	48	136	39	110	19	66	187	26	74	61	52	147	20	57						
15	40	111	18	50	55	154	426	28	78	82	136	376	23	64						
16	36	97	6	16	83	66	177	33	89	50	48	129	20	54						
17	56	159	32	91	25	96	272	35	100	64	68	193	21	60						
18	48	135	28	79	42	61	171	28	79	54	36	101	22	62						
19	57	160	54	151	5	90	252	38	107	58	64	180	29	81						
20	42	120	33	94	21	65	186	31	89	52	46	132	22	63						
21																				
22	48	129	33	89	33	55	148	24	64	56	44	118	22	59						
23	48	128	36	96	25	123	329	33	88	73	100	268	24	64						
24	56	155	36	100	36	69	190	41	113	41	40	110	24	66						
25	76	210	30	83	60	109	301	46	127	58	74	204	28	77						
26	41	113	33	91	19	61	168	32	88	48	31	85	15	41						
27																				
28	42	116	18	50	57	59	163	28	77	53	40	110	18	50						
29	57	148	40	104	29	70	182	24	73	66	62	161	15	39						
30	60	153	40	102	33	109	262	28	71	74	86	219	22	56						
31																				
TOTAL		4103		2928			6664		2614			4790		1713						
ARITH. MEAN	52	147	37	105	28	84	238	33	93	58	62	171	22	61						

Digester Volume, ft^3
Primary 14,000
Secondary 14,000

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MDPH
D-4.5

Supernatant To Raw wetwell
Process Pattern raw -pri.dig.-sec.dig.-beds

MONTH June 1974

DIGESTER AND SLUDGE DATA

OPERATOR Robert J. Swalwell

DATE	RAW SLUDGE Gals. 10	RAW SLUDGE Total Solids %	RAW SLUDGE Vol. Solids %	RAW SLUDGE Vol. Solids Lbs/1000c.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	177	12.5	61	41	6.3	100																		
2	133	11.8	56	27	6.2	96																		
3						99	4.9	3.1	61			12376		.29	50	1000			245					
4	88	14.7	51	20	6.0	112																		
5	177	11.5	57	35	6.1	100																		
6	177	9.3	56	28	6.2	96																		
7	265	10.2	63	52	6.1	92																		
8	88	9.1	68	17	6.2	85																		
9	133	8.2	58	19	6.2	102																		
10	88	9.9	57	15	6.0	99																		
11	155	12.8	52	31	6.1	99																		
12	88	16.4	84	37	5.8	92		1.9	64			10387												
13						90																		
14						114																		
15						102																		
16						98																		
17						92																		
18						91																		
19						95																		
20						91																		
21	177	12.7	51	34	5.9	90																		
22	177	14.3	57	44	6.1	88																		
23	265	12.6	51	52	6.1	80																		
24						90																		
25	133	13.4	51	28	6.1	88																		
26	88	13.6	61	22	6.1	88	5.1																	
27	110	13.9	54	25	5.9	102																		
28	155				6.1	100																		
29	177	11.4	52	32	6.0	88																		
30	133	12.2	51	25		82																		
31																								
TOTAL	2984											22763												
ARITH. MEAN	149	12.1	57	31		95		2.5	63			11381		.29	50	1000			245					

MDPH
D-4

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH July 19 74 — MISCELLANEOUS DATA — OPERATOR Robert J. Swalwell

DATE	WEATHER Precip. Inches	Temp. (°F) Max.	Temp. (°F) Min.	Type	RAW SEWAGE Temp. °F	Flow MGD Total MGD	Flow MGD Max. Rate	Flow MGD Min. Rate	pH	~~XXXX~~ water cf/~~XX~~	Cl_2 lbs.	POWER KWH	AUX. FUEL *	CHEMICALS APPLIED					REMARKS
1	.02	90	70	R	56	3.24	3.90	2.50	7.3	560	86	320	**						*Gas - cu. ft. X 100
2	.02	92	86	R	56	3.21	3.80	2.60	7.3	1310	145	360							
3		96	72	C	57	3.17	3.80	2.60	7.2	1360	130	320							** none used
4	.32	88	56	R	56	2.96	3.70	2.60	7.1	560	53	280							
5		84	56	C	56	3.03	3.60	2.60	7.1	1380	137	320							
6		90	57	C	54	3.01	3.50	2.50	7.1	1340	122	320							
7		90	66	C	55	3.01	3.50	2.60	7.3	1480	119	320							
8		96	70	C	58	3.19	3.90	2.40	7.3	1320	131	320							
9		95	70	C	57	3.14	3.70	2.40	7.2	1480	130	240							
10		82	56	CL	58	3.08	3.70	2.40	7.4	1510	135	280							
11		86	52	C	56	3.05	3.70	2.30	7.4	1680	128	280							
12		90	62	C	56	3.05	3.80	2.20	7.2	1770	130	320							
13		95	67	C	56	2.94	3.50	2.60	7.2	1520	112	280							
14		98	64	C	56	2.91	3.40	2.50	7.4	1560	115	280							
15		84	56	C	57	3.00	3.70	2.30	7.3	1350	136	280							
16		83	57	C	57	2.95	3.50	2.30	7.2	1500	134	280							
17		90	70	CL	57	2.94	3.60	2.20	7.2	1580	114	240							
18		90	66	CL	58	2.94	3.50	2.20	7.2	1500	130	280							
19		92	60	CL	57	3.00	3.50	2.20	7.4	1520	133	280							
20		82	50	C	57	2.85	3.50	2.20		1470	123	280							
21		82	62	CL	56	2.77	3.30	2.20	6.6	1350	112	250							
22	.07	76	60	R	57	2.93	3.70	2.20	7.3	1320	137	280							
23	.01	74	54	R	57	2.94	3.60	2.50	7.2	1300	175	280							
24		84	60	CL	58	2.96	3.70	2.50	7.3	1330	132	320							
25		84	62	CL	57	2.90	3.50	2.10	7.1	1410	130	280							
26		90	63	C	57	2.98	3.70	2.40		2030	127	280							
27		88	55	C	56	2.82	3.40	2.30	7.2	1650	113	280							
28	.92	90	60	R	56	2.89	3.80	2.30	7.2	1700	115	320							
29		76	56	C	56	3.05	3.80	2.30	7.2	1710	127	320							
30		76	54	C	57	2.98	3.50	2.30	7.2	1780	129	280							
31		78	52	C	57	3.05	3.80	2.40	7.2	1720	131	320							
TOTAL	1.36										3871	9080							
ARITH. MEAN						3.00				1454	125								

MDPH
D-4.1

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH July 19 74 — PRIMARY TREATMENT DATA — OPERATOR Robert J. Swalwell

DATE	5-DAY BOD INF. Mg/l	5-DAY BOD INF. LBS. X 10	5-DAY BOD EFF. Mg/l	5-DAY BOD EFF. LBS. X 10	5-DAY BOD REM. %	SUSPENDED SOLIDS INF. Mg/l	SUSPENDED SOLIDS INF. LBS. X 10	SUSPENDED SOLIDS EFF. Mg/l	SUSPENDED SOLIDS EFF. LBS. X 10	SUSPENDED SOLIDS REM. %	SUSP. VOLATILE SOLIDS INF. Mg/l	SUSP. VOLATILE SOLIDS INF. LBS. X 10	SUSP. VOLATILE SOLIDS EFF. Mg/l	SUSP. VOLATILE SOLIDS EFF. LBS. X 10	Total PHOSPHORUS – P INF. Mg/l	Total PHOSPHORUS – P INF. LBS. X	Total PHOSPHORUS – P EFF. Mg/l	Total PHOSPHORUS – P EFF. LBS. X	Total PHOSPHORUS – P REM. %	REMARKS
1	45	122	36	97	20	77	208	26	70	66										
2	48	128	44	117	8	62	166	35	94	44										
3	48	127	33	87	31	76	201	23	61	70	53	140	16	42						
4	12	30	8	20	33	30	74	16	40	47	25	62	12	30						
5	56	142	36	91	36	76	192	26	66	66	65	164	22	56						
6	42	105	27	68	36	54	136	22	55	60	44	110	18	45						
7	45	113	28	70	38	109	247	25	63	77	92	231	18	45						
8	52	138	45	119	13	74	197	33	88	55	53	141	24	64						
9	54	139	40	103	26	115	295	56	144	51	88	226	48	123						
10	63	165	45	118	29	93	243	33	86	65	71	186	21	55						
11																				
12	48	122	39	99	19	54	137	25	64	53	38	97	15	38						
13	48	118	42	103	13	62	152	27	66	56	49	120	12	29						
14	72	175	39	95	32	61	148	27	66	56	43	104	16	39						
15	72	180	54	135	25	51	128	45	113	11	37	93	36	90						
16	51	125	42	103	18	71	175	38	93	46	54	133	24	59						
17	56	137	42	103	25	65	159	46	113	29	49	120	33	81						
18	57	140	27	66	53	51	125	42	103	18	42	103	15	37						
19	144	360	66	165	54	100	250	70	175	30	79	198	57	143						
20																				
21	45	104	24	55	47	86	199	26	60	70	69	159	21	49						
22	54	132	42	103	22	64	156	39	95	39	45	110	29	71						
23	68	167	48	118	29	91	223	46	113	49	70	172	33	81						
24	69	170	57	141	17	117	289	39	96	67	93	230	24	59						
25	54	131	33	80	39	65	157	36	87	55	50	121	21	51						
26																				
27	48	113	36	85	25	58	136	23	54	60	45	106	13	31						
28	60	145	36	87	40	71	171	32	77	55	53	128	23	55						
29	60	153	36	92	40	110	280	41	104	63	74	188	31	79						
30	57	142	33	82	42	104	258	27	67	74	71	176	16	40						
31	54	137	40	102	22	129	328	44	112	66	72	183	23	59						
TOTAL		3960		2704			5457		2425			3801		1551						
ARITH. MEAN	57	141	39	132	30	78	195	35	87	54	59	146	24	60						

Digester Volume, ft^3
Primary 14000
Secondary 14000

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MDPH
D-4.5

Supernatant To Raw wetwell
Process Pattern raw-pri.-sec.dig.-beds

MONTH July 19 74

DIGESTER AND SLUDGE DATA

OPERATOR Robert J. Swalwell

DATE	RAW SLUDGE Gals. 10X	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. 10X	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. 10X	DIGESTED SLUDGE Total Solids %	DIGESTED SLUDGE Vol. Solids %	DIGESTED SLUDGE pH	Gas Produced cu. ft X
1						100																		
2	309	11.7	49	54	5.5	100																		
3	133	13.9	68	38	5.7	90																		
4						90																		
5	133	13.2	51	27	5.8	90																		
6	133	11.8	55	26	5.8	88																		
7	177	12.9	53	37	5.8	86																		
8						86	5.2	7.2	60			1061		.31	46	1240			250					
9	221	13.2	52	46	6.0	86																		
10	177	13.0	49	34	6.1	84																		
11	133	11.5	49	23	6.0	82																		
12	88	14.3	56	25	6.0	84																		
13	133	11.6	51	24	5.8	83																		
14	133	13.4	50	27		84																		
15	177	12.5	52	35	5.9	84		5.9	56			1503		.32	42	1340			245					
16	133	12.8	55	28	5.8	84																		
17	177	12.7	54	37	6.1	83																		
18	133	13.2	51	27	5.9	82														1380	11.5	42		
19	221	11.0	60	44	6.1	82																		
20	88	10.5	82	23	6.0	82																		
21	133	12.9	55	29	6.0	82																		
22	221	11.5	56	43	5.9	82																		
23	133	11.5	56	26	6.0	80																		
24	177	10.0	59	32	6.1	80																		
25	88	9.0	58	14	6.0	80		8.0	62															
26	177	10.0	53	28	6.1	110																		
27	133	17.2	48	33	5.6	90																		
28	221	11.2	61	45	5.7	84																		
29	177	11.3	55	33	5.8	84																		
30	133	11.6	58	27	5.6	100																		
31	575	11.7	55	112		108																		
TOTAL	4862											2564								1380				
ARITH. MEAN	174	11.7	55	35		90		7.0	59			1282		.31	1290				248	1380	11.5	42		

Marshall, City of
Mayor
323 W. Michigan Ave.
Marshall, Michigan 40068

Marshall W.W.T.P.
R.J. Swalwell, Supt.
323 W. Michigan Ave.
Marshall, Michigan 40068

MONTH August YEAR 1974
THIS IS THE REPORT FORM FOR →

1.1 CFS 38500 30 DISTRICT 03
Discharge to Kalamazoo River 001
Marshall, City of
Waste Water Treatment Plant

PLEASE COMPLETE THIS PAGE AND SUBMIT IT WITH YOUR OTHER FORMS AT THE END OF EACH MONTH. THE REPORTS MUST REACH OUR LANSING OFFICE BY THE 10th OF THE MONTH.

* DO NOT REPORT THE HIGHEST DAILY VALUE FOR PARAMETERS LIMITED BY A 7 DAY AVERAGE IN A PERMIT. INSTEAD REPORT THE HIGHEST 7 DAY AVERAGE FOR THESE PARAMETERS.

COLIFORM AVERAGES SHOULD BE COMPUTED AS A GEOMETRIC MEAN.
PLEASE USE UNITS SPECIFIED.

CARD NO 69 (1-2) STATION NO 130029 (3-8)

REMARKS CODE: 1=LESS THAN, 2=GREATER THAN

ORDER NO (9-13) / PARAM NO (14-18)	23540 / 85001	23540 / 00310	23540 / 85002	23540 / 00530	23540 / 31504
NAME	BOD-5#/D	BOD-5	SOLSUS#D	SOLIDSUS	COLI-TMF
UNITS	LBS/DAY	MG/L	LBS/DAY	MG/L	MF/100ML
STD.	< 1350	< 50	< 1220	< 45	< 1000
STD.	7D < 1760	7D < 65	7D < 1620	7D < 60	
MONTHLY SUMMARY (21-28)	1040	43	870	34	
AVERAGE (29)					
(30-37)	1121	50	978	40	
* HIGH (38)					
(39-46)	600	24	570	23	
LOW (47)					
REMARKS CODE					
NUMBER TIMES EXCEEDED (48-49)	0 0	0 0	0 0	0 0	
SAMPLE TYPE (50-51)	24	24	24	24	
FREQUENCY OF ANALYSIS (52-56)	27-31	27-31	27-31	27-31	
BEGINNING DATE (57-62)	08 01 74	DUP PUNCH (57-68)	DUP PUNCH (57-68)	DUP PUNCH (57-68)	DUP PUNCH (57-68)
MONTH DAY YEAR					
ENDING DATE (63-68)	08 31 74				

ORDER NO (9-13) / PARAM NO (14-18)	23540 / 50050	23540 / 00400	(9-13) / (14-18)	9-13 / (14-18)	9-13 / (14-18)
NAME	FLOW-MGD	PH			
UNITS	MGD	SU			
STD.		> 6.5			
STD.		< 9.5			
MONTHLY SUMMARY (21-28)	2.90	7.5			
AVERAGE (29)					
(30-37)	4.00	7.8			
* HIGH (38)					
(39-46)	1.60	7.2			
LOW (47)					
REMARKS CODE					
NUMBER TIMES EXCEEDED					
SAMPLE TYPE	N.A	24			
FREQUENCY OF ANALYSIS (52-56)	CONT	27-31			
BEGINNING DATE (57-62)	08 01 74	DUP PUNCH (57-68)	DUP PUNCH (57-68)	DUP PUNCH (57-68)	DUP PUNCH (57-68)
MONTH DAY YEAR					
ENDING DATE (63-68)	08 31 74				

SIGNATURE OF CERTIFIED OPERATOR Robert J. Swalwell

CERTIFICATION NUMBER 585

R 4315-M REV. 3/73

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

AUGUST, 19 74
Month

Marshall, Michigan
Municipality

Robert S. Swarthout
Superintendent, Signature

1 2 3 8 9 10 11 12 13 15
ID 130069 08 74 500
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	00003	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C		
SF															C		
01	4	.37	3.04	3.70	58	7.6	72	1830	100	2530					C		
02	4	.04	3.03	3.80	58	7.4	66	1670	111	2800					C		
03	4	.02	2.90	3.40	57	7.4	54	1310	61	1470					C		
04	4	.20	2.88	3.30	56	7.5	33	790	100	2400					C		
05	1		3.00	3.80	57	7.5	45	1130	84	2100					C		
06	1		2.98	3.80	58	7.4	51	1270	101	2510					C		
07	4	.02	2.96	4.00	58	7.7	60	1490	74	1840					C		
08	4	.15	2.97	3.70	58	7.6	80	1980	105	2600					C		
09	3		2.94	3.80	58	7.7	66	1550	93	2190					C		
10	4	.14	2.82	3.40	58	7.5	68	1600	58	1360					C		
11	4	.35	2.85	3.50	57	7.6	92	2190	104	2470					C		
12	3		2.99	4.00	59	7.3	80	1990	196	4880					C		
13	1		2.93	3.60	59	7.4	68	1660	128	3130					C		
14	1		2.90	4.00	58	7.7	76	1840	118	2850					C		
15	1		2.88	3.70	58	7.7	63	1510	101	2430					C		
16	4	.60	3.00	4.00	58	7.6	68	1700	99	2480					C		
17	1		2.81	3.20	58	7.7	45	1050	51	1190					C		
18	1		2.85	3.20	56										C		
19	1		2.97	3.90	58	7.9	63	1560	68	1680					C		
20	1		2.93	3.90	58	7.8	68	1660	89	2170					C		
21	1		2.89	3.70	58	7.8	96	2310	103	2480					C		
22	1		2.91	3.80	58	7.6	68	1650	96	2330					C		
23	3		2.91	3.80	60										C		
24	4	.02	2.75	3.30	56	7.9	63	1440	67	1540					C		
25	3		2.71	3.00	56	7.6	84	1900	146	3300					C		
26	4	.14	2.89	3.60	54	7.6	60	1450	85	2050					C		
27	4	.01	2.85	3.40	59	7.8	80	1900	99	2350					C		
28	3		2.83	3.50	58	7.7	64	1510	111	2620					C		
29	1		2.81	3.50	58										C		
30	4	.25	2.86	3.60	58	7.6	60	1430	84	2000					C		
31	1		2.71	3.30	58										C		
TL		2.31	89.75					43370		63750					C		
ME			2.90				66	1610	97	2360					C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

August, 19 74 (Month) — Marshall (Municipality), Michigan — Robert Q. Sundell (Superintendent's Signature)

ID 36029 (Plant No.) 08 (Mo.) 74 (Yr.) 000 (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	48	1220	33	33	840	67						7.4			C		
02	39	990	41	37	930	67						7.2			C		
03	36	870	33	27	650	56						7.3			C		
04	27	650	18	51	1220	49						7.4			C		
05	24	600	47	38	950	55						7.4			C		
06	33	820	35	31	770	69						7.2			C		
07	48	1190	20	32	800	57						7.4			C		
08	42	1040	48	38	940	64						7.4			C		
09	45	1060	32	32	750	66						7.6			C		
10	42	990	38	26	610	55						7.5			C		
11	48	1140	48	35	830	66						7.5			C		
12	60	1500	25	58	1450	70						7.2			C		
13	42	1030	38	39	950	70						7.4			C		
14	54	1310	29	32	770	73						7.5			C		
15	52	1250	17	42	1010	58						7.6			C		
16	51	1280	25	49	1230	51						7.6			C		
17	33	770	27	26	610	49						7.4			C		
18															C		
19	40	1100	37	23	570	66						7.8			C		
20	45	870	34	30	730	66						7.7			C		
21	36	1160	63	33	800	68						7.6			C		
22	48	990	29	38	920	60						7.6			C		
23															C		
24	52	1190	17	43	990	36						7.7			C		
25	42	950	50	30	680	79						7.4			C		
26	36	870	40	40	960	53						7.5			C		
27	36	860	55	30	710	70						7.6			C		
28	54	1270	16	45	1060	59						7.5			C		
29															C		
30	42	1000	30	30	720	64						7.4			C		
31															C		
TL		27970			23450										C		
ME	43	1040	34	34	870	62						7.5			C		
WA	50	1214	28	40	978	59									C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

AUGUST 19 74
Month

Marshall, Michigan
Municipality

Robert J. Sucholt
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID 130029 08 78
Plant No. M

DAY 1 2	GRIT 9 CF	AUXILIARY FUEL 14	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl2 LBS	39	44	49	54	59
PN											
SF											
01			280			139					
02			280			61					
03			280			110					
04			280			140					
05			280			132					
06			280			123					
07			280			129					
08			280			139					
09			280			126					
10			240			117					
11			240			116					
12			280			133					
13			280			137					
14			280			136					
15			240			146					
16			280			135					
17			280			120					
18			280			119					
19			280			131					
20			200			134					
21			200			131					
22			200			131					
23			160			137					
24			200			112					
25			160			112					
26			200			132					
27			200			126					
28			200			135					
29			200			130					
30			200			120					
31			200			119					
TL			7520			3958					
ME			243			128					

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours	V
TOTAL				
Superintendent	1		176	
Asst. Supt.	1		176	
Shift Foreman				
Shift Operator	1		180	
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 24000
Secondary 24000

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-45

Marshall, MICHIGAN

Supernatant To Raw wetwell
Process Pattern Raw - Pri. dig. - Sec. dig. - Beds

MONTH August 1974

DIGESTER AND SLUDGE DATA

OPERATOR Robert J Sullivan

DATE	RAW SLUDGE Gas X 10	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 10	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 10
1	265	11.0	56	44	6.1	96	5.4	2.3	75			1238		.14	39	960			340					30
2	88	12.7	48	16	6.0	92																		65
3	177	14.6	45	35	5.8	94																		43
4	88	16.5	42	19	5.7	89																		36
5	133	13.4	49	26	5.8	88																		30
6	265	13.0	59	62	6.0	86																		2
7	88	13.5	52	19	6.2	84		2.8	66			1193		.26	43	860			360					32
8	177	13.5	48	35	6.0	84																		66
9	177	12.5	51	34	5.9	84	5.6																	55
10	133	12.4	52	26	6.1	83																		52
11	177	13.6	52	37	6.1	78																		45
12						83																		37
13	221	11.7	57	79	6.1	83																		32
14	88	14.6	53	39	6.0	82		4.7	65			1547		.28	35	1140			37					29
15						82																		48
16	177	13.6	55	73	6.2	84																		40
17	221	15.4	46	48	6.1	86																		68
18	133	15.8	44	28	5.6	88																		58
19						87																		47
20	221	15.5	49	51	6.2	82																		40
21	221	13.1	53	47	6.1	78																		37
22	177	17.9	50	48	6.2	78																		35
23	133	15.6	53	33	6.2																			31
24																								30
25	88	15.3	48	20	6.1																			30
26	88	14.4	47	18	6.2																			28
27	88	12.5	49	16	6.0																			27
28	177	13.3	54	39	6.1																			20
29	133	15.9	54	35	5.4		5.6	5.2	50			1193												62
30																								50
31	177	14.2	47	36	6.0																			32
TOTAL	4110											5171												1237
ARITH. MEAN	158	14.0	51	37		85		3.7	64			1292		.22	39	986			357					40

Mayor
323 W. Michigan Ave.
Marshall, Michigan 40068

Marshall W.W.T.P.
R.J. Swalwell, Supt.
323 W. Michigan Ave.
Marshall, Michigan 40068

THIS IS THE REPORT FORM FOR MONTH September YEAR 1974

Discharge to Kalamazoo River 001
Marshall, City of
Waste Water Treatment Plant

PLEASE COMPLETE THIS PAGE AND SUBMIT IT WITH YOUR OTHER FORMS AT THE END OF EACH MONTH. THE REPORTS MUST REACH OUR LANSING OFFICE BY THE 10th OF THE MONTH.

* DO NOT REPORT THE HIGHEST DAILY VALUE FOR PARAMETERS LIMITED BY A 7 DAY AVERAGE IN A PERMIT. INSTEAD REPORT THE HIGHEST 7 DAY AVERAGE FOR THESE PARAMETERS.

COLIFORM AVERAGES SHOULD BE COMPUTED AS A GEOMETRIC MEAN.
PLEASE USE UNITS SPECIFIED.

CARD NO. 89 (1-2) STATION NO. 130029 (3-8)

REMARKS CODE: 1=LESS THAN, 2=GREATER THAN

ORDER NO / PARAM NO	23540 / 85001	23540 / 00310	23540 / 85002	23540 / 00530	23540 / 31504
NAME	BOD-5#/D	BOD-5	SOLSUS#D	SOLIDSUS	COLI-TMF
UNITS	LBS/DAY	MG/L	LBS/DAY	MG/L	MF/100ML
STD.	< 1350	< 50	< 1220	< 45	< 1000
STD.	7D < 1760	7D < 65	7D < 1620	7D < 60	
MONTHLY SUMMARY AVERAGE	111.1	4.9	912	4.0	
MONTHLY SUMMARY * HIGH	121.4	5.2	1200	5.2	
MONTHLY SUMMARY LOW	735	3.3	490	2.2	
REMARKS CODE					
NUMBER TIMES EXCEEDED	0	0	0	0	
SAMPLE TYPE	24	24	24	24	
FREQUENCY OF ANALYSIS	24-30	24-30	24-30	24-30	
BEGINNING DATE (MONTH DAY YEAR)	09 01 74				
ENDING DATE (MONTH DAY YEAR)	09 30 74				

ORDER NO / PARAM NO	23540 / 50050	23540 / 00400			
NAME	FLOW-MGD	PH			
UNITS	MGD	SU			
STD.		> 6.5			
STD.		< 9.5			
MONTHLY SUMMARY AVERAGE	2.74	7.35			
MONTHLY SUMMARY * HIGH	3.80	7.8			
MONTHLY SUMMARY LOW	1.66	7.4			
REMARKS CODE					
NUMBER TIMES EXCEEDED					
SAMPLE TYPE	NA	24			
FREQUENCY OF ANALYSIS	CONT	24-30			
BEGINNING DATE (MONTH DAY YEAR)	09 01 74				
ENDING DATE (MONTH DAY YEAR)	09 30 74				

SIGNATURE OF CERTIFIED OPERATOR Robert J. Swalwell

CERTIFICATION NUMBER 585

R 4515-M REV. 3/73

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

September, 19 74 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
ID 130628 09 74 500
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 33	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	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	4	.08	2.70	3.00	56											C			
02	4	.42	2.72	3.20	57											C			
03	4	.02	2.85	3.60	58											C			
04	3		2.82	3.40	58	7.6	52	1222	97	2280						C			
05	1		2.95	3.60	57	7.6	52	1279	68	1672						C			
06	1		2.84	3.60	58	7.6	57	1349	70	1657						C			
07	1		2.82	3.30	56	7.7	76	1787	71	1669						C			
08	1		2.82	3.30	56	7.5	65	1528	67	1575						C			
09	1		2.89	3.50	57	7.5	66	1590	77	1856						C			
10	3		2.82	3.30	58											C			
11	4	.87	2.91	3.66	58	7.8	72	1764	89	2159						C			
12	4	.34	2.88	3.46	58	7.7	72	1729	98	2352						C			
13	4	.02	2.80	3.60	59	7.5	64	1494	121	2825						C			
14	3		2.70	3.20	56	7.4	60	1351	61	1373						C			
15	1		2.70	3.10	56	7.7	88	1981	79	1779						C			
16	1		2.80	3.50	58	7.7	56	1308	69	1611						C			
17	3		2.77	3.50	58	7.6	90	2079	78	1802						C			
18	1		2.76	3.30	58	7.6	54	1243	76	1749						C			
19	4	.09	2.73	3.80	58	7.6	51	1161	65	1479						C			
20	4	.06	2.72	3.40	58	7.5	54	1225	63	1429						C			
21	4	.03	2.60	2.90	56											C			
22	1		2.59	3.60	56	7.6	64	1382	81	1750						C			
23	1		2.67	3.30	58	7.6	68	1536	73	1626						C			
24	3		2.61	3.20	56											C			
25	1		2.61	3.40	58	7.8	48	1045	64	1393						C			
26	1		2.60	3.10	57	7.6	84	1821	74	1604						C			
27	4	.24	2.62	3.20	58	7.7	56	1224	77	1682						C			
28	4	.32	2.57	3.00	57	7.7	60	1286	69	1372						C			
29	3		2.58	3.00	56	7.6	69	1485	80	1722						C			
30	3		2.67	3.60	58	7.6	52	1158	84	1870						C			
31																C			
TL		2.49	82.12					35031		42286						C			
ME			2.74				64	1460	77	1761						C			

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

September, 19 74 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
ID 130629 09 74 000
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	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															C			
02															C			
03															C			
04	40	940	23	50	1175	48						7.5			C			
05	48	1180	7	33	811	51						7.5			C			
06	44	1041	23	27	639	61						7.5			C			
07	52	1223	32	33	775	54						7.4			C			
08	52	1223	20	40	940	40						7.4			C			
09	45	1084	32	35	844	55						7.4			C			
10															C			
11	54	1310	25	39	946	56						7.6			C			
12	60	1440	17	59	1417	44						7.6			C			
13	54	1261	16	63	1471	48						7.5			C			
14	40	901	33	39	878	36						7.4			C			
15	51	1148	42	58	1306	27						7.6			C			
16	45	1051	20	36	841	48						7.7			C			
17	60	1386	33	62	1432	21						7.5			C			
18	51	1174	6	46	1058	39						7.4			C			
19	42	956	18	31	706	52						7.5			C			
20	44	998	19	29	658	54						7.8			C			
21															C			
22	48	1036	25	31	670	62						7.6			C			
23	36	802	48	22	490	30						7.6			C			
24															C			
25	49	914	13	41	893	36						7.5			C			
26	64	1388	24	43	932	42						7.4			C			
27	56	1224	0	32	699	58						7.6			C			
28	45	946	25	23	493	64						7.6			C			
29	60	1291	13	40	861	56						7.5			C			
30	33	735	37	43	958	49						7.6			C			
31															C			
TL		26670			21,893										C			
ME	49	1111	23	40	912	47						7.5			C			
WA	52	1214	21	52	1200	38						7.6			C			

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

SEPTEMBER, 19 74
Month

Marshall, Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID 130029 09 74 ...
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	44	49	54	59
PN											
SF											
01			200			81					
02			160			115					
03			280			129					
04			280			132					
05			280			79					
06			240			110					
07			160			109					
08			160			108					
09			240			142					
10			200			139					
11			240			139					
12			200			134					
13			200			134					
14			200			123					
15			160			116					
16			200			135					
17			200			136					
18			280			159					
19			240			129					
20			240			140					
21			280			120					
22			280			132					
23			280			125					
24		400	240			130					
25		200	280			129					
26		100	240			128					
27		200	280			129					
28		100	240			115					
29		300	240			113					
30		3300	320			174					
31											
TL		4600	7040			3784					
ME		657	235			126					

MANPOWER

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

GIVE THE HOURS PER DAY PLANT PERSONNEL ARE NORM

WEEKDAYS 9 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

Digester Volume, ft³
Primary 14,000
Secondary 14,000

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MDPH
D-4.5

Supernatant To Raw wetwell
Process Pattern Raw-Pri-dig-Sec.dig.-beds

MONTH September 1974

DIGESTER AND SLUDGE DATA

OPERATOR Robert J Swalwell

DATE	RAW SLUDGE Gals. X	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 100
1	2210	14.1	49	46	6.1																			32
2																								26
3	1768	11.7	53	23	6.3																			25
4	2652	14.8	54	64	6.2																			17
5	884	12.4	55	18	6.3																			34
6	884	15.3	50	21	6.3																			59
7	884	12.2	52	17	6.1																			34
8	884	12.2	58	19	5.9																			31
9	1326	11.3	55	25	6.1																			51
10																								42
11					6.1																			
12	1768	11.8	57	36	6.1																			
13	1326	11.3	55	25	6.1																			
14	1326	15.0	52	31	6.3																			
15	1326	12.8	53	27	6.2																			
16																								
17	1326	15.7	49	31	6.2																			
18	1326	13.6	52	27	6.3																			
19																								
20	1326	13.0	52	27	6.1																			
21	1326	13.1	55	29	6.2																			
22	2210	13.6	64	58	6.2																			
23																								
24	1326	13.4	50	27	6.1																			
25	2652	12.1	58	57	6.2																			
26	1326	14.9	51	31	6.3																			
27	1326	14.0	48	27	6.2																			13
28	1326	13.1	49	26	6.2																			17
29	1326	14.4	49	28	6.0																			15
30	1326	14.1	54	31	5.9																			1
31																								
TOTAL	35,360																							397
ARITH. MEAN	1473	13.3	53	32																				28

Mayor
323 W. Michigan Ave.
Marshall, Michigan 40068

Marshall W.W.T.P.
R.J. Swalwell, Supt.
323 W. Michigan Ave.
Marshall, Michigan 40068

THIS IS THE REPORT FORM FOR — MONTH: October — YEAR: 1974

Discharge to Kalamazoo River 001
Marshall, City of
Waste Water Treatment Plant

PLEASE COMPLETE THIS PAGE AND SUBMIT IT WITH YOUR OTHER FORMS AT THE END OF EACH MONTH. THE REPORTS MUST REACH OUR LANSING OFFICE BY THE 10th OF THE MONTH.

* DO NOT REPORT THE HIGHEST DAILY VALUE FOR PARAMETERS LIMITED BY A 7 DAY AVERAGE IN A PERMIT. INSTEAD REPORT THE HIGHEST 7 DAY AVERAGE FOR THESE PARAMETERS.

COLIFORM AVERAGES SHOULD BE COMPUTED AS A GEOMETRIC MEAN.
PLEASE USE UNITS SPECIFIED.

CARD NO: 69 (1-2)
STATION NO: 130029 (3-8)

REMARKS CODE: 1=LESS THAN, 2=GREATER THAN

ORDER NO (9-13)	23540	23540	23540	23540
PARAM NO (14-18)	85001	00310	85002	00530
NAME	BOD-5#/D	BOD-5	SOLSUS#D	SOLIDSUS
UNITS	LBS/DAY	MG/L	LBS/DAY	MG/L
STD.	< 1350	< 50	< 1220	< 45
STD.	7D < 1760	7D < 65	7D < 1620	7D < 60
MONTHLY SUMMARY (19-20) AVERAGE (21-28)	944	4.7	831	4.2
* HIGH (30-37)	1066	5.3	996	5.0
LOW (39-46)	474	4.4	390	1.9
REMARKS CODE				
NUMBER TIMES EXCEEDED (48-49)	0 0	0 0	0 0	0 0
SAMPLE TYPE (50-51)	2 4	1 4	2 4	2 4
FREQUENCY OF ANALYSIS (52-56)	2 4 - 3 1	2 4 - 3 1	2 4 - 3 1	2 4 - 3 1
BEGINNING DATE (57-62)	1 0 0 1 7 4	DUP PUNCH (57-68)	DUP PUNCH (57-68)	DUP PUNCH (57-68)
MONTH DAY YEAR				
ENDING DATE (63-68)	1 0 3 1 7 4			

ORDER NO (9-13)	23540	23540	23540	23540
PARAM NO (14-18)	31504			
NAME	COLI-TMF			
UNITS	MF/100ML			
STD.	< 1000			
STD.				
MONTHLY SUMMARY (19-20) AVERAGE (21-28)				
* HIGH (30-37)				
LOW (39-46)				
REMARKS CODE				
NUMBER TIMES EXCEEDED (48-49)				
SAMPLE TYPE (50-51)				
FREQUENCY OF ANALYSIS (52-56)				
BEGINNING DATE (57-62)	DUP PUNCH (57-68)	DUP PUNCH (57-68)	DUP PUNCH (57-68)	DUP PUNCH (57-68)
MONTH DAY YEAR				
ENDING DATE (63-68)				

ORDER NO (9-13)	23540	23540	(9-13)	(9-13)
PARAM NO (14-18)	50050	00400	(14-18)	(14-18)
NAME	FLOW-MGD	PH		
UNITS	MGD	SU		
STD.		> 6.5		
STD.		< 9.5		
MONTHLY SUMMARY (19-20) AVERAGE (21-28)	2.43	7.6		
* HIGH (30-37)	4.90	8.1		
LOW (39-46)	2.70	7.4		
REMARKS CODE				
NUMBER TIMES EXCEEDED (48-49)		0 0		
SAMPLE TYPE (50-51)	N A	2 4		
FREQUENCY OF ANALYSIS (52-56)	C O N T	2 4 - 3 1		
BEGINNING DATE (57-62)	1 0 0 1 7 4	DUP PUNCH (57-68)	DUP PUNCH (57-68)	DUP PUNCH (57-68)
MONTH DAY YEAR				
ENDING DATE (63-68)	1 0 3 1 7 4			

ORDER NO (9-13)	(9-13)	(9-13)	(9-13)	(9-13)
PARAM NO (14-18)	(14-18)	(14-18)	(14-18)	(14-18)
MONTHLY SUMMARY (19-20) AVERAGE (21-28)				
* HIGH (30-37)				
LOW (39-46)				
REMARKS CODE				
NUMBER TIMES EXCEEDED (48-49)				
SAMPLE TYPE (50-51)				
FREQUENCY OF ANALYSIS (52-56)				
DUP PUNCH (57-68)				

SIGNATURE OF CERTIFIED OPERATOR: Robert J. Swalwell

CERTIFICATION NUMBER: 585

R 4515-M REV. 3/73

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

October 19 74
Month

Marshall, Michigan
Municipality

Robert J
Sig

1 2 3 8 9 10 11 12 13 15
ID 130029 10 74 500
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	74
	See Code*	Inches	MGD	MGD	°F	SU	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	
SF														
01	4	.08	2.47	3.10	57	7.9	76	1506	83	1709				
02	1		2.45	3.20	57	7.8	84	1716	112	2288				
03	4	.01	2.40	2.90	57	7.6	96	1921	112	2241				
04	4	.02	2.42	2.90	57	7.9	72	1452	80	1614				
05	1		2.37	3.20	56	7.7	72	1423	83	1640				
06	4	.11	2.40	2.90	56	7.6	76	1521	98	1961				
07	3		2.52	3.10	57									
08	3		2.45	3.30	57									
09	1		2.55	3.10	57									
10	1		2.41	2.90	57									
11	1		2.41	3.00	57									
12	4	.02	2.30	2.90	55									
13	4	.49	2.37	2.80	55	7.4	72	1423	105	2075				
14	4	.09	2.51	2.90	58	7.8	51	1067	62	1298				
15	1		2.42	3.10	57	8.0	56	1130	83	1675				
16	3		2.23	2.90	56	7.8	60	1116	72	1339				
17	3		2.47	2.90	57	7.8	52	1071	90	1854				
18	3		2.44	3.30	56	7.7	56	1140	86	1750				
19	4	.06	2.38	2.90	54	7.7	66	1310	90	1787				
20	1		2.41	2.70	54	7.7	64	1286	108	2170				
21	1		2.50	3.30	56	7.8	60	1251	77	1605				
22	4	.01	2.41	4.30	56	7.8	66	1326	57	1145				
23	4	.02	2.34	4.70	57	7.8	56	1135	71	1438				
24	4	.02	2.41	4.70	57	7.9	75	1506	75	1506				
25	1		2.47	4.90	56	7.6	81	1668	70	1441				
26	1		2.34	2.80	57	7.9	72	1405	85	1658				
27	1		2.46	2.80	57	7.7	54	1107	35	718				
28	3		2.44	3.40	57	7.8	88	1789	78	1587				
29	4	.39	2.47	3.10	58	7.8	84	1730	91	1875				
30	3		2.49	3.20	57	7.8	112	2326	127	2637				
31	3		2.48	3.00	57									
TL		1.32	7528					34325		41011				
ME			2.43				71	1430	85	1709				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

October 19 74 — Month

Marshall — Municipality — Michigan

Robert — Supe

1 2 3 8 10 11 12 13 15
ID 13,0029 1,0 7,4 000
Plant No Mo Yr 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_3N 59 mg/l	pH 64 SU	DO 69 mg/l	F 74 #
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	
SF														
01	54	1112	29	44	906	47						7.6		
02	54	1103	36	30	613	73						7.6		
03	60	1201	38	72	1441	36						7.4		
04	57	1150	21	34	686	52						7.6		
05	68	1344	6	48	948	42						7.5		
06	54	1081	29	50	1000	49						7.5		
07														
08														
09														
10														
11														
12														
13	24	474	67	26	514	75						7.4		
14	44	921	14	48	1005	73						7.6		
15	45	908	20	68	1372	18						8.1		
16	44	818	27	40	744	44						7.6		
17	35	721	33	59	1215	34						7.7		
18	32	651	43	39	794	55						7.5		
19	36	715	45	67	1330	26						7.6		
20	30	603	53	22	441	62						7.7		
21	40	834	33	37	771	52						7.8		
22	51	1024	23	39	784	32						7.7		
23	42	851	25	49	993	31						7.7		
24	57	1145	24	30	602	60						7.6		
25	51	1050	37	34	700	51						7.4		
26	51	995	29	22	429	74						7.7		
27	24	492	56	19	390	48						7.6		
28	56	1139	36	33	671	58						7.6		
29	42	865	50	48	989	47						7.7		
30	70	1454	38	39	602	64						7.7		
31														
TL		22,651			19,940									
ME	47	944	34	42	831	49						7.6		
WA	53	1066	26	50	996	37						7.7		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

OCTOber 19 74
Month

Marshall, Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID 130029 10 74 ...
Plant No Mo Yr Sampling Point Code

DAY 1 2	GRIT 9	AUX.FUEL 14 GAS	POWER CONSUMPTION 19 #1	24 #2	29 #3	CHEMICALS APPLIED 34 Cl2	39	44	49	54	59
	CF	C.F.	KWH	KWH	KWH	LBS					
PN											
SF											
01		32	280			129					
02		14	320			134					
03		4	320			135					
04		5	280			132					
05		3	280			114					
06			240			117					
07		10	360			132					
08		5	280			136					
09		1	320			133					
10		10	280			128					
11		4	320			128					
12		9	240			114					
13		9	200			110					
14		8	280			128					
15		6	320			133					
16		6	280			127					
17		10	280			129					
18		10	280			134					
19		14	280			123					
20		14	280			111					
21		11	280			130					
22		7	280			95					
23		10	280			132					
24		6	280			130					
25		6	240			126					
26		7	280			115					
27		7	280			118					
28		5	280			136					
29		6	280			129					
30		2	240			130					
31		3	280			130					
TL		244	8720			3898					
ME		8	281			126					

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL			
Superintendent	1		184
Asst. Supt.	1		184
Shift Foreman			
Shift Operator	1		184
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 14000
Secondary 14000

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-45

Marshall, MICHIGAN

Supernatant To Wet well
Process Pattern Raw-Pri-Sed-dig-beds

MONTH October 1974

DIGESTER AND SLUDGE DATA

OPERATOR Robert J Swalwell

DATE	RAW SLUDGE Gals. X	Total Solids %	Vo. Solids %	Vo. 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						68																		1
2	1326	17.2	46	31	6.1	70	6.4																	28
3	1768	15.0	47	38	6.5	70																		2
4						66																		25
5	3094	12.8	48	58	6.3	70																		12
6	3536	15.9	44	78	6.5	70																		11
7	3536	12.3	52	69	6.4	71		.6	50			11050												
8	1768	11.4	51	31	6.4	70	6.3																	
9						69																		28
10	3978	14.3	50	86	6.5	70																		12
11						71																		3
12						70																		17
13						68																		14
14						68						15028		25	58	980			555					5
15						70	6.1	.5	75															28
16	1326	15.5	43	27	6.5	70																		14
17	884	16.4	48	21	6.3	70																		13
18	2210	15.5	46	48	6.3	70																		13
19	884	16.1	45	19	6.0	68																		12
20	884	18.3	43	21	6.2	68																		10
21						68																		
22	1326	16.4	41	27	6.2	68																		
23	1768	12.7	50	34	6.3	67																		
24	884	16.3	42	18	6.2	67																		23
25	3536	13.6	40	58	6.2	70																		3
26	1326	14.0	41	23	6.0	68																		
27	884	15.0	50	20	6.2	67																		
28						68																		23
29	884	9.4	61	15	6.6	70	5.9	.3	50			12818		19	55	480			240					3
30	884	9.5	58	15	6.4	70																		26
31	884	11.4	47	14	6.3	71																		13
TOTAL	37570											38,841												339
ARITH. MEAN	1789	14.2	47	36		69		.4	58			12,963		22	57	730			398					14

Marshall, City of
Mayor
323 W. Michigan Ave.
Marshall, Michigan 40068

Marshall W.W.T.P.
R.J. Swalwell, Supt.
323 W. Michigan Ave.
Marshall, Michigan 40068

MONTH November YEAR 1974
THIS IS THE REPORT FORM FOR →

Discharge to Kalamazoo River 001
Marshall, City of
Waste Water Treatment Plant

PLEASE COMPLETE THIS PAGE AND SUBMIT IT WITH YOUR OTHER FORMS AT THE END OF EACH MONTH. THE REPORTS MUST REACH OUR LANSING OFFICE BY THE 10th OF THE MONTH.

* DO NOT REPORT THE HIGHEST DAILY VALUE FOR PARAMETERS LIMITED BY A 7 DAY AVERAGE IN A PERMIT. INSTEAD REPORT THE HIGHEST 7 DAY AVERAGE FOR THESE PARAMETERS.

COLIFORM AVERAGES SHOULD BE COMPUTED AS A GEOMETRIC MEAN.
PLEASE USE UNITS SPECIFIED.

CARD NO (1-2): 89 | STATION NO (3-8): 130029

REMARKS CODE: 1=LESS THAN, 2=GREATER THAN

ORDER NO (9-13)	23540	23540	23540	23540	23540
PARAM NO (14-18)	85001	00310	85002	00530	31504
NAME	BOD-5#/D	BOD-5	SOLSUS#D	SOLIDSUS	COLI-TMF
UNITS	LBS/DAY	MG/L	LBS/DAY	MG/L	MF/100ML
STD.	< 1350 / 7D < 1760	< 50 / 7D < 65	< 1220 / 7D < 1620	< 45 / 7D < 60	< 1000
STD.					
MONTHLY SUMMARY (19-20)	27	27	27	27	
AVERAGE (21-28)	916	46	688	35	
*HIGH (30-37)	1001	61	871	44	
LOW (39-46)	563	28	305	17	
REMARKS CODE					
NUMBER TIMES EXCEEDED (48-49)	0, 0	0, 0	0, 0	0, 0	
SAMPLE TYPE (50-51)	2, 4	2, 4	2, 4	2, 4	
FREQUENCY OF ANALYSIS (52-56)	5 - 7	5 - 7	5 - 7	5 - 7	
BEGINNING DATE (57-62)	11 01 74 (MONTH DAY YEAR)	DUP PUNCH (57-68)	DUP PUNCH (57-68)	DUP PUNCH (57-68)	DUP PUNCH (57-68)
ENDING DATE (63-68)	11 30 74				

ORDER NO (9-13)	23540	23540			
PARAM NO (14-18)	50050	00400			
NAME	FLOW-MGD	PH			
UNITS	MGD	SU			
STD.		> 6.5 / < 9.5			
STD.					
MONTHLY SUMMARY (19-20)	30	27			
AVERAGE (21-28)	2.38	7.5			
*HIGH (30-37)	4.50	7.7			
LOW (39-46)	0.70	7.2			
REMARKS CODE					
NUMBER TIMES EXCEEDED (48-49)		0, 0			
SAMPLE TYPE (50-51)	N, A	2, 4			
FREQUENCY OF ANALYSIS (52-56)	C O N T	7 - 7			
BEGINNING DATE (57-62)	11 01 74 (MONTH DAY YEAR)	DUP PUNCH (57-68)	DUP PUNCH (57-68)	DUP PUNCH (57-68)	DUP PUNCH (57-68)
ENDING DATE (63-68)	11 30 74				

SIGNATURE OF CERTIFIED OPERATOR Robert J. Swalwell

CERTIFICATION NUMBER 585

R 4515-M REV 3/73

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

November, 19 74 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
ID | 130029 | 11 | 74 | 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	1		2.40	3.10	58	7.8	75	1500	117	2341					C			
02	1		2.37	2.90	55										C			
03	4	.64	2.45	2.90	55	7.7	76	1552	109	2227					C			
04	4	.75	2.57	3.30	57	7.6	76	1629	89	1907					C			
05	4	.03	2.52	2.90	56	7.9	69	1450	91	1912					C			
06	3		2.52	3.00	55	7.8	68	1429	89	1870					C			
07	1		2.49	2.90	56	7.6	51	1059	80	1661					C			
08	4	.03	2.45	3.10	55	7.6	60	1226	80	1634					C			
09	1		2.37	2.40	54	7.7	48	948	82	1620					C			
10	4	.12	2.41	2.90	54	7.5	69	1386	101	2029					C			
11	4	.04	2.49	4.50	56	7.5	69	1432	109	2262					C			
12	4	.07	2.44	3.20	56	7.6	72	1464	143	2908					C			
13	5	.23	2.41	3.10	55	7.6	48	964	132	2652					C			
14	5	.02	2.38	2.90	55	7.6	57	1131	93	1845					C			
15	5		2.29	2.90	54	7.6	41	783	75	1432					C			
16	4	.15	2.30	2.70	54										C			
17	1		2.29	2.60	54	7.6	72	1374	83	1584					C			
18	3		2.41	3.40	55	7.6	63	1266	81	1627					C			
19	4	.05	2.40	2.70	55	7.8	60	1200	99	1980					C			
20	4	.09	2.39	2.70	54	7.7	60	1195	92	1833					C			
21	3		2.37	2.70	54	7.5	60	1186	61	1205					C			
22	3		2.34	2.90	54	7.6	72	1405	115	2244					C			
23	4	.20	2.32	2.80	54	7.5	72	1392	139	2688					C			
24	4	.05	2.28	2.60	54	7.3	76	1445	86	1635					C			
25	5	.01	2.37	3.70	54	7.5	72	1423	119	2352					C			
26	3		2.35	2.70	54	7.9	62	1215	111	2175					C			
27	5	.04	2.35	2.80	54	7.8	68	1333	80	1568					C			
28	3		2.15	2.60	53	7.6	76	1326	82	1470					C			
29	3		2.19	2.60	53	7.7	60	1096	71	1296					C			
30	5	.06	2.19	2.70	52										C			
31															C			
TL		2.58	71.26					34,845		51,957					C			
ME			2.38				63	1,244	93	1,856					C			

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

November, 19 74 (Month) — Marshall (Municipality), Michigan — Robert J. Swackwell (Superintendent's Signature)

1 2 ID | 3–8 130029 (Plant No) | 9 10 11 (Mo) | 12 13 (Yr) | 14 15 000 (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	80	T COLI* 9 #/100 ml	REMARKS 14–19
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 31615	C	31504 [redacted]	
SF															C		
01	60	1200	33	34	680	71						7.7			C		
02															C		
03	48	981	37	41	838	62						7.6			C		
04	48	1029	37	25	536	72						7.6			C		
05	42	882	39	28	588	69						7.6			C		
06	42	882	38	30	630	66						7.5			C		
07	49	1017	4	38	789	53						7.5			C		
08	48	981	20	31	633	51						7.5			C		
09	36	711	25	41	810	50						7.5			C		
10	42	843	39	48	964	52						7.3			C		
11	48	996	30	29	602	73						7.3			C		
12	60	1220	17	57	1159	60						7.6			C		
13	28	563	42	56	1125	58						7.5			C		
14	44	873	23	36	714	61						7.6			C		
15	37	706	10	38	725	49						7.5			C		
16															C		
17	42	802	42	33	630	60						7.5			C		
18	57	1145	10	32	643	60						7.6			C		
19	51	1020	15	35	700	65						7.6			C		
20	54	1076	10	35	697	62						7.6			C		
21	56	1107	7	38	751	38						7.4			C		
22	48	936	33	39	761	66						7.5			C		
23	48	928	33	30	580	78						7.5			C		
24	42	798	45	38	722	56						7.2			C		
25	54	1068	25	35	692	71						7.3			C		
26	50	980	19	41	804	63						7.7			C		
27	52	1019	23	33	647	59						7.4			C		
28	60	1076	21	17	305	79						7.3			C		
29	44	803	27	30	548	58						7.2			C		
30															C		
31															C		
TL		25,642			19,273										C		
ME	46	916	25	35	688	59						7.5			C		
WA	51	1,001	17	44	871	57						7.4			C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

November, 1974 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2: ID | 3–8: 130019 (Plant No) | 9 10: 11 (Mo) | 11 12: 74 (Yr) | 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 Cl_2 LBS.	39	44	49	54	59
PN											
SF											
01		300	240			126					
02		500	240			110					
03		900	240			109					
04		1200	280			66					
05		1500	320			129					
06		1200	240			131					
07		100	280			134					
08		1200	280			130					
09		900	240			112					
10		1000	280			112					
11		1100	280			130					
12		1200	280			128					
13		1100	280			131					
14		1600	280			119					
15		6400	240			115					
16		5900	320			109					
17		5000	240			107					
18		4400	280			133					
19		3300	280			127					
20		2600	280			125					
21		1500	240			115					
22		1200	280			129					
23		500	280			112					
24		1300	240			110					
25		1500	320			125					
26		1600	280			126					
27		1600	280			128					
28		1600	280			118					
29		1100	320			118					
30		1900	240			117					
31											
TL		55200	8160			3581					
ME		1800	272			119					

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours	V
TOTAL				
Superintendent	1		168	
Asst. Supt.	1		168	
Shift Foreman				
Shift Operator	1		172	
Maint. Supervisor				
Mechanic				
Chemist				
Lab Technician				
Clerk-Typist				
Other				

GIVE THE HOURS PER DAY PLANT PERSONNEL ARI

WEEKDAYS 9 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

Digester Volume, ft³
Primary 14,000
Secondary 14,000

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-45

Marshall, MICHIGAN

Supernatant To Wet Well
Process Pattern raw - Pri - Sed - dig - beds

MONTH November 1974

DIGESTER AND SLUDGE DATA

OPERATOR Robert J Swalwell

DATE	RAW SLUDGE Gals. X	Total Solids %	Volatile Solids %	Volatile 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 %	Volatile Solids ~	Suspended Solids Mg/l	P Mg/l	P Lbs	5 Day BOD Mg/l	DIGESTED SLUDGE Gals X	Total Solids %	Volatile Solids %	pH	Gas Produced cu ft x 100
1	1326	9.5	58	22	6.3	72																		13
2	1768	11.7	56	35	6.5	72																		5
3	2210	10.1	52	35	6.1	72																		
4	884	8.7	53	12	6.1	72																		1
5	884	7.9	59	13	6.4	71																		
6	1326	10.1	56	23	6.4	71																		18
7	884	10.2	56	15	6.6	72																		
8	1768	8.2	52	23	6.3	71																		
9	884	9.2	68	17	6.2	71																		
10	884	10.6	52	15	6.2	71						12881		.08	36	600			280					
11	884	9.9	55	15	6.2	71	5.4	.9	50															25
12	1768	9.0	56	27	6.3	72																		3
13	1326	10.5	62	26	6.4	72																		9
14						71																		7
15	1768	11.5	75	46	6.3	71																		
16	884	11.9	75	24	6.2	77																		19
17	1326	7.2	70	20	6.1	83																		10
18	2210	11.5	67	52	6.1	87																		11
19	1326	9.6	74	29	6.2	90																		12
20	2210	10.6	61	43	6.2	92																		1
21	884	9.9	52	14	6.3	89						14144		.22	51	960			450					
22	884	10.7	56	16	6.0	86	5.6	.7	60															
23	1326	8.3	53	18	6.0	83																		
24	1326	11.1	56	25	6.1	82																		20
25	884	9.7	53	13	6.2	81																		
26	1326	9.6	61	24	6.1	80																		
27	1326	11.4	54	25	6.3	78																		21
28						77																		
29	1326	10.6	58	25	6.1	75																		
30	1326	8.4	61	21	6.1	72																		
31																								
TOTAL	37,128											27,025												175
ARITH. MEAN	969	9.9	59	24		77		.8	55			13,514		.15	44	750			365					12

Mayor
323 W. Michigan Ave.
Marshall, Michigan 40068

Marshall W.W.T.P.
R.J. Swalwell, Supt.
323 W. Michigan Ave.
Marshall, Michigan 40068

THIS IS THE REPORT FORM FOR MONTH December YEAR 74

Discharge to Kalamazoo River 001
Marshall, City of
Waste Water Treatment Plant

PLEASE COMPLETE THIS PAGE AND SUBMIT IT WITH YOUR OTHER FORMS AT THE END OF EACH MONTH. THE REPORTS MUST REACH OUR LANSING OFFICE BY THE 10th OF THE MONTH.

* DO NOT REPORT THE HIGHEST DAILY VALUE FOR PARAMETERS LIMITED BY A 7 DAY AVERAGE IN A PERMIT. INSTEAD REPORT THE HIGHEST 7 DAY AVERAGE FOR THESE PARAMETERS.

COLIFORM AVERAGES SHOULD BE COMPUTED AS A GEOMETRIC MEAN.
PLEASE USE UNITS SPECIFIED.

