SUB-APPENDIX A

2001 – 2003 MWWD DATA TABLES

City of San Diego MWWD
2001-2003 Daily and 7-Day Averages, Minimum, Maximum, and 90th and 95th Percentiles for MBC, PLWTP, SBWRP, and NCWRP

	MBC					
	Centrate Flow (mgd)		TSS Conc. (mg/L)		BOD Conc. (mg/L)	
Date	Daily	7-d Rng Avg	Daily	7-d Rng Avg	Daily	7-d Rng Avg
2001						
Average	2.232	2.24	693	698	359	357
Minimum	0.980	1.34	195	253	67	193
Maximum	3.318	2.54	12,600	6,046	4,120	2,488
90%tile	2.50	2.38	874	752	485	448
95%tile	2.62	2.43	997	1,088	550	538
2002						
Average	2.254	2.25	677	673	307	311
Minimum	0.602	1.22	140	309	67	184
Maximum	2.988	2.55	9,840	3,893	2,270	1,214
90%tile	2.57	2.46	980	1,104	406	395
95%tile	2.65	2.49	1,417	1,512	480	507
2003						
Average	2.307	2.31	684	690	287	284
Minimum	0.770	1.14	105	304	67	167
Maximum	3.028	2.68	15,000	3,504	1,380	587
90%tile	2.74	2.58	867	1,124	415	371
95%tile	2.85	2.62	1,355	1,318	477	421
OVERALL						
Average	2.256	2.26	685	686	324	324
Minimum	0.602	1.14	105	1	67	1
Maximum	3.318	2.68	15,000	3	4,120	3
90%tile	2.61	2.49	900	902	442	411
95%tile	2.71	2.52	1,320	1,466	523	514

City of San Diego MWWD
2001-2003 Daily and 7-Day Averages, Minimum, Maximum, and 90th and 95th Percentiles for MBC, PLWTP, SBWRP, and NCWRP

Point Loma

Date	Influent Flow (mgd)		Infl. TSS Conc. (mg/L)		Eff TSS Conc. (mg/L)		TSS Removal Rate (%)		Sys Wide TSS Removal (%)		Infl. BOD Conc. (mg/L)		Eff BOD Conc. (mg/L)		BOD Removal (%)	
	Daily	7-d Rng Avg	Daily	7-d Rng Avg	Daily	7-d Rng Avg	Daily	7-d Rng Avg	Daily	7-d Rng Avg	Daily	7-d Rng Avg	Daily	7-d Rng Avg	Daily	7-d Rng Avg
2001																
Average	174.7	174.8	274.7	274.2	41.4	41.7	85.04%	85.01%	85.35%	85.30%	257	253.1	95	93.6	62.17%	62.17%
Minimum	151.3	165.9	186.0	250.4	19.0	22.9	76.92%	80.92%	77.00%	81.14%	165	200.3	64	72.4	42.42%	50.56%
Maximum	221.6	201.3	417.0	326.1	60.0	55.0	94.67%	92.27%	92.00%	90.29%	446	292.4	224	123.4	74.16%	69.75%
90%tile	183.06	183.7	299.60	286.5	51.00	50.2	89.08%	88.90%	88.00%	87.61%	281.10	273.3	112.00	106.0	68.97%	66.74%
95%tile	189.78	190.9	321.00	290.7	53.00	51.4	91.73%	91.19%	89.00%	88.73%	290.55	276.7	117.60	107.6	70.22%	67.35%
2002																
Average	168.8	168.8	285.7	286.0	43.5	43.5	84.21%	84.20%	84.02%	84.16%	265	265.2	94	93.7	64.61%	64.59%
Minimum	154.9	162.1	23.0	224.1	28.0	33.7	-56.52%	63.57%	57.00%	63.57%	178	240.4	60	74.6	37.46%	53.12%
Maximum	188.6	180.8	397.0	343.4	69.0	58.0	90.11%	88.17%	93.00%	89.14%	369	295.9	177	119.7	77.03%	73.00%
90%tile	174.26	172.5	321.00	302.8	51.00	50.1	87.50%	86.55%	88.00%	87.51%	288.00	279.2	112.00	109.9	71.08%	69.65%
95%tile	176.46	174.0	328.80	311.4	55.00	51.8	88.33%	87.15%	89.00%	88.14%	300.00	287.5	117.00	113.4	72.32%	70.24%
2003																
Average	171.8	171.9	289.9	290.0	42.2	42.2	85.33%	85.34%	85.96%	85.69%	270	269.9	107	106.6	60.20%	60.40%
Minimum	158.1	163.2	225.0	252.6	26.5	32.5	77.49%	81.05%	62.43%	72.48%	206	224.9	70	85.2	40.96%	53.35%
Maximum	223.2	197.9	399.0	321.9	68.9	52.8	91.88%	88.25%	92.40%	88.74%	355	299.0	173	129.7	70.07%	67.95%
90%tile	182.90	185.0	316.00	304.9	49.50	47.1	88.23%	87.09%	89.13%	87.86%	293.20	287.1	127.00	121.6	66.07%	65.18%
95%tile	193.18	190.2	327.00	310.3	52.40	49.2	88.58%	87.19%	89.58%	88.03%	301.10	290.7	129.00	124.3	67.54%	65.87%
OVERALL																
Average	171.8	171.815	282.3	282.088	42.5	42.520	84.74%	84.72%	84.90%	84.89%	261.6	261.4	96.3	96.245	62.86%	62.83%
Minimum	151.3	1.142	23.0	1.142	19.0	1.142	-56.52%	114.16%	57.00%	114.16%	165.0	1.1	60.0	1.142	37.46%	114.16%
Maximum	223.2	2.684	417.0	2.684	69.0	2.684	94.67%	268.39%	93.00%	268.39%	369.0	2.7	177.0	2.684	77.03%	268.39%
90%tile	179.60	178.98	315.00	300.80	51.00	49.80	88.04%	86.91%	88.65%	87.67%	289.00	281.1	116.70	112.25	69.76%	67.85%
95%tile	186.38	185.53	325.00	305.83	54.00	51.40	88.80%	87.55%	89.00%	88.15%	298.00	286.7	123.00	117.46	71.22%	69.32%

City of San Diego MWWD
2001-2003 Daily and 7-Day Averages, Minimum, Maximum, and 90th and 95th Percentiles for MBC, PLWTP, SBWRP, and NCWRP

	SOUTH BAY WRP													
	Infl. Flow (mgd)		Infl. TSS Con (mg/L)		Infl. BOD Con (mg/L)		Eff. Flow (mgd)		Eff TSS Con (mg/L)		Eff BOD Con (mg/L)		Return to SMI (mgd)	
Date	Daily	7-d Rng Avg	Daily	7-d Rng Avg	Daily	7-d Rng Avg	Daily	7-d Rng Avg	Daily	7-d Rng Avg	Daily	7-d Rng Avg	Daily	7-d Rng Avg
2001														
Average														
Minimum														
Maximum														
90%tile														
95%tile														
2002														
Average	4.43	4.43	256.9	260.8	316.3	321.5	4.4	4.38	3.64	3.81	5.33	6.75	0.66	0.66
Minimum	1.99	3.97	40	106.7	121	237.1	3.00	3.81	1.6	1.94	2	3.43	0.33	0.45
Maximum	4.84	4.65	1050	438.4	695	441.3	5.41	4.96	13.7	8.35	34.7	10.31	1.11	0.84
90%tile	4.62	4.56	345.60	344.3	394.10	359.3	4.93	4.73	6.86	7.26	10.00	9.50	0.91	0.78
95%tile	4.66	4.61	519.90	375.9	466.05	364.9	5.00	4.77	8.97	7.74	11.95	9.77	0.94	0.80
2003														
Average	4.54	4.54	259.5		312.0		4.0	3.97	5.18		11.10		0.72	0.72
Minimum	2.03	4.08	43		193		1.72	3.37	1.6		2		0.23	0.53
Maximum	5.31	4.80	832		1370		6.28	4.75	20.2		44.3		1.12	0.96
90%tile	4.82	4.73	417.60		382.60		4.40	4.29	9.30		23.24		0.92	0.87
95%tile	4.90	4.74	528.80		437.40		4.50	4.42	10.34		25.98		0.96	0.89
OVERALL														
Average	4.49	4.48	258	260.8	315	321.5	4.17	4.166	4.42	3.813	8	6.751	0.69	0.691
Minimum	1.99	1.14	40	1.1	121	1.1	1.72	1.142	1.60	1.142	2	1.142	0.23	1.142
Maximum	5.31	2.68	1,050	2.7	1,370	2.7	6.28	2.684	20.20	2.684	44	2.684	1.12	2.684
90%tile	4.76	4.71	374.20	344.3	390.00	359.3	4.80	4.66	9.00	7.26	15.46	9.50	0.92	0.84
95%tile	4.82	4.73	527.60	375.9	467.70	364.9	4.96	4.73	10.30	7.74	23.39	9.77	0.96	0.87

City of San Diego MWWD
2001-2003 Daily and 7-Day Averages, Minimum, Maximum, and 90th and 95th Percentiles for MBC, PLWTP, SBWRP, and NCWRP

	NCWRP								NCWRP			
	Influent Flow (mgd)		Influent TSS (mg/L)		Influent BOD (mg/L)		Effluent Flow (mgd)		Effluent TSS (mg/L)		Effluent BOD (mg/L)	
Date	Daily	7-d Rng Avg	Daily	7-d Rng Avg	Daily	7-d Rng Avg	Daily	7-d Rng Avg	Daily	7-d Rng Avg	Daily	7-d Rng Avg
2001												
Average	23.6	23.55	233.5	231.60	209.7	207.24	21.4	21.26	3.0	3.05	2.6	2.60
Minimum	17.9	22.42	153.6	0.90	0.0	0.90	15.9	0.90	0.0	0.90	0.0	0.71
Maximum	26.3	24.67	1194.8	377.64	569.8	274.92	25.8	23.59	10.9	5.01	8.9	8.50
90%tile	24.58	24.32	260.83	251.75	245.37	232.21	23.10	22.73	5.20	4.66	5.20	5.46
95%tile	24.93	24.46	278.34	271.87	281.98	255.56	23.55	23.02	5.65	4.86	7.00	5.91
2002												
Average												
Minimum												
Maximum												
90%tile												
95%tile												
2003												
Average												
Minimum												
Maximum												
90%tile												
95%tile												
OVERALL												
Average	23.566	23.552	233.455	232.923	209.710	208.422	21.369	21.378	3.025	3.063	2.576	2.610
Minimum	1.142	1.142	1.142	1.142	1.142	1.142	1.142	1.142	1.142	1.142	1.142	1.142
Maximum	2.684	2.684	2.684	2.684	2.684	2.684	2.684	2.684	2.684	2.684	2.684	2.684
90%tile	24.58	24.32	260.83	251.75	245.37	232.21	23.10	22.73	5.20	4.66	5.20	5.46
95%tile	24.93	24.46	278.34	271.87	281.98	255.56	23.55	23.02	5.65	4.86	7.00	5.91

SUB-APPENDIX B

MBC CAMP MASS BALANACE MODEL RUNS

MODEL SUMMARY FOR CALENDAR YEAR CALIBRATION

Case No.:	CALIBRATION RUN - MBC CAMP PROJECT 10.6	**Year MER Reached:**	CALIBRATION
System AADF	189.3 mgd	**Year PS2 Cap. Reached:**	N/A
PS1 PWWF:	N/A mgd	**PS2 Storage Design Year:**	No Storage Provided
PS2 PWWF:	N/A mgd	**PS2 Storage Cap. (mgd):**	N/A
PL Eff TSS:	54 mg/L	**Year PS1 Cap. Reached:**	N/A
MBC Gas Prd:	312,087 scf	**Storage Tank Design Year:**	No Storage Provided
SSPF Gas Prd	0 scf	**Storage Tank Cap. (mgd):**	N/A

Assumptions:

- 83% solids recovery in dewatering cenrifuge
- 82.900% removal of non-centrate recylce TSS at PLWTP
- 100.000% Capture of Chemical Sludge
- 82.900% removal of thickener centrate TSS at PLWTP
- 82.900% removal of dewatering centrate TSS at PLWTP
- 13,600 mt/yr TSS MER limit at PLWTP
- 317 mg/L TBOD in the MSS Flow
- 296 mg/L TSS in the MSS Flow
- 82.900% removal of TSS from MSS and WRP Secondary Effluent
- 1.1 lb TSS/lb FeCl3 added
- 59% removal of TBOD at PLWTP
- 0.0% Diverted at PLWTP for Secondary Treatment
- 0.00 mgd diverted at PLWTP for Secondary Treatment
- 25 mgd NCWRP
- 0 mgd CWRP
- 5 mgd SBWRP (Southern Facility)
- 0 mgd CSTP
- 0 mgd SBSTP
- 298 mg/L TBOD in the PLWTP Influent
- 325 mg/L TSS in the PLWTP Influent
- 282 mg/L TBOD in the NCWRP Influent
- 278 mg/L TSS in the NCWRP Influent
- 250 mg/L TBOD in the Central WRP Influent
- 250 mg/L TSS in the Central WRP Influent
- 468 mg/L TBOD in the South Bay Influent
- 528 mg/L TSS in the South Bay Influent
- 0.0% Reclamation at NCWRP Annually
- 0.0% Reclamation at CWRP Annually
- 0.0% Reclamation at SBWRP Annually
- 30 mgd of WRP Capacity - VIOLATES OPRA
- *No WTP Sludge discharged to the sewer*
- NCES/PLTO Not Utilized
- SSPF Not Online
- *TSS MER Limit Applies to PLOO Only*

Source/Plant		Flow (mgd)	TSS (lb/d)	VSS (lb/d)	TBOD (lb/d)	SBOD (lb/d)
Total System Generation						
	MSS (Basic + Other Major Ind/Com Sources)	189.30	467,314	350,485	500,468	200,187
	Tijuana	0.00	0	0	0	0
	PS No. 2 Chemical	0.00	17,095	0	0	0
	Subtotal A - Total Generated	189.30	484,408	350,485	500,468	200,187
NCWRP						
	Applied	24.90	57,731	43,298	58,562	23,425
	Returned	23.21	1,103	883	1,355	472
	Subtotal B - Net Change	(1.69)	(56,628)	(42,416)	(57,207)	(22,952)
SWRP/MVWRP/MGWRP (i.e., CWRP)						
	Applied	0.00	0	0	0	0
	Returned	0.00	0	0	0	0
	Subtotal C - Net Change	0.00	0	0	0	0
SBWRP						
	Applied	4.80	21,137	15,853	18,735	7,494
	Returned	0.57	23,627	18,268	11,811	236
	Subtotal D - Net Change	(4.23)	2,490	2,415	(6,924)	(7,258)
SBSTP						
	Applied	0.00	0	0	0	0
	Returned	0.00	0	0	0	0
	Subtotal D - Net Change	0.00	0	0	0	0
NSPF (MBC)						
	Returned Thickener Centrate	1.55	12,325	9,512	6,466	517
	Dewatering Centrate	0.12	6,088	4,080	1,804	1,733
	Subtotal E - Net Change	1.68	18,412	13,592	8,271	2,251
SSPF						
	Returned Thickener Centrate	0.00	0	0	0	0
	Dewatering Centrate	0.00	0	0	0	0
	Subtotal F - Net Change	0.00	0	0	0	0
PLWTP						
	Applied					
	- w/o FISDF/FIRP, Plant & PS2 Chem	185.05	431,589	324,077	444,607	172,227
	- with PS No. 2 Chem & FISDF/FIRP	186.34	504,878	350,614	462,885	180,666
	- with PS No. 2 Chem, FISDF/FIRP & Plant Chem	186.35	556,162	350,614	462,885	180,666
	Effluent	184.95	83,411	47,334	189,783	177,935
	Removal Efficiency					
	- w/o FISDF/FIRP, Plant & PS2 Chem (per Waiver)	---	80.7%	85.4%	57.3%	-3.3%
	- with PS No. 2 Chem & FISDF/FIRP	---	83.5%	86.5%	59.0%	1.5%
	- with PS No. 2 Chem, FISDF/FIRP & Plant Chem	---	85.0%	86.5%	59.0%	1.5%
	Secondary Effluent from NCWRP	0.00	0	0	0	0
	Secondary Effluent from SWRP	0.00	0	0	0	0
	Secondary Effluent from SBWRP/SBSTP	0.00	0	0	0	0
	Total Ocean Discharge (PLWTP+NCWRP+SWRP/SBSTP)	184.95	83,411	47,334	189,783	177,935
	(TOTAL OCEAN DISCHARGE IN MT/YEAR)		13807			

	TSS	TBOD
	279.6	288.1
	324.9	297.9
	357.9	297.8

Metropolitan Sewerage System
2001-2003 Wastewater Quality and Flow Used for Model Calibration
MBC CAMP Silos and Truck Loadout Capacity Estimates

Daily - 95th Percentile

Year	PLWTPin			PLWTPout			Removal (%)		SBWRPin			SBWRPout			Removal (%)		SBWRPrel	MBC Centrate			NCWRPin			NCWRPout			Removal (%)	
	Flow	TSS	TBOD	Flow	TSS	TBOD	TSS	TBOD	Flow	TSS	TBOD	Flow	TSS	TBOD	TSS	TBOD	Flow	Flow	TSS	TBOD	Flow	TSS	TBOD	Flow	TSS	TBOD	TSS	TBOD
2001	189.8	321.0	290.6	188.7	53.0	117.6	91.7%	70.2%						-			-	2.6	997	550	24.9	278.3	282	23.6	5.7	7	98.0%	97.5%
2002	176.5	328.8	300.0	175.4	55.0	117.0	88.3%	72.3%	4.7	520	466	5.0	9.0	12.0	98.3%	97.4%	0.94	2.7	1417	480								
2003	193.2	325.0	301.1	192.1	52.4	129.0	88.6%	67.5%	4.9	529	437	4.5	10.3	26.0	98.1%	94.1%	0.96	2.9	1355	477								
3-yr	186.4	325.0	298.0	185.3	54.0	123.0	88.8%	71.2%	4.8	528	468	5.0	10.3	23.4	98.0%	95.0%	0.96	2.7	1320	523	24.9	278.3	282.0	23.6	5.7	7.0	98.0%	97.5%
Model	186.3	325	298	184.9	54.1	123.0	85.0%	59.0%	4.80	529	468	4.23	10.3	23.4	---	---	0.57	1.7	1317	592	24.90	278	282	23.21	5.7	7.0	---	---