CARD NO. 89 (1-2) | STATION NO. 130029 (3-8)

REMARKS CODE: 1=LESS THAN, 2=GREATER THAN

ORDER NO (9-13)	23540	23540	23540	23540	23540
PARAM NO (14-18)	85001	00310	85002	00530	31504
NAME	BOD-5#/D	BOD-5	SOLSUS#D	SOLIDSUS	COLI-TMF
UNITS	LBS/DAY	MG/L	LBS/DAY	MG/L	MF/100ML
STD.	< 1350	< 50	< 1220	< 45	< 1000
STD.	7D < 1760	7D < 65	7D < 1620	7D < 60	
MONTHLY SUMMARY (19-20)	29	29	26	26	
AVERAGE (21-28)	698	36	657	34	
*HIGH (30-37)	742	38	813	42	
LOW (39-46)	399	21	3[illegible]	18	
REMARKS CODE					
NUMBER TIMES EXCEEDED (48-49)	0.0	0.0	0.0	0.0	
SAMPLE TYPE (50-51)	24	24	24	24	
FREQUENCY OF ANALYSIS (52-56)	5-7	5-7	5-7	5-7	
BEGINNING DATE (57-62)	12 01 74				
ENDING DATE (63-68)	12 31 74				
DUP PUNCH (57-68)					

ORDER NO (9-13)	23540	23540			
PARAM NO (14-18)	50050	00400			
NAME	FLOW-MGD	PH			
UNITS	MGD	SU			
STD.		> 6.5			
STD.		< 9.5			
MONTHLY SUMMARY (19-20)		29			
AVERAGE (21-28)	2.30	7.8			
*HIGH (30-37)	4.40	7.9			
LOW (39-46)	1.10	7.0			
REMARKS CODE					
NUMBER TIMES EXCEEDED (48-49)		0.0			
SAMPLE TYPE (50-51)	N.A	24			
FREQUENCY OF ANALYSIS (52-56)	CONT	7-7			
BEGINNING DATE (57-62)	12 01 74				
ENDING DATE (63-68)	12 31 74				
DUP PUNCH (57-68)					

SIGNATURE OF CERTIFIED OPERATOR Robert J. Swalwell

CERTIFICATION NUMBER 535

R 4515-M REV. 3/7

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

December, 19 74 (Month)

Marshall (Municipality), Michigan

Robert J. Swalwell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
ID 1300219 12 74 500
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	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	.27	2.21	2.40	52										C			
02	3		2.28	2.80	54	7.5	51	969	58	1103					C			
03	3		2.25	2.70	53	7.9	40	750	64	1201					C			
04	3		2.28	2.70	53	7.6	60	1141	96	1825					C			
05	3		2.28	2.60	52	7.7	70	1330	102	1939					C			
06	3		2.33	4.40	53	7.7	52	1010	104	2021					C			
07	4	.38	2.27	2.60	52										C			
08	3		2.25	2.70	52	7.9	60	1126	58	1088					C			
09	5	.02	2.34	3.00	53	7.5	66	1171	116	2264					C			
10	3		2.31	3.00	52	7.9	60	1156	166	3197					C			
11	4	.18	2.32	3.70	52	7.5	57	1103	76	1471					C			
12	4	.03	2.28	2.80	53	7.6	76	1445	105	1996					C			
13	4	.03	2.35	2.90	52	7.5	48	941	106	2078					C			
14	3		2.23	2.60	52	7.5	64	1190	94	1748					C			
15	5	.46	2.28	2.70	52	7.5	57	1084	68	1293					C			
16	5	.04	2.45	3.30	53	7.9	51	1042	80	1634					C			
17	5	.11	2.38	2.70	52	7.8	51	1012	94	1866					C			
18	5	.12	2.40	2.90	52		45	900	125	2501					C			
19	5	.02	2.39	2.80	51	7.6	40	797	80	1594					C			
20	5	.13	2.34	3.20	52	7.6	51	996	104	2030					C			
21	5	.10	2.29	2.60	52	7.5	57	1089	80	1528					C			
22	3		2.22	2.90	52	7.9	56	1037	154	2851					C			
23	5	.06	2.31	3.10	52	7.9	63	1214	98	1888					C			
24	5	.09	2.28	2.70	52	7.9	72	1369							C			
25	5	.02	2.16	2.60	51	7.8	42	756							C			
26	3		2.33	2.80	51	7.8	66	1282	99	1924					C			
27	3		2.31	3.10	51	7.8	54	1040							C			
28	3		2.25	2.60	51	7.7	45	844	57	1070					C			
29	3		2.22	2.60	51	7.8	66	1238	90	1666					C			
30	3		2.30	3.10	51	7.6	42	805	97	1860					C			
31	5	.19	2.34	2.90	51	7.6	45	878	64	1249					C			
TL		2.25	71.23					30715		46,885					C			
ME			2.30				55	1059	99	1,803					C			

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

December, 19 74 — Month

Marshall, Michigan — Municipality

Robert J. Swartwell — Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID 13,029 12 74 000
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	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															C			
02	30	570	41	18	342	69						7.3			C			
03	40	750	0	19	356	70						7.7			C			
04	36	684	40	35	665	64						7.5			C			
05	42	798	40	40	760	61						7.0			C			
06	51	991	2	41	797	61						7.4			C			
07															C			
08	21	394	65	21	394	47						7.7			C			
09	30	586	50	31	605	73						7.3			C			
10	39	751	35	27	520	34						7.7			C			
11	36	697	37	22	426	71						7.4			C			
12	45	855	41	29	551	72						7.5			C			
13	39	764	19	33	647	69						7.5			C			
14	42	781	34	27	502	71						7.4			C			
15	42	798	26	37	703	46						7.4			C			
16	24	490	53	25	511	68						7.9			C			
17	30	595	41	32	635	66						7.7			C			
18	42	840	7	48	960	62									C			
19	32	638	20	59	1176	26						7.4			C			
20	36	703	29	28	547	73						7.5			C			
21	36	688	37	32	611	60						7.5			C			
22	48	888	14	42	777	73						7.8			C			
23	30	578	52	42	809	57						7.8			C			
24	45	856	38									7.8			C			
25	30	540	29									7.7			C			
26	30	583	55	41	797	59						7.4			C			
27	48	924	11									7.6			C			
28	24	450	53	52	976	9						7.6			C			
29	44	826	33	30	555	67						7.6			C			
30	27	518	36	43	825	56						7.8			C			
31	36	703	20	33	644	48						7.6			C			
TL		20,248			17090										C			
ME	36	698	31	34	657	61						7.6			C			
WA	38	742	28	42	813	51						7.7			C			

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

December, 19 74 (Month)

Marshall (Municipality), Michigan

Robert J. Swalwell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
ID 1,3,0,0,2,9 1,2 7,4 . .
Plant No. Mo. Yr Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX.FUEL 14 GBS C.F.	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl_2 LBS.	39	44	49	54	59
PN											
SF											
01		2000	280			113					
02		1300	320			121					
03		1900	280			126					
04		1500	320			94					
05		5000	280			124					
06		5500	320			129					
07		5400	280			95					
08		5500	280			100					
09		1700	360			115					
10		1400	320			124					
11		1200	280			122					
12		1200	320			116					
13		1300	280			129					
14		1400	280			116					
15		1300	320			113					
16		4600	320			120					
17		42.00	280			122					
18		48.00	280			123					
19		4000	320			119					
20		4300	280			119					
21		4400	280			109					
22		1700	240			106					
23		1200	320			121					
24		1400	280			116					
25		2000	280			105					
26		1500	320			125					
27		1400	320			125					
28		1300	320			114					
29		1300	320			118					
30		4600	320			130					
31		4900	320			130					
TL		85200	9320			3644					
ME		2700	301			118					

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL			
Superintendent	1		168
Asst. Supt.	1		168
Shift Foreman			
Shift Operator	1		164
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, ft^3
Primary 14000
Secondary 14000

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.5

Marshall, MICHIGAN

Supernatant To Wet Well
Process Pattern Raw - Pri - Sed - dig - beds

MONTH December 1974

DIGESTER AND SLUDGE DATA

OPERATOR Robert J. Swalwell

DATE	RAW SLUDGE Gals. X	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 100
1	884	9.1	54	13	6.1	73																		1
2	884	7.0	60	11	6.1	72																		1
3	1326	8.6	63	22	6.1	70																		
4	884	8.1	60	13	6.5	69																		
5	884	8.8	70	17	6.1	68																		11
6	884	8.8	63	15	6.1	74	5.8	1.0	43			15028		.2	42	660			360					
7	1326	9.4	70	27	6.1	76																		23
8	1768	8.7	68	32	6.2	84																		8
9	884	7.6	52	6	6.2	90																		8
10	1768	9.2	62	31	6.1	86																		8
11	884	7.9	58	12	6.2	82																		7
12	1326	9.2	64	24	6.2	80																		6
13	884	7.3	52	10	6.3	78																		7
14	884	6.7	63	11	6.2	78																		6
15	884	10.9	49	14	6.2	77																		6
16	884	9.4	60	15	6.2	76																		5
17	884	9.4	60	15	6.2	80																		5
18	884	8.5	53	12	6.3	83																		10
19	884	8.5	53	12	6.3	85																		1
20	1326	8.5	53	18	6.3	86																		
21	884	7.7	57	12	6.2	88																		
22	884	11.2	72	22	6.2	90	5.7	1.9	71			14144		.3	44	1580			780					23
23	884	7.0	60	11	5.7	87																		5
24	2210	8.3	63	35	6.5	85																		7
25						82																		5
26	1326	9.9	60	24	6.4	80																		4
27	1768	12.1	56	36	6.4	78																		2
28	884	10.6	55	16	6.5	76																		
29	1768	11.9	57	36	6.3	76																		
30	884	8.3	62	14	6.4	74																		
31	2652	11.0	62	50	6.4	79																		
TOTAL	35,360											29172												159
ARITH. MEAN	1179	8.9	60	20		79		1.45	57			14,586		2.5	43	1120			570					7

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

JANUARY (Month), 19 76

MARSHALL (Municipality), Michigan

Robert J. Swartwell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
ID 130029 01 76 540
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	.07	2.63	3.60	57	7.9	66	1316	41	899	2.2	48	37		C		
02	3		2.73	3.40	51	7.9	68	1448	64	1457			34		C		
03	5	.02	2.67	3.60	52	7.8	66	1356	62	1381			34		C		
04	5	.01	2.67	3.70	51	7.8	66	1410	30	668	2.8	62	25		C		
05	1		2.52	3.30	51	7.6	72	1643	103	2546	3.1	73	36		C		
06	5	.05	2.50	3.50	51	9.1	86	2008	148	3456	3.7	56	70		C		
07	5	.01	2.69	3.40	51	8.6	63	1413	66	1481	3.1	70	[illegible]		C		
08	3		2.76	3.40	51	7.8	71	1654	64	1473	3.6	[illegible]	56		C		
09	3		2.66	3.30	51	7.5	74	1142	51	1131			30		C		
10	5	.12	2.61	3.20	[illegible]	7.6	[illegible]	1456	44	1061			42		C		
11	5	.01	2.63	3.10	52	7.9	81	1777	102	2237			58		C		
12	3		2.70	3.30	51	8.4	75	1756	70	1576			46		C		
13	5	.34	2.61	3.60	51	7.9	76	1654	46	1001			35		C		
14	5	.01	2.64	3.60	51	7.3	84	1850	92	[illegible]	4.1	12	52		C		
15	5	.01	2.70	3.60	50	7.4	92	1846	[illegible]	2430	4.0	[illegible]	36		C		
16	3		2.65	3.50	51	7.2	72	1541	50	1105			46		C		
17	1		2.65	3.30	50	8.1	62	[illegible]	56	1238			42		C		
18	1		2.58	3.60	50	8.0	50	1124	54	1119	2.8	60	26		C		
19	5	.01	2.71	3.30	50	8.1	68	1531	89	1989	2.8	63	54		C		
20	5	.07	2.55	3.40	50	7.8	80	1701	70	1489	5.2	110	42		C		
21	5	.01	2.59	3.40	50	8.1	72	1552	74	1598	3.3	71	58		C		
22	5	.02	2.59	3.30	50	8.3	87	1814	82	1771	3.0	60	58		C		
23	3		2.56	3.30	50	8.0	75	1601	68	1467			48		C		
24	3		2.51	3.30	49	7.8	76	1510	88	1842			64		C		
25	5	.44	2.55	3.30	49	8.0	76	1616	66	1464	2.9	62	48		C		
26	3		2.60	3.60	50	7.0	108	2342	100	2186	3.5	76	72		C		
27	3		2.51	3.40	50	7.2	92	1972	62	1329	2.0	43	50		C		
28	5	.01	2.60	3.40	49	7.2	104	2255	92	1995	3.8	82	68		C		
29	5	.12	2.61	3.70	50	7.2	88	1916	84	1828			38		C		
30	5	.01	2.54	3.40	49	7.3	—	—	—	—	—	—	—		C		
31	5	.06	2.51	3.20	50	7.2	—	—	—	—	—	—	—		C		
TL		1.46	81.74				2226	49639	2131	47165	559	1236	1489		C		
ME			2.64				77	1691	73	1626	3.3	73	51		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

January, 19 76
Month

MARSHALL, Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID 130029 01 76 ..
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	56	1886	69	1513			51								C		
02	102	2322	165	3829			114								C		
03	90	2004	166	3696			116								C		
04	100	2226	160	3563			112								C		
05	62	1458	88	2070			56								C		
06	65	1518	106	2475			90								C		
07	70	1570	136	3051			104								C		
08	96	2011	111	2333			76								C		
09			142	3372			103								C		
10	134	2917	116	2525			87								C		
11	106	2325	174	3812			114								C		
12															C		
13	138	3004	190	4136			134								C		
14	96	2154	190	4265			128								C		
15	94	2117	200	4504			56								C		
16	66	1459	118	2609			90								C		
17	56	1235	130	2875			84								C		
18	72	1549	134	2883			76								C		
19	54	1844	126	2845			96								C		
20	76	1616	96	2042			56								C		
21	64	1382	86	1858			52								C		
22	60	1296	62	1339			34								C		
23	51	1089	46	982			32								C		
24	36	753	60	1256			40								C		
25	29	529	30	638			22								C		
26	56	1214	40	867			28								C		
27	51	1093	34	724			24								C		
28	60	1301	70	1518			58								C		
29	54	1175	36	784			12								C		
30	—	—	—	—			—								C		
31	—	—	—	—			—								C		
TL	2058	45465	3094	68590			2045								C		
ME	76	1683	110	2449			73								C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

January, 19 76 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
IP | 130029 | 01 | 76 | ..
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											3				C		
01	48		3.3							*	1479			87	C	62.9	
02			3.2								1460			84	C	61.2	
03			3.2								1485			86	C	72.9	
04			3.2								1495			87	C	65.4	
05			3.1	4.4	.33	3672	2090	24.5	1.25		1496	.711	68	83	C	66.5	
06			3.1	4.1	.29	3362	2315	26.0	1.29		1365	.722	68	75	C	85.1	
07			3.2	3.7	.32	3059	2037	23.5	1.30		1410	.721	66	74	C	90.8	
08			3.1	3.7	.32	3055	2042	24.0	1.27		1426	.715	67	72	C	66.2	
09			3.2								1450			70	C	48.7	
10			3.3								1384			69	C	48.2	
11			3.3								1368			68	C	38.3	
12			3.2								1359			73	C	73.3	
13			3.3								1318			74	C	57.1	
14			3.2								1399			72	C	59.9	
15			3.2	2.7	.36	3336	2194	25.0	1.33		1340	.791	65	77	C	59.6	
16			3.2								1329			78	C	70.6	
17			3.3								1260			74	C	76.7	
18			3.3								1360			79	C	67.1	
19			3.2	3.4	.28	3236	2082	25.5	1.27		1350	.760	64	77	C	1.8	
20			3.4	4.0	.26	3405	2165	26.5	1.28		1440	.774	63	83	C	18.0	
21			3.3	4.2	.23	3475	2241	26.0	1.34		1433	.825	64	81	C	25.2	
22			3.3	4.5	.22	3510	2265	27.5	1.28		1451	.821	63	74	C	28.5	
23			3.4	5.0	.21	3488	2224	26.5	1.32		1434			73	C	17.5	
24			3.4								1435			71	C	.0	
25			3.4								1371			69	C	.0	
26			3.3	7.6	.19	3300	2079	25.0	1.32		1433	.846	62	68	C	31.1	
27			3.4	8.0	.17	3334	2101	25.0	1.31		1460	.875	62	70	C	21.0	
28			3.3	9.8	.17	3452	2139	26.0	1.33		1401	.846	62	72	C	33.4	
29			3.3	10.3	.17	3385	2138	24.5	1.38		1421	.846	62	70	C	42.6	
30			3.4	9.9	.18	3154	2006	24.0	1.31		1432	.800	63	72	C	28.4	
31			3.4								1419			74	C	9.4	
TL															C	1427	
ME	11.6		3.3	5.7	.25	3304	2141	25.3	1.31		1448	.776	6.0	76	C	40.2	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

January 1986 — Month

Ishpeming — Municipality, Michigan

Robert J. Swanwell — Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID [illegible] 01 86 000
Plant No Mo Yr 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	80	T COLI* 9 #/100 ml	REMARKS 14	19
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 31615	C	31504 31505		
SF															C			
01	7	154	58	4	89	90	.18	3.9	92	2		7.8			C			
02	10	228	55	17	387	73				4		7.8			C			
03	12	267	50	15	334	76				6		7.9			C			
04	12	267	52	2	45	93	.29	6.4	96	1		7.9			C			
05	12	282	53	18	423	73	.44	10.3	86	11		8.0			C			
06	12	280	56	19	444	77	.44	10.2	88	10		8.4			C			
07	12	267	51	18	400	73	.60	13.4	81	15		7.9			C			
08	12	276	55	20	40[illegible]	69	.49	11.2	86	11		7.8			C			
09	16	355	75	11	2[illegible]	73				5		7.7			C			
10	21	457	64	1	34[illegible]	67				2		8.0			C			
11	25	564	72	2	41[illegible]	75				13		7.1			C			
12	21	473	73	[illegible]	353	76				3		8.0			C			
13	22	479	71	17	37[illegible]	23				9		7.9			C			
14	53	746	61	57	12[illegible]	3[illegible]	1.1	24.6	74	25		8.0			C			
15	21	473	14	41	923	62	.78	17.5	81	26		8.0			C			
16	18	398	70	26	575	48				26		8.0			C			
17	10	221	54	19	420	66				7		8.0			C			
18	16	344	56	27	581	48	.57	12.2	80	10		8.0			C			
19	8	181	55	11	249	58	.38	8.5	86	3		8.0			C			
20	16	340	86	24	510	66	.57	12.1	89	6		7.9			C			
21	21	454	71	34	734	57	.70	15.1	79	17		8.1			C			
22	14	302	83	24	518	71	.58	12.5	81	11		8.2			C			
23	17	363	77	33	705	50				16		8.0			C			
24	6	126	92	33	691	63				19		7.9			C			
25	14	298	82	19	404	71	.43	9.1	85	8		7.9			C			
26	11	239	90	32	694	68	.67	14.5	81	20		8.1			C			
27	16	343	83	21	450	66	.38	8.1	81	20		8.1			C			
28	12	260	88	19	412	79	.58	12.5	85	13		8.1			C			
29	12	261	86	27	588	68				9		8.2			C			
30	—	—	—	—	—	—	—	—	—	—		8.2			C			
31	—	—	—	—	—	—	—	—	—	—		8.2			C			
TL	437	9634	2325	624	14,133	2013	918	202.1	1425	345		2557			C			
ME	15	332	80	22	487	69	.54	11.8	84	12		8.2			C			
WA	23	503	70	29	648	59	.69	14.6	81	17					C			

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

January, 19 76
Month

Marshall, Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID 130029 01 76 ..
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 Polymer LBS.	49	54	59
PN											
SF		2									
01	2	101	3840			50	596	5.86			
02	2	91	3600			30	596	5.86			
03	2	132	3720			30	695	5.86			
04	2	149	3840			30	397	5.86			
05	2	144	3960			60	992	5.86			
06	2	105	3600			50	1390	5.86			
07	2	144	3720			30	596	5.86			
08	2	153	3960			30	993	5.86			
09	2	152	3960			30	995	5.86			
10	2	126	3600			40	993	5.86			
11	2	84	3600			50	993	5.86			
12	2	99	3600			40	1191	5.86			
13	2	77	3600			60	1503	5.86			
14	2	100	3960			50	1985	5.86			
15	2	85	3600			50	1588	5.86			
16	2	103	3720			40	1092	5.86			
17	2	116	3600			40	695	5.86			
18	2	127	3720			60	993	5.86			
19	2	89	3840			40	1588	5.86			
20	2	100	3960			40	1787	5.86			
21	2	95	4080			40	1191	5.86			
22	2	112	4200			30	993	5.86			
23	2	107	3840			40	794	5.86			
24	2	94	3720			40	794	5.86			
25	2	87	3600			30	794	5.86			
26	2	138	4080			60	1191	5.86			
27	2	132	3960			40	794	5.86			
28	2	109	3840			40	1191	5.86			
29	2	96	3960			30	794	5.86			
30	2	91	3960			40	516	5.86			
31	2	74	3600			40	357	5.86			
TL	62	3381	117840			1280	31156	182			
ME	2	109	3801			41	1005	5.86			

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	4		672
Superintendent	1		168
Asst. Supt.	1		168
Shift Foreman			
Shift Operator	2		336
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, ft^3
Primary 14000
Secondary 14000

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D 45

Marshall, MICHIGAN

Supernatant To
Process Pattern

MONTH January 19 76

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swiwell

DATE	RAW SLUDGE Gals X	Total Solids %	Vol. Solids %	Lbs 1000 cf 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 Gas %	Total Solids %	Vol Solids %	pH	Gas Produced cu ft X
1	804	[illegible]	[illegible]	9	[illegible]																			
2	2415	[illegible]	[illegible]	[illegible]	[illegible]																			
3	799	[illegible]	[illegible]	[illegible]	[illegible]																			
4	781	[illegible]	[illegible]	[illegible]	[illegible]																			
5	2445	[illegible]	[illegible]	[illegible]	[illegible]																			
6	1641	[illegible]	[illegible]	[illegible]																				
7	2424	[illegible]	[illegible]	[illegible]																				
8	2425	[illegible]	[illegible]	[illegible]																				
9	225	[illegible]	7[illegible]	[illegible]	[illegible]																			
10	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]																			
11	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]																			
12	2425	[illegible]	[illegible]	[illegible]	[illegible]																			
13	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]																			
14	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]																			
15	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]																			
16	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]																			
17	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]																			
18	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]																			
19	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]																			
20	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]																			
21	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]																			
22	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]																			
23	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]																			
24	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]																			
25	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]																			
26	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]																			
27	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]																			
28	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]																			
29	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]																			
30	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]																			
31	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]																			
TOTAL	[illegible]																							
MONTH MEAN	[illegible]	[illegible]	[illegible]	[illegible]																				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

Month [illegible] Michigan [illegible]

Plant No [illegible] Mo 02 Yr 76 Sample Point Code [illegible]

DAY	WEATHER TYPE	WEATHER PRECIP	FLOW TOTAL	FLOW MAX RATE	RAW SEWAGE QUALITY TEMP	PH	BOD 5 mg	BOD 5 LBS	SS mg/l	SS LBS	TOTAL P mg/l	TOTAL P LBS	VSS mg	[illegible] mg		REMARKS OR C
	See Code	Inches	MGD	MGD	°F											
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C	
SF															C	
01	5	.02	2.72	3.60	50	7.2	73	1471	60	1226	2.8	57	44		C	
02	3		2.6	3.4	50	7.0	54	1125	170	3017	3.7	81	104		C	
03	3		2.[illegible]	3.46	48	7.5	104	2255	148	3244	3.2	64	164		C	
04	1		2.50	3.30	49	7.3	64	1372	140	3001	2.8	66	60		C	
05	5	.66	2.50	3.80	49	7.2	80	1714	85	1821	3.5	81	74		C	
06	1		2.50	3.60	49	7.1									C	
07	1		2.5	3.30	49	7.3									C	
08	1		2.50	3.30	49	7.9	74	1515	52	1065	2.6	6	42		C	
09	1		2.67	3.60	50	7.2	67	1463	98	2142	6.4	14	[illegible]		C	
10	1		2.60	3.50	50	[illegible]	93	1974	100	2123	2.3	5	50		C	
11	1		[illegible]	3.50	50	7.1	72	1507	130	2705	[illegible]	6	37		C	
12	1		2.74	3.70	49	7.4									C	
13	1		[illegible]	6	50	[illegible]									C	
14	4	.05	2.73	3.50	49	[illegible]									C	
15	3		2.70	3.30	49	7.1									C	
16	4	.31	2.9	3.70	49	[illegible]	63	1656	66	1662	2.2	53	38		C	
17	4	.27	2.40	3.80	49	7.3	67	2095	128	3193	2.9	72	78		C	
18	4	.02	3.06	3.90	49	8.7	66	1637	76	1934	2.4	61	62		C	
19	1		3.02	3.70	49	8.1	78	1965	85	2216	2.5	63	76		C	
20	4	.87	3.10	4.00	50	8.1									C	
21	4+5	.49	3.30	3.90	48	7.6									C	
22	5	.01	3.20	3.80	48	7.4	56	1494	44	1174	2.1	56	32		C	
23	1		3.40	4.00	48	8.0	68	1928	86	2438	2.4	68	60		C	
24	1		3.36	4.00	48	8.0	78	2186	78	2186			66		C	
25	4	.02	3.33	4.00	49	8.1	68	1889	74	2055	2.8	78	44		C	
26	1		3.25	4.00	49	8.0	58	1572	80	2168	2.3	62	56		C	
27	1		3.17	4.00	49	8.0									C	
28	4	.08	3.09	3.80	50	8.0									C	
29	5	.55	3.09	3.70	50	8.0	59	1530	44	1431	2.7	88	26		C	
30															C	
31															C	
TL		2.75	83.87					33077		41273		1265			C	
ME			2.89				73	1741	91	2172	2.8	67	65		C	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

February, 19 76 (Month) — Marshall (Municipality), Michigan — Robert J. Swabell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
ID 130224 02 76 ..
Plant No Mo Yr Sampling Point Code

DAY	BOD 5 9 – 14 mg/l	BOD 5 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
1 2																C		
PN	00310	85001	00530	85002	00665	85004	00535	00610								C		
SF																C		
01	51	1042	84	1716			52									C		
02	43	871	84	1523			54									C		
03	84	1[illegible]	96	2032			75									C		
04	16	1286	34	724			10									C		
05	[illegible]	1286	50	1072	2.5	54	46									C		
06																C		
07																C		
08	[illegible]	251	26	54	3.1	7	25									C		
09	[illegible]	1076	72	1603	6.6	147	62									C		
10	[illegible]	1481	51	1256			36									C		
11	5	56	62	1301	1.6	42	46									C		
12																C		
13																C		
14																C		
15																C		
16	65	926	36	494	1.[illegible]	34	18									C		
17	62	546	72	1795	2.4	60	42									C		
18	56	424	56	1424	2.1	54	52									C		
19	46	151	23	705	2.1	53	22									C		
20																C		
21																C		
22	41	351	44	1174	2.1	56	34									C		
23	56	583	18	510	2.0	56	16									C		
24	57	547	50	1401			42									C		
25	51	416	44	1222	1.9	53	24									C		
26	44	1[illegible]3	54	1464	2.2	60	30									C		
27																C		
28																C		
29	46	53	34	1106	2.4	78	24									C		
30																C		
31																C		
TL		2,526		23,843		817										C		
ME	58	396	53	1257	2.5	63	37									C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

February, 19 76 (Month) — Marshall (Municipality), Michigan — Robert J. Sinclair (Superintendent's Signature)

1 2 ID | 3–8 130029 (Plant No) | 9 10 02 (Mo) | 11 12 76 (Yr) | 13–15 (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											3				C		
01	48		2.7								1424			73	C	36	
02			2.5	7.8	.26	2754	1711	20.0	1.35		1462	.716	62	64	C	12	
03			2.5	6.5	.23	2954	1835	22.0	1.34		1421	.765	64	64	C	7	
04			2.6	7.2	.20	3232	2116	23.5	1.38		1452	.798	65	70	C	30	
05			2.6	6.7	.22	[illegible]	[illegible]	23.0	1.35		144[illegible]	[illegible]	64	64	C	[illegible]	
06			2.6								[illegible]			54	C	16	
07			2.6								[illegible]			62	C	20	
08			2.6								1235			62	C	20	
09			2.5	6.2	.24	2967	1946	23.0	1.29		1303	.552	65	55	C	36	
10			2.5	5.7	.26	2453	1871	22.0	1.30		41	.842	65	56	C	30	
11			2.5	6.5	.27	2446	1756	19.5	1.36		1455	.827	66	54	C	[illegible]	
12			2.4	5.5	.30	2384	1614	18.0	1.33		[illegible]	.717	66	53	C	50	
13			2.3	5.1	.34	2290	1471	17.0	1.35		1453	.773	65	51	C	42	
14			2.4								1415			52	C	25	
15			2.4								1455			53	C	20	
16			2.3								[illegible]			51	C	[illegible]	
17			2.2	5.3	.32	2338	1545	18.0	1.30		1453	.765	65	45	C	16	
18			2.2	4.4	.39	2021	1334	16.0	1.26		1450	.741	66	42	C	30	
19			2.2	4.6	.36	2143	1414	17.0	1.26		1481	.733	65	42	C	42	
20			2.1	4.3	.37	2.64	1416	17.0	1.21		1450	.725	67	39	C	34	
21			2.1								1211			35	C	32	
22			2.1								1140			33	C	21	
23			1.9	4.6	.40	1941	1346	18.0	1.08		1123	.657	62	39	C	11	
24			2.0	5.3	.37	2.25	1454	2.0	1.01		1124	.757	63	39	C	38	
25			2.0	5.2	.35	2156	1485	20.1	1.08		1122	.717	63	35	C	32	
26			2.0	5.6	.32	2172	1492	20.0	1.09		1[illegible]	.723	67	38	C	46	
27			2.1	4.6	.38	1822	1239	19.0	.96		1240	.726	67	36	C		
28			2.2								1232			36	C	25	
29			2.2								1245			35	C	26	
30															C		
31															C		
TL															C	899	
[illegible]			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	C	[illegible]	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

February, 19 76 (Month) — Marshall (Municipality), Michigan — Robert J. Sudwell (Superintendent's Signature)

1 2	3 – 8	9 10	11 12	13 – 15
10	130029	02	76	020
	Plant No	Mo	Yr	Sampling Point Code

DAY	BOD 5 mg/l (9)	BOD 5 LBS (14)	BOD 5 % Rem (19)	SS mg/l (24)	SS LBS (29)	SS % Rem (34)	TOTAL-P mg/l (39)	TOTAL-P LBS (44)	TOTAL-P % Rem (49)	VSS mg/l (54)	NH_3N mg/l (59)	pH SU (64)	DO mg/l (69)	F COLI* # 100 ml (74)	C (80)	T COLI* #/100 ml (9)	REMARK (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	11	225	85	14	286	77	.48	10	83	6		8.2			C		
02	14	305	83	22	479	74	.38	8	90	14		8.1		5	C		
03	12	266	83	11	234	83	.48	10	85	4		8.[illegible]			C		
04	8	171	85	6	129	96	.40	9	86	3		7.4			C		
05	16	343	80	22	472	75	.40	8	88	16		8.1			C		
06												[illegible]			C		
07												[illegible]			C		
08	15	312	74	[illegible]	147	83	.48	10	82	2		[illegible]			C		
09	20	445	65	16	225	96	.42	10	82	7		[illegible]		5	C		
10	17	381	81	7	57	93	.36	8	87	3		[illegible]		5	C		
11	14	312	85	17	376	77	.36	8	87	7		8.0		5	C		
12												8.2		5	C		
13												8.[illegible]		2	C		
14												[illegible]			C		
15												[illegible]			C		
16	11	267	83	8	194	88	.42	10	8	5		[illegible]			C		
17	16	399	81	13	321	46	.32	8	87	6		[illegible]		5	C		
18	20	510	77	10	255	87	.36	9	80	7		8.2		5	C		
19	14	353	82	25	705	11	.38	9	85	25		8.[illegible]		5	C		
20												8.[illegible]		6	C		
21												8.0			C		
22	7	187	88	13	347	76	.37	12	78	10		7.9			C		
23	15	425	73	24	681	72	.36	10	85	19		8.0		2	C		
24	14	392	82	8	224	86				6		8.0		2	C		
25	14	389	74	7	194	91	.40	11	86	5		8.[illegible]		4	C		
26	8	217	86	17	461	79	.27	7	88	11		8.0			C		
27												7.9		4	C		
28												7.7			C		
29	8	206	80	6	195	86	.42	14	84	4		7.8			C		
30															C		
31															C		
TL		6162			6091			173							C		
ME	13	321	82	13	321	84	.38	9	86	9		8.0		4.3	C		
WA	16	373	78	16	412	80	.44	10	84	12				5.0	C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

February, 19 76 (Month) — Marshall (Municipality), Michigan — Robert J. Swabell (Superintendent's Signature)

ID 180029 (Plant No) 02 (Mo) 76 (Yr) (Sampling Point Code)

DAY	GRIT 9 CF	AUX FUEL 14 GAS CF	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl2 LBS	39 FeCl3 Lbs.	44 Polymer Lbs	49	54	59
PN											
SF		2									
01	2	129	3720			40	516	4.0			
02	2	136	4200			20	794	4.3			
03	2	103	3240			20	596	4.3			
04	2	97	3240			20	596	4.3			
05	2	130	3960			20	596	4.3			
06	2	125	3720			20	596	4.3			
07	2	24	3240			20	397	4.2			
08	2		3240			20	397	4.2			
09	2	25	3600			20	794	4.5			
10	2	6	3240			20	794	4.5			
11	2	22	3600			20	794	4.4			
12	2	35	3080			20	993	4.4			
13	2	50	3600			20	516	4.5			
14	2	60	3480			20	417	4.5			
15	2	42	3240			20	278	4.5			
16	2	45	3600			20	512	4.8			
17	2	63	3240			20	794	4.9			
18	2	59	3240			20	794	5.1			
19	2	71	3240			20	794	5.0			
20	2	72	3360			20	596	5.0			
21	2	75	3360			20	397	5.0			
22	2	90	3600			20	397	5.3			
23	2	81	3960			20	794	5.6			
24	2	37	3600			20	794	5.6			
25	2	7	3360			20	794	5.5			
26	2	4	3240			20	596	5.4			
27	2	13	3240			20	298	5.3			
28	2	4	3000			20	298	5.2			
29	2	6	3120			20	397	5.0			
30											
31											
TL	55	2057	103440			1020	17383	138			
ME	2	72	3567			35	599	4.7			

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	4		620
Superintendent	1		152
Asst Supt	1		152
Shift Foreman			
Shift Operator	2		316
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

MICHIGAN

DPH

DIGESTER AND SLUDGE DATA

	RAW SLUDGE					DIGESTED SLUDGE					SUPERNATANT					DIGESTED SLUDGE				
	Total				pH					pH					pH					pH
	100																			
1	30	7.6	72	70	7.4															
2	61	5.5	72	78	7.3															
3	71	5.1	75	63	7.2															
4	64	7.7	71	68	7.5															
5	64	[illegible]	[illegible]	[illegible]	7.2															
6	64	4.4	[illegible]	[illegible]	[illegible]															
7	6[illegible]	4.4	54	54	[illegible]															
8	6[illegible]	5.1	62	[illegible]	[illegible]															
9	[illegible]	7.[illegible]	79	[illegible]	[illegible]															
10	[illegible]	[illegible]	71	[illegible]	[illegible]															
11	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]															
12	[illegible]	[illegible]	[illegible]	[illegible]																
13	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]															
14	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]															
15	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]															
16	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]															
17	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]															
18	[illegible]	[illegible]	57	[illegible]	[illegible]															
19	[illegible]	5.5	[illegible]	[illegible]	[illegible]															
20	[illegible]	4.9	61	[illegible]	7.5															
21	[illegible]	4.2	[illegible]	[illegible]	[illegible]															
22	64	5.6	[illegible]	68	7.3															
23	64	5.0	63	60	7.2															
24	64	4.8	61	56	7.2															
25	72	6.1	70	77	7.1															
26	64	5.2	57	57	7.5															
27	72	5.6	64	77	7.2															
28	64	5.3	71	72	7.2															
29	64	4.9	59	56	7.2															
30																				
31																				
TOTAL	1871																			
ARITH MEAN	65	5.3	67	70																

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

March, 19 76 (Month)

Marshall (Municipality), Michigan

Robert J. Swaluell (Superintendent's Signature)

1 2: 1D | 3–8: 130029 (Plant No) | 9 10: 03 (Mo) | 11 12: 76 (Yr) | 13–15: 500 (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 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	.57	3.28	4.00	49	8.1	80	2188	120	3283	2.4	1.6	82		C		
02	4	.81	3.42	4.00	49	8.5	68	1939	82	2339	2.8	80	48		C		
03	4	.42	3.55	4.00	49	8.0	74	2191	102	3020	2.6	77	52		C		
04	4	.93	3.67	4.00	49	7.9	59	1866	82	2510	2.8	86	66		C		
05	1		3.78	4.00	50	7.7									C		
06	1		3.70	4.00	48	7.9									C		
07	3		3.64	4.00	48	7.9	48	1457	68	2064	1.8	55	52		C		
08	1		3.70	4.00	48	8.1	78	2467	44	1353	3.6	111	41		C		
09	4	.03	3.55	4.00	49	8.1	72	2132	104	3074	2.7	80	62		C		
10	4	.02	3.50	4.00	49	8.1	69	2014	102	2977	2.3	67	65		C		
11	4	.17	3.48	4.00	49	8.5	60	1741	72	2090			60		C		
12	4	.96	3.45	4.00	49	7.8									C		
13	3		3.37	3.90	49	7.5									C		
14	3		3.30	3.70	49	7.7	56	1541	82	2257	2.2	6.1	46		C		
15	5	.01	3.43	4.00	49	7.9	71	2031	80	2288	4.3	123	50		C		
16	3		3.35	4.00	49	7.8	42	1173	56	1565	2.7	67	38		C		
17	3		3.34	4.00	48	8.1	66	1838	130	3621	2.7	75	80		C		
18	3		3.32	4.00	49	8.0	69	1911	98	2714	2.7	75	78		C		
19	1		3.25	4.00	49	7.8									C		
20	4	.45	3.24	4.00	50	7.6									C		
21	3		3.20	3.60	49	7.7	54	1441	48	1281	2.5	67	46		C		
22	1		3.55	4.00	49	8.3	7.6	2123	130	3632			84		C		
23	1		3.31	4.00	49	8.8	74	2043	156	4306	2.9	80	92		C		
24	4	.11	3.24	4.00	50	8.2	88	2378	138	3724	3.0	81	80		C		
25	1		3.22	4.00	50	8.1	64	1719	92	2471	2.1	56	60		C		
26	4	.68	3.24	4.00	50	7.8									C		
27	4	.45	3.39	4.00	50	7.7									C		
28	1		3.41	3.80	49	7.7	54	1536	72	2048	2.4	68	48		C		
29	4	.01	3.49	4.00	50	7.9	68	1979	140	4075	2.7	76	102		C		
30	1		3.45	4.00	50	8.0	68	1957	114	3280	2.3	66	68		C		
31	4	.21	3.45	4.00	50	8.0	62	1784	103	2964	2.2	63	53		C		
TL		5.83	106.07					43329		63251		1580			C		
ME			3.42				66	1884	96	2750	2.6	75	63		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

March, 19 76 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

ID 1 2 — Plant No 3–8: 120029 — Mo 9 10: 03 — Yr 11 12: 76 — Sampling Point Code 13–15:

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 C	9	14
PN	00310	85001	00530	85002	00665	85004	00535	00610							C		
SF															C		
01	56	1532	66	1805	2.0	55	40								C		
02	56	1597	62	1768	2.4	68	46								C		
03	53	1569	60	1776	2.1	62	18								C		
04	51	1561	76	3226	1.8	55	68								C		
05															C		
06															C		
07	42	1275	30	911	2.3	70	24								C		
08	59	1821	54	1666	3.3	102	60								C		
09	54	1549	48	1421	2.0	59	18								C		
10	44	1284	44	1284	1.7	50	46								C		
11	50	1451	56	1625			52								C		
12															C		
13															C		
14	54	1486	86	2367	2.8	77	48								C		
15	62	1774	46	1316	3.7	106	30								C		
16	38	1062	65	1900	2.6	73	36								C		
17	48	1337	86	2396	2.1	53	40								C		
18	50	1384	66	1827	2.2	61	60								C		
19															C		
20															C		
21	47	1254	34	907	2.2	59	26								C		
22	54	1504	90	2515			54								C		
23	48	1325	52	1435	1.9	52	24								C		
24	47	1270	44	1189	2.1	57	24								C		
25	33	856	28	752	1.7	46	26								C		
26															C		
27															C		
28	57	1621	36	1024	1.8	51	22								C		
29	39	1135	42	1222	1.6	47	36								C		
30	35	1093	20	575	1.2	35	5								C		
31	41	1179	32	921	1.1	32	10								C		
TL		32004		35828		1275									C		
ME	49	1391	53	1558	2.1	61	35								C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

March, 19 76 (Month)

Marshall (Municipality), Michigan

Robert J. Swalwell (Superintendent's Signature)

1 2: ID | 3–8: 13.00.24 (Plant No) | 9 10: 03 (Mo) | 11 12: 76 (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											3				C		
01	48		2.6	4.9	.35	1913	1320	19.0	.97		1302	.848	67	38	C	0	
02			2.5	4.9	.34	2208	1480	23.0	1.04		1286	.480	68	36	C	11	
03			2.4	4.4	.33	2239	1577	21.0	1.09		1275	.870	69	35	C	33	
04			2.3	3.5	.39	2036	1347	21.5	.95		1211	.918	67	35	C	0	
05			2.3	3.5	.39	2078	1379	18.5	1.12		1218	.896	66	39	C	0	
06			2.3								1215			41	C	0	
07			2.4								1244			41	C	0	
08			2.3	4.3	.33	2450	1626	23.0	1.07		1404	.732	66	41	C	36	
09			2.4	4.7	.23	2654	1860	24.0	1.11		1404	.804	39	59	C	42	
10			2.5	5.2	.29	2674	1695	24.0	1.12		1382	.733	63	61	C	60	
11			2.5	5.3	.27	2741	1778	23.0	1.19		1380	.742	65	59	C	37	
12			2.5	5.2	.28	2671	1701	23.0	1.16		1326	.760	63	56	C	36	
13			2.6								1420			57	C	44	
14			2.6								1344			55	C	24	
15			2.5	5.4	.30	2653	1656	22.0	1.21		1371	.755	62	59	C	23	
16			2.6	5.4	.27	2873	1790	22.0	1.31		1349	.777	62	62	C	35	
17			2.6	4.8	.27	2789	1703	23.0	1.21	1.2	1394	.744	66	61	C	58	
18			2.6	4.2	.29	2550	1555	20.0	1.28	2.3	1435	.706	61	58	C	28	
19			2.7	4.7	.27	2745	1662	23.0	1.19	.7	1425	.768	61	59	C	36	
20			2.7								1466			57	C	40	
21			2.7								1270			55	C	24	
22			2.6	4.3	.28	2760	1661	20.5	1.35	.6	1274	.794	62	53	C	43	
23			2.6	4.5	.28	2600	1646	19.0	1.37		1284	.849	59	51	C	28	
24			2.7	4.8	.25	2709	1672	21.0	1.29	.8	1253	.808	61	55	C	26	
25			2.7	5.2	.25	2632	1667	21.0	1.28	.8	1356	.780	36	56	C	38	
26			2.7	4.9	.26	2506	1592	20.0	1.25	1.5	1378	.749	63	56	C	22	
27			2.5								1504			53	C	18	
28			2.5								1477			53	C	28	
29			2.5	5.4	.27	2488	1643	20.0	1.24	1.5	1421	.787	65	51	C	43	
30			2.5	5.1	.31	2186	1423	19.0	1.15	1.0	1416	.645	64	48	C	6	
31			2.5	7.1	.27	2467	1663	20.0	1.23	1.2	1445	.813	65	47	C	22	
TL															C	837	
ME			2.5	4.9	.30	2512	1611	21.3	1.18	1.2	1358	.772	62	51	C	27	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

March, 1976 (Month) — Marshall (Municipality), Michigan — Robert J. Swackhill (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
ID 130029 03 76 000
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	16	438	80	21	574	83	.67	18	72	14		8.1		2	C		
02	20	570	71	23	656	72	.80	23	71	17		8.2		2	C		
03	16	473	78	18	533	82	.52	15	80	14		8.0		2	C		
04	21	642	69	29	888	65	.80	24	71	28		7.9		2	C		
05												7.8		20	C		
06												7.9			C		
07	22	668	74	26	789	62	.93	15	73	15		7.9			C		
08	12	370	55	17	536	57	.98	36	73	13		8.0		15	C		
09	12	355	55	11	326	84	.58	17	79	7		7.9		5	C		
10	10	272	80	16	467	84	.30	9	87	11		8.0		0	C		
11	15	435	75	13	377	52				8		8.9		2	C		
12												7.8		0	C		
13												7.7			C		
14	10	275	82	22	605	73	.40	11	82	4		7.7			C		
15	13	372	82	4	114	95	.72	21	83	2		7.9		4	C		
16	11	307	74	23	643	59	.46	13	81	5		7.8		2	C		
17	8	223	88	27	669	52	.29	8	89	1		8.0	4.2	0	C		
18	11	305	84	10	277	60	.27	7	90	10		8.0	6.2	0	C		
19												7.9	5.2	0	C		
20												7.8			C		
21	8	219	88	5	133	96	.29	8	88	3		7.6			C		
22	17	475	78	19	531	85				6		8.2	5.9	58	C		
23	11	309	80	7	193	96	.29	8	90	4		7.8		0	C		
24	15	405	80	11	297	92	.42	11	86	6		8.1	5.8	8	C		
25	9	242	86	12	326	87	.33	9	84	2		8.0	5.9	80	C		
26												7.7	6.3	14	C		
27												7.7			C		
28	8	228	85	16	455	77	.55	16	77	6		7.8			C		
29	12	349	82	17	495	78	.52	15	81	15		7.9	5.6	TNTC	C		
30	11	317	84	4	115	96	.21	6	91	3		7.9	6.2	TNTC	C		
31	11	317	82	22	633	79	.43	12	80	8		8.0	5.9	TNTC	C		
TL		8576			10678			296							C		
ME	13	373	80	16	464	81	.49	14	81	9		7.9	5.7	39	C		
WA	17	502	74	21	621	73	.69	20	74	15				39	C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

Marshall, 19 76 (Month)

Marshall, Michigan (Municipality)

Robert J. Swalinell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
IP 130229 03 76 . .
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 Cl2 LBS	39 FeCl3 LBS	44 Polymer LBS	49	54	59
PN											
SF		2									
01	3	72	3720			40	794	5.5			
02	3	66	3840			50	794	5.7			
03	3	52	3840			50	993	5.9			
04	3	37	3480			60	596	6.1			
05	3	64	3480			50	397	6.3			
06	3	75	3600			30	397.	6.2			
07	3	52	3720			5	596.	6.0			
08	3	74	3480			[illegible]	993	6.2			
09	3	[illegible]	3480			[illegible]	993	5.9			
10	3	71	3960			[illegible]	993	5.8			
11	3	51	3720			40	794	5.8			
12	3	5[illegible]	3600			50	596	5.3			
13	3	40	3720			40	794.	5.6			
14	3	7[illegible]	3600			40	596.	5.5			
15	3	7[illegible]	3840			40	794	5.7			
16	3	4[illegible]	3720			40	596	5.6			
17	3	42	3960			40	993	5.6			
18	3	34	3840			20	794	5.6			
19	3	[illegible]	3360			30	873	5.5			
20	3	1	3360			30	794.	5.5			
21	3	10	3360			40	596.	5.3			
22	3	[illegible]	3840			20	993	5.6			
23	3	[illegible]	3720			20	794	5.5			
24	3	[illegible]	3360			30	596	5.4			
25	3	1	3480			10	596	5.4			
26	3	[illegible]	3120			20	397	5.4			
27	3	3	3480			20	298.	5.7			
28	3	8	3360			10	298.	5.7			
29	3	55	3720			20	794	5.8			
30	3	6	3480			20	596	5.8			
31	3	35	3840			20	794	5.8			
TL	93	1467	113040			1050	21,922	177.2			
ME	3	48	3646			33	707	5.7			

MANPOWER

POSITION TITLE	No. Full Time	No Part Time	Total Hours
TOTAL	4	1	872
Superintendent	1		184
Asst Supt	1		184
Shift Foreman			
Shift Operator	2		365
Maint Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk Typist			
Other		1	136

GIVE THE HOURS PER DAY PLANT PERSONNEL

WEEKDAYS 11 HRS

SATURDAYS 4 HRS

SUNDAYS 4 HRS

HOLIDAYS 4 HRS

Digester Volume, ft³
Primary 14000
Secondary 14000

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D 45

Marcell, MICHIGAN

Supernatant To
Process Pattern

MONTH March 1976

DIGESTER AND SLUDGE DATA

OPERATOR R J Swalwell

DATE	RAW SLUDGE Gals X 100	Total Solids %	Vol Solids %	Vol Solids Lbs 000 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	5.1	65	60	7.2																			
2	60	5.1	63	55	7.1																			
3	60	5.3	73	70	7.2																			
4	60	6.0	74	80	7.1																			
5	60	6.0	62	67	7.2																			
6	60	5.2	57	53	[illegible]																			
7	60	4.9	65	61	[illegible]																			
8	60	[illegible]	66	67	[illegible]																			
9	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]																			
10	75	[illegible]	[illegible]	[illegible]	[illegible]																			
11	60	[illegible]	[illegible]	[illegible]	[illegible]																			
12	60	[illegible]	[illegible]	[illegible]	[illegible]																			
13	60	[illegible]	[illegible]	[illegible]	[illegible]																			
14	60	[illegible]	60	[illegible]	[illegible]																			
15	60	[illegible]	[illegible]	[illegible]	[illegible]																			
16	60	4.9	[illegible]	52	[illegible]																			
17	60	[illegible]	[illegible]	53	[illegible]																			
18	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]																			
19	60	[illegible]	[illegible]	[illegible]	[illegible]																			
20	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]																			
21	60	[illegible]	[illegible]	[illegible]	[illegible]																			
22	60	[illegible]	[illegible]	[illegible]	[illegible]																			
23	75	[illegible]	[illegible]	[illegible]	[illegible]																			
24	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]																			
25	60	[illegible]	[illegible]	[illegible]	[illegible]																			
26	60	[illegible]	[illegible]	[illegible]	[illegible]																			
27	[illegible]	5.4	66	[illegible]	[illegible]																			
28	60	5.4	[illegible]	[illegible]	[illegible]																			
29	[illegible]	5.4	66	[illegible]	[illegible]																			
30	74	6.3	[illegible]	47	[illegible]																			
31	60	[illegible]	[illegible]	63	[illegible]																			
TOTAL	[illegible]																							
MEAN	62	5.4	66	66																				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

April (Month), 19 76 — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
ID | 1300.29 (Plant No) | 09 (Mo) | 76 (Yr) | 500 (Sampling Point Code)

DAY 1 2	WEATHER TYPE 9	WEATHER PRECIP 14	FLOW TOTAL 19	FLOW MAX RATE 24	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	.07	3.49	4.00	50	7.8	59	1717	68	1979	2.2	64	52		C		
02	1		3.37	4.00	49	7.8					2.4	67			C		
03	5	.07	3.27	4.00	49	7.7									C		
04	1		3.22	3.90	49	7.6	48	1289	40	1074	2.2	59	30		C		
05	1		3.33	4.06	50	7.5	106	2944	76	2111	2.7	75	46		C		
06	1		3.26	4.00	50	7.7	112	3045	78	2120	1.5	41	62		C		
07	1		3.27	4.00	50	7.7	110	3000	58	1582	2.4	65	46		C		
08	1		3.27	4.00	50	7.7	98	2673	74	2018	1.9	52	46		C		
09	1		3.20	4.00	50	7.5									C		
10	4	.15	3.13	3.70	50	7.5									C		
11	1		3.15	3.70	49	7.5	106	2785	42	1103	2.6	68	32		C		
12	1		3.30	4.06	50	7.9	114	3138	104	2862	2.9	80	72		C		
13	1		3.19	4.00	50	7.8	120	3193	64	1703			58		C		
14	1		3.20	3.80	51	7.7	72	1922	52	1388	2.0	53	40		C		
15	4	.57	3.22	4.00	52	7.8									C		
16	1		3.21	4.00	52	7.8									C		
17	1		3.21	4.00	51	7.5									C		
18	4	.09	3.14	4.00	51	7.6	72	1886	90	2357	2.6	68	74		C		
19	1		3.28	4.00	51	7.9	110	3009	180	4924	2.9	93	106		C		
20	4	.09	3.23	4.00	52	7.8	86	2317	94	2532	2.9	78	80		C		
21	4	.27	3.23	4.00	52	7.8	82	2209	102	2748	2.7	73	86		C		
22	4	.02	3.24	4.00	52	7.7	80	2162	86	2324			46		C		
23	4	.57	3.28	3.80	52	8.1									C		
24	4	1.37	3.12	3.80	51	8.1									C		
25	4&5	.63	3.67	4.00	51	8.1	60	1836	48	1469	2.5	77	38		C		
26	3		3.82	4.00	51	8.1	82	2612	114	3632	2.8	89	94		C		
27	1		3.79	4.00	51	8.3	72	2276	106	3351	2.9	92	78		C		
28	1		3.73	4.00	51	8.2	81	2520	98	3049	2.6	81	92		C		
29	1		3.64	4.00	51	7.9	66	2003	92	2793			39		C		
30	1		3.57	4.00	51	7.9									C		
31															C		
TL		3.90	10003					48536		47119		1275			C		
ME			3.33				87	2427	83	2356	2.5	71	61		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

April (Month), 19 76 — Marshall (Municipality), Michigan — Robert J. Swabell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
ID | 130029 | 04 | 76 | ...
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											3				C		
01	48		2.5	7.5	.25	2470	1640	21.0	1.18	2.1	1457	.80	65	46	C	28	
02			2.6	7.7	.24	2463	1643	20.5	1.20	1.9	1423	.82	66	47	C	24	
03			2.6								1393			49	C	41	
04			2.7								1444			51	C	34	
05			2.6	7.4	.34	2192	1401	20.0	1.10	1.1	1398			45	C	4	
06			2.6	9.6	.30	2535	1678	22.0	1.15	.8	1415	.85	65	49	C	31	
07			2.6	9.2	.36	2439	1621	21.0	1.16	.6	1443	.78	66	49	C	8	
08			2.6	9.8	.34	2632	1742	23.0	1.17	1.2	1453	.54	64	50	C	45	
09			2.7	8.9	.40	2382	1598	21.5	1.11	1.8	1393	.75	67	52	C	21	
10			2.8								1345			52	C	38	
11			2.7								1440			51	C	50	
12			2.6	7.5	.57	2079	1391	19.0	1.09	1.0	1363	.68	66	47	C	26	
13			2.7	7.6	.56	2146	1483	20.6	1.07	.8	1364	.71	68	50	C	27	
14			2.7								1389			50	C	26	
15			2.7	8.4	.46	2260	1552	20.5	1.10	1.0	1411	.72	68	50	C	32	
16			2.7								1434			50	C	36	
17			2.7								1441			50	C	46	
18			2.7								1445			51	C	51	
19			2.6	5.4	.55	1809	1232	20.0	.90	1.0	1446	.62	67	47	C	1	
20			2.7	6.8	.43	2140	1417	20.0	1.07	1.8	1378	.62	66	47	C	22	
21			2.7	6.5	.39	2210	1491	20.5	1.08	1.0	1343	.68	67	50	C	36	
22			2.7	6.8	.37	2130	1416	20.0	1.07	1.2	1379	.67	66	49	C	31	
23			2.6	6.7	.37	2156	1452	20.0	1.08	1.8	1408	.67	66	47	C	35	
24			2.8								1296			45	C	32	
25			2.3								1429			38	C	55	
26			2.3	4.5	.50	1752	1158	16.0	1.10	4.0	1354	.65	66	40	C		
27			2.3	6.2	.41	2007	1324	19.0	1.06	2.3	1294	.72	65	40	C		
28			2.3	6.9	.34	2216	1450	20.0	1.11	1.6	1311	.77	65	42	C	33	
29			2.4	7.3	.31	2286	1523	21.0	1.09	.7	1311	.77	66	45	C	26	
30			2.4								1266			47	C	31	
31															C		
TL															C	870	
ME			2.6	7.4	.40	2229	1485	20.3	1.10	1.5	1388	.73	66	48	C	31	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

APRIL, 19 76 (Month) — Marshall (Municipality), Michigan — Robert J. Swahell (Superintendent's Signature)

ID 1 2 | Plant No 3–8: 130C29 | Mo 9 10: 04 | Yr 11 12: 76 | Sampling Point Code 13 15: 000

DAY	BOD-5 9	BOD-5 14	BOD-5 19	SS 24	SS 29	SS 34	TOTAL-P 39	TOTAL-P 44	TOTAL-P 49	VSS 54	NH_3-N 59	pH 64	DO 69	F COLI* 74	80	T COLI* 9	REMARK 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	11	320	81	7	204	90	.43	13	80	5		7.9	5.7	158	C		
02							40	11	83			7.9	5.7	50	C		
03												7.8			C		
04	6	161	86	10	269	75	.42	11	81	5		7.6			C		
05	23	639	78	6	167	92	.58	16	79	3		7.6	5.1	170	C		
06	20	544	82	3	82	96	.38	10	75	2		7.8	5.0		C		
07	21	572	81	5	136	91	.48	13	80	3		7.9	5.8	130	C		
08	20	545	80	7	191	91	.42	11	78	2		7.8	5.7	30	C		
09												7.5	6.0	22	C		
10												7.5			C		
11	23	604	78	8	210	81	.55	14	79	5		7.6			C		
12	21	578	82	12	330	88	.68	19	77	6		7.8	5.2	30	C		
13	41	1091	66	8	213	88				5		7.7	5.1	40	C		
14	12	320	83	3	80	94	.29	8	86	2		7.8			C		
15												7.7	5.5	16	C		
16												7.7			C		
17												7.5			C		
18	13	340	82	14	367	84	.34	9	87	6		7.6			C		
19	21	574	81	15	410	92	.50	14	85	2		7.4	5.2	172	C		
20	15	404	83	5	135	95	.24	6	92	4		7.8	5.7	16	C		
21	20	534	76	17	458	83	.35	9	87	12		7.7	5.5	126	C		
22	19	513	76	3	81	97				2		7.7	5.9	18	C		
23												8.1	5.8	4	C		
24												8.0			C		
25	24	735	60	5	153	90	.58	18	77	2		8.0			C		
26	13	414	84	10	319	91	.53	17	81	7		8.0	6.3	198	C		
27	17	537	76	6	190	94	.37	12	87	5		8.1	5.6	12	C		
28	21	653	74	11	342	89	.49	15	81	10		8.1	5.2	98	C		
29	13	395	80	11	334	88				7		8.0	5.1	60	C		
30												7.9			C		
31															C		
TL		10514			4671			226							C		
ME	19	526	78	8	234	89	.45	13	82	5		7.8	5.5	46	C		
WA	24	653	75	10	275	88								46	C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

April, 19 76 (Month)

Marshall (Municipality), Michigan

Robert J. Swalwell (Superintendent's Signature)

1 2: 1D | 3–8: 130029 (Plant No) | 9 10: 04 (Mo) | 11 12: 76 (Yr) | 13–15: (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 Polymer LBS	49	54	59
PN											
SF		2									
01	2	51	3840			10	695	7.3			
02	2	9	3480			30	496	7.0			
03	2	2	3120			20	199	6.8			
04	2	3	3480			30	397	6.7			
05	2	2	3600			20	596	6.9			
06	2	1	3480			30	596	6.8			
07	2	3	3600			30	596	6.8			
08	2	4	3600			20	596	6.8			
09	2	3	3360			20	596	6.7			
10	2	2	3240			40	397	6.5			
11	2	5	3480			30	199	6.6			
12	2	4	3840			30	596	6.9			
13	2	1	3480			20	794	6.7			
14	2	1	3240			20	397	6.7			
15	2	2	3240			20	596	6.7			
16	2	1	2880			20	596	6.7			
17	2	1	3000			20	397	6.7			
18	2	2	3000			20	596	6.5			
19	2	1	3240			30	794	6.8			
20	2	2	3360			30	794	6.7			
21	2	2	3360			30	596	6.7			
22	2	1	3480			30	596	6.8			
23	2	2	3240			20	596	6.8			
24	2	1	3120			20	397	6.5			
25	2	24	3600			30	596	7.7			
26	2	30	3960			30	596	7.9			
27	2	13	3840			20	794	7.9			
28	2	3	3720			20	794	7.7			
29	2	3	3480			20	556	7.6			
30	2	1	3120			30	635	7.4			
31											
TL	60	180	99240			740	17079	2083			
ME	2	6	3308			25	569	6.9			

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	4		676
Superintendent	1		168
Asst. Supt.	1		168
Shift Foreman			
Shift Operator	2		340
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 4000
Secondary 14000

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D 45

Marshall, MICHIGAN

Supernatant To

Process Pattern

MONTH April 1976

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE Gals X/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	64	5.7	66	109	7.5																			
2	64	6.0	62	115	7.3																			
3	64	5.6	60	107	7.2																			
4	64	5.9	59	113	7.2																			
5	64	5.9	65	113	7.2																			
6	72	3.3	72	64	7.0																			
7	64	5.5	58	105	7.1																			
8	64	5.1	61	97	7.0																			
9	67	5.2	64	101	7.0																			
10	64	[illegible]	76	113	7.[illegible]																			
11	64	[illegible]	57	101	[illegible]																			
12	67	[illegible]	65	111	7.[illegible]																			
13	73	[illegible]	73	131	[illegible]																			
14	64	[illegible]	52	111	[illegible]																			
15	64	[illegible]	66	117	6.9																			
16	6[illegible]	[illegible]	67	96	7.[illegible]																			
17	64	5.6	61	107	6.9																			
18	64	[illegible]	71	119	6.9																			
19	64	5.2	65	100	6.8																			
20	64	5.8	67	111	6.9																			
21	64	6.1	68	85	7.0																			
22	64	5.2	62	99	7.0																			
23	64	6.1	54	117	7.1																			
24																								
25																								
26	112	[illegible]	56	195	7.0																			
27	112	5.2	69	175	7.0																			
28	112	5.7	65	192	7.3																			
29	112	[illegible]	67	198	7.7																			
30																								
31																								
TOTAL	1940																							
ARITH. MEAN	72	5.6	64	119																				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

May, 19 76 — Month

Marshall, Michigan — Municipality

Robert J. Swalwell — Superintendent's Signature

1 2: 15 | 3–8: 130029 (Plant No.) | 9 10: 05 (Mo.) | 11 12: 76 (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	BOD-5 44	SS 49	SS 54	TOTAL-P 59	TOTAL-P 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		3.50	4.00	51	7.6									C		
02	4	.38	3.39	4.00	51	7.7	48	1357	56	1583	2.3	65	50		C		
03	4	.02	3.54	4.00	51	8.0	76	2244	116	3424	3.0	89	66		C		
04	1		3.50	4.00	50	7.8	74	2160	106	3094			68		C		
05	4	.41	3.50	4.00	51	7.8	92	2685	148	4320	2.9	85	122		C		
06	4	1.03	3.80	4.00	51	7.8	80	2535	106	3359	3.1	98	72		C		
07	3		3.82	4.00	51	7.5									C		
08	1		3.82	4.00	50	7.8									C		
09	1		3.61	4.00	50	7.7	54	1626	58	1746	2.1	63	50		C		
10	4	.08	3.65	4.00	50	7.8	75	2283	118	3592	3.4	103	82		C		
11	1		3.52	4.00	51	7.9	92	2700	92	2700	2.4	70	64		C		
12	1		3.57	4.00	50	7.9	74	2203	110	2375	2.5	74	98		C		
13	3		3.66	4.00	51	7.7	54	1648	68	2076			44		C		
14	4	.02	3.55	4.00	51	7.7									C		
15	4	.26	3.43	4.00	51	7.8									C		
16	4	1.19	3.97	4.00	51	7.8	79	2616	86	2847	2.7	89	76		C		
17	4	.02	4.09	4.00	51	7.4	80	2729	124	4230	2.3	78	102		C		
18	1		3.91	4.00	51	7.9	66	2152	82	2674	2.4	78	48		C		
19	1		3.95	4.00	51	8.1	59	1944	114	3756	5.5	181	84		C		
20	4	.05	3.81	4.20	51	7.8	86	2733	108	3431	2.2	70	66		C		
21	1		3.80	4.40	51	7.6									C		
22	1		3.62	4.70	51	7.6									C		
23	1		3.54	4.20	51	7.6	77	2223	68	2008	2.7	80	36		C		
24	4	.01	3.76	4.50	52	7.6	94	2948	138	4327			108		C		
25	1		3.64	4.40	52	7.6	60	1821	136	4129	3.0	91	90		C		
26	1		3.60	4.40	52	7.5	72	2162	138	4143	2.7	81	72		C		
27	1		3.62	4.50	54	8.0	82	2476	128	3864	2.7	82	80		C		
28	4	.19	3.60	4.40	52	7.8									C		
29	4	.29	3.40	4.00	52	7.8									C		
30	4	.43	3.38	4.00	52	7.3									C		
31	3		3.42	4.60	52	7.3	52	1483	80	2282	2.7	77	50		C		
TL		4.38	112.97					46,478		65,960		1554			C		
ME			3.64				73	2228	104	3141	2.8	86	72		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

May, 19 76 (Month)

Marshall (Municipality), Michigan

Robert J. Swartwell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
ID 130029 05 76 ...
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
PN	00310	85001	00530	85002	00665	85004	00535	00610								C		
SF																C		
01																C		
02	32	905	26	735	1.9	54	20									C		
03	66	1949	32	945	2.0	59	16									C		
04	40	1168	62	1810			32									C		
05	48	1401	40	1168	1.6	47	36									C		
06	41	1299	36	1141	1.9	60	22									C		
07																C		
08																C		
09	32	963	24	723	2.2	66	18									C		
10	45	1370	42	1279	2.4	73	30									C		
11	44	1292	38	1116	2.1	62	26									C		
12	45	1340	34	1012	2.0	60	28									C		
13																C		
14																C		
15																C		
16																C		
17	60	2047	58	1978			34									C		
18	27	880	42	1370	1.8	59	32									C		
19	18	593	34	1120	4.2	138	18									C		
20	41	1302	30	953	1.5	48	22									C		
21																C		
22																C		
23	34	1004	42	1240	2.0	59	28									C		
24	47	1474	68	2132			64									C		
25	41	1245	32	971	2.9	88	10									C		
26	29	871	44	1321	1.3	39	20									C		
27	40	1208	44	1328	1.1	33	26									C		
28																C		
29																C		
30																C		
31	30	856	42	1198	2.0	57	20									C		
TL		23,185		32,540		1002										C		
ME	40	1220	41	1713	2.1	63	26									C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

MAY, 19 76 (Month) — MARSHALL (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
IP | 13.0029 | 05 | 76 | ..
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											3				C		
01	48		2.5								1267			46	C	3	
02			2.5								1295			46	C	26	
03			2.4	8.1	.28	2241	1482	22.0	1.02	1.5	1341	.70	66	51	C	45	
04			2.5	7.3	.29	2240	1466	22.0	1.02	1.5	1302	.67	65	51	C	31	
05			2.5	7.5	.27	2334	1552	20.0	1.11	1.2	1259	.65	66	54	C	24	
06			2.3	5.6	.32	2214	1443	22.0	1.01	2.0	1329	.67	64	56	C	23	
07			2.3	5.7	.32	2229	1452	22.5	.99	2.0	1340	.64	65	57	C	30	
08			2.3								1318			57	C	7	
09			2.4								1281			60	C	29	
10			2.4	6.7	.28	2523	1582	25.0	1.01	1.0	1284	.68	65	60	C	50	
11			2.4	6.6	.29	2510	1529	24.0	1.05	1.1	1376	.69	68	64	C	45	
12			2.4	6.1	.27	2355	1534	23.0	1.02	1.5	1410	.62	65	59	C	21	
13			2.4	6.1	.27	2417	1610	24.0	1.01	1.0	1341	.70	65	55	C	40	
14			2.4	6.5	.25	2498	1659	23.0	1.09	2.3	1343	.67	66	59	C	36	
15			2.5								1353			63	C	35	
16			2.2								1361			54	C	34	
17			2.1	5.4	.32	2406	1587	22.0	1.09	1.5	1396	.72	66	53	C	51	
18			2.2	5.4	.29	2267	1470	22.0	1.03	1.5	1413	.65	64	57	C	25	
19			2.2	5.9	.26	2525	1627	23.0	1.10	1.8	1380	.67	64	56	C	22	
20			2.3	6.2	.24	2642	1742	25.0	1.06	1.2	1309	.73	65	57	C	42	
21			2.3	6.1	.25	2573	1687	24.5	1.05	1.1	1386	.70	65	57	C	42	
22			2.4								1409			60	C	50	
23			2.4								1407			60	C	9	
24			2.3	5.4	.24	2494	1665	23.0	1.08	1.5	1390	.70	65	62	C	27	
25			2.4	5.6	.23	2489	1672	23.0	1.08	1.7	1396	.78	67	58	C	41	
26			2.4	6.2	.19	2607	1802	23.0	1.13	1.2	1366	.73	68	60	C	24	
27			2.4	7.1	.21	2607	1745	23.0	1.13	1.1	1365	.71	66	60	C	45	
28			2.4	5.8	.22	2447	1652	24.0	1.02	.8	1348	.68	67	62	C	30	
29			2.5								1342			65	C	41	
30			2.5								1344			66	C	30	
31			2.5								1353			65	C	24	
TL															C	982	
ME			2.4	6.3	.26	2431	1598	23.0	1.06	1.4	1348	.69	66	58	C	32	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

MAY (Month), 19 76 — Marshall (Municipality), Michigan — Robert J Swalwell (Superintendent's Signature)

1 2: IP | 3–8: 130029 (Plant No.) | 9 10: 05 (Mo.) | 11 12: 76 (Yr) | 13 15: 660 (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	80	T. COLI* 9 #/100 ml	REMARK 14
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	(31616) ~~31615~~	C	31504 31505	
SF															C		
01												7.7			C		
02	12	339	75	8	226	86	.55	16	76	5		7.7			C		
03	23	679	70	16	472	86	.95	28	68	8		7.7	5.1	291	C		
04	20	584	73	58	1693	45				13		7.5	5.5	28	C		
05	17	496	82	9	263	94	.40	12	86	7		7.6	5.4	46	C		
06	20	634	75	14	444	87	.60	19	81	12		7.6	5.6	24	C		
07												7.3	5.7	224	C		
08												7.6			C		
09	7	211	87	2	60	97	.55	17	74	2		7.5			C		
10	19	578	75	10	304	92	.60	18	82	4		7.8	4.7	TNTC	C		
11	16	470	83	4	117	96	.42	12	83	2		7.6	5.1	192	C		
12	17	506	77	8	238	93	.60	18	76	7		7.6	5.9	TNTC	C		
13	17	519	69	16	488	76				3		7.5	5.4	122	C		
14												7.5	5.2	30	C		
15												7.6			C		
16	14	464	82	11	364	87	.63	21	77	9		7.6			C		
17	20	682	75	14	478	89	.44	15	81	11		7.3	4.8	352	C		
18	13	424	80	12	391	85	.37	12	85	6		7.8	5.2	18	C		
19	11	362	81	3	99	97	43	14	92	1		7.7	5.7	70	C		
20	12	381	86	5	159	95	.30	10	86	4		7.4		190	C		
21												7.5	5.4		C		
22												7.6			C		
23	7	207	91	7	207	90	.42	12	84	4		7.5			C		
24	13	408	86	19	596	86				14		7.4	5.1	98	C		
25	13	395	78	9	273	93	.85	26	72	6		7.4	5.9		C		
26	11	330	85	20	600	86	.68	20	75	12		7.5	5.5	32	C		
27	14	423	83	22	664	83	.34	10	87	5		7.5	5.8	22	C		
28												7.4	5.2	178	C		
29												7.4			C		
30												7.5			C		
31	5	143	90	5	143	94	.52	15	81	2		7.4			C		
TL		9235			8279			295							C		
ME	14	440	80	13	394	87	.54	16	80	7		7.5	5.4	77	C		
WA	17	522	77	17	479	84	.59	18	79	7				93	C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

May, 19 76 — Month

Marshall, Michigan — Municipality

Robert J. Swalwell — Superintendent's Signature

1 2: IP | 3–8: 130029 (Plant No) | 9 10: 05 (Mo) | 11 12: 76 (Yr) | 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 FeCl3 LBS	44 Polymer LBS	49	54	59
PN											
SF		2									
01	3	1	3120			30	397	5.8			
02	3	5	3480			20	596	5.6			
03	3	63	3240			40	993	5.9			
04	3	10	3720			20	596	5.8			
05	3	2	3840			20	476	5.8			
06	3	5	3600			40	715	6.3			
07	3	5	3480			20	397	6.4			
08	3	1	3360			20	397	6.4			
09	3	2	3120			30	397	6.0			
10	3	1	3360			10	596	6.1			
11	3	1	3480			20	993	2.9			
12	3	2	3600			20	596	2.9			
13	3	1	3240			20	397	3.1			
14	3	1	3240			20	596	3.0			
15	3	1	3240			20	496	2.9			
16	3	2	3240			40	496	3.3			
17	3	1	3240			20	794	3.4			
18	3	2	3840			40	675	3.3			
19	3	2	3480			20	516	3.3			
20	3	1	3360			40	715	3.2			
21	3	2	3240			20	715	3.2			
22	3	1	3240			20	199	3.0			
23	3	1	3120			40	596	3.0			
24	3	1	3600			40	596	3.1			
25	3	1	3600			20	596	3.0			
26	3	2	3240			20	158	3.0			
27	3	1	3360			20	993	3.0			
28	3	1	3120			20	159	3.0			
29	3	1	3000			20	457	2.8			
30	3	1	3360			60	397	2.8			
31	3	2	3000			20	496	2.9			
TL	93	123	104160			790	17196	124.2			
ME	3	4	3360			25	555	4.0			

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	5		700
Superintendent	1		160
Asst. Supt.	1		160
Shift Foreman			
Shift Operator	3		380
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

MDPH
D-4.5

Marshall, MICHIGAN

Supernatant To _____
Process Pattern _____

MONTH May 1976

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE Gals. X 1000	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																								
2																								
3	10	5.9	63		7.1																			
4	10	5.6	59		7.3																			
5	10	6.1	65		7.6																			
6	10	5.7	66		7.7																			
7																								
8																								
9																								
10	10	5.7	61		7.3																			
11	10	5.8	68		7.7																			
12	10	5.3	65		7.2																			
13	10	5.4	61		7.3																			
14																								
15																								
16																								
17	10	5.0	63		7.1																			
18	10	5.9	59		7.5																			
19	10	5.5	64		7.2																			
20	10	5.3	60																					
21																								
22																								
23																								
24	10	4.7	63		6.4																			
25	10	5.1	61		7.4																			
26	10	4.5	63		7.3																			
27	10	5.0	48		7.4																			
28																								
29																								
30																								
31																								
TOTAL	160																							
ARITH. MEAN	10	5.4	62																					

Sludge pumped direct to filter

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

June, 19 76 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2: 1D | 3–8: 130029 (Plant No) | 9 10: 06 (Mo) | 11 12: 76 (Yr) | 13–15: 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	BOD-5 44	SS 49	SS 54	TOTAL-P 59	TOTAL-P 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		3.58	4.00	54	7.4	104	3105	122	3643	2.7	81	96		C		
02	1		3.52	4.20	54	7.4	90	2642	140	4110			88		C		
03	1		3.52	4.00	54	7.6	76	2231	128	3758	4.1	120	108		C		
04	1		3.46	4.00	54	7.6									C		
05	1		3.32	4.00	54	7.4									C		
06	1		3.30	4.40	54	7.5	68	1882	70	1938			56		C		
07	1		3.56	4.40	54	7.6	74	2197	136	4038	3.1	92	96		C		
08	1		3.46	3.90	55	7.6	112	3232	128	3694	3.1	89	96		C		
09	1		3.52	4.00	55	7.6	78	2290	150	4404	3.5	103	82		C		
10	4	.08	3.44	4.20	55	7.5	74	2123	78	2238	3.0	86	42		C		
11	1		3.36	4.00	55	7.6					3.0	84			C		
12	1		3.18	3.90	55	7.6									C		
13	1		3.22	3.70	54	7.4	57	1531	96	2578			54		C		
14	1		3.42	4.20	56	7.4	98	2795	108	3080			86		C		
15	4	.43	3.44	4.30	56	7.5	116	3328	132	3787	3.1	89	88		C		
16	3		3.36	4.20	54	7.5	68	1906	130	3643	3.2	90	92		C		
17	1		3.32	3.90	55	7.5	76	2104	82	2270	2.8	78	46		C		
18	4	.66	3.38	4.00	54	7.5					2.8	80			C		
19	3		3.32	3.80	54	7.5									C		
20	1		3.16	3.70	55	7.5	64	1687	100	2635	3.4	90	72		C		
21	1		3.40	4.20	55	7.3	92	2609	156	4424	3.2	91	126		C		
22	1		3.42	4.06	55	7.3	80	2282	104	2966	3.4	97	64		C		
23	4	.56	3.52	4.20	55	7.7	108	3171	154	4520	2.8	82	74		C		
24	4	.69	3.56	4.40	54	7.4	74	2197	156	4632	3.0	89	60		C		
25	1		3.36	4.40	54	7.5									C		
26	1		3.22	3.60	54	7.4									C		
27	1		3.18	3.80	55	7.3	57	1512	74	1962	2.5	66	56		C		
28	1		3.34	4.20	55	7.5	60	1671	110	3064	3.5	97	80		C		
29	4	1.01	3.35	4.40	56	7.6									C		
30	4	.54	3.46	4.20	54	7.4	40	1154	60	1731	2.7	80	42		C		
31															C		
TL		3.97	101.65					47649		69615		1684			C		
ME			3.38				79	2269	115	3291	3.1	89	76		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

June, 19 76 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
ID | 130029 | 06 | 76 | ..
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
PN	00310	85001	00530	85002	00665	85004	00535	00610							C		
SF															C		
01	39	1164	32	955	2.0	58	20								C		
02	45	1321	40	1174			26								C		
03	33	969	36	1057	2.8	82	14								C		
04															C		
05															C		
06	33	914	26	720			20								C		
07	45	1336	28	831	2.1	62	14								C		
08	36	1039	36	1039	2.3	66	16								C		
09	37	1086	68	1996	2.1	62	22								C		
10	46	1320	36	1033	1.8	52	18								C		
11					2.4	67									C		
12															C		
13	36	967	62	1665			34								C		
14	44	1255	50	1426			40								C		
15	47	1348	62	1779	2.5	72	34								C		
16	42	1177	52	1457	2.0	56	36								C		
17	35	969	50	1384	2.1	58	34								C		
18					2.3	63									C		
19															C		
20	35	922	36	949	2.5	66	20								C		
21	44	1248	70	1985	2.3	65	64								C		
22	41	1169	52	1483	2.0	57	36								C		
23	47	1380	66	1938	2.3	68	36								C		
24	45	1336	60	1781	2.3	68	32								C		
25															C		
26															C		
27	40	1061	34	902	2.2	58	24								C		
28	45	1253	56	1560	2.8	80	44								C		
29															C		
30	23	664	30	866	1.5		22								C		
31															C		
TL		22859		27980		1162									C		
ME	40	1088	47	1332	2.2	64	29								C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

June, 19 76 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2: ID | 3–8: 130029 (Plant No) | 9 10: 06 (Mo) | 11 12: 76 (Yr) | 13–15: (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	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											3				C			
01	48		2.4	5.8	.23	2430	1622	23.0	1.05	1.1	1327	.64	67	53	C	46		
02			2.4	5.6	.25	2344	1551	24.0	.98	.7	1299	.58	65	61	C	31		
03			2.4	6.3	.23	2391	1573	23.0	1.03	.8	1264	.59	67	57	C	50		
04			2.5	5.9	.23	2272	1543	22.0	1.03	1.4	1265			61	C	33		
05			2.6								1251			64	C	13		
06			2.6								1141			64	C	6		
07			2.4	6.7	.24	2316	1529	23.0	1.00	1.1	1208	.63	66	60	C	42		
08			2.5	7.8	.21	2548	1734	21.0	1.21	.9	1179	.64	68	58	C	38		
09			2.4	6.8	.23	2531	1638	24.6	1.25	1.0	1179	.68	67	58	C	23		
10			2.5	6.0	.25	2224	1513	24.0	.93	.4	1172	.66	67	59	C	38		
11			2.6	6.5	.23	2428	1603	25.0	.97	1.0	1188	.68	66	57	C	32		
12			2.7								1196			59	C	14		
13			2.7								1185			48	C	24		
14			2.5	5.5	.23	2289	1518	24.0	.95	1.4	1173	.67	66	55	C	32		
15			2.5	5.2	.24	2438	1649	24.0	.98	.5	1234	.67	67	53	C	40		
16			2.6	5.0	.26	2421	1617	25.0	.97	1.8	1253	.76	66	54	C	44		
17			2.6	4.6	.24	2309	1548	24.0	.96	1.3	1208	.68	67	52	C	27		
18			2.5	4.7	.26	2209	1471	22.5	.98	1.2	1109	.66	66	54	C	34		
19			2.6								1216			56	C	38		
20			2.7								1205			57	C	28		
21			2.5	4.3	.26	2217	1457	22.0	1.00	1.4	1204	.65	65	51	C	30		
22			2.5	4.8	.29	2100	1366	21.0	1.00	1.4	1194	.64	65	50	C	30		
23			2.5	4.0	.29	2157	1411	21.5	1.00	.8	1122	.66	64	49	C	32		
24			2.4	4.0	.29	2183	1418	21.0	1.04	1.0	1089	.69	64	48	C	37		
25			2.6	4.3	.28	2207	1368	21.5	1.02	1.4	1105	.65	61	50	C	37		
26			2.7								1121			54	C	6		
27			2.7								1091			53	C	33		
28			2.6	4.5	.29	2237	1369	22.0	1.02	1.5	1122	.69	60	57	C	27		
29			2.5	4.3	.29	2248	1425	22.0	1.02	1.1	1138	.65	63	56	C	55		
30			2.5	4.2	.30	2142	1323	19.0	1.13	2.0	1186	.61	62	51	C	50		
31															C			
TL															C	964		
ME			2.5	5.3	.26	2301	1511	22.6	1.01	1.1	1187	.66	65	55	C	32		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

June, 1976 (Month) — Marshall (Municipality), Michigan — Robert J. Swackhull (Superintendent's Signature)

ID: 130029 (Plant No) — 06 (Mo) — 76 (Yr) — 000 (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	12	358	88	5	149	96	.52	16	81	3		7.4	4.9	78	C		
02	9	264	90	7	205	95	[illegible]			3		7.4	4.4		C		
03	8	235	89	10	294	92	.67	20	84	10		7.4	5.1	12	C		
04												7.4	5.2	26	C		
05												7.5			C		
06	5	138	93	3	83	96				2		7.5			C		
07	16	297	86	8	238	94	.36	11	88	3		7.4	5.2	62	C		
08	9	260	92	8	231	94	.48	14	85	5		7.5	4.5	96	C		
09	12	352	85	28	822	81	.36	11	90	5		7.5	4.8	100	C		
10	8	230	89	9	258	88	.32	9	89	4		7.4	5.2	50	C		
11							.43	12	86			7.4	4.6	72	C		
12												7.4			C		
13	8	215	86	21	564	78				11		7.5			C		
14	10	258	90	16	456	85				11		7.3	5.4	42	C		
15	16	459	86	10	287	92	.23	7	93	1		7.4	5.1	66	C		
16	11	308	84	15	420	88	.42	12	87	8		7.4	5.7	6	C		
17	13	360	83	12	332	85	.33	9	88	2		7.5	5.5	26	C		
18							.42	12	85			7.4	5.7	132	C		
19												7.4			C		
20	7	184	89	6	158	94	.52	14	85	4		7.6			C		
21	8	227	91	19	539	88	.47	13	85	13		7.2	5.6	70	C		
22	11	314	86	8	228	92	.49	14	86	1		7.3	5.6	20	C		
23	11	323	90	14	411	91	.37	11	87	5		7.4	5.5	52	C		
24	17	505	77	18	534	88	.38	11	87	5		7.3	5.3	92	C		
25												7.6	5.6	22	C		
26												7.5			C		
27	17	451	70	3	80	96	.30	8	88	1		7.4			C		
28	10	279	83	8	223	93	.52	14	85	6		7.5	5.5	48	C		
29												7.5	4.8	100	C		
30	6	173	85	8	231	87	.30	9	89	7		7.4	6.6	44	C		
31															C		
TL		6172			6743			227							C		
ME	10	294	86	11	327	90	.42	12	87	5		7.4	5.3	46	C		
WA	12	338	84	16	448	83	.44	13	86	7				51	C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

June 1976 (Month) — Marshall (Municipality), Michigan — Robert J. Swackell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 14
10 | 130029 (Plant No.) | 06 (Month) | 76 | (Computing Period Code)

DAY 1 2	GRIT 9 CF	AUX FUEL 14	POWER CONSUMPTION 19 #1 KWH	24 #2 KWH	29 #3 KWH	CHEMICALS APPLIED 34 Cl2 LBS	39 FeCl3 LBS	44 Polymer LBS.	49	54	59
PN											
SF											
01	3		3240			40	675	4.4			
02	3		3360			20	834	4.4			
03	3		3360			40	476	4.4			
04	3		3120			20	596	4.3			
05	3		3000			20	397	4.3			
06	3		2880			40	675	4.1			
07	3		3240			20	476	4.4			
08	3		3240			40	834	4.3			
09	3		3120			20	834	4.4			
10	3		3240			20	675	4.3			
11	2		2880			20	615	4.2			
12	2		3000			20	417	4.0			
13	2		3000			20	675	4.0			
14	2		3120			30	596	4.2			
15	2		3240			20	794	4.3			
16	2		3240			30	596	4.2			
17	2		3120			20	596	4.1			
18	2		3240			20	596	4.2			
19	2		2880			20	596	4.1			
20	2		3000			40	397	3.9			
21	2		3120			20	794	4.2			
22	2		3240			20	695	4.2			
23	2		3240			25	655	4.4			
24	2		3240			25	834	4.4			
25	3		3240			25	715	4.3			
26	3		2760			25	377	4.0			
27	2		2880			25	794	3.9			
28	2		3240			20	794	4.1			
29	3		2760			25	794	4.2			
30	3		2880			40	397	4.3			
31											
TL	74		93120			770	19199	126.5			
ME	2.4		3104			26	640	4.2			

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

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-47

Marshall, MICHIGAN

MONTH June, 19 76

VACUUM FILTER & INCINERATION DATA

OPERATOR Robert 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 X100	R	Lbs. Dry	R	Tot. Hours	Yield	Gal X 10	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	100	5.1	428	6.4	23.0	54	270	6	9.0	3.17	855	12.2	932	27	2220		30	20.0	60	51	31				
2	100	4.9	412	6.4	23.0	56	270	7	9.0	3.05	855	12.2	868	29	2640		30	20.4	61	50	31				
3	100	5.0	420	6.4	24.0	57	270	6	9.0	3.11	855	12.2	840	28	2700		30	21.3	64	46	29				
4	100	5.0	420	6.6	16.0	38	210	5	7.0	4.00	665	12.3					30	22.0	66	46	30				
5																									
6																									
7	100	4.9	412	6.4	17.0	41	270	7	9.0	3.05	855	12.0	1014	30	3180		30	21.0	63	47	30				
8	100	5.7	479	6.4	14.0	29	270	6	9.0	3.55	855	12.2	946	28	2520		30	20.6	60	47	28				
9	102	5.3	454	6.5	14.0	31	270	6	9.0	3.36	855	12.0	1066	13	3920		30	19.9	66	52	31				
10	112	5.6	527	6.4	13.5	26	270	5	9.0	3.90	855	12.0	978	9	2640		30	20.3	61	50	30				
11																									
12																									
13																									
14	84	5.2	367	6.2	13.5	37	270	7	9.0	2.71	855	12.5	1026	15	2580		30	19.2	58	53	31				
15	106	5.7	508	6.2	13.5	27	270	5	9.0	3.76	855	12.1	1056	21	2940		30	18.9	57	57	32				
16	99	11.0	915	6.1	13.5	15	270	3	9.0	6.77	855	12.0	1540	20	4440		30	26.4	79	56	44				Digested
17	108	6.4	581	6.1	13.5	23	270	5	9.0	4.30	855	11.9	1070	15	3240		30	23.1	69	52	36				
18	100	5.1	428	6.2	13.5	32	270	6	9.0	3.17	855	12.0	952	34	2340		30	17.9	54	55	30				
19																									
20																									
21	118	5.5	545	6.3	13.5	25	270	5	9.0	4.03	855	11.9	1038	24	2400		30	18.9	57	52	29				
22	118	5.6	555	6.0	12.5	23	254	5	8.5	4.35	807	12.0	1190	16	2880		30	20.4	61	48	29				
23	100	5.9	496	6.8	13.5	27	270	5	9.0	3.67	855	12.0	2436	19			30	20.9	63	48	39				Digested
24	106	4.9	436	6.3	13.5	31	270	6	9.0	3.22	855	12.0	2116	22	2400		30	20.3	61	48	29				
25	121	5.3	538	6.1	13.5	25	270	5	9.0	3.98	855	12.1	2110	22	3060		30	20.0	60	50	30				
26																									
27																									
28	112	5.6	527	6.0	13.5	26	270	5	9.0	3.90	855	12.1	2242	28	2700		30	20.1	60	98	29				
29	88	5.5	406	6.1	13.5	33	270	7	9.0	3.00	850	11.9	1048	19	1800		30	20.2	61	51	31				
30																									
31																									
Total	2074		9854		3055		5829		178		16857						600		1235		629				
Arith Means	104	5.7	493		15.2	33	266	6	8.9	3.67	843		1284	22	2636		30	20.6	62	50	31				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

JULY, 19 76 (Month) — Marshall (Municipality), Michigan — Robert J. Swaluell (Superintendent's Signature)

1 2 IP | 3–8 13.0.29 (Plant No) | 9 10 07 (Mo.) | 11 12 76 (Yr) | 13–15 500 (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	BOD-5 44	SS 49	SS 54	TOTAL-P 59	TOTAL-P 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	.05	3.46	4.00	55	7.5	50	1442	92	2655	1.5	43	50		C		
02	1		3.56	3.90	55	7.4									C		
03	4	.08	3.30	4.00	54	7.4									C		
04	1		3.18	3.80	55	7.5									C		
05	1		3.24	4.10	54	7.6	44	1189	74	2000	2.8	76	58		C		
06	1		3.36	4.20	54	7.4	87	2438	110	3082	3.5	98	80		C		
07	1		3.30	4.00	54	7.7	57	1569	88	2422	3.5	96	66		C		
08	.		3.22	3.80	54	7.7	72	1993	150	4153	3.3	91	164		C		
09	4	.03	3.20	4.00	54	7.5									C		
10	1		3.20	3.80	55	7.4									C		
11	1		3.42	4.00	55	7.6	62	1768	88	2510	3.1	88	76		C		
12	1		3.32	4.00	55	7.6	47	1301	100	2769			70		C		
13	1		3.20	3.90	55	7.4	93	2482	106	2829			66		C		
14	1		3.26	3.90	55	8.1	92	2501	170	4622			126		C		
15	1		3.28	3.90	55	7.7	78	2134	102	2790			56		C		
16	1		3.14	3.40	55	7.8									C		
17	1		3.00	3.70	54	7.5									C		
18	1		2.98	3.60	54	7.5									C		
19	1		3.16	3.80	54	7.6	72	1898	130	3426	3.5	92	88		C		
20	4	.94	3.20	3.80	54	7.6	68	1815	90	2402	4.0	107	62		C		
21	1		3.18	3.80	54	7.8	68	1803	124	3289	3.5	93	52		C		
22	4	.07	3.14	3.80	54	7.6	66	1728	118	3090	3.5	92	90		C		
23	1		3.18	3.80	54	7.7									C		
24	1		3.02	3.70	54	7.6									C		
25	1		2.96	3.60	54	7.8	62	1531	64	1598	2.9	72	44		C		
26	4	.41	3.12	4.00	54	7.8	74	1926	158	4111	4.1	107	122		C		
27	.		3.08	4.00	55	7.7	68	1747	142	3648	3.3	85	74		C		
28	4	.18	3.06	4.20	55	7.7	58	1480	84	2144	3.4	87	54		C		
29	4	.02	3.00	3.80	57	7.9									C		
30	4	.02	3.08	4.00	57	7.9									C		
31	1		2.94	3.80	56	7.6									C		
TL		1.80	98.84					32772		53521		1227			C		
ME			3.19				68	1821	111	2973	3.3	88	74		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

JULY, 19 76
Month

Marshall, Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID 130029 07 76 ...
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
PN	00310	85001	00530	85002	00665	85004	00535	00610							C		
SF															C		
01	29	837	28	808	1.8	52	8								C		
02															C		
03															C		
04															C		
05	35	946	32	865	2.4	65	30								C		
06	34	1093	42	1177	2.7	76	28								C		
07	21	578	22	605	2.2	61	16								C		
08	24	665	78	2160	2.5	69	38								C		
09															C		
10															C		
11	33	941	38	1052	2.3	66	20								C		
12	42	1163	14	388			8								C		
13	38	1014	54	1441			32								C		
14	40	1088	50	1359			38								C		
15	36	985	24	657			4								C		
16															C		
17															C		
18															C		
19	45	1186	46	1212	1.8	47	32								C		
20	42	1121	58	1388	2.7	72	40								C		
21	46	1220	66	1750			16								C		
22	36	993	56	1467	2.1	55	40								C		
23															C		
24															C		
25	38	938	44	1086	2.5	62	24								C		
26	51	1327	56	1457	2.8	73	38								C		
27	41	1053	44	1130	1.8	46	20								C		
28	40	1021	36	919	2.4	61	26								C		
29															C		
30															C		
31															C		
TL		18119		20,921		805									C		
ME	38	1007	44	1162	27	62	25										

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

JULY, 19 76 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2 ID | 3–8 130624 Plant No | 9 10 07 Mo | 11 12 76 Yr | 13–15 .. 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 79	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											3				C		
01	48		2.5	5.2	.26	2149	1314	19.0	1.13	1.8	1157	.63	60	41	C	24	
02			2.4	4.8	.29	2042	1248	19.0	1.07	1.4	1155	.69	61	47	C	20	
03			2.6								1173			51	C	31	
04			2.7								1174			53	C	36	
05			2.7								1168			52	C	34	
06			2.6	6.2	.25	2145	1324	20.0	1.10	1.6	1175	.69	60	50	C	27	
07			2.6	6.8	.22	2243	1348	21.0	1.07	2.1	1168	.71	60	53	C	32	
08			2.6	6.1	.20	2306	1412	22.0	1.05	1.0	1158	.64	61	54	C	44	
09			2.7	6.2	.21	2253	1379	21.0	1.07	1.2	1146	.68	60	56	C	42	
10			2.7								1099			56	C	51	
11			2.5								1149			53	C	23	
12			2.6	6.6	.24	[illegible]	1331	21.0	1.05	1.2	12[illegible]	.67	60	52	C	42	
13			2.7	6.0	.2[illegible]	2[illegible]24	1317	20.0	1.06	1.6	1250	.65	59	53	C	39	
14			2.6	5.7	.23	2236	1356	21.0	1.06	.7	1207	.66	59	52	C	42	
15			2.6	6.1	.21	2241	1443	20.5	1.09	.7	1209	.69	63	50	C	54	
16			2.7	6.1	.21	2144	1400	19.0	1.13	1.5	1252	.66	64	50	C	42	
17			2.4								1259			59	C	6	
18			2.4								1249			54	C	7	
19			2.7	6.3	.21	2344	1533	20.0	1.20	1.1	1242	.71	66	55	C	51	
20			2.7	6.2	.24	2257	1454	21.5	1.05	1.6	1215	.61	62	49	C	44	
21			2.7	4.9	.26	2162	1367	20.0	1.05	1.7	1232	.70	62	52	C	41	
22			2.7	4.7	.26	2078	1366	20.0	1.04	2.1	1216	.52	64	50	C	30	
23			2.7	4.7	.24	2090	1351	17.0	1.23	1.6	1209	.67	64	41	C	27	
24			2.9								1231			52	C	30	
25			2.4								1231			56	C	34	
26			2.8	5.0	.27	2165	1374	21.0	1.03	.8	1225	.67	63	51	C	2	
27			2.8	5.3	.23	2343	1586	23.0	1.04	.8	1217	.74	65	58	C	30	
28			2.8	5.6	.23	2450	1587	20.0	1.23	1.0	1204	.70	64	60	C	30	
29			2.9	5.9	.22	2457	1628	24.0	1.02	1.2	1228	.67	67	61	C	31	
30			2.8	5.7	.23	2465	1553	24.0	1.03	1.1	1267	.66	64	58	C	47	
31			2.9								1312			62	C	15	
TL															C	1013	
ME			2.7	5.7	.24	2238	1416	21.0	1.09	1.3	1205	.67	62	53	C	33	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

July, 19 76 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2 ID | 3–8 Plant No: 130029 | 9 10 Mo: 07 | 11 12 Yr: 76 | 13–15 Sampling Point Code: 000

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	80 C	T. COLI* 9 #/100 ml	REMA 14
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	(31616) 31615	C	31504 31505	
SF															C		
01	5	144	90	5	144	96	.30	9	89	4		7.5	6.6	8	C		
02												7.5	5.9	24	C		
03												7.5			C		
04												7.5			C		
05	8	216	82	7	189	91	.22	6	86	5		7.5			C		
06	9	252	90	13	364	88	.27	8	92	8		7.5	5.9		C		
07	9	248	84	10	275	89	.32	9	89	7		7.6	5.3		C		
08	12	332	83	15	415	90	.47	13	86	7		7.6	5.0		C		
09												7.6	5.1	52	C		
10												7.5			C		
11	11	314	82	7	200	92	.25	7	92	5		7.6			C		
12	8	222	83	23	637	77				15		7.6	5.5	8	C		
13	10	267	89	11	294	90				5		7.5	6.1	30	C		
14	12	326	87	9	243	95				6		7.6	5.6	18	C		
15	8	219	89	9	246	91				5		7.6	5.3		C		
16												7.6	5.7	2	C		
17												7.6			C		
18												7.6			C		
19	11	290	85	10	264	92	.33	9	91	6		7.6	5.0	2	C		
20	11	294	84	13	347	86	.40	11	90	4		7.6	5.6	20	C		
21	13	345	81	30	796	77				2		7.5	6.2	56	C		
22	8	210	88	19	498	89	.32	8	91	14		7.6	6.2	4	C		
23												7.7	6.2	28	C		
24												7.6			C		
25	14	346	77	11	272	83	.21	5	93	7		7.6			C		
26	16	416	78	12	312	92	.28	12	84	7		7.6	5.3	32	C		
27	12	308	82	17	437	88	.40	10	85	4		7.7	4.6	38	C		
28	8	204	86	10	255	88	.37	9	89	7		7.7	4.5	102	C		
29												7.7	5.0	8	C		
30												7.6	4.8	20	C		
31												7.8			C		
TL		4953			6226			116							C		
ME	10	275	84	13	346	88	.33	9	89	7		7.6	5.5	16	C		
WA	12	327	82	15	418	85	.36	9.1	89								

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

JULY, 19 76 (Month) — MARSHALL (Municipality), Michigan — Robert J. Swaddell (Superintendent's Signature)

1 2 ID | 3–8 13002.9 (Plant No) | 9 10 0.7 (Mo) | 11 12 76 (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 PolyMer LBS.	49	54	59
PN											
SF											
01			3240			20	794	2.9			
02			3240			40	893	3.0			
03			2760			30	596	2.8			
04			2760			30	596	2.6			
05			3000			20	596	2.7			
06			3120			20	496	2.8			
07			3240			20	893	2.8			
08			3240			20	993	2.8			
09			3000			20	695	2.8			
10			2880			40	397	2.7			
11			2880			20	794	2.9			
12			3240			20	596	2.8			
13			3120			20	596	2.7			
14			3240			50	596	2.7			
15			3240			30	794	2.7			
16			3120			40	496	2.6			
17			3000			40	397	2.5			
18			3000			20	397	2.5			
19			3240			20	695	2.6			
20			3240			20	596	2.7			
21			3120			20	496	2.7			
22			3240			40	794	2.6			
23			3120			20	397	2.6			
24			2880			30	318	2.5			
25			2880			20	377	2.5			
26			3240			30	695	2.6			
27			3120			30	496	2.6			
28			3120			30	596	2.5			
29			3120			30	496	2.5			
30			3120			20	695	2.6			
31			2880			40	397	2.5			
TL			95560			850	18663	82.8			
ME			3083			27	602	2.7			

Out of Service For Cleaning

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 11 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

MDPH
D-4.7

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH July, 19 76 — 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 1	Tot. Sol. % 2	Lbs. Dry Sol. X 10 3	pH 4	Lbs. Dry 5	R 6	Lbs. Dry 7	R 8	Tot. Hours 9	Yield 10	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	Thou. Lbs. Wet 17	Tot. Sol. % 18	Lbs. Tot. Solids X 100 19	Vol. Sol. % 20	Lbs. Vol. Solids X 100 21	Hrs. Opr. 22	Yield 23	Fuel BTU 24	25
1	70	5.3	312	6.4	1059	34	143	5	6	3.46	57	11.6	1048	19	1800		25	18.9	47	54	25				
2	117	5.4	531	6.2	1588	30	214	4	9	3.93	86	11.8	1618	11	2460		35	18.5	65	52	34				
3																									
4																									
5																									
6	106	5.4	481	6.4	1588	33	214	4	9	3.56	86	12.2	1604	34	2700		35	19.6	69	51	35				
7	106	5.1	454	6.3	1588	35	214	5	9	3.36	86	12.1	1294	29	1620		35	19.0	67	53	35				
8	118	5.3	525	6.4	1588	30	214	4	9	3.88	86		1170	15	1740		35	18.9	66	52	34				
9	123	4.3	462	6.5	1588	34	214	5	9	3.42	86	12.1	1202	24	2190		35	19.4	68	50	34				
10																									
11																									
12	98	5.5	453	6.3	1588	35	214	5	9	3.35	86	12.0	1038	12	1770		35	19.3	68	54	36				
13	127	5.2	555	6.5	1588	29	214	4	9	4.11	86	12.2	960	10			35	18.9	66	50	33				
14	103	5.8	526	6.9	1588	30	214	4	9	3.89	86	11.8	1488	9			35	21.5	75	54	41				
15	112	5.0	513	6.5	1588	31	214	4	9	3.44	86	12.0	832	23			35	20.0	70	44	31				
16	112	5.3	499	6.5	1588	32	214	4	9	3.69	86	11.8	924	26			35	20.0	70	46	32				
17																									
18																									
19	118	5.8	575	6.4	1588	28	214	4	9	4.25	86	11.9	1036	29	2220		35	18.7	65	55	36				
20	142	5.0	596	6.6	1588	27	214	4	9	4.41	86	11.9	1040	12	2130		35	18.6	65	52	34				
21	135	4.4	499	7.1	1588	32	214	4	9	3.69	86	12.0	1414	9			35	18.3	64	46	29				
22	126	5.0	529	6.6	1588	30	214	4	9	3.91	86	11.9	994	8	1500		35	20.4	71	76	54				
23	127	4.7	501	6.7	1588	32	214	4	9	3.71	86	11.6	1134	7	2460		35	17.6	62	46	28				
24																									
25																									
26	140	5.8	682	6.6	1588	23	214	3	9	5.05	86	11.7	842	9	1980		35	18.1	63	51	32				
27	130	5.1	557	6.6	1588	29	214	4	9	4.12	86	11.7	648	28	2160		35	17.9	63	48	30				
28	136	5.5	628	6.3	1588	25	214	3	9	4.65	86	11.6	732	18	990		35	17.0	60	53	32				
29	116	5.2	507	6.8	1588	31	214	4	9	3.75	86	11.6	896	10	990		35	19.3	68	53	36				
30	116	5.3	516	6.8	1412	27	191	4	8	4.30	76	11.6	927	9	980		32	17.8	57	51	29				
31																									
Total	2459		10901		32642		4408		185		1776						722		1369		710				
Aritn Means	119	5.2	519		1554	30	209		8.8	3.92	85		1087	17	1856		34	18.9	65	52	34				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

AUGUST (Month) 19 76 — Marshall (Municipality), Michigan — Robert J. Swartwell (Superintendent's Signature)

1 2 ID | 3–8 130029 (Plant No) | 9 10 08 (Mo) | 11 12 76 (Yr) | 13–15 500 (Sampling Point Code)

DAY 1 2	WEATHER TYPE 9 (See Code)	WEATHER PRECIP 14 (Inches)	FLOW TOTAL 19 (MGD)	FLOW MAX RATE 24 (MGD)	RAW SEWAGE QUALITY TEMP 29 (°F)	pH 34 (SU)	BOD-5 39 (mg/l)	BOD-5 44 (LBS)	SS 49 (mg/l)	SS 54 (LBS)	TOTAL P 59 (mg/l)	TOTAL P 64 (LBS)	VSS 69 (mg/l)	NH_3 N 74 (mg/l)	78 80 C	REMARKS OF 9	14
PN		00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C		
SF															C		
01	3		2.88	3.90	58	7.6	90	1681	84	2018			56		C		
02	3		3.00	3.80	55	7.5	106	2652	184	4604	3.50	88	130		C		
03	1		3.00	4.00	58	7.8	96	2402	166	4152	4.10	103	112		C		
04	1		2.86	4.80	58	7.8	84	2004	116	2767	4.80	114	76		C		
05			2.94	3.90	58	7.4	103	2[illegible]	180	4414	3.50	86	126		C		
06			2.92	3.50	58	7.7									C		
07	1		2.80	3.60	58	7.7									C		
08	1		2.80	3.30	57	7.8	72	1[illegible]	84	19[illegible]	3.[illegible]	[illegible]	62		C		
09			2.96	3.70	57	7.8	96	2[illegible]	176	4[illegible]	3.30	[illegible]	122		C		
10	3		3.04	3.60	57	7.4	94	2[illegible]	176	37[illegible]	[illegible]	[illegible]	98		C		
11	4	.06	2.98	3.80	57	8.0	134	3336	280	6953	[illegible]	161	216		C		
12	5		3.00	3.60	56	8.3	104	2[illegible]	156	39[illegible]	[illegible]	102	88		C		
13	1	.07	3.06	3.90	56	7.7									C		
14	4	.04	2.96	3.60	57	7.4									C		
15	1		2.76	3.30	57	7.4	71	1624	106	2440	3.10	71	56		C		
16	1		2.96	4.60	58	7.6	102	2515	152	3752			92		C		
17	1		2.92	4.20	57	7.8	96	2333	156	3794	4.30	105	112		C		
18	1		2.88	3.70	58	8.3	102	2450	160	3834	3.90	94	110		C		
19	1		2.96	3.90	57	7.6	96	2322	234	5666	[illegible]	1[illegible]	136		C		
20	1		2.96	3.80	58	8.2									C		
21	1		2.80	3.60	58	8.0									C		
22	1		2.77	3.10	58	7.2	71	1640	152	3511	3.50	81	108		C		
23	1		2.88	3.80	58	7.6	90	2162	110	2642	3.50	[illegible]	76		C		
24	1		2.92	4.00	58	7.4	120	2922	212	5163	4.30	105	142		C		
[illegible]			2.90	4.20	59	7.7	90	2177	168	4063	4.60	111	130		C		
[illegible]	1		2.90	3.60	60	7.7	68	1[illegible]	124	2944	3.50	55	76		C		
[illegible]	1		2.90	3.60	59	7.7									C		
[illegible]	21	.09	2.72	3.40	56	7.4									C		
	1		2.70	3.30	58	7.4	68	1531	118	2657	4.30	97	80		C		
	1		2.80	3.60	58	8.5	84	1962	198	4624	5.[illegible]	119	[illegible]		C		
	1		2.80	4.60	58	8.2	96	2242	232	5415	5.80	135	182		C		
[illegible]		.26	84.67					1148		8449		2[illegible]			C		
[illegible]			2.89				92	2224	161	3591	4.[illegible]	99	[illegible]		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

AUGUST 1976 (Month) — MUSKEGON (Municipality) — Michigan — Robert J. Swabell (Superintendent's Signature)

ID 1366.24 (Plant No) 03 (Mo) 76 (Yr) (Sampling Point Code)

DAY	BOD 5 mg/l	BOD 5 LBS	SS mg/l	SS LBS	TOTAL P mg/l	TOTAL P LBS	VSS mg/l	NH_3 N mg/l	REMARKS OR OTHER PARAMETERS
	9–14		19–24		29–34		39	44	49–74
1 2	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l	
V	00310	85001	00530	85002	00665	85004	00535	00610	
F									
01	47	1124	24	576			12		
02	54	1521	62	1551	3.1	75	32		
03	41	[illegible]	36	901	2.32	5[illegible]	22		
04	36	654	34	5[illegible]1	2.7[illegible]	41	24		
05	45	[illegible]	52	12[illegible]	2.56	[illegible]	40		
6									
7	32		4[illegible]	[illegible]	2.65	[illegible]	18		
	46	[illegible]	4[illegible]	[illegible]	2.7[illegible]	[illegible]	30		
10	50	[illegible]	[illegible]	[illegible]	2.0[illegible]	[illegible]	2[illegible]		
11	47	[illegible]	56	9[illegible]	4.[illegible]	1[illegible]	50		
	4[illegible]		3[illegible]	[illegible]	[illegible]	4[illegible]	24		
14									
15	39	893	58	1330	2.60	60	20		
16	59	1456	48	1[illegible]97			26		
17	41	943	53	1215	2.66	1[illegible]	42		
18	45	1[illegible]31	36	865	2.30	55	24		
19	56	1[illegible]	60	1451	2.4[illegible]	5[illegible]	26		
20									
21									
22	48	0[illegible]	58	1155	2.60	[illegible]	36		
23	54	247	66	5[illegible]0	3.50	[illegible]4	46		
24	76	1521	58	1412	2.60	[illegible]	34		
25	38	14	60	145[illegible]	2.60	[illegible]	44		
26	39	[illegible]	36	[illegible]71	2.[illegible]	56	14		
29									
30	41	23	74	[illegible]	2.30	[illegible]	50		
	44	[illegible]	[illegible]	1445	2.76	[illegible]	40		
	42	[illegible]31	46	1074	2.60	61	36		
T		[illegible]		21454		1212			
AVE	47	41	49	1172	2.6[illegible]	61	31		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

Michigan

PN	8000		001	002	0000	0000	1001	81007	00300	81000	81006	70025	810 4	C1	2000	80389
SF										3				C		
01	4		3.6							1335	.67		64	C	21	
02			4	6.8	.24	2395	15 8	23 6	1	1346	1 4	64	61	C	44	
03				6.3	.24	3-7	5	22 8		13 8	1 64	65	61	C	16	
04			3 6	7.4	.22	2467	1 27	24 3	2	1 4	65	66	64	C	4	
05			2 1	6 4	.23	232	55	21		1 2	44	62	62	C		
06				7.1	.22	2375	161	25 0	.95	1 9		66	62	C	7	
07			1							1 9			65	C	1	
08										1 2			63	C	17	
09				5 9	.29		3	1 6	1.05	2 6	1146	15	63	C	1	
10				6.5	24	2355	619	22 0	.9	1 7	1 4	7	59	C		
11			3	7.2	22	2583	1727	24	1 27	1	1126	76	61	C	57	
12				7	23	2566	1764	23 0		1	1 9	6	26	C	3	
13			3	6.6	.24	2 8	1613	22 0	1	1 3	1155	.7	58	C	4	
14										1212			57	C	27	
15										1228			61	C	19	
16			3 5	5.8	.24	2156	1638	23 0	.93	1.9	1244	.67	66	55	C	6
17			3.0	6.6	.25	2466	1631	23 5	1.05	1.8	81	.74	66	54	C	41
18			3 0	6.5	.24	2388	1600	22 0	.09	1 7	42	.75	66	55	C	46
19			3.0	5.7	.25	2250	1511	21.0	1 27	3 0	1132	.76	66	55	C	26
20			3 9	5.8	.24	2340	1584	23 0	1.02	1 0	1 20	.73	67	54	C	38
21			3 1								1126			57	C	37
22			3 2								1179			57	C	28
23			3.0	5.2	.26	2217	1493	23.0	.96	2.6	1115	.66	67	56	C	4
24			3.0								1119			55	C	29
25			3 0	5 8	.24	2531	1678	23.5	1 08	1.0	1112	.72	66	52	C	38
26			3.0	5.8	.25	2420	1645	22.0	1.10	1.8	1102	.74	68	52	C	46
27			3.0	5.2	.28	2168	1449	21 0	1 03	1.3	1082	.65	67	53	C	42
28			3.2								1129			57	C	5
29			3.2								1179			57	C	40
30			3.1	4.7	.27	2139	1405	20.0	1 07	2.0	1158	.65	66	54	C	2.3
31			3 1	4.9	.26	2188	1428	21.0	1.04	1 7	1107	.68	64	54	C	39
TL															C	9.50
ME			3.0	6.2	.25	2336	1569	22.	1 05	1.6	1166	.67		.58	C	30.6

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

AUGUST 1976 — Month

MARSHALL, Michigan — Municipality

Robert J. Swahill — Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID 130029 08 76 003
Plant No Mo Yr Sampling Point Code

DAY	BOD 5 9	BOD 5 14	BOD 5 19	SS 24	SS 29	SS 34	TOTAL P 39	TOTAL P 44	TOTAL P 49	VSS 54	NH_3 N 59	pH 64	DO 69	F COLI* 74	80	T COLI* 9	REMARK 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 [redacted]	C	31504 31505	
SF															C		
01	8	192	89	10	240	88				.5		7.7			C		
02	19	475	82	11	275	94	.40	10	86	7		7.8	6.1	14	C		
03	10	250	90	5	125	97	.43	11	90	3		7.8	6.6	16	C		
04	8	191	90	6	143	95	.30	7	94	4		7.4	5.6	22	C		
05	10	215	90	14	343	92	.43	11	88	6		7.8	6.5	8	C		
06												7.8	5.6	10	C		
07												7.8			C		
08	2	47	93	9	225	89	.30	7	96	3		7.6			C		
09	23	545	76	7	173	94	.17	5	95	4		7.8	7.2	46	C		
10	17	421	82	8	202	95	.50	13	88	2		7.6	5.7	20	C		
11	16	395	88	15	373	95	.60	12	88	14		7.7	4.2	6	C		
[illegible]	[illegible]	[illegible]	87	4	100	97	.43	11	89	2		[illegible]	5.9	30	C		
13												7.5	5.6	116	C		
14												7.6			C		
15	10	230	86	24	552	77	.45	10	85	.5		7.5			C		
16	14	346	86	16	395	87				2		7.6	6.6	88	C		
17	19	463	80	13	317	92	.41	15	86	12		7.5	6.9	36	C		
18	24	576	76	12	255	93	.57	14	85	9		7.7	6.4	262	C		
19	16	387	83	15	363	94	.47	11	96	9		7.7	7.2	24	C		
20												7.8	5.5	41	C		
21												7.7			C		
22	14	323	80	12	277	92	.32	7	91	10		7.3			C		
23	14	326	84	13	312	88	.52	12	85	5		7.4	6.9	28	C		
24	20	457	83	7	170	97	.48	12	84	3		7.6			C		
25	8	93	91	15	363	91	.38	9	85	5		7.5	4.7	76	C		
26	8	93	88	4	97	97	.23	6	93	3		7.5	5.5	30	C		
27												7.5	6.6	46	C		
28												7.5			C		
29	8	80	88	21	473	82	.23	5	95	7		7.5			C		
30	8	157	90	13	361	93	.38	9	93	6		7.5	6.2	22	C		
31	13	304	86	8	187	97	.33	8	94	6		7.4	6.4	30	C		
TL		7412			6131			226							C		
AE	13	325	86	11	273	92	.43	10	89	6		7.6	6	30	C		
WA	16	351	82	15	351	89	.53	13	87					59	C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

Michiga

1	1	[illegible]			[illegible]	[illegible]					
[illegible]	1	[illegible]			[illegible]	[illegible]					
[illegible]		3240			[illegible]	[illegible]					
04	1	3240			[illegible]	446					
05	1	[illegible]			[illegible]	446					
[illegible]	1	[illegible]			[illegible]	[illegible]					
07	1	[illegible]			[illegible]	[illegible]					
08		[illegible]			[illegible]	[illegible]					
[illegible]	1	[illegible]			[illegible]	[illegible]					
[illegible]	1	[illegible]			[illegible]	[illegible]					
1	1	[illegible]			[illegible]	[illegible]					
[illegible]	1	[illegible]			[illegible]	[illegible]					
[illegible]	1	[illegible]			[illegible]	[illegible]					
4	1	[illegible]			[illegible]	[illegible]					
15	1	[illegible]			[illegible]	[illegible]					
[illegible]	1	[illegible]			[illegible]	397					
17	1	[illegible]			[illegible]	596					
18	1	[illegible]			[illegible]	397					
19	1	[illegible]			20	596					
20	1	[illegible]			40	496					
21	1	2850			20	397					
22	1	2640			20	596					
23	1	2850			20	397					
24	1	3000			20	397					
25	1	3120			20	794					
26	1	3000			20	397					
27	1	2760			30	596					
28	1	2760			30	397					
29	1	2850			40	596					
30	1	3000			40	596					
31	1	3000			20	596					
TL	31	92280			780	15979					
ME	1	2976			25	515					

CHEMICALS APPLIED

							44	49	54	59	

MANPOWER

POSITION, TITLE	Full Time	No Part Time	Total Hours
TOTAL	[illegible]		[illegible]
Superintendent	1		[illegible]
Asst Supt	1		[illegible]
Shift Foreman			
Shift Operator	[illegible]		[illegible]
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.

MDPH
D-4.7

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH August, 19 76 — VACUUM FILTER & INCINERATION DATA — OPERATOR R. J. Swartwell

DATE	SLUDGE TO FILTER				CHEMICALS TO FILTER				FILTER		FILTRATE						FILTER CAKE					INCINERATION			REMARKS
					COD		FeCl3																		
	Gal. X 100 1	Tot. Sol. % 2	Lbs. Dry Sol. X100 3	pH 4	Lbs. Dry 5	R 6	Lbs. Dry 7	R 8	Tot. Hours 9	Yield 10	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	Thou. Lbs. Wet 17	Tot. Sol. % 18	Lbs. Tot. Solids X 100 19	Vol. Sol. % 20	Lbs. Vol. Solids X 100 21	Hrs. Opr. 22	Yield 23	Fuel BTU 24	25
1																									
2	123	5.2	54	6.7	1728	32	216	4	9	4.0	86	11.7	658	25	1800		30	17.9	54	51	28				
3	131	5.6	62	6.7	1728	28	216	3	9	4.5	86	11.6	606	18	1500		30	19.2	58	53	31				
4	78	5.2	34	6.7	1152	34	144	4	6	3.7	57	11.2	608	17	1600		20	20.6	41	47	19				
5	135	5.7	65	6.8	1728	27	216	3	9	4.8	86	11.9	744	33	1980		30	20.4	61	55	34				
6	121	5.1	52	6.7	1728	33	216	4	9	3.9	86	11.8	1160	22	1380		30	17.9	54	54	29				
7																									
8																									
9	120	3.2	32	7.2	1728	54	216	7	9	2.3	86	11.2	386	31	1980		30	18.4	55	53	29				
10	60	5.4	27	6.4	768	28	96	4	4	4.5	38	11.2	900	15	1800		13	18.6	23	52	12				
11	120	4.7	47	6.4	1728	37	216	5	9	3.5	86	12.4	884	15	1560		30	20.3	61	51	31				
12	135	4.8	54	6.5	1728	32	216	4	9	4.0	86	12.1	822	29	1800		30	19.2	58	55	32				
13	136	4.7	54	6.6	1728	32	216	4	9	4.0	86	11.9	836	15	1440		30	18.6	56	50	28				
14																									
15																									
16	101	4.9	42	6.4	1728	41	216	5	9	3.1	86	12.0	880	23	1140		30	22.5	68	56	38				
17	98	5.5	45	6.2	1728	38	216	5	9	3.3	86	11.8	1036	14	1500		30	20.5	61	52	32				
18	100	6.5	55	7.4	1728	31	216	4	9	4.1	86	12.0	1206	15	1440		30	23.9	71	52	37				
19	90	5.6	42	7.6	1536	37	192	5	8	3.5	76	9.4	834	16	1860		27	21.1	57	46	26				
20	110	5.2	48	7.4	1728	36	216	5	9	3.6	86	11.8	1120	17	2040		30	18.0	54	52	28				
21																									
22																									
23	94	5.1	40	6.5	1536	38	192	5	8	3.3	76	9.3	790	12	1320		27	20.5	55	56	31				
24																									
25	117	5.0	49	6.3	1728	35	216	4	9	3.6	86	10.4	942	26	1440		30	18.2	55	57	31				
26	105	4.8	42	6.2	1728	41	216	5	9	3.1	86	10.2	982	19	1800		30	19.4	58	53	31				
27	74	5.3	33	6.4	1344	41	168	5	7	3.1	67	10.5	988	18	1740		23	18.8	43	45	19				
28																									
29																									
30	125	5.0	53	6.4	1728	33	216	4	9	3.9	86	10.6	1236	17	1380		30	18.9	57	47	27				
31	143	5.0	60	6.5	1728	29	216	4	9	4.4	86	10.9	714	11	1980		30	19.0	57	47	27				
Total	2316		990		33984		4248		177		1690						590		1157		600				
Arith Means	110	5.1	47		1618	35	202	4	8.4	3.7	80		866	19	1641		28	19.6	55	52	29				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

September, 19 76 (Month) — Marshall (Municipality), Michigan — Robert J. Swartwell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
ID | 13 0 2 2 7 | 09 | 76 | 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	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		2.76	3.30	58	7.6	94	2164	266	4742	5.5	134	156		C		
02	1		2.74	3.20	59	7.7	83	1574	134	2534	[illegible]	91	[illegible]		C		
03	1		2.7[illegible]	3.10	[illegible]	7.[illegible]									C		
04	1		2.74	3.50	58	7.6									C		
05	1		2.58	3.50	58	7.6									C		
06	1		[illegible]	3.50	5[illegible]	7.[illegible]	[illegible]	1468	[illegible]	2651	[illegible]	131	[illegible]		C		
07	1		[illegible]	[illegible]	[illegible]	[illegible]	71	1521	[illegible]	5351	[illegible]	117	[illegible]		C		
08	1		2.14	2.[illegible]	[illegible]	[illegible]	[illegible]	1315	[illegible]	2754	[illegible]	76	[illegible]		C		
09	4	1.[illegible]	[illegible]	2.50	[illegible]	[illegible]	[illegible]	2655	[illegible]	4.17	[illegible]	17	[illegible]		C		
10	1		2.70	3.50	[illegible]	7.[illegible]									C		
11	1		[illegible]	3.40	58	7.[illegible]									C		
12			[illegible]	3.70	5[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		C		
13	1		[illegible]	3.40	59	[illegible]	81	1919	[illegible]	3346	[illegible]	[illegible]			C		
14	4	0.8	[illegible]	2.30	[illegible]	[illegible]	76	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		C		
15	4	1.2	[illegible]	3.10	59	7.1	7[illegible]	1691	13[illegible]	3016	[illegible]	36	[illegible]		C		
16	1		2.75	3.70	59	[illegible]	[illegible]	2343	[illegible]	4553	[illegible]	[illegible]	[illegible]		C		
17	1		[illegible]	3.40	59										C		
18	1		2.68	3.20	59										C		
19	1	.35	[illegible]	3.5[illegible]	27	[illegible]	[illegible]	1500	[illegible]	[illegible]		73	[illegible]		C		
20	4	0.2	[illegible]	50	59	[illegible]	42	2202	[illegible]	[illegible]		79	[illegible]		C		
21	4	.16	2.75	3.00	5[illegible]	[illegible]	42	2133	3[illegible]	3660	[illegible]	17	[illegible]		C		
22	1	.11	[illegible]	3.20	[illegible]	[illegible]	4[illegible]	[illegible]	[illegible]	4340	[illegible]	41	[illegible]		C		
23	1		2.80	3.70	[illegible]	[illegible]	74	1775	[illegible]	2552	[illegible]	00	[illegible]		C		
24	1		2.74	3.50	59	[illegible]									C		
25	1	.37	[illegible]	3.50	59	[illegible]									C		
26	1	.15	[illegible]	3.40	59	[illegible]	[illegible]	1465	[illegible]	[illegible]	[illegible]	62	[illegible]		C		
27	1		[illegible]	3.4[illegible]	[illegible]	[illegible]	[illegible]	1245	[illegible]	[illegible]		74	[illegible]		C		
28	3		2.78	3.40	57	[illegible]	62	1427	[illegible]	[illegible]	[illegible]	74	[illegible]		C		
29	1		2.71	3.20	57	[illegible]	72	1[illegible]5	166	3743	[illegible]	55	[illegible]		C		
30	1		2.71	3.40	53	[illegible]	81	1151	14[illegible]	3154	[illegible]	51	[illegible]		C		
31															C		
TL		2.37	82.73					34985		65276		1855			C		
ME			2.76				82	1964	134	3107	3.8	88	89		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

SEPTEMBER, 19 76
Month

MARSHALL, Michigan
Municipality

Robert J Swalwell
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID 1300024 09 76
Plant No Mo Yr Sampling Point Code

DAY	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
1 2	mg/l	LBS	mg/l	LBS	mg/l	LBS	mg/l	mg/l							C		
3 4	00310	85001	00530	85002	00665	85004	00535	00610							C		
5F															C		
01	64	1473	36	1611	2.6	60	28								C		
02	59	1348	[illegible]	1371	3.0	68	46								C		
03															C		
04															C		
05															C		
06	43	[illegible]	41	1003	2.9	66	18								C		
07	[illegible]	[illegible]	[illegible]	1326	[illegible]	101	23								C		
08	[illegible]	[illegible]	[illegible]	1155	[illegible]	45	[illegible]								C		
09	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	49	[illegible]								C		
10															C		
11															C		
12	57	[illegible]	42	1346	[illegible]	61	[illegible]								C		
13	[illegible]	[illegible]	[illegible]	1232	[illegible]	56	26								C		
14	[illegible]	[illegible]	[illegible]	1370	[illegible]	62	[illegible]								C		
15	[illegible]	[illegible]	[illegible]	1371	[illegible]	56	[illegible]								C		
16	[illegible]	[illegible]	[illegible]	1314	3.1	71	[illegible]								C		
17															C		
18															C		
19	51	1131	28	1336	[illegible]	[illegible]	[illegible]								C		
20	54	1261	[illegible]	840	3.2	75	[illegible]								C		
21	[illegible]	[illegible]	[illegible]	927	1	43	26								C		
22	51	91	[illegible]	1331	1.4	56	33								C		
23	50	917	56	934	2.4	56	[illegible]								C		
24															C		
25															C		
26	50	42	[illegible]	1231	2.1	45	12								C		
27	42	901	14	1016	2.0	67	22								C		
28	[illegible]	701	125	763	1.7	47	25								C		
29	33	751	[illegible]	1021	1.6	37	6								C		
30	36	243	[illegible]	1371	1.3	30	[illegible]								C		
31															C		
TL		24927		25622		1224									C		
ME	50	163	59	1363	2.5	58	34								C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