Project P-10.6 - Replacement of Dewatering Centrifuges with Larger Capacity Units

30% = Solids Content (%)
355,898 = Mass Production Rate (dry lb/d)
178 = Mass Production Rate (dry ton/d)
1,522,983 = Volumetric Production Rate (gpd) - VPR
203,607 = Volumetric Production Rate (ft^3/d) - VPR

(i.e., 2 weekend days + 16 hours or 64 hours)

[illegible] = Dewatering Centrifuge Capacity Required (gpm)

8 = Number of Centrifuges Available
[illegible] = Assumed Number of Centrifuges in Operation
200 = Average Capacity per Centrifuge (gpm)
300 = Peak Capacity per Centrifuge (gpm)
1,200 = Total available average capacity (gpm)
1,800 = Total available peak capacity (gpm)

[illegible]

Plant Performance Criteria

Category	Process	Parameter	Units	Value	Model Designation	Comments
Permit Requirement		TSS MER	lb/d	82,159	TSS_MER	
			mt/yr	13,600		
		System Wide = 1; Specific to PLOO = 0	------->	0	MER_CRITERIA	
SBSTP		Advanced Primary Treatment Toggle	0=No; 1=Yes	0	SBSTP.ADV.PRIM	
Water Tmt Sludge		Water Treatment Sludge Solids Load	(1 = IN; 0 = OUT)	0	WTP.SLUDGE	
		- North (Poway WTP)	% of total load	3.0%	WTPLOAD.N	
		- Central (Helix WTP)	% of total load	11.4%	WTPLOAD.C	
		- South (Otay WTP)	% of total load	11.4%	WTPLOAD.S	
		- PLWTP Direct (Miramar and Alvarado WTPs)	% of total load	74.2%	WTPLOAD.PL	
AWT		AWT On-Line	(1 = Yes; 0 = No)	0	AWT	
San Pasqual/RB		San Pasqual Valley Situation	Scenario	0	SPVWRP.SCEN	0-Base; 1-Raw; 2-Raw-1; 3-TE
PS1		Peak Capacity	mgd	160	PS1.CAP	
PS2		Peak Capacity	mgd	432	PS2.CAP	
NCES/PLTO		Online? (1=Yes; 0=No)	---	0	NCES	
Peaking Factors		NCWRP	---	2.00	NCWRP.PEAK.Q	Based on Actual Design
		SBWRP	---	2.57	SBWRP.PEAK.Q	Based on Actual Design
		SBSTP	---	1.80	SBSTP.PEAK.Q	Based on Project Report
		CWRP	---	1.20	CWRP.PEAK.Q	Based on Project Report
		Impact of Flow removal at GAPS on PS1	---	1.34	GAPS.PS1.PF	Provided by PPG (2/19/97)
		Impact of Flow removal at GAPS on PS2	---	1.30	GAPS.PS2.PF	Provided by PPG (2/19/97)
		Impact of Flow removal at SRPS on PS1	---	1.62	SRPS.PS1.PF	Provided by PPG (2/19/97)
		Impact of Flow removal at SRPS on PS2	---	1.47	SRPS.PS2.PF	Provided by PPG (2/19/97)
		GAPS - Local	---	1.38	GAPS.LOCAL.PF	Provided by PPG (2/19/97)
		SRPS - Local	---	1.93	SRPS.LOCAL.PF	Provided by PPG (2/19/97)
		Criterion for Using which PF - % of PF	%	70.0%	PERCENT.PF	Provided by PPG (2/19/97)
		Peak Q at GAPS at MER Year	mgd	8.3	GAPS.MAX.Q	
		Peak Q at GAPS for PS1/PS2 Capacity Calc.	mgd	7.0	GAPS.MAX.PS1PS2	
SMI Flow Equalization		Design Life - Capacity till Year? (0=No Storage)	Year	0	STOR_YEAR	
System Flow Equalization		Design Life - Capacity till Year? (0=No Storage)	Year	0	STOR_YEAR.PS2	
		Provided where? (1=Central/North; 0=South)	---	0	STOR.LOC.PS2	
Raw Wastewater Quality		VSS	% of TSS	75%	RAWVSS%	
		SBOD	% of TBOD	40%	RAWSBOD%	
		Chemical Addition at PS2	mg/L	10	PS2.CHEM	
		Chemical Sludge Production	lb TSS/lb FeCl3	1.10	PS2.CHEM.PROD	3-yr average at PLWTP
		TBOD Concentration				
		- Total MSS	mg/L	317	TBOD.MSS	Iterate to match '2001-2003' sheet
		- Rancho Bernardo	mg/L	200	TBOD.RB	
		- SPVWRP Effluent	mg/L	5	TBOD.SPVWRP	
		- PQPS Influent	mg/L	282	TBOD.PQPS	Match '2001-2003' sheet
		- NCWRP Service Area	mg/L	282	TBOD.NCWRP	Match '2001-2003' sheet
		- Central WRP Service Area	mg/L	250	TBOD.CENTRAL	
		- SBWRP Influent	mg/L	468	TBOD.SOUTH	Match '2001-2003' sheet
		- SBSTP Influent	mg/L	468	TBOD.SBSTP	Match '2001-2003' sheet
		- OWRP Influent	mg/L	0	TBOD.OWRP	
		TSS Concentration				
		- Total MSS	mg/L	296	TSS.MSS	Iterate to match '2001-2003' sheet
		- Rancho Bernardo	mg/L	220	TSS.RB	
		- SPVWRP Effluent	mg/L	270	TSS.SPVWRP	
		- PQPS Influent	mg/L	278	TSS.PQPS	Match '2001-2003' sheet
		- NCWRP Service Area	mg/L	278	TSS.NCWRP	Match '2001-2003' sheet
		- Central WRP Service Area	mg/L	250	TSS.CENTRAL	
		- SBWRP Influent	mg/L	528	TSS.SOUTH	Match '2001-2003' sheet
		- SBSTP Influent	mg/L	528	TSS.SBSTP	Match '2001-2003' sheet
		- OWRP Influent	mg/L	0	TSS.OWRP	
WRP	Primary	TSS Removal	%	60%	WRP.TSS.REM	
		BOD Removal	%	35%	WRP.BOD.REM	
		Wastewater Temperture	deg-C	30.0	TEMP	
		Chemical Addition	mg/L	15	WRP.CHEM.CONC.P	
		Chemical Sludge Production	lb TSS/lb FeCl3	1.10	WRP.CHEM.PROD	
		Sludge Concentration	% (w/w)	0.50%	WRP.PR.SLD.C	
		VSS to TSS Ratio in Sludge	%	75%	WRP.PR.VSS%	
		VSS to TSS Ratio in Effluent	%	75%	WRP.PE.VSS%	
		Equalized Flow Peaking Factor	Dimensionless	1.20	EQPF	
	Secondary	Effluent TSS Conc.	mg/L	9	SEC.EFF.TSS	
		Effluent BOD Conc.	mg/L	9	SEC.EFF.BOD	
		Nonbiodeg Fraction of Inf VSS	%	40%	NBVSS	
		MLTSS Conc.	mg/L	2,800	MLTSS	
		RAS/WAS Solids Conc.	% (w/w)	0.50%	WAS%	
		VSS to TSS Ratio in Sludge	%	80%	WRP.SEC.VSS%	
		MCRT	days	5	MCRT	
		Net Yield	lb TSS gen/lb BOD rem	0.60	TSS.GEN.SEC	
		Decay Coefficient	Dimensionless	0.05	DECAY	
		RAS:Influent Flow Ratio	Dimensionless	0.50	RAS.INF	

Plant Performance Criteria

Category	Process	Parameter	Units	Value Model Designation	Comments
		Particulate BOD to VSS Ratio	%	100% PBOD.VSS.SEC	

Plant Performance Criteria

Category	Process	Parameter	Units	Value	Model Designation	Comments
	Tertiary	Effluent TSS Conc.	mg/L	4	TER.EFF.TSS	
		Effluent BOD Conc.	mg/L	8	TER.EFF.BOD	
		Chemical Addition - NaOCl	mg/L	5	WRP.CHEM.CONC.T	
		VSS to TSS Ratio in Tert Inf/Eff	%	47%	TER.VSS	
		Particulate BOD to VSS Ratio	%	47%	PBOD.VSS	
	Misc	Utility Water Flow	% of Plant Flow	3.0%	UTILITY	
PLWTP	Adv. Primary	Average TSS removal	%	89.0%	PL.TSS.AVGREM	
		MSS TSS removal	%	82.9%	PL.TSS.MSSREM	Iterate to match "2001-2003" sheet
		Waiver Required Removal	%	80.0%	WAIVER.TSS%	
		Influent Recycle TSS Removal	%	82.9%	PL.TSS.RECREM	
		Influent Thickener Centrate TSS Removal	%	82.9%	PL.TSS.TCENT	
		Influent Dewatering Centrate TSS Removal	%	82.9%	PL.TSS.DCENT	
		Influent Retreat TSS Removal	%	82.9%	PL.TSS.RETREM	
		Average BOD removal	%	59.0%	PL.BOD.AVGREM	
		MSS BOD removal	%	59.0%	PL.BOD.MSSREM	Iterate to match "2001-2003" sheet
		Waiver Required Removal	%	58.0%	WAIVER.TBOD%	
		Influent Recycle BOD Removal	%	59.0%	PL.BOD.RECREM	
		Influent Retreat BOD Removal	%	59.0%	PL.BOD.RETREM	
		Chemical Addition - FeCl3	mg/L	30	ADVPRI.CHEM	
		Chemical Sludge Production	lb TSS/lb FeCl3	1.10	ADVPRI.CHEM.PRD	
		Capture of Chemical Sludge	%	100%	CHEM.SLDG.PL	See chemical sludge spreadsheet
		Sludge Concentration	% (w/w)	4%	ADVPRI.SLD	
		VSS to TSS Ratio in Sludge	%	75%	ADVPRI.VSS%	
		SBOD to TBOD Ratio in Sludge	%	1%	ADVPRI.SBOD%	
		Bypass to Ocean Outfall	%	0%	PLWTP.BP	
Sludge Processing	General	Combined Sludge Specific Gravity	Dimensionless	1.01	SG.SLUDGE	Per 5/25/04 changes provided by MWWD
		SBOD to TBOD Ratio in Combined Sludge	%	2%	SBOD.CS	
	Thickening	Solids Recovery	%	82.5%	THCK.REC	Iterate to match "2001-2003" Sheet
		Sludge Concentration	% (w/w)	5%	THCK.SLD%	
		Thickened Sludge Specific Gravity	Dimensionless	1.03	SG.THCKSL	Per 5/25/04 changes provided by MWWD
		Fraction of TBOD Retained in Centrate	%	10%	TBOD.TC%	
		Fraction of SBOD Retained in Centrate	%	70%	SBOD.TC%	
	Digestion	Primary Sludge VSS Destroyed	%	50%	VSS.DES	
		Combined Sludge VSS Destroyed	%	52%	VSS.DES.COMB	Per 5/25/04 changes provided by MWWD
		Gas Production Rate	scf/lb VSS des	14.5	GAS.PROD	Per 5/25/04 changes provided by MWWD
		Influent to Effluent Flow Ratio	%	99%	INF.EFF.DIG	Per 5/25/04 changes provided by MWWD
		Digested Sludge Specific Gravity	Dimensionless	1.03	SG.DIG	Per 5/25/04 changes provided by MWWD
		Solubilization of Primary VSS (Inc. in VSS Des.)	%	5%	VSS.SOL	
		Solubilization of Combined VSS (Inc. in VSS Des.)	%	7%	VSS.SOL.COMB	
		Fraction of Solubilized VSS is SBOD	%	75%	SBOD.VSS.DIG	
		TBOD Reduction in Digester - Primary Sludge	%	75%	TBOD.RED%	
		TBOD Reduction in Digester - Combined Sludge	%	55%	TBOD.RED%.COMB	
		SBOD Reduction in Digester - Primary Sludge	%	75%	SBOD.RED%	
		SBOD Reduction in Digester - Combined Sludge	%	55%	SBOD.RED%.COMB	
	Dewatering	Solids Recovery - Centrifuge	%	88.5%	DEW.REC	Iterate to match "2001-2003" Sheet
		Solids Recovery - Belt Filter Press	%	92%	DEW.BFP	
		Sludge Concentration	% (w/w)	28%	DEW.SLD%	Per 5/25/04 changes provided by MWWD
		Dewatered Sludge Specific Gravity	Dimensionless	1.07	SG.DWTR	
		Dewatered Centrate Specific Gravity	Dimensionless	1.00	SG.DC	
		Fraction of TBOD Retained in Centrate	%	10%	TBOD.DWTR%	
		Fraction of SBOD Retained in Centrate	%	70%	SBOD.DWTR%	
		BFP Washwater Added to Filtrate	gpm	90	BFP.WW	
		Number of BFPs Operating at FISDF	Dimensionless	6	BFP	
		FIRP Startup Year	---	1998.5	FIRP.YEAR	
Centrate Treatment		Solids Recovery	%	97%	CENT.TMT.REC	Per 5/25/04 changes provided by MWWD
		Thickened Sludge Concentration	% (w/w)	3.5%	CENT.TMT.SLD%	Per 5/25/04 changes provided by MWWD
		Toggle to activate	0=off; 1=on	0	CENT.TMT.TGL	

Wastewater Quality and Quantity

Source	Facility Design Cap. (mgd)	Flow AADF (mgd)	TSS Concentration (mg/L)	VSS Concentration (mg/L)	TBOD Concentration (mg/L)	SBOD Concentration (mg/L)
MSS		189.30	296	222	317	127
NCWRP Influent	24.9	24.90	278	209	282	113
CWRP Influent	0	0.00	250	188	250	100
CSTP Influent	0					
OWRP Influent	0	0.00	0	0	0	0
SBWRP Influent	4.8	4.80	528	396	468	187
Tijuana	---	0.00	0	0	0	0
SBSTP Influent	0	0.00	260	195	315	126

Flow Distribution 0.00 = flow to AWT Analysis Year

Plant	Percent to Tertiary	Secondary Effluent (mgd)			Tertiary			Combined Raw Sludge		Centrate		
		Tertiary	Retreatment	Outfall	Reuse	Retreatment	Outfall	MBC/SSPF	Retreatment	Treatment	Recycle	Retreat
NCWRP	0%	0.00	23.21	0.00	0%	100%	0%	100%	0%	NA	NA	NA
SWRP (CWRP)	0%	0.00	0.00	0.00	100%	0%	0%	0%	100%	NA	NA	NA
OVWRP	0%	0.00	0.00	0.00	100%	0%	0%	0%	100%	NA	NA	NA
SBWRP	0%	0.00	0.00	4.23	0%	0%	100%	0%	100%	NA	NA	NA
SBSTP to Sec	0%	0.00	0.00	0.00	100%	0%	0%	100%	0%	NA	NA	NA
NSPF		NA	NA	NA	NA	NA	NA	NA	NA	0%	0%	100%
FIRP		NA	NA	NA	NA	NA	NA	NA	NA	0%	0%	100%
SSPF		NA	NA	NA	NA	NA	NA	NA	NA	0%	0%	100%
Node D (Raw Wastewater)			100%	0%	NA	NA	NA	NA	NA	NA	NA	NA
SBWRP											0%	

PLWTP: 0

Flow Diverted for Secondary Treatment at PLWTP: 0.00%

0 mgd

Flow Diverted for Secondary Treatment at SBSTP: 0%

0 mgd

Mass Balance for the NSPF Portion of MBC - Y:\CALIBRATION

Process	Units	Value	Assumtions
SLUDGE THICKENING			
Influent Flow			
●ADWF	mgd	1.69	
●PWWF	mgd		
Influent Character			
- TSS	mg/l	4,950	1.01 Specific Gravity of Combined Sludge
	lb/d	70,428	(Relative to H20 = 1.0)
- VSS	mg/l	3,820	
	lb/d	54,362	
- TBOD	mg/l	2,597	
	lb/d	36,950	
- SBOD	mg/l	52	
	lb/d	739	
Thickener Centrate Flow			
●ADWF	mgd	1.55	1.00 Centrate Specific Gravity
●PWWF	mgd		
Thickener Centrate Character			
- TSS	mg/l	951	82.5% Solids Recovery
	lb/d	12,325	
- VSS	mg/l	734	
	lb/d	9,512	
- TBOD	mg/l	499	
	lb/d	6,466	
- SBOD	mg/l	40	
	lb/d	517	70% SBOD Fraction Retained in Centrate
Thickened Sludge Flow			
●ADWF	mgd	0.14	5.0% Thickened Sludge Concentration
●PWWF	mgd		1.03 Thickened Sludge Specific Gravity
Thickened Sludge Character			
- TSS	mg/l	50,000	82.5% Solids Recovery
	lb/d	56,103	
- VSS	mg/l	38,587	
	lb/d	44,840	
- TBOD	mg/l	26,233	
	lb/d	30,484	
- SBOD	mg/l	191	
	lb/d	222	
SLUDGE DIGESTION			
Digester Effluent			
●ADWF	mgd	0.13	99% Flow Conserved
●PWWF	mgd		
Digested Sludge Character			
- TSS	mg/l	30,237	
	lb/d	34,786	
- VSS	mg/l	20,268	1.03 Specific Gravity of Digested Sludge
	lb/d	23,317	52.0% VSS Destruction in Digester
- TBOD	mg/l	11,924	7% Fraction of Influent VSS Solubilized
	lb/d	13,718	75% Fraction of Solubilized VSS is SBOD
- SBOD	mg/l	2,152	55% TBOD Reduction in Digester
	lb/d	2,476	55% SBOD Reduction in Digester
Digester Gas Production	scf	312,087	15 scf/lb VSS destroyed
SLUDGE DEWATERING			
Sludge Cake Flow			
●ADWF	mgd	0.011	
●PWWF	mgd		
Sludge Cake Character			
- TSS	mg/l	280,000	28% Solids Content
	lb/d	25,696	83% Solids Capture (Applies to TSS, VSS & TBOD)
- VSS	mg/l	187,683	1.07 Specific Gravity
	lb/d	19,236	0.170 = (1-Cent TSS Rem Eff)*(DAFT TSS Rem Eff) - b
- TBOD	mg/l	116,236	0.005 = (1-Cent TSS Rem Eff)*(1-DAFT TSS Rem Eff) - a
	lb/d	11,913	
- SBOD	mg/l	7,247	
	lb/d	743	70% Fraction of SBOD Retained in Centrate
Centrate Flow			7,112 Recycle Stream-TSS
●ADWF	mgd	0.122	4,787 Recycle Stream-VSS
●PWWF	mgd		2,298 Recycle Stream-TBOD
Centrate Character			
- TSS	mg/l	5,962	1.00 Specific Gravity of Centrate
	lb/d	6,088	
- VSS	mg/l	3,996	
	lb/d	4,080	
- TBOD	mg/l	1,767	
	lb/d	1,804	
- SBOD	mg/l	1,697	
	lb/d	1,733	