September 19 76 (Month) — Marshall (Municipality), Michigan — Robert J. Swahell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
ID | 130027 | 09 | 76 | ..
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											3				C		
01	48		3.1	5.0	.26	2231	1456	24.0	.93	1.5	1152	.67	66	55	C	38	
02			3.1	5.1	.27	2264	1517	22.0	1.02	1.3	1099	.65	66	53	C	31	
03			3.1	4.9	.25	2167	1159	21.0	1.03	1.2	1.03	.65	66	[illegible]	C	22	
04			3.1								1044			51	C	13	
05			3.3								1056			[illegible]	C	[illegible]	
06			3.1								[illegible]			[illegible]	C	[illegible]	
07			3.6	4.5	3.0	2.0	972	21.0	.93	.7	1.07	[illegible]	61	1[illegible]	C	3[illegible]	
08			3.0	5.0	2.0	[illegible]	1444	21.6	1.0[illegible]	1.0	[illegible]	[illegible]	6[illegible]	[illegible]	C	33	
09			[illegible]	[illegible]	.27	[illegible]	[illegible]	2[illegible]	[illegible]		[illegible]	[illegible]	6[illegible]	[illegible]	C	[illegible]	
10			3.1	3.5	.2[illegible]	2107	1335	21.0	1.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	C	[illegible]	
11			3.2								144			[illegible]	C	11	
12			3.2								[illegible]			[illegible]	C		
13			3.6	5.9	.23	2476	1774	2[illegible].0	1.11	[illegible]	[illegible]	.6[illegible]	6[illegible]	[illegible]	C	[illegible]	
14			3.0	5.2	.26	2249	1335	23.0	1.03		[illegible]	.76	[illegible]	[illegible]	C	1[illegible]	
15			3.1	5.7	.25	2[illegible]	1[illegible]3	21.0	1.23	3.[illegible]	[illegible]	.71	6[illegible]	[illegible]	C	2[illegible]	
16			3.1	5.4	.22	2536	1671	20.0	1.27	1.[illegible]	1.40	.76	65	5[illegible]	C	4[illegible]	
17			3.1	5.0	.24	2361	1555	2[illegible]	1.13	[illegible]	[illegible]	.73	65	[illegible]	C	22	
18			3.2								1133			52	C	13	
19			3.2								1.2[illegible]			[illegible]	C	13	
20			3.1	5.5	.23	2522	1641	22.0	1.15	1.2	[illegible]	.81	66	[illegible]	C	44	
21			3.1	5.0	.27	2102	1414	19.0	1.15	3.6	[illegible]	.74	66	[illegible]	C	16	
22			3.1	5.4	.24	2351	1563	20.0	1.13	[illegible]	[illegible]	.74	6[illegible]	45	C	7	
23			3.1	5.9	.24	2461	[illegible]	20.0	1.23	[illegible]	[illegible]	.7[illegible]	6[illegible]	[illegible]	C	42	
24			3.1	5.1	.23	2[illegible]	[illegible]	17.0	1.12	3	[illegible]	[illegible]	[illegible]	16	C	25	
25			3.3								[illegible]			[illegible]	C	41	
26			3.1								[illegible]			[illegible]	C	4	
27			3.0	5.7	2[illegible]	2348	1508	19.0	1.2[illegible]	[illegible]	[illegible]	.6[illegible]	6[illegible]	[illegible]	C	12	
28			3.1	4.6	.32	2[illegible]1	1269	19.0	1.6[illegible]	2.[illegible]	[illegible]	.7[illegible]	61	[illegible]	C	[illegible]	
29			3.1	4.3	.31	1965	1195	17.0	1.12	1.8	[illegible]	.57	[illegible]	[illegible]	C	29	
30			3.1	4.4	.26	1798	1400	15.0	1.1[illegible]	2.6	[illegible]	.72	65	42	C	23	
31															C		
TL															C	843	
ME			3.1	5.1	.26	2274	1498	20.5	1.11	1.6	1121	.72	65	50	C	28	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

September, 19 76 (Month) — Marshall (Municipality), Michigan — Robert J. Swartwell (Superintendent's Signature)

1 2 ID | 3–8 130039 (Plant No) | 9 10 09 (Mo) | 11 12 76 (Yr) | 13 15 000 (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	11	253	83	17	391	42	.33	6	94	4		7.5	4.8	86	C		
02	14	434	77	16	366	37	.34	7	93	11		7.1	5.2	70	C		
03												7.1	5.2	72	C		
04												7.2			C		
05												7.2			C		
06	10	224	86	4	46	[illegible]	[illegible]	7	93			7.2			C		
07	20	474	74	13	[illegible]	92	11	6	14				5.3	6[illegible]	C		
08	1[illegible]	241	[illegible]	11	241	91	.13	[illegible]	[illegible]	7		7.7	5.3	[illegible]	C		
09	1[illegible]	361	[illegible]	22	511	[illegible]	[illegible]	5	11	[illegible]		7.2	4.8	[illegible]	C		
10												7.1	5.5	1[illegible]	C		
11												7.6			C		
12	1[illegible]	[illegible]	[illegible]	16	[illegible]	18	[illegible]	1	12	[illegible]		7.[illegible]			C		
13	[illegible]	[illegible]	[illegible]	7	1[illegible]6	[illegible]	.13	3	92	[illegible]		7.[illegible]	4.9	11[illegible]	C		
14	1[illegible]	303	13	12	231	76	.12	1[illegible]	[illegible]	[illegible]		7.6	4.8	44	C		
15	1[illegible]	274	84	16	366	18	.21	5	94	[illegible]		7.5	5.5	16	C		
16	[illegible]	2[illegible]	31	14	3[illegible]	42	.29	7	93	5		7.6	5.8	27	C		
17												7.7	5.0	36	C		
18												7.7			C		
19	1[illegible]	533	17	20	444	35	.21	7	73	7		7.[illegible]			C		
20	1[illegible]	444	80	13	42[illegible]	47	.13	12	37	3		7.[illegible]	4.9	4[illegible]	C		
21	[illegible]	343	84	5	13[illegible]	41	.12	5	13	4		7.6	6.3	33	C		
22	1	351	85	1[illegible]	[illegible]	44	.16	9	[illegible]	4		7.7	5.6	44	C		
23	[illegible]	234	17	4	21[illegible]	46	.10	7	93	7		7.1	5.7	3[illegible]	C		
24												7.3	6.5	36	C		
25												7.[illegible]			C		
26		[illegible]1	86	16	[illegible]	34	.13	5	41	1		7.3			C		
27		[illegible]2	[illegible]	3	72	71	.19	12	[illegible]	3		7.[illegible]	5.3	1[illegible]	C		
28		133	57	6	151	[illegible]	.34	4	36	4		7.4	5.8	52	C		
29		266	[illegible]	8	133	75	.34	7	[illegible]	3		7.5	6.2	8	C		
30	16	411	77	17	333	38	.26	6	74	11		7.3	5.8	2	C		
31															C		
TL		6463			593[illegible]			153							C		
AVE	13	335	84	12	2[illegible]2	91	.32	7	91	6		7.5	5.5	39	C		
WA	15	337	83	14	332	90	.35	8	89					57	C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

September 19 76 (Month)

Marshall (Municipality), Michigan

Robert J. Sutherland (Superintendent's Signature)

1 2: 10 | 3–8: 130029 (Plant No) | 9 10: 09 (Mo) | 11 12: 76 (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 SO2 LBS	39 Fe2(SO4)3 LBS	44	49	54	59
PN											
SF											
01	.5		3000			40	596				
02	.5		3000			[illegible]	596				
03	.5		[illegible]			[illegible]	596				
04	.5		2760			[illegible]	517				
05	.5		2760			[illegible]	517				
06	.5		[illegible]			[illegible]	[illegible]				
07			[illegible]			[illegible]	716				
08	.5		[illegible]			[illegible]	716				
09	.5		[illegible]			[illegible]	[illegible]				
10	.5		[illegible]			[illegible]	[illegible]				
11	.5		[illegible]			[illegible]	697				
12	.5		[illegible]			[illegible]	[illegible]				
13	.5		2760			[illegible]	517				
14	.5		2720			[illegible]	496				
15	.5		[illegible]			[illegible]	716				
16	.5		3320			[illegible]	597				
17	.5		2720			[illegible]	[illegible]				
18	.5		2600			[illegible]	596				
19	.5		[illegible]			[illegible]	596				
20	.5		[illegible]			[illegible]	[illegible]				
21	.5		3120			[illegible]	596				
22	.5		3360			[illegible]	596				
23	.5		3240			[illegible]	695				
24	.5		[illegible]			[illegible]	596				
25	.5		2720			[illegible]	695				
26	.5		2520			[illegible]	397				
27	.5		[illegible]			[illegible]	596				
28	.5		2760			[illegible]	496				
29	.5		2520			[illegible]	596				
30	.5		3240			[illegible]	596				
31											
TL	15		83140			300	16773				
AVE	.5		2448			[illegible]	559				

MANPOWER

POSITION TITLE	No Full Time	No Part Time	Total Hours
TOTAL	5		844
Superintendent	1		160
Asst Supt	1		160
Shift Foreman			
Shift Operator	3		[illegible]
Maint Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNEL

WEEKDAYS 11 HRS

SATURDAYS 11 HRS

SUNDAYS 7 HRS

HOLIDAYS 4 HRS

MDPH
D 17

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH September 19 76 — VACUUM FILTER & INCINERATION DATA — OPERATOR R. J. Swallwell

DATE	SLUDGE TO FILTER: Gal x 100 (1)	Tot Sol % (2)	Lbs Dry Sol x 100 (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)	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)	Feed (23)	Fuel BTU (24)	REMARKS (25)
1	114	2.3	51	7.4	566	31	214	4	9	37	56	10.2	1131	29	1000		30	22.5	68	56	38				
2	123	2.1	56	6.5	1566	28	214	4	9	41	66	10.1	674	24	2670		30	21.4	64	53	34				
3	72	5.2	31	7.2	870	23	119	4	5	41	43	10.[illegible]	[illegible]	28	2110		17	19.1	31	53	16				
4																									
5																									
6																									
7	93	1.1	32		1566	44	214	6	9	2[illegible]	3[illegible]	1.1		13			3[illegible]	16	41	4	23				
8	163		4[illegible]	1	1566	36	214	5	9	2[illegible]	46	1.[illegible]	7[illegible]	29			3[illegible]	1[illegible]	56	1[illegible]	30				
9	1[illegible]		32		1566	46	2[illegible]	5	9	[illegible]	6[illegible]	1					3[illegible]		5[illegible]		2[illegible]				
10			2[illegible]		1566	41	21[illegible]	6	9	[illegible]	[illegible]	[illegible]					[illegible]		[illegible]		3[illegible]				
11																									
12																									
13	33		41		66	3[illegible]	[illegible]	5	9	3[illegible]	[illegible]	1[illegible]	[illegible]	[illegible]	[illegible]		[illegible]		61	1[illegible]	23				
14	111		93		1566	36	[illegible]	5	9	2[illegible]	[illegible]	[illegible]	7[illegible]	2[illegible]			3[illegible]		52	[illegible]	36				
15																									
16	2[illegible]	[illegible]	4[illegible]		566	34	214	5	9		2[illegible]	1		2[illegible]	[illegible]		3[illegible]	[illegible]	52	53	3[illegible]				
17	2[illegible]	1.1	4[illegible]	6	1566	33	214	4	9	[illegible]	6[illegible]	[illegible]	[illegible]	2[illegible]	[illegible]		[illegible]		4[illegible]	[illegible]	2[illegible]				
18																									
19																									
20	[illegible]	11.5	6[illegible]		1566	13	214	2	9	[illegible]	[illegible]	1.[illegible]	66[illegible]	[illegible]	[illegible]		[illegible]		63	[illegible]	24				
21	23	[illegible]	52	[illegible]	6[illegible]	32	[illegible]	4	1	3[illegible]	2[illegible]	[illegible]	[illegible]	12	[illegible]		3[illegible]	2	51	5[illegible]	30				
22	65	1[illegible]	8[illegible]	1[illegible]	6[illegible]	15	211	2	9	4[illegible]	2[illegible]	1[illegible]	[illegible]	17	[illegible]		[illegible]	[illegible]	57	[illegible]	5[illegible]				
23	3[illegible]	6[illegible]	7[illegible]	[illegible]	6[illegible]	31	211	3	9	5[illegible]	2[illegible]	1[illegible]	1[illegible]	1[illegible]	[illegible]		3[illegible]	[illegible]	31	53	22				
24	116	13	4[illegible]	6[illegible]	2[illegible]2	30	191	4	8	3[illegible]	2[illegible]	1[illegible]	1[illegible]2	3[illegible]	[illegible]		2[illegible]	[illegible]	49	57	26				
25																									
26																									
27	112	47	4[illegible]	6[illegible]	1566	36	214	5	9	3[illegible]	2[illegible]	[illegible]	[illegible]	1[illegible]	[illegible]		3[illegible]		31	53	21				
28	112	[illegible]	3	6[illegible]	1566	40	214	5	9	3[illegible]	2[illegible]	1[illegible]	7[illegible]	10	[illegible]		3[illegible]	[illegible]	52	[illegible]	30				
29	2[illegible]	[illegible]	4[illegible]	6[illegible]	1566	32	214	5	9	3[illegible]	2[illegible]	1[illegible]	[illegible]	23	13[illegible]		3[illegible]	1[illegible]	56	1	2[illegible]				
30	[illegible]	1	5	6[illegible]	1566	30	211	5	9	[illegible]	5[illegible]	1[illegible]	[illegible]	[illegible]	8[illegible]		[illegible]		53		21				
Tot	2315		[illegible]		30450		4162		175		1,[illegible]						584		1102		5[illegible]				
Avg or Mean	111	56	5		1523	33	208	4.7	8.8	38	34		764	23	1570		29	18.5	55	53	27				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

October, 1976 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
ID 130029 10 76 500
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		2.74		58	7.5									C		
02	1		2.56		57	7.6									C		
03	1		2.58		57	7.5	70	1560	192	4131	2.70	58	146		C		
04	1		2.72		58	7.6	66	1497	130	2949	3.90	88	36		C		
05	4	1.0	2.78		58	7.6	82	2040	162	3756	4.00	93	103		C		
06	4	.14	2.78		57	7.8	80	1855	114	2643	3.30	77	78		C		
07	1		2.78		57	7.8	80	1855	120	2782	3.50	81	55		C		
08	1		2.78		57	7.8									C		
09	1		2.60		57	7.7									C		
10	1		2.58		57	7.6	77	1652	80	1721	4.00	86	67		C		
11	1		2.74		57	7.6	80	1828	153	3496	4.00	91	99		C		
12	1		2.76		57	7.6	90	2027	136	3062	4.20	95	93		C		
13	1		2.66		58	7.6	82	1819	112	2485	5.20	115	78		C		
14	1		2.76		57	7.6	90	2026	164	3693	3.70	83	12[illegible]		C		
15	1		2.76		57	7.8									C		
16	1		2.58		57	7.6									C		
17	1		2.66		57	7.3	72	1597	92	2040	4.10	91	72		C		
18	1		2.68		58	7.4	89	1989	130	2906	3.70	83	164		C		
19	4	.15	2.70		57	7.6	98	2207	110	2477	3.50	79	9[illegible]		C		
20	4	.05	2.66		58	7.5	102	2263	106	2352	3.40	75	86		C		
21	3	.06	2.65		56	7.3	80	1788	98	2190	3.20	72	32		C		
22	3		2.64		57	7.5									C		
23	4	.04	2.61		57	7.4									C		
24	4	.06	2.61		57	7.5	68	1480	72	1567	3.30	72	62		C		
25	1		2.66		57	7.5	65	1504	126	2795	3.90	87	82		C		
26	3		2.64		57	7.4	69	1519	70	1541	3.30	73	62		C		
27	1		2.62		57	7.5	84	1835	118	2578	4.00	87	88		C		
28	1		2.60		57	7.5	86	1865	142	3079	4.40	95	98		C		
29	3		2.58		57	7.5									C		
30	4	.51	2.70		57	7.6									C		
31	1		2.62		55	7.5	72	1573	88	1923	3.20	70	78		C		
TL		2.04	82.64					37,789		56,166		1751			C		
ME			2.67				81	1799	120	2675	3.70	83	90		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

October, 19 76
Month

Marshall, Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID 130629 10 76 ...
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
PN	00310	85001	00530	85002	00665	85004	00535	00610							C		
SF															C		
01															C		
02															C		
03	47	1011	44	947	2.10	45	38								C		
04	36	817	32	726	2.80	64	24								C		
05	47	1084	34	788	1.80	42	16								C		
06	41	951	38	851	1.70	39	16								C		
07	55	581	49	1113	2.30	53	35								C		
08															C		
09															C		
10	38	818	30	646	2.60	56	18								C		
11	48	1092	46	1051	2.80	64	36								C		
12	41	923	38	856	1.70	38	22								C		
13	35	843	36	799	2.40	53	18								C		
14	42	946	44	991	1.80	41	38								C		
15															C		
16															C		
17	42	932	48	1065	3.00	67	30								C		
18	51	1140	38	844	2.60	55	37								C		
19	34	878	26	585	1.70	35	14								C		
20	45	998	42	931	2.60	58	40								C		
21	42	939	28	626	2.70	60	22								C		
22															C		
23															C		
24	42	914	60	1306	2.80	61	42								C		
25	45	998	68	1509	3.30	73	46								C		
26	38	837	48	1057	2.20	48	34								C		
27	40	874	38	830	2.60	57	24								C		
28	45	976	50	1084	3.00	65	20								C		
29															C		
30															C		
31	52	1136	88	1923	2.60	57	50								C		
TL		19998		26563		1137									C		
ME	43	952	44	979	2.40	54	30								C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

October, 19 76 (Month) — Marquette (Municipality), Michigan — Robert J. Swabell (Superintendent's Signature)

ID 130029 (Plant No) 10 (Mo) 76 (Yr) (Sampling Point Code)

DAY	AERATION SYSTEM					MIXED LIQUOR						SECONDARY SLUDGE					Process Modification	F
	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											3				C			
01	48		3.1	4.5	.30	2010	1266	17.0	1.18	1.6	1035	.70	62	45	C	26		
02			3.4								1027			47	C	39		
03			3.3								1038			46	C	17		
04			3.2	4.6	.28	2009	1268	19.0	1.06	1.1	1023	.64	62	48	C	7		
05			3.1	4.6	.25	2201	1409	20.0	1.10	.4	1016	.74	62	47	C	23		
06			3.1	5.0	.26	2128	1380	20.0	1.06	1.3	1065	.78	62	48	C	9		
07			3.1	6.8	.22	2262	1400	21.0	1.08	1.3	1071	.63	64	52	C	26		
08			3.1	6.4	.20	2165	1549	21.5	1.00	1.2	1061	.72	65	51	C	29		
09			3.3								1059			52	C	15		
10			3.3								1057			53	C	22		
11			3.1	8.5	.21	2533	1500	22.0	1.15	1.2	1046	.75	65	46	C	5		
12			3.2	8.4	.21	2546	1500	23.5	1.08	1.0	1011	.85	65	45	C	31		
13			3.2	8.4	.18	2587	1705	22.0	1.18	1.2	1042	.88	64	45	C	21		
14			3.2	8.4	.20	2513	1575	22.0	1.14	1.2	1024	.85	66	46	C	61		
15			3.2	7.2	.22	2165	1402	19.5	1.11	1.1	1041	.73	64	47	C	9		
16			3.3								1071			49	C	19		
17			3.2								1096			48	C	19		
18			3.2	7.4	.23	2201	1388	21.6	1.05	1.3	1051	.77	63	44	C	48		
19			3.2	7.3	.23	2144	1420	19.0	1.13	1.5	1065	.70	64	48	C	35		
20			3.2	7.0	.22	2016	1430	18.0	1.12	2.2	1054	.67	64	46	C	33		
21			3.2	6.8	.24	2031	1336	18.0	1.13	1.5	1064	.65	64	46	C	38		
22			3.1	8.4	.20	2481	1560	16.0	1.55	2.5	1081	.81	63	45	C	39		
23			3.3								1062			45	C	27		
24			3.3								1034			46	C	21		
25			3.2	5.8	.23	1900	1410	16.0	1.19	1.2	1066	.65	63	47	C	23		
26			3.1	6.6	.23	2118	1380	18.0	1.18	1.8	1076	.62	64	49	C	11		
27			3.3	6.6	.22	2210	1422	19.0	1.16	2.6	1086	.64	62	49	C	9		
28			3.3	6.5	.21	2275	1430	19.0	1.20	3.2	1068	.70	62	50	C	38		
29			3.3								934			52	C	26		
30			3.2								957			48	C	41		
31			3.3								948			47	C	14		
TL															C	781		
ME	48		3.2	6.8	.23	2225	1437	19.5	1.14	1.6	1045	.73	64	49	C	25		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

October, 19 76 (Month)

Marshall (Municipality), Michigan

Robert J. Swalwell (Superintendent's Signature)

ID 130029 (Plant No) 10 (Mo.) 76 (Yr) 000 (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	5.5	22	C		
02												7.5			C		
03	14	301	80	8	172	96	.26	5.6	90	6		7.4			C		
04	9	204	86	6	136	95	.37	8.4	91	4		7.6	5.5	20	C		
05	13	301	85	10	232	94	.36	8.3	91	5		7.6	5.0	28	C		
06	10	232	86	8	185	93	.27	6.3	92	3		7.6	4.5	6	C		
07	12	278	95	15	348	88	.21	4.9	94	13		7.7	5.6	12	C		
08												7.8	4.8	10	C		
09												7.7			C		
10	17	366	78	4	86	95	.37	7.9	91	2		7.7			C		
11	11	251	86	12	274	92	.39	8.9	90	2		7.7	5.2	50	C		
12	19	428	79	5	113	96	.53	11.9	87	4		7.5	4.4	52	C		
13	18	399	78	5	111	96	.39	8.7	93	2		7.5	5.1	34	C		
14	8	180	91	11	248	93	.67	15.0	82	8		7.5	5.6	20	C		
15												7.5	5.0	14	C		
16												7.5			C		
17	6	133	92	11	244	88	.53	11.7	87	7		7.4			C		
18	20	447	78	6	134	95	.44	9.8	88	4		7.5	5.8	32	C		
19	20	450	67	5	113	95	.28	6.3	92	3		7.6	5.5	26	C		
20	14	311	86	13	288	85	.60	13.3	82	11		7.4	6.0	34	C		
21	8	179	90	5	112	95	.61	13.6	81	3		7.4	5.7	24	C		
22												7.2	7.2	14	C		
23												7.4			C		
24	20	435	71	20	435	72	.50	10.8	85	3		7.4			C		
25	13	288	81	27	599	79	.73	16.1	81	6		7.3	5.9	22	C		
26	14	308	80	4	88	94	.77	16.9	77	3		7.4	5.6	30	C		
27	20	437	76	12	262	90	.51	11.1	87	6		7.4	6.6	14	C		
28	7	152	92	7	152	95	.47	10.1	84	4		7.4	7.0	30	C		
29												7.4		28	C		
30												7.6			C		
31	11	240	85	3	66	97	.37	8.0	88	2		7.4			C		
TL		6320			4398			214							C		
ME	14	301	82	9	209	92	.46	12.2	88	5		7.5	5.6	22	C		
WA	16	345	82	12	275	87	.60	13.1	83					30	C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

October, 19 76 (Month)

Marshall, Michigan (Municipality)

Robert J. Swalwell (Superintendent's Signature)

1 2 ID | 3–8 136029 (Plant No) | 9 10 10 (Mo.) | 11 12 76 (Yr.) | 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	.5		2880			35	695				
02	.5		2640			30	397				
03	.5		2760			35	695				
04	.5		3000			20	397				
05	.5		2880			40	596				
06	.5		3240			40	794				
07	.5		3360			30	596				
08	.5		3000			20	596				
09	.5		3000			20	397				
10	.5		2880			30	337				
11	.5		3000			30	893				
12	.5		2880			20	397				
13	.5		2880			40	397				
14	.5		2880			20	596				
15	.5		3000			40	596				
16	.5		3000			20	397				
17	.5		3120			40	596				
18	.5		3360			30	596				
19	.5	56	3360			20	596				
20	.5	63	3360			40	596				
21	.5	67	3480			20	596				
22	.5	57	3240			20	397				
23	.5	49	1800			20	397				
24	.5	65	3120			40	397				
25	.5	16	3120			20	397				
26	.5	11	3360			20	596				
27	.5	22	3240			30	397				
28	.5	7	3000			20	397				
29	.5		3000			20	397				
30	.5		2880			40	496				
31	.5		3000			20	496				
TL	15.5	407	93720			880	16,182				
ME	.5	41	3023			28	520				

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL			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 A

WEEKDAYS 11 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

MDPH
D-4.7

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH October, 1976 — 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. x100	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	106	4.4	39	6.9	920	24	167	4	7	3.7	67	11.7	982	15	1620		31	16.9	52	48	25				
2																									
3																									
4	133	8.0	89	6.4	1183	13	214	2	9	6.5	86	10.8	822	19	1740		40	17.4	70	54	38				
5	103	4.1	35	6.9	920	26	167	5	7	3.3	67	11.1	784	21	1740		31	16.5	51	45	23				
6	145	4.3	52	7.5	1183	23	214	4	9	3.9	86	10.9	572	17	1380		40	16.7	67	55	37				
7	136	4.8	55	7.8	1183	22	214	4	9	4.0	86	11.7	836	39	1740		40	17.0	68	52	35				
8	129	4.0	42	6.8	1183	28	214	5	9	3.1	86	11.6	1240	21	1140		40	17.3	69	54	37				
9																									
10																									
11																									
12	133	3.2	36	6.3	1183	33	214	6	9	2.6	86	11.7	886	20	1680		40	18.3	73	53	39				
13										3.5															
14	130	4.1	45	6.3	1183	26	214	5	9	3.3	86	11.6	900	15	1800		40	17.5	70	51	36				
15	106	4.1	37	6.4	920	25	167	5	7		67	11.6	948	16	1560		31	16.2	50	54	27				
16																									
17																									
18	137	4.2	48	6.1	1183	25	214	4	9	3.5	86	11.4	952	30	1800		40	16.9	68	55	37				
19	106	4.4	39	6.3	1183	30	214	5	9	2.9	86	11.2	842	19	1800		40	16.4	66	52	34				
20	101	3.7	31	6.3	1183	38	214	7	9	2.2	86	11.1	802	44	1560		40	16.3	65	58	38				
21	114	3.9	37	6.3	1183	32	214	6	9	2.7	86	11.3	942	14	1860		40	17.1	68	58	40				
22	55	4.2	19	6.7	657	35	119	6	5	2.5	48	11.2	944	15	1540		22	15.8	35	55	19				
23																									
24																									
25																									
26																									
27																									
28																									
29																									
30																									
31																									
Total	1594		604		15250		2760		116		1169						515		872		465				
Arith. Means	114	4.4	43		1084	27	197	5	8.2	3.4	79		889	22	1640		37	16.9	62	53	33				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

November, 19 76 (Month)

Marshall, Michigan (Municipality)

Robert J. Swalwell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
ID 130029 11 76 500
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		2.68		55	7.4	90	2012	134	2995	3.20	72	106		C		
02	1		2.64		56	7.4	66	1453	78	1717	6.20	137	62		C		
03	1		2.62		56	7.5	106	2249	148	3209	3.30	72	122		C		
04	1		2.62		55	7.5	74	1605	102	2212	3.90	85	72		C		
05	1		2.62		54	7.6									C		
06	1		2.62		55	7.4									C		
07	1		2.50		55	7.4	102	2126	188	3920	3.70	77	126		C		
08	1		2.62		54	7.6	86	1877	104	2272	4.80	105	84		C		
09	3		2.62		54	7.5	82	1792	152	3321	4.20	92	166		C		
10	5	.02	2.60		54	7.5									C		
11	1		2.60		54	7.4	104	2255	146	3166	4.40	95	98		C		
12	1		2.58		54	7.4									C		
13	1		2.46		54	7.4									C		
14	1		2.52		54	7.4	64	1345	120	2522	4.70	99	90		C		
15	1		2.54		54	7.4	72	1525	94	1991			58		C		
16	1		2.62		52	7.5	90	1967	172	3758			116		C		
17	1		2.56		52	7.5	90	1921	134	2861	4.00	85	84		C		
18	1		2.58		52	7.5	80	1721	164	3529	6.30	146	108		C		
19	1		2.50		53	7.4									C		
20	5	.04	2.42		52	7.4									C		
21	3		2.46		52	7.5	64	1313	84	1732	3.30	68	62		C		
22	5	.02	2.56		52	7.5	81	1724	146	3117	4.95	99	100		C		
23	3		2.52		53	7.5	102	2144	86	1807	4.55	96	50		C		
24	3		2.54		52	7.8									C		
25	4	.31	2.40		53	7.7									C		
26	4	.94	2.54		53	7.5									C		
27	5	.02	2.52		53	7.5									C		
28	5	.01	2.56		53	7.5	86	1836	104	2220	3.50	75	86		C		
29	5	.01	2.57		52	7.4	104	2229	146	3129	6.00	129	96		C		
30	5	.02	2.66		53	7.5	96	2129	176	3404	5.70	126	96		C		
31															C		
TL		1.39	76.85					35289		53382		1658			C		
ME			2.56				86	1857	130	2810	4.54	98	91		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

November, 19 76 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

ID 150029 (Plant No) 11 (Mo) 76 (Yr) (Sampling Point Code)

DAY	BOD-5 mg/l (9–14)	BOD-5 LBS. (9–14)	SS mg/l (19–24)	SS LBS (19–24)	TOTAL-P mg/l (29–34)	TOTAL-P LBS (29–34)	VSS mg/l (39)	NH_3-N mg/l (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	57	1274	50	1118	2.60	58	36			C	
02	45	991	34	749	4.80	106	26			C	
03	42	911	54	1171	2.60	56	38			C	
04	41	884	20	434	2.60	56	18			C	
05										C	
06										C	
07	48	1001	68	1418	2.40	50	42			C	
08	48	1049	38	830	4.00	87	34			C	
09	47	1027	50	1093	3.60	79	32			C	
10										C	
11	42	911	40	867	2.40	52	26			C	
12										C	
13										C	
14	38	799	44	925	4.10	86	36			C	
15	59	1250	48	1017			30			C	
16	45	983	68	1486			42			C	
17	44	939	70	1494	1.60	34	46			C	
18	60	1291	54	1162	5.20	112	26			C	
19										C	
20										C	
21	44	903	68	1395	3.00	62	46			C	
22	62	1323	64	1366	2.65	57	50			C	
23	62	1303	60	1261	3.40	71	34			C	
24										C	
25										C	
26										C	
27										C	
28	62	1323	62	1323	2.60	56	54			C	
29	95	2036	60	1286	2.80	60	50			C	
30	60	1331	50	1109	2.75	61	32			C	
31										C	
TL		21534		21504		1143				C	
ME	53	1133	53	1131	3.12	67	41			C	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

November, 19 76 (Month) — Marshall (Municipality), Michigan — Robert J. Swaluell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
ID 130029 11 76 ..
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											3				C		
01	48		3.2	5.4	.23	2310	1516	20.0	1.16	.4	929	.75	65	48	C	11	
02			3.3	6.5	.22	2573	1559	23.0	1.12	.6	1022	.75	63	48	C	52	
03			3.3	7.6	.21	2850	1590	20.0	1.44	1.2	1027	.86	62	48	C	51	
04			3.3	5.7	.26	1985	1272	18.5	1.07	2.1	1034	.62	64	48	C	1	
05			3.3	6.5	.23	2269	1469	22.0	1.03	1.7	1037	.75	64	48	C	36	
06			3.3								1027			50	C	23	
07			3.4								1061			52	C	28	
08			3.3	6.7	.22	2436	1587	21.0	1.16	2.0	1047	.73	62	53	C	25	
09			3.3	6.9	.22	2208	1509	22.0	1.00	2.0	971	.71	64	53	C	35	
10			3.3	7.4	.23	2336	1508	21.0	1.23	1.1	990	.66	63	53	C	49	
11			3.3	6.6	.25	2062	1321	19.0	1.08	2.7	1018	.66	63	53	C	22	
12			3.3	7.1	.22	2294	1500	22.0	1.04	2.2	1016	.65	65	55	C	17	
13			3.5								995			56	C	29	
14			3.4								1016			55	C	39	
15			3.4	7.2	.22	2254	1508	21.0	1.07	1.5	999	.66	66	53	C	35	
16			3.3	5.9	.23	2207	1475	21.0	1.05	1.7	992	.62	66	45	C	12	
17			3.4	5.9	.22	2163	1491	22.0	.98	2.1	971	.75	67	41	C	5	
18			3.3	5.3	.25	2038	1386	21.5	.95	1.4	969	.81	66	41	C	12	
19			3.4	6.7	.19	2475	1679	21.0	1.18	1.0	974	.88	67	42	C	26	
20			3.6								973			44	C	33	
21			3.5								988			46	C	54	
22			3.4	5.0	.25	2121	1405	20.0	1.06	3.5	991	.72	65	43	C	26	
23			3.4	5.0	.26	2157	1450	22.0	.98	1.4	1013	.83	65	44	C	37	
24			3.4	4.7	.28	2044	1376	21.0	.97	1.7	991	.71	65	44	C	18	
25			3.6								939			46	C	9	
26			3.4								910			43	C	44	
27			3.4								982			43	C	38	
28			3.4								1029			43	C	28	
29			3.4	4.5	.29	2041	1352	22.0	.43	2.3	1023	.76	65	41	C	12	
30			3.2	4.9	.33	2175	1437	23.0	.95	2.5	1040	.78	63	40	C	43	
31															C		
TL															C	850	
ME			3.4	6.1	.24	2251	1468	21.0	1.07	1.8	998	.73	65	47	C	26	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

November 19 76
Month

Marshall, Michigan
Municipality

Robert J. Surchell
Superintendent's Signature

ID 1320,29 11 76 000
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
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 ~~31616~~	C	31504 31505	
SF															C		
01	20	447	78	11	246	92	.37	8.3	88	5		7.4	4.6	38	C		
02	10	220	85	10	220	87	.74	16.2	92	4		7.4	4.3	40	C		
03	24	520	77	10	217	93	.51	11.0	85	5		7.4	6.1	40	C		
04	9	195	88	4	87	96	.46	9.9	88	2		7.4	5.9	82	C		
05												7.5	5.7	38	C		
06												7.3			C		
07	21	438	79	10	209	95	.44	9.2	88	1		7.4			C		
08	21	459	76	2	44	98	.66	14.4	86	1		7.5	6.1	74	C		
09	12	262	85	10	219	93	.46	10.0	89	2		7.4	5.9	36	C		
10												7.4	5.4	44	C		
11	11	239	89	6	130	96	.46	10.0	90	1		7.4	6.6	30	C		
12												7.4	5.8	42	C		
13												7.4			C		
14	5	105	92	3	63	98	.67	14.0	86	2		7.4			C		
15	25	530	65	5	106	95				3		7.4	5.9	70	C		
16	19	415	79	18	393	90				10		7.5	6.1	40	C		
17	10	214	89	15	320	89	.64	13.6	84	10		7.5	6.2	38	C		
18	12	258	85	6	127	96	.87	18.7	87	4		7.5	5.5	12	C		
19												7.4	4.5	12	C		
20												7.4			C		
21	7	144	89	16	328	81	.44	9.0	87	11		7.5			C		
22	22	470	73	15	320	90	.55	11.7	89	9		7.5	6.7	14	C		
23	15	315	85	5	105	94	.48	10.0	89	1		7.5	6.5	14	C		
24												7.5	6.4	6	C		
25												7.5			C		
26												7.5			C		
27												7.5			C		
28	10	214	88	14	299	87	.31	6.6	91	12		7.5			C		
29	40	857	62	21	450	86	.69	14.7	89	18		7.6	6.2	28	C		
30	12	266	88	14	311	92	.77	17.0	86	3		7.5	6.3	16	C		
31															C		
TL		6568			4196			204.3							C		
ME	16	346	82	10	221	92	.56	12.0	88	6		7.5	5.9	29	C		
WA	17	363	81	13	277	89	.59	13.0	87	.				45	C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

November, 19 76 — Month

Marshall — Municipality, Michigan

Robert J. Swalwell — Superintendent's Signature

ID 130029 — Plant No. 11 — Mo. 76 — Yr. ... — Sampling Point Code

DAY	GRIT	AUX. FUEL	POWER CONSUMPTION			CHEMICALS APPLIED					
	9	14 GAS	19 #1	24 #2	29 #3	34 Cl_2	39 $FeCl_3$	44	49	54	59
1 2	CF	CF	KWH	KWH	KWH	LBS.	LBS.				
PN											
SF		2									
01	1		3240			20	596				
02	1	6	3240			40	794				
03	1	8	3360			20	596				
04	1	104	3480			20	794				
05	1	90	3240			20	596				
06	1	70	3120			40	397				
07	1	74	3360			20	596				
08	1	84	3600			20	794				
09	1	48	3240			20	596				
10	1	74	3480			40	596				
11	1	103	3480			20	596				
12	1	75	3240			20	496				
13	1	75	3120			20	496				
14	1	91	3240			20	299				
15	1	79	3240			20	496				
16	1	67	3400			20	794				
17	1	60	3360			20	596				
18	1	68	3240			20	596				
19	1		3240			20	596				
20	1	40	3120			20	397				
21	1	13	3240			20	397				
22	1	103	3120			40	596				
23	1	93	3600			20	596				
24	1	15	3480			20	596				
25	1	166	3000			20	496				
26	1	58	2760			20	397				
27	1	12	3120			20	496				
28	1	40	3360			40	496				
29	1	269	3840			20	595				
30	1	41	3720			20	595				
31											
TL	30	2026	99280			700	16977				
ME	1	72	3309			23	566				

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 AF

WEEKDAYS 11 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

Digester Volume, ft³
Primary _____
Secondary _____

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-45

Marshall, MICHIGAN

Supernatant To _____
Process Pattern _____

MONTH November 1976

DIGESTER AND SLUDGE DATA

OPERATOR R. J. Swalwell

DATE	RAW SLUDGE Gals. X/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	69	3.9	61		6.4																			
2	100	3.8	76		6.4																			
3	102	4.4	67		6.3																			
4	105	4.0	62		6.4																			
5	107	4.1	57		6.4																			
6																								
7																								
8	115	3.6	74		6.3																			
9	123	4.2	64		6.4																			
10	62	4.0	67		6.5																			
11	74	4.6	68		6.5																			
12	60	4.3	60		6.5																			
13	58	4.4	64		6.4																			
14	54	4.4	70		6.4																			
15	71																							
16	54	3.8	62		6.5																			
17	68	4.7	68		6.5																			
18	64	4.5	64		6.5																			
19	63	4.7	67		6.5																			
20	57	4.0	68		6.7																			
21	47	4.3	68		6.6																			
22	60	4.6	69		6.4																			
23	41	4.5	58		6.5																			
24	64	4.0	78		6.7																			
25	64	4.2	61		6.7																			
26	74	4.2	50		6.6																			
27	78	3.9	56		6.7																			
28	64	3.9	63		6.5																			
29	58	3.7	75		6.6																			
30	58	3.8	60		6.6																			
31																								
TOTAL	2020																							
ARITH MEAN	72	4.2	65																					

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.7

Marshall, MICHIGAN

MONTH November, 1976 — VACUUM FILTER & INCINERATION DATA — OPERATOR R. J. Swalwell

DATE	SLUDGE TO FILTER: Gal. X 100 (1)	Tot. Sol. % (2)	Lbs. Dry Sol. X 10 (3)	pH (4)	CHEMICALS TO FILTER: CaO Lbs. Dry X 10 (5)	CaO R (6)	$FeCl_3$ Lbs. Dry (7)	$FeCl_3$ 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)	Yield (23)	Fuel BTU (24)	REMARKS (25)
1	92	3.9	301	6.4	111	37	143	5	6	3.3	57	11.2	1172	12	1920		30	17.8	534	34	181				
2	122	3.8	389	6.4	148	38	191	5	8	3.2	76	11.2	764	25	1560		30	18.1	543	59	320				
3	122	4.4	451	6.3	148	33	191	4	8	3.8	76	11.6	808	25	1440		30	17.6	528	58	306				
4	122	4.0	410	6.4	148	36	191	5	8	3.4	76	11.4	722	22	1260		30	16.0	480	55	264				
5	122	4.1	420	6.4	148	35	191	5	8	3.5	76	10.5	1160	8	1680		30	16.8	504	53	267				
6																									
7																									
8	122	3.6	369	6.3	148	40	191	5	8	3.1	76	11.5	1002	11	1320		30	21.6	648	61	395				
9	122	4.2	430	6.4	148	34	191	4	8	3.6	76	11.5	822	7	1440		30	17.8	534	53	283				
10	122	7.9	810	7.1	148	18	191	2	8	6.8	76	11.8	1160	8	1260		30	26.2	786	44	346				
11	122	10.2	1045	7.3	148	14	191	2	8	8.7	76	11.7	1590	10	840		30	29.3	879	54	475				
12																									
13																									
14																									
15																									
16	122	3.5	359	6.7	148	41	191	5	8	3.6	76	11.5	1370	10	1680		30	19.7	591	50	296				
17	122	4.4	451	6.6	148	33	191	4	8	3.8	76	11.4	1174	7	1560		30	17.3	519	52	270				
18	122	4.2	430	6.6	148	34	191	4	8	3.6	76	11.6	1174	4	1560		30	19.0	570	49	279				
19	107	4.0	360	6.5	129	36	167	5	7	3.4	67	11.1	1540	5	1860		30	18.1	543	45	244				
20																									
21																									
22	122	3.4	348	6.6	148	43	191	5	8	2.9	76	11.7	1084	16	1080		30	19.1	573	49	281				
23	122	4.5	461	6.8	148	32	191	4	8	3.8	76	11.4	1238	5	1560		30	18.4	552	48	265				
24	122	4.6	471	6.7	148	31	191	4	8	3.9	76	11.9	1180	7	1260		30	18.8	564	45	254				
25																									
26																									
27																									
28																									
29	122	4.4	451	6.7	148	33	191	4	8	3.8	76	11.4	1522	7	1440		30	18.9	567	47	266				
30	107	3.8	342	6.6	129	38	167	5	7	3.3	67	11.7	1078	12	1920		30	18.2	546	46	251				
31																									
Tot	2136		9434		2589		3342		132		1331						540		10533		5198				
Arit-Mean	119	4.6	524		144	34	186	4	7.3	3.9	74		1142	11	1480		30	19.2	585	50	289				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

December, 19 76 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
IP | 130029 | 12 | 76 | 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	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	.05	2.58		52	7.7									C		
02	3		2.56		52		82	1751	94	2007	5.10	109	76		C		
03	5	.15	2.44		52										C		
04	1		2.42		52	7.7									C		
05	3		2.45		52	7.7	65	1328	88	1798	3.60	74	60		C		
06	5		2.56		52		98	2092	146	3117	5.40	115	104		C		
07	1		2.54		52	7.8	94	1991	148	3135	3.30	70	88		C		
08	5	.02	2.52		52	8.2	98	2060	128	2690	3.40	71	78		C		
09	1		2.54		52	8.3	56	1186	90	1907	4.00	85	70		C		
10	1		2.51		52										C		
11	3		2.48		52	8.2									C		
12	1		2.44		52	8.1	70	1424	140	2849	4.10	83	92		C		
13	1		2.56		52	7.8	96	2050	122	2605	4.30	92	86		C		
14	1		2.58		52		104	2238	152	3271	4.40	95	62		C		
15	1		2.52		52	8.2	78	1634	66	1387	3.00	63	42		C		
16	1		2.52		52	8.0	136	2858	50	1051	3.85	81	30		C		
17	1		2.48		52	7.8									C		
18	1		2.42		52	7.9									C		
19	1		2.42		52	8.0									C		
20	5	.04	2.60		52		77	1670	132	2862	4.80	104	110		C		
21	3		2.50		52		100	2085	94	1960	3.60	75	74		C		
22	5	.03	2.54		52		108	2288	102	2161	3.85	82	46		C		
23	5	.02	2.42		52	7.8									C		
24	1		2.44		52	7.7									C		
25	5	.01	2.30		52	7.5									C		
26	5	.07	2.42		52	7.8	52	1050	146	2947	4.80	97	124		C		
27	5	.01	2.58		52	7.8	80	1721	92	1980	4.58	95	72		C		
28	5	.03	2.62		52	7.9	70	1530	74	1617	4.40	96	62		C		
29	3		2.50		51		92	1918	134	2799	4.70	98	104		C		
30	3		2.50		51	7.9									C		
31	5	.03	2.40		51	7.9									C		
TL		.46	77.36					32879		42201		1585			C		
ME			2.50				85	1827	111	2345	4.18	88	77		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

December, 19 76 (Month)

Marshall (Municipality), Michigan

Robert J. Swalwell (Superintendent's Signature)

ID 130029 (Plant No) 12 (Mo.) 76 (Yr) .. (Sampling Point Code)

DAY	BOD 5 (9–14) mg/l	BOD 5 (9–14) LBS	SS (19–24) mg/l	SS (19–24) LBS.	TOTAL-P (29–34) mg/l	TOTAL-P (29–34) 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
PN	00310	85001	00530	85002	00665	85004	00535	00610		C		
SF										C		
01										C		
02	62	1324	50	1068	2.90	62	40			C		
03										C		
04										C		
05	45	981	74	1512	3.30	67	44			C		
06	74	1580	38	811	2.30	49	28			C		
07	60	1271	62	1313	1.40	30	38			C		
08	47	988	50	1051	3.10	65	36			C		
09	53	1123	46	974	3.00	64	36			C		
10										C		
11										C		
12	46	936	54	1099	3.50	71	24			C		
13	74	1580	50	1068	3.40	73	30			C		
14	69	1485	62	1334	3.10	67	10			C		
15	53	1114	80	1681	2.50	53	49			C		
16	86	1807	96	2018	3.30	69	70			C		
17										C		
18										C		
19										C		
20	74	1605	56	1248	3.85	83	50			C		
21	66	1376	43	897	2.80	58	34			C		
22	63	1335	56	1186	3.40	72	8			C		
23										C		
24										C		
25										C		
26	42	848	50	1009	4.10	83	40			C		
27	77	1657	58	1248	4.45	96	46			C		
28	51	1114	22	481	3.85	84	16			C		
29	30	626	66	1376	3.75	78	52			C		
30										C		
31										C		
TL		22750		21374		1224				C		
ME	60	1264	56	1187	3.22	68	35			C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

December, 19 76 (Month)

Marshall (Municipality), Michigan

Robert J. Swalwell (Superintendent's Signature)

1 2: IP | 3–8: 130029 (Plant No.) | 9 10: 12 (Mo.) | 11 12: 76 (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											3				C		
01	48		3.3	5.7	.34	2006	1136	21.0	.96	2.0	995	.73	61	41	C	28	
02			3.4	5.7	.35	1964	1312	22.0	.89	1.5	1058	.73	65	41	C	1	
03			3.5	6.6	.29	2138	1500	23.5	.91	1.3	996	.82	65	43	C	33	
04			3.6								1009			44	C	60	
05			3.5								1004			44	C	7	
06			3.4	5.6	.41	1914	1032	21.0	.91	1.2	969	.76	65	42	C	4	
07			3.4	6.8	.27	2173	1555	23.0	.94	2.4	1021	.41	65	43	C	27	
08			3.4	5.4	.30	2094	1370	23.0	.91	3.0	1017	.77	62	40	C	31	
09			3.4	5.4	.26	2036	1560	22.5	.90	2.3	986	.86	65	39	C	34	
10			3.4	5.4	.28	2004	1451	22.0	.91	2.1	982	.77	67	41	C	18	
11			3.5								1021			42	C	36	
12			3.5								907			41	C	45	
13			3.4	4.9	.32	1859	1229	20.0	.93	3.2	991	.74	65	39	C	0	
14			3.3	5.6	.31	2088	1395	22.0	.95	2.4	939	.80	65	44	C	22	
15			3.4	5.6	.26	2277	1545	24.0	.95	2.2	829	.74	69	41	C	24	
16			3.4	5.2	.28	2321	1540	24.0	.97	1.5	827	.86	65	41	C	40	
17			3.5	5.8	.27	2390	1555	23.0	1.04	2.7	1682	.80	65	44	C	42	
18			3.6								1728			45	C	62	
19			3.6								1676			45	C	41	
20			3.3	5.4	.39	1826	1211	19.5	.94	2.7	916	.67	65	42	C	0	
21			3.4	4.9	.32	2149	1440	21.0	1.02	2.8	1172	.78	67	44	C	13	
22			3.4	5.4	.30	2397	1604	23.0	1.04	2.2	1950	.79	65	44	C	53	
23			3.6	5.4	.30	2162	1483	21.0	1.03	3.5	1732	.76	66	45	C	42	
24			3.5								1513			46	C	32	
25			3.7								973			48	C	6	
26			3.6								944			45	C	4	
27			3.3	4.9	.28	2238	1671	23.0	.97	2.2	1305	.86	69	41	C	23	
28			3.3	6.5	.27	2540	1804	23.0	1.10	1.8	1474	.87	71	42	C	30	
29			3.4	6.0	.27	2092	1477	22.0	.95	2.2	1384	.79	70	43	C	26	
30			3.4	6.3	.26	2181	1556	22.0	.99	4.5	1135	.80	67	44	C	18	
31			3.6								1596			45	C	39	
TL															C	841	
ME			3.5	5.6	.30	2136	1449	22.2	.96	2.4	1187	.77	66	41	C	27	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

December, 19 76 (Month)

Marshall (Municipality), Michigan

Robert J. Swalwell (Superintendent's Signature)

1 2: 10 | 3–8: 130029 (Plant No) | 9 10: 12 (Mo) | 11 12: 76 (Yr) | 13–15: 000 (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												7.6	6.7	8	C		
02	14	299	83	15	320	84	.50	10.7	90	13			6.8	12	C		
03													5.0	16	C		
04												7.5			C		
05	10	204	85	18	368	80	.46	9.4	87	9		7.7			C		
06	22	470	78	7	149	95	.90	19.2	83	5			6.1	54	C		
07	13	275	86	13	275	91	.39	8.3	88	2		7.6	6.8	4	C		
08	8	168	92	11	231	91	.46	9.7	86	7		7.8	6.5	2	C		
09	6	127	89	10	212	89	.83	17.6	79	8		7.8	6.5	18	C		
10													6.5	18	C		
11												7.7			C		
12	9	183	87	10	203	93	.39	7.9	90	2		7.5			C		
13	20	427	79	19	406	84	.90	19.2	79	9		7.8	6.6	90	C		
14	19	409	82	19	409	88	.77	16.6	83	13			5.3	50	C		
15	17	357	78	16	336	75	.47	9.8	84	10		8.0	5.7	40	C		
16	20	420	85	9	189	82	.61	12.8	84	3		7.8	5.0	50	C		
17												7.5	5.5	28	C		
18												7.6			C		
19												7.8			C		
20	28	607	64	12	260	91	.67	14.5	86	6			6.0	60	C		
21	14	292	86	23	480	76	.90	18.8	75	19			5.6	58	C		
22	11	233	90	15	318	85	.86	18.2	78	1			5.3	64	C		
23												7.8	6.2	16	C		
24												7.7			C		
25												7.5			C		
26	11	222	79	5	101	97	1.11	22.4	77	2		7.8			C		
27	29	624	64	10	215	89	1.07	23.0	77	5		7.8	5.6	100	C		
28	15	328	79	12	262	84	1.20	26.2	73	5		7.8	4.9	110	C		
29	11	229	88	12	250	91	.85	17.7	82	11		7.9	5.3	114	C		
30												7.9	7.0	16	C		
31												7.9			C		
TL		5874			4954			2820							C		
ME	15	326	82	13	277	87	.74	15.7	82	7		7.7	5.9	29	C		
WA	18	393	78	16	343	85	95	20.1	78					64	C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

December, 19 76 (Month)

Marshall (Municipality), Michigan

Robert J. Swartwell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
ID 130,029 12 76 ..
Plant No Mo Yr Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX. FUEL 14 GASCF	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	34	3600			20	794				
02	1	271	3840			20	397				
03	1	123	3600			20	397				
04	1	116	3360			20	199				
05	1	106	3240			20	397				
06	1	81	3600			20	596				
07	1	40	3600			40	397				
08	1	144	3720			20	596				
09	1	100	3480			20	397				
10	1	91	3480			20	496				
11	1	122	3360			20	397				
12	1	119	3360			20	496				
13	1	141	3360			20	397				
14	1	98	3600			20	496				
15	1	126	3360			20	496				
16	1	181	3480			20	546				
17	1	105	3240			20	397				
18	1	2	3120			20	397				
19	1	79	3000			30	199				
20	1	127	3600			20	546				
21	1	140	3600			30	397				
22	1	126	3480			20	397				
23	1	123	3360			20	199				
24	1	101	3360			20	0				
25	1	98	3120			20	0				
26	1	114	3240			20	99				
27	1	123	3480			20	199				
28	1	144	3600			30	496				
29	1	186	3720			20	496				
30	1	145	3360			30	298				
31	1	114	3360			20	298				
TL	31	3620	106,446			650	12012				
ME	1	117	3434			21	387				

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL			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.

Digester Volume, ft^3
Primary _____
Secondary _____

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MDPH
D-4.5

Supernatant To _____
Process Pattern _____

MONTH December 1976

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE Gals. X 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	60	4.3	67		6.8																			
2	60	4.1	64		6.9																			
3	60	5.1	59		7.0																			
4	60	2.8	61		7.0																			
5	60	4.1	65		6.8																			
6	60	4.7	71		6.5																			
7	60	3.8	57		6.8																			
8	60	4.1	67		6.8																			
9	60	4.0	76		7.1																			
10	60	4.7	54		7.2																			
11	60	4.0	57		6.8																			
12	60	4.2	52		7.2																			
13	60	4.6	68		7.2																			
14																								
15	70	2.9	58		7.2																			
16	70	4.2	35		6.9																			
17	70	4.8	65		7.1																			
18	70	4.1	63		7.2																			
19	70	3.1	80		6.7																			
20	70	4.6	66		6.9																			
21	70	4.2	67		7.0																			
22	70	4.6	68		7.0																			
23	70	4.4	58		7.0																			
24	70	4.5	65		7.1																			
25	70	3.9	55		7.1																			
26	70	4.5	60		7.1																			
27	70	4.3	67		7.1																			
28	70	4.4	77		6.7																			
29	70	4.4	65		6.6																			
30	70	4.7	63		6.9																			
31																								
TOTAL	1900																							
ARITH. MEAN	655	4.2	63																					

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.7

Marshall, MICHIGAN

MONTH December, 1976 — 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 1	Tot. Sol. % 2	Lbs. Dry Sol. X10 3	pH 4	Lbs. Dry 5	R 6	Lbs. Dry 7	R 8	Tot. Hours 9	Yield 10	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	Thou. Lbs. Wet 17	Tot. Sol. % 18	Lbs. Tot. Solids X 10 19	Vol. Sol. % 20	Lbs. Vol. Solids X 10 21	Hrs. Opr. 22	Yield 23	Fuel BTU 24	25
1	112	3.9	367	7.0	1760	48	202	5	8.5	2.9	81	11.6	1200	7	1560		30	18.7	561	47	264				
2	112	3.9	367	6.8	1760	48	202	5	8.5	2.9	81	11.6	1258	26	1920		30	18.3	549	48	264				
3	79	4.0	265	6.8	1242	47	143	5	6.0	2.9	57	11.6	1702	5	1260		21	19.0	399	45	180				
4																									
5																									
6	112	4.3	405	6.8	1760	43	202	5	8.5	3.2	81	11.9	1256	8	1980		30	18.8	564	45	254				
7	92	4.6	355	7.0	1449	41	167	5	7.0	3.4	67	11.4	1184	5	1560		25	18.1	453	47	213				
8	112	4.4	414	6.8	1760	43	202	5	8.5	3.2	81	12.0	1138	7	1320		30	18.4	552	49	270				
9	112	4.1	386	7.0	1760	46	202	5	8.5	3.0	81	12.0	1044	8	2640		30	18.1	543	31	168				
10	112	3.8	358	6.8	1760	49	202	6	8.5	2.8	81	11.7	1646	5	1200		30	18.6	558	45	251				
11																									
12																									
13																									
14	112	3.8	358	7.2	1760	49	202	6	8.5	2.8	81	11.6	956	1	1500		30	21.0	630	41	258				
15	106	3.9	347	7.1	1656	48	191	6	8.0	3.8	76	11.7	1074	13	1680		28	18.8	526	42	221				
16	112	6.2	583	6.8	1760	46	202	3	8.5	4.6	81	11.5	714	21	2580		30	20.0	600	47	282				
17																									
18																									
19																									
20	112	4.5	423	7.0	1760	42	202	5	8.5	3.3	81	11.8	1180	7	1560		30	18.4	552	46	254				
21	66	4.3	238	7.0	1035	43	119	5	5.0	3.2	48	11.3	1170	9	1560		18	19.2	346	47	162				
22	112	4.5	423	7.1	1760	42	202	5	8.5	3.3	81	11.5	786	4	1560		30	18.6	558	44	246				
23																									
24																									
25																									
26																									
27	112	4.2	395	6.9	1760	45	202	5	8.5	3.1	81	11.8	1306	9	1440		30	19.2	576	46	265				
28	112	4.4	414	6.8	1760	43	202	5	8.5	3.2	81	11.5	1254	7	1320		30	20.1	603	46	277				
29	106	4.2	374	7.1	1656	44	191	5	8.0	3.1	76	12.0	1362	27	1440		28	20.1	562	48	270				
30	66	4.3	238	7.3	1035	43	119	5	5.0	3.2	48	11.6	1260	10	1500		18	22.7	409	32	131				
31																									
Total	1859		6710		29193		3354		141.0		1344						498		9541		4236				
Arith. Means	103	4.3	372		1622	45	186	5.0	7.8	3.2	75		1194	10	1643		28	19.2	530	44	235				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

January, 19 78 (Month) — Marshall (Municipality), Michigan — Robert J. Swartwout (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
ID 130029 01 78 500
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	.19	2.14		51	7.7									C		
02	3		2.18		50	7.5	120	2182	124	2254			94		C		
03	3		2.34		51	7.7	210	4098	144	2810			138		C		
04	3		2.26		51	7.5	43	1753	60	1131	3.95	74	54		C		
05	3		2.32		51	7.6	114	2206	70	1354			54		C		
06	3		2.28		51	7.8			174	3304	4.70	89	118		C		
07	4	.03	2.20		51	7.7									C		
08	3		2.24		50	7.7	110	2055	94	1756			84		C		
09	5	.03	2.20		50	8.0	112	2055	86	1578			68		C		
10	5	.02	2.28		50	8.0	92	1749	82	1559	4.00	76	70		C		
11	3		2.30		49	8.2	117	2244	112	2148	3.10	59			C		
12	5	.20	2.32		50	7.7					3.60	70			C		
13	5	.06	2.28		50	8.0									C		
14	3		2.20		49	7.7									C		
15	3		2.24		49	7.6									C		
16	3		2.36		49	7.6	80	1575	136	2676			68		C		
17	1		2.37		49	7.7	159	3143	58	1146	4.60	91	56		C		
18	1		2.36		49	7.8	196	3858	84	1653	2.80	55	78		C		
19	5	.05	2.32		49	7.7	76	1471	38	735	3.85	74	30		C		
20	3		2.32		49	7.9	102	1974	90	1741	3.50	68	68		C		
21	1		2.24		49	7.8									C		
22	3		2.26		49	7.8									C		
23	3		2.32		50	7.4									C		
24	5	.14	2.32		50	7.8	87	1683	56	1084	3.40	66	66		C		
25	5	.65	2.32		50	7.6	84	1625			2.75	53	53		C		
26	5	.10	2.30		50	7.6									C		
27	5	.01	2.16		50	7.7			100	1801			90		C		
28	5	.01	2.12		50	7.7									C		
29	5	.02	2.24		50	7.6	54	1008	96	1793	2.30	43	76		C		
30	5	.01	2.32		50	7.5	69	1335	238	4605	7.00	135	140		C		
31	3	.01	2.33		49	8.4	94	1827	84	1632	3.20	62	74		C		
TL		1.53	7044					38741		36765		1015			C		
ME			2.27				109	2152	101	1935	3.77	73	78		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

January, 19 78
Month

Marshall, Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID 130029 01 78 ..
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
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	105	1909	92	1673			72									C		
03	114	2225	186	3630			76									C		
04	74	1395	70	1319	3.20	60	56									C		
05	90	1741	94	1819			86									C		
06			70	1331	3.80	72	50									C		
07																C		
08	94	1756	94	1756			90									C		
09	164	1908	82	1504			56									C		
10	90	1711	68	1293	4.30	82	52									C		
11	62	1184	40	767	3.20	61	36									C		
12					3.40	66										C		
13																C		
14																C		
15																C		
16	66	1299	106	2086			58									C		
17	74	1463	58	1146	3.50	69	50									C		
18	64	1259	88	1732	3.10	61	80									C		
19	70	1354	40	774	3.75	73	30									C		
20	66	1277	64	1238	3.50	68	56									C		
21																C		
22																C		
23																C		
24	78	1509	60	1161	2.95	57	52									C		
25	58	1123			2.80	54										C		
26																C		
27			70	1261			68									C		
28																C		
29	30	560	62	1158	2.50	47	48									C		
30	62	1200	82	1587	3.20	62	68									C		
31	70	1360	66	1283	3.10	60	54									C		
TL		26818		28518		896										C		
ME	78	1496	79	1501	3.31	64	60									C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

January, 19 78 (Month) — Marshall (Municipality), Michigan — Robert J. Swartwout (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
ID | 130029 | 01 | 78 | ..
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		4.0								1.71			52	C	44	
02			4.0								1.70			44	C	61	
03			3.7								1.73			47	C	59	
04			3.8	3.7	.25	2351	1655	21.0	1.12	1.4	167	.81	62	49	C	36	
05			3.7	4.6	.25	2625	1887	24.0	1.09	2.3	164	.92	78	48	C	45	
06			3.8	3.7	.27	2022	1550	17.0	1.19	.9	162			49	C	24	
07			3.9								159			50	C	53	
08			3.8								170			48	C	29	
09			3.9	2.6	.29	1449	1167	13.0	1.11	3.0	174	.53	80	49	C		
10			3.8	3.7	.25	1955	1358	18.0	1.09	2.2	172	.67	67	48	C		
11			3.7	4.2	.26	2223	1612	21.0	1.06	2.6	174	.78	69	48	C	40	
12			3.7	3.5	.24	1870	1235	16.0	1.17	1.9	169	.66	71	47	C		
13			3.8								166			48	C	2	
14			3.9								171			50	C	4	
15			3.8								170			49	C	9	
16			3.6	4.9	.25	2321	1605	22.0	1.06	2.7	170	.86	69	49	C	27	
17			3.6	4.6	.24	2146	1412	20.0	1.07	3.0	169	.80	63	46	C	13	
18			3.7	4.8	.25	2221	1578	21.0	1.06	3.2	168	.74	70	45	C	17	
19			3.7	4.9	.25	2118	1485	20.0	1.06	3.4	168	.74	69	46	C	6	
20			3.7	5.3	.25	2135	1485	20.5	1.04	2.6	167	.81	69	46	C	32	
21			3.8								168			46	C	34	
22			3.8								168			45	C	30	
23			3.7	3.9	.25	1575	1117	13.0	1.21	1.5	166	.59	66	47	C		
24			3.7	5.0	.26	1899	1355	17.0	1.12	1.5	163	.67	72	45	C		
25			3.7	5.6	.26	2152	1537	20.0	1.08	1.6	152	.77	68	47	C		
26			3.7								141			47	C		
27			4.0								163			50	C	13	
28			4.1								166			49	C	35	
29			3.8								170			47	C	10	
30			3.7	4.8	.25	1901	1333	19.0	1.00	3.9	172	.69	65	46	C		
31			3.7	6.0	.25	2260	1595	22.0	1.03	2.2	171	.78	69	46	C	18	
TL															C	641	
ME			3.8	4.5	.25	2072	1469	19.1	1.09	2.3	167	.73	69	47	C	28	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

January, 1978 (Month) — Marshall (Municipality), Michigan — Robert J. Sunderlik (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
ID | 13,0,0,24 | 01 | 78 | 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												7.6			C		
02	6	109	95	6	109	95				2		7.6			C		
03	29	468	89	17	332	88				11		7.6			C		
04	11	207	88	16	302	73	.76	14	81	9		7.5	4.6	40	C		
05	17	329	85	15	290	79				13		7.6	4.1	10	C		
06				7	133	96	1.10	21	77	2		7.5	5.1	6	C		
07												7.5			C		
08	16	299	85	9	168	90				8		7.5			C		
09	19	349	83	7	128	92				4		7.4	7.0	64	C		
10	11	209	88	8	152	90	.94	18	77	4		7.5	5.5	4	C		
11	8	153	93	5	96	96	.53	10	83	4		7.2	5.3	6	C		
12							.58	11	84			7.6	7.2	20	C		
13												7.6		4	C		
14												7.6			C		
15												7.5			C		
16	10	197	88	34	669	75				20		7.6	6.8	4	C		
17	8	158	95	14	277	76	.60	12	87	9		7.5	7.2	2	C		
18	8	157	92	8	157	91	.65	13	77	6		7.8	7.4	2	C		
19	6	116	92	3	58	92	.91	18	76	2		7.4	7.4	2	C		
20	8	155	92	12	232	87	.78	15	78	8		8.0	7.0	24	C		
21												7.9			C		
22												7.8			C		
23												7.9	5.8	2	C		
24	16	310	82	11	213	80	.94	18	72	6		7.6	5.8	2	C		
25	14	271	83									7.4	5.0	6	C		
26												7.6			C		
27				29	522	71	.95	18	65	25		7.6			C		
28												7.6			C		
29	4	75	93	4	75	96	.42	8	82	2		7.6			C		
30	16	310	77	15	290	94	.42	8	94	10		7.5	8.0	2	C		
31	6	117	94	7	136	92	.45	9	86	6		7.4	6.0	2	C		
TL		3935			4334			193							C		
ME	12	219	89	12	228	87	.72	14	80	8		7.6	6.2	6	C		
WA	15	289	87	16	304	82	.76	15	77					13	C		

Digester Volume, ft³
Primary
Secondary

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-45

Marshall, MICHIGAN

Supernatant To
Process Pattern

MONTH January 1978

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Sweldwell

DATE	RAW SLUDGE Gals.	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
	180																							
1	60	5.5	66		6.7																			
2	40	5.2	66		6.6																			
3	40	5.6	56																					
4	70	5.6	69		6.7																			
5	60	5.6	67		6.6																			
6	60	6.0	53		6.6																			
7	60	5.5	64		6.4																			
8	50	5.7	66		6.6																			
9	60	5.5	69		6.6																			
10	60	6.4	57		6.5																			
11	60	5.9	62		6.7																			
12	60	5.9	62		6.8																			
13	60	5.1	64		6.6																			
14	30	5.6	67																					
15	40	5.6	67		6.7																			
16	60	5.3	67		6.5																			
17	50	5.6	68		6.6																			
18	60	5.9	63		6.7																			
19	60	7.2	67		6.7																			
20	40	5.4	57		6.8																			
21	40	5.2	68		6.7																			
22	45	5.6	70		6.8																			
23	60	5.9	67		6.5																			
24	60	6.2	66		6.5																			
25	60																							
26																								
27	40	5.7	67		6.4																			
28	20																							
29	30																							
30																								
31	60	6.3	56		6.4																			
TOTAL	1495																							
ARITH MEAN	52	5.7	64																					

MDPH
D-4 7

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH January, 19 78 — 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	113	6.1	5790	6.7	2225		223		8.5		81	11.3			1260		32	20.8	67	49	32				
3																									
4	60	5.3	2671	6.8	1177		118		4.5		43	11.9	2094	5	600		17	19.5	33	48	16				
5	100	4.8	4032	6.8	1961		197		7.5		71	12.0	1700	9	1440		28	20.1	56	46	26				
6	100	5.8	4872	6.8	1961		197		7.5		71	12.0					28	18.6	52	41	21				
7																									
8																									
9	113	5.8	5505	6.9	2225		223		8.5		81	11.6	1244	4	1560		32	19.7	63	39	25				
10	93	6.1	4765	6.8	1831		183		7.0		67	11.5	1004	6	1800		26	19.3	50	46	23				
11	107	5.6	5633	7.1	2093		209		8.0		76	11.1	1006	5	1830		30	21.4	64	37	24				
12	100	4.9	4116	7.1	1961		197		7.5		71	10.9					28	22.2	62	35	24				
13																									
14																									
15																									
16																									
17	107	5.0	4494	6.8	2093		209		8.0		76	11.3	1014	6	1200		30	22.2	67	35	23				
18	107	5.4	4853	6.9	2093		209		8.0		76	11.2	1044	26	1260		30	22.4	67	26	17				
19	107	5.2	4674	7.0	2093		209		8.0		76	11.8	1034	6	1380		30	23.2	70	32	22				
20	107	5.4	4853	7.0	2093		209		8.0		76	12.2	1234	5	1260		30	20.2	61	38	23				
21																									
22																									
23																									
24	107	5.6	5033	6.8	2093		209		8.0		76	12.0	1070	19	1560		30	20.9	63	43	27				
25	67	5.4	3034	6.7	1308		131		5.0		48	11.8					19	18.5	35	40	14				
26																									
27																									
28																									
29																									
30																									
31	107	4.5	4045	6.8	2093		209		8.0		76	10.3	1488	6	1140		30	17.2	52	6	31				
Total	1495		62775		29300		2932		112		1065						420		862		348				
Arith Means	100	5.4	4518		1953		195		7.5		71		1268	9	1353		28	20.4	57	38	23				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

January, 19 78 — Month

Marshall, Michigan — Municipality

Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID 130029 01 78 ..
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 Cl2 LBS	39 FeCl3 LBS.	44	49	54	59
PN											
SF		2									
01		51	3000			20	397				
02		52	3240			30	596				
03		106	3240			20	198				
04		48	3360			30	198				
05		43	3240			20	397				
06		46	3120			20	198				
07		36	3000			20					
08		77	3000			40					
09		96	3360			20	794				
10		82	3480			20	794				
11		94	3600			10	695				
12		80	3360			10	496				
13		65	3120			20	397				
14		92	3120			20	397				
15		68	3240			20	397				
16		70	3240			40	397				
17		83	3480			30	596				
18		70	3480			20	596				
19		71	3360			30	596				
20		73	3360			20	596				
21		76	3240			10	199				
22		88	2880			20	397				
23		64	3120			20	199				
24		41	3000			20	596				
25		45	3120			10	397				
26		45	3120			20	397				
27		45	3120			20	397				
28		50	3120			20	397				
29		55	3120			30	496				
30		60	3120			20	496				
31		81	3360			20	496				
TL		2053	99720			670	13202				
ME		66	3217			22	455				

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	5		540
Superintendent	1		168
Asst. Supt.	1		168
Shift Foreman			
Shift Operator	4		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.

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

February (Month), 19 78 — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
IP | 130029 | 02 | 78 | 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 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	.16	2.30		49	8.8	63	1208	76	1343	2.95	57	50		C		
02	5	.02	2.28		49	7.6	82	1559	84	1597	3.10	59	60		C		
03	3		2.26		49	8.5	68	1282	62	1169			48		C		
04	5	.27	2.24		48	8.4									C		
05	3	.02	2.19		48	8.5	142	2599	66	1205	2.80	51	56		C		
06	3		2.30		48	7.7	96	1841	72	1381			56		C		
07	3		2.24		48	7.5	76	1420	104	1943	2.00	37	84		C		
08	3		2.24		49	7.5	100	1868	90	1681	4.20	78	60		C		
09	3		2.22		49	7.6	88	1629	120	2222	3.95	73	84		C		
10	3		2.16		49	8.2			92	1657	4.20	76	74		C		
11	3		2.10		49	7.8									C		
12	1		2.10		49	7.7	129	2259	136	2382	4.30	75	126		C		
13	5	.01	2.23		49	7.8	104	1934	100	1860	3.75	70	88		C		
14	5	.01	2.18		49	7.8	90	1636	118	2145	5.10	93	100		C		
15	5	.01	2.23		49	7.8	102	1897	94	1748	3.60	67	78		C		
16	1		2.25		49	8.2	93	1745	138	2584	4.40	83	118		C		
17	3		2.26		49	8.2	123	2318	133	2507			128		C		
18	1		2.20		49	8.0	68	1248	66	1211			62		C		
19	1		2.21		49	7.9									C		
20	1		2.32		49	7.9	112	2167	82	1587	3.70	72	60		C		
21	1		2.24		49	7.4	105	1962	82	1532	3.10	58	58		C		
22	1		2.28		49	7.3	136	2586	58	1103	2.75	52	48		C		
23	5	.02	2.26		49	7.6	100	1885	54	1018	2.25	42	40		C		
24	5	.03	2.24		48	7.5	87	1625	114	2130			100		C		
25	1		2.18		49	7.5	80	1454							C		
26	5	.01	2.18		49	7.5	122	2218	88	1600	3.00	55	70		C		
27	3		2.26		49	7.4	109	2054	126	2375	3.30	62	104		C		
28	5	.01	2.27		49	7.3	201	3805	188	3559	3.50	66	162		C		
29															C		
30															C		
31															C		
TL		.51	62.42					46,194		45344		1226			C		
ME			2.23				103	1925	97	1889	3.47	65	80		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

February, 19 78
Month

Marshall, Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID 130029 02 78 ..
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 C	9	14
PN	00310	85001	00530	85002	00665	85004	00535	00610								C		
SF																C		
01	60	1151	78	1496	2.95	57	54									C		
02	62	1179	66	1255	3.40	65	60									C		
03	52	980	56	1056			46									C		
04																C		
05	94	1717	78	1425	2.40	44	66									C		
06	70	1342	100	1918			44									C		
07	78	1457	100	1868	1.60	30	84									C		
08	60	1121	54	1008	3.75	70	30									C		
09	70	1296	98	1814	3.10	57	84									C		
10			86	1549	3.60	65	68									C		
11																C		
12	78	1366	68	1191	2.95	52	58									C		
13	84	1562	82	1525	2.70	50	70									C		
14	72	1309	70	1273	4.80	87	52									C		
15	72	1339	80	1488	2.50	46	64									C		
16	98	1839	76	1426	3.20	60	58									C		
17	102	1923	88	1659			78									C		
18	78	1431	82	1505			72									C		
19																C		
20	96	1857	58	1122	2.90	56	38									C		
21	86	1667	70	1308	2.50	47	56									C		
22	82	1559	80	1521	3.20	61	58									C		
23	80	1508	72	1357	2.25	42	50									C		
24	94	1756	82	1532			68									C		
25	84	1527														C		
26	74	1395	76	1382	2.70	49	50									C		
27	126	2375	110	2073	3.70	70	96									C		
28	219	4146	104	1969	2.40	54	84									C		
29																C		
30																C		
31																C		
TL		38692		35720		1062										C		
ME	86	1612	80	1488	2.98	56	62									C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

February, 19 78 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
ID | 13.0.0.29 | 02 | 78 | ..
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 Cod
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	5.3	.25	2270	1587	22.0	1.03	3.0	169	.83	67	47	C	9	
02			3.8	5.5	.25	2401	1693	22.0	1.09	3.2	168	.86	70	49	C	29	
03			3.8	5.4	.23	2358	1661	21.0	1.12	3.8	169	.80	70	49	C	35	
04			3.8								167			48	C	31	
05			3.9								168			46	C	2	
06			3.7	4.3	.32	2056	1399	20.0	1.03	5.0	174	.75	68	47	C	11	
07			3.8	4.5	.29	2199	1500	21.0	1.05	4.0	166	.77	68	49	C	9	
08			3.8	4.9	.26	2316	1617	22.0	1.05	1.8	164	.81	69	50	C	12	
09			3.9	5.1	.26	2489	1631	23.0	1.08	2.5	160	.82	62	50	C	29	
10			4.0	4.6	.27	2280	1590	21.0	1.09	1.6	159	.82	69	50	C	36	
11			4.1								159			50	C	13	
12			4.1								160			50	C	4	
13			3.9	4.4	.29	2314	1615	22.0	1.05	2.0	159	.86	69	47	C	42	
14			4.0	4.0	.31	2017	1420	18.0	1.12	3.2	162	.72	70	49	C	4	
15			3.9	4.5	.28	2275	1584	22.0	1.03	2.2	160	.82	62	46	C	57	
16			3.8	3.6	.39	1760	1233	16.0	1.10	2.5	164	.62	70	46	C	1	
17			3.8	4.5	.31	2320	1660	20.0	1.16	2.0	163	.77	71	47	C	29	
18			3.9								158			48	C	18	
19			3.9								158			47	C	39	
20			3.7								160			46	C	5	
21			3.8	5.2	.31	2447	1718	23.0	1.06	.05	159	.89	70	47	C	63	
22			3.8	4.0	.40	1944	1383	19.0	1.03	1.8	157	.69	67	46	C	36	
23			3.8	4.1	.43	1940	1295	20.0	.97	.7	152	.67	60	47	C	27	
24			3.8	4.4	.38	2081	1450	20.0	1.04	1.8	150	.71	69	48	C	15	
25			4.0								156			48	C	34	
26			4.0								161			48	C	22	
27			3.8	4.9	.34	2396	1644	26.0	.92	1.5	159	.88	68	46	C	39	
28			3.8	4.1	.36	2213	1575	22.0	1.01	1.0	163	.78	70	53	C	47	
29															C		
30															C		
31															C		
TL															C	693	
ME			3.8	4.6	.31	2214	1590	2105	1.05	2.3	162	.78	68	48	C	25	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

February, 19 78 (Month) — Marshall (Municipality), Michigan — Robert J. Swaluell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
ID | 130029 | 02 | 78 | 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	6	115	90	15	288	79	.51	10	83	9		7.5	6.7	6	C		
02	5	95	94	9	171	89	.62	12	80	8		7.5	6.2	8	C		
03	20	377	71	8	151	87				6		7.5	6.8	10	C		
04												7.5			C		
05	22	402	85	8	146	88	1.16	21	59	5		7.6			C		
06	7	134	93	7	134	90				4		7.5	6.9	2	C		
07	9	168	88	25	467	76	.43	8	79	19		7.5	5.8	2	C		
08	9	168	91	5	93	94	.64	12	85	3		7.5	4.8	2	C		
09	11	204	88	15	278	88	.58	11	85	6		7.3	5.2	2	C		
10				7	126	92	.42	8	90	5		7.4	6.2	4	C		
11												7.4			C		
12	8	140	94	4	70	97	.28	5	93	3		7.5			C		
13	18	335	83	7	130	93	.68	13	82	6		7.4	4.2	2	C		
14	8	145	91	3	55	97	.78	14	85	1		7.6	6.5	2	C		
15	19	353	81	9	167	90	.28	5	92	7		7.3	4.8	2	C		
16	8	150	91	18	338	87	.14	3	97	4		7.3	6.2	2	C		
17	17	320	86	13	245	91				11		7.4	4.5	4	C		
18	21	385	69	11	202	83				8		7.4			C		
19												7.3			C		
20	14	271	88	13	252	84	.35	7	91	10		7.4			C		
21	40	747	62	14	262	83	.35	7	89	7		7.5	4.5	240	C		
22	18	342	87	15	285	74	.37	7	87	8		7.4	4.5	134	C		
23	17	320	83	11	207	80	.41	8	66	5		7.6	4.7	90	C		
24	21	392	76	13	243	89				12		7.6	4.3	100	C		
25	23	418	70									7.6			C		
26	12	218	90	20	364	77	.73	13	76	10		7.6			C		
27	18	339	83	22	415	83	.76	14	77	17		7.6	4.0	300	C		
28	24	454	88	22	416	88	.48	9	86	12		7.2	3.8	TNTC	C		
29															C		
30															C		
31															C		
TL		6992			5505			187							C		
ME	16	291	84	12	229	87	.52	10	83	8		7.5	5.3	9	C		
WA	21	397	76	17	313	81	.62	12	82					49	C		

Digester Volume, ft^3
Primary _____
Secondary _____

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.5

Marshall, MICHIGAN

Supernatant To _____
Process Pattern _____

MONTH February 1978

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE Gals. X 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	70	6.0	64		6.4																			
2	60	6.4	65		7.5																			
3	60	7.6	75		6.8																			
4	60	5.9	59		7.0																			
5	60	5.8	67		6.9																			
6	60	5.8	66		6.7																			
7	60	5.3	72		6.7																			
8	60	6.6	70		6.9																			
9	60	5.5	61		6.9																			
10	60	5.3	69		6.8																			
11	60	6.8	51		6.9																			
12	50	6.1	71		6.8																			
13	50	6.5	65		6.8																			
14	50	6.0	67		6.7																			
15	60	5.5	73		6.9																			
16	60	7.2	65		6.9																			
17	60	8.3	80		6.8																			
18	40	7.8	53		6.8																			
19	40	5.7	63		6.9																			
20	40	6.0	59		7.0																			
21																								
22	60	5.2	70		7.0																			
23	20	6.2	58		7.0																			
24	50	5.5	69		7.1																			
25	40	5.8	68		6.9																			
26	30				7.0																			
27	50	5.9	68		7.0																			
28	50	6.4	70		6.6																			
29																								
30																								
31																								
TOTAL	1420																							
ARITH. MEAN	53	6.2	66																					

MDPH
D-4.7

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH February, 1978 — VACUUM FILTER & INCINERATION DATA — OPERATOR R. J. Swalwell

ATE	SLUDGE TO FILTER				CHEMICALS TO FILTER				FILTER		FILTRATE						FILTER CAKE					INCINERATION			REMARKS
					CaO		$FeCl_3$																		
	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	96	5.7	4596	6.8	1720		191		8.0		76	11.9	1138	27	1440		30	17.2	52	53	27				
2	84	5.1	3599	6.7	1505		166		7.0		67	11.8	1392	9	1320		26	17.0	44	9	4				
3	60	5.8	2923	6.9	1075		119		5.0		48	11.5	1612	43	1440		19	17.9	34	45	15				
4																									
5																									
6	90	5.3	4007	6.9	1613		179		7.5		71	11.1	1102	5	1380		28	17.5	49	46	23				
7																									
8	90	5.3	4007	6.8	1613		179		7.5		71	11.5	1008	6	1200		28	20.3	57	54	31				
9	78	5.4	3538	6.9	1398		155		6.5		62	11.3	1146	6	1140		24	18.4	44	44	19				
10	90	6.2	4687	6.8	1613		179		7.5		71	11.2	1126	6	1260		28	17.7	50	45	22				
11																									
12																									
13	72	6.2	3750	6.7	1290		143		6.0		57	10.9	1432	16	1320		23	19.2	44	51	23				
14	90	6.5	4914	6.8	1613		179		7.5		71	10.9	1106	7	1260		28	19.8	55	43	24				
15	84	5.1	3599	6.8	1505		166		7.0		67	11.1	1110	23	1320		26	17.7	46	47	22				
16	90	5.5	4158	6.9	1613		179		7.5		71	10.7	1588	11	1500		28	17.7	50	52	26				
17	60	5.9	2974	6.9	1075		119		5.0		48	11.2	1766	35	1440		19	17.9	34	66	22				
18																									
19																									
20																									
21	90	5.3	4007	6.7	1613		179		7.5		71	11.8	1392	6	1560		28	17.8	50	55	27				
22	90	5.6	4234	6.9	1613		179		7.5		71	12.1	1338	6	1800		28	18.4	52	43	22				
23	84	6.0	4234	6.8	1505		166		7.0		67	11.7	1090	6	1680		26	18.0	47	52	24				
24	90	5.0	3780	6.7	1613		179		7.5		71	11.8	1052	19	2040		28	18.0	50	50	25				
25																									
26																									
27																									
28	84	4.9	3457	6.9	1505		166		7.0		67	12.4	1330	7	1980		26	18.9	49	47	23				
29																									
30																									
31																									
otal	1422		66464		25488		2823		118.5		1127						443		807		379				
rith. eans	84	5.6	3910		1499		166		7.0		66		1278	14	1475		26	18.2	47	47	22				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

February, 19 78
Month

Marshall, Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID 13.00.29 02 78 . .
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		85	3360			20	596				
02		74	3120			20	695				
03		42	3360			10	596				
04		59	3000			10	496				
05		56	3120			20	496				
06		84	3360			20	496				
07		97	3240			20	596				
08		72	3360			20	794				
09		51	3120			10	596				
10		89	3360			20	596				
11		60	2760			10	397				
12		69	3000			20	596				
13		82	2640			20	794				
14		78	3360			10	596				
15		73	3360			20	794				
16		71	3240			30	794				
17		88	3000			10	496				
18		79	3120			10	496				
19		82	2640			10	496				
20		40	3000			20	298				
21		77	3120			10	596				
22		86	3360			20	794				
23		55	3120			20	596				
24		41	2880			10	794				
25		47	3000			20	397				
26		35	2880			20	496				
27		36	3120			10	496				
28		57	3240			30	496				
29											
30											
31											
TL		1915	87240			490	16329				
ME		68	3116			17	585				

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	5		794
Superintendent	1		152
Asst. Supt.	1		152
Shift Foreman			
Shift Operator	3		490
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

March, 19 78 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
ID 130029 03 78 500
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	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		2.22		48	7.6	90	1666	126	2333	4.10	76	94		C		
02	5	.06	2.18		48	7.5	90	1636	120	2182	2.90	53	85		C		
03	3		2.07		49	7.6	74	1278	88	1519			84		C		
04	5	.01	2.08		49	7.6	62	1076	106	1839			80		C		
05	3		2.14		48	7.5	114	1834	100	1785	2.95	53	88		C		
06	3		2.22		48	7.4	84	1555	84	1555	2.90	54	76		C		
07	3		2.20		48	7.8	80	1468	74	1358	2.90	53	58		C		
08	3		2.08		48	7.1	100	1735	124	2151	3.40	59	96		C		
09	3		2.23		49	7.4	58	1079	100	1860	2.30	43	72		C		
10	3		2.16		49	7.5	92	1657	78	1405			56		C		
11	5	.02	2.10		49	7.4									C		
12	1		2.21		49	7.4	70	1290	94	1733	2.30	42	76		C		
13	4	.36	2.31		49	7.4									C		
14	5	.01	2.29		48	7.4	117	2235	90	1719	3.20	61	66		C		
15	3		2.10		48	7.5	62	1086	72	1261	2.50	44	48		C		
16	5	.01	2.37		48	7.6	86	1700	74	1463	3.40	67	56		C		
17	5	.03	2.38		48	7.5	48	952	54	1072			50		C		
18	3		2.40		48	7.5	106	2122	66	1321			28		C		
19	3		2.50		48	7.4	58	1209	62	1293	2.40	50	40		C		
20	4	.50	2.47		48	7.4	111	2287	70	1442	3.60	74	60		C		
21	3		2.53		48	7.5	63	1329	44	928	2.25	47	38		C		
22	4	.03	2.58		49	7.4	51	1097	58	1248	2.25	48	54		C		
23	3		2.60		49	7.3	98	2125	118	2559			92		C		
24	4	.06	2.60		48	7.4	102	2212	126	2732			78		C		
25	4	.31	2.65		48	7.4	38	840	98	2166			44		C		
26	3		2.57		48	7.4									C		
27	4	.04	2.66		48	7.4	76	1686	74	1642	1.80	39	62		C		
28	1		2.63		48	7.3	54	1063	70	1378	2.60	51	60		C		
29	1		2.69		48	7.5	64	1436	38	853	1.40	31	26		C		
30	4	.05	2.68		49	6.7	153	3419	108	2413	3.60	80	70		C		
31	1		2.73		49	7.4	81	1844	66	1503			62		C		
TL		1.49	73.63					45116		46713		1025			C		
ME			2.38				82	1611	85	1668	2.78	54	64		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

March, 19 78 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
ID | 13,0,0,2,9 | 03 | 78 | ...
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	90	1666	78	1444	2.90	54	60								C		
02	100	1818	76	1382	2.80	51	65								C		
03	54	932	48	828			36								C		
04	60	1641	44	1631			56								C		
05	86	1535	80	1428	2.70	48	76								C		
06	52	963	78	1444	3.20	59	72								C		
07	70	1284	68	1248	3.20	59	54								C		
08	68	1180	78	1353	3.20	56	58								C		
09	45	839	60	1116	2.30	43	44								C		
10	80	1441	74	1333			54								C		
11															C		
12	60	1106	66	1216	2.00	37	50								C		
13															C		
14	63	1203	62	1184	2.30	44	56								C		
15	57	998	52	911	2.40	42	36								C		
16	66	1305	44	870	2.50	49	32								C		
17	45	893	60	1191			54								C		
18	87	1741	92	1841			78								C		
19	54	1126	76	1585	2.25	47	56								C		
20	90	1854	52	1071	3.50	72	34								C		
21	51	1076	34	717	2.90	61	26								C		
22	48	1033	44	947	2.80	60	34								C		
23	70	1518	102	2212			82								C		
24	90	1952	86	1865			66								C		
25	45	994	98	2166			60								C		
26															C		
27	56	1242	62	1375	1.65	37	52								C		
28	44	866	64	1260	1.60	31	62								C		
29	52	1167	60	1346	1.50	34	46								C		
30	105	2347	84	1878	1.50	34	52								C		
31	51	1161	38	865			34								C		
TL		36281		37707		918									C		
ME	66	1296	68	1347	2.48	48	53								C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

March, 1978 — Month

Marshall, Michigan — Municipality

Robert J Swalwell — Superintendent's Signature

1 2: ID | 3–8: 130029 (Plant No) | 9 10: 03 (Mo) | 11 12: 78 (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		3.9	5.3	.33	2814	2046	27.0	1.04	1.5	191	.83	72	57	C		
02			4.0	5.4	.34	2789	2010	28.0	.99	2.0	189	.87	71	57	C		
03			4.1	6.2	.29	2915	2095	34.0	.86	2.0	181	.89	71	60	C	35	
04			4.1								192			60	C	32	
05			4.0								189			58	C	32	
06			3.9	5.3	.35	2642	1683	32.0	.83	1.4	183	.86	61	58	C	52	
07			3.9	5.2	.29	2391	1545	25.0	.96	1.8	186	.74	63	60	C	36	
08			4.1	5.8	.28	2370	1467	24.0	.99	3.8	185	.70	59	59	C	42	
09			3.9	5.6	.26	2341	1486	22.0	1.06	3.7	176	.68	60	58	C	21	
10			4.0	5.5	.24	2352	1665	24.0	.98	1.5	176	.70	61	58	C	43	
11			4.1								174			53	C	33	
12			3.9								183			51	C	26	
13			3.7	5.5	.26	2280	1585	21.0	1.09	4.0	162	.81	68	48	C	22	
14			3.8	6.1	.23	2528	1764	24.0	1.05	2.3	167	.85	62	47	C	54	
15			4.1	5.4	.28	1930	1337	16.0	1.20	3.0	170	.67	64	50	C		
16			3.6	5.4	.28	2077	1436	19.0	1.09	2.5	169	.75	64	44	C		
17			3.6	6.2	.26	2186	1502	20.0	1.09	3.2	177	.82	65	43	C	7	
18			3.6								170			41	C	61	
19			3.4								173			41	C	55	
20			3.5	2.3	.19	925	654	8.0	1.16	4.6	163	.37	69	42	C		
21			3.4	3.8	.45	1473	1018	13.0	1.13	3.0	181	.56	68	40	C		
22			3.3	5.0	.37	1796	1219	16.0	1.12	2.3	178	.70	66	40	C		
23			3.3	3.9	.34	2012	1360	19.0	1.06	2.3	182	.78	67	39	C		
24			3.3								190			40	C		
25			3.3								179			40	C	41	
26			3.4								177			42	C	33	
27			3.2	4.4	.30	2392	1574	22.0	1.09	2.5	178	.90	65	40	C	30	
28			3.3	4.3	.28	2391	1549	22.0	1.09	2.5	175	.90	64	40	C	41	
29			3.2	3.4	.27	2066	1324	19.0	1.06	2.3	183	.76	65	40	C	25	
30			3.2	3.1	.33	2024	1320	19.0	1.07	2.2	178	.82	65	41	C		
31			3.2	4.1	.35	2320	1429	21.0	1.10	2.0	164	.90	65	39	C	36	
TL															C	757	
ME			3.7	4.9	.32	2225	1503	22.0	1.05	2.7	178	.77	65	48	C	36	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

March, 19 78 — Month

Marshall, Michigan — Municipality

Robert J. Swaskell — Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID 130024 03 78 000
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	22	407	76	24	444	83	.50	9	88	16		7.4	4.3	24	C		
02	19	255	84	29	527	76	.44	8	85	17		7.4	4.5	10	C		
03	11	190	85	14	242	84				6		7.3	4.4	6	C		
04	13	226	79	30	520	72				24		7.4			C		
05	16	286	86	13	232	87	.40	7	86	11		7.3			C		
06	13	241	85	14	259	83	.62	11	79	12		7.6	6.3	12	C		
07	10	183	88	12	220	84	.37	7	87	8		7.6	6.8	2	C		
08	10	173	90	14	243	89	.37	6	89	4		7.5	7.0	2	C		
09	5	93	91	5	93	45	.15	3	93	1		7.4	7.0	4	C		
10	10	180	89	15	270	81				10		7.3	5.3	8	C		
11												7.3			C		
12	11	203	84	5	92	95	.15	3	93	3		7.2			C		
13												7.4	7.2	6	C		
14	11	210	91	13	248	86	.43	8	86	10		7.3	5.6	6	C		
15	8	140	87	8	140	89	.40	7	84	5		7.4	8.3	2	C		
16	10	198	88	8	158	89	.60	12	82	5		7.5	6.9	8	C		
17	4	79	92	14	278	74				13		7.4	6.7	6	C		
18	9	180	92	12	240	82				10		7.4			C		
19	3	63	95	14	291	77	.30	6	88	9		7.4			C		
20	11	227	90	2	41	97	.25	5	93	2		7.4	8.8	2	C		
21	5	105	92	3	63	93	.23	5	90	1		7.3	5.6	2	C		
22	4	86	92	12	258	79	.24	5	89	10		7.4	6.1	2	C		
23	8	173	92	18	390	85				14		7.4	[illegible]	6	C		
24	7	152	93	26	564	79				17		7.4			C		
25	5	111	87	25	552	74				8		7.4			C		
26												7.3			C		
27	11	244	86	12	266	84	.21	5	88	10		7.3	6.5	6	C		
28	7	138	87	13	256	81	.23	5	91	12		7.2	6.5	2	C		
29	5	112	92	4	90	89	.22	5	84	2		7.4	6.8	2	C		
30	12	268	92	18	402	83	.25	6	93	4		7.5	[illegible]	2	C		
31	5	114	94	7	159	89				6		7.1	6.5	34	C		
TL		5037			7538			123							C		
ME	9	180	88	14	269	84	.33	6	88	9		7.4	6.4	5	C		
WA	14	255	83	19	399	81	.41	7	86					6	C		

Digester Volume, ft^3
Primary
Secondary

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MDPH
D 45

Supernatant To
Process Pattern

MONTH March 19 78

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE Gals. X 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	50	5.5	62		6.7																			
2	50	6.8	71		6.6																			
3	60	10.4	78		6.4																			
4	50	6.0	71		6.4																			
5	40	6.4	68		6.5																			
6	50	7.0	66		6.4																			
7	50	6.6	68		6.7																			
8	50	6.2	67		6.6																			
9	50	6.5	65		6.8																			
10	40	6.1	61		6.9																			
11	40	6.6	89		6.8																			
12	50	5.8	70		6.8																			
13	50	5.7	71		6.6																			
14	50	6.1	61		6.8																			
15	50	5.7	62		6.9																			
16	50	5.8	66		6.9																			
17	50	5.4	65		6.7																			
18	40	5.7	63		6.7																			
19	50	6.0	70		6.8																			
20	50	5.2	72		6.8																			
21	50	5.5	67		6.9																			
22	50	5.6	62		7.0																			
23	50	5.5	50		7.0																			
24	50	5.6	62		7.0																			
25	40	5.4	69		6.8																			
26	40	4.5	87		6.7																			
27	50	4.5	96		6.7																			
28	50	6.0	61		6.6																			
29	50	5.7	62		6.8																			
30	50	5.8	62		6.6																			
31	50	5.8	62		7.0																			
TOTAL	1500																							
ARITH. MEAN	48	6.0	70																					

MDPH
D-47

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH March, 1978 — VACUUM FILTER & INCINERATION DATA — OPERATOR R. J. Swalwell

DATE	SLUDGE TO FILTER				CHEMICALS TO FILTER				FILTER		FILTRATE						FILTER CAKE					INCINERATION			REMARKS
					CaO		$FeCl_3$																		
	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	84	5.5	3881	6.8	1505		167		7.0		67	12.1	1386	12	2100		26	18.3	48	52	25				
2	87	5.2	3669	6.8	1505		167		7.0		67	12.3	1228	7	2160		26	18.8	49	52	25				
3																									
4																									
5																									
6																									
7	90	6.6	4990	6.5	1613		179		7.5		71	12.2	1130	15	1680		28	16.0	45	53	24				
8	90	5.4	4460	6.5	1613		179		7.5		71	12.1	964	5	1680		28	20.9	59	50	29				
9																									
10	84	5.8	4092	6.5	1505		167		7.0		67		1130				26	19.4	50	52	26				
11																									
12																									
13	90	6.2	4687	6.4	1613		179		7.5		71	11.4					28	21.1	59	50	30				
14	84	5.3	3740	6.5	1505		167		7.0		67	11.8	1218	8	1920		26	20.0	52	56	29				
15	78	5.7	3735	6.5	1398		155		6.5		62	11.2	1176	12	1860		24	20.6	49	56	28				
16	84	4.9	3457	6.5	1505		167		7.0		67	11.2					26	20.8	54	48	26				
17	72	5.8	3508	6.5	1290		143		6.0		57	11.4	1288	38	1920		23	20.0	46	55	25				
18																									
19																									
20																									
21																									
22																									
23																									
24																									
25																									
26																									
27	84	5.1	3599	6.7	1505		167		7.0		67	11.2	1372	25	2280		26	19.7	51	55	28				
28	84	5.1	3599	6.6	1505		167		7.0		67	11.7	2212	16	2460		26	19.4	50	56	28				
29	84	5.1	3599	6.6	1505		167		7.0		67	11.3	1166	5	2640		26	19.1	50	54	27				
30	90	5.4	4082	6.7	1613		179		7.5		71	11.5	1492	6	1080		28	19.6	55	52	29				
31																									
Total	1182		55096		21180		2350		98.5		939						367		717		379				
Arith Means	84	5.5	3935		1513		168		7.0		67		1314	14	1980		26	19.6	51	53	27				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

March, 19 78 — Month

Marshall, Michigan — Municipality

Robert J. Swalwell — Superintendent's Signature

1 2 ID | 3–8 130029 Plant No | 9 10 03 Mo | 11 12 78 Yr. | 13–15 Sampling Point Code

DAY	GRIT	AUX. FUEL	POWER CONSUMPTION			CHEMICALS APPLIED					
	9	14 0.25	19 #1	24 #2	29 #3	34 Cl_2	39 $FeCl_3$	44	49	54	59
	CF	CF	KWH	KWH	KWH	LBS.	LBS.				
PV											
SF		2									
01		52	3240			30	695				
02		71	3360			40	695				
03		58	3120			30	496				
04		86	3120			30	397				
05		71	3000			30	496				
06		60	3120			40	596				
07		62	3360			20	596				
08		63	3120			30	794				
09		54	3120			20	596				
10		33	3000			30	794				
11		34	2880			20	397				
12		34	2760			30	496				
13		36	3000			20	695				
14		28	3240			20	794				
15		48	3120			20	794				
16		52	3120			20	794				
17		64	2040			20	794				
18		61	3000			30	397				
19		49	2880			30	397				
20		26	2880			20	397				
21		28	3000			20	596				
22		37	2880			20	397				
23		25	2880			20	397				
24		52	3120			20	397				
25		39	3000			20	397				
26		43	3120			30	496				
27		38	3120			10	596				
28		30	3240			20	595				
29		31	3360			20	496				
30		30	3120			20	794				
31		26	2520			20	397				
TL		1421	93840			250	17669				
ME		46	3027			24	570				

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

PLANT INFLUENT SHEET

April (Month), 19 78 — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
ID | 13.0029 | 04 | 78 | 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	2.63		48	7.2	56	1228	84	1842			66		C		
02	4	.25	2.60		49	7.1	66	1431	62	1344	1.15	25	44		C		
03	1		2.69		50	7.2	60	1346	48	1077	2.50	56	40		C		
04	4	.44	2.73		49	7.2	75	1708	74	1685	2.70	61	58		C		
05	4	.52	2.73		48	7.3	132	3005	70	1594	1.40	32	56		C		
06	4	.16	2.74		48	7.2	57	1303	50	1143	2.90	66	32		C		
07	1		2.81		49	7.2	38	890	36	844			24		C		
08	4	.04	2.83		49	7.3	54	1275	46	1086			22		C		
09	4	.31	2.77		48	7.3	93	2148	104	2403	2.90	67	56		C		
10	4	.15	2.79		49	7.2	63	1466	54	1257	3.70	86	40		C		
11	4	.05	2.79		49	7.3	120	2792	54	1257	2.60	60	26		C		
12	3		2.77		50	7.2	90	2079	132	3049	3.20	74	88		C		
13	3		2.78		49	7.3	70	1623	94	2179	3.40	79	88		C		
14	1		2.70		50	7.2	72	1621	74	1666			60		C		
15	1		2.63		50	7.2	64	1404	78	1711			56		C		
16	3		2.65		50	7.2									C		
17	3		2.74		50	7.3	105	2399	118	2696	3.50	80	98.		C		
18	4	.40	2.70		50	7.2	72	1621	54	1216	2.10	47	26		C		
19	4	.03	2.69		49	7.3	60	1346	52	1167	2.40	63	14		C		
20	4	.06	2.66		49	6.9	69	1531	94	2085			90		C		
21	4	.02	2.67		49	7.4	72	1603	112	2494			90		C		
22	3		2.60		50	7.3	165	3578	72	1561			62		C		
23	4	.01	2.54		50	7.3	117	2478	60	1271	3.00	64	46		C		
24	1		2.67		50	7.3	84	1870	72	1603	2.80	62	56		C		
25	1		2.65		50	7.7	108	2387	138	3050	3.60	80	120		C		
26	1		2.64		50	7.6	81	1783	82	1805	3.00	66	66		C		
27	1		2.62		50	7.9	87	1901	100	2185	3.10	68	86		C		
28	1		2.55		50	7.6	177	3764	54	1148			52		C		
29	3		2.49		50	7.6	174	3613	90	1869			66		C		
30	1		2.53		50	7.7	81	1709	60	1266	2.80	59	48		C		
31															C		
TL		2.46	80.39					56902		49553		1195			C		
ME			2.68				88	1962	76	1709	2.80	63	58		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

April, 19 78 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
ID 130029 04 78 ..
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
PN	00310	85001	00530	85002	00665	85004	00535	00610								C		
SF																C		
01	48	1053	80	1755			48									C		
02	54	1171	44	954	.85	18	38									C		
03	63	1413	48	1077	3.10	70	32									C		
04	58	1321	64	1457	2.90	66	42									C		
05	95	2163	68	1548	1.60	23	58									C		
06	50	1143	52	1188	1.90	43	44									C		
07	34	797	52	1219			40									C		
08	42	991	44	1038			18									C		
09	57	1317	80	1848	2.80	64	54									C		
10	57	1326	54	1257	3.20	74	36									C		
11	76	1768	30	698	1.80	42	18									C		
12	50	1155	48	1108	2.90	67	40									C		
13	42	974	56	1298	2.80	65	50									C		
14	42	946	40	901			20									C		
15	42	921	54	1184			36									C		
16																C		
17	54	1234	56	1280	2.40	66	36									C		
18	57	1283	52	1171	2.10	47	28									C		
19	52	1167	48	1077	2.20	49	20									C		
20	58	1287	60	1331			46									C		
21	51	1136	84	1870			70									C		
22	72	1561	68	1475			58									C		
23	68	1440	42	890	2.50	53	26									C		
24	62	1381	60	1336	2.80	62	40									C		
25	66	1459	64	1414	2.90	64	54									C		
26	68	1498	54	1189	2.20	48	40									C		
27	60	1311	60	1311	2.30	50	44									C		
28	104	2211	42	893			32									C		
29	90	1869	60	1246			54									C		
30	56	1182	46	971	2.50	53	38									C		
31																C		
TL		38,478		35,984		1024										C		
ME	60	1326	56	1241	2.40	54	40									C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

April, 19 78 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

ID 130029 (Plant No) 04 (Mo) 78 (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											W				C		
01	48		3.3								176			40	C		
02			3.3								180			42	C		
03			3.2	4.6	.33	2073	1385	18.0	1.15	1.2	166	.82	63	40	C		
04			3.2	5.1	.30	2368	1588	21.0	1.13	1.3	173	.95	66	40	C	7	
05			3.2	5.4	.28	2490	1645	23.0	1.08	1.5	178	1.01	71	40	C	8	
06			3.1	6.0	.27	2601	1720	22.0	1.18	2.5	172	1.00	65	42	C	8	
07			3.1	5.8	.27	2630	1733	22.0	1.20	2.0	183	.99	62	40	C	44	
08			3.0								189			40	C	65	
09			3.1								186			41	C	6	
10			3.1	3.9	.35	1816	1227	15.0	1.21	2.4	173	.67	65	40	C		
11			3.1	4.8	.30	2052	1361	18.0	1.14	2.4	183	.78	65	40	C		
12			3.1	5.6	.34	2207	1500	20.0	1.10	2.2	178	.85	81	40	C	5	
13			3.1	5.4	.29	2188	1450	21.0	1.04	3.2	186	.85	65	40	C	25	
14			3.2	5.4	.30	2041	1336	19.0	1.07	3.0	186	.79	88	41	C		
15			3.3								189			43	C		
16			3.3								187			43	C	27	
17			3.1	6.2	.31	2291	1268	20.0	1.15	3.0	183	.84	52	42	C	34	
18			3.2	5.5	.35	1988	1038	17.5	1.14	2.8	173	.75	52	43	C	1	
19			3.2	5.8	.27	2209	1350	21.5	1.03	2.0	168	.79	65	43	C		
20			3.2	5.6	.38	2152	1001	22.0	.98	1.3	173	.75	65	43	C		
21			3.2	5.3	.37	2217	1040	22.0	1.01	1.7	180	.76	65	48	C	14	
22			3.3								179			50	C	40	
23			3.4								175			51	C		
24			3.2	5.4	.33	2307	1318	19.0	1.21	3.0	176	.64	53	51	C	5	
25			3.3	5.3	.31	2277	1472	22.0	1.04	1.8	162	.70	59	51	C	17	
26			3.3	4.9	.31	2250	1473	21.0	1.07	2.3	153	.72	63	50	C	24	
27			3.3	5.3	.35	2155	1401	22.0	.98	2.0	152	.87	47	50	C	41	
28			3.4	5.0	.38	1954	1274	19.0	1.03	2.0	156	.61	60	53	C	1	
29			3.5								151			51	C	22	
30			3.4								164			51	C	22	
31															C		
TL															C	416	
ME			3.2	5.3	.32	2213	1379	22.0	1.10	2.18	174	.80	63	44	C	21	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

April, 19 78
Month

Marshall, Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID 130629 04 78 000
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 ~~31616~~	C	31504 31505	
SF															C		
01	6	132	89	20	439	76				8		7.1			C		
02	9	195	86	6	130	90	.19	4	83	4		7.2			C		
03	8	179	87	2	45	96	.32	7	87	1		7.1	6.2	66	C		
04	8	182	89	15	342	80	.45	10	83	9		7.1	4.7	132	C		
05	22	501	83	14	319	80	.27	6	81	12		7.2	5.3	146	C		
06	7	160	88	8	183	84	.28	6	90	3		7.2	5.8	64	C		
07	3	70	92	6	141	83				5		7.2	6.1	98	C		
08	6	142	89	8	189	83				3		7.2			C		
09	6	139	94	15	347	86	.22	5	92	4		7.2			C		
10	6	140	90	7	163	87	.22	5	94	3		7.3	8.5	4	C		
11	8	186	93	9	209	83	.28	7	89	8		7.3	6.1	18	C		
12	7	162	92	3	69	98	.37	9	88	2		7.2	6.6	2	C		
13	5	116	93	14	325	85	.42	10	88	13		7.3	7.0	14	C		
14	10	225	86	4	90	95				2		7.2	7.0	8	C		
15	11	241	83	16	351	79				10		7.3			C		
16												7.3			C		
17	9	206	91	7	160	94	.37	8	89	5		7.2	7.8	2	C		
18	9	203	88	6	135	89	.30	7	86	4		7.2	7.5	4	C		
19	11	247	82	8	179	85	.40	9	86	6		7.2	5.2	18	C		
20	11	244	84	18	399	81				14		7.0	5.4	20	C		
21	32	713	56	12	267	84				10		7.4	5.3	2	C		
22	11	238	93	19	412	74				16		7.2			C		
23	11	233	91	10	212	83	.50	11	83	8		7.2			C		
24	11	245	87	15	334	79	.56	12	80	12		7.2	6.3	2	C		
25	13	287	88	14	309	90	.58	13	84	12		7.6	6.5	2	C		
26	18	396	78	9	198	89	.35	8	88	6		7.5	6.2	4	C		
27	17	371	80	13	284	87	.30	7	90	2		7.5	6.1	4	C		
28	13	276	93	5	106	91				4		7.6	6.0	2	C		
29	19	395	89	9	187	96				6		7.6			C		
30	10	211	88	2	42	97	.27	6	90	1		7.5			C		
31															C		
TL		7035			6548			156							C		
ME	11	243	87	10	226	86	.35	8	87	7		7.3	6.3	10	C		
WA	16	355	81	14	304	83	.45	10	85					48	C		

Digester Volume, ft^3
Primary _____
Secondary _____

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.5

Marshall, MICHIGAN

Supernatant To _____
Process Pattern _____

MONTH April 1978

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE Gals. X 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	50	5.5	68		7.0																			
2	40	5.4	64		7.0																			
3	50	6.7	62		6.0																			
4	50	6.0	67		6.7																			
5	50	5.9	61		6.8																			
6	50	6.5	59		6.8																			
7	50	6.0	58		6.6																			
8	40	5.7	60		6.7																			
9	40	5.6	66		6.8																			
10	50	5.5	59		6.8																			
11	50	5.3	64		6.8																			
12	50	5.9	67		6.8																			
13	50	6.1	73		6.8																			
14	60	5.5	69		6.7																			
15	40	6.1	71		6.7																			
16	40	5.9	70		6.8																			
17	50	5.8	63		6.8																			
18	50	5.4	68		6.8																			
19	50	6.2	58		6.8																			
20	50	4.8	69		7.0																			
21	50	5.8	66		7.0																			
22	50	6.3	63		6.9																			
23	40	5.9	66		6.8																			
24	40	5.4	69		6.8																			
25	50	4.6	79		6.9																			
26	50	5.8	70		6.9																			
27	50	6.1	68		7.3																			
28	60	9.0	68		7.2																			
29	50	6.1	71		7.2																			
30	40	5.7	64		7.1																			
31																								
TOTAL	1440																							
ARITH. MEAN	48	5.9	66																					

MDPH
D-4.7

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH April, 19 78

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	85	5.1	3641	7.4	1512		167		7.0		67	11.5	1469	19	3000		26	20.0	52	53	28				
4	91	5.7	4357	7.0	1620		179		7.5		71	11.2	894	32	3240		28	19.4	54	52	28				
5	85	4.8	3427	6.8	1512		167		7.0		67	10.8	1081	25	2820		26	18.9	49	51	25				
6	85	5.0	3570	6.9	1512		167		7.0		67	11.2	1070	29	3120		26	21.1	55	52	29				
7	85	5.5	3927	6.6	1512		167		7.0		67	11.2	1000	6	2940		26	19.4	50	46	23				
8																									
9																									
10																									
11	91	5.7	4357	6.7	1620		179		7.5		71	11.0	1136	14	3240		28	19.3	54	54	29				
12	85	5.4	3855	6.8	1512		167		7.0		67	11.7	1062	8	2940		26	18.3	48	53	25				
13	91	5.4	4128	6.8	1620		179		7.5		71	11.9	928	20	2760		28	19.5	55	55	30				
14	91	5.0	3822	6.8	1620		179		7.5		71	10.9	768	6	3240		28	18.8	53	46	24				
15																									
16																									
17																									
18	85	5.0	3570	6.9	1512		167		7.0		67	10.4	982	5	3780		26	19.4	60	50	25				
19	85	5.2	3713	6.7	1512		167		7.0		67	12.2	1458	6	3600		26	19.1	50	46	23				
20	85	4.5	3213	6.7	1512		167		7.0		67	11.1	992	7	3780		26	18.9	49	49	24				
21	67	5.1	2870	7.0	1188		131		5.5		52	11.4	1080	7	3660		21	19.4	41	47	19				
22																									
23																									
24																									
25	79	5.5	3650	6.9	1404		155		6.5		62	11.4	948	5	3600		24	20.7	50	43	21				
26	85	6.0	4284	6.8	1512		167		7.0		67	11.7	964	6	4440		26	19.0	49	56	28				
27	85	5.6	3998	7.2	1512		167		7.0		67	12.2	1156	8	3660		26	20.2	53	47	25				
28	79	5.7	3783	7.0	1404		155		6.5		62	11.3	892	5	2520		24	19.9	48	51	24				
29																									
30																									
31																									
Total	1439		64165		25596		2827		118.5		1130						441		1860		430				
Arith Means	85	5.3	3774		1506		166		7.0		66		1051	12	3314		26	19.5	51	50	25				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

April, 19 78 (Month) Marshall, Michigan (Municipality) Robert J. Swalwell (Superintendent's Signature)

1 2: 10 | 3–8: 130029 (Plant No) | 9 10: 04 (Mo.) | 11 12: 78 (Yr.) | 13–15: (Sampling Point Code)

DAY 1 2	GRIT 9 CF	AUX. FUEL 14 C_2S 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		2	2640			20	397				
02		7	2880			20	596				
03		11	2880			10	596				
04		2	3000			20	794				
05		1	2760			20	596				
06		25	3000			30	993				
07		2	2760			10	596				
08		1	2760			30	397				
09		2	2760			20	596				
10		3	2760			20	397				
11		5	2880			30	794				
12			2880			20	794				
13		1	3000			20	794				
14		1	3000			20	794				
15			2640			20	397				
16		1	2640			20	397				
17		1	2760			20	596				
18			3000			20	397				
19		1	2760			20	596				
20		11	2640			20	794				
21		12	2760			20	596				
22			2520			20	397				
23		1	2400			20	397				
24		1	2520			20	596				
25			2520			20	794				
26		1	2520			20	695				
27		1	2520			20	695				
28			2400			20	397				
29		1	2160			20	397				
30		1	2520			20	397				
31											
TL		95	81240			610	17672				
ME		4	2708			20	589				

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

MAY, 19 78 (Month) — MARSHALL (Municipality), Michigan — Robert J. Swaskell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
ID | 130029 (Plant No) | 05 (Mo) | 78 (Yr) | 500 (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
	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		2.51		50	7.7	93	1947	64	1340	3.60	75	50		C		
02	1		2.48		50	7.6	87	1799	64	1324	3.60	74	56		C		
03	1		2.50		50	7.7	82	1814	66	1376	3.30	69	54		C		
04	4	.08	2.46		50	7.6	195	4060	58	1190	3.00	62	40		C		
05	4	.11	2.48		51	7.3	192	3971	200	4137			156		C		
06	1		2.44		50	7.4	90	1831	239	4864			202		C		
07	1		2.39		50	7.4	87	1734	92	1834	3.10	62	68		C		
08	4	.13	2.48		50	7.4	111	2296	84	1737	3.30	68	46		C		
09	4	.04	2.46		51	7.2	94	1929	120	2462	3.30	68	98		C		
10	1		2.46		51	7.1	120	2462	100	2052	3.20	66	54		C		
11	4	.64	2.54		51	7.3	87	1843	94	1991	2.65	56	78		C		
12	4	.70	2.55		51	7.4	78	1659	48	1021			30		C		
13	4	.22	2.47		51	7.4	74	1524	90	1854			68		C		
14	4	.23	2.47		51	7.3	120	2472	60	1236	2.40	49	46		C		
15	1		2.64		52	7.3	105	2312	84	1849	2.70	59	68		C		
16	1		2.58		52	7.2	72	1599	62	1334	3.10	67	46		C		
17	4	.35	2.59		52	7.2	84	1814	96	2074	2.60	56	72		C		
18	1		2.61		53	7.1	96	2090	100	2177	3.70	81	90		C		
19	1		2.56		52	7.2	63	1345	74	1580			58		C		
20	4	.92	2.70		52	7.3			100	2252			66		C		
21	1		2.51		52	7.2	93	1947	68	1423	3.80	80	56		C		
22	1		2.75		52	7.2	81	1858	78	1789	3.10	71	48		C		
23	4	.02	2.66		54	7.3	81	1797	80	1775	3.20	71	54		C		
24	1		2.63		54	7.5	102	2237	80	1755	2.70	59	68		C		
25	1		2.63		53	7.2	54	1184	76	1667	2.40	53	58		C		
26	1		2.62		53	7.5	186	4064	70	1530			56		C		
27	1		2.45		54	7.4	81	1655	68	1389			48		C		
28	1		2.52		54	7.4									C		
29	1		2.53		54	7.4	92	1941	78	1646	2.60	55	58		C		
30	1		2.60		54	7.2									C		
31	1		2.52		54	7.3	106	2228	84	1765	2.50	53	72		C		
TL		3.44	78.79					59302		54443		1354			C		
ME			2.54				97	2045	89	1877	3.04	64	68		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

May, 1978 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
ID | 130029 (Plant No) | 05 (Mo) | 78 (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		
PJ	00310	85001	00530	85002	00665	85004	00535	00610							C		
SF															C		
01	68	1423	54	1130	3.00	63	36								C		
02	110	2275	38	786	2.90	60	32								C		
03	63	1314	50	1043	2.30	48	38								C		
04	82	1682	50	1026	3.10	64	34								C		
05	183	3785	64	1324			38								C		
06	76	1547	60	1221			32								C		
07	62	1236	44	877	2.40	48	30								C		
08	148	3061	42	869	2.50	52	28								C		
09	105	2154	68	1345	2.70	55	58								C		
10	90	1846	44	903	2.60	53	16								C		
11	62	1313	64	1356	2.50	53	54								C		
12	54	1148	64	1361			36								C		
13	60	2136	70	1442			32								C		
14	76	1566	36	742	2.20	45	28								C		
15	146	3215	54	1189	2.50	55	44								C		
16	60	1241	48	1033	2.70	58	43								C		
17	63	1361	50	1080	2.70	58	40								C		
18	78	1695	34	740	2.70	59	22								C		
19	66	1409	60	1281			46								C		
20			88	1982			58								C		
21	134	2805	52	1089	2.00	42	36								C		
22	66	1514	56	1284	2.60	60	42								C		
23	64	1420	52	1154	2.60	58	28								C		
24	100	2193	52	1141	2.90	64	32								C		
25	34	746	44	965	3.10	68	34								C		
26	76	1661	62	1355			44								C		
27	134	2738	58	1185			44								C		
28															C		
29	84	1772	56	1182	2.40	61	48								C		
30															C		
31	86	1807	52	1093	2.50	53	32								C		
TL		52116		35228		1177									C		
ME	84	1861	54	1146	2.64	56	37								C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

May, 19 78 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2 ID | 3 8 13,0,0,29 (Plant No) | 9 10 05 (Mo) | 11 12 78 (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
SF											4				C		
01	48		3.4	4.8	.42	1824	1204	19.0	.96	2.5	163	.59	61	51	C		
02			3.5	5.9	.42	2081	1304	21.0	.99	1.8	162	.66	63	52	C		
03			3.4	6.2	.38	2213	1474	23.0	.96	2.6	159	.70	60	52	C	32	
04			3.5	5.6	.40	2010	1320	21.0	.98	4.0	154	.62	58	55	C	1	
05			3.5	6.3	.40	2317	1554	24.0	.97	2.1	153	.70	63	54	C	25	
06			3.5								156			55	C	34	
07			3.6								154			57	C		
08			3.5	5.5	.49	2042	1356	22.0	.93	2.1	164	.63	64	54	C		
09			3.5	5.7	.47	2174	1480	25.0	.87	1.7	177	.68	66	54	C	3	
10			3.5	6.0	.49	2222	1445	25.0	.89	1.5	183	.68	61	54	C	10	
11			3.4	6.0	.40	2274	1553	24.0	.95	2.0	173	.70	64	52	C	27	
12			3.4	5.7	.35	2316	1586	23.0	1.00	1.9	183	.70	60	57	C	42	
13			3.5								194			54	C		
14			3.5								197			55	C		
15			3.3	5.3	.41	2182	1413	23.0	.95	1.4	199	.68	66	51	C	36	
16			3.3	5.5	.35	2210	1546	21.0	1.05	2.0	199	.66	68	52	C	26	
17			3.3	5.3	.41	1918	1313	20.0	.96	2.2	196	.61	63	53	C		
18			3.3	5.7	.37	2100	1470	22.0	.95	1.3	197	.64	65	52	C		
19			3.4	6.4	.36	2255	1593	23.0	.98	1.0	192	.74	67	53	C		
20			3.2								196			52	C	47	
21			3.4								203			52	C		
22			3.1	5.2	.36	2274	1607	24.0	.95	1.8	199	.74	66	56	C	31	
23			3.2	5.1	.36	2176	1566	21.0	1.04	2.0	193	.70	69	54	C	20	
24			3.3	4.5	.41	1996	1455	19.0	1.05	2.2	192	.71	68	53	C		
25			3.3	5.3	.34	2267	1613	23.0	.99	2.5	191	.73	70	53	C	22	
26			3.3	5.7	.35	2182	1595	22.0	.99	1.8	189	.68	74	52	C	28	
27			3.5								188			56	C	3	
28			3.4								192			54	C	8	
29			3.4								179			53	C	44	
30			3.3	4.6	.43	1839	1332	19.0	.97	2.0	180	.57	67	53	C		
31			3.4	5.8	.37	2233	1565	24.0	.93	1.5	182	.67	70	54	C	28	
TL															C	467	
ME	48		3.4	5.6	.40	2141	1470	22.2	.96	2.0	182	67	1433	53	C	25	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

MAY, 1978 (Month) — MARSHALL (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

ID: 1300.25 (Plant No) 05 (Mo.) 78 (Yr) 400 (Sampling Point Code)

DAY	BOD-5 mg/l	BOD-5 LBS	BOD-5 % Rem	SS mg/l	SS LBS.	SS % Rem	TOTAL-P mg/l	TOTAL-P LBS	TOTAL-P % Rem.	VSS mg/l	NH_3-N mg/l	pH SU	DO mg/l	F. COLI* #/100 ml	C	T. COLI* #/100 ml	REMARK
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 ~~31615~~	C	31504 31505	
SF															C		
01	12	251	87	5	105	92	.48	10	87	1		7.7	7.0	2	C		
02	34	703	61	9	186	86	.51	11	86	6		7.5	5.8	2	C		
03	19	396	78	8	167	88	.43	9	87	5		7.5	6.0	4	C		
04	14	287	93	6	123	90	.88	18	71	5		7.5	7.0	2	C		
05	40	822	79	20	414	90				15		7.3	5.2	4	C		
06	14	285	84	8	163	97				3		7.5			C		
07	17	334	80	5	100	95	.32	6	90	3		7.4			C		
08	22	455	80	9	186	89	.37	7	89	7		7.4	6.2	2	C		
09	20	410	79	9	185	93	.53	11	84	5		7.2	5.2	2	C		
10	22	451	82	7	144	93	.44	9	86	3		7.4	5.6	2	C		
11	13	275	85	8	169	91	.40	8	85	5		7.3	5.8	2	C		
12	10	213	87	4	85	92				3		7.3	5.4	4	C		
13	8	165	89	18	371	80				9		7.3			C		
14	17	350	86	5	103	92	.23	5	90	3		7.2			C		
15	21	462	80	3	66	96	.35	8	87	2		7.2	5.5	2	C		
16	7	151	90	2	43	97	.40	9	87	1		7.2	5.5	2	C		
17	7	151	92	7	151	93	.33	7	87	5		7.3	7.0	2	C		
18	9	196	91	5	109	95	.53	12	86	4		7.2	6.5	2	C		
19	11	235	83	10	213	86				8		7.2	5.0	16	C		
20				20	450	80				15		7.2			C		
21	22	461	76	5	105	93	.30	6	92	3		7.2			C		
22	11	252	86	7	161	91	.43	10	86	4		7.2	6.2	6	C		
23	11	244	86	5	111	94	.37	8	88	4		7.2	6.8	6	C		
24	35	768	66	9	197	89	.45	10	83	6		7.5	6.8	16	C		
25	8	175	85	2	44	97	.40	9	83	1		7.2	6.3	8	C		
26	12	262	94	3	66	96				2		7.5	6.0	18	C		
27	22	450	73	8	163	88				6		7.4			C		
28												7.4			C		
29	13	274	84	5	106	94	.38	8	85	3		7.4			C		
30												7.2	6.0	200	C		
31	19	399	82	5	105	94	.45	9	82	4		7.3	4.8	20	C		
TL		9857			5491			195							C		
ME	17	353	83	7	189	91	.43	9	86	5		7.3	6.0	5	C		
WA	23	470		9	194									16	C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

May, 19 78 — Month

Marshall — Municipality, Michigan

Robert J. Swalwell — Superintendent's Signature

1 2 ID | 3–8 130029 Plant No | 9 10 05 Mo | 11 12 78 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			20	596				
02			2280			20	397				
03			2400			20	397				
04			2640			20	397				
05			2280			20	596				
06			2280			10	397				
07			2280			10	397				
08			2640			20	397				
09			2640			20	596				
10			2640			20	596				
11			2520			20	794				
12			2400			10	596				
13			2400			20	199				
14			2640			30	596				
15			2640			20	596				
16			2640			20	397				
17			2640			10	596				
18			2640			20	596				
19			2280			10	397				
20			2400			20	397				
21			2520			30	596				
22			2640			20	596				
23			2640			20	596				
24			2640			10	496				
25			2400			10	496				
26			2400			10	496				
27			2520			10	397				
28			2280			10	397				
29			2280			10	298				
30			2640			10	596				
31			2760			10	596				
TL			77520			510	15490				
ME			2501			16	500				

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	5		888
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.