Process	Units	Value		Assumptions
INFLUENT FLOW & WASTEWATER QUALITY (w/o FIRP Recycle & PS2 Chem)				
@ AADF	mgd	185.05		
@PWWF	mgd	333.10	1.8	peaking factor
TSS	mg/L	280		
	lb/d	431,589		
VSS	mg/L	210		
	lb/d	324,077		
TBOD	mg/L	288		
	lb/d	444,607		
SBOD	mg/L	112		
	lb/d	172,227		
PRIMARY SEDIMENTATION				
Total influent flow	mgd			
@ AADF		186.34	1.28	mgd from FIRP Recycle (MBC dewatering centrate cc
@ PWWF		334.38	0.00	mgd Thickening Centrate (the thinkening centrate at F
Influent TSS	lbs/day	504,878	56,195	lb/d from FIRP Recycle
	mg/L	325	0	lb/d from Thickening Centrate
Influent VSS	lbs/day	350,614	26,537	lb/d from FIRP Recycle
	mg/L	226	0	lb/d from Thickening Centrate
Influent TBOD	lbs/day	462,885	18,277	lb/d from FIRP Recycle
	mg/L	298	0	lb/d from Thickening Centrate
Influent SBOD	lbs/day	180,666	8,439	lb/d from FIRP Recycle
	mg/L	116	0	lb/d from Thickening Centrate
MSS TSS removal efficiency		82.90%		
MSS BOD removal efficiency		59.00%	83%	TSS Rem in other recycle stream
Dewatering Centrate TSS removal effiency		82.90%	83%	TSS Rem in Thickener Centrate
Dewatering Centrate BOD Removal efficiency		59.00%	59%	TBOD Rem in Thickener Centrate
In Plant Chemical Addition (FeCl▲d3▲0d)	mg/L	30	44%	Ferric Chloride Solution Added at PS2 & PLWTP
	lbs/day	46,622	1.5	Specific Gravity of FeCl3 Solution
	mgd	0.009	100%	Capture of Chemical Sludge
Chemical Sludge (as TSS) Produced	lbs/day	51,285	1.10	lb TSS Produced/lb FeCl3 Added
Primary sludge TSS	lbs/day	472,751		
Primary sludge VSS	lbs/day	303,279	75%	of Sludge TSS is VSS (exc. chem sludge)
Primary sludge TBOD	lbs/day	273,102	0.90	TBOD to VSS Ratio (Calculated)
Primary sludge SBOD	lbs/day	2,731	1%	of Sludge TBOD is SBOD
Primary sludge flow	mgd	1.40	4%	Advance Primary Sludge
Primary effluent TSS	lbs/day	83,411	1.01	Specific Gravity of Primary Sludge
Primary effluent TSS conc @AADF	mg/L	54.1	32,126	
Primary effluent VSS	lbs/day	47,334	83.4790%	Actual Removal (Plant Performance)
Primary effluent VSS conc @AADF	mg/L	30.7		
Primary effluent TBOD	lbs/day	189,783		
Primary effluent TBOD conc @AADF	mg/L	123.0		
Primary effluent SBOD	lbs/day	177,935	59.00%	Actual Removal (Plant Performance)
Primary effluent SBOD conc @AADF	mg/L	115.4		
Primary effluent flow	mgd			
@ AADF		184.95		
@ PWWF		332.99		
DIGESTION				
Digester Effluent				
@ AADF	mgd	1.39	99%	Flow Conserved
Digested Sludge Character				
- TSS	mg/l	26,911		
	lb/d	321,112		
- VSS	mg/l	12,708	1.03	Specific Gravity of Digested Sludge
	lb/d	151,640	50.0%	VSS Destruction in Digester
- TBOD	mg/l	5,722	5%	Fraction of Influent VSS Solubilized
	lb/d	68,276	75%	Fraction of Solubilized VSS is SBOD
- SBOD	mg/l	1,010	75%	TBOD Reduction in Digester
	lb/d	12,056	75%	SBOD Reduction in Digester
FISDF/FIRP SLUDGE DEWATERING				
Sludge Cake Flow				
@ AADF	mgd	0.106		
@PWWF	mgd			
Sludge Cake Character				
- TSS	mg/l	280,000	28%	Solids Content
	lb/d	264,917	83%	Solids Capture
- VSS	mg/l	132,225	1.07	Specific Gravity
	lb/d	125,103	0.47	VSS to TSS Ratio (Calculated)
- TBOD	mg/l	52,845	0.40	TBOD to VSS Ratio (Calculated)
	lb/d	49,998		
- SBOD	mg/l	3,823		
	lb/d	3,617	70%	Fraction of SBOD Retained in Centrate
Dewatering Centrate Flow				
@ AADF	mgd	1.28		
@PWWF	mgd		1.00	Specific Gravity of Centrate
Dewatering Centrate Character			0	gpm/BFP washwater added to centrate
- TSS	mg/l	5,252	0	BFP operating
	lb/d	56,195		
- VSS	mg/l	2,480	0.170	= (1-Cent TSS Rem Eff)*(DAFT TSS Rem Eff) - b
	lb/d	26,537	0.005	= (1-Cent TSS Rem Eff)*(1-DAFT TSS Rem Eff) - a
- TBOD	mg/l	1,708	65,653	Recycle Stream-TSS
	lb/d	18,277	31,004	Recycle Stream-VSS
- SBOD	mg/l	789	11,495	Recycle Stream-TBOD
	lb/d	8,439		

Process	Units	Value	Assumptions
INFLUENT FLOW			
@ AADF	mgd	4.8	
@PWWF	mgd	9.6	2 peaking factor
INFLUENT WASTEWATER QUALITY			
- TSS	mg/l	528	
- BOD	mg/l	468	
PRIMARY SEDIMENTATION			
Total influent flow	mgd		
@ AADF		4.80	0.00 mgd flow contributed by backwash
@ PWWF		9.60	
Influent TSS	lbs/day	21,137	
Influent BOD	lbs/day	18,735	
TSS removal efficiency for MSS Component		60%	
BOD removal efficiency		35%	
Chemical Addition (FeCl▲d3▲0d)	mg/L	0	
	lbs/day	0	44% by weight FeCl▲d3▲0d Sol'n
	mgd	0.0000	1.476 Specific Gravity of FeCl▲d3▲0d Sol'n
Chemical Sludge (as TSS) Produced	lbs/day	0	1.10 lb TSS Produced/lb FeCl3 Added
Primary sludge TSS	lbs/day	12,682	100% Chemical Sludge Removal Rate
Primary sludge flow	mgd	0.30	0.5% solids concentration.
Primary effluent TSS	lbs/day	8,455	
Primary effluent TSS conc @AADF	mg/l	225.49	Contribution during PWWF is mostly
Primary effluent BOD	lbs/day	12,178	dillution water with no BOD and TSS.
Primary effluent BOD conc @AADF	mg/l	324.78	
Primary effluent VSS	lbs/day	6,595	75% of raw wastewater TSS is VSS
Primary effluent VSS conc @AADF	mg/l	175.88	78% of primary effluent TSS is VSS
Primary effluent flow	mgd		
@ AADF		4.50	
@ PWWF		9.30	
ACTIVATED SLUDGE			
Gross Nonbiodeg. Incoming TSS	lbs/day	4,498	1,860 = NVSS (lb/day) including RAS fraction
MLTSS concentration	mg/l	2,800	40.0% = nonbiodeg fraction of inf. VSS (lb/day)
Influent flow	mgd		2,638 = NBVSS (lb/day) including RAS fraction
- Average		4.50	
- Peak		5.40	1.20 Peak equalized flow factor
Returned activated sludge flow	mgd	2.25	0.5% RAS solids concentration
RAS/influent ratio		0.50	80% of secondary TSS is VSS
Reactor inf/eff flow	mgd		
- Average		6.74	Assuming RAS flow remains constant.
- Peak		7.64	
Reactor effluent TSS	lbs/day	157,481	
Active biomass plus endogenous			5 SRT (MCRT)
biomass decay products	lbs/day	6,811	30 C assumed influent temperature
			0.6 =Ynet
SECONDARY SEDIMENTATION			
Influent flow	mgd		
- Average		4.50	
- Peak		5.40	
- TSS	lbs/day	8,455	
- TSS concentration	mg/l	225.49	
- BOD	lbs/day	12,178	
- BOD concentration	mg/l	324.78	
- VSS	lbs/day	6,595	
- VSS concentration	mg/l	175.88	157,481 lbs/day solids loading based on
Secondary effluent flow	mgd		2800 mg/l MLSS conc @ ADWF
- Average		4.23	178,479 lbs/day solids loading based on
- Peak		5.13	2800 mg/l MLSS conc @ PWWF
Secondary eff TSS	lbs/day	364	10.0 mg/l of TSS at the secondary effluent.
Secondary eff BOD	lbs/day	826	23.4 mg/l of BOD at the secondary effluent

Process	Units	Value	Assumptions
Waste activated sludge TSS	lbs/day	10,945	
Waste activated sludge flow	mgd	0.26	0.50 % solids
RAS & WAS flow	mgd	2.510411088	
Secondary's BOD removal eff		93.2%	
Secondary's TSS removal eff		95.7%	
TERTIARY FILTERS/ DISINFECTION			
Influent total flow	mgd		
- Average		0.00	utility water included
- Peak		0.00	1.20 Peaking Factor
Influent TSS	lbs/day	0	
Influent VSS	lbs/day	0	47% VSS to TSS Ratio
Influent TBOD	lbs/day	0	47% Particulate BOD to VSS Ratio
Influent SBOD	lbs/day	0	
Effluent flow	mgd		
- Average		0.00	
- Peak		0.00	
Effluent TSS	lbs/day	0	4.4 mg/l of TSS at the effluent.
Effluent VSS	lbs/day	0	8 mg/L of BOD at the effluent
Effluent TBOD	lbs/day	0	47% VSS to TSS Ratio
Effluent SBOD	lbs/day	0	47% Particulate BOD to VSS Ratio
Utility water flow WRP	mgd	0	3% of plant flow
Utility water TSS	lbs/day	0	
Utility water BOD	lbs/day	0	backwash flow is recycled to primaries
Backwash cumulative daily flow	mgd	0.00	20.0 gpm/sf of filter area.
Backwash cumulative TSS	lbs/day	0	15 minute backwash event.
Backwash TSS conc	mg/l	0	
Backwash cumulative BOD (lbs/day)	lbs/day	0	
Backwash BOD conc (mg/l)	mg/l	0	
Filters' BOD % removal		0%	
DISINFECTION			
Influent total flow	mgd		
- Average		0.00	
- Peak		0.00	1.2 Peaking Factor
Influent TSS	lbs/day	0	
Influent VSS	lbs/day	0	
Influent TBOD	lbs/day	0	
Influent SBOD	lbs/day	0	
Effluent flow	mgd		
- Average		0.00	
- Peak		0.00	
Effluent TSS	lbs/day	0	2 mg/l of TSS at the effluent.
Effluent VSS	lbs/day	0	4 mg/L of BOD at the effluent
Effluent TBOD	lbs/day	0	47% VSS to TSS Ratio
Effluent SBOD	lbs/day	0	

COMBINED SLUDGE FLOW =	0.57	MGD
COMBINED SLUDGE TSS MASS RATE =	23,627	lb/d
COMBINED SLUDGE VSS MASS RATE =	18,268	lb/d
COMBINED SLUDGE TBOD MASS RATE =	11,811	lb/d
COMBINED SLUDGE SBOD MASS RATE =	236	lb/d

Process	Units	Value	Assumptions
INFLUENT FLOW			
@AADF	mgd	24.9	
@PWWF	mgd	49.8	2 peaking factor
INFLUENT WASTEWATER QUALITY			
- TSS	mg/l	278	
- BOD	mg/l	282	
PRIMARY SEDIMENTATION			
Total influent flow	mgd		
@ AADF		24.90	0.00 mgd flow contributed by backwash
@ PWWF		49.80	
Influent TSS	lbs/day	57,731	
Influent BOD	lbs/day	58,562	
TSS removal efficiency		85%	
BOD removal efficiency		38%	
Chemical Addition (FeCl▲d3▲0d)	mg/L	10	
	lbs/day	2,077	44% by weight FeCl▲d3▲0d Sol'n
	mgd	0.0004	1.467 Specific Gravity of FeCl▲d3▲0d Sol'n
Chemical Sludge (as TSS) Produced	lbs/day	2,284	1.10 lb TSS Produced/lb FeCl3 Added
Primary sludge TSS	lbs/day	39,810	100% Chemical Sludge Removal Rate
Primary sludge flow	mgd	0.95	0.5% solids concentration.
Primary effluent TSS	lbs/day	20,206	
Primary effluent TSS conc @AADF	mg/l	101.18	Contribution during PWWF is mostly
Primary effluent BOD	lbs/day	36,308	dillution water with no BOD and TSS.
Primary effluent BOD conc @AADF	mg/l	181.81	
Primary effluent VSS	lbs/day	15,761	75% of raw wastewater TSS is VSS
Primary effluent VSS conc @AADF	mg/l	78.92	78% of primary effluent TSS is VSS
Primary effluent flow	mgd		
@ AADF		23.95	
@ PWWF		48.85	
ACTIVATED SLUDGE			
Gross Nonbiodeg. Incoming TSS	lbs/day	10,750	4,445 = NVSS (lb/day) including RAS fraction
MLTSS concentration	mg/l	2,155	40.0% = nonbiodeg fraction of inf. VSS (lb/day)
Influent flow	mgd		6,304 = NBVSS (lb/day) including RAS fraction
- Average		23.95	
- Peak		28.73	1.20 Peak equalized flow factor
Returned activated sludge flow	mgd	11.97	0.5% RAS solids concentration
RAS/influent ratio		0.50	80% of secondary TSS is VSS
Reactor inf/eff flow	mgd		
- Average		35.92	Assuming RAS flow remains constant.
- Peak		40.71	
Reactor effluent TSS	lbs/day	645,554	
Active biomass plus endogenous			5.86 SRT (MCRT)
biomass decay products	lbs/day	20,972	30 C assumed influent temperature
			0.6 =Ynet
SECONDARY SEDIMENTATION			
Influent flow	mgd		
- Average		23.95	
- Peak		28.73	
- TSS	lbs/day	20,206	
- TSS concentration	mg/l	101.18	
- BOD	lbs/day	36,308	
- BOD concentration	mg/l	181.81	
- VSS	lbs/day	15,761	
- VSS concentration	mg/l	78.92	645,554 lbs/day solids loading based on
Secondary effluent flow	mgd		2155 mg/l MLSS conc @ ADWF
- Average		23.21	731,628 lbs/day solids loading based on
- Peak		28.00	2155 mg/l MLSS conc @ PWWF
Secondary eff TSS	lbs/day	1,103	5.7 mg/l of TSS at the secondary effluent.
Secondary eff BOD	lbs/day	1,355	7.0 mg/l of BOD at the secondary effluent

Process	Units	Value	Assumptions
Waste activated sludge TSS	lbs/day	30,618	
Waste activated sludge flow	mgd	0.73	0.50 % solids
RAS & WAS flow	mgd	12.71	
Secondary's BOD removal eff		96.3%	
Secondary's TSS removal eff		94.5%	
TERTIARY FILTERS/ DISINFECTION			
Influent total flow	mgd		
- Average		0.00	utility water included
- Peak		0.00	1.20 Peaking Factor
Influent TSS	lbs/day	0	
Influent VSS	lbs/day	0	47% VSS to TSS Ratio
Influent TBOD	lbs/day	0	47% Particulate BOD to VSS Ratio
Influent SBOD	lbs/day	0	
Effluent flow	mgd		
- Average		0.00	
- Peak		0.00	
Effluent TSS	lbs/day	0	4.4 mg/l of TSS at the effluent.
Effluent VSS	lbs/day	0	8 mg/L of BOD at the effluent
Effluent TBOD	lbs/day	0	47% VSS to TSS Ratio
Effluent SBOD	lbs/day	0	47% Particulate BOD to VSS Ratio
Utility water flow WRP	mgd	0	3% of plant flow
Utility water TSS	lbs/day	0	
Utility water BOD	lbs/day	0	backwash flow is recycled to primaries
Backwash cumulative daily flow	mgd	0.00	20.0 gpm/sf of filter area.
Backwash cumulative TSS	lbs/day	0	15 minute backwash event.
Backwash TSS conc	mg/l	0	
Backwash cumulative BOD (lbs/day)	lbs/day	0	
Backwash BOD conc (mg/l)	mg/l	0	
Filters' BOD % removal		0%	
DISINFECTION			
Influent total flow	mgd		
- Average		0.00	
- Peak		0.00	1.2 Peaking Factor
Influent TSS	lbs/day	0	
Influent VSS	lbs/day	0	
Influent TBOD	lbs/day	0	
Inffluent SBOD	lbs/day	0	
Effluent flow	mgd		
- Average		0.00	Flow to the AWT
- Peak		0.00	
Effluent TSS	lbs/day	0	4.4 mg/l of TSS at the effluent.
Effluent VSS	lbs/day	0	8 mg/L of BOD at the effluent
Effluent TBOD	lbs/day	0	47% VSS to TSS Ratio
Effluent SBOD	lbs/day	0	

COMBINED SLUDGE FLOW =	1.69	MGD
COMBINED SLUDGE TSS MASS RATE =	70,428	lb/d
COMBINED SLUDGE VSS MASS RATE =	54,352	lb/d
COMBINED SLUDGE TBOD MASS RATE =	36,950	lb/d
COMBINED SLUDGE SBOD MASS RATE =	739	lb/d

MODEL SUMMARY FOR CALENDAR YEAR 2026

Case No.:	MBC CAMP PROJECT 10.6	Year MER Reached:	2026
System AADF:	241.5 mgd	Year PS2 Cap. Reached:	N/A
PS1 PWWF:	N/A mgd	PS2 Storage Design Year:	No Storage Provided
PS2 PWWF:	N/A mgd	PS2 Storage Cap. (mgd):	N/A
PL Eff TSS:	57 mg/L	Year PS1 Cap. Reached:	N/A
MBC Gas Prd:	376,008 scf	Storage Tank Design Year:	No Storage Provided
SSPF Gas Prd	0 scf	Storage Tank Cap. (mgd):	N/A