Digester Volume, ft³
Primary _____
Secondary _____

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.5

Marshall, MICHIGAN

Supernatant To _____
Process Pattern _____

MONTH May 19 78

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 /
1	50	5.9	78		6.9																			
2	50	5.1	72		6.9																			
3	50	3.8	95		6.8																			
4	50	5.7	70		7.1																			
5	50	5.4	77		7.0																			
6	50	5.4	65		6.9																			
7	40	5.3	79		6.8																			
8	50	7.1	72		6.8																			
9	50	5.3	71		6.7																			
10	50	5.8	68		6.9																			
11	50	5.9	70		6.9																			
12	58	6.9	79		6.5																			
13	50	5.6	67		6.7																			
14	50	5.9	72		6.8																			
15	50	5.2	66		6.6																			
16	50	5.8	68		6.6																			
17	50	5.7	69		6.6																			
18	50	5.3	67		6.5																			
19	30	5.4	72		6.5																			
20	50	5.4	72		6.5																			
21	50	6.2	60		6.5																			
22	50	5.4	71		6.5																			
23	50	5.2	67		6.6																			
24	56	4.8	71		6.5																			
25	50	5.2	72		6.5																			
26	50	6.5	75		6.5																			
27																								
28																								
29	50	4.2	88		6.6																			
30	50	4.8	66		6.3																			
31	50	5.1	65		6.3																			
TOTAL	1434																							
ARITH. MEAN	49	5.5	72																					

MDPH
D-47

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH May, 19 78 — VACUUM FILTER & INCINERATION DATA — OPERATOR R. J. Swallwell

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	94	5.5	4343	6.9	1508		155		6.5		62	10.3	990	7	3600		30	20.9	63	50	31				
2																									
3																									
4																									
5	65	5.4	2998	6.9	1044		107		4.5		43	10.4			3840		21	20.0	42	40	17				
6																									
7																									
8																									
9	86	4.5	3251	7.0	1392		143		6.0		57	10.8	1028	9			28	20.2	57	43	24				
10	101	5.2	4412	6.9	1624		167		7.0		67	11.1	984	7	3780		35	19.7	69	46	32				
11	101	5.0	4242	7.0	1624		167		7.0		67	11.0	1082	10	4200		28	191	53	50	27				
12	101	4.7	3987	7.0	1624		167		7.0		67	10.9	1174	4			35	19.9	70	50	35				
13																									
14																									
15	101	6.6	5599	6.5	1624		167		7.0		67	11.6	1228	6	3300		35	193	68	51	34				
16																									
17	86	5.3	3829	6.4	1392		143		6.0		57	11.7	1076	6	4020		28	186	52	46	24				
18	101	5.0	4242	6.4	1624		167		7.0		67	11.7	982	6	3720		35	178	62	52	32				
19																									
20																									
21																									
22	108	4.1	3720	6.4	1740		179		7.5		71	11.4	1202	6	4140		35	196	69	50	34				
23	108	4.8	4355	6.5	1740		179		7.5		71	11.4	1292	5	3900		35	193	68	49	33				
24	94	4.4	3474	6.4	1508		155		6.5		62	11.4	1290	4	4080		28	201	56	49	27				
25																									
26	101	5.1	4327	6.5	1624		167		7.0		67	11.8	1284	4			28	201	56	50	28				
27																									
28																									
29																									
30	101	4.7	3987	6.3	1624		167		7.0		67	11.9	1444	7	4260		35	19.5	68	46	31				
31	94	3.9	3079	6.2	1508		155		6.5		62	11.0	986	5	4080		28	17.3	48	51	25				
Tota	1442		54795		23200		2385		100		954						464		901		434				
Arith Means	96	4.9	3486		1547		159		6.7		64		954	7	3916		31	19.4	60	49	29				

19.4

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

June, 19 78 (Month) — Marshall (Municipality), Michigan — Robert J. Swabell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
ID 13,0,0,2,9 06 78 500
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 RATE 24 (MGD)	RAW SEWAGE QUALITY TEMP 29 (°F)	pH 34 (SU)	BOD-5 39 (mg/l)	BOD-5 44 (LBS)	SS 49 (mg/l)	SS 54 (LBS)	TOTAL-P 59 (mg/l)	TOTAL-P 64 (LBS)	VSS 69 (mg/l)	NH_3-N 74 78 (mg/l)	80 C	REMARKS OF 9	REMARKS OF 14
PN	00033	00045	50050	50051	00011	00400	00310	85001	00530	85002	00665	85004	00535	00610	C		
SF															C		
01	4	.02	2.65		54	7.4	105	2321	86	1901	2.40	53	29		C		
02	1		2.50		54	7.3									C		
03	1		2.40		54	7.1									C		
04	4	.04	2.37		54	7.2	78	1542	62	1225	2.40	47	48		C		
05	1		2.46		54	7.2									C		
06	4	.10	2.52		54	7.2	134	2816	124	2606	2.40	50	96		C		
07	4	.66	2.57		54	7.1	186	3987	120	2572	3.60	77	88		C		
08	4	.03	2.44		54	7.4	68	1384	68	1384	5.30	108	48		C		
09	1		2.47		54	7.2	99	2039	84	1730			76		C		
10	1		2.32		54	7.2									C		
11	1		2.30		54	7.2	114	2187	44	844	1.90	36	32		C		
12	4	.30	2.32		55	7.2	93	1799	102	1974	3.00	58	84		C		
13	1		2.31		54	7.2	198	3815	84	1618	2.60	50	68		C		
14	4	.02	2.30		54	7.2	88	1688	62	1189	4.60	88	46		C		
15	4	.02	2.09		54	7.2	102	1778	180	3138	5.90	103	136		C		
16	4	.34	2.36		54	7.3	86	1693	114	2244			46		C		
17	4	.05	2.26		54	7.2									C		
18	1		2.27		54	7.2	120	2272	48	908	3.20	61	30		C		
19	1		2.43		54	7.2	160	3243	68	1378	4.40	89	54		C		
20	4	.20	2.37		55	7.2	74	1463	94	1858	3.30	65	60		C		
21	1		2.41		55	7.3	80	1608	62	1246	2.80	56	18		C		
22	1		2.40		53	7.2	68	1361	70	1401	2.40	58	54		C		
23	4	.08	2.40		54	7.2	118	2362	144	2882			78		C		
24	1		2.27		54	7.2	146	2764	108	2045			80		C		
25	4	4.45	2.61		54	7.2	110	2394	104	2264	3.10	67	88		C		
26	4	.77	3.06		54	7.3	62	1582	72	1837	1.35	34	44		C		
27	4	.02	3.01		56	7.2	60	1506	68	1707	1.60	40	52		C		
28	1		2.97		56	7.3	46	1139	58	1437	3.20	79	42		C		
29	1		2.89		56	7.4	112	2699	108	2603			90		C		
30	1		2.73		55	7.2	146	3324	126	2869			114		C		
31															C		
TL		7.10	7451					53866		64860		1219			C		
ME			2.48				106	2155	90	2594	3.15	64	66		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

June, 19 78
Month

Marshall, Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID 130029 06 78 ..
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
															C		
PN	00310	85001	00530	85002	00665	85004	00535	00610							C		
SF															C		
01	68	1503	64	1414	2.40	53	50								C		
02															C		
03															C		
04	90	1779	64	1265	2.80	55	30								C		
05															C		
06	114	2396	68	1429	2.20	46	48								C		
07	82	1758	72	1543	2.60	56	52								C		
08	72	1465	78	1587	6.10	124	64								C		
09	70	1442	72	1483			58								C		
10															C		
11	148	2839	42	806	2.30	44	28								C		
12	166	3212	94	1819	3.20	62	70								C		
13	110	2119	112	2158	3.00	58	96								C		
14	70	1343	70	1343	4.00	77	40								C		
15	96	1673	72	1255	4.60	80	42								C		
16	68	1338	96	1890			74								C		
17															C		
18	148	2802	42	795	2.65	50	28								C		
19	122	2472	50	1013	3.50	71	26								C		
20	74	1463	44	870	2.70	53	36								C		
21	74	1487	54	1085	3.70	74	40								C		
22	60	1201	60	1201	3.50	70	50								C		
23	108	2162	58	1161			44								C		
24	84	1590	78	1477			56								C		
25	98	2133	62	1350	3.90	85	54								C		
26	56	1429	46	1174	1.40	36	38								C		
27	50	1255	40	1004	1.55	39	28								C		
28	42	1040	44	1090	2.40	59	36								C		
29	94	2266	72	1735			50								C		
30	142	3233	84	1913			58								C		
31															C		
TL		47400		33860		1192									C		
ME	92	1896	66	1354	3.08	63	1196								C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

June, 19 78 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
ID | 130029 | 06 | 78 | ..
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		3.3	4.7	.43	1905	1398	21.0	.91	1.6	179	.71	71	52	C		
02			3.4	5.9	.36	2348	1660	25.0	.94	1.5	186	.72	65	59	C	29	
03			3.6								186			55	C	22	
04			3.6								184			59	C	10	
05			3.5	5.1	.38	1980	1462	21.0	.94	3.0	186	.61	72	55	C		
06			3.4	5.0	.43	2149	1497	26.0	.83	.6	185	.70	61	52	C		
07			3.4	5.7	.36	2515	1700	27.0	.93	1.3	189	.73	65	53	C	43	
08			3.5	4.5	.42	2008	1367	23.0	.87	.6	204	.63	66	57	C		
09			3.5	5.1	.37	2370	1538	28.0	.85	.9	204	.75	65	55	C	19	
10			3.6								201			58	C	26	
11			3.7								194			58	C	11	
12			3.7	5.2	.37	2371	1745	25.0	.95	2.5	203	.70	71	58	C	2	
13			3.7	5.2	.36	2570	1772	32.0	.80	1.3	209	.82	65	58	C	19	
14			3.7	5.0	.40	2461	1567	30.0	.82	1.3	206	.78	64	60	C	32	
15			4.1	5.4	.33	2433	1607	22.0	1.11	1.5	199	.76	71	67	C		
16			3.7	4.8	.36	2527	1861	27.0	.94	.8	191	.80	71	58	C	18	
17			3.8								188			60	C	10	
18			3.8								191			58	C	63	
19			3.5	3.2	.52	1661	1238	18.0	.92	1.5	193	.60	72	57	C		
20			3.6	4.5	.39	2078	1542	24.0	.86	1.3	186	.66	73	57	C		
21			3.6	5.5	.37	2256	1666	24.0	.94	1.2	196	.69	69	57	C	25	
22			3.6	5.5	.35	2230	1625	26.0	.86	1.8	197	.67	71	55	C	17	
23			3.6	6.0	.36	2326	1725	27.0	.86	1.8	192	.72	71	56	C	28	
24			3.8								158			59	C	26	
25			3.3								179			51	C	23	
26			2.8	4.2	.52	2066	1245	22.0	.94	2.6	179	.81	65	43	C		
27			2.9	5.0	.38	2409	1628	22.0	.89	1.8	184	.80	67	44	C	20	
28			2.9	5.2	.35	2346	1684	27.0	.87	1.2	189	.84	66	46	C	18	
29			2.9	5.1	.34	2331	1622	26.0	.90	1.2	182	.76	67	46	C	23	
30			3.1	4.6	.39	2123	1511	24.0	.88	1.5	189	.73	66	52	C		
31															C		
TL															C	484	
ME			3.5	5.0	.39	2248	1584	25.0	.90	1.5	191	.73	68	55	C	23	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

June, 1978 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1D | 13,0,29 (Plant No) | 06 (Mo) | 78 (Yr) | 000 (Sampling Point Code)

DAY	BOD-5			SS			TOTAL P			VSS	NH_3-N	pH	DO	F COLI*		T. COLI*	REMARK
	3	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	10	221	90	3	66	97	.42	9	83	2		7.3	5.0	36	C		
02												7.2	4.5	6	C		
03												7.2			C		
04	6	119	92	2	40	96	.22	4	91	1		7.2			C		
05												7.2	6.5	4	C		
06	25	525	81	5	105	96	.60	13	75	3		7.2	4.7	2	C		
07	24	514	87	9	193	93	.53	11	85	6		7.0	4.3	200	C		
08	11	224	84	15	305	78	.81	16	85	13		7.3	5.2	22	C		
09	11	227	89	4	82	95				2		7.2	4.8	18	C		
10												7.3			C		
11	12	230	89	1	19	98	.12	2	94	1		7.2			C		
12	24	464	74	15	290	85	.47	9	84	10		7.2	6.7	2	C		
13	12	231	94	18	347	79	.40	8	85	12		7.2	5.8	2	C		
14	10	192	87	13	244	79	.53	10	88	9		7.2	6.6	2	C		
15	19	331	81	5	87	97	1.16	20	80	4		7.2	6.3	2	C		
16	12	236	86	13	256	84				9		7.2	5.5	12	C		
17												7.2			C		
18	18	341	85	3	57	94	.28	5	91	2		7.2			C		
19	14	284	91	5	101	93	.61	12	86	2		7.1	6.4	2	C		
20	19	382	74	6	121	94	.46	9	86	4		7.2	5.0	2	C		
21	19	380	76	4	80	94	.45	9	84	2		7.3	4.7	2	C		
22	10	200	85	6	120	91	.31	6	89	5		7.2	5.0	2	C		
23	24	454	80	6	114	96				4		7.2	5.1	2	C		
24	15	284	89	12	227	87				2		7.2			C		
25	20	435	82	12	261	88	.43	9	86	7		7.2			C		
26	9	230	85	6	153	92	.30	8	78	4		7.3	6.6	2	C		
27	12	301	80	3	75	96	.33	8	79	2		7.2	4.2	4	C		
28	8	198	83	7	173	88	.55	14	83	3		7.2	5.1	4	C		
29	16	386	86	14	337	87				10		7.4	5.1	14	C		
30	11	250	92	11	250	91				9		7.2	5.0	18	C		
31															C		
—		7639			4108			182							C		
ME	15	306	85	8	164	91	.47	6	85	5		7.2	5.4	5	C		
MA	17	332	82	10	198	87								15	C		

Digester Volume, ft³
Primary
Secondary

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MDPH
D 45

Supernatant To
Process Pattern

June 1978

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

Date	RAW SLUDGE Gals/100	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	Gals %	pH	SUPERNATANT Total Solids %	Vol. Solids %	Susp. Solids Mg/l	P Mg/l	P Lbs.	5 Day BOD Mg/l	Gas %	DIGESTED SLUDGE Total Solids %	Vol. Solids %	pH	Gas Produced cu. ft %
	50	5.4	69																					
2	50	5.4	70																					
3	50	5.3	70																					
4	50	5.1	68																					
5	50	5.0	59																					
6	50	5.2	72																					
7	50	5.1	69																					
8	50	5.0	71																					
9	60	5.7	69																					
10	50	5.2	73																					
	50	5.6	64																					
12	50	5.5	68																					
13	160	5.3	65																					
14	180	5.2	63																					
15																								
16	30	5.1	78																					
17	50	5.5	55																					
18	35	5.1	73																					
19	40	4.7	67																					
20	50	4.5	64																					
21	50	5.7	78																					
22	50	5.4	62																					
23	50	5.7	85																					
24	50	5.2	66																					
25	50	5.6	63																					
26	40	6.1	74																					
27	50	5.8	66																					
28	50	5.6	71																					
29	50	5.4	68																					
	50	6.7	58																					
	1045																							
	57	5.5	68																					

MDPH
D-4.7

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH June, 1978

VACUUM FILTER & INCIRATION DATA

OPERATOR R. J. Swalwell

DATE	SLUDGE TO FILTER: Gal. X 100 (1)	Tot. Solids % (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	75	4.7	2961	6.2	1568		167		7.0		67	11.2	1266	6	3360		35	16.8	58	51	29				
2	75	4.8	3204	6.2	1568		167		7.0		67	11.4	1230	7	3480		35	17.5	61	52	32				
3																									
4																									
5																									
6	80	5.4	3629	6.2	1680		179		7.5		71	12.1	1138	9	3600		35	18.8	66	48	32				
7	80	4.3	3226	6.3	1680		179		7.5		71	11.9	1124	6	4440		35	16.3	57	54	31				
8	75	4.7	2961	6.3	1568		167		7.0		67	11.3	1136	6	3720		35	16.4	57	53	30				
9	64	4.6	2473	6.4	1344		143		6.0		57	11.3	992	9	4380		21	17.3	36	54	20				
10																									
11																									
12																									
13	80	4.8	3226	6.2	1680		179		7.5		71	11.3	884	9	4380		35	17.1	60	50	30				
14	85	4.6	3284	6.1	1792		191		8.0		76	11.2	794	5	3360		35	17.6	62	48	30				
15	80	4.6	3226	6.2	1680		179		7.5		71	11.2	898	8			35	16.3	57	53	30				
16	75	4.1	2583	6.1	1568		167		7.0		67	11.0	854	13	3480		35	17.4	61	47	29				
17																									
18																									
19	80	6.2	4166	6.2	1680		179		7.5		71	10.8	1000	4	3720		35	16.7	58	52	30				
20	80	5.3	3562	6.1	1680		179		7.5		71	10.2	1128	6	3780		35	17.1	60	52	31				
21	75	4.8	3024	6.1	1568		167		7.0		67	10.9	1108	8	3660		28	17.0	48	46	22				
22	80	5.1	3427	6.1	1680		179		7.5		71	10.9	1152	5	3900		35	18.3	64	43	28				
23	69	5.0	2898	6.1	1456		155		6.5		62	11.0	1206	6	3720		28	16.6	46	51	24				
24																									
25																									
26																									
27	80	5.0	3360	6.2	1680		179		7.5		71	10.6	854	7	2820		35	17.4	61	48	29				
28	80	4.5	3024	6.2	1680		179		7.5		71	11.0	1268	8	2760		28	18.5	52	51	26				
29	80	5.1	3427	6.2	1680		179		7.5		71	11.0	966	8	3180		35	18.9	66	47	31				
30	53	4.7	2042	6.2	1120		119		5.0		48	10.6	844	8	2580		21	19.2	40	47	19				
Tot.	1446		58363		30352		3233		135.5		1288						616		1070		533				
Arith. means	76	4.9	3098		1597		170		7.0		68		1044	7	3385		32	17.4	56	50	28				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

June (Month), 19 78 — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
ID 130029 06 78 ...
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 Fec/3	44	49	54	59
PN											
SF											
01			2640			20	794				
02			2400			20	596				
03			2280			20	397				
04			2280			20	298				
05			2400			10	496				
06			2640			10	596				
07			2640			10	596				
08			2760			10	794				
09			2520			20	496				
10			2400			20	298				
11			2400			10	397				
12			2520			20	397				
13			2760			20	794				
14			2640			20	596				
15			2760			10	794				
16			2640			20	596				
17			2280			20	397				
18			2400			20	397				
19			2640			10	794				
20			2640			10	596				
21			2640			10	794				
22			2640			20	596				
23			2640			20	695				
24			3360			20	397				
25			3960			20	596				
26			2760			10	298				
27			2640			20	596				
28			2640			10	695				
29			2760			20	496				
30			2640			10	496				
31											
TL			79320			480	16778				
ME			2644			16	559				

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

PLANT INFLUENT SHEET

July (Month), 19 78 — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

ID 1 2 — 13a029 (Plant No, 3–8) 07 (Mo, 9 10) 78 (Yr, 11 12) 500 (Sampling Point Code, 13 15)

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	REMARKS OR 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	.46	2.65		55	7.2	116	2564	54	1193			44		C		
02	4	.40	2.55		55	7.1	64	1361	60	1276			30		C		
03	1		2.59		55	7.1	44	820	44	950			34		C		
04	1		2.55		55	7.1	38	808	32	681	2.50	53	12		C		
05	1		2.71		56	7.3	86	1943	76	1717	2.50	57	56		C		
06	1		2.70		56	7.2	140	3153	76	1711	1.70	38	50		C		
07	4	.01	2.73		56	7.3	132	3005	106	2413			74		C		
08	1		2.48		56	7.2	82	1696	112	2317			88		C		
09	1		2.67		56	7.2	28	623	34	757	2.10	47	22		C		
10	1		2.61		56	7.2	22	479	40	870	1.20	26	24		C		
11	1		2.55		56	7.1	116	2967	74	1574	2.50	53	48		C		
12	4	.03	2.60		56	7.3	88	1908	82	1778	3.00	65	42		C		
13	1		2.56		56	7.1	94	2007	74	1580	2.70	58	42		C		
14	1		2.57		56	7.1	138	2958	136	2915			120		C		
15	1		2.51		56	7.1	114	2386	34	712			24		C		
16	1		2.37		55	7.1	76	1502	56	1107	2.80	55	32		C		
17	1		2.51		56	7.1	120	2512	142	2973	2.80	59	86		C		
18	1		2.56		56	7.6	132	2818	68	1452	2.60	56	64		C		
19	1		2.49		57	7.6	132	2741	136	2824	4.10	85	110		C		
20	4	1.08	2.63		57	7.7	110	2413	72	1579	3.40	75	40		C		
21	4	.34	2.53		58	7.7	74	1561	146	3081			100		C		
22	4	.61	2.52		58	7.6	110	2312	224	4709			110		C		
23	1		2.40		58	7.6	100	2002	76	1521	2.40	48	62		C		
24	1		2.65		57	7.5	142	3138	74	1635	2.70	60	52		C		
25	1		2.56		58	7.6	90	1922	92	1964	2.40	62	78		C		
26	4	.05	2.56		59	7.4	70	1495	88	1879	2.60	56	72		C		
27	1		2.63		57	7.2	82	1799	64	1404	2.60	57	52		C		
28	1		2.47		57	7.1									C		
29	1		2.32		57	7.2	112	2162	108	2090			72		C		
30	1		2.45		57	7.2	112	2288	80	1635	2.50	51	58		C		
31	1		2.46		58	7.3	88	1805	124	2544	3.30	68	100		C		
TL		2.98	79.14					60653		54841		1129			C		
ME			2.55				95	2022	86	1828	2.65	56	60		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

JULY, 19 78
Month

MARSHALL, Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID 13429 67 78 ...
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
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	142	3138	54	1193			34								C		
02	54	1148	38	808			28								C		
03	42	907	16	346			10								C		
04	44	935	32	681	1.95	41	20								C		
05	80	1808	38	859	2.30	52	32								C		
06	132	2972	72	1621	1.70	38	56								C		
07	64	1457	86	1958			68								C		
08	52	1076	32	662			20								C		
09	12	267	48	1069	1.40	31	34								C		
10	20	435	30	653	1.00	22	20								C		
11	116	2467	56	1191	2.30	49	28								C		
12	80	1735	40	867	2.50	54	10								C		
13	88	1879	38	811	2.30	49	18								C		
14	92	1972	72	1543			52								C		
15	48	1005	24	502			16								C		
16	62	1225	40	791	3.40	67	20								C		
17	134	2805	36	754	3.40	71	30								C		
18	132	2818	44	939	2.60	56	36								C		
19	110	2284	52	1080	4.40	91	30								C		
20	94	2062	54	1184	4.00	88	34								C		
21	70	1477	58	1224			48								C		
22	78	1639	70	1471			60								C		
23	96	1922	24	480	3.40	68	16								C		
24	150	3315	60	1326	3.50	77	56								C		
25	82	1751	62	1324	2.80	60	46								C		
26	72	1537	64	1366	2.25	48	42								C		
27	66	1448	46	1009	2.60	57	32								C		
28															C		
29	80	1548	52	1006			34								C		
30	110	2248	54	1103	2.40	49	36								C		
31	70	1436	60	1231	2.75	56	40								C		
TL		52716		31052		1124									C		
ME	82	1757	48	1035	2.65	56	34								C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

JULY, 19 78 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
ID 130029 07 78 ..
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		3.3								188			51	C	40	
02			3.4								187			52	C		
03			3.3								173			51	C	18	
04			3.4								186			52	C		
05			3.2	6.0	.42	2164	1508	28.0	.77	1.0	183	.72	66	51	C		
06			3.2	6.0	.45	2190	1364	27.0	.81	.7	179	.71	59	50	C		
07			3.2	6.1	.40	2222	1500	26.0	.85	.5	180	.71	65	52	C		
08			3.5								181			54	C	9	
09			3.2								187			52	C	63	
10			3.3	4.1	.65	1460	625	15.0	.97	1.3	190	.52	54	52	C		
11			3.4	4.9	.41	1800	1161	19.0	.95	2.5	189	.59	59	50	C		
12			3.3	5.5	.37	2024	1402	21.0	.96	3.3	186	.68	60	50	C		
13			3.4	5.0	.56	1825	930	19.0	.96	2.3	175	.65	59	50	C	22	
14			3.4	5.5	.43	2147	1110	22.0	.98	1.7	178	.72	68	50	C		
15			3.4								180			51	C	51	
16			3.6								182			55	C		
17			3.4	6.8	.42	1985	1409	20.0	.99	2.0	179	.65	68	52	C		
18			3.4	6.3	.43	2330	1652	23.0	1.01	2.5	177	.72	68	54	C	38	
19			3.5	6.6	.49	1957	1401	19.0	1.03	2.5	171	.69	70	57	C		
20			3.3	7.2	.43	2391	1733	23.0	1.04	2.5	167	.78	69	52	C	36	
21			3.4	5.8	.48	1959	1451	12.0	1.63	1.4	168	.67	72	53	C		
22			3.4								180			52	C	6	
23			3.6								178			55	C		
24			3.3	7.0	.46	2592	1859	25.0	1.04	1.5	177	.82	65	50	C	36	
25			3.4	5.4	.50	2069	1525	18.0	1.15	1.4	173	.69	71	52	C		
26			3.4	6.0	.40	2435	1790	18.0	1.35	.6	169	.76	70	50	C		
27			3.3	6.1	.37	2518	1842	23.0	1.09	1.0	178	.87	69	48	C	40	
28			3.5	4.0	.48	1894	1320	16.0	1.18	1.0	190	.61	65	54	C		
29			3.7								165			55	C		
30			3.5								171			53	C	40	
31			3.5	4.4	.54	1645	1214	13.0	1.07	4.0	195	.46	73	52	C	1	
TL															C	400	
ME			3.4	5.7	.46	1992	1410	20.3	1.04	1.8	179	.68	66	52	C	31	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

July, 19 78 — Month

Marshall, Michigan — Municipality

Robert J. Swalwell — Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID 130929 07 78 000
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	14	309	88	5	111	91				3		7.2	5.8		C		
02	7	149	89	6	128	90				4		7.2			C		
03	4	86	91	6	130	86				4		7.2			C		
04	4	85	89	2	43	93	.19	4	92	1		7.2			C		
05	17	384	80	3	68	96	.42	9	83	2		7.2		10	C		
06	18	405	94	24	540	68	.80	18	53	17		7.2	5.0	16	C		
07	18	410	86	15	342	86				13		7.3	3.8	56	C		
08	17	352	79	20	414	82				13		7.2			C		
09	4	89	86	9	200	74	.37	8	82	6		7.2			C		
10	0	0	100	2	44	95	.00	0	100	1		7.2	6.4	22	C		
11	31	659	73	5	106	93	.18	4	93	3		7.2	6.5	2	C		
12	7	152	92	5	108	94	.22	5	93	3		7.3	6.6	8	C		
13	13	278	86	3	64	96	.43	9	84	1		7.2	6.1	2	C		
14	15	322	89	6	129	96				4		7.2	5.6	6	C		
15	6	126	95	3	63	91				1		7.3			C		
16	7	138	91	1	20	98	.16	3	94	1		7.2			C		
17	9	188	93	2	42	99	.29	6	90	1		7.2	5.1	2	C		
18	14	299	89	2	43	97	.38	8	85	1		7.5	5.3	6	C		
19	11	228	92	5	104	96	.58	12	86	3		7.5	5.3	2	C		
20	16	351	85	6	132	92	.69	15	80	3		7.6	5.3	8	C		
21	9	189	88	8	168	95				7		7.6	4.0	2	C		
22	23	460	79	13	260	94				6		7.5			C		
23	9	180	91	2	40	97	.23	5	90	1		7.5			C		
24	22	486	85	4	88	95	.38	8	86	2		7.5	4.0	2	C		
25	12	256	87	8	171	91	.46	10	84	7		7.6	4.2	10	C		
26	13	278	81	10	214	84	.40	9	85	8		7.4	4.2	8	C		
27	11	241	87	2	44	97	.33	7	87	1		7.3	4.2	2	C		
28												7.2	4.2	6	C		
29	19	368	83	5	97	95				3		7.2			C		
30	23	470	79	5	102	94	.20	4	92	4		7.2			C		
31	12	246	86	5	103	96	.24	5	93	3		7.3	7.4	2	C		
TL		8,54			4118			149							C		
ME	13	272	87	6	137	92	.35	7	87	4		7.3	5.2	5	C		
WA	16	314		11	248									9	C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

July, 19 78 — Month

Marshall, Michigan — Municipality

Robert J. Swalwell — Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
JD 130029 07 78 ,,
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			20	496				
02			2400			30	397				
03			2400			20	199				
04			2640			10	397				
05			2640			10	695				
06			2640			10	695				
07			2640			20	695				
08			2400			20	397				
09			2400			30	596				
10			2760			20	794				
11			2520			20	596				
12			2640			10	397				
13			2520			10	596				
14			2520			20	794				
15			2520			20	397				
16			2520			20	397				
17			2760			20	596				
18			2640			20	794				
19			2520			20	596				
20			2640			20	794				
21			2520			20	596				
22			2400			20	397				
23			2400			20	397				
24			2760			20	596				
25			2760			20	794				
26			2520			20	794				
27			2640			20	695				
28			2640			20	695				
29			2160			10	397				
30			2400			10	397				
31			2520			20	397				
TL			78,840			570	17473				
ME			2543			18	564				

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

MDPH
D-4.5

Marshall, MICHIGAN

Supernatant To _____
Process Pattern _____

MONTH July 1978

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE Gals. X 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	50	4.1	85		6.2																			
2	25	5.8	66		6.2																			
3																								
4																								
5	60	5.8	66		6.1																			
6	60	5.6	71		6.1																			
7	60	5.5	68		6.1																			
8	50	5.3	67		6.1																			
9	50	5.8	52		6.1																			
10	50	5.8	72		6.1																			
11	50	5.1	72		6.2																			
12	50	4.8	67		6.6																			
13	50	6.9	59		6.5																			
14	50	5.3	71		6.3																			
15	50	7.9	63		6.3																			
16	50	5.3	64		6.3																			
17	50	5.1	65		6.5																			
18	60	4.6	70		6.7																			
19	60	5.1	68		6.6																			
20	60	5.1	62		6.8																			
21	60	9.0	79		6.8																			
22	50	5.1	63		6.8																			
23	60	5.8	52		6.5																			
24	50	4.1	80		6.2																			
25	50	4.7	68		6.5																			
26	50	4.8	68		6.4																			
27	50	5.4	69		6.3																			
28	50	5.0	70		6.3																			
29	40	5.2	67		6.4																			
30	50	5.9	70		6.3																			
31	50	5.2	67		6.2																			
TOTAL	1495																							
AVERAGE MEAN	52	5.5	68																					

MDPH
D-4.7

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH July, 19 78 — 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	88	4.6	3400	5.9	1645		167		7.0		67	10.8	896	10	3060		28	16.2	45	50	23				
6	88	4.4	3252	6.0	1645		167		7.0		67	11.6	902	11	3720		35	17.2	60	44	26				
7	88	5.1	3770	6.0	1645		167		7.0		67	11.4	1024	7	4080		35	17.3	61	48	29				
8																									
9																									
10	94	5.0	3948	6.0	1763		179		7.5		71	10.7	960	11	2040		35	18.1	63	49	31				
11	75	6.6	4158	6.0	1410		143		6.0		57						28	19.7	55	49	27				
12																									
13	94	5.4	4264	6.2	1763		179		7.5		71	10.5	1006	5	2880		35	18.6	65	49	32				
14	94	5.4	4264	6.1	1763		179		7.5		71	10.4			3120		42	16.8	71	53	37				
15																									
16																									
17	50	4.8	2016	6.3	940		95		4.0		38	10.4	828	9	2880		21	17.3	36	49	18				
18	94	4.9	3869	6.4	1763		179		7.5		71	11.3	1044	9	3180		28	18.0	50	46	23				
19	88	4.1	3031	6.3	1645		167		7.0		67	11.0	1134	6	3900		21	18.0	38	46	17				
20	94	4.8	3796	6.5	1763		179		7.5		71	11.1	1114	10	3060		28	16.3	46	51	23				
21	88	4.6	3400	6.7	1645		167		7.0		67	11.6	1048	7	3840		28	16.6	46	49	23				
22																									
23																									
24	94	4.2	3316	6.5	1763		179		7.5		71	11.6	1236	9	3000		35	17.1	60	51	31				
25	94	6.8	5369	6.5	1763		179		7.5		71	11.8	998	21	2760		35	16.6	58	52	30				
26	88	3.9	2883	6.4	1645		167		7.0		67	11.1	912	9	1800		35	16.5	58	49	28				
27	94	4.8	3790	6.2	1763		179		7.5		71	10.4	886	10	2520		35	18.0	63	53	33				
28	88	4.2	3105	6.2	1645		167		7.0		67	10.7					35	17.6	62	53	33				
29																									
30																									
31																									
Total	1493		61625		27969		2839		119.		1132						539		937		464				
Arithm Means	88	4.9	3625		1645		167		7.0		67		999	10	3056		32	17.4	55	49	27				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

AUGUST (Month), 19 78

MARSHALL (Municipality), Michigan

Robert J. Swabell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
IP | 130024 | 08 | 78 | 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	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		2.45		58	7.4	80	1635	52	1063	2.90	59	36		C		
02	4	.52	2.59		58	7.2	96	2074	170	3672	4.00	86	118		C		
03	1		2.41		58	7.4	110	2211	80	1608	3.10	62	70		C		
04	1		2.44		58	7.3	98	1994	54	1099			36		C		
05	1		2.41		58	7.3									C		
06	1		2.30		57	7.4	86	1650	74	1419	3.10	59	58		C		
07	4	.03	2.43		58	7.4	86	1743	80	1622	3.40	69	72		C		
08	4	.20	2.49		59	7.3	90	1869	70	1454	2.50	51	46		C		
09	4	.02	2.47		59	7.2	142	2925	180	3708	3.40	70	144		C		
10	1		2.46		59	7.4	94	1929	90	1846	2.75	56	48		C		
11	1		2.41		59	7.4	156	3135	94	1889			84		C		
12	1		2.36		59	7.4									C		
13	1		2.28		58	7.4	80	1521	94	1787	2.50	47	78		C		
14	1		2.49		60	7.4	102	2118	84	1744	2.50	52	72		C		
15	4	.52	2.52		59	7.4	116	2438	92	1934	2.60	55	80		C		
16	1		2.46		59	7.4	94	1924	78	1600	2.80	57	60		C		
17	1		2.40		59	7.4			46	920	2.80	56	26		C		
18	4	.61	2.42		59	7.8	84	1695	94	1897			32		C		
19	4	.03	2.29		59	7.6	78	1490	146	2788			137		C		
20	1		2.23		58	7.6	110	2046	80	1488	2.75	51	60		C		
21	1		2.38		58	7.5	106	2104	78	1548	2.70	54	62		C		
22	1		2.36		59	7.4	128	2519	80	1545	2.80	55	56		C		
23	1		2.36		59	7.3	120	2362	42	827	2.60	51	38		C		
24	4	.03	2.42		59	7.2	104	2099	120	2422	3.40	69	100		C		
25	1		2.37		59	7.3	80	1581	30	593			23		C		
26	1		2.19		58	7.3									C		
27	4	.42	2.28		58	7.4									C		
28	4	03	2.42		58	7.3	92	1857	66	1332	2.40	48	50		C		
29	1		2.37		59	7.2	128	2530	80	1581	3.00	59	70		C		
30	1		2.34		59	7.2	78	1522	72	1405	2.10	41	52		C		
31	1		2.32		59	7.2	110	2128	66	1277	3.60	70	58		C		
TL		2.41	7412					35104		46068		1277			C		
ME			2.39				102	1350	85	1706	2.90	58	65		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

AUGUST, 19 78 (Month) — Marshall (Municipality), Michigan — Robert J. Swaboll (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
ID 13.0029 08 78 ..
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
1 2	mg/l	LBS.	mg/l	LBS.	mg/l	LBS	mg/l	mg/l								C		
PN	00310	85001	00530	85002	00666	85004	00535	00610								C		
SF																C		
01	50	1022	56	1144	2.60	53	48									C		
02	60	1296	44	950	3.00	65	32									C		
03	104	2090	52	1045	2.90	58	42									C		
04	70	1442	42	855			32									C		
05																C		
06	78	1496	50	959	2.90	56	30									C		
07	90	1824	78	1580	3.00	61	72									C		
08	68	1412	48	997	2.55	53	46									C		
09	120	2472	86	1772	2.90	60	68									C		
10	72	1477	60	1231	2.90	59	40									C		
11	156	3136	56	1126			42									C		
12																C		
13	80	1521	80	1521	2.75	52	72									C		
14	76	1528	52	1080	2.70	56	38									C		
15	112	2354	50	1051	3.10	65	40									C		
16	72	1477	58	1190	2.60	53	48									C		
17			86	1721	3.70	74	58									C		
18	64	1292	52	1050			32									C		
19	90	1719	74	1413			64									C		
20	66	1227	62	1153	3.90	73	50									C		
21	92	1826	30	595	3.70	73	16									C		
22	64	1260	52	1023	3.55	70	38									C		
23	74	1456	46	905	3.90	77	36									C		
24	70	1413	62	1251	3.90	79	36									C		
25	114	2253	30	593			20									C		
26																C		
27																C		
28	62	1251	26	525	2.25	45	20									C		
29	116	2293	52	1028	3.00	59	44									C		
30	74	1444	34	664	2.10	41	28									C		
31	108	2090	38	735	3.40	66	34									C		
TL		44121		29157		1348										C		
ME	85	1697	54	1080	3.06	61	42									C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

August, 19 78 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

ID 13,0,0,2,7 (Plant No) 08 (Mo) 78 (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	5.9	.31	2067	1529	18.0	1.15	1.5	101	.67	72	53	C		
02			3.3	6.6	.28	2328	1702	22.0	1.06	1.5	97	.75	68	51	C	25	
03			3.6	6.7	.30	2132	1577	18.0	1.18	2.2	101	.68	68	55	C		
04			3.5	7.6	.27	2404	1753	22.0	1.09	1.5	102	.78	65	54	C	21	
05			3.6								101			55	C	48	
06			3.7								100			59	C		
07			3.5	6.1	.30	2074	1522	19.0	1.09	3.0	97	.66	67	55	C		
08			3.5	7.1	.36	2360	1278	23.0	1.03	1.0	95	.75	65	52	C	20	
09			3.5	6.3	.32	2293	1659	21.0	1.07	1.2	96	.73	69	51	C	20	
10			3.5	6.0	.33	2200	1633	20.0	1.10	1.4	97	.70	69	52	C	3	
11			3.6	6.2	.33	2287	1713	19.0	1.20	1.5	95	.77	70	54	C		
12			3.7								93			55	C	27	
13			3.8								92			56	C		
14			3.5	5.2	.40	2148	1506	19.0	1.13	1.2	92	.75	69	53	C	1	
15			3.4	5.9	.37	2317	1712	19.0	1.22	1.0	91	.74	71	52	C	21	
16			3.5	5.6	.41	2201	1484	19.0	1.16	1.0	91	.72	60	50	C	27	
17			3.6	5.5	.41	2112	1454	17.0	1.24	1.0	92	.67	61	56	C	3	
18			3.6	5.6	.43	2139	1277	18.0	1.19	.8	85	.67	55	53	C	14	
19			3.8								101			60	C	3	
20			3.9								104			62	C	8	
21			3.6	6.3	.32	2226	1562	16.0	1.39	3.0	102	.65	67	58	C	17	
22			3.7	5.9	.33	2081	1456	16.0	1.30	1.5	96	.65	68	59	C		
23			3.7	6.8	.27	2342	1657	20.0	1.17	1.5	85	.72	65	57	C	5	
24			3.6	7.4	.27	2475	1692	18.0	1.38	1.5	86	.75	70	55	C	30	
25			3.6	9.2	.32	2815	1500	16.0	1.76	1.5	88	.68	65	57	C	22	
26			3.9								87			61	C		
27			3.8								86			58	C	6	
28			3.6	8.0	.31	2151	1533	11.0	1.96	2.0	86	.71	72	52	C	32	
29			3.6	6.4	.52	1653	970	11.0	1.50	2.5	89	.51	56	54	C	10	
30			3.7	8.0	.34	2042	1441	15.0	1.36	1.5	87	.67	68	56	C		
31			3.7	10.5	.28	2547	1835	18.0	1.42	1.4	89	.80	68	57	C	15	
TL															C	378	
ME			3.6	6.7	.35	2232	1541	18.0	1.27	1.5	94	.70	.66	.55	C	17	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

August (Month), 19 78 — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
ID 130029 08 78 000
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 ~~31616~~	C	31504 31505	
SF															C		
01	14	286	83	6	123	88	.38	8	86	4		7.3	5.8	4	C		
02	8	173	92	5	108	97	.35	8	91	2		7.2	4.0	2	C		
03	13	261	88	3	60	96	.35	7	89	1		7.3	6.3	2	C		
04	19	387	81	3	61	94				2		7.2	5.5	4	C		
05												7.2			C		
06	10	192	88	6	115	92	.27	5	91	4		7.2			C		
07	7	142	92	8	162	90	.45	9	87	5		7.3	6.7	8	C		
08	10	208	89	2	42	97	.48	10	81	1		7.3	4.8	20	C		
09	9	185	94	9	185	95	.48	10	86	7		7.2	4.5	2	C		
10	10	205	90	6	123	93	.43	9	84	4		7.3	4.8	2	C		
11	20	402	87	6	121	94				4		7.4	3.9	6	C		
12												7.4			C		
13	11	209	86	8	152	91	.46	9	82	7		7.4			C		
14	8	166	92	3	62	96	.68	14	73	2		7.4	5.4	10	C		
15	11	231	91	7	147	92	.37	8	86	5		7.4	4.3	12	C		
16	7	144	93	4	82	95	.28	6	90	3		7.4	4.6	2	C		
17				3	60	93	.33	7	88	1		7.4	5.1	4	C		
18	7	141	92	7	141	93				6		7.8	4.7	4	C		
19	18	344	77	23	439	86				15		7.5			C		
20	11	205	90	7	130	91	.27	5	90	6		7.5			C		
21	22	437	79	2	40	97	.37	7	86	1		7.5	6.6	2	C		
22	17	335	87	3	59	96	.51	10	82	2		7.3	6.0	12	C		
23	25	492	79	4	79	90	.51	10	80	2		7.3	4.0	86	C		
24	11	222	89	6	121	95	.38	8	89	4		7.3	4.0	2	C		
25	36	712	55	2	40	93				1		7.2	3.8	6	C		
26												7.3			C		
27												7.3			C		
28	19	383	83	2	40	97	.51	10	79	1		7.2	6.0	2	C		
29	17	336	87	2	40	98	.40	8	87	1		7.3	7.4	2	C		
30	17	332	78	2	39	97	.35	7	83	1		7.2	4.3	2	C		
31	27	522	75	2	39	97	.33	6	91	1		7.1	4.4	4	C		
TL		7652			2810			181							C		
ME	15	294	85	5	104	94	.41	8	86	3		7.3	5.2	4	C		
WA	22	428		8	155									7	C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

AUGUST (Month), 19 78 — MARSHALL (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
ID | 130029 | 08 | 78 | ..
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			2880			20	596				
02			2640			20	794				
03			2760			20	596				
04			2640			20	794				
05			2400			10	397				
06			2400			10	199				
07			2520			20	596				
08			2760			10	794				
09			2520			20	596				
10			2760			10	596				
11			2400			10	596				
12			2400			20	199				
13			2400			10	596				
14			2640			10	596				
15			2640			10	596				
16			2640			20	397				
17			2400			20	397				
18			2280			10	397				
19			2400			10	298				
20			2520			10	496				
21			2400			10	596				
22			2640			20	596				
23			2400			10	596				
24			2520			20	794				
25			2400			20	397				
26			2160			20	397				
27			2400			20	397				
28			2400			10	794				
29			2520			20	794				
30			2520			10	794				
31			2400			20	596				
TL			77760			470	17277				
ME			2508			15	557				

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

MDPH
D-4.5

Marshall, MICHIGAN

Supernatant To _____
Process Pattern _____

MONTH August 1978

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE Gals. X 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	50	5.4	68		6.3																			
2	20				6.3																			
3	50	4.9	73		6.3																			
4	50	5.7	67		6.4																			
5	50	5.0	71		6.5																			
6	50	5.8	71		6.4																			
7	50	5.7	63		6.1																			
8	50	5.3	65		6.1																			
9	50	5.1	65		6.0																			
10	50	5.8	74		6.2																			
11	50	4.2	92		6.1																			
12	40																							
13	50	5.1	80		6.2																			
14	50	5.3	71		6.4																			
15	50	5.8	95		6.0																			
16	50	5.1	70		6.3																			
17	50	5.1	68		6.3																			
18	50																							
19	50																							
20	50	5.6	70		6.2																			
21	50	5.9	73		6.1																			
22	50	5.8	78		6.1																			
23	50	5.3	69		6.3																			
24	50	5.3	69		6.3																			
25	50				6.2																			
26	50	5.8	71		6.3																			
27	50	5.4	72		6.2																			
28	50	5.3	75		6.4																			
29	50	5.4	72		6.4																			
30	50	5.5	71		6.3																			
31	50	5.9	77		6.3																			
TOTAL	1510																							
AVG. MEAN	49	5.4	73																					

MDPH
D-4.7

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH August, 19 78 — 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	84	5.5	3886	6.4	1505		167		7.0		66	11.2	934	7	1860		35	16.8	59	53	31				
2	84	4.7	3316	6.3	1505		167		7.0		66	11.3	922	8	2700		35	17.3	61	49	30				
3	90	5.5	4158	6.1	1613		179		7.5		71	10.9	898	8	3000		35	17.5	61	49	30				
4	84	4.8	3387	6.2	1505		167		7.0		66	11.0	940	4	1920		35	18.4	64	49	32				
5																									
6																									
7																									
8	84	4.7	3316	6.0	1505		167		7.0		66	10.4	854	7	2690		35	17.7	62	55	34				
9	90	5.2	3931	6.1	1613		179		7.5		71	10.5	944	7	2040		35	17.6	62	54	33				
10	90	4.6	3478	6.1	1613		179		7.5		71	10.6	760	8	3480		35	16.2	57	34	19				
11	78	5.3	3472	6.1	1398		155		6.5		62	11.8					28	17.9	50	52	26				
12																									
13																									
14	84	4.3	3034	6.0	1505		167		7.0		66	11.2	1046	8	2580		35	17.7	62	52	32				
15	84	4.4	3105	6.3	1505		167		7.0		66	11.4	906	9	2760		35	18.5	65	48	31				
16	84	3.9	2752	6.4	1505		167		7.0		66	11.3	784	8	2520		35	18.8	67	55	36				
17																									
18																									
19																									
20																									
21																									
22	84	5.1	3599	6.3	1505		167		7.0		66	11.3	970	6	3720		35	18.6	65	53	35				
23	84	5.4	3810	6.0	1505		167		7.0		66	11.6	1046	6	3720		35	17.5	61	54	33				
24	84	5.4	3810	6.2	1505		167		7.0		66	11.9	984	9	3600		35	18.4	64	57	37				
25	84			6.2	1505		167		7.0		66	11.7					28								
26																									
27																									
28																									
29	84	5.2	3669	6.4	1505		167		7.0		66	11.3	1056	7	4500		35	17.9	63	55	34				
30	84	4.9	3457	6.3	1505		167		7.0		66	11.0	998	9	3720		35	18.5	65	53	34				
31	78	5.5	3604	6.0	1398		155		6.5		62	10.9	970	9	4020		28	19.2	54	48	26				
Total	1518		59778		27200		3018		126.5		1195						609		1042		533				
Arith. Means	84	5.0	3516		1511		168		7.0		66		657	8	3052		34	17.9	61	51	31				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

September, 1978 (Month) — Marshall (Municipality), Michigan — Robert Swartwell (Superintendent's Signature)

ID 130429 (Plant No) 09 (Mo) 78 (Yr) 506 (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	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		2.34		58	7.5			146	2849			118		C	
02	1		2.16		58	7.3									C	
03	1		2.14		58	7.4									C	
04	1		2.24		58	7.4	156	2914	84	1569	2.80	52	66		C	
05	1		2.30		58	7.4	114	2187	60	1151	2.80	54	50		C	
06	1		2.31		59	7.0	86	1657	68	1310	2.80	54	44		C	
07	1		2.25		60	6.0	92	1726	102	1914	2.80	53	74		C	
08	1		2.30		59	7.2									C	
09	4	.01	2.18		59	7.3									C	
10	1		2.26		59	7.3	138	2601	84	1583	2.60	49	60		C	
11	4	1.12	2.34		60	7.0	116	2264	80	1561	3.20	62	60		C	
12	4	.74	2.40		59	7.2	104	2081	90	1801	2.60	52	62		C	
13	4	.48	2.35		60	7.0	68	1333	56	1098	5.30	104	40		C	
14	4	.51	2.42		60	7.4	96	1938	78	1574	2.50	50	70		C	
15	4	.05	2.39		60	7.9									C	
16	4	.88	2.77		59	7.6									C	
17	4	.34	3.27		59	7.8	108	2945	72	1964	2.60	71	60		C	
18	4	.01			60	7.8	104	2064	76	1509	3.40	67	54		C	
19	3				59	7.4	92	1826	90	1786	2.60	52	72		C	
20	4	.13			60	7.5	82	1628	88	1747	2.25	45	76		C	
21	4	.05			60	7.3	106	2044	74	1469	4.85	96	56		C	
22	1		2.36		59	7.6									C	
23	1				59	7.4									C	
24	1				59	7.5	152	3017	152	3017	2.60	52	104		C	
25	1				59	7.8	148	2938	132	2620	2.80	56	128		C	
26	1				59	7.8	72	1429	64	1270	2.30	46	60		C	
27	4	.15			59	7.8	120	2382	68	1350	2.55	51	48		C	
28	1				59	7.9	108	2549			2.50	50			C	
29	1				59	7.7									C	
30	4	.12			59	7.8									C	
31															C	
TL		4.59	71.36					41523		33142		1116			C	
ME			2.38				109	2185	88	1744	2.94	59	69		C	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

September, 19 78
Month

MARSHALL, Michigan
Municipality

Robert Swakwell
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID 130029 6.9 78 ..
Plant No Mo. Yr Sampling Point Code

DAY	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
1 2															C		
PN	00310	35001	00530	85002	00665	85004	00535	00610							C		
SF															C		
01			66	1288			56								C		
02															C		
03															C		
04	102	1906	46	859	2.25	42	32								C		
05	88	1688	54	1036	2.80	54	44								C		
06	98	1888	50	963	2.50	48	26								C		
07	78	1464	50	938	2.70	51	38								C		
08															C		
09															C		
10															C		
11	134	2615	68	1327	3.40	66	58								C		
12	88	1761	52	1041	2.50	50	38								C		
13	70	1372	28	549	5.15	101	14								C		
14	60	1211	40	807	2.60	52	30								C		
15															C		
16															C		
17	102	2782	64	1745	2.55	70	50								C		
18	82	1628	48	953	3.30	66	34								C		
19	78	1548	58	1151	2.50	50	48								C		
20	76	1506	84	1667	2.25	45	68								C		
21	62	1231	42	834	4.15	82	28								C		
22	S														C		
23															C		
24															C		
25	86	1707	52	1032	2.55	51	36								C		
26	56	1112	30	595	2.10	42	26								C		
27	138	2739	38	754	2.30	46	20								C		
28	88	2077			2.00	40									C		
29															C		
30															C		
31															C		
TL		30235		17539		956									C		
ME	87	1779	51	1032	2.80	56	38								C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

September, 19 78 (Month) — Marshall (Municipality), Michigan — Robert Swalwell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
ID | 130029 | 09 | 78 | ..
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 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		3.7	8.2	.35	2358	1679	17.0	1.15	1.5	175	.78	65	57	C	36	
02			4.0								171			63	C		
03			4.0								175			64	C	19	
04			3.8								173			59	C	51	
05			3.7	6.6	.48	1751	1261	14.6	1.25	1.5	169	.51	70	58	C		
06			3.7	7.4	.36	2314	1643	18.0	1.29	.8	169	.69	61	57	C	33	
07			3.8	6.5	.45	1960	1320	16.0	1.23	1.5	166	.59	69	60	C		
08			3.7	7.5	.37	2295	1657	20.0	1.15	1.5	161	.72	66	59	C	36	
09			4.0								162			62	C		
10			3.8								162			60	C	38	
11			3.7	5.3	.52	1846	1215	17.0	1.09	1.5	159	.58	63	59	C		
12			3.6	6.3	.38	2302	1724	21.0	1.10	2.5	165	.62	72	56	C	41	
13			3.7	5.6	.43	1885	1422	18.0	1.05	1.5	175	.60	74	58	C		
14			3.6	6.6	.35	2277	1680	20.0	1.14	2.0	178	.74	70	55	C	18	
15			3.6	6.1	.43	2080	1355	18.0	1.16	1.5	188	.63	57	58	C		
16			3.1								172			49	C	9	
17			2.6								175			41	C	33	
18			3.6	6.6	.42	2080	1383	17.0	1.22	3.8	171	.69	48	56	C		
19			3.6	6.9	.33	2433	1772	22.0	1.11	1.3	172	.76	68	56	C	36	
20			3.6	4.8	.40	1768	1320	15.0	1.18	2.5	169	.59	72	57	C	11	
21			3.6	6.1	.31	2194	1623	19.0	1.15	2.0	185	.65	70	59	C	23	
22			3.6	6.6	.34	2159	1485	17.0	1.27	3.0	192	.61	69	59	C	31	
23			3.6								192			59	C		
24			3.6								183			58	C	45	
25			3.6	4.4	.49	1596	1052	14.0	1.14	5.5	188	.45	63	59	C		
26			3.6	5.7	.39	2034	1313	18.0	1.13	2.3	186	.60	59	59	C	23	
27			3.6	6.0	.52	1981	1071	17.0	1.16	2.2	182	.59	52	62	C		
28			3.6	6.6	.44	2198	1268	20.0	1.16	1.9	189	.68	56	62	C	33	
29			3.6	6.0	.43	2000	1279	18.0	1.11	3.3	184	.56	59	62	C		
30			3.6											61	C	30	
31															C		
TL															C	546	
ME			3.6	6.2	.41	2076	1426	17.8	1.16	2.2	170	.63	64	58	C	30	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

September, 19 78 (Month) — Marshall (Municipality), Michigan — Robert Swalwell (Superintendent's Signature)

1 2: 10 — 3–8: 130029 (Plant No) — 9 10: 09 (Mo.) — 11 12: 78 (Yr) — 13–15: 000 (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				11	215	92				7		7.4	4.3	8	C		
02												7.4			C		
03												7.5			C		
04	25	448	85	2	37	98	.18	3	94	1		7.3			C		
05	21	403	82	6	115	90	.40	8	86	4		7.3	3.5	2	C		
06	22	424	74	2	39	97	.27	5	90	1		6.9	5.5	4	C		
07	21	394	77	7	131	93	.33	6	88	6		6.8	5.0	4	C		
08												7.2	5.6	16	C		
09												7.2			C		
10	23	415	87	5	94	94	.32	6	88	3		7.0			C		
11	20	390	85	3	59	96	.55	11	83	2		7.0	4.5	36	C		
12	13	260	88	2	40	98	.35	7	87	1		7.1	4.5	16	C		
13	11	216	87	1	20	98	.93	18	82	1		7.1	5.7	4	C		
14	11	222	81	6	121	92	.67	14	73	5		7.4	4.0	12	C		
15												7.7	4.5	8	C		
16												7.7			C		
17	9	245	92	7	191	90	.35	10	87	5		7.7			C		
18	10	198	90	9	179	88	.47	9	86	7		7.6	6.8	4	C		
19	13	258	86	7	139	92	.38	8	85	5		7.6	5.0	4	C		
20	7	139	91	7	139	92	.27	5	88	5		7.4	6.3	40	C		
21	8	159	92	9	179	88	.42	8	91	7		7.2	4.5	2	C		
22												7.4	7.0	4	C		
23												7.4			C		
24	15	298	90	8	159	95	.18	4	93	4		7.4			C		
25	8	159	95	6	119	95	.19	4	93	3		7.6	8.2	2	C		
26	5	99	93	2	40	97	.18	4	92	1		7.7	6.5	2	C		
27	6	119	95	6	119	91	.18	4	93	4		7.6	6.3	6	C		
28	10	236	91				.16	3	94			7.7	5.5	2	C		
29												7.7	6.3	2	C		
30												7.7			C		
31															C		
TL		5082			2135			137							C		
ME	13	267	87	6	112	93	.36	7	88	4		7.4	5.2	5	C		
WA	20	391		8	158									11	C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

September, 19 78 — Month

Marshall, Michigan — Municipality

Robert Swalwell — Superintendent's Signature

1 2: 10 — 3–8: 1300.24 Plant No. — 9 10: 09 Mo. — 11 12: 78 Yr — 13–15: .. 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		4									
SF		2									
01			2400			20	596				
02			2280			10	397				
03			2160			20	397				
04			2280			20	397				
05			2400			10	794				
06			2520			20	794				
07			2400			20	794				
08			2400			10	794				
09			2040			10	596				
10			2280			20	794				
11			2280			10	397				
12			2520			30	794				
13			2400			20	794				
14			2640			30	596				
15			2400			20	596				
16			2160			10	397				
17			2280			20	199				
18			2400			10	397				
19			2640			20	397				
20			2640			20	397				
21			2640			30	794				
22		22	2400			30	794				
23			2400			20	596				
24			2280			20	596				
25		29	2400			20	596				
26		29	2400			10	794				
27		24	2640			10	992				
28		24	2640			10	794				
29		24	2400			10	596				
30		23	2400			30	596				
31											
TL		175	72120			540	17870				
ME		25	2404			18	596				

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	5		80
Superintendent	1		16
Asst. Supt.	1		16
Shift Foreman			
Shift Operator	3		48
Maint. Supervisor			
Mechanic			
Chemist			
Lab Technician			
Clerk-Typist			
Other			

GIVE THE HOURS PER DAY PLANT PERSONNE

WEEKDAYS 11 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

Digester Volume, ft³
Primary _____
Secondary _____

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.5

Marshall, MICHIGAN

Supernatant To _____
Process Pattern _____

MONTH September 19 78

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE Gals. X 150	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	10.9	84		6.3																			
2	50	5.1	70		6.3																			
3	50	5.5	68		6.4																			
4	50	5.0	71		6.3																			
5	50	4.5	70		6.1																			
6	50	5.3	66		5.8																			
7	50	5.0	86		6.2																			
8	50	6.8	60		5.8																			
9	50	5.1	71		5.9																			
10	50	5.4	72		6.1																			
11	50	5.4	63		6.2																			
12	50	5.2	69		6.3																			
13	50	5.8	75		6.0																			
14	50	6.8	39		6.1																			
15	50	7.6	81		6.1																			
16	50	5.5	71		6.1																			
17	50	5.7	74		6.4																			
18	50	5.7	68		6.1																			
19	50	5.4	71		6.3																			
20	50	5.5	73		6.2																			
21	50	5.5	70		6.3																			
22	50	4.8	64		6.3																			
23	50	5.8	65		6.2																			
24	50	7.0	70		6.2																			
25	50	5.7	61		6.4																			
26	50	5.4	66		6.4																			
27	50	6.0	65		6.5																			
28	50	5.8	72		6.5																			
29	50	9.7	87		6.0																			
30	50	5.5	68		6.1																			
31																								
TOTAL	1500																							
ARITH. MEAN	50	5.9	70																					

MDPH
D-4.7

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH September, 19 78 — 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	105	5.2	4586	6.4	1505		166		7.0		67	10.7	1328	10			28	20.5	57	54	31				
2																									
3																									
4																									
5	97	4.8	3911	6.2	1398		155		6.5		62	10.1	1100	8	3780		28	21.2	59	54	32				
6	105	5.0	4410	6.2	1505		166		7.0		67	10.5	888	4	3600		35	18.7	65	51	33				
7	97	4.3	3504	6.2	1398		155		6.5		62	10.5	936	6	3960		28	18.2	51	48	24				
8	105	4.2	3704	6.2	1505		166		7.0		67	10.6	1308	7	4500		35	19.2	67	52	35				
9																									
10																									
11																									
12	105	4.4	3881	6.3	1505		166		7.0		67	10.6	1022	6	3900		35	19.0	67	47	31				
13	112	5.6	4704	6.1	1613		179		7.5		71	10.7	1040	13	3360		35	19.1	67	49	33				
14	90	4.8	3629	6.1	1290		143		6.0		57	11.4	1016	5	3840		28	18.7	52	53	28				
15	75	4.5	2835	6.0	1075		119		5.0		48	11.3	936	8	4260		21	20.7	43	51	22				
16																									
17																									
18																									
19	105	4.9	4322	6.3	1505		166		7.0		67	11.2	1218	6	4500		35	19.6	69	48	33				
20	105	5.3	4675	6.2	1505		166		7.0		67	11.2	1068	9	3960		35	19.9	70	51	36				
21	105	5.2	4586	6.0	1505		166		7.0		67	11.4	1076	6	4320		35	18.2	64	54	34				
22	90	6.9	5216	6.1	1290		143		6.0		57	11.3	1332	7	4740		28	18.2	51	50	25				
23																									
24																									
25																									
26																									
27	105	5.4	4763	6.1	1505		166		7.0		67	10.9	1108	7	4140		35	19.6	69	51	35				
28	105	4.9	4322	6.1	1505		166		7.0		67	10.2	1100	7	4380		35	18.1	63	48	30				
29																									
30																									
31																									
Total	1506		63048		21669		2388		100.5		960						476		914		462				
Arith. Means	100	5.0	4203		1441		159		6.7		64		1098	7	4089		32	19.3	61	51	31				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

October, 19 78 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
IP | 130029 | 10 | 78 | 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	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				59	7.7	124	2472	78	1555	2.50	50	64		C		
02	4	.16			59	7.7	122	2432	114	2273	2.90	58	90		C		
03	4	.07			59	8.0	100	1953	68	1355	2.80	56	42		C		
04	4	.02			59	8.0	116	2312	72	1435	2.20	40	52		C		
05	4	.73			59	8.2	104	2073	122	2432	7.00	140	120		C		
06	4	.12			59	8.0									C		
07	1				59	7.8									C		
08	4	.06			59	7.8	106	2113	58	1156	.80	16	38		C		
09	1				59	7.8	132	2631	136	2711	2.60	52	118		C		
10	1				59	7.7	114	2272	68	1355	2.30	46	58		C		
11	3				59	7.9	60	1196	72	1435	2.30	46	58		C		
12	4	.04	2.42		59	7.8	80	1615	82	1655	2.40	48	74		C		
13	1		2.41		59	7.5									C		
14	4	.03	2.32		58	7.5									C		
15	4	.54	2.43		58	7.7	148	2999	92	1864	2.90	59	70		C		
16	4	.06	2.44		57	6.9	102	2076	68	1384	2.80	57	60		C		
17	1		2.47		57	6.4	44	906	60	1236	2.50	51	52		C		
18	1		2.35		57	6.4									C		
19	1		2.40		57	7.5	114	2282	134	2682	3.80	76	108		C		
20	1		2.36		58	7.5									C		
21	1		2.26		59	7.5									C		
22	4	.36	2.34		58	7.5	132	2576	50	976	2.20	43	44		C		
23	3		2.38		57	7.5	124	2461	160	3176	2.90	58	116		C		
24	1		2.33		57	7.4	116	2254	128	2487	3.40	66	86		C		
25	4	.53	2.50		57	7.6	80	1668	76	1585	2.70	56	62		C		
26	4	.05	2.39		57	7.4	76	1515	60	1196	2.40	48	50		C		
27	1		2.41		57	7.6									C		
28	1		2.40		57	7.6									C		
29	1		2.31		57	7.5	80	1541	70	1349	2.50	48	52		C		
30	1		2.42		57	7.6	98	1978	50	1009	2.50	50	36		C		
31	1		2.45		56	7.5	62	1267	38	776	1.80	37	26		C		
TL		2.77	7408					44632		30782		1201			C		
ME			2.39				102	2029	84	1399	2.74	55	67		C		

2.39

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

October, 19 78
Month

Marshall, Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID 0300.29 10 78
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
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	1076	44	877	1.95	39	36									C		
02	78	1555	48	957	2.55	51	44									C		
03	70	1395	48	957	2.20	44	32									C		
04	118	2352	38	757	1.90	38	32									C		
05	92	1834	42	837	2.10	42	30									C		
06																C		
07																C		
08	108	2153	60	1196	.90	18	56									C		
09	70	1395	62	1236	2.40	48	52									C		
10	104	2073	40	797	2.10	42	38									C		
11	40	797	56	1116	1.90	38	44									C		
12	62	1251	40	807	2.10	42	32									C		
13																C		
14																C		
15	80	1621	56	1135	2.90	59	52									C		
16	98	1994	28	570	2.60	53	20									C		
17	24	494	22	453	2.25	46	15									C		
18																C		
19	64	1281	100	2002	2.50	50	75									C		
20																C		
21																C		
22	82	1600	46	898	2.30	45	32									C		
23	66	1310	38	754	2.50	50	20									C		
24	100	1943	44	855	2.70	52	32									C		
25	46	959	28	584	2.30	48	14									C		
26	62	1236	36	718	2.20	44	32									C		
27																C		
28																C		
29	54	1040	28	539	2.30	44	12									C		
30	108	2180	50	1009	2.10	42	38									C		
31	42	858	32	654	1.95	40	24									C		
TL		32397		19708		975										C		
ME	74	1473	45	896	2.21	44	35									C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

October, 19 78 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
ID | 13,0,0,2,9 | 10 | 78 | ..
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		3.6								181			61	C	8	
02			3.6	5.7	.46	1862	1142	18.0	1.01	1.4	175	.56	56	59	C		
03			3.6	7.7	.40	2221	1346	21.0	1.06	1.1	166	.68	59	59	C	29	
04			3.6	6.9	.41	2030	1397	19.0	1.07	1.4	177	.59	59	60	C		
05			3.6	5.9	.43	1647	1399	22.0	.75	1.3	168	.72	62	59	C	13	
06			3.6	7.6	.43	2211	1400	22.0	1.00	2.3	174	.70	60	59	C	32	
07			3.6								186			59	C		
08			3.6								186			59	C	55	
09			3.6	5.2	.59	1686	943	15.0	1.12	3.4	180	.52	51	59	C	1	
10			3.6	6.5	.51	2080	1179	18.0	1.16	2.4	177	.59	55	57	C		
11			3.6	7.3	.45	2381	1272	21.0	1.13	1.4	177	.70	55	58	C	25	
12			3.6	7.2	.48	2331	1195	19.0	1.23	3.0	179	.66	54	57	C	31	
13			3.6	6.2	.51	2005	1126	16.0	1.25	4.2	177	.59	52	57	C		
14			3.7								181			59	C	19	
15			3.5								171			57	C	39	
16			3.5	5.6	.51	1989	1064	16.0	1.24	4.2	169	.61	53	57	C	7	
17			3.5	7.7	.46	2268	1019	19.0	1.19	4.7	169	.70	44	55	C	42	
18			3.7	7.0	.41	1981	1098	15.0	1.32	4.5	168	.56	58	59	C		
19			3.6	7.5	.31	2460	1591	18.0	1.37	2.4	167	.67	61	58	C	24	
20			3.7	6.3	.54	2041	819	16.0	1.28	4.5	166	.58	45	58	C	25	
21			3.8								162			61	C		
22			3.7								158			59	C	27	
23			3.6	5.6	.43	1753	1038	14.0	1.25	4.3	167	.56	54	58	C		
24			3.7	7.0	.38	2189	1245	18.0	1.22	3.6	169	.68	51	60	C		
25			3.4	8.4	.32	2568	1489	21.0	1.22	1.5	138	.74	59	58	C	38	
26			3.6	6.9	.33	2155	1292	17.0	1.27	2.0	156	.61	56	62	C	7	
27			3.6	7.7	.33	2313	1302	19.0	1.22	1.8	158	.65	52	61	C	29	
28			3.6								166			63	C		
29			3.7								166			65	C		
30			3.6								158			53	C	21	
31			3.5	9.6	.31	2445	1502	20.0	1.22	1.2	150	.49	62	49	C	18	
TL															C	490	
ME			3.6	6.9	.43	2125	1231	18.3	1.17	2.7	164	.63	55	59	C	24.5	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

October, 19 78 (Month) — Marshall (Municipality), Michigan — Robert J. Swaldell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
ID 1300.29 (Plant No.) 10 (Mo.) 78 (Yr.) 000 (Sampling Point Code)

DAY	BOD-5 9	BOD-5 14	BOD-5 19	SS 24	SS 29	SS 34	TOTAL-P 39	TOTAL-P 44	TOTAL-P 49	VSS 54	NH_3-N 59	pH 64	DO 69	F. COLI* 74	80	T. COLI* 3	REMARK 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	458	81	4	80	95	.21	4	92	2		7.7			C		
02	10	199	92	2	40	98	.19	4	93	1		7.5	5.7	2	C		
03	6	120	94	5	100	93	.19	4	93	2		7.7	4.1	8	C		
04	9	179	92	5	100	93	.15	3	93	4		7.7	5.1	2	C		
05	9	179	91	2	40	98	.24	5	97	1		8.0	4.5	4	C		
06												7.8	5.1	4	C		
07												7.7			C		
08	3	60	97	5	100	91	.12	2	85	3		7.7			C		
09	5	100	96	5	100	96	.18	4	93	4		7.9	6.8	2	C		
10	12	239	89	3	60	96	.15	3	93	2		7.8	6.1	2	C		
11	3	60	95	8	159	89	.18	4	92	5		7.9	5.9	2	C		
12	8	161	90	4	81	95	.18	4	93	3		7.9	6.2	2	C		
13												7.9	4.2	2	C		
14												7.8			C		
15	12	243	92	7	142	92	.26	5	91	6		7.9			C		
16	23	468	77	1	20	99	.21	4	93	1		6.8	7.4	2	C		
17	3	62	93	2	41	97	.23	5	91	1		6.3	7.5	2	C		
18												6.8	7.9	8	C		
19	37	741	68	3	60	98	.38	8	90	2		7.4	5.5	40	C		
20												7.4	6.8	26	C		
21												7.3			C		
22	13	254	90	2	39	96	.18	4	92	1		7.4			C		
23	23	457	81	2	40	98	.21	4	93	1		7.4	7.7	10	C		
24	21	408	82	6	117	95	.21	4	94	4		7.4	5.6	6	C		
25	20	417	75	2	42	97	.24	5	91	1		7.5	4.5	28	C		
26	8	159	84	4	80	93	.20	4	92	3		7.4	6.3	18	C		
27												7.5	5.6	20	C		
28												7.5			C		
29	15	289	81	8	154	98	.21	4	92	5		7.5			C		
30	23	464	77	3	61	94	.24	5	90	2		7.4			C		
31	11	225	82	3	61	92	.28	6	84	2		7.3	5.1	6	C		
TL		5942			1717			95							C		
ME	13	270	87	4	78	95	.21	4	92	3		7.5	5.9	6	C		
WA	20	401		5	94									18	C		

• Digester Volume, ft^3
• Primary _____
• Secondary _____

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.5

Marshall, MICHIGAN

Supernatant To _____
Process Pattern _____

MONTH October 1978

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	5.6	68		6.1	86																		
2	50	5.2	70		6.6	86																		
3	50	6.2	63		6.9	89																		
4	50	5.1	66		7.5	90																		
5	50	5.3	63		7.1	91																		
6	50	5.8	71		7.6	92																		
7	50	4.1	85		7.4	93																		
8	45	5.6	70		7.4	94																		
9						95																		
10	60	5.9	68		7.4	96																		
11	60	10.8	86		6.5	94																		
12	40	4.1	69		7.3	94	7.2														3.0	67		
13	40	6.9	65		7.1	95																		
14	40	5.8	67		7.1	95																		
15	40	7.4	71		7.3	95																		
16	40	6.3	66		6.5	91																		
17	40	5.4	68		6.4	91																		
18	40	5.5	69		6.9	92	7.0														3.9	55		
19	40	5.8	62		7.1	92																		
20						92	7.0														3.9	55		
21	40	8.0	49		6.9	94																		
22	40	6.4	63		6.8	96																		
23						96																		
24	50	6.5	64		6.7																			
25	50	6.9	63		6.4																			
26	58	10.8	82		5.9	81																		
27	50	6.5	64		6.6	81	7.0																	
28	50	6.4	71		6.5	86	7.0																	
29	50	6.4	67		6.6	86																		
30	40	6.5	38		6.6	80																		
31	50	8.6	50		6.5	83																		
TOTAL	1313																							
ARITH. MEAN	47	6.4	66			91															3.6	59		

MDPH
D-4.7

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH October, 19 78 — 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	105	4.9	4322	6.2	1700		166		7.0		67	11.7	1388	6	4140		35	19.7	69	50	34				
3	105	4.7	4145	6.5	1700		166		7.0		67	10.3	1096	6	4020		35	17.8	62	53	33				
4	105	4.9	4322	5.7	1700		166		7.0		67	10.7	1240	6	3660		35	18.3	64	51	33				
5	105	5.5	4851	6.4	1700		166		7.0		67	9.3	1188	4	2280		35	18.1	63	53	34				
6																									
7																									
8																									
9																									
10																									
11																									
12																									
13																									
14																									
15																									
16																									
17																									
18																									
19																									
20																									
21																									
22																									
23																									
24																									
25																									
26	105	5.2	4586	7.0	1700		166		7.0		67	12.2	716	15	1740		28	17.8	50	41	20				
27	105	3.9	3440	7.0	1700		166		7.0		67	12.0	1488	11	3180		28	17.5	49	39	19				
28																									
29																									
30	105	4.4	3881	7.0	1700		166		7.0		67	11.9	1518	4	3300		35	17.3	61	42	25				
31	105	4.9	4322	6.9	1700		166		7.0		67	12.5	956	19	3600		35	17.5	61	44	27				
Total	840		33896		13600		1328		56		536						266		479		225				
Arith. Means	105	4.8	4237		1700		166		7.0		67		1200	9	3240		33	18.0	59	47	28				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

October, 19 78 — Month

Marshall, Michigan — Municipality

Robert J. Swaskell — Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID 130029 10 78 ..
Plant No Mo. Yr Sampling Point Code

DAY 1 2	GRIT 9 CF	AUX. FUEL 14 GOS 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		26	2286			10	794				
02		24	2646			10	993				
03		24	2520			20	794				
04		24	2640			10	993				
05		24	2520			20	794				
06		23	2400			20	794				
07		14	2400			20	397				
08		33	2400			30	596				
09		24	2400			10	397				
10		24	2400			10	596				
11		24	2400			10	397				
12		23	2400			20	397				
13		24	2400			10	397				
14		24	2280			10	596				
15		22	2640			20	596				
16		29	2520			20	397				
17		33	1800			10	596				
18		32	2520			10	397				
19		33	2400			20	397				
20		28	2280			10	397				
21		29	2400			10	596				
22		6	2280			20	596				
23			2400			30	397				
24			2400			10	596				
25			2280			20	794				
26			2640			10	794				
27		23	2640			10	794				
28		33	2400			20	397				
29		43	2760			20	794				
30		2	2520			20	794				
31		1	2520			20	596				
TL		649	75480			490	18863				
ME		24	2435			16	608				

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

November, 19 78 (Month) — Marshall (Municipality), Michigan — Robert J. Swabell (Superintendent's Signature)

1 2: IP | 3–8: 130029 (Plant No.) | 9 10: 11 (Mo.) | 11 12: 78 (Yr.) | 13–15: 500 (Sampling Point Code)

DAY 1 2	WEATHER TYPE 9	WEATHER PRECIP. 14	FLOW TOTAL 19	FLOW MAX RATE 24	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	REMARKS OR 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		2.40		56	7.5	98	1962	100	2002	3.10	62	72		C		
02	1		2.49		56	7.4	106	2201	74	1536			70		C		
03	1		2.40		56	7.4									C		
04	1		2.32		57	7.4									C		
05	1		2.35		56	7.5	76	1490	80	1568	2.40	47	60		C		
06	4	.33	2.45		56	7.5	120	2452	160	3269	3.30	67	126		C		
07	1		2.36		56	7.5	86	1693	108	2126	5.15	101	92		C		
08	1		2.19		56	7.4	84	1534	58	1059	2.60	48	50		C		
09	1		2.32		56	7.5	110	2128	98	1896	2.60	50	70		C		
10	1		2.17		56	7.5									C		
11	4	.03	2.18		56	7.5									C		
12	4	.01	2.13		56	7.5	86	1528	60	1066	2.30	41	46		C		
13	4	.19	2.25		56	7.1	80	1501	32	601	2.25	42	26		C		
14	1		2.22		56	7.2	70	1296	66	1222	2.55	47	42		C		
15	1		2.14		56	7.5	60	1071	48	857			38		C		
16	4	.20	2.18		55	7.2	70	1273	74	1345	2.30	42	58		C		
17	4	.37	2.21		56	7.2									C		
18	3		2.22		56	7.2									C		
19	1		2.16		56	7.3	94	1693	70	1261	2.20	40	62		C		
20	1		2.16		50	7.5									C		
21	1		2.24		52	7.5	86	1607	62	1158	2.40	45	30		C		
22	4	.46	2.28		54	7.4									C		
23	3		2.13		54	7.4									C		
24	3		2.30		54	7.4									C		
25	3		2.20		54	7.5									C		
26	5	.30	2.19		54	7.5									C		
27	5	.16	2.29		54	7.4	100	1910	70	1337	2.70	52	52		C		
28	1		2.35		54	7.7	64	1254	66	1294	2.50	49	56		C		
29	1		2.24		54	7.5	80	1494	78	1457	2.25	42	58		C		
30	5	.03	2.32		54	7.4	82	1587	56	1084	2.90	56	38		C		
31															C		
TL		2.08	6784					29674		26138		831			C		
ME			2.26				86	1649	76	1452	2.72	52	58		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

November, 19 78
Month

Marshall, Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID 130029 11 78 ...
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
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	1241	40	801	2.25	45	34									C		
02	76	1578	34	706			28									C		
03																C		
04																C		
05	54	1058	48	941	2.25	44	38									C		
06	68	1389	76	1553	2.30	47	66									C		
07	64	1260	50	984	4.50	89	34									C		
08	70	1279	50	913	2.60	47	42									C		
09	108	2090	54	1045	2.25	44	46									C		
10																C		
11																C		
12	78	1386	122	2167	2.30	41	42									C		
13	70	1314	50	938	2.20	41	36									C		
14	72	1333	74	1370	2.80	52	64									C		
15	58	1035	26	464			14									C		
16	48	873	44	800	2.10	38	34									C		
17																C		
18																C		
19	54	973	56	1009	2.40	43	48									C		
20																C		
21	60	1121	32	598	2.20	41	25									C		
22																C		
23																C		
24																C		
25																C		
26																C		
27	82	1566	56	1070	2.50	48	38									C		
28	50	980	36	706	2.10	41	34									C		
29	58	1084	36	673	1.70	32	28									C		
30	62	1200	58	1122	2.40	46	42									C		
31																C		
TL		22760		17860		739										C		
ME	64	1264	52	992	2.43	46	39									C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

November, 19 78 (Month) — Marshall (Municipality), Michigan — Robert J. Swaldell (Superintendent's Signature)

1 2: IP — 3–8: 130029 (Plant No.) — 9 10: 11 (Mo.) — 11 12: 78 (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		3.6	9.8	.30	2265	1359	19.0	1.19	1.5	151	.75	54	50	C	19	
02			3.5	8.9	.31	2167	1386	19.0	1.14	1.5	142	.71	59	49	C	11	
03			3.6	9.3	.37	2165	1600	19.0	1.14	1.5	134	.72	60	50	C	1	
04			3.7								132			51	C	11	
05			3.7								133			52	C	22	
06			3.5	6.2	.23	1847	1061	18.0	1.03	.3	137	.61	57	51	C		
07			3.7	7.7	.33	2370	1489	22.0	.88	2.0	147	.70	59	52	C	32	
08			3.9	6.9	.31	1963	1196	19.0	1.03	2.1	148	.58	59	56	C		
09			3.7	7.1	.29	2292	1371	25.0	.92	2.0	136	.65	58	53	C	30	
10			4.0	5.6	.30	1927	1311	17.0	1.13	1.6	130	.55	67	56	C		
11			4.0								134			54	C	33	
12			4.0								140			62	C		
13			3.8	4.7	.30	1872	1359	16.0	1.17	2.0	171	.54	74	60	C		
14			3.9	5.5	.35	2176	1635	20.0	1.08	2.4	201	.59	74	56	C	32	
15			4.0	4.4	.26	1675	1146	15.0	1.12	5.5	200	.55	67	56	C		
16			4.0	5.4	.34	1983	1479	18.0	1.10	3.5	194	.62	73	54	C		
17			3.9								187			53	C		
18			3.9								195			52	C	34	
19			4.0								199			53	C	4	
20			4.0	5.5	.34	2021	1430	20.0	1.01	4.5	200	.66	68	54	C		
21			3.8	6.7	.41	2566	1620	22.0	1.17	1.5	190	.70	61	51	C	32	
22			3.8	5.2	.31	1914	1240	18.0	1.06	4.2	181	.60	59	51	C		
23			4.0								175			54	C		
24			3.7								181			50	C	44	
25			3.9								182			53	C	4	
26			3.9								168			53	C		
27			3.8	5.4	.25	2001	853	20.0	1.00	4.2	203	.73	84	51	C		
28			3.7	7.7	.36	2260	1425	21.0	1.08	2.7	214	.78	59	49	C	31	
29			3.8	9.9	.33	1925	1198	18.0	1.07	3.3	205	.62	57	52	C		
30			3.7	8.8	.33	2319	1260	21.0	1.10	2.4	208	.68	53	50	C	30	
31															C		
TL															C	370	
ME			3.8	6.9	.32	2143	1338	19.6	1.07	2.6	171	.70	63	53	C	23	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

November, 19 78 — Month

Marshall — Municipality, Michigan

Robert L. Sandell — Superintendent's Signature

1 2: 10 — Plant No
3–8: 130029 — Mo.
9 10: 11 — Yr
11 12: 78
13–15: 000 — Sampling Point Code

DAY	BOD-5 9	BOD-5 14	BOD-5 19	SS 24	SS 29	SS 34	TOTAL-P 39	TOTAL-P 44	TOTAL-P 49	VSS 54	NH_3-N 59	pH 64	DO 69	F. COLI* 74	80	T. COLI* 9	REMARK 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	13	260	87	6	120	94	.28	6	91	3		7.3	6.6	10	C		
02	13	270	88	3	62	96				2		7.4	5.8	32	C		
03												7.3	5.4	20	C		
04												7.4			C		
05	10	196	87	6	118	93	.27	5	89	4		7.4			C		
06	11	225	91	18	368	89	.32	7	90	15		7.4	5.5	8	C		
07	11	217	87	9	177	95	.50	10	90	3		7.3	4.2	394	C		
08	8	146	90	7	128	88	.33	6	87	6		7.3	5.2	2	C		
09	17	329	85	8	155	92	.46	9	82	6		7.4	5.1	10	C		
10												7.5	5.6	28	C		
11												7.4			C		
12	11	195	87	9	160	85	1.00	18	56	7		7.4			C		
13	18	338	78	5	94	84	.90	17	60	2		7.3	5.0	2	C		
14	8	148	89	9	167	86	.95	18	63	6		7.5	6.1	14	C		
15	7	125	88	2	37	96				1		7.5	7.7	10	C		
16	6	109	91	6	109	92	.35	6	85	5		7.4	6.9	6	C		
17												7.5			C		
18												7.4			C		
19	14	252	85	9	162	87	.42	8	81	8		7.5			C		
20												7.3	7.1	6	C		
21	7	131	92	10	187	84	.35	7	85	2		7.3	6.6	2	C		
22												7.3	8.2	6	C		
23												7.3			C		
24												7.4			C		
25												7.4			C		
26												7.4			C		
27	6	115	94	5	95	93	.42	8	84	3		7.3	6.0	2	C		
28	6	118	91	11	216	83	.41	8	84	7		7.4	4.9	2	C		
29	4	75	95	4	75	95	.22	4	90	2		7.3	6.7	2	C		
30	5	97	94	12	232	79	.32	6	89	8		7.2	6.5	2	C		
31															C		
TL		3346			2737			143							C		
ME	10	186	89	8	152	90	.47	9	82	5		7.4	6.1	7	C		
WA	12	235	86	9	178									20	C		

Digester Volume, ft^3
Primary _____
Secondary _____

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MDPH
D-4.5

Supernatant To _____
Process Pattern _____

MONTH November 19 78

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE Gals. X 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	50	6.6	67		6.5																			
2	50	6.2	63		6.7																			
3	50	8.2	71		6.7																			
4	50	6.7	60		6.6																			
5	50	6.5	60		6.7																			
6	50	7.0	61		6.6																			
7	50	7.1	65		6.8																			
8	50	6.7	65		6.6																			
9	50	6.9	61		6.6																			
10	50	6.2	65		6.6																			
11	50	4.8	58		6.7																			
12	50	6.2	63		6.7																			
13	50	6.0	62		6.4																			
14	50	6.0	63		6.3																			
15	50	6.1	63		6.3																			
16	50	6.2	59		6.3																			
17	40	6.4	74		6.4																			
18	50	5.7	64		6.4																			
19	50	4.8	78		6.6																			
20	35	5.9	70		6.2																			
21																								
22																								
23	20	6.8	74		6.6																			
24	40	6.8	74		6.6																			
25	40	5.7	63		6.7																			
26	44	5.6	65		6.6																			
27	40																							
28	50	2.9	68		6.0																			
29	40	5.8	62		6.1																			
30	40	6.1	59		6.7																			
31																								
TOTAL	1289																							
ARITH. MEAN	46	6.1	65																					

MDPH
D-4.7

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH November, 1978 — 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	95	3.5	2793	6.9	1659		166		7.0		67	12.4	2916	18	2340		28	19.1	53	38	20				
2	95	4.5	3591	6.9	1659		166		7.0		67	11.8	1534	9	3360		28	17.8	50	45	22				
3	81	5.1	3470	6.9	1422		142		6.0		57	11.7	1486	17	2880		28	17.5	49	44	22				
4																									
5																									
6	95	4.4	3511	7.1	1659		166		7.0		67	11.7	1818	16	2340		28	17.5	49	44	22				
7	95	3.6	2873	7.0	1659		166		7.0		67	11.7	1050	10	1740		28	17.3	48	40	19				
8	95	4.6	3671	7.0	1659		166		7.0		67	11.8	718	13	2760		28	17.3	48	44	21				
9	95	3.7	2953	7.2	1659		166		7.0		67	11.5	1628	17	2940		35	18.5	65	43	28				
10	95	4.0	3192	6.9	1659		166		7.0		67	11.8	1766	9	3660		35	16.7	58	44	26				
11																									
12																									
13	88	4.1	3031	7.0	1541		154		6.5		62	11.4	1446	23	1980		28	17.8	50	42	21				
14	95	3.7	2953	7.1	1659		166		7.0		67	11.6	1694	18	1980		28	17.4	49	40	19				
15																									
16	81	4.9	3334	7.0	1422		142		6.0		57	11.8					21	20.7	43	40	17				
17	81	4.7	3198	7.0	1422		142		6.0		57	11.8	1766	17	1980		21	20.7	43	42	18				
18																									
19																									
20	54	5.1	2313	6.9	948		95		4.0		38	11.8					14	19.3	27	43	12				
21	95	5.0	3990	6.9	1659		166		7.0		67						21	20.7	43	40	17				
22	95	4.5	3591	6.9	1659		166		7.0		67						28	20.8	58	38	22				
23																									
24																									
25																									
26																									
27	81	4.4	2993	7.0	1422		142		6.0		57	11.5	1764	18	1320		21	23.1	49	36	17				
28	95	4.4	3511	7.0	1659		166		7.0		67	11.5	1764	18	1320		21	23.1	49	36	17				
29	88	4.1	3031	7.1	1541		154		6.5		62	11.6	962	60	1260		21	22.7	48	35	17				
30	95	3.9	3112	6.4	1659		166		7.0		67	11.1	1814	14	1680		28	21.4	60	42	25				
31																									
Total	1694		61111		29626		2963		125.0		1194						490		939		382				
Arith. Means	89	4.3	3216		1559		156		6.6		63		1608	18	2236		26	19.4	49	41	20				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

November, 19 78 — Month

Marshall, Michigan — Municipality

Robert J. Swalwell — Superintendent's Signature

1 2: IP | 3–8: 130029 (Plant No.) | 9 10: 11 (Mo.) | 11 12: 78 (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		2									
01			2640			10	794				
02			2520			20	794				
03			2400			10	596				
04			2400			10	596				
05			2040			10	794				
06			2520			20	794				
07			2640			30	379				
08			2520			20	794				
09			2520			10	397				
10			2400			10	397				
11			2160			20					
12			2520			20	199				
13			2640			10	397				
14			2760			10	397				
15			2640			20	397				
16			2640			10	596				
17		16	2520			10	397				
18			2400			20	596				
19		9	2880			30	397				
20		8	2760			20	397				
21		20	2880			10	596				
22		10	2640			20	794				
23			2400			10	397				
24			2400			10	397				
25			2280			30					
26		1	2880			20					
27		25	2880			10	596				
28		11	2760			10	596				
29		103	2880			20	397				
30		91	2880			10	794				
31											
TL		294	77400			470	14675				
ME		29	2580			16	544				

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

PLANT INFLUENT SHEET

December, 19 78 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
IP | 130029 | 12 | 78 | 506
Plant No. Mo. Yr. Sampling Point Code

DAY 1 2	WEATHER TYPE 9	WEATHER PRECIP. 14	FLOW TOTAL 19	FLOW MAX RATE 24	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	.42	2.18		54	7.5									C		
02	5	.53	2.15		54	7.5									C		
03	5	.01	2.32		54	7.5	114	2206	72	1393	2.10	41	66		C		
04	3		2.38		54	7.6	78	1548	56	1112	2.90	58	50		C		
05	3		2.27		54	7.5	96	1817	98	1855	3.30	62	80		C		
06	3		2.20		54	7.4	80	1468	70	1284	2.55	47	64		C		
07	4+5	.46	2.26		54	7.4	84	1583	48	905			40		C		
08	3		2.41		54	7.4									C		
09	5	.06	2.19		54	7.4									C		
10	3		2.25		53	7.5	76	1426	58	1088	2.50	47	44		C		
11	3		2.24		52	7.0	90	1681	78	1457	2.60	49	68		C		
12	3		2.34		53	7.0	80	1561	68	1327	2.55	50	42		C		
13	5	.01	2.30		53	7.2	70	1343	78	1469	2.40	46	68		C		
14	1		2.20		52	7.5	110	2018	44	807	2.25	41	40		C		
15	1		2.14		52	7.5									C		
16	5	.03	2.10		53	7.4									C		
17	1		2.17		52	7.4	84	1520	68	1231	2.50	45	60		C		
18	1		2.15		52	7.4	90	1614	76	1363	2.30	41	68		C		
19	4	.02	2.14		52	7.6	78	1392	80	1428	2.40	43	66		C		
20	4	.18	2.24		52	7.6	118	2204	58	1084	2.50	47	48		C		
21	5	.02	2.14		52	7.5									C		
22	1		2.05		52	7.5									C		
23	1		2.14		52	7.4									C		
24	4+5	.14	2.13		52	7.5									C		
25	3		1.96		52	7.5	80	1308	28	458	1.95	32	18		C		
26	5	.03	2.12		52	7.6	128	2263	24	424			12		C		
27	3		2.13		52	7.5	88	1563	82	1457	2.10	37	78		C		
28	5	.05	2.21		51	7.5	84	1548	72	1327	2.90	53	48		C		
29	4+5	.30	2.13		51	7.4									C		
30	4	.22	2.22		51	7.4									C		
31	4	.92	2.30		51	7.4									C		
TL		3.40	68.16					30063		21469		739			C		
ME			2.20				90	1670	64	1193	2.49	46	53		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

December, 19 78 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
IP | 1306.29 | 12 | 78 | ..
Plant No. Mo. Yr. Sampling Point Code

DAY 1 2	BOD-5 9 14 mg/l	BOD-5 9 14 LBS.	SS 19 24 mg/l	SS 19 24 LBS.	TOTAL-P 29 34 mg/l	TOTAL-P 29 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
PN	00310	85001	00530	85002	00665	85004	00535	00610	C		
SF									C		
01									C		
02									C		
03	62	1200	36	697	1.95	38	26		C		
04	58	1151	12	238	2.25	45	6		C		
05	74	1401	52	984	2.60	49	42		C		
06	66	1211	40	734	2.25	41	34		C		
07	74	1395	36	679			28		C		
08									C		
09									C		
10	68	1276	62	1163	2.90	54	18		C		
11	68	1270	52	971	2.20	41	42		C		
12	60	1171	24	468	2.30	45	6		C		
13	54	1036	42	806	2.20	43	32		C		
14	66	1211	24	440	2.20	40	16		C		
15									C		
16									C		
17	60	1086	64	1158	4.05	73	54		C		
18	70	1255	60	1076	2.00	36	46		C		
19	80	1428	36	643	2.00	36	28		C		
20	78	1457	46	859	1.95	36	42		C		
21									C		
22									C		
23									C		
24									C		
25	60	981	12	169	2.20	36	8		C		
26	104	1839	20	354			4		C		
27	74	1315	42	746	2.10	37	30		C		
28	64	1180	50	922	2.60	48	48		C		
29									C		
30									C		
31									C		
TL		22863		13107		698			C		
ME	69	1270	39	728	2.35	44	28		C		

DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

December, 19 78 — Month

Marshall, Michigan — Municipality

Robert J. Swalwell — Superintendent's Signature

1 2 3 8 9 10 11 12 13 15

IP | 1300229 | 12 | 78 | ..

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 69	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	6.9	.31	1868	1159	17.0	1.10	3.0	209	.71	57	53	C		
02			4.0								211			54	C		
03			3.7								201			50	C	47	
04			3.6	5.2	.22	1523	930	14.0	1.09	5.0	183	.48	57	49	C	49	
05			3.8	5.1	.20	1247	795	11.0	1.13	4.5	182	.40	60	53	C		
06			3.9	6.7	.29	1680	1081	14.0	1.20	3.5	187	.54	52	55	C		
07			3.8	8.6	.30	2023	1216	16.0	1.26	3.0	184	.66	57	50	C		
08			3.6	8.8	.31	2322	1370	20.0	1.16	2.5	193	.72	54	50	C	32	
09			3.9								194		53	53	C		
10			3.8								193			52	C	6	
11			3.8	7.4	.30	1998	1265	17.0	1.18	3.3	187	.66	58	53	C		
12			3.7	8.4	.29	2256	1286	20.0	1.13	3.0	178	.74	55	50	C	23	
13			3.7	7.8	.31	2105	1331	18.0	1.17	3.8	192	.65	85	50	C	21	
14			3.9	6.7	.30	1814	1185	16.0	1.13	4.5	187	.60	63	53	C		
15			4.0	8.0	.34	2109	1333	20.0	1.05	3.2	185	.67	61	54	C	9	
16			4.1								184			55	C		
17			4.0								189			52	C	42	
18			4.0	6.3	.28	1748	1087	17.0	1.02	3.0	184	.57	57	52	C	1	
19			4.0	7.0	.34	2042	1324	20.0	1.02	2.5	184	.68	57	50	C		
20			3.8	7.0	.34	2134	1435	22.0	.97	2.4	177	.72	62	48	C	37	
21			4.0	6.9	.29	1883	1177	21.0	.90	4.0	183	.61	56	51	C	1	
22			4.2								182			52	C		
23			4.0								183			49	C	31	
24			4.0								199			49	C	25	
25			4.4								198			56	C		
26			4.1	7.1	.25	1773	1093	18.0	.96	5.4	204	.65	57	51	C		
27			4.0	9.8	.30	2160	1340	21.0	1.03	3.6	198	.70	60	51	C		
28			3.9	9.7	.32	2391	1481	22.0	1.09	2.7	197	.83	60	48	C	41	
29			4.0	8.0	.25	1803	1143	18.0	1.00	4.2	195	.47	58	51	C		
30			3.9								195			48	C	31	
31			3.7								195			47	C		
TL															C	396	
ME			3.9	7.4	.29	1938	1244	18.0	1.08	3.5	191	63	62	51	C	26	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

December, 19 78 — Month

Marshall — Municipality, Michigan

Robert J. Swabwell — Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
IP 130029 12 78 000
Plant No. Mo. Yr. Sampling Point Code

DAY	BOD-5 9	BOD-5 14	BOD-5 19	SS 24	SS 29	SS 34	TOTAL-P 39	TOTAL-P 44	TOTAL-P 49	VSS 54	NH_3-N 59	pH 64	DO 69	F. COLI* 74	80	T. COLI* 9	REMARK 14 1
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	6.5	4	C		
02												7.3			C		
03	6	116	95	4	77	94	.26	5	88	2		7.3			C		
04	7	139	91	3	60	95	.32	6	89	2		7.3	7.7	2	C		
05	8	151	92	2	38	98	.33	6	90	1		7.3	7.5	2	C		
06	8	147	90	6	110	91	.34	6	87	4		7.2	6.6	2	C		
07	16	302	81	2	38	96				1		7.3	6.2	2	C		
08												7.3	5.7	2	C		
09												7.3			C		
10	11	206	86	9	169	84	.48	9	81	4		7.3			C		
11	7	131	92	7	131	91	.37	7	86	5		7.0	6.8	2	C		
12	8	156	90	2	39	97	.37	7	85	1		7.0	6.0	2	C		
13	10	192	86	8	153	90	.32	6	87	5		7.0	6.7	8	C		
14	10	183	91	1	18	98	.35	6	84	1		7.2	7.6	2	C		
15												7.2	6.5	2	C		
16												7.3			C		
17	7	127	92	2	36	97	.27	5	89	1		7.3			C		
18	7	126	92	2	36	97	.23	4	90	1		7.3	7.5	2	C		
19	11	196	86	4	71	95	.30	5	88	2		7.3	6.3	2	C		
20	8	149	93	6	112	90	.27	5	89	4		7.3	5.4	2	C		
21												7.4	7.2	4	C		
22												7.5			C		
23												7.5			C		
24												7.4			C		
25	21	343	74	1	16	96	.05	1	97	0		7.4			C		
26	7	124	95	3	53	88				2		7.5	4.2	2	C		
27	7	124	92	4	71	95	.24	4	88	2		7.5	8.0	2	C		
28	4	74	95	4	74	94	.30	6	90	2		7.3	7.8	2	C		
29												7.3	9.0	2	C		
30												7.3			C		
31												7.3			C		
TL		2986			1302			88							C		
ME	9	166	90	4	72	94	.31	6	88	2		7.3	6.8	2	C		
WA	11	188		5	94									3	C		

Digester Volume, ft³
Primary _____
Secondary _____

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

MDPH
D-4.5

Marshall, MICHIGAN

Supernatant To _____
Process Pattern _____

MONTH December 1978

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE Gals. 180 X	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	40	4.5	93		6.2																			
2	40	7.3	73		6.1																			
3	40	6.1	67		6.1																			
4	40	5.7	67		6.1																			
5	40	5.8	73		6.3																			
6	40	5.5	91		6.2																			
7																								
8	50	6.3	43		6.3																			
9	40	5.9	59		6.2																			
10	40	6.4	69		6.3																			
11	40	5.9	71		6.3																			
12	40	5.6	65		6.3																			
13	40	5.0	73		6.3																			
14	40	5.4	70		6.3																			
15	40	5.8	46		6.4																			
16	40	5.6	63		6.3																			
17	30	5.5	55		6.3																			
18	40	7.2	82		6.4																			
19	40	5.9	67		6.3																			
20	40	5.5	63		6.3																			
21	40	5.8	66		6.3																			
22	40	5.7	67		6.3																			
23	40	5.5	59		6.2																			
24	40	5.8	66		6.3																			
25	40	5.6	70		6.4																			
26																								
27	40	5.2	74		6.2																			
28	40	5.3	68		6.2																			
29	40	5.8	61		6.2																			
30	40	7.1	73		6.3																			
31	40	5.4	62		6.2																			
TOTAL	1160																							
ARITH. MEAN	40	5.8	67																					

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

December, 19 78 — Month

Marshall, Michigan — Municipality

Robert J. Swalwell — Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
IP | 1300.29 | 12 | 78 | ..
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		79	2760			20	596				
02		81	2520			20	596				
03		76	2760			10	496				
04		94	2760			10	695				
05		52	3000			10	794				
06		83	2880			10	596				
07		72	3360			10	596				
08		76	3120			10	596				
09		89	3000			10	596				
10		86	2880			10	199				
11		74	3120			10	596				
12		69	3120			10	794				
13		79	3240			10	794				
14		78	3120			10	397				
15		66	2880			10	596				
16		67	2880			10	397				
17		70	3000			10	596				
18		68	3120			10	596				
19		75	3240			10	794				
20		74	3120			10	496				
21		71	3000			10	496				
22		81	3000			10	199				
23		63	2760			10	596				
24		71	2760			20	397				
25		73	3120			10	397				
26		82	3360			10	596				
27		86	3120			10	397				
28		80	3120			10	596				
29		71	3120			10	397				
30		72	2880			10	397				
31		67	2880			10	397				
TL		2325	93000			340	16681				
ME		75	3000			11	538				

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours
TOTAL	5		772
Superintendent	1		152
Asst. Supt.	1		152
Shift Foreman			
Shift Operator	3		468
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

January, 19 80
Month

Marshall, Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID 130029 01 80 600
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	°NH3-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		2.43		52	7.2	74	1500			1.95	40			C		
02	4	.03	2.62		52	6.4	106	2316	112	2447	2.90	63	92		C		
03	5	.01	2.56		52	6.8	94	2007	54	1153	2.00	43	34		C		
04	3		2.51		52	6.6									C		
05	3		2.38		51	6.7									C		
06	4	.14	2.38		51	6.7	109	2164	72	1429	1.90	38	54		C		
07	5	.03	2.44		50	6.6	80	1628	70	1424	1.90	39	60		C		
08	1		2.45		51	6.3	76	1553	62	1267	1.95	40	48		C		
09	1		2.55		50	6.5	110	2339	64	1361	2.20	47	46		C		
10	4	.40	2.57		50	7.0	116	2486	84	1800	1.90	41	44		C		
11	4	.18	2.53		51	6.5									C		
12	1		2.41		51	6.4									C		
13	3		2.42		51	6.5	90	1816	42	848	2.00	40	38		C		
14	3		2.51		50	6.6	88	1842	72	1507	1.65	35	56		C		
15	3		2.54		50	6.8	106	2245	66	1398	1.65	35	58		C		
16	4	.17	2.53		50	6.5	92	1941	64	1350	2.10	44	50		C		
17	3		2.51		51	6.4	126	2637	50	1047	1.90	40	46		C		
18	1		2.44		51	6.5									C		
19	1		2.41		51	6.5									C		
20	1		2.43		50	6.5	100	2027	66	1338	1.70	34	50		C		
21	4	.01	2.49		50	6.6	100	2077	98	2035	2.00	42	72		C		
22	5	.02	2.46		50	7.0	72	1477	66	1354	1.65	34	56		C		
23	5	.01	2.41		50	6.5	100	2010	68	1367	1.90	38	58		C		
24	5	.09	2.43		50	6.6	92	1864	54	1094	1.60	32	46		C		
25	3		2.41		50	6.5									C		
26	1		2.34		50	6.6									C		
27	5	.04	2.30		50	6.7	84	1611	154	2954	3.30	63	130		C		
28	5	.01	2.43		49	6.5	72	1459	72	1459	1.90	39	56		C		
29	3		2.43		49	6.4	120	2432	60	1216	1.65	33	26		C		
30	1		2.42		49	6.4	116	2341	80	1615	2.30	46	64		C		
31	1		2.49		49	6.4	106	2201	62	1288	2.10	44	46		C		
TL		1.14	76.23					45,973		32,751		950			C		
ME			2.46				97	1999	72	1489	2.00	41	56		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

January, 19 80
Month

Marshall, Michigan
Municipality

Robert J. Swabert
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID 130029 01 80 ..
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
																C		
PN	00310	85001	00530	85002	00665	85004	00535	00610								C		
SF																C		
01	26	527			.85	17										C		
02	44	961	36	787	1.65	36	26									C		
03	50	1068	30	641	1.30	28	20									C		
04																C		
05																C		
06	56	1112	28	556	1.10	22	24									C		
07	38	773	44	895	1.40	28	40									C		
08	80	1635	56	1144	1.80	37	46									C		
09	74	1574	46	978	1.60	34	30									C		
10	52	1115	34	729	1.55	33	24									C		
11																C		
12																C		
13	28	565	8	161	.90	18	6									C		
14	52	1089	62	1298	2.00	42	52									C		
15	40	847	28	593	.80	17	22									C		
16	80	1688	70	1477	1.45	31	46									C		
17	104	2177	20	419	1.70	36	16									C		
18																C		
19																C		
20	20	405	32	649	.85	17	22									C		
21	68	1412	70	1454	2.10	44	50									C		
22	68	1395	82	1682	1.45	30	58									C		
23	92	1849	60	1206	2.10	42	50									C		
24	66	1338	56	1135	1.70	34	46									C		
25																C		
26																C		
27	32	613	50	959	1.20	23	42									C		
28	54	1094	72	1459	1.90	39	58									C		
29	116	2351	56	1135	1.60	32	36									C		
30	46	928	30	605	1.55	31	24									C		
31	42	872	60	1246	1.90	39	42									C		
TL		27,388		21,208		710										C		
ME	49	1191	47	964	1.50	31	35									C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

January, 19 80 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
ID 13.0029 01 80 ..
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								177			48	C	10	
02			3.3	4.4	.30	1831	1364	19.0	96	2.7	186	.67	67	46	C	10	
03			3.4	5.8	.27	1928	1340	20.0	96	2.2	184	.66	68	48	C	10	
04			3.4	6.0	.25	1978	1417	21.0	94	2.6	180	.70	70	48	C	10	
05			3.6								178			49	C	10	
06			3.6								173			49	C	10	
07			3.5	6.6	.25	1971	1374	16.0	1.23	5.5	181	.58	67	49	C	10	
08			3.5	6.8	.25	2085	1473	18.0	1.16	2.6	182	.70	70	47	C	10	
09			3.4	7.2	.27	2043	1417	21.0	97	3.0	167	.71	68	47	C	10	
10			3.4	7.3	.29	2033	1395	21.0	97	2.4	175	.72	67	47	C	10	
11			3.4	8.2	.27	2107	1390	22.0	96	1.9	181	.73	67	47	C	10	
12			3.6								172			50	C	10	
13			3.6								173			49	C	10	
14			3.4	7.8	.26	2158	1474	21.0	1.03	2.8	174	.73	66	47	C	10	
15			3.4	7.3	.26	2072	1434	21.0	99	2.8	166	.68	61	48	C	10	
16			3.4	6.6	.30	2013	1382	21.0	96	3.2	171	.68	66	47	C	10	
17			3.4	7.5	.34	1992	1294	18.0	1.11	3.0	175	.68	67	47	C	10	
18			3.5	8.1	.37	2085	1118	21.0	99	4.2	176	.68	63	50	C	10	
19			3.6								176			51	C	10	
20			3.5								172			50	C	10	
21			3.5	6.9	.29	1951	1341	20.0	98	5.0	173	.65	68	51	C	10	
22			3.5	5.2	.29	1861	1235	20.0	93	3.2	181	.66	63	49	C	10	
23			3.6	5.6	.35	1891	1284	20.0	95	3.5	181	.62	66	50	C	10	
24			3.5	5.1	.37	1916	1291	21.0	91	3.2	176	.64	66	49	C	10	
25			3.6	5.0	.36	1899	1313	21.0	90	3.8	180	.66	66	50	C	10	
26			3.7								181			51	C	10	
27			3.7								179			51	C	10	
28			3.5	4.9	.29	2032	1345	20.0	1.01	4.4	184	.67	65	49	C	10	
29			3.5	4.9	.33	2137	1458	21.0	1.02	3.8	185	.70	67	49	C	10	
30			3.6	5.3	.32	2075	1426	21.0	.99	3.4	178	.69	67	49	C	10	
31			3.6	5.7	.30	2170	1484	21.0	1.03	4.0	178	.73	61	43	C	10	
TL															C	310	
ME			3.5	6.0	.30	2011	1366	20.2	1.00	3.3	177	.68	67	49	C	10	

Digester Volume, ft³
Primary _____
Secondary _____

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

R 4619
4833-5382

Supernatant To _____
Process Pattern _____

MONTH January 1980

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE Gals. X/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	50	4.4	77		5.8																			
2	50	4.4	83		5.5																			
3	50	5.2	69		5.9																			
4	30	5.7	77		5.9																			
5	30	5.5	75		5.7																			
6	50	5.2	71		6.0																			
7	50	5.9	71		5.9																			
8	50	4.8	49		5.8																			
9	50	3.1	61		5.9																			
10	50	5.2	69		6.1																			
11	50	5.7	70		6.1																			
12	30	5.2	71		6.1																			
13	30	3.2	69		6.0																			
14	50	5.7	40		5.8																			
15	50	5.0	69		5.7																			
16	50	5.0	68		5.8																			
17	50	5.4	68		5.8																			
18	50	5.3	67		5.9																			
19	30	5.4	69		6.0																			
20	30	5.1	73		6.0																			
21	50	3.8	80		6.0																			
22	50	4.7	66		6.2																			
23	50	4.0	58		5.8																			
24	50	3.6	52		5.6																			
25	50	6.3	82		6.0																			
26	30	5.5	69		5.9																			
27	30	4.6	69		5.9																			
28	50	5.5	64		5.8																			
29	50	5.5	64		5.6																			
30	50	5.1	69		5.8																			
31	50	4.9	61		5.8																			
TOTAL	1390																							
ARITH. MEAN	45	5.0	68																					

MDPH
D-4.7

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH January, 19 80 — 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	100	5.2	4318	5.6	1627		183		6.6		63	11.9	1086	5	3660		33	18.3	60	52	31				
3	100	4.9	4116	5.6	1627		183		6.6		63	11.5	1090	16	2640		31	18.7	57	50	29				
4	100	5.4	4536	5.5	1627		183		6.6		63	11.8	1424	9	3540		31	19.8	61	50	31				
5																									
6																									
7																									
8	100	5.5	4620	5.6	1627		183		6.6		63	12.1	1026	8	2880		32	17.8	62	53	33				
9	100	5.8	4872	5.7	1627		183		6.6		63	11.5	950	6	1320		34	19.4	66	48	32				
10	100	5.0	4200	5.8	1627		183		6.6		63	11.2	1110	7	3000		31	18.6	58	53	31				
11																									
12																									
13																									
14																									
15	100	4.5	3780	5.9	1627		183		6.6		63	11.5	974	9	1080		28	19.6	55	50	27				
16	100	4.0	3360	6.1	1627		183		6.6		63	11.5	1140	11	3420		24	20.6	50	43	21				
17	100	10.2	8568	6.0	1627		183		6.6		63	12.1	1470	7	3180		46	22.1	102	44	45				
18																									
19																									
20																									
21																									
22	100	5.3	4452	5.9	1627		183		6.6		63	11.3	866	12	2580		31	20.0	62	41	25				
23																									
24	100	6.8	5712	5.6	1627		183		6.6		63	10.5	486	12	1680		36	20.2	73	40	29				
25	100	6.0	5040	6.1	1627		183		6.6		63	11.5	1464	4	2526		36	18.6	67	45	30				
26																									
27																									
28																									
29	100	4.3	3612	5.8	1627		183		6.6		63	11.0	1078	6	2700		27	19.6	53	50	26				
30	100	4.0	3360	5.8	1627		183		6.6		63	11.3	1172	6	1500		27	18.5	50	49	24				
31	100	4.2	3528	5.9	1627		183		6.6		63	11.3	1674	5	2040		29	17.9	52	49	25				
Total	1500		69924		24405		2745		99		945						476		928		439				
Arith. Means	100	5.4	4662		1627		183		6.6		63		1134	8	2516		32	19.3	62	48	29				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

January, 19 80 (Month)

Marshall (Municipality), Michigan

Robert J. Swoboda (Superintendent's Signature)

1 2 ID | 3–8 130029 (Plant No.) | 9 10 01 (Mo.) | 11 12 80 (Yr.) | 13–15 (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		46	3000			15	199				
02		61	3360			10	794				
03		82	3360			10	695				
04		82	3240			5	596				
05		81	3120			5	99				
06		96	3120			5	199				
07		80	3240			15	496				
08		118	3360			10	695				
09		112	3660			10	893				
10		56	3120			10	496				
11		82	3120			10	397				
12		91	3120			10	397				
13		60	3000			10	397				
14		54	2880			10	496				
15		46	2880			10	695				
16		36	3000			10	794				
17		45	2760			10	596				
18		51	2760			10	199				
19		58	2880			10	397				
20		65	2760			10	298				
21		82	2880			10	298				
22		77	2880			10	596				
23		105	3000			10	794				
24		114	3000			10	596				
25		81	3240			5	596				
26		96	2760			5	496				
27		95	2760			10	298				
28		90	3000			10	298				
29		96	3240			10	596				
30		108	3000			10	596				
31		108	3000			10	397				
TL		2454	96500			295	15389				
ME		79	3113			9.5	496				

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, 19 80 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
IP | 1300291 | 02 | 80 | 500
Plant No | Mo. | Yr. | Sampling Point Code

DAY 1 2	WEATHER TYPE 9	WEATHER PRECIP. 14	FLOW TOTAL 19	FLOW MAX RATE 24	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		2.37		49	6.3									C		
02	3		2.31		49	6.4									C		
03	1		2.28		49	6.4	88	1673	96	1825	2.00	38	78		C		
04	1		2.41		49	6.7	112	2251	80	1608	1.95	39	78		C		
05	5	.05	2.40		49	6.6	96	1922	56	1121	1.70	34	42		C		
06	5	.01	2.38		49	6.5	122	2422	74	1469	2.40	48	64		C		
07	3		2.39		49	6.5	88	1754	64	1270			48		C		
08	5	.06	2.40		49	6.7									C		
09	5	.08	2.32		49	6.7									C		
10	3		2.35		49	6.7	106	2078	68	1333	1.45	28	50		C		
11	5	.03	2.36		49	6.6	134	2637	48	945	2.25	44	32		C		
12	1		2.36		49	7.0	112	2204	56	1102	1.80	35	30		C		
13	3		2.36		48	6.3	72	1417	52	1023	1.95	38	48		C		
14	5	.30	2.33		49	6.6	112	2176	68	1321	2.20	43	46		C		
15	5	.17	2.32		49	7.1									C		
16	3		2.31		49	7.0									C		
17	3		2.28		49	7.1									C		
18	1		2.36		48	7.2	132	2598	92	1810			46		C		
19	1		2.38		49	6.1	124	2461	84	1667	2.00	40	68		C		
20	1		2.34		49	6.1	98	1913	94	1834	1.95	38	82		C		
21	4	.70	2.43		49	6.6			86	1743	1.95	40	72		C		
22	4	.12	2.36		49	6.4									C		
23	4	.02	2.37		49	6.4									C		
24	1		2.33		49	6.5	118	2293	56	1088	1.45	28	46		C		
25	5	.04	2.44		49	7.0	112	2279	108	2197			102		C		
26	5	.02	2.45		48	6.8	72	1471	46	940	1.60	32	32		C		
27	5	.03	2.40		48	6.5	82	1641	58	1160	1.80	36	34		C		
28	3		2.40		48	6.4	104	2082	42	841	1.95	39	30		C		
29	3		2.39		48	6.5									C		
30															C		
31															C		
TL		1.63	6858					37272		26297		600			C		
ME			2.36				105	2071	70	1384	1.90	38	54		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

February, 19 80 — Month

Marshall — Municipality, Michigan

Robert J. Swalwell — Superintendent's Signature

1 2 3 8 9 10 11 12 13 15

ID | 1300.29 | 02 | 80 | ..