Assumptions:

83%	solids recovery in dewatering centrifuge	303	mg/L TBOD in the PLWTP influent
82.900%	removal of non-centrate recyle TSS at PLWTP	339	mg/L TSS in the PLWTP influent
100.000%	Capture of Chemical Sludge	242	mg/L TBOD in the NCWRP influent
82.900%	removal of thickener centrate TSS at PLWTP	278	mg/L TSS in the NCWRP influent
82.900%	removal of dewatering centrate TSS at PLWTP	250	mg/L TBOD in the Central WRP influent
18,000	mt/yr TSS MER limit at PLWTP	250	mg/L TSS in the Central WRP influent
317	mg/L TBOD in the MSS Flow	468	mg/L TBOD in the South Bay influent
296	mg/L TSS in the MSS Flow	523	mg/L TSS in the South Bay influent
82.900%	removal of TSS from MSS and WRP Secondary Effluent	0.0%	Reclamation at NCWRP Annually
1.1	lb TSS/lb FeCl3 added	0.0%	Reclamation at CWRP Annually
85%	removal of TBOD at PLWTP	0.0%	Reclamation at SBWRP Annually
0.0%	Diverted at PLWTP for Secondary Treatment	46	mgd of WRP Capacity - Satisfies OPRA
0.00	mgd diverted at PLWTP for Secondary Treatment		*No WTP Sludge discharged to the sewer*
30	mgd NCWRP		NCES/PLTO Not Utilized
0	mgd CWRP		SSPF Not Online
16	mgd SBWRP (Southern Facility)		*TSS MER Limit Applies to PLOO Only*
0	mgd CSTP		
0	mgd SBSTP		

Source/Plant		Flow (mgd)	TSS (lb/d)	VSS (lb/d)	TBOD (lb/d)	SBOD (lb/d)
Total System Generation						
	MSS (Basic + Other Major Ind/Com Sources)	241.62	896,226	447,169	638,526	255,419
	Tijuana	0.00	0	0	0	0
	PS No. 2 Chemical	0.00	21,693	0	0	0
	Subtotal A - Total Generated	241.62	917,919	447,169	638,526	255,419
NCWRP						
	Applied	30.00	69,856	52,167	78,858	39,223
	Returned	27.97	1,529	1,064	1,033	869
	Subtotal B - Net Change	(2.03)	(68,226)	(51,103)	(68,824)	(27,853)
SWRP/MVWRP/MGWRP (i.e., CWRP)						
	Applied	0.00	0	0	0	0
	Returned	0.00	0	0	0	0
	Subtotal C - Net Change	0.00	0	0	0	0
SBWRP						
	Applied	15.00	66,063	49,540	66,847	23,419
	Returned	1.77	73,835	57,087	36,909	736
	Subtotal D - Net Change	(13.23)	7,783	7,547	(21,838)	(22,681)
SBSTP						
	Applied	0.00	0	0	0	0
	Returned	0.00	0	0	0	0
	Subtotal D - Net Change	0.00	0	0	0	0
NSPF (MBC)						
	Returned Thickener Centrate	1.87	14,849	11,460	7,791	823
	Dewatering Centrate	0.15	7,334	4,916	2,174	2,068
	Subtotal E - Net Change	2.02	22,184	16,376	9,965	2,711
SSPF						
	Returned Thickener Centrate	0.00	0	0	0	0
	Dewatering Centrate	0.00	0	0	0	0
	Subtotal F - Net Change	0.00	0	0	0	0
PLWTP						
	Applied					
	- w/o FISDF/FIRP, Plant & PS2 Chem	228.28	857,966	419,989	657,929	207,788
	- with PS No. 2 Chem & FISDF/FIRP	229.93	850,833	464,255	561,088	218,867
	- with PS No. 2 Chem, FISDF/FIRP & Plant Chem	223.94	714,213	454,255	561,868	218,867
	Effluent	228.14	107,703	62,852	238,246	215,239
	Removal Efficiency					
	- w/o FISDF/FIRP, Plant & PS2 Chem (per Waiver)	—	80.7%	85.1%	87.5%	-3.6%
	- with PS No. 2 Chem & FISDF/FIRP	—	83.5%	86.2%	89.6%	1.6%
	- with PS No. 2 Chem, FISDF/FIRP & Plant Chem	—	84.9%	86.2%	89.6%	1.6%
	Secondary Effluent from NCWRP	0.00	0	0	0	0
	Secondary Effluent from SWRP	0.00	0	0	0	0
	Secondary Effluent from SBWRP/SBSTP	0.00	0	0	0	0
	Total Ocean Discharge (PLWTP+NCWRP+SWRP/SBSTP)	228.14	107,703	62,852	238,246	215,239
	(TOTAL OCEAN DISCHARGE IN MT/YEAR)		17626			

	TSS	TBOD
	293.1	293.1
	330.5	303.0
	372.4	303.0

Metropolitan Sewerage System
2001-2003 Wastewater Quality and Flow Used for Model Calibration
MSC CAMP Silos and Truck Loadout Capacity Estimates

Daily - [illegible] Percentile

	PLWTPin			PLWTPout			Removal (%)		SBWRPin			SBWRPout			Removal (%)		SBWRPef	MSC Centrate			NCWRPin			NCWRPout			Removal (%)	
Year	Flow	TSS	TBOD	Flow	TSS	TBOD	TSS	TBOD	Flow	TSS	TBOD	Flow	TSS	TBOD	TSS	TBOD	Flow	Flow	TSS	TBOD	Flow	TSS	TBOD	Flow	TSS	TBOD	TSS	TBOD
2001	188.9	321.0	299.8	188.7	88.0	117.8	91.7%	70.2%										2.6	687	650	24.8	278.3	282	23.5	5.7	7	98.0%	97.5%
2002	178.6	320.8	300.6	175.4	88.0	117.0	80.3%	72.3%	4.7	530	499	5.0	9.0	12.0	98.3%	97.4%	0.94	2.7	1417	480								
2003	192.1	325.0	301.1	192.1	82.4	129.0	80.6%	57.9%	4.8	495	437	4.5	10.3	26.0	98.1%	94.1%	0.96	2.8	1265	477								
3-yr	185.4	325.0	296.0	185.3	64.0	123.0	80.8%	71.2%	4.8	528	468	5.0	10.3	23.4	98.0%	95.0%	0.96	2.7	1320	523	24.01	278.31	282.0	23.61	5.71	7.0	98.0%	97.5%
Model	228.8	339	305	228.1	88.6	126.2	84.8%	58.0%	15.90	526	468	13.23	10.3	23.4	—	—	1.77	2.0	1317	592	30.00	278	282	27.97	5.7	7.0	—	—

Project P-10.6 - Replacement of Dewatering Centrifuges with Larger Capacity Units

3% = Solids Content (%)
402,620 = Mass Production Rate (dry lb/d)
228 = Mass Production Rate (dry tons/d)
1,943,430 = Volumetric Production Rate (gpd) - VPR
259,817 = Volumetric Production Rate (ft^3/d) - VPR

1,350 = Dewatering Centrifuge Capacity required (gpm)

8 = Number of Centrifuges Available
6 = Assumed Number of Centrifuges in Operation
225 = Average Capacity per Centrifuge (gpm) 70% of peak capacity
300 = Peak Capacity per Centrifuge (gpm)
1,350 = Total available average capacity (gpm)
1,800 = Total available peak capacity (gpm)

1.00 = Required/Available

Should be less than or equal to 1 if sufficient capacity is available. Based on average capacity.

MODEL SUMMARY FOR CALENDAR YEAR CALIBRATION

Case No.:	CALIBRATION RUN - PROJECTS P-11.1 & 11.6	**Year MER Reached:**	CALIBRATION
System AADF	188.6 **mgd**	**Year PS2 Cap. Reached:**	N/A
PS1 PWWF:	N/A **mgd**	**PS2 Storage Design Year:**	No Storage Provided
PS2 PWWF:	N/A **mgd**	**PS2 Storage Cap. (mgd):**	N/A
PL Eff TSS:	51 **mg/L**	**Year PS1 Cap. Reached:**	N/A
MBC Gas Prd:	286,911 **scf**	**Storage Tank Design Year:**	No Storage Provided
SSPF Gas Prd	0 **scf**	**Storage Tank Cap. (mgd):**	N/A

Assumptions:

- 80% solids recovery in dewatering cenrifuge
- 82.700% removal of non-centrate recylce TSS at PLWTP
- 100.000% Capture of Chemical Sludge
- 82.700% removal of thickener centrate TSS at PLWTP
- 82.700% removal of dewatering centrate TSS at PLWTP
- 13,600 mt/yr TSS MER limit at PLWTP
- 300 mg/L TBOD in the MSS Flow
- 273 mg/L TSS in the MSS Flow
- 82.700% removal of TSS from MSS and WRP Secondary Effluent
- 1.1 lb TSS/lb FeCl3 added . . .
- 59% removal of TBOD at PLWTP
- 0.0% Diverted at PLWTP for Secondary Treatment
- 0.00 mgd diverted at PLWTP for Secondary Treatment
- 25 mgd NCWRP
- 0 mgd CWRP
- 5 mgd SBWRP (Southern Facility)
- 0 mgd CSTP
- 0 mgd SBSTP
- 286 mg/L TBOD in the PLWTP Influent
- 306 mg/L TSS in the PLWTP Influent
- 256 mg/L TBOD in the NCWRP Influent
- 272 mg/L TSS in the NCWRP Influent
- 250 mg/L TBOD in the Central WRP Influent
- 250 mg/L TSS in the Central WRP Influent
- 365 mg/L TBOD in the South Bay Influent
- 376 mg/L TSS in the South Bay Influent
- 0.0% Reclamation at NCWRP Annually
- 0.0% Reclamation at CWRP Annually
- 0.0% Reclamation at SBWRP Annually
- 29 mgd of WRP Capacity - VIOLATES OPRA
- *No WTP Sludge discharged to the sewer*
- NCES/PLTO Not Utilized
- SSPF Not Online
- *TSS MER Limit Applies to PLOO Only*

Source/Plant		Flow (mgd)	TSS (lb/d)	VSS (lb/d)	TBOD (lb/d)	SBOD (lb/d)
Total System Generation						
	MSS (Basic + Other Major Ind/Com Sources)	188.60	429,408	322,056	471,877	188,751
	Tijuana	0.00	0	0	0	0
	PS No. 2 Chemical	0.00	17,019	0	0	0
	Subtotal A - Total Generated	188.60	446,427	322,056	471,877	188,751
NCWRP						
	Applied	24.50	55,578	41,683	52,308	20,923
	Returned	22.90	936	749	1,127	378
	Subtotal B - Net Change	(1.60)	(54,642)	(40,935)	(51,181)	(20,545)
SWRP/MVWRP/MGWRP (i.e., CWRP)						
	Applied	0.00	0	0	0	0
	Returned	0.00	0	0	0	0
	Subtotal C - Net Change	0.00	0	0	0	0
SBWRP						
	Applied	4.70	14,738	11,054	14,307	5,723
	Returned	0.41	17,073	13,216	8,958	179
	Subtotal D - Net Change	(4.29)	2,335	2,163	(5,349)	(5,544)
SBSTP						
	Applied	0.00	0	0	0	0
	Returned	0.00	0	0	0	0
	Subtotal D - Net Change	0.00	0	0	0	0
NSPF (MBC)						
	Returned Thickener Centrate	1.47	13,114	10,113	6,582	468
	Dewatering Centrate	0.11	6,308	4,223	1,664	1,592
	Subtotal E - Net Change	1.58	19,422	14,336	8,246	2,060
SSPF						
	Returned Thickener Centrate	0.00	0	0	0	0
	Dewatering Centrate	0.00	0	0	0	0
	Subtotal F - Net Change	0.00	0	0	0	0
PLWTP						
	Applied					
	- w/o FISDF/FIRP, Plant & PS2 Chem	184.30	396,523	297,620	423,592	164,722
	- with PS No. 2 Chem & FISDF/FIRP	185.51	473,426	325,504	442,152	172,611
	- with PS No. 2 Chem, FISDF/FIRP & Plant Chem	185.52	524,483	325,504	442,152	172,611
	Effluent	184.20	78,958	42,418	180,398	169,993
	Removal Efficiency					
	- w/o FISDF/FIRP, Plant & PS2 Chem (per Waiver)	---	80.1%	85.7%	57.4%	-3.2%
	- with PS No. 2 Chem & FISDF/FIRP	---	83.3%	87.0%	59.2%	1.5%
	- with PS No. 2 Chem, FISDF/FIRP & Plant Chem	---	84.9%	87.0%	59.2%	1.5%
	Secondary Effluent from NCWRP	0.00	0	0	0	0
	Secondary Effluent from SWRP	0.00	0	0	0	0
	Secondary Effluent from SBWRP/SBSTP	0.00	0	0	0	0
	Total Ocean Discharge (PLWTP+NCWRP+SWRP/SBSTP)	184.20	78,958	42,418	180,398	169,993
	(TOTAL OCEAN DISCHARGE IN MT/YEAR)		13070			

TSS	TBOD
258.0	275.6
306.0	285.8
339.0	285.8

Metropolitan Sewerage System
2001-2003 Wastewater Quality and Flow Used for Model Calibration
MBC CAMP Silos and Truck Loadout Capacity Estimates

7-day Rolling Average - 95th Percentile

	PLWTPin			PLWTPout			Removal (%)		SBWRPin			SBWRPout			Removal (%)		SBWRPret	MBC Centrate			NCWRPin			NCWRPout			Removal (%)	
Year	Flow	TSS	TBOD	Flow	TSS	TBOD	TSS	TBOD	Flow	TSS	TBOD	Flow	TSS	TBOD	TSS	TBOD	Flow	Flow	TSS	TBOD	Flow	TSS	TBOD	Flow	TSS	TBOD	TSS	TBOD
2001	190.9	290.7	276.7	189.8	51.4	107.6	91.2%	67.4%										2.4	1098	538	24.5	272	256	23.0	4.9	5.9	98.2%	97.7%
2002	174.0	311.4	287.5	172.9	51.8	113.4	87.2%	70.2%	4.6	376	365	4.8	7.7	9.8	97.9%	97.3%	0.80	2.5	1512	507								
2003	190.2	310.3	290.7	189.1	49.2	124.3	87.2%	65.9%	4.7			4.4					0.89	2.6	1318	421								
3-yr	185.5	306	287	184.4	51.4	117.5	87.6%	69.3%	4.7	376	365	4.7	7.7	9.8	97.9%	97.3%	0.87	2.5	1466	514	24.5	272	256	23.0	4.9	5.9	98.2%	97.7%
Model	185.5	306	286	184.2	51.4	117.4	84.9%	59.2%	4.7	376	365	4.3	7.7	9.8	---	---	0.41	1.6	1469	624	24.5	272	256	22.99	4.9	5.9	---	---

Project P-11.1 - Additional Biosolids Storage Silos

28% = Solids Content (%)
269,807 = Mass Production Rate (dry lb/d)
135 = Mass Production Rate (dry ton/d)
107,981 = Volumetric Production Rate (gpd) - VPR
14,436 = Volumetric Production Rate (ft^3/d) - VPR

2.67 = Maximum days of storage required (i.e., 2 weekend days + 16 hours or 64 hours)

[illegible] = Truck Storage Cap Required (gal)
[illegible] = Truck Storage Cap Required (ft^3)

8 = Number of Silos Available
[illegible] = Assumed Number of Silos in Operation
6,950 = Storage Capacity per Silo (ft^3)
51,986 = Storage Capacity per Silo (gal)
55,600 = Total available capacity (ft^3)
415,888 = Total available capacity (gal)

[illegible] = Required Volume [illegible]

Project P-11.6 - New Biosolids Truck Loadout Facility

Capacity Estimate

648 = Loadout Capacity per Bay (ft^3)
4,847 = Loadout Capacity per Bay (gallon)
2 = Number of Bays
20 = Loading Duration per Truck (min)
5 = Number of days of operation per week
8 = Number of hours operation per day
480 = Maximum Operating Minutes per day
15,552 = Maximum Daily Volumetric Disposal per Bay (ft^3)

Maximum Daily Mass Load Disposal per Bay (ft^3) = (Maximum Operating Minutes per day / Loading Duration per Truck (min)) * Loadout Capacity per Bay (ft^3)

[illegible] = Volumetric Production Rate (ft^3/d) - VPR
[illegible] = Daily Maximum Load based on operating parameters noted above (ft^3/d)

[illegible] = Required Volume [illegible]

Mass Balance for the NSPF Portion of MBC - Yi CALIBRATION

Process	Units	Value		Assumptions
SLUDGE THICKENING				
Influent Flow				
●ADWF	mgd	1.60		
●PWWF	mgd			
Influent Character				
- TSS	mg/l	4,950	1.01	Specific Gravity of Combined Sludge
	lb/d	66,568		(Relative to H20 = 1.0)
- VSS	mg/l	3,818		
	lb/d	51,336		
- TBOD	mg/l	2,485		
	lb/d	33,411		
- SBOD	mg/l	50		
	lb/d	668		
Thickener Centrate Flow				
●ADWF	mgd	1.47	1.00	Centrate Specific Gravity
●PWWF	mgd			
Thickener Centrate Character				
- TSS	mg/l	1,068	80.3%	Solids Recovery
	lb/d	13,114		
- VSS	mg/l	824		
	lb/d	10,113		
- TBOD	mg/l	536		
	lb/d	6,582		
- SBOD	mg/l	38		
	lb/d	468	70%	SBOD Fraction Retained in Centrate
Thickened Sludge Flow				
●ADWF	mgd	0.12	5.0%	Thickened Sludge Concentration
●PWWF	mgd		1.03	Thickened Sludge Specific Gravity
Thickened Sludge Character				
- TSS	mg/l	50,000	80.3%	Solids Recovery
	lb/d	53,454		
- VSS	mg/l	36,559		
	lb/d	41,223		
- TBOD	mg/l	25,095		
	lb/d	26,829		
- SBOD	mg/l	188		
	lb/d	200		
SLUDGE DIGESTION				
Digester Effluent				
●ADWF	mgd	0.12	99%	Flow Conserved
●PWWF	mgd			
Digested Sludge Character				
- TSS	mg/l	30,252		
	lb/d	32,018		
- VSS	mg/l	20,253	1.03	Specific Gravity of Digested Sludge
	lb/d	21,436	52.0%	VSS Destruction in Digester
- TBOD	mg/l	11,407	7%	Fraction of Influent VSS Solubilized
	lb/d	12,073	75%	Fraction of Solubilized VSS is SBOD
- SBOD	mg/l	2,149	55%	TBOD Reduction in Digester
	lb/d	2,274	55%	SBOD Reduction in Digester
Digester Gas Production	scf	286,911	15	scf/lb VSS destroyed
SLUDGE DEWATERING				
Sludge Cake Flow				
●ADWF	mgd	0.010		
●PWWF	mgd			
Sludge Cake Character				
- TSS	mg/l	260,000	26%	Solids Content
	lb/d	25,711	80%	Solids Capture (Applies to TSS, VSS & TBOD)
- VSS	mg/l	167,455	1.07	Specific Gravity
	lb/d	17,213	0.191	= (1-Cent TSS Rem Eff)*(DAFT TSS Rem Eff) - b
- TBOD	mg/l	113,361	0.006	= (1-Cent TSS Rem Eff)*(1-DAFT TSS Rem Eff) - a
	lb/d	10,409		
- SBOD	mg/l	7,431		
	lb/d	682	70%	Fraction of SBOD Retained in Centrate
Centrate Flow			7,564	Recycle Stream-TSS
●ADWF	mgd	0.113	5,084	Recycle Stream-VSS
●PWWF	mgd		2,315	Recycle Stream-TBOD
Centrate Character				
- TSS	mg/l	6,698	1.00	Specific Gravity of Centrate
	lb/d	6,306		
- VSS	mg/l	4,464		
	lb/d	4,223		
- TBOD	mg/l	1,767		
	lb/d	1,664		
- SBOD	mg/l	1,691		
	lb/d	1,592		

Process	Units	Value		Assumptions
INFLUENT FLOW & WASTEWATER QUALITY (w/o FIRP Recycle & PS2 Chem)				
@ AADF	mgd	184.30		
@PWWF	mgd	331.74	1.8	peaking factor
TSS	mg/L	258		
	lb/d	396,523		
VSS	mg/L	194		
	lb/d	297,620		
TBOD	mg/L	276		
	lb/d	423,592		
SBOD	mg/L	107		
	lb/d	164,722		
PRIMARY SEDIMENTATION				
Total influent flow	mgd			
@ AADF		185.51	1.21	mgd from FIRP Recycle (MBC dewatering centrate cc
@ PWWF		332.95	0.00	mgd Thickening Centrate (the thinkening centrate at F
Influent TSS	lbs/day	473,426	59,884	lb/d from FIRP Recycle
	mg/L	306	0	lb/d from Thickening Centrate
Influent VSS	lbs/day	325,504	27,884	lb/d from FIRP Recycle
	mg/L	210	0	lb/d from Thickening Centrate
Influent TBOD	lbs/day	442,152	18,560	lb/d from FIRP Recycle
	mg/L	286	0	lb/d from Thickening Centrate
Influent SBOD	lbs/day	172,611	7,889	lb/d from FIRP Recycle
	mg/L	112	0	lb/d from Thickening Centrate
MSS TSS removal efficiency		82.70%		
MSS BOD removal efficiency		59.20%	83%	TSS Rem in other recycle stream
Dewatering Centrate TSS removal effiency		82.70%	83%	TSS Rem in Thickener Centrate
Dewatering Centrate BOD Removal efficiency		59.20%	59%	TBOD Rem in Thickener Centrate
In Plant Chemical Addition (FeCl▲d3▲0d)	mg/L	30	44%	Ferric Chloride Solution Added at PS2 & PLWTP
	lbs/day	46,415	1.5	Specific Gravity of FeCl3 Solution
	mgd	0.009	100%	Capture of Chemical Sludge
Chemical Sludge (as TSS) Produced	lbs/day	51,057	1.10	lb TSS Produced/lb FeCl3 Added
Primary sludge TSS	lbs/day	445,524		
Primary sludge VSS	lbs/day	283,087	75%	of Sludge TSS is VSS (exc. chem sludge)
Primary sludge TBOD	lbs/day	261,754	0.92	TBOD to VSS Ratio (Calculated)
Primary sludge SBOD	lbs/day	2,618	1%	of Sludge TBOD is SBOD
Primary sludge flow	mgd	1.32	4%	Advance Primary Sludge
Primary effluent TSS	lbs/day	78,958	1.01	Specific Gravity of Primary Sludge
Primary effluent TSS conc @AADF	mg/L	51.4	27.902	
Primary effluent VSS	lbs/day	42,418	83.3219%	Actual Removal (Plant Performance)
Primary effluent VSS conc @AADF	mg/L	27.6		
Primary effluent TBOD	lbs/day	180,398		
Primary effluent TBOD conc @AADF	mg/L	117.4		
Primary effluent SBOD	lbs/day	169,993	59.20%	Actual Removal (Plant Performance)
Primary effluent SBOD conc @AADF	mg/L	110.7		
Primary effluent flow	mgd			
@ AADF		184.20		
@ PWWF		331.63		
DIGESTION				
Digester Effluent				
@ AADF	mgd	1.31	99%	Flow Conserved
Digested Sludge Character				
- TSS	mg/l	27,032		
	lb/d	303,981		
- VSS	mg/l	12,587	1.03	Specific Gravity of Digested Sludge
	lb/d	141,543	50.0%	VSS Destruction in Digester
- TBOD	mg/l	5,819	5%	Fraction of Influent VSS Solubilized
	lb/d	65,439	75%	Fraction of Solubilized VSS is SBOD
- SBOD	mg/l	1,002	75%	TBOD Reduction in Digester
	lb/d	11,270	75%	SBOD Reduction in Digester
FISDF/FIRP SLUDGE DEWATERING				
Sludge Cake Flow				
@ AADF	mgd	0.098		
@PWWF	mgd			
Sludge Cake Character				
- TSS	mg/l	280,000	28%	Solids Content
	lb/d	244,097	80%	Solids Capture
- VSS	mg/l	130,377	1.07	Specific Gravity
	lb/d	113,659	0.47	VSS to TSS Ratio (Calculated)
- TBOD	mg/l	53,773	0.41	TBOD to VSS Ratio (Calculated)
	lb/d	46,878		
- SBOD	mg/l	3,878		
	lb/d	3,381	70%	Fraction of SBOD Retained in Centrate
Dewatering Centrate Flow				
@ AADF	mgd	1.21		
@PWWF	mgd		1.00	Specific Gravity of Centrate
Dewatering Centrate Character			0	gpm/BFP washwater added to centrate
- TSS	mg/l	5,927	0	BFP operating
	lb/d	59,884		
- VSS	mg/l	2,760	0.191	= (1-Cent TSS Rem Eff)*(DAFT TSS Rem Eff) - b
	lb/d	27,884	0.006	= (1-Cent TSS Rem Eff)*(1-DAFT TSS Rem Eff) - a
- TBOD	mg/l	1,837	71,810	Recycle Stream-TSS
	lb/d	18,560	33,437	Recycle Stream-VSS
- SBOD	mg/l	781	12,796	Recycle Stream-TBOD
	lb/d	7,889		

Process	Units	Value		Assumptions
INFLUENT FLOW				
@ AADF	mgd	4.7		
@PWWF	mgd	9.4	2	peaking factor
INFLUENT WASTEWATER QUALITY				
- TSS	mg/l	376		
- BOD	mg/l	365		
PRIMARY SEDIMENTATION				
Total influent flow	mgd			
@ AADF		4.70	0.00	mgd flow contributed by backwash
@ PWWF		9.40		
Influent TSS	lbs/day	14,738		
Influent BOD	lbs/day	14,307		
TSS removal efficiency for MSS Component		60%		
BOD removal efficiency		35%		
Chemical Addition (FeCl▲d3▲0d)	mg/L	0		
	lbs/day	0	44%	by weight FeCl▲d3▲0d Sol'n
	mgd	0.0000	1.476	Specific Gravity of FeCl▲d3▲0d Sol'n
Chemical Sludge (as TSS) Produced	lbs/day	0	1.10	lb TSS Produced/lb FeCl3 Added
Primary sludge TSS	lbs/day	8,843	100%	Chemical Sludge Removal Rate
Primary sludge flow	mgd	0.21	0.5%	solids concentration.
Primary effluent TSS	lbs/day	5,895		
Primary effluent TSS conc @AADF	mg/l	157.51		Contribution during PWWF is mostly
Primary effluent BOD	lbs/day	9,300		dillution water with no BOD and TSS.
Primary effluent BOD conc @AADF	mg/l	248.46		
Primary effluent VSS	lbs/day	4,598	75%	of raw wastewater TSS is VSS
Primary effluent VSS conc @AADF	mg/l	122.86	78%	of primary effluent TSS is VSS
Primary effluent flow	mgd			
@ AADF		4.49		
@ PWWF		9.19		
ACTIVATED SLUDGE				
Gross Nonbiodeg. Incoming TSS	lbs/day	3,136	1,297	= NVSS (lb/day) including RAS fraction
MLTSS concentration	mg/l	2,800	40.0%	= nonbiodeg fraction of inf. VSS (lb/day)
Influent flow	mgd		1,839	= NBVSS (lb/day) including RAS fraction
- Average		4.49		
- Peak		5.39	1.20	Peak equalized flow factor
Returned activated sludge flow	mgd	2.24	0.5%	RAS solids concentration
RAS/influent ratio		0.50	80%	of secondary TSS is VSS
Reactor inf/eff flow	mgd			
- Average		6.73		Assuming RAS flow remains constant.
- Peak		7.63		
Reactor effluent TSS	lbs/day	157,203		
Active biomass plus endogenous			5	SRT (MCRT)
biomass decay products	lbs/day	5,369	30	C assumed influent temperature
			0.6	=Ynet
SECONDARY SEDIMENTATION				
Influent flow	mgd			
- Average		4.49		
- Peak		5.39		
- TSS	lbs/day	5,895		
- TSS concentration	mg/l	157.51		
- BOD	lbs/day	9,300		
- BOD concentration	mg/l	248.46		
- VSS	lbs/day	4,598		
- VSS concentration	mg/l	122.86	157,203	lbs/day solids loading based on
Secondary effluent flow	mgd		2800	mg/l MLSS conc @ ADWF
- Average		4.29	178,164	lbs/day solids loading based on
- Peak		5.19	2800	mg/l MLSS conc @ PWWF
Secondary eff TSS	lbs/day	276	7.7	mg/l of TSS at the secondary effluent.
Secondary eff BOD	lbs/day	351	9.8	mg/l of BOD at the secondary effluent

Mass Balance - SBWRP

Process	Units	Value	Assumptions
Waste activated sludge TSS	lbs/day	8,230	
Waste activated sludge flow	mgd	0.20	0.50 % solids
RAS & WAS flow	mgd	2.441335848	
Secondary's BOD removal eff		96.2%	
Secondary's TSS removal eff		95.3%	
TERTIARY FILTERS/ DISINFECTION			
Influent total flow	mgd		
- Average		0.00	utility water included
- Peak		0.00	1.20 Peaking Factor
Influent TSS	lbs/day	0	
Influent VSS	lbs/day	0	47% VSS to TSS Ratio
Influent TBOD	lbs/day	0	47% Particulate BOD to VSS Ratio
Influent SBOD	lbs/day	0	
Effluent flow	mgd		
- Average		0.00	
- Peak		0.00	
Effluent TSS	lbs/day	0	4.4 mg/l of TSS at the effluent.
Effluent VSS	lbs/day	0	8 mg/L of BOD at the effluent
Effluent TBOD	lbs/day	0	47% VSS to TSS Ratio
Effluent SBOD	lbs/day	0	47% Particulate BOD to VSS Ratio
Utility water flow WRP	mgd	0	3% of plant flow
Utility water TSS	lbs/day	0	
Utility water BOD	lbs/day	0	backwash flow is recycled to primaries
Backwash cumulative daily flow	mgd	0.00	20.0 gpm/sf of filter area.
Backwash cumulative TSS	lbs/day	0	15 minute backwash event.
Backwash TSS conc	mg/l	0	
Backwash cumulative BOD (lbs/day)	lbs/day	0	
Backwash BOD conc (mg/l)	mg/l	0	
Filters' BOD % removal		0%	
DISINFECTION			
Influent total flow	mgd		
- Average		0.00	
- Peak		0.00	1.2 Peaking Factor
Influent TSS	lbs/day	0	
Influent VSS	lbs/day	0	
Influent TBOD	lbs/day	0	
Inffluent SBOD	lbs/day	0	
Effluent flow	mgd		
- Average		0.00	
- Peak		0.00	
Effluent TSS	lbs/day	0	2 mg/l of TSS at the effluent.
Effluent VSS	lbs/day	0	4 mg/L of BOD at the effluent
Effluent TBOD	lbs/day	0	47% VSS to TSS Ratio
Effluent SBOD	lbs/day	0	

COMBINED SLUDGE FLOW =	0.41	MGD
COMBINED SLUDGE TSS MASS RATE =	17,073	lb/d
COMBINED SLUDGE VSS MASS RATE =	13,216	lb/d
COMBINED SLUDGE TBOD MASS RATE =	8,958	lb/d
COMBINED SLUDGE SBOD MASS RATE =	179	lb/d

Process	Units	Value	Assumptions
INFLUENT FLOW			
@AADF	mgd	24.5	
@PWWF	mgd	49.0	2 peaking factor
INFLUENT WASTEWATER QUALITY			
- TSS	mg/l	272	
- BOD	mg/l	256	
PRIMARY SEDIMENTATION			
Total influent flow	mgd		
@ AADF		24.50	0.00 mgd flow contributed by backwash
@ PWWF		49.00	
Influent TSS	lbs/day	55,578	
Influent BOD	lbs/day	52,308	
TSS removal efficiency		65%	
BOD removal efficiency		38%	
Chemical Addition (FeCl▲d3▲0d)	mg/L	10	
	lbs/day	2,043	44% by weight FeCl▲d3▲0d Sol'n
	mgd	0.0004	1.467 Specific Gravity of FeCl▲d3▲0d Sol'n
Chemical Sludge (as TSS) Produced	lbs/day	2,248	1.10 lb TSS Produced/lb FeCl3 Added
Primary sludge TSS	lbs/day	38,373	100% Chemical Sludge Removal Rate
Primary sludge flow	mgd	0.92	0.5% solids concentration.
Primary effluent TSS	lbs/day	19,452	
Primary effluent TSS conc @AADF	mg/l	98.91	Contribution during PWWF is mostly
Primary effluent BOD	lbs/day	32,431	dillution water with no BOD and TSS.
Primary effluent BOD conc @AADF	mg/l	164.91	
Primary effluent VSS	lbs/day	15,173	75% of raw wastewater TSS is VSS
Primary effluent VSS conc @AADF	mg/l	77.15	78% of primary effluent TSS is VSS
Primary effluent flow	mgd		
@ AADF		23.58	
@ PWWF		48.08	
ACTIVATED SLUDGE			
Gross Nonbiodeg. Incoming TSS	lbs/day	10,349	4,279 = NVSS (lb/day) including RAS fraction
MLTSS concentration	mg/l	2,155	40.0% = nonbiodeg fraction of inf. VSS (lb/day)
Influent flow	mgd		6,069 = NBVSS (lb/day) including RAS fraction
- Average		23.58	
- Peak		28.30	1.20 Peak equalized flow factor
Returned activated sludge flow	mgd	11.79	0.5% RAS solids concentration
RAS/influent ratio		0.50	80% of secondary TSS is VSS
Reactor inf/eff flow	mgd		
- Average		35.37	Assuming RAS flow remains constant.
- Peak		40.09	
Reactor effluent TSS	lbs/day	635,699	
Active biomass plus endogenous			5.86 SRT (MCRT)
biomass decay products	lbs/day	18,783	30 C assumed influent temperature
			0.6 =Ynet
SECONDARY SEDIMENTATION			
Influent flow	mgd		
- Average		23.58	
- Peak		28.30	
- TSS	lbs/day	19,452	
- TSS concentration	mg/l	98.91	
- BOD	lbs/day	32,431	
- BOD concentration	mg/l	164.91	
- VSS	lbs/day	15,173	
- VSS concentration	mg/l	77.15	635,699 lbs/day solids loading based on
Secondary effluent flow	mgd		2155 mg/l MLSS conc @ ADWF
- Average		22.90	720,459 lbs/day solids loading based on
- Peak		27.62	2155 mg/l MLSS conc @ PWWF
Secondary eff TSS	lbs/day	936	4.9 mg/l of TSS at the secondary effluent.
Secondary eff BOD	lbs/day	1,127	5.9 mg/l of BOD at the secondary effluent

Process	Units	Value	Assumptions
Waste activated sludge TSS	lbs/day	28,195	
Waste activated sludge flow	mgd	0.68	0.50 % solids
RAS & WAS flow	mgd	12.47	
Secondary's BOD removal eff		96.5%	
Secondary's TSS removal eff		95.2%	
TERTIARY FILTERS/ DISINFECTION			
Influent total flow	mgd		
- Average		0.00	utility water included
- Peak		0.00	1.20 Peaking Factor
Influent TSS	lbs/day	0	
Influent VSS	lbs/day	0	47% VSS to TSS Ratio
Influent TBOD	lbs/day	0	47% Particulate BOD to VSS Ratio
Influent SBOD	lbs/day	0	
Effluent flow	mgd		
- Average		0.00	
- Peak		0.00	
Effluent TSS	lbs/day	0	4.4 mg/l of TSS at the effluent.
Effluent VSS	lbs/day	0	8 mg/L of BOD at the effluent
Effluent TBOD	lbs/day	0	47% VSS to TSS Ratio
Effluent SBOD	lbs/day	0	47% Particulate BOD to VSS Ratio
Utility water flow WRP	mgd	0	3% of plant flow
Utility water TSS	lbs/day	0	
Utility water BOD	lbs/day	0	backwash flow is recycled to primaries
Backwash cumulative daily flow	mgd	0.00	20.0 gpm/sf of filter area.
Backwash cumulative TSS	lbs/day	0	15 minute backwash event.
Backwash TSS conc	mg/l	0	
Backwash cumulative BOD (lbs/day)	lbs/day	0	
Backwash BOD conc (mg/l)	mg/l	0	
Filters' BOD % removal		0%	
DISINFECTION			
Influent total flow	mgd		
- Average		0.00	
- Peak		0.00	1.2 Peaking Factor
Influent TSS	lbs/day	0	
Influent VSS	lbs/day	0	
Influent TBOD	lbs/day	0	
Inffluent SBOD	lbs/day	0	
Effluent flow	mgd		
- Average		0.00	Flow to the AWT
- Peak		0.00	
Effluent TSS	lbs/day	0	4.4 mg/l of TSS at the effluent.
Effluent VSS	lbs/day	0	8 mg/L of BOD at the effluent
Effluent TBOD	lbs/day	0	47% VSS to TSS Ratio
Effluent SBOD	lbs/day	0	