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
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	30	570	44	837	1.70	32	36								C		
04	86	1729	66	1327	1.70	34	54								C		
05	56	1121	64	1281	1.45	29	40								C		
06	30	595	28	556	1.30	26	20								C		
07	72	1429	58	1151			50								C		
08															C		
09															C		
10	124	2430	52	1019	1.80	35	48								C		
11	74	1456	52	1032	2.10	41	40								C		
12	40	787	44	866	1.65	32	30								C		
13	40	787	32	630	1.40	28	30								C		
14	64	1244	40	777	1.95	38	24								C		
15															C		
16															C		
17															C		
18	70	1378	52	1023			44								C		
19	96	1905	58	1151	1.40	28	46								C		
20	68	1327	68	1327	1.55	30	58								C		
21			82	1662	1.90	39	35								C		
22															C		
23															C		
24	72	1399	50	972	1.30	25	26								C		
25	72	1465	94	1913			80								C		
26	74	1512	80	1635	1.90	39	70								C		
27	74	1481	94	1882	1.55	31	66								C		
28	100	2002	62	1240	1.45	29	50								C		
29															C		
30															C		
31															C		
TL		24,626		22281		516									C		
ME	69	1368	57	1173	1.63	32	45								C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

February, 19 80 — Month

Marshall — Municipality, Michigan

Robert J. Swalwell — Superintendent's Signature

1 2 ID | 3–8 130029 Plant No. | 9 10 02 Mo. | 11 12 80 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		3.6	6.3	.25	2119	1433	21.0	1.00	3.5	179	.75	67	50	C	10	
02			3.7								180			52	C	10	
03			3.8								179			51	C	10	
04			3.6	6.3	.25	2206	1532	19.0	1.16	4.8	181	.77	68	49	C	10	
05			3.6	6.0	.27	2172	1495	20.0	1.09	3.2	178	.72	67	48	C	10	
06			3.6	6.7	.27	2117	1410	20.0	1.06	4.0	175	.72	67	51	C	10	
07			3.6	7.1	.22	2276	1577	21.0	1.08	2.7	178	.74	68	48	C	10	
08			3.6	6.3	.25	2015	1394	21.0	.96	2.7	177	.76	62	48	C	10	
09			3.7								175			49	C	10	
10			3.7								176			49	C	10	
11			3.7	6.3	.30	2072	1452	21.0	.99	4.7	178	.71	68	48	C	10	
12			3.7	6.1	.32	2093	1437	22.0	.95	4.1	179	.69	68	50	C	10	
13			3.7	7.2	.26	2251	1547	22.0	1.02	4.3	173	.72	61	51	C	10	
14			3.7	7.1	.29	2097	1421	22.0	.95	4.4	173	.69	65	52	C	10	
15			3.7	7.6	.28	2188	1476	22.0	.99	3.5	176	.70	67	53	C	10	
16			3.7								176			53	C	10	
17			3.8								177			54	C	10	
18			3.7								171			52	C	10	
19			3.6	7.0	.32	2179	1506	23.0	.95	3.3	167	.70	67	51	C	10	
20			3.7	6.5	.30	2092	1405	24.0	.87	3.4	167	.70	67	52	C	10	
21			3.5	4.9	.40	1780	1100	24.0	.74	3.8	166	.73	67	49	C	10	
22			3.7	6.2	.27	2221	1564	23.0	.97	5.0	166	.76	69	50	C	10	
23			3.6								170			51	C	10	
24			3.7								170			52	C	10	
25			3.5	4.6	.33	1782	1404	19.0	1.04	4.0	176	.70	68	50	C	10	
26			3.5	4.9	.31	2332	1630	23.0	1.01	4.4	175	.75	68	50	C	10	
27			3.6	4.8	.31	2388	1604	24.0	1.00	4.7	174	.73	66	50	C	10	
28			3.6	4.5	.34	2263	1559	24.0	.94	4.5	177	.74	67	51	C	10	
29			3.6	4.4	.33	2247	1602	24.0	.94	6.0	183	.72	67	51	C	10	
30															C		
31															C		
TL															C	290	
ME			3.6	6.0	.29	2154	1480	22.0	.99	4.1	175	.73	67	51	C	10	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

February, 19 80 — Month

Marshall, Michigan — Municipality

Robert J. Swalwell — Superintendent's Signature

1 2: IP | 3–8: 130029 (Plant No) | 9 10: 02 (Mo) | 11 12: 80 (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 FeCl3 LBS	44	49	54	59
PN											
SF		2									
01		113	2880			10	596				
02		87	2760			10	199				
03		98	2880			10	397				
04		88	2760			10	397				
05		88	2880			10	596				
06		92	2880			10	397				
07		90	2880			5	695				
08		80	2880			10	496				
09		74	2640			10	397				
10		81	2640			15	199				
11		85	2760			10	397				
12		79	2760			10	397				
13		84	2640			10	397				
14		77	2640			10	199				
15		69	2760			5	199				
16		81	2640			5	397				
17		89	2760			10	199				
18		63	2640			10	397				
19		53	2760			10	596				
20		49	2760			10	397				
21		43	2640			10	397				
22		56	2520			10	397				
23		75	2520			10	397				
24		73	2520			10	199				
25		91	2760			10	596				
26		79	2880			10	397				
27		79	2760			10	794				
28		91	3000			10	596				
29		101	3000			10	596				
30											
31											
TL		2308	79800			280	12393				
ME		80	2752			10	427				

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

R 4619
4833–5382

Marshall, MICHIGAN

Supernatant To _____
Process Pattern _____

MONTH February 19 80

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	6.4	78		5.7																			
2	30	5.0	67		5.8																			
3	30	5.0	65		5.8																			
4	50	5.5	69		6.0																			
5	50	4.8	72		5.7																			
6	50	5.4	70		5.8																			
7	50	5.3	66		5.7																			
8	50	5.0	70		6.0																			
9	30	5.2	73		5.9																			
10	30	5.0	73		5.9																			
11	50	5.5	69		5.7																			
12	50	5.4	70		5.8																			
13	50	4.6	70		5.6																			
14	50	5.3	72		5.7																			
15	50	6.3	82		5.7																			
16	30	4.9	69		5.6																			
17	30	4.8	75		5.7																			
18	50	5.6	78		5.7																			
19	50	4.8	83		5.5																			
20	50	5.4	68		6.1																			
21	50	5.7	62		6.1																			
22	50	5.7	67		6.2																			
23	40	4.7	65		6.1																			
24	30	5.0	67		6.1																			
25	50	4.7	86		5.9																			
26	50	6.1	74		5.8																			
27	30	5.0	73		5.7																			
28	60	4.7	71		5.7																			
29	50	5.0	71		5.9																			
30																								
31																								
TOTAL	1290																							
ARITH. MEAN	44	5.2	72																					

MDPH
D-4.7

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH February, 19 80 — 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	100	5.1	4284	5.8	1953		214		9.0		85	11.7	1146	8	1440		34	18.0	61	49	30				
6																									
7	100	7.1	5964	5.8	1953		214		9.0		85	11.5	904	9	2460		44	18.2	80	51	41				
8	100	5.2	4368	5.9	1845		202		8.5		81	10.8	826	7	2760		31	19.9	62	46	28				
9																									
10																									
11																									
12																									
13																									
14																									
15																									
16																									
17																									
18																									
19	100	4.8	4032	5.7	1953		214		9.0		85	10.3	708	10	1800		33	18.4	61	56	34				
20	100	5.1	4284	6.0	1953		214		9.0		85	11.1	996	10	2460		34	18.0	61	45	28				
21	100	6.1	5124	6.0	1953		214		9.0		85	10.3	982	10	2580		37	19.0	70	49	34				
22																									
23																									
24																									
25																									
26	100	5.0	4200	6.0	1953		214		9.0		85	12.5	828	10	2160		32	19.3	66	50	33				
27																									
28	100	5.8	4872	6.1	1953		214		9.0		85	11.2	774	9	2700		36	18.9	68	47	32				
29	100	5.2	4368	5.9	1953		214		9.0		85	10.2	1632	6	2460		31	20.2	63	44	28				
30																									
31																									
Total	900		41772		17469		1914		80.5		741						312		592		288				
Arith. Means	100	5.5	4610		1941		213		8.9		82		970	9	2313		35	18.9	66	49	32				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

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

1 2 ID | 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
		18			19			16		19			28	20
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 31615
SF														
01												6.2	5.4	50
02												6.3		
03	6	114	93	10	190	90	.43	8	79	8		6.2		
04	24	482	79	13	261	84	.35	7	82	8		6.4	6.7	16
05	24	480	75	12	240	79	.32	6	87	10		6.4	5.8	52
06	21	417	83	7	139	91	.33	7	86	4		6.5	6.9	38
07	7	139	92	5	99	92				1		6.6	5.9	94
08												6.6	6.2	76
09												6.6		
10	27	529	75	9	176	87	.28	5	81	3		6.6		
11	26	512	81	8	157	83	.42	8	84	5		6.5	7.3	56
12	26	512	77	9	177	84	.40	8	78	5		6.7	6.6	18
13	5	98	93	5	98	90	.16	3	92	3		6.3	6.7	20
14	6	117	95	7	136	90	.35	7	89	5		6.4	6.8	12
15												7.0	6.3	26
16												7.0		
17												6.9		
18	26	512	80	13	256	86				10		6.9		
19	13	258	90	11	218	87	.30	6	85	7		6.1	6.2	8
20	6	117	94	5	98	95	.19	4	90	3		6.4	5.2	2
21				6	122	93	.18	4	91	4		6.4	5.9	12
22												6.3	5.8	16
23												6.3		
24	21	408	82	1	19	98	.21	4	86	1		6.4		
25	11	224	90	4	81	96				3		6.6	6.3	42
26	8	163	89	13	266	72	.23	5	86	9		6.4	6.3	4
27	12	240	85	10	200	83	.22	4	88	3		6.4	6.3	4
28	12	240	88	1	20	98	.18	4	91	1		6.3	6.3	20
29												6.5	7.1	12
30														
31														
TL		5562			2953			90						
ME	16	309	85	8	155	88	.28	6	86	5		6.5	6.3	19
WA	18	354		9	186									47

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

March (Month), 19 80 — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

ID 130029 (Plant No) 03 (Mo.) 80 (Yr.) 500 (Sampling Point Code)

DAY	WEATHER TYPE	WEATHER PRECIP	FLOW TOTAL	FLOW MAX RATE	TEMP	pH	BOD-5 mg/l	BOD-5 LBS	SS mg/l	SS LBS.	TOTAL-P mg/l	TOTAL-P LBS	VSS mg/l	NH_3-N mg/l		REMARKS OF
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		2.29		48	6.5									C	
02	1		2.24		48	6.4	50	934	98	1831	2.10	39	84		C	
03	1		2.41		48	6.5	70	1407	68	1367	1.70	34	44		C	
04	5	.12	2.39		48	6.4	94	1874	80	1595	1.80	36	58		C	
05	1		2.36		49	6.2	109	2047	70	1378	1.55	31	56		C	
06	5	.02	2.40		49	6.2	108	2162	72	1441	2.00	40	50		C	
07	5	.05	2.32		49	6.3									C	
08	5	.73	2.25		49	6.3									C	
09	1		2.36		49	6.3	82	1546	68	1282	1.80	34	54		C	
10	3		2.39		48	6.3	98	1953	64	1276	1.95	39	40		C	
11	3		2.37		48	6.2	74	1463	66	1305	2.00	40	44		C	
12	3		2.39		47	6.3	66	1316	74	1475	1.60	32	62		C	
13	5	.33	2.32		48	6.2	106	2051	52	1006	2.10	41	38		C	
14	1		2.32		48	6.3									C	
15	1		2.31		48	6.4									C	
16	4	.39	2.56		48	6.5	100	2135	78	1665	2.10	45	68		C	
17	4	.29	2.62		47	7.4	69	1398	48	1049	1.80	39	24		C	
18	1		2.67		48	7.4	68	1514	124	2761	1.80	40	112		C	
19	1		2.67		48	7.1	90	2004	46	1024	1.70	38	26		C	
20	5	.42	2.68		48	7.2	80	1788	64	1431	1.90	42	58		C	
21	1		2.60		49	7.4									C	
22	1		2.60		49	7.3									C	
23	4	.06	2.58		49	7.3	64	1377	80	1721	1.80	39	64		C	
24	4	.22	2.69		48	7.4	74	1660	128	2872	3.00	67	90		C	
25	3		2.78		48	7.2	96	2146	88	1967	2.50	56	62		C	
26	3		2.64		49	7.2	78	1750	56	1256	1.90	43	46		C	
27	3		2.61		48	7.3	94	2046	58	1263	2.30	50	48		C	
28	4	.19	2.55		47	7.2									C	
29	1		2.47		47	7.2									C	
30	4	.25	2.59		47	7.3	60	1296	40	864	1.70	37	30		C	
31	4	.03	2.65		48	7.3	92	2033	78	1733	2.30	51	60		C	
TL		3.10	76.93					37,540		33562		913			C	
ME			2.48				82	1706	73	1526	1.97	42	55		C	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

March, 19 80 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

1 2: 10 — 3–8: 130029 (Plant No) — 9 10: 03 (Mo) — 11 12: 80 (Yr) — 13–15: (Sampling Point Code)

DAY	BOD-5 9–14 mg/l	BOD-5 9–14 LBS	SS 19–24 mg/l	SS 19–24 LBS.	TOTAL-P 29–34 mg/l	TOTAL-P 29–34 LBS	VSS 39 mg/l	NH_3-N 44 mg/l	REMARKS OR OTHER PARAMETERS 49	54	59	64	69	74	79	80	9	14
1 2																C		
PN	00310	85001	00530	85002	00665	85004	00535	00610								C		
SF																C		
01																C		
02	38	710	86	1607	2.10	39	76									C		
03	68	1367	44	884	1.55	31	26									C		
04	58	1156	52	1036	1.55	31	32									C		
05	116	2283	74	1456	2.10	41	50									C		
06	72	1441	36	721	1.15	23	20									C		
07																C		
08																C		
09	32	603	42	792	1.05	20	14									C		
10	48	957	36	718	1.95	39	26									C		
11	64	1265	44	870	1.45	29	30									C		
12	40	797	44	877	1.45	29	28									C		
13	72	1393	72	1393	2.90	56	60									C		
14																C		
15																C		
16	32	683	28	598	.95	20	22									C		
17	50	1093	52	1136	1.90	42	38									C		
18	58	1291	66	1470	1.60	36	48									C		
19	70	1559	52	1158	1.40	31	18									C		
20	70	1565	60	1341	1.65	37	44									C		
21																C		
22																C		
23	42	904	56	1205	1.65	36	40									C		
24	40	897	50	1121	2.30	52	30									C		
25	68	1520	56	1252	2.10	47	36									C		
26	40	897	36	808	1.30	29	26									C		
27	56	1219	46	1001	1.60	35	36									C		
28																C		
29																C		
30	30	648	28	605	1.40	30	16									C		
31	54	1193	60	1326	1.80	40	42									C		
TL		25441		23375		773										C		
ME	55	1156	51	1063	1.68	35	34									C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

March, 1980 (Month) — Marshall (Municipality), Michigan — Robert J. Swabell (Superintendent's Signature)

1 2: 10 | 3–8: 170039 (Plant No.) | 9 10: 03 (Mo.) | 11 12: 80 (Yr.) | 13–15: .. (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 9	Waste Sludge	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		3.8								179			53	C	10	
02			3.8								196			54	C	10	
03			3.6	4.3	.42	2222	1479	22.0	1.01	5.5	168	.75	55	50	C	10	
04			3.6	4.7	.42	2244	1519	24.0	.94	5.1	163	.76	65	50	C	10	
05			3.7	4.7	.42	2203	1520	24.0	.92	2.6	168	.70	67	51	C	10	
06			3.6	5.4	.42	2249	1533	25.0	.90	4.5	168	.73	64	49	C	10	
07			3.7	6.0	.43	2407	1677	24.0	1.00	4.2	166	.76	68	51	C	10	
08			3.8								189			54	C	10	
09			3.8								201			54	C	10	
10			3.6	6.2	.42	2185	1494	24.0	.91		194	.72	67	51	C	10	
11			3.6	7.3	.42	2246	1539	25.0	.90		201	.75	68	52	C	10	
12			3.6	7.1	.42	2220	1536	25.0	.89		193	.72	68	51	C	10	
13			3.7	6.4	.43	2077	1389	23.0	.90		189	.69	68	53	C	10	
14			3.7								189			53	C	10	
15			3.7								188			53	C	10	
16			3.4								178			48	C	10	
17			3.3	6.4	.38	2088	1394	22.0	.95	4.5	185	.72	66	47	C	10	
18			3.2	5.3	.37	2081	1386	22.0	.95	3.7	187	.71	65	46	C	10	
19			3.2	5.3	.37	1996	1321	23.0	.87	2.2	179	.69	67	46	C	10	
20			3.2	5.3	.37	2105	1441	23.0	.92	3.5	178	.71	67	46	C	10	
21			3.3	5.3	.38	2055	1483	23.0	.89	3.5	185	.70	67	47	C	10	
22			3.3								184			47	C	10	
23			3.3								181			48	C	10	
24			3.2	5.2	.37	2037	1379	22.0	.93	4.4	188	.70	66	46	C	10	
25			3.2	4.9	.37	2045	1342	22.0	.93	3.9	189	.70	46	46	C	10	
26			3.2	5.2	.37	2048	1395	22.0	.95	4.0	192	.72	64	46	C	10	
27			3.1	5.9	.38	2173	1433	22.0	.99	4.5	185	.72	66	52	C	10	
28			3.4	5.7	.39	2059	1429	22.0	.93	4.0	183	.61	66	52	C	10	
29			3.5								184			53	C	10	
30			3.3								179			50	C	10	
31			3.3	6.6	.38	2291	1534	23.0	1.00	4.2	184	.74	65	52	C	10	
TL															C	310	
ME			3.5	5.7	.40	2156	1469	23.0	.93	4.0	189	.72	66	50	C	10	

Digester Volume, ft³
Primary _____
Secondary _____

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

R 4619
4833-5382

Marshall, MICHIGAN

Supernatant To _____
Process Pattern _____

MONTH March 1980

DIGESTER AND SLUDGE DATA

OPERATOR R. J. Gwalwell

DATE	RAW SLUDGE Gals. X 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	30	4.8	57		6.0																			
2	30	5.5	67		6.0																			
3	50	6.3	68		5.8																			
4	30																							
5	50	4.3	68		5.8																			
6	50	5.3	67		6.0																			
7	50	5.6	71		6.1																			
8	40	5.3	71		6.1																			
9	30	4.8	64		6.0																			
10	50	4.8	81		5.9																			
11	40																							
12	50	4.9	67		5.9																			
13	50	4.2	68		6.0																			
14	50	5.3	71		6.5																			
15	30	4.9	65		6.7																			
16	30	4.6	69		6.5																			
17	50	5.3	68		6.3																			
18	50	4.8	63		6.0																			
19	50	4.9	64		6.2																			
20	50	5.3	69		6.4																			
21	50	5.2	67		6.4																			
22	30	6.9	79		6.2																			
23	30				6.2																			
24	40	4.4	65		6.0																			
25	50	4.9	68		6.1																			
26	50	4.6	66		6.3																			
27	50	5.2	69		6.3																			
28	50	6.7	77		6.0																			
29	30	4.8	76		6.1																			
30	30	4.7	77		6.0																			
31	50	4.9	67		5.9																			
TOTAL	1320																							
ARITH. MEAN	4.3	5.1	69																					

MDPH
D-4.7

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH March, 1980 — 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	120	3.6	3628	5.7	1672		190		8.0		104	10.7	760	12	2280		27	19.9	54	47	25				
4																									
5	120	6.0	6048	5.8	1672		190		8.0		104	10.5	818	9	1920		38	20.3	77	41	32				
6	120	6.9	6955	5.9	1672		190		8.0		104	10.0	926	8	3360		43	20.0	86	49	42				
7																									
8																									
9																									
10																									
11	120	5.5	5544	5.9	1672		190		8.0		104	10.3	728	34	1380		37	19.7	73	52	38				
12	120	5.3	5342	6.0	1672		190		8.0		104	10.0			1500		37	18.9	70	52	36				
13																									
14																									
15																									
16																									
17																									
18	120	5.0	5040	6.0	1672		190		8.0		104	11.4	846	11	1680		37	18.1	67	52	35				
19	120	4.8	4838	6.0	1672		190		8.0		104	12.2					35	18.7	65	52	34				
20	120	5.3	5342	6.2	1672		190		8.0		104	12.3	674	13	2220		36	19.4	70	50	35				
21																									
22																									
23																									
24																									
25	120	5.5	5544	6.0	1672		190		8.0		104	12.3	718	10	2100		39	18.7	73	49	36				
26	120	4.7	4738	6.1	1672		190		8.0		104	12.3	434	34	2040		35	18.3	64	45	29				
27																									
28																									
29																									
30																									
31	120	5.3	5342	6.0	1672		190		8.0		104	11.5	772	20	2280		37	18.9	70	44	31				
Total	3720		58361		18392		2090		88		1144						401		769		373				
Arith. Means	120	5.3	5306		1672		190		8.0		104		742	17	2076		36	19.2	70	49	34				

MISCELLANEOUS SHEET

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

March, 19 80
Month

Marshall, Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2 IP | 3 8 130029 Plant No. | 9 10 03 Mo. | 11 12 80 Yr. | 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 FeCl3 LBS	44	49	54	59
PN											
SF		2				10	397				
01		101	2760			10	397				
02		122	2880			10	596				
03		56	2760			10	397				
04		52	2760			10	596				
05		75	2760			10	596				
06		25	2760			10	199				
07		57	2400			5	397				
08		61	2640			10	199				
09		81	2760			5	199				
10		40	2760			10	794				
11		85	2880			10	596				
12		78	2880			10	397				
13		48	2760			10	298				
14		53	2760			10	298				
15		41	2520			10	397				
16		29	2640			10	397				
17		45	2640			10	596				
18		47	2880			5	794				
19		25	2760			10	596				
20		2	2760			10	397				
21		51	2520			10	397				
22		37	2400			10	298				
23		40	2520			10	496				
24		36	2760			10	596				
25		46	3000			10	794				
26		53	2880			10	199				
27		32	2760			10	199				
28		4	2640			10	397				
29		4	2760			10	397				
30		23	2520			10	794				
31		53	3120			295	14,100				
TL		1572	84630			10	455				

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

FINAL EFFLUENT SHEET

_____ , 19 _____ (Month) _____ (Municipality), Michigan _____ (Superintenden)

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

DAY 1 2	22 BOD-5 9 mg/l	14 LBS.	19 % Rem.	22 SS 24 mg/l	29 LBS.	34 % Rem.	22 TOTAL-P 39 mg/l	44 LBS.	49 % Rem.	VSS 54 22 mg/l	NH_3-N 59 mg/l	pH 64 31 SU	DO 69 16 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												6.3		
02	14	262	72	9	168	91	.45	8	79	8		6.5		
03	12	241	83	8	161	88	.28	6	84	5		6.3	6.9	84
04	6	120	94	14	279	83	.37	7	79	5		6.3	5.0	40
05	10	197	90	16	315	77	.23	5	85	9		6.2	4.7	36
06	16	320	85	8	160	98	.17	3	92	3		6.1	5.2	8
07												6.2	4.6	6
08												6.2		
09	15	283	82	6	113	91	.10	2	94	4		6.2		
10	15	299	85	6	120	91	.23	5	88	2		6.0		6
11	6	119	92	6	119	91	.24	5	88	4		6.3		6
12	5	100	92	10	199	86	.20	4	88	7		6.3		4
13	8	155	92	7	135	87	.23	4	89	5		6.2		4
14												6.3		
15												6.4		
16	21	448	79	2	43	97	.18	4	91	1		6.5		
17	6	131	90	6	131	88	.24	5	87	4		7.4	5.6	8
18	4	89	94	2	45	98	.19	4	89	2		7.3	6.5	8
19	15	334	83	7	156	85	.15	3	91	5		7.3	5.5	2
20	5	112	94	4	89	94	.15	3	92	3		7.3	5.9	12
21												7.2	4.3	16
22												7.0		
23	5	108	92	4	86	95	.16	3	91	3		7.1		
24	4	90	95	10	224	92	.32	7	89	2		7.2	5.8	6
25	9	201	91	9	201	95	.24	5	90	4		7.0	6.5	2
26	5	112	94	9	202	84	.27	6	86	6		7.1	5.5	4
27	11	239	88	2	44	97	.24	5	90	1		7.2	6.2	10
28												7.0	5.5	38
29												7.0		
30	4	86	93	2	43	95	.24	5	86	1		7.0		
31	5	110	95	4	88	95	.32	7	86	1		7.2	5.5	42
TL		4156			3121			106						
ME	10	189	89	7	142	91	.24	5	88	4		6.7	5.6	10
WA	12	228		11	216									23

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

April (Month), 19 80 — Marshall (Municipality), Michigan — Robert J. Swabell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
ID 130029 04 80 500
Plant No Mo. Yr Sampling Point Code

DAY 1 2	WEATHER TYPE 9	WEATHER PRECIP. 14	FLOW TOTAL 19	FLOW MAX RATE 24	TEMP 29	pH 34	BOD-5 39	BOD-5 44	SS 49	SS 54	TOTAL-P 59	TOTAL-P 64	VSS 69	NH_3N 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	.10	2.66		48	7.3	84	1863	68	1509	1.70	38	48		C		
02	1		2.64		49	7.2	86	1844	64	1409	1.60	35	58		C		
03	4	.84	2.65		49	6.3									C		
04	4	.03	2.62		49	6.4									C		
05	1		2.70		49	6.4									C		
06	1		2.58		49	6.1	92	1980	70	1506	1.80	39	53		C		
07	4	.13	2.70		49	6.7	102	2297	48	1081	2.00	45	16		C		
08	4	.48	2.70		49	6.7	98	2207	56	1261	1.80	41	57		C		
09	4	.34	2.80		48	6.2	70	1635	146	3409	1.80	42	132		C		
10	3		2.77		49	6.2	64	1479	40	924	2.30	53	34		C		
11	4	.14	2.77		49	6.6									C		
12	4	.02	2.67		49	6.5									C		
13	4	.30	2.75		48	6.5	104	2385	86	1972	1.90	44	46		C		
14	4	.11	2.82		49	6.2	106	2493	110	2587	2.80	66	74		C		
15	1		2.82		49	6.0									C		
16	1		2.78		49	6.1	64	1484	66	1530	1.55	36	43		C		
17	1		2.83		49	6.1	62	1463	56	1322	1.65	39	42		C		
18	1		2.80		49	5.8									C		
19	1		2.70		48	6.1									C		
20	1		2.70		48	6.1	92	2072	82	1846	1.60	36	76		C		
21	1		2.75		49	6.6	108	2477	88	2018	2.10	48	52		C		
22	1		2.76		50	6.3	76	1749	60	1381	2.10	48	34		C		
23	1		2.75		50	6.1	72	1651	62	1422			58		C		
24	4+5	.16	2.70		50	6.3	89	2004	74	1666			68		C		
25	1		2.73		50	6.3									C		
26	1		2.56		50	6.2									C		
27	4	.48	2.64		50	6.8			64	1409	1.80	40	52		C		
28	4	.03	2.68		50	7.4	106	2369	114	2548	1.65	37	108		C		
29	4	.13	2.78		50	7.5	92	2133	80	1855	2.25	52	64		C		
30	1		2.71		50	7.7	84	1899	50	1130	1.80	41	40		C		
31															C		
TL		3.29	81.52					32534	74	33785		780			C		
ME			2.72				87	1975	1484	1689	1.90	43	58		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

April, 19 80 — Month

Marshall, Michigan — Municipality

Robert J. Swalwell — Superintendent's Signature

1 2: IP; 3–8: 130029 — Plant No; 9 10: 04 — Mo; 11 12: 80 — Yr.; 13–15: .. — Sampling Point Code

DAY	BOD 5 (9–14) mg/l	BOD 5 LBS.	SS (19–24) mg/l	SS LBS	TOTAL-P (29–34) mg/l	TOTAL-P LBS	VSS (39) mg/l	NH_3-N (44) mg/l	REMARKS OR OTHER PARAMETERS (49–80)							(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	
SP															C	
01	84	1863	54	1198	1.95	43	44								C	
02	58	1277	70	1541	1.40	31	58								C	
03															C	
04															C	
05															C	
06	64	1377	72	1549	1.90	41	48								C	
07	80	1801	54	1216	2.20	50	30								C	
08	50	1126	50	1126	1.90	43	38								C	
09	46	1074	28	654	1.55	36	16								C	
10	42	1026	56	1294	1.25	29	42								C	
11															C	
12															C	
13	44	1009	44	1009	1.95	45	30								C	
14	86	2023	68	1599	2.00	47	44								C	
15															C	
16	52	1206	78	1808	1.45	34	62								C	
17	86	2030	70	1652	2.25	52	68								C	
18															C	
19															C	
20	64	1441	66	1486	1.55	35	56								C	
21	68	1560	64	1468	2.00	46	38								C	
22	42	967	48	1105	1.95	45	28								C	
23	46	1055	30	688			22								C	
24	78	1756	68	1531			56								C	
25															C	
26															C	
27			50	1101	1.25	28	42								C	
28	48	1073	52	1162	1.55	35	44								C	
29	60	1391	70	1623	1.65	38	58								C	
30	60	1356	78	1762	2.25	51	62								C	
31															C	
TL		26421		26572		729									C	
ME	61	1391	59	1329	1.78	41	44								C	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

April, 19 80 (Month) — Marshall (Municipality), Michigan — Robert J. Swabell (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
10 | 13,20,29 | 04 | 80 | ..
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*
01	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF											4				C		
01	48		3.2	6.6	.25	2304	1547	24.0	.96	3.0	183	.73	66	52	C	10	
02			3.3	6.2	.27	2269	1541	24.0	.95	2.5	182	.71	66	52	C	10	
03			3.3	6.2	.27	2284	1517	24.0	.95	4.0	178	.68	68	52	C	10	
04			3.3								180			52	C	10	
05			3.2								183			52	C	10	
06			3.3								176			53	C	10	
07			3.2	5.9	.28	2442	1638	24.0	1.02	4.2	174	.75	66	50	C	10	
08			3.1	6.0	.27	2483	1671	25.0	.99	4.0	174	.75	66	52	C	10	
09			3.1	5.4	.31	2338	1555	24.0	.97	2.5	176	.75	66	51	C	10	
10			3.1	5.7	.30	2404	1587	24.0	1.00	4.8	181	.73	64	52	C	10	
11			3.1	5.6	.30	2390	1585	24.0	1.00	3.5	179	.78	65	51	C	10	
12			3.2								182			53	C	10	
13			3.1								181			51	C	10	
14			3.0	5.9	.28	2456	1671	24.0	1.02	3.5	182	.79	65	51	C	10	
15			3.0	5.8	.30	2311	1556	24.0	.96	4.4	184	.76	67	53	C	10	
16			3.1	5.9	.27	2462	1640	25.0	.98	3.7	187	.72	66	54	C	10	
17			3.0	5.6	.27	2463	1686	25.0	.99	3.2	183	.75	67	53	C	10	
18			3.1	5.8	.34	2536	1338	25.0	.99	3.0	179	.75	78	51	C	15	
19			3.2								175			54	C	15	
20			3.2								177			55	C	15	
21			3.1	5.2	.29	2557	1638	24.0	.94	3.5	176	.74	59	53	C	15	
22			3.1	4.9	.30	2376	1605	23.0	.97	3.0	168	.71	66	54	C	15	
23			3.1	5.0	.30	2334	1586	23.0	.99	3.3	180	.72	67	54	C	15	
24			3.2	5.2	.29	2392	1622	24.0	1.00	3.0	185	.70	63	54	C	15	
25			3.2	5.1	.30	2354	1586	24.0	.98	2.8	187	.70	66	53	C	15	
26			3.4								180			54	C	15	
27			3.3								185			54	C	15	
28			3.2	5.7	.30	2295	1517	23.0	1.00	2.5	168	.68	65	57	C	15	
29			3.1	5.5	.28	2339	1599	23.0	1.04	2.8	159	.70	68	51	C	15	
30			3.2	5.4	.26	2300	1622	22.0	1.05	2.5	166	.69	67	51	C	15	
31															C		
TL															C	36.5	
ME			3.2	5.6	.29	2385	1591	24.0	.99	3.3	178	.73	66	53	C	12	

Digester Volume, ft³
Primary
Secondary

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

R 4619
4833-5382

Marshall, MICHIGAN

Supernatant To
Process Pattern

MONTH April 1980

DIGESTER AND SLUDGE DATA

OPERATOR R. J. Swalwell

DATE	RAW SLUDGE Gals. 10x	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	50	4.2	84		6.3																			
2	50	5.2	70		6.5																			
3	50	5.7	63		6.2																			
4	40	4.2	67		6.3																			
5	30	5.1	70		6.4																			
6	30	4.1	73		5.9																			
7	50	3.9	74		5.7																			
8	50	4.5	69		5.7																			
9	50	5.0	68		5.8																			
10	50	5.0	83		5.7																			
11	50	8.0	87		5.9																			
12	30	5.3	75		5.7																			
13	30	4.6	71		5.9																			
14	30	6.0	70		5.8																			
15	50	6.0	70		5.7																			
16	50	4.2	81		5.8																			
17	50	5.3	69		5.8																			
18	50	5.5	65		5.6																			
19	30	4.6	65		5.6																			
20	30				5.7																			
21	50	5.4	70		5.8																			
22	50	4.3	72		5.6																			
23	50	5.2	69		5.7																			
24	50	4.8	72		5.8																			
25																								
26	50	5.2	67		5.7																			
27	50	5.6	70																					
28	50	4.9	72		5.6																			
29	50	4.9	61		6.5																			
30	50	7.5	75		6.5																			
31																								
TOTAL	1300																							
ARITH. MEAN	45	5.1	72																					

MDPH
D-4.7

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH April, 1980 — VACUUM FILTER & INCINERATION DATA — OPERATOR R. J. Swalwell

DATE	SLUDGE TO FILTER				CHEMICALS TO FILTER				FILTER		FILTRATE						FILTER CAKE					INCINERATION			REMARKS
					CaO		$FeCl_3$																		
	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	98	4.9	4081	5.9	1808		141		8.0			9.3	828	8	1980		31	18.8	58	52	30				
2	86	5.6	4045	5.4	1582		167		7.0			9.2	694	12	1980		30	18.8	56	45	25				
3																									
4																									
5																									
6																									
7																									
8	86	5.4	3901	5.6	1582		167		7.0			9.5	700	11	2520		29	18.8	55	52	28				
9	98	4.9	4081	5.6	1808		141		8.0			9.4	420	13	1980		32	18.3	59	48	28				
10																									
11	98	5.5	4582	5.7	1808		141		8.0			9.5	1012	9	2040		34	19.0	65	62	40				
12																									
13																									
14	74	5.2	3232	5.8	1356		143		6.0			10.2	1208	7	2460		24	19.4	47	52	24				
15	98	5.6	4665	5.6	1808		141		8.0			10.2					34	18.9	64	52	33				
16	74	6.0	4600	5.7	1356		143		6.0			10.0	772	10	2280		32	18.8	60	54	32				
17	49	4.6	1893	5.8	904		95		4.0			9.8	726	13	1320		14	19.6	27	49	13				
18	49	5.0	2058	5.6	904		95		4.0			9.4	634	8	1800		15	19.2	29	50	14				
19																									
20																									
21																									
22	98	4.5	3749	5.6	1808		141		8.0			10.7	644	12	1620		28	20.1	56	53	30				
23	98	5.2	4332	5.8	1808		141		8.0			9.9	860	21	1860		29	21.2	61	58	36				
24	98	6.1	5081	5.7	1808		141		8.0			9.1	728	15	2100		37	18.7	69	50	35				
25																									
26																									
27																									
28																									
29	98	5.8	4831	6.0	1808		141		8.0			10.1	630	14	1680		35	18.9	66	53	35				
30	98	8.4	6997	6.3	1808		141		8.0			12.5	580	10	1860		49	17.9	88	52	46				
31																									
Total	130		62178		23956		2529		1060								453		860		449				
Arith. Means	86	5.5	4142		1597		169		7.1				745	12	1963		30	19.0	57	52	30				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

GROUNDWATER MONITORING SHEET

March, 19 80
Month

Marshall, MICHIGAN
Municipality

Robert J. Swalwell
Superintendent's Signature

Precipitation for the last 30 days 2.71 inches

Samples Collected By: Robert Swalwell

Samples Analyzed By: Prein & Newhof Laboratory

1 2 4 9 10 11 12 13 14 15
19 134029 03 25 80
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 PAR Cu 70	Cr 75 79	80	Cu 10	Fe 15
P,N,b	72020	00940	00095	00400	00900	00410	00610	00620	00615	00665	38260	00335			c		
S,F,b															c		
103		8.92	540	6.5	260	212	0.09	5.00	--	0.013	0.008	< 1	<0.005	<0.03	c	0.010	0.58
															c		
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STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

April, 19 80 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwel (Superintendent's Signature)

1 2 IP | 3–8 12.0029 (Plant No.) | 9 10 04 (Mo.) | 11 12 80 (Yr.) | 13–15 .. (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 Ferric LBS.	44	49	54	59
PN											
SF		2									
01		32	2880			10	596				
02		13	2880			10	794				
03		9	2640			10	298				
04		4	2520			10	496				
05		14	2760			10	298				
06		1	2400			10	298				
07		2	2640				596				
08		2	2640			10	695				
09		4	2880			10	695				
10		62	2880			10	397				
11		7	2760			10	596				
12			2760			10	397				
13		1	2760			10	397				
14		59	3000			10	596				
15		58	2880			10	695				
16		27	3000			10	695				
17		3	2760			10	596				
18		1	2760			10	397				
19			2400			10	397				
20		1	2400			10	397				
21			2520			5	347				
22			2640			5	496				
23			2760			10	695				
24			2880			20	794				
25			2760			10	347				
26			2280			10	496				
27			2640			10	397				
28			2640			10	596				
29			2640			10	596				
30			2640			10	397				
31											
TL		300	81000			290	15587				
ME		17	2700			10	520				

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 11 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

~~MARCH~~ April, 19 80
Month

_____, Michigan
Municipality

_____
Superintendent

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

DAY 1 2	BOD-5 9 19 mg/l	BOD-5 14 LBS	BOD-5 19 % Rem	SS 24 20 mg/l	SS 29 LBS	SS 34 % Rem	TOTAL-P 39 18 mg/l	TOTAL-P 44 LBS	TOTAL-P 49 % Rem.	VSS 54 20 mg/l	NH_3-N 59 mg/l	pH 64 SU	DO 69 21 mg/l	F. COLI* 74 20 #/100 ml
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 31615
SF														
01	5	111	94	2	44	97	.26	6	85	1		7.0	5.0	50
02	5	110	94	7	154	89	.21	5	87	5		7.0	4.2	20
03				~~3~~		~~95~~				~~1~~		6.4	5.0	36
04												6.4		
05												6.6		
06	21	482	77	3	65	95	.21	5	95	1		6.2		
07	11	248	89	6	135	88	.10	2	95	3		6.6	5.8	72
08	5	~~118~~ 113	95	7	~~162~~ 158	88	.23	5	87	3		6.7	4.8	60
09	5	117	93	6	140	96	.19	4	89	4		6.7	5.5	200
10	5	115	92	4	92	90	.50	~~12~~	75	2		6.2	5.7	88
11												6.3	5.2	68
12												6.4		
13	20	459	81	19	436	75	20	5	89	11		6.4		
14	9	212	92	22	517	80	.75	18	73	17		6.2	4.8	200
15												6.1	5.1	
16	6	139	91	10	232	85	.24	6	85	8		6.0	5.5	116
17	5	118	92	15	354	73	.28	7	83	14		6.0	5.8	38
18												6.0	4.9	90
19												6.0		
20	11	248	88	4	90	95	.14	3	91	2		6.2		
21	17	390	84	3	69	97	.17	4	92	2		6.7	6.4	60
22	5	115	93	2	46	97	.22	5	90	1		6.1	5.3	67
23	4	93	94	2	46	97				1		6.0	6.3	140
24	9	203	90	5	113	93				3		6.4	5.3	176
25												6.2	4.9	170
26												6.2		
27				3	66	95	.14	3	92	2		6.5		
28	4	89	96	1	22	99	.15	3	91	1		7.4	5.9	39
29	5	116	95	3	70	96	.16	4	93	2		7.3	4.8	18
30	5	113	94	2	45	96	.16	4	91	1		7.5	4.0	10
31														
TL		3560			2899			101						
ME	8	187	91	6	145	91	.17	6	88	4		6.5	5.2	65
WA	9	209		17	385									112

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STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

May, 19 80 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwel (Superintendent's Signature)

1 2 3 8 9 10 11 12 13 15
IP 130029 05 80 500
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		2.73		50	7.7	116	2641	76	1730	2.40	55	60		C		
02	1		2.68		50	7.5									C		
03	1		2.66		50	7.4									C		
04	1		2.61		51	7.2	90	1959	68	1480	1.70	37	54		C		
05	1		2.74		51	7.3	98	2239	220	5027	2.60	59	188		C		
06	1		2.58		51	7.2	92	1980	122	2625	2.60	56	54		C		
07	3		2.63		51	7.6	98	2150	68	1492	1.65	36	66		C		
08	4	.05	2.59		50	7.4	112	2419	78	1685	2.10	45	68		C		
09	3		2.55		50	7.9									C		
10	4	.29	2.52		51	7.5									C		
11	1		2.50		50	7.5	76	1585	56	1168	2.00	42	40		C		
12	4	.41	2.58		51	7.6	136	2926	234	5035	3.50	75	184		C		
13	4	.20	2.61		52	7.6	104	2264	102	2612	2.10	46	80		C		
14	1		2.56		51	7.4	128	2733	84	1793	2.25	48	74		C		
15	4	.03	2.61		51	7.2	110	2394	108	2351	2.10	46	78		C		
16	4	.04	2.59		51	7.3									C		
17	4	1.53	2.64		51	7.2									C		
18	4	.02	2.64		51	7.1	126	2774	82	1805	1.95	43	70		C		
19	1		2.71		52	7.4	104	2351	70	1582	1.95	44	56		C		
20	1		2.70		51	7.3	108	2432	76	1711	2.20	50	64		C		
21	1		2.72		51	7.3	98	2223	44	998	2.70	61	24		C		
22	1		2.72		52	7.1	88	1996	40	907	1.95	44	20		C		
23	4	.02	2.70		52	7.4									C		
24	4	.72	2.65		52	7.2									C		
25	1		2.59		51	7.3									C		
26	1		2.62		52	7.3	70	1530	92	2010	2.40	52	68		C		
27	1		2.74		53	7.3	108	2968	136	3108	3.00	69	92		C		
28	4	.23	2.67		52	7.3	96	2138	96	2138	1.80	40	74		C		
29	3		2.61		52	7.2	122	2656	108	2351	1.90	41	90		C		
30	4	.96	2.59		52	7.1									C		
31	1		2.57		51	7.1									C		
TL		4.50	81.61					45,858		43,608		989			C		
ME			2.63				104	2293	98	2180	2.24	49	75		C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

May, 19 80
Month

Marshall, Michigan
Municipality

Robert J. Swalwell
Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID 130029 05 80 ..
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
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	76	1730	74	1685	1.80	41	58								C		
02															C		
03															C		
04	30	653	40	871	.75	16	34								C		
05	64	1462	76	1737	1.95	45	50								C		
06	76	1635	70	1560	1.65	36	60								C		
07	68	1492	80	1755	1.65	36	56								C		
08	94	2030	62	1339	1.60	35	56								C		
09															C		
10															C		
11	38	792	56	1168	1.45	30	40								C		
12	94	2023	84	1807	2.40	52	58								C		
13	94	2046	82	1785	2.20	48	58								C		
14	104	2220	72	1537	3.00	64	48								C		
15	76	1654	112	2438	3.00	65	68								C		
16															C		
17															C		
18	70	1541	46	1013	1.05	23	26								C		
19	66	1492	80	1808	1.70	38	56								C		
20	110	2477	64	1441	2.25	51	50								C		
21	78	1769	68	1543	1.95	44	40								C		
22	54	1225	50	1134	1.80	41	28								C		
23															C		
24															C		
25															C		
26	28	612	62	1355	1.15	25	48								C		
27	78	1782	84	1920	2.20	50	44								C		
28	72	1603	72	1603	1.55	35	40								C		
29	102	2220	108	2351	1.65	36	86								C		
30															C		
31															C		
TL		32458		31,850		811									C		
ME	74	1623	72	1593	1.84	41	50										

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

May, 19 80 — Month

Marshall, Michigan — Municipality

Robert J. Swalwell — Superintendent's Signature

1 2: 10 — 3 8: 13,0029 — 9 10: 05 — 11 12: 80 — 13 15: ..

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	5.7	.29	2184	1518	22.0	.99	2.0	166	.66	67	50	C	15	
02			3.2	5.4	.27	2416	1695	22.0	1.09	2.0	164	.76	68	51	C	15	
03			3.2								161			51	C	15	
04			3.3								159			52	C	15	
05			3.1	4.5	.30	2176	1529	22.0	.98	3.0	160	.70	68	51	C	15	
06			3.3	5.0	.26	2352	1604	23.0	.97	1.2	165	.69	67	54	C	15	
07			3.3	4.3	.30	2192	1517	21.0	1.05	2.5	169	.67	68	52	C	15	
08			3.3	4.3	.33	2149	1465	22.0	1.02	2.6	172	.64	67	53	C	15	
09			3.4	4.4	.32	2158	1507	22.0	1.01	3.0	168	.62	68	54	C	15	
10			3.4								162			55	C	15	
11			3.4								163			54	C	15	
12			3.3	4.6	.30	2217	1557	21.0	1.05	2.7	162	.70	69	53	C	15	
13			3.3	4.3	.38	2286	1611	21.0	1.08	2.5	208	.65	65	52	C	15	
14			3.4	4.5	.35	2320	1630	21.0	1.10	4.1	222	.74	67	52	C	15	
15			3.3	4.0	.37	2283	1587	21.0	1.09	4.0	222	.69	67	52	C	15	
16			3.3	3.9	.37	2205	1571	21.0	1.05	1.7	219	.69	69	52	C	15	
17			3.3								184			51	C	15	
18			3.3								193			51	C	15	
19			3.2	3.7	.39	2132	1504	21.0	1.02	4.0	193	.66	69	51	C	15	
20			3.2	3.9	.42	2235	1563	20.0	1.12	2.7	193	.68	69	52	C	15	
21			3.2	3.9	.41	2216	1568	20.0	1.11	2.2	191	.68	68	52	C	15	
22			3.2	4.2	.38	2228	1582	20.0	1.11	2.4	188	.67	69	51	C	15	
23			3.2	4.5	.37	2348	1628	20.0	1.17	2.5	198	.73	68	51	C	15	
24			3.3								196			51	C	15	
25			3.3								201			54	C	15	
26			3.3								205			52	C	15	
27			3.1	4.3	.36	2116	1436	18.0	1.18	2.7	200	.64	66	50	C	15	
28			3.2	4.4	.33	2236	1537	21.0	1.06	2.2	195	.62	68	53	C	15	
29			3.3	4.4	.34	2348	1626	21.0	1.12	2.5	192	.64	68	57	C	15	
30			3.3	4.6	.32	2414	1709	22.0	1.10	3.0	192	.65	69	61	C	15	
31			3.4								197			63	C	15	
TL															C	465	
ME			3.3	4.4	.34	2248	1569	21.0	1.07	2.6	186	.68	68	53	C	15	

Digester Volume, ft³
Primary _____
Secondary _____

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

R 4619
4833-5382

Marshall, MICHIGAN

Supernatant To _____
Process Pattern _____

MONTH MAY 1980

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE Gals. X 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	50	4.9	42		6.3																			
2	50	6.0	73		6.5																			
3	30	4.9	67		6.5																			
4	30	6.2	48		6.4																			
5	50	5.2	68		6.3																			
6	50	6.0	65		6.3																			
7	50	5.5	64		6.3																			
8	50	6.0	72		6.3																			
9	50	10.8	83		6.5																			
10	30	7.6	54		6.2																			
11	30	5.3	68		6.2																			
12	50	5.6	68		6.2																			
13	50	5.5	68		6.1																			
14	50	5.4	66		6.1																			
15	50	4.0	58		6.1																			
16	50	5.8	70		6.2																			
17	40	4.9	62		6.1																			
18	40	5.2	75		6.1																			
19	50	3.6	73		6.0																			
20	50	3.8	48		6.1																			
21	50	5.5	67		6.1																			
22	50	5.4	70		6.0																			
23	50	5.7	74		6.3																			
24	40	5.2	67		6.1																			
25	40	5.6	72		6.1																			
26	40	5.5	70		6.0																			
27	50	5.3	65		6.1																			
28	50	5.5	64		5.9																			
29	50	5.2	66		6.1																			
30	50	5.5	67		6.3																			
31	40	5.6	70		6.1																			
TOTAL	1410																							
ARITH. MEAN	46	5.6	66																					

MDPH
D-4.7

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH May, 1980 — VACUUM FILTER & INCINERATION DATA — OPERATOR R.J. Swalwell

DATE	SLUDGE TO FILTER				CHEMICALS TO FILTER				FILTER		FILTRATE						FILTER CAKE					INCINERATION			REMARKS
					C_2O		$FeCl_3$																		
	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	100	5.6	4704	6.5	1704		191		8.0		76	12.1	628	8	1680		27	24.1	65	46	30				
2	50	7.6	3192	6.1	850		95		4.0		38	12.4	870	13	2700		20	20.0	40	55	22				
3																									
4																									
5	100	5.7	4788	6.3	1704		191		8.0		76	12.4	965	8	1740		34	19.2	65	49	32				
6																									
7	100	5.8	4872	6.3	1704		191		8.0		76	12.4	804	11	1500		35	18.6	65	53	35				
8	100	6.6	5544	6.3	1704		191		8.0		76	11.3	888	16	2700		33	22.1	73	47	34				
9																									
10																									
11																									
12																									
13	100	5.7	4788	6.0	1704		191		8.0		76	12.3	826	12	1680		35	18.7	65	53	35				
14																									
15	100	5.9	4956	6.0	1704		191		8.0		76	12.0	800	11	3000		34	19.5	66	57	38				
16	63	5.1	2699	6.0	1065		119		5.0		48	11.8	818	11	2400		18	20.4	37	55	20				
17																									
18																									
19																									
20	63	5.5	2911	6.2	1065		119		5.0		48	9.4	780	8	2640		24	19.2	46	52	24				
21	100	6.0	5040	6.1	1704		191		8.0		76	11.3	770	15	3180		36	18.7	67	51	34				
22																									
23	100	5.3	4452	6.0	1704		191		8.0		76						31	19.8	61	50	31				
24																									
25																									
26																									
27	88	5.9	4361	5.9	1491		167		7.0		67	11.9	826	9	2940		33	17.7	58	50	29				
28	38	10.8	3447	5.8	639		71		3.0		29	11.3	1338	25	1860		20	20.2	40	46	19				
29	75	16.5	10,395	5.9	1278		143		6.0		57	11.5	976	22	1380		53	21.9	116	41	48				
30																									
31																									
Total	1177		66149		20020		2242		94.0		895						433		864		431				
Arith. Means	84	7.0	4725		1430		160		6.7		64		868	13	2234		31	20.0	62	50	31				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

May, 19 80 — Month

Marshall, Michigan — Municipality

Robert J. Swalwell — Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID 180029 05 80 ..
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			10	794				
02			2520			5	596				
03			2400			5	397				
04			2400			5	397				
05			2640			10	596				
06			2520			5	596				
07			2400			15	596				
08			2760			10	794				
09			2640			10	199				
10			2280			10	397				
11			2400			10	397				
12			2400			10	199				
13			2760			5	596				
14			2760			5	596				
15			2760			10	794				
16			2760			10	596				
17			2520			10	397				
18			2520			10	397				
19			2640			10	397				
20			2520			10	596				
21			2760			5	596				
22			2520			5	496				
23			2640			5	496				
24			2520			5	397				
25			2640			15	298				
26			2400			10	298				
27			2760			5	596				
28			2760			5	596				
29			2640			10	397				
30			2640			5	397				
31			2400			10	298				
TL			79920			250	14795				
ME			2578			8	477				

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.

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

INX +

May, 19 ____ (Month) ____ Municipality, Michigan ____ Superintendent's Signature

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

20 21

DAY	BOD-5			SS			TOTAL-P			VSS	NH_3-N	pH	DO	F. COLI*		T. COLI*	REMA
	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	8	182	93	2	46	97	.15	3	94	1		7.4	4.9	64	C		
02												7.3	4.0	60	C		
03												7.3			C		
04	4	87	96	6	131	91	.09	2	95	4		7.4			C		
05	2	46	98	3	69	99	.15	3	94	2		7.3	3.0	42	C		
06	4	86	96	5	108	96	.12	3	95	3		7.2	4.7	42	C		
07	4	88	96	8	175	88	.11	2	93	7		7.3	5.2	58	C		
08	7	151	94	4	86	95	.16	3	92	2		7.2	5.6	42	C		
09												7.7	5.1	72	C		
10												7.3			C		
11	3	63	96	3	63	95	.14	3	93	2		7.3			C		
12	7	151	95	11	237	95	.14	3	96	4		7.2	5.6	26	C		
13	4	87	96	7	152	93	.12	3	94	5		7.3	4.4	20	C		
14	5	107	96	5	107	94	.12	3	95	2		7.3	6.0	30	C		
15	5	109	95	2	44	98	.13	3	94	1		7.1	6.3	26	C		
16												7.2	5.4	40	C		
17												7.1			C		
18	8	176	94	2	44	98	.12	3	94	1		6.9			C		
19	6	136	94	5	113	93	.11	3	94	3		7.3	6.3	52	C		
20	10	225	91	4	90	95	.09	2	96	2		7.2	6.1	16	C		
21	4	91	96	2	45	95	.08	2	97	1		7.2	5.6	46	C		
22	4	91	95	2	45	95	.11	3	94	1		7.0	5.7	14	C		
23												7.2	5.7	14	C		
24												7.3			C		
25												7.3			C		
26	3	66	96	7	153	92	.09	2	96	6		7.3			C		
27	5	114	95	2	46	99	.09	2	97	1		7.3	6.0	24	C		
28	5	111	95	5	111	95	.12	3	93	3		7.3	4.0	106	C		
29	7	152	94	10	218	91	.06	1	97	7		7.1	4.1	48	C		
30												7.1	4.8	24	C		
31												7.1			C		
TL		2319			2083			52							C		
ME	5	116	95	5	104	95	.12	3	95	3		7.2	5.2	36	C		
WA	6	144		6	121									50	C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

PLANT INFLUENT SHEET

June (Month), 19 80 — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

ID 13,0,029 (Plant No) 06 (Mo) 8.0 (Yr) 5.00 (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 mg/l	BOD 5 44 LBS	SS 49 mg/l	SS 54 LBS	TOTAL-P 59 mg/l	TOTAL-P 64 LBS.	VSS 69 mg/l	NH_3 N 74 mg/l	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	.53	2.55		52	7.2	52	1106	52	1106	1.45	31	48			C		
02	4	.44	2.69		53	7.0	130	2916	46	1032	1.40	31	26			C		
03	1		2.48		54	7.4	104	2325	122	2727	1.45	32	116			C		
04	1		2.75		53	7.5	108	2477	72	1651	1.80	41	46			C		
05	4	.33	2.70		53	7.2	102	2297	72	1621	1.30	29	60			C		
06	4	.01	2.66		53	7.5										C		
07	4	.89	2.74		54	7.4										C		
08	3		2.71		54	7.5	102	2305	168	3797	1.95	44	112			C		
09	3		2.80		54	7.4	102	2382	56	1308	1.70	40	44			C		
10	1		2.74		54	7.5	108	2468	60	1371	1.60	37	46			C		
11	1		2.75		53	7.5	96	2202	36	826	1.70	39	24			C		
12	1		2.68		54	7.3	64	1430	54	1207	1.60	36	48			C		
13	4	.08	2.48		54	7.7										C		
14	4	.04	2.64		54	7.5										C		
15	4	.94	2.73		54	7.4	112	2550	80	1821	1.90	43	64			C		
16	1		2.74		54	7.4	114	2605	72	1645	1.30	30	48			C		
17	1		2.76		54	7.5	96	2210	86	1980	1.65	40	70			C		
18	1		2.69		54	7.3	68	1526	70	1570	1.70	38	54			C		
19	4	.20	2.69		54	7.5	112	2513	86	1929	4.25	95	52			C		
20	1		2.63		54	7.2										C		
21	1		2.59		54	7.2										C		
22	1		2.53		53	7.3	122	2574	60	1266	1.80	38	46			C		
23	1		2.64		55	7.5	122	2686	74	1629	3.20	70	60			C		
24	1		2.63		55	7.5	86	1886	84	1842	1.70	37	60			C		
25	1		2.64		55	7.5	108	2378	40	881	2.20	48	36			C		
26	1		2.62		53	7.3	118	2578	40	874	1.70	37	36			C		
27	1		2.60		55	7.8										C		
28	1		2.52		55	7.6										C		
29	1		2.44		55	7.7	106	2157	76	1547	2.10	43	56			C		
30	1		2.54		54	7.5	48	1017	82	1737	1.95	41	66			C		
31																C		
TL		3.96	79.76					48,586		35,367		920				C		
ME			2.66				99	2209	72	1608	1.88	42	55			C		

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Primary Effluent Sheet

(For Secondary or Tertiary Plants Only)

June, 19 80 — Month

Marshall, Michigan — Municipality

Robert J. Swalwell — Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID 1300.29 06 80 ..
Plant No Mo Yr Sampling Point Code

DAY	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
7															C			
PA	00310	85001	00530	85002	00665	85004	00535	00610							C			
SF															C			
01	28	595	16	340	1.15	24	10								C			
02	62	1391	34	763	1.05	24	14								C			
03	52	1162	50	1118	1.20	27	38								C			
04	86	1972	94	2156	1.30	30	66								C			
05	94	2117	74	1666	1.10	25	56								C			
06															C			
07															C			
08	44	994	46	1040	1.05	24	32								C			
09	72	1681	50	1168	1.45	34	38								C			
10	106	2422	102	2331	2.00	46	76								C			
11	68	1540	86	1972	1.25	29	44								C			
12	50	1118	86	1922	1.30	29	68								C			
13															C			
14															C			
15	64	1457	62	1412	1.10	25	38								C			
16	70	1600	74	1691	1.20	27	44								C			
17	106	2440	82	1888	1.75	40	56								C			
18	76	1705	88	1974	1.95	44	64								C			
19	76	1705	76	1705	2.20	49	48								C			
20															C			
21															C			
22	64	1350	72	1519	1.55	33	56								C			
23	84	1849	86	1894	2.00	44	58								C			
24	60	1316	96	2106	1.70	37	56								C			
25	54	1189	44	969	1.55	34	36								C			
26	78	1704	26	568	1.55	34	8								C			
27															C			
28															C			
29	74	1506	46	936	1.60	33	38								C			
30	16	339	52	1102	.90	19	40								C			
31															C			
TL		33,172		32,240		711									C			
AE	67	1509	67	1465	1.45	32	45								C			

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

ACTIVATED SLUDGE SHEET

June, 19 80 (Month) — Marshall (Municipality), Michigan — Robert J. Swalwell (Superintendent's Signature)

ID 130029 (Plant No) 06 (Mo) 80 (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*
P'J	80993	80994	81001	80990	80992	70323	70324	81004	81007	00300	81000	81006	70325	81014	C	80991	80889
SF											4				C		
01	48		3.4								192			63	C	15	
02			3.2	5.5	.29	2506	1745	23.0	1.08	3.0	191	.69	68	60	C	15	
03			3.2	5.3	.28	2385	1601	21.0	1.14	4.0	197	.66	65	60	C	15	
04			3.1	4.4	.36	2207	1482	20.0	1.10	3.8	199	.61	69	58	C	15	
05			3.2	4.1	.40	2000	1334	18.0	1.11	4.2	194	.57	66	60	C	15	
06			3.2	4.9	.33	2312	1611	19.0	1.21	5.5	190	.60	69	61	C	15	
07			3.1								193			58	C	15	
08			3.1								201			59	C	15	
09			3.1	4.6	.31	2354	1594	20.0	1.18	2.9	198	.77	66	58	C	15	
10			3.1	3.9	.38	2225	1506	20.0	1.11	3.1	203	.68	67	57	C	15	
11			3.1	3.8	.36	2330	1589	19.0	1.23	2.9	201	.64	66	52	C	15	
12			3.2	3.8	.35	2271	1582	19.0	1.20	5.1	196	.59	69	55	C	15	
13			3.2	4.1	.32	2419	1705	20.0	1.21	2.7	187	.60	70	54	C	15	
14			3.3								185			48	C	15	
15			3.2								192			50	C	15	
16			3.1	3.6	.33	2243	1559	19.0	1.18	3.8	201	.60	68	54	C	15	
17			3.1	3.3	.36	2168	1674	19.0	1.14	3.0	199	.60	59	51	C	15	
18			3.2	3.4	.38	2165	1538	19.0	1.14	3.1	181	.58	68	55	C	15	
19			3.2	3.8	.27	2335	1993	20.0	1.17	3.2	183	.69	79	58	C	15	
20			3.3	3.9	.29	2340	1830	21.0	1.11	3.2	183	.70	69	58	C	15	
21			3.3								179			60	C	15	
22			3.4								176			59	C	15	
23			3.3	3.9	.34	2431	1653	20.0	1.22	2.9	173	.73	65	53	C	15	
24			3.3	3.9	.34	2481	1664	20.0	1.24	2.6	179	.75	65	56	C	15	
25			3.3	4.0	.35	2376	1575	20.0	1.19	3.0	189	.76	64	55	C	15	
26			3.3	4.6	.29	2470	1745	20.0	1.24	2.8	174	.78	68	53	C	15	
27			3.3	4.6	.29	2454	1739	21.0	1.17	2.3	174	.79	70	55	C	15	
28			3.4								185			59	C	15	
29			3.5								189			61	C	15	
30			3.4	5.6	.25	2568	1724	22.0	1.17	4.1	190	.76	61	59	C	15	
31															C		
TL															C	450	
ME			3.2	4.2	.33	2335	1640	20.0	1.17	3.3	189	.67	67	57	C	15	

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MISCELLANEOUS SHEET

June, 19 80 — Month

Marshall, Michigan — Municipality

Robert J. Swalwell — Superintendent's Signature

1 2 3 8 9 10 11 12 13 15
ID 130029 06 80 ..
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			2520			20	298				
02			2520			10	397				
03			2520			5	596				
04			2640			5	596				
05			2760			10	794				
06			2760			10	596				
07			2400			10	397				
08			2640			5	397				
09			2640			15	794				
10			2760			10	794				
11			2640			10	794				
12			2640			5	993				
13			2400			5	397				
14			2520			10	397				
15			2400			20	397				
16			2640			10	397				
17	135		2640			10	596				
18			2760			5	993				
19			2640			10	596				
20			2640			5	397				
21			2400			5	298				
22			2520			5	298				
23			2520			5	397				
24			2880			5	794				
25			2640			5	795				
26			2640			5	795				
27			2640			10	794				
28			2520			10	298				
29			2640			10	397				
30			2760			10	695				
31											
TL	135		78,240			260	16,977				
ME			2608			9	566				

MANPOWER

POSITION TITLE	No. Full Time	No. Part Time	Total Hours	N Ve
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 11 HRS.

SATURDAYS 4 HRS.

SUNDAYS 4 HRS.

HOLIDAYS 4 HRS.

Digester Volume, ft³
Primary
Secondary

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

R 4619
4833-5382

Marshall, MICHIGAN

Supernatant To 6
Process Pattern

MONTH June 1980

DIGESTER AND SLUDGE DATA

OPERATOR R.J. Swalwell

DATE	RAW SLUDGE Gals. X 100	Total Solid %	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	F Mg/l	P Lbs.	5 Day BOD Mg/l	DIGESTED SLUDGE Gals X	Total Solids %	Vol. Solids %	pH	Gas Produced cu. ft X
1	40	5.3	66		6.1																			
2	50	5.2	67		5.9																			
3	50	5.2	68		6.3																			
4	50	5.2	76		6.2																			
5	50	5.0	69		6.3																			
6	50	6.1	77		6.0																			
7	40	5.0	63		6.0																			
8	40	5.1	67		6.1																			
9	50	4.9	64		6.2																			
10	50	6.7	83		6.2																			
11	50	4.9	67		6.3																			
12	50	5.0	67		6.3																			
13	50	5.4	67		6.4																			
14	40	5.0	68		6.3																			
15	40	5.1	63		6.0																			
16	50	7.0	78		5.9																			
17	50	5.2	68		6.1																			
18	50	5.2	67		6.2																			
19	50	5.7	63		6.2																			
20	50	5.7	44		6.3																			
21	40	5.8	70		6.1																			
22	40	5.3	54		6.1																			
23	50	6.4	71		6.1																			
24	50	6.3	73		6.0																			
25	50	5.3	65		6.1																			
26	50	5.0	65		6.0																			
27	50	4.0	84		6.0																			
28	40	5.3	65		6.0																			
29	40	5.3	69		5.9																			
30	50	5.2	74		6.0																			
31																								
Total	1410																							
Mean	47	5.4	68																					

MDPH
D-4.7

OPERATION REPORT OF WASTEWATER TREATMENT PLANT

Marshall, MICHIGAN

MONTH June, 1980 — 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	88	6.0	4435	6.0	1675		191		8.0		76	11.9	886	8	840		30	20.4	61	45	28				
5	88	5.0	3696	5.9	1675		191		8.0		76	12.0	940	17	2760		29	18.8	55	52	28				
6	88	4.9	3622	5.9	1675		191		8.0		76	12.0	840	8	3420		27	19.8	53	50	27				
7																									
8																									
9	88	5.4	3992	5.9	1675		191		8.0		76	11.9	818	11	2160		31	18.0	56	50	28				
10	88	5.0	3696	5.9	1675		191		8.0		76	11.7	928	9	1200		30	18.0	54	50	27				
11	88	5.0	3696	5.9	1675		191		8.0		76	11.7	880	8	2520		27	20.0	54	50	27				
12	88	4.3	3179	6.0	1675		191		8.0		76	11.9	906	8	2280		28	17.1	48	53	25				
13	88	6.2	4583	6.1	1675		191		8.0		76	10.7	756	9	2220		36	17.6	64	57	36				
14																									
15																									
16																									
17	88	4.6	3400	6.0	1675		191		8.0		76	12.1	880	8	2160		28	18.0	50	46	23				
18	88	5.1	3770	6.0	1675		191		8.0		76	12.3	838	7	2100		30	17.9	54	50	27				
19	88	7.1	5248	6.0	1675		191		8.0		76	15.1	622	9	1380		36	19.2	69	49	34				
20																									
21																									
22																									
23																									
24	88	5.5	4066	6.0	1675		191		8.0		76	12.3	876	8	2100		30	19.0	57	45	26				
25	88	4.4	3252	6.0	1675		191		8.0		76	12.3	710	8	1500		27	18.0	49	58	28				
26	88	5.0	3696	6.0	1675		191		8.0		76	9.5	834	9	2160		29	18.3	53	52	28				
27	88	5.1	3770	6.0	1675		191		8.0		76	9.3	840	8	2100		27	20.0	54	50	27				
28																									
29																									
30	88	5.5	4066	6.0	1675		191		8.0		76	10.2	1096	9	1080		29	19.7	57	51	29				
31																									
Total	1408		62167		26800		3056		128		1216						474		888		448				
Mth. Mean	88	5.3	3885		1675		191		8.0		76		853	9	1999		30	18.7	56	51	28				

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

FINAL EFFLUENT SHEET

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

1 2 3 8 9 10 11 12 13 15
ID [ ] [ ] [ ] [ ]
Plant No Mo Yr Sampling Point Code 22

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	80
PN	00310	85001	81010	00530	85002	81011	00665	85004	81012	00535	00610	00400	00300	31616 31615	C
SF															C
01	4	85	92	2	43	96	.07	1	95	1		6.8			C
02	8	179	94	2	45	96	.08	2	94	1		7.0	4.0	28	C
03	3	67	97	4	89	97	.11	2	92	3		7.6	6.5	36	C
04	9	206	92	4	92	94	.07	2	96	1		7.4	6.4	40	C
05	7	158	93	8	180	89	.07	2	95	5		7.3	6.2	26	C
06												7.3	6.0	24	C
07												7.3			C
08	5	113	95	8	181	95	.11	2	94	7		7.2			C
09	7	163	93	2	47	96	.12	3	93	1		7.2	4.9	118	C
10	7	160	94	4	91	93	.11	3	93	3		7.4	5.2	24	C
11	5	115	95	2	46	94	.09	2	95	1		7.4	5.2	78	C
12	4	89	94	2	45	96	.10	2	94	1		7.3	5.9	20	C
13												7.2	4.9	62	C
14												7.3			C
15	7	159	94	2	46	98	.13	3	93	1		7.3			C
16	7	160	94	8	183	89	.03	1	98	2		7.3	6.5	84	C
17	5	115	95	8	184	91	.14	3	92	7		7.4	6.5	36	C
18	5	112	93	5	112	94	.14	3	92	4		7.4	6.9	28	C
19	6	135	95	12	269	86	.32	7	92	10		7.3	4.6	80	C
20												7.2	5.4	54	C
21												7.3			C
22	9	190	93	2	42	96	.14	3	92	1		7.5			C
23	8	176	93	6	132	92	.28	6	91	4		7.3	5.9	70	C
24	4	88	95	4	88	95	.21	5	88	2		7.3	5.2	4	C
25	6	132	94	3	66	93	.18	4	92	2		7.3	5.0		C
26	12	262	90	2	44	95	.17	4	90	1		7.3	5.2	192	C
27												7.4	5.0	52	C
28												7.3			C
29	11	224	90	1	20	98	.08	2	96	1		7.3			C
30	2	42	96	7	148	91	.12	3	94	4		7.2	6.3	70	C
31															C
TL		3130			2193			65							C
ME	5	142	94	4	100	94	.13	3	93	3		7.3	5.6	43	C
WA	8	170		7	159									49	C