COMBINED SLUDGE FLOW =	1.60	MGD
COMBINED SLUDGE TSS MASS RATE =	66,568	lb/d
COMBINED SLUDGE VSS MASS RATE =	51,336	lb/d
COMBINED SLUDGE TBOD MASS RATE =	33,411	lb/d
COMBINED SLUDGE SBOD MASS RATE =	668	lb/d

Wastewater Quality and Quantity

Source	Facility Design Cap. (mgd)	Flow AADF (mgd)	TSS Concentration (mg/L)	VSS Concentration (mg/L)	TBOD Concentration (mg/L)	SBOD Concentration (mg/L)
MSS		188.60	273	205	300	120
NCWRP Influent	24.5	24.50	272	204	256	102
CWRP Influent	0	0.00	250	188	250	100
CSTP Influent	0					
OWRP Influent	0	0.00	0	0	0	0
SBWRP Influent	4.7	4.70	376	282	365	146
Tijuana	---	0.00	0	0	0	0
SBSTP Influent	0	0.00	260	195	315	126

Flow Distribution 0.00 = flow to AWT Analysis Year

Plant	Percent to Tertiary	Secondary Effluent (mgd)			Tertiary			Combined Raw Sludge		Centrate		
		Tertiary	Retreatment	Outfall	Reuse	Retreatment	Outfall	MBC/SSPF	Retreatment	Treatment	Recycle	Retreat
NCWRP	0%	0.00	22.90	0.00	0%	100%	0%	100%	0%	NA	NA	NA
SWRP (CWRP)	0%	0.00	0.00	0.00	100%	0%	0%	0%	100%	NA	NA	NA
OVWRP	0%	0.00	0.00	0.00	100%	0%	0%	0%	100%	NA	NA	NA
SBWRP	0%	0.00	0.00	4.29	0%	0%	100%	0%	100%	NA	NA	NA
SBSTP to Sec	0%	0.00	0.00	0.00	100%	0%	0%	100%	0%	NA	NA	NA
NSPF		NA	NA	NA	NA	NA	NA	NA	NA	0%	0%	100%
FIRP		NA	NA	NA	NA	NA	NA	NA	NA	0%	0%	100%
SSPF		NA	NA	NA	NA	NA	NA	NA	NA	0%	0%	100%
Node D (Raw Wastewater)			100%	0%	NA	NA	NA	NA	NA	NA	NA	NA
SBWRP											0%	

PLWTP: 0

Flow Diverted for Secondary Treatment at PLWTP: 0.00%

0 mgd

Flow Diverted for Secondary Treatment at SBSTP: 0%

0 mgd

Plant Performance Criteria

Category	Process	Parameter	Units	Value	Model Designation	Comments
Permit Requirement		TSS MER	lb/d	82,159	TSS_MER	
			mt/yr	13,600		
		System Wide = 1; Specific to PLOO = 0	-------->	0	MER_CRITERIA	
SBSTP		Advanced Primary Treatment Toggle	0=No; 1=Yes	0	SBSTP.ADV.PRIM	
Water Tmt Sludge		Water Treatment Sludge Solids Load	(1 = IN; 0 = OUT)	0	WTP.SLUDGE	
		- North (Poway WTP)	% of total load	3.0%	WTPLOAD.N	
		- Central (Helix WTP)	% of total load	11.4%	WTPLOAD.C	
		- South (Otay WTP)	% of total load	11.4%	WTPLOAD.S	
		- PLWTP Direct (Miramar and Alvarado WTPs)	% of total load	74.2%	WTPLOAD.PL	
AWT		AWT On-Line	(1 = Yes; 0 = No)	0	AWT	
San Pasqual/RB		San Pasqual Valley Situation	Scenario	0	SPVWRP.SCEN	0-Base; 1-Raw; 2-Raw-1; 3-TE
PS1		Peak Capacity	mgd	160	PS1.CAP	
PS2		Peak Capacity	mgd	432	PS2.CAP	
NCES/PLTO		Online? (1=Yes; 0=No)	---	0	NCES	
Peaking Factors		NCWRP	---	2.00	NCWRP.PEAK.Q	Based on Actual Design
		SBWRP	---	2.57	SBWRP.PEAK.Q	Based on Actual Design
		SBSTP	---	1.80	SBSTP.PEAK.Q	Based on Project Report
		CWRP	---	1.20	CWRP.PEAK.Q	Based on Project Report
		Impact of Flow removal at GAPS on PS1	---	1.34	GAPS.PS1.PF	Provided by PPG (2/19/97)
		Impact of Flow removal at GAPS on PS2	---	1.30	GAPS.PS2.PF	Provided by PPG (2/19/97)
		Impact of Flow removal at SRPS on PS1	---	1.62	SRPS.PS1.PF	Provided by PPG (2/19/97)
		Impact of Flow removal at SRPS on PS2	---	1.47	SRPS.PS2.PF	Provided by PPG (2/19/97)
		GAPS - Local	---	1.38	GAPS.LOCAL.PF	Provided by PPG (2/19/97)
		SRPS - Local	---	1.93	SRPS.LOCAL.PF	Provided by PPG (2/19/97)
		Criterion for Using which PF - % of PF	%	70.0%	PERCENT.PF	Provided by PPG (2/19/97)
		Peak Q at GAPS at MER Year	mgd	8.3	GAPS.MAX.Q	
		Peak Q at GAPS for PS1/PS2 Capacity Calc.	mgd	7.0	GAPS.MAX.PS1PS2	
SMI Flow Equalization		Design Life - Capacity till Year? (0=No Storage)	Year	0	STOR_YEAR	
System Flow Equalization		Design Life - Capacity till Year? (0=No Storage)	Year	0	STOR_YEAR.PS2	
		Provided where? (1=Central/North; 0=South)	---	0	STOR.LOC.PS2	
Raw Wastewater Quality		VSS	% of TSS	75%	RAWVSS%	
		SBOD	% of TBOD	40%	RAWSBOD%	
		Chemical Addition at PS2	mg/L	10	PS2.CHEM	
		Chemical Sludge Production	lb TSS/lb FeCl3	1.10	PS2.CHEM.PROD	3-yr average at PLWTP
		TBOD Concentration				Iterate to match "2001-2003"
		- Total MSS	mg/L	300	TBOD.MSS	sheet
		- Rancho Bernardo	mg/L	200	TBOD.RB	
		- SPVWRP Effluent	mg/L	5	TBOD.SPVWRP	
		- PQPS Influent	mg/L	256	TBOD.PQPS	Match "2001-2003" sheet
		- NCWRP Service Area	mg/L	256	TBOD.NCWRP	Match "2001-2003" sheet
		- Central WRP Service Area	mg/L	250	TBOD.CENTRAL	
		- SBWRP Influent	mg/L	365	TBOD.SOUTH	Match "2001-2003" sheet
		- SBSTP Influent	mg/L	365	TBOD.SBSTP	Match "2001-2003" sheet
		- OWRP Influent	mg/L	0	TBOD.OWRP	
		TSS Concentration				Iterate to match "2001-2003"
		- Total MSS	mg/L	273	TSS.MSS	sheet
		- Rancho Bernardo	mg/L	220	TSS.RB	
		- SPVWRP Effluent	mg/L	270	TSS.SPVWRP	
		- PQPS Influent	mg/L	272	TSS.PQPS	Match "2001-2003" sheet
		- NCWRP Service Area	mg/L	272	TSS.NCWRP	Match "2001-2003" sheet
		- Central WRP Service Area	mg/L	250	TSS.CENTRAL	
		- SBWRP Influent	mg/L	378	TSS.SOUTH	Match "2001-2003" sheet
		- SBSTP Influent	mg/L	378	TSS.SBSTP	Match "2001-2003" sheet
		- OWRP Influent	mg/L	0	TSS.OWRP	
WRP	Primary	TSS Removal	%	60%	WRP.TSS.REM	
		BOD Removal	%	35%	WRP.BOD.REM	
		Wastewater Temperture	deg-C	30.0	TEMP	
		Chemical Addition	mg/L	15	WRP.CHEM.CONC.P	
		Chemical Sludge Production	lb TSS/lb FeCl3	1.10	WRP.CHEM.PROD	
		Sludge Concentration	% (w/w)	0.50%	WRP.PR.SLD.C	
		VSS to TSS Ratio in Sludge	%	75%	WRP.PR.VSS%	
		VSS to TSS Ratio in Effluent	%	78%	WRP.PE.VSS%	
		Equalized Flow Peaking Factor	Dimensionless	1.20	EQPF	
	Secondary	Effluent TSS Conc.	mg/L	9	SEC.EFF.TSS	
		Effluent BOD Conc.	mg/L	9	SEC.EFF.BOD	
		Nonbiodeg Fraction of Inf VSS	%	40%	NBVSS	
		MLTSS Conc.	mg/L	2,800	MLTSS	
		RAS/WAS Solids Conc.	% (w/w)	0.50%	WAS%	
		VSS to TSS Ratio in Sludge	%	60%	WRP.SEC.VSS%	
		MCRT	days	5	MCRT	
		Net Yield	lb TSS gen/lb BOD rem	0.60	TSS.GEN.SEC	
		Decay Coefficient	Dimensionless	0.05	DECAY	
		RAS:Influent Flow Ratio	Dimensionless	0.50	RAS.INF	

Plant Performance Criteria

Category	Process	Parameter	Units	Value Model Designation	Comments
		Particulate BOD to VSS Ratio	%	100% PBOD.VSS.SEC	

Plant Performance Criteria

Category	Process	Parameter	Units	Value	Model Designation	Comments
	Tertiary	Effluent TSS Conc.	mg/L	4	TER.EFF.TSS	
		Effluent BOD Conc.	mg/L	8	TER.EFF.BOD	
		Chemical Addition - NaOCl	mg/L	5	WRP.CHEM.CONC.T	
		VSS to TSS Ratio in Tert Inf/Eff	%	47%	TER.VSS	
		Particulate BOD to VSS Ratio	%	47%	PBOD.VSS	
	Misc	Utility Water Flow	% of Plant Flow	3.0%	UTILITY	
PLWTP	Adv. Primary	Average TSS removal	%	89.0%	PL.TSS.AVGREM	
		MSS TSS removal	%	82.7%	PL.TSS.MSSREM	Iterate to match "2001-2003" sheet
		Waiver Required Removal	%	80.0%	WAIVER.TSS%	
		Influent Recycle TSS Removal	%	82.7%	PL.TSS.RECREM	
		Influent Thickener Centrate TSS Removal	%	82.7%	PL.TSS.TCENT	
		Influent Dewatering Centrate TSS Removal	%	82.7%	PL.TSS.DCENT	
		Influent Retreat TSS Removal	%	82.7%	PL.TSS.RETREM	
		Average BOD removal	%	59.2%	PL.BOD.AVGREM	
		MSS BOD removal	%	59.2%	PL.BOD.MSSREM	Iterate to match "2001-2003" sheet
		Waiver Required Removal	%	58.0%	WAIVER.TBOD%	
		Influent Recycle BOD Removal	%	59.2%	PL.BOD.RECREM	
		Influent Retreat BOD Removal	%	59.2%	PL.BOD.RETREM	
		Chemical Addition - FeCl3	mg/L	30	ADVPRI.CHEM	
		Chemical Sludge Production	lb TSS/lb FeCl3	1.10	ADVPRI.CHEM.PRD	
		Capture of Chemical Sludge	%	100%	CHEM.SLDG.PL	See chemical sludge spreadsheet
		Sludge Concentration	% (w/w)	4%	ADVPRI.SLD	
		VSS to TSS Ratio in Sludge	%	75%	ADVPRI.VSS%	
		SBOD to TBOD Ratio in Sludge	%	1%	ADVPRI.SBOD%	
		Bypass to Ocean Outfall	%	0%	PLWTP.BP	
Sludge Processing	General	Combined Sludge Specific Gravity	Dimensionless	1.01	SG.SLUDGE	Per 5/25/04 changes provided by MWWD
		SBOD to TBOD Ratio in Combined Sludge	%	2%	SBOD.CS	
	Thickening	Solids Recovery	%	80%	THCK.REC	Iterate to match "2001-2003" Sheet
		Sludge Concentration	% (w/w)	5%	THCK.SLD%	
		Thickened Sludge Specific Gravity	Dimensionless	1.03	SG.THCKSL	Per 5/25/04 changes provided by MWWD
		Fraction of TBOD Retained in Centrate	%	10%	TBOD.TC%	
		Fraction of SBOD Retained in Centrate	%	70%	SBOD.TC%	
	Digestion	Primary Sludge VSS Destroyed	%	50%	VSS.DES	
		Combined Sludge VSS Destroyed	%	52%	VSS.DES.COMB	Per 5/25/04 changes provided by MWWD
		Gas Production Rate	scf/lb VSS des	14.5	GAS.PROD	Per 5/25/04 changes provided by MWWD
		Influent to Effluent Flow Ratio	%	99%	INF.EFF.DIG	Per 5/25/04 changes provided by MWWD
		Digested Sludge Specific Gravity	Dimensionless	1.03	SG.DIG	Per 5/25/04 changes provided by MWWD
		Solubilization of Primary VSS (Inc. in VSS Des.)	%	5%	VSS.SOL	
		Solubilization of Combined VSS (Inc. in VSS Des.)	%	7%	VSS.SOL.COMB	
		Fraction of Solubilized VSS is SBOD	%	75%	SBOD.VSS.DIG	
		TBOD Reduction in Digester - Primary Sludge	%	75%	TBOD.RED%	
		TBOD Reduction in Digester - Combined Sludge	%	55%	TBOD.RED%.COMB	
		SBOD Reduction in Digester - Primary Sludge	%	75%	SBOD.RED%	
		SBOD Reduction in Digester - Combined Sludge	%	55%	SBOD.RED%.COMB	
	Dewatering	Solids Recovery - Centrifuge	%	80%	DEW.REC	Iterate to match "2001-2003" Sheet
		Solids Recovery - Belt Filter Press	%	92%	DEW.BFP	
		Sludge Concentration	% (w/w)	28%	DEW.SLD%	Per 5/25/04 changes provided by MWWD
		Dewatered Sludge Specific Gravity	Dimensionless	1.07	SG.DWTR	
		Dewatered Centrate Specific Gravity	Dimensionless	1.00	SG.DC	
		Fraction of TBOD Retained in Centrate	%	10%	TBOD.DWTR%	
		Fraction of SBOD Retained in Centrate	%	70%	SBOD.DWTR%	
		BFP Washwater Added to Filtrate	gpm	90	BFP.WW	
		Number of BFPs Operating at FISDF	Dimensionless	6	BFP	
		FIRP Startup Year	—	1998.5	FIRP.YEAR	
Centrate Treatment		Solids Recovery	%	97%	CENT.TMT.REC	Per 5/25/04 changes provided by MWWD
		Thickened Sludge Concentration	% (w/w)	3.5%	CENT.TMT.SLD%	Per 5/25/04 changes provided by MWWD
		Toggle to activate	0=off; 1=on	0	CENT.TMT.TGL	

MODEL SUMMARY FOR CALENDAR YEAR 2014

Case No.:	CALIBRATION RUN - PROJECTS P-11.1 & 11.6	**Year MER Reached:**	2014
System AADF:	218.0 mgd	**Year PS2 Cap. Reached:**	N/A
PS1 PWWF:	N/A mgd	**PS2 Storage Design Year:**	No Storage Provided
PS2 PWWF:	N/A mgd	**PS2 Storage Cap. (mgd):**	N/A
PL Eff TSS:	54 mg/L	**Year PS1 Cap. Reached:**	N/A
MBC Gas Prd:	351,319 scf	**Storage Tank Design Year:**	No Storage Provided
SSPF Gas Prd	0 scf	**Storage Tank Cap. (mgd):**	N/A

Assumptions:

80%	solids recovery in dewatering centrifuge	289	mg/L TBOD in the PLWTP Influent
82.700%	removal of non-centrate recyice TSS at PLWTP	319	mg/L TSS in the PLWTP Influent
100.000%	Capture of Chemical Sludge	258	mg/L TBOD in the NCWRP Influent
82.700%	removal of thickener centrate TSS at PLWTP	272	mg/L TSS in the NCWRP Influent
82.700%	removal of dewatering centrate TSS at PLWTP	250	mg/L TBOD in the Central WRP Influent
13,600	mt/yr TSS MER limit at PLWTP	250	mg/L TSS in the Central WRP Influent
300	mg/L TBOD in the MSS Flow	365	mg/L TBOD in the South Bay Influent
273	mg/L TSS in the MSS Flow	376	mg/L TSS in the South Bay Influent
82.700%	removal of TSS from MSS and WRP Secondary Effluent	0.0%	Reclamation at NCWRP Annually
1.1	lb TSS/lb FeCl3 added	0.0%	Reclamation at CWRP Annually
59%	removal of TBOD at PLWTP	0.0%	Reclamation at SBWRP Annually
0.0%	Diverted at PLWTP for Secondary Treatment	45	mgd of WRP Capacity - Satisfies OPRA
0.00	mgd diverted at PLWTP for Secondary Treatment		*No WTP Sludge discharged to the sewer*
30	mgd NCWRP		NCES/PLTO Not Utilized
0	mgd CWRP		SSPF Not Online
15	mgd SBWRP (Southern Facility)		*TSS MER Limit Applies to PLOO Only*
0	mgd CSTP		
0	mgd SBSTP		

Source/Plant		Flow (mgd)	TSS (lb/d)	VSS (lb/d)	TBOD (lb/d)	SBOD (lb/d)
Total System Generation						
	MSS (Basic + Other Major Ind/Com Sources)	217.98	496,301	372,226	545,386	218,154
	Tijuana	0.00	0	0	0	0
	PS No. 2 Chemical	0.00	18,923	0	0	0
	Subtotal A - Total Generated	217.98	515,224	372,226	545,386	218,154
NCWRP						
	Applied	30.00	68,054	51,041	64,051	25,620
	Returned	28.05	1,148	917	1,380	463
	Subtotal B - Net Change	(1.95)	(66,906)	(50,124)	(62,671)	(25,157)
SWRP/MVWRP/MGWRP (i.e., CWRP)						
	Applied	0.00	0	0	0	0
	Returned	0.00	0	0	0	0
	Subtotal C - Net Change	0.00	0	0	0	0
SBWRP						
	Applied	14.35	44,987	33,740	43,671	17,468
	Returned	1.25	52,114	40,341	27,343	547
	Subtotal D - Net Change	(13.10)	7,127	6,601	(16,328)	(16,921)
SBSTP						
	Applied	0.00	0	0	0	0
	Returned	0.00	0	0	0	0
	Subtotal D - Net Change	0.00	0	0	0	0
NSPF (MBC)						
	Returned Thickener Centrate	1.80	16,058	12,383	8,060	573
	Dewatering Centrate	0.14	7,724	5,171	2,037	1,950
	Subtotal E - Net Change	1.94	23,782	17,554	10,097	2,522
SSPF						
	Returned Thickener Centrate	0.00	0	0	0	0
	Dewatering Centrate	0.00	0	0	0	0
	Subtotal F - Net Change	0.00	0	0	0	0
PLWTP						
	Applied					
	- w/o FISDF/FIRP, Plant & PS2 Chem	204.87	460,301	346,258	476,484	178,598
	- with PS No. 2 Chem & FISDF/FIRP	206.27	548,009	378,582	497,551	187,728
	- with PS No. 2 Chem, FISDF/FIRP & Plant Chem	206.28	604,779	378,582	497,551	187,728
	Effluent	204.76	91,532	50,416	203,001	184,782
	Removal Efficiency					
	- w/o FISDF/FIRP, Plant & PS2 Chem (per Waiver)	—	80.1%	85.4%	57.4%	-3.5%
	- with PS No. 2 Chem & FISDF/FIRP	—	83.3%	86.7%	59.2%	1.6%
	- with PS No. 2 Chem, FISDF/FIRP & Plant Chem	—	84.9%	86.7%	59.2%	1.6%
	Secondary Effluent from NCWRP	0.00	0	0	0	0
	Secondary Effluent from SWRP	0.00	0	0	0	0
	Secondary Effluent from SBWRP/SBSTP	0.00	0	0	0	0
	Total Ocean Discharge (PLWTP+NCWRP+SWRP/SBSTP)	204.76	91,532	50,416	203,001	184,782
	(TOTAL OCEAN DISCHARGE IN MT/YEAR)		16152			

	TSS	TBOD
	269.4	278.9
	318.6	289.2
	351.5	289.2

Metropolitan Sewerage System
2001-2003 Wastewater Quality and Flow Used for Model Calibration
MSC CAMP Sites and Truck Loadout Capacity Estimates

7-day Rolling Average - 95th Percentile

	PLWTPin			PLWTPout			Removal (%)		SBWRPin			SBWRPout			Removal (%)		SBWRPout	MSC Centrate			NCWRPin			NCWRPout			Removal (%)	
Year	Flow	TSS	TBOD	Flow	TSS	TBOD	TSS	TBOD	Flow	TSS	TBOD	Flow	TSS	TBOD	TSS	TBOD	Flow	Flow	TSS	TBOD	Flow	TSS	TBOD	Flow	TSS	TBOD	TSS	TBOD
2001	190.9	290.7	276.7	169.8	51.4	107.6	91.2%	87.4%										2.4	1088	638	24.8	272	256	23.0	4.9	5.9	98.2%	97.7%
2002	174.0	311.4	287.5	172.6	51.8	113.4	97.2%	76.2%	4.6	376	366	4.8	7.7	9.9	97.9%	97.3%	0.80	2.8	1512	807								
2003	190.2	310.3	290.7	189.1	49.2	124.3	97.2%	95.9%	4.7			4.4					0.89	2.9	1718	421								
3-yr	185.5	306	287	184.4	51.4	117.5	97.6%	89.3%	4.7	376	366	4.7	7.7	9.9	97.9%	97.3%	0.87	2.5	1466	514	24.8	272	256	23.01	4.97	5.9	98.2%	97.7%
Model	206.3	318	288	204.8	53.9	118.9	94.9%	89.2%	14.3	376	366	13.1	7.7	9.8	—	—	1.28	7.9	1469	624	30.0	272	256	26.05	4.9	5.9	—	—

Project P-11.1 - Additional Biosolids Storage Silos

20% = Solids Content (%)
311,681 = Mass Production Rate (dry lb/d)
156 = Mass Production Rate (dry ton/d)
124,811 = Volumetric Production Rate (gpd) - VPR
16,686 = Volumetric Production Rate (ft^3/d) - VPR

2.83 = Maximum days of storage required

326,263 = Truck Storage Cap Required (gal)
43,604 = Truck Storage Cap Required (ft^3)

6 = Number of Silos Available
7 = Assumed Number of Silos in Operation
6,969 = Storage Capacity per Silo (ft^3)
51,965 = Storage Capacity per Silo (gal)
90% = Percent of Total Silo Capacity Available Operationally
46,769 = Total available capacity (ft^3)
327,512 = Total available capacity (gal)

1.00 = Request/Available — should be less than or equal to 1 if sufficient capacity is available

Project P-11.6 - New Biosolids Truck Loadout Facility

Capacity Estimate
848 = Loadout Capacity per Bay (ft^3)
4,847 = Loadout Capacity per Bay (gallon)
90% = Percent of Total Loadout Capacity Available Operationally
2 = Number of Bays
25 = Loading Duration per Truck (min)
5 = Number of days of operation per week
8 = Number of hours operation per day
480 = Maximum Operating Minutes per day
11,197 = Maximum Daily Volumetric Disposal per Bay (ft^3)

Maximum Daily Mass Load Disposal per Bay (ft^3) = (Maximum Operating Minutes per day / Loading Duration per Truck (min)) * Loadout Capacity per Bay (ft^3)

16,686 = Volumetric Production Rate (ft^3/d) - VPR
20,200 = Daily disposal rate based on operational parameters noted above (ft^3/d)

1.04 = Request/Available — Should be equal to 1 if sufficient capacity is available

MODEL SUMMARY FOR CALENDAR YEAR 2017

Case No.:	CALIBRATION RUN - PROJECTS P-11.1 & 11.6	**Year MER Reached:**	2017
System AADF:	224.8 mgd	**Year PS2 Cap. Reached:**	N/A
PS1 PWWF:	N/A mgd	**PS2 Storage Design Year:**	No Storage Provided
PS2 PWWF:	N/A mgd	**PS2 Storage Cap. (mgd):**	N/A
PL Eff TSS:	54 mg/L	**Year PS1 Cap. Reached:**	N/A
MBC Gas Prd:	351,319 scf	**Storage Tank Design Year:**	No Storage Provided
SSPF Gas Prd	0 scf	**Storage Tank Cap. (mgd):**	N/A

Assumptions:

80%	solids recovery in dewatering centrifuge	290	mg/L TBOD in the PLWTP Influent
82.700%	removal of non-centrate recyle TSS at PLWTP	320	mg/L TSS in the PLWTP Influent
100.000%	Capture of Chemical Sludge	256	mg/L TBOD in the NCWRP Influent
82.700%	removal of thickener centrate TSS at PLWTP	272	mg/L TSS in the NCWRP Influent
82.700%	removal of dewatering centrate TSS at PLWTP	250	mg/L TBOD in the Central WRP Influent
13,600	mt/yr TSS MER limit at PLWTP	250	mg/L TSS in the Central WRP Influent
300	mg/L TBOD in the MSS Flow	365	mg/L TBOD in the South Bay Influent
273	mg/L TSS in the MSS Flow	378	mg/L TSS in the South Bay Influent
82.700%	removal of TSS from MSS and WRP Secondary Effluent	0.0%	Reclamation at NCWRP Annually
1.1	lb TSS/lb FeCl3 added	0.0%	Reclamation at CWRP Annually
50%	removal of TBOD at PLWTP	0.0%	Reclamation at SBWRP Annually
0.0%	Diverted at PLWTP for Secondary Treatment	45	mgd of WRP Capacity - Satisfies OPRA
0.00	mgd diverted at PLWTP for Secondary Treatment		*No WTP Sludge discharged to the sewer*
30	mgd NCWRP		NCES/PLTO Not Utilized
0	mgd CWRP		SSPF Not Online
15	mgd SBWRP (Southern Facility)		*TSS MER Limit Applies to PLOO Only*
0	mgd CSTP		
0	mgd SBSTP		

Source/Plant		Flow (mgd)	TSS (lb/d)	VSS (lb/d)	TBOD (lb/d)	SBOD (lb/d)
Total System Generation						
	MSS (Basic + Other Major Ind/Com Sources)	224.84	511,920	383,940	562,550	225,020
	Tijuana	0.00	0	0	0	0
	PS No. 2 Chemical	0.00	19,502	0	0	0
	Subtotal A - Total Generated	224.84	531,422	383,940	562,550	225,020
NCWRP						
	Applied	30.00	68,054	51,041	64,051	25,620
	Returned	28.05	1,146	917	1,380	463
	Subtotal B - Net Change	(1.95)	(66,908)	(50,124)	(62,671)	(25,157)
SWRP/MVWRP/MGWRP (i.e., CWRP)						
	Applied	0.00	0	0	0	0
	Returned	0.00	0	0	0	0
	Subtotal C - Net Change	0.00	0	0	0	0
SBWRP						
	Applied	15.00	47,038	35,278	45,662	18,265
	Returned	1.31	54,489	42,180	28,590	672
	Subtotal D - Net Change	(13.69)	7,452	6,902	(17,072)	(17,593)
SBSTP						
	Applied	0.00	0	0	0	0
	Returned	0.00	0	0	0	0
	Subtotal D - Net Change	0.00	0	0	0	0
NSPF (MBC)						
	Returned Thickener Centrate	1.80	16,058	12,383	8,060	573
	Dewatering Centrate	0.14	7,724	5,171	2,037	1,950
	Subtotal E - Net Change	1.94	23,782	17,554	10,097	2,522
SSPF						
	Returned Thickener Centrate	0.00	0	0	0	0
	Dewatering Centrate	0.00	0	0	0	0
	Subtotal F - Net Change	0.00	0	0	0	0
PLWTP						
	Applied					
	- w/o FISDF/FIRP, Plant & PS2 Chem	211.13	476,245	358,273	492,903	184,692
	- with PS No. 2 Chem & FISDF/FIRP	212.58	566,846	391,713	514,697	194,137
	- with PS No. 2 Chem, FISDF/FIRP & Plant Chem	212.59	625,354	391,713	514,697	194,137
	Effluent	211.01	94,691	52,221	209,996	191,090
	Removal Efficiency					
	- w/o FISDF/FIRP, Plant & PS2 Chem (per Waiver)	—	80.1%	85.4%	57.4%	-3.5%
	- with PS No. 2 Chem & FISDF/FIRP	—	83.3%	86.7%	59.2%	1.6%
	- with PS No. 2 Chem, FISDF/FIRP & Plant Chem	—	84.9%	86.7%	59.2%	1.6%
	Secondary Effluent from NCWRP	0.00	0	0	0	0
	Secondary Effluent from SWRP	0.00	0	0	0	0
	Secondary Effluent from SBWRP/SBSTP	0.00	0	0	0	0
	Total Ocean Discharge (PLWTP+NCWRP+SWRP/SBSTP)	211.01	94,691	52,221	209,996	191,090
	(TOTAL OCEAN DISCHARGE IN MT/YEAR)		15674			

	TSS	TBOD
	270.5	279.9
	319.7	290.3
	352.7	290.3

Metropolitan Sewerage System
2001-2003 Wastewater Quality and Flow Used for Model Calibration
WBC CAMP Sites and Truck Loadout Capacity Estimates

7-day Rolling Average - 90th Percentile

	PLWTPin			PLWTPout			Removal (%)		SBWRPin			SBWRPout			Removal (%)		SBWRPmf	WBC Centrate			NCWRPin			NCWRPout			Removal (%)	
Year	Flow	TSS	TBOD	Flow	TSS	TBOD	TSS	TBOD	Flow	TSS	TBOD	Flow	TSS	TBOD	TSS	TBOD	Flow	Flow	TSS	TBOD	Flow	TSS	TBOD	Flow	TSS	TBOD	TSS	TBOD
2001	193.9	390.7	276.7	189.8	61.4	107.8	91.2%	87.4%										2.4	1088	838	24.8	272	256	23.9	4.6	5.9	98.2%	97.7%
2002	174.0	311.4	287.5	172.9	51.8	113.4	87.2%	70.2%	4.8	378	366	4.8	7.7	9.8	97.9%	97.3%	0.90	2.5	1512	907								
2003	190.2	310.3	290.7	189.1	49.2	124.3	87.2%	86.9%	4.7			4.4					0.89	2.9	1318	421								
3-yr	185.8	308	267	184.4	51.4	117.6	87.6%	89.3%	4.7	378	366	4.7	7.7	9.8	97.9%	97.3%	0.87	2.5	1466	614	24.8	272	256	23.01	4.6	5.9	98.2%	97.7%
Model	212.8	320	290	211.0	53.8	118.3	84.9%	89.2%	15.0	378	366	13.7	7.7	9.8	—	—	1.31	1.9	1469	624	30.0	272	256	28.05	4.9	5.9	—	—

Project P-11.1 - Additional Biosolids Storage Silos

29% = Solids Content (%)
321,209 = Mass Production Rate (dry ton/d)
161 = Mass Production Rate (dry ton/d)
128,589 = Volumetric Production Rate (gpd) - VPR
17,191 = Volumetric Production Rate (ft^3/d) - VPR

3.63 = Maximum days of storage required

466,776 = Truck Storage Cap Required (gal)
62,403 = Truck Storage Cap Required (ft^3)

12 = Number of Silos Available
10 = Assumed Number of Silos in Operation
6,900 = Storage Capacity per Silo (ft^3)
51,606 = Storage Capacity per Silo (gal)
90% = Percent of Total Silo Capacity Available Operationally
62,580 = Total available capacity (ft^3)
467,874 = Total available capacity (gal)

1.00 = Required/Available — Should be less than or equal to 1 if sufficient capacity is available

Project P-11.6 - New Biosolids Truck Loadout Facility

Capacity Estimate

648 = Loadout Capacity per Bay (ft^3)
4,847 = Loadout Capacity per Bay (gallon)
90% = Percent of Total Loadout Capacity Available Operationally
2 = Number of Bays
25 = Loading Duration per Truck (min)
5 = Number of days of operation per week
8 = Number of hours operation per day
480 = Maximum Operating Minutes per day
11,197 = Maximum Daily Volumetric Disposal per Bay (ft^3)

Maximum Daily Mass Load Disposal per Bay (ft^3) = (Maximum Operating Minutes per day / Loading Duration per Truck (min)) * Loadout Capacity per Bay (ft^3)

17,191 = Volumetric Production Rate (ft^3/d) - VPR
24,087 = Daily disposal rate based on operational parameters noted above (ft^3/d)

1.07 = Required/Available — Should be equal to 1 if sufficient capacity is available

MODEL SUMMARY FOR CALENDAR YEAR 2025

Case No.:	**CALIBRATION RUN - PROJECTS P-11.1 & 11.6**	**Year MER Reached:**	**2025**
System AADF:	***239.5 mgd***	***Year PS2 Cap. Reached:***	**N/A**
PS1 PWWF:	**N/A mgd**	**PS2 Storage Design Year:**	**No Storage Provided**
PS2 PWWF:	**N/A mgd**	**PS2 Storage Cap. (mgd):**	**N/A**
PL Eff TSS:	**54 mg/L**	**Year PS1 Cap. Reached:**	**N/A**
MBC Gas Prd:	**351,319 scf**	**Storage Tank Design Year:**	**No Storage Provided**
SSPF Gas Prd	**0 scf**	**Storage Tank Cap. (mgd):**	**N/A**

Assumptions:

80%	**solids recovery in dewatering centrifuge**	**292**	**mg/L TBOD in the PLWTP Influent**
82.700%	**removal of non-centrate recylce TSS at PLWTP**	**320**	**mg/L TSS in the PLWTP Influent**
100.000%	**Capture of Chemical Sludge**	**256**	**mg/L TBOD in the NCWRP Influent**
82.700%	**removal of thickener centrate TSS at PLWTP**	**272**	**mg/L TSS in the NCWRP Influent**
82.700%	**removal of dewatering centrate TSS at PLWTP**	**250**	**mg/L TBOD in the Central WRP Influent**
13,600	**mt/yr TSS MER limit at PLWTP**	**250**	**mg/L TSS in the Central WRP Influent**
300	**mg/L TBOD in the MSS Flow**	**385**	**mg/L TBOD in the South Bay Influent**
273	**mg/L TSS in the MSS Flow**	**378**	**mg/L TSS in the South Bay Influent**
82.700%	**removal of TSS from MSS and WRP Secondary Effluent**	**0.0%**	**Reclamation at NCWRP Annually**
1.1	**lb TSS/lb FeCl3 added**	**0.0%**	**Reclamation at CWRP Annually**
50%	**removal of TBOD at PLWTP**	**0.0%**	**Reclamation at SBWRP Annually**
0.0%	**Diverted at PLWTP for Secondary Treatment**	**45**	**mgd of WRP Capacity - Satisfies OPRA**
0.00	**mgd diverted at PLWTP for Secondary Treatment**		***No WTP Sludge discharged to the sewer***
30	***mgd NCWRP***		**NCES/PLTO Not Utilized**
0	**mgd CWRP**		**SSPF Not Online**
15	**mgd SBWRP (Southern Facility)**		***TSS MER Limit Applies to PLOO Only***
0	**mgd CSTP**		
0	**mgd SBSTP**		

Source/Plant		Flow (mgd)	TSS (lb/d)	VSS (lb/d)	TBOD (lb/d)	SBOD (lb/d)
Total System Generation						
	MSS (Basic + Other Major Ind/Com Sources)	239.50	545,298	408,974	599,229	239,692
	Tijuana	0.00	0	0	0	0
	PS No. 2 Chemical	0.00	20,856	0	0	0
	Subtotal A - Total Generated	239.50	566,154	408,974	599,229	239,692
NCWRP						
	Applied	30.00	68,054	51,041	64,051	25,620
	Returned	28.05	1,146	917	1,380	463
	Subtotal B - Net Change	(1.95)	(66,908)	(50,124)	(62,671)	(25,157)
SWRP/MVWRP/MGWRP (i.e., CWRP)						
	Applied	0.00	0	0	0	0
	Returned	0.00	0	0	0	0
	Subtotal C - Net Change	0.00	0	0	0	0
SBWRP						
	Applied	15.00	47,038	35,278	45,662	18,265
	Returned	1.31	54,489	42,180	28,590	572
	Subtotal D - Net Change	(13.69)	7,452	6,902	(17,072)	(17,693)
SBSTP						
	Applied	0.00	0	0	0	0
	Returned	0.00	0	0	0	0
	Subtotal D - Net Change	0.00	0	0	0	0
NSPF (MBC)						
	Returned Thickener Centrate	1.80	16,058	12,383	8,060	573
	Dewatering Centrate	0.14	7,724	5,171	2,037	1,950
	Subtotal E - Net Change	1.94	23,782	17,554	10,097	2,522
SSPF						
	Returned Thickener Centrate	0.00	0	0	0	0
	Dewatering Centrate	0.00	0	0	0	0
	Subtotal F - Net Change	0.00	0	0	0	0
PLWTP						
	Applied					
	- w/o FISDF/FIRP, Plant & PS2 Chem	225.79	509,623	383,306	529,583	199,364
	- with PS No. 2 Chem & FISDF/FIRP	227.34	606,552	419,089	552,969	209,473
	- with PS No. 2 Chem, FISDF/FIRP & Plant Chem	227.35	669,121	419,089	552,969	209,473
	Effluent	225.67	101,325	55,811	225,811	206,199
	Removal Efficiency					
	- w/o FISDF/FIRP, Plant & PS2 Chem (per Waiver)	---	80.1%	85.4%	57.4%	-3.4%
	- with PS No. 2 Chem & FISDF/FIRP	---	83.3%	86.7%	59.2%	1.6%
	- with PS No. 2 Chem, FISDF/FIRP & Plant Chem	---	84.9%	86.7%	59.2%	1.6%
	Secondary Effluent from NCWRP	0.00	0	0	0	0
	Secondary Effluent from SWRP	0.00	0	0	0	0
	Secondary Effluent from SBWRP/SBSTP	0.00	0	0	0	0
	Total Ocean Discharge (PLWTP+NCWRP+SWRP/SBSTP)	225.67	101,325	55,811	225,811	206,199
	(TOTAL OCEAN DISCHARGE IN MT/YEAR)		16773			

	TSS	TBOD
	270.6	281.2
	319.9	291.6
	352.9	291.6

Metropolitan Sewerage System
2001-2003 Wastewater Quality and Flow Used for Model Calibration
MSC CAMP Sites and Truck Loadout Capacity Estimates

7-day Rolling Average - 95th Percentile

	PLWTPin			PLWTPout			Removal (%)		SBWRPin			SBWRPout			Removal (%)		SBWRPrtn	MSC Centrate			NCWRPin			NCWRPout			Removal (%)	
Year	Flow	TSS	TBOD	Flow	TSS	TBOD	TSS	TBOD	Flow	TSS	TBOD	Flow	TSS	TBOD	TSS	TBOD	Flow	Flow	TSS	TBOD	Flow	TSS	TBOD	Flow	TSS	TBOD	TSS	TBOD
2001	180.6	290.7	276.7	188.6	51.4	107.6	91.2%	67.4%										2.4	1088	536	24.8	272	255	23.0	4.9	5.9	98.2%	97.7%
2002	174.0	311.4	267.5	172.9	51.8	113.4	87.2%	70.2%	4.8	378	366	4.8	7.7	8.8	97.9%	97.3%	0.80	2.6	1512	507								
2003	190.2	310.3	290.7	199.1	49.2	124.3	87.2%	65.9%	4.7			4.4					0.89	2.8	1318	421								
3-yr	185.6	308	287	184.4	51.4	117.5	87.6%	69.3%	4.7	378	366	4.7	7.7	8.8	97.9%	97.3%	0.87	2.6	1466	514	24.8	272	255	23.0	4.9	5.9	98.2%	97.7%
Model	227.9	320	292	225.7	53.8	119.9	84.9%	69.2%	15.0	376	366	13.7	7.7	8.8	---	---	1.31	1.9	1469	634	30.9	272	255	28.05	4.9	5.9	---	---

Project P-11.1 - Additional Biosolids Storage Silos

28% = Solids Content (%)
341,896 = Mass Production Rate (dry lb/d)
171 = Mass Production Rate (dry ton/d)
136,700 = Volumetric Production Rate (gpd) - VPR
18,276 = Volumetric Production Rate (ft^3/d) - VPR

3.63 = Maximum days of storage required

466,219 = Truck Storage Cap Required (gal)
66,339 = Truck Storage Cap Required (ft^3)

13 = Number of Silos Available
11 = Assumed Number of Silos in Operation
5,950 = Storage Capacity per Silo (ft^3)
51,988 = Storage Capacity per Silo (gal)
90% = Percent of Total Silo Capacity Available Operationally
66,605 = Total available capacity (ft^3)
514,881 = Total available capacity (gal)

0.98 = Required/Available — Should be less than or equal to 1 if sufficient capacity is available.

Project P-11.6 - New Biosolids Truck Loadout Facility

Capacity Estimate

948 = Loadout Capacity per Bay (ft^3)
4,847 = Loadout Capacity per Bay (gallon)
90% = Percent of Total Loadout Capacity Available Operationally
2 = Number of Bays
25 = Loading Duration per Truck (min)
5 = Number of days of operation per week
8 = Number of hours operation per day
480 = Maximum Operating Minutes per day
11,197 = Maximum Daily Volumetric Disposal per Bay (ft^3)

Maximum Daily Mass Load Disposal per Bay (ft^3) = (Maximum Operating Minutes per day / Loading Duration per Truck (min)) * Loadout Capacity per Bay (ft^3)

18,276 = Volumetric Production Rate (ft^3/d) - VPR
25,565 = Daily disposal rate based on operational parameters noted above (ft^3/d)

1.14 = Required/Available — Should be equal to 1 if sufficient capacity is available

MODEL SUMMARY FOR CALENDAR YEAR 2025

Case No.:	CALIBRATION RUN - PROJECTS P-11.1 & 11.6	Year MER Reached:	2025
System AADF:	239.5 mgd	Year PS2 Cap. Reached:	N/A
PS1 PWWF:	N/A mgd	PS2 Storage Design Year:	No Storage Provided
PS2 PWWF:	N/A mgd	PS2 Storage Cap. (mgd):	N/A
PL Eff TSS:	54 mg/L	Year PS1 Cap. Reached:	N/A
MBC Gas Prd:	351,319 scf	Storage Tank Design Year:	No Storage Provided
SSPF Gas Prd	0 scf	Storage Tank Cap. (mgd):	N/A

Assumptions:

80%	solids recovery in dewatering centrifuge	292	mg/L TBOD in the PLWTP Influent
82.700%	removal of non-centrate recyle TSS at PLWTP	320	mg/L TSS in the PLWTP Influent
100.000%	Capture of Chemical Sludge	256	mg/L TBOD in the NCWRP Influent
82.700%	removal of thickener centrate TSS at PLWTP	272	mg/L TSS in the NCWRP Influent
82.700%	removal of dewatering centrate TSS at PLWTP	250	mg/L TBOD in the Central WRP Influent
13,600	mt/yr TSS MER limit at PLWTP	250	mg/L TSS in the Central WRP Influent
300	mg/L TBOD in the MSS Flow	385	mg/L TBOD in the South Bay Influent
273	mg/L TSS in the MSS Flow	376	mg/L TSS in the South Bay Influent
82.700%	removal of TSS from MSS and WRP Secondary Effluent	0.0%	Reclamation at NCWRP Annually
1.1	lb TSS/lb FeCl3 added	0.0%	Reclamation at CWRP Annually
59%	removal of TBOD at PLWTP	0.0%	Reclamation at SBWRP Annually
0.0%	Diverted at PLWTP for Secondary Treatment	45	mgd of WRP Capacity - Satisfies OPRA
0.00	mgd diverted at PLWTP for Secondary Treatment		*No WTP Sludge discharged to the sewer*
30	mgd NCWRP		NCES/PLTO Not Utilized
0	mgd CWRP		SSPF Not Online
15	mgd SBWRP (Southern Facility)		*TSS MER Limit Applies to PLOO Only*
0	mgd CSTP		
0	mgd SBSTP		

Source/Plant		Flow (mgd)	TSS (lb/d)	VSS (lb/d)	TBOD (lb/d)	SBOD (lb/d)
Total System Generation						
	MSS (Basic + Other Major Ind/Com Sources)	239.50	545,298	408,974	599,229	239,692
	Tijuana	0.00	0	0	0	0
	PS No. 2 Chemical	0.00	20,856	0	0	0
	Subtotal A - Total Generated	239.50	566,154	408,974	599,229	239,692
NCWRP						
	Applied	30.00	68,054	51,041	64,051	25,620
	Returned	28.05	1,146	917	1,360	463
	Subtotal B - Net Change	(1.95)	(66,908)	(50,124)	(62,671)	(25,157)
SWRP/MVWRP/MGWRP (i.e., CWRP)						
	Applied	0.00	0	0	0	0
	Returned	0.00	0	0	0	0
	Subtotal C - Net Change	0.00	0	0	0	0
SBWRP						
	Applied	15.00	47,038	35,278	45,662	18,265
	Returned	1.31	54,489	42,180	28,590	572
	Subtotal D - Net Change	(13.69)	7,452	6,902	(17,072)	(17,693)
SBSTP						
	Applied	0.00	0	0	0	0
	Returned	0.00	0	0	0	0
	Subtotal D - Net Change	0.00	0	0	0	0
NSPF (MBC)						
	Returned Thickener Centrate	1.80	16,068	12,383	8,060	573
	Dewatering Centrate	0.14	7,724	5,171	2,037	1,950
	Subtotal E - Net Change	1.94	23,792	17,554	10,097	2,522
SSPF						
	Returned Thickener Centrate	0.00	0	0	0	0
	Dewatering Centrate	0.00	0	0	0	0
	Subtotal F - Net Change	0.00	0	0	0	0
PLWTP						
	Applied					
	- w/o FISDF/FIRP, Plant & PS2 Chem	225.79	509,623	383,306	529,583	199,364
	- with PS No. 2 Chem & FISDF/FIRP	227.34	606,552	419,069	552,969	209,473
	- with PS No. 2 Chem, FISDF/FIRP & Plant Chem	227.35	669,121	419,069	552,969	209,473
	Effluent	225.67	101,325	55,811	225,611	206,199
	Removal Efficiency					
	- w/o FISDF/FIRP, Plant & PS2 Chem (per Waiver)	—	80.1%	85.4%	57.4%	-3.4%
	- with PS No. 2 Chem & FISDF/FIRP	—	83.3%	86.7%	59.2%	1.6%
	- with PS No. 2 Chem, FISDF/FIRP & Plant Chem	—	84.9%	86.7%	59.2%	1.6%
	Secondary Effluent from NCWRP	0.00	0	0	0	0
	Secondary Effluent from SWRP	0.00	0	0	0	0
	Secondary Effluent from SBWRP/SBSTP	0.00	0	0	0	0
	Total Ocean Discharge (PLWTP+NCWRP+SWRP/SBSTP)	225.67	101,325	55,811	225,611	206,199
	(TOTAL OCEAN DISCHARGE IN MT/YEAR)		16773			

	TSS	TBOD
	270.6	281.2
	319.9	291.6
	352.9	291.6

Metropolitan Sewerage System
2001-2003 Wastewater Quality and Flow Used for Model Calibration
MSC CAMP Sites and Truck Loadout Capacity Estimates

7-day Rolling Average - 90th Percentile

Year	PLWTPin			PLWTPout			Removal (%)		SBWRPin			SBWRPout			Removal (%)		SBWRPout	MSC Controls			NCWRPin			NCWRPout			Removal (%)	
	Flow	TSS	TBOD	Flow	TSS	TBOD	TSS	TBOD	Flow	TSS	TBOD	Flow	TSS	TBOD	TSS	TBOD	Flow	Flow	TSS	TBOD	Flow	TSS	TBOD	Flow	TSS	TBOD	TSS	TBOD
2001	190.8	290.7	276.7	186.8	51.4	107.6	91.2%	97.4%										2.4	1085	836	34.8	272	255	23.9	4.9	8.9	98.2%	97.7%
2002	174.0	311.4	287.5	172.9	51.8	113.4	87.2%	70.2%	4.8	376	365	4.8	7.7	8.8	97.9%	97.3%	0.80	2.5	1812	807								
2003	180.2	310.3	290.7	189.1	49.2	124.3	87.2%	86.9%	4.7			4.4					0.80	2.8	1315	421								
3-yr	185.8	300	287	184.4	51.4	117.5	87.6%	89.3%	4.7	376	365	4.7	7.7	8.8	97.9%	97.3%	0.81	2.5	1469	514	34.8	272	255	23.0	4.9	8.9	98.2%	97.7%
Model	227.3	320	192	226.7	53.8	118.9	84.9%	69.2%	15.6	376	365	13.7	7.7	8.8	---	---	1.51	1.9	1469	624	30.0	272	255	28.05	4.9	8.9	---	---

Project P-11.1 - Additional Biosolids Storage Silos

28% = Solids Content (%)
341,888 = Mass Production Rate (dry lb/d)
171 = Mass Production Rate (dry ton/d)
136,709 = Volumetric Production Rate (gpd) - VPR
18,276 = Volumetric Production Rate (ft^3/d) - VPR

2.83 = Maximum days of storage required

359,526 = Truck Storage Cap Required (gal)
48,084 = Truck Storage Cap Required (ft^3)

10 = Number of Silos Available
3 = Assumed Number of Silos in Operation
6,850 = Storage Capacity per Silo (ft^3)
51,268 = Storage Capacity per Silo (gal)
90% = Percent of Total Silo Capacity Available Operationally
80,040 = Total available capacity (ft^3)
374,299 = Total available capacity (gal)

0.96 = Required/Available — Should be less than or equal to 1 if sufficient capacity is available

Project P-11.9 - New Biosolids Truck Loadout Facility

Capacity Estimate

846 = Loadout Capacity per Bay (ft^3)
4,847 = Loadout Capacity per Bay (gallon)
90% = Percent of Total Loadout Capacity Available Operationally
2 = Number of Bays
25 = Loading Duration per Truck (min)
5 = Number of days of operation per week
8 = Number of hours operation per day
480 = Maximum Operating Minutes per day
11,197 = Maximum Daily Volumetric Disposal per Bay (ft^3) — Maximum Daily Mass Load Disposal per Bay (ft^3) = (Maximum Operating Minutes per day / Loading Duration per Truck (min)) * Loadout Capacity per Bay (ft^3)

18,276 = Volumetric Production Rate (ft^3/d) - VPR
25,595 = Daily disposal rate based on operational parameters noted above (ft^3/d)

1.14 = Required/Available — Should be equal to 1 if sufficient capacity is available

ATTACHMENT C

ESTIMATE OF TSS PRODUCTION FROM FERRIC CHLORIDE ADDITION

City of San Diego MWWD
Mass Balance and MBC CAMP Project
Calculation Sheet

Purpose

To determine the amount of TSS generated per pound of ferric chloride added at PLWTP

Given/Assumptions

Use the following simplified equation (assumes 100% removal of chem sludge):

$$TSSin + TSSchem = TSSps + TSSout$$

or

$$TSSchem = TSSps + TSSout - TSSin$$

$$TSSin = Qin \times C_{TSSin} \times 8.34$$

$$TSSout = Qout \times C_{TSSout} \times 8.34$$

$$Qout = Qin - Qps$$

$$M_{FeCl3} = Q_{FeCl3} \times SG \times 8.34 \times \text{Solution Strength}$$

where:
- TSSin = Daily TSS mass (lb/d) in the raw wastewater influent to PLWTP (pre-ferric addition)
- TSSchem = Daily TSS mass (lb/d) associated with ferric chloride addition (includes generation of hydroxides, sulfides, etc. and removal of soluble BOD colloids not typically associated with advance primary treatment
- TSSps = Daily TSS mass (lb/d) in the primary sludge sent to PLWTP digesters
- TSSout = Daily TSS mass (lb/d) in the PLWTP effluent
- C_{TSSin} = TSS concentration of raw wastewater influent to PLWTP (mg/L)
- C_{TSSout} = TSS concentration in the PLWTP effluent (mg/L)
- Qin = Annual average daily flow of PLWTP influent (mgd)
- Qout = Annual average daily flow of PLWTP effluent (mgd)
- Qps = Annual average daily flow of PLWTP primary sludge (mgd)
- Q_{FeCl3} = Annual average daily flow of ferric chloride used at PLWTP (gpd)
- SG = Specific gravity (relative to water)
- M_{FeCl3} = Daily mass of ferric chloride added at PLWTP (lb/d)

Ferric Chloride Quality

SG = 1.467 (based on assay of $FeCl_3$ solution delivered to PS2 on 1/28/03 - Order # 49747)

Solution Strength = 0.44 (based on assay of $FeCl_3$ solution delivered to PS2 on 1/28/03 - Order # 49747)

Calculations

Solving for TSSchem...

Calendar Year	Qin [1] (mgd)	C_{TSSin} [1] (mg/L)	TSSin (lb/d)	Qps [1] (mgd)	Qout (mgd)	C_{TSSout} [1] (mg/L)	TSSout (lb/d)	TSSps [1] (ton/d)	TSSps (lb/d)	TSSchem (lb/d)
2001	174.8	275	400,904	1.07	173.73	43	62,303	190	380,000	41,399
2002	168.9	287	404,276	1.11	167.79	44	61,572	189	378,000	35,297
2003	169.8	285	403,598	1.15	168.65	42	59,075	197	394,000	49,477

(1) Average annual daily values as reported in the 2001, 2002 and 2003 Point Loma Ocean Outfall Annual Monitoring Report

Ferric Chloride Added at PLWTP....

Calendar Year	Q_{FeCl3} [1] (gpy)	Q_{FeCl3} (gpd)	M_{FeCl3} (lb/d)
2001	2,398,457	6,571	35,374
2002	2,468,148	6,762	36,402
2003	2,864,716	7,849	42,251

(1) Average annual daily values as reported in the 2001, 2002 and 2003 Point Loma Ocean Outfall Annual Monitoring Report

Mass Ratios...

Calendar Year	TSSchem (lb/d)	M_{FeCl3} (lb/d)	Ratio TSSchem:M_{FeCl3}
2001	41,399	35,374	1.17
2002	35,297	36,402	0.97
2003	49,477	42,251	1.17
Average	42,058	38,009	1.10

<= Use this value for Mass Balance calculations

END OF CALCULATIONS